Planning Commission
Regular Meeting
March 3, 2026 - 7:00 PM
City Hall Council Chambers

AGENDA

CALL TO ORDER

PUBLIC PARTICIPATION

A. The Planning Commission Meeting scheduled for Tuesday, March 3, 2026, at 7:00 p.m. will be held in person and virtually.

Virtual Participation Link:
To listen to the meeting by phone or Zoom, please call the number below or click the link:
Join from PC, Mac, iPad, or Android:
https://us06web.zoom.us/j/82929793685
Phone one-tap:
+12532158782,,82929793685# US (Tacoma)
+12532050468,,82929793685# US
Join via audio:
+1 253 215 8782 US (Tacoma)
+1 253 205 0468 US
888 475 4499 US Toll Free
877 853 5257 US Toll Free
Webinar ID: 829 2979 3685

PLEDGE OF ALLEGIANCE

ROLL CALL

AGENDA MODIFICATIONS

PUBLIC COMMENT

This is the place on the agenda where the public is invited to speak to the Board on any issue.

A. The public can participate in-person or submit written comments in advance. Participants can submit written comments via mail or email. All written comments must be received prior to 5:00 p.m. on the day before the scheduled meeting and must be 350 words or less.

Please mail written comments to:
City of Auburn
Attn: Tammy Gallier, Administrative Specialist
25 W Main St
Auburn, WA 98001

Email written comments to: planning@auburnwa.gov

If an individual requires accommodation to allow for remote oral comment because of a difficulty attending a meeting of the governing body, the City requests notice of the need for accommodation by 5:00 p.m. on the day before the scheduled meeting. Participants can request accommodation to be able to provide a remote oral comment by contacting the Community Development Department in person, by phone (253) 931-3090 or by email (planning@auburnwa.gov.)

APPROVAL OF MINUTES

A. February 3, 2026 Draft Minutes from the Regular Planning Commission Meeting

BUSINESS ITEM #1

A. **Battery Energy Storage System (BESS) Code Update**
Staff Introduction/Presentation (Clark)
Staff will present the proposed development standards and land use approval pathways for BESS to Planning Commission for a recommendation to City Council.

B. **Public Hearing**

C. **Deliberate and Vote**

BUSINESS ITEM #2

A. **Critical Areas Ordinance Update**
Staff Introduction/Presentation (Tatro)
Staff will provide an update on the work being done to update the Critical Areas Ordinance, Chapter 16.10 ACC, specifically regarding stream regulations.

BUSINESS ITEM #3

A. **Downtown Design Standards and Code Update**
Staff Introduction/Presentation (Tatro)
Staff will provide an update on the public outreach conducted for the draft Downtown Design Standards and provide an overview of the changes made to Chapter 18.29 ACC.

BUSINESS ITEM #4

A. **Citywide Design Standards and Code Update**
Staff Introduction/Presentation (Reed)
Staff will provide an update on the public outreach conducted for the draft Citywide Design Standards and provide an overview of the associated code updates.

COMMUNITY DEVELOPMENT REPORT

ADJOURNMENT

The City of Auburn Planning Commission is a seven member advisory body that provides recommendations to the Auburn City Council on the preparation of and amendments to land use plans and related codes such as zoning. Planning Commissioners are appointed by the Mayor and

confirmed by the City Council.

Actions taken by the Planning Commission, other than approvals or amendments to the Planning Commission Rules of Procedure, are not final decisions; they are in the form of recommendations to the City Council which must ultimately make the final decision.

CITY OF AUBURN WASHINGTON

AGENDA BILL APPROVAL FORM

Agenda Subject:
February 3, 2026 Draft Minutes from the Regular Planning Commission Meeting

Meeting Date:
March 3, 2026

Department:
Community Development

Attachments:
2-3-2026 Planning Commission Meeting Minutes

Budget Impact:

Administrative Recommendation:

Background for Motion:

Background Summary:
See attached minutes.

Councilmember:

Staff: Jason Krum

Planning Commission
Regular Meeting
February 3, 2026 - 7:00 PM
City Hall Council Chambers

MINUTES

PUBLIC PARTICIPATION
The City of Auburn Planning Commission Meeting was held in person and virtually.

CALL TO ORDER
Chair Judi Roland called the meeting to order at 7:00 p.m. in the Council Chambers of Auburn City Hall, 25 West Main Street.

ROLL CALL
Commissioners present: Chair Judi Roland, Julie Berry, Aaron Vanderpol, Lynn Walters, and Kirk Hiller. Commissioner Ajay Ganesan arrived at 7:04 p.m. Commissioner William Stewart was excused.

Staff members present: Planning Services Manager Alexandria Teague, Senior Planner Alyssa Tatro, Senior Planner Dinah Reed, Planner II Gabriel Clark, Assistant City Attorney Chandra Hein, and Deputy City Clerk Rebecca Wood-Pollock.

PLEDGE OF ALLEGIANCE
Chair Roland led those in attendance in the Pledge of Allegiance.

PUBLIC COMMENT
No one came forward to speak.

AGENDA MODIFICATIONS
There were no modifications to the agenda.

APPROVAL OF MINUTES

A. January 6, 2026 Draft Minutes from the Regular Planning Commission Meeting

Commissioner Walters moved and Commissioner Vanderpol seconded to approve the January 6, 2026 Planning Commission Meeting minutes.

MOTION CARRIED UNANIMOUSLY. 5-0

OTHER BUSINESS

A. **Downtown Design Standards Update and associated Text Amendment (Tatro)**
Planning Commission to review the proposed updates to the Downtown Urban Center Design Standards.

Planner Tatro provided the Commission with the Downtown Design Standards Update and associated Text Amendment, including existing zoning districts, an overview of the changes, applicability, a Block Frontage Standards overview, transparency and visibility standards, usable residential recreation space, public plazas, parking lots, garages, and drive access, building massing and articulation, roofline design, building details, blank wall treatments, implications, and the next steps in the process.

The Commission discussed accessibility, transparency standards and advertising, public input, building costs, and existing standards.

B. **Citywide Design Review Standards Update and associated Text Amendments (Reed)**
Planning Commission to review the proposed updates to the Citywide (formerly Mixed-Use and Multifamily) Design Standards.

Planner Reed provided the Commission with the Citywide Design Review Standards Update and associated Text Amendments, including the purpose for the update, applicable locations, designated areas, Block Frontage Standards, minimum setbacks, mixed block frontages, mixed-use street corner standards, building massing and articulation, and parking.

The Commission discussed current construction, design standard purpose, zoning development standards, public and private spaces, trees and vegetation, transit lines, and affordable housing.

Chair Roland called for a recess at 8:16 p.m.
Chair Roland reconvened the meeting at 8:25 p.m.

C. **BESS Code Update (Clark)**
Planning Commission to review the proposed development standards for Battery Energy Storage Systems.

Planner Clark provided the Commission with the BESS Code Update, including objectives, the structure of the Supplemental Standards, General Standards, zoning maps, Tier I, Tier II, and Tier III Standards, and the proposed timeline.

The Commission discussed prohibitions, flood plains, noise pollution, electric vehicles, energy capacity, input from the Valley Regional Fire Authority, public input, the timeline, environmental review requirements, the Tier Standards, and necessity.

D. **Rules of Procedure (Hein)**
Planning Commission to review and adopt the 2026 Rules and Procedures and proposed amendments.

Attorney Hein presented the Commission with the final proposed version of the updated Planning Commission Rules of Procedure, including the Commission's approved changes and requested changes.

Commissioner Vanderpol moved and Commissioner Walters seconded to adopt the Planning Commission Rules of Procedure as presented.

MOTION CARRIED UNANIMOUSLY. 6-0

COMMUNITY DEVELOPMENT REPORT
Manager Teague shared an update on the GSA site to be a Home Depot lumber sorting site, and that the next meeting is scheduled for March 3, 2026.

The Commission discussed roundabout construction, road safety, and flood damage restoration at the Auburn Golf Course.

ADJOURNMENT
There being no further business to come before the Planning Commission, the meeting was adjourned at 9:21 p.m.

APPROVED this 3rd day of March, 2026.

_____ _____
JUDI ROLAND, CHAIR Rebecca Wood-Pollock, Deputy City Clerk

CITY OF AUBURN WASHINGTON

AGENDA BILL APPROVAL FORM

Agenda Subject:
Battery Energy Storage System (BESS) Code Update
Staff Introduction/Presentation (Clark)
Staff will present the proposed development standards and land use approval pathways for BESS to Planning Commission for a recommendation to City Council.

Meeting Date:
March 3, 2026

Department:
Community Development

Attachments:
Planning Commission Staff Report, Exhibit 1 - BESS Presentation, Exhibit 2 - ACC 18.04.174 Text Amendment, Exhibit 3 - ACC 18.07.020 Text Amendment, Exhibit 4 - ACC 18.23.030 Text Amendment, Exhibit 5 - Chapter 18.29 ACC Text Amendment, Exhibit 6 - ACC 18.31.240 Text Amendment, Exhibit 7 - ACC 18.35.030 Text Amendment, Exhibit 8 - 12/02/25 P.C. Memo, Exhibit 9 - 12/02/25 P.C. Presentation, Exhibit 10 - 01/06/26 P.C. Memo, Exhibit 11 - 01/06/26 P.C. Presentation, Exhibit 12 - 02/03/26 P.C. Memo, Exhibit 13 - 02/03/26 P.C. Presentation, Exhibit 14 - Public Comments

Budget Impact:

Administrative Recommendation:

Background for Motion:

Background Summary:
See attached Planning Commission Staff Report

Councilmember:

Staff: Jason Krum

PLANNING COMMISSION STAFF REPORT

AGENDA SUBJECT/TITLE:
Battery Energy Storage System Code Update

CITY FILE NO(s).:
ZOA24-0004

APPLICANT/AGENT/OWNERS:
City of Auburn

REQUEST:
Planning Commission to hold a public hearing, deliberate, and take action on the revised proposed regulations for Battery Energy Storage Systems.

LOCATION:
City-wide.

NOTIFICATION:
Hearing Notice was published in the Seattle Times and posted on the City's Land Use Notice webpage and physically at City Hall and City Hall Annex on February 20, 2026.

HEARING DATE:
March 3rd, 2026

SEPA STATUS:
A SEPA Environmental Checklist – Non-Project Action, was prepared by the City of Auburn as Lead Agency. A Determination of Non-Significance (DNS) was issued on January 28, 2026, with the appeal period expiring on February 25, 2026.

STAFF:
Gabriel Clark, Planner II, Dept. of Community Development
Planning@auburnwa.gov
253-470-2147

STAFF RECOMMENDATION:
Planning Commission to deliberate and take action to recommend to City Council approval of the Battery Energy Storage System Code Update text amendments included in this staff report as Exhibits 2 through 7. The proposed code updates modify Chapters 18.04 "Definitions," Chapter 18.07 "Residential Zones," Chapter 18.23 "Commercial and Industrial Zones," Chapter 18.29 "Downtown Urban Center District," Chapter 18.31 "Supplemental Development Standards," and Chapter 18.35 "Special Purpose Zones."

SUMMARY OF CODE CHANGES:
The proposal is a non-project action to amend portions of Title 18 "Zoning" Auburn City Code to regulate the development of Battery Energy Storage Systems within City limits. The proposed code changes include amendments to the following chapters.

- Chapter 18.04 ACC "Definitions"
- Chapter 18.07 ACC "Residential Zones"
- Chapter 18.23 ACC "Commercial and Industrial Zones"
- Chapter 18.29 ACC "Downtown Urban Center District"
- Chapter 18.31 ACC "Supplemental Development Standards"
- Chapter 18.35 ACC "Special Purpose Zones"

The proposed changes include defining BESS, designating proper land use approval pathways for each zone and tier, and the establishment of development standards specific to each tier of BESS. These amendments may permit Tier I (Accessory) in most zones with a capacity of up to 100 kWhs; may permit Tier II (Commercial/Industrial) in high density commercial, industrial and residential zones with a capacity of up to 4 MWhs through an administrative land use review process; and may permit Tier III (Regional/Utility) with capacities over 4 MW within the Heavy Commercial and Industrial zones through a conditional use permit process.

Based on the concerns made to staff by the Planning Commission, staff is proposing to prohibit Tier II systems in the Open Space Zone.

FINDINGS OF FACT:

Background Summary:
1. Battery Energy Storage Systems are systems which store and release electrical energy generated by the grid. These systems have increased in popularity in our region due to changing legislation and economic factors for end users. Enacted into law in 2019, Senate Bill (SB) 5116 defined specific milestones which require the State's electrical supply to be free of greenhouse gas emissions by 2045 (see Exhibit 8).

2. In 2021 Puget Sound Energy (PSE) published an Integrated Resource Plan which contains the Public Utility District's goals and policies over the next planning period for the agency. Of which Battery Energy Storage Systems are identified as a central component to the Utility's "Distributed Energy Resource" goals of providing 3,222 MW of capacity by 2045 (see Exhibit 8).

3. In 2021 PSE consulted with Power Systems Consultants to perform a qualitative and quantitative analysis for siting of possible energy storage systems within the PSE electrical system. This report identified several sites suitable for BESS in and near the City of Auburn (see Exhibit 8).

4. Staff is proposing new development regulations to coordinate the siting, construction, and installation of BESS within the City of Auburn.

5. Due to a lack of regulations, the City instituted a six-month moratorium and extension on the siting, construction, and operation of BESS within the City of Auburn. The moratorium and extension is set to expire on May 5, 2026.

6. Staff held a roundtable discussion on October 2, 2025, with labor unions, the Valley Regional Fire Authority, the Muckleshoot Indian Tribe, and Puget Sound Energy to gain a deeper understanding of this technology and its associated impacts.

Procedural Steps:

7. By authorization of the Revised Code of Washington (RCW) 36.70A.390, the City Council of Auburn established a six-month moratorium on the application, processing, or approval of Battery Energy Storage Systems by passage of Ordinance No. 6978 on May 5, 2025.

8. By authorization of RCW 36.70A.390 the City Council of Auburn extended the moratorium six additional months by passage of Ordinance No. 6995.

9. Staff discussed the proposed text amendments with the Planning Commission regular meetings on December 2, 2025, January 6, 2026, and February 3, 2026, respectively. Staff memos provided Planning Commission for the aforementioned meetings detail the purpose and scope of the amendments to Title 18 "Zoning" ACC (see Exhibits 8, 10, and 12).

10. In accordance to RCW 36.70A.106(1) the Planning Staff provided the proposed development regulations to the Department of Commerce for a 60-day comment review period on January 2, 2026, with a comment period deadline of March 3, 2026. The Department of Commerce acknowledged the request providing reference number 2026-S-11392. At the time this report was completed, the Department of Commerce did not provide any comments on the proposed text amendments.

11. A SEPA Environmental Checklist – Non-Project Action, was prepared by the City of Auburn as Lead Agency. A Determination of Non-Significance (DNS) was issued on January 28, 2026, with the appeal period expiring on February 25, 2026. Comments received are provided in Exhibit 14.

12. ACC 18.68.025 outlines what text amendments may be initiated by the City or the Public.
    A. *City-Initiated Text Amendments*
        1. The director of community development may initiate an amendment to the text of this title [Title 18] for the following purposes:
            a. Change the text to increase the consistency with the comprehensive plan in compliance with ACC 14.22.050, Conformance and consistency.
            b. Change the text in response to changes in state and/or federal laws.
            c. Change the text to correct errors, which are determined by the director of community development to be substantive and beyond the scrivener's error.
            d. Change the text to increase internal consistency if this title (Zoning).
        2. The mayor may request the director of community development to initiate an amendment to the text of this title, or by the request of the mayor on behalf of the city council or the planning commission.

B. *Public-Initiated Text Amendments*.

Any member of the public may submit an application requesting to amend the text of this title using the city's established application process.

13. Staff will pursue option ACC 18.68.025(A)(1)(b) *"change in text in response in state and/or federal laws"* as regulations pertaining to electrical storage systems (ESS) which include BESS have greatly expanded (see Exhibit 12).

14. ACC 18.68.030 outlines the procedural requirements to complete a Substantive Zoning Text Amendment.
B. A "Zoning Text Amendment" is an application to change the text of ACC Title 18. This type of application or initiation shall be processed as a legislative nonproject decision, consistent with ACC 14.03.060. Public notice shall be provided consistent with ACC Title 14.
1. Substantive Zoning Text Amendments. For the purposes of this chapter, substantive zoning text amendments shall be distinguished from procedural or administrative amendments in accordance with the following: "Substantive" matters relate to regulations that define or limit what can be done in terms of conduct, use or action (e.g., what land use may be made of property, what requirements apply to development, and what public infrastructure may be required of certain developments). "Procedural" or "administrative" matters are those that relate to the process of how an application to take such action must be pursued (e.g., time limits for decisions and appeals, what forms must be used, and where or how applications must be submitted. Essentially, "procedural" or "administrative" matters are the mechanical rules by which substantive issues may be pursued.) Substantive text amendments shall be reviewed by the planning commission, and the planning commission shall conduct a public hearing and make a recommendation before being presented to the city council for consideration and action.

15. A Notice of Public Hearing (NOH) will be issued on February 20, 2026. Pursuant to ACC18.68.030(B)(1), the following methods of noticing for the Planning Commission public hearing were conducted:
    a. The NOH was published in the Seattle Times on February 20, 2026.
    b. The NOH was posted in two general public locations (City Hall and City Annex).
    c. The NOH was posted on City's Public Land Use Notice webpage.

16. A public hearing is scheduled by the Planning Commission on March 3, 2026. The City has received any comments pertaining to the NOH, however Staff will provide any comments received to Planning commission at the time of the scheduled Public Hearing.

EXHIBITS:

1. BESS Presentation
2. ACC 18.04.174 Text Amendment
3. ACC 18.07.020 Text Amendment
4. ACC 18.23.020 Text Amendment
5. Chapter 18.29 ACC Text Amendment
6. ACC 18.31.240 Text Amendment
7. ACC 18.35.030 Text Amendment
8. 12/2/2025 Planning Commission Memo
9. 12/2/2025 Planning Commission Presentation
10. 1/6/2026 Planning Commission Memo
11. 1/6/2026 Planning Commission Presentation
12. 2/3/2026 Planning Commission Memo
13. 2/3/2026 Planning Commission Presentation
14. Public Comments Received

EXHIBIT 1

PLANNING COMMISSION

ENERGY STORAGE SYSTEM CODE UPDATE

PRESENTED BY
GABRIEL CLARK, PLANNER II
MARCH 3, 2026

Department of Community Development

Planning • Building • Development Engineering • Permit Center
Economic Development • Code Enforcement

AUBURN VALUES

SERVICE

ENVIRONMENT

ECONOMY

CHARACTER

SUSTAINABILITY

WELLNESS

CELEBRATION

PURPOSE

- Define tiers, separated by capacity
- Determine appropriate zones
- Determine appropriate land use approval pathways
- Coordinate existing regulations with proposed development standards

APPLICABLE REGULATIONS

- Washington Administrative Code (WAC) 51-54A- 1207
- International Fire Code (IFC) Chapter 12
- National Fire Protection Association
- City of Auburn Engineering Design Standards

TIER I



- Allowed as a Type I decision
- Stored energy capacity limited to 100 kWh
- Accessory to primary use

TIER II



- Allowed as a Type II decision
- Energy capacity up to 4 MWh
- Restricted to higher intensity land uses

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TIER III



Aerial view of the completed 250MW BESS at Torrens Island, South Australia. Image: Wärtsilä-AGL

- Allowed as a Type II or Type III decision
- Stored energy capacities in excess of 4 MWh
- Restricted to heavy commercial and industrial land uses

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ZONING CLASSIFICATION RESIDENTIAL

	RC	R-1	R-2	R-3	R-4	R-NM	R-F
Tier I	P	P	P	P	P	P	P
Tier II	X	X	X	A	A	A	X
Tier III	X	X	X	X	X	X	X

ZONING CLASSIFICATION
COMMERCIAL & INDUSTRIAL

	DUC	C-1	C-2	C-AG	M-1	M-2
Tier I	P	P	P	P	P	P
Tier II	A	A	A	A	A	A
Tier III	X	X	C	X	A	A

ZONING CLASSIFICATION
SPECIAL PURPOSE

	P-1	I	OS
Tier I	P	P	P
Tier II	A	A	X
Tier III	X	X	X

PUBLIC COMMENTS

- Concerns over fire safety
- Concerns over environmental precautions
- Concerns regarding the permitted thresholds

RECOMMENDATION

- Planning Commission to recommend to City Council approval of the Battery Energy Storage System text amendments included as Exhibits 2 through 7.

QUESTIONS?

Department of Community Development

Planning • Building • Development Engineering • Permit Center
Economic Development • Code Enforcement

AUBURN VALUES

SERVICE

ENVIRONMENT

ECONOMY

CHARACTER

SUSTAINABILITY

WELLNESS

CELEBRATION

Exhibit 2

Chapter 18.04
DEFINITIONS

Sections:

18.04.174 Battery energy storage system (BESS)

18.04.174 Battery energy storage systems (BESS)

"Battery energy storage systems" means a rechargeable energy storage system consisting of batteries, battery chargers, controls, and associated electrical equipment designed to store and distribute electrical power. These systems are typically used to provide standby or emergency power, an uninterruptable power supply, load shedding, load sharing, or similar capabilities.

The Auburn City Code is current through Ordinance 7002, passed October 6, 2025.

Disclaimer: The city clerk's office has the official version of the Auburn City Code. Users should contact the city clerk's office for ordinances passed subsequent to the ordinance cited above.

City Website: www.auburnwa.gov

Hosted by General Code.

EXHIBIT 3

18.07.020 Uses.

Table 18.07.020. Permitted Use Table – Residential Zones

P = Permitted A = Administrative C = Conditional Use X = Not Permitted							
Land Uses	**Zoning Designations**						
	RC	**R-1**	**R-2**	**R-3**	**R-4**	**R-NM**	**R-F**
A. Residential Uses.							
Accessory dwelling units subject to the provisions contained in Chapter 18.32 ACC	P[1]	P[1]	P[1]	P[1]	P[1]	P[1]	P[1]
Accessory use, residential	P	P	P	P	P	P	P
Adult family home	P	P	P	P	P	P[1]	P
Apartments (7 units or more)	X	X	X	P[11]	P	P	X
Bed and breakfast or short-term rentals	P	P	P	P	P	X	P
Caretaker apartment	X	X	X	X	X	P	X
Communal residence	P	P	P	P	P	X	P
Foster care homes	P	P	P	P	P	X	P
Group residence facilities (7 or more residents)	X	X	X	P	P	P	P
Group residence facilities (6 or fewer residents)	P	P	P	P	P	P	P
Keeping of animals[4]	P[2]	P[2]	P[2]	P[2]	P[2]	P[2]	P[2]
Middle housing subject to the provisions in Chapter 18.25 ACC (2 to 6 units)	P	P	P	P	P	P	P

P = Permitted A = Administrative C = Conditional Use X = Not Permitted							
Land Uses	**Zoning Designations**						
	RC	**R-1**	**R-2**	**R-3**	**R-4**	**R-NM**	**R-F**
Neighborhood recreational buildings and facilities owned and managed by the neighborhood homeowners' association	A[6]	A[6]	A[6]	A[6]	A[6]	P	P
Use as dwelling units of (1) recreational vehicles that are not part of an approved recreational vehicle park, (2) boats, (3) automobiles, and (4) other vehicles	X	X	X	X	X	X	X
Renting of rooms, for lodging purposes only, to accommodate not more than two persons in addition to the family or owner occupied unit[8]	P	P	P	P	P	P	P
Residential care facilities including but not limited to assisted living facilities, convalescent homes, continuing care retirement facilities	P	P	P	P	P	P	P
Single-unit detached dwellings, new	P	P	P	X	X	X	P
Supportive housing (permanent), subject to the provisions of ACC 18.31.160	P	P	P	P	P	P	P
Swimming pools, tennis courts and similar outdoor recreation uses only accessory to residential or park uses	P	P	P	P	P	P	P
Townhouses (attached)	X	X	X	X	P	P	P
Transitional housing	P	P	P	P	P	P	P
B. Commercial Uses.							

P = Permitted A = Administrative C = Conditional Use X = Not Permitted							
Land Uses	**Zoning Designations**						
	RC	**R-1**	**R-2**	**R-3**	**R-4**	**R-NM**	**R-F**
Commercial horse riding and bridle trails	A	X	X	X	X	X	X
Commercial recreation facility, indoor	X	X	X	X	P	P	X
Commercial retail establishment	X	X	A	A	P	P	A
Convenience store	X	X	X	X	P	P	X
Daycare, limited to a mini daycare center. Daycare center, preschool or nursery school may also be permitted but must be located on an arterial	X	P	P	P	P	P	P
Grocery or specialty food store	X	X	X	A	P	P	A
Home-based (or family) daycare as regulated by RCW 35.63.185 and through receipt of approved city business license	P	P	P	P	P	P	P
Home occupations subject to compliance with Chapter 18.60 ACC	P	P	P	P	P	P	P
Marijuana cooperative	X	X	X	X	X	X	X
Marijuana processor	X	X	X	X	X	X	X
Marijuana producer	X	X	X	X	X	X	X
Marijuana-related business	X	X	X	X	X	X	X
Marijuana researcher	X	X	X	X	X	X	X
Marijuana retailer	X	X	X	X	X	X	X

P = Permitted A = Administrative C = Conditional Use X = Not Permitted							
Land Uses	**Zoning Designations**						
	RC	**R-1**	**R-2**	**R-3**	**R-4**	**R-NM**	**R-F**
Marijuana transporter business	X	X	X	X	X	X	X
Mixed-use development[310]	X	X	X	P	P	P	P
Personal service shop	X	X	A	P	P	P	P
Nursing homes	X	X	X	X	C	C	C
Privately owned and operated parks and playgrounds and not homeowners' association-owned recreational area	X	A	A	A	A	P	P
Professional offices	X	X	A	A	P[9]	P	P
Restaurant, café, or coffee shop	X	X	A	A	P	P	A
Neighborhood retail establishment	X	X	A	A	P	P	P
C. Resource Uses.							
Agricultural enterprise:[7]							
When 50 percent, or more, of the total site area is dedicated to active agricultural production during the growing season, and with 52 or less special events per calendar year	A[7]	X	X	X	X	X	X
When less than 50 percent of the total site area is dedicated to active agricultural production during the growing season, or with more than 52 special events per calendar year	C[7]	X	X	X	X	X	X

P = Permitted A = Administrative C = Conditional Use X = Not Permitted							
Land Uses	**Zoning Designations**						
	RC	**R-1**	**R-2**	**R-3**	**R-4**	**R-NM**	**R-F**
Agricultural type uses are permitted provided they are incidental and secondary to the single-family use:							
Agricultural crops and open field growing (commercial)	P	X	X	X	X	X	X
Barns, silos and related structures	P	X	X	X	X	X	X
Commercial greenhouses	P	X	X	X	X	X	X
Pasturing and grazing[4]	P	X	X	X	X	X	X
Public and private stables[4]	P	X	X	X	X	X	X
Roadside stands, for the sale of agricultural products raised on the premises. The stand cannot exceed 300 square feet in area and must meet the applicable setback requirements.	P	X	X	X	X	X	X
Fish hatcheries	C	X	X	X	X	X	X
D. Government, Institutional, and Utility Uses.							
Civic, social and fraternal clubs	X	X	X	X	A	A	A
Government facilities	A	A	A	A	A	A	A
Hospitals (except animal hospitals)	X	X	X	X	X	C	C
Municipal parks and playgrounds	A	P	P	P	P	P	P

P = Permitted A = Administrative C = Conditional Use X = Not Permitted							
Land Uses	**Zoning Designations**						
	RC	**R-1**	**R-2**	**R-3**	**R-4**	**R-NM**	**R-F**
Museums	X	X	X	X	A	A	A
Religious institutions, less than one acre lot size[12]	A	A	A	A	A	A	A
Religious institutions, one acre or larger lot size[12]	C	C	C	C	C	C	C
Transmitting towers	C	C	C	C	C	C	C
Type 1-D wireless communications facility (see ACC 18.04.912(W) and 18.31.100)	P	P	P	P	P	P	P
Eligible facilities request (EFR) (wireless communications facility – See ACC 18.04.912(H))	P	P	P	P	P	P	P
Utility facilities and substations	C[5]	C[5]	C[5]	C[5]	C[5]	C[5]	C[5]
Battery Energy Storage Systems, Tier I	P[13]	P[13]	P[13]	P[13]	P[13]	P[13]	P[13]
Battery Energy Storage Systems, Tier II	X	X	X	A[13]	A[13]	A[13]	x
Battery Energy Storage Systems, Tier III	X	X	X	X	X	X	X
Small wireless facilities (ACC 18.04.912(Q))	P	P	P	P	P	P	P

1 An accessory dwelling unit may be permitted with an existing single-unit residence pursuant to Chapter 18.32 ACC.

2 Please see the supplemental development standards for animals in ACC 18.31.220.

3 Individual uses that make up a mixed-use development must be permitted within the zone. If a use making up part of a mixed-use development requires an administrative or conditional use permit, the individual use must apply for and receive the administrative or conditional use approval, as applicable.

4 Proximity of pasture or livestock roaming area to wells, surface waters, and aquifer recharge zones is regulated by the King or Pierce County board of health, and property owners shall comply with the provisions of the board of health code.

5 Excludes all public and private utility facilities addressed under ACC 18.02.040(E).

6 Administrative use permit not required when approved as part of a subdivision or binding site plan.

7 Agricultural enterprise uses are subject to supplemental development standards under ACC 18.31.210, Agricultural enterprises development standards.

8 An owner occupant that rents to more than two persons but no more than four persons is required to obtain a city of Auburn rental housing business license and shall meet the standards of the International Property Maintenance Code.

9 As component of mixed-use developments and/or office ground floor uses permitted up to 5,000 square feet.

10 Commercial uses permitted outright, or allowed administratively or conditionally in this table may be allowed as part of mixed-use development.

11 Apartment buildings and mixed-use development consisting of no more than 20 units and three stories per lot is permitted.

12 Reference ACC 18.31.165 for standards related to homeless encampments hosted by a religious organization.

13 Reference ACC 18.31.240 for standards related to Battery Energy Storage Systems (BESS).

(Ord. 6977 § 1 (Exh. A), 2025; Ord. 6959 § 1 (Exh. A), 2024; Ord. 6799 § 5 (Exh. E), 2020; Ord. 6642 § 4, 2017; Ord. 6600 § 9, 2016; Ord. 6565 § 2, 2015; Ord. 6560 § 9, 2015; Ord. 6477 § 8, 2013; Ord. 6369 § 2, 2011; Ord. 6363 § 3, 2011; Ord. 6269 § 3, 2009; Ord. 6245 § 5, 2009.)

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18.23.030 Uses.

A. *General Permit Requirements.* Table 18.23.030 identifies the uses of land allowed in each commercial and industrial zone and the land use approval process required to establish each use.

B. *Requirements for Certain Specific Land Uses.* Where the last column (Standards for Specific Land Uses) in Table 18.23.030 includes a reference to a code section number, the referenced section determines other requirements and standards applicable to the use regardless of whether it is permitted outright or requires an administrative or conditional use permit.

C. *Uses Affected by the Airport Overlay.* Refer to Chapter 18.38 ACC to determine whether uses are separately prohibited by that chapter or will be required to comply with additional regulations that are associated with the airport overlay.

Table 18.23.030. Permitted, Administrative, Conditional and Prohibited Uses by Zone, Commercial and Industrial Zones

PERMITTED, ADMINISTRATIVE, CONDITIONAL AND PROHIBITED USES BY ZONE						**P – Permitted** **C – Conditional** **A – Administrative** **X – Prohibited**
LAND USE	**Zoning Designation**					**Standards for Specific Land Uses**
	C-1	**C-2**	**C-AG**	**M-1**	**M-2**	
INDUSTRIAL, MANUFACTURING AND PROCESSING, WHOLESALING						
Building contractor, light	X	P	X	P	P	
Building contractor, heavy	X	X	X	A	P	
Manufacturing, assembling and packaging – Light intensity	X	P	X	P	P	ACC 18.31.180

PERMITTED, ADMINISTRATIVE, CONDITIONAL AND PROHIBITED USES BY ZONE						P – Permitted C – Conditional A – Administrative X – Prohibited
LAND USE	**Zoning Designation**					**Standards for Specific Land Uses**
	C-1	**C-2**	**C-AG**	**M-1**	**M-2**	
Manufacturing, assembling and packaging – Medium intensity	X	A	X	P	P	ACC 18.31.180
Manufacturing, assembling and packaging – Heavy intensity	X	X	X	X	A	ACC 18.31.180
Marijuana processor	X	X	X	C	C	Chapter 18.59 ACC
Marijuana producer	X	X	X	C	C	Chapter 18.59 ACC
Marijuana researcher	X	X	X	C	C	Chapter 18.59 ACC
Marijuana retailer	X	C	X	C	C	Chapter 18.59 ACC
Marijuana transporter business	X	X	X	C	C	Chapter 18.59 ACC
Outdoor storage, incidental to principal permitted use on property	X	P	X	P	P	ACC 18.57.020(A)
Storage – Personal household storage facility (mini-storage)	P	P	X	P	P	ACC 18.57.020(B)
Warehousing and distribution	X	X	X	P	C	ACC 18.57.020(C)
Warehousing and distribution, bonded and located within a designated foreign trade zone	X	P	X	P	P	

PERMITTED, ADMINISTRATIVE, CONDITIONAL AND PROHIBITED USES BY ZONE						P – Permitted C – Conditional A – Administrative X – Prohibited
LAND USE	**Zoning Designation**					**Standards for Specific Land Uses**
	C-1	**C-2**	**C-AG**	**M-1**	**M-2**	
Wholesaling with on-site retail as an incidental use (e.g., coffee, bakery)	X	P	X	P	P	
RECREATION, EDUCATION AND PUBLIC ASSEMBLY USES						
Commercial recreation facility, indoor	P	P	P	P	A	
Commercial recreation facility, outdoor	X	A	A	P	A	ACC 18.57.025(A)
Conference/convention facility	X	A	X	A	X	
Library, museum	A	A	X	A	X	
Meeting facility, public or private	P	P	X	A	A	
Movie theater, except drive-in	P	P	P	X	X	
Private school – Specialized education/training (for profit)	A	P	P	P	P	
Religious institutions, lot size less than one acre	P	P	A	A	A	ACC 18.31.165
Religious institutions, lot size more than one acre	P	P	A	A	A	ACC 18.31.165
Sexually oriented businesses	X	P	X	P	P	Chapter 18.74 ACC

PERMITTED, ADMINISTRATIVE, CONDITIONAL AND PROHIBITED USES BY ZONE						P – Permitted C – Conditional A – Administrative X – Prohibited
LAND USE	**Zoning Designation**					**Standards for Specific Land Uses**
	C-1	**C-2**	**C-AG**	**M-1**	**M-2**	
Sports and entertainment assembly facility	X	A	X	A	A	
Studio – Art, dance, martial arts, music, etc.	P	P	P	P	A	
RESIDENTIAL						
Apartment units, as part of a mixed-use development [2]	X	P	P	P	X	ACC 18.57.030
Apartments, standalone	X	X	X	X	X	
Caretaker apartment	P	P	X	P	P	
Indoor emergency housing or shelter	P	P	P	A	A	ACC 18.31.160
Live/work unit, as part of a mixed-use development [2]	X	P	P	P	X	
Live/work unit, standalone [3]	X	X	X	X	X	
Work/live unit, as part of a mixed-use development [2]	X	P	P	P	X	
Work/live unit, standalone [3]	X	X	X	X	X	
Marijuana cooperative	X	X	X	X	X	

PERMITTED, ADMINISTRATIVE, CONDITIONAL AND PROHIBITED USES BY ZONE						P – Permitted C – Conditional A – Administrative X – Prohibited
LAND USE	**Zoning Designation**					**Standards for Specific Land Uses**
	C-1	**C-2**	**C-AG**	**M-1**	**M-2**	
Nursing home, assisted living facility	P	P	C	X	X	
Senior housing[2]	X	A	X	X	X	
Supportive housing (permanent)	P	P	P	A	A	ACC 18.31.160
Transitional housing	P	P	P	A	A	ACC 18.31.160
RETAIL						
Building and landscape materials sales	X	P	X	P	P	ACC 18.57.035(A)
Community retail establishment	P	P	P	P	P	
Construction and heavy equipment sales and rental	X	X	X	A	P	
Convenience store	A	P	X	P	P	
Drive-through espresso stands	A	P	A	P	A	
Drive-through facility, including banks and restaurants	A	P	P	P	P	ACC 18.52.040
Entertainment, commercial	A	P	X	A	A	
Groceries, specialty food stores	P	P	P	P	X	

PERMITTED, ADMINISTRATIVE, CONDITIONAL AND PROHIBITED USES BY ZONE						P – Permitted C – Conditional A – Administrative X – Prohibited
LAND USE	**Zoning Designation**					**Standards for Specific Land Uses**
	C-1	**C-2**	**C-AG**	**M-1**	**M-2**	
Neighborhood retail establishment	P	P	P	P	P	
Nursery	X	P	A	P	P	ACC 18.57.035(C)
Outdoor displays and sales associated with a permitted use (auto/vehicle sales not included in this category)	P	P	P	P	P	ACC 18.57.035(D)
Regional retail establishment	X	P	P	P	A	
Restaurant, cafe, coffee shop	P	P	P	P	P	
Tasting room	P	P	P	P	P	
Tavern	P	P	P	P	A	
Wine production facility, small craft distillery, small craft brewery	P	P	P	P	P	
SERVICES						
Animal daycare (excluding kennels and animal boarding)	A	P	A	P	P	ACC 18.57.040(A)
Animal sales and services (excluding kennels and veterinary clinics)	P	P	P	P	P	ACC 18.57.040(B)

PERMITTED, ADMINISTRATIVE, CONDITIONAL AND PROHIBITED USES BY ZONE						P – Permitted C – Conditional A – Administrative X – Prohibited
LAND USE	**Zoning Designation**					**Standards for Specific Land Uses**
	C-1	**C-2**	**C-AG**	**M-1**	**M-2**	
Banking and related financial institutions, excluding drive-through facilities	P	P	P	P	P	
Catering service	P	P	A	P	P	
Daycare, including mini daycare, daycare center, preschools or nursery schools	P	P	P	P	X	
Dry cleaning and laundry service (personal)	P	P	P	P	P	
Equipment rental and leasing	X	P	X	P	P	
Kennel, animal boarding	X	A	X	A	A	ACC 18.57.040(C)
Government facilities; this excludes offices and related uses that are permitted outright	A	A	A	A	A	
Hospital	P	P	X	P	P	
Lodging – Hotel or motel	P	P	P	A	A	
Medical – Dental clinic	P	P	P	P	X	
Mortuary, funeral home, crematorium	P	P	X	P	X	
Personal service shops	P	P	P	P	X	

PERMITTED, ADMINISTRATIVE, CONDITIONAL AND PROHIBITED USES BY ZONE						P – Permitted C – Conditional A – Administrative X – Prohibited
LAND USE	**Zoning Designation**					**Standards for Specific Land Uses**
	C-1	**C-2**	**C-AG**	**M-1**	**M-2**	
Pharmacies	P	P	P	X	X	
Print and copy shop	P	P	P	P	X	
Printing and publishing (of books, newspaper and other printed matter)	A	P	P	P	P	
Professional offices	P	P	P	P	P	
Repair service – Equipment, appliances	A	P	P	P	P	ACC 18.57.040(D)
Veterinary clinic, animal hospital	P	P	P	P	X	
Youth community support facility	P	X	X	X	X	ACC 18.57.040(E)
TRANSPORTATION, COMMUNICATIONS AND INFRASTRUCTURE						
Ambulance, taxi, and specialized transportation facility	X	A	X	P	P	
Broadcasting studio	P	P	X	P	P	
Heliport	X	C	X	C	C	
Motor freight terminal[1]	X	X	X	X	X	See Footnote No. 1
Parking facility, public or commercial, surface	P	P	P	P	X	

PERMITTED, ADMINISTRATIVE, CONDITIONAL AND PROHIBITED USES BY ZONE						P – Permitted C – Conditional A – Administrative X – Prohibited
LAND USE	**Zoning Designation**					**Standards for Specific Land Uses**
	C-1	**C-2**	**C-AG**	**M-1**	**M-2**	
Parking facility, public or commercial, structured	P	P	P	P	X	
Battery Energy Storage Systems, Tier I	P	P	P	P	P	ACC 18.31.240
Battery Energy Storage Systems, Tier II	A	A	A	A	A	ACC 18.31.240
Battery Energy Storage Systems, Tier III	X	C	X	A	A	ACC 18.31.240
Towing storage yard	X	X	X	A	P	ACC 18.57.045(A)
Utility transmission or distribution line or substation	A	A	A	A	A	
Wireless communications facility (WCF) (See ACC 18.04.912(W))	*	*	*	*	*	*See ACC 18.31.100 for use regulations and zoning development standards.
Eligible facilities request (EFR) (wireless communications facility) (See ACC 18.04.912(H))	P	P	P	P	P	
Small wireless facilities (ACC 18.04.912(Q))	P	P	P	P	P	
VEHICLE SALES AND SERVICES						

PERMITTED, ADMINISTRATIVE, CONDITIONAL AND PROHIBITED USES BY ZONE						**P – Permitted** **C – Conditional** **A – Administrative** **X – Prohibited**
LAND USE	**Zoning Designation**					**Standards for Specific Land Uses**
	C-1	**C-2**	**C-AG**	**M-1**	**M-2**	
Automobile washes (automatic, full or self-service)	A	P	P	P	P	ACC 18.57.050(A)
Auto parts sales with installation services	A	P	P	P	P	
Auto/vehicle sales and rental	A	P	X	P	P	ACC 18.57.050(B)
Fueling station	A	P	P	P	P	ACC 18.57.050(C)
Mobile home, boat, or RV sales	X	P	X	P	P	
Vehicle services – Repair/body work	X	P	X	P	P	ACC 18.57.050(D)
OTHER						
Any commercial use abutting a residential zone which has hours of operation outside of the following: Sunday: 9:00 a.m. to 10:00 p.m. or Monday – Saturday: 7:00 a.m. to 10:00 p.m.	A	A	A	A	A	
Other uses may be permitted by the planning director or designee if the use is determined to be consistent with the intent of the zone and is of the same general character of the uses permitted. See ACC 18.02.120(C)(6), Unclassified Uses.	P	P	P	P	P	

1 Any motor freight terminal, as defined by ACC 18.04.635, in existence as of the effective date of the ordinance codified in this section, is an outright permitted use in the M-1 and M-2 zones. Any maintenance,

alterations and additions to an existing motor freight terminal which are consistent with ACC 18.23.040, Development standards, are allowed.

2 Any mixed-use development or senior housing project vested prior to Resolution No. 5187 (December 7, 2015) is an outright permitted use in the C-1 zone. Subsequently, if a nonresidential use within a vested mixed-use development changes, then the nonresidential use shall maintain a minimum of 10 percent of the cumulative building ground floor square footage consisting of the uses permitted outright, administratively, or conditionally, listed under "Recreation, Education, and Public Assembly," "Retail," or "Services" of the C-1 zone.

3 Any standalone live/work units or standalone work/live units vested prior to the effective date of the ordinance codified in this chapter are outright permitted uses.

(Ord. 6977 § 1 (Exh. A), 2025; Ord. 6959 § 1 (Exh. A), 2024; Ord. 6885 § 1 (Exh. A), 2022; Ord. 6838 § 1 (Exh. A), 2021; Ord. 6799 § 6 (Exh. F), 2020; Ord. 6728 § 3 (Exh. C), 2019; Ord. 6688 § 1 (Exh. 1), 2018; Ord. 6644 § 2, 2017; Ord. 6642 § 9, 2017; Ord. 6508 § 1, 2014; Ord. 6433 § 26, 2012.)

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EXHIBIT 5

Chapter 18.29
DUC DOWNTOWN URBAN CENTER DISTRICT

Sections:

18.29.050 Use limitations.
18.29.053 Uses/activities requiring an administrative use permit.

18.29.050 Use limitations.

Hereafter, all buildings, structures or properties may be used for any use, unless specifically prohibited herein. Ground floor retail, restaurants and/or office use is required for all building frontages facing Main Street. All uses shall be subject to review and approval by the director. The following uses are prohibited:

A. Sexually oriented businesses as defined in Chapter 18.74 ACC.

B. All industrial uses as defined in the North American Industrial Classification System (2022 Edition), categories 48 through 49 (transportation), 31 through 33 (manufacturing) and 42 (wholesale trade).

C. Outdoor storage of materials and equipment (except during active construction projects).

D. New automobile maintenance and repair businesses.

E. Work release facilities; secure community transition facilities.

F. Wrecking yards.

G. Solid waste transfer stations.

H. Car washes.

I. New gasoline stations.

J. Street-level ministorage.

K. Outdoor sales of vehicles, boats or equipment.

L. Drive-in/drive-through facilities with direct vehicular driveway access onto Main Street.

M. All marijuana-related businesses and marijuana cooperatives.

N. New single-unit detached dwellings; except for DUC neighborhood residential district.

O. Battery Energy Storage Systems, Tier III.

PO. Other uses may be prohibited by the director if the use is determined to be inconsistent with the intent of this zone or is of the same general character of the other prohibited uses listed in this section. (Ord. 6959 § 1 (Exh. A), 2024; Ord. 6642 § 10, 2017; Ord. 6071 § 6 (Exh. A), 2007.)

18.29.053 Uses/activities requiring an administrative use permit.

The following uses/activities may be permitted when an administrative use permit has been issued pursuant to the provisions of Chapter 18.64 ACC:

A. Expansions of existing automobile maintenance and repair businesses;

B. Expansions of existing gasoline stations;

C. Animal daycare businesses that feature outdoor exercise areas and/or kennels;

D. Wine production facility; small craft distillery; small craft brewery; and a tasting room is an outright allowed use in the DUC zone;.

E. Battery Energy Storage Systems, Tier II[2] (Ord. 6368 § 8, 2011; Ord. 6269 § 32, 2009.)

2 Battery Energy Storage Systems, Tier II shall comply with the supplemental standards contained in ACC 18.31.240.

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EXHIBIT 6

Chapter 18.31

SUPPLEMENTAL DEVELOPMENT STANDARDS

Sections:

18.31.240 Battery energy storage systems (BESS)

18.31.240 Battery energy storage systems (BESS)

A. *Purpose.* The requirements contained in this section are intended to capture the minimum requirements set by International Code Councils, National Laboratories, and State Law. This section contains general and specific standards applicable to all BESS, and specific standards for each tier of BESS.

B. *General Standards.*

1. Adoption by reference. WAC 51-54A-1207 including any amendments thereto, are adopted by reference as if fully set forth in addition to IBC, IFC, and NFPA.

2. Setbacks. BESS shall comply with the minimum setback requirements of the underlying zoning district.

3. Noise. Average operational noises heard at the property line to adjacent land uses shall subject to Chapter 8.28 ACC and be limited to;

a. Residential: 60 decibels.

b. Commercial: 65 decibels.

c. Industrial: 70 decibels.

4. Safety. BESS and equipment shall be UL 9540 certified in accordance with IFC 1207.

5. Floodplain. BESS sited on properties which contain the 100-year floodplain or Special Flood Hazard Area (SFHA) shall be subject to the definitions and minimum development standards contained in Chapter 15.68 ACC.

6. Critical Areas. In areas which contain regulated critical areas defined in Chapter 16.10 ACC, BESS shall be subject to the standard buffer widths, applicable to each critical area.

7. Supplemental Information Required for Applications. For BESS installations that surpass the energy storage capacities identified in the Threshold Quantities table of WAC 51-54A-1207 the permit application shall contain the following information:

a. Construction Documents. The applicant shall include all information specified in WAC 51-54A-1207.

b. Commissioning Plan. The applicant shall submit a commissioning plan consistent with the requirements of WAC 51-54A-1207.

c. Decommissioning Plan. The applicant shall submit a decommissioning plan consistent with the requirements of WAC 51-54A-1207.

d. Hazard Mitigation Analysis. The applicant shall submit a hazard mitigation analysis consistent with the requirements of WAC 51-54A-1207.

C. *BESS, Tier I.*

1. Capacity Threshold. BESS, Tier I shall be limited to 100 kWh of total system capacity.

2. Location. BESS, Tier I may be installed only in the following locations as specified in WAC 51-54A-1207:

a. Within utility closets, basements, and storage or utility spaces.

b. In attached or detached garages and detached accessory structures.

c. On exterior walls.

d. Outdoors on the ground.

3. Screening. If installed exterior to the structure, BESS, Tier I shall be screened from the public right-of-way and located behind the extent of the front façade of the primary structure on the property.

D. BESS, Tier II and BESS, Tier III

1. Capacity Threshold. BESS, Tier II shall not exceed a total energy capacity of 4 MWh. BESS Tier, III includes systems with a total energy capacity beyond 4 MWhs.

2. System Testing. Large-scale fire testing shall be conducted on a representative BESS in accordance with UL 9540A by the methods contained in Chapter 12 IFC.

3. Location. If located within rooms, areas, or walk in structures shall not exceed the maximum allowable quantities contained in WAC 51-54A-1207.

4. Fencing. BESS that do not occur within an enclosed principle structure shall be fenced with a self-locking gate in accordance to Chapter 12 IFC. Fencing shall comply with ACC 18.31.020 applicable to the zone which the site is located.

5. Vegetation Control. Areas within 10 feet on each site of outdoor BESS shall be cleared of combustible vegetation and other combustible growth per Chapter 12 IFC .

6. Secondary Containment and Spill Neutralization. Secondary containment facilities shall meet the applicable standards contained in the current National Pollutant Discharge Elimination System (NPDES) and the City of Auburn Engineering Design Standards and as amended. Secondary spill containment and neutralization shall comply with Chapter 12 IFC.

7. Access. Where access to a tier II Facility is provided from a street that would otherwise function as a dead-end, a minimum of one secondary emergency vehicle access EVA route shall be provided to allow alternate emergency repose access and staging.

The secondary emergency vehicle access shall be designed and constructed in accordance with the City of Auburn Engineering Design Standards and applicable fire code requirements and shall provide a continuous, unobstructed route suitable for emergency vehicle operations.

8. Hydrant Spacing. Hydrant spacing shall meet the minimum requirements for commercial structures in the City of Auburn Engineering Design Standards and as amended.

9. Insurance. The permit applications shall contain the information cited by ACC 18.31.240(B)(7) including:

a. Insurance. The owner and/or operator of the BESS facility shall maintain insurance for the project with the City of Auburn named as co-insured. The insurance shall cover the estimated costs associated to decommissioning activities specified by the decommissioning plan. The insurance policy shall be active for life of the facility or until all requirements of the decommissioning plan are satisfied. Proof of insurance shall be provided to the City of Auburn.

i. Abandonment. BESS shall be considered abandoned when it ceases to operate consistently or when permits issued for the facility have been suspended or revoked. If the owner and/or operator fails to

comply with decommissioning upon any abandonment, the City of Auburn may, at its discretion, enter the property and utilize the available insurance for the removal of the facility and restore the site in accordance with the approved decommissioning plan.

10. Land Use Decision. In respect to the land use decision required by the applicable zoning district, by authorization of an administrative use or conditional use permit, the planning director or designee, or hearing examiner may attach thereto conditions regarding the location, character, and other features of the proposed structure or use as they may deem necessary to carry out the intent and purpose of this title and in the public interest.

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EXHIBIT 7

18.35.030 Uses.

A. *General Permit Requirements.* Table 18.35.030 identifies the uses of land allowed in each special purpose zone and the planning permit required to establish each use.

B. *Requirements for Certain Specific Land Uses.* Where the last column (Standards for Specific Land Uses) in Table 18.35.030 includes a section number, the referenced section determines other requirements and standards applicable to the use regardless of whether it is permitted outright or requires an administrative or conditional use permit.

Table 18.35.030. Permitted, Administrative, Conditional and Prohibited Uses by Zone

Permitted, Administrative, Conditional and Prohibited Uses by Zone				**P – Permitted** **C – Conditional** **A – Administrative** **X – Prohibited**
LAND USE	**Zoning Designations**			**Standards for Specific Land Uses**
	P-1	**I**	**OS**	
MARIJUANA-RELATED BUSINESSES				
Marijuana processor	X	X	X	
Marijuana producer	X	X 18.	X	
Marijuana researcher	X	X	X	
Marijuana retailer	X	X	X	
Marijuana transporter business	X	X	X	

Permitted, Administrative, Conditional and Prohibited Uses by Zone				P – Permitted C – Conditional A – Administrative X – Prohibited
LAND USE	**Zoning Designations**			**Standards for Specific Land Uses**
	P-1	**I**	**OS**	
PUBLIC				
Animal shelter, public	P	X	X	
Government facilities; this excludes offices and related uses that are permitted outright	P	P	C	
Municipal parks and playgrounds	P	P	P	
RECREATION, EDUCATION AND PUBLIC ASSEMBLY				
Campgrounds	X	P	P	
Recreational vehicle parks, private	X	P	X	
Cemetery, public	P	A	X	
Cemetery, private	X	A	X	
College, university, public	A	A	X	
Commercial recreation facility – Indoor	X	P	X	
Commercial recreation facility – Outdoor	X	A	C	ACC 18.57.025(A)
Conference/convention facility	X	A	X	

Permitted, Administrative, Conditional and Prohibited Uses by Zone				P – Permitted C – Conditional A – Administrative X – Prohibited
LAND USE	**Zoning Designations**			**Standards for Specific Land Uses**
	P-1	**I**	**OS**	
Library, museum	P	P	A	
Meeting facility, public or private	P	P	A	
Private school – specialized education/training (for profit)	X	P	X	
Public schools (K-12) and related facilities	P	X	X	
Religious institutions, lot size less than one acre	X	P	X	
Religious institutions, lot size more than one acre	X	P	X	
Studio – Art, dance, martial arts, music, etc.	X	X	X	
RESIDENTIAL				
Middle housing subject to the provisions in Chapter 18.25 ACC (2 to 6 units)	X	A[1]	X	
Home occupation	X	P	P	Chapter 18.60 ACC
Live/work, work/live unit	X	A	X	
Apartments (7 or more units)	X	A[2]	X	
One single-unit detached dwelling	X	X	P[4]	

Permitted, Administrative, Conditional and Prohibited Uses by Zone				P – Permitted C – Conditional A – Administrative X – Prohibited
LAND USE	**Zoning Designations**			**Standards for Specific Land Uses**
	P-1	**I**	**OS**	
Nursing home, assisted living facility	X	P	X	
Senior housing	X	A	X	
RETAIL				
Marijuana cooperative	X	X	X	
Restaurant, cafe, coffee shop, excluding drive-through facilities	P	A	X	
SERVICES				
Banking and related financial institutions, excluding drive-through facilities[3]	X	X	X	
Daycare, including mini daycare, daycare center, preschools or nursery schools	X	P	A	
Home-based daycare	X	P	P	
Medical services – Clinic or urgent care[3]	X	X	X	
Mortuary, funeral home, crematorium	X	X	X	
Professional offices	X	A	A	

Permitted, Administrative, Conditional and Prohibited Uses by Zone				P – Permitted C – Conditional A – Administrative X – Prohibited
LAND USE	**Zoning Designations**			**Standards for Specific Land Uses**
	P-1	**I**	**OS**	
Personal service shops	X	X	X	
Pharmacies	X	X	X	
TRANSPORTATION, COMMUNICATIONS AND INFRASTRUCTURE				
Battery Energy Storage Systems, Tier I	P	P	P	See ACC 18.31.240
Battery Energy Storage Systems, Tier II	A	A	X	See ACC 18.31.240
Battery Energy Storage Systems, Tier III	X	X	X	See ACC 18.31.240
Utility facilities, substations, utility transmission or distribution line	X	X	A	See ACC 18.02.040(E)
Wireless communications facility (WCF) (See ACC 18.04.912(W))	*	*	*	*See ACC 18.31.100 for use regulations and zoning development standards.
Eligible facilities request (EFR) (Wireless communications facility) (See ACC 18.04.912(H))	P	P	P	
Small wireless facilities (ACC 18.04.912(Q))	P	P	P	

Permitted, Administrative, Conditional and Prohibited Uses by Zone				P – Permitted C – Conditional A – Administrative X – Prohibited
LAND USE	**Zoning Designations**			**Standards for Specific Land Uses**
	P-1	**I**	**OS**	
Emergency wireless communications facility (EWCF)	X	P	X	See ACC 18.04.912 and 18.31.100
OTHER USES THAT ARE NOT LISTED				
Other uses may be permitted by the planning director or designee if the use is determined to be consistent with the intent of the zone and is of the same general character of the uses permitted	P	P	P	

Notes:

1 Minimum lot area not applicable; duplexes must meet other development standards of the I zone.

2 Minimum lot area not applicable; apartments must meet other development standards of the I zone, dwellings; provided, that 2,400 square feet of lot area is provided for each dwelling unit.

3 Permitted within a public college or university as an amenity or service provided to students: A stand-alone bank or medical services/clinic is not permitted.

4 One single-unit detached dwelling unit per existing legal lot. No residential subdivisions permitted in the open space zone.

(Ord. 6959 § 1 (Exh. A), 2024; Ord. 6894 § 1 (Exh. B), 2022; Ord. 6799 § 9 (Exh. I), 2020; Ord. 6716 § 1 (Exh. A), 2019; Ord. 6677 § 3, 2018; Ord. 6642 § 11, 2017; Ord. 6434 § 1, 2012.)

The Auburn City Code is current through Ordinance 7002, passed October 6, 2025.

Disclaimer: The city clerk's office has the official version of the Auburn City Code. Users should contact the city clerk's office for ordinances passed subsequent to the ordinance cited above.

City Website: www.auburnwa.gov

Hosted by General Code.

EXHIBIT 8

MEMORANDUM

TO: Judi Roland, Chair, Planning Commission
Bill Stewart, Vice-Chair, Planning Commission
Planning Commission Members

FROM: Gabriel Clark, Planner II
Department of Community Development

DATE: November 18th, 2025

RE: City File No. ZOA24-0004 – City of Auburn Battery Energy Storage Code

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I. INTRODUCTION AND BACKGROUND

Battery Energy Storage Systems also known as BESS are systems of rechargeable batteries that help to moderate the demand for electricity on our grid. During peak usage or extreme weather events, BESS can react quickly, providing additional electricity. In extreme cases BESS protect sensitive equipment such as transformers, transmission lines, switches and other infrastructure from overload preventing blackouts or long-term service outages.

BESS are found in a variety of applications and are scalable based on the need. On the smaller scale, they can be installed at a private residence, constructed at a wastewater treatment plant or a hospital, to a stand-alone storage facility in a larger scale application.



Figure 1 Residential BESS


Figure 2 Commercial BESS

In response to industry interest in developing these facilities within the City, staff proposes to revise Title 18 "Zoning" to reflect the specific uses of these facilities. The revisions include identifying which zones would be best suited for the size threshold and appliable land use intensities. King County Ordinance (Attachment 2) for example, identifies 2 Megawatts (MW) as the transition point between what is considered accessory use as seen in figure 1 to commercial applications seen in figures 2 and 3.



Figure 3 Commercial BESS

To fully understand how BESS interacts with the grid, the diagram on the following page depicts an outline of the energy grid in a simplified manner. Within the grid are four elements (1) generation, (2) transmission, (3) distribution, and (4) consumption that needs to be defined.

(1) Generation occurs at established power generation facilities such as wind and solar stations located east of the Cascades and as far as Stillwater County, Montana.
(2) The electricity generated needs to travel from its source, to the location of demand. This can be over many hundreds of miles and requires high voltage transmission lines.
(3) When the high voltage electricity enters the region of demand (Auburn) it needs to be brought down to save levels for distribution.
(4) Consumers, both residential and commercial demand the electricity and demand can shift rapidly given the environmental conditions.

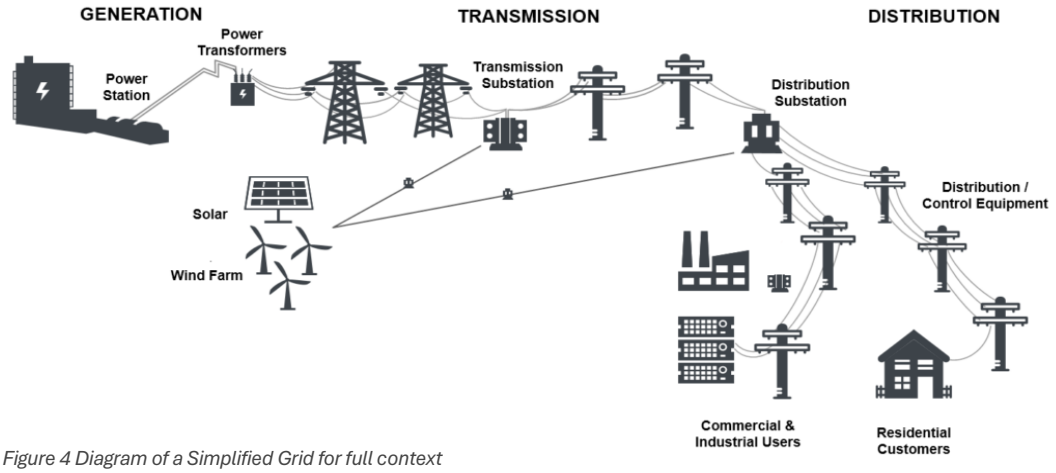


Figure 4 Diagram of a Simplified Grid for full context see attachment 14

In 2019 and forward, the Washington State Legislature passed a series of laws affirming the region's commitment to climate resiliency and reduction in carbon emissions.

- ***The Clean Energy Transformation Act (SB 5116, 2019)*** - defines specific milestones which require the State's electricity supply to be free of greenhouse gas emissions by 2045. (Attachment 3)
- ***The Climate Commitment Act (SB 5126, 2021)*** - established the cap-and-invest program, a market-based system that cost-effectively limits and lowers climate pollution and generates revenue for climate and air quality projects. (Attachment 4)

FUNDED BY WASHINGTON'S CLIMATE COMMITMENT ACT

As a result, enormous pressure is building for the region's utility providers and local jurisdictions to work together to become free of greenhouse gas emissions by the mid-century. Puget Sound Energy (PSE) produced its first Integrated Resource plan (IRP) (Attachment 5) which identifies the regional needs, its shortcomings, and sectors of energy production to reduce impacts on its customers while reducing total carbon emissions.

The IRP identifies the trajectory of investments into cleaner natural gas, battery storage systems and renewable energy sources.

Changes in the wholesale electricity market within the Western Interconnect (WI) means the region is tightening supply as customers require power from clean energy sources. This includes governments, industries, and customers. "Since 2016 nearly 15,000 MW of clean energy resources, namely intermittent wind and solar, and 500 MW of batteries have been added to the WI. At the same time, 12,000 MW of traditional dispatchable coal and natural gas resources have been retired or mothballed."

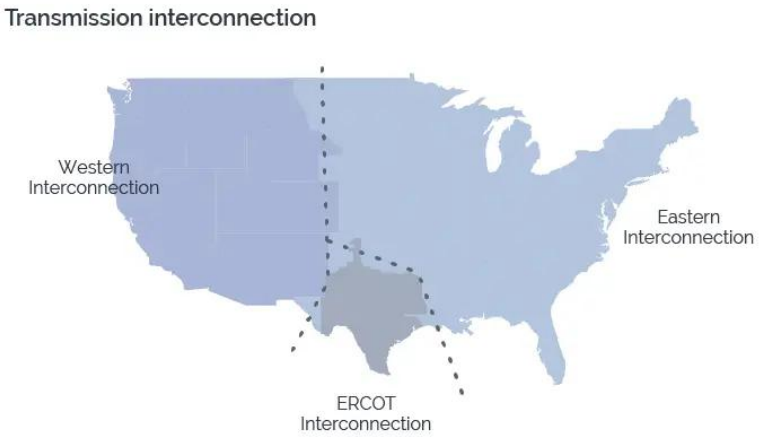


Figure 5 Transmission Interconnections in the United States

As a result of a tightening supply, volatility has also increased. On average, wholesale energy prices remain low in the Pacific Northwest. However, spikes in energy prices are becoming more frequent. "Notable events include the summer of 2018, when high regional temperatures coincided with forecasted outages at

Colstrip, and March 2019, when regional cold temperatures coincided with reduced Westcoast Pipeline and Jackson Prairie storage availability. Most recently, in August 2020, a west-wide heatwave cased many entities in the region to ta a range of actions from energy alerts to rolling blackouts. To combat the future energy needs as the region transitions to clean energy sources, PSE has identified six elements in the preferred energy portfolio. More information on these elements can be found in the IRP.

(1) Accelerated Acquisition of Energy Conservation
(2) Increased Demand Response
(3) Integration of Distributed Energy Resources (BESS)
(4) Significant Investments in Renewable Resources
(5) Additional Need for Flexible Capacity
(6) Firm Resource Adequacy Qualifying Capacity Contracts.

The table on the following page shows a summary of the forecasted need for additional electrical sources in the preferred portfolio. The capacity if resource additions is measured in terms of peak hourly capacity over a planning horizon of 24 years. The preferred portfolio illustrates a diverse mix of demand and supply side resources that meet the project capacity needs of the region. Resource additions are added incrementally across three planning periods; 2022-2025, 2026-2031, and 2032-2045.

Figure 1-4: Electric Preferred Portfolio,
Incremental Nameplate Capacity of Resource Additions

Resource Type	Incremental Resource Additions			Total
	2022-2025	2026-2031	2032-2045	
Distributed Energy Resources				
Demand-side Resources[1]	256 MW	440 MW	1,061 MW	1,757 MW
Battery Energy Storage	25 MW	175 MW	250 MW	450 MW
Solar	80 MW	180 MW	420 MW	680 MW
Demand Response	29 MW	167 MW	21 MW	217 MW
DSP Non-wire Alternatives[2]	22 MW	28 MW	68 MW	118 MW
Total Distributed Energy Resources	412 MW	990 MW	1,820 MW	3,222 MW
Renewable Resources				
Wind	400 MW	1100 MW	1750 MW	3,250 MW
Solar	-	398 MW	300 MW	698 MW
Biomass	-	-	105 MW	105 MW
Renewable + Storage Hybrid	-	-	375 MW	375 MW
Total Renewable Resources	400 MW	1,498 MW	2,530 MW	4,428 MW
Peaking Capacity with Biodiesel	-	255 MW	711 MW	966 MW
Firm Resource Adequacy Qualifying Capacity Contracts	574 MW	405 MW	-	979 MW

Demand-side resources which includes a broad energy efficiency program and implementation which may free 1,757 MW of energy that may have otherwise been wasted. This may include

local and state policies on energy efficiency. Solar readiness and photovoltaic systems installed on customer's roofs or properties account for a planned 680 MW of total capacity resources. BESS also makes 14% of the total capacity resource additions in the distributed resource application and is significantly more responsive to changing demands than the development of a large-scale generating station.

The Economic Development Element of the Comprehensive Plan (Attachment 6) describes Auburn as a proud blue-collar community; leading in manufacturing employment since the construction of the freight terminus for the Trans-Continental Railroad in the early 20th Century. This momentum has not shifted as our community strength and core values continue to be reflected in our land use practices, and economic development achievements. Our residents are highly educated and experienced in manufacturing, construction, and wholesale trade and deserve to continue to be supported by policies that promote the rapidly changing construction and manufacturing industry. Figure 7 depicts the top industries by sector within the City.

As a result of regional manufacturing and other industries, Auburn's median household income in 2021 was $79,415. The high concentration of the well-paying jobs in the City reflects a job to unit of housing ratio at 1.48 which means the region benefits from the City's continued evolution as a manufacturing center for the Puget Sound. As this relates to affordability, the City recognizes the need for attainable housing and has implemented land use and zoning changes to increase the capacity of housing throughout the City (Attachment 7 – Housing Needs and Availability Assessment).

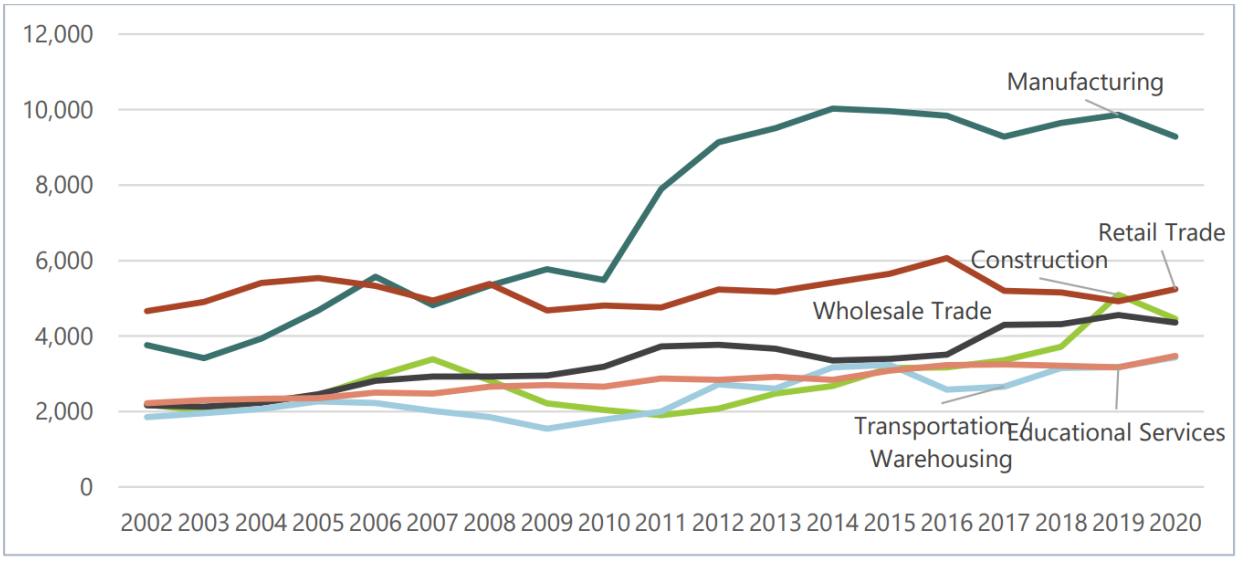


Figure 7 Top Industry Sectors in Auburn (2002-2020)

In harmony with the existing conditions identified by the IRP, and market pressures for development of Commercial BESS facilities (Attachment 15), the City does recognize the need to update its Zoning Ordinance. Title 18 "Zoning" does not have a clear path forward for private developers or utilities to develop these facilities within the City. The Department of Community

Development is working to develop additional land use policies to guide the siting, construction, and operation of these facilities.

As a result, staff requested City Council of the City of Auburn to pass a 6-month development moratorium on the acceptance, processing, and approval of BESS until proper development standards are implemented. (See attachment 8)

As staff continued to research the development of the code, it became understood that discussion with industry leaders was essential to understand the implications of developing or prohibiting BESS.

In October of 2025, staff organized a roundtable meeting with industry leaders to discuss the future of BESS in our community. A copy of the notes generated from the meeting has been provided to you as Attachment 10. To summarize the discussion:

(1) Labor unions representing construction trades were supportive of the City to continue to research these facilities as they provide expert technical training and experience.
(2) PSE provided information on the need for cities and counties to permit BESS near areas near existing infrastructure and expressed the deep need for grid stabilization that BESS can create.
(3) The Muckleshoot Tribe of Indians expressed their desire for microgrids and also shared concerns of potential environmental impacts related to fires and construction.
(4) Valley Regional Fire Authority also expressed concerns with fire hazards and clarified of new state requirements in the International Fire Codes (IFC) Chapter 1207 and National Fire Protection Association (NFPA) Chapter 855.

Staff requested council to consider a six-month extension to the moratorium. Which is set to expire at the beginning of May 2026. (See attachment 9)

Staff conducted a survey which included 101 community development offices throughout the State. The survey resulted in 10 responses, and 13 separate conversations on how each of the jurisdictions regulate BESS. The data collected shows BESS, when permitted are subject to a variety of land use approvals. These approvals include Type II and Type III processes and are typically applied to commercial and industrial land use designations, though there are several exceptions. (Attachment 11)

The applicable zoning classification for BESS varied between Cities and Counties. Counties that permitted BESS did so broadly and allowed BESS to be installed alongside solar generation facilities in rural areas for example. In cities like Sumner, Puyallup, Mountlake Terrace additional land use approvals are required and mainly concentrate in the commercial and industrial zones of the City.

Another trend that was observed in the data was the definition of BESS. Some jurisdictions allow BESS to be included within “Substation or other Public Utility”, and other jurisdictions define BESS separately. While the code and its applications are unique to the jurisdiction that utilizes it,

the City of Auburn intends to define BESS as a separate land use activity. The separate definition would direct these infrastructure investments in areas of the City that have existing supportive infrastructure and space where the potential visual, noise, and potential environmental impacts are consistent with existing land use designations.

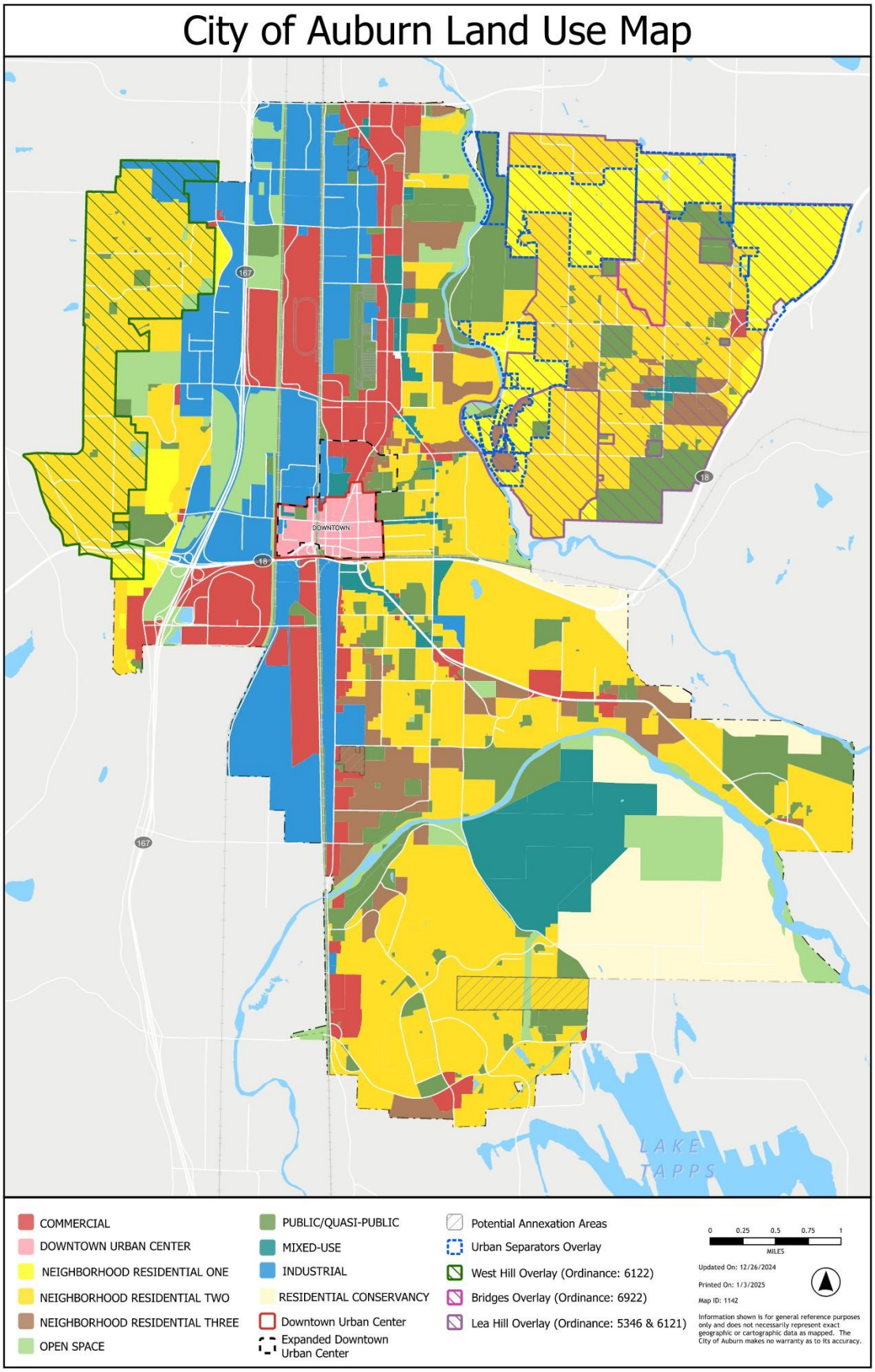
Title 18 "Zoning," divides the City into zones where the location, height, and use of buildings, the use of land, the size of setback areas, and other open space, and the provision of off-street parking and loading are regulated and restricted in accordance with the Comprehensive Plan for the City. These zones and regulations are deemed necessary and are made with reasonable consideration, among other things, as to the character of each zone and its particular suitability for specific uses (such as BESS), the need for such uses, the common rights and interests of all within the zone as well as those of the general public, and with the view of conserving and encouraging the most appropriate use of land throughout the City and to prevent and abate public nuisances.

While staff recognizes the opportunities and investment BESS may bring, the City wants to ensure development is orderly and reflects the intent of the Zoning Ordinance. The purpose of the Zoning Ordinance is outlined in Section 18.02.030; BESS is described and how it meets or does not meet the purpose of Title 18.

Purpose Statement	*Conformance with Title 18*
Provide adequate public facilities and services, including utilities, roads, schools, and parks in conjunction with development;	BESS provides emergency back-up generation during periods of black-outs or power outages allowing public facilities and services to continue to operate. This includes services such as City administration, hospital operation, Fire Department Administration, or regional load shedding. In conjunction with residential development, BESS may pose development challenges. Depending on the proposal, BESS can occupy areas that would otherwise be used for residential purposes. To ensure BESS is able to meet the provisions of this title, additional land use review is required for specific zones. A table on page 8 of the report outlines the basic information pertaining on project review types ensuring compatibility with the spirit and intent of each zoning classification.
Provide housing with essential light, air, privacy, and open space;	The zones in which permitted BESS will have specific regulations developed to ensure the provided housing continues to support light, air, privacy and open space. The measures include setbacks, screening, and additional landscape requirement.

Facilitate safe and efficient movement of traffic on the City's streets	Throughout the City of Auburn, many of our traffic signals use BESS as a way to continue normal operation even with energy disruption. Traffic impacts seen by commercial BESS would be negligible after the site is in operation. Maintenance and inspection teams would be the only of the few seen at the site during normal operation. There may be temporary traffic impacts or revisions during the construction periods.
Stabilize and enhance property values	The argument that BESS decreases or improves property values is multifaced and shall be reviewed on a project by project basis. BESS that conforms to the screening and landscaping requirements of the DUC zone may not have as large of a potential negative impact to property values in the surrounding vicinity. Compared to a Utility-scale facility that is exposed and occupies a large portion of the area may have some negative impacts and may not be considered under a proposal. While impacts vary by context, it is important to understand appropriate siting and design can mitigate potential negative effects.
Facilitate adequate provisions for doing public and private business and thereby safeguard the community's structure upon which the prosperity and welfare of all depends	BESS, when meeting the adequate provisions of the Title can safeguard the community's structure upon which the prosperity and welfare depends. Allowance of BESS and alternative energy systems can indeed capture development and financial capital furthering Auburn's manufacturing, construction, and administrative industries. These industries provide well-paying jobs and will help Auburn transition to clean energy infrastructure.
Through such achievements, help ensure safety and security of home life. Foster good citizenship, and create and preserve a more healthful, serviceable, and attractive municipality and environment in which to live.	The response to ensure BESS aligns with the purpose of the Zoning Ordinance in Title 18, includes a specific look into the operations and available site conditions that are unique to each site. Involving the community when input is needed fosters good citizenry and active public discourse. BESS also could allow the continuation of governmental services in times of crises aiding to the safety and security of the home life.

Figure 8 Alignment of BESS with Title 18


City of Auburn Land Use Map
DOWNTOWN
167
18
LAKE TAPPS
COMMERCIAL
DOWNTOWN URBAN CENTER
NEIGHBORHOOD RESIDENTIAL ONE
NEIGHBORHOOD RESIDENTIAL TWO
NEIGHBORHOOD RESIDENTIAL THREE
OPEN SPACE
PUBLIC/QUASI-PUBLIC
MIXED-USE
INDUSTRIAL
RESIDENTIAL CONSERVANCY
Downtown Urban Center
Expanded Downtown Urban Center
Potential Annexation Areas
Urban Separators Overlay
West Hill Overlay (Ordinance: 6122)
Bridges Overlay (Ordinance: 6922)
Lea Hill Overlay (Ordinance: 5346 & 6121)
0 0.25 0.5 0.75 1
MILES
Updated On: 12/26/2024
Printed On: 1/3/2025
Map ID: 1142
Information shown is for general reference purposes only and does not necessarily represent exact geographic or cartographic data as mapped. The City of Auburn makes no warranty as to its accuracy.

As reviewed in the section above staff understands the need for the City's Zoning Ordinance to be updated to reflect the policies and goals of climate and energy resilience. Following, is a staff analysis on how BESS integrates with the community for each zone. In most cases, BESS will be applied as an accessory to a primary use such as a residence to emergency back-up for commercial purposes and would be permitted in all zones.

As mentioned earlier, King County has adopted 2 MW (Attachment 1) as the threshold which separates accessory use from commercial use. In the context of Auburn, staff proposes the threshold to be delineated at 1 MW.

Commercial uses of BESS are the uses accessory or standalone which surpass the threshold quantity of 1 Megawatt (MW). Commercial applications of BESS are substantially larger than what is deemed as "accessory use" per ACC 18.04.020:

> *"Accessory use" means a use, a building or structure, or part of a building or other structure which is subordinate to and the use of which is incidental to that of the main building, structure or use on the same lot, including a residential garage. If an accessory building is attached to the main building by a common wall or roof, such accessory building shall be considered a part of the main building. Parking areas will not be considered an accessory use under this definition. See related definitions for "Accessory use, manufactured home community" and "Accessory use, residential."*

The following table presents a visual representation of the proposed zones and project review requirements for Commercial applications of BESS within the City. The use is analyzed further with the intent of each appliable zone. These determinations are not final and may be subject to change.

As a reference, PSE provided staff with a model ordinance as a recommended guidance document for amending City code to allow for BESS throughout the City. Seen in Attachment 12, this ordinance is useful for understanding the legal requirements, but does not account for the scope of BESS in the individual zones as analyzed below.

SECTION 3. Table X.X of the City Land Use Code is hereby amended to read as follows:

Land Use	Zone classification					
	Rural	Resource	Industrial	Commercial	Residential	All Other Zones
Battery Energy Storage System						
Consumer Scale Battery Energy Storage System						

Zoning Classification	*Type I*	*Type II*	*Type III*	*Not Permitted*
Downtown Urban Center		X		
C-1, Light Commercial				X
C-2, Heavy Commercial		X		
I, Institutional			X	
M-1, Light Industrial	X			
M-2, Heavy Industrial	X			
LF – Airport Lading Field				X
OS – Open Space				X
P-1, Public Use			X	
R-1, Residential 1 DU/Acre				X
R-2, Residential Low				X
R-3, Residential Moderate				X
R-4, Residential High				X
R-NM Neighborhood Mixed Use				X
RC, Residential Conservancy				X
RF, Residential Flex				X
Planned Unit Development District (PUD)				X
R-MHC, Residential Mobile Home Community				X
Lakeland Hills PUD				X

Figure 9 Land Use Activity and Applicability Table

Downtown Urban Center – *Staff Analysis*

The intent of the Downtown Urban Center (DUC) Zone is to create a distinct and strong identity for downtown Auburn. The DUC Zone is intended to produce a concentration and mixture of commercial, office, medical, retail, residential, and civic uses that attract shoppers, visitors, and workers. Development that occurs within the downtown urban center zone often requires architectural and site design review which can be either Type I or Type II decisions made by staff.

While the physical form of BESS may not always align with the intended character of a zone particularly where space is typically reserved for shops, hotels, housing, or professional offices, there is a strong case for allowing BESS through the Type III review process when serving institutional needs.

BESS can provide critical emergency and backup power to essential facilities such as hospitals, City Hall, and other public buildings that require uninterrupted power during outages. Without the option to site BESS in this area, these institutions would remain reliant on diesel generators, which are noisy, emit air pollutants, and require regular fuel replacement every 6–12 months unless treated with stabilizers.

There are specific sites, and applications of BESS that require additional review and public input which supports the decision for a Type III Quasi-Judicial review and decision made by the hearing examiner.

For these reasons, staff recommends Commercial BESS be conditionally permitted in the DUC.

C-1, Light Commercial – *Staff Analysis*
Support for siting BESS within the C-1 Zone is limited due to land use priorities and compatibility concerns. Many C-1 parcels boarder low and moderate intensity residential zones and are intended to serve as future local commercial destinations.

The purpose of the C-1 Zone is to promote a vibrant mix of small-scale, pedestrian oriented uses. BESS facilities are typically enclosed and occupy the full extent of the parcel, which can diminish the zone's ability to meet its intended character and functions.

For these reasons, commercial scale BESS installations are recommended to be prohibited from the C-1 Zone.

C-2, Heavy Commercial -*Staff Analysis*
The C-2 Zone supports a broad range of medium to high intensity land uses. While the zone is primarily intended for retail, commercial, entertainment, and professional services, it also accommodates high intensity uses such as low intensity industrial activities and utility infrastructure through additional land use approvals.

A significant portion of the zone is located along the valley floor West of Auburn Way which physically separates the C-2 Zoned parcels from a majority of the residentially zoned properties and remains underutilized. This area is well-suited for the development of BESS, offering both design flexibility and proximity to existing infrastructure.

For these reasons, staff recommends that commercial scale BESS be permitted through the Type II administrative land use review process in the C-2 Zone.

I – Institutional Zone – *Staff Analysis*
The Institutional Zone (I) is designed to support public-serving uses such as educational, cultural, and civic facilities. Distributed through the City, this zone meets both local and regional needs.

Historically, public and institutional facilities in this zone that require on-site power generation have relied on diesel generators. This mirrors the patterns seen in the DUC zone. However, diesel generators are noisy, polluting, and require frequent fuel replacement and maintenance.

For these reasons, staff recommends that commercial scale BESS be allowed in the I Zone through the Type III conditional land use review process.

M-1, Light Industrial and M-2, Heavy Industrial – *Staff Analysis*
The City's industrial zones are designed to accommodate a broad spectrum of industrial, manufacturing, and commercial activities. Residential uses are not permitted unless they are already established, ensuring that these zones remain focused economic development and operational flexibility as outlined in the Comprehensive Plan.

The M-1 Zone supports industrial and commercial uses based on the nature of operations rather than the products produced such as warehousing and packaging. The M-2 Zone allows even greater flexibility, including activities that process raw materials and may have more substantial impacts on surrounding areas.

Given the purpose of these zones, the operational characteristics of BESS, and the presence of high-capacity transmission infrastructure, industrial areas are well suited for BESS installations. Impacts to nearby residents are minimal and unlikely to exceed those of existing permitted uses in the M-1 and M-2 Zones.

For these reasons, staff recommends that commercial scale BESS be permitted outright in the industrial zones.

LF – Airport Landing Field District – *Staff Analysis*
The Comprehensive Plan identifies airport hazards as threats to the safety of airport users and nearby properties. Obstruction-type hazards, in particular, can reduce the available area for aircraft to land, take off, and maneuver safely.

To protect public health, safety, and general welfare, it is essential to prevent the creation of such hazards.

While BESS are not inherently dangerous, their presence within the LF District introduces potential risks. In the event of an aircraft collision, BESS could trigger cascading impacts such as fire, explosion, or widespread power outages. Additionally, the infrastructure required to support BESS, particularly high-voltage transmission lines often exceeds 65 feet in height surpassing the 45-foot maximum height limit for the LF Zone.

For these reasons and regulatory constraints, staff recommends commercial scale BESS be prohibited within the LF Zone.

OS – Open Space Zone – *Staff Analysis*
The OS zone is intended to permit land uses that tend to be managed in a largely undeveloped character, including passive parks, watersheds, natural and urban conservancy shoreline districts, significant wildlife habitats, and areas with significant development restrictions.

Permitting BESS in the OS Zone would require a demonstrated trend toward development, which is inconsistent with the zone's preservation-focused intent. While limited utility infrastructure, such as substations, or transmission lines is allowed, these facilities are typically modest in scale and impact compared to the potential footprint of a commercial scale BESS installation.

Given the City's commitment to preserving these areas to the fullest extent possible, staff recommends commercial scale BESS be prohibited within the OS Zone.

P-1 Public Use Zone – *Staff Analysis*
The P-1 Zone, similar in purpose to the Institutional Zone, is intended to support public-services at a community and regional scale. It provides space for cultural, educational, recreational, and civic facilities such as schools parks, and government offices. The P-1 Zone is often located within or near residential zones.

While BESS are generally developed in serve of the public good, their function does not completely align with the core intent of the P-1 Zone, which emphasizes active, community oriented uses. BESS would be best suited for facilities that rely on on-site power generation mirroring the patterns in the Institutional and DUC zones. BESS could remove the reliance on diesel generation and improve the overall reliability of the services provided.

For these reasons, staff proposes commercial BESS be allowed in the P-1 Zone through the Type III conditional land use review process.

Residential Zones – *Staff Analysis*
Residential Zones are intended to support a range of housing types, from single family homes to multistory apartment buildings while maintaining a focus on residential character and livability. Commercial and industrial activities are either significantly restricted or outright prohibited in these areas to preserve neighborhood integrity and minimize incompatible land uses.

Given these limitations, and the intent of residential zoning, staff recommends, that commercial scale BESS be prohibited in all residential zones.

II. SUMMARY OF KEY CODE CHANGES

Staff is working to prepare revisions to Title 18 "Zoning," and more specifically the following Chapters:

- Chapter 18.04 ACC "Definitions"
- Chapter 18.07 ACC "Residential Zones"
- Chapter 18.23 ACC "Commercial and Industrial Zones"
- Chapter 18.29 ACC "DUC Downtown Urban Center District"
- Chapter 18.31 ACC "Supplemental Development Standards"
- Chapter 18.35 ACC "Special Purpose Zones"

The Washington State Amendments to the International Building Code IBC 2021 and the International Fire Code, Washington Administrative Code (WAC) 51-54A-1207 (attachment 13) contains development standards for stationary and mobile electrical energy storage systems (BESS). Thus, reducing the burden of developing code that would eventually be in conflict with the State's trajectory of clean and resilient energy.

Residential Zones

- Changes to this chapter include a revision to the use table ACC 18.07.020 to show commercial applications of BESS as prohibited with "X."
- There may be additional development standards for accessory uses referenced in the supplemental development standards captured in Chapter 18.31 ACC.

Commercial and Industrial Zones

- Changes to this chapter include the use table ACC 18.23.030 to show "X" in the C-1 zone, "A" in the C-2 Zone, and "P" in both the M-1 and M-2 zones.
- There may be additional development standards referenced in the supplemental development standards captured in Chapter 18.31 ACC.

DUC Downtown Urban Center District

- Changes to this chapter include the inclusion of BESS to the Uses/activities requiring an administrative use permit.
- There may be additional development standards referenced in the supplemental development standards captured in Chapter 18.31 ACC.

Special Purpose Zones

- Changes to this chapter include the use table ACC 18.35.030 to show "X" in the P-1 zone, "X" in the I zone, and "X" in the OS zone.
- There may be additional development standards for accessory uses referenced in the supplemental development standards contained in Chapter 18.31 ACC.

Supplemental Development Standards

- The inclusion of additional siting and screening requirements. Such as accessory uses of BESS being required to be sited behind the front façade of the structure.
- Minor changes to required landscaping to prevent taller shrubbery from overtopping the wall.
- Code will include references to code books such as the International Fire Codes 1207 and National Fire Protection Association 855 standards to reduce the administrative burden on planning staff.
- Code will include specific standards for commissioning, decommissioning, and operation. These standards will be referenced from IFC 1207 and other standards.

III. TEXT AMENDMENT

Draft text amendments have not been prepared for this meeting. Planning Services expects a draft version of code to be presented to Planning Commission at the January 6th meeting.

IV. STAFF REQUEST

Staff requests Planning Commission to read through the items listed in the memo and corresponding attachments.

V. ATTACHMENTS

(1) Staff Presentation
(2) King County Ordinance No. 19824
(3) SB 5116 – Clean Energy Transformation Act
(4) SB 5126 – Climate Commitment Act
(5) 2021 PSE Integrated Resource Plan
(6) City of Auburn Economic Development Element
(7) Housing Needs and Characteristics Assessment Update
(8) City of Auburn Ordinance No. 6978 Establishment of 6-month Moratorium
(9) Round Table Meeting Notes
(10) City of Auburn Ordinance No. 6995 6-month Moratorium Extension
(11) Outreach and Survey Materials
(12) PSE Model Ordinance
(13) WAC 51-54A1207 Electrical Energy Storage Systems
(14) Outline and Functions of the US Energy Grid
(15) PSC Energy Storage System Location Study

VI. GLOSSARY OF KEY TERMS

(1) Accessory Energy Storage System (Accessory ESS / Accessory BESS)
A battery energy storage system with a capacity below the City's proposed 1-megawatt (MW) threshold. These systems are subordinate to a primary use—such as a residence or small facility—and provide backup power or limited grid support.

(2) Administrative Use Permit (Type II Review)
An administrative land-use decision made by staff to determine whether a proposed use—such as a Commercial BESS in the C-2 Zone—meets zoning and development standards.

(3) Battery Energy Storage System (BESS)
A system of rechargeable batteries that stores electricity for later use. BESS improves grid stability, captures excess renewable energy, and provides backup power for homes, businesses, and essential facilities.

(4) Clean Energy Transformation Act (CETA)
Washington State legislation (SB 5116, 2019) that requires electric utilities to transition to 100% clean electricity by 2045, increasing demand for renewable energy and storage technologies.

(5) Climate Commitment Act (CCA)
Washington State legislation (SB 5126, 2021) establishing a cap-and-invest program that limits carbon emissions and funds climate and air-quality initiatives.

(6) Commercial Energy Storage System (Commercial ESS / BESS)
A battery energy storage system that exceeds the City's proposed 1-megawatt (MW) threshold. These systems may serve utility-scale or standalone commercial functions and require higher-level land-use review.

(7) Conditional Use Permit (Type III Review)
A quasi-judicial land-use process requiring a public hearing and decision by the Hearing Examiner. This review level is recommended for siting Commercial BESS in zones where community input and compatibility review are necessary.

(8) Distributed Energy Resources (DERs)
Small-scale energy technologies located near where energy is consumed, such as rooftop solar or BESS. DERs improve grid flexibility and local resilience.

(9) Downtown Urban Center (DUC)
A mixed-use zone intended for commercial, residential, civic, and medical uses. Commercial BESS may be permitted through Type III review when serving institutional or public-service needs.

(10) Energy Storage System (ESS)
A general term for installations that store energy for later use, including batteries, control systems, and power-conversion equipment. ESS systems help balance supply and demand on the electrical grid.

(11) Industrial Zones (M-1 Light Industrial and M-2 Heavy Industrial)
Zones intended for industrial, manufacturing, and commercial uses. These areas contain compatible infrastructure and are proposed to allow Commercial BESS outright.

(12) International Fire Code (IFC) Section 1207 / NFPA 855
State-adopted safety standards governing the design, installation, operation, and fire-protection requirements for energy storage systems. These standards will be referenced in Auburn's zoning updates.

(13) Integrated Resource Plan (IRP)
Puget Sound Energy's long-term energy planning document, identifying future energy needs, renewable resource integration, and the role of BESS in meeting regional capacity and reliability goals.

(14) Megawatt (MW)
A unit of electrical power equal to one million watts. Used to differentiate between accessory-scale (<1 MW) and commercial-scale (>1 MW) battery storage facilities.

(15) Moratorium
A temporary halt on accepting or processing specific development applications. Auburn established two consecutive six-month moratoriums on BESS projects to allow time for research and zoning updates.

(16) Open Space (OS) Zone
A zone intended to preserve passive parks, watersheds, habitat areas, and environmentally sensitive lands. Commercial BESS is proposed to be prohibited in this zone.

(17) Public Use (P-1) Zone
A zone intended for civic, recreational, and community-serving public facilities. Commercial BESS may be allowed through Type III review when supporting essential public uses.

(18) Quasi-Judicial Review

A formal land-use decision-making process involving public hearings and fact-finding, typically associated with conditional use permitting for projects such as Commercial BESS in sensitive zones.

(19) Residential Zones

Zones intended primarily for housing. Commercial BESS is proposed to be prohibited in all residential zones, while accessory-scale BESS remains allowed.

(20) Supplemental Development Standards (ACC 18.31)

Citywide development requirements that apply across multiple zones, including screening, siting, landscaping, and safety standards applicable to BESS installations.

(21) Transmission, Distribution, Generation, and Consumption

The four functional components of the electrical grid:

- *Generation*: where electricity is produced.
- *Transmission*: long-distance, high-voltage transport.
- *Distribution*: local delivery at safe voltages.
- *Consumption*: end-use by households, businesses, and institutions.

BESS supports all stages by storing and releasing energy as needed.

EXHIBIT 9

PLANNING COMMISSION

ENERGY STORAGE SYSTEM CODE UPDATE

PRESENTED BY
GABRIEL CLARK, PLANNER II
DECEMBER 2, 2025

Department of Community Development
Planning • Building • Development Engineering • Permit Center
Economic Development • Code Enforcement

AUBURN VALUES

SERVICE
ENVIRONMENT
ECONOMY
CHARACTER
SUSTAINABILITY
WELLNESS
CELEBRATION

BATTERY ENERGY STORAGE SYSTEMS

- Battery Energy Storage Systems (BESS) vary widely in their uses and installation types; their primary function is to store electrical energy during periods of low demand and discharge at periods of high demand

- Other functions include:
  - Load Shedding
  - Load Sharing
  - Smoothing and dispatching from renewable energy sources
  - Emergency power storage

ACCESSORY AND COMMERCIAL

Accessory

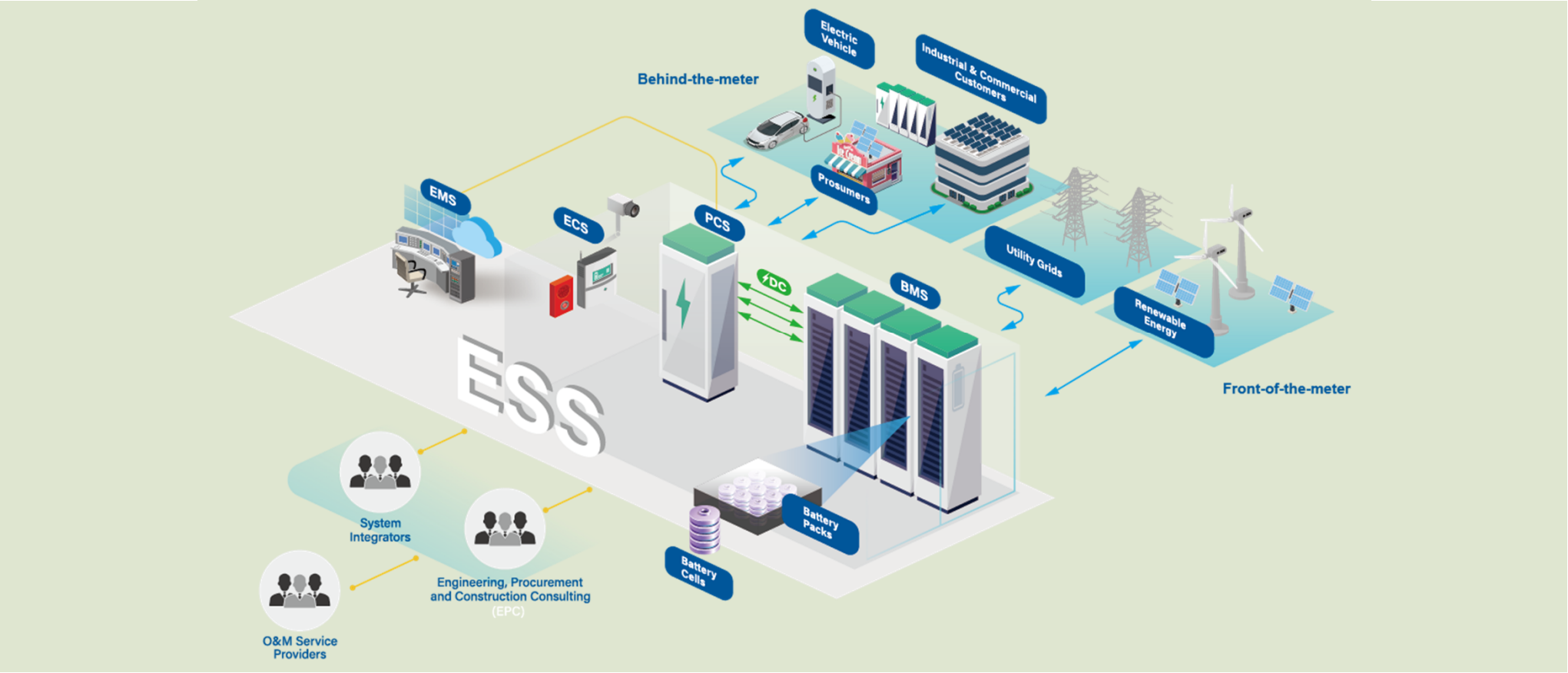


Commercial

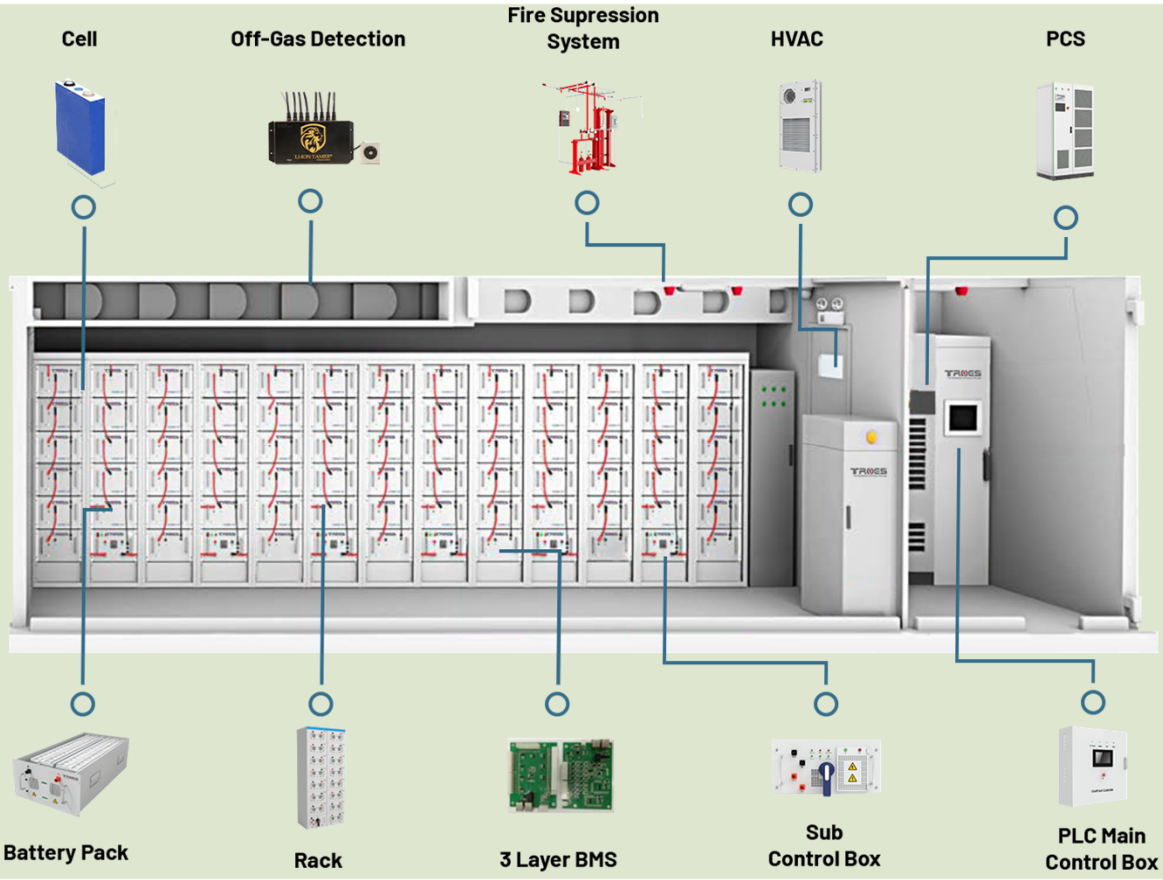


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COMMERCIAL BESS



CROSS SECTION OF A BESS CABINET



WHY A LITHIUM-ION BATTERY?

- Lithium-ion batteries are a very common method of storing electrical energy for usage and may be charged and discharged
- Examples:





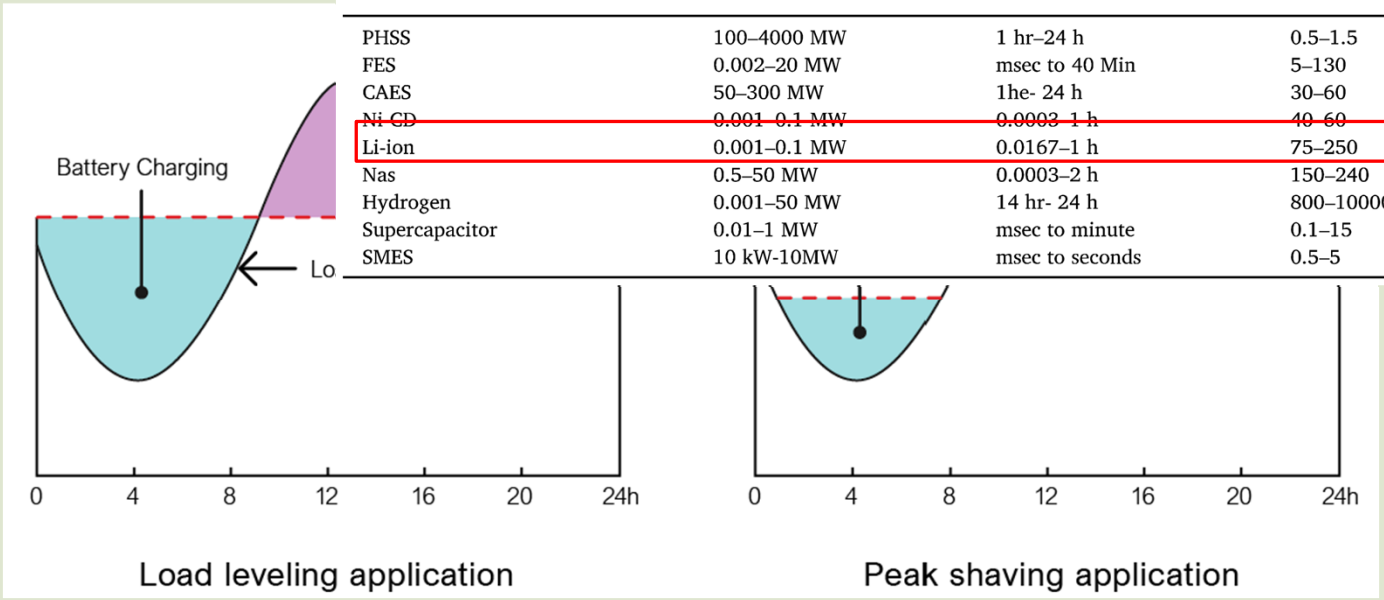


CONOMY • CHARACTER • S

PRIMARY FUNCTIONS VISUALIZED

Table 14
General technical specifications of energy storage techniques [1,10,186,187].

Energy storage system	Power Rating	Discharge	Energy density Wh/kg	Energy cost €/KWh	Lifetime Efficiency
PHSS	100–4000 MW	1 hr–24 h	0.5–1.5	50–150	70–85 %
FES	0.002–20 MW	msec to 40 Min	5–130	1000–3500	90–95 %
CAES	50–300 MW	1he- 24 h	30–60	10–120	70–80 %
~~Ni-CD~~	~~0.001–0.1 MW~~	~~0.0003–1 h~~	~~40–60~~	~~200–1000~~	~~60–91 %~~
Li-ion	0.001–0.1 MW	0.0167–1 h	75–250	200–1800	85–100 %
Nas	0.5–50 MW	0.0003–2 h	150–240	200–900	85–90 %
Hydrogen	0.001–50 MW	14 hr- 24 h	800–10000	1–15	20–50 %
Supercapacitor	0.01–1 MW	msec to minute	0.1–15	300–4000	90-95^
SMES	10 kW-10MW	msec to seconds	0.5–5	700–7000	80–90 %



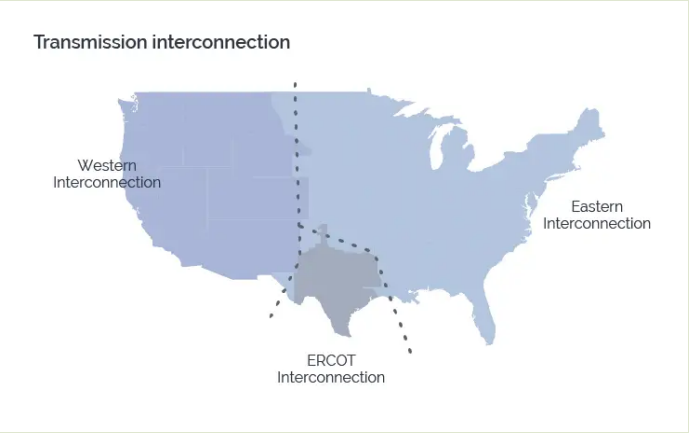
Load leveling application

Peak shaving application

WHAT IS THE DEMAND?

Figure 1-4: Electric Preferred Portfolio,
Incremental Nameplate Capacity of Resource Additions

Resource Type	Incremental Resource Additions			Total
	2022-2025	2026-2031	2032-2045	
Distributed Energy Resources				
Demand-side Resources[1]	256 MW	440 MW	1,061 MW	1,757 MW
Battery Energy Storage	25 MW	175 MW	250 MW	450 MW
Solar	80 MW	180 MW	420 MW	680 MW
Demand Response	29 MW	167 MW	21 MW	217 MW
DSP Non-wire Alternatives[2]	22 MW	28 MW	68 MW	118 MW
Total Distributed Energy Resources	412 MW	990 MW	1,820 MW	3,222 MW
Renewable Resources				
Wind	400 MW	1100 MW	1750 MW	3,250 MW
Solar	-	398 MW	300 MW	698 MW
Biomass	-	-	105 MW	105 MW
Renewable + Storage Hybrid	-	-	375 MW	375 MW
Total Renewable Resources	400 MW	1,498 MW	2,530 MW	4,428 MW
Peaking Capacity with Biodiesel	-	255 MW	711 MW	966 MW
Firm Resource Adequacy Qualifying Capacity Contracts	574 MW	405 MW	-	979 MW



FUNDED BY WASHINGTON'S
CLIMATE COMMITMENT ACT

EXISTING STANDARDS

- International Fire Code (IFC) and National Fire Protection Association (NFPA)
  - Chapter 12 of the Washington State IFC (Est. March 2024)
  - 2023 edition of the NFPA 855 Standard Installation of Stationary Energy Storage Systems
- International Building Code (IBC) siting and construction standards

DEVELOPING STANDARDS

- Comprehensive guidance on siting, construction, and operation of ESS facilities
  - Identification of applicable zones
  - Application procedures and decision types
  - Defining the thresholds
  - Developing supplemental standards

QUESTIONS?

Department of Community Development

Planning • Building • Development Engineering • Permit Center
Economic Development • Code Enforcement

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WELLNESS

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EXHIBIT 10

CITY OF AUBURN WASHINGTON

MEMORANDUM

TO: Judi Roland, Chair, Planning Commission
Bill Stewart, Vice-Chair, Planning Commission
Planning Commission Members

FROM: Gabriel Clark, Planner II
Department of Community Development

DATE: December 26th, 2025

RE: City File No. ZOA24-0004 – City of Auburn Battery Energy Storage Code

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I. INTRODUCTION AND BACKGROUND

Battery Energy Storage Systems (BESS) are systems of rechargeable batteries that balance the demand for electricity on our grid. During peak usage or extreme weather events, BESS can react quickly, providing electricity. In extreme cases BESS protects sensitive equipment such as transformers, transmission lines, switches and other infrastructure from overloads, preventing blackouts or long-term service outages.

At the December 2nd meeting, staff presented background information which described the purpose of the code updates. At this meeting staff will introduce the land use tables of each zone and the proposed "project permit decision" (Title 14 ACC) applicable to each tier of BESS.



Figure 1 BESS, Tier I [residential accessory BESS cabinet]



Figure 2 BESS, Tier II [commercial BESS cabinet]



Figure 3 BESS, Tier III [utility BESS station, image includes BESS cabinets, accessory buildings, and substation connections]

How is the Capacity of BESS Measured?
The capacity of BESS is measured in two separate ways, one being a Watt-Hour (Wh) and the second being a Watt (W).

A **Watt-hour** is the **capacity of electrical energy** in watts (W) BESS can **store and discharge over time (h).** A typical BESS operates in capacities of kilowatt-hours (kWh) and a megawatt-hours (MWh). Think of this portion of BESS as a **reservoir to a dam**, which can contain many hundreds to millions of gallons of water to be sent over the spillway.

A **Watt (W)** is the **maximum amount of energy** that **BESS can charge or discharge**. A typical BESS has charging and dishcarging capacities in kilowatts (kW) to megawatts (MW). Think of this portion of BESS to the **spillway of a dam**, this portion of the dam controlls the amount of water that can exit the system.

The appropriate capacity to regulate is the Wh component of BESS since it limits the amount of stored energy at the site. This size limitation also restricts the number of BESS cabinets and the scale of the facility which is more appropriate when considerting the siting within the City. WAC 51-54A-1207 has established precident to regulate this capacity as it targets the sizing of these systems.

If the City were to regulate only the W component, then the threshold quantities would be a muut point and BESS of larger scales could be installed in areas the City origionally saw as unfit for operation leading to an inneffective code.

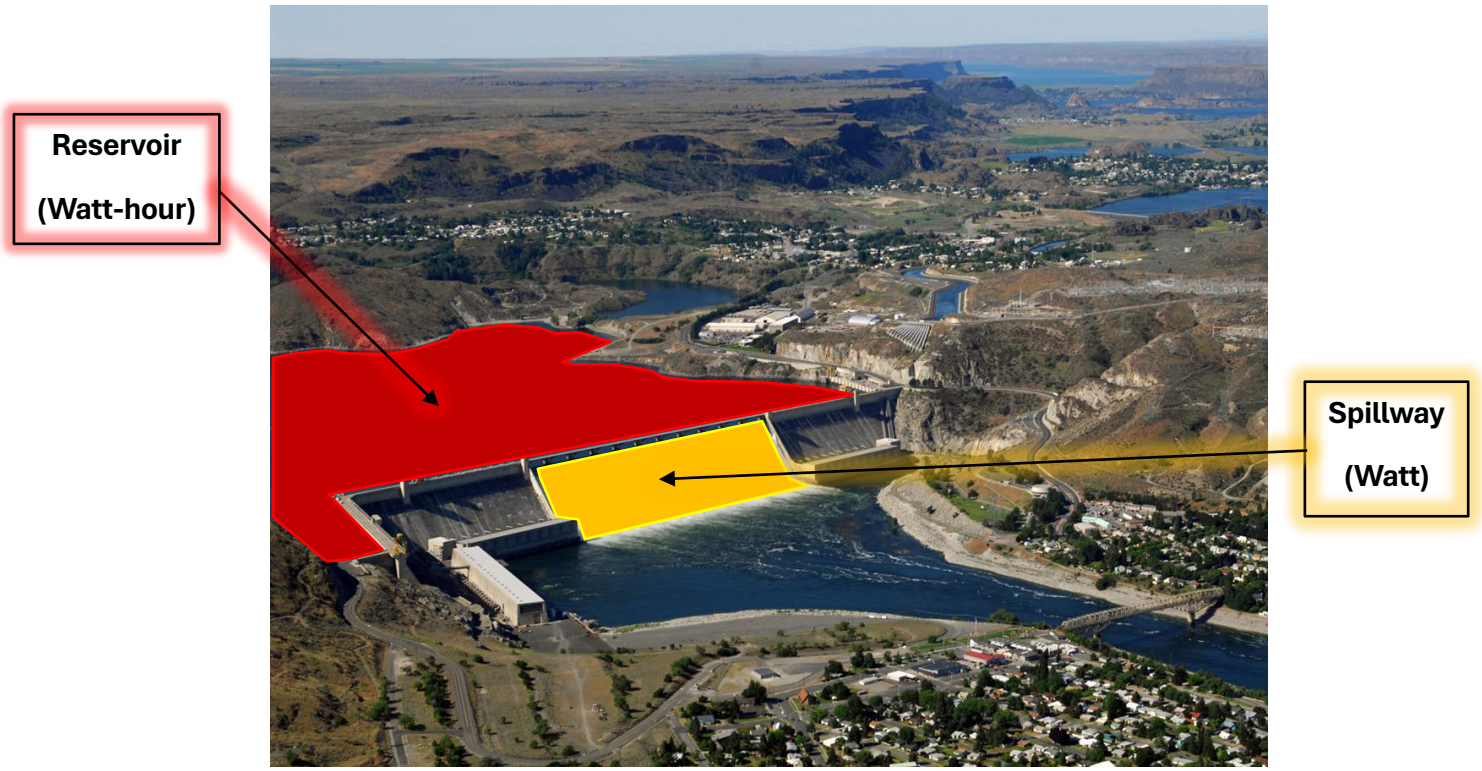


Figure 4 Grand Coulee Dam [comparing watt-hour to a reservoir and watt to the spillway]

Regulatory Breakdown

The regulations that determine the design, siting, construction, and operation are based on several standards including Washington Administrative Code (WAC), the International Building Code (IBC), International Fire Code (IFC), National Fire Protection Association (NFPA), Underwriters Laboratories (UL), and Auburn City Code (ACC).

State Regulations

Chapter 51-54A WAC contains the State building code and its amendments and regulatory information pertaining to electrical energy storage systems. These regulations are proposed do be adiopted by reference to Auburn City Code.

As shown in Table 1207.1.1 (Figure 4), the State requires all electrical energy storage systems exceeding the prescribed thresholds to comply with the minimum standards of the section. These are dependant on the type of technology used. The minium standards of WAC 51-54A-1207 include submitting 1) construction documents, 2) a hazard mitigation analysis, 3) commissioning and decommissioning plans and 4) testing standards, size and separation requirements, and explosion control documents to the permitting jurisdiction.

TABLE 1207.1.1
Energy Storage System (ESS) Threshold Quantities

Technology	Energy Capacity[a]
Capacitor ESS	3 kWh
Flow batteries[b]	20 kWh
Lead-acid batteries, all types	70 kWh[c]
Lithium-ion batteries	20 kWh
Sodium nickel chloride batteries	70 kWh
Nickel-cadmium batteries (Ni-Cd), Nickel Metal Hydride (Ni-MH), and Nickel Zinc (Ni-Zn) batteries	70 kWh
Nonelectrochemical ESS[d]	70 kWh
Other battery technologies	10 kWh
Other electrochemical ESS technologies	3 kWh
Zinc manganese dioxide batteries (Zn-MnO2)	70 kWh

For SI: 1 kilowatt-hour = 3.6 megajoules.
[a] Energy capacity is the total energy capable of being stored (nameplate rating), not the usable energy rating. For units rated in amp-hours, kWh shall equal rated voltage times amp-hour rating divided by 1,000.
[b] Shall include vanadium, zinc-bromine, polysulfide-bromide and other flowing electrolyte-type technologies.
[c] Fifty gallons of lead-acid battery electrolyte shall be considered equivalent to 70 kWh.
[d] Covers nonelectrochemical technologies such as flywheel and thermal ESS.

Figure 5 Threshold Quantities Table [a table depicting energy storage capacities in kilowatt hours which trigger state requirements]

II. SUMMARY OF KEY CODE CHANGES

Staff is preparing revisions to Title 18 "Zoning," to incorporate these changes.

- Chapter 18.04 ACC "Definitions"
- Chapter 18.07 ACC "Residential Zones"
- Chapter 18.23 ACC "Commercial and Industrial Zones"
- Chapter 18.29 ACC "DUC Downtown Urban Center District"
- Chapter 18.31 ACC "Supplemental Development Standards"
- Chapter 18.35 ACC "Special Purpose Zones"

Given that the City is granted the authority to develop regulatory standards, the proposed code will contain the following standards to supplement the regulatory minimums provided by statute.

Threshold Quantities

The capacity thresholds for each tier of BESS are dervied from the State's standards for each type of battery technology (per WAC 51-54A-1207). These are the most used and readily available to the consumer. Table 1207.1.1 (Figure 4) includes specific thresholds to which these standards apply. Additionally, the state has set the precident to measure the energy storage capacity by watt-hour versus watt. As described in the introduction and background, codes regulating watt-hour are critical to establishing boundaries for the size and scope of BESS.

BESS, Tier I operate in energy capacities of up to the threshold quantities identified in Table 1207.1.1. BESS that are below the threshold quantities for their specific battery chemistry do not

require the applicant to submit additional application materials such as a hazard mitigation plan, commissioning plans, decommissioning plans, and other materials.

This is generally considered sufficient for residential accessory use and is comperable home back up generators. Compliance with the building, electrical, fire, and City codes and UL certification is required.

BESS, Tiers II and III are larger in scale and surpass the threshold quantities listed in Table 1207.1.1. As a result State law requires the proponent of the project to meet the minimum requirements of WAC 51-54A-1207. The proposed City Code intends to adopt by reference each of these standards and as amended to ensure any development is regulated by the latest available standards.

Permitted Zoning Districts
Figure 5 depicts the land use approval process for each Tier of BESS.

BESS, Tier I is permitted in most zoning districts.

BESS, Tier II is allowed in the high density residential and commercial zones with exception of the R-F zone. This tier would be allowed through the administrative use permit process contained in Chapter 18.64 ACC.

BESS, Tier III is limited to the City's highest intensity zones. This tier would be allowed as an administrative or conditional use process contained in Chapter 18.64 ACC.

Figure 6 Land Use Approval Process

Zoning District	BESS, Tier I	BESS, Tier II	BESS, Tier III
RC	P	X	X
R-1	P	X	X
R-2	P	X	X
R-3	P	A	X
R-4	P	A	X
R-NM	P	A	X
R-F	P	X	X
C-1	P	A	X
C-2	P	A	C
C-AG	P	A	X
M-1	P	A	A
M-2	P	A	A
P-1	P	A	X
I	P	A	X
OS	P	A	X
DUC	P	A	X

***P = Permitted, A = Administrative Review, C = Conditional Review**

III. TEXT AMENDMENT

Draft text amendments are shown by strikeout/underline and are attached to this memo as Attachments 2 through 6.

IV. STAFF REQUEST

Staff requests Planning Commission to review the items listed in the memo and corresponding attachments.

V. ATTACHMENTS

(1) Presentation
(2) ACC 18.04.174 Text Amendment
(3) ACC 18.07.020 Text Amendment
(4) ACC 18.23.030 Text Amendment
(5) Chapter 18.29 ACC Text Amendment
(6) ACC 18.35.030 Text Amendment
(7) PSE Response

VI. GLOSSARY OF KEY TERMS

(1) Battery Energy Storage System (BESS)
A system of rechargeable batteries that stores electricity for later use. BESS improves grid stability, captures excess renewable energy, and provides backup power for homes, businesses, and essential facilities.

(2) International Building Code (IBC)
Guidelines and requirements for the design, construction, and maintenance of buildings. Aiming to protect the health, safety, and well-being of the occupants and the surrounding community.

(3) International Fire Code (IFC)
A set of regulations designed to safeguard life and property from fire and explosion hazards. It covers various topics including emergency planning, fire department access, automatic sprinkler systems, fire alarm systems, and the storage and use of hazardous materials.

(4) Kilowatt Hour (kWh)
A unit of energy that represents the amount of electricity generated or consumed over a period of one hour. One kilowatt hour is the equivalent energy to using a 1,000 watt microwave for 1 hour. This is a smaller unit of measurement and is most found on your monthly electrical bill. The average household in the US consumes 30 kWh per day.

(5) National Fire Protection Association
A nonprofit organization dedicated to eliminating death, injury, property damage, and economic loss due to fire, electrical, and related hazards.

(6) Megawatt Hour (MWh)

A unit of energy that represents the amount of electricity generated or consumed over a period of one hour. One Megawatt hour is equal to 1,000 kilowatt hours. The same 1,000-watt microwave could operate for 1 thousand hours or approximately 300 to 1,000 homes for one hour.

(7) Stored Energy Capacity

The total capacity of a BESS in either kilowatt hours or megawatt hours.

(8) Supplemental Development Standards (ACC 18.31)

Citywide development requirements that apply across multiple zones, including screening, siting, landscaping, and safety standards applicable to BESS installations.

(9) WAC 51-54A-1207

Washington State's adopted safety standards for electrical energy storage systems. Including fire protection, hazard mitigation, separation distances, and commissioning requirements.

EXHIBIT 11

PLANNING COMMISSION

ENERGY STORAGE SYSTEM CODE UPDATE

PRESENTED BY
GABRIEL CLARK, PLANNER II
JANUARY 6, 2026

Department of Community Development

Planning • Building • Development Engineering • Permit Center
Economic Development • Code Enforcement

AUBURN VALUES

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WELLNESS

CELEBRATION

OBJECTIVE

- Define how BESS are ***sized***
- Identify ***Tiers and thresholds*** of BESS
- Identify ***applicable*** zoning districts
- Determine appropriate land use ***approval***

PROJECT PERMIT DECISIONS

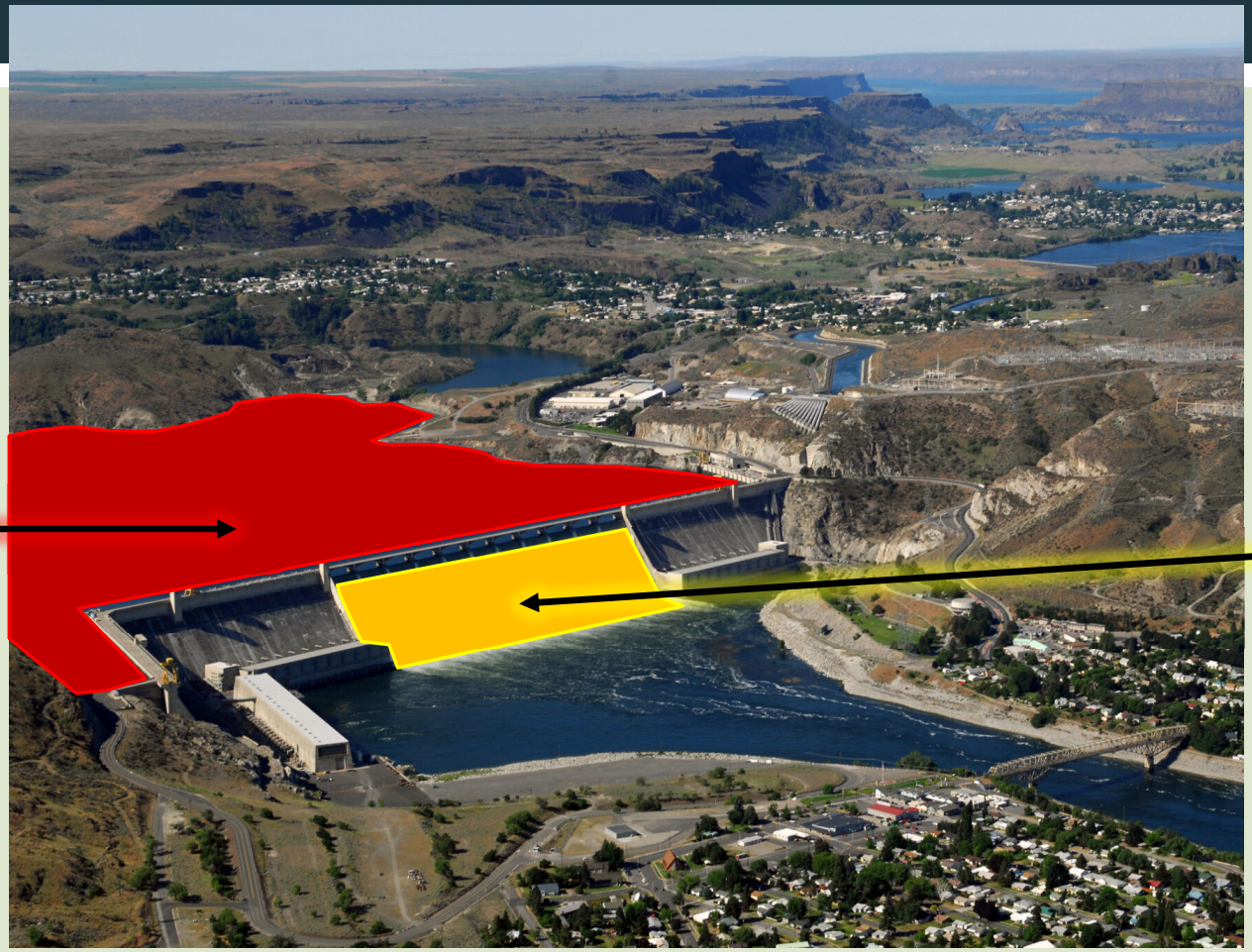
- Type I: Administrative decisions made by *staff*
- Type II: Administrative decisions with *public notice*
- Type III: Quasi-judicial decision by *hearing examiner*

WATTHOUR VERSUS WATT

- Watt-hour – the ***capacity*** of energy BESS can ***store and discharge over time***

- Watt– the ***maximum amount of energy*** BESS can ***charge or discharge***

WATT-HOUR VERSUS WATT



THRESHOLD QUANTITIES
WAC 51-54A-1207

TABLE 1207.1.1
Energy Storage System (ESS) Threshold Quantities

Technology	Energy Capacity[a]
Capacitor ESS	3 kWh
Flow batteries[b]	20 kWh
Lead-acid batteries, all types	70 kWh[c]
Lithium-ion batteries	20 kWh
Sodium nickel chloride batteries	70 kWh
Nickel-cadmium batteries (Ni-Cd), Nickel Metal Hydride (Ni-MH), and Nickel Zinc (Ni-Zn) batteries	70 kWh
Nonelectrochemical ESS[d]	70 kWh
Other battery technologies	10 kWh
Other electrochemical ESS technologies	3 kWh
Zinc manganese dioxide batteries (Zn-MnO2)	70 kWh

For SI: 1 kilowatt-hour = 3.6 megajoules.

a Energy capacity is the total energy capable of being stored (nameplate rating), not the usable energy rating. For units rated in amp-hours, kWh shall equal rated voltage times amp-hour rating divided by 1,000.

b Shall include vanadium, zinc-bromine, polysulfide-bromide and other flowing electrolyte-type technologies.

c Fifty gallons of lead-acid battery electrolyte shall be considered equivalent to 70 kWh.

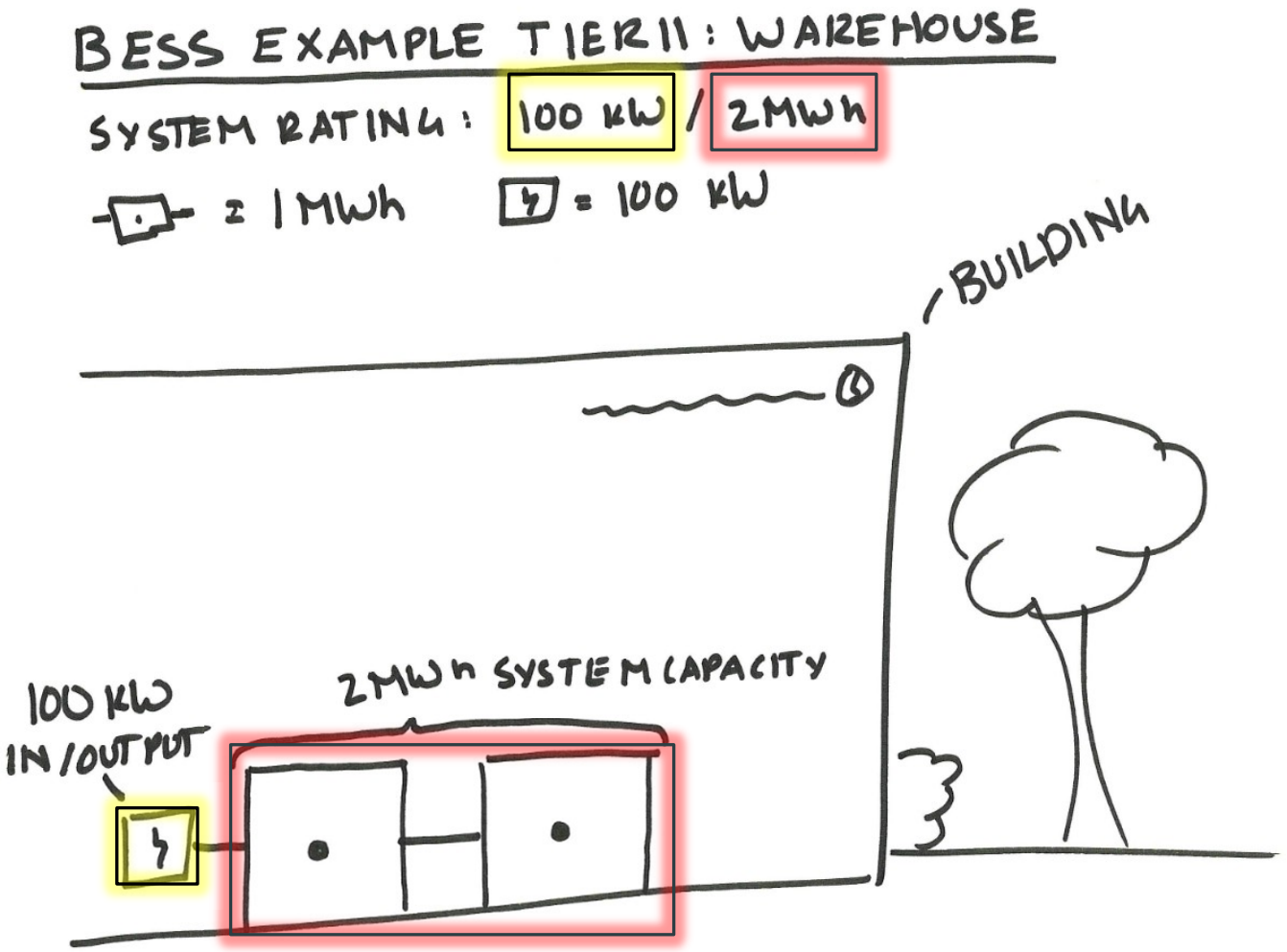
d Covers nonelectrochemical technologies such as flywheel and thermal ESS.

BESS EXAMPLE TIER 1: RESIDENCE

SYSTEM RATING: 10 kW / 20 kWh

= 10 kWh = 10 kW

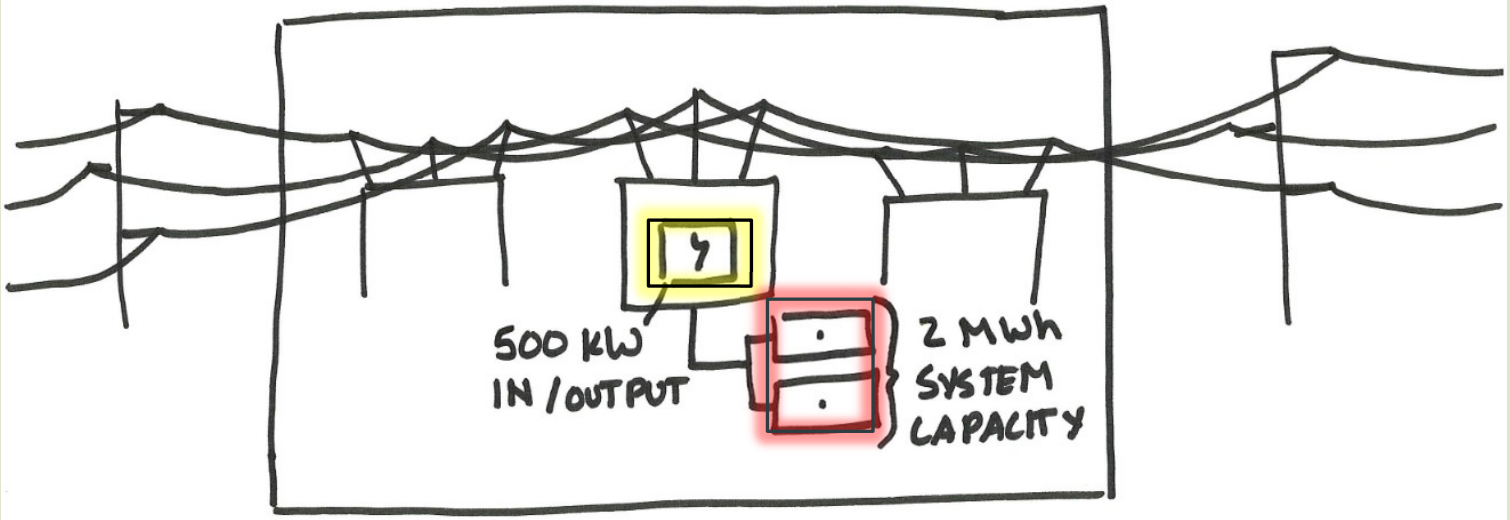



BESS EXAMPLE TIER II : WAREHOUSE
SYSTEM RATING : 100 kW / 2MWh
= 1MWh
= 100 kW
BUILDING
100 kW
IN / OUT PUT
2MWh SYSTEM CAPACITY

BESS EXAMPLE TIER II : SUBSTATION

SYSTEM RATING : 500 KW / 2 MWh

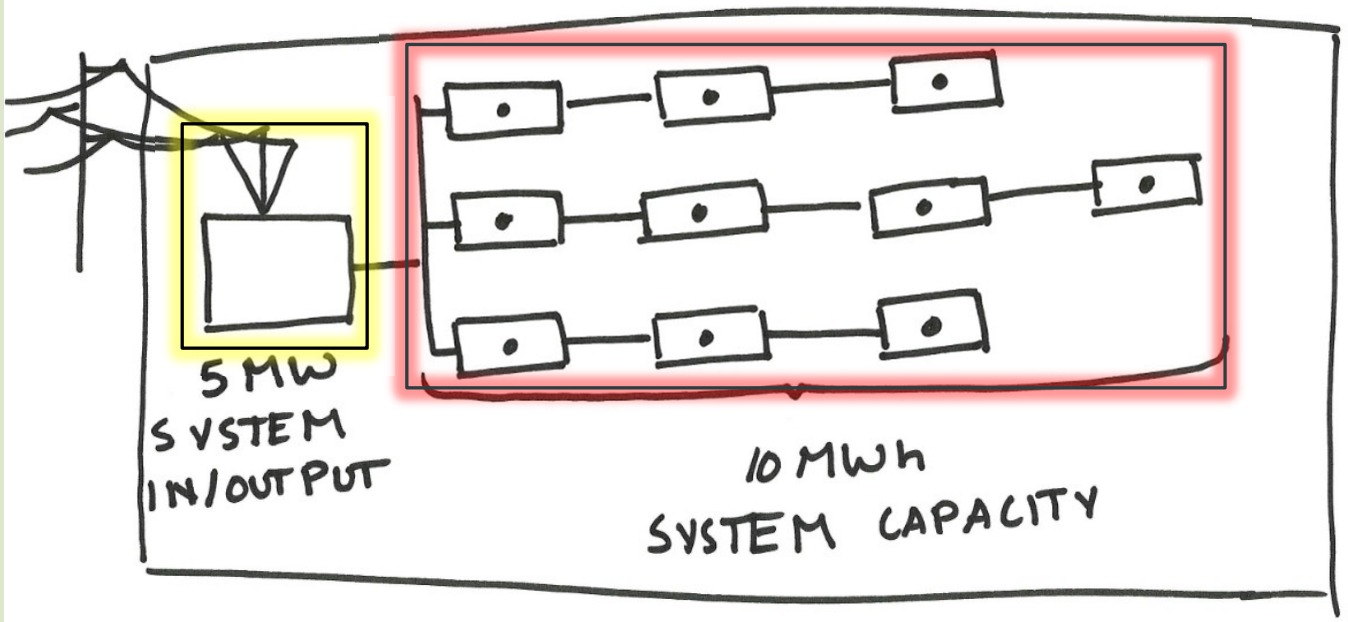
= 1 MWh = 500 kW



BESS EXAMPLE TIER III : STAND ALONE

SYSTEM RATING : 5MW / 10 MWh

= 1 MWh = 5MW



TIER I



- Allowed as a Type I decision
- Stored Energy Capacity limit to Table 1207.1.1
- Accessory to primary use

TIER II



- Allowed as a Type II decision
- Energy capacity up to 2 MWh
- Restricted to higher intensity land uses

TIER III



- Allowed as a Type II or Type III decision
- Stored energy capacities in excess of 2 MWh
- Restricted to heavy commercial and industrial land uses

ZONING CLASSIFICATION
RESIDENTIAL

	RC	R-1	R-2	R-3	R-4	R-NM	R-F
Tier I	P	P	P	P	P	P	P
Tier II	X	X	X	A	A	A	X
Tier III	X	X	X	X	X	X	X

ZONING CLASSIFICATION
COMMERCIAL & INDUSTRIAL

	DUC	C-1	C-2	C-AG	M-1	M-2
Tier I	P	P	P	P	P	P
Tier II	A	A	A	A	A	A
Tier III	X	X	C	X	A	A

ZONING CLASSIFICATION – SPECIAL PURPOSE

	P-1	I	OS
Tier I	P	P	P
Tier II	A	A	A
Tier III	X	X	X

QUESTIONS FOR CONSIDERATION

- Does Planning Commission understand the difference between a Watt and a Watt-hour?

QUESTIONS FOR CONSIDERATION

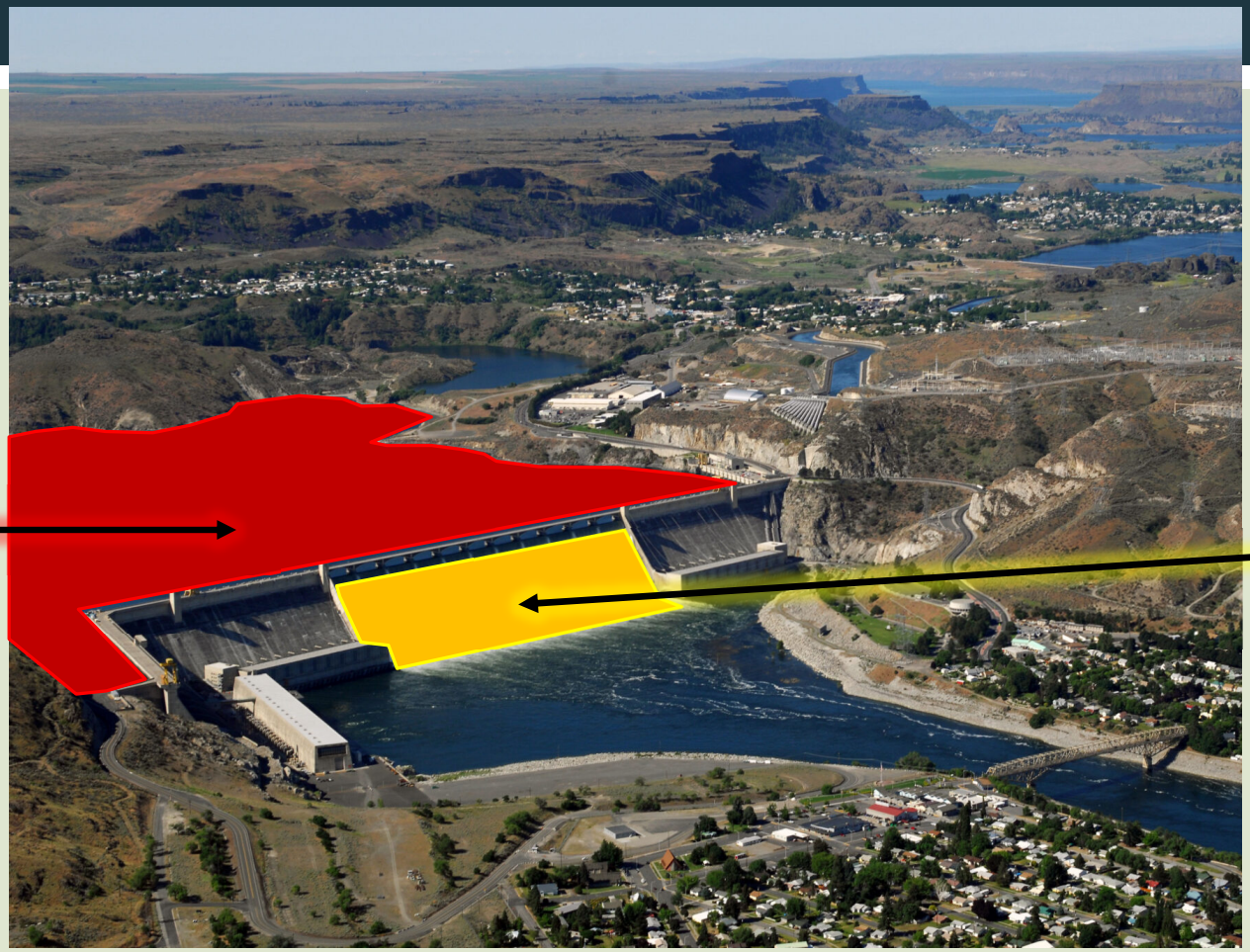
- Does Planning Commission understand the intent to regulate Watt-hour versus Watt?

WATTHOUR VERSUS WATT

- Watt-hour – the ***capacity*** of energy BESS can ***store and discharge over time***

- Watt– the ***maximum amount of energy*** BESS can ***charge or discharge***

QUESTIONS FOR CONSIDERATION



QUESTIONS FOR CONSIDERATION

- Does Planning Commission feel comfortable with the recommended zoning classifications and permit project decision types?

OBJECTIVE

- ~~Define how BESS are *sized*~~ ✓
- ~~Identify *Tiers and thresholds* of BESS~~ ✓
- ~~Determine appropriate land use *approval*~~ ✓
- ~~Identify *applicable* zoning districts~~ ✓

PROPOSED TIMELINE

JAN
- Present code to Planning Commission

FEB
- Planned Planning Commission Meeting

MAR
- Planned Public Hearing

APR
- Planned Council Study Session and Action

QUESTIONS?

Department of Community Development

Planning • Building • Development Engineering • Permit Center
Economic Development • Code Enforcement

AUBURN VALUES

SERVICE

ENVIRONMENT

ECONOMY

CHARACTER

SUSTAINABILITY

WELLNESS

CELEBRATION

EXHIBIT 12

CITY OF AUBURN WASHINGTON

MEMORANDUM

TO: Judi Roland, Chair, Planning Commission
Bill Stewart, Vice-Chair, Planning Commission
Planning Commission Members

FROM: Gabriel Clark, Planner II
Department of Community Development

DATE: January 14th, 2026

RE: City File No. ZOA24-0004 – City of Auburn Battery Energy Storage Code

---

I. INTRODUCTION AND BACKGROUND

Battery Energy Storage Systems, also known as BESS, are systems of rechargeable batteries that moderate the demand for electricity on our grid. During peak usage or extreme weather events, BESS can react quickly, providing electricity. In extreme cases BESS protect sensitive equipment such as transformers, transmission lines, switches and other infrastructure from overload preventing blackouts or long-term service outages.



Figure 1 BESS, Tier I



Figure 2 BESS, Tier II



Figure 3 BESS, Tier III

At the December 2nd, 2025, meeting, staff presented background information which described the purpose of the code updates. At this meeting staff will introduce the land use tables of each zone and the proposed "project permit decision" (Title 14 ACC) applicable to each tier of BESS.

At the January 6th, 2026, meeting, staff presented contextual information to describe how BESS are sized, what the intention of the regulations were, and formalized land use approval pathways for each tier of BESS. Staff also briefed Planning Commission with a memo from Puget Sound Energy advising staff to increase the threshold quantities of each tier to align with existing end-user installations. A primary concern was limiting capacities with the Tier I systems which are permitted in residential zones.

At the February 3rd, 2026, meeting, staff will present the proposed development standards, staff comments received, and notification of any public comments received during the SEPA process.

II. SUMMARY OF KEY CODE CHANGES

Staff is preparing revisions to Title 18 "Zoning," to incorporate these changes.

Given that the City is granted the authority to develop regulatory standards, the proposed code will contain the following standards to supplement the regulatory minimums provided by statute.

Land Use Tables

Revisions to Chapters 18.04 "Deffinitions," 18.07 "Residential Zones," 18.23 "Commercial and Industrial Zones," 18.29 "DUC Downtown Urban Center District," and 18.35 "Special Purpose

Zones" do not change substationally. Changes are limited to expanding "BESS" to "Battery Energy Storage System" in the land use tables where BESS has not been defined.

Supplemental Development Standards
In conjunction with Community Development, Public Works, Valley Regional Fire Authority, and Legal staff members, a set of supplemental standards to regulate the development of BESS throughout the City have been developed. These supplemental standards also include regulations adopted by the State of Washington and the International Code Councils and their amendments.

The structure of the code includes general standards which apply to each of the three Tiers, followed by two sections which offer specific requirements for each tier.

General Standards
General standards include references to citations such as the Washington Administrative Code (WAC) 51-54A-1207, International Building Code (IBC), and the International Fire Code (IFC) 1207 which provides supplemental standards for BESS facilities, fire suppression, secondary containment, and spill neutralization. These three codebooks provide the foundation for the City's regulations, as such adopting the WAC, IBC, and IFC by reference allows the City to incorporate standards of the best available science without needing to perform a code cycle update.

This subsection also places general restrictions on BESS. These restrictions inclde prohibiting the construction or siting of BESS within critical areas and the floodplain. According to the United States Department of Transportation, lithium batteries have been classified as a hazardous substance. Per our floodplain development code, Chapter 15.68 ACC, hazardous materials and substances are prohibited from being located within the floodplain.

Additionally, Chapter 16.10 ACC prohibits development within the City's regulated critical areas and its buffers. As a result, BESS will be subject to the standard buffer widths aplicable to each critical area.

BESS facilities that are below the threshold quantities table identified in WAC 51-54A-1207 would be exempt from portions of the chapter.

The next three sections will provide context for the three tiers of BESS; Tier I, Tier II, and Tier III.

BESS, Tier I
BESS, Tier I is intended to serve residential and small commercial customers due to the restricted energy storage capacity of 100 kWh. These systems are required to be installed in one of the four prescribed locations specified by WAC 51-54A-1207. If located on the exterior of a structure, then some amount of screening would be required. This could include a fence or located behind the front façade of the structure.

It should be noted that when the energy storage capacity of BESS, Tier I surpasses the thresholds set by the threshold quantity table of WAC 51-54A-1207, the applicant would be required to submit commissioning plans, construction documents, hazard mitigation analyses, as well as meet additional requirements of the WAC.

BESS, Tier II and Tier III
BESS, Tier II is intended to serve moderate intensity residential and commercial customers as the threshold is designated at 4 MWh. The structure of this section incorporates language from Title 18 "Zoning" ACC, the model ordinance, and the WAC.

Similarly, BESS, Tier III systems are systems with energy storage capacities beyond 4 MWhs and are intended to serve micro and regional grids. Tier III systems follow the same list of requirements to Tier II systems.

At this capacity, large-scale fire testing, vegetation control, secondary containment, access, hydrant spacing, and financial securities are required.

System testing, location, fencing, and vegetation controls are standards contained in the WAC, IFC, or IBC standards.

Staff has worked with the Valley Regional Fire Authority to determine the minimum applicable standards for emergency vehicle access and availability of hydrants. Included in the proposed code are two standards (1) access and (2) hydrant spacing.

Valley Regional Fire Authority had significant concerns regarding access to the site, especially if the site is served by a dead-end road. If a fire were to break out, a secondary access point would provide a safe alternative to approach the site and avoid any additional exposure to the smoke.

If a BESS facility is proposed in an area where hydrants do not meet the minimum commercial hydrant spacing requirements contained within the City of Auburn Engineering Design Standards, the applicant is required to install hydrants to the minimum specification.

Since BESS, Tier II and Tier III are larger systems intended to support moderate to large commercial/residential projects and the grids, staff determined the applicant of such system shall provide a financial security or bond equal to 125% of the estimated costs associated to decommissioning. The decommissioning security will aid to protect the interests of the City and the applicant in the event of failure or abandonment.

The financial security will operate in a similar manner to a mitigation or landscape bond. When the BESS facility is decommissioned in accordance with the approved decommissioning plan the city may release the bond back to the owner of the facility. In the event the facility is abandoned or ceases to operate consistenly, the City reserves the right enter the facility to decommission the facility and utilize the available bond to cover the costs associated with the site.

The site may be in operation for a number of decades resulting the need for language where the financial security can be renewed on a regular basis to ensure the security maintains its position with rising costs due to inflation. Staff are refining the language to ensure the requirement is clear.

III. STAFF COMMENTS

Staff has colleced the first round of comments from Public Works department, Valley Regional Fire Authority, Legal Departlent, Building Division, and Development Engineering Divisions of the City.

To summarize the comments:

1. Public Works has concerns over the existence of critical areas on sites where a BESS facility may be sited and whether the City has the authority to have additional restrictions for these sites.

    a. Staff response: BESS and their impacts on critical areas are a concern of the City. Development of a site which contains critical areas shall conform to the minimum local, federal, and state requirements. Within the City of Auburn Title 16 "Environment" of the Auburn City Code provides explicit restrictions on the development of critical areas. For projects that do have temporary or permanent impacts, ACC 16.10.100 provides standards for alteration or development of critical areas which requires mitigation strategies, monitoring, and implements replacement/enhancement ratios. BESS shall meet the standard buffer width required by the applicable critical area.

    To reduce risk, the City proposes to incorporate a financial security component which will provide the property owner or City with a direct source of funds to decommission and restor the site to prior conditions when the BESS was planned.

    This financial security will be a required component of the decommissioning plan.

2. Public Works had a concern with the language pertaining to noise. Public Works Staff pointed to Chapter 8.28 ACC "Noise" which contains what are considered public disturbances.

    a. Staff response: Planning will incorporate by reference Chapter 8.28 ACC "Noise" into the proposed code.

3. Public Works and Development Engineering provided recommendations for updated language pertaining to secondary containment for Tier II and Tier III systems.

    a. Staff response: Planning staff will update the language to include requirements for BESS facilities to meet the minimum standards of City standards, International Fire Code (IFC) and NPDES requirements.

4. Public Works Staff provided comments for the required decommissioning bond.

    a. Staff response: The applicant and/or owner of the BESS project will be required by code to obtain a financial security and will not be released until the criteria of the decommissioning bond have been satisfied. The exact bond and duration of the bond is still under review. Staff is working with the City's Legal department to identify what type of security is the most risk adverse.

5. Valley Regional Fire Authority (VRFA) provided comments regarding secondary emergency vehicle access (EVA) and hydrant spacing.

    a. Staff response: staff has incorporated VRFAs comments to include a secondary EVA route and compliance with the City of Auburn Engineering Design Standards for commercial hydrant spacting for sites that do not meet these standards.

IV. SEPA

A DNS has been distributed to agencies and parties of record for comment. In accordance to WAC 197-11-340 the City will not act on the proposal for a period of 14 days. The comment period began on January 28th and is set to expire at 5:00 PM February 11th 2026.

Staff will provide comments received from agencies and the public at the February 3rd Meeting.

V. TEXT AMENDMENT

Draft text amendments are shown by strikeout/underline and are attached to this memo as Attachment 2.

VI. STAFF REQUEST

Staff requests Planning Commission to review the items listed in the memo and corresponding attachments.

VII. ATTACHMENTS

(1) Staff Presentation
(2) ACC 18.31.240 Text Amendment
(3) Model Ordinance (PSE)
(4) WAC 51-54A-1207

VIII. GLOSSARY OF KEY TERMS

(1) Battery Energy Storage System (BESS)
A system of rechargeable batteries that stores electricity for later use. BESS improves

grid stability, captures excess renewable energy, and provides backup power for homes, businesses, and essential facilities.

(2) Buffer or Buffer Area, Critical Area

Means a naturally vegetated, undisturbed, enhanced or revegetated zone surrounding a critical area that protects the critical area from adverse impacts to its integrity and value, and is an integral part of the resource's ecosystem.

(3) Critical Areas or Environmentally Sensitive Areas

Means areas that possess important natural functions and embody a variety of important natural and community values. Such areas include wetlands, streams, fish and wildlife habitat, geologically hazardous areas, aquifer recharge areas, and flood hazard areas. If not conducted properly, development or alteration of such areas may cause significant impacts to the valuable functions and values of these areas and/or may generate risks to the public health and general welfare, and/or to public and private property.

(4) Floodplain or Flood Prone Area

Means any land area susceptible to being inundated by water from any source.

(5) International Building Code (IBC)

Guidelines and requirements for the design, construction, and maintenance of buildings. Aiming to protect the health, safety, and well-being of the occupants and the surrounding community.

(6) International Fire Code (IFC)

A set of regulations designed to safeguard life and property from fire and explosion hazards. It covers various topics including emergency planning, fire department access, automatic sprinkler systems, fire alarm systems, and the storage and use of hazardous materials.

(7) Kilowatt Hour (kWh)

A unit of energy that represents the amount of electricity generated or consumed over a period of one hour. One kilowatt hour is the energy equivalent to using a 1,000-watt microwave for 1 hour. This is a smaller unit of measurement and is most found on your monthly electrical bill. The average household in the US consumes 30 kWh per day.

(8) National Fire Protection Association

A nonprofit organization dedicated to eliminating death, injury, property damage, and economic loss due to fire, electrical, and related hazards.

(9) Megawatt Hour (MWh)

A unit of energy that represents the amount of electricity generated or consumed over a period of one hour. One Megawatt hour is equal to 1,000 kilowatt hours. The same 1,000-watt microwave could operate for 1 thousand hours or approximately 300 to 1,000 homes for one hour.

(10) Special Flood Hazard Area (SFHA)

Means the land subject to inundation by the base flood. Special flood hazard areas are designated on Flood Insurance Rate Maps with the letters "A" or "V" including "AE

(Floodway),” “AO,” “AH,” “A1-99”, and “VE.” The special flood hazard area is also referred to as the area of special flood hazard or SFHA.

(11) Stored Energy Capacity

The total capacity of a BESS in either kilowatt hours or megawatt hours.

(12) Supplemental Development Standards (ACC 18.31)

Citywide development requirements that apply across multiple zones, including screening, siting, landscaping, and safety standards applicable to BESS installations.

(13) WAC 51-54A-1207

Washington State’s adopted safety standards for electrical energy storage systems. Including fire protection, hazard mitigation, separation distances, and commissioning requirements.

EXHIBIT 13

PLANNING COMMISSION

ENERGY STORAGE SYSTEM CODE UPDATE

PRESENTED BY
GABRIEL CLARK, PLANNER II
FEBRUARY 3RD, 2026

Department of Community Development

Planning • Building • Development Engineering • Permit Center
Economic Development • Code Enforcement

AUBURN VALUES

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OBJECTIVE

- Describe the proposed development standards
- Take feedback on proposed development standards

REFERENCE BOOKS AND STANDARDS

- WAC 51-54A-1207 (incorporates International Building Codes (IBC))
- International Fire Code (IFC) 1207
- City of Auburn Engineering Design Standards
- National Pollutant Discharge Elimination System (NPDES)

STRUCTURE OF SUPPLEMENTAL STANDARDS

- General – includes references and standards applicable to all BESS
- Tiers – describes requirements for each tier

GENERAL STANDARDS

- Minimum requirements specified by the referenced code books
- Noise generated from a BESS facility shall remain below adopted thresholds
- BESS and equipment shall be UL 9540 certified

GENERAL STANDARDS

- Restricted from the Floodplain and Special Flood Hazard Area
- Critical Area buffer widths
- Required documentation when triggered by WAC 51-54A-1207

GENERAL STANDARDS

- City of Auburn GIS
- City of Auburn Critical Areas Code (Chapter 16.10 ACC)

BESS, TIER I STANDARDS

- Restricted to 100 kWh in capacity
- Permitted installation locations
- Minimum screening requirements

BESS, TIER II AND TIER III STANDARDS

- BESS, Tier II capacity threshold of 4 MWh
- BESS, Tier III capacities above 4 MWh
- Vegetation control, secondary containment, access, hydrant spacing, application documents, and financial securities

PROPOSED TIMELINE

FEB

- Planning Commission Meeting

MAR

- Planned Public Hearing

APR

- Planned Council Study Session and Action

QUESTIONS?

Department of Community Development

Planning • Building • Development Engineering • Permit Center
Economic Development • Code Enforcement

AUBURN VALUES

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WELLNESS

CELEBRATION

Comment 1

EXHIBIT 14

Outlook

FW: BESS

From Planning <planning@auburnwa.gov>
Date Fri 1/30/2026 10:38 AM
To Gabriel Clark <GClark@auburnwa.gov>
Cc Alexandria Teague <ateague@auburnwa.gov>; Alyssa Tatro <ATatro@auburnwa.gov>; Dinah Reed <DReed@auburnwa.gov>; Owen Goode <OGoode@auburnwa.gov>; Steven Sturza <ssturza@auburnwa.gov>

FYI

CODE QUESTIONS?
Book an online meeting: Virtual Permit Center - City of Auburn (auburnwa.gov)

Best,
Muwaffaq Usman Adam, AICP, PMP
Planner I
Department of Community Development
City of Auburn | www.auburnwa.gov
Office 253-398-7353| musmanadam@auburnwa.gov
Mailing Address: 25 W Main Street, Auburn, WA 98001
Permit Center Address: 1 E Main Street, Auburn, WA 98002 (Click Here for Map)
Customer Service Survey | Application Forms | Zoning Maps

American Planning Association: www.planning.org/profile/musmanadam
Badges: https://www.credly.com/users/muwaffaq-usman-adam

"By far the greatest and most admirable form of wisdom is that needed to plan and beautify cities and human communities."
~Socrates

From: momjhm@comcast.net <momjhm@comcast.net>
Sent: Friday, January 30, 2026 8:49 AM
To: Planning <planning@auburnwa.gov>
Subject: BESS

CAUTION: **The following message originated from outside the City of Auburn. Be careful opening links and**

attachments

To Whom it may concern---

I am somewhat concerned about the recent designation of "non-signifiance" by Auburn for the proposal of an installation of a Battery Energy Storage System. I've briefly read over some information about this...and am concerned that there is not an identified location for such a system. Also....it is my understanding that this system will not benefit the city of Auburn, but be used to "sell" energy to other areas.

Am I mistaken? If so, please let me know how such a system will support the city of Auburn, and how, Auburn will be able to safeguard our residents if there is a fire and the smoke and other byproducts of the fire infiltrate and spread to other areas surrounding the storage site. Smoke/byproducts can easily and quickly travel and be widely spread by wind hundreds of yards away from the source of the fire. Also...what other safeguards can be put in place to put out such a fire?

Thank you for your attention to my concerns. I look forward to hearing from you.

:-) Joanne

Joanne Martin
1818 4th Place NE
Auburn, WA 98002

COMMENT 2

Outlook

Re: No BESS in Auburn

From Gabriel Clark <GClark@auburnwa.gov>
Date Thu 1/29/2026 9:17 AM
To elisabethcaitlinyanez@gmail.com <elisabethcaitlinyanez@gmail.com>

Good morning Elizabeth,

Thank you for your comments regarding BESS.

They have been added to our records. There are a series of public meetings in the next few weeks, and I ask you to review the materials and have the opportunity to comment in those as well.

- Planning Commission Regular Meeting (no public hearing) February 3rd at 7 pm at City Hall.

Please let me know if you have any further questions.

CODE QUESTIONS?
Book an online meeting: Virtual Permit Center - City of Auburn (auburnwa.gov)

Gabriel Clark, Planner II
Department of Community Development
City of Auburn | www.auburnwa.gov
Office 253-470-2147| gclark@auburnwa.gov
Mailing Address: 25 W Main Street, Auburn, WA 98001
Permit Center Address: 1 E Main Street, Auburn, WA 98002 (Click Here for Map)
Customer Service Survey | Application Forms | Zoning Maps

From: Planning <planning@auburnwa.gov>
Sent: Thursday, January 29, 2026 8:20 AM
To: Gabriel Clark <GClark@auburnwa.gov>
Subject: FW: No BESS in Auburn

Hey Gabriel,

This looks like a comment related to your recent notification. Thank you.

Best,

Owen Goode
Planner II
Department of Community Development
City of Auburn | www.auburnwa.gov
Phone: (253) 470-2170 | ogoode@auburnwa.gov
Mailing Address: 25 W Main Street, Auburn, WA 98001

From: Beth Heighton <elisabethcaitlinyanez@gmail.com>
Sent: Wednesday, January 28, 2026 10:32 PM
To: Planning <planning@auburnwa.gov>
Subject: No BESS in Auburn

CAUTION: **The following message originated from outside the City of Auburn. Be careful opening links and attachments**

Please do not give all future lithium BESS a "Determination of Non-Significance"!!!!

Lithium BESS have a significant impact on the surrounding areas. Here's a couple impacts:

1) Noise- average daily noise levels are between 96db and 106db and can be as high as 120db.
2) Fire risk- there is no known 100% effective thermal runaway prevention solution nor is there a 100% effective extinguishing solution- the primary Standard Operating proceedure for firefighters is to watch it burn- and get people evacuated.
3) Evacuations - last on average 5 days- smoke and gasses have caused exposure symptoms 13-23 miles away (downwind).
Fallout/ash- Moss Landing's Jan 2025 BESS fire showed toxic levels of ash/fallout as far away as 42 miles downwind. Prior to the Jan 2025 Moss landing BESS fire there was no absolutely irrefutable evidence of fallout/ash and it was ignored. San Jose State University's Marine lab found 100x increases of lithium battery heavy metals across their 2-mile study area- SEE Letter Two former lithium BESS sites have the EPA involved in the cleanup due to the toxic risk/dangers involved- clean up is estimated to take years.
4) Toxic gasses from burning/offgassing lithium batteries can permantly disable you and/or kill you within minutes even if you are 300ft away and aren't in smoke- see 4 Sacremento Firefighters who were disabled from a small EV fire offgassing after it had already burned for hours and been extinguished.

Thank you,
Elisabeth Yanez

Comment 3

Valley Regional Fire Authority · Fire Marshal's Office
Creating the safest community to live, work, and visit.

2905 C Street SW, Auburn, WA 98001 · (253) 288-5870 · Fax: (253) 288-5970

February 20, 2026

Subject: Response to Planning Commission Questions, Battery Energy Storage Systems (BESS)

The increasing deployment of commercial-scale Battery Energy Storage Systems (BESS) introduces operational and public safety considerations that differ significantly from traditional commercial development. Tier II and Tier III BESS facilities represent high-energy industrial installations with the potential for thermal runaway, toxic vapor release, prolonged fire conditions, and re-ignition. The Valley Regional Fire Authority (VRFA) provides the following responses to the Planning Commission's questions regarding these facilities and the proposed standards under ACC 18.31.240.

1. Equipment and training availability to combat an event at a BESS site.
VRFA is an all-hazards agency and will respond to any emergency incident involving a BESS facility within our jurisdiction. All suppression personnel are trained to the Hazardous Materials Operations Level in accordance with WAC 296-824-30005, Safety Standards for Emergency Response, and three members are trained to the Technician Level. An incident involving a Tier II or Tier III BESS would be managed as both a fire and hazardous materials event and would likely require automatic and mutual aid from regional partners. These responses may involve specialized air monitoring equipment, extended use of self-contained breathing apparatus, and coordination among multiple agencies. Due to the unique hazards of BESS incidents, response efforts focus on scene safety, air monitoring, protecting nearby property, and mitigating the fire or hazardous condition in coordination with facility experts.

2. The time needed to extinguish and monitor the event.
Lithium-ion battery fires are not typically extinguished in the conventional sense. Industry best practices and national experience demonstrate that affected battery units should be allowed to burn while protecting exposures and preventing fire spread. Documented commercial BESS incidents have required operational commitments exceeding 12 hours, with continued monitoring due to the risk of delayed reignition. Such incidents may require extended road closures, evacuation considerations, and regional resource commitments that span multiple operational periods. These realities underscore the importance of site design features that support sustained and safe emergency operations.

3. Any concerns/support VRFA has with the proposed code.
VRFA collaborated with the City of Auburn Development Office to address concerns regarding BESS facilities. The proposed ACC Supplemental Standard 18.31.240

incorporates provisions specifically requested by VRFA for larger Tier II and Tier III sites. These provisions are intended to enhance firefighter safety by requiring a secondary emergency response access route and ensuring adequate on-site water supply, as outlined in Section 18.31.240(D)(7) and (8). VRFA supports these amendments and believes they appropriately address the public safety considerations associated with commercial-scale energy storage facilities.

VRFA appreciates the opportunity to provide technical input and remains available to assist the Planning Commission with any further clarification if requested.

Respectfully,

Andrew Bergford
Fire Marshal
Valley Regional Fire Authority

Comment 4

PUGET SOUND ENERGY

February 11, 2026

City of Auburn
25 W Main Street
Auburn, WA 98001

RE: Comments on Proposed Battery Energy Storage System Code Updates - City File No. ZOA24-0004

Puget Sound Energy (PSE) appreciates the opportunity to provide input on the City of Auburn's proposed Battery Energy Storage System (BESS) code updates following the development moratorium. As the state's oldest and largest energy utility serving Auburn residents and businesses, PSE is committed to delivering safe and reliable service while supporting the City's clean energy and resilience goals.

PSE staff reviewed the proposed language addressing BESS development in the Auburn City Code (ACC). Please consider the enclosed information as the City contemplates updates to its municipal code to address the development of BESS within City limits.

PSE's regulatory obligations

PSE is a regulated utility with obligations under WAC 480-100 and WAC 480-90 to serve customers reliably and cost-effectively. We are also subject to Washington state's climate policies like the Clean Energy Transformation Act (CETA) to supply 100% clean electricity by 2045. These obligations require us to support distributed energy resources like BESS that enhance grid flexibility, defer costly infrastructure upgrades, and support customer resilience.

BESS contributions to Auburn Comprehensive Plan goals and policies

Auburn's Comprehensive Plan establishes clear values and goals across multiple elements that directly align with the benefits provided by appropriately regulated BESS installations. The City's stated values emphasize infrastructure that supports economic resilience (Economy), environmental stewardship (Environment), and sustainable growth (Sustainability).

- **Climate Element Integration:** Auburn's Climate Element Vision explicitly commits the City to "taking action to mitigate the worst impacts of climate change" while "living out its commitment to its core community values of sustainability, environmental stewardship, and economic vibrancy." BESS installations directly support this vision by enabling clean energy integration and enhancing grid resilience. Policy C-42 specifically calls for the City to "support local businesses' efforts to generate and store renewable electricity on-site, which can provide back-up power during emergencies and help ensure continuity of operations." Policy C-65 advocates for "increased grid reliability through...environmentally responsible storage technologies that reduce peak load and provide grid flexibility," explicitly recognizing BESS as beneficial infrastructure.
- **Renewable Energy and Resilience Goals:** The Climate Element's Goal 17 aims to "reduce greenhouse gas emissions by transitioning to renewable energy sources" and Policy C-57 calls to

"expand local onsite renewable energy production." Policy C-50 promotes "improved energy efficiency in existing commercial and residential buildings by offering expedited permitting processes, limiting administrative barriers, and reducing costs for residential solar projects." BESS systems are essential complements to solar installations, enabling customers to maximize their renewable energy investments.

- **Economic Development and Green Jobs:** The Economic Development Element's Vision calls for "economic growth carried out in a climate friendly manner" and Policy ED-7 emphasizes attracting businesses "designing, creating, selling and distributing climate-friendly products." The Climate Element's Policy C-40 supports developing "a green workforce" and Action 13.1 specifically supports "sustainable practices, green skills development, and the low carbon transition."
- **Utilities Element Integration:** Policy U-2 requires that utility services be provided "in an equitable manner that prioritizes easy access, and that offers pricing structures that strive to reduce barriers." Policy U-1 calls for utility facilities to support coordinated infrastructure expansion consistent with planned growth.

PSE Recommendations

1. Modify the definition of BESS provided in ACC 18.04.174

The proposed definition of BESS in ACC 18.04.174 is overly specific or prescriptive with regards to the purpose of BESS. PSE advises that the following changes (additions in blue, deletions noted with a strikethrough) be made to the definition in the draft code section:

> "BESS means a facility designed and constructed for the purpose of storing and deploying ~~rechargeable energy storage system consisting of electrochemical storage batteries, battery chargers, controls, and associated electrical equipment designed to provide~~ electrical power to a building or the grid. Battery energy storage system uses may include associated electrical equipment including, but not limited to, generation interconnection lines, transformers, and cooling equipment as facility components. ~~The system is typically used to provide standby or emergency power, an uninterruptable power supply, load shedding, load sharing, or similar capabilities."~~

2. Modify the upper capacity limits for BESS, Tiers I & II articulated in the draft section ACC 18.31.240.C & D

PSE recommends that the City of Auburn modify the upper capacity limits for both Tiers I and II BESS in ACC 18.31.240.D as outlined in the table below. These adjustments would better align Auburn's regulatory framework with the size of distribution level behind-the-meter and front-of-the-meter BESS installations, which are essential for achieving both local and state clean energy goals. Both types of BESS are critical for the utility's clean energy transformation, with an estimated need for approximately 1,500 MW of storage by 2030 to support Washington's Clean Energy Transformation Act requirements.

BESS Tier	Tier maximum capacity proposed in draft code section ACC 18.31.240	Tier maximum capacity range proposed by PSE
Tier I	100 kWh	200-400 kWh
Tier II	4 MWh	12-20 MWh

Tier I: Behind-the-meter BESS installations typically range from 5-100 kW with 4-hour duration capabilities (20-400 kWh). However, the current 100 kWh threshold constrains the ability of Auburn residents and small businesses to install appropriately sized systems that can provide meaningful backup power during extended outages or maximize the value of paired solar installations.

Behind-the-meter batteries (5-100 kW/20-400 kWh) sized for the facility's load with minimal footprint.



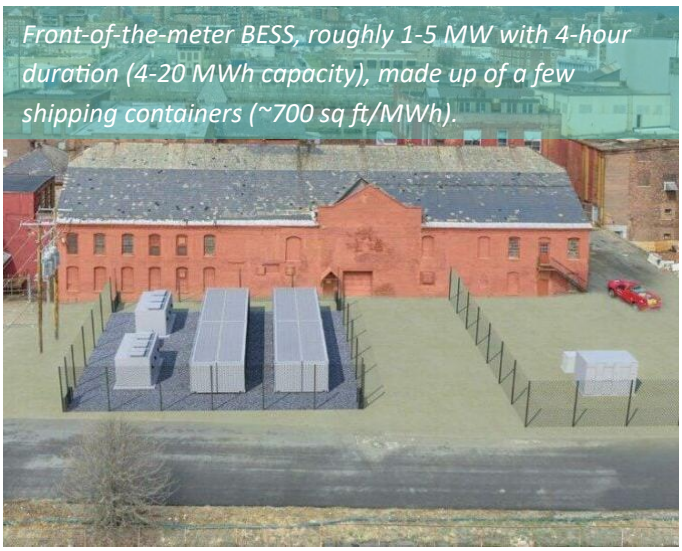


50 kW/332 kWh battery installed in 2023 at Samish Island Fire Station to test new microgrid.

Increasing the Tier I threshold to 200-400 kWh would enable Auburn customers to install systems capable of supporting critical loads for 12-24 hours during emergencies, rather than the limited 2-4 hour backup capability provided by systems under 100 kWh. This modification would support Auburn's Comprehensive Plan Climate Element goals, particularly Policy C-42 which calls for the City to "support local businesses' efforts to generate and store renewable electricity on-site, which can provide back-up power during emergencies," and Policy C-65 which advocates for "increased grid reliability through...environmentally responsible storage technologies." Additionally, this change would maintain the streamlined permitting process for residential-scale installations while ensuring that larger utility-scale systems requiring more extensive review and safety measures remain appropriately regulated under Tier II and III categories.

Tier II: Distribution-level, front-of-the-meter BESS resources typically range from 1-5 MW with 4-hour duration, which translates to 4-20 MWh of energy capacity. Auburn's current 4 MWh threshold for Tier II systems would effectively prohibit most utility-scale installations that could provide meaningful grid benefits, forcing these beneficial projects into the more restrictive Tier III category or preventing them entirely in many zones.

Expanding Tier II to accommodate systems up to 12-20 MWh would enable Auburn to host appropriately scaled utility infrastructure that can deliver community-wide grid resilience benefits, support renewable energy integration, and help defer costly transmission upgrades. This modification would position Auburn for more efficient deployment of clean energy infrastructure deployment rather than creating barriers to said deployment, while still maintaining appropriate regulatory oversight through the existing Tier II administrative permitting process.



Front-of-the-meter BESS, roughly 1-5 MW with 4-hour duration (4-20 MWh capacity), made up of a few shipping containers (~700 sq ft/MWh).



2 MW/4.4 MWh lithium-ion BESS built in 2015 adjacent to existing Glacier substation in Whatcom County.

The City of Auburn and PSE have shared goals to foster resilience, safety, and decarbonization of the grid at a community level. The proposed code update draws from relevant state fire safety codes and from other municipality precedents, and the draft code incorporates appropriate requirements for safety, fencing, screening, lighting, and sound based on the scale, size, and location of the BESS installation. PSE recommendation to increase maximum capacities of BESS Tier I and BESS Tier II not only aligns with the proposed requirements, but also aligns the draft code with Auburn's own comprehensive plan goals referenced above.

Ongoing Collaboration

PSE requests that the City consider the unique benefits that appropriately regulated BESS can provide to Auburn's residents and businesses. We ask that the City engage with PSE technical staff to better understand BESS operational characteristics and safety standards while drafting code updates, as well as the ways in which BESS can contribute to Auburn's stated Comprehensive Plan goals. We hope to help the City foster the economic and resilience benefits that distributed energy resources can provide, and to develop regulations that preserve community values while enabling beneficial technologies.

PSE looks forward to working collaboratively with the City to develop BESS regulations that protect community interests while supporting energy resilience and clean energy goals. We welcome continued engagement throughout this process and are available to provide technical expertise, operational data, and policy guidance to support informed decision-making.

Please do not hesitate to contact me at (206) 716-2754 or at dylan.marcus@pse.com to discuss these recommendations further.

Sincerely,

Dylan Marcus
Municipal Land Planner
Puget Sound Energy

Comment 5

Gabriel Clark

From: Gabriel Clark
Sent: Friday, February 13, 2026 2:48 PM
To: 'Zachary Pratt'
Subject: RE: Planning email regarding BESS code update and SEP24-0021

Good afternoon Zachary,

Thank you for providing your comments during the SEPA process. Your comment has been recorded and will be transmitted to planning commission for consideration.

Please let me know if you have any further questions.

CODE QUESTIONS?
Book an online meeting: Virtual Permit Center - City of Auburn (auburnwa.gov)

Gabriel Clark, Planner II
Department of Community Development
City of Auburn | www.auburnwa.gov
Office 253-470-2147 | gclark@auburnwa.gov
Mailing Address: 25 W Main Street, Auburn, WA 98001
Permit Center Address: 1 E Main Street, Auburn, WA 98002 (Click Here for Map)
Customer Service Survey | Application Forms | Zoning Maps

From: Zachary Pratt <zachpratt25@gmail.com>
Sent: Wednesday, February 11, 2026 6:03 AM
To: Planning <planning@auburnwa.gov>
Subject: Planning email regarding BESS code update and SEP24-0021

CAUTION: The following message originated from outside the City of Auburn. Be careful opening links and attachments

As a long time resident of Auburn, I am deeply concerned that short term benefits were taking precedence over permanent regional resource losses.

You are introducing a permanent hazardous material site capable of catching on fire at any time of day or night that is inextinguishable, not containable and consequently exposing an entire region to forever toxins that will affect every natural resource in King County and all neighboring counties.

BESS fires are a noticeable hazard in our community, as the resources used during a disaster are complex, misunderstood and create a large culmative impact.

Water doesn't put out the fire like a normal house fire, foam products for chemical fires don't work, simply smothering them does effectively nothing. In many cases, the option is containment efforts and let it burn.

The current guidelines for suppressing a Lithium Battery Storage Facility fire falsely use structure firefighting standards, which do not work in this application.

A common structure fire such as a house or a commercial building advise fire department units to stage 100-300' feet away from the burning structure to protect firefighters from heat and toxic smoke while the engine pumps water to firefighters who wear protective gear and advance charged hose lines to the seat of the fire.

But Battery Storage Facility fires create an excessive amount upwards and north of 2000 degrees. A fire engine would melt and the personnel would burn to death if they tried to get within 100'-300' of the incident.

A safe distance would be 3,200' - 5,000' away which is not a plausible distance to spray water. Water would just evaporate and turn into steam when in contact with such high heat.

Pictures of these facilities on Nextera's website show them sitting on a slab of concrete out in the open with rows of metal containers sitting feet away from each other.

There are no fire proof concrete walls to buffer them from sun, rain, snow and salty air.

There are no statistics about the long term integrity of the metal containers or how they are insulated or treated to prevent corrosion.

Putting hundreds of units of temperature sensitive, flammable batteries in a metal box sitting outside exposed to the variable temperatures we experience annually is a short sided idea. Especially given our summers have gotten warmer over the years, management of these systems will be strained, opening up to failure of these units.

They use water to cool them down. What happens to the water when it snows here? Can you imagine a fire breaking out in freezing conditions?

Nextera, the company based in Juno Florida, has only just recently started building Litihum Ion Battery Storage Facilities. They only have 50 across the United States. They are aggressively seeking property across the nation to build as many as they possibly can. They made 7 Billion dollars last year.

Their builds show no infrastructure to contain the toxic water that is a bi product of trying to cool and extinguish a fire. The toxic smoke would blow by prevailing winds hundreds of miles away while the site would burn and hopefully not spread, but then how would you prevent spread to nearby target hazards with heavy fuel loads such as the airport, or industrial areas these plants are supposed to be in.

By comparison, the oil refinery on March Point has large flammable liquid above ground storage tanks. The grounds around them are designed to capture their contents should they fail. Fire suppression systems are designed to pump water or extinguishing agents at pressure necessary to extinguish their contents. Security and personnel are on duty 24 hours a day 7 days a week. The storage tanks are

monitored physically and visibly. A responsible party is onsite at all times. All personnel are trained annually to handle an emergency.

The type of energy storage you are creating has no redundancy to prevent catastrophic damage or prevent spreading. These are major discrepancies left to emergency response agencies that are under funded, under staffed, under trained and ill informed.

This is creating an unprecedented situation that has more potential to do irreversible harm than good.

I urge you to reconsider this decision and save this area from having to recover from a major disaster. Please do not allow BESS sites in the city of Auburn and please advocate to not allow them in our area.

Zach Pratt

Comment 6

Gabriel Clark

From: Gabriel Clark
Sent: Friday, February 13, 2026 8:55 AM
To: 'bonnibusmaximus@aol.com'
Subject: RE: Battery Energy Storage Systems Code Update: SEPA

Good morning Bonnie,

Thank you for your thoughtful comments regarding the City's proposed development regulations. Your comments will be transmitted to the Planning Commission for consideration.

Regarding the adopted Building, Fire, and other national Codes, these standards are developed using the best available science from industry experts. Because both the technology and the codes continue to evolve, it is essential that the City reference the State-adopted Building and Fire Codes. This approach allows the City to implement updated standards immediately as they are revised. Additional requirements are also incorporated from Auburn City Code and the Engineering Design Standards.

International Fire Code (IFC) Chapter 1207 (2024) contains specific fire suppression and containment requirements that the Valley Regional Fire Authority is aware of and will apply during project review. These standards are referenced throughout the proposed supplemental development standards contained in Auburn City Code.

For example:

- IFC 1207.1.7 requires large-scale fire testing in accordance with UL 9540A. This testing must demonstrate that a fire involving one ESS will not propagate to adjacent units and, when located within a structure, will remain contained for the duration of the test. The test must be conducted or witnessed by an approved testing laboratory, and the report must be submitted to the fire code official for review and approval under IFC 104.2.2.

- IFC 1207.5.5 requires that BESS facilities located within structures be equipped with an automatic fire suppression system. Additional technology-specific requirements for ESS installations are outlined in IFC 1207.6.

There is a substantial amount of technical material involved, but I want to assure you that the City is applying the most risk-averse standards available, grounded in established codes and the best available science. Where existing codes do not fully address Auburn's specific context, staff are proposing additional restrictions and safeguards to protect critical areas and the locations where a BESS may be sited. Specifically, the proposed code includes provisions to prevent the intrusion of pollutants into critical areas generated by a facility. Secondary containment systems will be designed as independent structures, separate from any stormwater system and increased buffer widths, to ensure that potential contaminants are fully isolated.

Please let me know if you have any additional comments or concerns,

CODE QUESTIONS?
Book an online meeting: Virtual Permit Center - City of Auburn (auburnwa.gov)

Gabriel Clark, Planner II
Department of Community Development

City of Auburn | www.auburnwa.gov
Office 253-470-2147 | gclark@auburnwa.gov
Mailing Address: 25 W Main Street, Auburn, WA 98001
Permit Center Address: 1 E Main Street, Auburn, WA 98002 (Click Here for Map)
Customer Service Survey | Application Forms | Zoning Maps

From: bonnibusmaximus@aol.com <bonnibusmaximus@aol.com>
Sent: Wednesday, February 11, 2026 1:14 AM
To: Planning <planning@auburnwa.gov>
Subject: Battery Energy Storage Systems Code Update: SEPA

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Hello,

I'd like to request that there be a hearing to discuss the details of the SEPA findings.

The WAC referenced that would be used as guidelines for siting is very generic and vague even in its descriptions of fire suppression and monitoring systems. I'd also argue it is out of date as these systems and chemistry have undergone several changes in code, yet continue to fail.[1]

I'd also like to point out that there is new data regarding how hazardous materials are dispersed into the environment as was discovered in new Moss Landing data collection.[2] They used different methodology than the EPA did and learned about how the different metals and chemicals moved through the environment. Given the recent flooding in the valley, I'd be very concerned how the release of toxic and polluting battery components would affect our wetlands and move differently into the environment. Since the ordinance is citywide, and the plume spread and dispersion of pollutants can be miles long, I am worried a critical aquifer recharge area (CARA) would be negatively impacted.

These are unlikely to serve as intended for emergency backup for the community.

"The SOC of a BESS affects the ability of the BESS to provide energy or other ERSs to the BPS at any given time. In many cases, the BESS may have SOC limits that are tighter than 0–100% for battery lifespan, and other equipment and performance considerations. SOC limits affect the ability of the BESS to operate as expected, and any SOC limits will override any other ability of the BESS to provide ERSs or energy to the BPS." "At this time, it is unlikely that most legacy BESS can support system restoration activities as a stand-alone resource..." (see attached)

I also have concerns about placement of any tier 2 or 3 BESS in residential zones. The burden to community services cannot be downplayed in the event of a failure as BESS continue to have no plan to extinguish containers, and they are allowed to burn while being monitored.[1] These should be placed only in heavy industrial zone and every project should be evaluated through the strictest planning process, including public hearing/input whenever able.

I appreciate the thoughtfulness of including financial responsibility requirements, but would these be held by the land owner or BESS operator? Given how expensive response and clean up is, with some BESS sites having now become superfund sites, what is a realistic number to put on the costs of failure?[3] These things and many more should be discussed at a hearing before any determination is made.

Thank you,
Bonnie Helms
253-632-6085

[1] https://villageofwarwickny.gov/28-church-street-west-warwick-3-battery-energy-storage-site-fire-information-updates/

[2] https://www.nature.com/articles/s41598-025-25972-8

[3] https://americanbatterytechnology.com/epa-taps-abtc-for-large-scale-battery-recycling-project/

Gabriel Clark

From: Gabriel Clark
Sent: Friday, February 13, 2026 2:40 PM
To: bonnibusmaximus@aol.com
Subject: RE: Battery Energy Storage Systems Code Update: SEPA

Good afternoon Bonnie,

Thank you for providing your comment regarding Battery Energy Storage System regulations in the City of Auburn. Your comment has been attached with your second comment and will be provided to Planning Commission.

CODE QUESTIONS?
Book an online meeting: Virtual Permit Center - City of Auburn (auburnwa.gov)

Gabriel Clark, Planner II
Department of Community Development
City of Auburn | www.auburnwa.gov
Office 253-470-2147 | gclark@auburnwa.gov
Mailing Address: 25 W Main Street, Auburn, WA 98001
Permit Center Address: 1 E Main Street, Auburn, WA 98002 (Click Here for Map)
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From: bonnibusmaximus@aol.com <bonnibusmaximus@aol.com>
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Subject: Battery Energy Storage Systems Code Update: SEPA

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Thank you,
Bonnie Helms
253-632-6085

[1] https://villageofwarwickny.gov/28-church-street-west-warwick-3-battery-energy-storage-site-fire-information-updates/

[2] https://www.nature.com/articles/s41598-025-25972-8

[3] https://americanbatterytechnology.com/epa-taps-abtc-for-large-scale-battery-recycling-project/

NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Reliability Guideline

Performance, Modeling, and Simulations of BPS-Connected Battery Energy Storage Systems and Hybrid Power Plants

June 2023

RELIABILITY | RESILIENCE | SECURITY






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Atlanta, GA 30326
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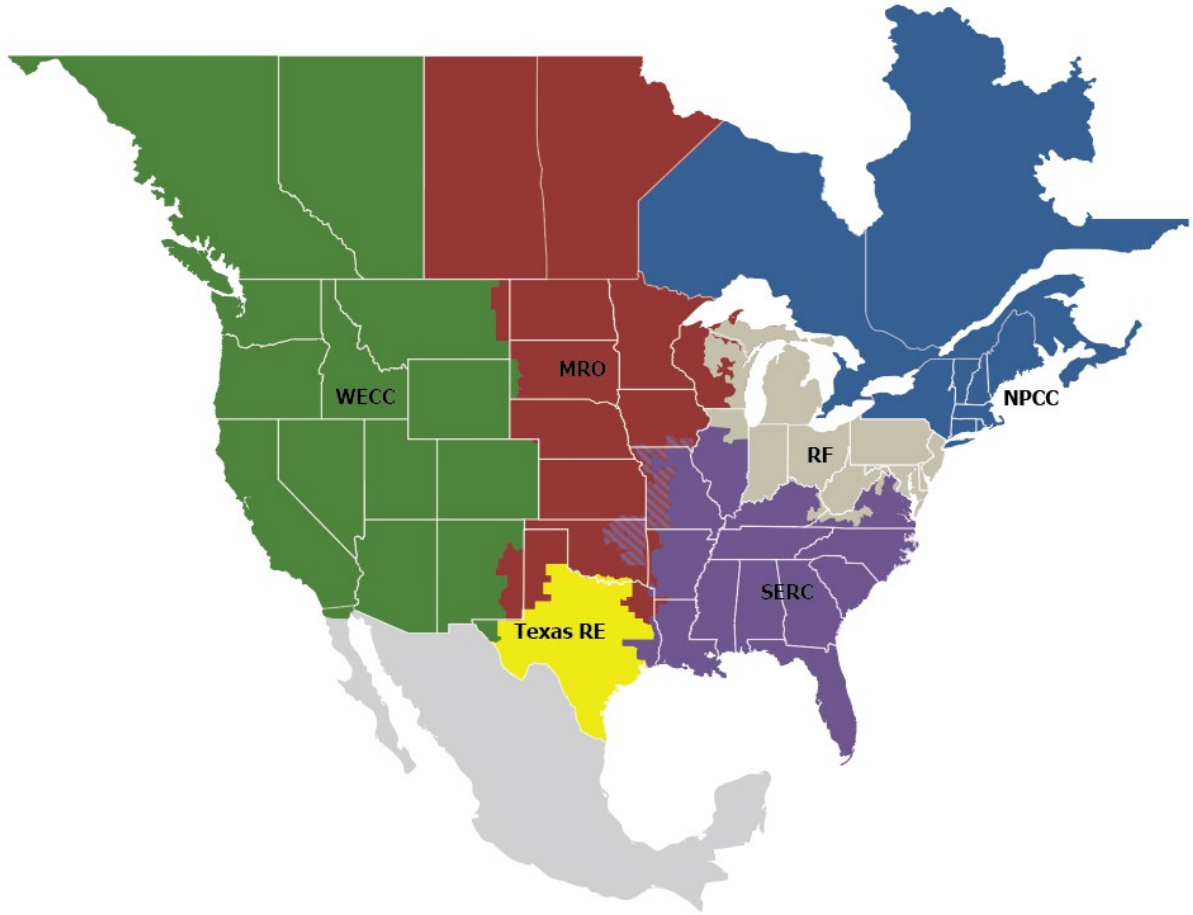
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Preface

Electricity is a key component of the fabric of modern society and the Electric Reliability Organization (ERO) Enterprise serves to strengthen that fabric. The vision for the ERO Enterprise, which is comprised of NERC and the six Regional Entities, is a highly reliable, resilient, and secure North American bulk power system (BPS). Our mission is to assure the effective and efficient reduction of risks to the reliability and security of the grid.

Reliability | Resilience | Security
Because nearly 400 million citizens in North America are counting on us

The North American BPS is made up of six Regional Entities as shown on the map and in the corresponding table below. The multicolored area denotes overlap as some load-serving entities participate in one Regional Entity while associated Transmission Owners/Operators participate in another.



MRO	Midwest Reliability Organization
NPCC	Northeast Power Coordinating Council
RF	ReliabilityFirst
SERC	SERC Reliability Corporation
Texas RE	Texas Reliability Entity
WECC	WECC

Preamble

The NERC Reliability and Security Technical Committee (RSTC), through its subcommittees and working groups, develops and triennially reviews reliability guidelines in accordance with the procedures set forth in the RSTC Charter. Reliability guidelines include the collective experience, expertise, and judgment of the industry on matters that impact BPS operations, planning, and security. Reliability guidelines provide key practices, guidance, and information on specific issues critical to promote and maintain a highly reliable and secure BPS.

Each entity registered in the NERC compliance registry is responsible and accountable for maintaining reliability and compliance with applicable mandatory Reliability Standards. Reliability guidelines are not binding norms or parameters nor are they Reliability Standards; however, NERC encourages entities to review, validate, adjust, and/or develop a program with the practices set forth in this guideline. Entities should review this guideline in detail and in conjunction with evaluations of their internal processes and procedures; these reviews could highlight that appropriate changes are needed, and these changes should be done with consideration of system design, configuration, and business practices.

Executive Summary

Interconnection queues across North America are seeing a rapid influx of requests for battery energy storage systems (BESS) and hybrid power plants.[1] While there are different types of energy storage technologies, BESS are experiencing a rapid increase in penetration levels due to favorable economics, policies, and technology advancements.[2] Similarly, BESS are most commonly being coupled with inverter-based generating resources, such as wind and solar photovoltaic (PV). Therefore, BESS and inverter-based hybrid power plants are the primary focus of this reliability guideline.

NERC's previously published reliability guidelines provided performance recommendations and suggested improvements to interconnection requirements and planning processes for newly interconnecting inverter-based resources. BESS and hybrid power plants were not specifically addressed in detail in these guidelines, and there are certain considerations and nuances to the operation of this technology that warrant additional guidance. Hybrid plants also provide new benefits to the BPS by combining operational capabilities across different technologies; however, there are different types of hybrid configurations (ac-coupled versus dc-coupled), and complexities and unique operational considerations of hybrid plants that need additional guidance as well. The reliability guideline presented here provides guidance, clarifications, and considerations not covered in the other reliability guidelines, focusing specifically on BESS and hybrid power plants. This document also contains guidance for Transmission Operators (TO), Transmission Planners (TP), and Planning Coordinators (PC) to further enhance their interconnection requirements and study processes for BESS and hybrid power plants.

The recommendations in this guideline should apply to all BPS-connected BESS and hybrid plants and should not be limited only to Bulk Electric System (BES) facilities. Many newly interconnecting BESS projects and hybrid plants may not meet the BES definition; however, having unified performance and behavior from all BPS-connected inverter-based resources (including BESS and hybrid plants) is important for reliable operation of the North American BPS. TOs are encouraged to incorporate the recommended performance characteristics into their interconnection requirements per NERC FAC-001, and TPs and PCs are encouraged to incorporate the recommended modeling and study approaches into their interconnection processes per NERC FAC-002.

This reliability guideline includes the recommended performance of BPS-connected BESS and hybrid power plants that all Generator Owners (GOs) and developers seeking interconnection to the BPS should consider. TOs, TPs, and PCs can also use these performance recommendations to improve their interconnection requirements and study processes for these facilities. This guideline also covers recommended modeling and study practices that should be considered by TPs and PCs as they perform planning assessments with increasing numbers of BESS and hybrid power plants in the interconnection study process, annual planning process, and for any specialized studies needed to ensure BPS reliability.

High-Level Recommendations

This reliability guideline contains detailed recommendations regarding BESS and hybrid power plant performance, modeling, and studies. Industry is strongly encouraged to review the guidance, use the technical details, and reference materials, and adapt the recommendations for their specific processes and practices. **Table ES.1** provides a set of high-level recommendations (categorized by performance, modeling, and studies) and their applicability[3] to all aspects of the guidance contained throughout this reliability guideline.

[1] A hybrid power plant is defined herein as "a generating resource that is comprised of multiple generation or energy storage technologies controlled as a single entity and operated as a single resource behind a single POI."

[2] https://www.eia.gov/analysis/studies/electricity/batterystorage/

[3] The applicability column for each of the recommendations made is solely intended to provide guidance for the entities that should consider the recommendation for their business practices.

Table ES. 1: High-Level Recommendations for BESS and Hybrid Plant Performance, Modeling, and Studies		
#	**Recommendation**	**Applicable Entities**
A1	**Applicability:** The recommendations in this guideline should be applied to all BPS-connected BESS and hybrid plants and should not be limited to only BES facilities. Many newly interconnecting BESS and hybrid power plants may not meet the BES definition; however, having unified performance and behavior from all BPS-connected inverter-based resources is important for reliable operation of the North American BPS.	TOs, TPs, PCs, BAs, RCs, GOs, GOPs, developers, equipment manufacturers
P1	**BESS and Hybrid Plant Performance:** Generation Owners (GO) of existing or newly interconnecting BESS and hybrid power plants should closely review the recommended performance characteristics outlined in this reliability guideline and adopt these recommendations into existing and new facilities to the extent possible. Newly interconnecting GOs of BESS and hybrid power plants should work closely with their respective TOs, Balancing Authorities (BA), Reliability Coordinators (RC), TPs, and PCs to ensure all entities have an understanding of the operational capabilities and limitations of the facilities being interconnected. BESS and hybrid plant developers, in coordination with equipment manufacturers, should also use the recommendation provided herein regarding BESS/hybrid plant performance when designing new facilities.	GOs, GOPs, developers, equipment manufacturers
P2	**Interconnection Requirements and Processes:** TOs should update or improve their interconnection requirements to ensure they are clear and consistent for BESS and hybrid power plants. TPs and PCs should ensure that their modeling requirements include clear specifications for BESS and hybrid power plants. TPs and PCs should also ensure that their study processes and practices are updated and improved to consider the unique operational capabilities of those facilities.	TOs, TPs, PCs
P3	**Unique Operational Capabilities of BESS and Hybrid Power Plants:** All applicable entities should consider the detailed guidance contained in this guideline and fully utilize the operational capabilities of these new technologies to support reliable operation of the BPS. Capabilities like grid forming technology, operation in low short-circuit networks, the ability to provide primary and fast frequency response (FFR), and other functions more readily available in these new technologies should be fully utilized (as needed) and are essential reliability services (ERS) for the BPS.	TOs, TPs, PCs, BAs, RCs, GOs, GOPs, developers, equipment manufacturers
M1	**Models Matching As-Built Controls, Settings, and Performance:** All BESS and hybrid plant GOs (in coordination with the developer and equipment manufacturers) should ensure that the models used to represent BESS and hybrid power plants accurately represent the controls, settings, and performance of the equipment installed in the field. This requires concerted focus by the GO, developer, and equipment manufacturer during the study and commissioning process as well as more rigorous verification and testing by the TP and PC throughout. GOs should also provide updated models to the TP and PC that reflect as-built settings and controls after plant commissioning. The TP and PC should study any modifications to equipment settings that have an impact on the electrical performance of the equipment prior to changes being made, per the latest effective version of NERC FAC-002. TPs and PCs should ensure their modeling requirements and processes clearly define the types of models that are acceptable, the level of detail expected for each model, and the benchmarking between models required during the planning study process. GOs, Generation Operators (GOP), and developers of each BESS and hybrid power plant (in coordination with their TP, PC, and equipment manufacturer) should verify that the dynamic models fully represent the expected behavior of the as-built facility.	TPs, PCs, GOs, GOPs, developers, equipment manufacturers

Table ES. 1: High-Level Recommendations for BESS and Hybrid Plant Performance, Modeling, and Studies		
#	**Recommendation**	**Applicable Entities**
M2	**Software Enhancements:** The technological advancement of BESS and hybrid plant controls is outpacing the capabilities available in the standardized library models. Simulation software vendors should work with BESS and hybrid plant inverter and plant-level controller manufacturers to develop more flexible dynamic models to represent these facilities. Software developers should be proactive in addressing modeling challenges faced by TPs and PCs in this area, particularly as the number of these types of resources rapidly increases in Interconnection-wide base cases. Software vendors should support the advancement of using "real-code"[4] models or other user-defined models in a manner that does not degrade or limit the quality and fidelity of the overall Interconnection-wide base case. Software vendors should consider adding model validation, verification, quality review, and other screening tools to their programs to support TP and PC review of model quality. Software vendors should improve the steady-state model representation of hybrid plants such that engineers are not required to use workarounds, such as modeling two separate units to represent a single hybrid plant.	Simulation software vendors, equipment manufacturers
S1	**Study Process Enhancements:** TPs and PCs should improve their study methodologies for both interconnection studies and annual planning studies to ensure they are appropriate for a BPS with significantly more BESS and hybrid power plants. Determination of stressed operating conditions, selection of study assumptions, inclusion of various modeling practices, and determination of appropriate dispatch conditions are just a few areas where close attention will be needed by TPs and PCs to ensure their study approaches align with the new technologies.	TPs, PCs
S2	**Expansion of Study Conditions:** The variability and uncertainty of renewable energy resources has led TPs and PCs to study different expected operating conditions than were previously used for planning assessments. BESS and hybrid plants may help address some of the operational variability; however, developing suitable and reasonable study assumptions will become a significant challenge for future planning studies. TPs and PCs may need to expand the set of study conditions used for future planning assessments as the most severe operating conditions may change over time.	TPs, PCs

[4] "Real code" models are a type of black box model that implement the actual control code from the equipment. The real-code aspects of the model pertain mainly to the controller-related code in the turbine controls, inverter controls, protection and measurement algorithms, and plant-level controller.

Introduction

Fundamentals of Energy Storage Systems

Energy storage can take many different forms, and some are synchronously connected to the grid while others are connected through a power electronics interface (i.e., inverter-based). Examples of different energy storage technologies include, but are not limited to, the following:[5]

- **Battery Energy Storage:** There are many types of BESS, such as lithium-ion, nickel-cadmium, sodium sulfur, redox flow, and others.[6] Batteries convert stored chemical energy to direct current (dc) electrical energy, and vice versa. Power electronic converters (i.e., inverters) are used to connect the battery to the alternating current (ac) power grid.
- **Pumped Hydroelectric Storage:** Pumped hydroelectric power is one of the most mature and commonly used large-scale electric storage technologies today. Water flowing through a hydroelectric turbine-generator produces electric energy for the BPS. Energy is then stored by sending the water back to the upper reservoir through a pump.
- **Mechanical Energy Storage:** Mechanical systems store kinetic or gravitational energy for later use as electric energy. Flywheels are an example of mechanical energy storage; they work by accelerating a rotor to a very high speed so that the inertia of the flywheel can then be delivered to the grid as energy when needed.
- **Hydrogen Energy Storage:** Hydrogen energy storage involves the separation of hydrogen from some precursor material, such as water or natural gas, and storage of the hydrogen in vessels that range from pressurized containers to underground salt caverns for later use. The hydrogen can later be used to produce electricity with fuel cells or combined-cycle power plants.[7]
- **Thermal Energy Storage:** Thermal energy storage involves heating or cooling a material with a high heat capacity and recovering the energy later by using the thermal gradient between the thermal storage medium and the ambient conditions. For example, electric energy could be used to heat volcanic stones that can then be converted back to electric energy by using a steam turbine.[8] Concentrated solar plants use molten salt as thermal storage medium and steam turbines to convert heat to electric energy.
- **Compressed Air Energy Storage:** Compressed air storage contains energy in the form of pressurized air in a geological feature or other facility. Energy can be delivered back to the grid at a later time, usually by heating the pressurized air and sending it through a turbine to generate power.
- **Supercapacitors:** Supercapacitors or ultracapacitors are high-power electrostatic devices with fast charging and discharging capability (on the order of 1–10 seconds) and low energy density. No chemical reactions occur during charging and discharging, so these units have low maintenance costs, long lifetimes, and high efficiency. These devices are scalable, but their fast response can generally not be sustained due to the low energy density.

There are multiple benefits of BPS-connected energy storage systems, including (but not limited to) the following:

- Providing balancing and fast-ramping services
- Mitigating transmission congestion
- Enabling energy arbitrage to charge during low price periods and discharge during high price periods
- Providing ERSs like frequency response and dynamic voltage support

[5] https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/Master_ESAT_Report.pdf
[6] https://energystorage.org/why-energy-storage/technologies/solid-electrode-batteries/
[7] https://energystorage.org/why-energy-storage/technologies/hydrogen-energy-storage/
[8] https://www.siemensgamesa.com/products-and-services/hybrid-and-storage/thermal-energy-storage-with-etes

Each of the energy storage technologies described can provide benefits to BPS reliability and resilience. The interaction between battery energy storage devices and the electrical grid is dominated by the power electronics interface at the inverter level and plant controller level, specifically on small time scales (from microseconds to tens of seconds to minutes). The interactions that BESS and hybrid plants have with the BPS is the primary focus of this guideline, and guidance provided also covers ways that industry can model and study these resources connecting to the BPS.

Fundamentals of Hybrid Plants with BESS

Hybrid power plants are also becoming increasingly popular due to federal incentives, cost savings, flexibility, and higher energy production by sharing land, infrastructure, and maintenance services. Hybrid power plants ("hybrid resources") are defined here as follows:

> **Hybrid Power Plant (Hybrid Resource):** A generating resource that is comprised of multiple generation or energy storage technologies controlled as a single entity and operated as a single resource behind a single point of interconnection (POI).

There are many types of hybrid power plants that combine synchronous generation, inverter-based generation, and energy storage systems;[9] however, the most predominant type of hybrid power plant observed in interconnection queues across North America is a combination of renewable energy (solar PV or wind) and battery energy storage technologies.[10] Due to this fact, this guideline concentrates primarily on hybrid plants that combine renewable (specifically inverter-based) generation with BESS technology.

The conversion of dc to ac current occurs at the power electronics interface. However, the way this conversion occurs within a hybrid plant affects how the resource interacts with the BPS, its ability to provide ERSs, how it is modeled, and how it is studied. Hybrid plants can be classified as either of the following:

- **AC-Coupled Hybrid Plants:** An ac-coupled hybrid power plant couples each form of generation or storage at a common collection bus after it has been converted from dc to ac at each individual inverter. **Figure I.1** shows a simple illustration of one possible configuration of an ac-coupled hybrid power plant where a BESS is coupled with a solar PV or wind power plant on the ac side. The BESS may be charged either from the renewable generating component or from the BPS if appropriate contracts and rates are available.
- **DC-Coupled Hybrid Plants:** A dc-coupled hybrid power plant couples both sources at a dc bus tied to the grid via a dc-ac inverter. There are often dc-dc converters between the individual units and the common dc collection bus. **Figure I.2** shows a simple illustration of another possible configuration of a dc-coupled hybrid power plant where the energy storage component is coupled through a dc-dc converter on the dc side. The dc–ac inverter can be unidirectional where the BESS can only be charged from the renewable resource or bi-directional where the BESS can also be charged from the BPS (depending on interconnection requirements and agreements).[11] There are multiple possible configurations for dc-coupled facilities, particularly on the dc-side between the generating resource, the BESS, and ways they connect through the ac–dc inverter.[12]

[9] Such as natural gas and BESS hybrid plants, combined heat and power with BESS, or multiple types of inverter-based generation technologies

[10] Note that hybrid natural gas-BESS plants may be desirable in some areas where capacity shortages have been identified.

[11] ERCOT has drafted a concept paper specifically on dc-coupled resources, which may be a useful reference: http://www.ercot.com/content/wcm/key_documents_lists/191191/KTC_11_DC_Coupled_2-24-20.docx.

[12] https://www.dynapower.com/products/energy-storage-solutions/dc-coupled-utility-scale-solar-plus-storage/

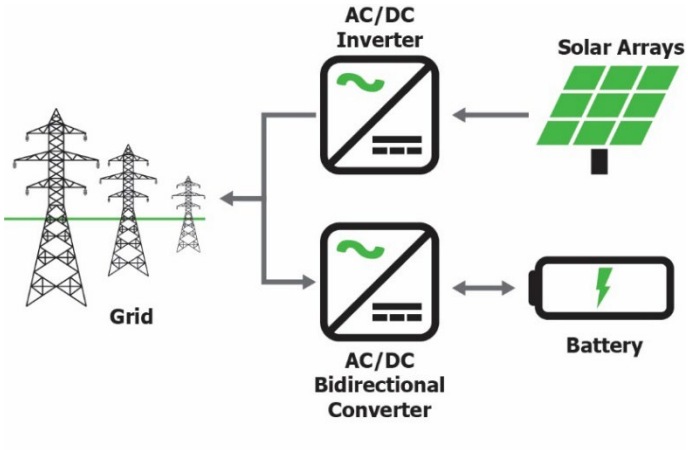


Figure I.1: Illustration of AC-Coupled Hybrid Plant

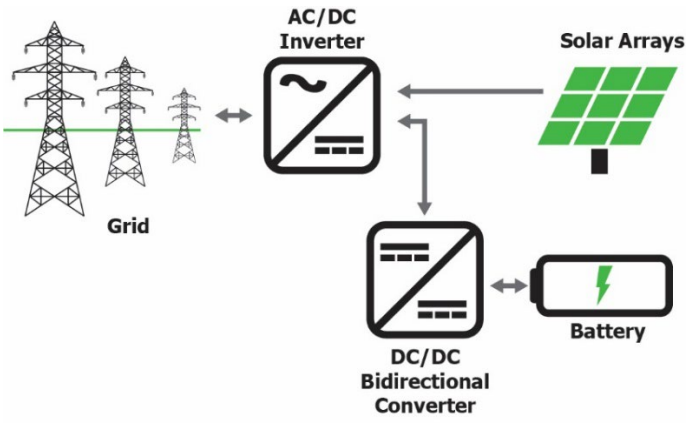


Figure I.2: Illustration of DC-Coupled Hybrid Plant

Different technologies may deploy ac- and dc-coupled systems for different reasons. For example, it may be economical for a solar PV and BESS system to be coupled on the dc-side whereas it may be more cost effective for wind turbine generators to be coupled with a BESS on the ac-side. Each newly interconnecting hybrid will have its reasons for using ac- or dc-coupled technology that ultimately comes down to which configuration provides the most value for the given installation.

Hybrid plants combine many of the benefits of stand-alone BESS with renewable energy generating resources, including (but not limited to) the following:[13]

- **Cost Efficiencies:** Integrating different technologies at the same location enables a developer to save on shared electrical, controls, and communications equipment; simplifies siting; allows for shared personnel; improves maintenance schedules; reduces electrical losses associated with ac/dc conversion efficiency (i.e., dc-coupled); and saves on other relevant operational costs.
- **Reduced Interconnection Costs:** In some cases, adding a battery that can charge and discharge on command can reduce interconnection costs for a renewable generator by avoiding overloads on existing transmission equipment or addressing reliability needs that may have required new transmission equipment.

[13] The benefits noted are also generally applicable to stand-alone energy storage devices, such as BESS; the benefits noted here focus on how addition of a BESS to a traditional renewable energy-generating project can improve the operational capabilities and flexibility of the resource.

- **Energy Arbitrage:** The storage element in a hybrid plant can be used to charge during low-priced hours and discharge during high-priced hours, therefore shifting energy production to those hours where energy is needed. Current arbitrage for hybrids (and BESS) is on the order of hours and days; future technologies may be able to further shift energy storage and production based on system needs.
- **Excess Energy Harvesting:** Hybrid plants have the added benefit of being able to capture any excess solar or wind production that would otherwise be lost or "clipped" (e.g., due to curtailment or oversizing of PV panels compared to inverter size). Capturing excess energy increases plant capacity factor and enables it to continue operating when the generating resource output decreases.
- **Frequency Response Capability:** Adding energy storage to a renewable facility increases the ability of the plant to respond to underfrequency events while still operating the renewable component at maximum available power (given appropriate interconnection practices and agreements) as well as bringing some certainty to providing this service. Addition of battery storage to a synchronous generator facility may also allow the hybrid plant to provide FFR.[14] The energy storage component can initially charge or discharge rapidly, delivering initial performance of FFR, while the synchronous generator turbine-governor provides a slower, longer-term sustained response.
- **Reduce Generating Fleet Variability:** As higher penetrations of renewable energy resources enter the BPS, higher levels of uncertainty and variability are occurring. This requires additional flexibility in resources. Hybrid plants with the BESS component can be a significant source of fast and flexible energy.

Co-Located Resources vs. Hybrid Resources

As described above, a hybrid power plant is "a single generating resource comprised of multiple generation or storage technologies controlled as a single entity and operated as a single resource behind a single POI." Similarly, some transmission entities[15] are differentiating co-located power plants from hybrid plants due to their key differences. Co-located power plants can be defined as follows:

- **Co-Located Power Plants (Co-Located Resources):** Two or more generation or storage resources that are operated and controlled as separate entities yet are connected behind a single POI.

The key difference here is that the units are operated independently from one another even though they may be electrically connected identically to a hybrid resource. This distinction is important when considering how and when these resources will operate as well as how to model and study these resources in operations and planning assessments.

Background

The North American generation mix, like many areas around the world, is trending toward increasing amounts of inverter-based resources, most predominantly wind and solar PV resources. According to the U.S. Energy Information Administration (EIA) *Annual Energy Outlook 2020*,[16] wind power capacity in the United States more than doubled in the past decade (39.6 GW in 2010 to 107.4 GW in 2019) and solar generation multiplied by 25x from 2.7 GW in 2010 to 67.7 GW in 2019. Wind and solar generation supplied nearly 7.2% and 2.7% of United States energy in 2019, respectively. The EIA and many other organizations have projected continued rapid growth of both technologies over the next several decades. This rapid evolution at both the BPS and distribution system challenges conventional planning and operating practices yet poses benefits to BPS planning, operations, and design. One of the primary

[14] For example, in ERCOT, a BESS was added to a quick-start combustion turbine for participation in ERCOT's Responsive Reserve Service. The combustion turbine is normally offline, and if frequency falls outside of a pre-defined deadband, the BESS will provide FFR until the combustion turbine is turned on to sustain the provided response.

[15] http://www.caiso.com/InitiativeDocuments/RevisedStrawProposal-HybridResources.pdf
http://www.caiso.com/Documents/IssuePaper-HybridResources.pdf

[16] U.S. Energy Information Administration (EIA), "Annual Energy Outlook 2020 with projections to 2050," Jan. 2020. https://www.eia.gov/outlooks/aeo/pdf/aeo2020.pdf

challenges is the variability and uncertainty of renewable energy resources, which leads to additional variability and uncertainty in the planning and operations horizons. The need for flexibility, coupled with favorable economics, has therefore led to an influx of BPS-connected energy storage projects and hybrid power plants that use energy storage.[17]

Areas across North America are also seeking low-carbon power systems. For example, California requires[18] that eligible renewable energy resources and zero-carbon resources supply 100% of retail sales of electric energy to California end-use customers and 100% of electric energy procured to serve all state agencies by the end of 2045. As such, the California Public Utilities Commission has seen a surge of new energy storage contracts, achieving its 2020 energy storage goal of 1,325 MW ahead of time,[19] and is projected to have 55,000 MW of new storage by 2045.[20] At the same time, the risk and impact of wildfires in the area is leading California utilities, policymakers, and end-use customers to more closely consider grid resilience and flexibility. Energy storage systems, particularly BESS and BESS coupled with inverter-based resources to create hybrid power plants, are providing short-term energy and reliability services, including ramping and variability control, voltage and frequency regulation, operation in low short-circuit strength conditions, and other features.

Historically, BESS have not been a significant factor in planning and operating the BPS; however, interconnection requests and projects being constructed today have scaled up to match the size of solar PV and wind plants. For example, the Gateway Project in the San Diego Gas and Electric area consists of a 250 MW BESS providing energy and ancillary services in the California Independent System Operator (CAISO) market.[21] California recently approved a proposed 1,500 MW battery at Moss Landing.[22] Southern California Edison currently has several hundred megawatts of BESS deployed in its footprint with much more in its interconnection queue.[23] **Figure I.3** shows a cursory review of the CAISO interconnection queue (captured in early 2020) where most new interconnection requests are either stand-alone BESS or hybrid plants that consist mainly of solar PV or wind combined with a BESS component. Elsewhere, over 1,500 MW of BESS in ERCOT are under construction and 7,500 GW more are in advanced development.[24] These types of interconnection requests are observed across North America, and these newly connecting resources will need to operate reliably to provide ERSs and be modeled appropriately. They will also need to be studied as part of the interconnection process.

[17] Hybrid plants combine multiple technologies of generation and energy storage at the same facility, enabling benefits to both the plant and to the BPS. The majority of newly interconnecting hybrid resources are a combination of renewable energy and battery energy storage.
[18] California Senate Bill No. 100: https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180SB100
[19] https://www.cpuc.ca.gov/General.aspx?id=3462
[20] Phil Pettingill, "Ensuring RA in Future High VG Scenarios – A View from CA", ESIG Spring Workshop. April 10, 2020
[21] https://www.lspower.com/ls-power-energizes-largest-battery-storage-project-in-the-world-the-250-mw-gateway-project-in-california-2/
[22] https://pv-magazine-usa.com/2020/08/13/vistra-approved-to-build-a-grid-battery-bigger-than-all-utility-scale-storage-in-the-us-combined/
[23] https://www.edison.com/home/innovation/energy-storage.html
[24] https://insight.factset.com/ercot-battery-dynamics-set-to-follow-caiso-trends

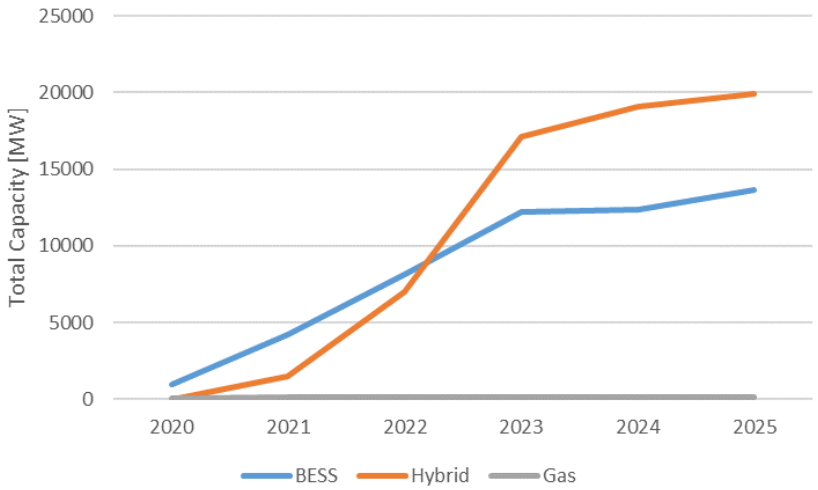


Figure I.3: Review of CAISO Interconnection Queue for Hybrid Resources and BESS

Generation interconnection queues are currently inundated with requests for new interconnections of BESS and hybrid power plants. TPs and PCs need the capabilities to accurately model and study these resources in interconnection studies and annual planning processes. While early BESS were primarily proposed for energy arbitrage and mitigating renewable resource variability, there has been more recent interest in installing BESS for broader services as a generating resource or even as a source of transmission services, such as voltage support under "storage as transmission facility"[25] programs. Therefore, it is imperative to have clear guidance on how BESS and hybrid power plants should perform when connected to the BPS and also to have recommended practices for modeling and studying BESS and hybrid power plants for power flow, stability, short-circuit, and electromagnetic transient (EMT) studies. These types of modeling practices and studies are the primary focus of this guideline.[26]

For the purposes of this guideline, the terms BESS and hybrid plant refer to the resource in its entirety up to the POI, including the main power transformers; the terms do not refer only to the individual storage device or converters themselves. As such, both BESS and hybrid plants are considered inverter-based resources.

[25] https://cdn.misoenergy.org/20190109%20PAC%20Item%2003c%20Storage%20as%20a%20Transmission%20Asset%20Phase%20I%20Proposal%20(PAC%20004)307822.pdf

[26] Other types of studies, such as harmonics and geomagnetic disturbance studies, are outside the scope of this guideline.

Chapter 1: BPS-Connected BESS and Hybrid Plant Performance

BESS and hybrid plants have performance requirements similar to other BPS-connected inverter-based resources (e.g., wind and solar PV plants). However, there are unique recommended operational and technological differences to consider when describing the recommended performance for these facilities. This chapter describes the specific technological considerations that should be made when describing the recommended performance for these resources in more depth. The NERC *Reliability Guideline: BPS-Connected Inverter-Based Resource Performance*,[27] as a precursor to IEEE 2800-2022, provided a foundation of recommended performance for BPS-connected inverter-based resources, including BESS and hybrid plants; however, the guideline is planned to be retired. For more information regarding quantitative technical minimum performance requirements, consider relevant and specific sections in IEEE 2800-2022.[28]

Recommended Performance and Considerations for BESS Facilities

Table 1.1 provides an overview of the considerations that should be addressed when describing the recommended performance of BESS facilities compared with other BPS-connected inverter-based generating resources.

Table 1.1: High Level Considerations for BESS Performance

Category	Specifications and Comparison with BPS-Connected Inverter-Based Generators
Momentary Cessation	There are no significant differences from other BPS-connected inverter-based generating resources; momentary cessation should not be used to the greatest possible extent[29] during charging and discharging operation.
Phase Jump Immunity	This has no significant difference from other BPS-connected inverter-based generating resources.
Capability Curve	The capability curve of a BESS extends into both the charging and discharging regions to create a four-quadrant capability curve. The shape of many individual BESS inverter capability curves is almost[30] symmetrical for charging and discharging. From an overall plant-level perspective, the capability curves may be asymmetrical. System-specific requirements may not necessitate the use of the full equipment capability; however, the resources should not be artificially limited from providing its full capability (particularly reactive capability) to support reliable operation of the BPS. See **Capability Curve** section for more information.

[27] https://www.nerc.com/comm/RSTC_Reliability_Guidelines/Inverter-Based_Resource_Performance_Guideline.pdf

[28] https://standards.ieee.org/ieee/2800/10453/

[29] This is true unless there is an equipment limitation or a need for momentary cessation to maintain system stability. The former has to be communicated by the GO to the TP while the latter has to be validated by extensive studies.

[30] The capability curve is almost symmetrical because when the BESS is operated in the second and third quadrant (consuming active power), a rise in dc voltage could limit the amount of power absorption or consumption where reactive power also has to be consumed.

Table 1.1: High Level Considerations for BESS Performance	
Category	**Specifications and Comparison with BPS-Connected Inverter-Based Generators**
Active Power-Frequency Control	Active power-frequency controls can be extended to the charging area of operation for BESS. The conventional droop characteristic can be used in both discharging and charging modes. Furthermore, a droop gain[31] and deadband should be used in both operating modes, and there should be a seamless transition between modes (i.e., there should not be a deadband in the power control loop for this transition) unless interconnection requirements or market rules preclude such operation. As with all resources, speed of response[32] of active power-frequency control to support the BPS should be coordinated with system needs. The fast response of BESS to frequency deviations can provide reliability benefits. Consistent with FERC Order 842, there should be no requirement for BESS resources to provide frequency response if the state of charge (SOC) is very low or very high (which may be specified by the BA), though that service can be optionally procured by the BA. See **Active Power-Frequency Control** section for more information.
Fast Frequency Response	BESS are well-positioned to provide FFR to systems with a high rate-of-change-of-frequency (ROCOF) due to not having any rotational components (similar to a solar PV facility). The need for FFR is based on each specific Interconnection's need.[33] Sustained forms of FFR help arrest fast frequency excursions and overall frequency control. BESS are likely to be able to provide sustained FFR within their SOC constraints. With the ability of BESS to rapidly change MW output across their full charge and discharge ranges (within SOC limits), BPS voltage fluctuations should be closely monitored, especially on systems of lower short-circuit strength. See **Fast Frequency Response** section for more information.
Reactive Power-Voltage Control	BESS should be configured to provide dynamic voltage control during both discharging and charging operations to support BPS voltages during normal and abnormal conditions. TOPs should provide a voltage schedule (i.e., a voltage set point and tolerance) to all BESS, applicable to both operating modes.
Reactive Current-Voltage Control	There is no significant difference from other BPS-connected inverter-based generating resources. BESS should be configured to provide dynamic voltage support during large disturbances both while charging and discharging.
Reactive Power at No Active Power Output	There is no significant difference from other BPS-connected inverter-based generating resources.

[31] Droop should be set using the same base for both charging and discharging mode of operation (i.e., rated active power, P_{max}), so that the same rate of response is provided regardless of charging or discharging.
[32] Speed of response is dictated by the controls programmed into the inverter-based resource (most commonly in the plant-level controller), which is a function of the time constants and gains used in the proportional-integral controls as well as the droop characteristic.
[33] NERC, "Fast Frequency Response Concepts and Bulk Power System Reliability Needs," March 2020: https://www.nerc.com/comm/PC/InverterBased%20Resource%20Performance%20Task%20Force%20IRPT/Fast_Frequency_Response_Concepts_and_BPS_Reliability_Needs_White_Paper.pdf

Table 1.1: High Level Considerations for BESS Performance	
Category	**Specifications and Comparison with BPS-Connected Inverter-Based Generators**
Inverter Current Injection during Fault Conditions	BESS should be configured to provide fault current contribution during large disturbance events that can support legacy BPS protection and stability.[34] Inverter limits will need to be met, as with all inverter-based resources; however, SOC may not be an issue for providing fault current for BESS since faults are typically cleared in fractions of a second. Additionally, limits on dc voltage magnitude can apply. See **Inverter Current Injection during Fault Conditions** section for more information.
Return to Service Following Tripping	BESS should return to service following any tripping or other off-line operation by operating at the origin (no significant exchange of active or reactive power with the BPS) and then ramp back to the expected power output. This is a function of plant settings and interconnection requirements set by the Balancing Authority (BA) or TO.
Balancing	There is no significant difference from other BPS-connected inverter-based generating resources. The capability to provide balancing services for the BPS should be available from all BESS. BAs, TPs, PCs, and RCs should ensure requirements are in place for appropriate balancing of the BPS.
Monitoring	There is no significant difference from other BPS-connected inverter-based generating resources.
Operation in Low Short-Circuit Strength Systems	There is no significant difference from other BPS-connected inverter-based generating resources. BESS should use grid forming control, as appropriate (see Grid Forming category below), to support BPS stability and reliability in low short-circuit strength operating conditions.
Grid Forming	BESS have the unique capabilities to effectively deploy grid forming technology to help improve BPS reliability in the future of high penetration of inverter-based resources. Key aspects that enable this functionality include availability of an energy buffer to be deployed for imbalances in generation and load, low communication latency between different layers of controllers, and robust dc voltage that enables synthesis of an ac voltage for a wide variety of system conditions. In grids where system strength and other stability issues are of concern, BESS may be required to have this capability to support reliable operation of the BPS. TPs and PCs should develop interconnection requirements and new practices, as needed, to integrate the concepts of grid forming technology into the planning processes. See **Grid Forming** section for more information.

[34] Large disturbance fault current contribution from inverter-based resources can help BPS protection schemes operate appropriately by ensuring they have appropriate voltage-current relationships of magnitude and phase angles (i.e., appropriate positive and negative sequence current injection).

Table 1.1: High Level Considerations for BESS Performance	
Category	**Specifications and Comparison with BPS-Connected Inverter-Based Generators**
Fault Ride-Through Capability	There is no significant difference from other BPS-connected inverter-based generating resources. BESS should have the same capability to ride through fault events on the BPS when point of measurement (POM) voltage and frequency is within the curves specified in the latest effective version of PRC-024.[35] This applies to both charging and discharging modes; unexpected tripping of generation or load resources on the BPS will degrade system stability and adversely impact BPS reliability. Ride-through capability is a fundamental need for all BPS-connected resources such that planning studies can identify any expected risks. However, the behavior during ride-through while discharging and charging may be different.
System Restoration and Blackstart Capability	BESS may have the ability to form and sustain their own electrical island if they are to be designated as part of a blackstart cranking path. This may require new control topologies or modifications to settings that enable this functionality. Blackstart conditions may cause large power and voltage swings that must be reliably controlled and withstood by all blackstart resources (i.e., operation under low short-circuit grid conditions). For BESS to operate as a blackstart resource, assurance of energy availability as well as designed energy rating that ensures energy availability for the entire period of restoration activities is required. At this time, it is unlikely that most legacy BESS can support system restoration activities as a stand-alone resource; however, they may be used to enable start-up of subsequent solar PV, wind, or synchronous machine plants. See **System Restoration and Blackstart Capability** section for more information.
Protection Settings	There is no significant difference from other BPS-connected inverter-based generating resources.
State of Charge *(new)*	The SOC of a BESS affects the ability of the BESS to provide energy or other ERSs to the BPS at any given time.[36] In many cases, the BESS may have SOC limits that are tighter than 0–100%[37] for battery lifespan, and other equipment and performance considerations. SOC limits affect the ability of the BESS to operate as expected, and any SOC limits will override any other ability of the BESS to provide ERSs or energy to the BPS. These limits and how they affect BESS operation should be defined by the equipment manufacturers and plant developer, agreed upon by the GO, and provided to the BA, TOP, RC, TP, and PC. See **State of Charge** section for more information.
Oscillation Damping Support	BESS can have the capability to provide damping support similar to synchronous generators and high-voltage direct current (HVDC)/flexible ac transmission systems (FACTS) facilities. BPS-connected inverter-based resources could also provide damping support. A major difference from other BPS-connected inverter-based resources is that BESS can operate in the charging mode in addition to the discharging mode, which provide greater capabilities of damping support.

Topics with Minimal Differences between BESS and Other Inverter-Based Resources

The following topics have minimal difference between the recommended performance of BESS and other BPS-connected inverter-based resources:

[35] Unless there is an equipment limitation, which must be communicated by the GO to the TP
[36] https://www.nrel.gov/docs/fy19osti/74426.pdf
[37] Or the values 0% and 100% can simply be defined as the normally allowable range of operation.

- **Momentary Cessation:** To the greatest possible extent,[38] BESS should not use momentary cessation as a form of large disturbance behavior when connected to the BPS. Any existing BESS that use momentary cessation should eliminate its use to the extent possible, and its use for newly interconnecting BESS should be disallowed by TOs in their interconnection requirements. Sufficiently fast dynamic active and reactive current controls are more suitable.[39] If voltage at the POM is outside the curves specified in the latest effective version of PRC-024, momentary cessation may be used to avoid the BESS tripping. However, momentary cessation should not be used inside the curves, subject to limitations for legacy equipment. This recommendation applies for both charging and discharging operation.
- **Phase Jump Immunity:** Similar to other inverter-based resources, BESS should be able to withstand all expected phase jumps on the BPS; this applies during both charging and discharging operation. The TO (in coordination with their TP and PC) should clearly specify worst-case expected phase jumps during grid events so that newly interconnecting projects can test their performance against them.
- **Reactive Current-Voltage Control (Large Disturbances):** Fundamentally, there are no significant differences between BESS and other BPS-connected inverter-based resources with respect to reactive current-voltage control during large disturbances. BESS inverters should maintain stability, adhere to inverter current limits, and provide fast dynamic response to BPS fault events in both charging and discharging modes. Transitions from charging to discharging (e.g., caused by active power-frequency controls) during large disturbances should not impede the BESS from dynamically supporting BPS voltage and reactive current injection. Studies should ensure stable performance for charging and discharging.
- **Reactive Power at No Active Power Output:** BESS should have capability to provide dynamic reactive power to support BPS voltage while not discharging or charging active power. This is one of the benefits of inverter-based technology and it can be used by grid operators to help regulate BPS voltages. Every BESS should have the capability to perform such operation, and the actual use of such capability should be coordinated with the TOP and RC regarding any voltage regulation requirements and scheduled voltage ranges.
- **Return to Service Following Tripping:** BESS should adhere to any requirements set forth by its respective BA. In general, following any tripping or other off-line operation, BESS should return to service starting at their origin point on the capability curve (i.e., operation at no active or reactive power loading) and then ramp to their expected operating point based on recommendations or requirements provided by the BA (or TO in their interconnection requirements).
- **Return to Normal Operation Following Large Disturbance:** BESS output should return to pre-disturbance active power levels as soon as possible without any artificial ramp rate limit or delay imposed by the power plant controller. Plants connected to low short-circuit strength systems or under other special circumstances may require a slower dynamic response to BPS faults and should be studied appropriately by the TP and PC during interconnection studies. In these circumstances, the plant performance necessary for BPS reliability takes precedence over these recommendations.
- **Balancing:** BAs, TPs, PCs, and other applicable entities should understand what services BESS provide; however, all BESS should have the capability to provide the BA with balancing services to ensure BPS reliability.
- **Monitoring:** BESS should have equipment that provides the functionality of a digital fault recorder (DFR), dynamic disturbance recorder, sequence of events recorder, harmonics recorder, and battery management

[38] Unless there is an equipment limitation or a need for momentary cessation to maintain system stability. The former has to be communicated by the GO to the TP while the latter has to be validated by extensive studies.

[39] In rare cases, momentary cessation may be admissible based on reliability studies performed by the TP and PC on a case-by-case basis.

system (BMS)[40] monitoring capability. TOs (in coordination with the TOP, TP, and PC) should include clear requirements and specifications for the types of data needed for BESS facilities (and other inverter-based resources).

- **BESS Stability:** Appropriate studies should be conducted to ensure that the BESS would operate stably in its electrical environment and in any of its operating modes. For example, if the short-circuit strength is low, the TP and PC should study the operation of the hybrid resource in detail with EMT simulations as appropriate. Studies should also be conducted to ensure that no instability modes exist at higher frequencies. In addition, the ability of newly interconnecting BESS to operate with grid forming technology[41] (described in section below) enables BESS to operate in very low short-circuit strength networks and further provide BPS support beyond other grid-following inverter-based resources. Refer to recommendations from NERC *Reliability Guideline: Integrating Inverter-Based Resources into Low Short Circuit Strength Systems*.[42]
- **Fault Ride-Through Capability:** BESS, like other BPS-connected inverter-based resources, should have the capability to ride through voltage and frequency disturbances when RMS voltage at the POM is within the curves of the latest effective version of PRC-024, subject to limitations for legacy equipment. Ride-through performance requirements should apply to both charging and discharging modes since unexpected tripping of any generation or load resources on the BPS will degrade system stability and adversely impact BPS reliability. Ride-through capability is a fundamental need for all BPS-connected resources so that planning studies can identify any expected risks.
- **Protection Settings:** Appropriate protections should be in place to operate BESS facilities safely and reliably when connected to the BPS. To ensure proper site coordination with the interconnecting TO, protection settings and coordination should be clearly documented and provided to the TO for approval by the BESS owner. Additionally, BESS owners should provide protection settings to their TP, PC, TOP, RC, and BA to ensure all entities are aware of expected performance of the BESS during planning and operations horizons.[43]

The following sub-sections outline the additional topics from **Table 1.1** that warrant additional details and where BESS have specific considerations to be addressed.

Capability Curve

BESS are generally four-quadrant devices that extend into the charging region. BESS inverters may be nearly symmetrical[44] (see **Figure 1.1**). From an overall plant-level perspective, the capability curves may be asymmetrical and further impacted by collector system losses and any dependencies on external factors, such as ambient temperature (if applicable). Capability curves should capture the gross and net ratings of the facility, accounting for station service, losses, and other factors. Capability curves for the overall BESS should be provided by the GO to the TO, TP, PC, TOP, and RC to ensure sufficient understanding of the capabilities of the BESS to provide reactive power under varying active power outputs.

[40] System-level BMS data related to SOC and state of health (SOH) should be accessible to the GOP, TOP, and RC (as deemed necessary) for independent evaluation to verify accuracy of reported metrics, assess operational issues, and correct any apparent miscalculations. All critical data and metrics (e.g., SOC and SOH) of the BMS should have accuracy requirements established by the GO, which could be based on equipment standards (where applicable).

[41] There are different types of control topologies or definitions that could be considered "grid forming." Inverter manufacturers are beginning to offer commercial products that can support the BPS more broadly using these capabilities.

[42] https://www.nerc.com/comm/PC_Reliability_Guidelines_DL/Item_4a._Integrating%20_Inverter-Based_Resources_into_Low_Short_Circuit_Strength_Systems_-_2017-11-08-FINAL.pdf

[43] See NERC Reliability Standard PRC-027-1: https://www.nerc.com/_layouts/15/PrintStandard.aspx?standardnumber=PRC-027-1&title=Coordination%20of%20Protection%20Systems%20for%20Performance%20During%20Faults&Jurisdiction=United%20States
See NERC System Protection and Control Working Group technical reference document, *Power Plant and Transmission System Protection Coordination*:
https://www.nerc.com/comm/PC/System%20Protection%20and%20Control%20Subcommittee%20SPCS%2020/SPCS%20Gen%20Prot%20Coordination%20Technical%20Reference%20Document.pdf

[44] This is due to effects of BESS dc voltage and inverter derating due to temperature and altitude impacting reactive and active power output.

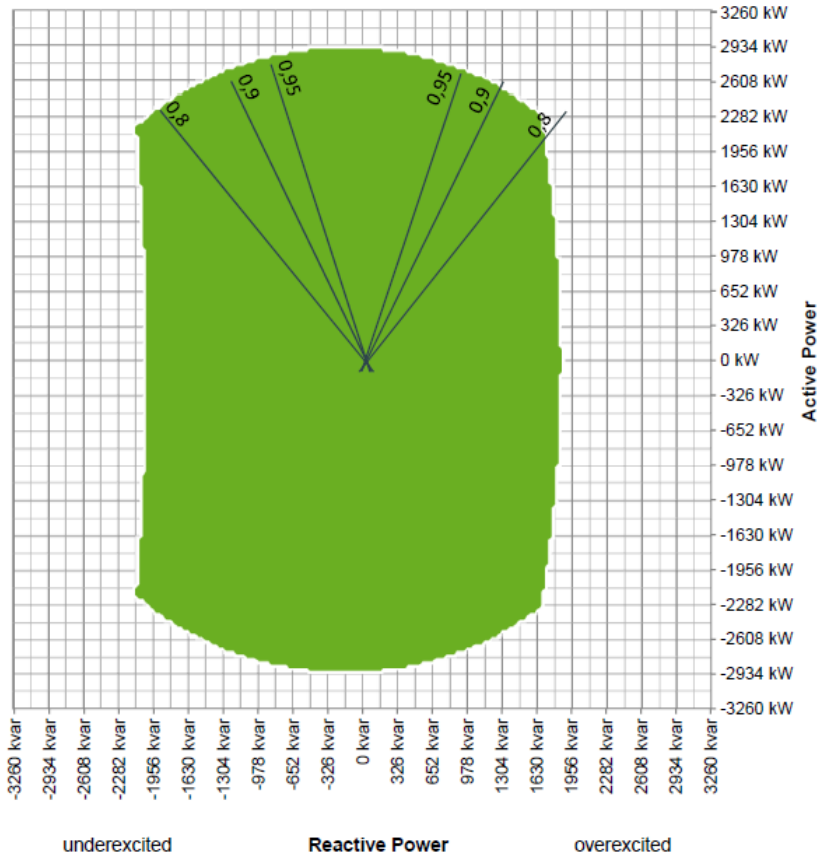


Figure 1.1: Example of 2.7 MVA BESS Capability Curve [Source: SMA America]

Active Power-Frequency Control

BESS should have the capability to provide active power-frequency control that extends to the charging region; the conventional droop characteristic can be extended into this region, and operation along the droop characteristic can occur naturally. Deadbands, droop settings, and other response characteristics should be specified by the BA based on studies performed by TPs and PCs. The droop characteristic and deadbands should be symmetrical, meaning that the mode of operation settings for charging is the same for discharging. Droop should be set using the same base for both charging and discharging mode of operation (i.e., rated active power, P_{max}) so that the same rate of response is provided regardless of operation mode (charging/discharging). Any transition between charging and discharging modes of operation should occur seamlessly (i.e., a continuous smooth transition between charging and discharging). The speed of response should also be coordinated with the BA based on primary frequency response needs. Consistent with FERC Order 842, there should be no requirement for BESS resources to maintain a specific SOC for provision of frequency response. Any active power-frequency control should be sustained unless the BESS SOC limits power consumption or injection from the resource. However, the capacity and energy needed to support interconnection frequency control is relatively small and for a short period; the BA may specify sustaining times. The number of times active power-frequency controls change power output outside of the defined deadbands will have a small but finite impact on battery lifespan depending on the technology used.

Fast Frequency Response

As the instantaneous penetration of inverter-based resources continues to increase, on-line synchronous inertia may decrease and rate-of-change of frequency (ROCOF) may continue to increase. High ROCOF systems may be faced with

the need for faster-responding resources to ensure that unexpected underfrequency load shedding (UFLS) operations do not occur.[45]

BESS have the capability to provide FFR to counter rapid changes in frequency due to disturbances on the BPS. Similar to solar PV, there are no rotational elements and therefore the active power output is predominantly driven by the controls that are programmed into the inverter. BESS should have at least the following functional capabilities that may be used if the BESS is within SOC and set points limits consistent with FERC Order 842:

- Configurable and field-adjustable droop gains, time constants, and deadbands within equipment limitations; tuned to the requirements or criteria specified by the BA
- Real-time monitoring of BESS SOC to monitor performance limitations imposed on FFR capabilities
- The ability to provide a specified power response for a predetermined time profile in coordination with primary frequency response as defined by the BA

Many different simulations can be performed to show the benefits of utilizing BESS for improving frequency response, particularly improving the nadir of system frequency following a large loss of generation. **Figure 1.2** illustrates one study demonstrating these effects. The blue trace shows the response following a large generation loss for a synchronous generation-based system. The red plot shows the same system (with same amount of reserves) with the synchronous generation replaced with BESS (with one option of frequency control enabled). The green plots show the system with BESS with a different frequency control logic and tuned appropriately. The system dominated by synchronous machines exhibits an initial inertial response followed by a slower turbine-governor response. On the other hand, while the BESS system does not have physical inertia like a synchronous machine, its controls can be tuned to provide a suitably fast injection of energy such that the initial ROCOF remains nearly the same (or even improves) and the frequency nadir is significantly improved. Note that voltages should be monitored closely as high-speed active power responses can cause high-speed voltage fluctuations, especially in low short-circuit-ratio conditions.

[45] https://www.nerc.com/comm/PC/InverterBased%20Resource%20Performance%20Task%20Force%20IRPT/Fast_Frequency_Response_Concepts_and_BPS_Reliability_Needs_White_Paper.pdf

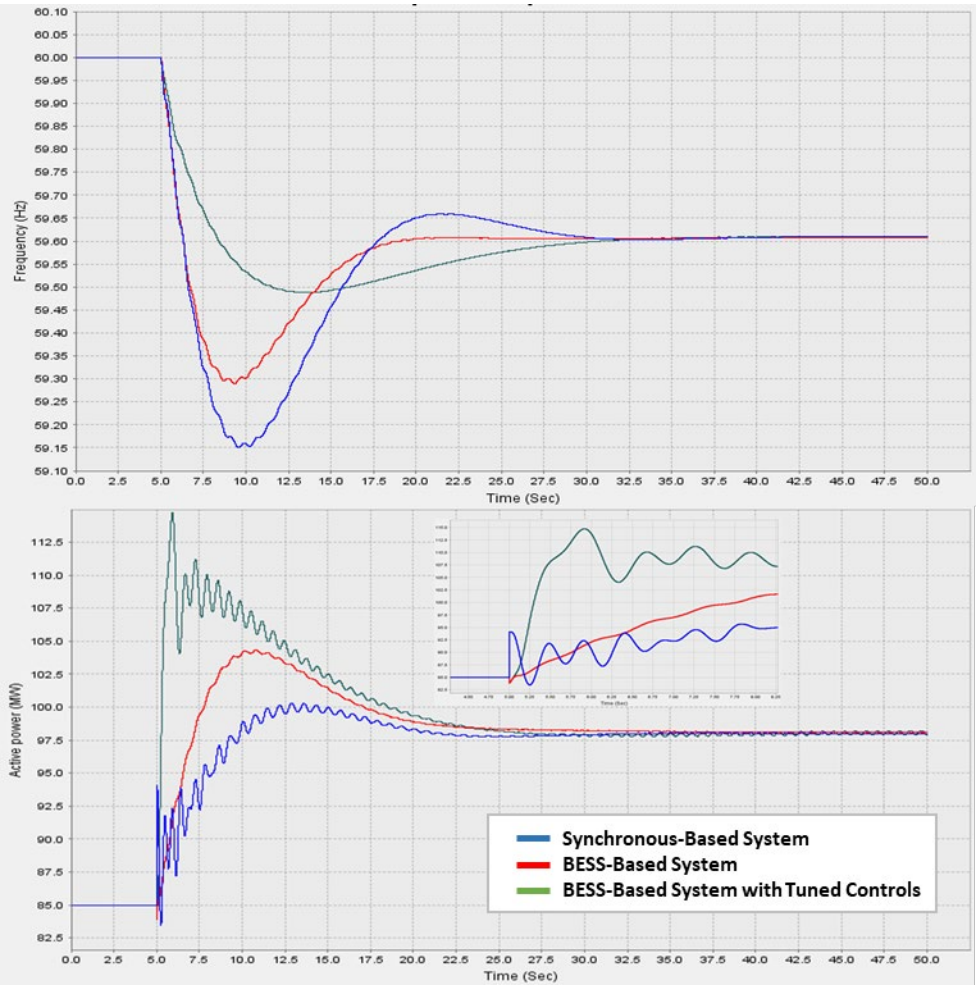


Figure 1.2: Demonstration of Impacts of a BESS on Frequency Response [Source: EPRI]

Reactive Power-Voltage Control (Normal Conditions and Small Disturbances)

BESS should have the capability to provide reactive power-voltage control in both charging and discharging modes; however, it is useful to separate out the recommendations into each mode of operation:

- **Discharging Operation:** There are no significant differences between BESS during discharge operation and other BPS-connected inverter-based generators with respect to reactive power-voltage control. BESS should have the ability to support BPS voltage control by controlling their POM voltage within a reasonable range during normal and abnormal grid conditions.
- **Charging Operation:** BESS should have the capability to control POM voltage during normal operation and abnormal small disturbances on the BPS while operating in charging mode. The ability for resources consuming power to support BPS voltage control adds significant reliability benefits to the BPS and may be required by TOs as part of their interconnection requirements or by BAs, TOPs, or RCs for BPS operations.

As the resource transitions from charging to discharging modes of operation (or vice versa) or operates at zero active power output while connected to the BPS, the BESS should have the capability and operational functionality enabled to continuously control BPS voltage. This should be coordinated with any requirements established by the TO or TOP.

Inverter Current Injection during Fault Conditions

BESS should behave similar to other inverter-based resources during fault conditions in terms of active and reactive current injection. Active and reactive current injection during severe fault events should be configured to support the BPS during and immediately following the fault event. Inverter-based resources, including BESS, should ensure that the appropriate voltage-current relationships of magnitude and phase angles (i.e., appropriate positive and negative sequence current injection) are applied. Inverter current limits should be adhered to in order to avoid unnecessary tripping of inverters during fault events. Injection of current during and immediately after faults should be configured to enable the inverter-based resource to remain connected to the BPS and support BPS reliability.

BESS will need to ensure adherence to SOC limits. A BPS fault typically persists for fractions of a second, and thus, SOC should typically not be a concern; however, the SOC limits are always in effect and closely monitored by BESS. If necessary, it may be possible to reserve a minor amount of energy for transient response to fault conditions.

The reactive current injection during fault conditions while the BESS is charging or discharging will depend on the specific inverter controls and settings as well as the BESS PQ curve and its symmetry; in either case, dynamic reactive current injection should support BPS voltages in both operating states. Furthermore, controls should be configured for each specific installation such that voltage support (i.e., reactive current injection) has priority and the BESS can stably recover active current output very quickly. Typically, this should occur in less than one second; however, this will need to be studied by the TP and PC and configured accordingly.

Grid Forming

Most commercially available inverters currently require an external source to provide a reference voltage to which the inverter phase-locks. These inverters are termed "grid following."[46] An alternative option is to control the BESS in a way that it does not rely on external system strength for stable operation (i.e., termed "grid forming").[47] While there is currently no standard industry definition for grid forming technology, a broad definition can be as follows:

> **Grid Forming:** An inverter operating mode that enables reliable, stable, and secure operation when the inverter is operating on a part of the grid with few (or zero) synchronous machines along with the possibility of weak or non-existent ties to the rest of the BPS.

Four key aspects that enable achieving this operation mode are the following:

- Availability of an "energy buffer" to be deployed for imbalances in generation and load
- Ability of the inverter to contribute toward regulation of voltage and frequency
- Minimal communication latency between different layers of controllers
- A robust dc voltage that enables synthesis of an ac voltage for a wide variety of system conditions

BESS have these attributes and can effectively employ grid forming technology to improve BPS performance in the future as penetrations of inverter-based resources continue to grow. Operation in grid forming mode may help support BPS reliability and inverter stability during low short-circuit strength conditions. The capability to enable this feature should be provided by all future BESS and used by the TP and PC as a possible solution option if necessary to mitigate reliability issues that would otherwise result in costly reinforcement projects. However, the application of grid forming technology is unlikely to be the sole solution that addresses all issues and thus, it should be used in coordination with other possible solutions.

[46] If short-circuit strength falls too low (i.e., the apparent fundamental-frequency impedance of the grid source becomes too high due to high impedance or lack of available fault current), the sensitivity of the POM voltage to the active and reactive current injection of the inverter-based resource increases and grid-following inverters can be susceptible to instability or control malfunction. There are multiple mitigation options for these low short-circuit strength issues to help stabilize the ac voltage.

[47] https://www.epri.com/research/products/000000003002018676

Tesla's Grid Forming + Grid Following Philosophy

Tesla BESS currently use a concept of "grid forming + grid following" where the BESS can provide both functionalities based on BPS reliability needs. When the BESS is operating in virtual machine mode, the dynamics of a virtual synchronous condenser are added to the output of the current-source inverter (see **Figure 1.3**). In a high short-circuit strength grid, the virtual machine remains naturally inert and preserves the rapid, precisely controllable behaviors of traditional inverter controls. On a lower short-circuit strength grid, the machine model reinforces grid strength by providing subcycle phase response, voltage stability, and fast fault current injection that helps in smooth transitions between different operating states. With such a hybrid approach, the BESS remains responsive to active and reactive power dispatch commands while providing ERSs to the BPS during dynamic grid events. While there are many possible ways to accomplish grid forming capabilities, Tesla has implemented this feature into its products to support BPS operation with decreased inertia and overall system strength.

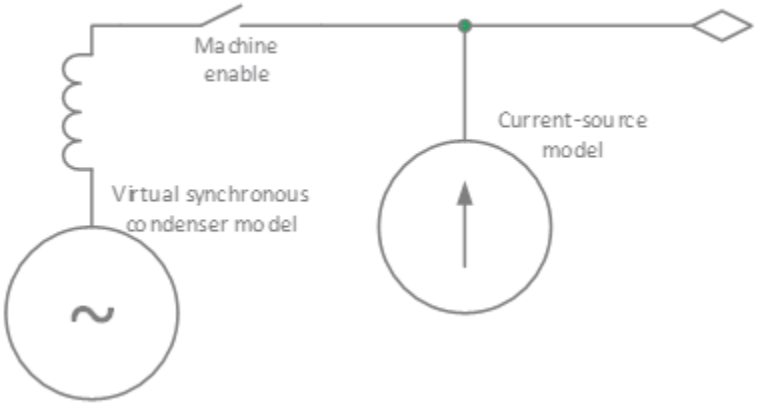


Figure 1.3: Concept of Tesla "Grid Forming + Grid-Following" Mode [Source: Tesla]

System Restoration and Blackstart Capability

In the event of a large-scale outage caused by system instability, uncontrolled separation, or cascading, system operators are tasked with executing blackstart plans to re-energize the BPS and return electric service to all customers. This process is relatively slow as the blackstart plan identifies the boundaries of outage conditions, system elements, critical loads, etc.; reconnects pre-defined generators and load points to the overall BPS; and carefully resynchronizes regions or portions of the BPS. Throughout this entire process, grid operators are closely balancing generation and demand as well as managing BPS voltages within operating limits. In order to actively participate in blackstart and system restoration, a BESS will need to perform the following:

- Generate its own voltage and seamlessly synchronize to other portions of the BPS
- Reliably operate during large frequency, voltage, and power swings, and in low short-circuit strength networks (detailed EMT studies should be conducted to demonstrate the ability to operate under these conditions)
- Provide sufficient inrush current to energize transformers and transmission lines and start electric motors, coordinating with the blackstart load (note that BESS, like other inverter-based resources, have limited ability to provide high levels of inrush current relative to their nominal current rating)
- Assure availability immediately after a large-scale outage requiring system restoration activities; BESS will need to be available for their RC and TOP at any point in time to be considered as a blackstart resource

- Have sufficient energy to remain on-line and operational for the time required to ensure blackstart plans can be successfully executed.[48] Therefore, BESS energy ratings should be designed to achieve the required periods and their states of charge should be maintained above a limit to ensure enough energy is available for blackstart purposes
- Be able to quickly respond to and control fluctuations in system voltage and frequency
- Be able to start rapidly to minimize system restoration times
- Have redundancy to self-start in the event of any failures within the facility
- Make all control design, settings, configurable parameters, and accurate models available to the BA, TP, PC, TOP, and RC, in order to ensure proper integration into the overall system blackstart scheme and coordination between resources via appropriate engineering studies
- Have remote startup and operational control capabilities to avoid requiring dispatch of personnel to the field

State of Charge

SOC represents the present level of charge of an electric battery relative to its capacity, within the range of fully discharged (0%) to fully charged (100%). Refer to the description of FERC Order No. 841 in Appendix A. The SOC of a BESS affects the ability of the BESS to provide energy or other ERSs to the BPS at any given time.[49] In many cases, the BESS may have SOC limits that are tighter than 0–100% for battery lifespan and other equipment and performance considerations. Alternatively, 0% and 100% may be defined as the normal range of operation, ignoring the extreme-but-not-recommended charge and discharge levels.

In terms of performance, the following should be considered for the capability and operation of a BESS:

- **Provision of ERSs to the BPS:** All BESS should have the capability to provide ERSs, such as voltage support, frequency response, and ramping capabilities, to support BPS operation. However, each BESS will be configured to provide any one or multiple ERSs during on-line operation, based on real-time dispatch, SOC, and system needs.
- **Nearing SOC limits:** As a BESS approaches its SOC limits, the BESS may ramp down its charging or discharging. This ramp should be clearly defined by the owner of the BESS and communicated to the BA, TOP, and RC.
- **SOC Limits and Frequency Response:** Consistent with FERC Order 842, there should be no requirement for BESS resources to maintain a specific SOC for provision of frequency response.
- **SOC Limits and Reactive Power Support:** Through the full range of SOC limits (i.e., SOC_{min} to SOC_{max}), the BESS should be designed to provide full reactive power capability as required by the interconnection agreement. SOC limits should not impact reactive power capability.
- **SOC Limits and Blackstart Capabilities:** SOC should be maintained above a limit to ensure there is energy to fully execute a blackstart process as designed.

SOC limits affect the ability of the BESS to operate as expected, and any SOC limits will override any other ability of the BESS to operate. These limits and how they affect BESS operation should be defined by the equipment manufacturer, agreed upon by the BESS owner, and provided to the BA, TOP, and RC. For planning assessments, this information is also important to the TP and PC as they establish planning cases.

[48] This is defined by the TOP and RC. For example, PJM has requirements for blackstart resources to be operational for 16 hours: http://www.pjm.com/-/media/markets-ops/ancillary/black-start-service/pjm-2018-rto-wide-black-start-rfp.ashx?la=en

[49] https://www.nrel.gov/docs/fy19osti/74426.pdf

The SOC of any BESS depends on the past operating conditions of the BESS and the services it is providing to the BPS. To study BESS SOC, a time series (or quasi-dynamic) study can be used. **Figure 1.4** shows an example of a BESS that provides two services: peak shaving (charging in morning and discharging at night) and transmission line congestion management around a set of wind power plants. The magnitude and duration of any other service provided by the BESS (such as voltage control or frequency support capability) revolves around the two primary services. **Figure 1.4** shows the evolution of the BESS SOC over two days, evaluated at half-hour time steps but with tracking of the dynamic evolution of the SOC.

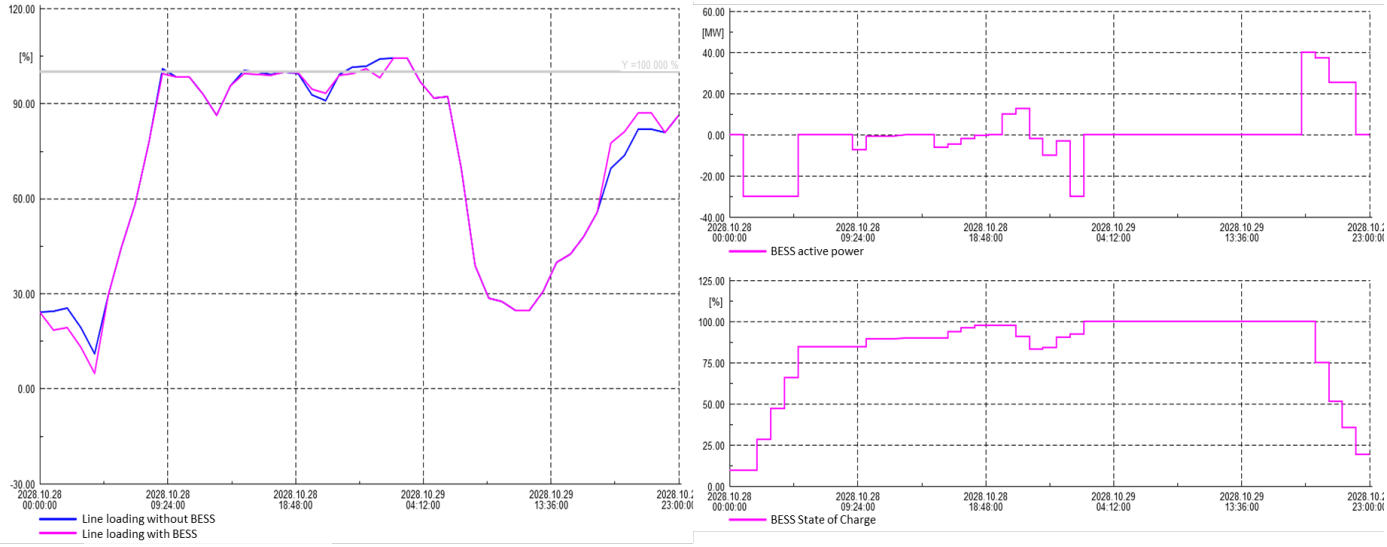


Figure 1.4: Example Time Series of BESS State of Charge [Source: EPRI]

The assumption used in dynamic stability simulations is that SOC will not affect or limit the response of the BESS for short-duration events (i.e., faults or short-term frequency excursions). However, longer-term issues, such as thermal overload mitigation, may require more extensive information regarding BESS SOC. BESS manufacturers establish a full operating range of the batteries (i.e., 0–100% SOC); however, the equipment manufacturer may also establish a tighter range (e.g., 5–95% SOC) as the full operating range and this information may be provided to the GO or developer. The full operating range of the BESS should be provided to the RC, TOP, BA, TP, and PC for inclusion in tools and studies. It is important that the SOC base value (i.e., what establishes the operational 0–100% SOC) be well-defined by the appropriate entities.

Oscillation Damping Support

Many synchronous generators are equipped with power system stabilizers (PSS) that provide damping to system oscillation typically in the range of 0.2 Hz to 2 Hz. As these resources become increasingly limited (either retire or are off-line during certain hours of the day), there is a growing need for oscillation damping support in certain parts of the BPS. For example, in the West Texas area of the ERCOT footprint where significant amounts of renewable generation resources connect, synchronous generators in West Texas may be off-line under a high renewable output condition and could lead to insufficient damping support required to maintain stability for high-power long distance power transfer during and after large disturbances. Currently, renewable generation resources are not required to provide damping support in ERCOT, and synchronous condensers typically are not equipped with PSS. A study conducted by ERCOT in 2019 identified oscillatory responses around 1.8 Hz between synchronous condensers in the Panhandle area and other synchronous generators far away from this area under a high renewable generation penetration condition with large power transfers to electrically distant load centers.[50]

[50] http://www.ercot.com/content/wcm/lists/197392/2019_PanhandleStudy_public_V1_final.pdf

Newly interconnecting BPS-connected inverter-based resources (IBR) should have the capability to provide power oscillation damping controls. A major difference from BPS-connnected inverter-based resources is that BESS can operate in the charging mode in addition to the discharging mode, which provide greater capabilities of damping support. TPs and PCs may identify a reliability need for this type of control as the penetration of inverter-based resources continues to increase. At that time, TOs should develop requirements to ensure that the capability is activated and that BESS properly damps power oscillations in the range of 0.2 Hz to 2 Hz (typically) when the resources are on-line and operational. Newly interconnecting facilities require detailed studies that would ensure the controls provide oscillation damping as intended. Controls may need to be tuned (and possibly retuned after interconnection) for optimal performance as the grid evolves over time. These types of studies are critical to ensure reliable operation of the BPS over time. TOs should ensure interconnection requirements suitably address this functionality so the capabilities can be used when needed.

Recommended Performance and Considerations for Hybrid Plants

Hybrid power plants, as described in the Introduction, include both dc-coupled and ac-coupled facilities. In terms of describing the nuances and differences across technologies and configurations, it is useful to differentiate between ac- and dc-coupled plants. Therefore, the following sub-sections introduce dc-coupled plants first (since there are minimal differences between these facilities and standalone BESS facilities) and then provide more details around considerations for ac-coupled plants. As previously mentioned, the guideline focuses primarily on hybrid plants combining inverter-based renewable generation with BESS technology. The recommended performance characteristics for hybrid plants generally refer to the overall hybrid facility since they are coordinated at the plant-level; however, this guideline may refer to individual BESS or generation components within the facility where necessary.

DC-Coupled Hybrid Plants

There is no significant difference in recommended performance between dc-coupled hybrid plants and stand-alone BESS. The following performance characteristics are practically the same and are covered in **Table 1.1** and in the previous section:

- Momentary cessation
- Phase jump immunity
- Reactive current-voltage control during large disturbances
- Reactive power at no active power output
- Return to service following tripping
- Inverter current injection during fault conditions
- Balancing
- Monitoring
- Operation in low short-circuit strength systems
- Fault ride-through capability
- System restoration and blackstart capability
- Grid forming[51]
- Protection settings

[51] The entire plant can have the capability to be grid forming, the capabilities will be limited by the inverter current limits and size of the BESS portion of the dc-hybrid.

- State of charge
- Damping support

Additionally, the following topics from **Table 1.1** warrant additional details where dc-coupled hybrids have specific considerations that need to be taken into account:

- **Reactive Capability Curve:** It is likely that total installed capacity of BESS and of other generating resources behind the common inverter will be higher than the common inverter rating. Therefore, reactive capability of dc-coupled hybrid during both active power injection and withdrawal, as well as zero active power, will be limited by the inverter rating.
- **Active Power – Frequency Controls and FFR:** For these two topics, dc-coupled performance considerations will be similar to that of ac-coupled hybrid as discussed in the next section. Overall, a dc-coupled plant's capability to provide frequency control both for under- and over-frequency events will be further limited by the common inverter rating.
- **Monitoring:** BAs, TPs, PCs, independent system operators/regional transmission organizations (ISO/RTOs) may require telemetry from each individual component within the facility (e.g., separate metering points for the BESS and the generating component) to support forecasting, situational awareness tools in the control room, and operations and planning study dispatch assumptions.
- **State of Charge:** State of charge has performance considerations similar to ac-coupled hybrids; they are discussed in the next section.

AC-Coupled Hybrid Plants

Table 1.2 provides an overview of the considerations that should be addressed when describing the recommended performance of ac-coupled hybrid plants compared with other BPS-connected inverter-based generating resources.

Table 1.2: High Level Considerations for AC-Coupled Hybrid Plant Performance

Category	Comparison with BPS-Connected Inverter-Based Generators
Momentary Cessation	There are no significant differences from other BPS-connected inverter-based generating resources; for the BESS part of the hybrid, momentary cessation should not be used to the greatest possible extent[52] during charging and discharging operation.
Phase Jump Immunity	There is no significant difference from other BPS-connected inverter-based generating resources.
Capability Curve	The overall composite capability curve of a hybrid plant is the aggregation of the individual capability curves of the generating resources and BESS plus any other reactive devices and less any losses within the facility as measured at the plant POI. The capability curve extends into the BESS charging region to create a four-quadrant capability curve. The curve is not symmetrical for injection and withdrawal. On the injection side, the capability curve will be equal to the sum of capability curves of a generator and capability curve of BESS during discharging. On the withdrawal side, capability will be equal to BESS capability curve, when charging. Note that interconnection requirements may not allow the full use of hybrid resource capability depending on how the BESS can charge and discharge with the generating component and with the grid. See **Capability Curve** section for more information.

[52] Unless there is an equipment limitation or a need for momentary cessation to maintain BPS stability. The former has to be communicated by the GO to the TP while the latter has to be validated by extensive studies.

Table 1.2: High Level Considerations for AC-Coupled Hybrid Plant Performance	
Category	**Comparison with BPS-Connected Inverter-Based Generators**
Active Power-Frequency Controls	There is no significant difference from other BPS-connected inverter-based generating resources and BESS. The conventional droop characteristic can be used in both generating and charging modes of the hybrid. Active power-frequency control capability may be limited by total active power injection and/or the withdrawal limit of the hybrid plant at the POI that may be set lower than the sum of active power ratings of the individual resources within the hybrid plant. Due to the presence of the BESS, a hybrid plant can also have the capability of providing frequency response for under frequency conditions, subject to the SOC and set point limits outlined in FERC Order 842. See **Active Power-Frequency Controls** section for more information.
Fast Frequency Response	FFR capability will depend on the resources making up the hybrid plant. BESS are well-positioned to provide FFR to systems with high ROCOF due to absence of any rotational components (similar to a solar PV facility). However, if the BESS is combined with wind generation facility, coordination between resources within the hybrid may be needed to achieve sustained FFR. Additionally, hybrid plant FFR capability may be limited to total active power injection and/or withdrawal limit of the hybrid plant. The need for FFR varies with each Interconnection's specific needs.[53] Sustained forms of FFR help arrest fast frequency excursions but also help overall frequency control. BESS are likely to be able to provide sustained FFR within their SOC constraints. Consistent with FERC Order 842, there should be no requirement for hybrid resources to reserve headroom or violate set point or SOC limits to provide frequency response though the BA can procure that service. See **Fast Frequency Response** section for more information.
Reactive Power-Voltage Control (Small Disturbances)	There is no significant difference from other BPS-connected inverter-based generating resources. The dynamic voltage support capability of a hybrid is a combination of capability of the generating resource(s) and BESS, which are part of the hybrid. The BESS portion of the hybrid has the capability to provide dynamic voltage control during both discharging and charging operations. Note that system specific requirements may not necessitate use of the full equipment capability of the hybrid plant. TOPs should provide a voltage schedule (i.e., a voltage set point and tolerance) to the hybrid that can apply to both operating modes (injection and withdrawal). See **Reactive Power-Voltage Control (Small Disturbances)** section for more information.
Reactive Current-Voltage Control (Large Disturbance)	There is no significant difference from other BPS-connected inverter-based generating resources. The BESS portion of the hybrid can be configured to provide dynamic voltage support during large disturbances both while charging and discharging.
Reactive Power at No Active Power Output	There is no significant difference from other BPS-connected inverter-based generating resources.[54]
Inverter Current Injection during Fault Conditions	There is no significant difference from stand-alone BPS-connected inverter-based generating resources and BESS. See **Inverter Current Injection during Fault Conditions** section for more information.

[53] NERC, "Fast Frequency Response Concepts and Bulk Power System Reliability Needs," March 2020: https://www.nerc.com/comm/PC/InverterBased%20Resource%20Performance%20Task%20Force%20IRPT/Fast_Frequency_Response_Concepts_and_BPS_Reliability_Needs_White_Paper.pdf

[54] As the resource transitions from charging to discharging modes of operation (or vice versa) or operates at zero active power output while connected to the BPS, the BESS should have the capability and operational functionality enabled to continuously control BPS voltage.

Table 1.2: High Level Considerations for AC-Coupled Hybrid Plant Performance	
Category	**Comparison with BPS-Connected Inverter-Based Generators**
Return to Service Following Tripping	There is no significant difference from other BPS-connected inverter-based generating resources. A hybrid plant should return to service following any tripping or other off-line operation by operating at the origin (no significant exchange of active or reactive power with the BPS), and then ramp back to the expected set point values, as applicable. This is a function of settings and any requirements set forth by the BA (or TO in their interconnection requirements).
Balancing	There is no significant difference from other BPS-connected inverter-based generating resources.
Monitoring	There is no significant difference from other BPS-connected inverter-based generating resources.
Operation in Low Short-Circuit Strength Systems	There is no significant difference from other BPS-connected inverter-based generating resources.
Grid Forming	The BESS portion of a hybrid plant has unique capabilities to effectively deploy grid forming technology to help improve BPS reliability in the future of a high penetration of inverter-based resources. Newly interconnecting hybrid plants should consider using grid forming technology to support the BPS under these future conditions. See **Grid Forming** section for more information.
Fault Ride-Through Capability	There is no significant difference from other BPS-connected inverter-based generating resources. A hybrid plant should have the same capability to ride through fault events on the BPS, when point of measurement (POM) voltage is within the curves specified in the latest effective version of PRC-024, subject to limitations of legacy equipment. For the BESS part of the hybrid, this applies to both charging and discharging modes. Unexpected tripping of generation or load resources on the BPS will degrade system stability and adversely impact BPS reliability. Ride-through capability is a fundamental need for all BPS-connected resources such that planning studies can identify any expected risks.
System Restoration and Blackstart Capability	Hybrid plants may have the ability to form and sustain their own electrical island if they are a part of a blackstart cranking path. This may require new controls topologies or modifications to settings that enable this functionality. Blackstart conditions may cause large power and voltage swings that must be reliably controlled and withstood by all blackstart resources (i.e., operation under low short-circuit grid conditions). For the hybrid to operate as a blackstart resource, assurance of energy availability and a designed energy rating that ensures energy availability for the entire period of restoration activities are needed. At this time, it is unlikely that most legacy hybrid plants can support system restoration activities as a stand-alone resource; however, they may be used to enable start-up of subsequent solar PV, wind, or synchronous machine plants and accommodate fluctuations in supply and demand. See **System Restoration and Blackstart Capability** section for more information.
Protection Settings	There is no significant difference from other BPS-connected inverter-based generating resources.

Table 1.2: High Level Considerations for AC-Coupled Hybrid Plant Performance	
Category	**Comparison with BPS-Connected Inverter-Based Generators**
Power Quality	There is no significant difference from other BPS-connected inverter-based generating resources.
State of Charge *(new)*	Similarly to the standalone BESS, the SOC of a BESS portion of the hybrid may affect the ability of the hybrid to provide energy or other ERSs to the BPS at any given time.[55] These limits and how they affect BESS operation should be defined by the hybrid owner and provided to the BA, TOP, RC, TP, and PC. BESS SOC will be optimized by the hybrid plant controller in coordination with other parts of the hybrid (wind or solar) based on irradiance and/or wind conditions, market prices, energy, and ERS obligations of the hybrid plant. In addition, the manner in which the BESS would charge is to be communicated by the GO. Here, system loading conditions and generation from other parts of the hybrid plant will play a role. For example, in a wind-BESS hybrid plant during low load high renewable scenarios, the BESS may be charged directly from the wind output. In this scenario, the hybrid plant will not appear as a load on the system. Alternatively, the plant may be directed to charge from the network in order to increase the loading on the system to satisfy stability considerations. See **State of Charge** section for more information.
Operational Limits *(new)*	Based on economics or design considerations, the BESS portion of the hybrid may be operated to only charge from the wind and/or solar part of the hybrid or to charge from the grid as well. The hybrid owner should provide this information to the BA, TOP, RC, TP, and PC. Hybrid plant owners may choose to limit injection/withdrawal at the POI to a level that is lower than actual capability of the hybrid. The hybrid owner should also provide this information to the BA, TOP, RC, TP, and PC. Where such limit exists, the studies as well as voltage support and frequency support requirements may apply only up to the limit. See **Operational Limits** section for more information.
Damping Support	BESS can have the capability of providing oscillation damping support, similar to synchronous gnerators, HVDC/FACTS facilities, and other BPS-connected inverter-based resources. BESS can operate in both charging and discharging modes, which provides greater capabilities for damping support.

Topics with Minimal Differences between AC-Coupled Hybrids and Standalone BESS Resources

Ac-coupled hybrid plants and standalone BESS share the following performance characteristics:

- Momentary cessation
- Phase jump immunity
- Reactive current-voltage control during large disturbances
- Reactive power at no active power output
- Return to service following tripping
- Inverter current injection during fault conditions
- Balancing

[55] https://www.nrel.gov/docs/fy19osti/74426.pdf

- Monitoring
- Operation in low short-circuit strength systems
- Fault ride-through capability
- System restoration and blackstart capability
- Grid forming[56]
- Protection settings
- Damping support

The following sub-sections outline the additional topics from **Table 1.2** that warrant additional details and where ac-coupled hybrids have specific considerations that need to be addressed.

Capability Curve

The overall active and reactive power capability of an ac-coupled hybrid plant is the summation of the capabilities for each of the BESS and generating components within the facility. In terms of establishing the capability curve for an ac-coupled hybrid plant, both the BESS and generating component should have their own capability curve that simulation models would represent separately. The capability curve the GO provides to the RC, TOP, BA, TP, and PC for their tools and studies should explicitly document and provide for any contractual limits that may limit active power to a pre-determined level. Furthermore, the facility should not be unnecessarily limited from providing its full reactive power capability by any plant-level controls. In general, the overall plant-level capability of an ac-coupled hybrid plant will be asymmetrical with more active and reactive power capability when both the generating component and BESS are injecting active power to the BPS. **Figure 1.5** illustrates an example of an ac-coupled hybrid plant consisting of a solar PV generation component with a BESS component.

TOs should ensure their interconnection requirements are clear on how capability curves are provided for BESS and hybrid power plants, and TPs and PCs should ensure that their modeling requirements are also clear on how to represent steady-state capability curves in the simulation tools used to study these resources.

[56] The BESS component of an ac-coupled hybrid can have the capability to provide grid forming capability; if the hybrid facility is dc-coupled, the entire plant can have the capability to be grid forming.

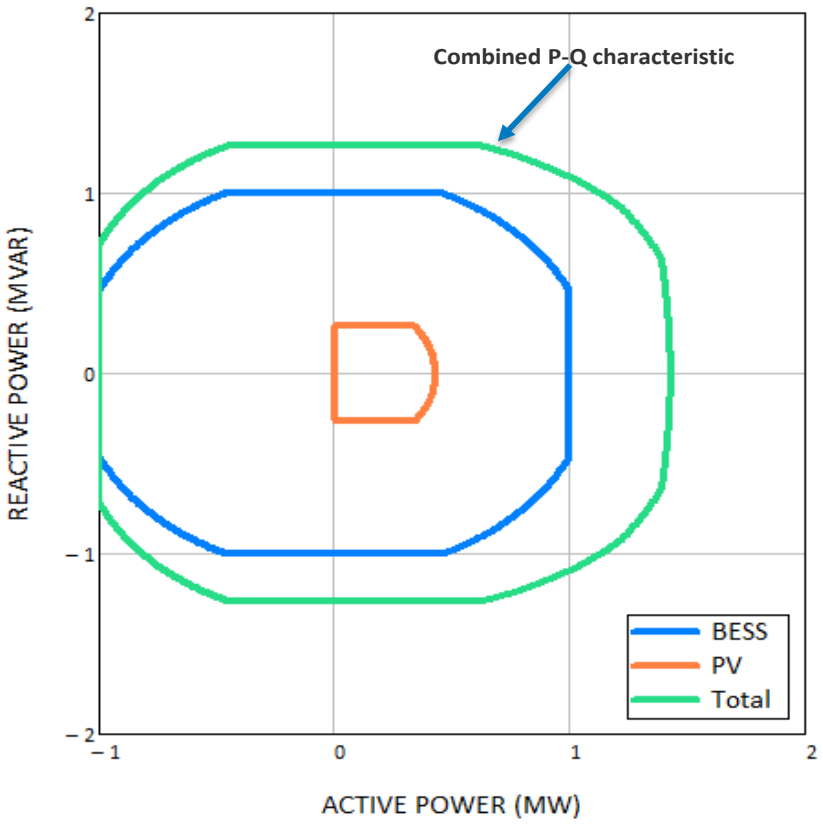


Figure 1.5: Example of AC-Coupled Solar PV + BESS Hybrid Plant Capability Curve [Source: NREL]

Active Power-Frequency Control

Active power-frequency controls can be extended to the charging region of operation for the BESS part of the hybrid as described in detail in standalone BESS section earlier. The overall active power-frequency control capability of the hybrid is equal to combined capability of all resources that are part of the hybrid plant. The overall capability may be limited by total active power injection and/or withdrawal limit of the hybrid plant that may be set lower than the sum of active power ratings of the individual resources within the hybrid plant.

Fast Frequency Response

BESS and solar PV have the capability of providing FFR to rapid changes in frequency disturbances on the BPS. Since there are no rotational elements, the controls that are programmed into the inverter drive the active power output predominantly. Wind generating resources can provide FFR through tapping into kinetic energy of rotating mass of a wind turbine.[57] Such response, however, cannot be sustained. To obtain sustained FFR from hybrid plants containing wind/solar PV generating resources along with the BESS, the FFR capability of the ac-coupled hybrid plant is equal to combined capability of all resources that are part of the hybrid plant. The resources within the hybrid can be coordinated to optimize total FFR and achieve required sustain time. The overall capability may be limited by total active power injection and/or withdrawal limit of the hybrid plant that may be set lower than actual capability of the plant.

[57] https://www.nerc.com/comm/PC/InverterBased%20Resource%20Performance%20Task%20Force%20IRPT/Fast_Frequency_Response_Concepts_and_BPS_Reliability_Needs_White_Paper.pdf

An ac-coupled hybrid plant should have at least the following capabilities that may be used based on BA requirements and BPS reliability needs:

- Configurable and field-adjustable droop gains, time constants, and deadbands tuned to the requirements or criteria specified by the BA
- Real-time monitoring of BESS SOC to understand performance limitations that could impose on FFR capabilities from the hybrid
- The ability to provide sustained response, coordinated with primary frequency response as defined by the BA
- Consistent with FERC Order 842, there should be no requirement for hybrid plants to maintain a specific SOC for provision of frequency response

Reactive Power-Voltage Control (Normal Conditions and Small Disturbances)

There are no significant differences between ac-coupled hybrids and BPS-connected inverter-based resources with respect to reactive power-voltage control during normal grid conditions and small disturbances. In essence, the hybrid plant should have the capability to provide reactive power-voltage control both during power injection at the POM and power withdrawal (during BESS charging); however, it is useful to separate the recommendations for each mode of operation:

- **Power Injection:** There are no significant differences between hybrid plants during power injection into the grid and other BPS-connected inverter-based generators with respect to reactive power-voltage control. The hybrid plant should have the ability to support BPS voltage. Voltage control needs to be coordinated between all resources within the hybrid plant to control the hybrid plant's POM voltage within a reasonable range during normal and abnormal grid conditions.
- **Power Withdrawal:** Hybrid plants should have the capability to control POM voltage during normal operation and abnormal small disturbances on the BPS while the BESS part of the hybrid is operating in charging mode. The ability for resources consuming power to support BPS voltage control adds significant reliability benefits to the BPS and may be required by TOs as part of their interconnection requirements or by BAs, TOPs, or RCs for BPS operations.

As the resource transitions from charging to discharging modes of operation (or vice versa) or operates at zero active power output while connected to the BPS, the BESS should have the capability and operational functionality enabled to continuously control BPS voltage. This should be coordinated with any requirements established by the TO or TOP. Generally, the output voltages of inverter-based renewable energy resources vary severely due to large fluctuations and rapid changes in the availability of their energy resources. Therefore, if used individually, it is difficult to control these resources' voltage; however, this issue is resolved in a hybrid power plant. Since the output voltage variation of the BESS from a fully charged to a discharged state is typically less, this variation can be easily controlled to maintain a stable output voltage. In addition, the battery is capable of balancing the power fluctuations either by absorbing the excess power from the renewable energy resources during charging or by supplying the power to satisfy the load-demand changes during discharging. As the resource transitions from charging to discharging modes of operation, or vice versa, a hybrid power plant should continuously have the ability to control BPS voltage throughout the transition.

State of Charge

SOC considerations for the BESS portion of the ac-coupled hybrid plant are similar to those of a stand-alone BESS discussed earlier. The SOC of a BESS portion of the hybrid may affect the ability of the BESS to provide energy or other ERSs to the BPS at any given time.[58] The hybrid owner should define these limits and how they affect BESS operation

[58] https://www.nrel.gov/docs/fy19osti/74426.pdf

and provide these definitions to the BA, TOP, RC, TP, and PC. A BESS SOC will be optimized by the hybrid plant controller in coordination with other parts of the hybrid (wind or solar) based on irradiance and/or wind conditions, market prices, energy, and ESR obligations of the hybrid.

Operational Limits

Based on economics or design considerations, the BESS portion of a hybrid plant may be operated to only charge from the generating component or to charge from the grid as well. Technical, economic, and policy considerations will dictate whether the hybrid plant charges from the grid or only from the generating component.[59] TOs and BAs should clearly define the acceptable charging behavior from the hybrid plant and ensure that sufficient monitoring capability is available to verify this performance. The hybrid owner should provide the charging characteristics and any operational limitations to the BA, TOP, RC, TP, and PC.

The hybrid plant owner for various economic consideration may choose to set the injection/withdrawal limits at the POI lower than actual capability of the hybrid plant. The hybrid owner should provide this information to the BA, TOP, RC, TP, and PC. Where such a limit exists, the studies as well as voltage support and frequency support requirements may apply only up to the limit.

[59] In addition to any requirements imposed by the TO or BA regarding acceptable charging behavior, the structure of investment tax credits may also contribute to the charging characteristic. For example, currently a hybrid plant may need to charge the BESS by renewable energy for more than 75% of the time for the first five years of commercial operation, and the tax credit value for the storage component is derated in proportion to the amount of grid charging between 0% and 25%.

Chapter 2: BESS and Hybrid Plant Power Flow Modeling

BPS-connected BESS and hybrid plants are modeled very similarly to other BPS-connected inverter-based resources, such as solar PV and wind power plants. This chapter provides a brief overview of the presently recommended power flow modeling practices.

BESS Power Flow Modeling

The power flow representation for a BPS-connected BESS is similar to other types of BPS-connected inverter-based resources. **Figure 2.1** shows a generic[60] power flow model for a BPS-connected BESS facility. The power flow representation of a BPS-connected BESS facility includes the following components:

- **Generator Tie Line:** Where the BESS is connected to the BPS (to the POI) through a transmission circuit (i.e., the generator tie line), this element should be explicitly modeled in the power flow to properly represent active and reactive power losses and voltage drops or rises.
- **Substation Transformer:** Any substation transformers[61] (also referred to as "main power transformers") should be explicitly modeled in the power flow base case. All relevant transformer data, such as tap ratios, load tap changer controls, and impedance values, should be modeled appropriately.
- **Collector System Equivalent:** Based on the cabling and layout of the BESS facility, some GOs may choose to model an equivalent collector system to capture any voltage drop across the collector system. However, BESS facilities are not geographically and electrically dispersed like wind and solar PV facilities, so BESS collector system equivalent impedances are likely much smaller. Therefore, this may or may not be included in the BESS power flow model.
- **Equivalent Pad-Mounted Transformer:** Each of the inverters interfacing the battery systems with the ac electrical network will include a pad-mounted transformer. An equivalent pad-mounted transformer is typically modeled, scaled to an appropriate size to match the overall MVA rating of the aggregate inverters at the BESS facility.
- **Equivalent BESS:** An equivalent BESS generating resource is modeled to represent the aggregate amount of inverter-interfaced BESS installed at the facility. The capability is scaled to match the overall capability of aggregate inverters. The equivalent BESS is modeled as a generator in the power flow, and appropriate voltage control settings (and other applicable control settings) should be specified in the model. In situations where different inverter types (i.e., make and model of inverter) are used[62] within the BESS, each different inverter type is typically separately aggregated. GOs should consult with their TP and PC for recommended modeling practices.
- **Shunt Compensation and Reactive Devices:** The plant may include shunt reactive devices to meet the reactive capability and voltage requirements defined by the TO and TOP. These may include shunt capacitors and reactors, FACTS devices, or synchronous condensers as applicable. If these devices are installed, they should be modeled appropriately. **Figure 2.1** also denotes that these installations could even be located at the POI within the boundary of the GO and GOP and should also be modeled appropriately.
- **Plant Loads:** The plant may include a small load to represent station service load as deemed necessary based on the TP and PC modeling requirements. Auxiliary loads supplied by the dc bus are generally not modeled.

[60] Different configurations may exist for BESS facilities based on considerations at each individual installation. The power flow model provided by the GO to the TP and PC should be an accurate representation of the actual installed (or expected) facility and should not use any default or generic parameters or configurations.

[61] Some BESS may have more than one substation transformer, and each should be explicitly modeled.

[62] This occurs more frequently in inverter-based generating resources, either installed in different phases or often in large facilities.

Elements in Figure 2.1 shown in red are elements that may or may not be represented in BESS models based on each specific installation's modeling needs, with the goal of capturing all the needed electrical effects. The elements described in black should be modeled in all BPS-connected BESS facilities. Common voltage levels are shown in Figure 2.1 for illustrative purposes.

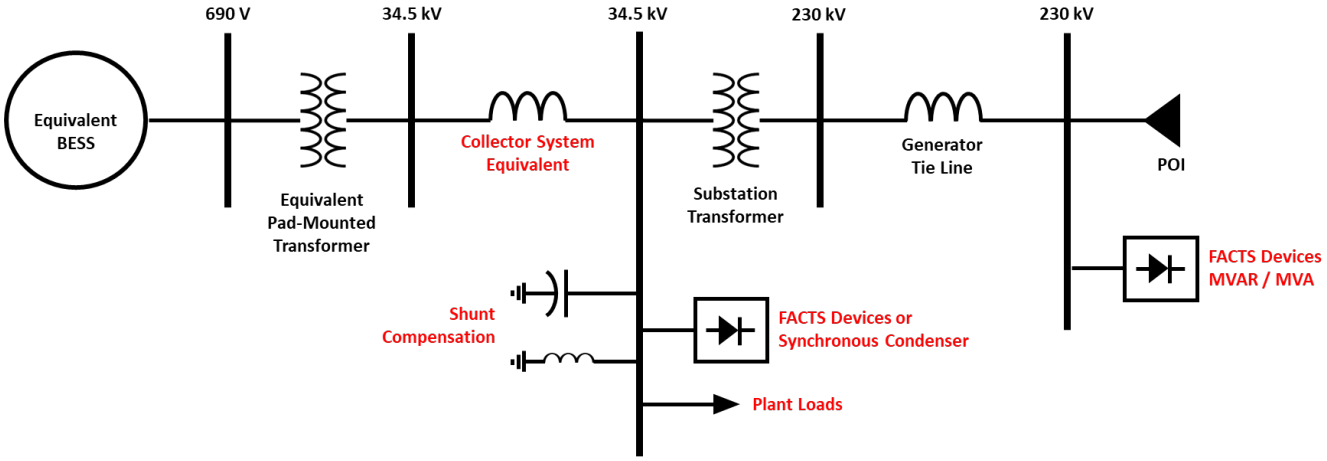


Figure 2.1: Generic Power Flow Model Example for BESS

The GO, TP, and PC will need to consider the following aspects of steady-state power flow modeling for BESS:

- **Charging Operation:** Charging capability can be modeled by setting the equivalent BESS generator with an appropriate negative value for the active power limit, P_{min}. Note that the maximum charging limit (P_{min}) may be different from the maximum discharging limit (P_{max}). These P_{min} and P_{max} limits in the equivalent BESS generator record should be set to any limits imposed by the plant and inverter controllers in coordination with the capability of the inverters. In addition, the BA, TOP, RC, TP, and PC should ensure they understand how the other BESS facility components (e.g., shunt compensation) operate during charging operation such that the overall BESS model can be set up correctly in both charging and discharging modes.
- **Point of Voltage Control and Power Factor Mode:** As with other generating resources, the generating resource (i.e., the equivalent BESS) can be configured to operate in either a power factor control mode or a voltage control mode with a specific control point in the grid (i.e., the POM or POI). This should be configured appropriately in the generator record voltage controls. Newer models may have advanced controls such as voltage droop characteristic. Generator voltage reference can be changed to meet the voltage schedule.

Hybrid Power Flow Modeling

The configuration of hybrid plants will likely vary more than BESS facilities, based on the size of the plant, the type of technologies used, and the overall layout of the facility. Regardless, each hybrid plant should be modeled according to the expected[63] or actual facilities installed in the field. Furthermore, hybrid plants may be modeled differently depending on whether they are ac-coupled or dc-coupled facilities. GOs should consult with their TP and PC to determine the appropriate modeling approach based on whether the facility is ac-coupled or dc-coupled.

AC-Coupled Hybrid Plant Power Flow Modeling

Figure 2.2 illustrates a generic model representation for an ac-coupled hybrid plant.[64] Since the BESS and the generating resource are connected through the ac network, each component should be represented accordingly, as shown in Figure 2.2. An equivalent BESS generation, an equivalent pad-mounted transformer and an equivalent collector system (if needed to properly represent the electrical effects) should be represented. For the example

[63] During the interconnection study process

[64] There are many different ac-coupled hybrid plant configurations; this is used as an example only.

shown in Figure 2.2, where the ac-coupling is at the low voltage side of the substation main power transformer, the inverter-based generating resource is coupled to the BESS at this point. The inverter-based generating resource also has its own equivalent generator model, equivalent pad-mounted transformer, and equivalent collector system modeled appropriately. The substation main power transformers and generator tie line are also modeled explicitly. Any shunt compensation, such as shunt reactors, capacitors, FACTS devices, or synchronous condensers, should be modeled as well. Again, elements shown in red may or may not be represented in the model based on each specific location, and elements shown in black should be modeled for all facilities. Common voltage levels are shown only for illustrative purposes.

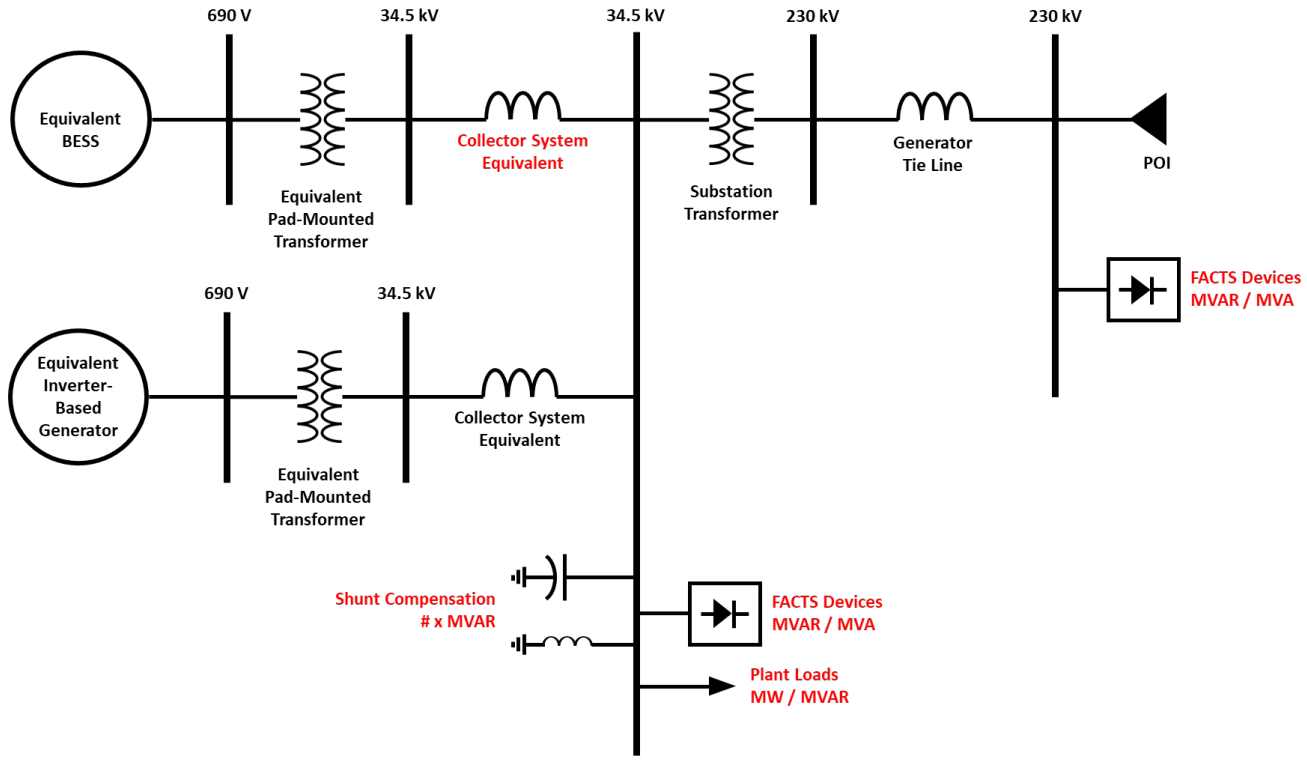


Figure 2.2: Generic Power Flow Model Example for AC-Coupled Hybrid Power Plants

The GO, TP, and PC will need to consider the following aspects of steady-state power flow modeling for ac-coupled hybrid power plants:

- **Plant Configuration:** The ac-coupled hybrid plants can have significantly different configurations on the ac-side of the inverter interface. Therefore, special attention should be given to ensuring that the power flow model accurately represents the overall configuration of the plant (which may be different from Figure 2.2).
- **Coordinated Operation of BESS and Generating Component:** Since the BESS is explicitly modeled, charging and discharging capability can be represented by setting the equivalent BESS generator P_{min} and P_{max} values appropriately. The P_{min} and P_{max} limits in the equivalent BESS generator record should be set to any limits imposed by the plant and inverter controllers in coordination with the capability of the inverters. BESS operation should be modeled by setting active power output, P_{gen}, accordingly. The BA, TOP, RC, TP, and PC should ensure they understand how the BESS is expected to operate in relation to the inverter-based generating component within the plant, such that the output of both resources is coordinated. This includes at least the following:
  - **Maximum Overall Plant Power Output (Plant P_{max}):** The maximum power output of the overall hybrid facility may be limited by interconnection agreement, plant controller, or other means. While the nameplate rating of the individual BESS and generating resources may exceed the limit, the power output

of the overall facility may not; therefore, it is important to understand what the maximum operational output of the plant will be. Most power flow software today does not have a way to represent this limit, but the software industry should pursue the ability to explicitly model both the BESS and the generator within an overall plant model with its own limitations. In the meantime, BAs, TOPs, RCs, TPs, PCs, and GOs should develop a standardized way of documenting and communicating such limits.

- **BESS Charging from BPS or from Generating Resource:** Depending on the interconnection agreement, the hybrid plant may or may not be able to charge from the BPS. If allowed, the BESS may be able to charge power from the BPS with the generating unit dispatched off. If not allowed, the BESS will only charge using energy produced by the generating component of the plant. Most power flow software today does not have an automatic or effective way to represent this limit, but the software industry should pursue this capability. In the meantime, BAs, TOPs, RCs, TPs, PCs, and GOs should develop a standardized way of documenting and communicating such limits.
- **Coordinating Voltage Controls for BESS and Generating Component:** The hybrid power plant will have obligations per VAR-002-4.1 to control voltage at its POI or POM, and the power flow base case should be configured to ensure similar voltage control strategies as used in the field. In an ac-coupled hybrid plant with the BESS and generating component modeled explicitly, the voltage controls will need to be coordinated among both devices. Both equivalent generator records for the BESS and generating component can be coordinated using the reactive power sharing parameter in each unit.[65]

The WECC Renewable Energy Modeling Task Force (REMTF) has developed recommendations for software vendors to improve the capability for modeling BESS and hybrid plants,[66] particularly for representing overall plant-level active power limitations as well as plant-level coordinated voltage controls in the power flow base case. This will enable more effective modeling of hybrid plant dispatch scenarios as well as overall plant voltage control.

DC-Coupled Hybrid Plant Power Flow Modeling

Figure 2.3 illustrates a generic model representation for a dc-coupled hybrid plant. For dc-coupled plants, the BESS and inverter-based generating resources are coupled on the dc-side of the inverter. Therefore, the coupling is not necessarily modeled in power flow simulation tools, and the coupled BESS and inverter-based generating resources are aggregated to a single aggregate generator model. Since the coupling occurs at each individual generating resource, there is no BESS inverter, pad-mounted transformer, or equivalent collector system represented. Only the equivalent inverter-based generating resource (including the battery), the ac-side equivalent pad-mounted transformer, and the equivalent collector system are represented. Similar to ac-coupled hybrid plants and other BPS-connected inverter-based resources, the substation main power transformer and generator tie line are modeled explicitly. Any shunt compensation, such as shunt reactors, capacitors, FACTS devices, or synchronous condensers should be modeled as well. Again, elements shown in red may or may not be represented in the model based on each specific location, and elements shown in black should be modeled for all facilities. Common voltage levels are shown only for illustrative purposes.

[65] This is similar to configuring multiple synchronous generators to control the same bus voltage.

[66] WECC White Paper on Modeling Hybrid Power Plant of Renewable Energy and Battery Energy Storage System: https://www.wecc.org/_layouts/15/WopiFrame.aspx?sourcedoc=/Administrative/WECC%20White%20Paper%20on%20modeling%20hybrid%20solar-battery.pdf

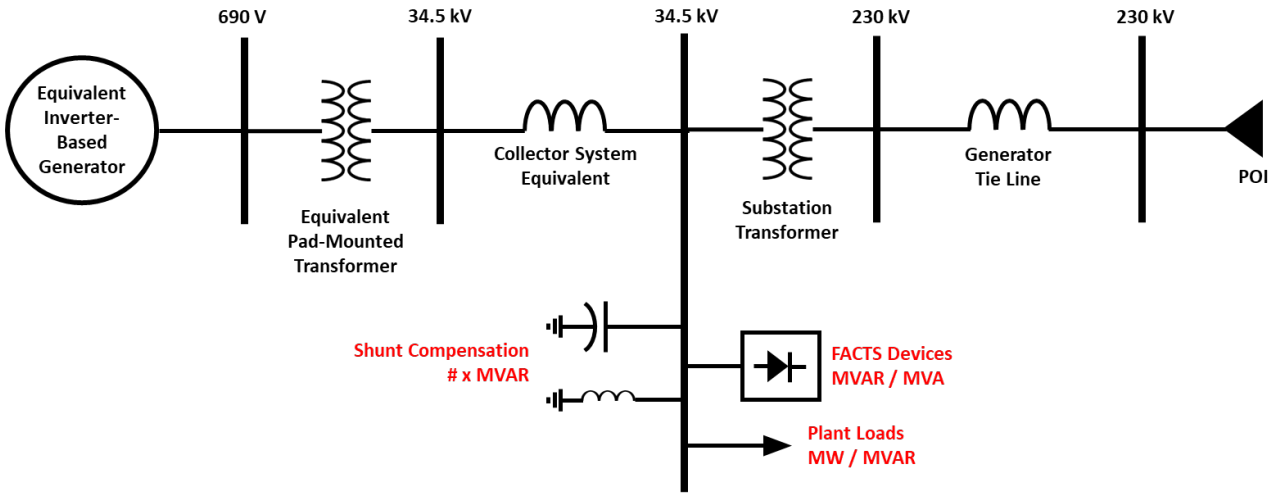


Figure 2.3: Generic Power Flow Model for DC-Coupled Hybrid Power Plants

The GO, TP, and PC will need to consider the following aspects of steady-state power flow modeling for dc-coupled hybrid power plants:

- **Charging and Discharging Operation:** If the BESS only charges from the generating component (due to interconnection requirements or if the ac/dc inverter is not bidirectional), then P_{min} will remain zero for the facility. If the BESS can charge from the grid, then P_{min} for the equivalent generator component can be set to the corresponding aggregate negative active power limit. Similarly, the maximum equivalent generator power output, P_{max}, should also be set according to equipment capabilities and plant limitations. Note that the maximum charging limit (P_{min}) may be different than the maximum discharging limit (P_{max}). The TP and PC should ensure they understand how the BESS and generating components are expected or required to operate during charging and discharging operation so that the overall model can be set up correctly.
- **Voltage Control:** The appropriate type of voltage control should be accurately modeled (as with other inverter-based resources), and all plant voltage control settings should be coordinated in the models.
- **Frequency Response:** While frequency response is modeled in the dynamic models, active power limits for the facility should be coordinated between models so the resource is configured appropriately in the steady-state and dynamic simulations. Droop gain should be configured appropriately to be consistent with per unit representation of the plant and the actual MW response from the BESS portion.

Chapter 3: BESS and Hybrid Plant Dynamics Modeling

With an appropriate power flow representation for the BESS or hybrid plant, dynamic models can be used to represent the behavior of these resources during BPS disturbances. Dynamic modeling practices for BESS and hybrid plants are similar to those of other BPS-connected inverter-based resources; however, there are some unique characteristics to capture regarding four-quadrant operation of energy storage and consideration of SOC. This chapter describes recommended practices for modeling BESS and hybrid plants including use of appropriate models, model quality considerations, and EMT models.

Use of Standardized, User-Defined, and EMT Models

As with other inverter-based resources, the dynamic models used to represent BESS and hybrid power plants will depend on TP and PC modeling requirements as well as the types of studies being conducted. GOs should refer to the specific modeling requirements for each TP and PC when providing models during the interconnection study process and should ensure that the models reflect the expected behavior of the facility seeking interconnection (or facility installed in the field). TPs and PCs should consider updating their modeling requirements to ensure clarity and consistency for modeling BESS and hybrids during interconnection studies, during annual planning assessments, and any other studies being conducted. Some considerations for different model types include the following:

- **Standardized Library Models:** These types of models may be appropriate (and required) for Interconnection-wide base case development. Standardized models, however, may not fully capture all BESS and hybrid behavior and response characteristics during large disturbances. Standardized library models may not be able to represent fully nonlinearities in control, communications delays across technologies, dynamic rise times, etc. GOs should coordinate with their equipment manufacturers and any consultants developing plant-level models to ensure these models are appropriate and suitably parameterized. TPs and PCs should ensure that sufficient documentation is provided by the GO to verify that the actual field performance will sufficiently match the dynamic model provided.
- **User-Defined Models:** These types of models are more appropriate for interconnection studies that may be testing or screening for various issues, such as ride-through performance, operation in low short-circuit conditions, local stability analysis, and other localized reliability assessments. The user-defined models may be required in conjunction with the standardized library models, and TPs and PCs may require the GO to provide benchmarking reports between the two models. A user-written dynamic model can be used to tune the response of a standardized library model to represent the actual response of the resource as closely as possible. Any discrepancies should be documented and explained by the equipment manufacturers. User defined models that capture the "real code" of the inverters and plant-level controller installed in the field are preferred.
- **EMT Models:** EMT platform allows for the most accurate representation of the dynamic response of an inverter-based resource (including BESS and hybrid plants). TPs and PCs are recommended to require EMT models for newly interconnecting BESS and hybrid plants since these models are the most appropriate to test and analyze for ride-through capability, controls instability, unbalanced fault analysis, operation in low short-circuit strength conditions, and any anomalous controls or instability performance that may be identified during screening with the aforementioned model types. EMT models that capture the "real code" of the inverters and plant-level controller installed in the field are preferred. As the grid continues to evolve, modeling practices improve, and inverter control schemes get more complex, it is likely that EMT models will be used more extensively. Reliability Guideline on EMT modeling [67] provides recommendations for the development of EMT model requirements, EMT model collection, and model quality verification practices specifically for EMT models used to represent BPS-connected inverter-based resources in reliability studies

[67] Reliability Guideline: Electromagnetic Transient Modeling for BPS-Connected Inverter-Based Resources—Recommended Model Requirements and Verification Practices

conducted by TPs and PCs. The recommendations are intended to help ensure that EMT models provided by GOs are representative of the expected behavior of the actual or planned facility to the greatest extent possible so that potential reliability risks are adequately captured in the modeling studies. TPs and PCs are advised to establish EMT model requirements and model quality verification practices as per the guideline.

As more BESS and hybrid plants interconnect to the BPS, it imperative that these resources are studied appropriately with accurate models. TPs and PCs will weigh these considerations against their modeling practices and capabilities and determine appropriate modeling requirements for existing and newly interconnecting generating resources. Generating resources should not be allowed to interconnect without first meeting all modeling requirements of the TPs and PCs.

Dynamic Model Quality Review Process

All TPs and PCs should have modeling requirements that include quality testing to ensure that the dynamic model is a reasonable representation of the equipment installed in the field, that the model meets certain specifications, and that the model performs reasonably when subjected to a set of simulation tests. Many TPs and PCs currently have these types of quality tests in place,[68] and all TPs and PCs are encouraged to strengthen their requirements, particularly in the area of BESS and hybrid plant modeling. These quality tests can be applied to standardized library models, to user-defined models, as well as to EMT models. The goal of these tests is to give the TP and PC assurance that the model being used reasonably represents the equipment in the field and meets the expected performance specifications established by the TO in their interconnection requirements. Examples of model quality tests used for inverter-based resources that should also be applied to BESS and hybrid plants include, but are not limited to, the following:

- **Low and High Voltage Ride-Through Analysis:** under various charging and discharging conditions (including at power output limits), SOC conditions, and both consuming and producing reactive power
- **Small Voltage and Frequency Disturbances:** under various charging and discharging conditions (including at power output limits), SOC conditions, and both consuming and producing reactive power
- **Short-Circuit Strength Analysis:** under varying levels of short-circuit strength with different (or stressed) local dispatch scenarios for different charging and discharging conditions (including at power output limits) and SOC conditions

BESS Dynamic Modeling

Although the implementation may be different among equipment manufacturers, the modeling structure of BPS-connected BESS is (in principle) the same as BPS-connected solar PV and Type 4 wind plants. The overall structure consists of a converter control module, an electrical control module, and a plant control module. Frequency ride-through and voltage ride-through settings are modeled with the generator protection modules. This section describes the use of the latest standardized library models to represent BESS (see **Figure 3.1**). The standardized library models, with variation for each module, provide flexibility to simulate the overall plant dynamic behavior. The modules may not directly match control blocks in the field, but they can be set up to achieve the desired performance by selecting proper modules and control flags. User-defined models may also be required as described in this chapter. If user-defined models are required by the TP and PC, specific modeling requirements should be in place that describe the level of detail, transparency, functionality, and documentation.

[68] ERCOT Model Quality Guide: https://www.ercot.com/files/docs/2021/04/20/Model_Quality_Guide.zip

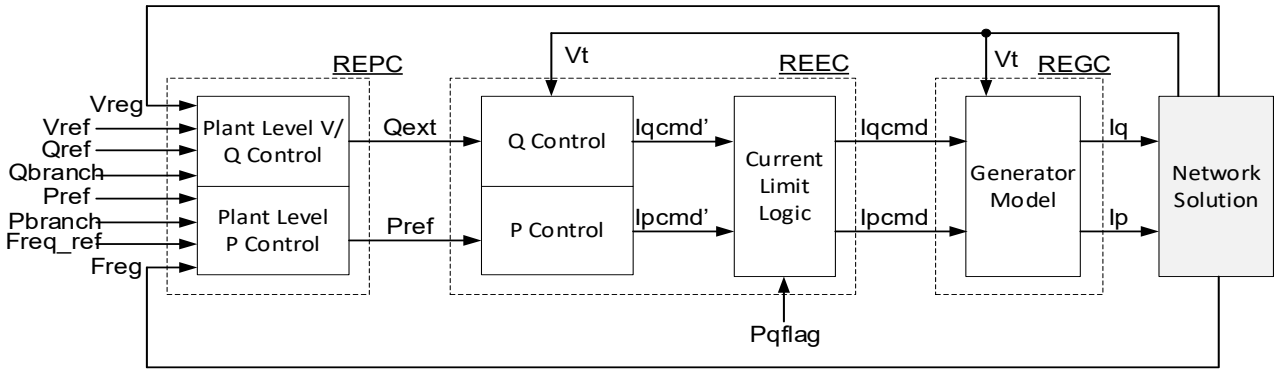


Figure 3.1: Block Diagrams of Different Modules of the WECC Generic Models[69]

The different modules used in representing the dynamic behavior of a BESS include:

1. **REGC (REGC_*)[70] Module:** used to represent the converter (inverter) interface with the grid. It processes the real and reactive current command and outputs of real and reactive current injection into the grid model.
2. **REEC (REEC_C/REEC_D)[71] Module:** used to represent the electrical controls of the inverters. It acts on the active and reactive power reference from the REPC module, with feedback of terminal voltage and generator power output, and gives real and reactive current commands to the REGC module.
3. **REPC (REPC_*) Module:** used to represent the plant controller. It processes voltage and reactive power output to emulate volt/var control at the plant level. It also processes frequency and active power output to emulate active power control. This module gives active/reactive power commands to the REEC module.

Table 3.1 shows the list of BESS simulation modules used in two common simulation platforms. Although implementation across simulation platforms may differ, the modules have the same functionality and parameter sets.

Table 3.1: Dynamic Models used to Represent BESS in PSLF and PSSE

Module	GE PSLF Modules	Siemens PTI Modules
Grid interface	regc_*	REGC*
Electrical controls	reec_c or reec_d	REECC1 or REECD1
Plant controller	repc_*	REPC*/PLNTBU1
Voltage/frequency protection	lhvrt/lhfrt	VRGTPA/FRQTPA

Model invocation varies across software platforms, and users should refer to the software manuals for software-specific implementations. The regulated bus and monitored branch in the REPC invocation should match the control modes used in the REPC model. For example, if voltage droop control is used (droop control gain kc), then the monitored branch should be specified in the model invocation.

[69] WECC Solar PV Plant Modeling and Validation Guideline: https://www.wecc.org/Reliability/Solar%20PV%20Plant%20Modeling%20and%20Validation%20Guidline.pdf
[70] The symbol * is used throughout this document to refer to all available variation of the module (e.g., REGC_A, REGC_B, and REGC_C).
[71] REEC_D and REPC_B model descriptions: https://www.wecc.org/Administrative/Memo_RES_Modeling_Updates_083120_Rev17_Clean.pdf

Scaling for BESS Plant Size and Reactive Capability

Model parameters are expressed in per unit of the generator MVA base except in REPC_B. The specification of MVA base is implementation-dependent.[72] To scale the dynamic model to the size of the plant, the generator MVA base parameter must be adjusted. It should be set to the sum of the individual inverter MVA ratings. The active and reactive range are expressed in per unit on the scaled MVA base. The MVA base for the REPC_B model is always the system MVA base in GE PSLF; Siemens PTI PSS/e implementation allows a different MVA base to be specified. The per unit parameters of the REPC_B model should be expressed based on the MVA base used.

Reactive Power/Voltage Controls Options

The plant-level control module allows for the following reactive power control modes:

- Closed loop voltage regulation (V control) at a user-designated bus with optional line drop compensation, droop response and deadband
- Closed loop reactive power regulation (Q control) on a user-designated branch, with optional deadband
- Constant power factor (PF) control on a user-designated branch active power and power factor. This control function is available in REPC_B, not in REPC_A

In the electrical control module, other reactive control options are available as follows:

- Constant PF control based on the generator PF in the solved power flow case
- Constant reactive power based on either the equivalent generator reactive power in the solved power flow case or from the plant controller
- Closed loop voltage regulation at the generator terminal
- Proportional reactive current injection during a user-defined voltage-dip event

Various combinations of plant-level and inverter-level reactive control are possible by setting the appropriate parameters and switches. **Table 3.2** shows a list of control options and respective models and the switch that would be involved. Additional variations[73] of flag settings are not shown in **Table 3.2** since they are not likely to be used for BESS operation.

Table 3.2: Reactive Power Control Options for BESS Generic Models

Functionality	Required Models	pfflag	vflag	qflag	refflag
Plant-level V control	REEC + REPC	0	N/A*	0	1
Plant-level Q control and local coordinated Q/V control	REEC + REPC	0	1	1	0
Plant-level V control and local coordinated Q/V control	REEC + REPC	0	1	1	1
Plant-level PF control and local coordinated Q/V control	REEC + REPC (repc_b and above)	0	1	1	2

* "N/A" indicates that the state of the switch does not affect the indicated control mode.

[72] For example, if MVA base is zero in reec_* or repc_*, then the MVA base entered for the regc applies to those models as well in the PSLF implementation. The user may specify a different MVA if desired. In the PSSE implementation, the MVA base is set in the power flow model.

[73] These unlikely variations include no representation of the plant-level controller (which is not likely with new facilities) and voltage regulation options that would not meet automatic voltage regulation requirements found in NERC VAR Standards and most interconnection requirements.

Active Power Control Options

The plant controller models include settable flags for the user to specify active power control. **Table 3.3** shows the active power control modes, the models, and parameters involved, respectively. These types of controls include the following:

- Constant active power output based on the generator output in the solved power flow case
- Active power-frequency control with a proportional droop of different gains for over- and under-frequency conditions, based on frequency deviation at a user-designated bus

The BESS is expected to provide frequency response in both upward and downward directions. The no response and down only options are greyed out in **Table 3.3** because they are unlikely to be approved by the transmission planning entity (assuming interconnection requirements are fully utilizing the bi-direction capabilities of BESS technology). In the WECC-recommended modeling enhancement for hybrid power plants,[74] BaseLoad flag in the power flow model could override the frqflag setting in the dynamic model. The frqflag/ddn/dup are meant to reflect the inverter capability while BaseLoad flag represents the availability of the operational headroom. It is important to set BaseLoad flag to zero for BESS generators regulating frequency.

Table 3.3: Active Power Control Options

Functionality	BaseLoad flag*	frqflag	ddn	dup
No frequency response	2	0	0	0
Frequency response, down only regulation	1	1	> 0	> 0
Frequency response, up and down	0	1	> 0	> 0

*BaseLoad flag is set in the power flow model.

Current Limit Logic

The electrical control module first determines the active and reactive current commands independently according to the active power control option and reactive power control option. Each command is subject to the respective current limit, 0 to Ipmax for active current and Iqmin to Iqmax for reactive current; then the total current of $\sqrt{\mathrm{Ipcmd}^2 + \mathrm{Iqcmd}^2}$ is limited by Imax. In situations where the current limit (Imax) of the equivalent inverter is reached, the user should specify whether active or reactive current takes precedence by setting the pqflag parameter in the REEC module.

State of Charge

The REEC_C module includes simulation of BESS's SOC (see **Table 3.2**). An initial condition SOCini is specified. Then Pgen is integrated during the simulation and added to SOCini. When SOC reaches SOCmax (i.e., fully charged), charging is disabled by adjusting ipmin from a negative value to zero. Similarly, when SOC reaches SOCmin (i.e., depleted of energy), discharging is disabled by adjusting ipmax from a positive value to zero. This requires the user to set SOCini based on the dispatching condition being analyzed. A common source of error has been that the BESS is in the charging mode with SOCini = 1 and the Pgen is forced to zero in the simulation. Given the timeframe of transient stability simulation, change of SOC throughout the simulation is negligible. For this reason, the SOC is removed from the REEC_D module.

[74] WECC *White Paper on Modeling Hybrid Power Plant of Renewable Energy and Battery Energy Storage System:* https://www.wecc.org/_layouts/15/WopiFrame.aspx?sourcedoc=/Administrative/WECC%20White%20Paper%20on%20modeling%20hybrid%20solar-battery.pdf

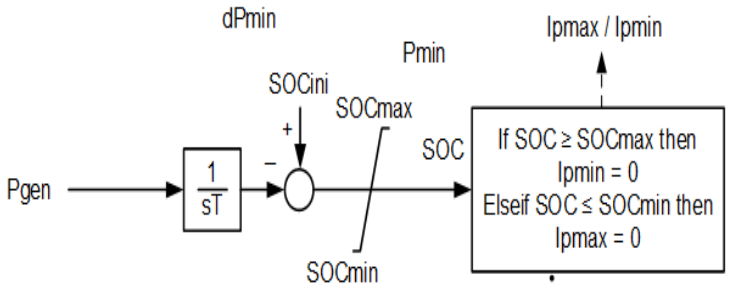


Figure 3.2: Block Diagram of the Charging/Discharging Mechanism of the BESS

Representation of Voltage and Frequency Protection

Frequency and voltage ride-through are needed for transmission-connected solar PV plants. Because they are simplified, the generic models may not be suitable to fully assess compliance with the voltage and frequency ride-through requirement. Voltage ride-through is engineered as part of the plant design and needs far more sophisticated modeling detail than is possible to capture in a positive-sequence simulation environment. It is best to use a standardized (existing) protection model with voltage and frequency thresholds and time delays to show the minimum disturbance tolerance requirement that applies to the plant. In addition, the frequency calculations in a positive-sequence simulation tool are not accurate during or immediately following a fault nearby. It is best to use the frequency protection relay model in a monitor-only mode and always have some time delay (e.g., at least 50 milliseconds) associated with any under- and over-frequency trip settings.[75]

Hybrid Plant Dynamics Modeling

The dynamic modeling approach to hybrid power plants also depends on whether they are ac-coupled or dc-coupled. The modeling practices for the BESS component for ac-coupled hybrid resources generally follow the same principles discussed in the **BESS Dynamic Modeling** section. This section provides additional considerations unique to the hybrid power plants, both ac-coupled and dc-coupled.

As with stand-alone BESS modeling, model invocation is based on the specific simulation tool being used. The plant-level controller model for ac-coupled hybrid resources will require careful consideration. In general, this model needs to be invoked from one of the on-line generators in the plant, and the regulated bus and monitored branch must be specified for the REPC_* model.

AC-Coupled Hybrid Modeling

For an ac-coupled hybrid plant, each resource type is modeled explicitly by a set of equivalent generator(s), equivalent pad-mounted transformer(s) and equivalent collector system(s) in the power flow. Each generator has its set of REGC and REEC models. It is recommended that REPC_B be used as the master plant controller to coordinate electrical controls among all generators and apply plant-level active and reactive power limits. It is also recommended that REEC_D be used for the non-BESS inverter-based generators for the reason discussed later in active power control. Refer to **Table 3.4** for implementations in two different software platforms.

Table 3.4: Models for AC-Coupled Hybrid Plants (in PSLF and PSSE)

Functionality	GE PSLF Module	Siemens PTI Module
BESS Grid Interface	regc_*	REGC*
BESS Electrical Controller	reec_c or reec_d	REECC1 or REECD1

[75] https://www.wecc.org/Reliability/WECC_White_Paper_Frequency_062618_Clean_Final.pdf

Table 3.4: Models for AC-Coupled Hybrid Plants (in PSLF and PSSE)		
Functionality	**GE PSLF Module**	**Siemens PTI Module**
Plant-Level Controller	repc_b[76]	PLNTBU1
Auxiliary Controller		REAX4BU1 or REAX3BU1
Voltage/Frequency Protection	lhvrt/lhfrt	VRGTPA/FRQTPA
Non-BESS Generation Component of Hybrid Facility	Use appropriate modules for the generation type (i.e., applicable models for wind, solar, synchronous generation, etc.)	

Reactive Power Control

Each individual generation type in the hybrid power plant has its qmax and qmin specified in the REEC module. The qmax and qmin values in REPC_B represent the reactive capability limits at the plant level. Depending on specific interconnection requirements, the plant level limit could be contractual instead of physical. The qmax and qmin values should reflect how the plant operates. The qmax and qmin values in REPC_B are provided on the system MVA base instead of the generator MVA base. Similar practices need to be carefully applied when using other software platforms.

The reactive power capability requirement is generally specified at the high side of the substation transformer(s). For a hybrid power plant, an individual generation type may not have the capability to meet the requirement. Instead, different generation types supplement each other to provide required var capability. Depending on the dispatch condition, one type may have little reactive capability available and the other has full capability. The weighting factors of voltage/var control (parameter kwi) need to be tuned for different operating conditions.

Active Power Control

Hybrid power plants may have a contractual plant-level Pmax less than the sum of the individual generator Pmax. Pmax and Pmin in the REPC_B module represent the contractual plant level active power limits. Pmax and Pmin in REPC_B are provided on the system MVA base instead of the generator MVA base. This should be carefully considered in all models.

The frequency response is only modeled in REPC_B for the entire plant and pref is distributed among generators by the weighting factors kzi. Kzi may need to be tuned for different operation conditions. But more often, the hybrid plant relies on BESS for upward frequency response. REEC_D module should be used in conjunction with REPC_B to block or enable frequency response at the generator level. See an example in **Table 3.5**. The generator type that does not have headroom for upward frequency response has its BaseLoad flag set to 1. REEC_D module will set Pmax to initial Pgen during the initialization, thus, blocking the upward frequency response. The BESS has its BaseLoad flag set to 0 and will respond to the active power command from REPC_B.

[76] The repc_b module in PSLF is equivalent to the combined PLNTBU1 and REAX4BU1/REAX3BU1 in PSS®E.

Table 3.5: Active Power-Frequency Control Settings for Hybrid Configurations		
Component	**BaseLoad Flag**	**Module**
Solar PV - Frequency response, down only regulation	1	reec_d
BESS - Frequency response, up and down	0	reec_c or reec_d
Plant controller	N/A*	repc_b with Frqflag=1, dup > 0, ddn > 0

* The BaseLoad flag in the power flow is associated with each individual component. There is no BaseLoad flag for the plant.

DC-Coupled Hybrid Modeling

For a dc-coupled hybrid plant, one equivalent generator represents the inverters for multiple dc-side sources, typically solar PV and battery storage. One set of REGC, REEC, and REPC models is needed for the equivalent generator. The electrical control module suitable for the battery storage (REEC_C or REEC_D) could always be used for these types of inverters. In case the battery does not charge from the grid, the user may choose to use the electrical control module suitable for the other dc-side energy source, e.g., the REEC_A module. Refer to **Table 3.6** for implementations in two different software platforms.

Table 3.6: Models for DC-Coupled Hybrid in PSLF and PSS®E			
Component		**PSLF Module**	**PSS®E Modules**
Grid Interface		regc_*	REGC*
Electrical Controls	May Charge from Grid	reec_c or reec_d	REECC1 or REECD1
	DC-Side Charging Only	reec_a or reec_d	REECA1 or REECD1
Plant Controller		repc_*	REPC*/PLNTBU1
Voltage/Frequency Protection		lhvrt/lhfrt	VRGTPA/FRQTPA

The modeling considerations for a dc-coupled hybrid plant are the same as those discussed in the **BESS Dynamic Modeling** section above.

Electromagnetic Transient Modeling for BESS and Hybrid Plants

Recommendations pertaining to EMT modeling of BESS and hybrid power plants are very similar to those outlined in other NERC reliability guidelines.[77] All TPs and PCs should establish EMT modeling requirements for all newly interconnecting BESS and hybrid plants. GOs should coordinate with equipment manufacturers and any other entities (e.g., consultants developing the models) to ensure the model represents the expected topologies, controls, and settings of the plant seeking interconnections and to ensure that the models are updated after commissioning to represent the as-built settings of the facility. TPs and PCs should collect sufficient data and supplementary information from the GO to ensure that the as-built settings match the model.

It is important that the fundamental-frequency, positive-sequence dynamic models are a reasonable representation of the facility as well, and the EMT models can help serve as a useful verification of those models. Benchmarking becomes increasingly important, as plant-level controls get more complex across multiple manufacturers and

[77] https://www.nerc.com/comm/PC_Reliability_Guidelines_DL/Reliability_Guideline_IBR_Interconnection_Requirements_Improvements.pdf

different technologies. TPs and PCs should ensure that equipment manufacturers and GOs provide documentation to explain how the plant controller works and how the model(s) map to those controls.

Chapter 4: BESS and Hybrid Plant Short Circuit Modeling

BESS and hybrid plants should be modeled in short-circuit programs during the interconnection process and during ongoing planning, design, and protection setting activities. TPs, PCs, TOs, and other entities should develop or enhance modeling practices for BESS and hybrid plants as new capabilities and features for existing tools become available. At a high-level, the recommendations for modeling BESS and hybrid plants are nearly identical to other full-converter, inverter-based generating resources (i.e., Type 4 wind, solar PV, voltage source converter HVDC, and other FACTS devices).[78] The modeling practices described in this chapter should help the industry develop standardized approaches for modeling BESS and hybrid plants (similar to other inverter-based resources) that capture the key performance characteristics and other nuances[79] involved with modeling each specific facility appropriately and representing equipment ratings.

BESS Short Circuit Modeling

The IEEE Power System Relaying and Control Committee Working Group C24 led the development of state-of-the-art inverter-based resource short-circuit modeling practices and recently published *Technical Report #78: Modification of Commercial Fault Calculation Programs for Wind Turbine Generators*.[80] This report advised industry on necessary modifications to commercial short-circuit programs to allow accurate modeling of wind turbine generators and wind power plants. While the report does not specifically discuss modeling solar PV, BESS, or other inverter-based resources, the recommendations for modeling Type 4, full-converter wind resources also apply to solar PV and BESS facilities. Presently, software vendors for commercial short-circuit programs have incorporated the new modeling approach to represent voltage-dependent current sources in their respective programs.[81] TOs, TPs, and PCs should coordinate to ensure that modeling requirements are reflective of these new capabilities and that well-defined specifications are in place to collect all necessary short-circuit modeling information from the GO. GOs can work with their inverter manufacturer to gather the necessary information to meet the modeling requirements.

In general, inverters are voltage-dependent current sources, meaning the amount of active and reactive current injected by the inverter during a fault is dependent on its terminal voltage. Inverter control logic dictates the voltage dependency (i.e., K-factor or closed-loop response) and is typically non-linear. As with wind and solar PV resources, the fault current from a BESS also depends on the pre-fault current. Particularly for BESS, it also depends on whether the BESS is charging or discharging prior to the fault. BESS fault current is relatively independent of BESS SOC since the SOC does not modify any control loops or affect inverter overload current capability.[82]

The IEEE Power System Relaying and Control Committee Working Group C24 report recommends that fault current injection information be provided for inverter-based resources in a tabular form (see **Table 4.1** as an example). These tables should be provided for different fault types as specified by the TO, TP, and PC. Furthermore, inverter controls may take time to reach a steady-state fault current level so the report recommends that fault current data is provided for various time instants after fault initiation (e.g., 1, 3, and 5 cycles). If the resource provides unbalanced fault currents for unbalanced faults, then additional tables will be needed for the negative sequence current contribution. Particularly for BESS, a different set of tables should be provided for BESS in charging and discharging operation. Most TPs and PCs prefer data provided in sequence domain (positive, negative, and zero) rather than in phase domain. Again, TOs, TPs, and PCs should ensure their modeling requirements are clear regarding the type of information (and

[78] See Chapter 3 of NERC *Reliability Guideline: Improvements to Interconnection Requirements for BPS-Connected Inverter-Based Resources*: https://www.nerc.com/comm/PC_Reliability_Guidelines_DL/Reliability_Guideline_IBR_Interconnection_Requirements_Improvements.pdf.

[79] Such as capturing different control algorithms and any additional short-circuit current from BESS due to additional energy on the dc bus

[80] IEEE PES Technical Report TR78: Modification of Commercial Fault Calculation Programs for Wind Turbine Generators: https://resourcecenter.ieee-pes.org/technical-publications/technical-reports/PES_TP_TR78_PSRC_FAULT_062320.html

[81] See "Siemens Technical Bulletin - Inverter-Based Generator Models with Controlled Power and Current – 2019 PSS CAPE User Group Meeting" and "ASPEN Technical Bulletin – Modeling Type-4 Wind Plants and Solar Plants" for more details.

[82] BESS SOC is closely managed and not expected to be operated near the edge of its charge or discharge limit during normal operation.

format) needed, and GOs should coordinate with their inverter manufacturer to provide the necessary modeling information.

Table 4.1 shows an example (and should only be taken as an example) of the steady-state fault current contribution of a BESS to a symmetrical three-phase fault and assumes that the BESS only provides positive sequence current. In this example, if a three-phase fault were to cause the inverter terminal positive sequence voltage to drop to 50%, the inverter will inject 120% of rated current at a power factor angle of -45 degrees. A negative power factor angle (i.e., current lags voltage) means that the reactive current is injected into the network. Assuming that the inverter is not designed to inject unbalanced current during unbalanced faults, the inverter would inject the same current if a Line-to -Line fault on the network results in an inverter terminal positive sequence voltage of 50%. However, if the inverter can inject an unbalanced current, then a similar table representing negative sequence quantities should be provided by the GO. TOs, TPs, and PCs should ensure that their interconnection requirements clearly state how this short-circuit behavior (and short-circuit models) must be provided during the interconnection process.

Table 4.1: Example Positive Sequence Fault Current from BESS

V1* (pu)	I1* (pu)			Angle between V1 and I1 (deg)
	Active	Reactive	Total	
0.9	1.00	0.17	1.01	-9.7
0.8	1.00	0.34	1.06	-18.8
0.7	1.00	0.51	1.12	-27.0
0.6	0.80	0.68	1.20	-34.5
0.5	0.85	0.85	1.20	-45.0
0.4	0.63	1.02	1.20	-58.3
0.3	0.15	1.19	1.20	-82.9
0.2	0.0	1.20	1.20	-90.0
0.1	0.0	1.20	1.20	-90.0

* V1 = positive sequence voltage; I1 = positive sequence current

Hybrid Plant Short Circuit Modeling

As with the steady-state and dynamics modeling recommendations described in Chapter 2 and Chapter 3, respectively, short-circuit modeling recommendations depend on whether the plant is ac-coupled or dc-coupled:

- **DC-Coupled Hybrid Plant:** As noted earlier, the fault current contribution is dictated by the inverter that couples the ac side with multiple resources on the dc side. The fault behavior of an inverter does not change if there are multiple energy sources behind it. For the purpose of short-circuit modeling, inverter modeling practices are the same as noted above (i.e., dc-coupled plants are modeled like other inverter-based resources).
- **AC-Coupled Hybrid Plant:** An ac-coupled hybrid power plant couples each form of generation or storage at a common collection bus on the ac side. The ac-coupled plants should have the generating component and the BESS component modeled separately. The inverters used may be from different manufacturers, from different models, and have different control philosophies that need to each be represented appropriately.

Chapter 5: Studies for BESS and Hybrid Plants

As BESS and hybrid plants become more prevalent, it will become increasingly important to accurately reflect these resources in simulations of BPS reliability, including studies during the interconnection process as well as operational planning and annual planning assessments. When considering study assumptions, the primary difference between BESS (including hybrid plants with BESS) revolves around the assumptions regarding charging and discharging operating points under various system conditions when compared to other resources. This chapter describes considerations to be accounted for in these studies that model the various dispatches and study the reliability impacts of these resources.

Interconnection Studies

Interconnection studies for new or modified BESS and hybrid plants include the same types of studies performed for any other IBR, including steady-state, short circuit, and stability analyses. These studies should be designed to consider all reasonable charging and discharging scenarios the plant may be expected to experience and that may be expected to stress the system and the plant under study. Given that a BESS or the battery component of a hybrid resource are controllable and generally responsive to system conditions, study assumptions should be appropriate for all possible operating scenarios (e.g., when the BESS or battery component of a hybrid plant are charging and discharging). In addition, the most-stressed assumptions should be modeled to assess reliability while keeping in mind that there can be different most-stressed scenarios for different hours of a year and for different local networks. Consideration should be given to the characteristics of the system where the plant is interconnecting, including other resource types in the area.

Interconnection studies should incorporate appropriate steady-state and dynamic ratings of all equipment, any qualified changes to battery management system (BMS) firmware or site controls, and identify the most-limiting elements that establish any system operating limits. Interconnecting entities should apply dynamic limits of equipment as appropriate to support all services available from the BESS or hybrid plant. No administrative limits should be applied. Entities should avoid establishing static limits that will limit BESS and hybrid plants from providing dynamic services for the BPS. Short-circuit studies will also be needed in order to ensure appropriate breaker duty ratings, protective relay settings, and sufficient and appropriate fault currents. EMT studies may also be needed, based on specific system conditions at the POI (e.g., control interactions or control instability in low short-circuit strength areas). All reliability studies should use models that have been validated and rigorously verified by the TP and PC to be appropriate for the type of study being conducted.

Table 5.1 provides a list of example scenarios possibly studied during the interconnection process and considerations for each. This list is not exhaustive nor is it necessary for every interconnection study. TPs and PCs should consider the full extent of possible BESS and hybrid plant modes of operation based on the local interconnection requirements or market rules and perform reliability studies to ensure reliable operation of the BPS under all expected operating conditions. For example, hybrid plants may or may not be allowed to charge from the BPS depending on local requirements. TPs and PCs will need to make these considerations as they develop their study approaches. In general, BESS and hybrid plants will follow directives from the BA and RC based on system reliability needs and market incentives where applicable, and TPs and PCs can use this assumption when determining appropriate charge and discharge assumptions. For example, in a market environment, the battery will typically discharge during periods of high power prices and charge during times of low power prices. Generally, the price of power will be higher during peak demand and lower during low demand or high renewable output conditions.[83] **Table 5.1** was constructed with these assumptions in mind with exceptions noted.

[83] However, these assumptions may change over time as more BESS and hybrid plants connect to the BPS, changing the overall system's operational characteristics.

Table 5.1: Potential BESS and Hybrid Plant Study Dispatch Scenarios			
System Conditions	**Plant Type**	**Plant Dispatch**	**Considerations**
Peak net demand	BESS	Fully discharging	This is a feasible scenario.
		Fully charging	Depending on market mechanisms and system rules, this scenario may not be feasible. However, there may be situations where this is a feasible scenario. For example, in a system that has a lot of wind generation, a BESS may be charging to prepare for a time later in the day when the wind is expected to die down if there is high wind output at peak load. Another feasible scenario would be when a BESS is charging right before peak load, when the system is "near" peak.
	Hybrid	Maximum plant output	This is a feasible scenario. This scenario could be achieved by a combination of maximum renewable generation output and/or maximum battery output to achieve the maximum facility rating as limited by the power plant controller.
		Maximum renewable generation output with battery fully charging	This may be a feasible scenario. Though it is unlikely to stress the system, this scenario could stress the plant and may need to be studied in transient simulations.
		No or low renewable generation output with battery fully discharging	This is a feasible scenario. The BESS component injects power at its maximum capability with some or no contributions from the generating component.
		No or low renewable generation output with battery fully charging from the grid	This is similar to the BESS fully charging scenario as described above. Depending on interconnection requirements and market rules, this scenario may not be feasible. However, there may be situations where this is a feasible scenario depending on localized transmission constraints.
Off-peak (low) net demand	BESS	Fully discharging	This is an unlikely scenario, but it is possible an area could have a high price due to nearby constraints so it needs to be studied.
		Fully charging	This is a feasible scenario.
	Hybrid	Maximum plant output	This is a feasible scenario. This scenario could be achieved by maximum renewable generation output that is sustained for a period long enough that the battery is no longer able to charge.
		Maximum renewable generation output with maximum battery charging	This may be a feasible scenario. Though it is unlikely to stress the system, this scenario could stress the plant and may need to be studied in transient simulations.
		No or low renewable generation output with battery fully discharging	This is unlikely to be feasible, but it may be a feasible scenario for ac-coupled hybrids in some situations depending on localized transmission constraints.

Table 5.1: Potential BESS and Hybrid Plant Study Dispatch Scenarios			
System Conditions	**Plant Type**	**Plant Dispatch**	**Considerations**
		No or low renewable generation output with battery fully charging from the grid	This may be a feasible scenario depending on interconnection requirements, market rules, and plant design. Solar investment tax credit rules may incent hybrids to not charge from the grid during the first five years of operation, but it may be feasible starting in year six.
High system-wide renewable generation output	BESS	Fully discharging	This is an unlikely yet possible scenario.
		Fully charging	This is a feasible scenario.
	Hybrid	Maximum plant output	This is a feasible scenario.
		Maximum renewable generation output with maximum battery charging	This may be a feasible scenario. Though it is unlikely to stress the system, this scenario could stress the plant and may need to be studied in transient simulations.
Changes in dispatch	BESS	Variable	BESS transitions between charging and discharging should be tested in both steady-state and dynamic simulations. TPs and PCs should test that the model matches required ramping requirements (as applicable) and ensure that changes in power dispatch do not adversely affect BPS reliability (e.g., power quality, flicker, voltage deviations, successive operation[84] of voltage control devices).

BESS can operate in different operating modes that may change over time. Examples include active power-frequency control, peak shaving, and energy arbitrage. TPs should consider the impact of each operating mode on BPS performance.

Hybrid Additions: Needed Studies

When a BESS component is added to an existing generating facility or BMS firmware of an existing BESS is changed or updated, additional interconnection studies may be required per the latest version of the NERC FAC-002 Reliability Standard, as this would constitute a qualified change of the existing facility. Studies of qualified changes are crucial for ensuring that changes to facility ratings, performance, or behavior do not adversely affect BPS reliability. The types of studies and the level of detail of those studies should be determined by the TP and PC as part of the study process. This is particularly dependent on how the addition of the BESS affects the existing facility; see example scenarios as follows:

- If the BESS connects through the same existing ac/dc inverter as the generating component (i.e., dc-coupled), and no modifications to the ac/dc inverter occur
- If the BESS connects through the same existing ac/dc inverter as the generating component (i.e., dc-coupled), and modifications to the ac/dc inverter occur or a new ac/dc inverter is used
- If the BESS connects through its own ac/dc inverter (i.e., ac-coupled)

[84] Some voltage control devices, such as transformer load tap changers or fixed capacitors, are limited in the number of operations that are allowed in a given timeframe.

A key aspect to consider, particularly with the second and third scenarios in this list, is whether the modifications to the facility and its new operational characteristics allow the BESS to charge from the BPS or only from the generating component (a key factor for existing unidirectional inverter technology). The operational capabilities and requirements in place should drive the specific types of studies the TP and PC will perform. Again, any modifications to the facility that result in changes to its electrical behavior, operational characteristics, or performance should be studied through the qualified change process in the latest version of the FAC-002 standard. Table 5.2 provides some guidance on the studies that should be performed for these situations.

Table 5.2: Interconnection Study Needs for Battery Storage Addition at Existing Plant

Process/ Study	AC-Coupled or DC-Coupled with New/Modified Inverter	DC-Coupled with Existing Inverter and Grid Charging	DC-Coupled without Grid Charging (no inverter changes)
Registration with and Notification to the TP/PC	Needed	Needed	Needed
Steady-State Power Flow Study	Needed if the maximum plant active power injection or withdrawal capability changes or if the operational characteristics change; not needed otherwise	Needed to study charging mode	May be needed to study different operating conditions
Short-Circuit Study	Needed	Not needed	Not needed
Stability Study[85]	Needed	Needed to study charging mode	May be needed to study different operating conditions

In all cases in Table 5.2 regarding the modification of an existing facility to convert it to a hybrid facility, the GO should coordinate with their TP and PC to ensure that any necessary modeling, study, and performance requirements are met with the changes being made. TPs and PCs should ensure that their interconnection process and requirements clearly describe how studies are performed using accurate models of the expected facility modifications.

Transmission Planning Assessment Studies

Traditionally, system-assessment steady-state and stability studies tend to focus on peak-load and off-peak study conditions. However, with the growth of variable energy resources combined with an increase in BESS and hybrid resources, operational planning and long-term planning studies need to evolve to analyze more scenarios as there may be critical and stressed conditions outside of those traditionally studied. TPs and PCs should develop a set of study conditions that reasonably stress the system for their region. TPs and PCs may begin relying on the operational flexibilities of BESS and hybrid plants in the future and will need to consider the operational limitations and energy ratings of the BESS and hybrid plants. Planners will need to consider the impact of BESS SOC and the duration of charge available to ensure that the operational solution can remain in place until other automatic or operator actions take place. This is particularly important when performing steady-state contingency analysis, where TPs and PCs will

[85] This includes review of system and plant stability as well as other types of performance tests such as voltage, frequency, and phase jump ride-through performance.

need to closely consider the duration of the outage and the energy available from BESS and hybrid plants to support the BPS post-contingency.[86] Refer back to **Table 5.1** as a reference for study scenarios to begin these conversations.

A good approach to determine when the BESS or hybrid plant is expected to charge versus discharge is to employ production cost simulation techniques. The results from production cost simulations can provide useful information regarding the operational characteristics of the BESS or hybrid plant. The most stressed system conditions can then be determined by using engineering judgement for future-year cases. Similar tools could also be used for the power flow and dynamics analyses to avoid guessing at the most stressed conditions. One challenge with using production cost approaches is determining the exact location and operational characteristics of future BESS and hybrid plants in future year cases where system operational characteristics may be different than past experience. This poses a challenge for grid planners in developing corrective action plans and planning a future system that has sufficient operational flexibility.

Even when charging from the grid, a BESS or a hybrid plant is not considered to be load. Curtailment of charging should not be considered non-consequential load loss if such curtailment is needed to meet performance requirements of Table 1 of TPL-001-4/TPL-001-5.

Blackstart Study Considerations

In the near-term, it is not likely that BESS will be sized with sufficient energy to meet blackstart requirements (in terms of sustained power output); however, it is likely that BESS and hybrid plants may be able to help support system restoration. This will require that the BESS or hybrid plant can operate in "island mode" or stand-alone operation and be able to transition to BPS-connected automatically. It also requires that the resource operate in "grid forming" mode where it can develop its own local voltage (without any or minimal support from synchronous machines), energize BPS elements, and connect to other local loads and generators. TPs and PCs performing blackstart studies should ensure proper transitions to and from operation in islanding mode. Considerations for these studies include the following:

- **Transitioning to and from Islanding Mode:** The objective is to ensure stable transition of BESS operation between grid-connected mode and islanding mode. An example of such a study is to consider the loss of the last synchronous machine in the network that results in the BESS or hybrid plant (possibly along with other IBRs) being the only sources of energy to serve load. Following the transition, and for any subsequent events within the island (for example, a fault or load change), the BESS or hybrid plant (and other IBR) controls should be able to bring voltage and frequency back close to their nominal values while meeting existing reliability and system security metrics. The same stable transition should be delivered when returning to a grid-connected mode.
- **Operating in Islanding Mode:** The objective is to ensure that the BESS or hybrid plant can properly control local voltage and frequency when connected to local load with no, or minimal, other synchronous machines or other generators. Simulation tests to be performed may include load step up/down, ringdown, voltage ride-through, and frequency ride-through tests.
- **Blackstart:** If the BESS or hybrid plant meets the TO, TP, and PC requirements for blackstart, then the objective is to ensure the blackstart capability can be met whether the BESS or hybrid plant is the sole resource or is deployed as part of the blackstart cranking path. A typical example of a blackstart study can be conducted as follows: energize main power transformer from project side, connect the project to the local BPS network and serve localized load, and then apply a bus fault at the POI to demonstrate that the resource can stably and reliably serve that local load during the system restoration process.

[86] This may become more complex as increasing numbers of BESS and hybrid plants connect to the BPS and are modeled in power flow studies.

CAISO BESS and Hybrid Study Approach Example

This section provides a brief description of the CAISO approach for studying BESS and hybrid plants.

CAISO Generation Interconnection Study

Most of the active CAISO interconnection requests are hybrid plants. All hybrid plant requests are studied at the hybrid plant full output level with the BESS at discharging mode. If the interconnection customer elects to charge from the grid, the hybrid request is studied in the charging assessment as well. The maximum charging power is specified in the interconnection request. The two studies that are performed include the following:

- **Discharging Assessment:** This assessment includes gross peak and off-peak daytime scenarios with dispatch shown in Table 5.3. For hybrid power plant requests, the total hybrid plant active power is enforced.
- **Charging Assessment:** This assessment includes gross peak or shoulder peak and off-peak nighttime scenarios. In shoulder peak and off-peak nighttime scenarios, solar power output is zero. For most of the hybrid requests, this means on-site generation is not available to charge the energy storage and create the most stressed condition for the transmission grid.

Table 5.3 shows the different assumptions that are used for the studies conducted. The purpose of the reliability assessment is to define the boundaries of operation. Mitigation of a potential problem is usually through generation re-dispatch (congestion management) or RAS actions. Careful consideration should be made during the interconnection process regarding facilities with planned RASs. As the number of RASs increase on the BPS, the need for a comprehensive system review should be considered.

Table 5.3: CAISO Reliability Assessment Dispatch Assumptions

Condition	Peak	Peak Charging	Shoulder Peak Charging	Off-Peak Daytime	Off-Peak Nighttime Charging
Load Level[87]	1-in-10 years	1-in-10 years	75% of peak	50% ~ 65% of peak	40% of peak
Solar Generation	Pmax	Pmax	0	85% of Pmax	0
Wind Generation	Pmax	50–65% of Pmax	50% of Pmax	Pmax	Pmax
Energy Storage Dispatch	Max discharging[88]	Max charging[89]	Max charging	Max discharging	Max charging
Other Renewable	Pmax	Pmax	Pmax	Pmax	Pmax
Thermal Generation	Pmax	As needed to balance load	As needed to balance load	As needed to balance load	As needed to balance load
Hydro Generation	Based on historical data	Based on historical data	Based on historical data	Based on historical data	Based on historical data
Import Levels	Historical max flows adjusted to accommodate output from renewable generation as needed				

[87] Forecasted demand levels for peak conditions are in likelihoods (1-in-10 is a 1 in 10-year likelihood) and are based on historical data for off-peak conditions that are then scaled to selected study years.
[88] Maximum steady-state positive output associated with the maximum net output in the Interconnection Request
[89] Maximum steady-state negative output for re-charging of the energy storage facility

BESS follow market dispatch instructions and will be discharged or charged according to system needs. A possible solution to mitigate reliability issues is to dispatch the BESS in a different mode (charging or discharging). However, there are challenges associated with reliance on this capability without knowing detailed information about the SOC of the BESS. Furthermore, experience has shown that the frequency of deep cycling the BESS shortens its lifetime, so BESS should be sized based on expected frequency profile at the POI.

CAISO also performs deliverability assessments[90] as part of the interconnection study process. This includes a deliverability assessment at peak demand for resource adequacy purposes as well as a delivery assessment at off-peak demand to evaluate potential curtailment of intermittent resources (i.e., wind and solar). **Table 5.4** shows the assumptions used in these deliverability assessments.

Table 5.4: Study Assumptions for BESS and Hybrid Resources in Deliverability Assessment

Delivery Assessment	Standalone BESS	AC-Coupled Hybrid	DC-Coupled Hybrid
Peak	4-hr discharging capacity	4-hr discharging capacity with total plant output <= plant pmax	
Off-Peak	Pgen=0 from BESS. Existing BESS or hybrid may be put into charging mode in order to mitigate overload.		

CAISO Transmission Planning Study

Many different power flow and stability studies are conducted when considering the overall annual transmission planning study program. The dispatch of BESS and hybrid plants are set based on the time stamp and assumptions used for each scenario being studied. Production cost simulations are used to determine the appropriate dispatch scenarios for future year cases.

[90] http://www.caiso.com/Documents/IssuePaper-GenerationDeliverabilityAssessment.pdf

Appendix A: Relevant FERC Orders to BESS and Hybrids

The Federal Energy Regulatory Commission (FERC) recently issued orders pertaining to electric storage resources that are relevant to the guidance contained in this reliability guideline. FERC defined an electric storage resource as follows:

- **Electric Storage Resource (FERC Definition):**[91] a resource capable of receiving electric energy from the grid and storing it for later injection of electric energy back to the grid."

FERC's determinations in Order No. 841, Order No. 842, and Order No. 845 are leading to new wholesale market participation models, updates to interconnection studies processes, and new operating practices.

FERC Order No. 841

In Order No. 841[92] (February 15, 2018), FERC required RTOs and ISOs under its jurisdiction to establish participation models that recognize the physical and operational characteristics of electric storage resources. Each participation model, per the order, must "ensure that a resource using the participation model for electric storage resources is eligible to provide all capacity, energy, and ancillary services that it is technically capable of providing in the RTO/ISO markets" and "account for the physical and operational characteristics of electric storage resources through bidding parameters or other means." These ancillary services may include blackstart service, primary frequency response service, reactive power service, frequency regulation, or any other services defined by the RTO/ISO.

The Commission gave flexibility to both transmission providers in determining telemetry requirements as well as to electric storage resources in managing SOC. To the extent that electric storage resources are providing ancillary services, such as frequency regulation, an electric storage resource managing its SOC is required to follow dispatch signals. For ease of reference, the Commission provided a chart of "physical and operational characteristics of electric storage resources for which each RTO's and ISO's participation model for electric storage resources must account," as shown in **Table A.1**. How these characteristics are accounted for in participation models may vary between RTOs and ISOs. Note that these definitions are not endorsed by the NERC Inverter-Based Resource Performance Subcommittee (IRPS); rather, they are provided here only as a reference.

Table A.1: FERC Participation Model Parameters

Physical or Operational Characteristic	Definition
State of Charge	The amount of energy stored in proportion to the limit on the amount of energy that can be stored, typically expressed as a percentage. It represents the forecasted starting SOC for the market interval being offered into.
Maximum State of Charge (SOC_{max})	A SOC value that should not be exceeded (i.e., gone above) when a resource using the participation model for electric storage resources is receiving electric energy from the grid (e.g., 95% SOC).[93]
Minimum State of Charge	A SOC value that should not be exceeded (i.e., gone below) when a resource using the participation model for electric storage resources is injecting electric energy to the grid (e.g., 5% SOC).

[91] FERC Order No. 841, paragraph 29
[92] https://ferc.gov/sites/default/files/2020-06/Order-841.pdf
[93] The IRPS notes that the base for defining the percentage SOC is not defined and therefore up to interpretation by the ISO/RTO.

Table A.1: FERC Participation Model Parameters	
Physical or Operational Characteristic	**Definition**
Maximum Charge Limit	The maximum MW quantity of electric energy [power][94] that a resource using the participation model for electric storage resources can receive from the grid.
Maximum Discharge Limit	The maximum MW quantity that a resource using the participation model for electric storage resources can inject to the grid.
Minimum Charge Time	The shortest duration that a resource using the participation model for electric storage resources is able to be dispatched by the RTO/ISO to receive electric energy from the grid (e.g., one hour).
Maximum Charge Time	The maximum duration that a resource using the participation model for electric storage resources is able to be dispatched by the RTO/ISO to receive electric energy from the grid (e.g., four hours).
Minimum Run* Time	The minimum amount of time that a resource using the participation model for electric storage resources is able to inject electric energy to the grid (e.g., one hour).
Maximum Run Time	The maximum amount of time that a resource using the participation model for electric storage resources is able to inject electric energy to the grid (e.g., four hours).
Minimum Discharge Limit	The minimum MW output level that a resource using the participation model for electric storage resources can inject onto the grid.
Minimum Charge Limit	The minimum MW level that a resource using the participation model for electric storage resources can receive from the grid.
Discharge Ramp Rate	The speed at which a resource using the participation model for electric storage resources can move from zero output to its Maximum Discharge Limit.
Charge Ramp Rate	The speed at which a resource using the participation model for electric storage resources can move from zero output to its Maximum Charge Limit.

* Note that the definitions here interchange "run" and "discharge." The preferred term is "discharge."

FERC Order No. 842

In Order No. 842[95] (February 15, 2018), the Commission determined that electric storage resources under its jurisdiction are only required to provide primary frequency response (PFR) when they are "online and are dispatched to inject electricity to the grid and/or dispatched to receive electricity from the grid." This excludes situations when an electric storage resource is not dispatched to inject or receive electricity.[96] The Commission required electric storage resources and transmission providers to specify an "operating range for the basis of the provision of primary frequency response." The operating range, the Commission explained, represents the minimum and maximum states of charge between which an electric storage resource must provide PFR. The operating range for each electric storage resource must ensure the following:

[94] There is a disagreement between units in the FERC definitions. The term "power" is added to note that IRPS believes this refers to a power term (i.e, MW) and it not intended to be a rate (i.e., MW/sec).

[95] https://cms.ferc.gov/sites/default/files/whats-new/comm-meet/2018/021518/E-2.pdf

[96] As in, electric storage resources are not obligated to provide any frequency response to the BPS if dispatched at 0 MW output. However, the requirements in Order No. 842 are minimum requirements and an electric storage resource may provide this service if the market rules or interconnection requirements are set up to enable this capability. Providing primary frequency response when dispatched at 0 MW could help BPS frequency stability moving forward.

- Be agreed to by the interconnection customer and the transmission provider, in consultation with the Balancing Authority
- Consider the system needs for primary frequency response
- Consider the physical limitations of the electric storage resource as identified by the developer and any relevant manufacturer specifications
- Be established in Appendix C of the Large Generator Interconnection Agreement (LGIA) or Attachment 5 of the Small Generator Interconnection Agreement (SGIA)

The Commission noted that this suite of requirements "effectively allows electric storage resources to identify a minimum and maximum set point below and above which they will not be obligated to provide primary frequency response comparable to synchronous generation." In summary, the Commission provided electric storage resource interconnection customers with the ability to propose an operating range and the transmission provider or BA the ability to consider system needs for primary frequency response before determining final operating ranges.

Given that "system conditions and contingency planning can change" and that "capabilities of electric storage resources to provide primary frequency response may change due to degradation, repowering, or changes in service obligations," the Commission determined that the ultimate operating ranges may be dynamic values. If a dynamic range is implemented, then transmission providers must also determine how frequently the operating range will be reevaluated and the factors that may be considered during its reevaluation. The Commission provided electric storage resources specific exemptions from PFR provision for a "physical energy limitation":

> "the circumstance when a resource would not have the physical ability, due to insufficient remaining charge for an electric storage resource or insufficient remaining fuel for a generating facility to satisfy its timely and sustained primary frequency response service obligation, as dictated by the magnitude of the frequency deviation and the droop parameter of the governor or equivalent controls."

The Commission also clarified that MW droop response is derived from nameplate capacity. If dispatched to charge during an abnormal frequency deviation, the Commission required electric storage resources to meet PFR requirements by increasing (for overfrequency) or decreasing (for underfrequency) the "rate at which they are charging according to the droop parameter." To illustrate, the Commission gave an example of an electric storage resource charging at two MW with a calculated response per the droop parameter to increase real-power output by one MW. According to the Commission, during an underfrequency deviation the electric storage resource could "satisfy its obligation by reducing its consumption by one MW (instead of completely reducing its consumption by the full two MW and then discharging at one MW, which would result in a net of three MW provided as primary frequency response)." Electric storage resources are not required to change from charging to discharging, or vice versa, if technically incapable of doing so during the event when PFR is needed.

The Commission also noted that requirements adopted in Order No. 842 are minimum requirements. An electric storage resource may elect, in coordination with its transmission provider and BA, "to operate in a more responsive mode by using lower droop or tighter deadband settings."

As with all frequency-responsive resources connected to the BPS, speed of response has a significant impact on frequency performance during large disturbances, particularly in low inertia systems with high ROCOF. FERC Order No. 842 does not prescribe any speed of response characteristics for electric storage resources. See **Chapter 1** for more details on how the performance of BESS and hybrid plants can be configured to support BPS frequency response needs.

FERC Order No. 845

In Order No. 845[97] (April 19, 2018), the Commission clarified that "in certain situations, electric storage resources can function as a generating facility, a transmission asset, or both." The Commission made clear that electric storage resources under its jurisdiction that are greater than 20 MW had the option to interconnect pursuant to the Large Generator Interconnection Procedures (LGIP) and LGIA "so long as they meet the threshold requirements as stated in those documents." In the event the LGIA does not accommodate for the load characteristics of electric storage resources, transmission providers may enter into non-conforming LGIAs.

Furthermore, in Order No. 845, the Commission declined to move forward with "any requirements for modeling electric storage resources":

> "…given the limited experience interconnecting electric storage resources and the abundant desire for regional flexibility, we are not imposing any standard requirements at this time and instead continue to allow transmission providers to model electric storage resources in ways that are most appropriate in their respective regions."

Instead, the Commission encouraged transmission providers to continue to consider modeling approaches that will "save costs and improve the efficiency of the interconnection process."

FERC Order No. 845-A

In Order No. 845-A[98] (February 21, 2019), the Commission reiterated that Order No. 845 allows electric storage resources to interconnect pursuant to the LGIP and LGIA but declined to impose requirements on how transmission providers study the load characteristics of electric storage resources. Instead, the Commission clarified that transmission providers "have the flexibility to address the load characteristics of electric storage resources" within studies, including studies of electric storage resource load characteristics and studies of the upgrades required to accommodate electric storage resource load characteristics. Furthermore, the Commission stated that transmission providers may enter into non-conforming LGIAs "when necessary" in order to accommodate a particular electric storage resource.

[97] https://www.ferc.gov/sites/default/files/2020-04/E-2_47.pdf
[98] https://ferc.gov/sites/default/files/2020-06/Order-845-A.pdf

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Guideline Information and Revision History

Guideline Information	
Category/Topic: BESS Modeling	**Reliability Guideline/Security Guideline/Hybrid:** Reliability Guideline
Identification Number: RG – MOD- 0623	**Subgroup:** Inverter-Based Resource Performance Subcommittee

Revision History		
Version	**Comments**	**Approval Date**
2		

Metrics

Pursuant to the Commission's Order on January 19, 2021, *North American Electric Reliability Corporation*, 174 FERC ¶ 61,030 (2021), reliability guidelines shall now include metrics to support evaluation during triennial review consistent with the RSTC Charter.

Baseline Metrics

All NERC reliability guidelines include the following baseline metrics:

- BPS performance prior to and after a reliability guideline as reflected in NERC's State of Reliability Report and Long Term Reliability Assessments (e.g., Long Term Reliability Assessment and seasonal assessments)
- Use and effectiveness of a reliability guideline as reported by industry via survey
- Industry assessment of the extent to which a reliability guideline is addressing risk as reported via survey

Specific Metrics

The RSTC or any of its subcommittees can modify and propose metrics specific to the guideline in order to measure and evaluate its effectiveness, listed as follows:

- Review of the number of category 1i events[99] involving utility-scale battery energy storage systems and hybrid inverter-based resources under the NERC Event Analysis program

Effectiveness Survey

On January 19, 2021, FERC accepted the NERC-proposed approach for evaluating Reliability Guidelines. This evaluation process takes place under the leadership of the RSTC and includes:

- industry survey on effectiveness of Reliability Guidelines;
- triennial review with a recommendation to NERC on the effectiveness of a Reliability Guideline and/or whether risks warrant additional measures; and
- NERC's determination whether additional action might be appropriate to address potential risks to reliability in light of the RSTC's recommendation and all other data within NERC's possession pertaining to the relevant issue.

NERC is asking entities who are users of Reliability and Security Guidelines to respond to the short survey provided in the link below.

Guideline Effectiveness Survey

[99] https://www.nerc.com/pa/rrm/ea/ERO_EAP_Documents%20DL/ERO_EAP_v4.0_final.pdf#search=EAP

COMMENT 7

Outlook

RE: Concerns about determination of "Non-Significance" for lithium Battery Energy Storage Systems (BESS)

From Alexandria Teague <ateague@auburnwa.gov>
Date Thu 1/29/2026 2:30 PM
To jamesdelay@hotmail.com <jamesdelay@hotmail.com>
Cc Gabriel Clark <GClark@auburnwa.gov>

Good afternoon James,

Thank you for your comment regarding the City's proposed Battery Energy Storage System (BESS) code update.

Your comments have been received, and you have been added as a party of record to receive future project updates. Staff will discuss the proposed supplemental standards at the February 3rd, 2026 Planning Commission meeting (City Hall, Council Chambers at 7 p.m.). For future updates on Planning Commission and City Council meetings please visit: Events • Agendas and Minutes - City of Auburn, WA • CivicClerk.

The clarify the purpose of the SEPA Determination of Non-Significance (DNS) - this DNS (issued under City File No. SEP24-0021) applies to the development standards regulating BESS within the City of Auburn. This SEPA is for a "non-project action" (e.g. code update) and does not authorize the construction, operation, or siting of any specific BESS facility. It instead evaluates the proposed standards intended to regulate BESS within the City. Any individual project that exceeds the thresholds identified in WAC 197-11-800 will require an environmental review (i.e. SEPA) and a project specific threshold determination in addition to other appropriate building, civil, and land use approvals.

Sincerely,

Alexandria

Planning or Land Use Questions?
Book an online meeting with staff.
Check out our FAQ!

If inquiring about a specific site, please include the parcel number or address, or if inquiring about a specific project, please include the City project number in your email.

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Permit Center Address: 1 E Main Street, Auburn, WA 98002 (Click Here for Map)
Customer Service Survey | https://www.surveymonkey.com/r/XNSL95J
Application Forms | http://www.auburnwa.gov/services/resource_library/forms.htm
Zoning Maps | http://www.auburnwa.gov/services/resource_library/maps.htm

This email and your response are considered a public record and can be subject to disclosure under Washington's Public Records Act.

From: James DeLay <jamesdelay@hotmail.com>
Sent: Thursday, January 29, 2026 8:49 AM
To: Planning <planning@auburnwa.gov>
Subject: Fw: Concerns about determination of "Non-Significance" for lithium Battery Energy Storage Systems (BESS)

CAUTION: **The following message originated from outside the City of Auburn. Be careful opening links and attachments**

Please see email below (accidently type .gpv instead of .gov

From: James DeLay <jamesdelay@hotmail.com>
Sent: Wednesday, January 28, 2026 5:11 PM
To: planning@auburnwa.gpv <planning@auburnwa.gpv>
Cc: crakes@auburnwa.gov <crakes@auburnwa.gov>; ttaylor@auburnwa.gov <ttaylor@auburnwa.gov>; blott@auburnwa.gov <blott@auburnwa.gov>; ctaylor@auburnwa.gov <ctaylor@auburnwa.gov>; LStirgus@auburnwa.gov <lstirgus@auburnwa.gov>; hamer@auburnwa.gov <hamer@auburnwa.gov>; info@vrfa.org <info@vrfa.org>
Subject: Concerns about determination of "Non-Significance" for lithium Battery Energy Storage Systems (BESS)

Good afternoon Auburn leaders,

I saw the public notice about planning giving BESS a green light to approval and providing all BESS a determination of Non-Significance- where after the Jan 2025 Moss Landing BESS fire where we were shocked to learn that there is significant and toxic ash/fallout and that people 20+ miles away suffered exposure to the toxic smoke/gasses and experienced and are still suffering from exposure.

Two Lithium BESS that had fires are now under the EPA's control/management for cleanup (Otay Mesa, CA and Moss Landing, CA) which is expected to take years.

I'll send more emails about additional issues as it is terrifying that Auburn says "This decision was made after review of a completed environmental checklist and other information on file with the lead agency. "

In coming to that determination, I would assume that no due diligence was done and that Auburn took PSE's word, BESS Developer's word, Union's who will get work's word, and ignored all the evidence about the dangers of lithium BESS that is not Industry PR...

Simply put, there is no 100% effective fire/thermal runaway prevention technology nor is there an 100% effective extinguishing technology- current SOP is to let it burn and spray mist to cool down nearby containers and/or attempt to capture the toxins and reduce its spread.

I would like to become a party of record. And I have requested all data regarding BESS- all communications from PSE, Union, BESS developers as well as all communication between Auburn employees and anyone and everyone in any and all forms of communication regarding BESS...

This Ordinance/rules need to be safety first- so here's more info about why we need significant setbacks/evacuation distances:

Industry influenced NFPA-855 says only a 10ft setback is required from schools and homes:

> **NFPA 855 Standard Setbacks**
>
> - **Near Exposures (Residential/Schools):** For outdoor BESS installations near buildings or lot lines that can be built upon (such as homes and schools), a minimum separation of **10 feet (3 meters)** is required from various exposures.
> - **Remote Locations:** To be classified as a "remote" installation—which allows for less stringent requirements—the BESS must be located more than **100 feet (30.5 meters)** from buildings, lot lines, and public ways.
> - **Means of Egress:** Systems must maintain at least **10 feet** of separation from any path used for building occupants to exit, ensuring safe egress during a fire.

Contrasting that significantly, is the 1/3rd mile recommended by the Emergency Response Guide:

GUIDE 147 LITHIUM ION AND SODIUM ION BATTERIES

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- Lithium ion and sodium ion batteries contain flammable liquid electrolyte that may vent, ignite and produce sparks when subjected to high temperatures (> 150°C (302°F)), when damaged or abused (e.g., mechanical damage or electrical overcharging).
- May burn rapidly with flare-burning effect.
- May ignite other batteries in close proximity.

HEALTH

- Contact with battery electrolyte may be irritating to skin, eyes and mucous membranes.
- Fire will produce irritating, corrosive and/or toxic gases.
- Burning batteries may produce toxic hydrogen fluoride gas (see GUIDE 125).
- Fumes may cause dizziness or asphyxiation.

PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering, but only if properly trained and equipped.

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

EVACUATION

Immediate precautionary measure

- Isolate spill or leak area for at least 25 meters (75 feet) in all directions.

Spill

- Increase the immediate precautionary measure distance, in the downwind direction, as necessary.

Fire

- If rail car or trailer is involved in a fire, ISOLATE for 500 meters (1/3 mile) in all directions; also initiate evacuation including emergency responders for 500 meters (1/3 mile) in all directions.

https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/2024-04/ERG2024-Eng-Web-a.pdf?fbclid=IwY2xjawPffZNleHRuA2FlbQIxMABicmlkETFTVVg4Y1UwWklBeUR0MWtHc3J0YwZhcHBfaWQQMjIy

MDM5MTc4ODIwMDg5MgABHj8lwDu30wMHnGeYL9VfP6IxDzOeWTAJKN6Cp9qpK4-5GKHIk4qiWTao10zY_aem_eSxkgWRuCVeJcnBWiFWHtQ

They also suggest 800 meter or ½ mile evacuation for toxic and/or corrosives in a fire:

GUIDE 154 — Substances - Toxic and/or Corrosive (Non-Combustible)

POTENTIAL HAZARDS

HEALTH

- **TOXIC and/or CORROSIVE**; inhalation, ingestion or skin contact with material may cause severe injury or death.
- Contact with molten substance may cause severe burns to skin and eyes.
- Avoid any skin contact.
- Fire may produce irritating, corrosive and/or toxic gases.
- Runoff from fire control or dilution water may be corrosive and/or toxic and cause environmental contamination.

FIRE OR EXPLOSION

- Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.
- Some are oxidizers and may ignite combustibles (wood, paper, oil, clothing, etc.).
- Corrosives in contact with metals may evolve flammable hydrogen gas.
- Containers may explode when heated.
- For electric vehicles or equipment, GUIDE 147 (lithium ion or sodium ion batteries) or GUIDE 138 (sodium batteries) should also be consulted.

PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shipping paper.** If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering, but only if properly trained and equipped.

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer **when there is NO RISK OF FIRE.**
- Structural firefighters' protective clothing provides thermal protection **but only limited chemical protection.**

EVACUATION

Immediate precautionary measure

- Isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.

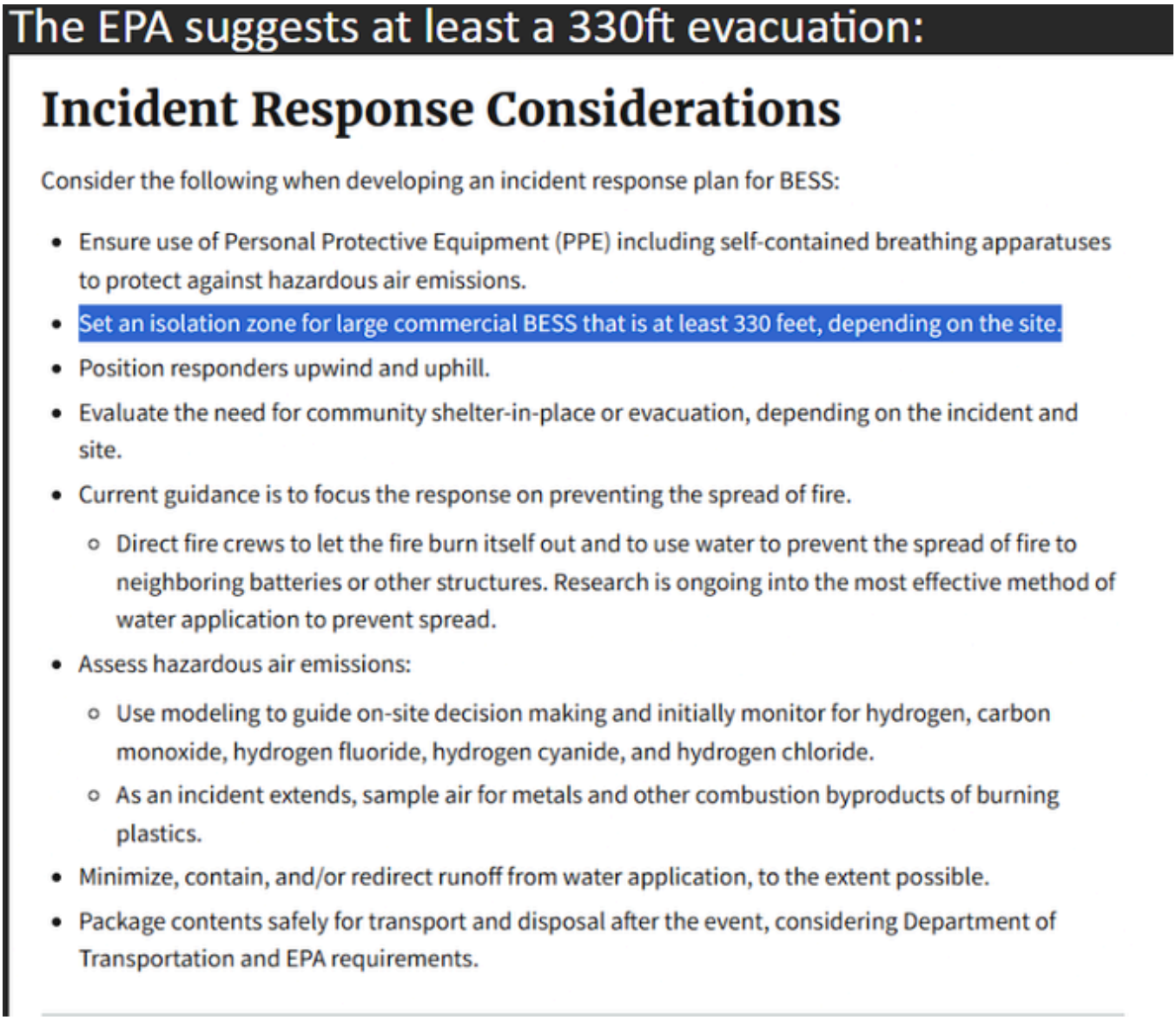
Spill

- For highlighted materials: see Table 1 - Initial Isolation and Protective Action Distances.
- For non-highlighted materials: increase the immediate precautionary measure distance, in the downwind direction, as necessary.

Fire

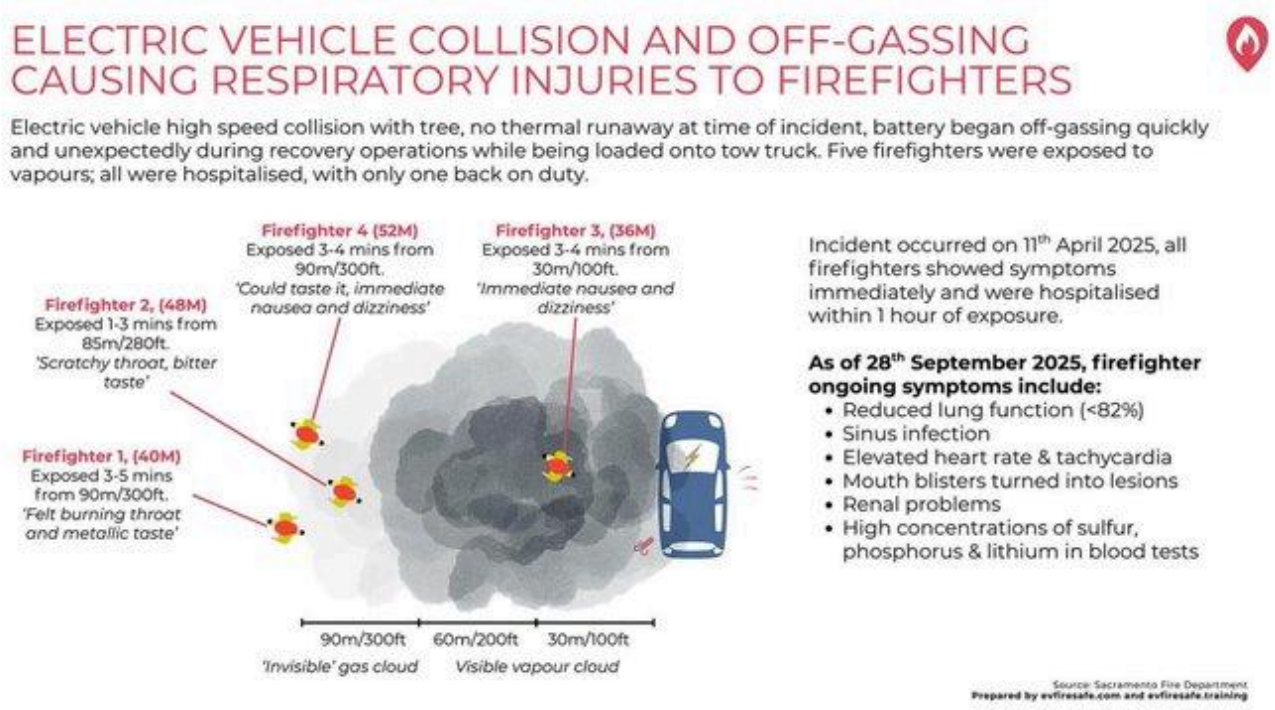
- If tank, rail tank car or highway tank is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

The EPA suggests at least a 330ft evacuation:



https://www.epa.gov/electronics-batteries-management/battery-energy-storage-systems-main-considerations-safe?fbclid=IwY2xjawPffehleHRuA2FlbQIxMABicmlkETFMTThlZldyb1NUelloT0Z0c3J0YwZhcHBfaWQQMjIyMDM5MTc4ODIwMDg5MgABHgigOXGqsrebgi-lJaRxe3UhB_KJPBhaek9pI-_W8bbWDaGPeyWeLmfwNsC5_aem_2EOwLRfv-poeW5AdgdsxiA

Which is wholly inadequate in light of the new evidence from 4 of 5 Sacramento Firefighters who have been disabled when they were exposed a single EV battery fire's off-gassing after the EV fire had been extinguished and they were in "cleanup mode" and they removed their HAZMAT gear. Three of the firefighters were about 300ft away from the EV when it started off-gassing invisible toxins AND they were exposed to the toxins for less than 5 minutes and then were taken to the ER quickly.



The volume of toxins released from a 60KW-90KW Tesla EV that had already burned itself out and had been labeled "extinguished" and the area declared "safe" before the off-gassing started is miniscule to the volumes of toxins that will be released from a single average sized 3MW-5MW BESS that enters thermal runaway (please note, 14.5MW BESS containers are now available in 20ft container size by some Chinese manufacturers).

Comparing the largest Tesla EV battery size of 90kw vs the smallest BESS container size of 3MW, it is reasonable to determine the BESS contains 33x the size/volume of batteries and that it would release 33x the toxins...

Here's more info about the Tesla EV incident- Please study the above graphic closely.

Please note the EV car crash occurred on April 11th and all 5 firefighters showed exposure symptoms and were hospitalized within an hour of exposure:

The closest firefighter (#3- who is a 36yr old male) was 100ft away and inside the visible smoke cloud and was exposed to the toxic smoke/gasses for 3-4 minutes before experiencing "immediate nausea and dizziness"

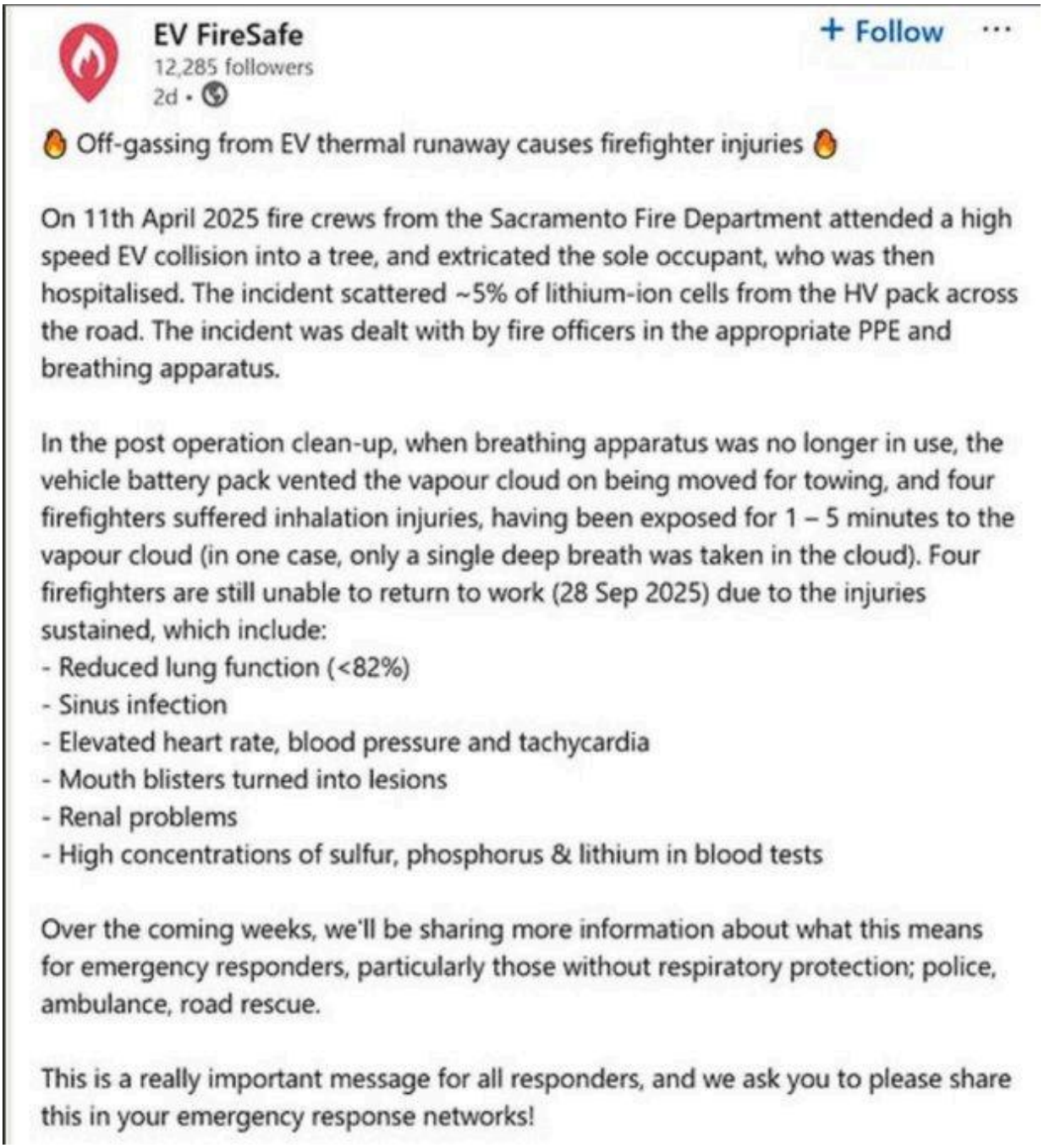
The next closest firefighter (#2- who is a 48yr old male) was 280ft away and outside of the visible smoke cloud, but in the "invisible" gas cloud and was only exposed to the toxic and invisible gasses for 1-3 minutes and experienced "Scratchy throat, bitter taste"

The next two firefighters (#4- who is a 52yr old male and #1- who is a 40yr old male) were both 300ft away and outside of the visible smoke cloud, but in the "invisible" gas cloud and #4 was only exposed to the toxic and invisible gasses for 3-4 minutes (he "could taste it" and experienced "immediate nausea and dizziness") and #1 was only exposed to the toxic invisible gasses for 3-5 minutes ("felt burning in throat and metallic taste")

This occurred on April 11th 2025 and five (5) firefighters exhibited exposure symptoms from the invisible gas cloud and the four (4) "firefighters shown in the graphic above are still unable to return to work due to injuries sustained which include:

- Reduced lung function (<82%) - Sinus infection - Elevated heart rate, blood pressure and tachycardia - Mouth blisters turned into lesions - Renal problems - High concentrations of sulfur, phosphorus & lithium in blood tests"

Here are more details about the fire fighters being exposed to toxic lithium battery fire gasses/smoke:



Here's a news channel video from September (9/30/25) where they mention that the firefighters are still undergoing "experimental" blood transfusions to try to reduce the levels of heavy metals in their blood- and they have no idea if there will be permanent damage to their lungs and bodies...

https://www.kcra.com/article/sacramento-firefighters-injured-toxic-ev-battery-fire/68141225



KCRA 3 | Updated: 5:20 PM PDT Sep 30, 2025 | Editorial Standards ⓘ



Michelle Bandur

Reporter

SACRAMENTO, Calif. — Sacramento firefighters are facing new challenges as they encounter more electric battery fires, including an **e-scooter that spontaneously combusted Tuesday morning** at the Executive Inn and Suites Hotel on Bannon Street.

"When they made entry, they found out there was an e-scooter inside that had spontaneously combusted from the batteries," said Battalion Chief Keith Wade of the Sacramento Fire Department.

Although the fire was small and quickly put out, firefighters called out hazmat teams for cleanup and decontamination.

"We're seeing these types of fires more and more," Wade said. "How do we respond to keep our people safe? Because the batteries are very toxic."

"We've never had anyone off related to any type of lithium-ion battery fire. This is the first," said Justin Sylvia, with the Sacramento Fire Department.

Four firefighters are being treated for exposure to a Tesla battery fire last April.

"A very low-lying white cloud, as it was described by those members, came across them. They immediately had a metallic taste in their mouth," said Sylvia. "One of the chemicals in those batteries, once it hits water, it turns to an acid."

Sylvia further explained the dangers of electric vehicle fires.

"Once you split that series (of batteries), that's when it becomes dangerous, because it can short-circuit and get into that thermal runaway and become very unpredictable on its own," he said.

The unpredictability adds to the danger, he said, as the four firefighters did not have on their breathing apparatus since the fire was out and they were in clean-up mode.



Sylvia emphasized the need for crews to always wear their protective gear.

"These EVs are something that is new to us," he said. "We really need to look at what the best practice on fighting these fires and not becoming a victim ourselves."

The four affected firefighters are undergoing experimental IV-infused therapy to remove heavy metals from their bloodstream and lungs, but it is unclear if there will be permanent damage.

Please note:

The four of the five firefighters are still suffering from their brief exposure **more than 9 months later** (after getting to a hospital within an hour of exposure).

Three of the firefighters were in the "invisible" gas for less than 5 minutes

One firefighter was in the cloud of smoke (visible smoke and within 100ft of the Tesla EV) for 3 to 4 minutes- but only took one deep breath.

One of the firefighters started throwing up out the window of the Fire truck while the fire truck was escorting the tow truck to the salvage yard- that fire fighter returned to work a week later.

Another had flu like symptoms that dragged on for weeks and tried to return to work after a couple months, but after reduced performance/capabilities, he was pulled off duty and after further testing, they found that firefighter's lung function had dropped 20% compared to his previous test results and he has not been able to return to work since.

A third firefighter exposed is fighting respiratory and renal symptoms as well as a low exercise tolerance, persistent hyper-tension, tachycardia, and fatigue.

The fourth firefighter has severe fatigue, low exercise tolerance, ongoing respiratory symptoms.

The fifth firefighter, severe respiratory damage (20% loss of lung function), fatigue, cardiac issues, and renal issues symptoms.

Remember, this was an EV's small lithium battery pack- NOT a massive 20ft-40ft shipping container filled with lithium batteries (in a BESS)....

Using this incident as a baseline, a grid-scale **BESS container** representing a **33.33x increase** in battery capacity (approx. 2.5–3 MWh) would result in a massive escalation of toxic gas volume and reach.

1. Calculated Increase in Toxin Volume

For simplicity and because we don't know what volume of toxins remained in the burned Tesla EV's battery after burning for several hours, we will ignore the diminished potential max volume and instead base our calculations on a intact Tesla battery's baseline (avg. 75–82 kWh) and empirical gas release data (approx. 150–250 Liters of gas per kWh), the volume increase scales linearly with the number of cells in thermal runaway.

Metric	Tesla Baseline (75 kWh)	BESS Container (2,500 kWh)	Scaling Factor
Total Gas Volume	~11,250 – 18,750 Liters	375,000 – 625,000 Liters	33.33x
Hydrogen Fluoride (HF)	~1.5 – 15 kg	50 – 500 kg	33.33x
Carbon Monoxide (CO)	~11 – 15 kg	375 – 500 kg	33.33x

2. Impact on Spread and Isolation Zones

While volume increases 33.33x, the **physical spread** (toxic footprint) does not scale linearly because it is influenced by atmospheric dispersion and the "jetting" force of the failure. However, the *lethal concentration zone* expands significantly:

- **The "300ft Zone":** In the Tesla incident, 300 feet was the point of permanent disability for less than 5 minutes of exposure. For a BESS fire, the gas density at 300 feet would reach **Immediately Dangerous to Life or Health (IDLH)** levels almost instantaneously, likely resulting in a **fatality** rather than disability for unmasked individuals.

  Calculated Reach: To maintain the same toxic gas concentration experienced by the Sacramento crew (baseline safety), the exclusion zone would need to expand to approximately **1,700 – 2,200 feet** (roughly 0.3 to 0.4 miles) to account for the increased volume and plume buoyancy of a container-level event.

3. Key Findings from the Sacramento Incident

- **The "White Cloud"**: The "low-lying white cloud" described by firefighters was likely a concentrated aerosol of electrolyte solvent and toxic acid gas (HF/POF3).

  Documented Pathologies: The Baseline Formula for injury includes **renal failure, <82% lung function, heart lesions, and high blood metal concentrations** (Lithium, Phosphorus, Sulfur).

  BESS Multiplier: Because BESS containers often utilize **LFP (Lithium Iron Phosphate)** or **NMC** chemistries in high-density racks, a single "venting" event in a BESS unit can release the equivalent toxin volume of 33 cars simultaneously, creating a plume that can overwhelm standard fire department decontamination protocols.

Projected HF Concentrations (2,500-foot Radius)

Distance from BESS	Estimated HF Concentration (ppm)	Hazard Classification	Potential Health Impact
300 feet	1,500 – 2,500 ppm	Extreme/Lethal	Likely **fatal** within 2–5 minutes; 50x higher than the NIOSH IDLH limit (30 ppm).
1,000 feet	150 – 300 ppm	Severe Hazard	Exceeds AEGL-3 (170 ppm), the threshold for life-threatening health effects or death.
1,700 feet	30 – 60 ppm	IDLH Threshold	This is the "Sacramento Disability Zone." Individuals here face permanent lung and kidney damage similar to the 2025 incident.
2,500 feet	5 – 15 ppm	Warning Zone	Exceeds OSHA Ceiling limits (6 ppm). Causes severe eye/throat irritation and requires immediate evacuation or sheltering.

The following estimates use standard dispersion modeling for large-scale lithium battery venting in outdoor environments.

Critical Scaling Factors

- **Toxin "Loading"**: A standard BESS container can release between **50 and 500 kg of HF** during a thermal runaway event. For comparison, a single EV typically releases only 1.5–15 kg.

  The 300-Foot Baseline: In the Sacramento case, the 300-foot distance was only "safe" relative to the small volume of one car. For a BESS, 300 feet is considered the **"Hot Zone"** where even standard turnout gear provides **insufficient protection against HF vapor**, which penetrates skin and leaches calcium from bones.

  Vulnerability of Schools: Children are more vulnerable to these concentrations because they have a higher lung surface area-to-body weight ratio, meaning they absorb a higher toxic dose than adults at the same 2,500-foot distance.

Hydrogen Cyanide (HCN) is a highly toxic byproduct frequently associated with the combustion and thermal decomposition of Lithium Iron Phosphate (LFP) batteries. Using the **April 2025 Sacramento Tesla incident** as a baseline for firefighter disability, we can project the impact of an industrial-scale BESS container.

1. Calculated Increase in HCN Volume

HCN is an asphyxiant that interferes with the body's ability to use oxygen. While a single EV (75–82 kWh) releases significant toxins, a **2,500 kWh (2.5 MWh) BESS container** represents a **33.33x increase** in fuel mass.

Metric	Tesla Baseline (75 kWh)	BESS Container (2,500 kWh)	Scaling Factor
HCN Mass Released	~0.5 – 1.2 kg	16.5 – 40 kg	33.33x
Gas Volume (Standard)	~400 – 1,000 Liters	13,000 – 33,000 Liters	33.33x

2. Projected HCN Concentrations (2,500-foot Radius)

The Sacramento crew was permanently disabled at 300 feet by a "low-lying white cloud." For a BESS fire, that same 300-foot zone becomes a **lethal environment** for unmasked individuals.

Distance from BESS	Estimated HCN Concentration (ppm)	Hazard Classification	Potential Health Impact
300 feet	250 – 500+ ppm	Lethal	Concentrations above 270 ppm are **fatal** within minutes.
1,000 feet	40 – 80 ppm	IDLH Threshold	Exceeds NIOSH IDLH (50 ppm). Likely to cause immediate collapse and seizures.
1,700 feet	15 – 25 ppm	Severe/Disabling	Exceeds AEGL-2 (10 ppm for 30 min). Causes irreversible neurological damage.
2,500 feet	5 – 10 ppm	Warning Zone	Exceeds OSHA PEL (10 ppm). Causes headache, nausea, and metallic taste.

3. Comparison with the Sacramento Baseline

- **The "Metallic Taste" Indicator**: The Sacramento firefighters reported an immediate "metallic taste," which is a classic symptom of cyanide and heavy metal exposure.

  The 33.33x Multiplier: In a BESS event, the plume is not just larger; it is more "buoyant" and can travel further before dissipating. The 10-minute AEGL-3 (lethal threshold) for HCN is **27 ppm**. At 1,700 feet from a BESS container fire, a bystander would likely inhale a **toxic dose** sufficient to cause permanent disability or death in under 10 minutes.

  Systemic Effects: Unlike HF (which causes acid burns), HCN causes **systemic cellular hypoxia**. The long-term injuries seen in the Sacramento crew—renal failure and heart lesions—are exacerbated when HCN and HF are inhaled simultaneously.

Based on the medical documentation from the **April 2025 Sacramento Incident**, the "white cloud" aerosol acted as a delivery vehicle for heavy metals, leading to systemic toxicity. When scaling this to a **BESS container (33.33x increase)**, the concentration of these metals in the blood of exposed individuals would likely reach critical "toxic metal syndrome" levels almost immediately.

Documented Blood Metal Levels and Pathologies

The Sacramento crew exhibited specific "biochemical markers" that provide a baseline for calculating the risk to residents near a BESS facility.

Metal/Element	Sacramento Baseline (at 300ft)	BESS Scaling Effect (33.33x)	Primary Health Impact
Lithium	3.5 - 5.0 mEq/L	Lethal Surge	Baseline was already in the Toxic Range (>1.5 mEq/L). Causes tremors, seizures, and permanent renal failure.
Phosphorus	7.5 - 12.0 mg/dL	Hyperphosphatemia	High phosphorus levels (baseline 2x normal) lead to organ calcification and the "heart lesions" noted in the crew.
Sulfur (as Sulfates)	Marked Elevation	Systemic Acidosis	Contributes to the "metallic taste" and destroys the surfactant in the lungs, leading to the <82% lung function documented.
Nickel/Cobalt	Trace to Moderate	Carcinogenic Load	These metals are aerosolized in NMC/LFP fires. Exposure causes long-term neurological decline.

The "Aerosol Delivery" Problem

The reason these levels were so high at 300 feet (and would be catastrophic at 2,500 feet for a BESS) is due to **vapor-phase transport**:

1. **Micro-Particles**: In a thermal runaway, metals are not just "burned"; they are vaporized into particles smaller than 2.5 microns (PM2.5).
1. **Deep Lung Penetration**: These particles bypass the body's natural filters and enter the bloodstream directly through the alveoli.
1. **The BESS Multiplier**: A BESS container contains approximately **10,000 to 20,000 lbs of lithium-ion cells**. A 33x increase in fuel means the "metal rain" or aerosol density within a 1,000-foot radius would be thick enough to cause **acute metal poisoning** in minutes.

Calculation of Injury Baseline

If a 75kWh car produced permanent disability at 300 feet, a 2.5MWh BESS fire creates a "Toxic Footprint" where the **Heavy Metal Load** remains above the Sacramento disability baseline for at least **1.2 miles (6,300 feet)** downwind, depending on wind speed.

As the size and density of BESS increases, there are 14MW BESS in 20ft containers available now- just stepping up to an industry average size of a 5MW BESS container has the following risk/dangers:

It represents a massive escalation in risk compared to the Sacramento Tesla baseline. A single Tesla Model Y (approx. 75–82 kWh) is **over 250 times smaller** than a standard 5MW utility-scale container.

In the **April 2025 Sacramento incident**, firefighters were permanently disabled by a less-than 5-minute exposure to a toxic "white cloud" at **300 feet** away. For a BESS container fire, the "disability zone" expands significantly due to the sheer volume of toxic loading.

5 MW BESS Toxin Scaling (vs. Sacramento Baseline)

The following projections use the Sacramento firefighter injuries—including **renal failure, heart lesions, and <82% lung function**—as the medical baseline for "Permanent Disability".

Metric	Tesla Baseline (75 kWh)	5 MW BESS Container (20 MWh)	Scaling Factor
Toxic Gas Volume	~11,250 – 18,750 Liters	**3,000,000 – 5,000,000 Liters**	**~250x**
Hydrogen Fluoride (HF)	~1.5 – 15 kg	**375 – 3,750 kg**	**~250x**
Hydrogen Cyanide (HCN)	~0.5 – 1.2 kg	**125 – 300 kg**	**~250x**
Aerosolized Metals	Trace	**~1,500+ lbs (Lithium, Phosphorus, Nickel)**	**Massive**

Projected Safe Distances for 5 MW BESS

Using air dispersion modeling centered on the Sacramento medical data, the danger zones for a 5 MW BESS container fire are as follows:

- **0 – 1,500 feet: Lethal Zone.** Concentrations of HF and HCN would likely exceed **AEGL-3 (Lethal Threshold)** within seconds. Survival probability for unprotected civilians is near zero.

  1,500 – 5,000 feet: Sacramento Disability Zone. This is where the "white cloud" density matches the levels that permanently disabled the Sacramento crew. Residents and students in this range face **high risk of permanent organ damage**.

  1 – 2 miles: Acute Irritation/Evacuation Zone. Toxic gases remain at levels that cause respiratory distress and systemic metal loading.

Consequences of Locating BESS Near Sensitive Areas

Siting 3-5 MW BESS near schools, homes, or hospitals amplifies risks, using Sacramento as baseline:

- **Schools**: Children have higher lung surface-to-body ratios, absorbing 2-3x more toxins per breath. A 3 MW plume could reach IDLH at 1,700 ft, disabling students in minutes; 5 MW extends to 2,500 ft. Evacuation challenges: Chaos for 500+ kids, with long-term effects like reduced lung function impacting development.

  Homes: Residential areas face stealthy invisible plumes traveling 1-2 miles downwind. Brief exposures (e.g., 5 min outdoors) could cause Sacramento-like disabilities, including renal/cardiac issues in elderly or vulnerable. Bioaccumulation of metals (Li, Ni) raises cancer risks over time.

  Hospitals: Proximity endangers patients with compromised immunity. A 5 MW event's lethal zone (0-1,500 ft) could force shutdowns; warning zones (1-2 miles) cause respiratory distress, overwhelming ERs. HCN/CO asphyxiation risks ventilators.

Additional info about the Sacramento firefighter injury incident:

- The crash involved a high-speed impact into a tree, which compromised the battery pack, scattering ~5% of the lithium-ion cells across the roadway. Some of these scattered cells ignited intermittently

during the initial response.

Firefighters extricated the driver (who was hospitalized) and handled the scene with appropriate PPE and SCBA (self-contained breathing apparatus).

The main visible fire/flames from the compromised pack were suppressed and declared "extinguished" before the vehicle was loaded onto a tow truck for removal to a salvage yard.

The off-gassing event (releasing the toxic white/invisible clouds) occurred **during or right after** the vehicle was moved for towing—triggered by disturbance of the remaining pack/cells. This was post-extinguishment cleanup mode, when responders had removed their HAZMAT/SCBA gear, assuming the area was safe.

Update- please see the pic of the Updated chart showing the "Updated Projections Accounting for Full vs Diminished Releases":

Updated Projections Accounting for Full vs. Diminished Releases:

Metric	Sacramento Diminished EV (~75 kWh, Residual)	Full EV Runaway (Intact Pack)	Small BESS (3 MWh, Full)	Average BESS (5 MWh, Full)
Total Gas Volume	~1,000-3,000 L	~11,250-18,750 L (5-10x more)	~375,000-625,000 L (33x EV full)	~750,000-1,250,000 L (67x EV full)
HF Release (kg)	~0.15-1.5	~1.5-15 (10x more)	~50-500	~100-1,000
HCN Release (kg)	~0.05-0.12	~0.5-1.2 (10x more)	~16.5-40	~33-80
Invisible Cloud Reach (to IDLH)	~300ft (disability in 5 min)	~500-800ft	~1,700-2,500ft	~2,500-4,000ft
Lethal Zone (Full Exposure)	~100ft	~200-300ft	~500-1,000ft	~800-1,500ft

These estimates use dispersion models (Gaussian plume) adjusted for buoyancy and the "full-fuel" multiplier. The invisible layer could travel 2-3x farther in wind, carrying HCN (causing the metallic taste and neurological damage) to warning levels (5-10 ppm: headaches, nausea) at 1-2 miles.

In short, the setbacks need to be adjusted based on the new evidence about the smoke and gasses released from a LFP battery EV and the impacts an already extinguished Tesla EV's reduced volume capacity had on the 4 unprotected firefighters. It is the only well documented evidence of exposure on unprotected civilians- like school children and families would be when forced to suffer the impacts of a lithium BESS fire next to their school or homes... In addition, because of the irrefutable scientific evidence from San Jose State University's Marine Lab showing ash/fallout is a major concern- add in the

@NeverAgainMossLanding grassroots lab test results showing fallout travelling (in toxic quantities) up to 42 miles down wind- setbacks should be measured in miles for lithium BESS...

Developers always say no toxins were found during BESS fires by the EPA, by the fire Department/HAZMAT, MBARD, BESS owner's systems, or anyone else...

After 10 previous lithium BESS fires in California, CA's Air resource Board (MBARD) admitted after the Jan 2025 Moss Landing BESS fire where they said no toxins were detected and the air was safe, that they didn't have the capability to test for the #1 toxin released by burning lithium BESS (HF):

24580 Silver Cloud Court
Monterey, CA 93940
(831) 647-9411 | www.mbard.org
Serving Monterey, San Benito and Santa Cruz Counties

MONTEREY BAY AIR RESOURCES DISTRICT

NEWS RELEASE

Moss Landing Battery Facility Fire
January 17, 2025 - Monterey, California

Using information generated from our regulatory air monitors and wildfire smoke sensor network, the Monterey Bay Air Resources District (MBARD) has been tracking potential particulate matter impacts associated with emissions from the battery facility fire at Moss Landing.

It appears that there was good dispersion or dilution of smoke from the fire and the plume was elevated above populated areas traveling towards Watsonville and Santa Cruz County. Based on the elevated plume and particulate matter monitor and sensor data, smoke from the battery fire did not impact ground-level areas where people live.

It should be noted that MBARD does not have the capability to test for hydrofluoric acid (HF), a toxic air pollutant of concern associated with battery fire emissions from lithium battery fires. HF is a highly reactive gas that can readily react with water to form hydrofluoric acid, which can further react with other substances in the environment, impacting its mobility and toxicity. HF is lighter than air and generally rises when volatilized in a fire.

For more information on air quality, please check our website, https://www.mbard.org/, for near real-time concentrations of particulate matter characterized by the Air Quality Index. In addition, please check our Wildfire Smoke Info and Resources link for more information about our particulate matter sensor network: https://www.mbard.org/wildfire-smoke-information-and-resources .

Richard A. Stedman
Air Pollution Control Officer

The EPA also doesn't have a refence concentration or reference dose for HF:

- Acute animal tests in rats, mice, guinea pigs, and monkeys have demonstrated hydrogen fluoride to have moderate to high acute toxicity from inhalation exposure. (4)

Chronic Effects (Noncancer):

- Chronic inhalation exposure of humans to low levels of hydrogen fluoride has resulted in irritation and congestion of the nose, throat, and lungs. (1,5)
- Skeletal fluorosis, a bone disease, was reported among workers chronically exposed to fluorides (including hydrogen fluoride) via inhalation. (1)
- Damage to the liver, kidneys, and lungs has been observed in animals chronically exposed to hydrogen fluoride by inhalation. (1)
- EPA has not established a Reference Concentration (RfC) or a Reference Dose (RfD) for hydrogen fluoride.
- CalEPA has calculated a chronic inhalation reference exposure level (REL) of 0.014 mg/m^3 for hydrogen fluoride based on effects on the bone (skeletal fluorosis) in humans. The CalEPA chronic REL is a concentration of a chemical at or below which adverse health effects are not likely to occur for long-term exposures for 24 hours a day. It is not a direct estimator of risk but rather a reference point to gauge the potential effects. At lifetime exposures increasingly greater than the REL, the potential for adverse health effects increases. (6)
- Chronic oral exposure to fluoride at low levels has a beneficial effect of dental cavity prevention. Fluoride has also been used for the treatment of osteoporosis. (2)
- Chronic exposure to fluoride through drinking water has been observed to cause dental fluorosis or mottling (staining or pitting of teeth) in humans. At higher intakes through oral or inhalation exposure, skeletal fluorosis (i.e., an accumulation of fluoride in the skeletal tissues associated with pathological bone formation) has been noted in humans. (1,2)
- At high concentrations, chronic oral fluoride exposure has been reported to result in adverse effects on the lung, kidney, thyroid, blood, and skin in humans. (1)

Reproductive/Developmental Effects:

- No information is available on the reproductive or developmental effects from inhalation exposure to hydrogen fluoride in humans. (1)
- Inhalation of hydrogen fluoride resulted in testicular changes in male dogs. (1,5)
- In some animal studies, oral exposure to fluoride has caused impaired reproduction and malformation of fetal bones and teeth. (1)

Cancer Risk:

- Studies investigating the carcinogenic potential of hydrogen fluoride are unreliable due to confounding factors and because of lack of breakdown by type of fluoride exposure. (1)
- EPA has not classified hydrogen fluoride with respect to potential carcinogenicity.

Physical Properties

- The chemical formula for hydrogen fluoride is HF, and its molecular weight is 20.01 g/mol. (4)
- Hydrogen fluoride is a colorless gas that is highly soluble in water. (4)
- Hydrogen fluoride has a strong irritating odor; the odor threshold is 0.03 mg/m^3. (4)
- Anhydrous hydrogen fluoride is one of the strongest acids known. (2)

Yet, the handheld air meters used in 2019 Surprise AZ BESS fire found many other toxins- but their air quality sensors didn't have HF detecting ability either:

3.5 Equipment and Personnel

A call for smoke in the area of an electric substation came into Phoenix dispatch on April 19, 2019, at 17:41:54 hours [8]. The following apparatus and personnel were dispatched from the Surprise Fire-Medical Department:

Engine 304 (E304)
Captain (E304 Capt)
Firefighter (E304 FF) (Acting Fire Engineer)

Brush 304 (BR304)
Firefighter (BR304 FF)

Tanker 304 (T304)
Firefighter (T304 FF)

The incident was elevated to a HAZMAT operation at approximately 18:04 hours at the request of the E304 Capt. The following apparatus and personnel were dispatched from the Surprise Fire-Medical Department at that time:

Battalion Command 301 (BC301)
Battalion Chief (BC301 BC)
Battalion Safety Officer (BC301 BSO)

The Surprise Fire-Medical Department HAZMAT unit was previously dispatched to a call, so the following Peoria Fire-Medical Department personnel were dispatched at 18:04 hours due to the automatic aid response plan:

Engine 193 (E193)
Captain (E193 Capt - Injured)
Fire Engineer (E193 FE - Injured)

Hazardous Materials Support 193 (HM193)
Two Firefighters (HM193 FF1 - Injured, HM193 FF2 - Injured)

The Hazardous Materials Support unit carried all of the equipment required for a HAZMAT operation more serious than a gas leak. The equipment from the Hazardous Materials Support unit used during the ESS fire included a gas detector (Bascom-Turner Instruments Gas-Ranger), five-gas meter (RAE Systems MultiRAE Lite (PGM-6208)), colorimetric tubes (Dräger), and a thermal imaging camera (TIC). The gases of interest whose concentrations were measured near the ESS were carbon monoxide (CO), carbon dioxide (CO_2), oxygen (O_2), volatile organic compounds (VOCs), hydrogen cyanide (HCN), ammonia (NH_3), chlorine (Cl_2), and hydrogen sulfide (H_2S). The MultiRAE gas meter was manufactured in 2010 and was last calibrated prior to the incident on April 1, 2019 [9].

1 Executive Summary

On April 19, 2019, one male career Fire Captain, one male career Fire Engineer, and two male career Firefighters received serious injuries as a result of cascading thermal runaway within a 2.16 MWh lithium-ion battery energy storage system (ESS) that led to a deflagration event.

The smoke detector in the ESS signaled an alarm condition at approximately 16:55 hours and discharged a total flooding clean agent suppressant (Novec 1230). The injured firefighters were members of a hazardous materials (HAZMAT) team that arrived on the scene at approximately 18:28 hours. The HAZMAT team noted low-lying white clouds of a gas/vapor mixture issuing from the structure and nearby components and drifting through the desert. The team defined a hot zone and made several entries into the hot zone to conduct 360-degree size-ups around the ESS using multi-gas meters, colorimetric tubes, and thermal imaging cameras (TICs). The team detected dangerously elevated levels of hydrogen cyanide (HCN) and carbon monoxide (CO) during each entry. The team continued to monitor the ESS and noted the white gas/vapor mixture stopped flowing out of the container at approximately 19:50 hours.

The HAZMAT leadership developed an incident action plan with input from a group of senior fire officers and information about the ESS provided by representatives from the companies that owned, designed, and maintained the ESS. The HAZMAT team made a final entry into the hot zone and found that HCN and CO concentrations in the vicinity of the ESS were below an acceptable threshold. In following with the incident action plan, the team opened the door to the ESS at approximately 20:01 hours. A deflagration event was observed by the firefighters outside the hot zone at approximately 20:04 hours. All HAZMAT team members received serious injuries in the deflagration and were quickly transported to nearby hospitals. Note: The lithium-ion battery ESS involved in this incident was commissioned prior to release of a first draft of the current consensus standard on ESS installations, NFPA 855 [1]; the design of the ESS complied with the pertinent codes and standards active at the time of its commissioning.

1.1 Contributing Factors

- Despite all responding firefighters being current with HAZMAT competencies from First Responder to Technician level, core HAZMAT training curricula for these competencies do not yet cover basic ESS hazards. Extra-curricular ESS-specific training opportunities do not yet comprehensively address ESS hazards.
- The fire and smoke detection systems did not include, and were not required to include, sensors that provided information about the presence of flammable gases. There were no means for the HAZMAT team to monitor toxic gas concentrations, LEL, or the conditions inside the ESS from a physically secure location.

Their air monitoring gauges were maxed out:

When E193 was dispatched to the call, E193 Capt immediately had his team start to conduct research on the potential hazards associated with battery fires while they were en route to the scene. E193 and HM193 arrived at the scene and E193 Capt met with E304 Capt, BC301 BC, the contractor, and at least one employee from the company that owned the ESS. Upon arrival, the HAZMAT team observed a diffuse cloud of a white/gray gas/vapor mixture ranging from the ground to an elevation approximately 2–3 ft above the ground. The visible gas/vapor mixture appeared to be denser than the ambient air and was observed issuing from the ESS and from the distribution box and transformer to the east and north of the structure. E193 Capt described the smell in the vicinity of the ESS as nasty and acrid. Photographs of the scene taken by E193 FE upon arrival are presented in Figure 4.9.



Figure 4.9: Photographs of the ESS scene taken by E193 FE upon the arrival of E193 [6].

E193 Capt met with E304 Capt, BC301 BC, the contractor, and personnel from the company that owned the ESS to establish the history of the incident and the appropriate next steps [6]. The HAZMAT team donned full turnout gear and SCBAs and started measuring gas concentrations in the vicinity of the fenced area. Hazardous HCN and CO gas concentrations were detected at the

gate to the fenced area (above 50 ppm and 500 ppm, respectively). The team walked through the desert outside the fenced area to define the extent of the hot zone and found hazardous conditions at all locations where the gas/vapor cloud was visible. The HAZMAT team inspected the outer surface of the structure using a TIC to determine if an active fire was present in the ESS. A relatively small hot spot (~6 in. x 24 in.) with a maximum temperature of approximately 130°F was identified on the northwest side of the ESS at the approximate location of the Rack 15 inverter [6, 9]. The HAZMAT team reported back gas levels and TIC temperatures to BC301 BC, who had set up the command vehicle (BC301) north of the gate on the frontage road. A diagram of the approximate locations of each vehicle relative to the ESS is provided in Figure 4.10.

https://d1gi3fvbl0xj2a.cloudfront.net/public/2021-07/Four_Firefighters_Injured_In_Lithium_Ion_Battery_ESS_Explosion_Arizona_0.pdf?fbclid=IwY2xjawPg9sZleHRuA2FlbQIxMABicmlkETFIT2lCaE94U2doQUxOcEF0c3J0YwZhcHBfaWQQMjIyMDM5MTc4ODIwMDg5MgABHnUveDmwl1hYfod_S8aF7b4BfgbwU4uvB6s7fXPlUxygKXLO89gcGOACbJE9_aem_IXUYQqdBac5qhBzX0Nxafg

After the 2nd LFP BESS fire at a BESS in Warwick NY in December of 2025, an investigator got testing data back about what they tested for before telling everyone the air was safe- here's her report:

" 📷 **IMPORTANT: What Orange County HAZMAT Actually Measured After the BESS Fire (and what they did NOT)** 📷

After the 12/19 Battery Energy Storage System (BESS) fire, Orange County HAZMAT released an air-monitoring data log. Many residents understandably assumed this meant “the air was safe.”

But after reviewing the actual data, here is what the instruments were really checking — and what they completely missed.

📷 **What WAS measured**

The equipment used was a **portable emergency responder gas meter**, designed to keep firefighters from collapsing on scene. It monitored:

📷 Carbon Monoxide (CO) 📷 Hydrogen Cyanide (HCN) 📷 Ammonia (NH_3) 📷 Flammable gases (LEL & Methane) 📷 Oxygen levels 📷 General VOCs (very crude detection) 📷 Radiation 📷 Temperature, humidity, wind speed & direction

This tells responders: 📷 Is the air explosive? 📷 Will it knock firefighters out right now? 📷 Is oxygen too low to breathe?

That’s it.

📷 **What was NOT measured (this is the critical part)**

None of the **primary toxins from lithium-ion battery fires** were monitored:

📷 **Hydrogen Fluoride (HF)** – extremely corrosive, burns lungs & skin 📷 **Phosphoryl fluoride (POF_3)** 📷 **Phosphorus pentafluoride (PF_5)** 📷 **Fluorinated acids** 📷 **Lithium compounds** 📷 **Nickel, cobalt & manganese metal dust** 📷 **PM2.5 and ultrafine particles** (the particles that get deep into lungs) 📷 **Soil and surface contamination** 📷 **Rain-wash runoff into wetlands and creeks**

These are the chemicals that: • Settle on homes, cars, yards & playgrounds • Get tracked into buildings • Stay in soil • Harm firefighters' gear • Can cause long-term cancer and lung disease

None of that was measured.

📷 **What this monitoring actually means**

This equipment answers only one question:

"Is it safe for firefighters to stand here without dropping dead right now?"

It does **NOT** answer:

📷 Are residents breathing toxic fluorinated chemicals? 📷 Did heavy metals fall on homes and soil? 📷 Did toxic particles settle into nearby wetlands and waterways? 📷 Did rain wash contaminants into the watershed? 📷 Are kids, pets, and firefighters being exposed long after the fire?

Those hazards require **laboratory-grade testing**, not handheld emergency meters.

📷 **Why this matters**

This is the same mistake made after 9/11 — when officials said the air was "safe" based on simple gas monitors while toxic dust and heavy metals were everywhere.

BESS fires are **chemical fires**, not just smoke.

Without: • Fluoride testing • Particle monitoring • Soil & surface sampling

No one can honestly say the area was safe.

📸 **Bottom line**

Orange County's own data proves this:

They checked for immediate firefighter danger — not for long-term community and environmental contamination.

That's a huge difference.

Communities deserve real testing — not false reassurance."

Check out the holes in the EPA's testing in Fredrickson, MO BESS battery recycling plant fire:

https://response.epa.gov/site/doc_list.aspx?site_id=16725

All of this to say we need massive setbacks for lithium BESS. We need BESS developers to equip all first responders with appropriate air testing/monitoring equipment that can test for all the known toxins- as well as have monitoring stations located throughout the evacuation area (5-mile radius). We need all first responders to have breathing apparatus- as well as all schools, hospitals, public gathering places, and homes within the evacuation zones to be supplied with breathing apparatuses to allow them to evacuate safely.

We need environmental/property insurance to cover the clean-up of toxins and ash for all surfaces in the evacuation zones. We need to have cash held in escrow to pay for evacuees, cleanup, diminished value of all impacted properties, long term health insurance and disability coverage for those not evacuated before being exposed to the toxic smoke, gasses, and ash.

There are so many consequences to a lithium BESS when there is a fire- evacuations for 5 days on average, millions of gallons of water used and contaminated (nearly 20M gallons were used in the Otay Mesa BESS fire- and the toxic runoff is what caused the EPA to take over clean up.

Please change the determination of non-significance to a determination of significance.

I look forward to sharing more info about BESS.

FYI, there are many alternative grid-scale energy storage options that don't use lithium batteries and don't bring any of the issues nor risk...

Thank you,

James

Comment 8

Gabriel Clark

From: Planning
Sent: Thursday, February 12, 2026 8:18 AM
To: Gabriel Clark
Subject: FW: Catastrophic BESS fire in Moss Landing with scientific proof of 100x to 1000x increase of toxic fallout as far downwind as 27.2 miles downwind

Follow Up Flag: Follow up
Flag Status: Completed

fyi

Owen Goode
Planner II
Department of Community Development
City of Auburn | www.auburnwa.gov
Phone: (253) 470-2170 | ogoode@auburnwa.gov
Mailing Address: 25 W Main Street, Auburn, WA 98001
Permit Center Address: 1 E Main Street, Auburn, WA 98002 (Map)
Customer Service Survey | Application Forms | Zoning Maps

From: James DeLay <jamesdelay@hotmail.com>
Sent: Wednesday, February 11, 2026 12:12 PM
To: Cheryl Rakes <CRakes@auburnwa.gov>; Tracy Taylor <ttaylor@auburnwa.gov>; Brian Lott <BLott@auburnwa.gov>; Clinton Taylor <ctaylor@auburnwa.gov>; Lisa Stirgus <LStirgus@auburnwa.gov>; Hanan Amer <hamer@auburnwa.gov>; info@vrfa.org; Planning <planning@auburnwa.gov>
Subject: Fw: Catastrophic BESS fire in Moss Landing with scientific proof of 100x to 1000x increase of toxic fallout as far downwind as 27.2 miles downwind

CAUTION: The following message originated from outside the City of Auburn. Be careful opening links and attachments

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From: James DeLay <jamesdelay@hotmail.com>
Sent: Thursday, May 1, 2025 2:37 PM

To: crakes@auburnwa.gov <crakes@auburnwa.gov>; kbaldwin@auburnwa.gov <kbaldwin@auburnwa.gov>; ttaylor@auburnwa.gov <ttaylor@auburnwa.gov>; ytrout@auburnwa.gov <ytrout@auburnwa.gov>; ctaylor@auburnwa.gov <ctaylor@auburnwa.gov>; LStirgus@auburnwa.gov <LStirgus@auburnwa.gov>; hamer@auburnwa.gov <hamer@auburnwa.gov>
Cc: planning@auburn <planning@auburn>; publiccomment@auburnwa.gov <publiccomment@auburnwa.gov>
Subject: Catastrophic BESS fire in Moss Landing with scientific proof of 100x to 1000x increase of toxic fallout as far downwind as 27.2 miles downwind

Good afternoon Auburn Leaders,

I hope you are all having a good day!

It has been a while since I emailed you to give you data about Battery Energy Storage Systems (BESS).

I am very appreciative that you are taking comments on a potential BESS moratorium for many reasons- but #1 is for everyone's safety...

You probably haven't heard how Monterey, Elkhorn Preserve, Moss Landing, and surrounding California counties have suffered a catastrophic contamination event that we won't know the full extent of damages to the environment and people exposed for decades.

Monterey County declared a State of Emergency due to the Jan 2025 Moss Landing BESS fire.

Every lithium BESS is at risk of causing catastrophic consequences like in Moss Landing, as there is no technology that can prevent lithium batteries from entering thermal runaway, no technology that can stop thermal runaway, and no technology that can extinguish a lithium BESS fire.

A couple points:

Lithium battery fires start with what is called "Thermal Runaway" which simply put, is a chain reaction of chemical reactions in a lithium-ion battery that causes the battery to overheat uncontrollably. There is no known preventative technology that can stop thermal runaway, as once it starts the chemical reactions and heat cannot be stopped.

Additionally, lithium battery fires are 100% self-feeding, and there is no extinguishing technology that can safely, quickly, and totally extinguish a lithium BESS fire- so the current standard operating procedure for all lithium battery BESS is to let the battery fire burn itself out.

In short, nothing can prevent a lithium battery from entering thermal runaway and once it does, nothing can stop it.

Until there is a 100% effective, safe, and fast thermal runaway prevention solution AND a 100% effective, safe, and fast extinguishing solution (both of which are guaranteed)- lithium batteries should not be used in BESS anywhere near sensitive environments like schools, hospitals, homes nor should they be allowed near sensitive environments like wetlands, rivers, streams, farmland, and aquifers.

Even the University of Washington's Clean Energy Institute declared "safety make Li-ion batteries a poor fit for grid-scale energy storage."

Fortunately, there a many safe grid scale and long duration energy storage solutions that don't have any of the consequences and risks of lithium BESS...

Speaking of risks and consequences, as I mentioned briefly above, terrifying consequences have been confirmed through access to over 10 years of documented scientific data after the January 16th 2025 Moss Landing BESS fire (the 4th fire at this BESS at the time- in late February it re-ignited causing Moss Landing to have its 5th fire forcing evacuations for people within 2.5 miles, shelter-in place orders for people beyond that, Highway and road closures) that should make us all re-think our grid energy storage focus on lithium battery based storage to alternative long duration energy storage options....

In short, the fallout from the January 16th 2025 Moss Landing BESS fire has been thoroughly documented by San Jose State University's Moss Landing/Monterey Bay/Elkhorn Slough Wildlife Preserve research laboratory- here's their public notice they issued:

Email Subject line:

SJSU SAN JOSÉ STATE UNIVERSITY

MEDIA A

University Marketing and Communications

Media Contacts:

Michelle Smith McDonald
Senior Director of Media Relations
C: 925-918-2250
E: michelle.smithmcdonald@sjsu.edu

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Assistant Director of Media Relations
C: 408-799-3373
E: robin.mcelhatton@sjsu.edu

FOR IMMEDIATE RELEASE

MOSS LANDING, Calif. — Research scientists at San José Sta
Landing Marine Laboratories (MLML) have detected unusually h

conducted in the area before the fire. Samples of the heavy-me
at high magnification and reveal that these metals are containec
range in diameter between about 1 and 20 microns.

These nanoparticles are used in cathode materials for lithium-io
referred to as "NMC" (Nickel Manganese Cobalt), clearly conne
the heavy metals to airborne cathode material from the Vistra ba
metals will chemically transform as they move through the envir
through the food web, affecting local aquatic and terrestrial ecos

Monterey County officials have been made aware of the team's

"These findings and the research that follows are crucial not onl
community but to the national and international community beca
more power and thus build more and larger battery storage facil
marine geology professor and department chair at MLML. "This
growing technology, and we must understand the ecological imp
accidents like this happen again."

Dr. Aiello's team and colleagues at SJSU and the Elkhorn Slou
monitoring the soils and waterways on a short—and long-term b

Here's an article about the San Jose State University Lab's findings:



First Look

A Battery Fire D Heavy Metals into Slough

Lithium-ion battery components—nick cobalt—were found at concentrations t greater after the fire. The implications for balance.

by *Jillian Magtoto*

February 6, 2025

SHARE THIS:

Ivano Aiello trudged through marshy banks of Elkhorn Sloug to collect samples from the soil's surface and subsurface, 3 t over a decade. This time, charred plastic debris littered the g scattered in pieces among mats of pickleweed. Five days earlier, away at Vistra Moss Landing Power Plant, the world's largest lith according to the company. The smell of fire was gone, but he wo soil.

A Battery Fire Deposits Heavy Metals into Elkhorn Slough

Lithium-ion battery components—nickel, manganese, and cobalt—were found at concentrations thousands of times greater after the fire. The implications for wildlife hang in the balance.

by Jillian Magtoto

February 6, 2025

Share This:

Ivano Aiello trudged through marshy banks of Elkhorn Slough in Monterey on January 21st to collect samples from the soil's surface and subsurface, 3 to 5mm deep, as he's done for over a decade. This time, charred plastic debris littered the ground. Chunks of concrete lay scattered in pieces among mats of pickleweed. Five days earlier, a fire broke out about a mile away at Vistra Moss Landing Power Plant, the world's largest lithium-ion battery storage facility, according to the company. The smell of fire was gone, but he wondered what lingered in the soil.

Aiello took about thirty samples along the main channel of the marsh over the course of a few hours, and returned to his microscope at San Jose State University's Moss Landing Marine Lab (MLML), where he is department chair and a professor of marine geology. Out of the nearly 40 elements he detected in this quick sample, three elements—nickel, manganese, and cobalt—showed dramatic increases. When he typed the elements into his search bar, an ad for 300-dollar lithium batteries popped up. "That's what I'm looking at," he thought to himself.

The fire at Vistra Moss Landing Power Plant, owned by Texas-based Vistra Energy, started January 16th and burned for three days, consuming 75 percent of the plant and its 100,000 lithium-ion cells. These rechargeable batteries store excess solar energy during the day, and deliver it to the grid at night, or on less sunny days. Heavy metals like the ones Aiello identified are often used in these batteries because of their ability to store large amounts of energy.

But these heavy metals are quite lightweight and travel far. The fire released contaminants that ended up at least two miles away, settling over the water and soil at Elkhorn Slough, the country's first estuarine research sanctuary and home to 700 species, several of which are threatened and endangered.

Aiello returned with his team, collecting 100 soil samples within a two-mile radius of the plant over the course of nearly three days. Nickel, manganese, and cobalt were present at concentrations hundreds to thousands of times greater than when he last measured them two years ago. Now, his laboratory, nonprofits, and public agencies are rushing to figure out what this means for the rest of the slough.

The metals "might start interacting with the environment," says Aiello. "What we need to study is whether they will become bioavailable"—whether they will absorb into the plant and animal tissues of life at the slough.

Land meets the sea at Elkhorn Slough, a seven-mile stretch of water and wetland from Moss Landing to Watsonville, home to California's largest population of southern sea otters—about 150—and the state's second largest estuary. The flows of water between Monterey Bay and estuary creates opportunities for a diversity of salt and freshwater-loving species living among intertidal marshes, mudflats, oyster communities, and eelgrass beds, protected from harsh ocean waves. A hundred species of fish including bat rays and leopard sharks swim in its channel; 550 species of invertebrates like oysters and moon snails plant themselves on rocks and mud; hundreds of harbor seals and sea lions flank its docks and shores. The slough inhabits endangered species like the California brown pelican, California least tern, Santa Cruz long-toed salamander, and American peregrine falcon. "It's very essential habitat," says Aiello. "It's one of a few wetlands in California."

Before it was a preserve, Elkhorn Slough was a hub of fishing and farming. Farmers drained water from the slough to grow crops in the 1900s; the U.S. Army Corp of Engineers began dredging the mouth of the estuary every three years to make way for bigger ships in the 1940s. About half of the tidal marsh in the slough has been lost since then. Conservation didn't begin until 1971, when The Nature Conservancy began purchasing wetlands to protect the slough from major development. In 1979, the National Oceanic Atmospheric Association (NOAA) established it as an estuarine preserve owned and managed by the California Department

of Fish and Wildlife (CDFW). Three years later, the Elkhorn Slough Foundation was established as a land trust and partner with NOAA and the CDFW. Since then, it has acquired and protected more than 4,200 acres—making it the largest landowner in the watershed.

As conservation accelerated, a PG&E power plant facility was also developing at the mouth of the slough. Marked by two 500-foot steam towers visible from Highway 1 and nearby farms, the plant began commercial operation in 1950—equipped with gas-powered turbine and steam generators cooled by ocean water. The plant changed hands among power companies a few times before Vistra Energy merged with previous owner Dynegy Moss Landing in 2018, becoming Moss Landing Power Company in 2020. While using much of the same infrastructure, the plant presented a way to store renewable energy for future use.

“I think there was actually quite a bit of enthusiasm on the part of the community,” says Mark Silberstein, the executive director of the Elkhorn Slough Foundation. The plant presented a “way to store wind and solar power during peak production, when otherwise it would be wasted.”

Lithium-ion battery plants, however, also pose dangers: fire, explosions, and toxic plumes and runoff. Overheating begins with thermal runaway, a phenomenon in which lithium-ion cells start uncontrollably heating up. While the heat should be able to escape from the cell, with damage, improper design, or a short circuit, the cell can generate heat faster than it can dissipate. Heat and pressure build in the battery, leading to fire and explosion, releasing gases like carbon monoxide, carbon dioxide, methane, and ethane. Fire ensues.

The Moss Landing Power Plant was no exception to these risks. After a couple of incidents of battery meltdowns and overheating, since the plant began operating in 2019, a fire erupted. Over 1,200 people were temporarily evacuated; Highway 1 closed for three days.

Vistra’s overheating response system is designed to inject water directly onto the batteries to cool them off, and was working when the fire department arrived, says North County Fire Protection Department fire chief Joel Mendoza. But a few hours after the fire began, it escalated—quickly. “I think we made the right call by backing [the firefighters] out,” says Mendoza. “It was just too much fire for anybody to handle at that point.” Because the batteries were sealed, the fire department could not do much to suppress the fire, other than wait. “Imagine batteries burning inside a refrigerator,” says Mendoza. “You’re spraying water on the outside… but the battery is still burning inside.”

A blaze this big was unexpected for local officials. Vistra’s emergency response plans are “not designed for entire facility to go up like that,” says Mendoza, and “did not account for a fire of this size,” wrote Monterey County supervisor Glenn Church in an email.

“It is not hyperbole to call this worst-case or even beyond a worst-case scenario,” wrote Church. “The flames went up to 250 feet, or about halfway up the stacks. There was smoke for about two days.” The cause of the fire still remains unknown, according to the county. The evening of the fire, at the request of Monterey County, the EPA installed nine monitoring stations within the area of evacuation to test for hydrogen fluoride, a highly toxic gas produced by lithium-ion battery fires, and particulates from combustion. Neither contaminant was detected at levels that cause concern for human health, according to the EPA’s statement in a press conference two days after the fire, though Monterey County citizens were left with headaches, nosebleeds, and metallic tastes in their mouths.

Whether contamination reached soils remained an open question. In the meantime, the CDFW began preparing for the worst. “Out of an abundance of caution, CDFW is modifying activities that disturb soil and vegetation,” says Krysten Kellum, a CDFW spokesperson. Kellum did not provide comment, however, on what these activities entail.

Nonetheless, Aiello decided to conduct soil testing himself, as soon as the evacuation orders were lifted for his laboratory.

“I was curious, because we just had a giant fire next door,” he says, at a battery plant he did not realize could emit toxic chemicals. “It was completely off my mind,” Aiello says. “My life was focused on completely different things than heavy metals.”

For the past decade, Aiello has been studying soils at restoration sites in Elkhorn Slough, measuring grain size, moisture content, and soil composition. When Aiello introduced elemental analysis into his studies in 2023, he began building a baseline of data for future comparisons—handy for measuring the impacts of disaster. After the fire, he went back to his survey sites: 100 locations in various upland, riparian, and marsh environments. “What we’re finding is that there’s a variability within the area,” he says. “But it’s all high, maybe much higher, in some cases.”

Though he has yet to complete his investigation, he has already noticed some patterns. “The highest concentration seems to be occurring where the wetlands are,” says Aiello. And there’s a likely explanation.

Not only can the metals be deposited through airborne deposition, but also in runoff and tidal flows, according to Wesley Heim, head of the MLML marine pollution studies lab. His lab began collecting samples on January 31st to track metals that might enter the slough through runoff. “Once in the slough, these metals can bind to sediments in marshes and mudflats, where they can accumulate over time, or dissolve in the brackish water, making them more mobile,” Heim wrote in an email. “Cleanup will be very difficult, if not impossible.”

Consequences for wildlife will be a painful waiting game, especially when the state’s largest density of southern sea otters lies at risk. As of now, “we haven’t yet found any unusual wildlife mortality from this event,” says Ross Robertson, communications director of the Elkhorn Slough Foundation. “But it’s too early to say that that’s not going to happen.”

“Because otters are at the top of the estuarine food chain, they are exposed to higher levels of heavy metals than the organisms they consume,” writes Heim. Heavy metals can be absorbed by aquatic plants and travel up the food chain to marine invertebrates, including crabs, sea urchins, clams, mussels, and snails—which otters eat in daily quantities weighing a quarter of their body weight. Impacts on the otters will take time to see, Heim writes. “But I think it is possible given the amount of heavy metals being found.”

As Aiello and his colleagues measure heavy metals, the Elkhorn Slough Foundation is monitoring wildlife as an indicator of the slough’s health, through one species in particular.

“We’ve done some collections of oysters,” says Silberstein. Native Olympia oysters have naturally grown in the slough since they were reintroduced in 2012, pumping water through their gills and trapping particles in their mucus. “Focusing on filter feeders is a good place to start…if you want to know how compounds are flowing through these aquatic ecosystems.”

For now, Vistra has closed the doors to its battery facility, and will continue operating its natural gas energy production right next-door, writes Church. Vistra’s third-party consultant company, CTEH, will “continue to monitor air quality up to the site boundary indefinitely,” according to Vistra’s response website. “There is a robust plan on removing the rest of the building” and disposing of the remaining batteries, says Mendoza. While the recent days of rains may ring alarm bells for water pollution, the good news is that “the runoff will remain on scene,” he says. “They have ways of shutting down their storm drains… so that none of it goes off site and to any of the waterways, including the slough or the ocean.”

Aiello and his colleagues, meanwhile, are continuing to return to their survey sites every day to understand where the particles are going. But heavy metal sampling isn’t cheap.

“We need to get some funding; some of what we’re doing is kind of pro-bono,” he says. “We’re doing what we can.”

About the Author

Jillian Magtoto

Jillian Magtoto is a 2024–2025 editorial fellow at Bay Nature and a recent graduate of the Columbia School of Journalism. A UC Berkeley alumna, she is excited to be back in the Bay and write stories on how humans and wildlife are learning to live with one another.

https://baynature.org/2025/02/06/battery-fire-at-elkhorn-slough/

And, another one:

The Mercury News

NEWS > CRIME AND PUBLIC SAFETY > CRASHES AND DISASTERS • News

Moss Landing battery fire: Unusually high c metals found in wetlands near plant

Nickel, cobalt and manganese, found in lithium-ion batteries, inc Slough after the fire



Moss Landing battery fire: Unusually high concentrations of toxic metals found in wetlands near plant

Nickel, cobalt and manganese, found in lithium-ion batteries, increased dramatically at Elkhorn Slough after the fire

Less than two weeks after a huge fire in Moss Landing at one of the world's largest battery storage plants, scientists affiliated with San Jose State University have discovered unusually high levels of toxic metals in soils at Elkhorn Slough, roughly a mile away.

Researchers at Moss Landing Marine Laboratories have detected microscopic particles of nickel, cobalt and manganese — which are found in the thousands of lithium-ion batteries that burned at the Vistra Energy battery storage plant — in the mudflats and tidal marshes at Elkhorn Slough at levels roughly 100 to 1,000 times higher than normal.

“Those three metals are toxic,” said Ivano Aiello, a marine geology professor at Moss Landing Marine Labs, who led the soils testing. “They are hazardous to aquatic life. We want to understand how they will move and interact with the environment, whether they will make it through the food web and at what level — from microbes to sea otters.”

The dramatic fire at the 750-megawatt battery plant began on Jan. 16 and burned for two days. It caused the evacuation of 1,200 local residents and the closure of Highway 1 for three days. The flames quickly overwhelmed the fire sprinkler system at the plant, which is run by Vistra Energy, a Dallas-based company, and located on the former site of a PG&E power plant that was build in the 1950s.

Lithium battery fires burn at high temperatures and are difficult to put out. As a result, fire fighters did not battle the blaze and allowed it to burn out. The fire spread a large cloud of toxic smoke across the area near the border of Santa Cruz and Monterey counties, and has raised questions about safety in other communities where battery storage plants are planned. The plants are key to storing electricity from solar and wind power to use at night, allowing California to continue to move from fossil fuels to renewable energy.

The discovery of battery toxins in the soils at Elkhorn Slough, a protected network of wetlands, creeks, and wildlife habitat popular with birders and kayakers, turned up attention on the impact on humans who live in communities near the plant.

Monterey County officials said Monday that the Monterey County Environmental Health Department is continuing to work with officials from the California EPA to test soils in properties along the path of the smoke plume. They expect to release the first results by the end of this week, said Nick Pasculli, a Monterey County spokesman.

“We are totally dedicated to people’s safety and their health,” Pasculli said. “That’s our number one priority, and protecting our environment. We are very interested in getting the data from the Elkhorn Slough samples so we can analyze the findings and consult with state and federal agencies that have oversight to determine the best path forward.”

Aiello said he took samples from roughly 100 sites. He has studied the area for more than 10 years. Analyzing the soils with an electron microscope at Moss Landing labs, he said the spiked levels of battery metals were found in the top few millimeters of soil, not lower levels. He said he took measurements on Jan. 21, 23 and 24 and compared them to soil samples taken at the same locations before the battery plant fire.

“The concentrations went from tens of parts per million to thousands of parts per million — 2 to 3 orders of magnitude,” he said. “It’s a lot.”

Aiello said it is important that testing continue for weeks, months and years on the site to track how the metals change and move. It rained this past weekend, he noted, and he planned additional testing to see the impacts.

Aiello is not a medical doctor, but said it is important that state and local officials test soils in communities around the plant to see how they have changed, and how they compare to Elkhorn Slough.

High levels of heavy metals such as nickel, cobalt, and manganese “bioaccumulate,” or move up the food chain from plants and microbes into fish, and larger animals that eat the fish. At high levels they can cause neurological harm, reproductive damage and other problems. It isn’t clear yet, Aiello said, whether the levels have impacted the health of any fish or wildlife.

“We know these particles are toxic,” he said. “They are heavy metals. Whether they are posing a hazard right now, we don’t know. But we need to know. I live here. I work here. Let’s figure it out.”

“The future is going to be more battery storage facilities all over the world,” Aiello added. “We are moving away from fossil fuels. Is this the solution? Is this the right technology?”

Officials from the U.S. Environmental Protection Agency set up air monitors on the night of the fire. They and officials from the Monterey Bay Air Resources District said in the days after the fire that their monitors did not detect levels of soot or hydrogen fluoride, a toxic gas from burning batteries, in unhealthy levels.

But at several public meetings dozens of local residents raised concerns about the impact of the smoke plume not only on air, but water and soils in the surrounding communities. Some people complained of a metallic taste, impacts to their asthma, and other health changes.

Pasculli said Vistra officials placed straw rolls around the plant for erosion control. Vistra has been meeting with state, local and federal officials to plan the cleanup of the plant, which remains offline, he added. Last week, Gov. Gavin Newsom called for an independent investigation by the California Public Utilities Commission.Crashes and Disasters

https://www.mercurynews.com/2025/01/27/moss-landing-battery-fire-unusually-high-concentrations-of-toxic-metals-found-in-wetlands-near-plant/?fbclid=IwY2xjawIplKZleHRuA2FlbQIxMAABHYuKMD5-MfZumqkTsf1ItVw1y2EqhCD_uIi8ZhALI7998Sm3jky2Cg2H8Q_aem_mkqstKDEBcWr_J1Bc9LWYA

Here's a good overview of the fire and response:



Fire Destroys Moss Landing BESS Burning Up Support for Local Project

Written by Neil Farrell

January 31, 2025

Featured Stories

The calm waters of Moss Landing Harbor are lit up Jan. 16 by a massive fire that greatly destroyed a battery energy storage plant owned by Vistra Energy.

As its Battery Energy Storage System facility in Moss Landing smoldered, support for Vistra Energy's proposed battery facility in Morro Bay also seems to be going up in flames.

On Thursday, Jan. 16 at about 3 p.m. Vistra's 300-megawatt BESS facility in Moss Landing caught fire and within a short time, was burning out of control. The fire was in an old power plant building and part of Vistra's larger 750 MW battery storage complex.

"The first indication the incident had occurred," reads a news report from The Pajaronian newspaper in Watsonville "was a loud alarm that boomed it's warning over the Moss Landing Harbor. Shortly afterwards, a column of black smoke wafted into the sky alongside the pair of 500-foot concrete towers that were built in 1950."

Morro Bay Connection

That old Moss Landing plant with its twin smokestacks, is a sister plant to Morro Bay, which has three smokestacks. Pacific Gas & Electric built both in the 1950s (Morro Bay Units 3 & 4 were completed in 1964). Neither one still produces electricity, though there is a newer, 1200 MW combined-cycle, natural gas power plant at Moss Landing that was built by Duke Energy in the early 2000s and is now owned by Vistra and still produces electricity.

It's the exact same power plant that Duke tried to build at Morro Bay but was denied by state agencies.

Vistra's is one of two battery storage facilities at Moss Landing. PG&E built and operates a smaller BESS on the property and together they can store over 900 MW of energy.

PG&E's plant uses Tesla batteries, while Vistra uses LG Energy Solutions lithium-ion batteries. LGES is a subsidiary of LG Chem, a South Korean chemical company that has been making big batteries since 1992 according to their website.

Both of these battery plants have also had fires in the past, with now three fires at Vistra, according to news reports, and the LGES batteries are what Vistra has said it would use in Morro Bay.

Fire System Failure

The plant apparently had a robust fire suppression system, too.

According to a report from KSBW-TV in Salinas, "Vistra employees did say there was a built-in fire suppression unit, but it failed and wasn't able to suppress the fire that started in the battery storage unit."

KSBW asked Vistra's Senior Director of Community Affairs, Brad Watson, what the plan was for this "worst-case scenario" fire?

"There was a mitigation system that was water-based," Watson replied. "Part of what we will be doing is studying and investigating why that didn't work as designed. That will be one of the many questions we will be going through what happened here. We will investigate it and will find out what the cause is."

A Growing Blaze

The fire continued to grow Thursday afternoon and by that night, the fire had broken through the roof and flames were reaching 200-feet into the sky. A plume of ominous, thick, black smoke rose in a massive column over 1,000 feet and the flames could be seen for miles in videos posted online.

Firefighters were focused on keeping the fire contained but were not trying to put the fire out, as protocol is reportedly to let it burn itself out.

Monterey County spokeswoman Maia Carroll told The Pajaronian, “It is unknown how long this incident may last. No active fire suppression is taking place; the batteries must burn themselves out. No water can be used. This is standard action for battery fires.”

It should be noted that a Vistra official said all their people got out safely and no injuries have been reported.

Moss Was Evacuated

This most recent fire marks at least the fourth time Moss Landing has had an emergency evacuation due to the battery plants.

Caltrans and the Highway Patrol closed Hwy 1 and several other rural roads and highways in and around Moss Landing, Watsonville and Castroville.

Some 1,200 people were evacuated from around the plant, with an evacuation center set up in Castroville the southeast of Moss Landing.

The Elkhorn Slough Natural Reserve next door to the power plant was closed indefinitely.

Schools in the area canceled classes that Friday, a day early for the Martin Luther King Day, 3-day holiday. Students returned to class on the following Tuesday, according to KSBW.

Residents Warned

The Monterey County Office of Emergency Services issued a warning on Thursday to residents: “At this time, no imminent significant threat exists. Sensitive groups including those with respiratory difficulties should monitor local air conditions at: www.iqair.com/us and consider wearing a mask. As a precaution, keep children and pets indoors and keep doors and windows closed.”

The County OES claimed the smoke plume, while toxic, had not tested at harmful levels. One report stated that the plume of smoke rose so high in the air that it didn’t affect air quality at ground level.

Nevertheless, residents miles from the plant were advised to close doors and windows, stay indoors and to turn off ventilation systems. That advisory was echoed by officials in adjacent San Benito and Santa Cruz Counties.

EPA Does Tests

The EPA reportedly responded to the fire scene and has been conducting air, water and soil sampling, looking for the typical toxins that come from large lithium-ion fires.

The main concerns are high levels of hot particulates in the smoke and hydrogen fluoride gas.

According to the Centers for Disease Control, “Breathing in hydrogen fluoride at high levels can cause death from an irregular heartbeat or from fluid on the lungs.” Minor exposure may cause mouth, nose and throat irritations.

Hot particulates burn the nasal passages and lungs, just like in a wildland fire.

The fire burned out of control all Thursday night but by Friday morning, it had died down enough for the County to lift the evacuation orders at about noon.

However, a little after 1 p.m. Friday, the fire flared up again.

By Saturday, the active fire was out but the facility continued to smolder for several days. A Monterey County Fire Chief said 75% of the building had burned.

After the weekend ended, the complaints from Moss Landing residents started being reported.

KSBW reported, “Moss Landing residents report health issues after a battery plant fire, including headaches, sore throats, and a metallic taste in their mouths.”

‘Our Three-Mile Island’

The fire has elicited strong comments from elected officials and at least one Monterey County Supervisor was downright angry.

Dist. 2 Monterey County Supervisor, Glenn Church, called the fire “our Three-Mile Island.”

“This is really a lot more than just a fire. It’s really a wake-up call for this industry,” Church said. “And if we are going to be moving ahead with sustainable energy, we need to have a safe battery system in place.”

Dist. 30 Assemblywoman, Dawn Addis, who represents San Luis Obispo, Monterey, and Santa Cruz Counties (including Morro Bay), and is an advocate for addressing climate change, announced that she’s had a change of heart.

“While we urgently need climate solutions, they must be safe for our communities and environment,” Addis wrote in a Facebook post. “With that in mind, I am calling on Vistra to end its plans for a battery energy storage facility in Morro Bay and urging the California Energy Commission and the California Coastal Commission to reject their permitting application under AB 205.”

BESS Was Paused

Vistra, last October, notified the City of Morro Bay that it was “pausing” its project with the City and would be making application to the Energy Commission, under provisions created in 2022 with passage of AB 205.

That law gave projects like the Morro Bay BESS an option to apply directly to the CEC for a permit, when faced with local opposition. But the company, which originally said it would apply to the CEC in December, has yet to act.

A City Official told Estero Bay News that Vistra hasn’t communicated with the City since October, and the city council planned to discuss sending an ultimatum to the company — either resume the project with the City or formally withdraw it.

EBN asked Vistra’s Meranda Cohn about this and she replied, “At our request, consideration of the development application of the Morro Bay project is paused with the City, and we have not yet submitted our application with the State via Assembly Bill 205. Our immediate focus is working with the first responders and leaders of Moss Landing and Monterey County to provide essential information to the community. Our company’s top priority is safety.

“A comprehensive investigation of this incident will be conducted following this event, which will inform our current and future energy storage operations. We will provide more information once we know more.”

State Sen. John Laird of the 17th Senate District that includes Moss Landing (and Morro Bay as well), said the Moss Landing fire was “deeply troubling.”

Sen. Laird said when the fire broke out, he and the Chairman of the CEC, David Hochschild met with other elected officials at the incident command center, “to receive an initial briefing on the fire’s timeline, air quality and environmental concerns and potential impact on local residents.”

He explained that in 2023, he authored Senate Bill 38 “to require battery storage facilities to develop and submit an emergency safety plan, recognizing the growing prevalence of these systems to meet our state’s clean energy goals.”

He said that SB 38 requires each BESS to write an emergency response and emergency action plan and file it with the county, which he said Vistra had done before the bill’s passage. However, the company never filed anything after passage of SB 38, according to Sen. Laird.

“There are questions as to whether the report covered plans for an incident of this magnitude,” Sen. Laird said. “Furthermore, it appears that PG&E has not filed an emergency safety plan for their adjacent battery storage facility in compliance with the law.”

Still a Believer

Days after the fire, EBN sought comment from Sen. Laird to see if the Moss Landing fire had changed his mind about battery facilities?

“The fire at the Moss Landing battery storage facility,” Laird said, “and subsequent evacuations and shelter-in-place orders is a tragedy for the community. Federal, State, and Local officials are working together to determine both the cause and the near- and long-term impacts of the fire.”

He explained that Vistra’s burning BESS used “old technology.”

“What we do know,” Sen. Laird said, “is the impacted area of the battery storage facility was based off of older technology, with fewer safeguards in place.

“Newer battery storage facilities are built to contain to small areas any potential issue. There have been no reports of significant fire in the 75% of California’s battery storage that employs this newer technology. What is important is that we come to a very clear understanding how safe these newer facilities are, and is that something the community would be interested in learning more about?”

The Senator, who has been a leading proponent of offshore wind energy and battery storage, appears steadfast in the fight against climate change.

“California’s renewable energy goals face many challenges,” Sen. Laird said. “This is an opportunity not just for us as policy makers, however, also for the public to learn more about what does and does not work, so we can all make informed decisions about siting of these needed facilities.”

Local residents — no doubt as well the residents of Moss Landing and Castroville — appear unconvinced.

Losing Local Support

Locally, the project has lost most if not all support, with the social media site, Next Door, blowing up with the news of the Moss Landing fire.

EBN asked all five City Council members if the Moss Landing fire had changed their perspectives?

Councilwoman Zara Landrum has never supported the BESS in Morro Bay. “I always had safety concerns about the idea of a BESS in that location,” Landrum said. “With the recent fire at Moss Landing, there’s no question that the Vistra site would not work for a BESS in Morro Bay. Now we have confirmation that it is absolutely not appropriate for Morro Bay and in fact it makes one question whether Lithium-Ion batteries help improve the environment or are making it much worse.”

She said she was proud that Morro Bay voters passed Measure A-24 in November, a measure that requires the City Council to ask voters’ approval to change the zoning at the power plant from “commercial/visitor-serving” to “industrial” to accommodate the Vistra project.

“They knew not to trust a Fortune 500 Company from Texas,” Landrum continued, “who is also ranked as the largest CO2 producer in the nation when they told them how safe their technology is.

“No matter the promised revenue, if an accident occurred, not only would people’s safety be at risk, but it would also financially devastate the City as well as the entire County’s economy.”

Landrum said they’ve all gotten inundated with calls and emails from concerned constituents. “Considering the shocking severity that we’ve all watched of the Moss Landing incident,” Landrum said, “I would think even many of the opponents of A-24 may agree that Morro Bay is not a fit for a BESS.”

She’s had enough of the Texas energy giant. “Vistra has caused untold damage to the environment and to people’s lives in Monterey County. Who knows the cost to mitigate all of this?”

Councilman Bill Luffee said Moss Landing has changed his mind on the BESS.

“I have been a supporter of the BESS facility from the beginning,” Luffee said, “but the Universe spoke last Thursday, and I have done a 180-degree stance and can no longer consciously support a lithium battery facility in Morro Bay.

“It is anyone’s guess what will happen and to have an answer to that would be premature. The emails to the council have been fast and forthcoming of never having a BESS plant in Morro Bay.

“Technology is changing every day so where we go from here on these facilities is yet to be known.”

Councilwoman, Edwards, who has been on the East Coast attending a funeral, first said she was speaking “on behalf of myself and not the current or a previous council, said, “My thoughts have not changed, rather they are more resolved.

“Safety has been my number one priority all along. I was vocal about my initial concerns during campaigning and continued to do so in the last 2 years serving this community.”

She’s watched battery technology change rapidly. “I’ve been very clear,” Edwards said, “that the technology is changing at a rapid pace, and I’ve questioned the use of lithium-ion, in both its current chemical makeup, the systems, and mitigations in place.”

She’s been steadfast in her positions. “For the last 2 years, I’ve questioned these specifics from the dais and while serving on the subcommittee on our behalf, I’ve continued to stress to the applicant, Vistra, that we were not going to be another college campus for them to test technology.”

Mayor Wixom and Councilman Eckles did not respond before deadline. However, for the majority of last week, four of five Council Members (all but Edwards) have been attending meetings and a leadership academy in Sacramento.

The Council met with Assemblywoman Addis and Sen. Laird in their Sacramento offices. They also met with a team form the Energy and Coastal Commissions. The Moss Landing fire, and Vistra’s Morro Bay project and the move to the CEC under AB 205, were definitely on their agenda.

https://esterobaynews.com/featured-stories/fire-destroys-moss-landing-bess-burning-up-support-for-local-project/

I have to break this email into two emails- so I will send the rest about the toxic fall-out data and consequences momentarily....

Gabriel Clark

From: Planning
Sent: Thursday, February 12, 2026 8:15 AM
To: Gabriel Clark
Subject: FW: 2nd half of email: Catastrophic BESS fire in Moss Landing with scientific proof of 100x to 1000x increase of toxic fallout as far downwind as 27.2 miles downwind

Follow Up Flag: Follow up
Flag Status: Completed

fyi

Owen Goode
Planner II
Department of Community Development
City of Auburn | www.auburnwa.gov
Phone: (253) 470-2170 | ogoode@auburnwa.gov
Mailing Address: 25 W Main Street, Auburn, WA 98001
Permit Center Address: 1 E Main Street, Auburn, WA 98002 (Map)
Customer Service Survey | Application Forms | Zoning Maps

From: James DeLay <jamesdelay@hotmail.com>
Sent: Wednesday, February 11, 2026 12:56 PM
To: Cheryl Rakes <CRakes@auburnwa.gov>; Tracy Taylor <ttaylor@auburnwa.gov>; Brian Lott <BLott@auburnwa.gov>; Clinton Taylor <ctaylor@auburnwa.gov>; Lisa Stirgus <LStirgus@auburnwa.gov>; Hanan Amer <hamer@auburnwa.gov>; info@vrfa.org; Planning <planning@auburnwa.gov>
Subject: 2nd half of email: Catastrophic BESS fire in Moss Landing with scientific proof of 100x to 1000x increase of toxic fallout as far downwind as 27.2 miles downwind

CAUTION: The following message originated from outside the City of Auburn. Be careful opening links and attachments

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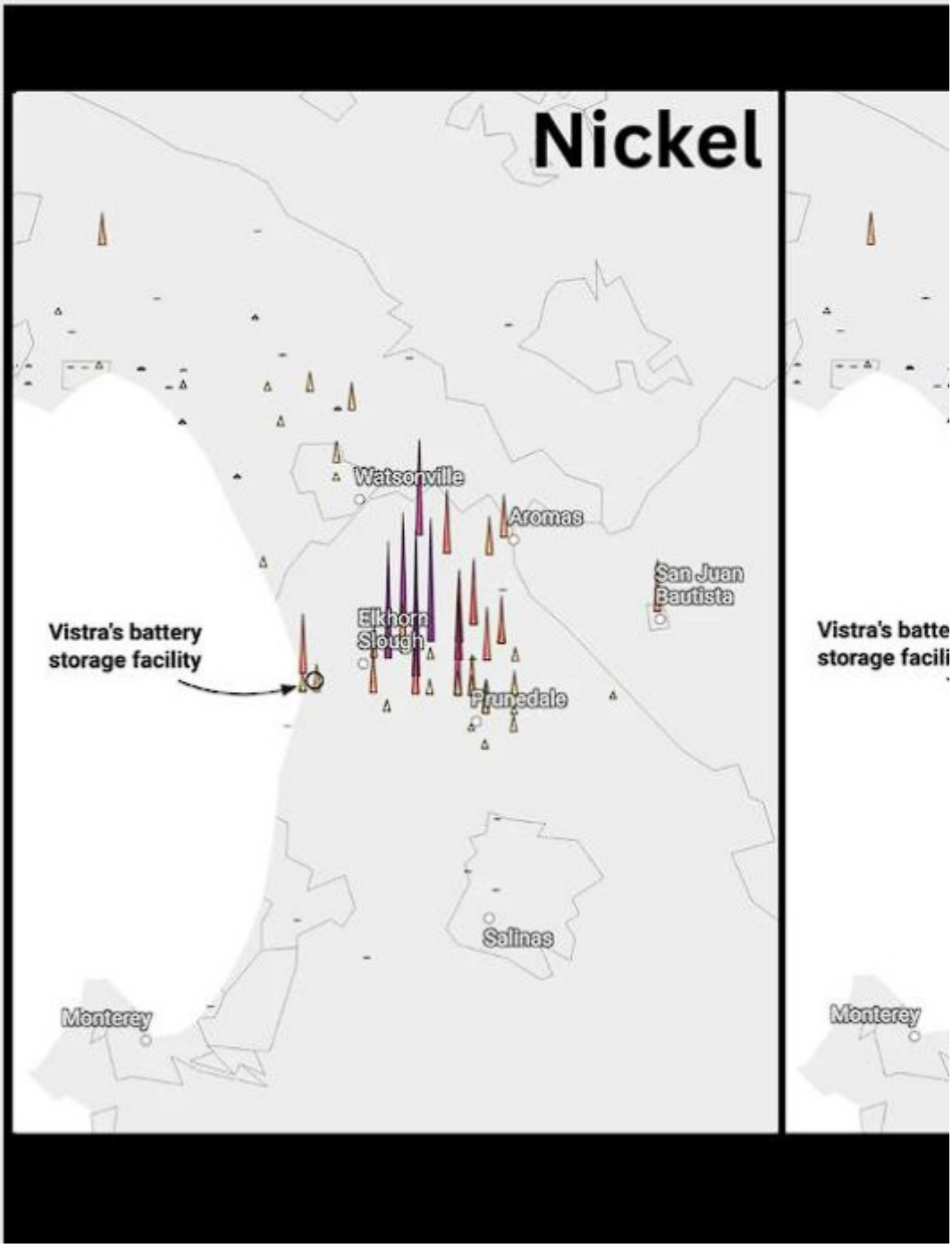
Good afternoon Auburn leaders,

Here's the rest of the email:

And finally, the results from the grass-roots sampling and labs tests:

HUNTERBROOK

BREAKING: NEW DATA INDICA
VISTRA FIRE



The group has also decided to supplement testing efforts by Monterey into their own hands: On the weekend after the fire had apparently bu collected 124 surface wipe samples throughout the Monterey Bay area from patio tables to solar panels to hot tub covers.



Never Again Moss Landing, a group of residents who conducted independent soil and water testi storage facility on February 8, 2025, in Moss Landing, Calif. Source: Ruth Dusseault/Bay City New

Data analysis reveals elevated heavy metal concentrations following

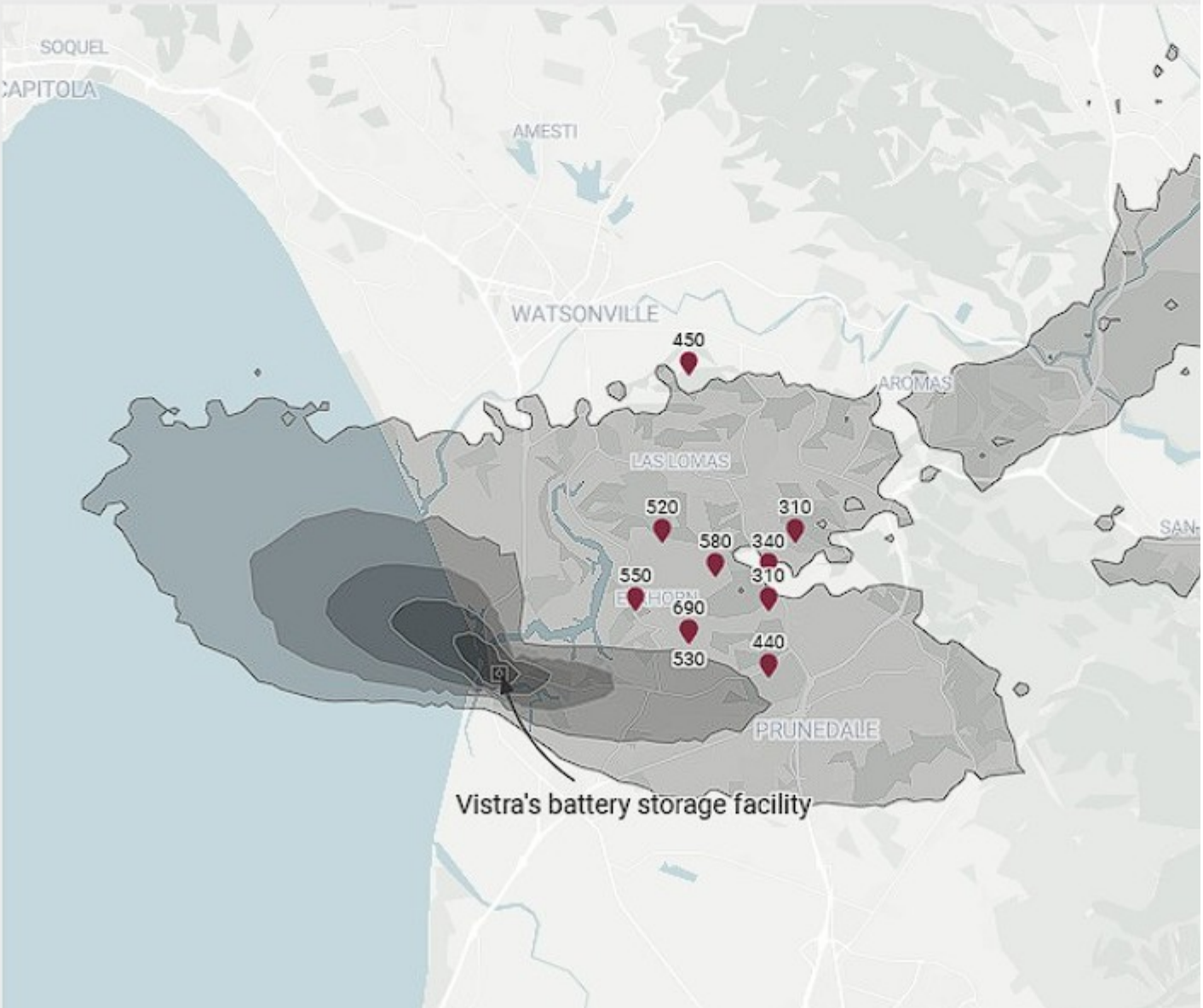
Hunterbrook's data visualizations show that nickel, cobalt, and manganese l
elevated east and northeast of the Vistra facility, which matches plume mod
Peter Weiss-Penzias, a researcher at University of California, Santa Cruz, tha
from the fire moved in that direction — suggesting a connection between hig
concentrations and the fire.

Highest Heavy Metal Concentrations

Measured in µg/100cm²

Click on the buttons below to switch between metals:

Nickel Cobalt Manganese Lithium

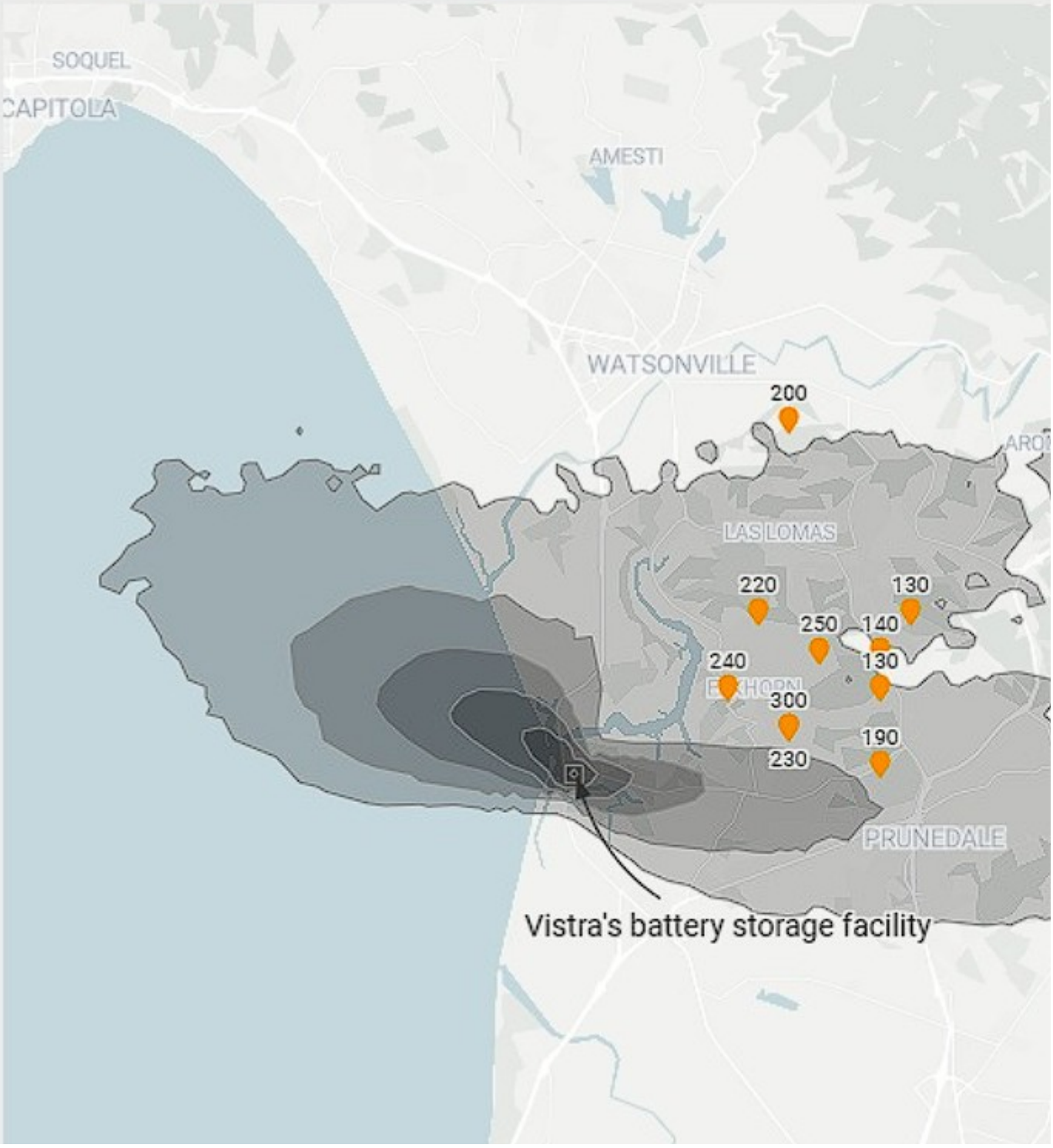


Highest Heavy Metal Concentrations

Measured in µg/100cm²

Click on the buttons below to switch between metals:

Nickel | Cobalt | Manganese | Lithium

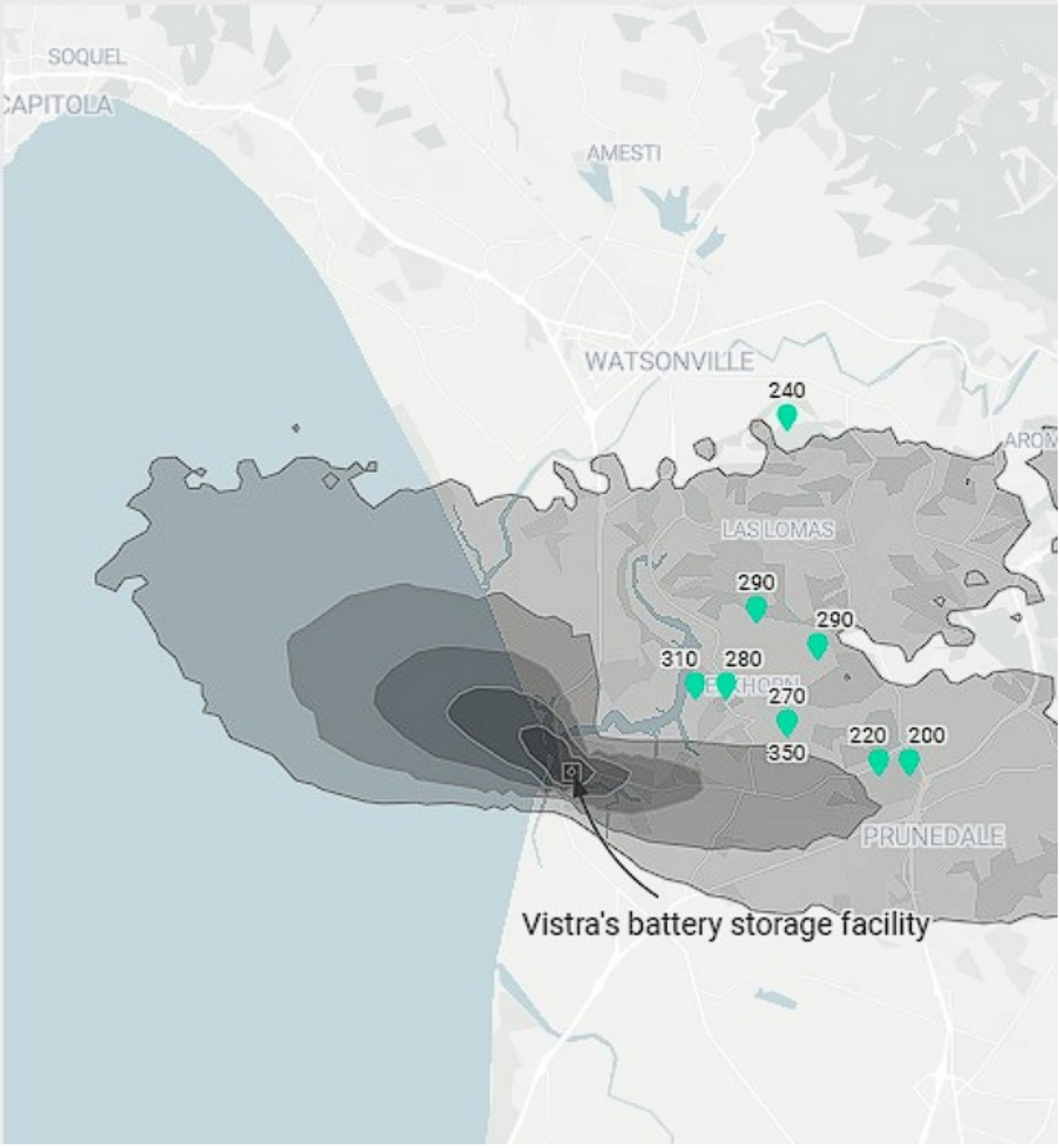


Highest Heavy Metal Concentrations

Measured in µg/100cm²

Click on the buttons below to switch between metals:

Nickel Cobalt Manganese Lithium



Highest Heavy Metal Concentrations

Measured in µg/100cm²

Click on the buttons below to switch between metals:

Nickel | Cobalt | Manganese | Lithium

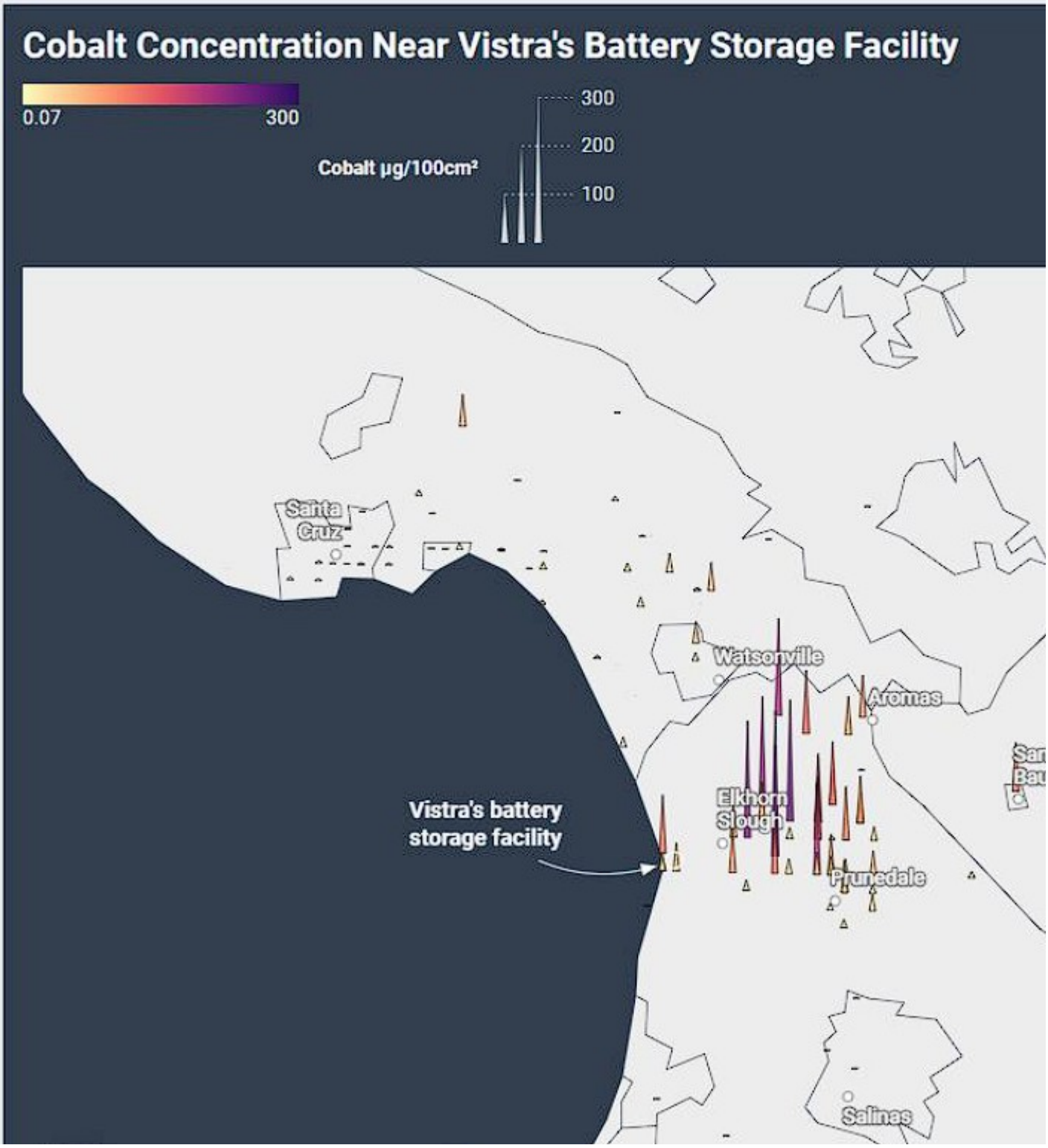


Moss Landing facility on average have nickel and cobalt concentrations tha
higher than the levels found in samples collected further away from the pl



Several samples close to the facility showed elevated nickel and cobalt concen
180 times higher than the average levels more than 20 miles away.

Manganese concentrations within the 20-mile radius are more than 12 times
outside. Lithium levels are three times higher.



BREAKING: New Data Indicates Elevated Heavy Metal After Vistra Fire

Feb 11, 20255:55 pmBy:Till Daldrup Ruth Dusseault Michelle Cera Bay City NewsEditor:Sam Koppelman

- Surface sample testing conducted by a grassroots community response group shows elevated heavy metal concentrations near Vistra Corp.'s (NYSE: $VST) battery storage facility in Moss Landing, California, after a lithium-ion battery fire burned for several days.
- A Hunterbrook analysis of the testing data shows that samples taken within 20 miles of Vistra's Moss Landing facility on average have nickel and cobalt concentrations that are about 34 times higher than the levels found in samples collected further away from the plant.
- Preliminary soil test results published by Monterey County also show cobalt concentrations above screening levels for all selected testing sites. San José State University researchers had already found "unusually high concentrations" of nickel, manganese, and cobalt in marsh soil at a nearby estuary.
- Planning documents obtained by Hunterbrook via FOIA request show that the Monterey County Planning Commission waived a more thorough environmental review when it considered Vistra's application to build the Moss Landing battery energy storage facility in 2019.
- More than three weeks after the fire, residents are still reporting health issues, including headaches, respiratory issues, and fatigue.
- When asked about the community surface sample tests, Vistra did not respond. On its incident response website, the company acknowledged the preliminary soil test results published by Monterey County, stating: "More sampling is needed to understand how the results compare to relevant screening levels."

MOSS LANDING, Calif. — "I have lithium in my blood," Heather Griffin's voice quivered as she spoke to supporters at a demonstration across from Vistra's battery storage facility in Monterey County, California, just weeks after a multiday fire at the plant. "I got tested because I had a metallic taste in my mouth and gums, soreness, and my teeth were sore even a week after the fire was put out."

Griffin is one of dozens of residents who have reported suffering from an illness following the flames, with symptoms including trouble breathing, painful sores, bloody noses, extreme fatigue, and persistent headaches.

For some residents with preexisting conditions, such as asthma or COPD, conditions have worsened.

On Saturday morning, members of the community organized a demonstration under the banner of a new grassroots group: Never Again Moss Landing. The group formed days after the Moss Landing battery energy storage facility fire, with the goal of advocating for community interests and organizing volunteer efforts to collect facts so that the January 16 fire, the second in three years after a fire at PG&E's battery facility in 2022, is the last.

The group has also decided to supplement testing efforts by Monterey County and take matters into their own hands: On the weekend after the fire had apparently burned itself out, volunteers collected 124 surface wipe samples throughout the Monterey Bay area, swabbing everything from patio tables to solar panels to hot tub covers.

Data analysis reveals elevated heavy metal concentrations following path of plume

The samples were shipped to an independent laboratory in Utah for analysis and the group shared the results with Monterey County, the California EPA, and journalists. It also intends to publish the raw data on its website.

A Hunterbrook analysis of the testing data shows that samples taken within 20 miles of Vistra's Moss Landing facility on average have nickel and cobalt concentrations that are abo

Several samples close to the facility showed elevated nickel and cobalt concentrations more than 180 times higher than the average levels more than 20 miles away.

Manganese concentrations within the 20-mile radius are more than 12 times higher than outside. Lithium levels are three times higher.

Hunterbrook's data visualizations show that nickel, cobalt, and manganese levels are mostly elevated east and northeast of the Vistra facility, which matches plume models generated by Peter Weiss-Penzias, a researcher at University of California, Santa Cruz, that indicate the smoke from the fire moved in that direction — suggesting a connection between higher heavy metal concentrations and the fire.

All of the highest concentrations for nickel, cobalt, manganese, and lithium — with the exception of one sample with elevated manganese levels in the Santa Cruz area — were located in or in the direct vicinity of the model showing the smoke plume's extent about 24 hours after the fire started.

Roughly 25,000 people live in the area covered by the smoke plume model.

Trace elements such as nickel and cobalt occur naturally. Their compounds can be found in soil, plants, and animals. While small amounts of cobalt and certain other metals can be beneficial for humans and plants, high concentrations can become toxic. Long-term exposure may cause health problems and adversely affect plant growth.

The samples in this community-organized test were collected with wipe sampling kits. While this data shows that surface levels of heavy metals are elevated closer to the Vistra facility, it is not easily comparable with heavy metal baseline data or EPA screening levels, according to Michael Polkabla, the industrial hygienist who conducted the surface sample tests for the Moss Landing community group.

"What we wanted to capture was what was the impact of the Vistra fire incident and what was coming out of that smoke plume and soil on surfaces," he said. "We're looking at an increase as we get closer to the site."

Community testing results build on data from county, university

The County of Monterey conducted soil tests in collaboration with the California Department of Toxic Substances Control. Preliminary results were published on January 31.

Cobalt exceeded screening levels at all testing sites. One of the eight chosen testing sites exceeded screening levels for nickel, manganese, and copper, in addition to cobalt. It is located northeast of the Vistra facility, where the smoke plume moved. The County emphasized that the data has not been fully analyzed or validated and is not conclusive.

When asked about the community surface sample tests, Vistra did not respond.

On its incident response website, the company acknowledged the soil test results published by Monterey County, stating: "These are preliminary test results that are designed to determine areas that may benefit from additional study. More sampling is needed to understand how the results compare to relevant screening levels."

Vistra also said that it is conducting its own soil sample tests with a third-party contractor. So far, however, Vistra does not appear to have published the results.

The community and county test results add to other scientific evidence suggesting that the fire at Vistra's facility may have caused elevated heavy metal concentrations in the surrounding areas. After the fire, San José

State University researchers found unusually high concentrations of nickel, manganese, and cobalt in marsh soil at a nearby estuary.

Documents reveal Vistra avoided environmental review

Planning documents obtained by Hunterbrook show that the Monterey County Planning Commission waived a more thorough environmental review when it considered Vistra's application to build the Moss Landing battery storage facility in 2019, stating that there was "no substantial evidence that the proposed project as designed, conditioned and mitigated will have a significant effect on the environment."

In the May 2019 meeting commission meeting where it voted to waive the review, the commission did not discuss a fire at the Vistra facility and its potential environmental impact. The application included a fire safety plan, which the local North County Fire Protection District reviewed and deemed acceptable.

The plan at the time of the application did not account for a multiday fire at the facility. An emergency response plan from 2023 that Vistra posted on its incident response site assumed the "worst case" scenario to be a fire extinguished after 30 minutes.

Hunterbrook obtained a letter that the Monterey County Board of Supervisors sent to Vistra and PG&E, which operates an adjacent battery storage facility, in the aftermath of the January 16 fire. In the letter, the board requests that both companies develop emergency response plans that include a "catastrophic worst case scenario" defined as a "full conflagration" of the facilities.

"The approval of both Vistra and PG&E's battery facilities never received the fullest review and robust public discussion that they deserved," wrote Glenn Church, supervisor for Monterey County District 2, in a blog post about the Moss Landing fire. "They were promoted as a great step forward for our energy future. The downside was never properly vetted."

The Vistra facility is based in the Salinas Valley, an area also known as "America's Salad Bowl." It produces 70% of the lettuce grown in California, as well as other fruits and vegetables, including broccoli, cauliflower, spinach, strawberries, tomatoes, grapes, and artichokes.

According to the Monterey County Farm Bureau's 2023 crop report, the region produces vegetables and fruits with a gross production value of about $4.3 billion. Produce sourced from Salinas Valley is sold in grocery stores across the country.

Because it's winter, there were few crops in fields at the time of the fire, according to the Farm Bureau.

"[Agricultural] Associations are working to assess any impacts and ensure that crops, farmworkers, and consumers are safe," Norm Groot, the Farm Bureau's Executive Director, wrote in an email to Hunterbrook. "It should be noted that 'heavy metals' such as those involved in the emissions from this fire are elements commonly found as natural plant micronutrients. Experts do not anticipate significant plant uptake or toxicity concerns based on current soil pH levels and organic matter composition."

New regulations may follow the fire

Rules for approving battery storage facilities may become stricter in California in reaction to the fire.

California Assemblymember Dawn Addis introduced a bill that would return approval authority over battery energy storage facilities back to local communities, closing an authorization bypass through California's Energy Commission. It would also require facilities to be built at least 3,200 feet away from homes, schools, and hospitals.

The California Public Utilities Commission (CPUC) also proposed new safety standards for battery facilities that would "increase oversight over emergency response action plans" and establish "technical logbook standards." The proposal will be voted on at a CPUC meeting on March 13. The CPUC's Safety and

Enforcement Division has started an investigation of Vistra's facility, "requesting information and updates" from the company.

Residents say they continue to suffer

More than three weeks after the fire, local residents told Hunterbrook they are still experiencing health issues. And many of them are frustrated with Vistra's and county officials' responses.

The Monterey County Department of Health said that as of January 31, it had received 27 reports from people concerned about their health and the Vistra power storage facility fire. The most common symptoms reported included "eye, nose, and throat irritation; metallic taste or smell; and exacerbation of chronic respiratory problems like asthma."

Marcy Castro had a bad feeling when her daughter returned to elementary school, three days after the fire apparently had burned itself out.

They both had experienced intense headaches and fatigue during and after the fire, and the school is only five miles from the facility. She asked the school's office staff and the principal about possible health impacts from the fire and protocols for cleaning the playground from debris that may have traveled from the burning battery facility. "'Clueless' I guess is a good word," she said. "They're all kind of clueless about what should be done."

When she picked her daughter up from school, she noticed a peculiar — but somewhat familiar — taste.

"I notice that for a few hours afterwards I'm having that weird taste on the tip of my tongue like I've been testing batteries all day," she says. "Like you know we were kids and you tested the square batteries and you'd have that weird taste and feeling on the tip of your tongue. I get that when I go over there."

After she heard that her daughter's class was running laps outside in gym class, she decided to keep her home, fearing exposure to the air near the facility could impact her health.

Like many of the residents Hunterbrook spoke with, Sherry Okamoto has been navigating persisting symptoms in the aftermath of the fire. What began as headaches turned into a hard time breathing, nausea, wheezing, and rashes. Okamoto, who said she struggles with autoimmune disorders, has relied on respiratory support since the fire.

"When things hit me, it hits me hard," she said, and added, "I'm lucky I have my breathing machines."

Her two-year-old granddaughter has also experienced respiratory issues since the fire. One of her chickens died, her cats and dog have been wheezing, and her duck pool is covered in an oily film. She is concerned her homegrown produce and eggs might be contaminated.

"I'm not going to give it to my kids," she said. So she pulled up her whole garden.

Okamoto feels left behind. "Nobody will answer us," she lamented after detailing a lack of support and information from Vistra and the state government.

Stephanie, who is using a pseudonym because she doesn't want her name published, is in a similarly difficult position. The sole caretaker for her 77-year-old husband, who has Parkinson's, her past few weeks have been marked by extreme anxiety and stress. "I've never been this scared in my life," she said. "My husband doesn't breathe well. He has a compromised system … I worry about him."

Stephanie told Hunterbrook she and her husband never got evacuation warnings or information about air contamination. "No one was looking out for us," she said. And when the EPA released a statement informing residents that the air posed no risk to public health, Stephanie mentioned she did not believe it. "We feel that we were ignored."

Shiree Ames Goins and her husband were living about seven miles from the Vistra plant at the time of the fire. She described a series of cascading symptoms that first night — headaches, nausea, a chemical taste in her mouth, and eventually, a heavy feeling in her chest and belabored breathing.

After speaking on the phone with her doctor, she and her husband knew they had to leave the area. She told Hunterbrook they rented an Airbnb north of their home for about two weeks. While their symptoms persisted because the plume from the fire had also traveled north, they found that their symptoms became less intense the farther they got from home.

When they returned to their home, her symptoms came back. She now worries her home will not be livable, and she will be unable to sell it to someone else in good conscience. “We could end up being homeless.”

“We’re going into the third week,” Goins said, “and everybody’s still living here amongst this toxic, invisible, possibly carcinogenic material.”

And she said she has had very little guidance or support from elected officials or Vistra: “I would have never dreamt in Monterey County that this would not only happen but have such an underwhelming response.”

“The doctors and the labs don't know what to do,” said Brian Roeder, a community facilitator for Never Again Moss Landing. Roeder said he spent $2,700 of his own money to help pay for the volunteer’s test kits.

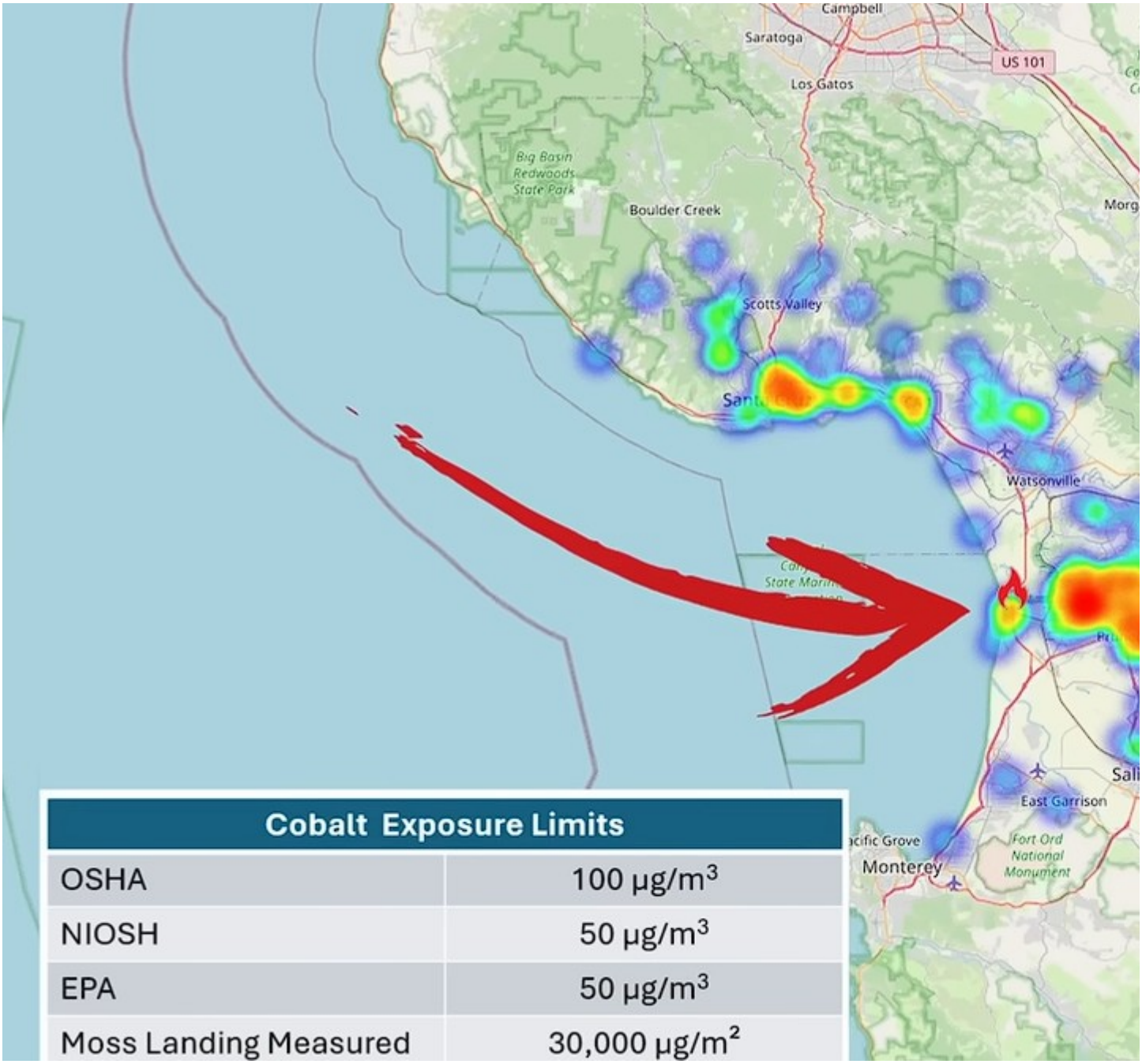
Jill Amos, whose work as a realtor requires her to be outside a lot, has struggled to get heavy metals blood testing done with her doctor. “No one is prepared, not even our medical facilities,” she told Hunterbrook.

Goins also had difficulty getting heavy metals testing done, and she recalled her doctor telling her that her symptoms might be from anxiety. “You have to prove to people that you’re sick. They think it’s in your head.”

“I think they're waiting for Sacramento,” Roeder told Hunterbrook, referring to the county’s hesitance to take big action on public health. “The cavalry is not coming. Look, guys, you need to tell the labs and the doctors: A) People are going to come in. B) Something did happen. This is a test they need. This is how they can get it, right. And we'd like to know the results. And none of that's happened because I think they're expecting the feds and the state to come in and do that. And they haven’t. The EPA left, and that was it. The fire is out. We're gone. Nothing happened. Nothing to see.”

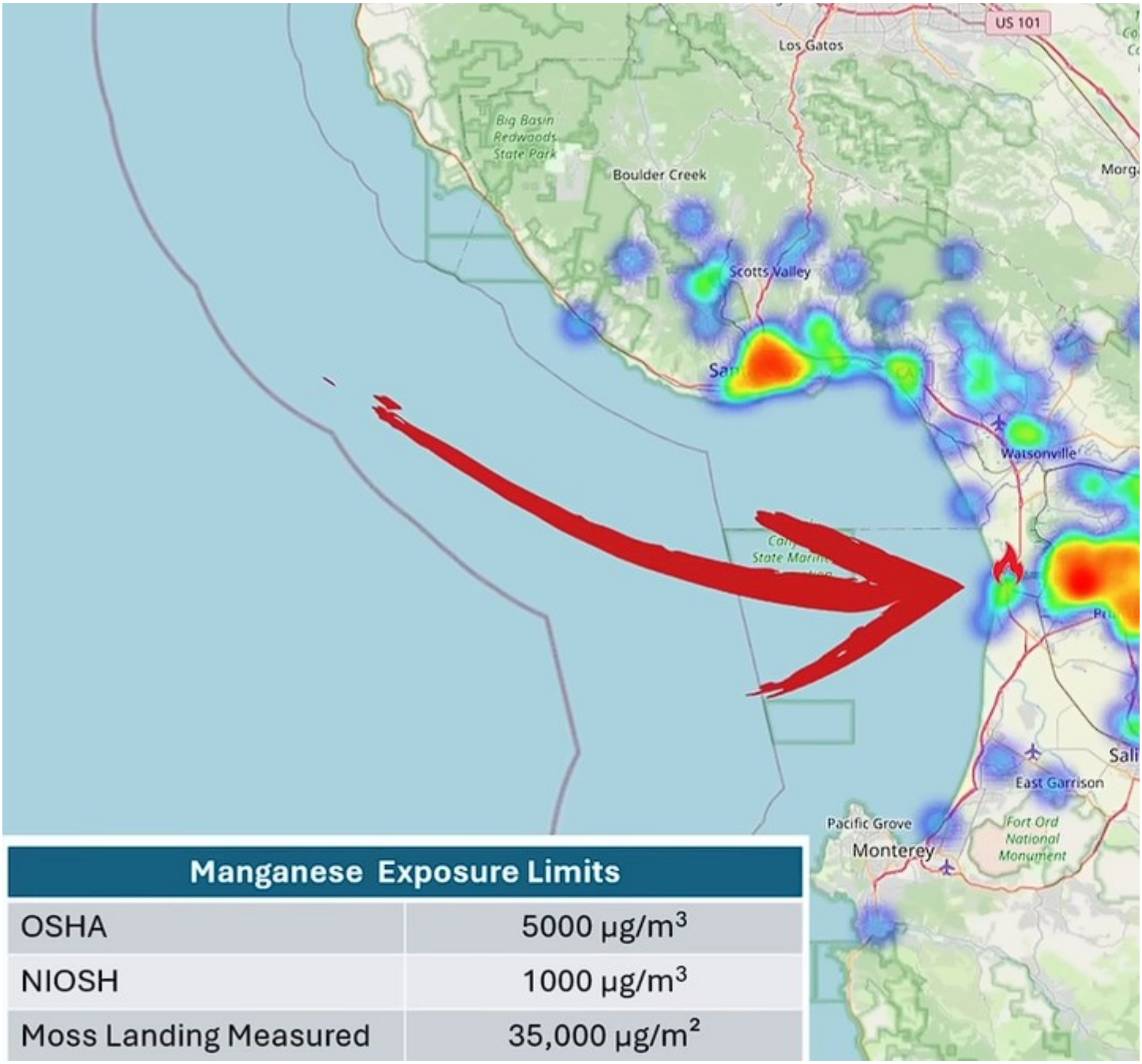
https://hntrbrk.com/vistra-data/?fbclid=IwY2xjawIpziRleHRuA2FlbQIxMAABHbZN-Mpvgu7UG0mwEeLBJcT15oJUbA2ZJP7ToVUukZfgru85D-8cSTY4bA_aem_d2nLua8E6flctsz9KUeaRA

To give you a better understanding of what the data means, here are some charts showing the OSHA, NIOSH, and EPA limits allowed compared to the lab test results:
COBALT:



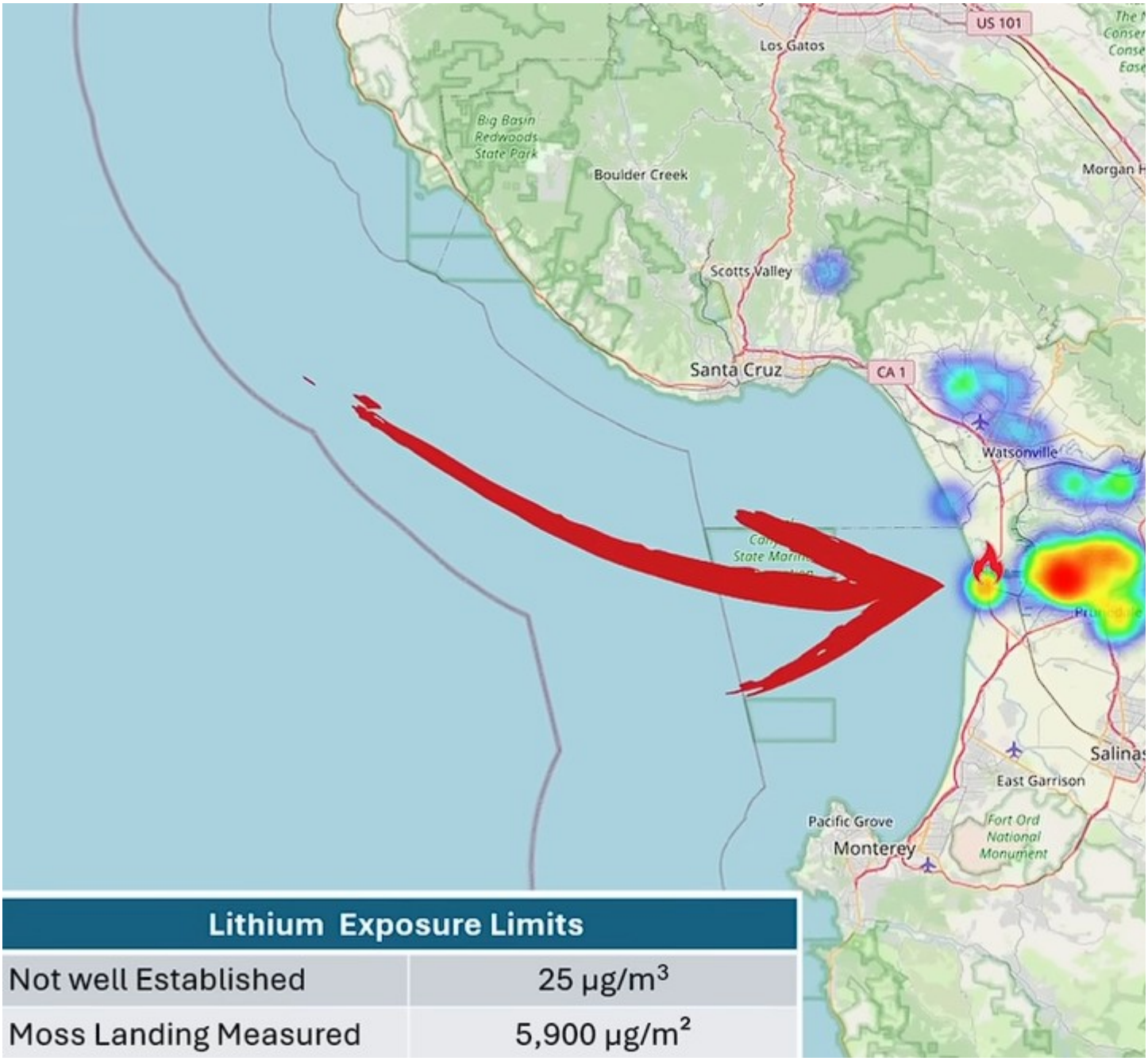
Cobalt Exposure Limits	
OSHA	100 µg/m^3
NIOSH	50 µg/m^3
EPA	50 µg/m^3
Moss Landing Measured	30,000 µg/m^2

Manganese:



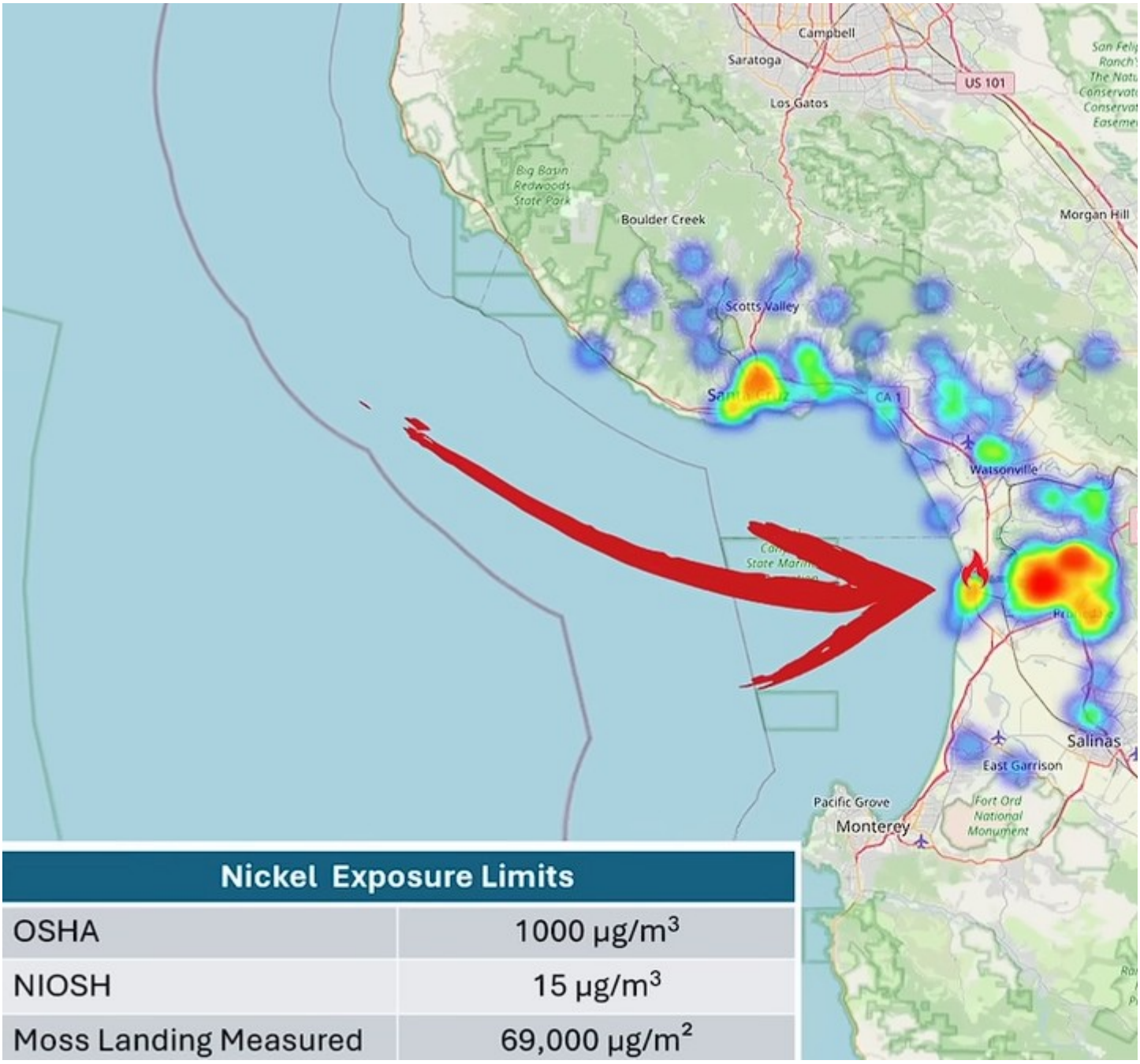
Manganese Exposure Limits	
OSHA	5000 µg/m^3
NIOSH	1000 µg/m^3
Moss Landing Measured	35,000 µg/m^2

Lithium:



Lithium Exposure Limits	
Not well Established	25 µg/m^3
Moss Landing Measured	5,900 µg/m^2

Nickel:



Nickel Exposure Limits	
OSHA	1000 µg/m^3
NIOSH	15 µg/m^3
Moss Landing Measured	69,000 µg/m^2

Here's a chart showing the comparison of the Moss Landing BESS fire fallout lab results compared to typically high exposure jobs and the levels those jobs expose employees to:

	Moss Landing			Boat Mai	
	Average	Min	Max	Average	M
Lithium	1,250	250	5,900	7	
Cobalt	3,950	8	30,000	90	
Manganese	5,795	13	35,000	240	
Nickel	9,387	29	69,000	550	

*All units are $\mu g/m^2$

No one knows how long the effects of the fallout from the BESS will harm the environment and everything living in the fallout zone that has been scientifically proven to have fallen as far out as 27.2 miles away:

	A	B	C
1	##	Location	Coordinates t second decim
117	1052	- Empire Grade, Santa Cruz, CA 95060	37.01, -122.08
118	1088	- Vine Hill Rd, Santa Cruz, CA 95065	37.08, -121.98
119	1033	- Macarthur Rd, Felton, CA 95018	37.04, -122.07
120	1149	- McAdams Ln, Felton, CA 95018	37.06, -122.06
121	1022	- Pine Dr, Felton, CA 95018	37.04, -122.09
122	1029	- CA-9, Ben Lomond, CA 95005	37.09, -122.09
123	1030	- Pine Flat Rd, Santa Cruz, CA 95060	37.06, -122.15
124	1070	- Ocean St, Davenport, CA 95017	37.01, -122.20
125	1073	- Westridge Dr, Portola Valley, CA 94028	37.39, -122.21

And have 100s of documented exposure victims as far away as 30-40 miles downwind:

If you don't want to risk contaminating all the surrounding areas around lithium BESS, and help prevent contamination potentially as far away as 27.2 miles downwind from each lithium BESS from being impacted by toxic fallout, please open a line of communication with the Governor, any and all Agencies, Indian Tribes, and communicate the risks based on evidence from previous BESS fires (especially the new fallout data from the Jan 16th 2025 Moss Landing BESS fire).

#2 Please require soil samples to be taken at every property for at least a 2-mile radius surrounding BESS so we have historical records- so when there is a lithium BESS fire, there is no question about toxins pre-existing as we will have the historic sampling documentation.

#3 Require catastrophic levels of insurance for every lithium BESS to cover full medical coverage for exposure victims, 100% property de-contamination, and 100% environmental clean up for at least the surrounding 2 miles- if not 10 or 20 miles...

#4 Please create setback requirements for all lithium BESS- CA has a proposed law (AB-303 Battery energy storage facilities) requiring a 3200ft setback from any sensitive locations (homes, schools, hospitals, care facilities) and sensitive environments. Ideally, we could get 5 miles or more in light of the fallout evidence showing wind can carry the fallout 27.2 miles away...

This should be enough proof that BESS have the potential to have significant (if not catastrophic) environmental impacts and should not be allowed any where near sensitive environments like homes, schools, hospitals, nor near environmentally sensitive environments.

And, in case you are wondering about spraying defensive and containment water spray/mist to capture the toxins before they can be blown around by the wind, please don't forget the 3-miles of total fishkill at another lithium battery fire where the run-off from fire fighting killed everything instantly almost 3-miles down stream from the lithium battery fire:

Nearly 3 miles of dead fish found in Fredericktown after battery plant fire, official says

Officials are monitoring the nearby Little St. Francis River to see if fish kills are happening further downstream, the Missouri Department of Conservation said.



https://www.ksdk.com/article/news/local/fredericktown-mo-battery-plant-fire-dead-fish-kill-updates-investigation-firefighting-foam-lithium-battery-fire/63-02253d7c-de87-450d-a324-c78b5d404b88?fbclid=IwY2xjawIp7zpleHRuA2FlbQIxMQABHY11eVpfaOMhlKHDPG4ok6I6qVmBOcV-x_ERFUkkYxtcUtXUpjBQNjEnkA_aem_NzcL2KS7HteeIQWamlQsgQ



[Missouri battery plant fire leaves miles-long trail of dead fish | ksdk.com]

That's the one thought Dave Knuth, a fisheries biologist with the Missouri Department of Conservation, said he had when approaching the site of a 2 1/2-mile-long fish kill Friday near Fredericktown.

www.ksdk.com

If you have made it this far- thank you!

I know this is a lot and I would be more than happy to meet with you virtually or in person to discuss further- as I barely touched on the evacuation and shelter-in-place orders, road/Highway closures, and why those are needed (in short, due to all the gases and toxins that are released from burning lithium batteries) and to answer all you questions...

The scary thing is, is there are hundreds of people that have exposure symptoms (burning eyes, nose, throat, lungs, difficulty breathing, skin rashes/burns, headaches, dizziness, open sores, exhaustion, constant metallic taste in mouth, and many other symptoms across Monterey and downwind into other Counties and many lawsuits have been filed with many more on the horizon... People who evacuated said symptoms started whent hey came back- people with symptoms who leave start to feel better, but once they return home the symptoms return... Knowing about the toxic levels of fallout that are all over explains this... Unfortunately, the BESS owner has only offered a $750 gift card to the people who live the closest to help cover evacuation costs, but hasn't done anything to help people with clean up. Hasn't said anything about cleaning up Elkhorn, Monterey Bay- and say it may be years before the BESS fire site is cleaned up due to toxicity/contamination....

People are still experiencing exposure symptoms today- two months after the fire started and there is a FB Group with almost 4k members where people are posting up pics, sharing documents, and info about their symptoms.

Monterey County didn't issue Guidance for Medical Providers until almost a month after the fire:

Health Advisory for Medical Provid

February 13, 2025

From: Edward L. Moreno, MD, MPH
Health Officer & Director of Public Health
831-755-4585

Kristy Michie, MS
Assistant Director of Public Hea
831-755-4503

Guidance for Health Concerns Related to Ja
Vistra Energy Storage Facility Battery Fir

Current Situation

On January 16, 2025, the County of Monterey Health Department was notified of a battery f energy storage facility located in Moss Landing. Smoke was visibly emitting from the facility through January 19. Because the smoke's composition was unknown, the County of Monte Operations Center issued guidance to residents in the area who could see or smell smoke t indoors and wearing a well-fitting respirator. Due to the composition of batteries located at immediate air quality concerns included particulate matter, hydrogen fluoride gas, and nicke cobalt dusts.

Early air monitoring data by the US EPA indicated that levels of hydrogen fluoride gas did n standards outside of the facility's perimeter during the fire. Monterey Bay Air Quality District matter monitoring sensors near Moss Landing in Castroville, Watsonville, Prunedale, and A to moderate air quality during the fire. County of Monterey Health Department's Environmer (EHB) collected samples from drinking water systems in the Moss Landing area. The report manganese, copper, aluminum and nickel in the samples did not exceed the associated reg contaminant level (MCL) or Public Health Goal (PHG) for drinking water. Department of Tox Control (DTSC) testing indicated there are not elevated metals associated with the fire in sc areas within four miles of the facility.

While progress is being made by multiple agencies on additional air, soil, and water testing characterize what, if any, exposures may have occurred, patients may have ongoing questi about their health. County of Monterey Health Department consulted with subject matter ex California Department of Public Health and compiled the below information for health care p

Recommendations for Health Care Providers

- **Take a detailed risk history.**
  - Patients presenting with symptoms possibly related to exposure to contaminated air should be evaluated with a thorough history and physical.

So, finally... We know we need massive amounts of grid scale storage- but lithium BESS are NOT the answer... So what is the solution? Fortunately, there are many solutions that are totally safe and have none of the risks, concerns, issues of lithium BESS. To name a few categories, there are many types and many vendors of each of the following: gravity based storage, pumped hydro storage, compressed air energy storage, liquid to air energy storage, thermal energy storage, hydrogen storage, and even other non-lithium based battery energy storage options.

We need everyone to understand that lithium BESS brings potential for significant/catastrophic impacts on the environment.

Again, please do not hesitate to reach out with any questions.

Thank you,

James

Gabriel Clark

From: Planning
Sent: Thursday, February 12, 2026 8:14 AM
To: Gabriel Clark
Subject: FW: New evidence proves Lithium BESS require significant setbacks from schools, hospitals, and homes

Follow Up Flag: Follow up
Flag Status: Completed

fyi

Owen Goode
Planner II
Department of Community Development
City of Auburn | www.auburnwa.gov
Phone: (253) 470-2170 | ogoode@auburnwa.gov
Mailing Address: 25 W Main Street, Auburn, WA 98001
Permit Center Address: 1 E Main Street, Auburn, WA 98002 (Map)
Customer Service Survey | Application Forms | Zoning Maps

From: James DeLay <jamesdelay@hotmail.com>
Sent: Wednesday, February 11, 2026 12:59 PM
To: Cheryl Rakes <CRakes@auburnwa.gov>; Tracy Taylor <ttaylor@auburnwa.gov>; Brian Lott <BLott@auburnwa.gov>; Clinton Taylor <ctaylor@auburnwa.gov>; Lisa Stirgus <LStirgus@auburnwa.gov>; Hanan Amer <hamer@auburnwa.gov>; info@vrfa.org; Planning <planning@auburnwa.gov>
Subject: New evidence proves Lithium BESS require significant setbacks from schools, hospitals, and homes

CAUTION: The following message originated from outside the City of Auburn. Be careful opening links and attachments

Good afternoon Auburn leaders,

All lithium BESS will cause significant environmental impacts when they have an unpreventable and unextinguishable thermal runaway event and they should require massive setbacks.

FYI, two Lithium BESS that had fires are now under the EPA's control/management for cleanup (Otay Mesa, CA and Moss Landing, CA), which is expected to take years.

Simply put, there is no 100% effective fire/thermal runaway prevention technology nor is there an 100% effective extinguishing technology to make lithium BESS "safe"- current Standard Operating Procedure (SOP) for emergency response crews is to evacuate the area and let the BESS burn itself out- with an option to spray misting water to cool down nearby containers and/or attempt to capture the toxins in the mist and reduce the spread of those toxins.

Here's new evidence about why we need significant setbacks/evacuation distances:

Industry influenced code that was cowritten by BESS developers, NFPA-855, says only a 10ft setback is required from schools and homes:

> **NFPA 855 Standard Setbacks**
>
> - **Near Exposures (Residential/Schools):** For outdoor BE or lot lines that can be built upon (such as homes and sc of **10 feet (3 meters)** is required from various exposures
> - **Remote Locations:** To be classified as a "remote" instal stringent requirements—the BESS must be located more

Contrasting that significantly, is the 1/3rd mile Evacuation in all directions for fires involving "Lithium Ion and Sodium Ion Batteries" found in the latest (2024) Emergency Response Guide Section 147 - which is the firemen's ultimate guide to emergency responses:

GUIDE 147 LITHIUM ION AND SODIUM ION BATT

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- Lithium ion and sodium ion batteries contain flammable liquid electrolyte produce sparks when subjected to high temperatures (> 150°C (302°F)), mechanical damage or electrical overcharging).
- May burn rapidly with flare-burning effect.
- May ignite other batteries in close proximity.

HEALTH

- Contact with battery electrolyte may be irritating to skin, eyes and mucou
- Fire will produce irritating, corrosive and/or toxic gases.
- Burning batteries may produce toxic hydrogen fluoride gas (see GUIDE 1
- Fumes may cause dizziness or asphyxiation.

PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shi** not available or no answer, refer to appropriate telephone number listed
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering, but only if properly trained and e

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing provides thermal protection **but or**

EVACUATION

Immediate precautionary measure

- Isolate spill or leak area for at least 25 meters (75 feet) in all directions.

Spill

- Increase the immediate precautionary measure distance, in the downwin

Fire

- If rail car or trailer is involved in a fire, ISOLATE for 500 meters (1/3 mile) evacuation including emergency responders for 500 meters (1/3 mile) in

https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/2024-04/ERG2024-Eng-Web-a.pdf?fbclid=IwY2xjawPffZNleHRuA2FlbQIxMABicmlkETFTVVg4Y1UwWklBeUR0MWtHc3J0YwZhcHBfaWQQMjIyMDM5MTc4ODIwMDg5MgABHj8lwDu30wMHnGeYL9VfP6IxDzOeWTAJKN6Cp9qpK4-5GKHIk4qiWTao10zY_aem_eSxkgWRuCVeJcnBWiFWHtQ

They also suggest 800 meter or ½ mile evacuation for toxic and/or corrosives in a fire:

GUIDE 154 — SUBSTANCES - TOXIC AND/OR CORR (NON-COMBUSTIBLE)

POTENTIAL HAZARDS

HEALTH

- **TOXIC and/or CORROSIVE**; inhalation, ingestion or skin contact with ma or death.
- Contact with molten substance may cause severe burns to skin and eyes
- Avoid any skin contact.
- Fire may produce irritating, corrosive and/or toxic gases.
- Runoff from fire control or dilution water may be corrosive and/or toxic an contamination.

FIRE OR EXPLOSION

- Non-combustible, substance itself does not burn but may decompose upo and/or toxic fumes.
- Some are oxidizers and may ignite combustibles (wood, paper, oil, clothir
- Corrosives in contact with metals may evolve flammable hydrogen gas.
- Containers may explode when heated.
- For electric vehicles or equipment, GUIDE 147 (lithium ion or sodium ion (sodium batteries) should also be consulted.

PUBLIC SAFETY

- **CALL 911. Then call emergency response telephone number on shi** not available or no answer, refer to appropriate telephone number listed
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Ventilate closed spaces before entering, but only if properly trained and e

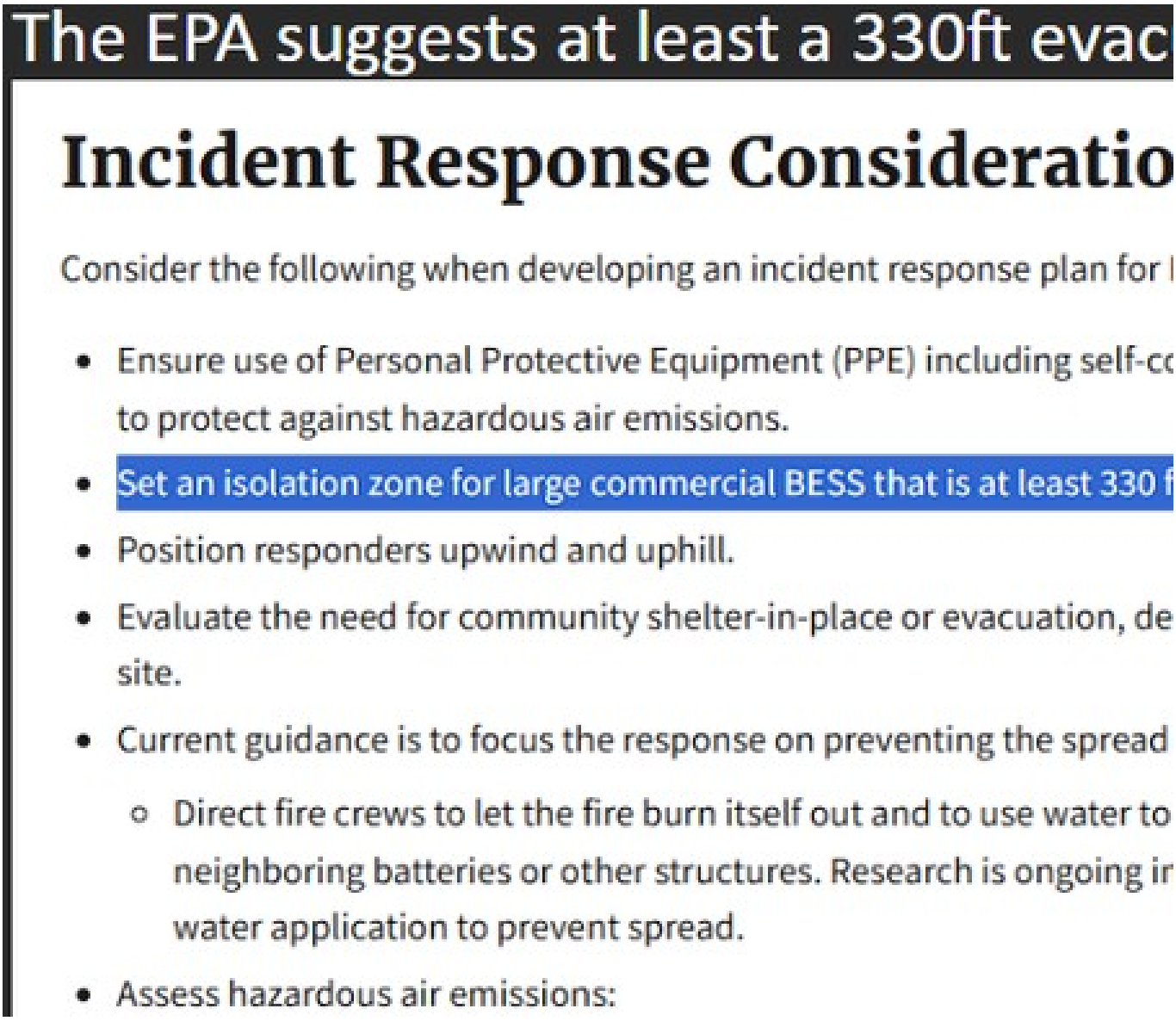
PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by th **NO RISK OF FIRE.**
- Structural firefighters' protective clothing provides thermal protection **but or**

EVACUATION

Immediate precautionary measure

The EPA suggests **<u>at least</u>** a 330ft evacuation:



https://www.epa.gov/electronics-batteries-management/battery-energy-storage-systems-main-considerations-safe?fbclid=IwY2xjawPffehleHRuA2FlbQIxMABicmlkETFMTThlZldyb1NUelloT0Z0c3J0YwZhcHBfaWQQMjIyMDM5MTc4ODIwMDg5MgABHgigOXGqsrebgi-lJaRxe3UhB_KJPBhaek9pI-_W8bbWDaGPeyWeLmfwNsC5_aem_2EOwLRfv-poeW5AdgdsxiA

Which is wholly inadequate in light of the new evidence from the April 2025 Firefighter injury incident where 4 of the 5 Sacramento Firefighters exposed to lithium battery smoke/gasses have been disabled from a single EV battery fire's toxic smoke, and invisible gasses during a POST-fire/POST-extinguished off-gassing event **after the EV fire had already been extinguished and the area/air deemed "safe".**

The firefighters were in "cleanup mode" because the EV had already burned itself out, cooled down, and the incident was considered over/completed and the area was deemed "safe" and the burned carcass of the EV was being loaded up on the tow truck to be removed and taken to a safe storage facility where it can be stored 50ft away from anything combustible due to the possibility of it spontaneously re-igniting up to a month later.



Battery fires can take up to 24 hours to fully cool
visibly subsided, a thermal image camera can be
temperature of the high voltage battery and mon
must be no fire, smoke, audible popping/hissing, or heating pre
least 45 minutes before the vehicle can be released to second
vehicle transporters, etc.). The battery must be completely coo
ond responders or otherwise leaving the incident.

There is always a risk of battery re-ignition. Drain excess water
front of the vehicle approximately 30 cm (1 foot). This operatio
tion.

Due to potential re-ignition, a Model Y that has been involved i
compromised the high voltage battery should be stored in an o
exposure.



WARNING During all firefighting activities, consider t
full PPE including a Self-Contained Breathing Apparatu

High-Voltage Battery — Fire Damage



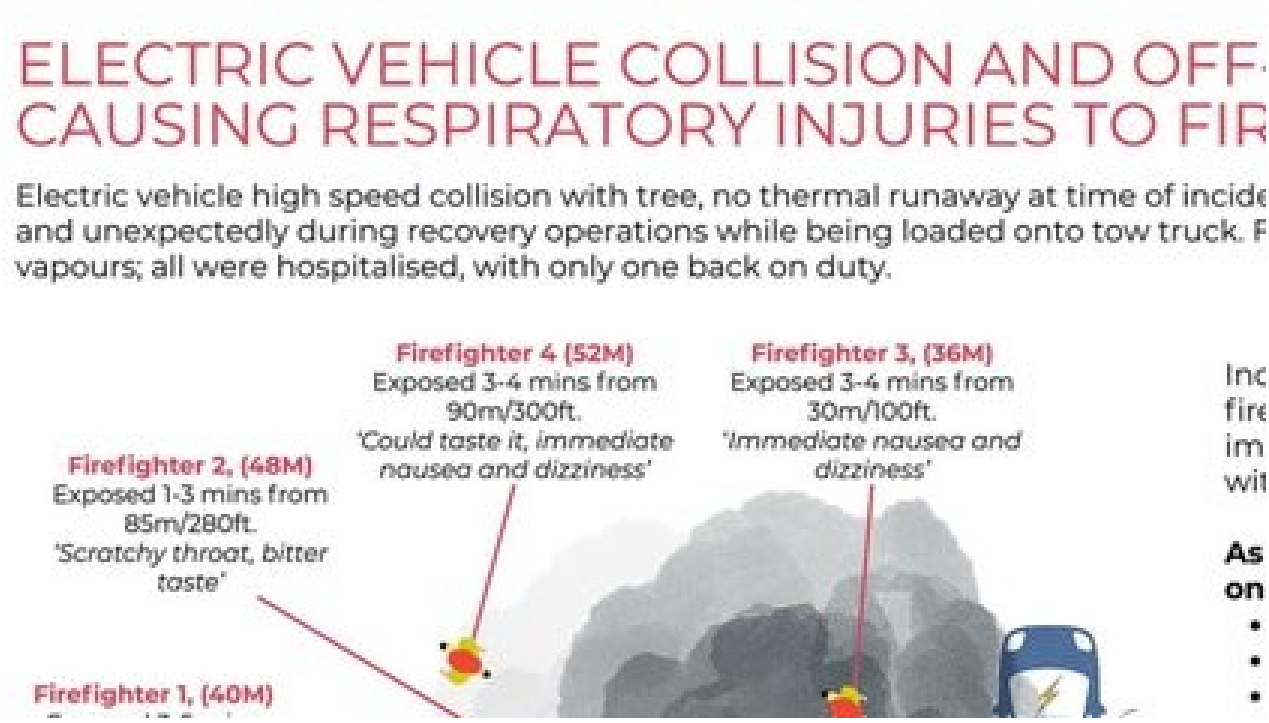
Similar to conventional and other electric and hy
super-heated gases and toxic vapors. This relea
pounds, hydrogen gas, carbon dioxide, carbon
oxides of nickel, aluminum, lithium, copper, cob
should always protect themselves with full PPE,
measures to protect civilians downwind from th



A damaged high voltage battery can create rapi
tice smoke, steam, or audible popping or hissing
assume that it is heated and take appropriate ac

Because the scene was deemed safe, the firefighters removed their HAZMAT gear- including their breathing apparatus to do clean-up.

Three of the firefighters were about 300ft away from the EV when it started off-gassing invisible toxic gases AND they were exposed to the toxins for less than 3-4 minutes, and one was exposed for less than 5 minutes and were taken to the ER quickly as soon as they showed exposure symptoms. The closest firefighter was about 100ft from the EV and was engulfed in both the invisible toxic gasses and visible toxic smoke- he recognized what was happening as he was being enveloped in the smoke and only took one deep breath while in the cloud of smoke and was exposed to the smoke/gasses for 3-4 minutes before being transported to the ER.



The volume of toxins released from a 60KW-90KW Tesla EV that had already burned itself out and had been labeled "extinguished" and the area declared "safe" before the off-gassing started is absolutely miniscule compared to the volumes of toxins that will be released from a single average-sized 3MW-5MW BESS container (please note, BESS facilities can have 100s of these individual BESS containers) that enters thermal runaway (please also be aware that the density is increasing rapidly and 14.5MW BESS containers are now available in a 20ft container size by some Chinese manufacturers and would release nearly 5x-3x the toxins of an average-sized 3MW-5MW BESS container).

Comparing the largest Tesla Model Y EV battery size of 90kw vs the smallest BESS container size of 3MW, it is reasonable to determine the BESS contains 40x the size/volume of batteries and that it would release 33x the toxins...

Here's more info about the Tesla EV incident- Please study the above graphic closely.

Please note the EV car crash occurred on April 11th and all 5 firefighters showed exposure symptoms and were hospitalized within an hour of exposure:

The closest firefighter (#3- who is a 36yr old male) was 100ft away and inside the visible smoke cloud and was exposed to the toxic smoke/gasses for 3-4 minutes before experiencing "immediate nausea and dizziness"

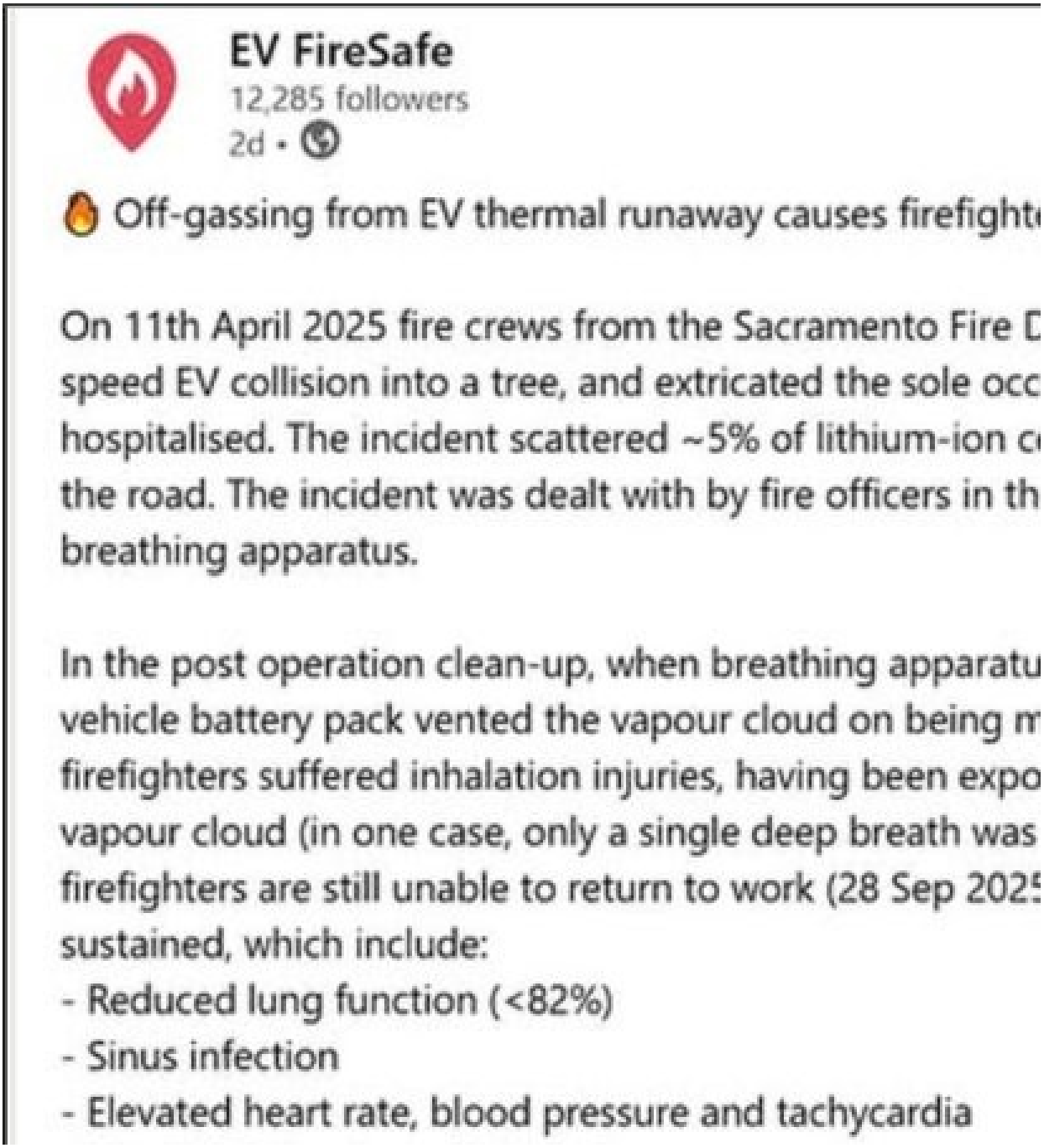
The next closest firefighter (#2- who is a 48yr old male) was 280ft away and outside of the visible smoke cloud, but in the "invisible" gas cloud and was only exposed to the toxic and invisible gasses for 1-3 minutes and experienced "Scratchy throat, bitter taste"

The next two firefighters (#4- who is a 52yr old male and #1- who is a 40yr old male) were both 300ft away and outside of the visible smoke cloud, but in the "invisible" gas cloud and #4 was only exposed to the toxic and invisible gasses for 3-4 minutes (he "could taste it" and experienced "immediate nausea and dizziness") and #1 was only exposed to the toxic invisible gasses for 3-5 minutes ("felt burning in throat and metallic taste")

This occurred on April 11th 2025 and five (5) firefighters exhibited exposure symptoms from the invisible gas cloud and the four (4) "firefighters shown in the graphic above are still unable to return to work due to injuries sustained which include:

- Reduced lung function (<82%) - Sinus infection - Elevated heart rate, blood pressure and tachycardia - Mouth blisters turned into lesions - Renal problems - High concentrations of sulfur, phosphorus & lithium in blood tests"

Here are more details about the fire fighters being exposed to toxic lithium battery fire gasses/smoke:



Here's a news channel video from September (9/30/25) where they mention that the firefighters are still undergoing "experimental" blood transfusions to try to reduce the levels of heavy metals in their blood- and they have no idea if there will be permanent damage to their lungs and bodies...

https://www.kcra.com/article/sacramento-firefighters-injured-toxic-ev-battery-fire/68141225



KCRA 3 | Updated: 5:20 PM PDT Sep 30, 2025 | Editorial Stand



Michelle Bandur

Reporter

SACRAMENTO, Calif. — Sacramento firefighters are facing new electric battery fires, including an **e-scooter that spontaneously combi** Executive Inn and Suites Hotel on Bannon Street.

"When they made entry, they found out there was an e-scooter inside t from the batteries," said Battalion Chief Keith Wade of the Sacramento

Although the fire was small called out hazmat teams fo

"We're seeing these types of fires more and more," Wade said. "How do

Please note:

The four of the five firefighters are still suffering from their brief exposure **more than 9 months later** (after getting to a hospital within an hour of exposure).

Three of the firefighters were in the "invisible" gas for less than 5 minutes

One firefighter was in the cloud of smoke (visible smoke and within 100ft of the Tesla EV) for 3 to 4 minutes- but only took one deep breath.

One of the firefighters started throwing up out the window of the Fire truck while the fire truck was escorting the tow truck to the salvage yard- that fire fighter returned to work a week later.

Another had flu like symptoms that dragged on for weeks and tried to return to work after a couple months, but after reduced performance/capabilities, he was pulled off duty and after further testing, they found that firefighter's lung function had dropped 20% compared to his previous test results and he has not been able to return to work since.

A third firefighter exposed is fighting respiratory and renal symptoms as well as a low exercise tolerance, persistent hyper-tension, tachycardia, and fatigue.

The fourth firefighter has severe fatigue, low exercise tolerance, ongoing respiratory symptoms.

The fifth firefighter, severe respiratory damage (20% loss of lung function), fatigue, cardiac issues, and renal issues symptoms.

Remember, this was an EV's small lithium battery pack- NOT a massive 20ft-40ft shipping container filled with lithium batteries (in a BESS)....

Using this incident as a baseline, a grid-scale **BESS container** representing a **33x increase** in battery capacity (approx. 3 MWh) would result in a massive escalation of toxic gas volume and reach.

1. Calculated Increase in Toxin Volume

For simplicity and because we don't know what volume of toxins remained in the burned Tesla EV's battery after burning for several hours, we will ignore the diminished potential max volume and instead base our calculations on a intact Tesla battery's baseline (avg. 75–82 kWh) and empirical gas release data (approx. 150–250 Liters of gas per kWh), the volume increase scales linearly with the number of cells in thermal runaway.

Metric	Tesla Baseline (75 kWh)	BESS Contain
Total Gas Volume	~11,250 – 18,750 Liters	375,000 – 62
Hydrogen Fluoride (HF)	~1.5 – 15 kg	50 – 500 kg

2. Impact on Spread and Isolation Zones

While volume increases 33.33x, the **physical spread** (toxic footprint) does not scale linearly because it is influenced by atmospheric dispersion and the "jetting" force of the failure. However, the *lethal concentration zone* expands significantly:

- **The "300ft Zone":** In the Tesla incident, 300 feet was the point of permanent disability for less than 5 minutes of exposure. For a BESS fire, the gas density at 300 feet would reach **Immediately Dangerous to Life or Health (IDLH)** levels almost instantaneously, likely resulting in a **fatality** rather than disability for unmasked individuals.

  Calculated Reach: To maintain the same toxic gas concentration experienced by the Sacramento crew (baseline safety), the exclusion zone would need to expand to approximately **1,700 – 2,200 feet** (roughly 0.3 to 0.4 miles) to account for the increased volume and plume buoyancy of a container-level event.

3. Key Findings from the Sacramento Incident

- **The "White Cloud"**: The "low-lying white cloud" described by firefighters was likely a concentrated aerosol of electrolyte solvent and toxic acid gas (HF/POF3).

  Documented Pathologies: The Baseline Formula for injury includes **renal failure, <82% lung function, heart lesions, and high blood metal concentrations** (Lithium, Phosphorus, Sulfur).

BESS Multiplier: Because BESS containers often utilize **LFP (Lithium Iron Phosphate)** or **NMC** chemistries in high-density racks, a single "venting" event in a BESS unit can release the equivalent toxin volume of 33 cars simultaneously, creating a plume that can overwhelm standard fire department decontamination protocols.

Projected HF Concentrations (2,500-foot Radius)

Distance from BESS	Estimated HF Concentration (ppm)	Hazard Classification	Potential H
300 feet	1,500 – 2,500 ppm	Extreme/Lethal	Likely fatal than the
1,000 feet	150 – 300 ppm	Severe Hazard	Exceeds for life-thre death.
1,700 feet	30 – 60 ppm	IDLH Threshold	This is the ' Individuals kidney dam

The following estimates use standard dispersion modeling for large-scale lithium battery venting in outdoor environments.

Critical Scaling Factors

- **Toxin "Loading"**: A standard BESS container can release between **50 and 500 kg of HF** during a thermal runaway event. For comparison, a single EV typically releases only 1.5–15 kg.
-

The 300-Foot Baseline: In the Sacramento case, the 300-foot distance was only "safe" relative to the small volume of one car. For a BESS, 300 feet is considered the **"Hot Zone"** where even standard turnout gear provides **insufficient protection against HF vapor**, which penetrates skin and leaches calcium from bones.

Vulnerability of Schools: Children are more vulnerable to these concentrations because they have a higher lung surface area-to-body weight ratio, meaning they absorb a higher toxic dose than adults at the same 2,500-foot distance.

Hydrogen Cyanide (HCN) is a highly toxic byproduct frequently associated with the combustion and thermal decomposition of Lithium Iron Phosphate (LFP) batteries. Using the **April 2025 Sacramento Tesla incident** as a baseline for firefighter disability, we can project the impact of an industrial-scale BESS container.

1. Calculated Increase in HCN Volume

HCN is an asphyxiant that interferes with the body's ability to use oxygen. While a single EV (75–82 kWh) releases significant toxins, a **2,500 kWh (2.5 MWh) BESS container** represents a **33.33x increase** in fuel mass.

Metric	Tesla Baseline (75 kWh)	BESS Containe
HCN Mass Released	~0.5 – 1.2 kg	16.5 – 40 kg

2. Projected HCN Concentrations (2,500-foot Radius)

The Sacramento crew was permanently disabled at 300 feet by a "low-lying white cloud." For a BESS fire, that same 300-foot zone becomes a **lethal environment** for unmasked individuals.

Distance from BESS	Estimated HCN Concentration (ppm)	Hazard Classification	Poten
300 feet	250 – 500+ ppm	Lethal	Conce fatal v
1,000 feet	40 – 80 ppm	IDLH Threshold	Excee to cau seizur
1,700 feet	15 – 25 ppm	Severe/Disabling	Excee

3. Comparison with the Sacramento Baseline

- **The "Metallic Taste" Indicator**: The Sacramento firefighters reported an immediate "metallic taste," which is a classic symptom of cyanide and heavy metal exposure.

  The 33.33x Multiplier: In a BESS event, the plume is not just larger; it is more "buoyant" and can travel further before dissipating. The 10-minute AEGL-3 (lethal threshold) for HCN is **27 ppm**. At 1,700 feet from a BESS container fire, a bystander would likely inhale a **toxic dose** sufficient to cause permanent disability or death in under 10 minutes.

  Systemic Effects: Unlike HF (which causes acid burns), HCN causes **systemic cellular hypoxia**. The long-term injuries seen in the Sacramento crew—renal failure and heart lesions—are exacerbated when HCN and HF are inhaled simultaneously.

Based on the medical documentation from the **April 2025 Sacramento Incident**, the "white cloud" aerosol acted as a delivery vehicle for heavy metals, leading to systemic toxicity. When scaling this to a **BESS container (33.33x increase)**, the concentration of these metals in the blood of exposed individuals would likely reach critical "toxic metal syndrome" levels almost immediately.

Documented Blood Metal Levels and Pathologies

The Sacramento crew exhibited specific "biochemical markers" that provide a baseline for calculating the risk to residents near a BESS facility.

Metal/Element	Sacramento Baseline (at 300ft)	BESS Scaling Effect (33.33x)	Prima
Lithium	3.5 - 5.0 mEq/L	Lethal Surge	Basel Rang seizu failur
Phosphorus	7.5 - 12.0 mg/dL	Hyperphosphatemia	High norm calcif noted
Sulfur (as	Marked	Systemic Acidosis	Contr

The "Aerosol Delivery" Problem

The reason these levels were so high at 300 feet (and would be catastrophic at 2,500 feet for a BESS) is due to **vapor-phase transport**:

1. **Micro-Particles**: In a thermal runaway, metals are not just "burned"; they are vaporized into particles smaller than 2.5 microns (PM2.5).
1. **Deep Lung Penetration**: These particles bypass the body's natural filters and enter the bloodstream directly through the alveoli.
1. **The BESS Multiplier**: A BESS container contains approximately **10,000 to 20,000 lbs of lithium-ion cells**. A 33x increase in fuel means the "metal rain" or aerosol density within a 1,000-foot radius would be thick enough to cause **acute metal poisoning** in minutes.

Calculation of Injury Baseline

If a 75kWh car produced permanent disability at 300 feet, a 3MWh BESS fire creates a "Toxic Footprint" where the **Heavy Metal Load** remains above the Sacramento disability baseline for at least **1.2 miles (6,300 feet)** downwind, depending on wind speed.

As the size and density of BESS increases, there are 14.5MW BESS in 20ft containers available now- just stepping up to an industry average size of a 5MW BESS container has the following risk/dangers:

It represents a massive escalation in risk compared to the Sacramento Tesla baseline. A single Tesla Model Y (approx. 75–82 kWh) is **over 250 times smaller** than a standard 5MW utility-scale container.

In the **April 2025 Sacramento incident**, firefighters were permanently disabled by a less-than 5-minute exposure to a toxic "white cloud" at **300 feet** away. For a BESS container fire, the "disability zone" expands significantly due to the sheer volume of toxic loading.

5 MW BESS Toxin Scaling (vs. Sacramento Baseline)

The following projections use the Sacramento firefighter injuries—including **renal failure, heart lesions, and <82% lung function**—as the medical baseline for "Permanent Disability".

Metric	Tesla Baseline (75 kWh)	5 MW BESS Conta
Toxic Gas Volume	~11,250 – 18,750 Liters	3,000,000 – 5,000
Hydrogen Fluoride (HF)	~1.5 – 15 kg	375 – 3,750 kg
Hydrogen Cyanide	~0.5 – 1.2 kg	125 – 300 kg

Projected Safe Distances for 5 MW BESS

Using air dispersion modeling centered on the Sacramento medical data, the danger zones for a 5 MW BESS container fire are as follows:

- **0 – 1,500 feet: Lethal Zone.** Concentrations of HF and HCN would likely exceed **AEGL-3 (Lethal Threshold)** within seconds. Survival probability for unprotected civilians is near zero.

  1,500 – 5,000 feet: Sacramento Disability Zone. This is where the "white cloud" density matches the levels that permanently disabled the Sacramento crew. Residents and students in this range face **high risk of permanent organ damage**.

  1 – 2 miles: Acute Irritation/Evacuation Zone. Toxic gases remain at levels that cause respiratory distress and systemic metal loading.

Consequences of Locating BESS Near Sensitive Areas

Siting 3-5 MW BESS near schools, homes, or hospitals amplifies risks, using Sacramento as baseline:

- **Schools**: Children have higher lung surface-to-body ratios, absorbing 2-3x more toxins per breath. A 3 MW plume could reach IDLH at 1,700 ft, disabling students in minutes; 5 MW extends to 2,500 ft. Evacuation challenges: Chaos for 500+ kids, with long-term effects like reduced lung function impacting development.

  Homes: Residential areas face stealthy invisible plumes traveling 1-2 miles downwind. Brief exposures (e.g., 5 min outdoors) could cause Sacramento-like disabilities, including renal/cardiac issues in elderly or vulnerable. Bioaccumulation of metals (Li, Ni) raises cancer risks over time.

  Hospitals: Proximity endangers patients with compromised immunity. A 5 MW event's lethal zone (0-1,500 ft) could force shutdowns; warning zones (1-2 miles) cause respiratory distress, overwhelming ERs. HCN/CO asphyxiation risks ventilators.

Additional info about the Sacramento firefighter injury incident:

- The crash involved a high-speed impact into a tree, which compromised the battery pack, scattering ~5% of the lithium-ion cells across the roadway. Some of these scattered cells ignited intermittently during the initial response.

  Firefighters extricated the driver (who was hospitalized) and handled the scene with appropriate PPE and SCBA (self-contained breathing apparatus).

  The main visible fire/flames from the compromised pack were suppressed and declared "extinguished" before the vehicle was loaded onto a tow truck for removal to a salvage yard.

  The off-gassing event (releasing the toxic white/invisible clouds) occurred **during or right after** the vehicle was moved for towing—triggered by disturbance of the remaining pack/cells. This was post-extinguishment cleanup mode, when responders had removed their HAZMAT/SCBA gear, assuming the area was safe.

Update: **Updated Sacramento Baseline and Scaling Factors**

- **Tesla Model Y Baseline (75 kWh)**:
  - Full Runaway: Assumes intact pack; volumes based on per-kWh data.
  - Diminished (Sacramento Actual): ~5-10x reduced due to prior burn-out.
- **Scaling to BESS**:
  - 3 MWh: 3,000 kWh / 75 kWh = 40x full EV baseline.
  - 5 MWh: 5,000 kWh / 75 kWh ≈ 66.67x full EV baseline.
  - 14.5 MWh: 14,500 kWh / 75 kWh ≈ 193.33x full EV baseline.

Compounded by the full-fuel state (vs. Sacramento's diminished), total effective multipliers vs. the incident could reach 200-1,933x for toxins in worst-case BESS events.

Chart 1: Toxin Volume Scaling (Table Representation of Bar Chart)

This table shows calculated toxin releases, with the estimated diminished capacity, 75 kWh baseline fixed for MAX battery size of the Tesla Model Y involved in this incident. Values for Sacramento are the diminished actual values; full EV and BESS assume intact packs. Imagine this as a bar chart with a logarithmic y-axis to capture the exponential growth.

Metric	Sacramento Diminish
Total Gas Volume (Liters)	1,000-3,000
HF (kg)	0.15-1.5
HCN (kg)	0.05-0.12

Chart 2: Projected Danger Zones (Table Representation of Radial Chart)

Recalculated zones using the 75 kWh baseline, with dispersion scaled by sqrt(volume) for plume spread (adjusted for higher BESS buoyancy). Baseline: 300 ft caused disability in 5 minutes. Envision as concentric circles on a map, expanding dramatically with size.

Distance from Source	Sacrament
0-300 ft	Disability (5 cloud
300-1,000 ft	Irritation to
1,000-1,700 ft	Warning (he
1,700-2,500 ft	Minimal

Chart 3: Health Impact Projections (Table Representation of Impact Matrix)

Updated pathologies, scaled by recalculated exposure intensities. Assumes equivalent brief exposure (5 minutes) at distances matching Sacramento's 300 ft disability threshold (e.g., ~1,700 ft for 3 MWh, farther for larger).

Health Impact	Sacramento Baseline (300 ft, 5 min)	3
Lung Function Loss	<82% (up to 20%)	4
Renal Issues	Failure risks, hyperphosphatemia	In
Cardiac Problems	Tachycardia, lesions	L

In short, the setbacks need to be adjusted based on the new documented evidence of the firefighter's exposure and injuries from the smoke and gasses released from a small 75kw LFP battery EV and the disabling impacts an already extinguished Tesla EV's reduced total-volume/capacity had on the 4 unprotected firefighters. It is the only well documented evidence of exposure on unprotected victims- like school children and families would be when forced to suffer the impacts of a lithium BESS fire next to their school or homes... In addition, because of the irrefutable scientific evidence from San Jose State University's Marine Lab showing ash/fallout is a major concern- add in the documented grassroots lab test results showing fallout travelling (in toxic quantities) up to 42 miles down wind- setbacks should be measured in miles for lithium BESS...

Developers always say no toxins were found during BESS fires by the EPA, by the fire Department/HAZMAT, MBARD, BESS owner's systems, or anyone else...

After 10 previous lithium BESS fires in California, CA's Air Resource Board (MBARD) admitted after the Jan 2025 Moss Landing BESS fire where they said no toxins were detected and the air was safe, that they didn't have the capability to test for the #1 toxin released by burning lithium BESS (HF):

24580 Silver Cloud Court
Monterey, CA 93940
(831) 647-9411 | www.mbard.org
Serving Monterey, San Benito and Santa Cruz Counties

MONTEREY

NEWS

Moss Landing Battery Facil

January 17, 2025 - Monterey, C

Using information generated from our regulatory air monitors and wildfire si
Monterey Bay Air Resources District (MBARD) has been tracking potential pa
associated with emissions from the battery facility fire at Moss Landing.

It appears that there was good dispersion or dilution of smoke from the fire
above populated areas traveling towards Watsonville and Santa Cruz County
and particulate matter monitor and sensor data, smoke from the battery fire
areas where people live.

It should be noted that MBARD does not have the capability to test for hydro
pollutant of concern associated with battery fire emissions from lithium batt
gas that can readily react with water to form hydrofluoric acid, which can fu
in the environment, impacting its mobility and toxicity. HF is lighter than air
volatilized in a fire.

For more information on air quality, please check our website, https://www.
concentrations of particulate matter characterized by the Air Quality Index.
Wildfire Smoke Info and Resources link for more information about our parti
https://www.mbard.org/wildfire-smoke-information-and-resources .

The EPA also doesn't have a refence concentration or reference dose for HF:

- Acute animal tests in rats, mice, guinea pigs, and monkeys have dem to have moderate to high acute toxicity from inhalation exposure. (4

Chronic Effects (Noncancer):

- Chronic inhalation exposure of humans to low levels of hydrogen flu irritation and congestion of the nose, throat, and lungs. (1,5)
- Skeletal fluorosis, a bone disease, was reported among workers chro (including hydrogen fluoride) via inhalation. (1)
- Damage to the liver, kidneys, and lungs has been observed in animal hydrogen fluoride by inhalation. (1)
- EPA has not established a Reference Concentration (RfC) or a Referer fluoride.
- CalEPA has calculated a chronic inhalation reference exposure level (hydrogen fluoride based on effects on the bone (skeletal fluorosis) ir chronic REL is a concentration of a chemical at or below which adver likely to occur for long-term exposures for 24 hours a day. It is not a rather a reference point to gauge the potential effects. At lifetime ex than the REL, the potential for adverse health effects increases. (6)
- Chronic oral exposure to fluoride at low levels has a beneficial effect Fluoride has also been used for the treatment of osteoporosis. (2)
- Chronic exposure to fluoride through drinking water has been obser or mottling (staining or pitting of teeth) in humans. At higher intakes exposure, skeletal fluorosis (i.e., an accumulation of fluoride in the s with pathological bone formation) has been noted in humans. (1,2)
- At high concentrations, chronic oral fluoride exposure has been rep effects on the lung, kidney, thyroid, blood, and skin in humans. (1)

Reproductive/Developmental Effects:

- No information is available on the reproductive or developmental eff exposure to hydrogen fluoride in humans. (1)
- Inhalation of hydrogen fluoride resulted in testicular changes in male

Yet, the handheld air meters used in 2019 Surprise AZ BESS fire found many other toxins- but their air quality sensors didn't have HF detecting ability either- yet nothing was found in the air from the Jan 2025 tests:

3.5 Equipment and Personnel

A call for smoke in the area of an electric substation came into Phoenix at 17:41:54 hours [8]. The following apparatus and personnel were di Fire-Medical Department:

Engine 304 (E304)
Captain (E304 Capt)
Firefighter (E304 FF) (Acting Fire Engineer)

Brush 304 (BR304)
Firefighter (BR304 FF)

Tanker 304 (T304)
Firefighter (T304 FF)

The incident was elevated to a HAZMAT operation at approximately 1 the E304 Capt. The following apparatus and personnel were dispatcl Medical Department at that time:

Battalion Command 301 (BC301)
Battalion Chief (BC301 BC)
Battalion Safety Officer (BC301 BSO)

The Surprise Fire-Medical Department HAZMAT unit was previous the following Peoria Fire-Medical Department personnel were dispat the automatic aid response plan:

Engine 193 (E193)
Captain (E193 Capt - Injured)
Fire Engineer (E193 FE - Injured)

1 Executive Summary

On April 19, 2019, one male career Fire Captain, one male career
career Firefighters received serious injuries as a result of cascadi
2.16 MWh lithium-ion battery energy storage system (ESS) that led

The smoke detector in the ESS signaled an alarm condition at ap
discharged a total flooding clean agent suppressant (Novec 1230).
members of a hazardous materials (HAZMAT) team that arrived o
18:28 hours. The HAZMAT team noted low-lying white clouds of a g
the structure and nearby components and drifting through the desert.
and made several entries into the hot zone to conduct 360-degree si
multi-gas meters, colorimetric tubes, and thermal imaging camera
dangerously elevated levels of hydrogen cyanide (HCN) and carbon
entry. The team continued to monitor the ESS and noted the whi
flowing out of the container at approximately 19:50 hours.

The HAZMAT leadership developed an incident action plan with
fire officers and information about the ESS provided by representat
owned, designed, and maintained the ESS. The HAZMAT team made
and found that HCN and CO concentrations in the vicinity of the E
threshold. In following with the incident action plan, the team op
approximately 20:01 hours. A deflagration event was observed by t
zone at approximately 20:04 hours. All HAZMAT team members re
deflagration and were quickly transported to nearby hospitals. Note:
involved in this incident was commissioned prior to release of a first
standard on ESS installations, NFPA 855 [1]; the design of the ESS
codes and standards active at the time of its commissioning.

Their air monitoring gauges were maxed out:

When E193 was dispatched to the call, E193 Capt immediatel
research on the potential hazards associated with battery fires
scene. E193 and HM193 arrived at the scene and E193 Capt m
the contractor, and at least one employee from the company tha
the HAZMAT team observed a diffuse cloud of a white/gray gas
ground to an elevation approximately 2–3 ft above the ground.
appeared to be denser than the ambient air and was observed iss
distribution box and transformer to the east and north of the stru
smell in the vicinity of the ESS as nasty and acrid. Photographs
upon arrival are presented in Figure 4.9.



Figure 4.9: Photographs of the ESS scene taken by E193 FE

E193 Capt met with E304 Capt, BC301 BC, the contractor, and p
owned the ESS to establish the history of the incident and the
HAZMAT team donned full turnout gear and SCBAs and started
the vicinity of the fenced area. Hazardous HCN and CO gas con

https://d1gi3fvbl0xj2a.cloudfront.net/public/2021-07/Four_Firefighters_Injured_In_Lithium_Ion_Battery_ESS_Explosion_Arizona_0.pdf?fbclid=IwY2xjawPg9sZleHRuA2FlbQIxMABicmlkETFIT2lCaE94U2doQUxOcEF0c3J0YwZhcHBfaWQQMjIyMDM5MTc4ODIwMDg5MgABHnUveDmwl1hYfod_S8aF7b4BfgbwU4uvB6s7fXPlUxygKXLO89gcGOACbJE9_aem_IXUYQqdBac5qhBzX0Nxafg

Additionally, people from miles around went into the hospital and spoke with their doctor- and Monterey County eventually issued a Health notice:

COUNTY OF MONTE
HEALTH DEPAI
Elsa Jimenez, Director of Health
Administration Animal Servi
Emergency Medical Services Environmental He

Health Advisory fo

February 13, 2025

From: Edward L. Moreno, MD, MPH
Health Officer & Director of Public Health
831-755-4585

Guidance for Health Cor
Vistra Energy Storag

Current Situation

On January 16, 2025, the County of Monterey Health D
energy storage facility located in Moss Landing. Smoke
through January 19. Because the smoke's composition
Operations Center issued guidance to residents in the a
indoors and wearing a well-fitting respirator. Due to the
immediate air quality concerns included particulate mat
cobalt dusts.

After the 2nd LFP BESS fire at a BESS in Warwick NY in December of 2025, an investigator got testing data back about what they tested for before telling everyone the air was safe- here's her report:

" **IMPORTANT: What Orange County HAZMAT Actually Measured After the BESS Fire (and what they did NOT)**

After the 12/19 Battery Energy Storage System (BESS) fire, Orange County HAZMAT released an air-monitoring data log. Many residents understandably assumed this meant “the air was safe.”

But after reviewing the actual data, here is what the instruments were really checking — and what they completely missed.

What WAS measured

The equipment used was a **portable emergency responder gas meter**, designed to keep firefighters from collapsing on scene. It monitored:

Carbon Monoxide (CO) Hydrogen Cyanide (HCN) Ammonia (NH_3) Flammable gases (LEL & Methane) Oxygen levels General VOCs (very crude detection) Radiation Temperature, humidity, wind speed & direction

This tells responders: Is the air explosive? Will it knock firefighters out right now? Is oxygen too low to breathe?

That’s it.

What was NOT measured (this is the critical part)

None of the **primary toxins from lithium-ion battery fires** were monitored:

Hydrogen Fluoride (HF) – extremely corrosive, burns lungs & skin **Phosphoryl fluoride (POF_3)** **Phosphorus pentafluoride (PF_5)** **Fluorinated acids** **Lithium compounds** **Nickel, cobalt &**

manganese metal dust 📷 **PM2.5 and ultrafine particles** (the particles that get deep into lungs) 📷 **Soil and surface contamination** 📷 **Rain-wash runoff into wetlands and creeks**

These are the chemicals that: • Settle on homes, cars, yards & playgrounds • Get tracked into buildings • Stay in soil • Harm firefighters' gear • Can cause long-term cancer and lung disease

None of that was measured.

📷 **What this monitoring actually means**

This equipment answers only one question:

"Is it safe for firefighters to stand here without dropping dead right now?"

It does **NOT** answer:

📷 Are residents breathing toxic fluorinated chemicals? 📷 Did heavy metals fall on homes and soil? 📷 Did toxic particles settle into nearby wetlands and waterways? 📷 Did rain wash contaminants into the watershed? 📷 Are kids, pets, and firefighters being exposed long after the fire?

Those hazards require **laboratory-grade testing**, not handheld emergency meters.

📷 **Why this matters**

This is the same mistake made after 9/11 — when officials said the air was "safe" based on simple gas monitors while toxic dust and heavy metals were everywhere.

BESS fires are **chemical fires**, not just smoke.

Without: • Fluoride testing • Particle monitoring • Soil & surface sampling

No one can honestly say the area was safe.

📷 **Bottom line**

Orange County's own data proves this:

They checked for immediate firefighter danger — not for long-term community and environmental contamination.

That's a huge difference.

Communities deserve real testing — not false reassurance."

Check out the holes in the EPA's testing in Fredrickson, MO BESS battery recycling plant fire:

https://response.epa.gov/site/doc_list.aspx?site_id=16725

All of this to say we need massive setbacks for lithium BESS. We need BESS developers to equip all first responders with appropriate air testing/monitoring equipment that can test for all the known toxins- as well as have monitoring stations located throughout the evacuation area (5-mile radius). We need all first responders to have breathing apparatus- as well as all schools, hospitals, public gathering places, and homes within the evacuation zones to be supplied with breathing apparatuses to allow them to evacuate safely.

We need environmental/property insurance to cover the clean-up of toxins and ash for all surfaces in the evacuation zones. We need to have cash held in escrow to pay for evacuees, cleanup, diminished value of all impacted properties, long term health insurance and disability coverage for those not evacuated before being exposed to the toxic smoke, gasses, and ash.

There are so many consequences to a lithium BESS when there is a fire- evacuations for 5 days on average, millions of gallons of water used and contaminated (nearly 20M gallons were used in the Otay Mesa BESS fire- and the toxic runoff is what caused the EPA to take over clean up.

FYI, there are many alternative grid-scale energy storage options that don't use lithium batteries and don't bring any of the issues nor risk...

Thank you,

James

Gabriel Clark

From: Planning
Sent: Thursday, February 12, 2026 8:14 AM
To: Gabriel Clark
Subject: FW: Firefighters officially oppose lithium BESS near schools, neighborhoods, fire stations, and other hard to evacuate locations- so should you!

Follow Up Flag: Follow up
Flag Status: Completed

fyi

Owen Goode
Planner II
Department of Community Development
City of Auburn | www.auburnwa.gov
Phone: (253) 470-2170 | ogoode@auburnwa.gov
Mailing Address: 25 W Main Street, Auburn, WA 98001
Permit Center Address: 1 E Main Street, Auburn, WA 98002 (Map)
Customer Service Survey | Application Forms | Zoning Maps

From: James DeLay <jamesdelay@hotmail.com>
Sent: Wednesday, February 11, 2026 1:03 PM
To: Cheryl Rakes <CRakes@auburnwa.gov>; Tracy Taylor <ttaylor@auburnwa.gov>; Brian Lott <BLott@auburnwa.gov>; Clinton Taylor <ctaylor@auburnwa.gov>; Lisa Stirgus <LStirgus@auburnwa.gov>; Hanan Amer <hamer@auburnwa.gov>; info@vrfa.org; Planning <planning@auburnwa.gov>
Subject: Firefighters officially oppose lithium BESS near schools, neighborhoods, fire stations, and other hard to evacuate locations- so should you!

CAUTION: The following message originated from outside the City of Auburn. Be careful opening links and attachments

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Good afternoon Auburn Leaders,

Lithium BESS have significant impacts on people and the environment when they have an unpreventable and unextinguishable thermal runaway fire.

Here's a few Firefighter, Unions, and others that have taken a stand to protect citizens, school children, and other neighbors from the dangers of lithium Battery Energy Storage Systems:

LOS ANGELES COUNTY FIRE FIGHTERS LOCAL 1014

3460 FLETCHER AVE. • EL MONTE, CA 91731 • (310) 639-1014 • FAX (310) 639-53

January 2, 2026

Anthony Marrone, Fire Chief
Los Angeles County Fire Fighters Local 1014
1320 N. Eastern Avenue
Los Angeles, CA 90063

CEASE AND DESIST NOTICE: Consideration or Approval of Energy Storage System (ESS) Fac Station 43 or Residential Occupancies

Dear Chief Marrone:

This correspondence serves as a formal **CEASE AND DESIST NOTICE** on behalf of the Los Angeles Local 1014.

IAFF Local 1014 hereby demands that the Los Angeles County Fire District, Fire Prevention Bureau, any subordinate authority immediately cease and desist from any consideration, review, approval facilitation of an Energy Storage System (ESS) facility proposed to be located adjacent to Los Angeles C proximity to residential occupancies within Los Angeles County.

NOTICE OF UNACCEPTABLE AND FORESEEABLE DANGER

The siting of an ESS facility next to an occupied fire station—where firefighters work and reside twenty constitutes an unacceptable, unsafe, and indefensible action that directly contradicts established fi principles, firefighter safety standards, and the intent of applicable codes. ESS facilities are recognize installations that present uniquely severe risks, including but not limited to:

- Thermal runaway and cascading battery failure
- Deflagration and explosive overpressure events
- Release of highly toxic gases, including hydrogen fluoride (HF)
- Delayed ignition and re-ignition without warning

Fire stations are mixed-use facilities containing residential occupancies under the California Building C and Los Angeles County amendments. Firefighters live, eat, and sleep within these facilities. Placing a such an occupancy would never be permitted for traditional residential housing and is equally impermiss

KNOWN AND DOCUMENTED FIRE SERVICE INJURY HISTORY

Lithium-ion battery incidents, using the same technology deployed in ESS facilities, have already caused

Large-scale ESS incidents—including the Moss Landing BESS fire (2025), Gateway Energy Storage fire the McMicken ESS explosion—further confirm that these facilities can catastrophically fail without wa defensive firefighting tactics, exclusion zones, and evacuation to prevent injury or loss of life.

These realities alone establish that ESS facilities do not belong near occupied fire stations or residential co

RESIDENTIAL COMMUNITY SAFETY

IAFF Local 1014's opposition is not limited to fire stations. ESS facilities pose an existential threat to pub when located near residential homes, schools, or neighborhoods. Civilians—including children, seniors, a populations—have no ability to mitigate or respond to ESS failures involving toxic gas release, explosion, events.

Local 1014 does not oppose energy storage technology in principle. However, such facilities must be sited residential areas of Los Angeles County, where failure does not endanger the public or emergency respon

DEMAND TO CEASE AND DESIST

Accordingly, IAFF Local 1014 hereby demands that you:

1. Immediately cease and desist from any further consideration, review, or approval of an ESS fa Station 43.
2. Cease and desist from approving ESS facilities in proximity to residential occupancies within
3. Confirm that no permits, conditional approvals, variances, or discretionary actions will be gra

NOTICE OF ESCALATION AND LIABILITY

Should Local 1014 become aware that Fire Prevention personnel or the Fire Marshal's Office has approve ESS facilities near fire stations or residential communities, this matter will be immediately escalated to the Board of Supervisors. California Professional Firefighters (CPF), the state union representing over 30,000 aware of this issue and stands in full support of Local 1014.

Any future injury, long-term health impact, or loss of life resulting from an ESS incident approved despite solely with:

- The Los Angeles County Fire District
- The Fire Marshal and Fire Prevention Division
- The County of Los Angeles and all approving authorities

The dangers are known, foreseeable, and preventable.

You are hereby directed to provide a **formal written response within five (5) business days** confirming th rejected and removed from further departmental or County consideration. Failure to do so will be interpret with this notice and will result in immediate escalation.

Vice President Tony Carcioppolo will be handling this issue for Local 1014, please contact him with any q and with your response.

Braintree Fire Department
1 Union Place – Braintree MA 02184

Acting Chief Frederick Viola

Emergency (781-843-3600)
Business (781-843-3601)
(781-843-2395 x4001)
Fax (781-356-4362)

TO: Mellisa Santucci-Rozzi, Department of Planning and Community Development

FROM: Frederick Viola, Acting Chief Braintree Fire Department

DATE: December 2, 2024

RE: Proposed Battery Energy Storage System Facility 119 Common Street

Dear Director Santucci-Rozzi,

I am writing to you with the understanding that you can disseminate this to the rest of the board regarding the application for a proposed Battery Energy Storage System (BESS) facility filed by Braintree Electric Light Department and Convergent Energy.

My focus remains steadfast on ensuring public safety for the residents and visitors of our community. After thorough consideration, I have significant concerns regarding the risks associated with placing this facility at the proposed location.

Following detailed research, including consultation of industry publications, input from employees, guidance from the Department of Fire Services of Massachusetts, and discussions with municipal fire chiefs in communities managing similar facilities, I have concluded that I cannot support this location for the BESS facility.

The Common Street corridor is a densely populated residential area that experiences frequent congestion, particularly due to its proximity to South Shore Plaza and Route 3 South. This issue is further exacerbated during peak times, such as the holiday shopping season. The proposed evacuation routes, which encompass all access points in and out of the area, appear insufficient for a quick and organized evacuation or for ensuring timely fire apparatus response.

Furthermore, the Emergency Response Guidebook (ERGB), a global standard for hazardous materials incidents, specifies a minimum evacuation distance of 500 meters (approximately one-third of a mile) for lithium-ion battery storage fires, including for first responders. This evacuation requirement would strain resources, potentially hindering an effective response while consuming departmental capacity solely for evacuation management.

The proposed site is located just 159 feet from the nearest residential home and 200 feet from a church hall, which frequently hosts outdoor activities. Additionally, the current plans do not provide sufficient access to the entire facility's perimeter for fire suppression, nor is there adequate consideration of water distribution needs for cooling adjacent batteries in the event of a fire.

While I appreciate the effort and thought that the applicants have dedicated to this proposal, I believe this facility would be better suited to a more industrial location in town where the associated risks can be mitigated more effectively.

Thank you for your attention to this matter.

Sincerely,

Frederick T. Viola

Acting Chief, Braintree Fire Department

WEST THURSTON REGIONAL FIRE AUTHORITY

10828 Littlerock Rd SW Olympia WA 98512
Phone 360.352.1614 Fax 360.352.1696

Date: 01/08/2025
To: Thurston Co Community Planning and Development - Kraig Chalem
From: Chief Nathan Drake
Subject: Comment on Lithium-Ion Battery Energy System – 7505 183rd Ave SW, Rochester

Dear Community Planning and Development,

West Thurston Regional Fire Authority has reviewed the proposed land use application for the installa a lithium-ion battery energy storage system (BESS) at 7505 183rd Ave SW, Rochester. While we acknowledge the importance of renewable energy initiatives, we must express significant concerns reg the safety implications of this project and the potential risks associated with the operation of a lithium battery system.

The following points summarize our primary concerns:

Fire Risk: Lithium-ion batteries, especially at large scale, present a heightened fire risk due to therma runaway, which can result in uncontrolled fires that are difficult to extinguish. The potential for catast fire incidents in the event of system malfunction, external damage, or other unforeseen events is a maj safety concern for both the facility and surrounding areas. Fires caused by lithium-ion batteries can be extremely challenging to control and may lead to significant hazards, including the release of toxic ga potential damage to nearby properties.

Emergency Response Readiness: Lithium-ion battery fires require specialized training, equipment, a knowledge to safely respond. West Thurston Fire currently lacks adequate resources and training spec tailored to managing large-scale battery storage fires. This may result in increased difficulty in effecti and safely managing an emergency situation.

Impact on Fire Suppression Infrastructure: Given the size and nature of a lithium-ion battery energ storage system, there is a risk that standard fire suppression systems may not be adequate. There are n hydrants in this proposed area. This means that the vast amount of water needed for firefighting activi and containment would have to be trucked in using water tender operation. West Thurston Fire and ou mutual aid partners do not have the capacity to keep up with these water flow requirements. We urge applicant to provide detailed plans for advanced fire detection, suppression systems, and additional infrastructure improvements to ensure safe operation.

Potential for Escalating Risk Over Time: As battery systems age, the risk of malfunction and failur increases. Given the long operational lifespan of these systems, ongoing safety assessments, maintena and oversight are crucial to mitigate risks.

Considering the above concerns, West Thurston Fire Regional Fire Authority opposes the approval of land use application unless the applicant demonstrates full compliance with the necessary fire safety standards and implements additional safeguards and infrastructure improvements to mitigate the risks associated with lithium-ion battery storage systems. We recommend that the applicant engage in furth discussions with the Thurston County Fire Marshal Office to ensure that all fire-related safety measur adequately addressed before moving forward.

Thank you for your attention to this critical matter.

Sincerely,



Nathan Drake
Fire Chief
West Thurston Regional Fire Authority
10828 Littlerock Rd SW Olympia, WA 98512
Phone: 360-352-1614
nathan.drake@wtrfa.org

Vacaville Firefighters IAFF L

PO Box 5006, Vacaville Ca. 95696 www.IA

October 30, 2025

To the Honorable Members of the California Energy Commission,

The Vacaville Firefighters Association formally submits this letter in
Corby Battery Energy Storage System (BESS) Project.

Our position is based on the risk the project poses to the health and s
members. Bypassing local government and critical local funding mec
increase this risk.

There is a clear and documented danger posed by lithium-ion BESS f
result in the release of highly toxic gases and heavy metals that pose
risks.

As we have learned from recent incidents, fires in battery storage fac
resource intensive. These emergencies require large personnel and eq
a response would strain resources and inhibit or delay our ability to r
from our residents.

Solano County has identified more remote industrial locations appro
the event of a "thermal runaway" incident at the proposed location, t
to Interstate 80, surrounding rural homes and a large subdivision. A s
facility site could cause evacuations or shelter in place orders for tho
importantly, the public and first responders could be exposed to toxic
evacuations or responding to the incident itself.

We urge the California Energy Commission to place the health of ou
above corporate convenience. The Corby Project, in its current form
permitting path, poses an unnecessary risk to our residents and firefig

We formally request that the CEC reject the current application for t

Sincerely,

Van Zandt County

ANDY REESE
COUNTY JUDGE

121 East Dallas, Room 206
Canton, Texas 75103
judgereese@vanzandtcounty.org

VOICE: (903) 567-7
FAX: (903) 567-7
www.vanzandtcounty.

PRESS RELEASE – Wednesday March 26, 2025

Van Zandt County Fire Marshal Issues Order to Taaleri Energia (Project Amador)

On Friday March 21, 2025, Van Zandt County Fire Marshal issued an order to Taale Energia to conform to all applicable National Fire Protection Association (NFPA standards per Texas Local Government Code Chapter 233 and NFPA 855 (2020 ed Taaleri Energia started construction of a Battery Energy Storage Facility (BESS) nea the intersection of FM 47 and FM 1651 in December of 2024.

Requirements that must be completed according to the Order of the Van Zandt Count Fire Marshal include:

1. Application for the permit for new construction and pay the applicable fee.
2. Submit container test results conducted by a Underwriters Laboratory (UL) certified laboratory.
3. Submit a survey of the construction site for review and approval.
4. Submit a site-specific hazard mitigation plan.
5. Submit a site-specific emergency response plan.
6. Provide documentation that a permanent water source will be available in proximity to this location.

Taaleris Energia Project Amador is ordered to comply with all relevant fire codes and permitting proce by April 7, 2025, and prior to any batteries arriving in Van Zandt County.

County Judge Andy Reese stated, "I am proud of the work being done by our Fire Marshal to protect tl safety of the residents near this facility. I am working diligently and aggressively with Fire Marshal Kev Palmer and our District Attorney Tonda Curry to ensure that we are using every available legal tool force Taaleri to comply with all provisions of NFPA 855. The DA assures me that appropriate court actic will be taken if Taaleri does not comply with the Fire Marshal's order."

For additional information, contact the Van Zandt County Fire Marshal Kevin Palmer at 903-567-602

HAUPPAUGE FIRE DISTRICT
855 WHEELER ROAD, HAUPPAUGE NY 11788

FOR IMMEDIATE RELEASE

STATEMENT BY THE BOARD OF FIRE COMMISSIONERS REGARDING THE LITHIUM-ION BATTERY ENERGY STORAGE SYSTEM PLANNED FOR 220 RABRO DRIVE

The Commissioners of the Hauppauge Fire District and the Chiefs of the Hauppauge Fire Departm expressed serious safety concerns regarding the proposed Key Capture Energy 79-megawatt (MW energy storage system (BESS) planned for 220 Rabro Drive.

The Hauppauge Fire District urges the Town of Islip to extend the current moratorium on this pr another year. This would allow time for KCE to address our safety concerns. It would also a Hauppauge Fire Department and the Hauppauge community to receive up to date informati experts familiar with the hazards associated with BESS facilities like the one planned.

The Board of Fire Commissioners and the Chiefs of the Hauppauge Fire Department maintai until these concerns are resolved, the KCE NY 29 project should not proceed. Our stance is in a commitment to transparency, safety, and the well-being of the Hauppauge community a as the protection of our local environment.

Main Concerns and Questions

- Reports from the Suffolk County Economic Development and Planning Commission (Dece 2023) and the Long Island Power Authority (December 18, 2024), confirm that KCE NY 29 **lithium-ion** Battery Energy Storage System (BESS) with an output of 79 MW and a storage ca 316 megawatt-hours (MWh). The Hauppauge Fire District believes that 220 Rabro Drive suitable location for such a facility, especially given the history of **lithium-ion** battery fires a sites globally. The site is at the eastern edge of the industrial park less than a thousand fe residential neighborhood, about half a mile from Bretton Woods Elementary school, St Thom Church and the HYO ball fields. The location is just over half a mile from the headwate Nissequogue River and it is just blocks from a major transportation route, the Long Island Exp

- Community and Environmental Safety: The safety of our residents, the environment, responders is a central concern. If a fire or other emergency occurs at the KCE NY 29 facility,

- Battery Technology: There is uncertainty about the specific battery system KCE intends to us it is believed that the Tesla Megapack ***lithium-ion*** system—first introduced in 2019—may b recent information suggests that in 2024 Tesla began moving towards a **lithium-iron-pho** battery system. The Hauppauge Fire District seeks clarity on which lithium-ion battery type installed at the site by KCE.

- Communication and Coordination: While KCE has engaged with Suffolk County and Town officials, there has been minimal direct contact with the Hauppauge Fire District by KCE. Commissioners and Chiefs stress that their involvement is critical, as their personnel would first to respond in an emergency.

- Community Involvement: The Hauppauge Fire District encourages all members of the Hau community to voice their concerns at the scheduled Town of Islip Board meeting on August 1 at 2 PM. We want to ensure that community safety and environmental stewardship take prec in any decisions regarding this lithium-ion BESS project.

On or about August 28, 2023 the Riverhead Fire Dist
requested the imposition of a moratorium on Battery
within the Town of Riverhead related to fire safety c
volunteer firefighters; impacts on water supply; as we
facilities on waterbodies. The Riverhead Fire District f
necessary to understand the complexity of the sta
Riverhead Fire Department and neighboring depart
resources to train its membership in conjunction with t
Safety Working Group.

These concerns, coupled with the Town Board's ne
assurance about the safety of these types of faciliti
ensuring the technology and availability of equipment
be able to suppress a fire should one occur, precauti
deterring any necessary fire suppression chemicals
the adequacy of location and other special permit sta
has persuaded the Town Board to take pause on th
enactment of a three (3) month limited moratorium
Battery Energy Storage Systems pursuant to Town
these issues are further considered and the law is a
outstanding concerns, including the potential for cata
planning.

agency working group on the safety of BESS facilities, and a letter to the Town Board last week from the Riverhead Fire District Commissioners asking the town to enact a moratorium on BESS facilities, convinced Hubbard that a moratorium is needed, he said today.

“On behalf of the 170 volunteer members of the Riverhead Fire Department, we write to you today to implore you to follow the townships around us and impose a moratorium on Battery EnergyStorage Systems(BESS) in the Town of Riverhead,” the Riverhead Fire District commissioners wrote in an Aug. 28 letter to the Town Board.

Citing the fires, the commissioners said the town’s volunteer firefighters “face potentially extreme conditions in the case of a fire at once of these facilities.”

The state working group will begin immediate inspections of energy storage sites across the state, Gov. Kathy Hochul said in July, when she announced the group’s formation. It will “collaborate with first responders and local leaders to identify best practices, address potential risks to public safety, and ensure energy storage sites across New York are safe and effective.” The group will also “independently assess and identify common causes, air monitoring results or other community impacts, and other factors involved with energy storage fires,” the governor said.

“We look forward to the results of this task force,” the Riverhead Fire District Commissioners said in the letter.

“Additional time is needed to study the complexity of this issue and its impact on our community, as well as to ensure that the Riverhead Fire Department and neighboring departments have sufficient time and resources to train all members. Finally, more time is needed to determine whether we have the necessary resources to fight these fires and safeguard our members against the hazardous conditions they may present,” the fire

December 3, 2024

Reference: Corner of Byrnes Road and Kilkenny Road Solano County, Battery Energy Storage System (BESS)

Dear California Energy Commission Board Members,

This notification is to clearly make you aware **We are not in favor and adamantly oppose** the location of this Lithi
Battery Energy Storage System (BESS) at Byrnes Road and Kilkenny Road.

Please do not approve this application without a fair and thorough public review. At minimum, an extension of revie
period is necessary.

Our family home is located within ¼ mile, directly across, of the proposed development location. We live within the Vac
City limits. We were never contacted or notified of this proposed development/use until a neighbor told us yesterday o
2024. **This is not acceptable.** We find the deceptive, covert, and calculated methods being used by the developer, Co
Energy Storage/Next ERS with their intent to clearly bypass public comments and deceitfully gain the approval from the
California Energy commission Board Members appalling.

This company has been less then forthcoming with the surrounding residents of the City of Vacaville and County of Sola
along with the California Energy Commission Board Members. Please do not allow this developer to use you as a pawn
around standard processes because of an oversite in AB205, which creates a loophole in the law. It was **not** the intent o
assembly bill.

This company had proposed the development of this facility site in another separate location approximately 1 mile away
was met with extreme opposition and development denial by the County of Solano. The prior location residents will be
in the drift hazard and evacuation zone pathway from incidents occurring at this facility.

Most general population will say they have **fires** which are not extinguishable. The industry uses the term "Thermal
Runaway" to avoid using the word fire. Whatever terminology is used, Thermal Runaway is a large problem and is not
avoidable. During thermal runaway, batteries will burn uncontrollably, emit toxic fumes, emit flammable vapors and p
explosion hazards. This will always require evacuation from surrounding area for public safety.

There are many residential homes and small acreage (2 ½ to 5 acre) in this immediate area. They will all be at risk due t
proven hazards these facilities generate. All other Lithium-ion Battery Storage sites are in completely Isolated areas to a
the negative impact to residents.

The new location proposed is prime agricultural land. Agricultural lands defined as Mediterranean. These areas are ve
limited in the California and United States and are considered top producing for our Country. Depleting our prime agric
lands to place hazardous operating Lithium-ion battery storage yards should be criminal. Destroying prime agricultural l
not acceptable, recognizing less than 1% of the world population grows our foods.

These facilities are prone to failure due to their nature. The Batteries will overheat and result in fire "thermal runaway"
their industry calls it. Our extreme seasonal temperatures will not benefit Lithium-Ion batteries and will enhance the cl
and cause overheating. Thermal runaway can occur due to exposure to excessive temperatures, external shorts due to
wiring, or internal shorts due to cell defects. Thermal runaway events result in the venting of toxic and highly flammabl
and the release of significant energy in the form of heat. Vented gases are hot enough to melt metal. If ignited, these g
can cause enclosed areas to over pressurize, and if unmitigated, this overpressure can result in an explosion and severe

Since 2018 there have been over 40 significantly large fires "Thermal Runaways" of lithium-ion battery storage facilities fires "Thermal Runaways" are extremely hard to put out and require excessive amounts of water and sometimes will bu weeks causing closure and displacement due to evacuation and shutdowns. Our fire personnel have no effective way o stopping these events.

In September 2022 a battery storage fire in Moss Landing shut down an eight (8) mile stretch of Hwy 1. THIS LOCATION APPROVED, WILL CLOSE DOWN A COMPARIABLE SECTION OF INTERSTATE 80. This will be a significant impact to the en state. This proposed location is less then a mile from Interstate 80. It is not if it will happen - because it will. It is wher

Cells generate heat, even under normal operating conditions. It is proven that the heat generated from large lithium-i battery storage facilities increases the ambient temperatures surrounding the facilities. This is a negative impact to the environment, residents and wildlife within the area.

These facilities generate a nonstop Noise issue. They require their own equipment to charge and cool the batteries, wh creates an extremely loud buzzing or humming noise 24/7 that can be heard in neighboring area. This will substantiall our quality of living and depreciate our properties value. This proposal is within one (1) mile of Kaiser Permanente Hos and Solano Community College. The continuous noise will also impact the natural wild life found within the area. Haw Migratory birds, Egrets, Herans and small animals, livestock and pets. They will provide you a signed document saying t exempt but in prior experiences the equipment exceeds established dba levels and are not intended 24/7. Noise is a significant issue to quality of life.

The operation of these Lithium-ion battery Storage yards also brings environmental hazards. Runoff from daily use of w for cooling batteries and runoff from cooling exploded burning "Thermal runaway" batteries will contaminate the nearb creeks, canals and pollute groundwater which also may affect nearby City and Residential wells. As required for all oth hazardous materials that are subject to spills, no containment and capturing of contaminated water will occur at the fa will contaminate soil and ground waters.

This facility does not provide long term jobs or energy benefit for City of Vacaville or Solano County. Once built, these are usually remotely monitored. Concerning when an incident occurs and the response is delayed. The energy saved directly to PG&E and doesn't guarantee power for the surrounding area during blackouts. Only millions of dollars in pr the developer.

Most Fire jurisdictions have NO ability to address the incidents occurring at these facilities. They can only take precau evacuating surrounding residents, evacuating Hospital, evacuating college campuse, shutting down roads/major interst and notifying surrounding Airports Nut Tree Vacaville and Travis Air Force Base) both who have direct flight paths over t area. This can be for days until they can get control of the Fire "thermal runaway", Flammable and Toxic gases they call "Thermal Runaway. Residents evacuated, Hospital, Airports closed, College Campus closed, Highway 80 closed will cre severe negative impact to the economy. I cannot imagine having to evacuate myself, from my home, for days.

This is not an appropriate location for this Lithium-Ion Battery Storage Facility.

Please do not approve this application. We are opposed and do not approve of this use so close to residents, h airports and Interstate 80. Your Approval would be an injustice to the people.

Thank you for hearing our concerns,

Kimberly Korff, Retired State of California Fire Marshal
Fred Korff, Retired Small Business Owner
6859 Willow Road
Vacaville, CA 95698

FIRE HEADQUARTERS
ROUTE 139
LINCOLNDALE, NEW YORK

TEL (914) 248-741
FAX (914) 248-698

BOARD OF FIRE COMMISSIONERS
TOWN OF SOMERS
SOMERS FIRE DISTRICT

P.O. BOX 300
SOMERS, NEW YORK 10589

RECEIVI
APR 18 202
RALPH STUPPLE
FIRE DISTRICT MANA
OFFICE OF THE SUPERV
CLAIRE KELMER
TOWN OF SOMERS
SECRETARY

ERIC ZOHAR, CHAIRMAN
JOHN FITZGERALD
LAURENT VERARD
STEPHANIE PORTEUS
JOHN CHRYSOGELOS

JOANNE VALENTINE
TREASURER

April 15, 2024

Via Mail and E-Mail to rtrombetta@ci.carmel.ny.us

Town of Carmel Planning Board Members
60 McAlpin Avenue
Mahopac, NY 10541

Re: Proposed Lithium Battery Storage Facility Located off Miller Road, Mahopac and adjoining the Town of Somers

Dear Chairman Paeper and Members of the Carmel Planning Board,

On behalf of the Somers Fire District Board of Fire Commissioners, I am writing to share our grave trepidations regarding the Lithium Battery Storage Facility proposal (hereinafter the "Project") which will come before your Board for deliberation. While the approval of the Project does not fall within the purview of the Town of Somers, our Fire District borders the Town of Carmel and, due to mutual aid agreements among our fire departments, we have numerous concerns regarding adequate training of firefighters, **who are unequipped and unprepared** with respect to fighting battery storage facility fires, the cost of adequate equipment and gear, and the amount of manpower that would be required in case of a battery storage emergency like those seen in Warwick, East Hampton and Lyme, New York, along with numerous other lithium battery fires around the country. As you might recall, residents within a one-mile radius of the Lyme fire were directed to shelter in place for several hours due to the amount of smoke in the air, and the Warwick fire caused heavy smoke and burning plastics, prompting the evacuation of the district office and all local schools.

Critically, days after the fires were out, officials said the area was too hot for anyone to enter to investigate the cause, and firefighters and public safety personnel were forced to remain on scene to observe the facilities in case of an outbreak of new fires. Therein lies just one of the critical issues of concern. As you know, both Carmel and Somers, along with numerous nearby fire departments are all volunteer agencies. Most of the volunteers have full time work, families and numerous additional obligations. Thus, there is, and should be, great concern regarding the

While East Point Energy has apparently stated that the Project will not be approved until the Fire Department has signed off on it, there needs to be clarification as to which Fire Department(s) they are referring. In our opinion, each and every Fire Department that is part of the mutual aid plan which would be expected to provide emergency assistance in case of a battery storage fire, **must be considered, heard and sign off on this Project before it is approved.**

Finally, we urge that the Planning Board take a different stance than that of the Town Board which vigorously and, quite frankly, **discourteously refused** to take comment from anyone with respect to the proposed Project, despite the Town of Carmel's absolute reliance on its own as well as neighboring fire departments to provide emergency assistance in case of a battery storage fire, and **allow and encourage** that **ALL** residents of **ALL** communities be permitted to speak and be heard during the Planning Board review process. After all, not only do many of these residents live within 200 feet of the proposed Project, but they are also the residents who the Town expects and relies upon to step up to help and/or be impacted by the proposed Project.

In sum, for the reasons stated above, the Somers Board of Fire Commissioners joins with the Somers Town Board in urging transparency, careful consideration and **Full public participation** during the review process. Until that time, the Somers Board of Fire Commissioners vehemently opposes the proposed Project.

Respectfully,

Ariye Zohar
Chairman, Somers FD BOFC

cc: Mike Lawler, NYS Congressman
Pete Harckham, NYS Senator
Matt Slater, NYS Assemblyman
George Latimer, Westchester County Executive
Kevin Byrne, Putnam County Executive
Vedat Gashi, Westchester County Legislator
Michael Cazzari, Carmel Town Supervisor
Robert Scorrano, Somers Town Supervisor
Somers Town Board
Somers Volunteer Fire Department
Mahopac Volunteer Fire Department
Mahopac Falls Volunteer Fire Department
Carmel Fire Department
Avangrid, Inc. & NYSEG, its subsidiary
The Somers Record (Halston Media News)

WHAT TACTICS OR PROCEDURES HAS YOUR DEPARTMENT PU
LITHIUM-ION BATTERY FIRES?

Captain (Ret.) Chris G. Greene, Seattle (WA) Fire Department: In my opinion, the emergency respo enough to result in prescriptive "best practices" for our profession. Our strength lies in understandin surrounding these batteries. One thing is for certain: We are not going to widget and gadget our wa reexamination of some basic fire principles.

It's important to recognize the basic hazard considerations and influences for incidents involving the and electrical shock. Each has to be considered and anticipated. The magnitude of the hazard has t cells, confinement of the gas), which influences the explosive nature of the byproducts; and state of thermal failure.

For example, a failure of a single 2170 cell in an apartment will not directly result in a deflagration ha hazard for the space, but a fire of substance will be dependent on other combustibles within the apa will have a direct influence on the potential for deflagration and thermal intensity. It is the confineme on the situations.

Incident resolution and stabilization will rely on addressing the thermal and confinement concerns fo removing the batteries from enclosures. Furthermore, crews should recognize that these fundament are baseline considerations for most fire events. Understanding the use platforms and anticipating v underpinnings to developing tactics specific to lithium-ion influences.

Firefighter concerns

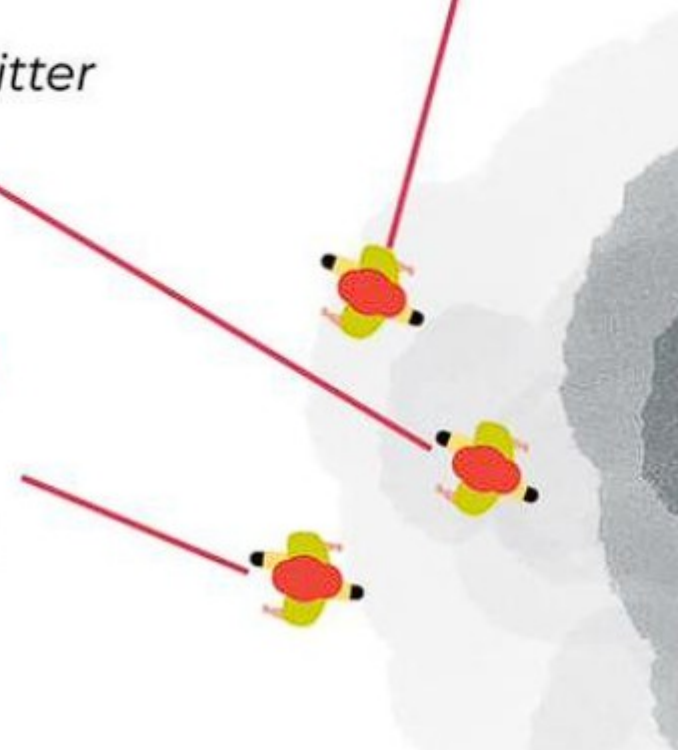
ELECTRIC VEHICLE
CAUSING RESPIRAT

Electric vehicle high speed collision with
and unexpectedly during recovery oper
vapours; all were hospitalised, with only

Firefighter 4 (52M
Exposed 3-4 mins fr
90m/300ft.
'Could taste it, immed
nausea and dizzine

Firefighter 2, (48M)
Exposed 1-3 mins from
85m/280ft.
'Scratchy throat, bitter taste'

Firefighter 1, (40M)
Exposed 3-5 mins
from 90m/300ft.
'Felt burning throat and metallic taste'



EV FireSafe
12,285 followers
2d •

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🔥 Off-gassing from EV thermal runaway causes firefighter injuries 🔥

On 11th April 2025 fire crews from the Sacramento Fire Department attended a high speed EV collision into a tree, and extricated the sole occupant, who was then hospitalised. The incident scattered ~5% of lithium-ion cells from the HV pack across the road. The incident was dealt with by fire officers in the appropriate PPE and breathing apparatus.

In the post operation clean-up, when breathing apparatus was no longer in use, the vehicle battery pack vented the vapour cloud on being moved for towing, and four firefighters suffered inhalation injuries, having been exposed for 1 – 5 minutes to the vapour cloud (in one case, only a single deep breath was taken in the cloud). Four firefighters are still unable to return to work (28 Sep 2025) due to the injuries sustained, which include:
- Reduced lung function (<82%)
- Sinus infection
- Elevated heart rate, blood pressure and tachycardia
- Mouth blisters turned into lesions
- Renal problems
- High concentrations of sulfur, phosphorus & lithium in blood tests

Over the coming weeks, we'll be sharing more information about what this means for emergency responders, particularly those without respiratory protection; police, ambulance, road rescue.

This is a really important message for all responders, and we ask you to please share this in your emergency response networks!

on qualifying
Internet bundles

Advertisement

Four firefighters are being treated for exposur
battery fire last April.

"A very low-lying white cloud, as it was descrit
members, came across them. They immediate
taste in their mouth," said Sylvia. "One of the
those batteries, once it hits water, it turns to a

Sylvia further explained the dangers of electri

"Once you split that series (of batteries), that's
becomes dangerous, because it can short-circ
that thermal runaway and become very unpre
own," he said.

The unpredictability adds to the danger, he said, as the four firefighters did not have on th
apparatus since the fire was out and they were in clean-up mode.

Sylvia emphasized the need for crews to always wear their protective gear.

"These EVs are something that is new to us," he said. "We really need to look at what the b
fighting these fires and not becoming a victim ourselves."

The four affected firefighters are undergoing experimental IV-infused therapy to remove h
their bloodstream and lungs, but it is unclear if there will be permanent damage.

Here's a news story, dated Sept 30th 2025 discussing the firefighter's exposure back in April and still today are suffering exposure symptoms and are undergoing experimental IV-infused therapy to attempt to remove heavy metals from their bloodstream:
https://www.kcra.com/article/sacramento-firefighters-injured-toxic-ev-battery-fire/68141225?fbclid=IwY2xjawPSXvJleHRuA2FlbQIxMABicmlkETE0OXNEN2VINE0wRlVBSGJac3J0YwZhcHBfaWQQMjIyMDM5MTc4ODIwMDg5MgABHo0vh7Z8VsTNnmvSAKugQftL2WTGk8TN_AtG-xL7j4fMgC1uSU0eOJH4MtMc_aem_x5AyVtC4XEid3rZfR7vpRg

Here's a presentation from one of the Surprise AZ firefighters who was severely injured in the lithium BESS explosion:

https://youtu.be/USnTf1JPgts?si=UtbOWe5fg81ItGk4

NEWS

TEEX Initiates Tests on First Responder PPE Exposed t

December 6, 2024

The challenges associated with responding to electric vehicle/energy storage system (EV/ESS) emergencies changing as these technologies continue to evolve and become more prevalent across the United States. L are used in electric vehicles, energy storage systems, scooters, bicycles, hoverboards and many other cons

The Texas A&M Engineering Extension Service (TEEX) recently initiated a series of tests to determine the cc produced by lithium-ion (Li-ion) battery fires and their impacts on first responders and their personal prot equipment (PPE). The tests were conducted by researchers at the Southwest Research Institute (SwRI) in S Texas. SwRI researchers also measured the effectiveness of two different cleaning methods to remove the emissions from the PPE.

During testing, researchers subjected the batteries to thermal runaway by overcharging and causing them The tests were conducted in a blast chamber where swatches of first responder bunker gear and apparatu self-contained breathing apparatus straps were exposed to the byproducts of Li-ion battery fires. The tests heavy metals and 75 semi-volatile organic compounds (SVOCs) resulting from the battery fires.

The tests concluded that Li-ion battery fires release highly toxic gases and particles that exceed the Occup High concentrations of lithium, nickel, cobalt, manganese and copper were detected during each Li-ion the emissions from the battery fires raise awareness of the human health and environmental risks associated



The traditional National Fire Protectic 99 percent of the metallic particles in metallic particles. However, some SV ranging from 21 percent to 92 percer that was used.

"This series of tests provides informa

https://teex.org/news/teex-initiates-tests-on-first-responder-ppe-exposed-to-lithium-ion-battery-fires/

Firefighters' Clothing Contamination in Fires of Electric Vehicle Batterie and Photovoltaic Modules—Literature Review and Pilot Tests Results

Ewelina Szmytke [1], Dorota Brzezińska [1,*], Waldemar Machnowski [2], Szymon Kokot [3]

Editor: Paul B Tchounwou

▸ Author information ▸ Article notes ▸ Copyright and License information

PMCID: PMC9566750 PMID: 36231742

Abstract

The electric vehicle (EV) market, together with photovoltaic (PV) installations continues t develop at a pace. However, there are concerns that EV and PV installation fires may creat more harmful substances than other types of fire. PV modules and car battery fires emit a range of carcinogenic and highly toxic compounds that are not yet fully understood and m pose a threat to firefighters' health. This also raises the question of the impact on firefight clothing and the safe handling and cleaning after such fires. This article presents a literatu and standards review of the firefighters' protective clothing maintenance and cleaning. It also contains test results showing that firefighters' clothes accumulate harmful substance after fighting these types of fires. Pilot tests for the presence of polycyclic aromatic hydrocarbons (PAHs) and formaldehyde showed that levels exceeded limits in all clothing samples. For example, the cobalt level was 24 times higher than that considered safe in th test carried out with car battery fire. Although it is recognized that liquid carbon dioxide (LCO_2) methods of cleaning may be more effective than traditional water washing, further research on cleaning efficiency for clothing containing substances emitted from car batter and PV modules fires is required.

Keywords: firefighter safety, firefighters, PV fire, electrical fire, car battery, electric vehicle firefighters' protective clothing, firefighters' clothing cleaning, liquid CO_2 firefighters' clothing decontamination

1. Introduction

https://pmc.ncbi.nlm.nih.gov/articles/PMC9566750/

HOW WE PROTECT OURSELVES

How we protect ourselves really falls into two predictable spaces: having the proper personal protect and the ability to remove potential contaminants from said PPE.

PPE recommendation. Wearing the standard structural firefighting ensemble to include self-contain the expectation for fires involving lithium-ion batteries. Furthermore, this is the standard expectation recognize that fires involving these energy sources have been part of the landscape for more than 30 emergency protection our gear affords is robust when it's in place, but we must be vigilant and rigid v PPE.

Decontamination of PPE. Complete removal of all fireground contaminants from turnout clothing re And though today this is not achievable, tomorrow it may be. We must continue to strive for this goal moving beyond the baseline expectations outlinedin NFPA 1851, *Standard on Selection, Care, and Ma Fighting and Proximity Fire Fighting,* now consolidated as part of the 2026 edition of NFPA 1850, *Sta Ensembles for Structural Fire Fighting and Proximity Fire Fighting and Open-Circuit Self-Contained* of conventional water-based extractors and consider exploring more advanced technologies like liqu additional enhancement for heavy metal removal. For some, the improvements this technology offer firefighters—they represent incremental progress toward that North Star.

Consider this: Current extractor washing temperatures had been set at 105°F for laundering our bun temperatures have now been increased to 120°F in the new NFPA 1850. These temperature settings c decontamination algorithm that balances toxin removal with fatigue of the PPE caused by this type c gear, the minimum expectation for contaminant removal for both organic and inorganic compounds semi-volatile organic compounds (SVOCs) and heavy metals set by NFPA 1850/1851 (Figure 1).

Figure 1. SVOCs and Heavy Metals Set by NFPA 1850/1851

SEMI-VOLATILE ORGANIC COMPOUNDS (10)		HEAVY METALS (6)	
1.	Acenaphthene	1.	Antimony
2.	Anthracene	2.	Arsenic
3.	Diethyl phthalate	3.	Cadmium
4.	Di-n-octyl phthalate	4.	Chromium
5.	Fluorene	5.	Cobalt
6.	Phenanthrene	6.	Lead
7.	2-Nitrophenol		
8.	Phenol		
9.	Pyrene		
10.	2,4,6-Trichlorophenol		

https://www.fireengineering.com/firefighting/lithium-ion-influenced-fires-back-to-basics/

Lithium BESS fires are unpreventable and unextinguishable:

https://www.cbs8.com/article/news/local/fire-safety-concerns-san-diego-county-battery-energy-storage/509-ab9b0716-7784-47a6-9394-efeebd875279

https://www.newsdata.com/california_energy_markets/regional_roundup/researchers-assess-metal-fallout-from-moss-landing-battery-fire/article_7d68d110-977d-4123-be33-ec4f39fdf09f.html

Thank you for your attention to this matter, and please step up and officially oppose lithium BESS being sited within 1 mile of schools, homes, and other hard to evacuate locations.

Thank you,

James

Gabriel Clark

From: Planning
Sent: Thursday, February 12, 2026 8:13 AM
To: Gabriel Clark
Subject: FW: MORE Firefighters officially oppose lithium BESS near schools, neighborhoods, fire stations, and other hard to evacuate locations- so should you!

Follow Up Flag: Follow up
Flag Status: Completed

fyi

Owen Goode
Planner II
Department of Community Development
City of Auburn | www.auburnwa.gov
Phone: (253) 470-2170 | ogoode@auburnwa.gov
Mailing Address: 25 W Main Street, Auburn, WA 98001
Permit Center Address: 1 E Main Street, Auburn, WA 98002 (Map)
Customer Service Survey | Application Forms | Zoning Maps

From: James DeLay <jamesdelay@hotmail.com>
Sent: Wednesday, February 11, 2026 1:04 PM
To: Cheryl Rakes <CRakes@auburnwa.gov>; Tracy Taylor <ttaylor@auburnwa.gov>; Brian Lott <BLott@auburnwa.gov>; Clinton Taylor <ctaylor@auburnwa.gov>; Lisa Stirgus <LStirgus@auburnwa.gov>; Hanan Amer <hamer@auburnwa.gov>; info@vrfa.org; Planning <planning@auburnwa.gov>
Subject: RE: MORE Firefighters officially oppose lithium BESS near schools, neighborhoods, fire stations, and other hard to evacuate locations- so should you!

CAUTION: The following message originated from outside the City of Auburn. Be careful opening links and attachments

Good afternoon Community leaders and EFSEC leaders,

Here's more official opposition to lithium BESS:



ABOUT CPF | NEWS &

NEWS

NEWS A

EVENTS

CPF FI

CPF MA

Oct 02, 2024

Joint Statement of International Longshore and Warehouse Union and California Professional Firefighters

On September 26th, a big rig carrying lithium-ion batteries at the San Pedro Bay Port Complex overturned, igniting an intense fire that disrupted port operations and caused the closure of a major freeway. The batteries burned for more than 24 hours while firefighters took a defensive stance to protect the surrounding area.

Incidents like this are happening more frequently. Firefighters risk great bodily harm, even death, when responding to these emergencies. ILWU members, who ensure the Ports of Los Angeles and Long Beach move goods efficiently and safely, are also put at risk during these incidents.

While we understand the importance of clean energy technologies and the efforts to ensure community safety, it is our firefighters who are bearing the brunt of risks posed by this technology. Over the past few years, we have witnessed a surge in lithium-ion battery fires in vehicles on our highways and battery storage facilities.

When these fires occur, entire highways are shut down and all traffic ceases. This impacts commercial transportation and the surrounding communities. A greater concern is the health impacts on those who respond to these fires. Even when wearing the proper personal protective equipment and respirators, firefighters face dangerous exposures. A single exposure can lead to a firefighter being forced to medically retire after suffering from irreversible damage to their body.

There is a current void in preparedness to respond to lithium-ion battery emergencies. When ignited, these batteries off-gas and can shoot flames up to 10 feet high. Firefighters have no choice but to let these fires burn out because water does little to quell the flames and intense heat.

CPF and ILWU will continue to collaborate on solutions to improve safety and reduce risk in the San Pedro Bay Port Complex and beyond, including through the convening of state agencies called by Governor Newsom on Friday, September 27th on this topic.

The ILWU dispatches longshore, marine clerk, foreman and security guard labor at 14 California Ports, including the Ports of Los Angeles and Long Beach, day and night, 365 days a year to move the nation's cargo and provide fluidity to the global supply chain.

CPF, state council of the International Association of Firefighters, represents 35,000 professional firefighters and emergency medical services personnel across California, including the firefighters who responded to the lithium battery fire at the San Pedro Bay Port Complex.

https://www.cpf.org/news/news-updates/joint-statement-of-international-longshore-and-warehouse-union-and-california-professional-firefighters?fbclid=IwY2xjawPTkYBleHRuA2FlbQIxMABicmlkETFWeXlwYmJkTUNqV1hOeFFSc3J0YwZhcHBfaWQ

QMjIyMDM5MTc4ODIwMDg5MgABHmCr-Ba-RSLwLq_Rha_bFKNjhr6BavEaSD-ai26uXa191KVi0zTp5Ui_6GIC_aem_iWnHcgvKkaZ_DRwpiYfHxA

From: James DeLay <jamesdelay@hotmail.com>
Sent: Wednesday, February 11, 2026 1:02 PM
To: crakes@auburnwa.gov <crakes@auburnwa.gov>; ttaylor@auburnwa.gov <ttaylor@auburnwa.gov>; blott@auburnwa.gov <blott@auburnwa.gov>; ctaylor@auburnwa.gov <ctaylor@auburnwa.gov>; lstirgus@auburnwa.gov <lstirgus@auburnwa.gov>; hamer@auburnwa.gov <hamer@auburnwa.gov>; info@vrfa.org <info@vrfa.org>; Planning <planning@auburnwa.gov>
Subject: Firefighters officially oppose lithium BESS near schools, neighborhoods, fire stations, and other hard to evacuate locations- so should you!

Good afternoon Auburn Leaders,

Lithium BESS have significant impacts on people and the environment when they have an unpreventable and unextinguishable thermal runaway fire.

Here's a few Firefighter, Unions, and others that have taken a stand to protect citizens, school children, and other neighbors from the dangers of lithium Battery Energy Storage Systems:

LOS ANGELES COUNTY
FIRE FIGHTERS LOCAL 1014
3460 FLETCHER AVE. • EL MONTE, CA 91731 • (310) 639-1014 • FAX (310) 639-53

January 2, 2026

Anthony Marrone, Fire Chief
Los Angeles County Fire Fighters Local 1014
1320 N. Eastern Avenue
Los Angeles, CA 90063

CEASE AND DESIST NOTICE: Consideration or Approval of Energy Storage System (ESS) Fac Station 43 or Residential Occupancies

Dear Chief Marrone:

This correspondence serves as a formal **CEASE AND DESIST NOTICE** on behalf of the Los Angeles Local 1014.

IAFF Local 1014 hereby demands that the Los Angeles County Fire District, Fire Prevention Bureau, any subordinate authority immediately cease and desist from any consideration, review, approval facilitation of an Energy Storage System (ESS) facility proposed to be located adjacent to Los Angeles C proximity to residential occupancies within Los Angeles County.

NOTICE OF UNACCEPTABLE AND FORESEEABLE DANGER

The siting of an ESS facility next to an occupied fire station—where firefighters work and reside twenty constitutes an unacceptable, unsafe, and indefensible action that directly contradicts established fi principles, firefighter safety standards, and the intent of applicable codes. ESS facilities are recognize installations that present uniquely severe risks, including but not limited to:

- Thermal runaway and cascading battery failure
- Deflagration and explosive overpressure events
- Release of highly toxic gases, including hydrogen fluoride (HF)
- Delayed ignition and re-ignition without warning

Fire stations are mixed-use facilities containing residential occupancies under the California Building C and Los Angeles County amendments. Firefighters live, eat, and sleep within these facilities. Placing a such an occupancy would never be permitted for traditional residential housing and is equally impermiss

KNOWN AND DOCUMENTED FIRE SERVICE INJURY HISTORY

Lithium-ion battery incidents, using the same technology deployed in ESS facilities, have already caused

Large-scale ESS incidents—including the Moss Landing BESS fire (2025), Gateway Energy Storage fire the McMicken ESS explosion—further confirm that these facilities can catastrophically fail without wa defensive firefighting tactics, exclusion zones, and evacuation to prevent injury or loss of life.

These realities alone establish that ESS facilities do not belong near occupied fire stations or residential c

RESIDENTIAL COMMUNITY SAFETY

IAFF Local 1014's opposition is not limited to fire stations. ESS facilities pose an existential threat to pub when located near residential homes, schools, or neighborhoods. Civilians—including children, seniors, a populations—have no ability to mitigate or respond to ESS failures involving toxic gas release, explosion, events.

Local 1014 does not oppose energy storage technology in principle. However, such facilities must be sitec residential areas of Los Angeles County, where failure does not endanger the public or emergency respon

DEMAND TO CEASE AND DESIST

Accordingly, IAFF Local 1014 hereby demands that you:

1. Immediately cease and desist from any further consideration, review, or approval of an ESS fa Station 43.
2. Cease and desist from approving ESS facilities in proximity to residential occupancies within
3. Confirm that no permits, conditional approvals, variances, or discretionary actions will be gra

NOTICE OF ESCALATION AND LIABILITY

Should Local 1014 become aware that Fire Prevention personnel or the Fire Marshal's Office has approve ESS facilities near fire stations or residential communities, this matter will be immediately escalated to the Board of Supervisors. California Professional Firefighters (CPF), the state union representing over 30,000 aware of this issue and stands in full support of Local 1014.

Any future injury, long-term health impact, or loss of life resulting from an ESS incident approved despite solely with:

- The Los Angeles County Fire District
- The Fire Marshal and Fire Prevention Division
- The County of Los Angeles and all approving authorities

The dangers are known, foreseeable, and preventable.

You are hereby directed to provide a **formal written response within five (5) business days** confirming t rejected and removed from further departmental or County consideration. Failure to do so will be interpret with this notice and will result in immediate escalation.

Vice President Tony Carcioppolo will be handling this issue for Local 1014, please contact him with any q and with your response.

Braintree Fire Department
1 Union Place – Braintree MA 02184

Acting Chief Frederick Viola

Emergency (781-843-3600)
Business (781-843-3601)
(781-843-2395 x4001)
Fax (781-356-4362)

TO: Mellisa Santucci-Rozzi, Department of Planning and Community Development

FROM: Frederick Viola, Acting Chief Braintree Fire Department

DATE: December 2, 2024

RE: Proposed Battery Energy Storage System Facility 119 Common Street

Dear Director Santucci-Rozzi,

I am writing to you with the understanding that you can disseminate this to the rest of the board regarding the application for a proposed Battery Energy Storage System (BESS) facility filed by Braintree Electric Light Department and Convergent Energy.

My focus remains steadfast on ensuring public safety for the residents and visitors of our community. After thorough consideration, I have significant concerns regarding the risks associated with placing this facility at the proposed location.

Following detailed research, including consultation of industry publications, input from employees, guidance from the Department of Fire Services of Massachusetts, and discussions with municipal fire chiefs in communities managing similar facilities, I have concluded that I cannot support this location for the BESS facility.

The Common Street corridor is a densely populated residential area that experiences frequent congestion, particularly due to its proximity to South Shore Plaza and Route 3 South. This issue is further exacerbated during peak times, such as the holiday shopping season. The proposed evacuation routes, which encompass all access points in and out of the area, appear insufficient for a quick and organized evacuation or for ensuring timely fire apparatus response.

Furthermore, the Emergency Response Guidebook (ERGB), a global standard for hazardous materials incidents, specifies a minimum evacuation distance of 500 meters (approximately one-third of a mile) for lithium-ion battery storage fires, including for first responders. This evacuation requirement would strain resources, potentially hindering an effective response while consuming departmental capacity solely for evacuation management.

The proposed site is located just 159 feet from the nearest residential home and 200 feet from a church hall, which frequently hosts outdoor activities. Additionally, the current plans do not provide sufficient access to the entire facility's perimeter for fire suppression, nor is there adequate consideration of water distribution needs for cooling adjacent batteries in the event of a fire.

While I appreciate the effort and thought that the applicants have dedicated to this proposal, I believe this facility would be better suited to a more industrial location in town where the associated risks can be mitigated more effectively.

Thank you for your attention to this matter.

Sincerely,

Frederick T. Viola

Acting Chief, Braintree Fire Department

WEST THURSTON REGIONAL FIRE AUTHORITY

10828 Littlerock Rd SW Olympia WA 98512
Phone 360.352.1614 Fax 360.352.1696

Date: 01/08/2025
To: Thurston Co Community Planning and Development - Kraig Chalem
From: Chief Nathan Drake
Subject: Comment on Lithium-Ion Battery Energy System – 7505 183rd Ave SW, Rochester

Dear Community Planning and Development,

West Thurston Regional Fire Authority has reviewed the proposed land use application for the installa a lithium-ion battery energy storage system (BESS) at 7505 183rd Ave SW, Rochester. While we acknowledge the importance of renewable energy initiatives, we must express significant concerns reg the safety implications of this project and the potential risks associated with the operation of a lithium battery system.

The following points summarize our primary concerns:

Fire Risk: Lithium-ion batteries, especially at large scale, present a heightened fire risk due to therma runaway, which can result in uncontrolled fires that are difficult to extinguish. The potential for catast fire incidents in the event of system malfunction, external damage, or other unforeseen events is a maj safety concern for both the facility and surrounding areas. Fires caused by lithium-ion batteries can be extremely challenging to control and may lead to significant hazards, including the release of toxic ga potential damage to nearby properties.

Emergency Response Readiness: Lithium-ion battery fires require specialized training, equipment, a knowledge to safely respond. West Thurston Fire currently lacks adequate resources and training spec tailored to managing large-scale battery storage fires. This may result in increased difficulty in effecti and safely managing an emergency situation.

Impact on Fire Suppression Infrastructure: Given the size and nature of a lithium-ion battery energ storage system, there is a risk that standard fire suppression systems may not be adequate. There are n hydrants in this proposed area. This means that the vast amount of water needed for firefighting activi and containment would have to be trucked in using water tender operation. West Thurston Fire and ou mutual aid partners do not have the capacity to keep up with these water flow requirements. We urge applicant to provide detailed plans for advanced fire detection, suppression systems, and additional infrastructure improvements to ensure safe operation.

Potential for Escalating Risk Over Time: As battery systems age, the risk of malfunction and failur increases. Given the long operational lifespan of these systems, ongoing safety assessments, maintena and oversight are crucial to mitigate risks.

Considering the above concerns, West Thurston Fire Regional Fire Authority opposes the approval of land use application unless the applicant demonstrates full compliance with the necessary fire safety standards and implements additional safeguards and infrastructure improvements to mitigate the risks associated with lithium-ion battery storage systems. We recommend that the applicant engage in furth discussions with the Thurston County Fire Marshal Office to ensure that all fire-related safety measur adequately addressed before moving forward.

Thank you for your attention to this critical matter.

Sincerely,



Nathan Drake
Fire Chief
West Thurston Regional Fire Authority
10828 Littlerock Rd SW Olympia, WA 98512
Phone: 360-352-1614
nathan.drake@wtrfa.org

Vacaville Firefighters IAFF L

PO Box 5006, Vacaville Ca. 95696 www.IA

October 30, 2025

To the Honorable Members of the California Energy Commission,

The Vacaville Firefighters Association formally submits this letter in
Corby Battery Energy Storage System (BESS) Project.

Our position is based on the risk the project poses to the health and s
members. Bypassing local government and critical local funding mec
increase this risk.

There is a clear and documented danger posed by lithium-ion BESS f
result in the release of highly toxic gases and heavy metals that pose
risks.

As we have learned from recent incidents, fires in battery storage fac
resource intensive. These emergencies require large personnel and eq
a response would strain resources and inhibit or delay our ability to r
from our residents.

Solano County has identified more remote industrial locations appro
the event of a "thermal runaway" incident at the proposed location, t
to Interstate 80, surrounding rural homes and a large subdivision. A s
facility site could cause evacuations or shelter in place orders for tho
importantly, the public and first responders could be exposed to toxic
evacuations or responding to the incident itself.

We urge the California Energy Commission to place the health of ou
above corporate convenience. The Corby Project, in its current form
permitting path, poses an unnecessary risk to our residents and firefig

We formally request that the CEC reject the current application for t

Sincerely,

Van Zandt County

ANDY REESE
COUNTY JUDGE

121 East Dallas, Room 206
Canton, Texas 75103
judgereese@vanzandtcounty.org

VOICE: (903) 567-7
FAX: (903) 567-7
www.vanzandtcounty.

PRESS RELEASE – Wednesday March 26, 2025

Van Zandt County Fire Marshal Issues Order to Taaleri Energia (Project Amador)

On Friday March 21, 2025, Van Zandt County Fire Marshal issued an order to Taale Energia to conform to all applicable National Fire Protection Association (NFPA standards per Texas Local Government Code Chapter 233 and NFPA 855 (2020 ed Taaleri Energia started construction of a Battery Energy Storage Facility (BESS) nea the intersection of FM 47 and FM 1651 in December of 2024.

Requirements that must be completed according to the Order of the Van Zandt Count Fire Marshal include:

1. Application for the permit for new construction and pay the applicable fee.
2. Submit container test results conducted by a Underwriters Laboratory (UL) certified laboratory.
3. Submit a survey of the construction site for review and approval.
4. Submit a site-specific hazard mitigation plan.
5. Submit a site-specific emergency response plan.
6. Provide documentation that a permanent water source will be available in proximity to this location.

Taaleris Energia Project Amador is ordered to comply with all relevant fire codes and permitting proce by April 7, 2025, and prior to any batteries arriving in Van Zandt County.

County Judge Andy Reese stated, "I am proud of the work being done by our Fire Marshal to protect tl safety of the residents near this facility. I am working diligently and aggressively with Fire Marshal Kev Palmer and our District Attorney Tonda Curry to ensure that we are using every available legal tool force Taaleri to comply with all provisions of NFPA 855. The DA assures me that appropriate court actic will be taken if Taaleri does not comply with the Fire Marshal's order."

For additional information, contact the Van Zandt County Fire Marshal Kevin Palmer at 903-567-602

HAUPPAUGE FIRE DISTRICT
855 WHEELER ROAD, HAUPPAUGE NY 11788

FOR IMMEDIATE RELEASE

STATEMENT BY THE BOARD OF FIRE COMMISSIONERS REGARDING THE LITHIUM-ION BATTERY ENERGY STORAGE SYSTEM PLANNED FOR 220 RABRO DRIVE

The Commissioners of the Hauppauge Fire District and the Chiefs of the Hauppauge Fire Departm expressed serious safety concerns regarding the proposed Key Capture Energy 79-megawatt (MW energy storage system (BESS) planned for 220 Rabro Drive.

The Hauppauge Fire District urges the Town of Islip to extend the current moratorium on this pr another year. This would allow time for KCE to address our safety concerns. It would also a Hauppauge Fire Department and the Hauppauge community to receive up to date informati experts familiar with the hazards associated with BESS facilities like the one planned.

The Board of Fire Commissioners and the Chiefs of the Hauppauge Fire Department maintai until these concerns are resolved, the KCE NY 29 project should not proceed. Our stance is in a commitment to transparency, safety, and the well-being of the Hauppauge community a as the protection of our local environment.

Main Concerns and Questions

- Reports from the Suffolk County Economic Development and Planning Commission (Dece 2023) and the Long Island Power Authority (December 18, 2024), confirm that KCE NY 29 **lithium-ion** Battery Energy Storage System (BESS) with an output of 79 MW and a storage ca 316 megawatt-hours (MWh). The Hauppauge Fire District believes that 220 Rabro Drive suitable location for such a facility, especially given the history of **lithium-ion** battery fires a sites globally. The site is at the eastern edge of the industrial park less than a thousand fe residential neighborhood, about half a mile from Bretton Woods Elementary school, St Thom Church and the HYO ball fields. The location is just over half a mile from the headwate Nissequogue River and it is just blocks from a major transportation route, the Long Island Exp

- Community and Environmental Safety: The safety of our residents, the environment, responders is a central concern. If a fire or other emergency occurs at the KCE NY 29 facility,

- Battery Technology: There is uncertainty about the specific battery system KCE intends to us it is believed that the Tesla Megapack ***lithium-ion*** system—first introduced in 2019—may b recent information suggests that in 2024 Tesla began moving towards a **lithium-iron-pho** battery system. The Hauppauge Fire District seeks clarity on which lithium-ion battery type installed at the site by KCE.

- Communication and Coordination: While KCE has engaged with Suffolk County and Town officials, there has been minimal direct contact with the Hauppauge Fire District by KCE. Commissioners and Chiefs stress that their involvement is critical, as their personnel would first to respond in an emergency.

- Community Involvement: The Hauppauge Fire District encourages all members of the Hau community to voice their concerns at the scheduled Town of Islip Board meeting on August 1 at 2 PM. We want to ensure that community safety and environmental stewardship take prec in any decisions regarding this lithium-ion BESS project.

On or about August 28, 2023 the Riverhead Fire Dist
requested the imposition of a moratorium on Battery
within the Town of Riverhead related to fire safety c
volunteer firefighters; impacts on water supply; as we
facilities on waterbodies. The Riverhead Fire District f
necessary to understand the complexity of the sta
Riverhead Fire Department and neighboring depart
resources to train its membership in conjunction with t
Safety Working Group.

These concerns, coupled with the Town Board's ne
assurance about the safety of these types of faciliti
ensuring the technology and availability of equipment
be able to suppress a fire should one occur, precauti
deterring any necessary fire suppression chemicals
the adequacy of location and other special permit sta
has persuaded the Town Board to take pause on th
enactment of a three (3) month limited moratorium
Battery Energy Storage Systems pursuant to Town
these issues are further considered and the law is a
outstanding concerns, including the potential for cata
planning.

agency working group on the safety of BESS facilities, and a letter to the Town Board last week from the Riverhead Fire District Commissioners asking the town to enact a moratorium on BESS facilities, convinced Hubbard that a moratorium is needed, he said today.

“On behalf of the 170 volunteer members of the Riverhead Fire Department, we write to you today to implore you to follow the townships around us and impose a moratorium on Battery EnergyStorage Systems(BESS) in the Town of Riverhead,” the Riverhead Fire District commissioners wrote in an Aug. 28 letter to the Town Board.

Citing the fires, the commissioners said the town’s volunteer firefighters “face potentially extreme conditions in the case of a fire at once of these facilities.”

The state working group will begin immediate inspections of energy storage sites across the state, Gov. Kathy Hochul said in July, when she announced the group’s formation. It will “collaborate with first responders and local leaders to identify best practices, address potential risks to public safety, and ensure energy storage sites across New York are safe and effective.” The group will also “independently assess and identify common causes, air monitoring results or other community impacts, and other factors involved with energy storage fires,” the governor said.

“We look forward to the results of this task force,” the Riverhead Fire District Commissioners said in the letter.

“Additional time is needed to study the complexity of this issue and its impact on our community, as well as to ensure that the Riverhead Fire Department and neighboring departments have sufficient time and resources to train all members. Finally, more time is needed to determine whether we have the necessary resources to fight these fires and safeguard our members against the hazardous conditions they may present,” the fire

December 3, 2024

Reference: Corner of Byrnes Road and Kilkenny Road Solano County, Battery Energy Storage System (BESS)

Dear California Energy Commission Board Members,

This notification is to clearly make you aware **We are not in favor and adamantly oppose** the location of this Lithi
Battery Energy Storage System (BESS) at Byrnes Road and Kilkenny Road.

Please do not approve this application without a fair and thorough public review. At minimum, an extension of revie
period is necessary.

Our family home is located within ¼ mile, directly across, of the proposed development location. We live within the Vac
City limits. We were never contacted or notified of this proposed development/use until a neighbor told us yesterday o
2024. **This is not acceptable.** We find the deceptive, covert, and calculated methods being used by the developer, Co
Energy Storage/Next ERS with their intent to clearly bypass public comments and deceitfully gain the approval from the
California Energy commission Board Members appalling.

This company has been less then forthcoming with the surrounding residents of the City of Vacaville and County of Sola
along with the California Energy Commission Board Members. Please do not allow this developer to use you as a pawn
around standard processes because of an oversite in AB205, which creates a loophole in the law. It was **not** the intent o
assembly bill.

This company had proposed the development of this facility site in another separate location approximately 1 mile away
was met with extreme opposition and development denial by the County of Solano. The prior location residents will be
in the drift hazard and evacuation zone pathway from incidents occurring at this facility.

Most general population will say they have **fires** which are not extinguishable. The industry uses the term "Thermal
Runaway" to avoid using the word fire. Whatever terminology is used, Thermal Runaway is a large problem and is not
avoidable. During thermal runaway, batteries will burn uncontrollably, emit toxic fumes, emit flammable vapors and p
explosion hazards. This will always require evacuation from surrounding area for public safety.

There are many residential homes and small acreage (2 ½ to 5 acre) in this immediate area. They will all be at risk due t
proven hazards these facilities generate. All other Lithium-ion Battery Storage sites are in completely Isolated areas to a
the negative impact to residents.

The new location proposed is prime agricultural land. Agricultural lands defined as Mediterranean. These areas are ve
limited in the California and United States and are considered top producing for our Country. Depleting our prime agric
lands to place hazardous operating Lithium-ion battery storage yards should be criminal. Destroying prime agricultural l
not acceptable, recognizing less than 1% of the world population grows our foods.

These facilities are prone to failure due to their nature. The Batteries will overheat and result in fire "thermal runaway"
their industry calls it. Our extreme seasonal temperatures will not benefit Lithium-Ion batteries and will enhance the cl
and cause overheating. Thermal runaway can occur due to exposure to excessive temperatures, external shorts due to
wiring, or internal shorts due to cell defects. Thermal runaway events result in the venting of toxic and highly flammabl
and the release of significant energy in the form of heat. Vented gases are hot enough to melt metal. If ignited, these g
can cause enclosed areas to over pressurize, and if unmitigated, this overpressure can result in an explosion and severe

Since 2018 there have been over 40 significantly large fires "Thermal Runaways" of lithium-ion battery storage facilities fires "Thermal Runaways" are extremely hard to put out and require excessive amounts of water and sometimes will bu weeks causing closure and displacement due to evacuation and shutdowns. Our fire personnel have no effective way o stopping these events.

In September 2022 a battery storage fire in Moss Landing shut down an eight (8) mile stretch of Hwy 1. THIS LOCATION APPROVED, WILL CLOSE DOWN A COMPARIABLE SECTION OF INTERSTATE 80. This will be a significant impact to the en state. This proposed location is less then a mile from Interstate 80. It is not if it will happen - because it will. It is wher

Cells generate heat, even under normal operating conditions. It is proven that the heat generated from large lithium-i battery storage facilities increases the ambient temperatures surrounding the facilities. This is a negative impact to the environment, residents and wildlife within the area.

These facilities generate a nonstop Noise issue. They require their own equipment to charge and cool the batteries, wh creates an extremely loud buzzing or humming noise 24/7 that can be heard in neighboring area. This will substantiall our quality of living and depreciate our properties value. This proposal is within one (1) mile of Kaiser Permanente Hos and Solano Community College. The continuous noise will also impact the natural wild life found within the area. Haw Migratory birds, Egrets, Herans and small animals, livestock and pets. They will provide you a signed document saying t exempt but in prior experiences the equipment exceeds established dba levels and are not intended 24/7. Noise is a significant issue to quality of life.

The operation of these Lithium-ion battery Storage yards also brings environmental hazards. Runoff from daily use of w for cooling batteries and runoff from cooling exploded burning "Thermal runaway" batteries will contaminate the nearb creeks, canals and pollute groundwater which also may affect nearby City and Residential wells. As required for all oth hazardous materials that are subject to spills, no containment and capturing of contaminated water will occur at the fa will contaminate soil and ground waters.

This facility does not provide long term jobs or energy benefit for City of Vacaville or Solano County. Once built, these are usually remotely monitored. Concerning when an incident occurs and the response is delayed. The energy saved directly to PG&E and doesn't guarantee power for the surrounding area during blackouts. Only millions of dollars in pr the developer.

Most Fire jurisdictions have NO ability to address the incidents occurring at these facilities. They can only take precau evacuating surrounding residents, evacuating Hospital, evacuating college campuse, shutting down roads/major interst and notifying surrounding Airports Nut Tree Vacaville and Travis Air Force Base) both who have direct flight paths over t area. This can be for days until they can get control of the Fire "thermal runaway", Flammable and Toxic gases they call "Thermal Runaway. Residents evacuated, Hospital, Airports closed, College Campus closed, Highway 80 closed will cre severe negative impact to the economy. I cannot imagine having to evacuate myself, from my home, for days.

This is not an appropriate location for this Lithium-Ion Battery Storage Facility.

Please do not approve this application. We are opposed and do not approve of this use so close to residents, h airports and Interstate 80. Your Approval would be an injustice to the people.

Thank you for hearing our concerns,

Kimberly Korff, Retired State of California Fire Marshal
Fred Korff, Retired Small Business Owner
6859 Willow Road
Vacaville, CA 95698

FIRE HEADQUARTERS
ROUTE 139
LINCOLNDALE, NEW YORK

TEL (914) 248-741
FAX (914) 248-698

BOARD OF FIRE COMMISSIONERS
TOWN OF SOMERS
SOMERS FIRE DISTRICT

P.O. BOX 300
SOMERS, NEW YORK 10589

RECEIVI
APR 18 202
RALPH STUPPLE
FIRE DISTRICT MANA
OFFICE OF THE SUPERV
CLAIRE KELMER
TOWN OF SOMERS
SECRETARY

ERIC ZOHAR, CHAIRMAN
JOHN FITZGERALD
LAURENT VERARD
STEPHANIE PORTEUS
JOHN CHRYSOGELOS

JOANNE VALENTINE
TREASURER

April 15, 2024

Via Mail and E-Mail to rtrombetta@ci.carmel.ny.us

Town of Carmel Planning Board Members
60 McAlpin Avenue
Mahopac, NY 10541

Re: Proposed Lithium Battery
Storage Facility Located off Miller
Road, Mahopac and adjoining the
Town of Somers

Dear Chairman Paeper and Members of the Carmel Planning Board,

On behalf of the Somers Fire District Board of Fire Commissioners, I am writing to share our grave trepidations regarding the Lithium Battery Storage Facility proposal (hereinafter the "Project") which will come before your Board for deliberation. While the approval of the Project does not fall within the purview of the Town of Somers, our Fire District borders the Town of Carmel and, due to mutual aid agreements among our fire departments, we have numerous concerns regarding adequate training of firefighters, **who are unequipped and unprepared** with respect to fighting battery storage facility fires, the cost of adequate equipment and gear, and the amount of manpower that would be required in case of a battery storage emergency like those seen in Warwick, East Hampton and Lyme, New York, along with numerous other lithium battery fires around the country. As you might recall, residents within a one-mile radius of the Lyme fire were directed to shelter in place for several hours due to the amount of smoke in the air, and the Warwick fire caused heavy smoke and burning plastics, prompting the evacuation of the district office and all local schools.

Critically, days after the fires were out, officials said the area was too hot for anyone to enter to investigate the cause, and firefighters and public safety personnel were forced to remain on scene to observe the facilities in case of an outbreak of new fires. Therein lies just one of the critical issues of concern. As you know, both Carmel and Somers, along with numerous nearby fire departments are all volunteer agencies. Most of the volunteers have full time work, families and numerous additional obligations. Thus, there is, and should be, great concern regarding the

While East Point Energy has apparently stated that the Project will not be approved until the Fire Department has signed off on it, there needs to be clarification as to which Fire Department(s) they are referring. In our opinion, each and every Fire Department that is part of the mutual aid plan which would be expected to provide emergency assistance in case of a battery storage fire, **must be considered, heard and sign off on this Project before it is approved.**

Finally, we urge that the Planning Board take a different stance than that of the Town Board which vigorously and, quite frankly, **discourteously refused** to take comment from anyone with respect to the proposed Project, despite the Town of Carmel's absolute reliance on its own as well as neighboring fire departments to provide emergency assistance in case of a battery storage fire, and **allow and encourage** that **ALL** residents of **ALL** communities be permitted to speak and be heard during the Planning Board review process. After all, not only do many of these residents live within 200 feet of the proposed Project, but they are also the residents who the Town expects and relies upon to step up to help and/or be impacted by the proposed Project.

In sum, for the reasons stated above, the Somers Board of Fire Commissioners joins with the Somers Town Board in urging transparency, careful consideration and **Full public participation** during the review process. Until that time, the Somers Board of Fire Commissioners vehemently opposes the proposed Project.

Respectfully,

Ariye Zohar
Chairman, Somers FD BOFC

cc: Mike Lawler, NYS Congressman
Pete Harckham, NYS Senator
Matt Slater, NYS Assemblyman
George Latimer, Westchester County Executive
Kevin Byrne, Putnam County Executive
Vedat Gashi, Westchester County Legislator
Michael Cazzari, Carmel Town Supervisor
Robert Scorrano, Somers Town Supervisor
Somers Town Board
Somers Volunteer Fire Department
Mahopac Volunteer Fire Department
Mahopac Falls Volunteer Fire Department
Carmel Fire Department
Avangrid, Inc. & NYSEG, its subsidiary
The Somers Record (Halston Media News)

WHAT TACTICS OR PROCEDURES HAS YOUR DEPARTMENT PU
LITHIUM-ION BATTERY FIRES?

Captain (Ret.) Chris G. Greene, Seattle (WA) Fire Department: In my opinion, the emergency respo enough to result in prescriptive "best practices" for our profession. Our strength lies in understandin surrounding these batteries. One thing is for certain: We are not going to widget and gadget our wa reexamination of some basic fire principles.

It's important to recognize the basic hazard considerations and influences for incidents involving the and electrical shock. Each has to be considered and anticipated. The magnitude of the hazard has t cells, confinement of the gas), which influences the explosive nature of the byproducts; and state of thermal failure.

For example, a failure of a single 2170 cell in an apartment will not directly result in a deflagration ha hazard for the space, but a fire of substance will be dependent on other combustibles within the apa will have a direct influence on the potential for deflagration and thermal intensity. It is the confineme on the situations.

Incident resolution and stabilization will rely on addressing the thermal and confinement concerns fo removing the batteries from enclosures. Furthermore, crews should recognize that these fundament are baseline considerations for most fire events. Understanding the use platforms and anticipating v underpinnings to developing tactics specific to lithium-ion influences.

Firefighter concerns

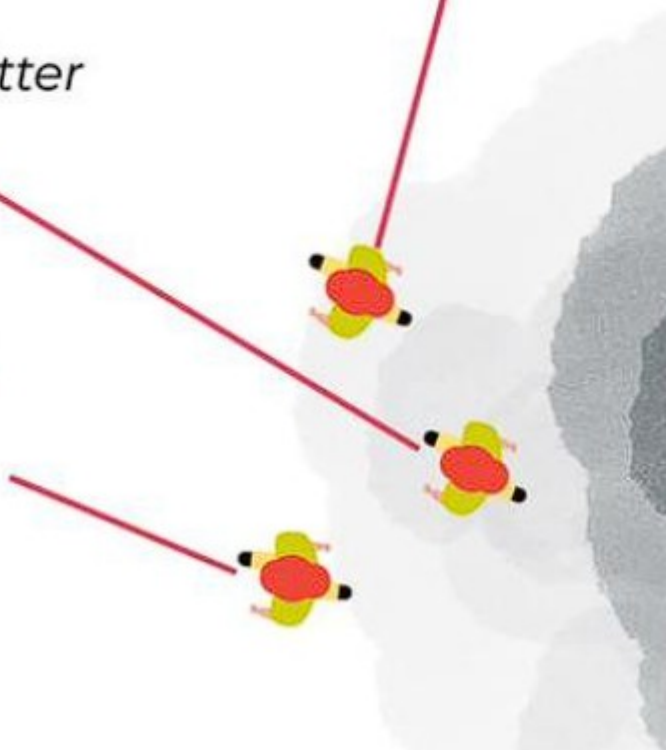
ELECTRIC VEHICLE
CAUSING RESPIRAT

Electric vehicle high speed collision with
and unexpectedly during recovery oper
vapours; all were hospitalised, with only

Firefighter 4 (52M
Exposed 3-4 mins fr
90m/300ft.
'Could taste it, immed
nausea and dizzine

Firefighter 2, (48M)
Exposed 1-3 mins from
85m/280ft.
'Scratchy throat, bitter taste'

Firefighter 1, (40M)
Exposed 3-5 mins
from 90m/300ft.
'Felt burning throat and metallic taste'



EV FireSafe
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🔥 Off-gassing from EV thermal runaway causes firefighter injuries 🔥

On 11th April 2025 fire crews from the Sacramento Fire Department attended a high speed EV collision into a tree, and extricated the sole occupant, who was then hospitalised. The incident scattered ~5% of lithium-ion cells from the HV pack across the road. The incident was dealt with by fire officers in the appropriate PPE and breathing apparatus.

In the post operation clean-up, when breathing apparatus was no longer in use, the vehicle battery pack vented the vapour cloud on being moved for towing, and four firefighters suffered inhalation injuries, having been exposed for 1 – 5 minutes to the vapour cloud (in one case, only a single deep breath was taken in the cloud). Four firefighters are still unable to return to work (28 Sep 2025) due to the injuries sustained, which include:
- Reduced lung function (<82%)
- Sinus infection
- Elevated heart rate, blood pressure and tachycardia
- Mouth blisters turned into lesions
- Renal problems
- High concentrations of sulfur, phosphorus & lithium in blood tests

Over the coming weeks, we'll be sharing more information about what this means for emergency responders, particularly those without respiratory protection; police, ambulance, road rescue.

This is a really important message for all responders, and we ask you to please share this in your emergency response networks!

on qualifying
Internet bundles

Advertisement

Four firefighters are being treated for exposur
battery fire last April.

"A very low-lying white cloud, as it was descrit
members, came across them. They immediate
taste in their mouth," said Sylvia. "One of the
those batteries, once it hits water, it turns to a

Sylvia further explained the dangers of electri

"Once you split that series (of batteries), that's
becomes dangerous, because it can short-circ
that thermal runaway and become very unpre
own," he said.

The unpredictability adds to the danger, he said, as the four firefighters did not have on th
apparatus since the fire was out and they were in clean-up mode.

Sylvia emphasized the need for crews to always wear their protective gear.

"These EVs are something that is new to us," he said. "We really need to look at what the b
fighting these fires and not becoming a victim ourselves."

The four affected firefighters are undergoing experimental IV-infused therapy to remove h
their bloodstream and lungs, but it is unclear if there will be permanent damage.

Here's a news story, dated Sept 30th 2025 discussing the firefighter's exposure back in April and still today are suffering exposure symptoms and are undergoing experimental IV-infused therapy to attempt to remove heavy metals from their bloodstream:
https://www.kcra.com/article/sacramento-firefighters-injured-toxic-ev-battery-fire/68141225?fbclid=IwY2xjawPSXvJleHRuA2FlbQIxMABicmlkETE0OXNEN2VINE0wRlVBSGJac3J0YwZhcHBfaWQQMjIyMDM5MTc4ODIwMDg5MgABHo0vh7Z8VsTNnmvSAKugQftL2WTGk8TN_AtG-xL7j4fMgC1uSU0eOJH4MtMc_aem_x5AyVtC4XEid3rZfR7vpRg

Here's a presentation from one of the Surprise AZ firefighters who was severely injured in the lithium BESS explosion:

https://youtu.be/USnTf1JPgts?si=UtbOWe5fg81ItGk4

NEWS

TEEX Initiates Tests on First Responder PPE Exposed t

December 6, 2024

The challenges associated with responding to electric vehicle/energy storage system (EV/ESS) emergencies changing as these technologies continue to evolve and become more prevalent across the United States. L are used in electric vehicles, energy storage systems, scooters, bicycles, hoverboards and many other cons

The Texas A&M Engineering Extension Service (TEEX) recently initiated a series of tests to determine the cc produced by lithium-ion (Li-ion) battery fires and their impacts on first responders and their personal prot equipment (PPE). The tests were conducted by researchers at the Southwest Research Institute (SwRI) in S Texas. SwRI researchers also measured the effectiveness of two different cleaning methods to remove the emissions from the PPE.

During testing, researchers subjected the batteries to thermal runaway by overcharging and causing them The tests were conducted in a blast chamber where swatches of first responder bunker gear and apparatu self-contained breathing apparatus straps were exposed to the byproducts of Li-ion battery fires. The tests heavy metals and 75 semi-volatile organic compounds (SVOCs) resulting from the battery fires.

The tests concluded that Li-ion battery fires release highly toxic gases and particles that exceed the Occup High concentrations of lithium, nickel, cobalt, manganese and copper were detected during each Li-ion the emissions from the battery fires raise awareness of the human health and environmental risks associated



The traditional National Fire Protectic 99 percent of the metallic particles in metallic particles. However, some SV ranging from 21 percent to 92 percer that was used.

"This series of tests provides informa

https://teex.org/news/teex-initiates-tests-on-first-responder-ppe-exposed-to-lithium-ion-battery-fires/

Firefighters' Clothing Contamination in Fires of Electric Vehicle Batterie and Photovoltaic Modules—Literature Review and Pilot Tests Results

Ewelina Szmytke [1], Dorota Brzezińska [1,*], Waldemar Machnowski [2], Szymon Kokot [3]

Editor: Paul B Tchounwou

▸ Author information ▸ Article notes ▸ Copyright and License information

PMCID: PMC9566750 PMID: 36231742

Abstract

The electric vehicle (EV) market, together with photovoltaic (PV) installations continues t develop at a pace. However, there are concerns that EV and PV installation fires may creat more harmful substances than other types of fire. PV modules and car battery fires emit a range of carcinogenic and highly toxic compounds that are not yet fully understood and m pose a threat to firefighters' health. This also raises the question of the impact on firefight clothing and the safe handling and cleaning after such fires. This article presents a literatu and standards review of the firefighters' protective clothing maintenance and cleaning. It also contains test results showing that firefighters' clothes accumulate harmful substance after fighting these types of fires. Pilot tests for the presence of polycyclic aromatic hydrocarbons (PAHs) and formaldehyde showed that levels exceeded limits in all clothing samples. For example, the cobalt level was 24 times higher than that considered safe in th test carried out with car battery fire. Although it is recognized that liquid carbon dioxide (LCO_2) methods of cleaning may be more effective than traditional water washing, further research on cleaning efficiency for clothing containing substances emitted from car batter and PV modules fires is required.

Keywords: firefighter safety, firefighters, PV fire, electrical fire, car battery, electric vehicle firefighters' protective clothing, firefighters' clothing cleaning, liquid CO_2 firefighters' clothing decontamination

1 Introduction

https://pmc.ncbi.nlm.nih.gov/articles/PMC9566750/

HOW WE PROTECT OURSELVES

How we protect ourselves really falls into two predictable spaces: having the proper personal protect and the ability to remove potential contaminants from said PPE.

PPE recommendation. Wearing the standard structural firefighting ensemble to include self-contain the expectation for fires involving lithium-ion batteries. Furthermore, this is the standard expectation recognize that fires involving these energy sources have been part of the landscape for more than 30 emergency protection our gear affords is robust when it's in place, but we must be vigilant and rigid v PPE.

Decontamination of PPE. Complete removal of all fireground contaminants from turnout clothing re And though today this is not achievable, tomorrow it may be. We must continue to strive for this goal moving beyond the baseline expectations outlinedin NFPA 1851, *Standard on Selection, Care, and Ma Fighting and Proximity Fire Fighting,* now consolidated as part of the 2026 edition of NFPA 1850, *Sta Ensembles for Structural Fire Fighting and Proximity Fire Fighting and Open-Circuit Self-Contained* of conventional water-based extractors and consider exploring more advanced technologies like liqu additional enhancement for heavy metal removal. For some, the improvements this technology offer firefighters—they represent incremental progress toward that North Star.

Consider this: Current extractor washing temperatures had been set at 105°F for laundering our bun temperatures have now been increased to 120°F in the new NFPA 1850. These temperature settings c decontamination algorithm that balances toxin removal with fatigue of the PPE caused by this type c gear, the minimum expectation for contaminant removal for both organic and inorganic compounds semi-volatile organic compounds (SVOCs) and heavy metals set by NFPA 1850/1851 (Figure 1).

Figure 1. SVOCs and Heavy Metals Set by NFPA 1850/1851

SEMI-VOLATILE ORGANIC COMPOUNDS (10)		HEAVY METALS (6)	
1.	Acenaphthene	1.	Antimony
2.	Anthracene	2.	Arsenic
3.	Diethyl phthalate	3.	Cadmium
4.	Di-n-octyl phthalate	4.	Chromium
5.	Fluorene	5.	Cobalt
6.	Phenanthrene	6.	Lead
7.	2-Nitrophenol		
8.	Phenol		
9.	Pyrene		
10.	2,4,6-Trichlorophenol		

https://www.fireengineering.com/firefighting/lithium-ion-influenced-fires-back-to-basics/

Lithium BESS fires are unpreventable and unextinguishable:

https://www.cbs8.com/article/news/local/fire-safety-concerns-san-diego-county-battery-energy-storage/509-ab9b0716-7784-47a6-9394-efeebd875279

https://www.newsdata.com/california_energy_markets/regional_roundup/researchers-assess-metal-fallout-from-moss-landing-battery-fire/article_7d68d110-977d-4123-be33-ec4f39fdf09f.html

Thank you for your attention to this matter, and please step up and officially oppose lithium BESS being sited within 1 mile of schools, homes, and other hard to evacuate locations.

Thank you,

James

Gabriel Clark

From: Planning
Sent: Thursday, February 12, 2026 8:13 AM
To: Gabriel Clark
Subject: FW: When Mayors are warning neighboring town officials about dangers of lithium BESS after his town experienced 3 LFP BESS fires since Warwick, NY got their first BESS- changed are needed

Follow Up Flag: Follow up
Flag Status: Completed

fyi

Owen Goode
Planner II
Department of Community Development
City of Auburn | www.auburnwa.gov
Phone: (253) 470-2170 | ogoode@auburnwa.gov
Mailing Address: 25 W Main Street, Auburn, WA 98001
Permit Center Address: 1 E Main Street, Auburn, WA 98002 (Map)
Customer Service Survey | Application Forms | Zoning Maps

From: James DeLay <jamesdelay@hotmail.com>
Sent: Wednesday, February 11, 2026 1:12 PM
To: Cheryl Rakes <CRakes@auburnwa.gov>; Tracy Taylor <ttaylor@auburnwa.gov>; Brian Lott <BLott@auburnwa.gov>; Clinton Taylor <ctaylor@auburnwa.gov>; Lisa Stirgus <LStirgus@auburnwa.gov>; Hanan Amer <hamer@auburnwa.gov>; info@vrfa.org; Planning <planning@auburnwa.gov>
Subject: When Mayors are warning neighboring town officials about dangers of lithium BESS after his town experienced 3 LFP BESS fires since Warwick, NY got their first BESS- changed are needed

CAUTION: The following message originated from outside the City of Auburn. Be careful opening links and attachments

Good afternoon Auburn leaders,

There are significant impacts on people and the environment when there is an unpreventable and unextinguishable thermal runaway BESS fire. ALL BESS should start with a determination of significance.

As the article says, after Warwick NY's 3rd LFP BESS fire, he's warning other town officials about the dangers and lies...

Warwick mayor warns Ulster town officials of lithium-ion battery issues

LOCAL NEWS

Warwick mayor warns Ulster town officials of lithiu



A sign opposing a proposed lithium-ion plant at the former John A. Coleman High School in the town of Ulster, N.Y., is posted on Main Street in Hurley, Tuesday morning, Aug. 19, 2025. (Dwayne Kroohs/Daily Freeman)



A sign opposing a proposed lithium-ion plant at the former John A. Coleman High School in the town of Ulster, N.Y., is posted on Main Street in Hurley, N.Y., on Tuesday morning, Aug. 19, 2025. (Dwayne Kroohs/Daily Freeman)

By **William J. Kemble** | news@freemanonline.com
PUBLISHED:
December 26, 2025 at 1:29 PM EST
| UPDATED:
December 26, 2025 at 2:34 PM EST

TOWN OF ULSTER, N.Y. – Warwick village Mayor Michael Newhard has sent warnings to the Ulster Town Board about the promises made and failure to keep them by battery storage developers after a second lithium-ion fire at a relatively small battery energy storage system.

During a Wednesday, Dec. 24, interview, the caution was specific against believing developers' talking about plans "meeting industry best practices" or "exceeds stringent state standards."

The question that Warwick officials are now asking about the combined 11.4-megawatt Convergent Energy system is the same question that town of Ulster officials need to ask for a proposed 250-megawatt Terr-Gen lithium-ion system on the former Coleman Catholic High School on Hurley Avenue, Newhard said.

Newhard said municipalities should stand firm against having facilities near residential areas and, by all means, demand that all schematics are shown for fire suppression systems and have all test results readily available to prove that the equipment works.

"After the first incident (in 2023), we were more than guarded; we really pushed (system owner) Convergent to do safety measures," Newhard said. "Some they complied with. But some they haven't. And so we are still in that space where we really have a lack of trust, and our greatest concern, which was not forthcoming, was public safety."

Warwick has two locations for the same Convergent Energy system, with a fire occurring at the 8-megawatt installation on June 26, 2023, on the Warwick Valley School District campus, which has three schools and the district's transportation building. That incident, which is in the town of Warwick, shut down the school district for seven days and, according to minutes of the district's July 6, 2023, meeting, the same rainstorm also "triggered alarms" at the connected 3.4-megawatt system on Church Street in the village of Warwick.

There are 10 containers that are about 40 feet long, 8 feet wide and 9.5 feet tall on the school property, while the village site has four containers of about the same height and width but about half the length.

At the site of the former Coleman High School on Hurley Avenue in the town of Ulster, Terra-Gen has proposed about 300 containers measuring about the same dimensions as the Warwick village site.

Newhard said the 2023 incident in the village was a "potential fire event" that did require the fire suppression system to be used before it reached the significant blaze phase that occurred at the school property. He considers it a cautionary moment that foretold the Dec. 19, 2025, fire, which has already led to the village issuing a violation notice to Convergent Energy for failing to live up to critical requirements set down by officials to avoid health and safety risks.

"It's great to have this new technology, but if the new technology puts us in harm's way, then is that valuable or worth it, or should we wait until it becomes a safer infrastructure?" he said.

"We're going to go through a lot now because this trust had eroded during the original (2023) event," Newhard said. "Now, trust is pretty much completely off the table. Evaporated would be a good way to put it."

The school fire gave village officials deep concerns because "multiple cells caught on fire (and) lasted for many days," Newhard said.

“The plume of smoke on the first time around out of the school (site) really had everyone with great concern,” he said.

“The testing came in (reporting) that there was never a point where the levels reached a threshold of being harmful,” Newhard said. “That’s great, but we still have questions as, what are those numbers? And, give us more information. We’re at a point where we’re really pushing to get as much information as possible after the fact so that we really have a clearer picture.”

Recommendations to the town of Ulster are being made after Warwick found that Convergent Energy led its village Planning Board to believe that everything would be “peaches and cream” in terms of safety, Newhard said.

“Tread carefully,” he said. “Demand a level of protection on an ongoing basis if they do install it. … These companies, they create these things and they basically walk away, and then they leave it in the lap of the community, which has been a level of frustration for us, clearly.”

Wawrick officials wasted no time in issuing a violation notice for the Dec. 19 event, with a letter sent on Dec. 23 from village attorney J. Benjamin Gailey saying Convergent Energy needs to essentially shut down its system.


A battery energy storage facility fire that began Friday evening, Dec. 19, 2025, at a site located within the village of Warwick. (town of Warwick photo)

“Convergent is operating the BESS facility without the required certificate of compliance,” he wrote.

“The village Building Inspector is ordering Convergent to immediately reduce the stored energy in the battery units to the maximum extent feasible, take all other technical measures to assure there is no re-ignition, and disconnect the facility from the electric grid and all other connections,” Gailey wrote. “A certificate of

compliance will not be issued until the Building inspector and the village's engineering consultant are satisfied that all necessary safety measures have been implemented at the facility."

Fueling the concerns of Warwick village officials, who earlier this year warned about "hazardous moisture potential," was an August 21, 2025, email from Convergent, saying leak detection inspections were not necessary.

"This is obviously not the case," Gaily wrote. "Convergent's disregard of the village engineer and Building Inspector requests and disregard of the safety of surrounding persons and property is appalling."

Ulster town Supervisor James Quigley responded openly to the offer of suggestions from Warwick, and before the Dec. 19 incident had already instructed fire officials to "do a deep dive" review of the 2023 blaze to determine what could happen with a system on Hurley Avenue that would be 74 times larger.

"I asked the Spring Lake Fire Company leadership to personally reach out to the leadership of the fire companies in the locations of the 2023 fires to understand what happened in their communities, to understand the level of responses that was required by those organizations, and the level of resource usage that was required by those events," he said.

"I am not averse to picking up the phone and talking to the elected leaders in those communities and discussing their experiences," Quigley said. "I think that's an important part of fact finding."

Terra-Gen Vice President Mark Turner said in an email on Friday that his company is "distinctive among storage developers" because it operates the battery energy storage facilities it constructs.

"Once a project is online you'll see our operations team regularly on site—the people in the white hard hats and the white trucks—conducting inspections, monitoring performance, and ensuring the facility operates safely and efficiently in accordance with applicable codes, permits, and our internal standards," he wrote.

Terra-Gen was fined $628,193.42 by the Federal Energy Regulatory Commission for "submitting false or misleading information" to the California Independent System Operator. The penalty was levied on Aug. 2, 2021, for incorrectly reporting the "physical capabilities of the wind-powered electric generation" of its subsidiary Cameron Ridge LLC and violating the state tariff regulations by "deviating its wind farm's output" from state instructions.

https://www.dailyfreeman.com/2025/12/26/warwick-warns-ulster-town-officials-of-lithium-ion-battery-issues/

Here's the letter the City's outsourced lawyers sent:

J&G LAW LLP

J. Benjamin Gailey
John C. Cappello
Gary M. Schuster
Kara J. Cavallo
Kelly A. Pressler
Michele P. Ellerin*
Michael Wagner*
Lauren E. Scott
Rebecca C. Johnson
Rachel J. Rosenwasser
Gregory R. Picciano
Conor C. Horan
Isabelle A. Hayes
Christine F. Harrington
Anastasia Rivera-Bonilla
Maria C. Donovan

David B. Gubits**
Howard Protter**
George W. Lithco**

*Also admitted in NJ

December 23, 2025

Via Federal Express #887370957859
And email: fgenova@convergentep.com

West Warwick Energy Storage 3, LLC
7 Times Square Tower, Suite 3504
New York, New York 10036
Attn: Frank Genova

Re: Convergent Battery Energy Storage System
28 Church Street, Village of Warwick
Our File No. 17404-201

Dear Mr. Genova:

This office represents the Village of Warwick.

On December 19-21, a fire occurred at Convergent's battery energy

David B. Gubits**
Howard Protter**
George W. Lithco**

*Also admitted in NJ
**OF COUNSEL

REPLY TO:
158 Orange Avenue
P.O. Box 367
Walden, NY 12586
tel. (845) 778-2121
fax (845) 778-5173

548 Broadway
Monticello, NY 12701
tel. (845) 791-1765
fax (845) 794-9781

JGLAW.LAW

This office represents the Village of Warwick.

On December 19-21, a fire occurred at Convergent's battery energy storage system (BESS) located at the above address in the Village of Warwick. The facility is located in an area of nearby residences and businesses. A similar fire occurred in 2023 at Convergent's other BESS facility in Warwick, and this Church Street facility also experienced a potential hazard event shortly after that fire. The first fire was caused by rain or moisture intrusion into the battery storage containers and the December 19-21 fire occurred shortly after a wind/rain event. It is obvious that Convergent has not taken the necessary safety measures or hardened its equipment.

Email correspondence demonstrates that earlier this year Convergent refused to address safety concerns raised in writing by the Village. These concerns related directly to the hazardous moisture potential and inspection of the facility to address these concerns. Convergent's representative informed the Village Building Inspector in an August 21, 2025, email that leak detection inspections are not necessary. This is obviously not the case. Convergent's disregard of the Village Engineer and Building Inspector requests and disregard of the safety of surrounding persons and property is appalling.

Convergent is operating the BESS facility without the required certificate of compliance. Orange & Rockland has informed the Village that the facility was connected to the electric grid on July 6, 2024. Even if not connected to the grid, the storage of electric energy at the facility constitutes unlawful operation without the certificate of compliance.

Through this letter, the Village Building Inspector is ordering Convergent to immediately (i) reduce the stored energy in the battery units to the maximum extent feasible, (ii) take all other technical measures to assure there is no re-ignition, and (iii) disconnect the facility from the electric grid and all other connections. The Village demands that Convergent schedule an immediate inspection of the facility with the Building Inspector and the Village's engineering consultant. A certificate of compliance will not be issued until the Building Inspector and the Village's engineering consultant are satisfied that all necessary safety measures have been implemented at the facility.

The Village will seek reimbursement of all of its fees and expenses incurred as a result of this safety hazard caused by Convergent.

The Village expects full cooperation by Convergent. The Village reserves all rights and remedies.

Very truly yours,

J. Benjamin Gailey

I apologize for the formatting as the original/full letter has been deleted from the internet...

We need to learn from other's suffering to avoid putting us at the same risks...

There is no way to prevent lithium BESS fires nor is there any way to extinguish them once they have started- meanwhile everyone nearby will be forced to evacuate for an average of 5 days/nights while the lithium BESS burns itself out.

Please protect us by creating BESS siting rules that are safety first and have adequate setbacks from schools, homes, hospitals, fire stations, and other hard to evacuate locations- I would say a 2-5 mile buffer would generally be adequate.

Thank you,

James

Gabriel Clark

From: Planning
Sent: Thursday, February 12, 2026 8:13 AM
To: Gabriel Clark
Subject: FW: BESS Toxins released- significant impact on people and environment

Follow Up Flag: Follow up
Flag Status: Completed

fyi

Owen Goode
Planner II
Department of Community Development
City of Auburn | www.auburnwa.gov
Phone: (253) 470-2170 | ogoode@auburnwa.gov
Mailing Address: 25 W Main Street, Auburn, WA 98001
Permit Center Address: 1 E Main Street, Auburn, WA 98002 (Map)
Customer Service Survey | Application Forms | Zoning Maps

From: James DeLay <jamesdelay@hotmail.com>
Sent: Wednesday, February 11, 2026 2:25 PM
To: Cheryl Rakes <CRakes@auburnwa.gov>; Tracy Taylor <ttaylor@auburnwa.gov>; Brian Lott <BLott@auburnwa.gov>; Clinton Taylor <ctaylor@auburnwa.gov>; Lisa Stirgus <LStirgus@auburnwa.gov>; Hanan Amer <hamer@auburnwa.gov>; info@vrfa.org; Planning <planning@auburnwa.gov>
Subject: BESS Toxins released- significant impact on people and environment

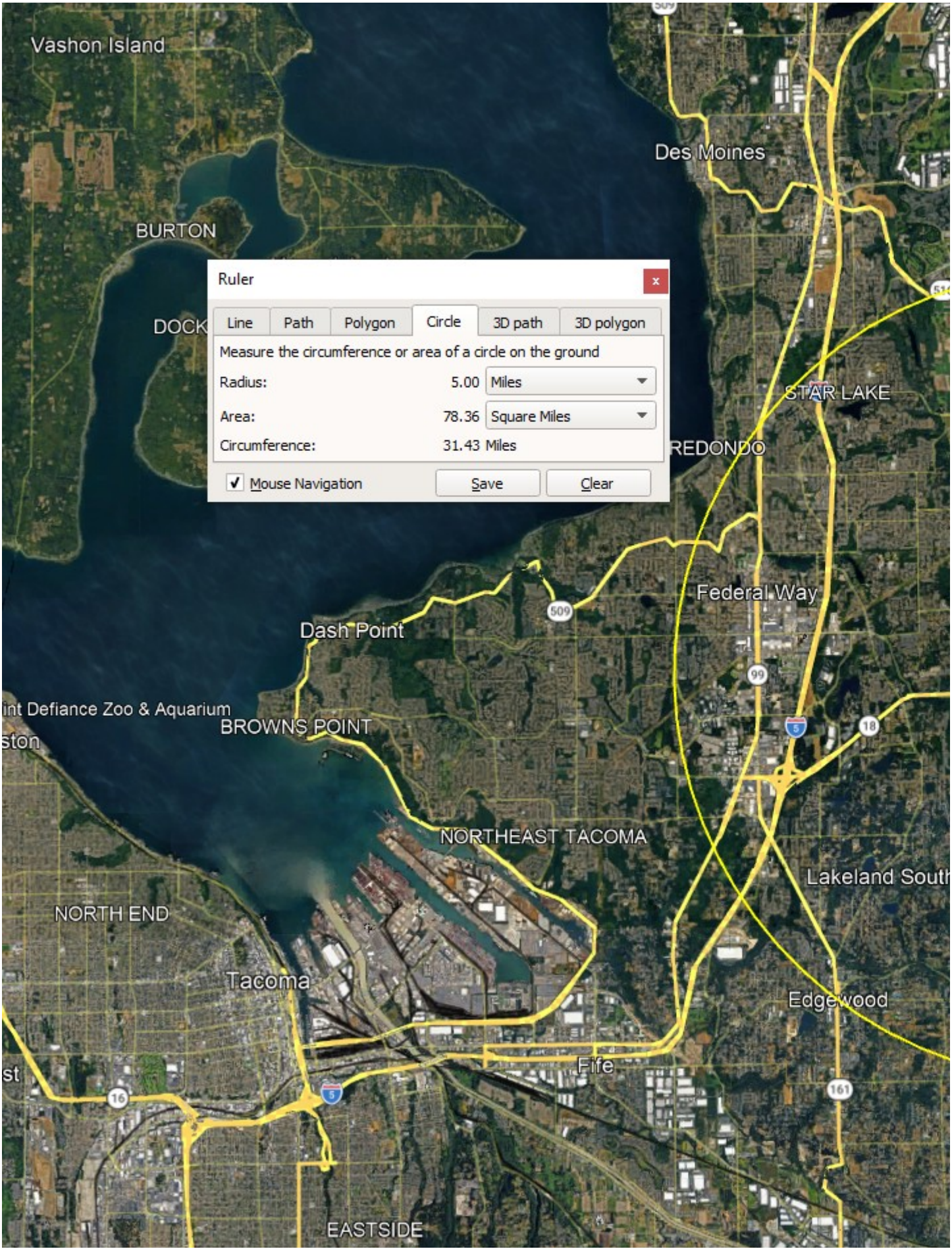
CAUTION: **The following message originated from outside the City of Auburn. Be careful opening links and attachments**

Good afternoon Auburn Leaders,

As you know lithium BESS pose a significant environment impact and a significant impact on anyone exposed to the toxic smoke, gasses, and ash released from 100s of thousands (potentially millions) of lithium batteries burning and due to the immediate threat to life, evacuations are forced and usually last for 5 days....

Since you should now be familiar with the Moss Landing Bess's 4th fire in Jan 2025 (they had a re-ignition a month later at the same BESS and clean-up of the site is still in the early stages and will take years) and you know how it spewed toxic ash for miles around- initially reported by San Jose State Research's lab tests to be a 100x - 1000x increase of lithium battery heavy metals across their 2-mile radius research area and then further lab testing found toxic levels of ash traveled 27.2 miles down wind.

People are always talking about lithium battery fires and the dangerous smoke- whether it is a cell phone or a e-mobility device spontaneously combusting- a BESS, may have 100,000s of lithium batteries in each individual BESS container and the BESS facility may have 100s of BESS containers- here's a list of some of the toxins released from a burning lithium battery that will hit Auburn within minutes of the smoke/off-gassing starting (depending on the wind) and will have to be evacuated ASAP along with everyone and everything else within 5 miles of the BESS and remain evacuated for an average of 5 days- Here's a pic of a 5-mile radius area (circling the estimated location) that would either have to be evacuated or locked down under shelter-in-place orders and all roads closed when there is a fire and could be contaminated with most dangerous levels of toxic ash:


Vashon Island
Des Moines
BURTON
Ruler
Line
Path
Polygon
Circle
3D path
3D polygon
Measure the circumference or area of a circle on the ground
Radius: 5.00 Miles
Area: 78.36 Square Miles
Circumference: 31.43 Miles
Mouse Navigation
Save
Clear
STAR LAKE
REDONDO
Federal Way
Dash Point
BROWNS POINT
NORTHEAST TACOMA
Lakeland South
NORTH END
Tacoma
Edgewood
Fife
EASTSIDE

Here's a refresher on the contents of the toxic smoke, gasses, and ash released when a lithium BESS burns:

Hydrogen cyanide (HCN):

Fatal if swallowed, is fatal in contact with skin, is fatal if inhaled, causes damage to organs through prolonged or repeated exposure, is very toxic to aquatic life (with long lasting effects) and is an extremely flammable liquid and vapour. From nitrogen-containing polymers (e.g., separators)—ScienceDirect (2024) lists HCN as 10x higher in LFP vs. NMC. Typically reads off-the-charts when tested at BESS fire, exceeding 50 ppm (NIOSH IDLH) and Lethal at 270 ppm (CDC), dermally absorbed (UFUA, McConville)

Hydrogen chloride (HCl):

Severe skin burns and eye damage, is toxic if inhaled, may damage fertility or the unborn child, causes serious eye damage, may cause damage to organs through prolonged or repeated exposure, may be corrosive to metals, may cause respiratory irritation and contains gas under pressure and may explode if heated.

Chlorine (Cl2):

Is a very toxic chemical element that can cause eye irritation, coughing, vomiting and other symptoms. It is easily distinguishable by its greenish-yellow color and a bleach-like odor. Chlorine was even weaponized during World War I and is estimated to have caused at least 1100 deaths in its first usage due to reactions with other organic chemicals in the atmosphere leading to dangerous reactions.

Hydrogen sulfide (H2S):

Is a flammable and highly toxic substance that can be dangerous in both acute and chronic forms. One exposure to high levels of H2S can cause immediate death, while health problems might not show up until three days after the exposure. It is a chalcogen-hydride gas, and is poisonous, corrosive, and flammable, with trace amounts in ambient atmosphere having a characteristic foul odor of rotten eggs

Nitrogen dioxide (NO2):

Breathing smoke containing high levels of nitrogen dioxide (NO2) can irritate airways, impair lung function, and increase the risk of respiratory infections, especially in children and those with asthma or COPD. Long-term exposure can also contribute to chronic bronchitis and potentially cause permanent lung damage. Fatal if inhaledin high levels, causes severe skin burns and eye damage; and may cause or intensify fire (oxidiser).0.961.91

Sulphur dioxide (SO2):

Poses significant health risks, primarily affecting the respiratory system, causing irritation, coughing, and difficulty breathing, particularly for those with asthma or other lung conditions. Severe skin burns and eye damage and is toxic if inhaled.

Phosphoryl fluoride (POF3):

POF3 is a CORROSIVE CHEMICAL and contact can severely irritate and burn the skin and eyes with possible eye damage. Breathing Phosphorus Oxychloride can irritate the nose and throat. Breathing Phosphorus Oxychloride can irritate the lungs causing coughing and/or shortness of breath.

Ammonia (NH3):

Is hydroscopic, or water-seeking. When combined with moisture it forms a corrosive substance. Ammonia gas is very irritating to the eyes, nose and respiratory system, and in high concentrations is also corrosive to the skin and eyes. Breathing ammonia gas can be fatal. The level of danger depends on the concentration of ammonia and length of exposure

Hydrogen fluoride (HF):

Fatal if swallowed, is fatal in contact with skin, is fatal if inhaled and causes severe skin burns and eye damage. The immediate dangerous to life or health (IDLH) level for HF is 0.025 g/m3 (30 ppm) and the lethal 10 minutes HF toxicity value (AEGL-3) is 0.0139 g/m3 (170 ppm). 20–200 mg/Wh from LiPF6 electrolyte (ScienceDirect, 2017) Impact: Corrosive, lethal at 30 ppm (OSHA), skin-penetrating (UFUA). The release of hydrogen Fluoride from a Li-ion battery therefore can be a severe risk.

Fluorinated Compounds (e.g., PF5, CF4)

Health Impacts: Phosphorus pentafluoride (PF5) and tetrafluoromethane (CF4) are highly reactive, causing severe respiratory irritation and potential lung damage. PF5 hydrolyzes into HF, amplifying toxicity. Exposure Levels: Limited specific data, but HF-related thresholds (30 ppm IDLH) apply. commonly associated with lithium BESS fires Source: Decomposition of LiPF6 or fluorinated polymers.

Dioxins/Furans

Highly toxic, persistent organic pollutants causing skin lesions (chloracne), immune suppression, and cancer (IARC Group 1) with long-term exposure. Exposure Levels: No acute threshold; chronic exposure at ppt levels is hazardous. Source: Combustion of chlorinated/fluorinated materials (e.g., PVDF binders).

Carbon Monoxide (CO):

Is an odorless, colorless and tasteless gas produced when fuels such as gasoline, natural gas, oil, kerosene, wood or charcoal are burned. When inhaled it reduces the blood's ability to carry oxygen and can reach dangerous levels indoors or outdoors. Common symptoms of CO poisoning include headache, dizziness, weakness, upset stomach, vomiting, chest pain, and confusion. If you breathe in a lot of CO it can make you pass out or kill you; people who are sleeping or drunk can die from CO poisoning before they have a chance to wake up. Toxic if inhaled, may damage the unborn child, causes damage to organs through prolonged or repeated exposure and is an extremely flammable gas, Common in all BESS fires—EPRI (2025) notes CO as an asphyxiant in 90+ incidents. NIOSH IDLH (1200 ppm) but hazardous (FSRI, p. 17).

Carbon dioxide (CO2):

Can be extremely dangerous for humans and the environment. High levels of CO2 indoors can reduce cognitive performance score by up to 20%. Above 5,000 parts per million (ppm), asphyxiation may take place as CO2 replaces oxygen in the blood. Cause headaches, dizziness, confusion, loss of consciousness, and asphyxiation at high concentrations

Hydrocarbons:

Flammable Hydrocarbons, such as CH4, are described as acting as simple asphyxiants without other significant physiologic effects when they are present in high concentrations, hence are not given limit values as the significant factor is the availability of oxygen. This is assumed for H2 as well.

Hydrogen (H2):

Extremely flammable Hydrogen is described as acting as simple asphyxiants without other significant physiologic effects when they are present in high concentrations, hence are not given limit values as the significant factor is the availability of oxygen.

Solvents:

Highly flammable liquid and vapour [53]. Very irritating to eyes, skin and airways [44].DEC 700, PC 8.5cDEC 1000, PC 8.5c

Formaldehyde:

Poses serious health risks, including irritation of the eyes, nose, and throat, as well as potential for respiratory problems and, in some cases, an increased risk of certain cancers Eye/throat irritation, coughing (0.75 ppm+). IARC Group 1—nasopharyngeal cancer, leukemia (Web ID 0). 0.75 ppm (8-hour TWA), 2 ppm (15-min STEL, 29 CFR 1910.1048).

Benzene:

Poses serious health risks, including short-term effects like dizziness and headaches, and long-term risks like leukemia and other blood disordersIARC Group 1—leukemia, bone marrow damage (OSHA). 1 ppm (8-hour TWA), 5 ppm (15-min STEL, 29 CFR 1910.1028).

Acetylene:

Poses significant fire and explosion hazards, and can cause asphyxiation due to oxygen displacement. It is an extremely flammable gas that forms explosive mixtures with air or oxygen, and its cylinders can rupture violently if heated Explosion risk, asphyxiation (high %LEL).No chronic toxicity—acute fire/asphyxiation only. None—flammable, not toxicologically limited (29 CFR 1910.1000).

Heavy metals released in smoke/ash/fallout:

Lithium (Li):

OSHA PEL: None established—lacks specific workplace limit (Web ID 19). Short-Term Exposure Health Impacts: BESS Fires: Grassroots 10–50 ppm (Chaumont, NY precedent) in soil/smoke—inhalation may cause nausea, dizziness (ResearchGate, 2021). Surprise's cloud likely included Li salts. Acute Effects: Irritates eyes, skin (NIOSH Pocket Guide). Long-Term Exposure Health Impacts: BESS Fallout: Chronic low-level exposure (untested in Moss Landing) risks kidney dysfunction, thyroid suppression (StatPearls, 2023)—unquantified in fires. Environmental: Bioaccumulation in water/food (Valley Center missed it, Escondido.gov). Prescribed Side Effects (Lithium Carbonate, Bipolar Disorder): Common: Tremors, thirst, nausea, weight gain, fatigue (Mayo Clinic, 2023) and permanent damage to kidneys and thyroid. Serious: Kidney damage (nephrogenic diabetes insipidus), hypothyroidism, arrhythmia—dose-dependent (500–1200 mg/day, NIH). Toxicity: Confusion, seizures, coma (>1.5 mEq/L serum, StatPearls). Other Known Side Effects: Neurological (memory loss), gastrointestinal distress (Occup-Med, 2024).

Cobalt (Co):

OSHA PEL: 0.1 mg/m³ (8-hour TWA, 29 CFR 1910.1000, Table Z-1). Short-Term Exposure Health Impacts: BESS Fires: Inhalation of Co in smoke (e.g., Surprise, AZ cloud; UFUA McConville) causes respiratory irritation, coughing, and shortness of breath. SJSU's 13,300 ppm soil finding (Moss Landing, 2025) suggests dust inhalation risks near homes/farms. Acute Effects: Skin contact (dermal absorption, UFUA) leads to rashes; high doses (>0.1 mg/m³) may cause nausea, dizziness (NIOSH). Long-Term Exposure Health Impacts: BESS Fallout: Chronic inhalation (Hunterbrook's 200 ppm avg, 20 miles) risks lung fibrosis, asthma (OSHA), and cardiomyopathy (StatPearls, 2023). Bioaccumulation in fish/animals (Monterey Bay) may lead to dietary exposure. Carcinogenicity: IARC Group 2B (possibly carcinogenic)—lung cancer linked to Co dust (ScienceDirect, 2017). Prescribed Side Effects: Cobalt isn't prescribed, but cobalt chloride (historical use) caused thyroid enlargement, heart failure (StatPearls). Other Known Side Effects: Neurotoxicity (tremors), reproductive issues in high occupational exposure (Occup-Med, 2024).

Nickel (Ni):

OSHA PEL: 1 mg/m³ (8-hour TWA, 29 CFR 1910.1000, Table Z-1). Short-Term Exposure Health Impacts: BESS Fires: Ni in smoke (Moss Landing, SJSU 500–5000 ppm) irritates lungs, throat—nosebleeds reported (Hunterbrook). Surprise's "deadly cocktail" likely included Ni particulates. Acute Effects: Skin contact causes dermatitis (OSHA OTM)—common in welders (Web ID 0). Long-Term Exposure Health Impacts: BESS Fallout:

Grassroots 50–100 ppm (27 miles) and Hunterbrook 180 ppm suggest chronic lung damage, asthma (OSHA). IARC Group 1—nasal/lung cancer from prolonged inhalation (ScienceDirect, 2017). Systemic: Kidney damage, reduced fertility (StatPearls, 2023). Prescribed Side Effects: Nickel isn't medicinal—only toxic via exposure. Other Known Side Effects: Allergic sensitization (rashes), neurological decline (Occup-Med, 2024).

Manganese (Mn):

OSHA PEL: 5 mg/m³ (Ceiling limit, 29 CFR 1910.1000, Table Z-1)—not to be exceeded at any time. Short-Term Exposure Health Impacts: BESS Fires: Mn in Moss Landing soil (SJSU 1000–10,000 ppm) risks dust inhalation—coughing, bronchitis (NIOSH REL 1 mg/m³, Web ID 10). Acute Effects: High doses (>5 mg/m³) cause headaches, fatigue (OSHA). Long-Term Exposure Health Impacts: BESS Fallout: Chronic exposure (grassroots 50–100 ppm) leads to manganism—Parkinson-like tremors, speech issues (Web ID 10). Neurotoxic via mitochondrial damage (StatPearls, 2023). Other: Lung inflammation, memory loss (Occup-Med, 2024). Prescribed Side Effects: Not prescribed—essential trace mineral, but excess is toxic. Other Known Side Effects: Psychiatric disturbances ("manganese madness"), infertility (NIOSH).

Particulate Matter (PM2.5/PM10)

Fine particles penetrate deep into lungs, causing inflammation, asthma exacerbation, and cardiovascular strain. Heavy metals (Li, Co, Ni, Mn) in PM increase toxicity, with chronic exposure linked to cancer and organ damage (EPA, 2023). Exposure Levels: OSHA PM10 limit is 5 mg/m³; BESS fires often exceed this in fallout zones. Source: Smoke and ash from burning batteries. Source: Smoke and ash from burning batteries.

There are so many safe alternative energy storage solutions that Lithium BESS should only be used as a last resort and only be allowed miles and miles away from any sensitive receptors, locations, or environments...

I sent you two very long emails called Part 1 and part 2: "Catastrophic BESS fire in Moss Landing with scientific documentation/proof of 100x to 1000x increase of toxic fallout as far downwind as 27.2 miles downwind" to give you info and irrefutable scientific evidence of the environmental impacts lithium BESS have on the surrounding areas when they burn- going into detail about the consequences of the Jan 2025 Moss Landing BESS fire.

Please help protect Auburn by giving BESS a determination of significance instead of the proposed determination of non-significance!

My best,

James

Gabriel Clark

From: Planning
Sent: Thursday, February 12, 2026 8:12 AM
To: Gabriel Clark
Subject: FW: 4th fire since 2021 at the Moss Landing lithium Battery energy Storage System (BESS)- these are dangerous and we must have laws to protect us!

Follow Up Flag: Follow up
Flag Status: Completed

fyi

Owen Goode
Planner II
Department of Community Development
City of Auburn | www.auburnwa.gov
Phone: (253) 470-2170 | ogoode@auburnwa.gov
Mailing Address: 25 W Main Street, Auburn, WA 98001
Permit Center Address: 1 E Main Street, Auburn, WA 98002 (Map)
Customer Service Survey | Application Forms | Zoning Maps

From: James DeLay <jamesdelay@hotmail.com>
Sent: Wednesday, February 11, 2026 3:04 PM
To: Cheryl Rakes <CRakes@auburnwa.gov>; Tracy Taylor <ttaylor@auburnwa.gov>; Brian Lott <BLott@auburnwa.gov>; Clinton Taylor <ctaylor@auburnwa.gov>; Lisa Stirgus <LStirgus@auburnwa.gov>; Hanan Amer <hamer@auburnwa.gov>; info@vrfa.org; Planning <planning@auburnwa.gov>
Subject: 4th fire since 2021 at the Moss Landing lithium Battery energy Storage System (BESS)- these are dangerous and we must have laws to protect us!

CAUTION: The following message originated from outside the City of Auburn. Be careful opening links and attachments

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Good afternoon Auburn Leaders,

It has been over a year since the Jan 2025 BESS fire provided the first scientific and irrefutable evidence that lithium BESS release toxic smoke and fallout/ash...

Prior to the fire, there had never been any proof that we should even be concerned about the ash/fallout... There are significant impacts from lithium BESS and Auburn should not give developers an inch by providing them with a determination of insignificance as a starting point.

Now we know- the email below was sent back when the Moss Landing BESS fire was still burning in Jan 2025...

I'll let this interview with the Monterey County Supervisor Glenn Church do the talking as it takes place during the initial phases of the BESS fire- please note the people hacking and coughing in the background and watch the fire and explosions:

https://youtu.be/VRYdVejcUdw?si=Ow3yWvhw6IjLjhBA

YouTube

Share your videos with friends, family, and the world

youtu.be

And, this is proof that BESS with hundreds of 40ft shipping container-like containers filled with lithium batteries can have multiple fires!

The fires are unpreventable and unstoppable. You need to wake up and see how dangerous these BESS facilities are and protect our kids and community!

The MOSS Landing BESS has had 4 fires (Sept 2021, Feb 2022, Sept 2022, and yesterday's in Jan 2025 that started at 330pm)- and after each fire, the BESS owners say no concerns, no toxicity, nothing to see here, and the evacuations/shelter-in-place orders were just gov officials being overly cautious.... And they always added that the last fire was a learning experience and they implemented all their learnings and made improvements and now have the safest most robust and redundant battery management systems (BMS), safest lithium batteries, the best warning and detection systems, and state of the art fire suppression systems with back-up systems for redundancy so fires won't be an issue in the future....

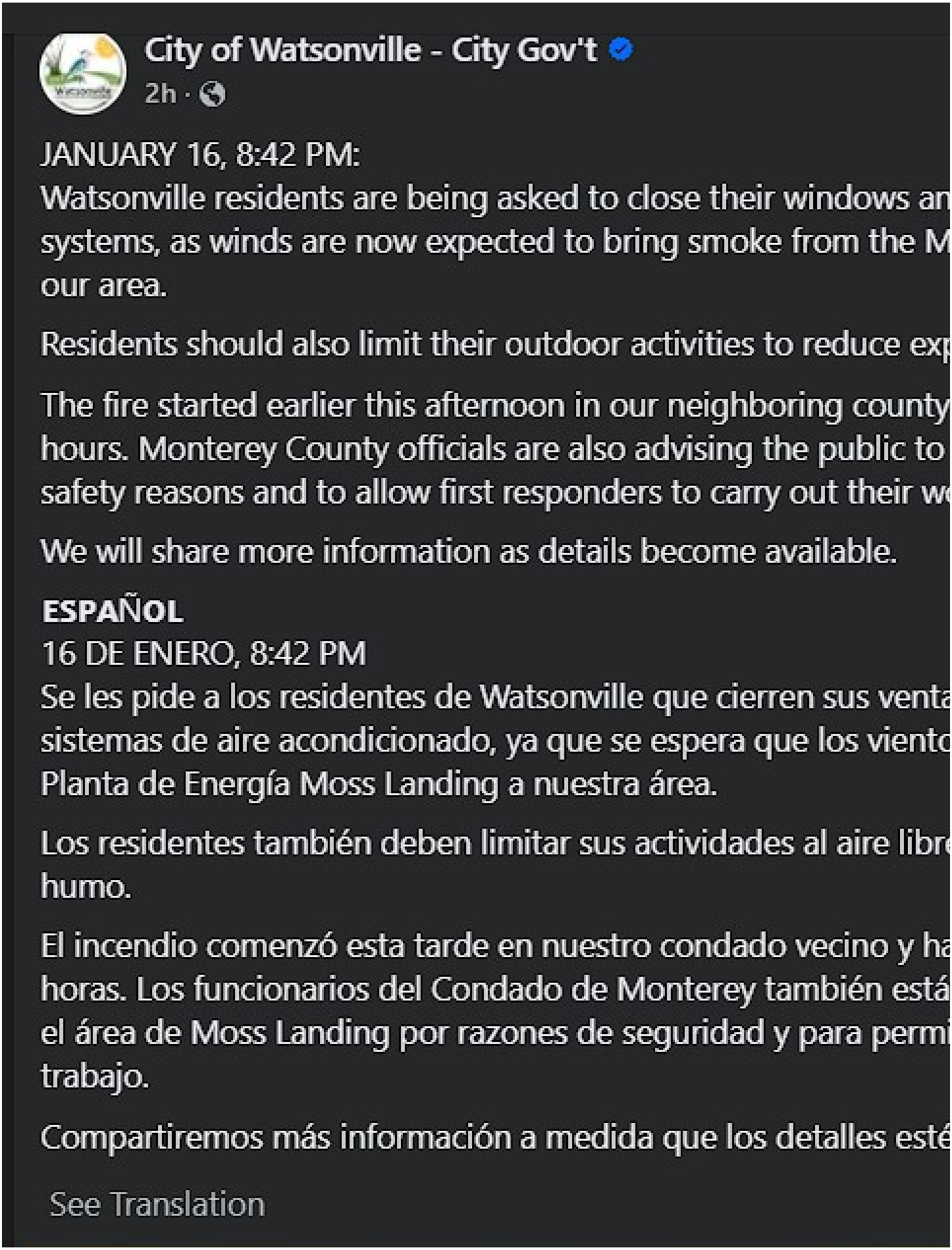
FYI, at 6:30pm an evacuation order was given for everyone within a 3-mile zone and shelter-in-place orders were issued for those further out...

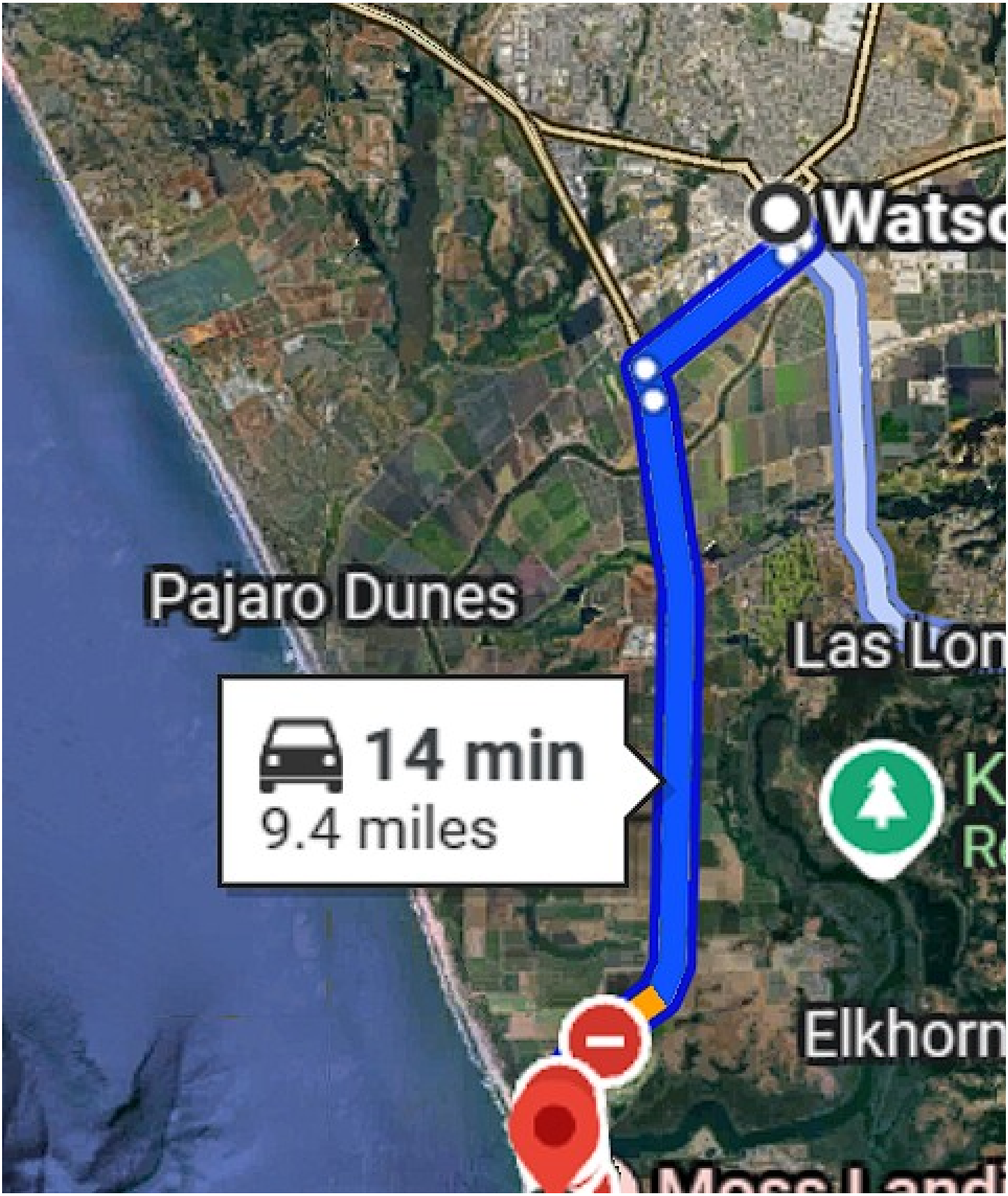
Fire at the world's largest in California forces evacu

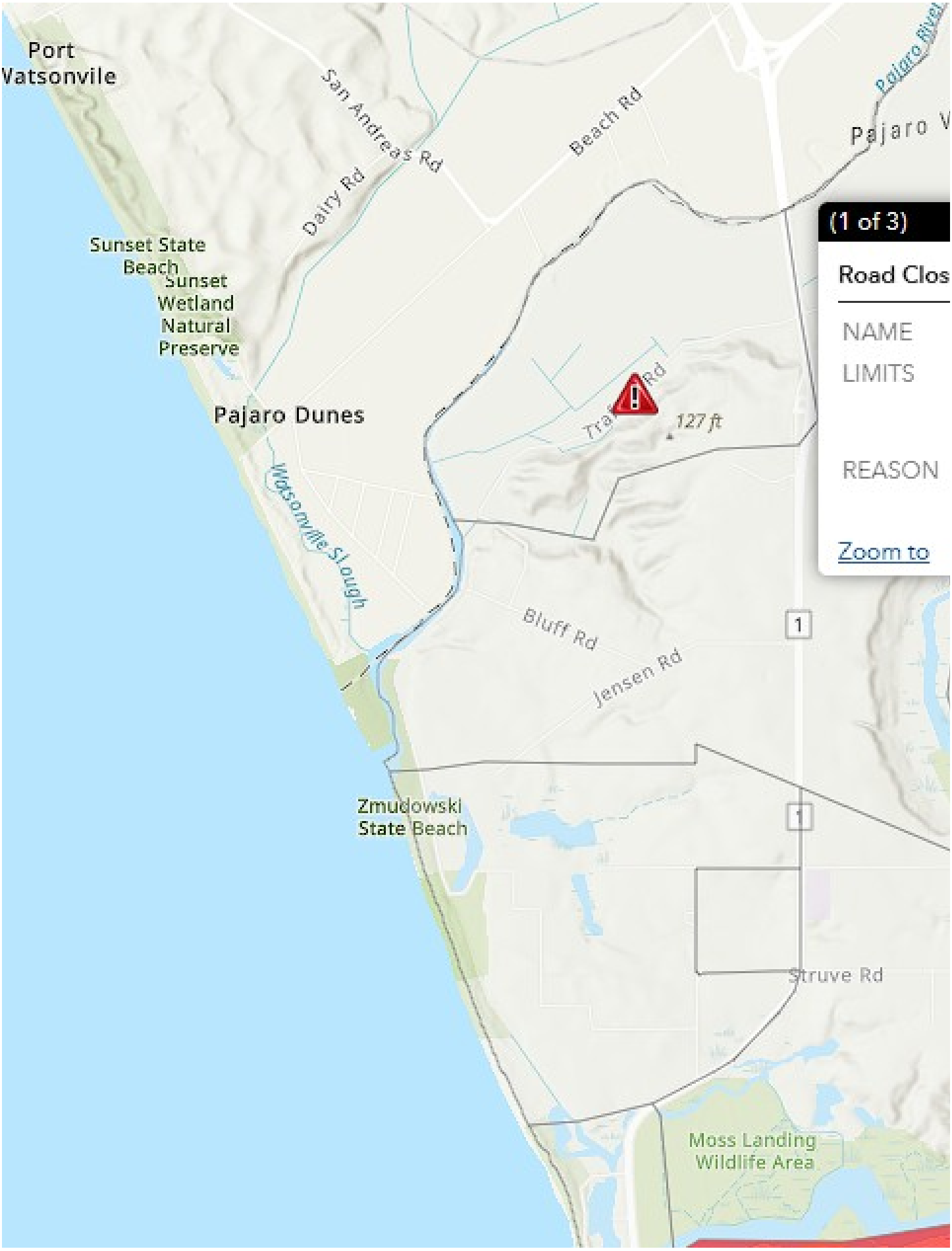


Just now, evacuation orders are still in effect and about 1,500 are evacuated.

Watsonville, a city 9 miles away and in a different county has issued a shelter-in-place order:

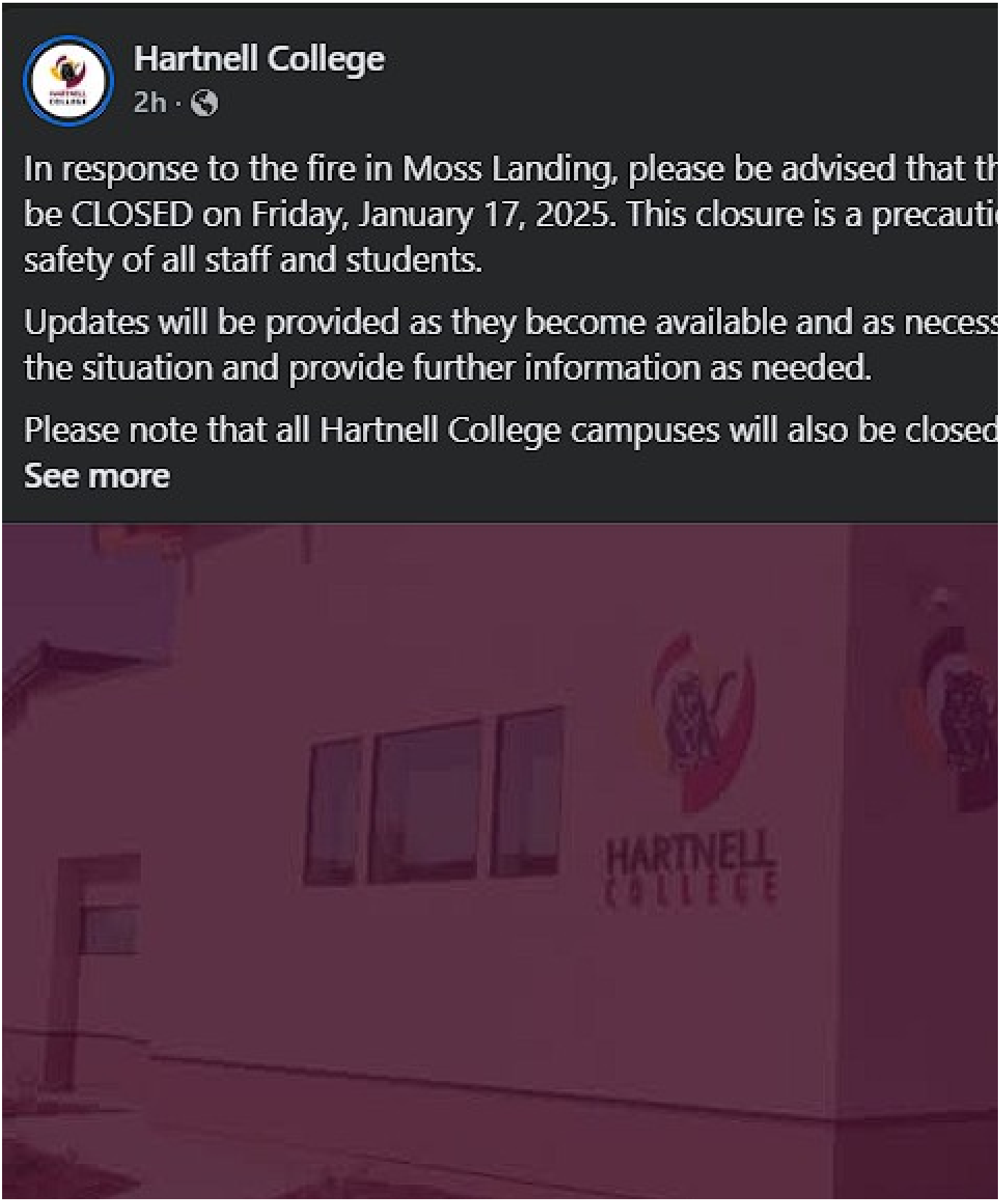

City of Watsonville - City Gov't
2h ·
JANUARY 16, 8:42 PM:
Watsonville residents are being asked to close their windows an
systems, as winds are now expected to bring smoke from the M
our area.
Residents should also limit their outdoor activities to reduce exp
The fire started earlier this afternoon in our neighboring county
hours. Monterey County officials are also advising the public to
safety reasons and to allow first responders to carry out their wo
We will share more information as details become available.
ESPAÑOL
16 DE ENERO, 8:42 PM
Se les pide a los residentes de Watsonville que cierren sus venta
sistemas de aire acondicionado, ya que se espera que los viento
Planta de Energía Moss Landing a nuestra área.
Los residentes también deben limitar sus actividades al aire libre
humo.
El incendio comenzó esta tarde en nuestro condado vecino y ha
horas. Los funcionarios del Condado de Monterey también está
el área de Moss Landing por razones de seguridad y para permi
trabajo.
Compartiremos más información a medida que los detalles esté
See Translation


Watsc
Pajaro Dunes
Las Lom
14 min
9.4 miles
Elkhorn


Port
Watsonville
San Andreas Rd
Beach Rd
Pajaro R
Pajaro V
Dairy Rd
(1 of 3)
Road Clos
NAME
LIMITS
REASON
Zoom to
Sunset State
Beach
Sunset
Wetland
Natural
Preserve
Pajaro Dunes
127 ft
Watsonville Slough
Bluff Rd
Jensen Rd
1
Zmudowski
State Beach
Struve Rd
Moss Landing
Wildlife Area

As part of the shelter-in-place orders, Watsonville (9-miles away) also shut down roads due to the toxic smoke:
https://montereyco.maps.arcgis.com/apps/webappviewer/index.html?id=905a9458324b4868804d96b5593eb978&fbclid=IwY2xjawH3bUBleHRuA2FlbQIxMAABHXKlMWtTR6LBWSv21Gso5kBg3g23UU8vaY8xFDw_JQb52s3CvNCyKE2B9Q_aem_KALhPwKjFPUyu5LOKpQdTQ

Schools and colleges are being forced to close



Nature reserves are being closed:

Elkhorn Slough Reserve

3h ·

The Elkhorn Slough Reserve will be closed on Friday, January 17t
area is in place due to health risks from the fire at Moss Landing
are available on the Monterey County Emergency website.



Whole classrooms full of kids in nearby school districts are reportedly experiencing exposure symptoms like headaches, burning lungs, throat, cough, swollen throats, burning eyes, and other symptoms of exposure 9 miles down wind...

And more:

San Benito County says there is no immediate threat to resider

"We are monitoring closely and in contact with the National W
and following their recommendations," said the county.

Road Closures

- Caltrans says both ways of Highway 1 at Salinas Road

Landing power plant. Use Highway 101 instead advises C

- Hard closure at Highway 183 (Merritt Road)
- Hard closure at Dolan Road at Castroville Boulevard.
- Highway 1 at Struve Road is closed.
- Paradise at Walker Valley Road.
- Elkhorn at Bayview Road.
- Elkhorn at Walker Valley Road.
- Elkhorn at Strawberry Road.
- Elkhorn at Hidden Valley Road.
- Elkhorn Rd between Kirby Road and Wauh Road.
- Elkhorn at the intersection of Hall Road at the fire stat
- Russo Road at Dolan Road
- Trafton Road to Bluff Road

A new fire or re-flareup has flared up at MOSS landing Friday afternoon after they thought the lithium batteries were close to extinguishing themselves becuase the burned so fast and hot... - and reporter is saying is fiercer and bigger than last nights- he can't tell if it is a new section or the original fire re-igniting:

New fire starts at Moss La

Share



Ricardo Tovar

Digital Content Manager







This plume is way bigger than yesterdays and spreading WAY farther:





Please don't force us to deal with this and make strong BESS laws that prevent BESS from being located anywhere near schools, hospitals, and homes...



I'll share more info as this continues- but, as I've said these are dangerous and shouldn't be located anywhere near schools, hospitals nor homes- especially when there are totally safe long duration energy storage systems available..

And, seriously watch the interview of the County Supervisor- he calls out the lies of the developers who promised that fires wouldn't be an issue ever again because of everything they implemented after the last fires...

Thank you,

James

Gabriel Clark

From: Planning
Sent: Thursday, February 12, 2026 8:12 AM
To: Gabriel Clark
Subject: FW: BESS fires' smoke, gasses, and ash's toxicity immeditate threats to life and force emergency health notices and evacuations and shelter in place orders

Follow Up Flag: Follow up
Flag Status: Completed

fyi

Owen Goode
Planner II
Department of Community Development
City of Auburn | www.auburnwa.gov
Phone: (253) 470-2170 | ogoode@auburnwa.gov
Mailing Address: 25 W Main Street, Auburn, WA 98001
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Customer Service Survey | Application Forms | Zoning Maps

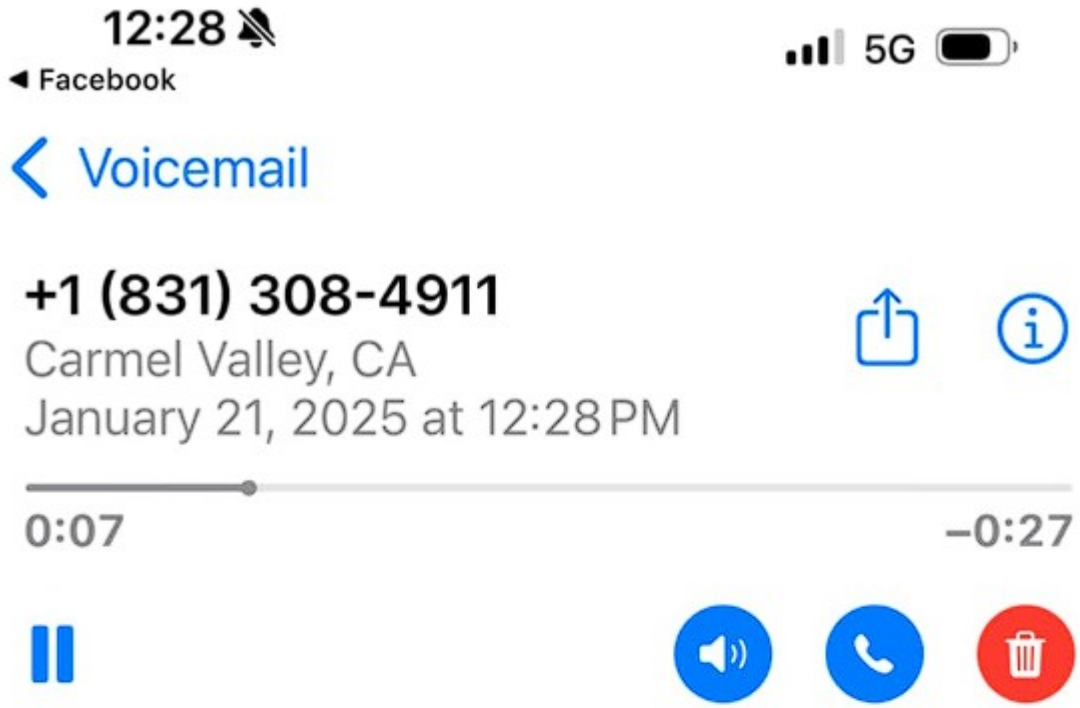
From: James DeLay <jamesdelay@hotmail.com>
Sent: Wednesday, February 11, 2026 3:13 PM
To: Cheryl Rakes <CRakes@auburnwa.gov>; Tracy Taylor <ttaylor@auburnwa.gov>; Brian Lott <BLott@auburnwa.gov>; Clinton Taylor <ctaylor@auburnwa.gov>; Lisa Stirgus <LStirgus@auburnwa.gov>; Hanan Amer <hamer@auburnwa.gov>; info@vrfa.org; Planning <planning@auburnwa.gov>
Subject: BESS fires' smoke, gasses, and ash's toxicity immeditate threats to life and force emergency health notices and evacuations and shelter in place orders

CAUTION: The following message originated from outside the City of Auburn. Be careful opening links and attachments

---

Good afternoon Auburn Leaders,

If you don't give BESS a determination of significance instead of your proposed determination of non-significance, and make it difficult for BESS developers to locate lithium BESS near schools, hospitals, and people's homes, you will be responsible for our emergency messaging systems sending messages like these to everyone within 5-9 miles of a burning BESS like Monterey County, CA did when the BESS fire started in Jan of 2025 because people are still suffering and showing exposure symptoms- over a year after the BESS fire started:



Transcription

"Irritation coughing and difficulty breathing people who may be more sensitive to smoke include young children older adults pregnant people and people with heart and lung condition such as heart failure asthma and chronic obstructive pulmonary disease also called COPD individuals who develop new or worse worsening symptoms may choose to contact their healthcare provider or seek medical attention for the latest news and press releases visit alert.org/Moss landing fire..."

Was this transcription useful or not useful?

It is the transcript of a message from the County Of Monterey's Emergency messaging system...

Here's another one:



Message from Alert Monterey County:

Health officials in Monterey County understand that individuals may be concerned about potential impacts of smoke on their health and the health of their family and friends.

While smoke levels are minimal now, public health officials wish to remind community residents that smoke may cause eye and throat irritation, coughing, and difficulty breathing. People who may be more sensitive to smoke include:

- Young children,
- Older adults,
- Pregnant people, and
- People with heart and lung conditions such as heart failure, asthma, and chronic obstructive pulmonary disease, also called COPD.

These were both sent on Tuesday January 21st 2025 afternoon and the fire and evacuations started Thursday January 16th 2025...

Now, over a year later people are still suffering from exposure from smoke, gasses, and fallout.

Please do more to protect us!

Please make all BESS start out with a determination of significant impact.

My best,

James

Gabriel Clark

From: Planning
Sent: Thursday, February 12, 2026 8:11 AM
To: Gabriel Clark
Subject: FW: Let's learn from CA's BESS siting mistakes- we need strong laws to protect us- like the proposed 3200ft setback CA is now considering

Follow Up Flag: Follow up
Flag Status: Completed

fyi

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Planner II
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Phone: (253) 470-2170 | ogoode@auburnwa.gov
Mailing Address: 25 W Main Street, Auburn, WA 98001
Permit Center Address: 1 E Main Street, Auburn, WA 98002 (Map)
Customer Service Survey | Application Forms | Zoning Maps

From: James DeLay <jamesdelay@hotmail.com>
Sent: Wednesday, February 11, 2026 3:25 PM
To: Cheryl Rakes <CRakes@auburnwa.gov>; Tracy Taylor <ttaylor@auburnwa.gov>; Brian Lott <BLott@auburnwa.gov>; Clinton Taylor <ctaylor@auburnwa.gov>; Lisa Stirgus <LStirgus@auburnwa.gov>; Hanan Amer <hamer@auburnwa.gov>; info@vrfa.org; Planning <planning@auburnwa.gov>
Subject: Let's learn from CA's BESS siting mistakes- we need strong laws to protect us- like the proposed 3200ft setback CA is now considering

CAUTION: The following message originated from outside the City of Auburn. Be careful opening links and attachments

Good afternoon Auburn leadership,

We need to have BESS developers start with a determination of significant impact...

This is what caring leadership looks like after experiencing a catastrophic BESS fire! Let's learn from their suffering and not duplicate the risks and face the same consequences...

https://www.youtube.com/live/D0ibZMSm9RY?si=AO8qVrXVXwqRul7k



Addis Presents Battery Energy Safety & Accountability Act, Preventing Future Energy Storage Fires - YouTube

Assemblymember Dawn Addis invites you to join a live press conference on January 23 at 3 p.m., where she will introduce the Battery Energy Safety & Accountab...

www.youtube.com

Assembly member Addis of CA has just introduced a law (AB303) that says BESS can not be located within 3200ft of sensitive areas like schools, people's homes, and healthcare facilities and takes the power away from the State level approval process and returns it to the local level...

Also in this this video, County Supervisor Glenn also says that cleanup is going to take months... But, it is now estimated to take years- as we just passed the 1 year mark and they haven't been able to remove all the burned batteries due to the toxicity of the former BESS site.

He says CA EPA, Office of Environmental Hazard Assessment, Dept of toxic substance control are working with Monterey County Environmental Health and will all be involved in testing water and soil in the surrounding communities...

Monterey County has declared a state of emergency due to Moss Landing BESS fire:
https://www.usatoday.com/story/news/nation/2025/01/23/moss-landing-lithium-battery-plant-fire-vistra/77912642007/

Please make a safety-first BESS ordinance to protect your citizens and your king county neighbors, and King County's environment from the significant and catastrophic event that BESS can cause!

Thank you,

James

Gabriel Clark

From: Planning
Sent: Thursday, February 12, 2026 8:11 AM
To: Gabriel Clark
Cc: Alexandria Teague
Subject: FW: Thorough and Complete decontamination process required for everyone leaving contaminated BESS site during cleanup

Follow Up Flag: Follow up
Flag Status: Completed

BESS Comment

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From: James DeLay <jamesdelay@hotmail.com>
Sent: Wednesday, February 11, 2026 3:48 PM
To: Cheryl Rakes <CRakes@auburnwa.gov>; Tracy Taylor <ttaylor@auburnwa.gov>; Brian Lott <BLott@auburnwa.gov>; Clinton Taylor <ctaylor@auburnwa.gov>; Lisa Stirgus <LStirgus@auburnwa.gov>; Hanan Amer <hamer@auburnwa.gov>; info@vrfa.org; Planning <planning@auburnwa.gov>
Subject: Thorough and Complete decontamination process required for everyone leaving contaminated BESS site during cleanup

CAUTION: The following message originated from outside the City of Auburn. Be careful opening links and attachments

Good afternoon Auburn leaders,

Please take a look at the requirements for cleanup personnel for the Moss Landing BESS site clean up below- they are required to undergo complete and thorough decontamination prior to exiting the impacted area of the site:

United States Environmental Protection Agency

Moss Landing Battery Fire Cleanup

Keeping the Community Safe

Throughout the post-fire recovery process at the Moss Landing Power Plant, **our high are worker safety, community safety, and environmental protection**. Vistra, with overs has implemented numerous safety precautions to ensure the process proceeds safely

Safety Measures

Air Quality

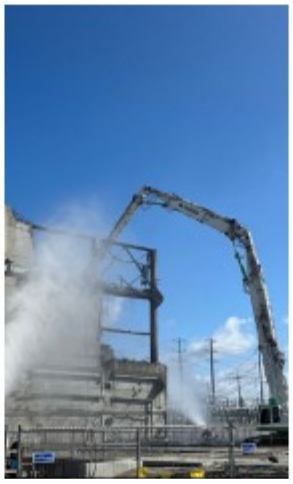
- Continuous air quality monitoring and daily air sampling is conducted both onsite and in the surrounding community.
  - Stations around the plant continuously monitor air for PM2.5 (particulate matter that is 2.5 microns or less) and hydrogen fluoride concentrations in real time.
  - Sampling stations pump air through a filter, which is collected daily and analyzed to determine the concentration of metals (aluminum, cobalt, copper, lead, lithium, manganese, and nickel) in the air.
  - If monitoring or sampling detects any readings above EPA-approved action levels, additional control measures will be implemented as needed. If a fire or other threat to human health is detected, work will be stopped and the EPA-approved Emergency Response Plan will be implemented.
- Water is sprayed at the site to control dust from cleanup activities.

Worker Safety & Decontamination

- Workers go through extensive training and certification.
- EPA oversight team and contractors are on-site to oversee operations.
- Workers wear personal protective equipment (PPE) during clean-up activities and complete a thorough decontamination process prior to

Sampling

- All water from Moss 300 (the bur is collected onsite and sampled t handling and disposal.
  - Water with contaminant levels abo pollution requirements will be tran approved off-site facility. See Water sheet for more information.
- All contaminated ash and debris from the Moss 300 building will and transported to appropriate E disposal or recycling facilities.
  - Trucks transporting materials offsit specifically to ensure road safety ar See Truck Routes fact sheet for mo





The fire happened over a year ago and the site is still so contaminated that every individual leaving the site has to go complete and thorough decontamination process before exiting the site.

Please give lithium BESS a determination of significant impact!

Thank you,

James

Gabriel Clark

From: Planning
Sent: Thursday, February 12, 2026 8:07 AM
To: Gabriel Clark
Subject: FW: Lithium BESS - noise level studies

Follow Up Flag: Follow up
Flag Status: Completed

BESS Comment

Owen Goode
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Department of Community Development
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Customer Service Survey | Application Forms | Zoning Maps

From: James DeLay <jamesdelay@hotmail.com>
Sent: Wednesday, February 11, 2026 5:04 PM
To: Cheryl Rakes <CRakes@auburnwa.gov>; Tracy Taylor <ttaylor@auburnwa.gov>; Brian Lott <BLott@auburnwa.gov>; Clinton Taylor <ctaylor@auburnwa.gov>; Lisa Stirgus <LStirgus@auburnwa.gov>; Hanan Amer <hamer@auburnwa.gov>; info@vrfa.org; Planning <planning@auburnwa.gov>
Subject: Lithium BESS - noise level studies

CAUTION: The following message originated from outside the City of Auburn. Be careful opening links and attachments

Good afternoon Auburn leaders,

I can't remember if I sent this to you already...

PSE and BESS developers will tell you BESS aren't loud and that they won't exceed the rural/city/county noise limits, but that is simply not true- at least not without a lot of sound mitigation.

Lithium BESS have to remain at their ideal temperature (70 degrees) to avoid overheating and entering thermal runaway- the process of charging and discharging lithium BESS generates significant levels of heat (up to 130 degrees)- due to the heat generated by every single lithium battery cell in a shipping container-like BESS container being charged and discharged. Because of this, BESS containers usually have up to 6 massive HVAC units cooling each individual BESS container 24/7 on all but the coldest nighttime sub-freezing temps.

It is a constant battle to keep the lithium batteries in a lithium BESS cool enough to avoid overheating and triggering thermal runaway- several BESS fires have been caused by failure of the cooling system to keep the batteries cool enough due to cooling systems being inadequately sized and can't keep up on the hottest Summer days (this cause has been mostly eliminated by engineered oversizing), cooling system failures, faulty cooling system installation or parts, failed cooling system components (Tesla Megapack at Moss Landing had bearings in a fan cause too much resistance and reduced the fan speed/cooling ability), and failed accessory parts (coolant line leaked in Tesla Megapack in Victoria, AUS).

BESS developers try to trick permitting agencies and make it sound like BESS aren't loud by flat out lying and then back up their lies by paying an engineering firm to create a sound level study for their BESS and ask them to issue a report that results in sound levels that meet the legal noise levels for the area...

In many cases, BESS developers have found that if they have the Sound Engineering firm run the tests or simulations showing the BESS cooling systems operating at 40% of capacity, they can meet those noise thresholds as seen here:

Impact Assessment

Methodology

Onsite Equipment Operation

Using DataKustik's CadnaA software, which models three-dimensional c International Organization for Standardization (ISO) 9613-2 algorithms and r scenario of the proposed project was modeled for purposes of this analysi following operating assumptions for the anticipated noise sources: 260 ba with five [5] cooling system fans operating at 40% capacity[1]; 65 MV transfor nominally at 300 MVA. Under the with-Augmentation scenarios, an ad transformers are also onsite and emitting noise. Facilities are expected to c or charging onsite batteries, up to 24 hours a day, 365 days a year. The pr above equipment is operating under a charging or discharging condition tha For purposes of this preliminary analysis, the overall A-weighted levels appea individual project sound sources.

Table 1. Sound Power Levels for the Modeled Individual Noise Emission

Source	Sound Power Level (PWL) per Octave Band Cente					
	31.5	63	125	250	500	1,000
BESS unit[a]	36	54	63	77	71	75
HV transformer[b]	80	86	88	83	83	77
MV transformer	30	49	61	63	69	66

https://efsec.wa.gov/sites/default/files/2025-06/Goldeneye%20ASC_Attachment%20O_Noise%20Memo.pdf

Please note, that even when operating at 40%, the overall sound levels for the BESS are still 84.9DB- which massively exceeds most area's noise levels- except heavy industrial zoned areas (which is where lithium BESS should be exclusively sited). The HV transformer releases 88db at 125hz (constant hum) and 83.4DB overall. The medium voltage transformer releases 69db at 500hz and 72.4db overall- exceeding most zone's max sound level- and this will be 24/7...

Remember, that is running at 40%.... On a hot Summer day, they will be running at 100%...

So, BESS developers specifically ask the sound engineers to make the test sound levels at lower fan speeds (like 40%) to provide the best test result possible to get their permit through permitting...

Easy peasy!

But, in reality, the cooling systems of the BESS are in a constant fight with the heat created by the continuously charging and discharging the lithium batteries- and, once lithium batteries overheat they go into thermal runaway and ignite and or explode...

So cooling is the primary defense against thermal runaway- you don't want to be running your systems at 40% just to avoid noise violation fees...

And, if you remember the June 13th 2023 BESS Developer presentation to the Covington City Council, you would know that their answer to what happens if the BESS is louder than they say and exceeds the noise limits- the BESS developer's response was, "We'd pay noise violation fines- that is just the cost of doing business"...

The Covington City Council was far more educated about BESS and associated issues than the developer planned and the meeting is worth a watch: https://www.youtube.com/watch?v=kYZ8AKr-T4E&t=1s

Fortunately, another engineering firm did a BESS sound level study on Tesla Megapack 2 and included both the sound levels at 40% and 100% operational capacity...

Table 6-2 Reference Sound Power Level

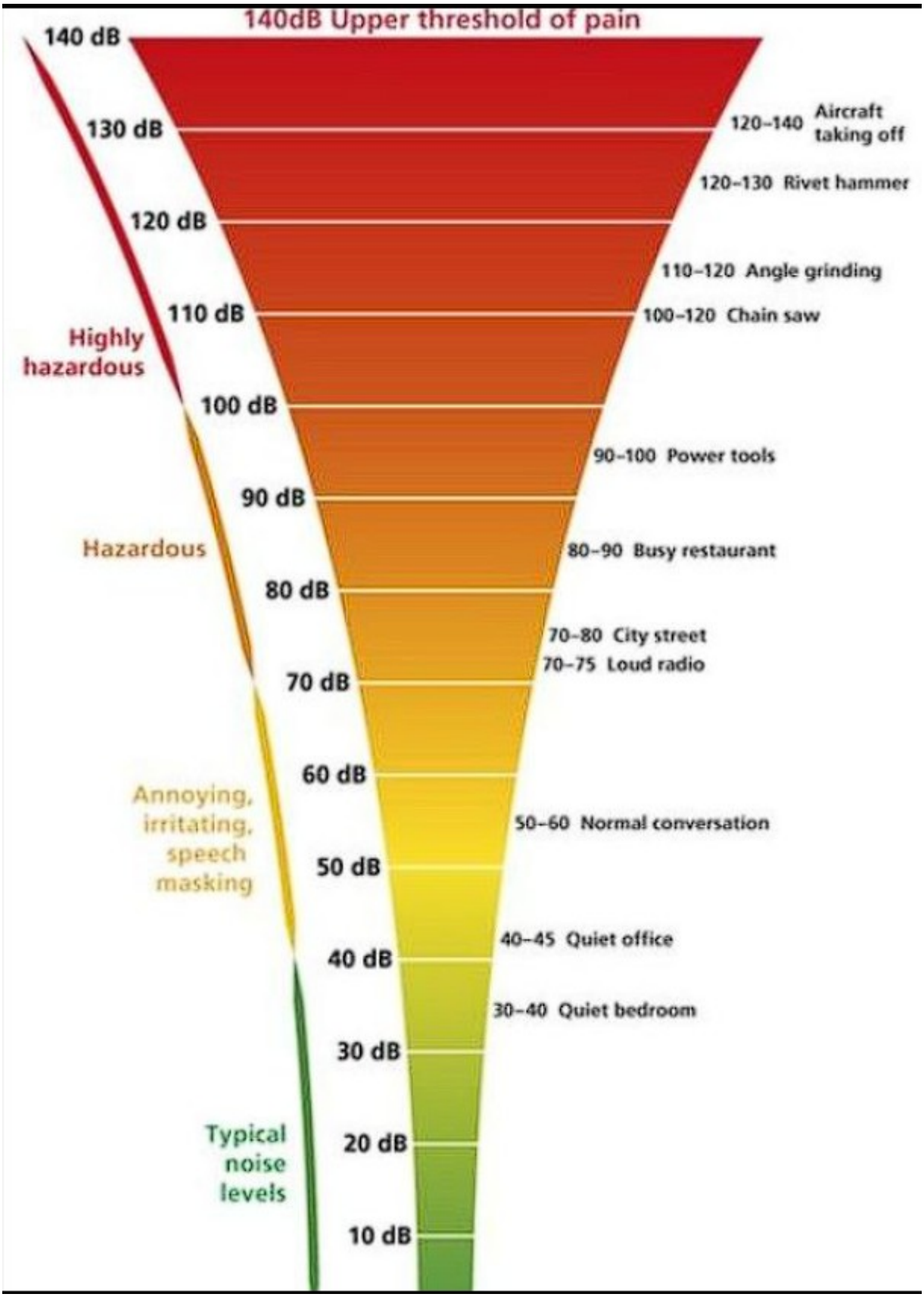
Proposed Source	Broadband Sound Power Level per Unit
	dBA
Tesla Megapack @ 100%	95[1,2]
Tesla Megapack @ 40%	84[2,3]
Power transformer	88[4]

1. Sound power level per Megapack, with fan spe
2. Octave band data for Megapack calculated fro data.
3. Sound power level per Megapack, fan speeds t
4. Broadband and octave band data for power t Noise Guide, Edison Electric Institute, 2nd editi (NEMA) rating of 67 dBA.

The "Goldeneye" Sedro Woolley noise study shared above (with only 40% fan speed), specifies that the BESS developer specifically requested the engineering firm to do the study at 40% to skew the results in their favor...

Ideally, you would not allow simulations, but instead require BESS to submit a sound study with microphones set up at all the "receptors" sites within line of site and within 1+ miles and sound travels easily...

NIOSH recommends less than 15 minutes of exposure per day of any noises above 100db- BESS operate 24/7 and they want to put BESS next to schools and people's homes.



Here's a BESS study showing a lithium BESS releasing highly hazardous sound levels (120db at 31.5hz):

analysis, it was assumed that all equipment would operate consistently during the daytime and nighttime hours.

Table 7. Modeled Octave Band Sound Power Level for Major Pieces of Project Equipment

Sound Source	Sound Power Level (L_W) by Octave Band Frequency dBL									Broadband Level
	31.5	63	125	250	500	1k	2k	4k	8k	dBA
PE Inverter	88	87	87	91	86	83	81	78	73	89
BESS	120	105	112	106	99	93	86	79	74	102
Transformer (85 MVA)	104	110	112	107	107	101	96	91	84	108
Transformer (170 MVA)	101	107	109	104	104	98	93	88	81	104

5.3 Noise Prediction Model Results

Broadband (dBA) sound pressure levels were calculated for expected normal Project operation assuming that all components identified previously are operating continuously and concurrently at the representative manufacturer-rated sound power level. For the purpose of the analysis, it was assumed that all equipment will operate consistently during the daytime, while only the substation transformers and BESS units will operate during the nighttime. After calculation, the sound energy was then summed to determine the equivalent continuous A-weighted downwind sound pressure level at a point of reception. A sound contour plot displaying broadband (dBA) sound levels presented as color-coded isopleths are provided in Figure 2 for Project operations. The sound contours are graphical representations of the cumulative noise associated with operation of the equipment and show how operational noise would be distributed over the area surrounding the Project. The contour lines shown are analogous to elevation contours on a topographic map (i.e., the sound contours are continuous lines of equal noise level around some source, or sources, of sound).

Table 8 shows the projected exterior sound levels resulting from full, normal operation of the Project during daytime and reduced operation during nighttime hours, at all nearby NSRs. The Project is located on Class C land while the adjacent properties consist of a mix of both Class C land with Class A residential structures, which has a daytime limit of 60 dBA and nighttime limit of 50 dBA, and Class C land, which has a daytime and nighttime limit of 70 dBA.

Table 8 shows that the Project will comply with the 60 dBA daytime limit and 50 dBA nighttime limit at all NSRs. In addition, based on the results displayed in Figure 2, the Project will comply with all WAC noise limits at the land use zones adjacent to the Project Area.

https://www.grantcountywa.gov/DocumentCenter/View/12601/Acoustic-Assessment-Report

Here's a noise study showing BESS units individually are 94db but when all combined it shows a total sound power level 118db of noise- it also shows the reduction in sound levels with decreased fan speeds (decreasing from 100% down to 20% utilization):

5.4 Operations noise

5.4.1 Design drawings

The acoustic assessment has been based on preliminary layout drawing (Figure 2.1). In addition, the noise model has considered the proposed acoustic barriers (4 m in height) to the north, east, south and west of the BESS footprint area maintaining an access opening to the north-west.

5.4.2 Plant and equipment

Noise impact from the general operation of the project was considered at assessment locations outlined in Section 3.1 from BESS.

As part of the detailed design process, the final locations for potential noise-generating infrastructure, in particular the substation and BESS facilities, will consider the distance between this type of infrastructure and nearby non-project related residences, so as to minimise operational noise impacts, where practicable.

Noise sources considered during the operational phase of the project include battery cubicles, power conversion systems (PCS) and high voltage transformers. Envisaged operational noise sources are presented in Table 5.3. Based on manufacturer data and assuming constant operation of the LV/HV transformers and HV transformers, Table 5.3 also incorporates the reduced total sound power levels under varying utilisation levels and cooling system operation of the battery cubicles and inverters.

Table 5.3 Operational noise source sound power levels

Noise source	L_{Aeq} sound power level per unit, dB[1]	Total sound power level, dB
Battery Cubicles/PCS /Inverters (x268) [2]	94	118
LV-MV transformers (4.9 MVA x268) [3]	76	100
MV-HV transformers (325 MVA x2) [4,5]	94	101
Total at 100% utilisation		**118**
Total at 80% utilisation		**116**
Total at 60% utilisation		**113**
Total at 40% utilisation		**109**
Total at 20% utilisation		**106**

Notes:
1. The combined noise levels will be subject to final quantity, configuration and layout of equipment as well as any noise attenuating measures.
2. Combined battery/inverter system 1/3 octave band levels reviewed from supplier information and confirmed not tonal.
3. Standard limit for LV-MV transformer with no tonal penalty.
4. Based on reduced limit AS60076.10 specifications with 5dB tonal penalty to MV-HV transformer only.
5. Potential for HV transformers to be located within the south-east portion of the TransGrid Wellington Substation.

Only on rare occasions (<2%) during high heat load and electricity network demand would a utilisation above 40% occur for the BESS operation – this would also only occur during daytime operation due to the linkage to high heat load. A worst-case discharge cycle during the evening would be a continuous period of around 1.5 hours (full

https://wellingtonbess.com/wp-content/uploads/2024/02/Appendix-K-NVIA.pdf

Here's a noise study for a BESS showing 109db at low/bass frequencies and the transformer making 110db:

Draft Acoustic Assessment Report

was assumed that all equipment would operate cons
substation transformers and BESS units will operate

Table 8. Modeled Octave Band Sound Power Level fo

Sound Source	Sound Power Level (Lw)			
	31.5	63	125	250
Step-up Transformer	73	79	81	76
Inverter	106	99	104	98
BESS	109	94	101	95
Substation Transformer	102	109	110	105

https://efsec.wa.gov/sites/default/files/2025-06/HopHill_ASC_Attachment_Q_AcousticAssessment.pdf

Here's a study showing a 110db- but also shows that a BESS can be installed in 16-20 weeks:

Table 4: Construction Phases and Expected Equipment

Construction Phase	Timefra me	Plant Item	Number Required	Sound Power Level, dB(A)	Acoustical Usage Factor, % [c]
Site preparation and construction of acoustic wall and ancillary infrastructure a)	Weeks 1-8	Truck & Dog [b]	2	110	40
		Compactor	2	103	20
		Bulldozer	1	109	40
		Water Cart	1	103	40
		Vibratory Roller	2	103	20
Concrete footing installation and cable installation	Weeks 5-12	Concrete truck	2 per day	99	40
		Excavator	2	105	40
		Concrete truck discharge	2	96	100
BESS and inverter container installation	Weeks 5-16	Trucks	5 per day	110	40
Electrical wiring and testing	Weeks 9-16	Hand tools	5	95	50
commissioning	Weeks 13-20	Hand tools	5	90	50
All	All	Light Vehicle	35/hour		

a) Construction plant used intermittently as required. Continuous use not expected.
b) Truck movements associated with deliveries assumed to move through site at 10 km per hour as a moving point source.
c) The 'Acoustical Usage Factor' represents the percentage of time that a particular item of equipment is assumed to be running at full power while working on site.

3.4 Assessment of Impacts

For the purposes of predicting impacts associated with noise emissions from the Subject S on nearby sensitive receptors, noise modelling of the sources was completed using t proprietary software CadnaA (version 2021 MR2 build 181.5161) developed by DataKus CadnaA incorporates the influence of meteorology, terrain, ground type and air absorption addition to source characteristics to predict noise impacts at receptor locations. All predictio have been undertaken in accordance with CONCAWE.

The model is utilised to assess the potential noise emissions from the subject site unde range of operating scenarios and meteorological conditions. The noise modelling also allo investigation of possible noise management solutions, in the event that non-compliance w the assessment criterion is predicted.

For this assessment, all the construction phases were assumed to operate concurrently, wh is the worst-case scenario. It can be seen from Table 5, that the predicted noise levels at receptors comply with the noise affected of 50 dB(A) during standard hours. The high predicted noise level is expected to occur at receptor R01. Although no exceedance is observ it is recommended that reasonable and feasible mitigation measures such as those present in Section 3.5 are implemented to reduce the noise impact at this receptor.

https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-35160796!20220906T051215.997%20GMT&fbclid=IwZXh0bgNhZW0CMTAAAR2Z3U6Ur18m0cW3UGDXmUMQyMTPcObGjWtPZS9Kehg4PrGB5izUxmAek6k_aem_Afl-F4G-oCrT5FUsSxPeJmR7HkPXjSgFcIywVjjGuP2hM0LAl5gbZJSaGTsIy5jzLau6ZrU1SJwGpGBYIB3UhanS

Here's a noise study showing he BESS generating an overall sound level of 106db:

TETRA TECH

MEMO

To:	Linnea Fossum
From:	Tricia Pellerin
Date:	January 27, 2023
Subject:	Wautoma Solar Project – EFSEC Draft Data Responses (Noise)

Please see the draft responses to EFSEC data requests pertaining to the Acoustic Assessment conducted in support of permitting the Wautoma Solar Project.

Noise-1: **In Attachment O, it is unclear how the 500-kV transmission line was incorporated into the model or the final noise impact results from Project operations. Please clarify noise source inputs into the model or the calculated impacts from the transmission line are included along with the location of the line in the attachment's figures.**

Response:

The 500-kV transmission line was incorporated into the CadnaA model as an elevated line source aligned with the proposed route. The sound source level information representing the transmission line in CadnaA is shown in revised Table 8 from Appendix O (Acoustic Assessment). For the purposes of the acoustic modeling analysis, foul weather conditions were conservatively assumed, which is when transmission lines generate the most corona noise.

Table 8. Modeled Octave Band Sound Power Level for Major Pieces of Project Equipment (Revised)

Sound Source	Sound Power Level (Lw) by Octave Band Frequency dBL									Broadband Level
	31.5	63	125	250	500	1k	2k	4k	8k	dBA
Step-up Transformer	77	77	73	73	73	67	62	56	49	73
BESS	85	93	100	101	100	97	92	85	78	106
Substation Transformer	100	104	99	100	99	93	89	83	75	100
Transmission Line	45	53	69	68	74	80	81	82	79	87
Tracking Motor	40	40	44	48	52	52	48	44	40	57

Figures 2 and 3 of Appendix O have been revised to display the transmission line.

Noise-2: **Noise impacts from the tracking system motors during operations were omitted from the ASC as a possible source of noise. Please include this possible source of noise in the analysis of noise impacts**

Response:

The Project acoustic modeling analysis has been revised to include the 14,570 tracking motors expected as part of the site layout design. The octave band sound power level associated with the tracking motors was added to the revised version of Table 8 from Appendix O, shown above. Table 9 of Appendix O has also been revised, providing the acoustic modeling results that have been updated to incorporate the sound contribution of the tracking motors.

https://efsec.wa.gov/sites/default/files/2025-07/Attachment%201_Wautoma_Data%20Request_Response_Noise.pdf

They play around with the numbers as well so that when you compare noise levels across BESS and it's components it doesn't always make sense:

Table 8. Modeled Octave Band Sound Power Level for Major Pieces of Facility Equipment

Sound Source	Sound Power Level (L_W) by Octave Band Frequency dBL									Broadband Level
	31.5	63	125	250	500	1k	2k	4k	8k	dBA
BESS	102	87	94	88	81	75	68	61	56	84
Inverter	92	90	92	91	95	86	85	93	86	97
72 MVA Substation Transformer	57	77	89	91	97	94	90	85	76	100
1 MVA Auxiliary Transformer	28	48	60	62	68	65	61	56	47	71
Tracking Motor	36	36	40	44	48	48	44	40	36	53

4.3 Noise Prediction Model Results

Broadband (dBA) sound pressure levels were calculated for expected normal Facility operation assuming that all components identified previously are operating continuously and concurrently at the representative manufacturer-rated sound power level. It is expected that all sound-producing equipment would operate during both daytime and nighttime periods. After calculation, the sound energy was then summed to determine the equivalent continuous A-weighted downwind sound pressure level at a point of reception. Sound contour plots displaying broadband (dBA) sound levels presented as color-coded isopleths are provided in Figure 2 for operations with the under clear and rainy conditions. The sound contours are graphical representations of the cumulative noise associated with full operation of the equipment and show how operational noise would be distributed over the surrounding area of the Facility site. The contour lines shown are analogous to elevation contours on a topographic map (i.e., the sound contours are continuous lines of equal noise level around some source, or sources, of sound).

Table 9 shows the projected exterior sound levels resulting from full, normal operation of the Facility during both daytime and nighttime hours at all nearby NSRs. The Facility is located on Class C land while the adjacent properties consist of a mix of both Class C land with Class A residential structures, which has a daytime limit of 60 dBA and nighttime limit of 50 dBA, and Class C land, which has a daytime and nighttime limit of 70 dBA. The Facility will comply with the applicable noise regulations with the one NSR located within 1 to 2 miles of the Facility site.

Table 9. Acoustic Modeling Results Summary

NSR ID	Participation Status	UTM Coordinates (meters) NAD83 UTM Zone 11		Operational Sound Level (dBA)
		Easting	Northing	
1	Unknown	311271	5088662	18

https://efsec.wa.gov/sites/default/files/2025-06/11_Wallula%20Gap_ASC_Attachment%20J_Acoustic%20Assessment%20Report.pdf

Sometimes things match- like this Carriger Solar BESS sound levels match the Wautoma BESS sound levels, but then other components are different:

Table 8. Modeled Octave Band Sound Power Level for Major Pieces of Project Equipment

Sound Source	Sound Power Level (Lw) by Octave Band Frequency dBL									Broadband Level
	31.5	63	125	250	500	1k	2k	4k	8k	dBA
Step-up Transformer	98	102	98	98	98	92	87	81	74	98
Inverter	78	86	93	94	93	90	85	78	71	99
BESS	85	93	100	101	100	97	92	85	78	106
Substation Transformer	98	102	98	98	98	92	87	81	74	98

In addition to the above, the modeling analysis accounts for the 500-foot-long 500-kilovolt (kV) transmission line located between the Project substation and the existing Knight substation. Transmission lines generate sound referred to as corona. The level of corona noise generated by a transmission line is highly dependent on weather conditions (i.e., foul weather), electrical gradient, altitude, and condition of the conductor wires. The corona effect is initiated where the conductor's electric field is concentrated by imperfections in the conductor surface such as nicks or scratches, or by substances on the lines such as water droplets, dirt or dust, and bird droppings. Corona activity increases with increasing altitude, and with increasing voltage in the line, but is generally not affected by system loading. Details pertaining the transmission line have not been finalized, but the audible sound level associated with transmission line operation under foul weather conditions was conservatively estimated at 69 dBA at a distance of 50 feet from the transmission line.

4.3 Noise Prediction Model Results

Broadband (dBA) sound pressure levels were calculated for expected normal Project operation assuming that all components identified previously are operating continuously and concurrently at the representative manufacturer-rated sound power level. It is expected that all sound-producing equipment would operate during both daytime and nighttime periods. After calculation, the sound energy was then summed to determine the equivalent continuous A-weighted downwind sound pressure level at a point of reception. Sound contour plots displaying broadband (dBA) sound levels presented as color-coded isopleths are provided in Figures 2 and 3 for operations with the under clear and rainy conditions. The sound contours are graphical representations of the cumulative noise associated with full operation of the equipment and show how operational noise would be distributed over the surrounding area of the Project site. The contour lines shown are analogous to elevation contours on a topographic map (i.e., the sound contours are continuous lines of equal noise level around some source, or sources, of sound).

Table 9 shows the projected exterior sound levels resulting from full, normal operation of the Project during both daytime and nighttime hours, at all nearby NSRs. The Project is located on Class C land while the adjacent properties consist of a mix of both Class C land with Class A residential structures, which has a daytime limit of 60 dBA and nighttime limit of 50 dBA, and Class C land, which has a daytime and nighttime limit of 70 dBA. The Project will be in compliance with the applicable noise regulations at all non-participating and participating receptors .

https://efsec.wa.gov/sites/default/files/2025-06/Attachment_H_Carriger_Acoustic_Assessment_Report.pdf

Here's one that was officially submitted showing the BESS will be silent at 31.5hz vs every other sound study showing between 36db and 120db at that low frequency:

supply frequency: 120 Hz for 60 Hz transformers. The cooling equipment (fans and pumps) may also be noise components, depending on fan design. During air forced cooling method, cooling fan noise is produced in addition to the core noise. The resulting audible sound is a combination of hum and the broadband fan noise. Breaker noise is a sound event of very short duration, expected to occur only a few times throughout the year. Just as horsepower ratings designate the power capacity of an electric motor, a transformer's megavolt amperes rating indicates its maximum power output capacity.

The Applicant is considering one of two POI options to connect the Project to existing transmission lines. Modern transmission lines are designed, constructed, and maintained so that the line will generate a minimum of corona-related noise during dry conditions. Corona can be a design concern with transmission lines of 345 kV and higher; however, the Project is considering connecting to an existing transmission line and will therefore not generate additional corona noise. The gen-tie line associated with the Project will be 230 kV and is therefore not expected to be a significant generator of corona noise. An associated switchyard will also be constructed along the interconnection route. An associated switchyard will also be constructed along the overhead 230 kV gen-tie line route at the determined POI option. However, since the switchyard will not have any transformers, it is not expected to generate significant noise levels. Therefore, the overhead 230 kV gen-tie line and associated switchyard were not included in this acoustic analysis.

Reference sound power levels input to Cadna-A were provided by equipment manufacturers, based on information contained in reference documents or developed using empirical methods. The source levels used in the predictive modeling are based on estimated sound power levels that are generally deemed to be conservative. The projected operational noise levels are based on Applicant-supplied sound power level data for the major sources of equipment. Table 8 summarizes the equipment sound power level data used as inputs to the acoustic modeling analysis. For the purpose of the analysis, it was assumed that all equipment would operate consistently during both daytime and nighttime periods.

Table 8. Modeled Octave Band Sound Power Level for Major Pieces of Project Equipment

Sound Source	Sound Power Level (Lw) by Octave Band Frequency dBL									Broadband Level
	31.5	63	125	250	500	1k	2k	4k	8k	dBA
Integrated Inverter/Transformer	78	86	93	94	93	90	85	78	71	99
BESS	--	67	66	74	81	86	83	76	69	89
Substation Transformer	96	100	96	96	96	90	86	79	72	105

4.3 Noise Prediction Model Results

Broadband (dBA) sound pressure levels were calculated for expected normal Project operation assuming that all components identified previously are operating continuously and concurrently at

https://efsec.wa.gov/sites/default/files/2025-06/16_Badger%20Mtn_ASC_Attach%20O_AcousticAssessment.pdf

Here's another sound study showing no sound output by the BESS at 31.5hz

Noise Prediction Locations. There are 165 noise-sensitive receptors located within 1.5 miles of the Project. Noise levels were predicted at the 25 receptors closest to the Facility, which range from roughly 440 feet to over one-half mile from the Facility property line. Predicted noise levels at the more distant receptors will be less than those shown herein. To assess compliance with the Township Ordinance, noise levels were also predicted in the form of contours, where lines representing specific noise levels, e.g., 55 dBA, are plotted over an aerial photograph of the site. Between the Facility and a given contour line the predicted noise level is greater than the value represented by the contour line. All point and noise contour predictions were done at 5 feet above the ground level.

Table 4-1. Noise Emission Factors Used in Acoustic Model

Equipment Description And Quantity	Source Type	Overall Sound Power Level (dBA)	Octave Band Sound Emission Levels (dBA)								
			31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1,000 Hz	2,000 Hz	4,000 Hz	8,000 Hz
BESS Unit Cooling (120)	Area	95	-	69	85	87	88	89	88	85	78
PCS Unit (40)	Point	93	52	66	76	84	83	84	84	89	81
Substation Transformer (1)	Point	100	54	76	90	92	97	93	87	79	65

Noise Mitigation

Compliance with the 55 dBA property line noise limit was achieved using a 20-foot-high earthen berm along the entire western and approximately 330 feet of the northern side of the Facility. The berm has a 2:1 slope and is located approximately 80 feet away from the Facility fence line.

4.2 Predicted Noise Levels

Table 4-2 lists the predicted noise level at the loudest 25 receptors. The predicted noise levels are shown graphically in Figure 4-2. Predicted noise levels at these receptors range from 35 to 46 dBA, and are below 55 dBA along the entirety of the Facility property line.

https://salinetownship.org/uploads/notices/HEI%20-%20Voyager%20BESS%20Noise%20Study%2020250131%20(1).pdf

This one has similar results as the 40% Sedro Woolley BESS that I first shared- but never mentions that this BESS sound study was done at reduced fan/cooling system speed:

purpose of the analysis, it was assumed that all equipment would operate consistently during both daytime and nighttime periods.

Table 7. Modeled Octave Band Sound Power Level for Major Pieces of Facility Equipment

Sound Source	Sound Power Level (Lw) by Octave Band Frequency dBL									Broadband Level
	31.5	63	125	250	500	1k	2k	4k	8k	dBA
Integrated Inverter/Transformer	78	86	93	94	93	90	85	78	71	99
BESS	54	64	71	77	80	79	78	73	64	85
Substation Transformer	63	83	95	97	103	100	96	91	82	106

4.3 Noise Prediction Model Results

Broadband (dBA) sound pressure levels were calculated for expected normal Facility operation assuming that all components identified previously are operating continuously and concurrently at the representative manufacturer-rated sound power level. It is expected that all sound-producing equipment would operate during both daytime and nighttime periods. After calculation, the sound energy was then summed to determine the equivalent continuous A-weighted downwind sound pressure level at a point of reception. Sound contour plots displaying broadband (dBA) sound levels presented as color-coded isopleths are provided in Figures 2 and 3 for potential 24-hour operation. Figure 2 displays operational sound levels assuming centralized BESS while Figure 3 displays operational sound levels assuming distributed BESS. The sound contours are graphical representations of the cumulative noise associated with full operation of the equipment and show how operational noise would be distributed over the surrounding area of the Facility site. The contour lines shown are analogous to elevation contours on a topographic map (i.e., the sound contours are continuous lines of equal noise level around some source, or sources, of sound).

Table 8 shows the projected exterior sound levels resulting from full, normal operation of the Facility during both daytime and nighttime hours, at all nearby NSRs using both centralized and distributed BESS. The Facility is located on Class C land while the adjacent properties consist of a mix of both Class A land, which has a daytime limit of 60 dBA and nighttime limit of 50 dBA, and Class C land, which has a daytime and nighttime limit of 70 dBA. The Project successfully demonstrates compliance with the applicable 50 dBA nighttime limit at NSRs (i.e., residential structures), using either BESS option. In addition, compliance was evaluated at the property lines closest to the Facility Area Extent. As displayed in Figures 2 and 3, the Facility is expected to successfully comply with the applicable WAC regulatory limits at the closest property lines as well.

https://efsec.wa.gov/sites/default/files/2025-05/20210119_Attch_I_AcousticAssessmentReport.pdf

Here's another sound study- the broadband number is 66db???? They say there are 14,946 BESS units but they only make 66db of noise overall- that doesn't make sense?!?!?

The projected operational noise levels are based on Applicant-supplied sound power level data for the major sources of equipment in addition to the BESS analysis above. Table Y-5 summarizes the equipment sound power level data used as inputs to the acoustic modeling analysis. For the purpose of the analysis, it was assumed that all equipment would operate consistently during both daytime and nighttime periods.

Table Y-5. Equipment Sound Power Level by Octave Band Center Frequency

Noise Sources	Quantity	Octave Band Sound Power Level by Frequency (Hz) dBL									Broadband (dBA)
		31.5	63	125	250	500	1000	2000	4000	8000	
Inverter Skid	318	83	82	84	83	87	78	77	85	79	89
BESS Unit	14,946	85	69	76	70	63	57	50	43	38	66
Main Power Transformer	6	97	103	105	100	100	94	89	84	77	100

5.3.1.1 Transmission Lines

Transmission line sound sources will primarily consist of corona noise in addition to Aeolian noise, and noise associated with maintenance activities. Transmission line noise (also called corona noise) is caused by the partial electrical breakdown of the insulating properties of air around the electrical conductors and overhead power lines. Audible noise generated by corona on transmission lines is composed of two major components. The higher frequencies of the broadband component distinguish it from more common outdoor environmental noise. The random phase relationship of the pressure waves generated by each corona source along a transmission line results in a characteristic sound commonly described as crackling, frying, or hissing. The second component is a lower-frequency sound that is superimposed over the broadband noise. The corona discharges produce positive and negative ions that, under the influence of the alternating electric field around alternating current conductors, are alternately attracted to and repelled from the conductors. This motion establishes a sound-pressure wave having a frequency twice that of the voltage (i.e., 120 Hz for a 60-Hz system). Higher harmonics (e.g., 240 Hz) may also be present, but they are generally of lower significance (EPRI 2015). Corona activity increases with increasing altitude, and with increasing voltage in the line, but is generally not affected by system loading. The relative magnitude of hum and broadband noise may be different depending on weather conditions at the line. According to EPRI, when the line is wet (such as during rainy weather conditions), the broadband component typically dominates; however, under icing conditions, the lower frequency components may be more prevalent.

Corona noise levels during precipitation may vary over a wide range. During the initial stages, when the conductors are not thoroughly wet, there may be considerable fluctuation in the noise level as the precipitation intensity varies. When the conductors are thoroughly wet, the noise fluctuations will often be less significant, because even as the intensity of precipitation diminishes the conductors will still be saturated, which can result in corona discharge. The variation in noise levels

https://www.oregon.gov/energy/facilities-safety/facilities/Facility%20Exhibits/SSP/2024-05-16-SSPAPPDoc25-25-ASC-Exhibit-Y-Noise.pdf

Here's another sound study where they didn't include the broadband power nor the sound levels at each frequency:

TABLE 4-2 MODELLED NOISE SOURCES

Plant Item	Sound Power Level per Plant Item, L_{eq} dB(A)	Quantity	Notes
Battery Unit	79.7	525	• Make and Model: CSI Solbank • Based on supplier noise assess • Maximum cooling power opera • Equipment noise data sheet pr
Inverter	85.8	105	• Make and Model: SMA SCS 39 • Sound Power Level provided m • Fitted with silencer • Equipment noise data sheet pr
Power Conversion Unit (PCU)	63.9	105	• Medium Voltage (MV) Transfor • Client advice and noise measu • Equipment noise data sheet pr
Substation High Voltage (HV) Transformer	97.6	2	• 180 MVA Transformer • Sound Power Level based on I 600076.10:2009) – Standard

https://www.enelgreenpower.com/content/dam/enel-egp/immagini/plants-in-development/capricorn-bess-project/Appendix%20E%20-%20Noise%20Impact%20Assessment.pdf

This sound study includes the sound reductions created by "low noise cooling systems" and a combination of 8ft tall x 180ft long sound barrier, 15ft tall x 570ft long sound barrier wall, 14ft tall x 730ft long sound barriers:

Table 6. Modeled Sound Power Level Data for Operational Equipment

Equipment	Octave Band Sound Pressure Levels at 1 meter (dBL)									Overall SPL at 1 meter (dBA)
	31.5	63	125	250	500	1000	2000	4000	8000	
APS	62	68	68	63	63	57	52	47	40	64
Augmentation Unit	71	66	66	64	61	58	53	48	46	63
Battery Cabinet with Cooling	68	63	63	62	58	56	51	46	45	61
MVT + PCS	60	60	60	59	63	55	59	57	52	65
MPT	69	75	75	70	70	64	59	54	47	70

6.3 Noise Control Measures

As stated above, the sound pressure levels in Table 6 include noise reduction measures incorporated by the manufacturers. Additional sound walls are included as well to further reduce the noise generated from the Project. The noise contour measures incorporated into the Project design include the following:

- The BESS will include specialized damper coverings specifically designed to reduce the noise emissions.
- The BESS will incorporate a low noise cooling system.
- The MVT and PCS will incorporate a noise reduction kit.
- The MVT and PCS will incorporate a noise reduction cover.
- The MPT will incorporate low noise fans.
- The additional sound walls include:
  - 8-foot-high wall with a length of 180 feet along the eastern property line.
  - 15-foot-high wall with a length of 570 feet along the southern property line (set back 75 feet from Lake Road).
  - 14-foot-high wall with a length of 730 feet along the western property line (set back 25 feet from the Project property line).

These noise control measures were incorporated into the noise assessment to demonstrate the feasibility of the Project to meet applicable noise requirements. Final design may incorporate different mitigation measures in order to achieve the same objective as demonstrated in the assessment.

6.4 Noise Prediction Model Results

Broadband (dBA) sound pressure levels were calculated at an elevation of 1.5 meters (5 feet) above the ground, the height of the ears of a standing person, for expected normal Project operation assuming that all components identified previously are operating continuously and concurrently at the representative manufacturer-rated sound levels. The sound energy was then summed to determine the equivalent A-weighted sound pressure level at a point of reception during normal

https://portal.ct.gov/-/media/csc/1_dockets-medialibrary/1_media_do500_600/do527/applicantsubmissions/application/15---appendix-m_acoustic-assessment.pdf?rev=8d742930a650432c8afe6e9ac7c158ed&hash=F32A9F8007CEB809581E8BA508196068

Here's another study that hides all the frequency based sound levels:

Technical Appendix 11.1: Assessment of Battery Energy Storage Facility

11.1 In addition to the wind farm, it is also proposed to include a battery energy storage facility on site. An acoustic assessment in accordance with BS 4142:2014+A1:2019[1] has been undertaken in order to determine the acoustic impact due to the operation of this part of the Proposed Development.

11.2 The baseline data adopted is that determined at a wind speed of 1 ms^{-1} during the background noise measurements made to inform the acoustic assessment of operational noise from the proposed wind farm, which correspond to the worst case, or quietest, levels. These are detailed in **Table 11.5** and **Table 11.6** of the main chapter, with the baseline data from each survey location being applied to the properties closest to them.

11.3 The main sources of sound within the battery energy storage facility are the power conversion system (PCS) units, substation transformer and the heating, ventilation and air conditioning systems (HVAC) for the battery energy storage system (BESS) units. The BESS units are expected to be continuously charging and discharging. If there are any rest periods for the PCS units these are likely to be infrequent.

11.4 Acoustic emission data for the proposed equipment is detailed in **Table 11.1.1**. The data corresponds to the maximum acoustic emission for each device as advised by the manufacturer. Predictions based on this data therefore represent the worst case and the sound levels would be expected to be less when the site is not operating at maximum capacity. The amount of the time that this is the case is unknown at this stage as it depends upon which services the site provides.

Table 11.1.1: Acoustic Emission Data

Equipment	Sound Power Level, dB(A) L_W	Number of units
PCS unit	96	5
BESS unit HVAC	82	20
Substation transformer	95	1

11.5 Predicted specific sound levels due to the proposed battery energy storage facility at nearby residential properties, calculated using the ISO 9613-2 propagation model, are detailed in **Table 11.1.2**. A sound footprint for the battery energy storage facility is shown in **Figure 11.2**.

11.6 The propagation model takes account of sound attenuation due to geometric spreading and atmospheric absorption. The assumed temperature and relative humidity are 10 °C and 70 % respectively.

11.7 Ground effects are also taken into account by the propagation model, with a ground factor of 1 adopted to reflect the porous ground conditions between the site and the assessment locations. A 1.5 m receiver height has been used. The effect of surface features such as buildings and trees has not been considered. There is a degree of conservatism built into the model as a result of the adoption of these settings.

https://mullaghclogher-windfarm.co.uk/media/nankxbzi/ta111-assessment-of-battery-energy-storage-facility.pdf

Here's another 40% sound study that includes the largest range of sound frequencies out of any test I have seen, but is missing 20hz, 31.5hz, and 40hz:

ADVERTISED
PLAN

C2 One-third octave band noise data, linear dB

			One-third octave band centre frequency (Hz)											
Unit type	Number of units	Noise Data	25	31.5	40	50	63	80	100	125	160	200	250	3
Batteries 40% fan speed	164	SWL				76	73	73	81	78	78	78	85	7
HV TX	2	SWL	61	64	77	93	76	89	106	83	78	79	76	7

		One-third octave band centre frequency (Hz)											
Unit type	Noise Data	1k	1.25k	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	d
Batteries 40% fan speed	SWL	68	73	69	68	66	68	67	64	61	58	55	8
HV TX	SWL	68	66	64	61	59	57	55	51	53	51	46	8

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https://sftpbspompppprod01.blob.core.windows.net/applicationfiles/45276d90-2c12-ed11-b83d-00224891e4e7_PA2201752-06-Thomastown%20Battery%20Energy%20Storage%20System-Noise%20Modelling-191022.pdf

This noise study is all estimated sound levels and omit frequences below 60hz:

ADVERTISED PLAN

5.0 OPERATIONAL NOISE ASSESSMENT

5.1 Operational noise sources

At this stage of the Project, equipment selections have not been conclusively determined and final selections will be established following detailed design and tender. The project design and equipment selections detailed in this report have been used for the purpose of noise assessment and have been reviewed by GPGA and approved as being representative.

Where available, GPGA has provided detailed third octave noise data from the corresponding manufacturer. Where this data is not available MDA has established approximations or assumptions based on comparable data or existing acoustic literature.

Where project design, equipment selections and associated noise data or any other aspect of the noise assessment detailed in this report change, additional noise modelling and assessment should be conducted to verify continued compliance.

Sound power levels for individual equipment items, as used in the noise model, are detailed in Table 6. Data is provided as un-weighted (linear) octave band spectra and A-weighted overall sound power level.

Table 6: Sound power levels for Project equipment items, dB L_W

Item	Octave band centre frequency, Hz							
	63	125	250	500	1000	2000	4000	L_{WA}
Inverter	90	91	94	82	83	80	81	90
Battery unit	77	90	84	81	80	80	76	86
HV transformer	94	96	91	91	85	80	75	91
Auxiliary transformer	77	79	74	74	68	63	58	75

The noise data above aligns with the typical worst case operating conditions for the Project being:

- The maximum effective sound power level associated with each individual equipment item i.e. maximum fan duty due to the most significant charge / discharge conditions and / or elevated ambient temperature
- All equipment operating concurrently for the entirety of the 30-minute assessment period.

Whilst the above operating condition represents a typical worst case, for a large majority of the time the Project will be subject to reduced demand and ambient temperature, resulting in reduced individual equipment noise levels, and thus during these conditions, overall noise levels at receivers, will be lower than that predicted by this assessment.

Based on information provided by GPGA it is understood that while the above typical worst case operating condition has the potential to occur at any time during a typical 24 hr period, it is much less likely to occur in the night-time period, than the day or evening period.

Generally, noise data for the inverter and battery unit represent the mid to lower end of the range of noise levels exhibited on the market, for comparable ambient temperatures and equipment duties, based on MDA's knowledge and research.

https://sftpbspomppprod01.blob.core.windows.net/applicationfiles/8f45eb39-ec94-ef11-8a68-002248938a9c_PA2403305%20-%20Tarrone%20BESS%20-%20Noise%20Assessment.pdf

This sound study is incorporating a 4.5 meter tall sound barrier- and omitting frequences below 63hz:

8.0 NOISE DATA

Equipment noise levels have been provided by the proposed equipment supplier in *Fluence Cube Vibration and Noise Data Collection Report* (See Table 1) and are listed in Table 5.

Table 5: Noise level data, dB L_{eq}

	Octave band centre frequency, Hz							
Description	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**A**
Battery cooling measured at 1 m from front of cube [1]	74[3]	74	70	70	65	65	64	72
Battery cooling measured at 1 m from rear of cube [1, 2]	76[3]	76	69	67	64	63	61	71
Inverter measured at 1 m	54[3]	54	67	68	69	70	63	79 [4]
Battery cooling measured at 1 m from the side of cube [1]	70[3]	70	63	59	54	52	49	62
MV transformer sound power level [5]	60	72	79	72	61	50	44	73
Power transformer sound power level[5]	60	72	79	72	61	50	44	73

Notes:

[1] Adjusted for background noise influence

[2] Adjusted for reflection from a nearby building structure

[3] 63 Hz octave band values were not provided. 63 Hz noise levels have been presumed to be equal to the 125 Hz values

[4] The reported octave band values do not equate to the reported overall A-weighted values. The octave band values used in the modelling have been factored to equate to the reported overall A-weighted values

[5] Based on 132/11kV. 50 MVA transformer as referenced in the Greenacre Zone Substation Environmental Noise Assessment

The noise levels provided in Table 5 have been used to derive sound power levels for the purpose of noise modelling. The derived sound power levels are provided in Appendix F.

Documentation reviewed by MDA during the course of the assessment indicated that the noise from the equipment exhibits some directional characteristics. Directivity corrections, sourced from *Technical Report – Sound Pressure Level in FREEMAQ PCSK/FREESUN HEMK Inverters* (see Table 1), and summarised in Appendix G, have been included in the noise model.

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https://sftpbspomppprod01.blob.core.windows.net/applicationfiles/587693da-ac20-ec11-b6e6-000d3ad1e7ec_PA2101362-Rangebank%20BESS-Acoustic%20Report-Stamped-290921.pdf

Here's one where the sound levels were provided by the BESS developer- omitting frequencies below 63hz:

Parameters/calculation settings	Details
Ground attenuation over land	Ground factor: 0.8 (grazed pasture)
Air temperature	293.15 K
Atmospheric pressure	101.33k Pa
Air humidity	60%
Source heights (relative)	PV inverters 1m above ground. Transformer station (MVPS) up to 2.5m above ground Central Inverter (UP) 3m above ground HVAC- battery containers 2m
Receiver heights (relative)	1.5 m above ground

6.1.5 Sound power levels of plant items

Our assessment is based on the sound power level specifications that have been provided to us by the Project Team (set out below). The exact plant to be used on site will be confirmed as part of the procurement and detailed design phase. A condition of consent is proposed that will require the applicant to demonstrate that the final plant arrangements will comply with the operational noise limits.

Table 3: Frequency spectrum data for plant

Plant	Octave band sound power levels (dB LwA)								
	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	Overall dBA
HV Transformer	91	93	88	88	82	77	72	65	88 *+ 5 dB for special audible character**
Battery/ HVAC *Based on manufacturer data confirming 60 dBA at 1.5m*	80	80	73	69	64	62	59	55	72
Inverter units *Based on manufacturer data confirming 78 dB at 1m*	66	66	78	80	81	82	75	75	86
MV Transformers	78	80	75	75	69	64	59	52	75 + 5 dB for special audible

https://cdc.govt.nz/wp-content/uploads/2024/07/Appendix-10-Acoustic-Assessment.pdf

This study shows the sound levels behind a 5 meter tall acoustic barrier on the E, W, and S sides- but omits frequences below 125hz for the BESS fans:

For the fans and the transformer core, the spectral values have been normalised to an o
A-weighted sound power level (SWL). Applied overall SWLs and spectra for each of the mo
noise sources are provided in Table 2.

Table 2 Modelled Sound Power Level (SWL)

Item	Octave band centre frequency, Hz								Applie broad- band S
	63	125	250	500	1,000	2,000	4,000	8,000	dB(A)
	Sound power level, dB								
Roof of tank	63.0	65.0	60.0	60.0	54.0	49.0	44.0	37.0	88.
Long walls of tank (per wall)	63.0	65.0	60.0	60.0	54.0	49.0	44.0	37.0	89.
End walls of tank (per wall)	63.0	65.0	60.0	60.0	54.0	49.0	44.0	37.0	84.
Fans (per unit)	-	68.2	77.0	78.2	77.2	74.0	72.2	62.9	84.
Total	-	-	-	-	-	-	-	-	95.

The modelled noise sources are shown in Figure 1.



https://www.boom-power.co.uk/content/uploads/2025/08/Accu-Acoustics-00005-Carrog-BESS-Substation-merged.pdf

Here's a sound study that incorporates a 5M tall sound barrier AND fans operating at 30% to hit the required noise levels- omitting BESS container frequencies below 100hz:

candidate. As such, the supplier has recommended that 3 dB is added to the overall sound powe level value to account for this increase. The resulting one-third octave band sound power level da used to model the PCS units equates to a broadband value of 81 dBA (as opposed to the 78 dBA data shown within Table 5).

Table 5 – Sound power levels for proposed plant

Frequency (Hz)	Sound Power Level, dB L_{wA}		
	DC container	AC inverter	HV Grid Transformer
50	N/A[1]	58	64
63	N/A[1]	60	48
80	N/A[1]	61	55
100	48	64	72
125	54	63	69
160	58	63	78
200	64	66	74
250	59	65	77
315	65	67	80
400	67	65	77
500	68	67	77
630	67	66	79

800	68	68	79
1000	67	72	77
1250	67	65	75
1600	67	64	72
2000	67	61	70
2500	67	58	69
3150	66	57	68
4000	64	58	67
5000	62	52	65

9613-2:2024 calculation methodology to predict the effects on noise propagation of geometric spreading, topography, screening, meteorological conditions, and information provided regarding sources of noise.

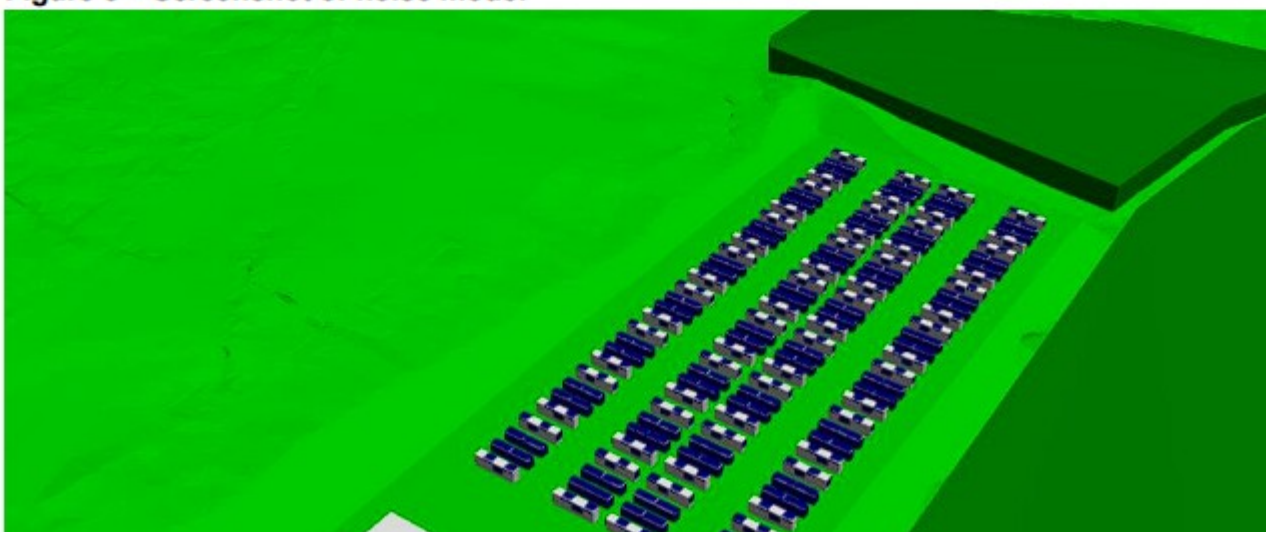
A 5 m noise barrier is included in the model around the southern and south-eastern boundary of t site.

Details of the settings used in the model are summarised as follows:

- Default ground absorption: G=0.8 (acoustically absorbent).
- Three orders of reflection (buildings are reflective).
- ISO 9613 (2024) propagation model.
- Topography data was included in the model.
- Offsite receptor locations derived from satellite imagery.
- Receptors have heights of 4.0 m.
- Predicted levels are free field.
- Heights of buildings are assumed to be 6 meters.
- Sound power level data are based on information received by Field, as summarised above.

A screenshot of the model is shown in Figure 5 for reference. Noise plots are presented in Appen C.

Figure 5 – Screenshot of noise model



https://www.fieldcorriemoillie.co.uk/wp-content/uploads/2024/12/Noise-Impact-Assessment-Report.pdf

Here is a sound study that has considered a 4.5 meter tall sound barrier in it's sound level calculations:

APPENDIX B: SOUND POWER LEVELS

Sound power levels utilised in the assessment are shown in Table B1.

Table B1: Sound Power Levels

Plant item	Octave Band Centre Frequency (dB)									Total dB(A)
	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	
HV transformer	78	82	96	94	93	85	78	73	61	93
Auxiliary transformer	67	73	75	70	70	64	59	54	47	70
MV transformer	60	66	68	63	63	57	52	47	40	63
Inverter	74	79	74	75	73	74	74	68	63	79
Fluence Cube battery enclosure (each)	75	75	75	76	69	63	57	51	45	71

https://www.studocu.com/en-au/document/university-of-melbourne/project-finance/rangebank-bess-environmental-noise-assessment-s7794c1-may-2023/136793704

Here's another BESS sound study- omitting frequencies below 63hz:

Land designated Open Space by the City of New London is adjacent to the proposed BESS. This receptor type not covered under the City's noise regulations. As a result, the State of CT noise requirements will be reference for the corresponding Receptor Measurement Location.

3.0 NOISE MODELING

Veneklasen developed a noise model to represent the proposed QCells BESS running condition. The model wa conducted using the noise modeling software package Predictor version V2021 by Envirosuite. Predictor is a advanced noise propagation modeling software that considers geometric spreading, atmospheric soun propagation, ground impedance effects, site topography, and geometric, vegetation, and environmenta conditions. The calculations performed in Predictor were conducted in accordance with the ISO 9613 standard which is generally followed for environmental noise assessments.

ISO 9613 uses a slight downwind condition from each noise source to each receiver. The model temperature was set to 68 °F (20 °C) and a relative humidity of 50%. As such, the ISO 9613 model produces results representative of metrological conditions favoring sound propagation, and the environmental condition modeled represents the "close to worst case" sound propagation condition.

3.1 Noise Modeling Method

The project site layout was obtained from drawings sent by the client and from Google Earth. The overall sound power levels were determined through the manufacturer's data provided by the client. The noise spectrum is estimated from the Test Report dated November 29, 2021, provided by the client.

The transformer sound data is not available in the provided manufacture cut sheets, and Veneklasen calculated the sound power level in the theoretical method. All calculations were undertaken in octave bands. The computer model was used to determine the future noise levels at the Modeling Receptor locations shown in Table 5 with the future equipment running. The results were compared with the Noise criteria as governed by Regs. Conn. Agencies §§ 22a-69-1 through 22a-69-7.4 as well as City of New London noise standards.

Per the Test Report, the total sound power levels of the QCells Battery Storage Units are shown in Table theoretically calculated Transformer sound power levels are shown in Table 4

Table 3– Battery Server Sound Pressure Level (dBA) @ 1m

Frequency Hz	63	125	250	500	1000	2000	4000	8000
Sound Pressure Level (dBA)	48	58	75	74	72	68	63	62

Table 4– Transformer Sound Pressure Level (dBA) @ 1 m

Frequency Hz	63	125	250	500	1000	2000	4000	8000
Sound Pressure Level (dBA)	47	61	62	64	67	60	55	49

4.0 NOISE MODELING RESULTS

Given the battery and transformer sound pressure levels presented in Table 3 and Table 4, Veneklasen predicted the future emitting noise levels. Moreover, Veneklasen employed traffic counts supplied by the Department of Transportation of Connecticut to assess the ambient noise levels resulting from traffic contribution.

Figure 3 indicates the different receiving locations at the nearest property lines and Table 5 shows the predict noise levels at each location. *Figure 4* presents 1/3 Octave Band Spectrum at the receptor locations. The spec shows that the proposed BESS facility will not produce "prominent discrete tones" (as defined by the state no

https://portal.ct.gov/-/media/csc/3_petitions-medialibrary/petitions_medialibrary/mediapetitionnos1601-1700/pe1607/petitionersubmissions/petition/exhibit-e-qcells-bess-facility---acoustical-analysis-report.pdf?rev=159515a1b5b846c4a4861c50160ec4c4&hash=9B2B2C4AA18072900DF8D76BAA47FD20

Here's another BESS sound study omitting frequences below 63hz:

5. Calculation and Assessment of Noise from the Operation of the Solar Farm

5.1. Proposed Plant and Equipment

The solar panels would be connected to a series of string inverters, positioned at the ends of the solar arrays and located beneath the solar panels. The string inverters would link into centralised transformer stations, which would connect to the main substation located within the north-western area of the site.

There would be a small BESS located centrally within the site. This would contain a number of battery modules and a PCS inverter.

Whilst the solar inverters would only operate during hours of daylight, the plant and equipment associated with the operation of the battery stations and main substation could operate at any time within a 24-hour period, typically in the early morning and evenings.

The locations of the inverter cabins, battery stations and substation are indicated on Figure 2.

As indicated on the figure, the plant would be located well away from surrounding properties and has been positioned within the site to maximise separation to neighbouring properties, whilst allowing the connection to the national grid to be made.

Source term noise levels for the proposed plant have been obtained from manufacturers' specifications and are provided in Table 5.1 below.

Plant	Sound Power Level SWL [dB(A)]	Octave Band Sound Power Level SWL [dB]							
		63	125	250	500	1k	2k	4k	8k
String Inverter	83	76	76	81	80	79	74	69	62
Battery Module (BESS)	75	82	86	79	71	63	59	50	48
PCS Inverter (BESS)	78	59	77	78	78	72	65	63	66
Transformer Stations	65	60	61	62	66	60	49	44	44
Substation Transformer	84	82	79	96	91	81	70	56	53

Table 5.1 Source Term Noise Levels

5.2. Calculation of Plant Noise Levels

As indicated above, the main noise generating element of the proposed development would be attributable to the operation of the inverters, battery stations and transformers within the transformer stations and substation.

Calculations have been made using SoundPlan, which implements the calculation methodology from ISO 9613-2. The calculations have taken account of the land formation around the site

https://docs.planning.org.uk/20240322/230/S8E8BLNSIF600/qy6uzgwsia1j6ii0.pdf

Another strategy BESS developers will have their hired engineering firms provide results only showing one piece of data- hiding all the rest of the sound data:

Here's a noise study showing only the sound level at fan speed at 50% and only providing the average noise level- please note, this does note, that "Reasonable worst-case fan load is 99db" which makes zero no sense- and maybe they meant max fan load is 99% and they say the difference between 50% fan speed and worst case of 99% fan speed only has a MAXIMUM increase of 5db???? The average seems to be about 3db increase/decrease for every 10% of fan speed difference:

Noise Source	Sound Power Level dBA re 10^{-12} Watts	Number of Units	Directivity	Operation time
Containerised Battery Storage (BESS)	Fan load (50%): 94 dB L_{WA} Reasonable worst-case fan load: 99 dB L_{WA}[17]	28	None	Daytime and night-time (normally for a few hours at night)
Auxiliary Transformers (50MVA)	90 dB L_{WA}	2	None	All times

6.2 Noise Level Calculations

Noise levels have been calculated at the notional boundaries of the nearest receivers.

We have calculated 'daytime' and 'night-time' noise levels on the assumption that the decentralised inverters will operate at lower power during the prescribed night period (before 7am). We have also calculated 'daytime' and 'night-time' scenarios for the BESS operating at 'typical' load and at a 'reasonable worst-case' load.

Table 5 summarises the results of our calculations.

Table 5: Calculated Noise levels

Receiver Location	Noise Limits [daytime / night] (dB L_{Aeq})	Calculated Rating Noise Level (dB L_{Aeq})			
		Typical BESS fan load		Worst-case BESS fan load	
		Day	Night	Day	Night
Compliance receivers:					
92 – 112 Taylor Rd [1]	55 / 45	28 - 30	27 - 29	31 - 33	30 - 33
128, 130, 138 Taylor Rd [1]	55 / 45	31 - 32	30 - 31	34 - 35	34
179 Taylor Rd	55 / 45	35	35	39	39
98 Herrick St	55 / 45	31	31	35	35
593 Ongaonga Waipukurau Rd	55 / 45	33	33	38	38
865 Ongaonga Waipukurau Rd	55 / 45	34	34	39	39
1063 Burnside Rd	55 / 45	33	32	37	37
Other receivers:					
126 Taylor Rd [2]	55 / 45	32	31	35	34
162 Taylor Rd [3]	55 / 45	35	34	38	37

Note 1: Noise levels have been calculated at the legal boundary of the most affected (unbuilt) sites.

https://www.chbdc.govt.nz/assets/Document-Library/Resource-Consents/RM-240016/Acoustic-Assessment.pdf

Here's a Tesla Megapack 2XL where they hide the sound level details but provide sound levels at nightime levels operating at 50% and daytime levels operating at 60% (and is still at 96db at night 50% and 99db at daytime 60%:

Noise Source Summary Table

Source ID	Source Description	Sound Power Level (dBA)	Source Location[1]	Sound Characteristic[2]	Noise Co Measur
DT_Megapack	Battery Storage Container - 4-hour, 60% fan speed Megapack 2XL (Tesla)	99*	O	T	U
NT_Megapack	Battery Storage Container - 4-hour, 50% fan speed Megapack 2XL (Tesla)	96*	O	T	U
MVTX	Medium-Voltage Transformer - 6MVA	89*	O	T	U

*Includes attenuation due to silencing and/or penalty adjustment.

1. O: located/installed outside the building, including on the roof, I: located/installed inside the building

2. S: Steady; Q: Quasi Steady Impulsive; I: Impulsive; B: Buzzing; T: Tonal; C: Cyclic

3. S: Silencer, Acoustic Louvre, Muffler; A: Acoustics lining, Plenum; B: Barrier, Berm, Screening; E: Acoustic Enclosure; O: Other; U: Uncontrolled R: Removed from Service

https://www.mississippimills.ca/media/3mlgsfpa/appendix-l-almonte-bess-2-acoustic-assessment.pdf

Here's a study showing only the broadband DB sound level (hiding the rest of the sound levels):

7.0 BESS OPERATIONAL NOISE

To estimate sound levels generated by the Project, Burns & McDonnell calculated the combined sound levels of the operational equipment included as part of the Project. The Project cumulative sound levels were calculated based on sound level data provided by LS Power Development.

For the sound level calculations, conservative assumptions were made. Reflections and shielding were not considered for sound encountering physical structures. Sound levels near the Project could be influenced by sound shielding from physical structures onsite (i.e. the battery building). The area surrounding the Project has mild elevation changes, which can scatter and absorb the sound waves. Terrain and surface effects, such as ground absorption, were not included in the calculation. These assumptions would likely overpredict offsite sound levels. However, they were included as a conservative measure.

7.1 Project Sound Sources

The BESS will receive and store excess energy generated by the CSE and to return this electricity to the grid at a later time when needed. Though the batteries themselves do not generate a significant amount of noise, the inverters, transformers, and heating ventilation and air conditioning (HVAC) equipment associated with the BESS will. The major sound emitting components included within the Project are expected to be the 2.5-megawatt (MW) inverters, 2.5-megavolt-ampere (MVA) transformers, rooftop HVAC units, substation HVAC units, and the substation step-up transformer. The major BESS and substation equipment sources of noise are listed below in Table 7-1, with their estimated sound levels.

Table 7-1: Major Equipment Sound Levels

Source	Number of Sources	Sound Pressure Level (dBA)	Notes
BESS Equipment			
2.5 MW Inverter	56	80	SPL at 3 feet
2.5 MVA Transformer	56	62	SPL at 5 feet
Rooftop HVAC Unit	40	85	SPL at 3 feet
Substation Equipment			
Step-up Transformer	1	87	SPL at 5 feet
Substation HVAC Unit	2	67	SPL at 10 feet

*dBA – A-weighted decibels, MW – megawatt, MVA – megavolt ampere, SPL – sound pressure level, HVAC – heating ventilation and air conditioning

https://www.icpds.com/assets/planning/draft-environmental-impact-reports/supplemental-le-conte-battery-energy-storage-system-deir/le-conte-battery-energy-storage-system-app-f.pdf

Here's another showing only the broadband DB sound level (hiding the rest of the sound levels):

2.2.1 Operational Equipment Noise Levels On-site

Energy stored by the project would be transmitted via underground cable/vaults that would enable connection of the project to the Avocado substation; an easement is being acquired along the northern boundary of parcel 105-410-44. Connection would be made from the project to the substation and no new substation is needed or proposed.

The proposed 2.76-kilowatt (kW) Inverters, Power Electronics Model FS1331CH, have unshielded noise rating of 79 dBA at 1 meter (3 feet) *(Source: Power Electronics Pure Energy Solar Solutions Inverters|Stations)*. The HVAC would be Marvair ComPac Model AVP60ACA and would have an unshielded noise level rating of 79 dBA at 5 Feet (1.5 meters) *(Source: Marvair ComPac I & ComPac II 2-6 Vertical All Mount Air Conditions, Models AVP24-30-36-42-48-60-72)*. The National Electrical Manufacturers Association (NEMA) test results for the transformers and the proposed inverters manufacturer's specifications are provided as ***Attachment A*** of this report.

Noise levels from the proposed BESS facility were modeled with SoundPlan Essential, version 4.0 (SoundPlan), a three-dimensional acoustical modeling software package. Propagation of modeled stationary noise sources was based on ISO Standard 9613-2, "Attenuation of Sound during Propagation Outdoors, Part 2: General Method of Calculation." The assessment methodology assumes that all receptors would be downwind of stationary sources. This is a worst-case assumption for total noise impacts, since, in reality, only some receptors will be downwind at any one time.

The primary on-site sources would be the inverters and HVAC systems. The modeled source noise levels are presented in Table 2-2. All sound power reference levels were taken from manufactured specification sheets.

Table 2-2: Source Noise Level in Decibels (dBA)

Name	Sound Power Level (dBA)
Inverters	86.2
HVAC	86.4

To be conservative, all HVAC were modeled as active at 100 percent power for a full hour during all hours. Similarly, the inverters were assumed to operate at full power during the entire hour regardless of the time period. This is considered a reasonably conservative assumption as it would be unlikely that the HVAC or inverters would be active for a full hour at the same time regardless of temperature.

https://www.sandiegocounty.gov/content/dam/sdc/pds/ceqa/FallbrookBatteryEnergyStorage/Noise%20Assessment.pdf

Here's another showing only the broadband DB sound level (hiding the rest of the sound levels):

4.0 Project Equipment

4.1 Drawings

Equipment specifications and the arrangement of equipment in the acoustical model are based on information and drawings provided by the Project design team. The acoustical model was built primarily using layout drawing 419596-KND01-CV-C-SI.PL-01 (Rev. C) as shown in Figure 2. This report includes the most current drawings and equipment information at the time of issue.

4.2 Equipment Sound Levels

Equipment sound levels provided by vendors were compiled by project staff from Black & Veatch. Some equipment either does not have supplier sound level data, or it was unclear whether the sound level data was at a specified distance or an overall sound power level. In these instances, an estimation or calculation was made. Transformer noise was estimated using International Electrotechnical Commission (IEC) Standard 60076-10 (2016): Power Transformers – Determination of sound levels.

Table 1 – Equipment Sound Levels

Equipment Name	QTY	Expected Sound Power Level	Source
Substation Step-up Transformer (Hyosung 3ø, 115 MVA max)	1	95 dBA L_w (Note 1)	Estimated (Note 2)
PCS Skid Transformer	30	66 dBA L_w (Note 1)	Estimated (Note 2)
BESS - Titan 2.0 (2H, HX)	60	87 dBA L_w (Note 1) (Daytime, 45°C) 81 dBA L_w (Note 1) (Nighttime, 35°C)	Sungrow Test Data (Note 3)

Notes:
1) L_w – Sound power level (reference 1 pW).
2) IEC 60076-10
3) Vendor data reported a +2.9 dB uncertainty, which was applied to the model.

Sungrow supplied detailed acoustic test data for the Titan 2.0 units specified for the Project. The sound pressure and power levels were given for varying load and ambient temperature. The low-noise treatment option, as selected by the Project, provides an overall sound power level reduction of 20 dBA, and a 35 dB reduction at the peak frequency band of 500 Hz, as compared to the non-mitigated BESS option. The two highest tested ambient temperatures were for 45°C (113°F) and 35°C (95°F). Under higher ambient temperatures, the BESS cooling system operates at a higher load and produces more noise, as shown in Table 1.

Regional historical meteorological data showed that the 45°C ambient temperature represents a reasonable worst-case scenario at extreme summertime temperatures for the BESS noise levels at daytime, and the 35°C operation is representative of a worst-case expected ambient nighttime. It should be noted that nighttime temperatures of 35°C are extremely rare in this region.

https://www.knightdalenc.gov/sites/default/files/uploads/projects/documents/419596.41.0604-de-kdl-noise-study-report-240927_signed.pdf

Here's another showing only the broadband DB sound level (hiding the rest of the sound levels at each frequency):

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4. Assessment

An assessment is undertaken based on the following major noise sources:

- 576 Battery Energy Storage System (BESS) containers
- 192 Inverters
- Substation and transformers

The following assumptions are made as part of the commercial noise assessment:

- All sources operating simultaneously at full capacity for the full period of assessment.
- Ground conditions between the Subject Site and receivers is grass (absorption factor is 1)

Noise level data is based on manufacturer data for selected equipment where available and supplemented by typical equipment noise levels if required. A summary of noise levels used for acoustic modelling is provided in Table 2 below and detail is provided in Appendix A.

Table 2: Modelled sound power levels

Equipment	Sound Power Level	
	Unmitigated	Mitigated
Inverter	92 dB(A)	78 dB(A)
Transformer	108 dB(A)	96 dB(A)
BESS	94 dB(A)	76 dB(A)

The predicted unmitigated noise level at the worst affected receivers R1 and R2 is provided in Table 4 below for all equipment running at full capacity during the night-time period.

The predicted unmitigated noise level at receiver locations is tonal in character and an adjustment in accordance with the EPA noise protocol is applied. Approach and calculation of tonal correction is provided in Appendix B.

Table 3: Predicted unmitigated noise level and assessment

Location	Noise Level		Criteria	Compliance
	Predicted	Adjusted		
R1, North west	51 dB(A)	56 dB(A)	31 dB(A)	No
R2, North east	42 dB(A)	47 dB(A)	31 dB(A)	No

The predicted unmitigated noise level, including adjustment for tonality exceeds the noise criteria and noise attenuation is required.

file:///C:/Users/James/Downloads/Kiewa%20Valley%20BESS%20-%20Noise%20Impact%20Assessment.pdf

This sound study shows only the sound levels per unit (hiding the rest of the sound levels data):

6. Operational Noise Assessment

6.1. Noise Modelling

6.1.1. Source Data

The A-weighted sound source levels associated with the Proposed Development can be seen below in Table 5. At this stage, these are considered robust candidate source noise levels to be achieved by scheme design.

Table 5: Sound Source Data

Plant	Quantity	Sound Power Level per unit, L_{wA} (dB)*
Inverter Unit with Standard Acoustic Attenuation Pack	12	88 (Day – 80% Ventilation Duty) 84 (Night – 60% Ventilation Duty)
Battery Cooling System	96	76
Auxiliary Transformer	9	71
BESS Intake Substation	1	78

** Some suppliers provide their data in terms of Sound Pressure Level (SPL) at a given distance rather than Sound Power Level (SWL/L_w). However, SPL depends on the environment the measurements are taken in, dimensions and shape of the plant and distance to the measurement position, etc. SWL represent a more objective metric for noise assessments, as it represents the total sound energy radiated by a sound source and can therefore being used into the noise modelling to predict the SPL at any distance, under various environmental conditions. Thus, our noise specifications are provided as derived SWL for a transparent comparison between suppliers.*

Some plant manufacturers advise that since the weather in the UK is temperate, it is unlikely that the fans would reach a 100% duty cycle, and that at night-time fan duty cycle can be even lower due to less cooling demand. This assessment assumes 80% fan speed during the day and 60% for the night time periods, based on robust information from various manufacturers. Confirmation from the selected plant manufacturers that the above noise levels can be achieved should always be sought prior to plant procurement.

These input parameters are intended as acoustic specifications, to determine the likely sources of noise impact and whether attenuation is likely to be required, such that acoustic feasibility is demonstrated for the purposes of planning consideration.

6.1.2. Calculation Process

Calculations were carried out using Cadna/A, which undertakes its calculations in accordance with guidance given in ISO9613[5], which considers a worst-case downwind propagation to all receptors.

https://assets.lightsourcebp.com/app/uploads/2024/05/01140125/Noise-Survey-and-Acoustic-Report.pdf

Here's another sound study by the same company- where they don't give any details, but for a smaller BESS and they reduced the soud levels by theroetically adding noise reducing features like a 4 meter tall sound barrier wall (and inverters noise reduction kit for the air inlets and outlets, and ow noise HVAC systems should be used for the battery containers):

5. Operational Noise Assessment

5.1. Noise Modelling

5.1.1. Source Data

The A-weighted sound pressure levels associated with the Proposed Development can be seen below in Table 6. At this stage, these are considered robust candidate source noise levels to be achieved by scheme design.

Table 6: Sound Source Data

Plant	Quantity	Sound Power Level per unit, L_{wA} (dB)
MV Skids (inverter + Transformer) (Mitigated)	19	81
Battery Container Cooling System	19	82
HV Substation Transformer (including cooling)	1	80

** Some suppliers provide their data in terms of Sound Pressure Level (SPL) at a given distance rather than Sound Power Level (SWL/L_w). However, SPL depends on i) the environment the measurements are taken in, ii) the dimensions and shape of the plant and iii) the distance from the source to the measurement position, etc. SWL is a more objective metric for noise assessments, as it represents the total sound energy radiated by a sound source and can therefore being used in the noise modelling to predict the SPL at any distance, under various environmental conditions. Thus, our noise specifications are provided as derived SWL to enable a transparent and robust comparison between different suppliers.*

These input parameters are intended to determine the likely sources of noise impact and whether attenuation is likely to be required, such that acoustic feasibility is demonstrated for the purposes of planning consideration.

5.1.2. Calculation Process

Calculations were carried out using Cadna/A, which undertakes its calculations in accordance with guidance given in ISO9613-1:1993 and ISO9613-2:1996.

https://docs.planning.org.uk/20230821/15/RZHNBROKHZQ00/tqlaisxsynrwah7j.pdf

Here's a Tesla Megapack sound study showing higher fan speed for the day and reduced fan speed at night- dropping the sound level by 15db:

5. Operational Noise Assessment

5.1. Noise Modelling

5.1.1. Source Data

The A-weighted sound power levels associated with the Proposed Development can be seen below in Table 6. At this stage, these are considered robust candidate source noise levels to be achieved by scheme design.

Table 6: Sound Source Data

Plant	Quantity	Sound Power Level per unit, L_{WA} (dB)
Tesla Megapack Battery/Inverter Unit	32	91 (Day – Full Duty) 76 (Night – Reduced Duty)
33KV Substation/Transformer	16	71

5.1.2. Calculation Process

Calculations were carried out using Cadna/A, which undertakes its calculations in accordance with guidance given in ISO9613-1:1993 and ISO9613-2:1996.

5.1.3. Model Assumptions

Given that the land between proposed development and nearest receptors is largely soft, the ground factor has been set to 1, within the calculation software, with 2 orders of reflection. Full octave frequency spectrum has been used in the calculations. It has been assumed that all processes will occur simultaneously, representing a worst-case scenario.

In order to accurately model the land surrounding the development, an AutoCAD DXF drawing was produced, which was based on data provided by the Ordnance Survey, along with associated topographic contours sourced from Defra.

5.1.4. Specific Sound Level Map

The sound map showing the specific sound level emissions from the Proposed Development can be seen in Figure 4 and Figure 5 for daytime and night-time periods respectively.

https://planning.walsall.gov.uk/swift/MediaTemp/73797-324158.pdf

ANother sound study hiding the frequency data:

assessment locations are upwind of the Proposed Development, the sound levels would be expected to be less and the downwind predictions presented as part of this report would be regarded as conservative, i.e. greater than those likely to be experienced in practice.

The predominant sources of sound to be introduced as part of the Proposed Development are the cooling systems associated with the 64 BESS containers, 32 attached power conversion system (PCS) units, 16 associated transformers and two substation transformers.

The relevant assumed sound power data for the equipment to be installed at the BESS facility are provided at **Table 11.3.3**. The overall levels correspond to the maximum expected sound output for each of the respective plant, as advised by a candidate manufacturer. The propagation modelling therefore represents a conservative scenario and the actual sound levels would be expected to be less when the site is not operating at maximum capacity.

The combination of assumptions detailed above are considered to provide a conservative prediction/modelling basis overall. The various equipment has been located at the proposed BESS facility location and the results of the predictions at the various residences surrounding the site(s) are shown in **Section 5**.

Table 11.3.3: Overall Sound Power Levels, dB L_{WA}

Equipment & ID	Sound Power Level, dB L_{WA}
Battery Energy Storage System (BESS)	68
Power Conversion System (PCS)	80
PCS Transformer (TRA)	76
Substation Transformer (SUB)	93

The sound emitted by the various equipment to be introduced as part of the battery storage facilities can have distinctive tonal character (i.e. a whine, whistle or hum). Under the subjective method described in BS 4142, a correction of 2 dB has been applied in the assessment to account for this feature. However, the assessed specific and rating noise levels detailed in **Section 5** below are particularly low and potential tonal noise in the sound emitted from the various plant may well be masked by existing sources of sound in the area.

https://www.clune-windfarm.co.uk/media/153cmhi1/technical-appendix-113-bess-acoustic-assessment.pdf

This Noise study isn't represented in a chart as they only gave the average sound levels:

4.0 NOISE IMPACT ASSESSMENT AND RECOMMENDATIONS

Criteria and Methodology

4.1 The potential noise impact of the plant associated with the proposed BESS scheme has been assessed accordance with BS4142[1] and in context. This standard is outlined in Section 2 above.

Closest noise sensitive properties

4.2 The potential noise levels have been assessed at receptor R which is shown on Figure 2.

Source noise levels

4.3 Information provided by the client indicates that there will be 16 groups of 2x12.5MW battery module with each module containing 10 cabinets. Each group of battery modules will be served by a P container. There will be 16 of these PCS containers in total, with each one housing a PCS cabinet and transformer. There will also be a new sub-station and switchgear cabin towards the north of the site shown on Figure 3.

4.4 Manufacturers data for a group of battery modules (10 cabinets) shows a range of noise levels measur at different positions, with the log average of those values being 58.9 dB(A) at 10m on rated power. sound power level of 86.9dB(A) has been derived by applying a distance correction of 20dB(A) and 8dB(A) sound power level conversion. This has been modelled as two sources each with a sound pow level of 83.9 dB(A) one representing each group of 5 cabinets. The sources have been modelled one each long face of the group of 10 modules.

4.5 The sound power level provided by the client for a PCS container (which houses both a PCS cabinet a a transformer) is 86 dB(A) SWL. This has been modelled as two sources each with a sound power lev of 83 dB(A) one on each long face of the container.

4.6 A sound power level of 81.5 dB(A) SWL has been provided for the sub-station.

https://webportal.ribblevalley.gov.uk/planx_downloads/24_0366_Statement_Appendix_E_Noise_Impact_Assessment_Redacted.pdf

This sound study only says 88db at 60% and 82db at 40% and withholds all frequency data:

4. NOISE IMPACT ASSESSMENT

For the purposes of this assessment, E3P has used noise modelling software, CadnaA 2022 MR1, to determine the impact of noise from the proposed plant items.

The following noise level data has been provided by the client:

- Battery unit, 60% duty cycle (daytime) = 88 dB L_{WA}.
- Battery unit, 5 fans 40% duty cycle,4 fans 20% duty cycle (night-time) = 82 dB L_{WA}.
- Battery transformer = 60 dB L_{WA}.
- Grid transformer = 75 dB L_{WA}.

The above have input into the noise model as point sources. The operational periods for the plant are considered to be 24/7.

The following inputs have been included in the model:

- Proposed Site plan (Operational) HS-PSP-Rev M.
- Ground elevations have been taken as existing by way of a 2 m grid Digital Terrain Model (DTM) which contains public sector information licensed under the Open Government License v3.0.
- Existing buildings have been included in the model and assumed to have a structured façade.
- With regards commercial/industrial sound, corrections have been applied to the inputted sound power levels to account for acoustic characteristics, as per BS 4142:2014+A1:2019. As such, the model output is the Rating Level, L_{Ar}.
- A reflection order of 2 has been used in all calculations.
- Noise levels generated using ISO 9613-1 and ISO 9613-2 "*Acoustics – Attenuation of sound during propagation outdoors*" as incorporated into CadnaA software.

For the BS 4142:2014 assessments, penalties are applied to the specific sound level to provide the rating level. These penalties relate to the acoustic features of the sound source. Given the distance to the nearest receptors, no features are likely to be audible, however, to inform a worst-case assessment, just perceptible tonality is applied with a correction of +2 dB.

4.1. DAYTIME ASSESSMENT – 07:00-23:00

Figure 2 should be used to view the daytime specific noise level, $L_{Aeq,1hr}$, at the existing receptors. To inform the assessment, the lowest typical background sound level, 33 dB $L_{A90,1hr}$ has been used for the assessment.

This assessment considers the operation of all plant during typical daytime periods, Monday to Sunday.

As can be seen, the highest predicted specific noise level is 27 dB at the receptors to the north west of the Site. This results in a maximum predicted rating level of 29 dB at existing receptors. This falls below the background sound level by 4 dB. As such, no adverse impact is predicted during daytime periods.

https://planningexplorer.barnsley.gov.uk/Home/FileDownload/01GEE4NB2HQ66LTJMKTFBJPOF2GUCLW6D4?ApplicationNumber=2023%2F0322

This sound level study only gives the average sound level of a single "battery unit" and there will be 525 battery units:

TABLE 4-2 MODELLED NOISE SOURCES

Plant Item	Sound Power Level per Plant Item, L_{eq} dB(A)	Quantity	Notes
Battery Unit	79.7	525	• Make and Model: CSI Solbank • Based on supplier noise assess • Maximum cooling power opera • Equipment noise data sheet pr
Inverter	85.8	105	• Make and Model: SMA SCS 39 • Sound Power Level provided b • Fitted with silencer • Equipment noise data sheet pr
Power Conversion Unit (PCU)	63.9	105	• Medium Voltage (MV) Transfor • Client advice and noise measu • Equipment noise data sheet pr
Substation High Voltage (HV) Transformer	97.6	2	• 180 MVA Transformer • Sound Power Level based on I 600076.10:2009) – Standard

https://potentiaenergy.com.au/wp-content/uploads/2025/03/Capricorn-BESS-Noise-Impact-Assessment_Final.pdf

Another study hiding the noise levels at the specified frequencies and only provided the Sound level:

5 Noise Assessment

Operational Noise Assessment

5.1 Predictions of the proposed operational noise of the proposed BESS have been carried out to consider these against the results of the baseline survey.

5.2 Details of the proposed noise generating equipment to be installed on Site have been provided by the applicant. Sound power levels for the candidate plant is provided in **Table 5.1**. The battery source level is based on 100% of maximum power for temperatures of less than 35^{0}C.

Type of Machinery	Quantity on Site	Source Height, m	Sound Power Level, dB
PowerTitan2.0	112	2	81
MVS SCC	64	2	84
Transformer	1	2	74

Table 5.1 Operational Plant

5.3 The noise predictions have been undertaken using the proprietary software IMMI; a 3-D noise mapping package which implements a wide range of national and international standards, guidelines and calculation algorithms, including those set out in ISO9613-2.

5.4 The noise map model has assumed:

- downwind propagation, i.e. a wind direction that assists the propagation of sound from source to receptor;
- a maximum reflection factor of three where buildings and barriers are assumed to have a 'smooth' reflective façade, as a worst case; and
- that noise sources do not have strong radiation patterns and therefore radiate equally in all directions.

5.5 The predicted noise levels at the nearby noise-sensitive receptors are presented in **Table 5.2**.

Sensitive Receptor	Predicted Noise Level, dB
Abergelli Farm	40
Maes-Eglwys	29

Table 5.2 Predicted Operational Noise Levels

5.6 Analysis of the impact in accordance with BS4142 has been undertaken as presented in **Table 5.3**.

https://www.edf-powersolutions.uk/wp-content/uploads/2025/05/Noise-Assessment-1.pdf

Here's another study showing only one data point from the manufacturer:

Facility Sound Analysis

Facility-related sound impacts that are associated with equipment at the proposed BESS facility have been calculated using CadnaA environmental sound modeling software (Version 2023 MR2 DataKustic GmbH). The CadnaA sound modeling software uses algorithms and procedures described in International Standard ISO 9613-2:1996 "Acoustics- Attenuation of sound during propagation outdoors – Part 2: General method of calculation". This standard and its associated methodology are the most universally accepted approach for environmental sound modeling of industrial and transit sound sources. The methodology described in this standard provides estimates of A-weighted sound levels for meteorological conditions that are favorable for the propagation of sound (downwind with a wind speed of 1-5 meters/sec). This methodology is also valid for sound propagation under well-developed moderate ground-based temperature profile inversions, which commonly occur on clear calm nights.

Our analysis considers the following sound sources:

1. ***Fourteen Energy Storage Containers***

   BYD Cube Energy Storage Systems with a maximum sound level of 72 dBA at a distance of 1 meter (based on manufacturer's test report dated 8/28/2020).

2. ***Fourteen Inverters***

   EPC CAB1000 1500 kVA inverters with a maximum sound level of 75 dBA at a distance of 1 meter (based on manufacturer's test report dated 11/24/2022).

3. ***Five Transformers***

   4000 kVA transformers with a maximum NEMA sound rating of 60 dBA.

Figure 1 presents the results of the acoustic modeling for proposed BESS facility. Table 2 below provides a summary of our estimates of facility A-weighted sound levels at relevant property boundaries. Figures 2 and 3 present 1/3 octave band spectra of the property line estimates. Our review of the spectra concludes that the proposed project will not produce "prominent discrete tones" (as defined by the state noise regulation) at any of the surrounding receptors.

TABLE 2
Estimate of Facility Sound Levels at Property Boundaries (dBA)

Receptor	BESS Sound	Produces Tone	Limit
C1	58	No	66
C2	54	No	66
C3	49	No	66
C4	51	No	66
R1	37	No	51

https://portal.ct.gov/-/media/csc/3_petitions-medialibrary/petitions_medialibrary/mediapetitionnos1601-1700/pe1604/petitionersubmissions/appendix-g---sound-assessment.pdf?rev=b64e84c1a723454980ce779a944e30b2&hash=CC05362D3CCCA1AF8C23D77F8CE46228

Here's a liquid cooled BESS with the cooling system operating at 40% and 30%:

5. Operational Noise Assessment

5.1. Noise Modelling

5.1.1. Source Data

The following noise reports from the proposed plant manufacturer, Envision, have been used for this assessment:

- Noise Test Report for the Air-Cooled Chiller of Envision's Liquid-Cooled DC Container Model: EMW600HCNC1B (file 'EE - DC Container Noise Test Report v1.0.0 (2)'), dated 28 June 2024.
- Directional sound power level data for the five exposed faces of Envision AC 6900 twinskid units operating at 32% fan speed, provided by envision on 12th November 2024 (file '2024-11-12 AC 32% fan speed.xlsx').

The table below summarises the sound source data used in the noise model, based on the above reports and proposed Envision layout.

Table 4: Sound Source Data

Plant	Qty.	Sound Power Level per unit, L_{wA} (dB) Daytime	Sound Power Level per unit, L_{wA} (dB) Night-time
DC container (40% cooling load daytime and 30% cooling load night-time)	36	82	78
Aux Tx	2	71	71
AC 6900twin-skid Low Noise at 32% fan speed (Total Sound Power Level L_{wA} 78 dB - daytime and night-time)			
AC 6900twin-skid FRONT 32% fan speed	9	72	
AC 6900twin-skid BACK 32% fan speed	9	72	
AC 6900twin-skid LEFT 32% fan speed	9	68	
AC 6900twin-skid RIGHT 32% fan speed	9	60	
AC 6900twin-skid ROOF 32% fan speed	9	74	

The fan speeds/cooling loads presented in Table 4 have been confirmed by Envision as sufficient to provide the necessary cooling to the systems without power de-rating, based on the ambient temperature profile of the area.

The DC Cooling systems have been modelled as a point source at 2m high on one end of each DC container, to represent a centralised cooling unit as mentioned in the Envision report for their containerised units. The AC units have been modelled as one vertical area source on each side and one area source on the roof, with the individual sound power levels presented above.

https://docs.planning.org.uk/20241214/78/SOE1VMJIHNO00/asxqjjdjnzk54tyh.pdf

Here's a study hiding all the noise levels and getting sound level data from BESS developer, but showing a liquid cooled BESS:

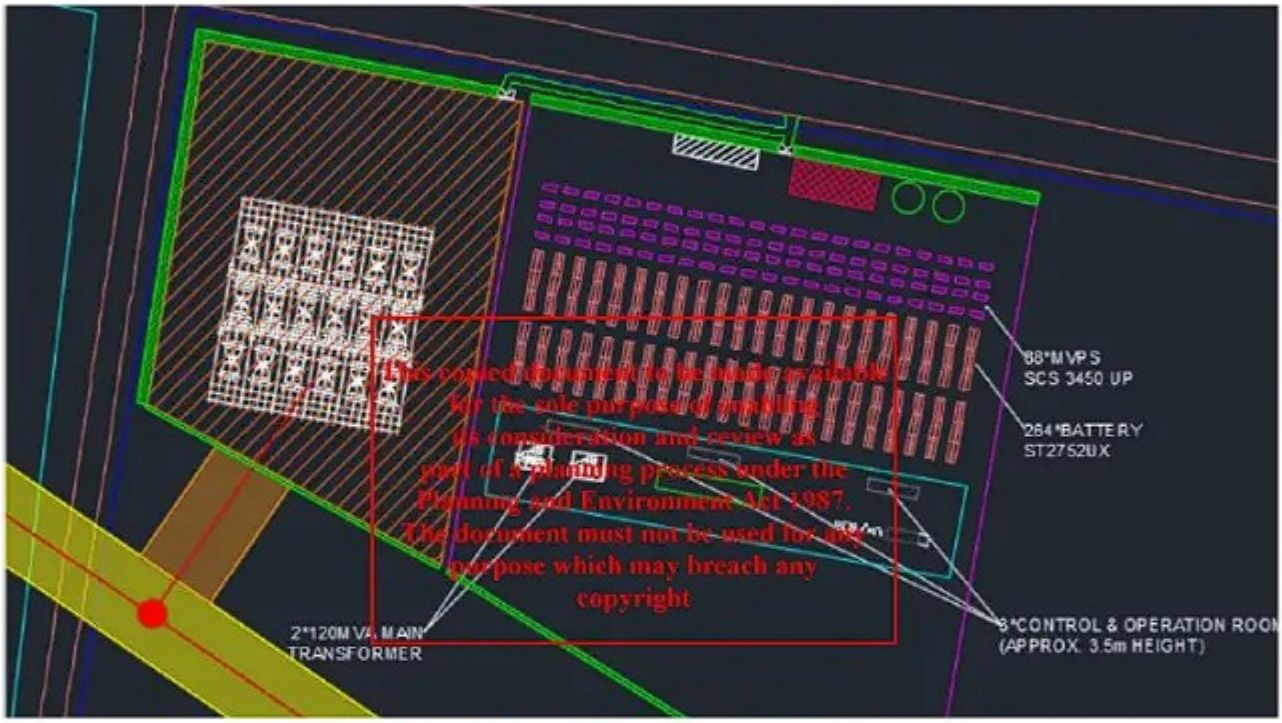
ADVERTISED PLAN

7.2. Site Configuration and Relevant Noise Sources

When considering noise emissions associated with the proposed use, the client has advised that the relevant noise sources will include the following:

- 88no. MVPS units.
- 264no. Battery storage containers.
- 2no. 120MVA transformers.

Figure 4 below provides a site plan for the proposal including the relevant equipment locations.



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Figure 4: Site plan including relevant noise sources

For the purposes of this assessment, WMG has considered source noise data provided by the inverter and battery unit manufacturers combined with input from the client.

A summary of the sound power levels adopted for each item of equipment is included within Table 6.

Table 7: Adopted source sound power levels

Noise Source	Source Description	Adopted Sound Power Level
MVPS inverter unit – fitted with noise reduction kit.	SMA 4000-S2 (1no. SCS 3450 UP unit)	90 dB(A) – per unit
MVPS Transformer	5MVA unit	65 dB(A)
Battery cabinet liquid cooling unit	Sungrow ST2752UX	79 dB(A) – per unit*
Main transformer	120MVA – per unit	86 dB(A) – per unit

https://www.scribd.com/document/736589960/3b3c8082-87fb-ed11-8f6e-002248933fc5-PA2302257-Glenbrae-BESS-Acoustic-Report-Copie-2

This noise study claims that the BESS will be quiter than normal sound levels at 2 residences and a beach nearby (but doesn't provide any details beyond that):

Table F-1 – Acoustic Model Results vs. Typical Local Noise Limits and NYSDEC Guidelines					
Receptor	**Receiving Property**	**Typical Nighttime Sound Level Limit / Assumed Ambient (dBA)**	**Calculated Project Only Sound Level (dBA)**	**Difference: Typical Nighttime Limit - Calculated Sound Level (dBA)**	**Expected Increase over Ambient (dB)**
R-1	Residential Property	50	33	-17	0
R-2	Historic Residence	50	40	-10	0
R-3	Public Beach	50	34	-16	0

Figure 3 of **Appendix F** shows the 50 to 65 dBA sound contours for operation. As shown in **Table F-1** above, the Proposed Action is not anticipated to exceed 50 dBA at any of the documented receptors. The greatest noise impacts will be observed at night. As no significant nighttime impacts to noise were identified, there will be no impact to daytime noise levels.

The project-only sound levels were combined with the assumed ambient sound level of 50 dBA at the three receivers to estimate future sound levels with the Proposed Action in place.[2] A 0 dBA increase is expected at each of the three receptor locations. This project is therefore well under the 10 dB(A) increase, at which level the NYSDEC guidance recommends mitigation (see **Table F-1** above).

Project noise levels will not exceed the typical local nighttime residential noise limits of 50 dBA at the historic residence, the nearest residential properties, or the public beach.

Considering the above, no significant adverse impact to noise is anticipated.

https://www.psegliny.com/aboutpseglongisland/proposalsandbids/-/media/894B1477D1CD436CBE2435B8AD87FC80.ashx

This noise study doesn't disclose at what fan speed the tests were done- and instead says it was done at nominal fan speed (software limted to 80%):

4 Noise Impact Assessment

4.1 Proposed Equipment

4.1.1 Sound data has been provided by the client based on information provided by the manufacturer. The A-weighted sound power levels and indicative sound pressure level at 10m used in the assessment are detailed in Table 4.1.

Table 4.1: Summary of Sound Source Data

Item of Plant	Number of Units	Sound Power Level (dBA)	Sound Pressure Level at 10m (dBA)*
MVS Inverter Skids	80	84	56
Battery Storage Unit	160	79	51
400Kv Transformer**	2	83	52
132/33Kv Transformer	4	83	55
*Data has been provided as derived sound power levels. Calculated sound pressure levels at a distance of 10 meters from the plant are included for reference. **Free-field conditions			

4.1.2 Spectral data has been used in the assessment and can be provided upon request.

4.1.3 Some cooling systems may perform at lower duty during the night, when ambient temperature is lower, using variable fan speed. This assessment assumes nominal fan speed (firmware limited up to 80% on battery storage units and 100% on other plant items) during the daytime and night-time periods.

4.1.4 Confirmation from the selected plant manufacturers that appropriate sound levels can be achieved at the relevant noise sensitive receptor should be sought prior to plant procurement. The relevant contractor/manufacturer is responsible for ensuring that appropriate sound levels are achieved at the relevant noise sensitive receptor.

4.2 Mitigation

4.2.1 Based on a preliminary review of the proposals, calculations indicate that a 3m high acoustic barrier is required around the battery enclosures, as shown in Figure 4.1 below. The acoustic barrier should be solid, continuous, sealed at all interfaces and have a surface density of 15 kg/m^2 over the lifespan of the barrier. Mitigation is based upon the current technology and noise data that is currently available from the chosen manufacturer. Mitigation is required at the time of writing the report, based on current manufacturer data, however, should the technology change, resulting in lower noise levels, a further assessment may demonstrate that the mitigation should not be required, which may remove the need for acoustic fencing.

4.2.2 The acoustic barrier has been included in this assessment and is shown on the proposed layout submitted as part of the wider planning application.

https://newenergystoragesystem.com/wp-content/uploads/2024/09/Willingham-by-Stow-BESS-Noise-Impact-Assessment.pdf

And, these are my favorite:

CATL's noise levels are covered by an NDA and not shared at all- but they give Broadband sound levels:

5.1.4 Source Noise Levels

Table 5-1 presents the octave band sound power levels (SWL) used in the noise model for each noise source.

Table 5-1: Octave Band Sound Power Levels of Modelled Noise Sources, dBA

Noise Source	Broadband	Octave band							
	dBA	63	125	250	500	1000	2000	4000	8000
CATL Battery Unit*	79	Spectral data covered by NDA - confidential							
SMA UP MV Inverter*	86	Spectral data covered by NDA - confidential							
ABB Grid Transformer*	82	58	73	76	77	75	69	65	59
* Indicates a noise source that has been modelled using one third octave band data									

5.2 Incorporation of Additional Mitigation Measures

An acoustic fence has been included within the design to reduce noise immission levels at the most sensitive NSRs, which are located to the northwest of the Proposed Grid Connection. The fencing has been modelled at a height of 4 m around the northwestern perimeter of the Site. The location of the fencing is shown within Figure A4.2 of Annex 4.

The fencing is assumed to be reflecting and of sufficient density to prevent sound passing through the structure. It should be sufficiently robust and maintained so as to achieve the level of attenuation required throughout the lifetime of the development. Fencing must be installed with no air gaps between the panels and floor.

5.3 Calculated Immission Levels

Noise immission levels have been calculated at 7 BESS Noise Assessment Locations (termed BNALs), which have been selected to represent the closest NSRs to the Proposed Grid Connection. Each BNAL has been set on the side of the property facing the Proposed Grid Connection. The BNALs are detailed in Table 5-2 alongside its associated representative NML. BNALs are also shown on Figure A4.1a-d in Annex 4. Additional residential receptors i.e. all those identified within a 2.5 km study area, were also included in the noise model and these are detailed in Annex 5.

Table 5-2: Noise Assessment Locations (NALs)

Noise Assessment Location		OS Grid Reference		Representative NML
BNAL ID	BNAL Descriptor	Eastings	Northings	
BNAL01	225 m, northwest	554717	748406	05

https://www.pleanala.ie/publicaccess/Case%20Documentation/323761/Applicant%20Documents/Application%20Docs/Vol.%201%20and%20Vol.%203%20Environmental%20Impact%20Assessment%20Report/Appendix%2012-3%20Battery%20Storage%20Noise%20Assessment%20F%20-%202025.09.26%20-%20190723.pdf

Totally redacted:

Table 5 – Sound power levels for proposed plant

Frequency (Hz)	Sound Power Level, dB L_{wA}		
	DC skid BESS container	AC skid twin inverter and transformer (PCS)	HV Grid Transformer
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]

https://www.fieldbeauly.co.uk/wp-content/uploads/2025/02/Noise-Assessment.pdf

So, when PSE or a BESS developer or lobbyist come to you and say a BESS is quiet- you now know that they are not...

Ideallly, you would require BESS developers to give you sound studies that include all frequencies at all fan speeds- and that the BESS has multiple Db meters installed around the fenceline and provides you with live and historical records- and when sound levels exceed the max limites submitted in their Sound study and or exceed allowed noise levels you are pinged and they are fined $10k. Additionally, if the BESS is located anywhere near schools, homes, or other locations that would be easily disturbed the developer has to provide each location with professional and calibrated sound meters so they can take sound measurements- and if they record a higher sound level and send in a pic and report the excess sound levels, the developer gets fined and the person who lost their ability to have peace and enjoyment of their property gets 50% of the $10k fine for reporting it...

BESS developers and PSE lie about many things.. Sound levels is just another one of the lies...

BESS are loud during normal operation and have a significant impact on surrounding receptors- and should be determnied to have a significant impact!

Thank you,

James

Gabriel Clark

From: Alexandria Teague
Sent: Friday, February 13, 2026 1:06 PM
To: Gabriel Clark
Subject: Fwd: Lithium BESS - noise level studies

Sent from my iPhone

Begin forwarded message:

> **From:** Alexandria Teague <ateague@auburnwa.gov>
> **Date:** February 13, 2026 at 08:35:00 PST
> **To:** jamesdelay@hotmail.com
> **Subject: RE: Lithium BESS - noise level studies**
>
> Good morning James,
>
> Thank you for the information. We have received this all of the emails that were sent on Feb. 11th. They will be included in the packet for Planning Commission.
>
> Sincerely,
>
> Alexandria
>
> Planning or Land Use Questions?
> Book an online meeting with staff<https://www.auburnwa.gov/cms/one.aspx?portalId=11470638&pageId=18097838>.
> Check out our FAQ<https://www.auburnwa.gov/cms/one.aspx?portalId=11470638&pageId=18097838>!
>
> If inquiring about a specific site, please include the parcel number or address, or if inquiring about a specific project, please include the City project number in your email.
>
> Alexandria D. Teague, AICP, Planning Services Manager
> Department of Community Development
> City of Auburn | www.auburnwa.gov<http://www.auburnwa.gov/>
> 253.931.3003 | ateague@auburnwa.gov<mailto:ateague@auburnwa.gov>
> Mailing Address: 25 W Main Street, Auburn, WA 98001
> Permit Center Address: 1 E Main Street, Auburn, WA 98002 (Click Here for Map<https://www.google.com/maps/dir/1+E+Main+St,+Auburn,+WA+98002/@47.3076588,-122.2291546,19z/data=!4m13!1m4!3m3!1s0x5490586fdf805021:0xc1488b17b5a4b4c5!2s1+E+Main+St,+Auburn,+WA+98002!3b1!4m7!1m0!1m5!1m1!1s0x5490586fdf805021:0xc1488b17b5a4b4c5!2m2!1d-122.2291546!2d47.3076588?hl=en>)
> Customer Service Survey | https://www.surveymonkey.com/r/XNSL95J

Application Forms | http://www.auburnwa.gov/services/resource_library/forms.htm
Zoning Maps | http://www.auburnwa.gov/services/resource_library/maps.htm

This email and your response are considered a public record and can be subject to disclosure under Washington's Public Records Act.

From: James DeLay <jamesdelay@hotmail.com<mailto:jamesdelay@hotmail.com>>
Sent: Wednesday, February 11, 2026 5:04 PM
To: Cheryl Rakes <CRakes@auburnwa.gov<mailto:CRakes@auburnwa.gov>>; Tracy Taylor <ttaylor@auburnwa.gov<mailto:ttaylor@auburnwa.gov>>; Brian Lott <BLott@auburnwa.gov<mailto:BLott@auburnwa.gov>>; Clinton Taylor <ctaylor@auburnwa.gov<mailto:ctaylor@auburnwa.gov>>; Lisa Stirgus <LStirgus@auburnwa.gov<mailto:LStirgus@auburnwa.gov>>; Hanan Amer <hamer@auburnwa.gov<mailto:hamer@auburnwa.gov>>; info@vrfa.org<mailto:info@vrfa.org>; Planning <planning@auburnwa.gov<mailto:planning@auburnwa.gov>>
Subject: Lithium BESS - noise level studies

CAUTION: The following message originated from outside the City of Auburn. Be careful opening links and attachments

---

Good afternoon Auburn leaders,

I can't remember if I sent this to you already...

PSE and BESS developers will tell you BESS aren't loud and that they won't exceed the rural/city/county noise limits, but that is simply not true- at least not without a lot of sound mitigation.

Lithium BESS have to remain at their ideal temperature (70 degrees) to avoid overheating and entering thermal runaway- the process of charging and discharging lithium BESS generates significant levels of heat (up to 130 degrees)- due to the heat generated by every single lithium battery cell in a shipping container-like BESS container being charged and discharged. Because of this, BESS containers usually have up to 6 massive HVAC units cooling each individual BESS container 24/7 on all but the coldest nighttime sub-freezing temps.

It is a constant battle to keep the lithium batteries in a lithium BESS cool enough to avoid overheating and triggering thermal runaway- several BESS fires have been caused by failure of the cooling system to keep the batteries cool enough due to cooling systems being inadequately sized and can't keep up on the hottest Summer days (this cause has been mostly eliminated by engineered oversizing), cooling system failures, faulty cooling

system installation or parts, failed cooling system components (Tesla Megapack at Moss Landing had bearings in a fan cause too much resistance and reduced the fan speed/cooling ability), and failed accessory parts (coolant line leaked in Tesla Megapack in Victoria, AUS).

BESS developers try to trick permitting agencies and make it sound like BESS aren't loud by flat out lying and then back up their lies by paying an engineering firm to create a sound level study for their BESS and ask them to issue a report that results in sound levels that meet the legal noise levels for the area...

In many cases, BESS developers have found that if they have the Sound Engineering firm run the tests or simulations showing the BESS cooling systems operating at 40% of capacity, they can meet those noise thresholds as seen here:
[cid:image002.png@01DC9CC3.5E2AEEE0]
https://efsec.wa.gov/sites/default/files/2025-06/Goldeneye%20ASC_Attachment%20O_Noise%20Memo.pdf

Please note, that even when operating at 40%, the overall sound levels for the BESS are still 84.9DB- which massively exceeds most area's noise levels- except heavy industrial zoned areas (which is where lithium BESS should be exclusively sited). The HV transformer releases 88db at 125hz (constant hum) and 83.4DB overall. The medium voltage transformer releases 69db at 500hz and 72.4db overall- exceeding most zone's max sound level- and this will be 24/7...

Remember, that is running at 40%.... On a hot Summer day, they will be running at 100%...

So, BESS developers specifically ask the sound engineers to make the test sound levels at lower fan speeds (like 40%) to provide the best test result possible to get their permit through permitting...

Easy peasy!

But, in reality, the cooling systems of the BESS are in a constant fight with the heat created by the continuously charging and discharging the lithium batteries- and, once lithium batteries overheat they go into thermal runaway and ignite and or explode...

So cooling is the primary defense against thermal runaway- you don't want to be running your systems at 40% just to avoid noise violation fees...

And, if you remember the June 13th 2023 BESS Developer presentation to the Covington City Council, you would know that their answer to what happens if the BESS is louder than they say and exceeds the noise limits- the BESS developer's response was, "We'd pay noise violation fines- that is just the cost of doing business"...

The Covington City Council was far more educated about BESS and associated issues than the developer planned and the meeting is worth a watch: https://www.youtube.com/watch?v=kYZ8AKr-T4E&t=1s<https://url.us.m.mimecastprotect.com/s/vf4oCwpAgNsvy7OpFVfqIJB1gB?dom

ain=youtube.com>

Fortunately, another engineering firm did a BESS sound level study on Tesla Megapack 2 and included both the sound levels at 40% and 100% operational capacity...
[cid:image003.png@01DC9CC3.5E2AEEE0]
The "Goldeneye" Sedro Woolley noise study shared above (with only 40% fan speed), specifies that the BESS developer specifically requested the engineering firm to do the study at 40% to skew the results in their favor...

Ideally, you would not allow simulations, but instead require BESS to submit a sound study with microphones set up at all the "receptors" sites within line of site and within 1+ miles and sound travels easily...

NIOSH recommends less than 15 minutes of exposure per day of any noises above 100db- BESS operate 24/7 and they want to put BESS next to schools and people's homes.

[cid:image004.png@01DC9CC3.5E2AEEE0]

Here's a BESS study showing a lithium BESS releasing highly hazardous sound levels (120db at 31.5hz):
[cid:image005.png@01DC9CC3.5E2AEEE0]
https://www.grantcountywa.gov/DocumentCenter/View/12601/Acoustic-Assessment-Report<https://url.us.m.mimecastprotect.com/s/TyLbCxkBj0cLxyGOFvhmIyK4CJ?domain=grantcountywa.gov>

Here's a noise study showing BESS units individually are 94db but when all combined it shows a total sound power level 118db of noise- it also shows the reduction in sound levels with decreased fan speeds (decreasing from 100% down to 20% utilization):
[cid:image006.png@01DC9CC3.5E2AEEE0]
https://wellingtonbess.com/wp-content/uploads/2024/02/Appendix-K-NVIA.pdf<https://url.us.m.mimecastprotect.com/s/CaEfCyPDk4h7LgjnfQixIxrHnn?domain=wellingtonbess.com>

Here's a noise study for a BESS showing 109db at low/bass frequencies and the transformer making 110db:

[cid:image007.png@01DC9CC3.5E2AEEE0]
https://efsec.wa.gov/sites/default/files/2025-06/HopHill_ASC_Attachment_Q_AcousticAssessment.pdf

Here's a study showing a 110db- but also shows that a BESS can be installed in 16-20 weeks:
[cid:image008.png@01DC9CC3.5E2AEEE0]
https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getConten

t?AttachRef=SSD-35160796!20220906T051215.997%20GMT&fbclid=IwZXh0bgNhZW0CMTAAAR2Z3U6Ur18m0cW3UGDXmUMQyMTPcObGjWtPZS9Kehg4PrGB5izUxmAek6k_aem_Afl-F4G-oCrT5FUsSxPeJmR7HkPXjSgFcIywVjjGuP2hM0LAl5gbZJSaGTsIy5jzLau6ZrU1SJwGpGBYIB3UhanS<https://url.us.m.mimecastprotect.com/s/A2whCzpEl8sG43PLSKsXI9GlBs?domain=majorprojects.planningportal.nsw.gov.au>

Here's a noise study showing he BESS generating an overall sound level of 106db:

[cid:image009.png@01DC9CC3.5E2AEEE0]
https://efsec.wa.gov/sites/default/files/2025-07/Attachment%201_Wautoma_Data%20Request_Response_Noise.pdf

They play around with the numbers as well so that when you compare noise levels across BESS and it's components it doesn't always make sense:

[cid:image010.png@01DC9CC3.5E2AEEE0]
https://efsec.wa.gov/sites/default/files/2025-06/11_Wallula%20Gap_ASC_Attachment%20J_Acoustic%20Assessment%20Report.pdf

Sometimes things match- like this Carriger Solar BESS sound levels match the Wautoma BESS sound levels, but then other components are different:

[cid:image011.png@01DC9CC3.5E2AEEE0]
https://efsec.wa.gov/sites/default/files/2025-06/Attachment_H_Carriger_Acoustic_Assessment_Report.pdf

Here's one that was officially submitted showing the BESS will be silent at 31.5hz vs every other sound study showing between 36db and 120db at that low frequency:

[cid:image012.png@01DC9CC3.5E2AEEE0]
https://efsec.wa.gov/sites/default/files/2025-06/16_Badger%20Mtn_ASC_Attach%20O_AcousticAssessment.pdf

Here's another sound study showing no sound output by the BESS at 31.5hz
[cid:image013.png@01DC9CC3.5E2AEEE0]
https://salinetownship.org/uploads/notices/HEI%20-%20Voyager%20BESS%20Noise%20Study%2020250131%20(1).pdf<https://url.us.m.mimecastprotect.com/s/T9qmCAD2OLcZEgmYFQtRIGNjsw?domain=salinetownship.org>

This one has similar results as the 40% Sedro Woolley BESS that I first shared- but never mentions that this BESS sound study was done at reduced fan/cooling system speed:

[cid:image014.png@01DC9CC3.5E2AEEE0]
https://efsec.wa.gov/sites/default/files/2025-05/20210119_Attch_I_AcousticAssessmentReport.pdf

Here's another sound study- the broadband number is 66db???? They say there are 14,946 BESS units but they only make 66db of noise overall- that doesn't make sense?!?!?
[cid:image015.png@01DC9CC3.5E2AEEE0]
https://www.oregon.gov/energy/facilities-safety/facilities/Facility%20Exhibits/SSP/2024-05-16-SSPAPPDoc25-25-ASC-Exhibit-Y-Noise.pdf<https://url.us.m.mimecastprotect.com/s/6WwFCBB2EMuD81Zoc1uKI2SyOb?domain=oregon.gov>

Here's another sound study where they didn't include the broadband power nor the sound levels at each frequency:
[cid:image016.png@01DC9CC3.5E2AEEE0]
https://www.enelgreenpower.com/content/dam/enel-egp/immagini/plants-in-development/capricorn-bess-project/Appendix%20E%20-%20Noise%20Impact%20Assessment.pdf<https://url.us.m.mimecastprotect.com/s/WWa6CDk2EOco316PfRC8IjRHs9?domain=enelgreenpower.com>

This sound study includes the sound reductions created by "low noise cooling systems" and a combination of 8ft tall x 180ft long sound barrier, 15ft tall x 570ft long sound barrier wall, 14ft tall x 730ft long sound barriers:
[cid:image017.png@01DC9CC3.5E2AEEE0]
https://portal.ct.gov/-/media/csc/1_dockets-medialibrary/1_media_do500_600/do527/applicantsubmissions/application/15---appendix-m_acoustic-assessment.pdf?rev=8d742930a650432c8afe6e9ac7c158ed&hash=F32A9F8007CEB809581E8BA508196068<https://url.us.m.mimecastprotect.com/s/hUkrCER2QgslpmAPIxFQI7uEhE?domain=portal.ct.gov>

Here's another study that hides all the frequency based sound levels:
[cid:image018.png@01DC9CC3.5E2AEEE0]
https://mullaghclogher-windfarm.co.uk/media/nankxbzi/ta111-assessment-of-battery-energy-storage-facility.pdf<https://url.us.m.mimecastprotect.com/s/pvFKCG62KkTBAmyghrHJIBlWXi?domain=mullaghclogher-windfarm.co.uk>

Here's another 40% sound study that includes the largest range of sound frequencies out of any test I have seen, but is missing 20hz, 31.5hz, and 40hz:

[cid:image019.png@01DC9CC3.5E2AEEE0]
https://sftpbspompppprod01.blob.core.windows.net/applicationfiles/45276d90-2c12-ed11-b83d-00224891e4e7_PA2201752-06-

Thomastown%20Battery%20Energy%20Storage%20System-Noise%20Modelling-191022.pdf<https://url.us.m.mimecastprotect.com/s/afzZCJ62XnTBKR4XhKIvIyCZVc?domain=sftpbspompppprod01.blob.core.windows.net>

This noise study is all estimated sound levels and omit frequences below 60hz:
[cid:image020.png@01DC9CC3.5E2AEEE0]
https://sftpbspompppprod01.blob.core.windows.net/applicationfiles/8f45eb39-ec94-ef11-8a68-002248938a9c_PA2403305%20-%20Tarrone%20BESS%20-%20Noise%20Assessment.pdf<https://url.us.m.mimecastprotect.com/s/h1PPCKr2EosD4lAJckSRI5HvOA?domain=sftpbspompppprod01.blob.core.windows.net>

This sound study is incorporating a 4.5 meter tall sound barrier- and omitting frequences below 63hz:
[cid:image021.png@01DC9CC3.5E2AEEE0]
https://sftpbspompppprod01.blob.core.windows.net/applicationfiles/587693da-ac20-ec11-b6e6-000d3ad1e7ec_PA2101362-Rangebank%20BESS-Acoustic%20Report-Stamped-290921.pdf<https://url.us.m.mimecastprotect.com/s/R3uhCL92BpikQAoviYT7Iy_FUx?domain=sftpbspompppprod01.blob.core.windows.net>

Here's one where the sound levels were provided by the BESS developer- omitting frequencies below 63hz:
[cid:image022.png@01DC9CC3.5E2AEEE0]
https://cdc.govt.nz/wp-content/uploads/2024/07/Appendix-10-Acoustic-Assessment.pdf<https://url.us.m.mimecastprotect.com/s/4SSzCM82Bqs2zgolCqU6I8F2MF?domain=cdc.govt.nz>

This study shows the sound levels behind a 5 meter tall acoustic barrier on the E, W, and S sides- but omits frequences below 125hz for the BESS fans:

[cid:image023.png@01DC9CC3.5E2AEEE0]
https://www.boom-power.co.uk/content/uploads/2025/08/Accu-Acoustics-00005-Carrog-BESS-Substation-merged.pdf<https://url.us.m.mimecastprotect.com/s/lT4pCNk21rcZjAnRF3cwIyxNyY?domain=boom-power.co.uk>

Here's a sound study that incorporates a 5M tall sound barrier AND fans operating at 30% to hit the required noise levels- omitting BESS container frequencies below 100hz:
[cid:image024.png@01DC9CC3.5E2AEEE0]
[cid:image025.png@01DC9CC3.5E2AEEE0]
https://www.fieldcorriemoillie.co.uk/wp-content/uploads/2024/12/Noise-Impact-Assessment-Report.pdf<https://url.us.m.mimecastprotect.com/s/w5h5COY29vHNvJPGT9fQIGoOwF?

domain=fieldcorriemoillie.co.uk>

Here is a sound study that has considered a 4.5 meter tall sound barrier in it's sound level calculations:
[cid:image026.png@01DC9CC3.5E2AEEE0]
https://www.studocu.com/en-au/document/university-of-melbourne/project-finance/rangebank-bess-environmental-noise-assessment-s7794c1-may-2023/136793704<https://url.us.m.mimecastprotect.com/s/WjGsCPN9JwI03ODlfJhJIxQpvJ?domain=studocu.com>

Here's another BESS sound study- omitting frequencies below 63hz:
[cid:image027.png@01DC9CC3.5E2AEEE0]
https://portal.ct.gov/-/media/csc/3_petitions-medialibrary/petitions_medialibrary/mediapetitionnos1601-1700/pe1607/petitionersubmissions/petition/exhibit-e-qcells-bess-facility---acoustical-analysis-report.pdf?rev=159515a1b5b846c4a4861c50160ec4c4&hash=9B2B2C4AA18072900DF8D76BAA47FD20<https://url.us.m.mimecastprotect.com/s/beNOCQW2LxuXo8DxIliLIGW-bZ?domain=portal.ct.gov>

Here's another BESS sound study omitting frequences below 63hz:
[cid:image028.png@01DC9CC3.5E2AEEE0]
https://docs.planning.org.uk/20240322/230/S8E8BLNSIF600/qy6uzgwsia1j6ii0.pdf<https://url.us.m.mimecastprotect.com/s/AU2nCR60ByTG5JKVSVsvI1d8RV?domain=docs.planning.org.uk>

Another strategy BESS developers will have their hired engineering firms provide results only showing one piece of data- hiding all the rest of the sound data:

Here's a noise study showing only the sound level at fan speed at 50% and only providing the average noise level- please note, this does note, that "Reasonable worst-case fan load is 99db" which makes zero no sense- and maybe they meant max fan load is 99% and they say the difference between 50% fan speed and worst case of 99% fan speed only has a MAXIMUM increase of 5db???? The average seems to be about 3db increase/decrease for every 10% of fan speed difference:
[cid:image029.png@01DC9CC3.5E2AEEE0]
https://www.chbdc.govt.nz/assets/Document-Library/Resource-Consents/RM-240016/Acoustic-Assessment.pdf<https://url.us.m.mimecastprotect.com/s/jTFDCVOkZDC2g74vCotwIEwPv4?domain=chbdc.govt.nz>

Here's a Tesla Megapack 2XL where they hide the sound level details but provide sound levels at nightime levels operating at 50% and daytime levels operating at 60% (and is still at 96db at night 50% and 99db at daytime 60%:
[cid:image030.png@01DC9CC3.5E2AEEE0]
https://www.mississippimills.ca/media/3mlgsfpa/appendix-l-almonte-bess-2-acoustic-assessment.pdf<https://url.us.m.mimecastprotect.com/s/pilnCW6lBET6D2pkUMu6IokKBj?domain=mississippimills.ca>

Here's a study showing only the broadband DB sound level (hiding the rest of the sound levels):

[cid:image031.png@01DC9CC3.5E2AEEE0]

https://www.icpds.com/assets/planning/draft-environmental-impact-reports/supplemental-le-conte-battery-energy-storage-system-deir/le-conte-battery-energy-storage-system-app-f.pdf<https://url.us.m.mimecastprotect.com/s/5-SuCXD0VGc4O16JTzCKIWcvYc?domain=icpds.com>

Here's another showing only the broadband DB sound level (hiding the rest of the sound levels):

[cid:image032.png@01DC9CC3.5E2AEEE0]

https://www.sandiegocounty.gov/content/dam/sdc/pds/ceqa/FallbrookBatteryEnergyStorage/Noise%20Assessment.pdf<https://url.us.m.mimecastprotect.com/s/RHq6CYEnXJiDAQ08c1F9IxnrSl?domain=sandiegocounty.gov>

Here's another showing only the broadband DB sound level (hiding the rest of the sound levels):
[cid:image033.png@01DC9CC3.5E2AEEE0]
https://www.knightdalenc.gov/sites/default/files/uploads/projects/documents/419596.41.0604-de-kdl-noise-study-report-240927_signed.pdf<https://url.us.m.mimecastprotect.com/s/gGoGCZ6oXKT7QEmGfwHrIB6yze?domain=knightdalenc.gov>

Here's another showing only the broadband DB sound level (hiding the rest of the sound levels at each frequency):
[cid:image034.png@01DC9CC3.5E2AEEE0]
file:///C:/Users/James/Downloads/Kiewa%20Valley%20BESS%20-

%20Noise%20Impact%20Assessment.pdf<https://url.us.m.mimecastprotect.com/s/AssHCn5oJATXmzy5IkSLIJrHZL?domain=c>

This sound study shows only the sound levels per unit (hiding the rest of the sound levels data):

[cid:image035.png@01DC9CC3.5E2AEEE0]
https://assets.lightsourcebp.com/app/uploads/2024/05/01140125/Noise-Survey-and-Acoustic-Report.pdf<https://url.us.m.mimecastprotect.com/s/4GkoC1wn7os6q1jRUPIrIV9S5c?domain=assets.lightsourcebp.com>

Here's another sound study by the same company- where they don't give any details, but for a smaller BESS and they reduced the soud levels by theroetically adding noise reducing features like a 4 meter tall sound barrier wall (and inverters noise reduction kit for the air inlets and outlets, and ow noise HVAC systems should be used for the battery containers):
[cid:image036.png@01DC9CC3.5E2AEEE0]
https://docs.planning.org.uk/20230821/15/RZHNBROKHZQ00/tqlaisxsynrwah7j.pdf<https://url.us.m.mimecastprotect.com/s/-bbYC2koJpcV8vxjU3SoI5qb9U?domain=docs.planning.org.uk>

Here's a Tesla Megapack sound study showing higher fan speed for the day and reduced fan speed at night- dropping the sound level by 15db:

[cid:image037.png@01DC9CC3.5E2AEEE0]
https://planning.walsall.gov.uk/swift/MediaTemp/73797-324158.pdf<https://url.us.m.mimecastprotect.com/s/DsC-C31pJqsX2w8BInTzIQo8rY?domain=planning.walsall.gov.uk>

ANother sound study hiding the frequency data:
[cid:image038.png@01DC9CC3.5E2AEEE0]
https://www.clune-windfarm.co.uk/media/153cmhi1/technical-appendix-113-bess-acoustic-assessment.pdf<https://url.us.m.mimecastprotect.com/s/3qz5C4xqKrhzlyjotEUNI4cwve?domain=clune-windfarm.co.uk>

This Noise study isn't represented in a chart as they only gave the average sound levels:
[cid:image039.png@01DC9CC3.5E2AEEE0]
https://webportal.ribblevalley.gov.uk/planx_downloads/24_0366_Statement_Appendix_E_Noise_Impact_Assessment_Redacted.pdf<https://url.us.m.mimecastprotect.com/s/QyyoC5yr0vSM6onvCYcYIk0z8d?domain=webportal.ribblevalley.gov.uk>

This sound study only says 88db at 60% and 82db at 40% and withholds all frequency data:
[cid:image040.png@01DC9CC3.5E2AEEE0]
https://planningexplorer.barnsley.gov.uk/Home/FileDownload/01GEE4NB2HQ66LTJMKTF

BJPOF2GUCLW6D4?ApplicationNumber=2023%2F0322<https://url.us.m.mimecastprotect.com/s/FGhoC68vVwsPyE3DfAfyI5F_nM?domain=planningexplorer.barnsley.gov.uk>

This sound level study only gives the average sound level of a single "battery unit" and there will be 525 battery units:
[cid:image041.png@01DC9CC3.5E2AEEE0]
https://potentiaenergy.com.au/wp-content/uploads/2025/03/Capricorn-BESS-Noise-Impact-Assessment_Final.pdf<https://url.us.m.mimecastprotect.com/s/wGHEC73wJxuzZvPqtnh7Io_8T7?domain=potentiaenergy.com.au>

Another study hiding the noise levels at the specified frequencies and only provided the Sound level:
[cid:image042.png@01DC9CC3.5E2AEEE0]
https://www.edf-powersolutions.uk/wp-content/uploads/2025/05/Noise-Assessment-1.pdf<https://url.us.m.mimecastprotect.com/s/ONa_C82xYyTXYUrIPiBIyd_uG?domain=edf-powersolutions.uk>

Here's another study showing only one data point from the manufacturer:

[cid:image043.png@01DC9CC3.5E2AEEE0]
https://portal.ct.gov/-/media/csc/3_petitions-medialibrary/petitions_medialibrary/mediapetitionnos1601-1700/pe1604/petitionersubmissions/appendix-g---sound-assessment.pdf?rev=b64e84c1a723454980ce779a944e30b2&hash=CC05362D3CCCA1AF8C23D77F8CE46228<https://url.us.m.mimecastprotect.com/s/xBy3C9ryXzsz2vZ1t9s7IqAcbZ?domain=portal.ct.gov>

Here's a liquid cooled BESS with the cooling system operating at 40% and 30%:
[cid:image044.png@01DC9CC3.5E2AEEE0]
https://docs.planning.org.uk/20241214/78/SOE1VMJIHNO00/asxqjjdjnzk54tyh.pdf<https://url.us.m.mimecastprotect.com/s/yF8YC0Rm3nskmKE8iQtlI99f4z?domain=docs.planning.org.uk>

Here's a study hiding all the noise levels and getting sound level data from BESS developer, but showing a liquid cooled BESS:
[cid:image045.png@01DC9CC3.5E2AEEE0]
https://www.scribd.com/document/736589960/3b3c8082-87fb-ed11-8f6e-002248933fc5-PA2302257-Glenbrae-BESS-Acoustic-Report-Copie-2<https://url.us.m.mimecastprotect.com/s/h3TYCgJGXquqGrgkHwu9I4iawS?domain=scribd.com>

This noise study claims that the BESS will be quiter than normal sound levels at 2

residences and a beach nearby (but doesn't provide any details beyond that):

[cid:image046.png@01DC9CC3.5E2AEEE0]
https://www.psegliny.com/aboutpseglongisland/proposalsandbids/-/media/894B1477D1CD436CBE2435B8AD87FC80.ashx<https://url.us.m.mimecastprotect.com/s/6HkvCjRkJwsYR269ClCmIm9t5V?domain=psegliny.com>

This noise study doesn't disclose at what fan speed the tests were done- and instead says it was done at nominal fan speed (software limted to 80%):
[cid:image047.png@01DC9CC3.5E2AEEE0]
https://newenergystoragesystem.com/wp-content/uploads/2024/09/Willingham-by-Stow-BESS-Noise-Impact-Assessment.pdf<https://url.us.m.mimecastprotect.com/s/syp6CkRlMxsk57LNimFlIGhhnK?domain=newenergystoragesystem.com>

And, these are my favorite:

CATL's noise levels are covered by an NDA and not shared at all- but they give Broadband sound levels:
[cid:image048.png@01DC9CC3.5E2AEEE0]
https://www.pleanala.ie/publicaccess/Case%20Documentation/323761/Applicant%20Documents/Application%20Docs/Vol.%201%20and%20Vol.%203%20Environmental%20Impact%20Assessment%20Report/Appendix%2012-3%20Battery%20Storage%20Noise%20Assessment%20F%20-%202025.09.26%20-%20190723.pdf<https://url.us.m.mimecastprotect.com/s/jGKXClYm6yH1Xy97UZHgIzfZiT?domain=pleanala.ie>

Totally redacted:
[cid:image049.png@01DC9CC3.5E2AEEE0]

https://www.fieldbeauly.co.uk/wp-content/uploads/2025/02/Noise-Assessment.pdf<https://url.us.m.mimecastprotect.com/s/wPTGCmZnXzhpWZ02CoIpIRHzTT?domain=fieldbeauly.co.uk>

So, when PSE or a BESS developer or lobbyist come to you and say a BESS is quiet- you now know that they are not...

Ideallly, you would require BESS developers to give you sound studies that include all frequencies at all fan speeds- and that the BESS has multiple Db meters installed around the fenceline and provides you with live and historical records- and when sound levels exceed the max limites submitted in their Sound study and or exceed allowed noise levels you are pinged and they are fined $10k. Additionally, if the BESS is located anywhere near

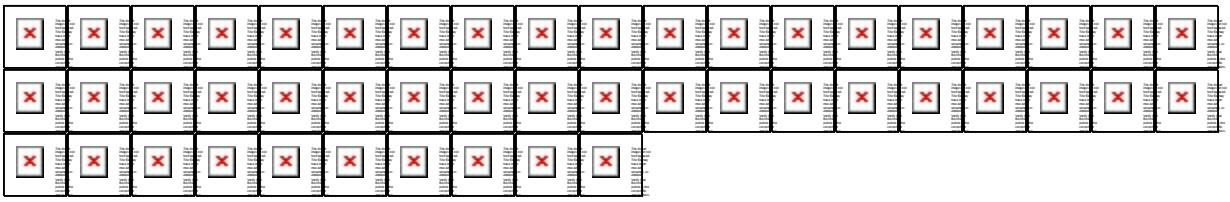
schools, homes, or other locations that would be easily disturbed the developer has to provide each location with professional and calibrated sound meters so they can take sound measurements- and if they record a higher sound level and send in a pic and report the excess sound levels, the developer gets fined and the person who lost their ability to have peace and enjoyment of their property gets 50% of the $10k fine for reporting it...

BESS developers and PSE lie about many things.. Sound levels is just another one of the lies...

BESS are loud during normal operation and have a significant impact on surrounding receptors- and should be determnied to have a significant impact!

Thank you,

James



CITY OF AUBURN WASHINGTON

AGENDA BILL APPROVAL FORM

Agenda Subject:
Critical Areas Ordinance Update
Staff Introduction/Presentation (Tatro)
Staff will provide an update on the work being done to update the Critical Areas Ordinance, Chapter 16.10 ACC, specifically regarding stream regulations.

Meeting Date:
March 3, 2026

Department:
Community Development

Attachments:
Planning Commission Memorandum, Attachment 1 - PowerPoint Presentation, Attachment 2 - Chapter 16.10 ACC Text Amendment, Attachment 3 - Technical Memo Prepared by Facet NW, Attachment 4 - WDFW Comments, Attachment 5 - Existing Stream Buffers Map, Attachment 6 - SPTH Buffers Map, Attachment 7 - Proposed Stream Buffers Map, Attachment 8 - Proposed Increased Stream Buffers Map

Budget Impact:

Administrative Recommendation:

Background for Motion:

Background Summary:
See attached Planning Commission Memorandum

Councilmember:

Staff: Jason Krum

CITY OF AUBURN WASHINGTON
MAYOR NANCY BACKUS
25 WEST MAIN STREET, AUBURN, WA 98001
253-931-3000
AUBURNWA.GOV

PLANNING COMMISSION MEMORANDUM

TO: Judi Roland, Chair, Planning Commission
Bill Stewart, Vice Chair Planning Commission
Planning Commission Members

FROM: Alyssa Tatro, Senior Planner
Dept. of Community Development

DATE: February 17, 2026

RE: Critical Areas Ordinance Code Update

I. BACKGROUND & PURPOSE

The City of Auburn is currently completing updates to Chapter 16.10 ACC, Critical Areas, as a follow-on action to the 2024 Periodic Comprehensive Plan update required under the Growth Management Act (GMA). The GMA requires local jurisdictions to designate and protect critical areas using best available science (BAS) when developing policies and development regulations.

Planning Commission previously reviewed the proposed Critical Areas Ordinance updates on September 16, 2025. At that meeting, staff discussed the comments received from Washington Department of Fish and Wildlife (WDFW) regarding stream regulations. WDFW recommended that Auburn consider the Site Potential Tree Height (SPTH) method for stream buffer widths, consistent with current BAS for stream/riparian protection.

Based on this feedback, the Planning Commission and city staff agreed that additional analysis was needed to understand how the SPTH approach would apply within Auburn's urban context. Following the meeting, staff have been working with Facet Northwest, an environmental and engineering consulting firm, to conduct a city-specific analysis of stream conditions and potential buffer changes. Since September 2025, City staff and Facet have completed a technical review of stream and riparian science, analyzed local stream conditions using GIS data, and evaluated how updated buffer approaches could impact Auburn.

II. SUMMARY OF PROPOSED CODE CHANGES

Based on the technical analysis and BAS review, the City is proposing updates to stream regulations that include:

- Increasing stream buffer widths to better align with best available science;
- Adding stream vegetated buffer standards; and
- Provision for buffer increases where vegetation standards are not met or minimization measures are not implemented.

The proposed changes are intended to improve protection of stream and riparian functions while maintaining flexibility for development through existing buffer averaging and enhancement provisions.

III. ATTACHMENTS

1) PowerPoint Presentation
2) Chapter 16.10 ACC Text Amendment
3) Technical Memo prepared by Facet NW
4) WDFW Comments
5) Existing Stream Buffers Map
6) SPTH Buffers Map
7) Proposed Stream Buffers Map
8) Proposed Increased Stream Buffers Map

ATTACHMENT 1

PLANNING COMMISSION

CRITICAL AREA ORDINANCE UPDATE – TEXT AMENDMENT

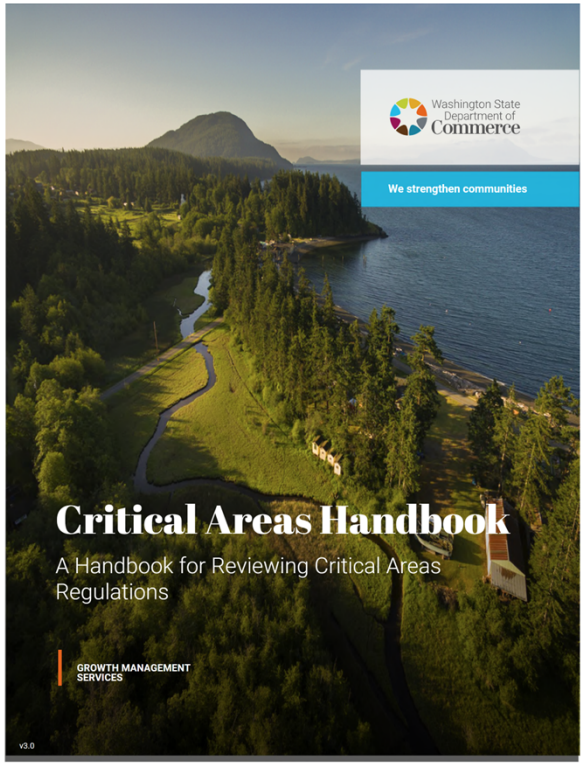
PRESENTED BY
ALYSSA TATRO, SENIOR PLANNER
MARCH 3, 2026

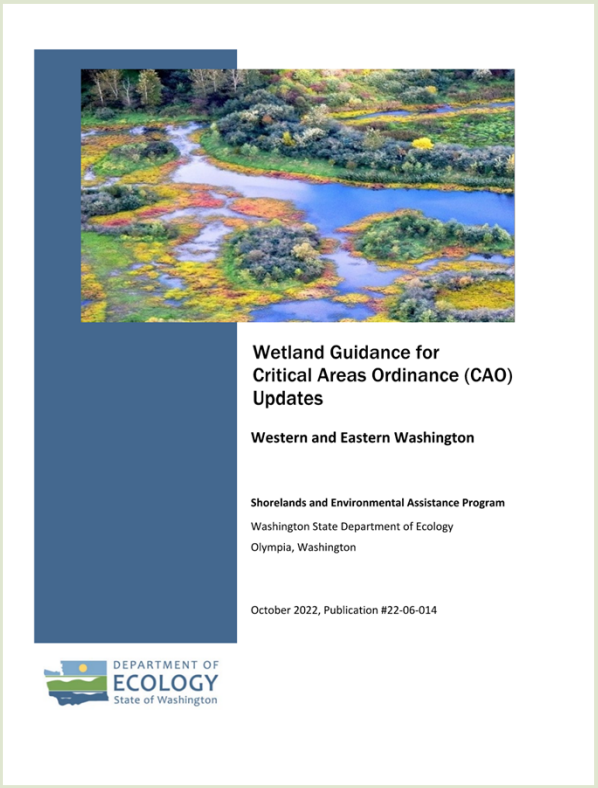
Department of Community Development
Planning • Building • Development Engineering • Permit Center
Economic Development • Code Enforcement

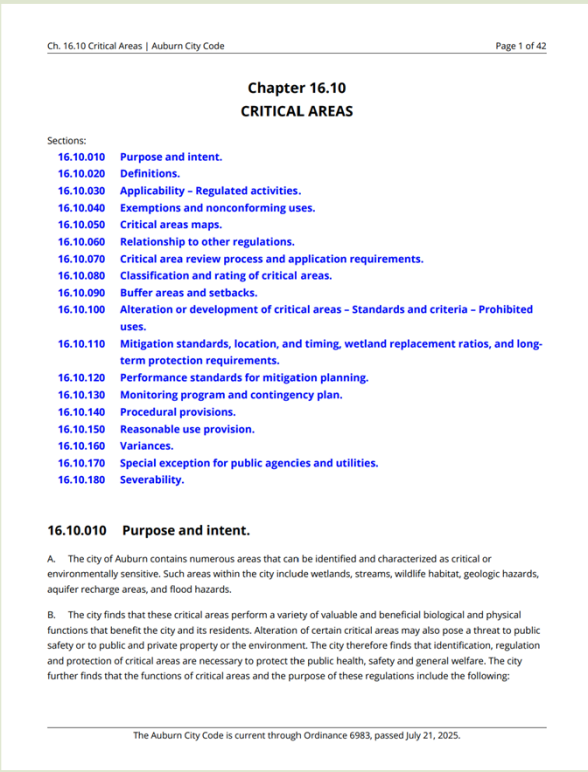
AUBURN VALUES

SERVICE
ENVIRONMENT
ECONOMY
CHARACTER
SUSTAINABILITY
WELLNESS
CELEBRATION

BACKGROUND AND PURPOSE







Ch. 16.10 Critical Areas | Auburn City Code Page 1 of 42

Chapter 16.10
CRITICAL AREAS

Sections:

16.10.010 Purpose and intent.
16.10.020 Definitions.
16.10.030 Applicability – Regulated activities.
16.10.040 Exemptions and nonconforming uses.
16.10.050 Critical areas maps.
16.10.060 Relationship to other regulations.
16.10.070 Critical area review process and application requirements.
16.10.080 Classification and rating of critical areas.
16.10.090 Buffer areas and setbacks.
16.10.100 Alteration or development of critical areas – Standards and criteria – Prohibited uses.
16.10.110 Mitigation standards, location, and timing, wetland replacement ratios, and long-term protection requirements.
16.10.120 Performance standards for mitigation planning.
16.10.130 Monitoring program and contingency plan.
16.10.140 Procedural provisions.
16.10.150 Reasonable use provision.
16.10.160 Variances.
16.10.170 Special exception for public agencies and utilities.
16.10.180 Severability.

16.10.010 Purpose and intent.

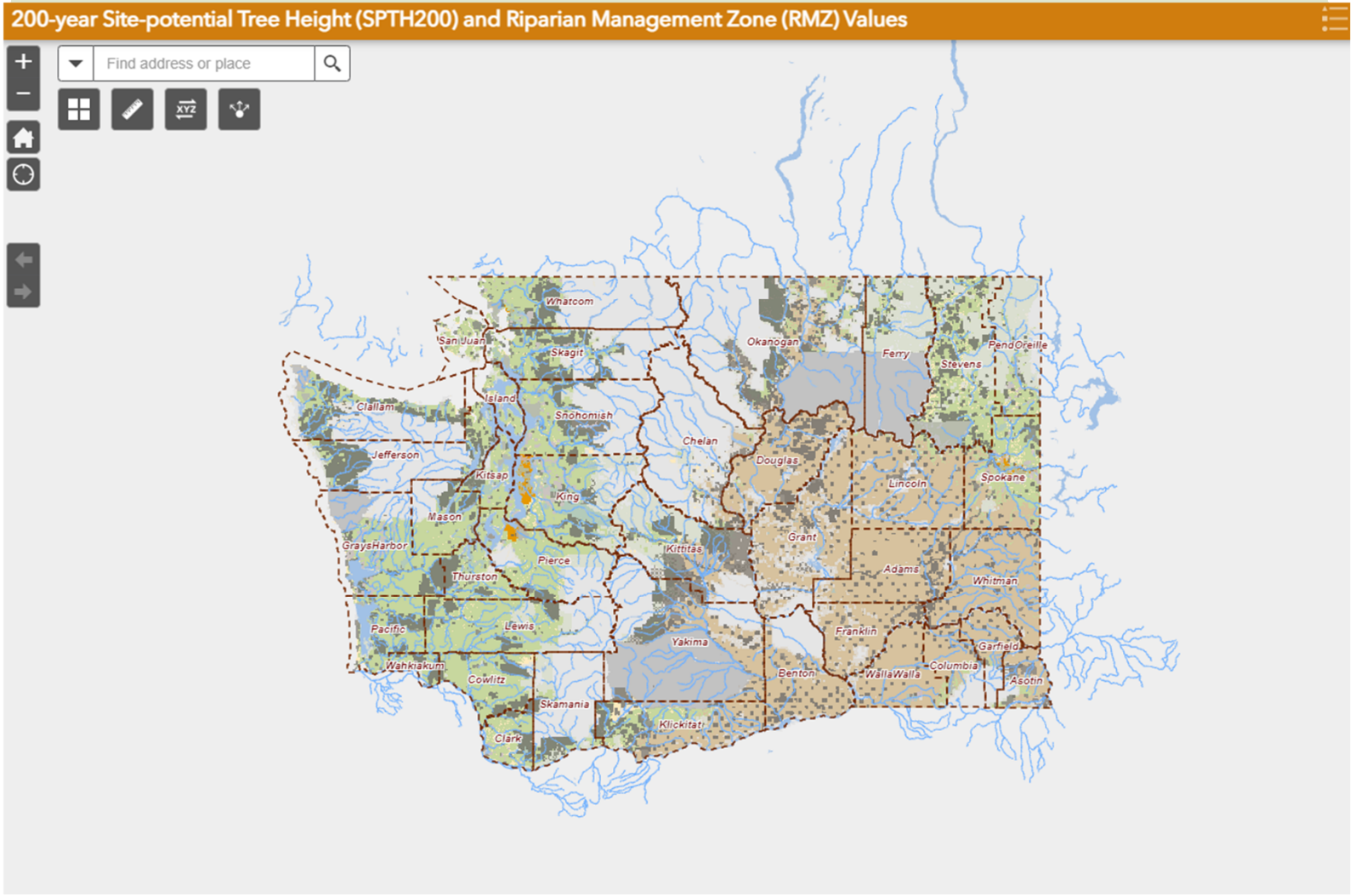
A. The city of Auburn contains numerous areas that can be identified and characterized as critical or environmentally sensitive. Such areas within the city include wetlands, streams, wildlife habitat, geologic hazards, aquifer recharge areas, and flood hazards.

B. The city finds that these critical areas perform a variety of valuable and beneficial biological and physical functions that benefit the city and its residents. Alteration of certain critical areas may also pose a threat to public safety or to public and private property or the environment. The city therefore finds that identification, regulation and protection of critical areas are necessary to protect the public health, safety and general welfare. The city further finds that the functions of critical areas and the purpose of these regulations include the following:

The Auburn City Code is current through Ordinance 6983, passed July 21, 2025.

SERVICE • ENVIRONMENT • ECONOMY • CHARACTER • SUSTAINABILITY • WELLNESS • CELEBRATION

WDFW'S SPTH MAPPING TOOL:



ADDRESSING COMMENTS

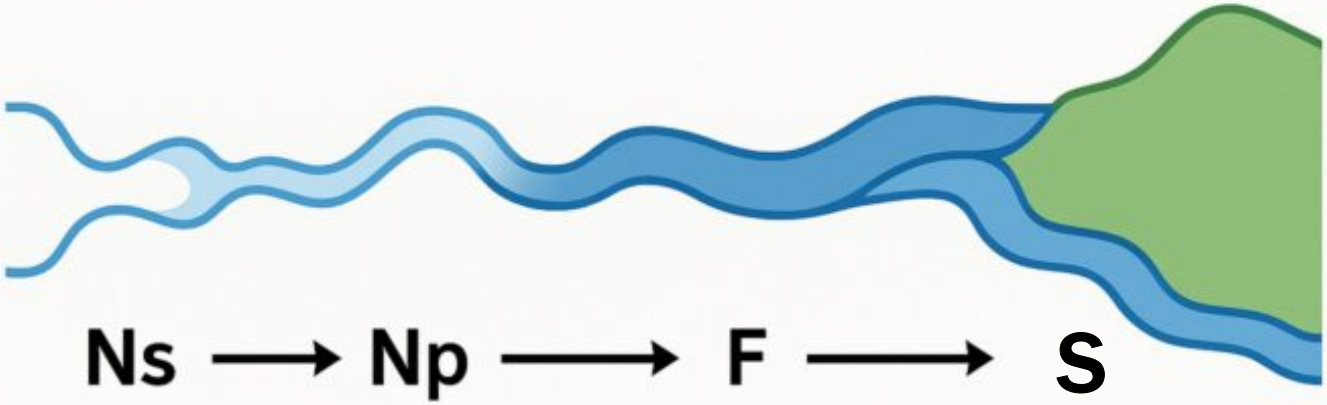
SERVICE ☐
ENVIRONMENT ☐
ECONOMY ☐
CHARACTER ☐
SUSTAINABILITY ☐
WELLNESS ☐
CELEBRATION

TECHNICAL ANALYSIS FINDINGS

- Vegetated riparian buffers are important for temperature control, habitat function, and water quality

- Science supports wider vegetated riparian buffers, with 100-feet commonly supported as a minimum width for water quality function

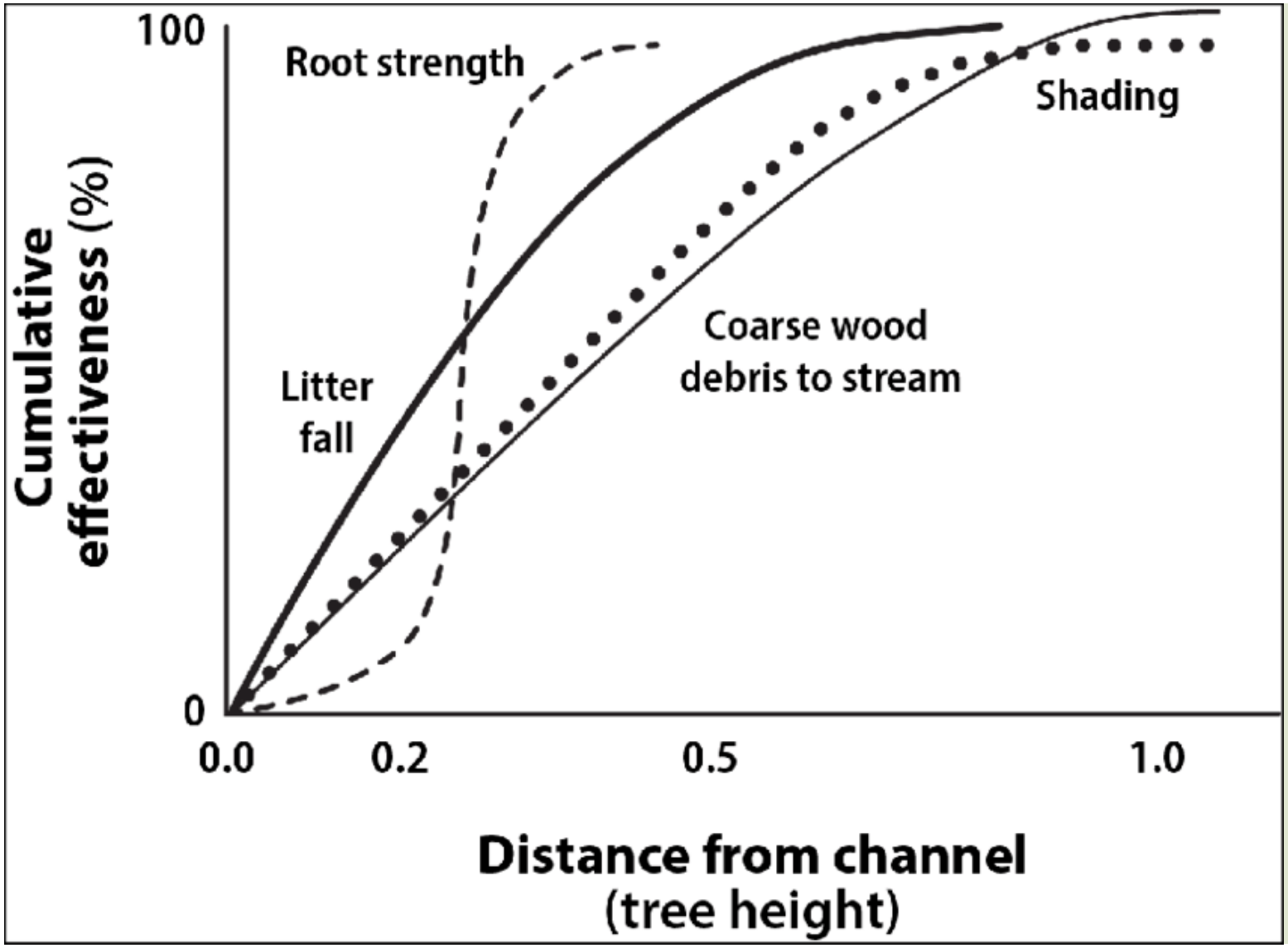
Water Typing (WAC 222-16-031)



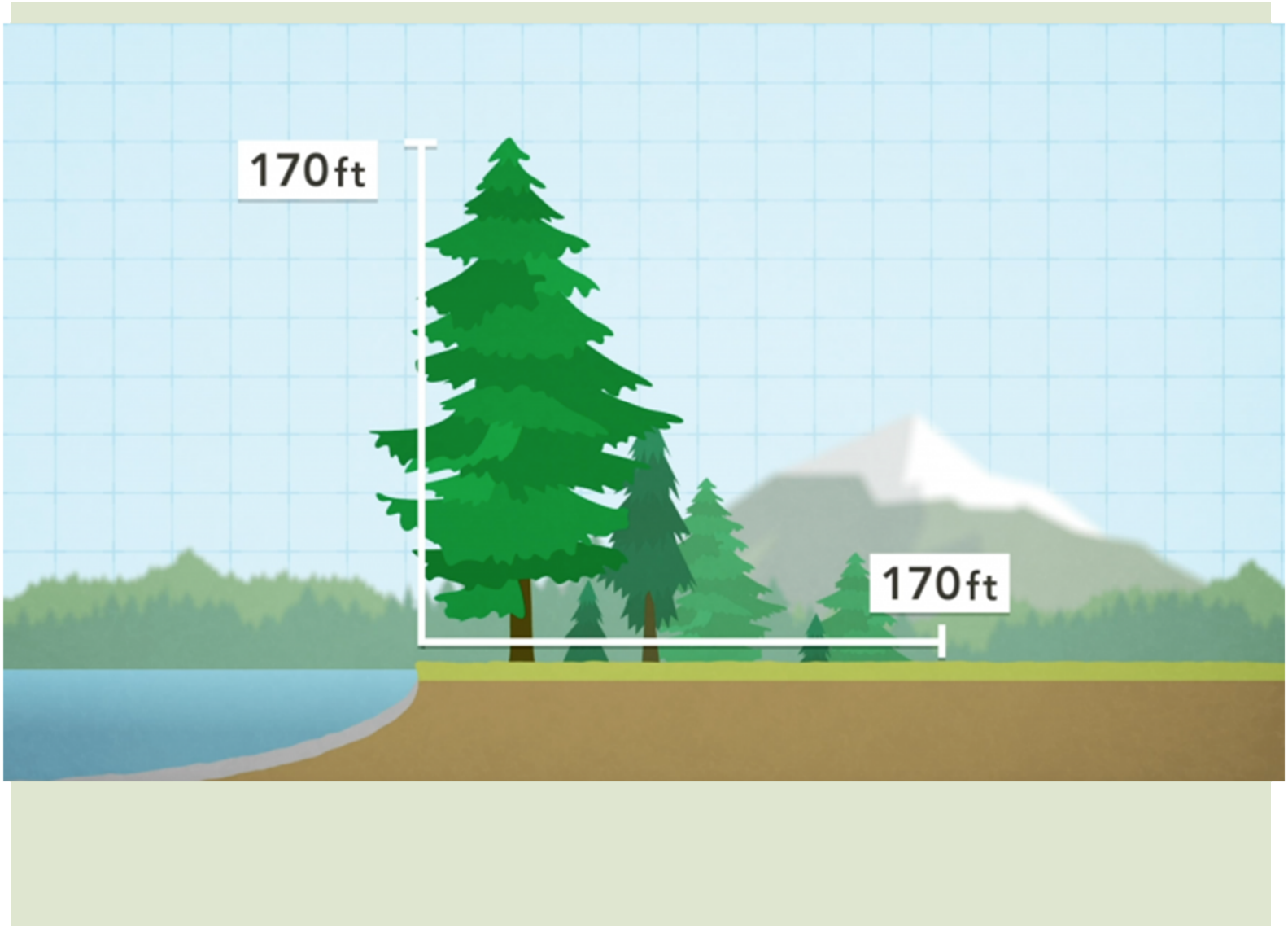
Ns → **Np** → **F** → **S**

Seasonal Non-fish	Perennial Non-fish	Fish-bearing	Shorelines of the State
(Type 5)	(Type 4)	(Type 2–3)	(Type 1)

STREAM TYPOLOGY

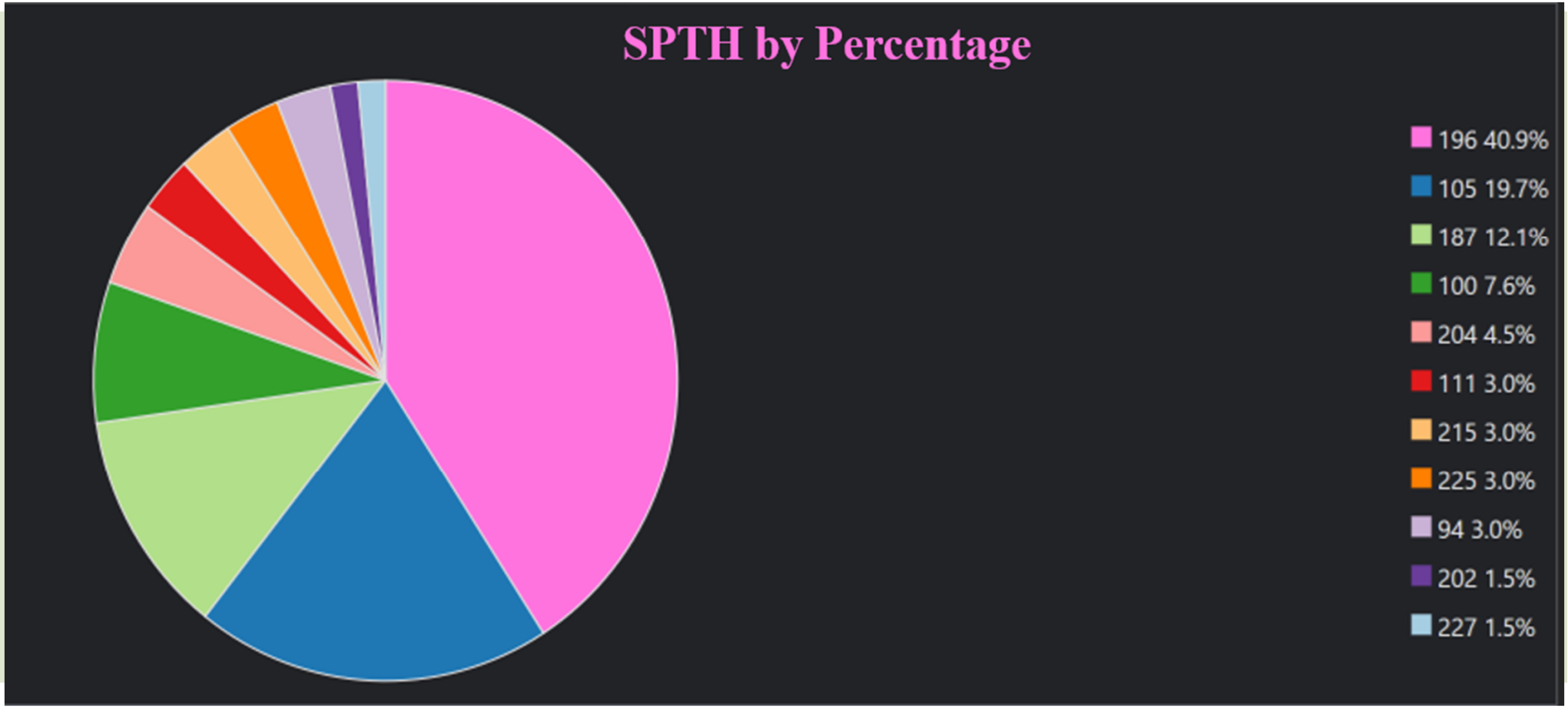


SITE POTENTIAL TREE HEIGHT (SPTH)



SITE POTENTIAL TREE HEIGHT (SPTH)

SITE POTENTIAL TREE HEIGHT (SPTH)



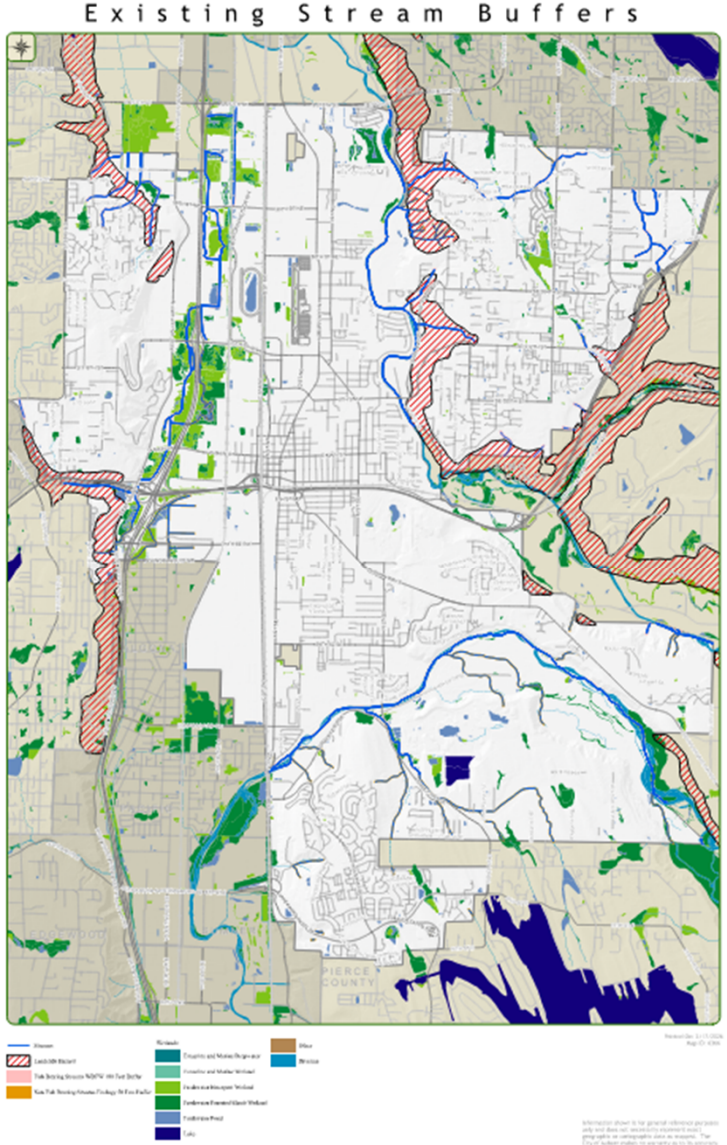
FACET RECOMMENDATIONS

- Increase stream buffer widths to better align with best available science
- Add vegetative buffer standards
- Where appropriate, use the term “riparian” to align with WDFW’s recommendations

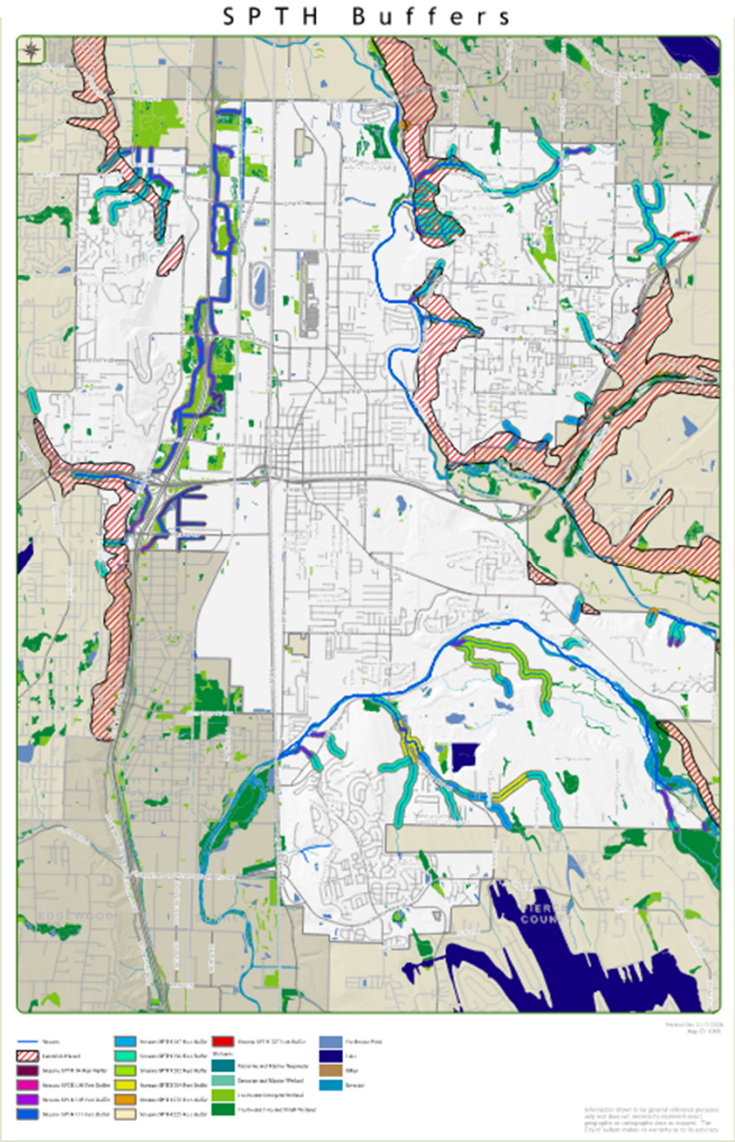
EXISTING BUFFERS

Stream buffers shall be established as follows:

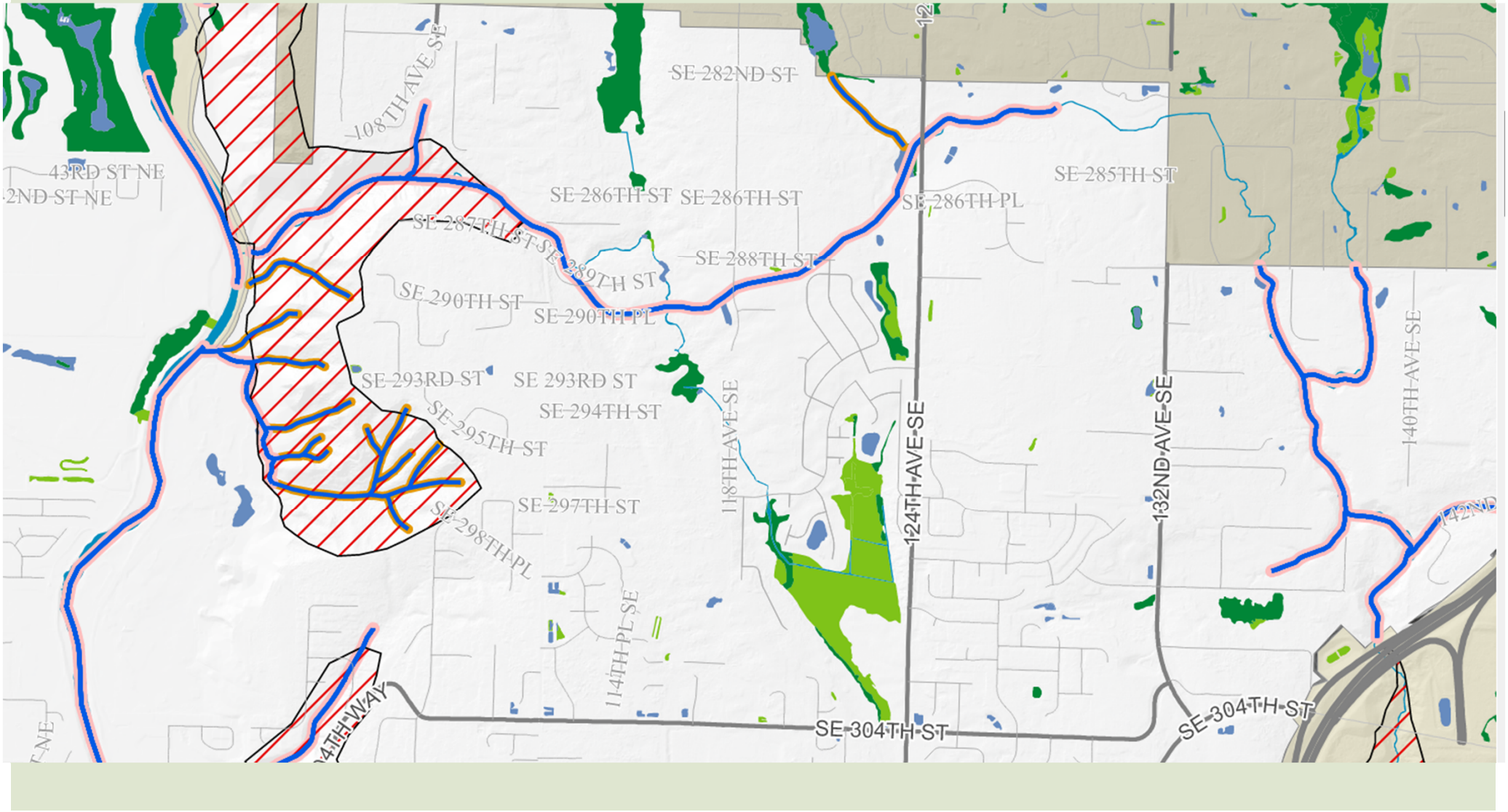
Stream Type	Minimum Buffer Width (in feet)
Type S	Per SMP
Type F	100
Type Np	50
Type Ns	50

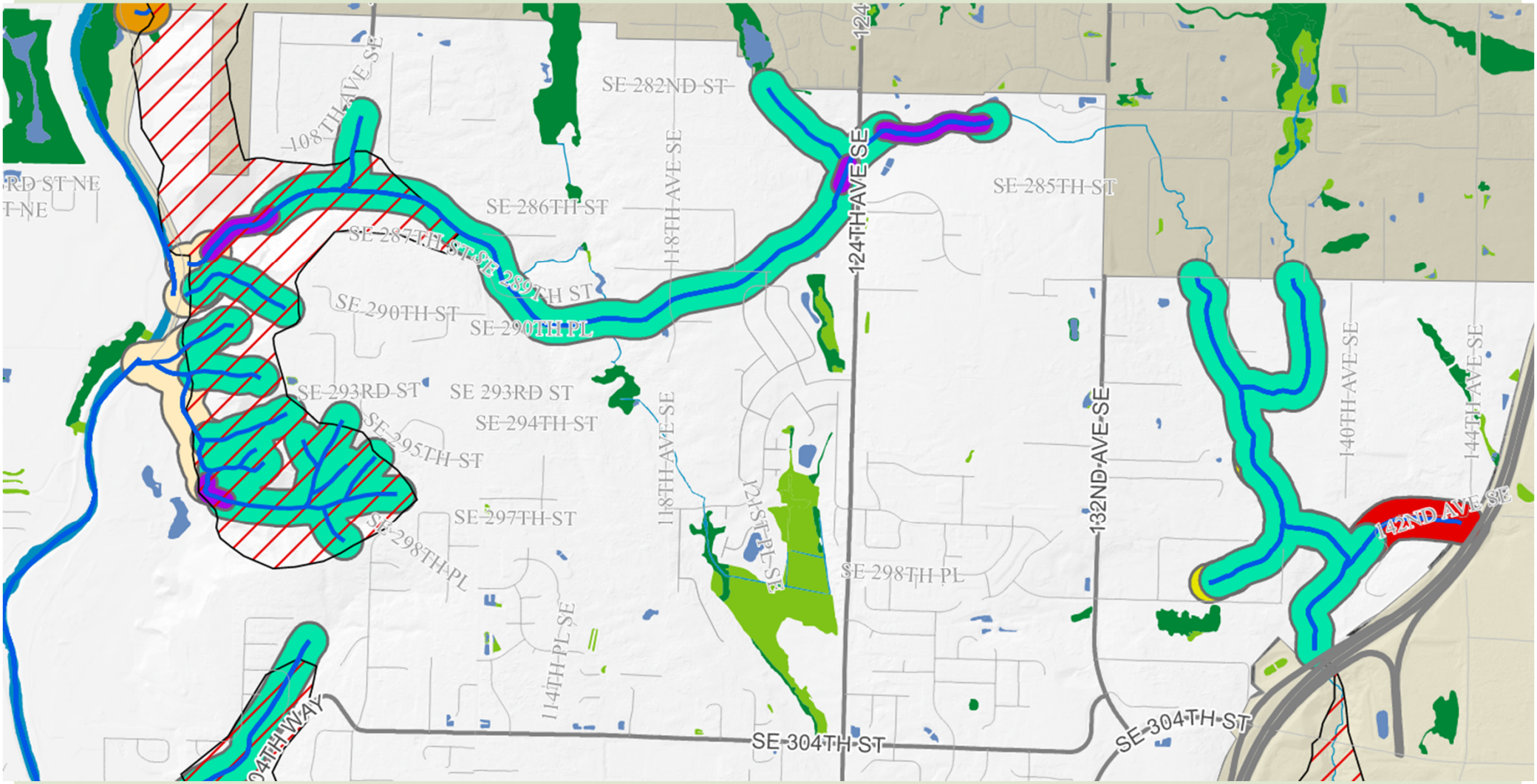


EXISTING STREAM BUFFERS MAP



AUBURN GIS ANALYSIS


SE 282ND ST
108TH AVE SE
43RD ST NE
2ND ST NE
SE 286TH ST
SE 286TH ST
SE 285TH ST
SE 286TH PL
SE 287TH ST
SE 289TH ST
SE 288TH ST
SE 290TH ST
SE 290TH PL
SE 293RD ST
SE 293RD ST
SE 294TH ST
SE 295TH ST
118TH AVE SE
124TH AVE SE
132ND AVE SE
140TH AVE SE
SE 297TH ST
SE 298TH PL
114TH PL SE
SE 304TH ST
SE 304TH ST

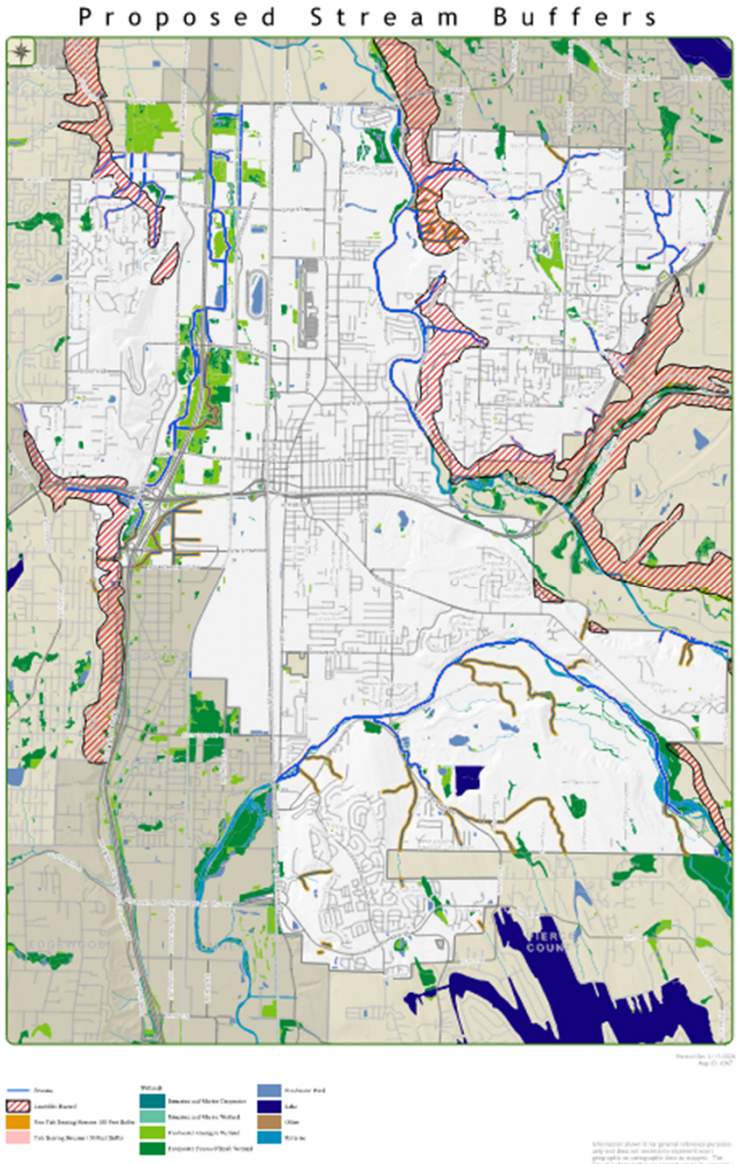

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108TH AVE SE
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SE 290TH ST
SE 290TH PL
SE 293RD ST
SE 294TH ST
SE 295TH ST
SE 297TH ST
SE 298TH PL
114TH PL SE
118TH AVE SE
121ST PL SE
124TH AVE SE
SE 285TH ST
132ND AVE SE
140TH AVE SE
142ND AVE SE
144TH AVE SE
SE 304TH ST

Stream Type	Proposed Stream(riparian) Buffers	
	Standard Buffer[1]	Increased Buffer[2]
Type S	Per SMP	Per SMP
Type F	150 ft	200 ft
Type Np	100 ft	133 ft
Type Ns	100 ft	133 ft

*1 Director decision based on site-specific conditions, such as presence of critical habitat for ESA species.

*2 In addition to ESA review, an increase applies if the applicant does not implement applicable minimization measures and does not meet vegetated buffer standards.

PROPOSED STREAM (RIPARIAN) BUFFERS



PROPOSED STREAM BUFFERS MAP

VEGETATIVE STANDARD

To be considered fully functioning, a stream buffer (riparian management zone) must contain:

- i. An average of eighty percent (80%) native vegetation cover, with no more than ten percent (10%) noxious weed cover; and

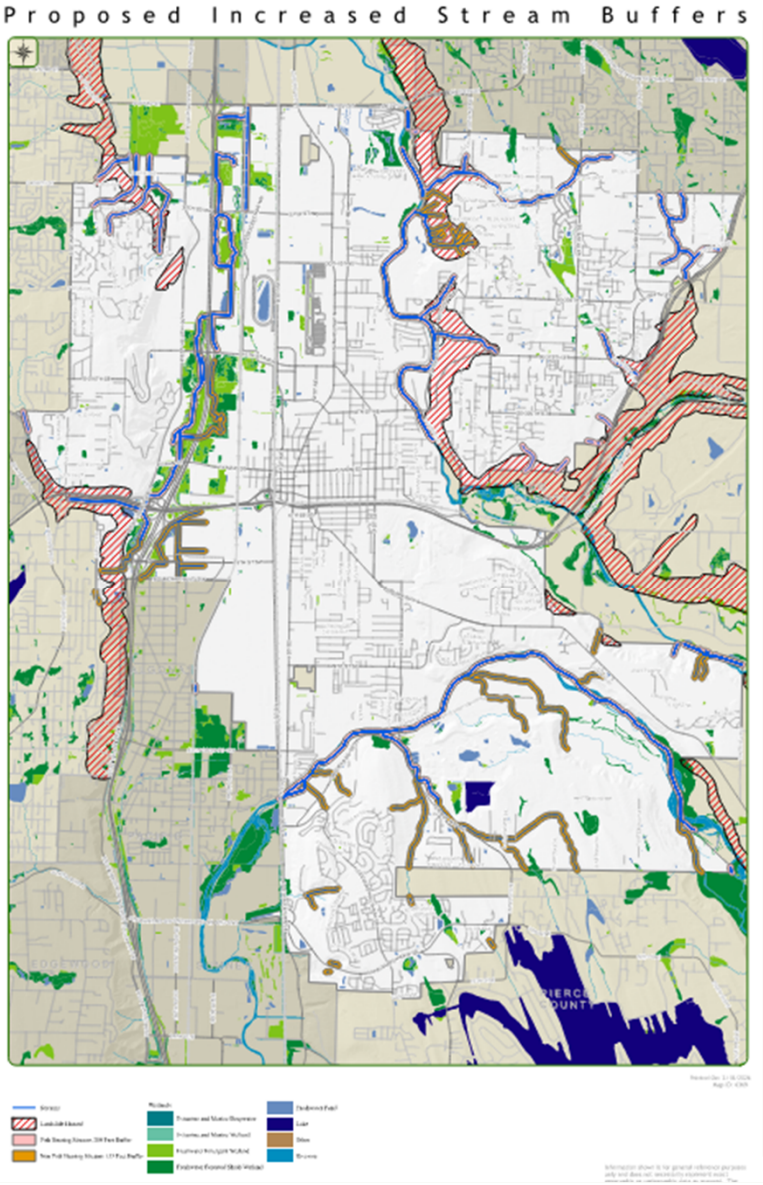
- ii. A native plant community that includes tree, shrub, and groundcover proportions that mimic native forest for the region.

Stream Type	Proposed Stream(riparian) Buffers	
	Standard Buffer[1]	Increased Buffer[2]
Type S	Per SMP	Per SMP
Type F	150 ft	200 ft
Type Np	100 ft	133 ft
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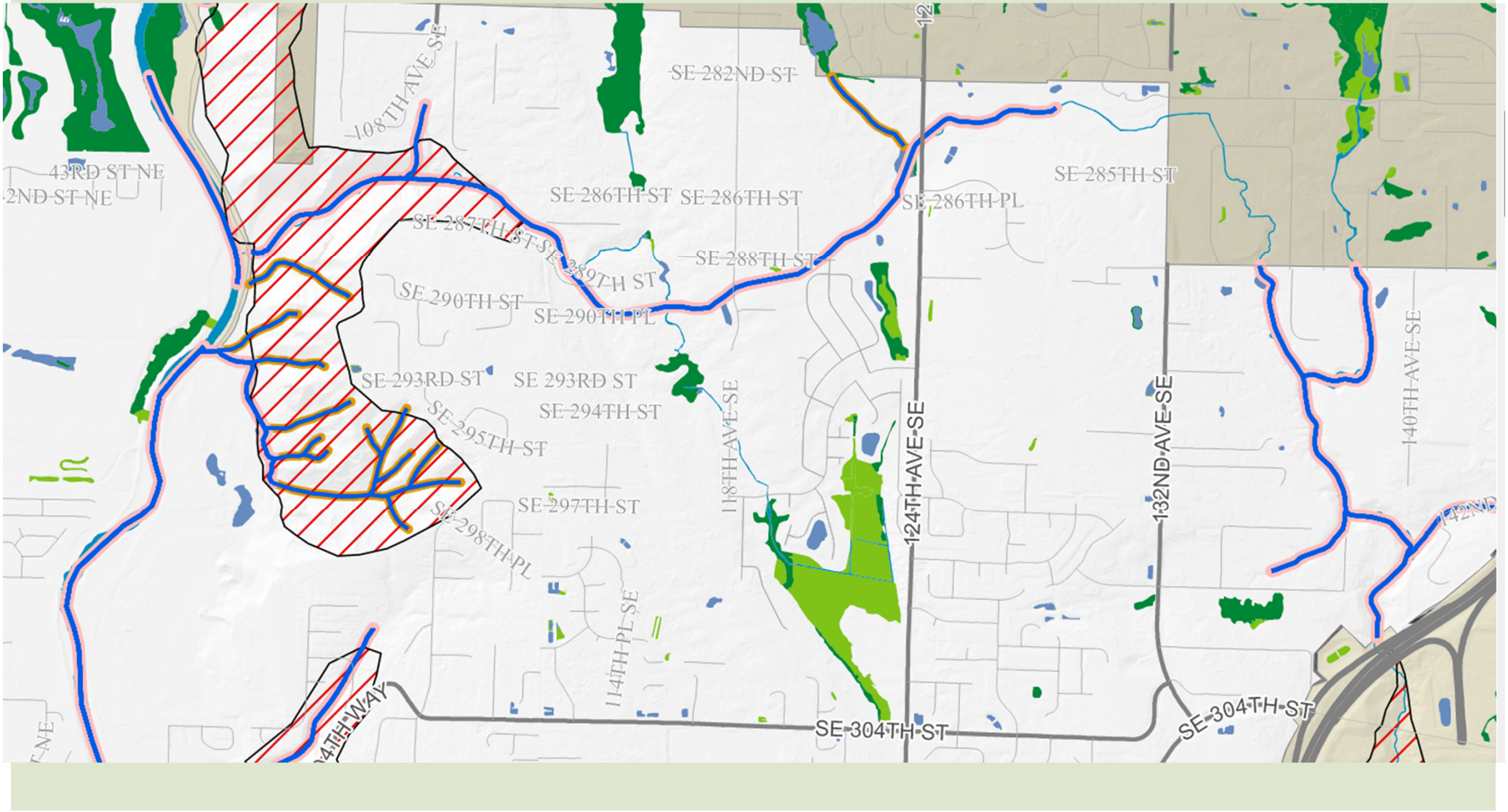
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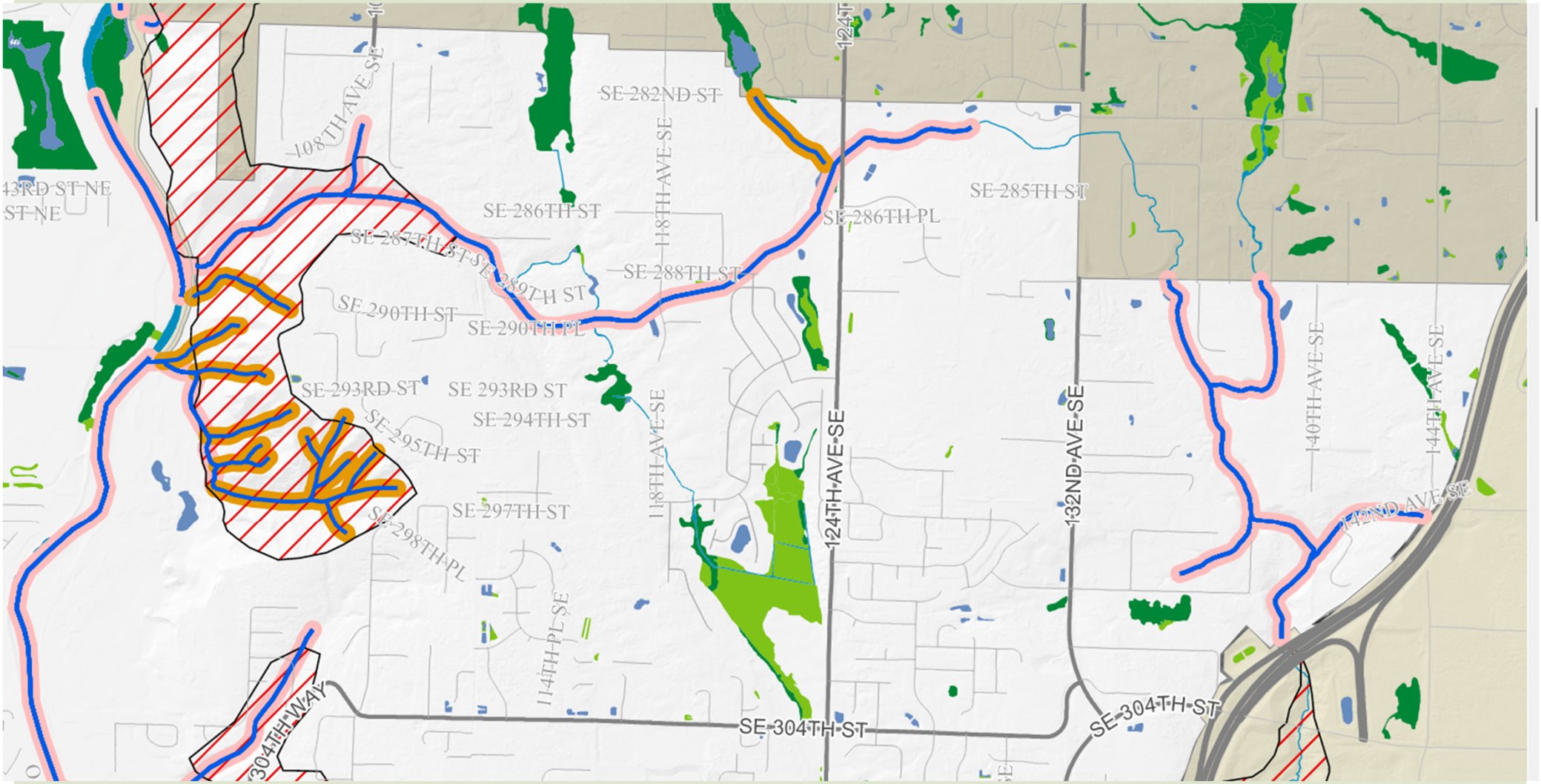
*2 In addition to ESA review, an increase applies if the applicant does not implement applicable minimization measures and does not meet vegetated buffer standards.

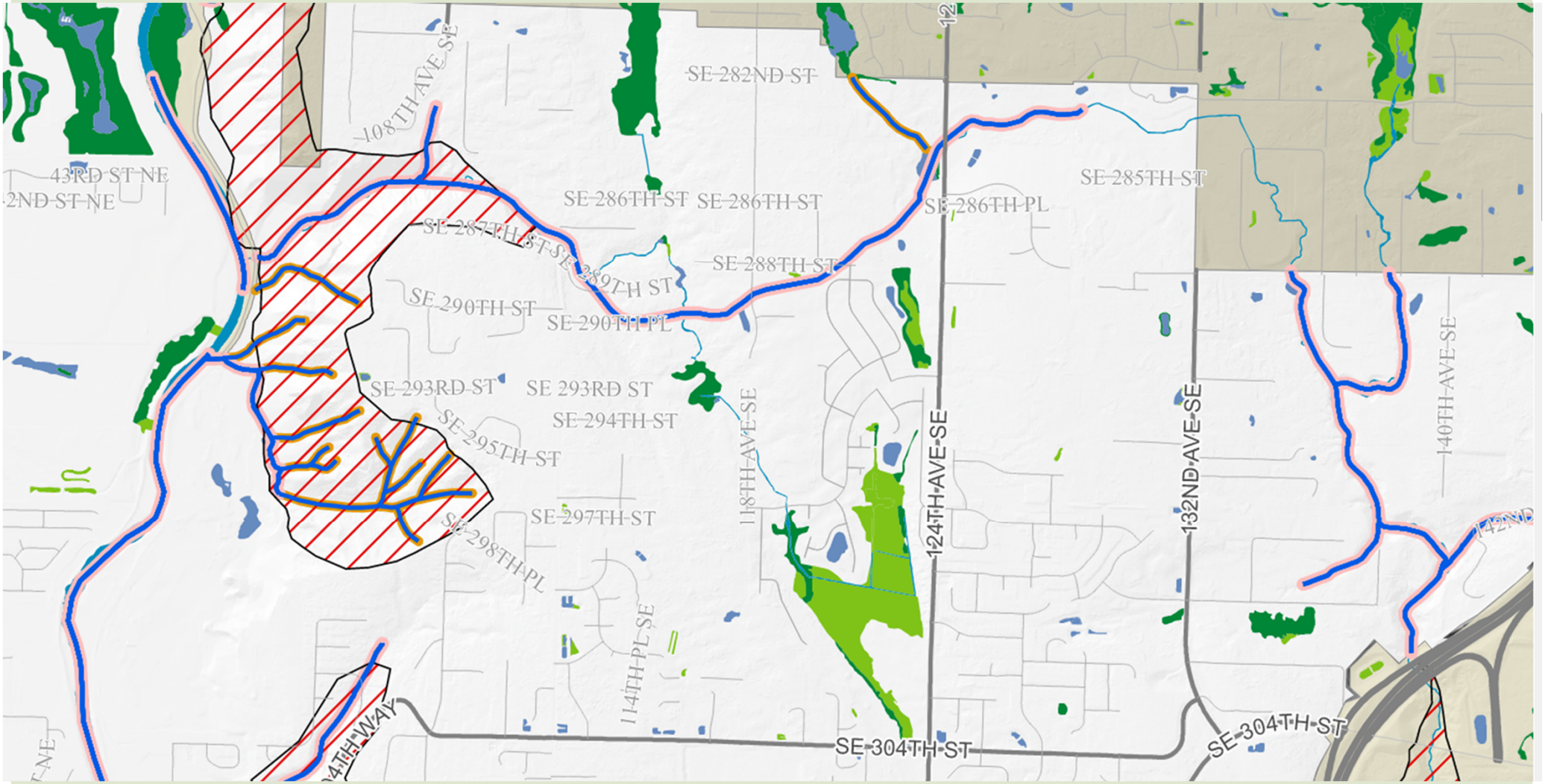
PROPOSED STREAM (RIPARIAN) BUFFERS

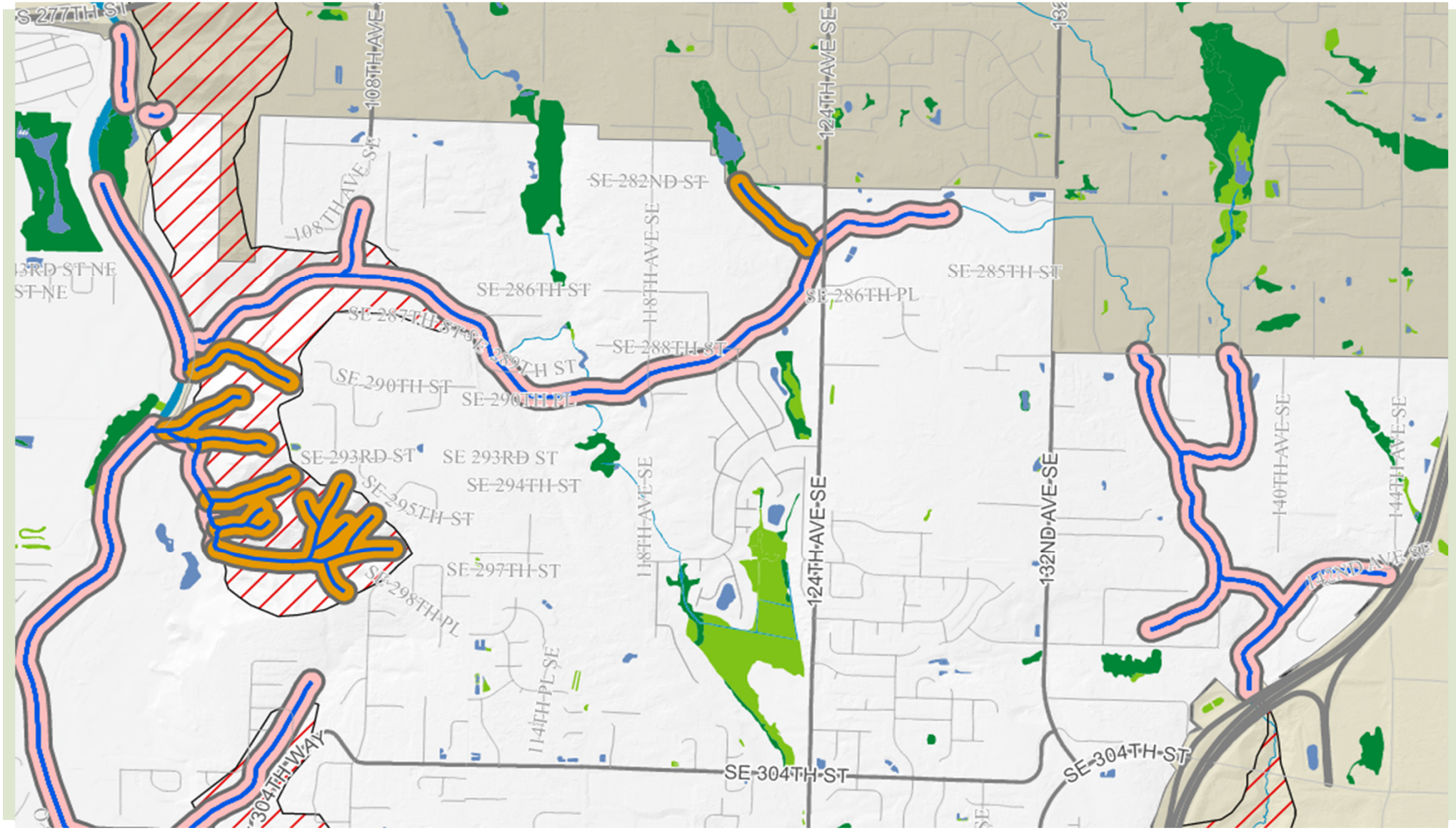


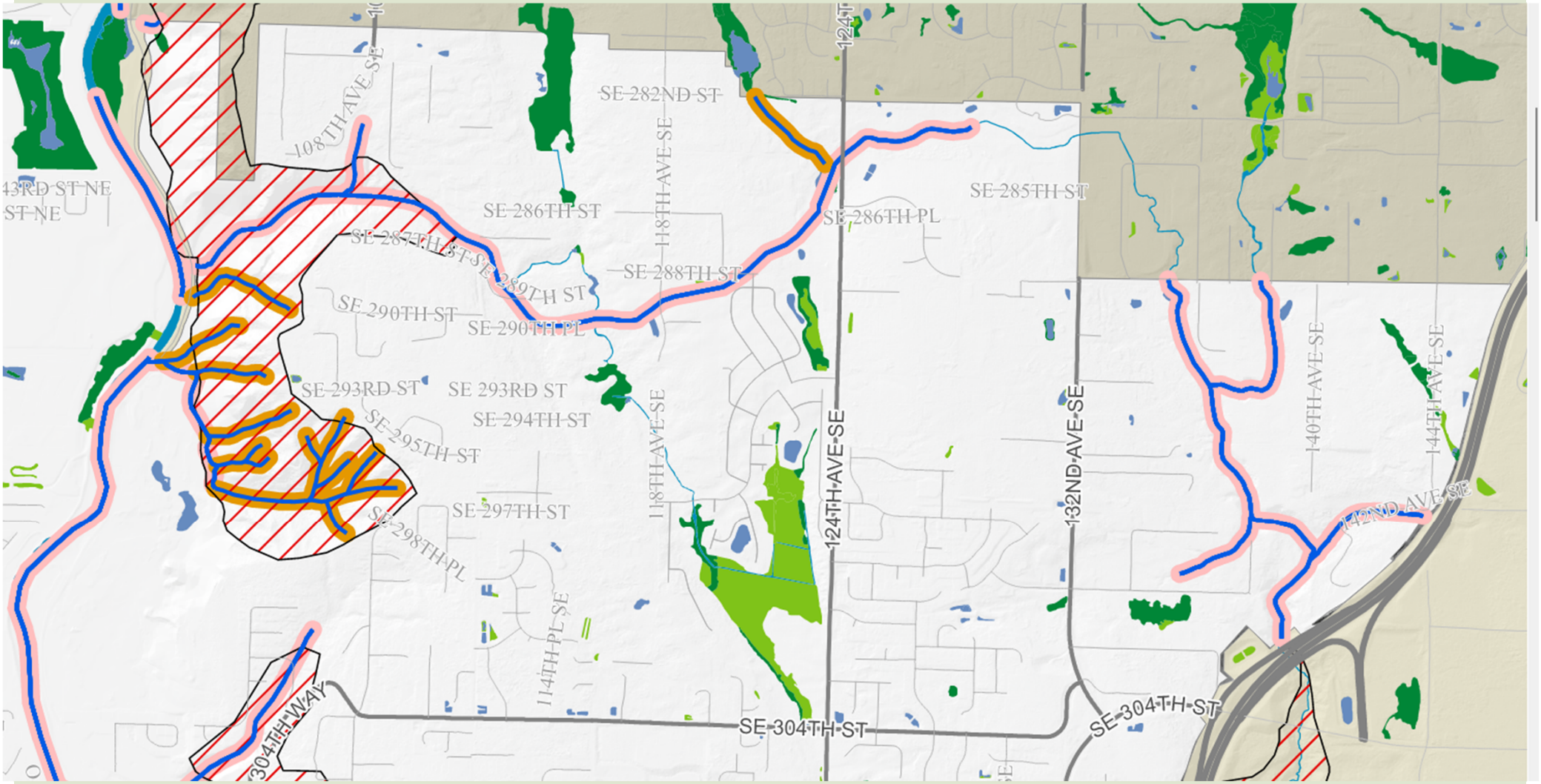
PROPOSED INCREASED STREAM BUFFERS MAP

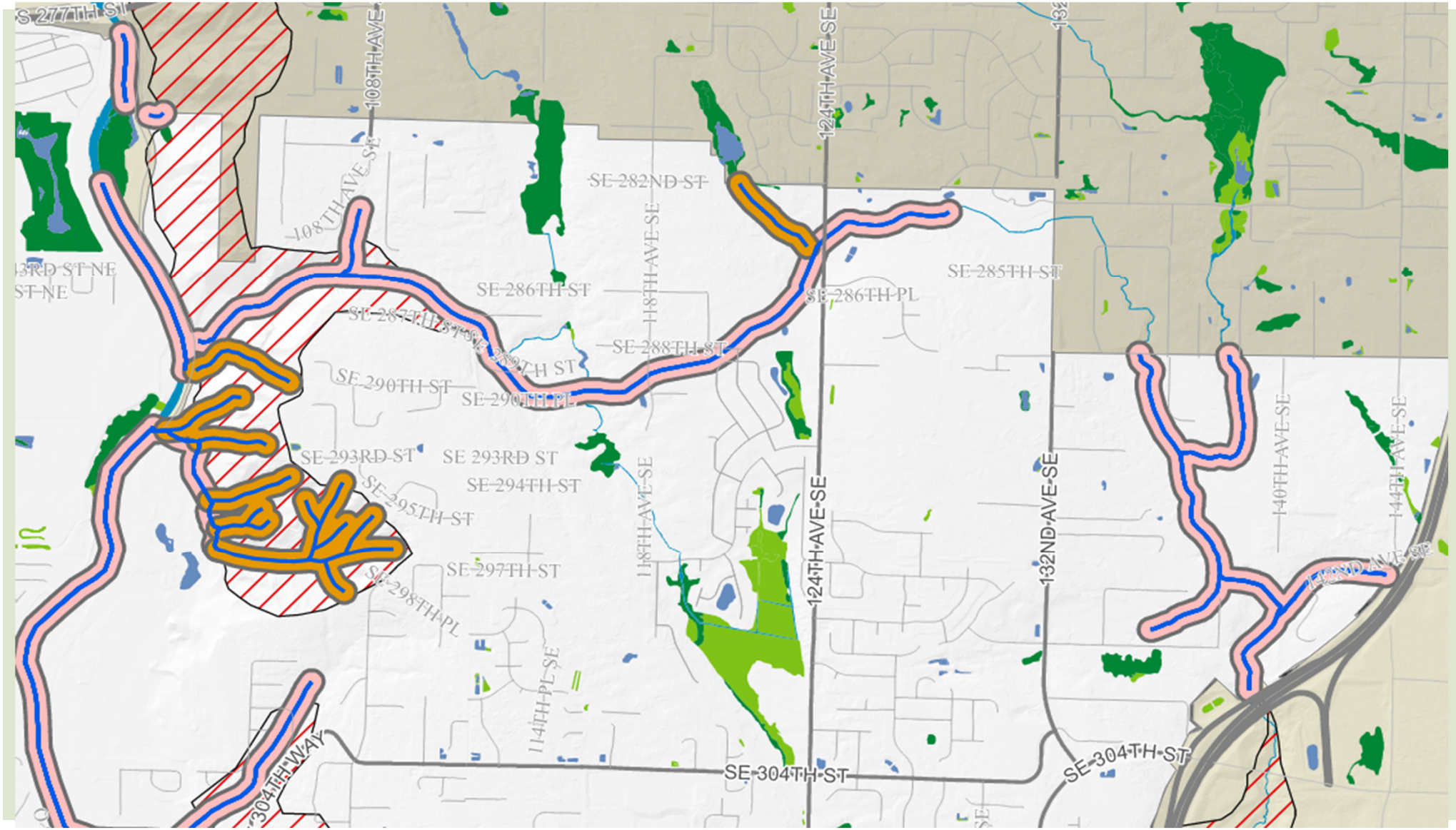

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108TH AVE SE
43RD ST NE
2ND ST NE
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SE 295TH ST
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132ND AVE SE
140TH AVE SE
SE 297TH ST
SE 298TH PL
114TH PL SE
SE 304TH ST
SE 304TH ST

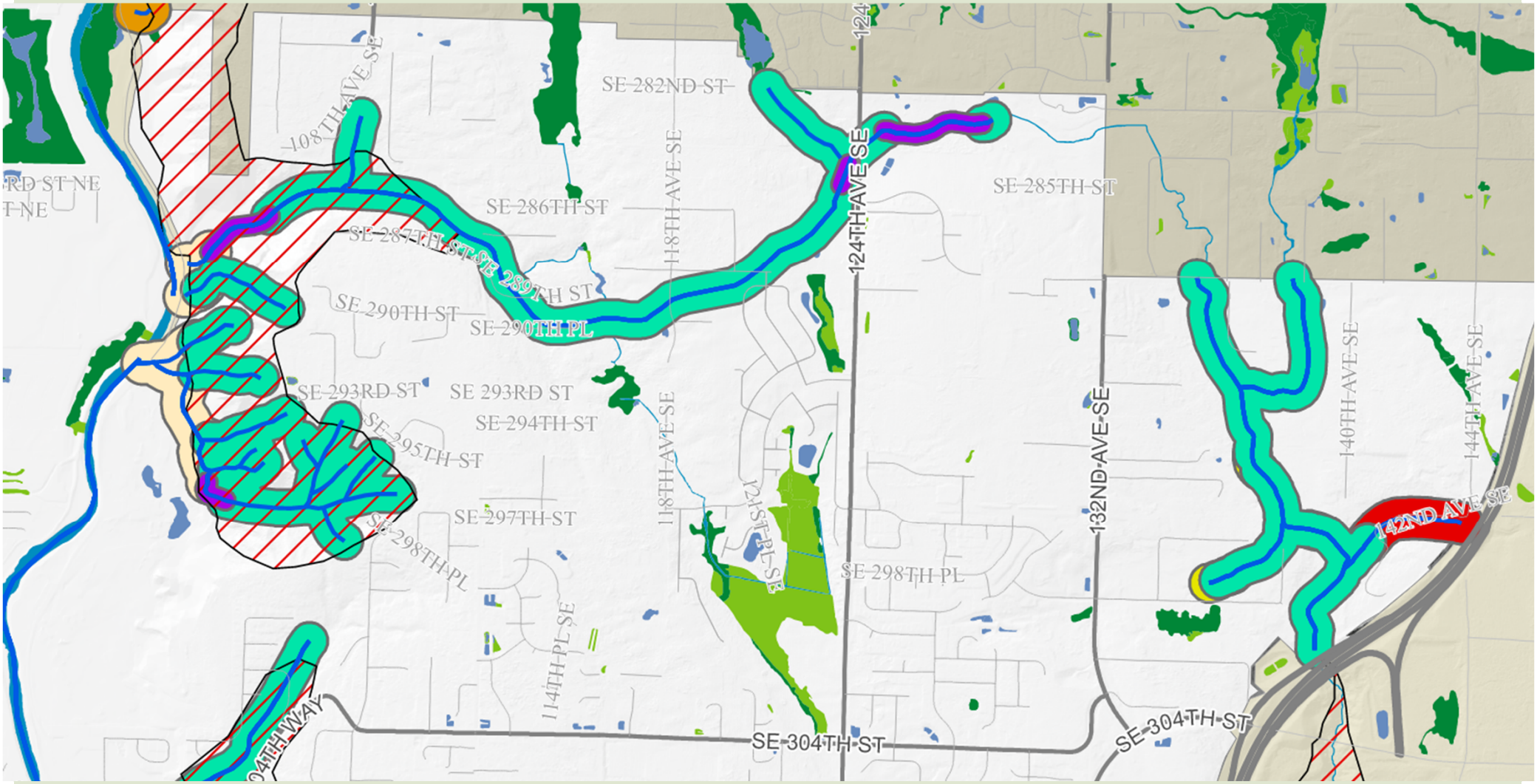

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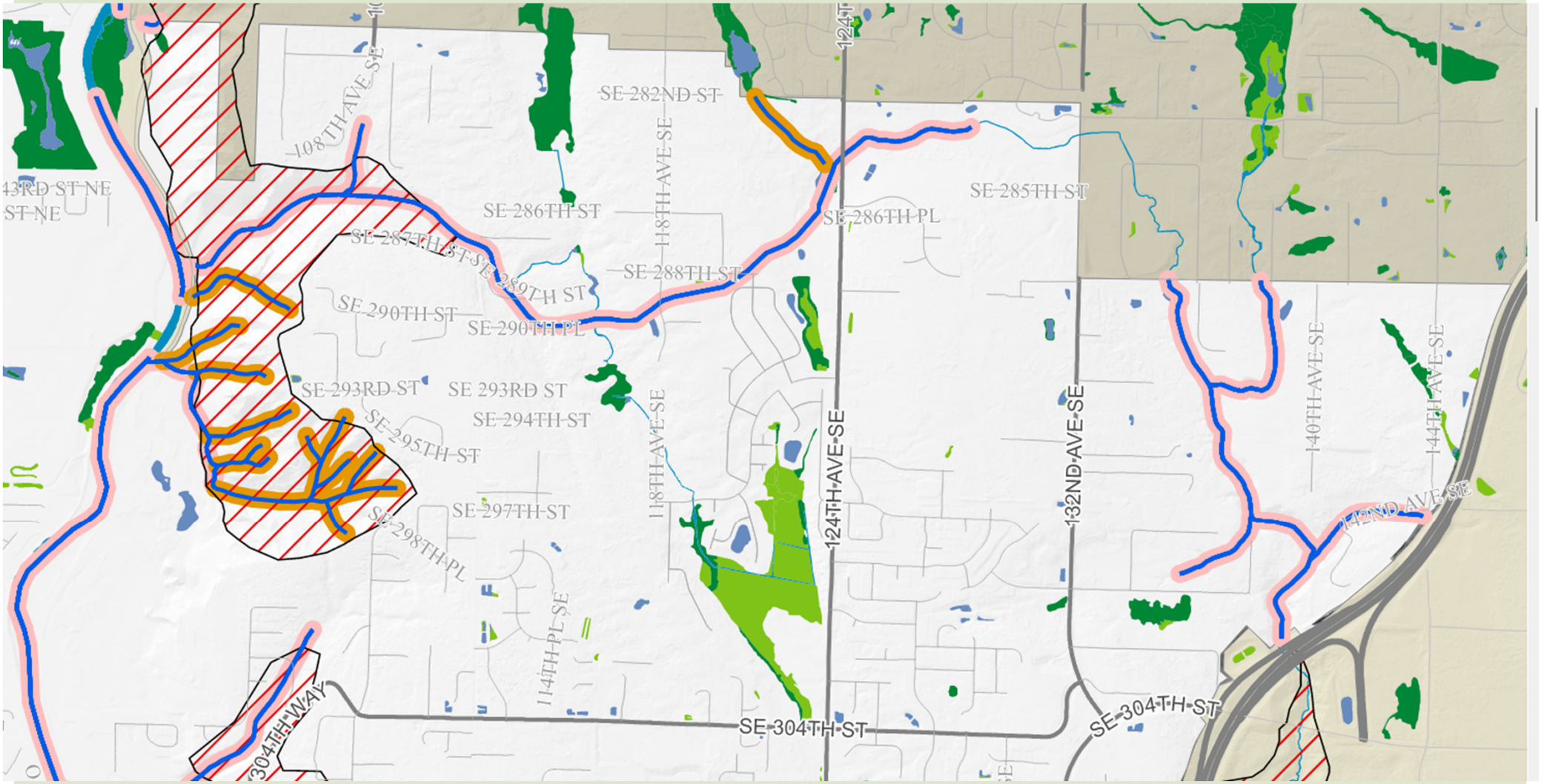

108TH AVE SE
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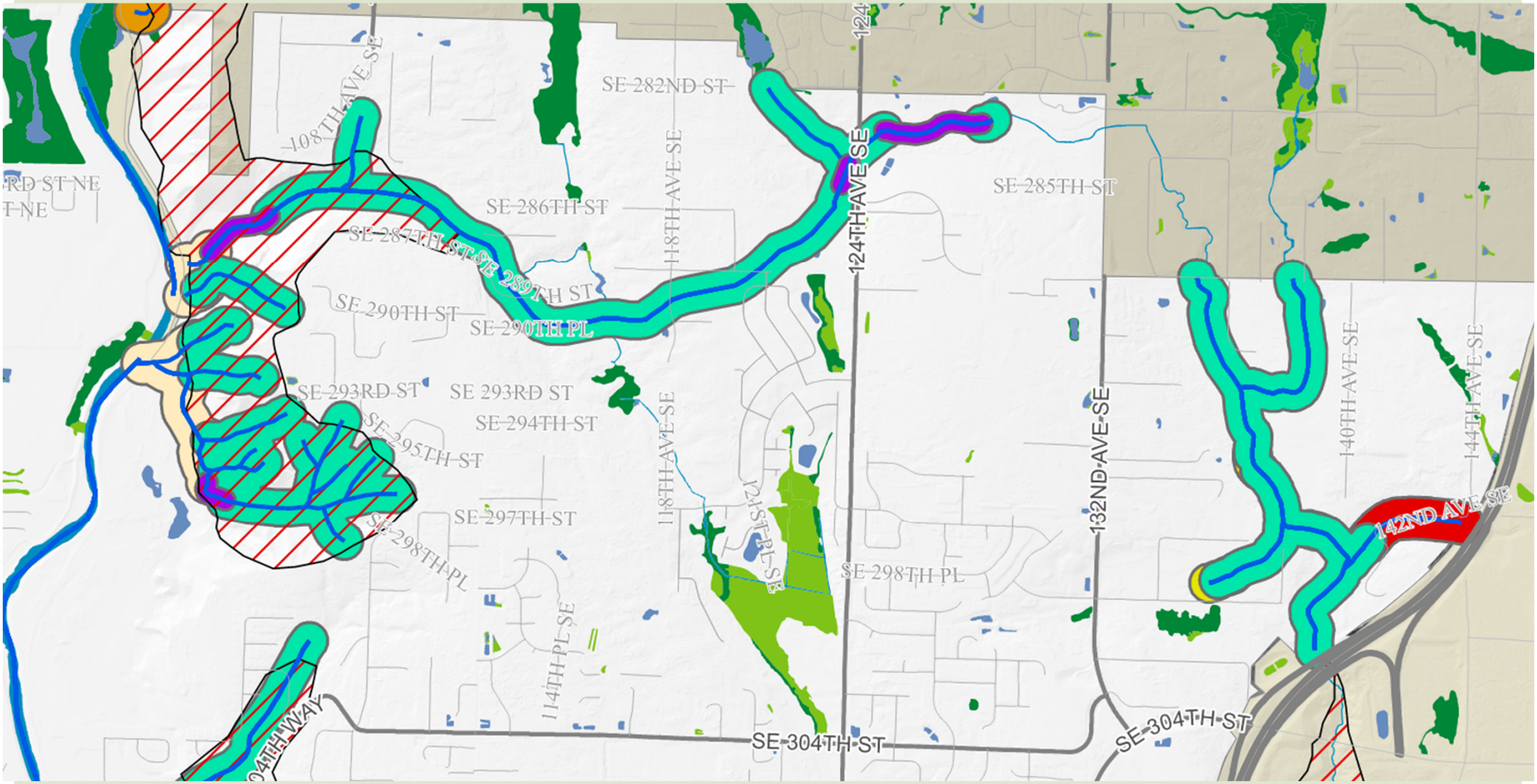

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132ND AVE SE
140TH AVE SE
144TH AVE SE
SE 304TH ST
304TH WAY

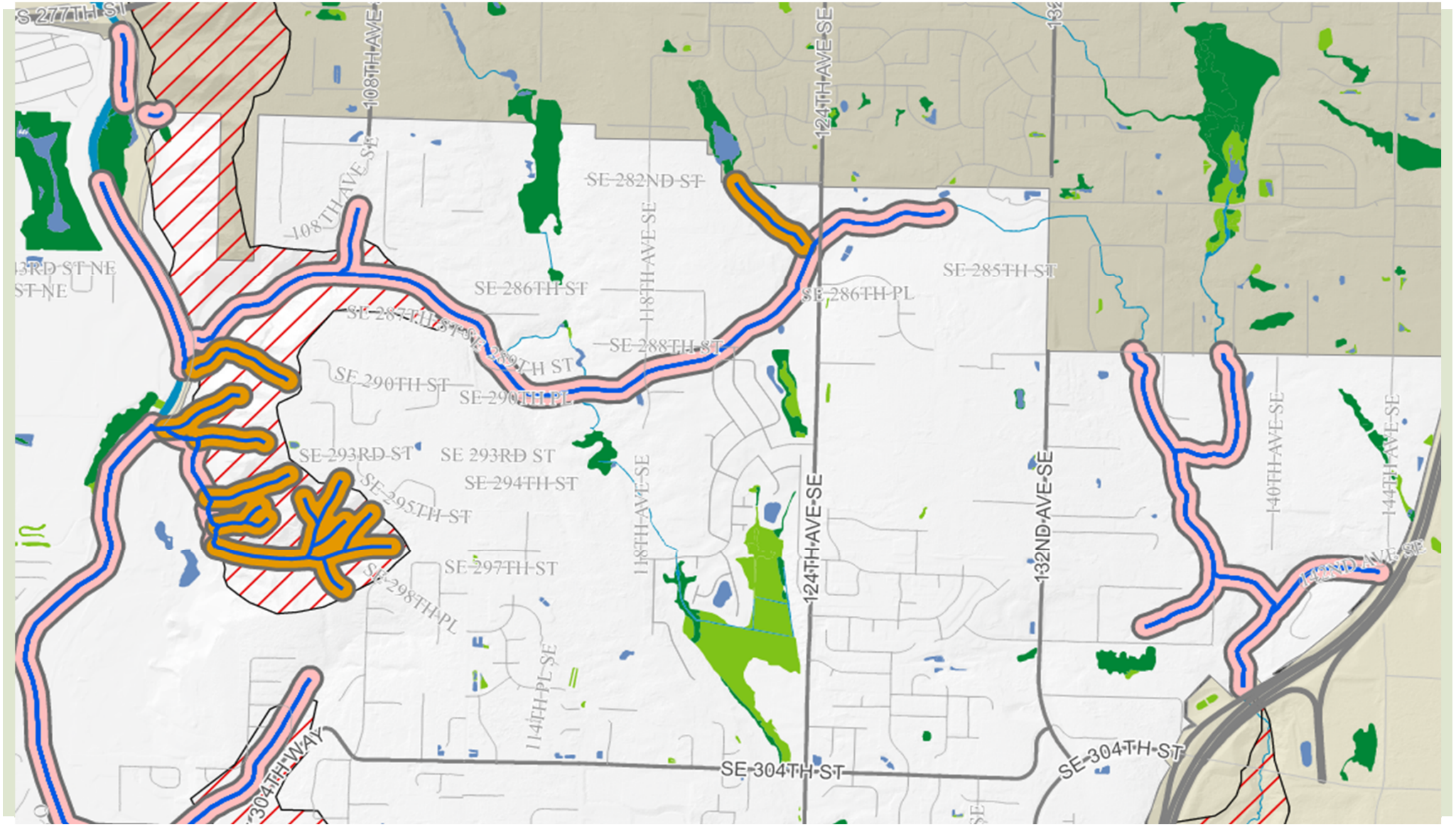

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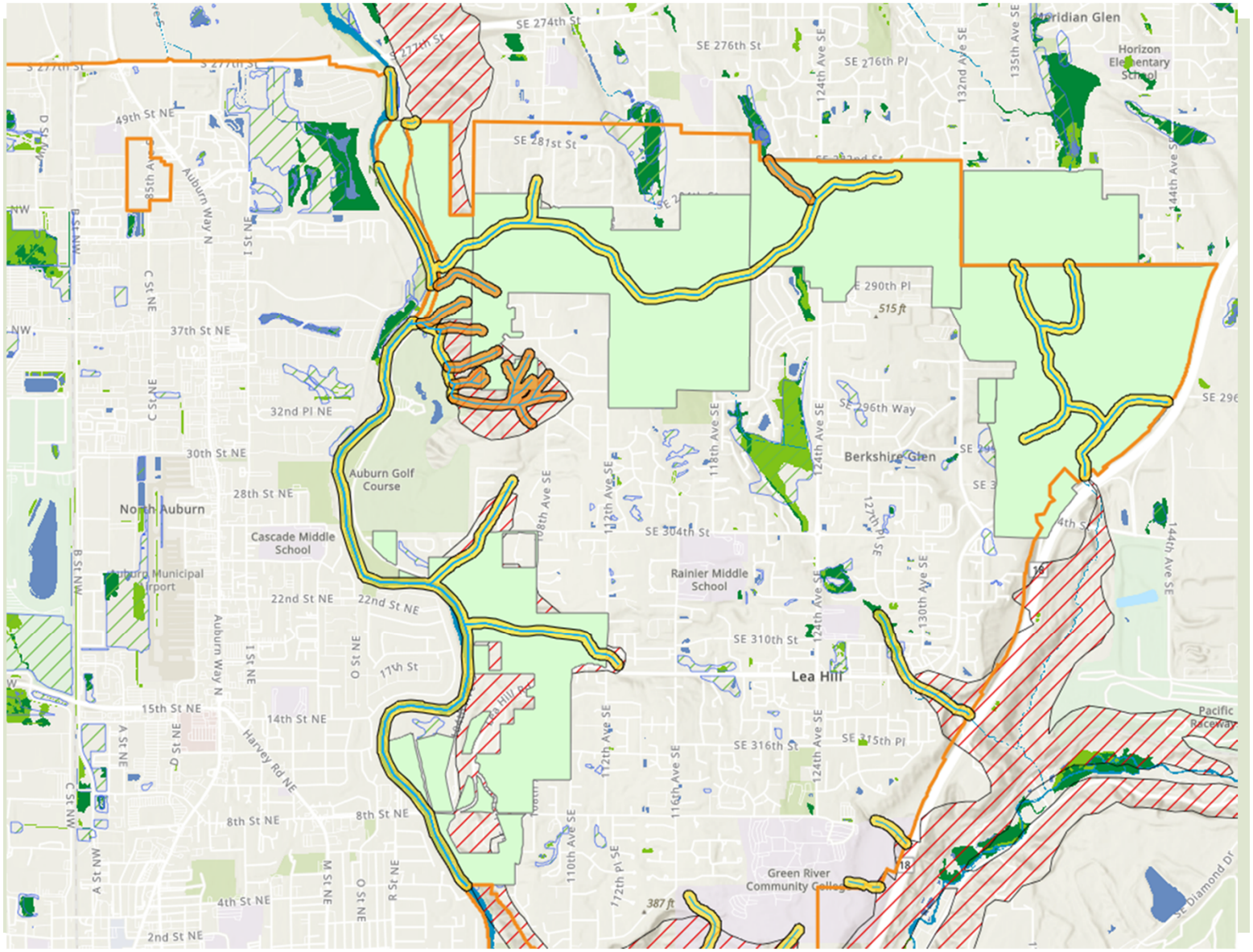

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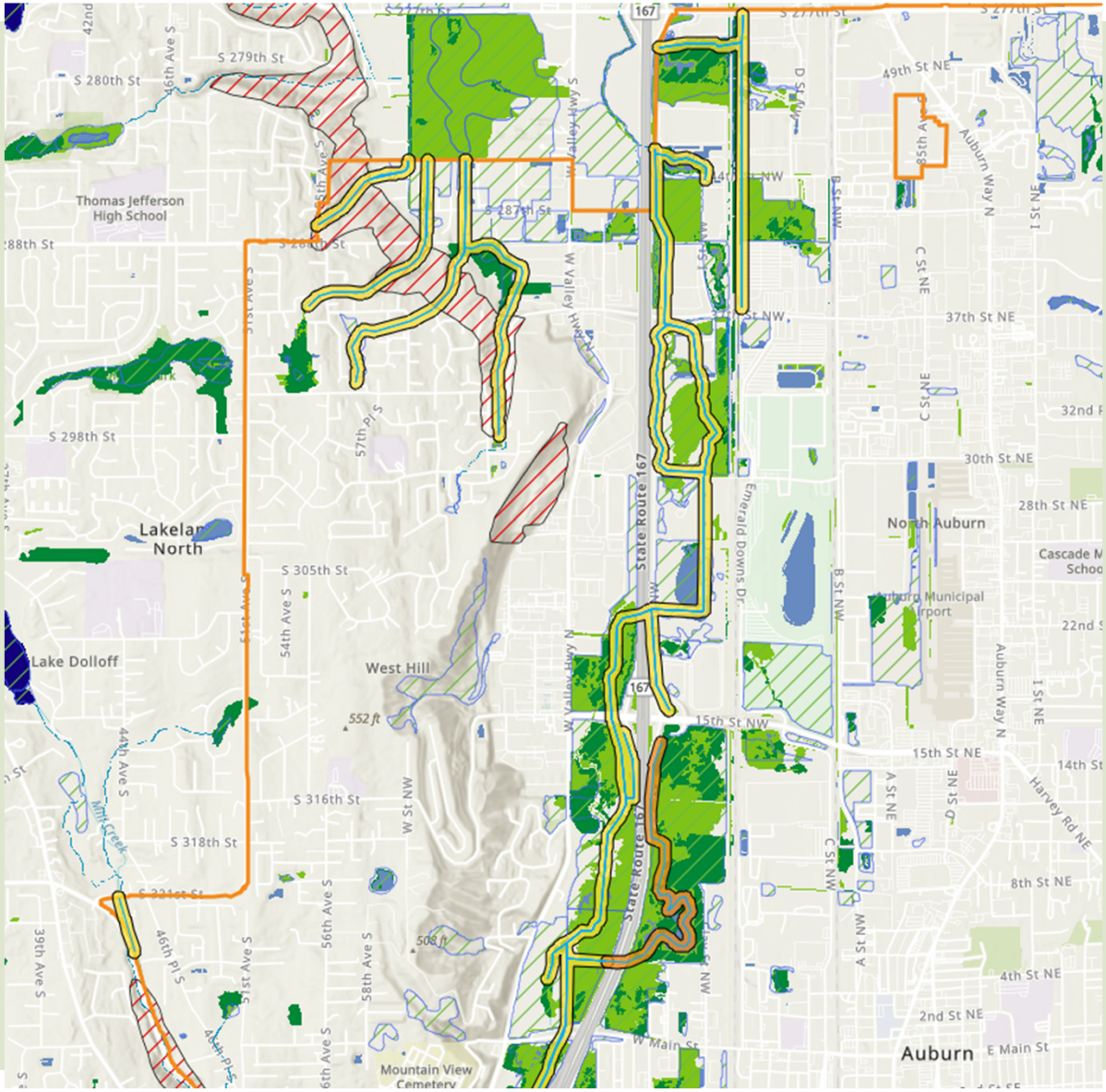

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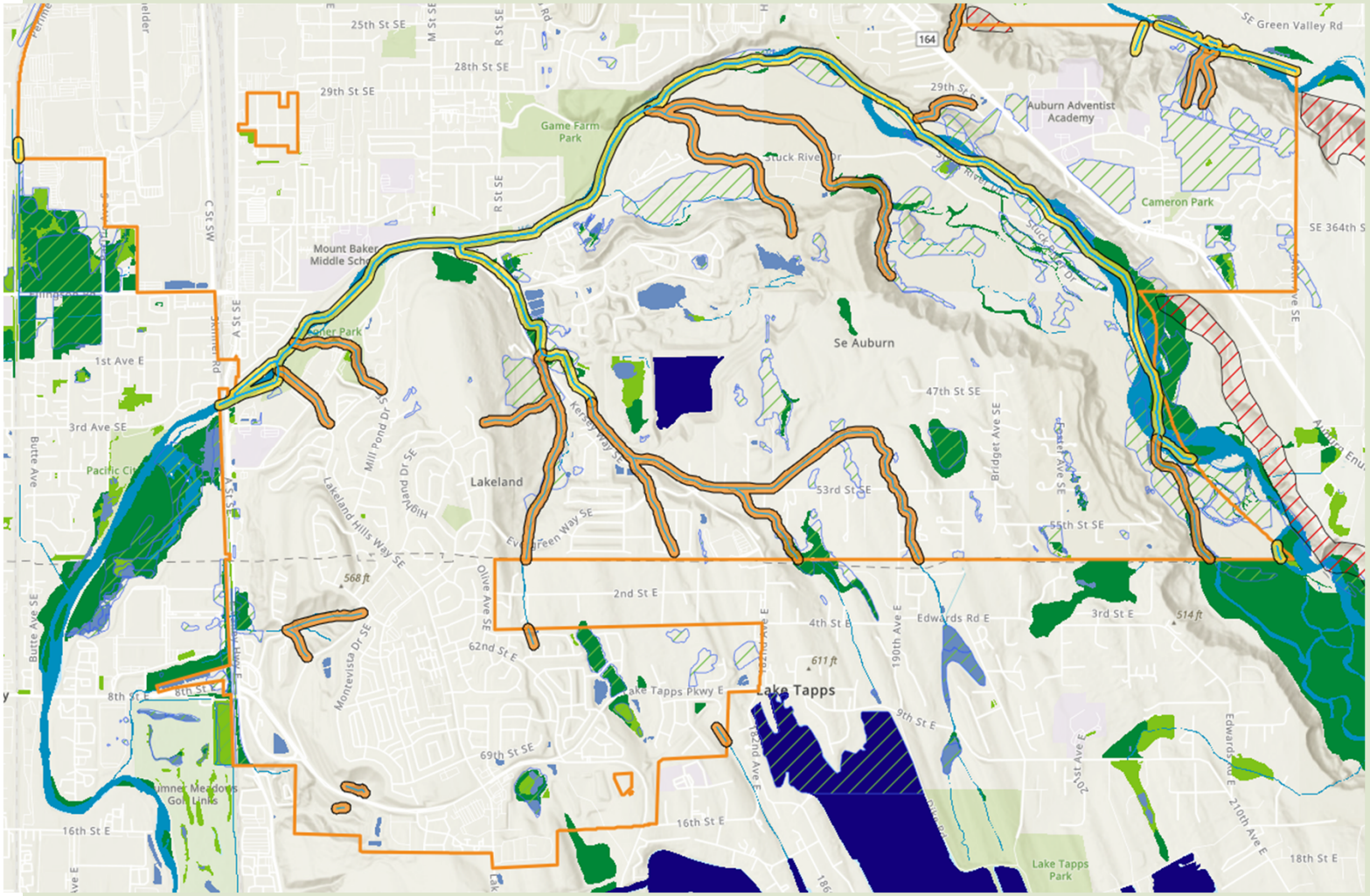

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AUBURN GIS ANALYSIS



AUBURN GIS ANALYSIS



AUBURN GIS ANALYSIS

COMPARISON TO OTHER JURISDICTIONS

Kent (DRAFT; proposed to be adopted)	Burien (adopted)	Covington (adopted)	Maple Valley (adopted)
Type F: 112-150' (was 100') Type NP: 100' (was 40') Type NS: 100' (was 40')	Type F: 150' - 199' (was 100') Type Np: 100' – 133' (was 50') Type Ns: 100' – 133' (was 50')	Type F: 125' – 166' Type NP: 100' – 133' Type NS: 100' – 133'	Type F: 100' Type NP: 100' Type NS: 100'

Renton (adopted)	SeaTac (adopted)
Type F: 115' – 200' Type NP: 75' – 100' Type NS: 50' – 67'	Type F: 200' (was 100') Type NP: 100' (was 50') Type NS: 100' (was 25')

SUMMARY OF CHANGES

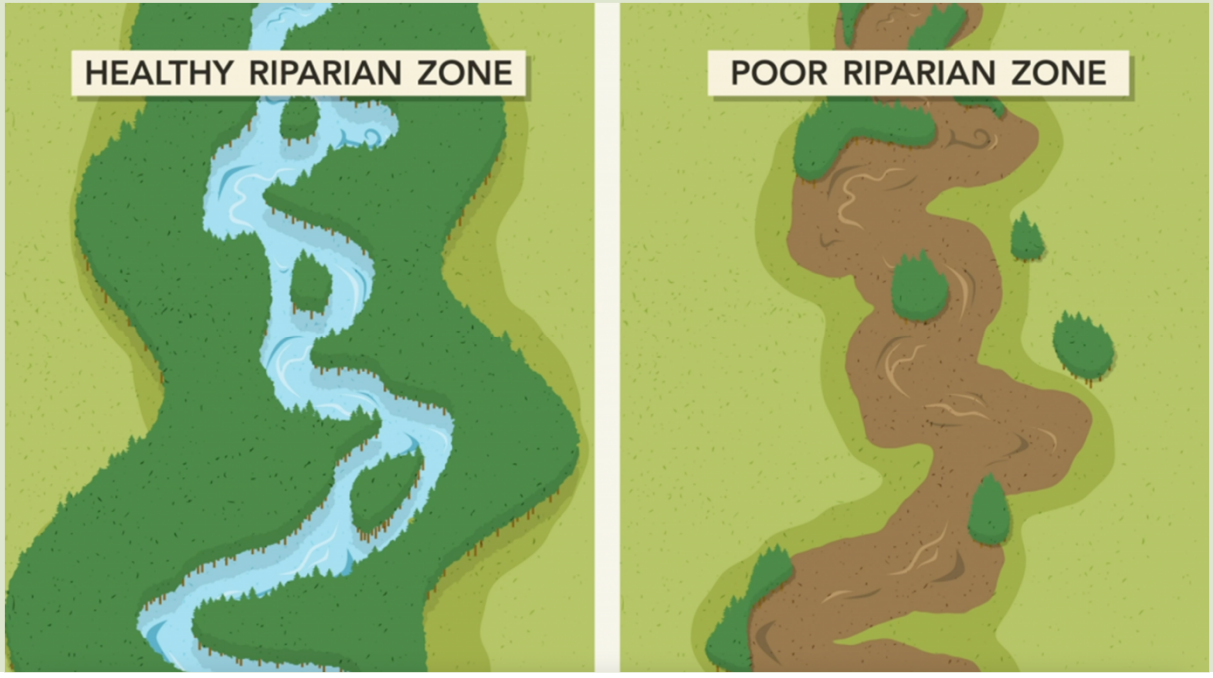
Stream Type	Existing Code		Proposed Code	
	Minimum buffer	Maximum buffer[1]	Standard Buffer[1]	Increased Buffer[2]
Type S	Per SMP	Per SMP	Per SMP	Per SMP
Type F	100 ft	150 ft	150 ft	200 ft
Type Np	50 ft	100 ft	100 ft	133 ft
Type Ns	50 ft	75 ft	100 ft	133 ft

*1 Director decision based on site-specific conditions, such as presence of critical habitat for ESA species.

*2 In addition to ESA review, an increase applies if the applicant does not implement applicable minimization measures and does not meet vegetated buffer standards.

SUMMARY OF CHANGES CONT.

- Stream typology consistency edits
- Streams now must comply with minimization measures



NEXT STEPS

- Requesting Planning Commission Feedback
- Future Public Hearing on Critical Areas Ordinance Text Amendment



Thank you for your time.
Questions?



Department of Community Development

Planning • Building • Development Engineering • Permit Center
Economic Development • Code Enforcement

AUBURN VALUES

SERVICE

ENVIRONMENT

ECONOMY

CHARACTER

SUSTAINABILITY

WELLNESS

CELEBRATION

Chapter 16.10
CRITICAL AREAS

Sections:

16.10.010 Purpose and intent.
16.10.020 Definitions.
16.10.030 Applicability – Regulated activities.
16.10.040 Exemptions and nonconforming uses.
16.10.050 Critical areas maps.
16.10.060 Relationship to other regulations.
16.10.070 Critical area review process and application requirements.
16.10.080 Classification and rating of critical areas.
16.10.090 Buffer areas and setbacks.
16.10.100 Alteration or development of critical areas – Standards and criteria – Prohibited uses.
16.10.110 Mitigation standards, location, and timing, wetland replacement ratios, and long-term protection requirements.
16.10.120 Performance standards for mitigation planning.
16.10.130 Monitoring program and contingency plan.
16.10.140 Procedural provisions.
16.10.150 Reasonable use provision.
16.10.160 Variances.
16.10.170 Special exception for public agencies and utilities.
16.10.180 Severability.

16.10.010 Purpose and intent.

A. The city of Auburn contains numerous areas that can be identified and characterized as critical or environmentally sensitive. Such areas within the city include wetlands, streams, fish and wildlife habitat conservation areas, geologic hazard areass, aquifer recharge areas, and flood hazards areas.

B. The city finds that these critical areas perform a variety of valuable and beneficial biological and physical functions that benefit the city and its residents. Alteration of certain critical areas may also pose a threat to public safety or to public and private property or the environment. The city therefore finds that identification, regulation and protection of critical areas are necessary to protect the public health, safety and general welfare. The city further finds that the functions of critical areas and the purpose of these regulations include the following:

1. *Wetlands.* Wetlands perform a variety of functions that include maintaining water quality; storing and conveying storm water and flood water; recharging groundwater; providing important fish and wildlife habitat; and serve as areas for recreation, education and scientific study, and aesthetic appreciation.

Wetland buffers serve to moderate runoff volume and flow rates; reduce sediment, chemical nutrient and toxic pollutants; provide shading to maintain desirable water temperatures; provide habitat for wildlife; and protect wetland resources from harmful intrusion.

The primary goals of wetland regulation are to avoid adverse effects to wetlands; to achieve no net loss of wetland function and value – acreage may also be considered in achieving the overall goal; to provide levels of protection that reflect the sensitivity of individual wetlands and the intensity of proposed land uses; and to restore and/or enhance existing wetlands, where possible.

2. *Streams* *and stream buffers (riparian management zone).* Streams and their associated riparian corridors provide important fish and wildlife habitat; help to maintain water quality; store and convey storm water and flood water; recharge groundwater; recruit large woody debris to create habitat structure; provide shade to maintain water temperatures and dissolved oxygen levels; support bank integrity and root reinforcement to reduce erosion; and serve as areas for recreation, education and scientific study and aesthetic appreciation. ~~Stream buffers serve to moderate runoff volume and flow rates; reduce sediment, chemical nutrient and toxic pollutants; provide shading to maintain desirable water temperatures; provide habitat for wildlife; and protect stream resources from harmful intrusion.~~

The primary goals of stream regulation are to avoid adverse effects to streams and associated riparian corridors; to achieve no net loss of functions and values of the larger ecosystem in which the stream is located; to protect fish and wildlife resources; to protect

water quality through appropriate management techniques; and, where possible, to provide for stream enhancement and rehabilitation.

3. *Fish and Wildlife Habitat Conservation Areas and Wildlife Habitat Corridors*. Wildlife habitat provides opportunities for food, cover, nesting, breeding and movement for fish and wildlife; maintains and promotes diversity of species and habitat; coordinates habitat protection with elements of the open space system; helps to maintain air and water quality; helps control erosion; serves as areas for recreation, education, scientific study, and aesthetic appreciation; and provides neighborhood separation and visual diversity within urban areas.

The primary goals of wildlife habitat regulation are to avoid adverse effects to critical habitats for fish and wildlife; to achieve no net loss of functions and values of the larger ecosystem in which the wildlife habitat is located; to implement the goals of the Endangered Species Act (ESA); to promote connectivity between habitat areas to allow for wildlife movement; to provide multi-purpose open space corridors; and where possible to provide for fish and wildlife habitat enhancement and rehabilitation that reflect the sensitivity of the species.

4. *Aquifer Recharge Areas.* Aquifer recharge areas provide a source of potable water and contribute to stream discharge/flow. Such areas contribute to the replenishing~~charge~~ of aquifers, and springs ~~and/or wells~~ and are susceptible to contamination of water supplies through infiltration of pollutants through the soil.

The primary goals of aquifer recharge protection regulations are to protect groundwater resources and water quality by maintaining the quantity of recharge; avoiding or limiting land use activities that pose potential risk of aquifer contamination; ~~to~~ minimizing~~e~~ or avoiding adverse effects to groundwater through the application of performance standards, ~~;~~ and ~~to~~ complying with the requirements of the Federal Safe Drinking Water Act and Washington Administrative Code that require Group A public water systems to develop and implement a wellhead protection program.

5. *Geologic~~ally~~ Hazard~~ous~~ Areas.* Geologic~~ally~~ hazard~~ous~~ areas means areas that, because of their susceptibility to erosion, sliding, earthquake, volcanic activity, or other geological events, are not suited to the siting of commercial, residential, or industrial development consistent with public health or safety concerns.

The primary goals of regulating geologic hazards areas are to avoid and minimize potential impacts to life and property by regulating and/or limiting land uses where necessary, and to conduct appropriate levels of analysis and ensure sound engineering and construction practices to address identified hazards.

6. *Flood Hazard Areas.* Refer to Chapter 15.68 ACC Floodplain Development Management. Floodplains help to store and convey storm water and flood water; recharge groundwater; provide important areas for riparian habitat; and serve as areas for recreation, education, and scientific study. Development within floodplain areas can be hazardous to those inhabiting such development, and to those living upstream and downstream. Floods also cause substantial damage to public and private property that results in significant costs to the public and individuals.

The primary goals of flood hazard regulations are to limit or condition development within the regulatory floodplain to avoid substantial risk of damage to public and private property and that results in significant costs to the public and individuals; to avoid significant increases in peak storm water flows or loss of flood storage capacity; to protect critical habitat for fish and wildlife, and to meet the purposes set forth in Chapter 15.68 ACC. Requirements for the identification, assessment, alteration, and mitigation of flood hazard areas are contained in Chapter 15.68 ACC.

C. This chapter and other sections as incorporated by reference contain standards, procedures, criteria and requirements intended to identify, analyze, and mitigate potential impacts to the city's critical areas, and to enhance and restore degraded resources where possible. The general intent of these regulations is to avoid impacts to critical areas. In appropriate circumstances, impacts to specified critical areas resulting from regulated activities may be minimized, rectified, reduced and/or compensated for, consistent with the requirements of this chapter.

D. It is the further intent of this chapter to:

1. Comply with the requirements of the Growth Management Act (Chapter 36.70A RCW) and implement rules to identify and protect critical areas and to perform the review of development regulations required by RCW 36.70A.215;

2. Develop and implement a comprehensive, balanced and fair regulatory program that avoids impacts to critical resources where possible, that requires that mitigation be

performed by those affecting critical areas, and that thereby protects the public from injury, loss of life, property or financial losses due to flooding, erosion, landslide, seismic events, soil subsidence, or steep slope failure;

3. Implement the goals and policies of the Auburn comprehensive plan, including those pertaining to natural features and environmental protection, as well as goals relating to land use, housing, economic development, transportation, and adequate public facilities;

4. Serve as a basis for exercise of the city's substantive authority under the State Environmental Policy Act (SEPA) and the city's environmental review procedures, where necessary to supplement these regulations, while also reducing the city's reliance on project-level SEPA review;

5. Provide consistent standards, criteria and procedures that will enable the city to effectively manage and protect critical areas while accommodating the rights of property owners to use their property in a reasonable manner;

6. Provide greater certainty to property owners regarding uses and activities that are permitted, prohibited, and/or regulated due to the presence of critical areas;

7. Coordinate environmental review and permitting of proposals involving critical areas with existing development review and approval processes to avoid duplication and delay pursuant to the Regulatory Reform Act, Chapter 36.70B RCW;

8. Establish conservation and protection measures for threatened and endangered fish species in compliance with the requirements of the Endangered Species Act and the Growth Management Act requirements to preserve or enhance anadromous fisheries, WAC 365-195-925;

9. Alert members of the public, including appraisers, assessors, owners, potential buyers or lessees, to the development limitations of critical areas and their required buffers.

E. *Best Available Science.* The city has considered and included the best available science in developing these regulations, consistent with RCW 36.70A.172 and WAC 365-195-900, et seq. This has been achieved through research and identification of relevant technical sources of information, consultation with experts in the disciplines covered by this chapter, and consultation and requests for technical information regarding best available science from state and federal resource agencies.

Preparation of this chapter has included the use of relevant nonscientific information, including consideration of legal, social, policy, economic, and land use issues. This reflects the city's responsibilities under numerous laws and programs, including other provisions of the Growth Management Act, and the need to weigh and balance various factors as part of decision making to accomplish municipal objectives. This may result in some risk to the functions and values of some critical areas; however, it is recognized that the Growth Management Act requires the city to designate and protect critical areas. The city will also use its authority under the State Environmental Policy Act (SEPA) to identify, consider and mitigate, where appropriate, significant adverse effects on critical resources not otherwise addressed by the regulations of this chapter.

The city intends to review and monitor implementation of its critical areas regulations and to use an adaptive management approach. It will make adjustments to the regulations, as appropriate, in response to changing conditions, new information about best available science, or empirical data indicating the effectiveness of its regulatory program. This will occur in the context of the city's ongoing review and revision of its comprehensive plan and development regulations pursuant to the Growth Management Act.

Additional information, both scientific and nonscientific, regarding compliance with WAC 365-195-915(c), including identification of risks to resources and Washington State Department of Ecology guidance, is contained in the findings and conclusions and the overall record supporting adoption of Auburn's critical areas regulations. (Ord. 6733 § 3 (Exh. B), 2019; Ord. 6295 § 3, 2010; Ord. 5894 § 1, 2005.)

16.10.020 Definitions.

For purposes of this chapter, the following definitions shall apply:

"Anadromous fish" means fish that spawn and rear in freshwater and mature in the marine environment, such as salmon, steelhead, sea-run cutthroat, and bull trout.

"Applicant" means the person, party, firm, corporation, or other entity that proposes or has performed any activity that affects a critical area.

"Aquifer" means ~~, generally, any~~underground layer of water bearing soil or rock ~~unit~~ formation. Specifically, an underground body of soil or rock formation that contains sufficient saturated

permeable material to conduct groundwater and capable of ~~and~~ yielding ~~economically~~ significant quantities of groundwater to wells or springs.

"Aquifer recharge area" ~~means areas with a critical recharging effect on aquifers used for potable water, including areas where an aquifer that is a source of drinking water is vulnerable to contamination that would affect the potability of the water, or is susceptible to reduced recharge.~~ are land areas that have a critical recharging effect on aquifers used for potable water, including designated areas, such as wellhead protection zones, where an aquifer that is a source of drinking water is vulnerable to contamination that would affect the potability of the water, or is susceptible to reduced recharge.

"Artificially created wetlands" means wetlands created from nonwetland sites through purposeful, legally authorized human action, such as irrigation and drainage ditches, grass-lined swales, canals, retention or detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities.

Best Available Science. As defined in the Procedural Criteria for Adopting Comprehensive Plans and Development Regulations for Best Available Science at WAC 365-195-900, et seq.

"Buffer or buffer area, critical area" means a naturally vegetated, undisturbed, enhanced or revegetated zone surrounding a critical area that protects the critical area from adverse impacts to its integrity and value, and is an integral part of the resource's ecosystem.

"Characterized by urban growth" refers to land having urban growth located on it, or to land located in relationship to an area with urban growth on it as to be appropriate for urban growth.

"City" means the city of Auburn.

"Clearing" ~~means the removal of timber, brush, grass, ground cover or other vegetative matter from a site, which exposes the earth's surface of the site, or any actions which disturb the existing ground surface.~~ Means the destruction and removal of vegetation by manual, mechanical, or chemical methods.

"Climate resilience" means the capacity of ecosystems and infrastructure to recover and adapt to climate-related stressors including extreme weather, flooding, drought, and wildfire.

"Comprehensive plan" means the city of Auburn comprehensive plan as now adopted or hereafter amended.

"Critical area report" means a report prepared by a qualified professional~~consultant~~ to determine the presence, type, class, size, function and/or value of an area subject to these regulations. Also see "Stream or wetland reconnaissance report," "Wetland impact assessment report" and "Wildlife report."

"Critical areas" or "environmentally sensitive areas" means areas that possess important natural functions and embody a variety of important natural and community values. Such areas include wetlands, streams, fish and wildlife habitat, geologic~~ally~~ hazard~~ous~~ areas, aquifer recharge areas, ~~and~~ flood hazard areas, and any other areas designated as critical under state law, including but not limited to those defined in RCW 36.70A.030. If not conducted properly, development or alteration of such areas may cause significant impacts to the valuable functions and values of these areas and/or may generate risks to the public health and general welfare, and/or to public and private property.

"Critical erosion hazard areas" means lands or areas underlain by soils identified by the U.S. Department of Agriculture Soil Conservation Service (SCS) (now known as the Natural Resources Conservation Service) as having "severe" or "very severe" erosion hazards. This includes, but is not limited to, the following group of soils when they occur on slopes of 15 percent or greater: Alderwood-Kitsap (AkF), Alderwood gravelly sandy loam (AgD), Kitsap silt loam (KpD), Everett (EvD), and Indianola (InD). Additional soil groups may be identified through site-specific analysis.

"Critical geologic hazard areas" means lands or areas subject to high or severe risks of geologic hazard, including critical erosion hazard areas, critical landslide hazard areas, critical volcanic hazard areas, and critical seismic hazard areas.

"Critical habitat" or "critical wildlife habitat" means habitat areas associated with threatened, endangered, or sensitive species of plants or wildlife (pursuant to WAC 232-12-297(2.4), (2.5) and (2.6)) and which, if altered, could reduce the likelihood that the species will maintain and reproduce over the long term.

"Critical landslide hazard areas" means lands or areas where there is a high (Class III) or very high (Class IV) risk of landslide due to a combination of slope, soil permeability, and water.

"Critical seismic hazard areas" means lands or areas where there is a high risk of seismic events and damage.

"Delineation manual," "wetland delineation manual," or "wetland delineation methodology" means the methodology used for identification of wetlands and delineation of their boundaries and shall be done in accordance with the approved federal wetland delineation manual and the Western Mountains, Valleys, and Coast Regional supplement, as required by WAC 173-22-035.

"Department" means the city of Auburn department of community development or successor agency, unless the context indicates a different city department.

"Director" means the director of the city of Auburn department of community development or successor agency.

"Earth~~/earth~~ material" means naturally occurring rock, soil, stone, sediment, or combination thereof.

"Ecosystem functions" means the products, physical and biological conditions, and environmental qualities of an ecosystem that result from interactions among ecosystem processes and ecosystem structures. Ecosystem functions include, but are not limited to, sequestered carbon, attenuated peak streamflow, aquifer water level, reduced pollutant concentrations in surface and ground waters, cool summer in-stream water temperatures, and fish and wildlife habitat functions.

"Ecosystems values" are the cultural, social, economic, and ecological benefits attributed to ecosystem functions.

"Engineered slope" means a made slope that is specifically designed and constructed with the intention of maintaining stability and preventing failure.

"Enhancement" means the improvement of an existing viable wetland, stream or habitat area or the buffers established for such areas, through such measures as increasing plant diversity, increasing wildlife habitat, installing environmentally compatible erosion controls, increasing structural diversity or removing plant or animal species that are not indigenous to the area. Enhancement also includes actions performed to improve the quality of an existing degraded wetland, stream, or habitat area. See also "Restoration."

"Erosion" means a process whereby wind, rain, water, and other natural agents mobilize and transport soil particles.

"Erosion hazard areas" means lands or areas that, based on a combination of slope inclination and the characteristics of the underlying soils, are susceptible to varying degrees of risk of erosion. Erosion hazard areas are classified as "low" (areas sloping less than 15 percent) or "high" (areas sloping 15 percent or more) on the following Soil Conservation Service (SCS), now known as the Natural Resources Conservation Service (NRCS), soil types: Alderwood-Kitsap (AkF), Alderwood gravelly sandy loam (AgD), Kitsap silt loam (KpD), Everett (EvD) and Indianola (InD). Additional soil groups may be identified through site-specific analysis.

"Excavation" means the removal or displacement of earth material by human or mechanical means.

"Existing and ongoing agricultural activities" means those activities conducted on lands defined in RCW 84.34.020(2), and those activities involved in the production of crops and livestock. Such activity must have been in existence as of July 1, 1990 (the effective date of the Growth Management Act). The definition includes, but is not limited to, operation and maintenance of farm and stock ponds or drainage ditches, irrigation systems, changes between agricultural activities or crops, and normal operation, maintenance or repair of existing serviceable structures, facilities, or improved areas. Activities, which bring an area into agricultural use from a previous nonagricultural use, are not considered part of an ongoing activity. An operation ceases to be ongoing when the area on which it was conducted is proposed for conversion to a nonagricultural use or has lain idle for a period of longer than five years, unless the idle land is registered in a federal or state soils conservation program. Forest practices are not included in this definition.

"Exotic" means any species of plant or animal that is foreign and not indigenous to the lower Puget Sound area.

"Fill~~/fill~~ material" means a deposit of earth material placed by human or mechanical means.

"Filling" ~~means the act of transporting and placing (by any manner or mechanism) fill material from, to, or on any surface water body or wetland, soil surface, sediment surface, or other fill material.~~ means the act of transporting or placing (by any manner or mechanism) fill material from, to, or on any soil surface, natural vegetative covering of soil surface, or fill material (including temporary stockpiling of fill material).

"Fish habitat" or habitat that supports fish life means habitat that is used by fish life at any life stage and at any time of the year including potential habitat likely to be used by fish life, which could reasonably be recovered by restoration or management and includes off-channel habitat.

"Geologic~~ally~~ hazard~~ous~~ areas" means areas characterized by geologic, hydrologic, and topographic conditions that render them susceptible to erosion, sliding, earthquake, or other geological events.

"Geotechnical report" means a report prepared in accordance with the city's engineering design standards for geotechnical engineering and evaluation of soils.

"Grading" ~~means any excavating, filling, clearing, leveling or contouring of the ground surface by human or mechanical means.~~ means any excavating, filling, clearing, or re-contouring of the ground surface or combination thereof.

"Groundwater protection areas" means land areas designated by the city beneath which groundwater occurs that is a current or potential future source of drinking water for the city. Please see the definition of "aquifer recharge areas" for additional regulated areas.

"Habitat management" means management of land and its associated resources/features to maintain species in suitable habitats within their natural geographic distribution so that isolated subpopulations are not created. This does not imply maintaining all habitat or individuals of all species in all cases.

"Hazardous substances" means any liquid, solid, gas, or sludge, including any material, substance, product, commodity, or waste, regardless of quantity, that exhibits any of the physical, chemical, or biological properties described in Chapter 173-303 WAC or Chapter 70.105 RCW.

"Hazard tree" means a tree that is considered a threat to life, property, or public safety. Due to their high habitat value, except when in the public right-of-way, hazard tree removal shall not adversely affect ecosystem functions to the extent practicable, encourage the creation of snags (Priority Habitat features) rather than complete tree removal, involve an avoidance and minimization of damage to remaining trees and vegetation, and require a qualified arborist to evaluate requests for hazard tree removal. When a hazard tree is within the right-of-way the City Engineer shall determine its removal.

"In-kind wetland mitigation" means replacement of wetlands with wetlands whose characteristics closely approximate those destroyed or degraded by a regulated activity.

"Injection well" means a well that is used for the subsurface emplacement of fluids. (From WAC 173-218-030.)

"Intentionally created streams" means streams created through purposeful human action, such as irrigation and drainage ditches, grass-lined swales, and canals. This definition does not include stream modifications performed pursuant to city authorization, such as changes or redirection of stream channels.

"Lahar" means mudflows or debris flows associated with volcanic activity and which pose a threat to life, property, and structures.

"Landslide" means episodic downslope movement of a mass of soil or rock.

"Landslide hazard areas" means areas that, due to a combination of slope inclination, relative soil permeability, and hydrologic conditions are susceptible to varying degrees of risk of landsliding. Landslide hazard areas are classified as Classes I through IV based on the degree of risk as follows:

1. *Class I/Low Hazard.* Areas with slopes of 15 percent or less.

2. *Class II/Moderate Hazard.* Areas with slopes of between 15 percent and 40 percent and that are underlain by soils that consist largely of sand, gravel or glacial till.

3. *Class III/High Hazard.* Areas with slopes between 15 percent and 40 percent that are underlain by soils consisting largely of silt and clay.

4. *Class IV/Very High Hazard.* Areas with slopes steeper than 15 percent with identifiable zones of emergent water (e.g., springs or groundwater seepage), areas of identifiable landslide deposits regardless of slope and all areas sloping more steeply than 40 percent.

The slopes referenced above include only those where the surface drops 10 feet or more vertically within a horizontal distance of 25 feet and are not an engineered slope part of a project or development permitted by the city.

"Mature and old-growth forested wetlands" means wetlands containing mature or old-growth forested areas, generally requiring a century or more to develop. These systems represent two priority habitats, as defined by the Washington State Department of Fish and Wildlife.

"Mitigation" means activities which include:

1. Avoiding the impact altogether by not taking a certain action or parts of actions;

2. Minimizing impacts by limiting the degree or magnitude of the action and its implementation, by using appropriate technology, or by taking affirmative steps to avoid or reduce impacts;

3. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;

4. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action;

5. Compensating for the impact by replacing, enhancing, or providing substitute resources or environments; and/or

6. Monitoring the impact and taking appropriate corrective measures.

While monitoring without additional actions is not considered mitigation for the purposes of these regulations, it shall be part of a comprehensive mitigation program.

"Mitigation sequencing" means considering or performing mitigation actions, as defined in the definition of "mitigation," in a preferred sequence from (1) through (6). Avoidance is preferred and must be considered prior to pursuing other forms of mitigation.

"Monitoring and Adaptive Management" means the process of monitoring and improving permits, regulations, and programs to ensure the protection of critical areas.

"Native" means any species of plant or animals which are or were indigenous to the lower Puget Sound area.

"Natural heritage wetlands" means wetlands that are identified by scientists of the Washington Natural Heritage Program/DNR as high quality, relatively undisturbed wetlands, or wetlands that support state-listed threatened or endangered plants.

"No net loss" refers to the actions taken to achieve and ensure no overall reduction in existing ecosystem functions and values or the natural systems constituting the protected critical areas. This may involve fully offsetting any unavoidable impacts to critical area functions and values pursuant to the Growth Management Act, WAC 365-196-830 'Protection of critical areas,' or as amended.

"Off-site mitigation" means performance of mitigation actions, pursuant to standards established in this chapter, on a site or in an area other than that proposed for conduct of a regulated activity.

"Out-of-kind mitigation" means replacement of wetlands or habitat with substitute wetlands or habitat whose characteristics do not closely approximate those adversely affected, destroyed, or degraded by a regulated activity.

"Permanent erosion control" means continuous on-site and off-site control measures that are needed to control conveyance or deposition of earth, turbidity, or pollutants after development, construction, or restoration.

"Plant association of infrequent occurrence" means one or more plant species which because of the rarity of the habitat and/or the species involved, or for other botanical or environmental reasons, do not often occur in the city of Auburn. Examples include but are not limited to:

1. Wetlands with a coniferous forested class or subclass consisting of trees such as western red cedar, Sitka spruce, or lodgepole pine growing on organic soils;

2. Bogs with a predominance of sphagnum moss, or those containing sphagnum moss, and typically including one or more species such as Labrador tea, sundew, bog laurel, or cranberry.

"Priority habitat and species (PHS)" means a classification by the Washington Department of Fish and Wildlife of habitats and species that require protective measures due to their sensitivity, rarity, or ecological importance.

"Qualified professional~~consultant~~," for purposes of these regulations, shall mean a person who has attained a degree from an accredited college or university in the subject matter necessary to evaluate the critical area in question (e.g., biology, ecology, or horticulture/arboriculture for wetlands, streams, wildlife habitat, and geology and/or civil engineering for geologic hazards, and hydrogeologist for aquifer recharge areas), and/or who is professionally trained and/or

certified or licensed by the state of Washington to practice in the scientific disciplines necessary to identify, evaluate, manage, and mitigate impacts to the critical area in question. In addition, a qualified professional~~consultant~~ for wetlands and streams must be a professional wetland scientist with at least two years of full-time work experience as a wetlands professional, including delineating wetlands using the federal manual and supplements, preparing wetland reports, conducting function assessments, and development and implementing mitigation plans. A qualified professional~~consultant~~ for aquifer recharge areas must be a currently licensed Washington State geologist holding a current specialty license in hydrogeology.

"Reasonable use" means a legal concept articulated by federal and state courts in regulatory taking cases.

"Regulated activities" means activities that have a potential to significantly impact a critical area that is subject to the provisions of this chapter. Regulated activities generally include, but are not limited to, any filling, dredging, dumping or stockpiling, release of contaminants to soil or water, draining, excavation, flooding, clearing or grading, construction or reconstruction, driving pilings, obstructing, clearing, or harvesting.

"Restoration" means actions taken to re-establish wetland, stream or habitat functional values, and the characteristics that have been destroyed or degraded by past alterations (e.g., filling or grading). See also "Enhancement."

"Riparian management zone" (RMZ) means the area that has the potential to provide full riparian functions. In many forested regions of the state, this area occurs within one 200-year site-potential tree height measured from the edge of the stream channel. In situations where a CMZ is present, this occurs within one site potential tree height measured from the edges of the CMZ. In non-forest zones, the RMZ is defined by the greater of the outermost point of the riparian vegetative community or the pollution removal function, at 100 feet. For delineating RMZs, see the qualified professional resources in Appendix A of Washington Department of Fish and Wildlife's Guidelines for Determining Site Potential Tree Height from Field Measurements.

"Salmonids" means the family of fish which includes salmon, trout, and char.

~~"Secondary habitat" means areas that offer less diversity of animal and plant species than critical habitat but are important for performing the essential functions of habitat.~~

"Seismic hazard areas" means areas that, due to a combination of soil and groundwater conditions, are subject to risk of ground shaking, subsidence, or liquefaction of soils during earthquakes. These areas are typically underlain by soft or loose saturated soils (such as alluvium), have a shallow groundwater table, and are typically located on the floors of river valleys.

"Site" means the location containing a regulated critical area and on which a regulated activity is proposed. The location may be a parcel or portion thereof, or any combination of contiguous parcels where a proposed activity may impact a critical area.

"Slope" means an inclined earth surface, the incline of which is expressed as the ratio of horizontal distance to vertical distance. The slopes referenced above include only those where the surface drops 10 feet or more vertically within a horizontal distance of 25 feet.

"Sole source aquifer" means an area formally designated as such by the U.S. Environmental Protection Agency under the federal Safe Drinking Water Act.

"Spring" means a source of water where an aquifer comes in contact with the ground surface.

"Stream or wetland reconnaissance report" means a type of critical area report prepared by an applicant's qualified professional~~consultant~~ to describe a stream or wetland and to characterize its conditions, source of hydrologic support, wildlife, habitat values and water quality. The report may also include an analysis of impacts but generally does not include adequate impact assessment and definition of a mitigation proposal sufficient to meet all the requirements of a more comprehensive critical areas report.

"Streams" means those areas where surface waters produce a defined channel or bed that demonstrates clear evidence of the passage of water and includes, but is not limited to, bedrock channels, gravel beds, sand and silt beds and defined-channel swales. The channel or bed need not contain water year-round. This definition is not intended to include artificially created irrigation ditches, canals, stormwater or surface water devices, or other entirely artificial watercourses unless they are used by salmonids or created for the purposes of stream mitigation.

"Structural diversity, vegetative" means the relative degree of diversity or complexity of vegetation in a wildlife habitat area as indicated by the stratification or layering of different

plant communities (e.g., ground cover, shrub layer and tree canopy), the variety of plant species and the spacing or pattern of vegetation.

“Substrate” means the soil, sediment, decomposing organic matter or combination of those located on the bottom surface of the wetland, lake, stream, or river.

“Temporary erosion control” means on-site and off-site control measures that are needed to control conveyance or deposition of earth, turbidity, or pollutants during development, construction, or restoration.

~~“Tertiary habitat” means habitat that supports some wildlife but does not satisfy the definition of secondary or critical habitat.~~

“Tree” means any self-supporting perennial woody plant characterized by natural growth of one main stem or trunk with a definite crown, and maturing at a height of at least six feet above the ground.

“Tree base fee” means the current cost of the tree based on species and minimum code required installation size, installation (labor and equipment), maintenance for two years and fund administration.

"Urban growth" refers to growth that makes intensive use of land for the location of buildings, structures, and impermeable surfaces to such a degree as to be incompatible with the primary use of such land for the production of food, other agricultural products, or fiber, or the extraction of mineral resources. Urban growth typically requires urban governmental services.

“Utility” includes natural gas, electric, telephone and telecommunications, cable communications, water, sanitary sewer or storm drainage and their respective facilities, lines, pipes, mains, equipment and appurtenances.

“Variance” means permission to depart from the requirements of the specific regulations of this title for a particular piece of property.

“Volcanic hazard areas” means areas identified by the U.S. Geological Survey (maps dated 1998 or as hereafter revised) as subject to a risk of large lahars with a recurrence interval of 500 to 1,000 years.

"Watercourse" as defined in WAC 220-660-030(154).

"Water dependent use" means a principal use which can only exist when the land/water interface provides biological or physical conditions necessary for the use.

"Wellhead Pprotection Aarea" means the portion of a well's, wellfield's or spring's zone of contribution within the 6-month, 1-year, 5-year, and 10-year time of travel boundary, or boundaries established using alternate criteria approved by the State Department of Health in those settings where groundwater time of travel is not a reasonable delineation criterion.

"Wetland" or "wetlands" means areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Wetlands do not include those artificial wetlands intentionally created from nonwetland sites, including but not limited to irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway. Wetlands may include those artificial wetlands intentionally created from nonwetland areas created to mitigate conversion of wetlands. (Definition taken from RCW 36.70A.030(23).) Wetlands shall be classified and rated according to the Washington State Wetland Rating System for Western Washington: 2014 Update, Version 2.0 or latest approved by Ecology.

"Wetland impact assessment report" means a report prepared by a qualified professionalconsultant that identifies, characterizes and analyzes potential impacts to wetlands consistent with applicable provisions of these regulations. A wetland impact assessment may be combined with and include a formal wetland delineation.

"Wetland mosaic" means an area with a concentration of multiple small wetlands, in which each patch of wetland is less than one acre; on average, patches are less than 100 feet from each other; and areas delineated as vegetated wetland are more than 50 percent of the total area of the entire mosaic, including uplands and open water.

"Wildlife report" means a report prepared by a qualified professionalconsultant that evaluates plant communities and wildlife functions and values on a site, consistent with the format and requirements established by this chapter. The report also includes an analysis of impacts. (Ord. 6733 § 3 (Exh. B), 2019; Ord. 6287 § 2, 2010; Ord. 5894 § 1, 2005.)

16.10.030 Applicability – Regulated activities.

A. The provisions of this chapter shall apply to any activity that potentially affects a critical area or its buffer unless otherwise exempt. Such regulated activities include but are not limited to:

1. Removing, excavating, disturbing or dredging soil, sand, gravel, minerals, organic matter, or materials of any kind;

2. Dumping, discharging or filling with any material;

3. Draining, flooding or disturbing the water level or water table, or diverting or impeding water flow;

4. Driving pilings or placing obstructions;

5. Constructing, reconstructing, demolishing, or altering the size of any structure or infrastructure;

6. Destroying or altering vegetation through clearing, grading, harvesting, shading, or planting vegetation that would alter the character of or impact a critical area;

7. Release of contaminants to soil or water;

~~8. Activities that result in significant changes in water temperature, physical or chemical characteristics of water sources, including quantity and pollutants; and~~

8~~9~~. Any other activity potentially affecting a critical area or buffer not otherwise exempt from the provisions of this chapter as determined by the director.

9. Activities that result in:

a. A significant change of water temperature,

b. A significant change of the physical or chemical characteristics of the sources of water to the wetland,

c. A significant change in the timing, frequency, depth, or duration of water entering or within the wetland,

d. Immediate and substantial erosion and/or sediment transport of surface soils,

e. Sloughing of exposed surface soils,

f. The emergence, or an increase in the flow, of water seeps or springs,

B. To avoid duplication, the following permits and approvals shall be subject to and coordinated with the requirements of this chapter: land clearing; grading; subdivision or short subdivision; building permit; planned unit development (if permitted by the city code); shoreline substantial development; variance; conditional use permit; and any other permits that may lead to the development or alteration of land.

C. Administrative actions, such as rezones, annexations, and the adoption of plans and programs, shall be subject to the requirements of this chapter. However, the director may, using discretion, permit any studies or evaluations required by this chapter to use methodologies and provide a level of detail appropriate to the administrative action proposed.
(Ord. 6733 § 3 (Exh. B), 2019; Ord. 6187 § 3, 2008; Ord. 5991 § 3, 2006; Ord. 5894 § 1, 2005.)

16.10.040 Exemptions and nonconforming uses.

A. The following activities performed on sites containing critical areas as defined by this chapter shall be exempt from the provisions of this chapter:

1. Existing and ongoing agricultural activities, as defined in this chapter;

2. Activities involving artificially created wetlands or streams intentionally created from nonwetland sites, including but not limited to grass-lined swales, irrigation and drainage ditches, retention or detention facilities, and landscape features, except wetlands or streams created as mitigation or that provide critical habitat for salmonids and except when the site contains another critical area;

3. Normal and routine maintenance, operation, repair and reconstruction of existing roads, streets, utilities and associated structures; provided, that reconstruction of any structures may not increase the impervious area and may not cause further encroachment on the critical area or its buffer, and may not result in adverse impacts to surface water and groundwater quality. Operation and maintenance includes vegetation management performed in accordance with best management practices that is part of ongoing maintenance of structures, infrastructure, or utilities; provided, that such management

actions are part of regular and ongoing maintenance, do not expand further into the critical area, are not the result of an expansion of the structure or utility, and do not directly impact an endangered or threatened species;

4. *Minor Utility and Street Projects.* Utility or street projects which have minor or short duration impacts to critical areas, as determined by the director in accordance with the criteria below, and which do not significantly impact the functions or values of a critical area(s); as determined through a critical areas report; provided, that such projects are constructed with best management practices and additional restoration measures are provided through a mitigation plan. Minor activities shall not result in the transport of sediment or increased storm water. Such allowed minor utility projects shall meet the following criteria:

a. There is no practical alternative to the proposed activity with less impact on critical areas;

b. The activity involves the placement of underground piping, conduit, traffic signal equipment, lighting equipment, utility pole(s), signs, anchor, or vault or other small component of a utility or street facility;

5. Normal maintenance, repair and reconstruction of residential or commercial structures, facilities and landscaping; provided, that reconstruction of any structures may not increase the previous floor area;

6. The addition of floor area within an existing building which does not increase the building footprint;

7. A one-time Aadditions to a legally established single-family residential structure in existence before May 13, 2005, located within a wetland or stream buffer may be permitted if all of the following criteria area met:

a. The addition is no greater than 500 square feet of building footprint over that in existence as of May 13, 2005;

b. The addition is not located closer to the critical area than the existing structure;

c. The addition is consistent with other applicable development regulations;

dc. Impacts on critical area functions are avoided consistent with the purpose and intent of this title and as demonstrated in a critical areas report by a qualified professional and as applicable mitigated through an approved mitigation plan~~consultant~~; and

ed. ~~There are no changes in slope stability, flood conditions or drainage;~~ Demonstrate through analysis by qualified professionals that other existing property conditions covered by this title (e.g. – slope stability, flood conditions, drainage) have not changed with the proposed addition;

8. Site investigative work and studies that are prerequisite to preparation of an application for development authorization including soils tests, water quality studies, wildlife studies and similar tests and investigations; provided, that any disturbance of the critical area shall be the minimum necessary to carry out the work or studies;

9. Educational activities, scientific research, and outdoor passive recreational activities, including but not limited to interpretive field trips, birdwatching and hiking, that will not have a significant effect on the critical area;

10. Emergency activities necessary to prevent an immediate threat to public health, safety, property or the environment which requires immediate action within a time too short to allow full compliance with this chapter as long as any alteration undertaken pursuant to this subsection is reported to the city as soon as possible. Only the minimum intervention necessary to reduce the risk to public health, safety or welfare and/or the imminent risk of damage to private property shall be authorized by this exemption. The director shall confirm that an emergency exists or existed and determine what, if any, additional applications and/or measures shall be required to protect the environment consistent with the provision of this section and to repair any damage to a pre-existing resource; the director shall determine a time limit between 1-2 years for restoration, rehabilitation, or replacement to minimize temporal loss of critical area functions and values;

11. Activities affecting previously legally filled wetlands;

12. Activities in storm and water quality basins and “wetlands” created by poorly maintained or plugged culverts or pipes~~lines~~, and artificially created ditches that are not used by fish~~salmonids~~;

13. Minor activities not mentioned above and determined by the director to have minimal impacts to a critical area, will not result in no net loss of ecological values and functions, and are constructed with best management practices and additional restoration measures are provided through a mitigation plan.

B. Notwithstanding the exemptions provided by this subsection, any otherwise exempt activities occurring in or near a critical area shall comply with the purpose and intent of these standards and shall consider on-site alternatives that avoid or minimize significant adverse impacts.

C. Exempt activities occurring in flood hazard areas shall not alter flood storage capacity or conveyance except in conformance with floodplain requirements of Chapter 15.68 ACC.

D. No property owner or other entity shall undertake exempt activities in subsection (A)(2), (7) or (13) of this section without first providing 14 calendar days' notice to the city in writing and receiving confirmation in writing that the proposed activity is exempt. In case of any question as to whether a particular activity is exempt from the provisions of this section, the director's determination shall govern and shall be confirmed in writing.

E. An established use or existing structure that was lawfully permitted prior to May 13, 2005, but which is not in compliance with this chapter, shall be deemed a nonconforming use as defined in ACC 18.04.650. Unless otherwise provided for, existing structures, which intrude into critical areas buffers, shall not be reconstructed in such a manner that results in the further intrusion into the buffer area. Structures or developments that are nonconforming solely due to being contrary to the provisions of this chapter shall not be subject to the nonconforming use provisions of Chapter 18.54 ACC. (Ord. 6733 § 3 (Exh. B), 2019; Ord. 5894 § 1, 2005.)

16.10.050 Critical areas maps.

Maps have been developed by the city that show the general location of critical areas. These maps are available for reference at the city department of community development. These maps shall be used for informational purposes as a general guide only for the assistance of property owners and other interested parties; the boundaries and locations shown are generalized. The actual presence or absence, type, extent, boundaries and classification of critical areas on a specific site shall be identified in the field by a qualified

professional~~consultant~~ and determined by the city, according to the procedures, definitions and criteria established by this chapter. In the event of any conflict between the critical area location or designation shown on the city's maps and the criteria or standards of this section, the criteria, definition, and standards shall prevail. (Ord. 6733 § 3 (Exh. B), 2019; Ord. 6287 § 2, 2010; Ord. 5894 § 1, 2005.)

16.10.060 Relationship to other regulations.

A. These critical area regulations shall apply as an overlay and in addition to zoning, land use and other regulations established by the city of Auburn. In the event of any conflict between these regulations and any other regulations of the city, the regulations which provide greater protection to critical areas shall apply.

B. Areas characterized by particular critical areas may also be subject to other regulations established by this chapter due to the overlap or multiple functions of some sensitive or critical areas. Wetlands, for example, may be defined and regulated according to the wetland, habitat and stream management provisions of this chapter. In the event of any conflict between overlapping regulations for multiple critical areas on the same site, the regulations which provide greater protection to critical areas shall apply.

C. Compliance with the provisions of this chapter does not constitute compliance with other federal, state, and local regulations and permit requirements that may be required (for example, shoreline substantial development permits, hydraulic project approval (HPA) permits, Army Corps of Engineers Section 404 permits, National Pollutant Discharge Elimination System (NPDES) permits). The applicant is responsible for complying with these requirements, apart from the process established in this chapter. Where applicable, the director will encourage use of information such as permit applications to other agencies or special studies prepared in response to other regulatory requirements to support required documentation submitted for critical areas review. (Ord. 6733 § 3 (Exh. B), 2019; Ord. 5894 § 1, 2005.)

16.10.070 Critical area review process and application requirements.

A. *Pre-Application Conference.* A pre-application ~~conference~~ meeting is available and encouraged prior to submitting an application for a project permit.

B. *Application Requirements.*

1. *Timing of Submittals.* Concurrent with submittal of a State Environmental Policy Act (SEPA) checklist, or concurrent with submittal of an application for projects exempt from SEPA, a critical area report must be submitted to the city for review when the city believes that a critical area may be present. The purpose of the report is to determine the extent, characteristics and functions of any critical areas located on or potentially affected by activities on a site where regulated activities are proposed. The report will also be used by the city to determine the appropriate critical area classification and, if applicable, to establish appropriate buffer requirements.

2. *Report Contents.* Reports and studies required to be submitted by this chapter shall contain, at a minimum, the information indicated in the provisions of this chapter applicable to each critical area. The director may tailor the information required to reflect the complexity of the proposal and the sensitivity of critical areas that may potentially be present.

C. *Consultant Qualifications and City Review.* All reports and studies required of the applicant by this section shall be prepared by a qualified professional~~consultant~~ as that term is defined in these regulations. The city may retain a qualified professional~~consultant~~ paid for by the applicant to review and confirm the applicant's reports, studies and plans if the following circumstances exist:

1. The city has technical information that is unavailable to the applicant; or

2. The applicant has provided inaccurate or incomplete information on previous proposals or proposals currently under consideration.

D. *Review Process.* This section is not intended to create a separate critical area review permit for development proposals. To the extent possible, the city shall consolidate and integrate the review and processing of critical area-related aspects of proposals with other land use and environmental considerations and approvals. Any permits required by separate codes or regulations, such as floodplain development permits or shoreline substantial development

permits, shall continue to be required. (Ord. 6733 § 3 (Exh. B), 2019; Ord. 6295 § 4, 2010; Ord. 5894 § 1, 2005.)

16.10.080 Classification and rating of critical areas.

A. To promote consistent application of the standards and requirements of this chapter, critical areas within the city of Auburn shall be rated or classified according to their characteristics, function and value, and/or their sensitivity to disturbance.

B. Classification of critical areas shall be determined by the director based on consideration of the following factors and in the following order:

1. Consideration of the technical reports submitted by qualified professionals~~consultants~~ in connection with applications subject to these regulations;

2. Application of the criteria contained in these regulations; and

3. Critical areas maps maintained by the department of community development.

C. Classification shall incorporate Best Available Science as defined under WAC 365-195-900., and utilize statewide classification schemes, such as Ecology's Wetland Rating System, WDFW Priority Habitats and Species maps, and the Washington Geologic Information Portal.

D~~C~~. *Wetland Classification.* Wetlands shall be rated according to the Washington Department of Ecology wetland rating system, as set forth in the Washington State Wetland Rating System for Western Washington: 2014 Update, Version 2.0,~~2014 Update (Ecology Publication No. 14-06-029,~~ or as revised and approved by Ecology~~)~~. Wetland rating categories shall not change due to illegal modifications.

1. "Category I wetlands" include wetlands which: represent unique or rare wetland types, are more sensitive to disturbance than most wetlands, are relatively undisturbed and contain ecological attributes that are impossible to replace within a human lifetime, or provide a high level of functions, as indicated by a rating system score of 23 points or more on the classification system referenced above.

2. "Category II wetlands" provide high levels of some functions, being difficult, though not impossible to replace, and have a moderately high level of functions, scoring between 20 and 22 points.

3. "Category III wetlands" have a score between 16 and 19 points, generally have been disturbed in some way and are often less diverse or more isolated from other natural resources in the landscape than Category II wetlands.

4. "Category IV wetlands" have the lowest levels of functions, scoring fewer than 16 points and are often heavily disturbed. These are wetlands that should be able to be replaced, or in some cases be improved. However, experience has shown that replacement cannot be guaranteed in any specific case. These wetlands may provide some important functions, and should be protected to some degree.

5. "Artificially created wetlands" are purposefully created landscape features, ponds and storm water detention or retention facilities. Artificially created wetlands do not include wetlands created as mitigation, and wetlands modified for approved land use activities. Purposeful creation must be demonstrated to the director through documentation, photographs, statements and/or other evidence. Artificial wetlands intentionally created from nonwetland sites are excluded from regulation under this section.

E~~D~~. *Stream Classification.* Streams shall be classified according to the water typing system as provided in WAC 222-16-030, as amended, and designated as Type S, Type F, Type Np, and Type Ns.

1. "Type S streams" are those natural streams identified as "shorelines of the state" under Chapter 90.58 RCW and the city of Auburn shoreline master program.

2. "Type F streams" are those natural streams that are not Class I streams and are either perennial or intermittent and have one of the following characteristics:

   a. Contain fish habitat; or

   b. Has significant recreational value, as determined by the director.

3. "Type Np streams" are those natural streams with perennial (year-round) or intermittent flow and do not contain fish habitat.

4. "Type Ns streams" are those natural streams and drainage swales with channel width less than two feet taken at the ordinary high water mark, that do not contain fish habitat.

5. "Intentionally created streams" are those manmade streams defined as such in these regulations, and do not include streams created as mitigation. Purposeful creation must be demonstrated through documentation, photographs, statements and/or other evidence. Intentionally created streams may include irrigation and drainage ditches, grass-lined swales and canals. Intentionally created streams are excluded from regulation under this section, except manmade streams that provide "critical habitat," as designated by federal or state agencies, for salmonids, or streams that contain fish. Intentionally created streams must install fish exclusion devices when applicable.

FE. *Fish and Wildlife Habitat Conservation Areas.* ~~*Wildlife Habitat Classification.*~~ Land managed to maintain populations of species in suitable habitats within their natural geographic distribution so that the habitat available is sufficient to support viable populations over the long term and isolated subpopulations are not created. Fish and Wildlife habitat conservation areas are listed in WAC 365-190-130 and the following list are those that are present in the City of Auburn: ~~shall be classified as critical, secondary or tertiary according to the criteria in this section:~~

1. *"Critical habitat"* are those habitat areas which meet any of the following criteria:

   a. Areas where endangered, threatened, and sensitive species have a primary association; ~~The documented presence of species or habitat listed by federal or state agencies as "endangered," "threatened," or "sensitive"; or~~

   b. The presence of unusual nesting or resting sites such as heron rookeries;

   c. Category I wetlands, as defined in these regulations; ~~or~~

   d. Waters of the State or Type S streams, as defined in these regulations.

   e. Streams and rivers planted with game fish by a governmental or tribal entity; and

   f. Habitats and species of local importance.

2. *"Priority habitat"* are those habitat areas that require protective measures due to their sensitivity, rarity, or ecological importance, and ~~"Secondary habitat" is habitat which is valuable to fish and wildlife and~~ support~~s~~ a wide variety of species due to its undisturbed

nature, a diversity of plant species and structure, presence of water, or the area's size, location, or seasonal importance.

~~3. "Tertiary habitat" is habitat which is not classified as critical or secondary. It is habitat which, while supporting some wildlife and performing other valuable functions, does not currently possess essential characteristics necessary to support diverse wildlife communities. Tertiary habitat also includes habitat which has been created purposefully by human actions to serve other or multiple purposes, such as open space areas, landscape amenities, and detention facilities.~~

GF. *Aquifer Recharge Areas.* The following areas are hereby designated as aquifer recharge areas subject to review under this chapter:

1. *Type I.*

a. Sole source aquifers and wellhead protection areas designated pursuant to the Federal Safe Drinking Water Act and WAC 246-290-135.

b. Areas established for special protection pursuant to a groundwater management program as described by Chapters 90.44, 90.48 and 90.54 RCW and Chapters 173-100 and 173-200 WAC.

c. Any other area meeting the definition of "areas with a critical recharging effect on aquifers used for potable water" as described in Chapter 365-190 WAC and the Auburn comprehensive plan, including groundwater protection areas Nos. 1 through 3 as designated in the "Water Resource Protection Report" prepared for the city by the Pacific Groundwater Group, December 2000.

2. *Type II.*

a. Groundwater protection area No. 4 as designated in the "Water Resource Protection Report" prepared for the city by the Pacific Groundwater Group, December 2000.

b. Any other area within the city that is not otherwise designated or that is added to the city via annexation shall be treated as a Type II aquifer recharge area.

G. *Geologic ~~ally~~ Hazard Area~~ous~~ Classifications.* Geologically hazardous areas shall be classified according to the criteria in this section:

1. *Critical Erosion Hazard Areas.* Critical erosion hazard areas are lands or areas underlain by soils identified by the U.S. Department of Agriculture Soil Conservation Service (SCS), now known as the Natural Resources Conservation Service, as having "severe" or "very severe" erosion hazards. This includes the following group of soils when they occur on slopes of 15 percent or greater: Alderwood-Kitsap (AkF), Alderwood gravelly sandy loam (AgD), Kitsap silt loam (KpD), Everett (EvD), and Indianola (InD).

2. *Landslide Hazard Areas.* Landslide hazard areas are classified as Class I, Class II, Class III, or Class IV as follows:

a. *Class I/Low Hazard.* Areas with slopes of 15 percent or less.

b. *Class II/Moderate Hazard.* Areas with slopes of between 15 percent and 40 percent and that are underlain by soils that consist largely of sand, gravel, or glacial till.

c. *Class III/High Hazard.* Areas with slopes between 15 percent and 40 percent that are underlain by soils consisting largely of silt and clay.

d. *Class IV/Very High Hazard.* Areas with slopes steeper than 15 percent with mappable zones of emergent water (e.g., springs or groundwater seepage), areas of known (mappable) landslide deposits regardless of slope, and all areas with slopes 40 percent or greater.

3. *Seismic Hazard Areas.* Seismic hazard areas are lands that, due to a combination of soil and groundwater conditions, are subject to severe risk of ground shaking, subsidence, or liquefaction of soils during earthquakes. These areas are typically underlain by soft or loose saturated soils (such as alluvium), have a shallow groundwater table and are typically located on the floor of river valleys. (Ord. 6733 § 3 (Exh. B), 2019; Ord. 6287 § 2, 2010; Ord. 5894 § 1, 2005.)

16.10.090 Buffer areas and setbacks.

A. *General Provisions.* The establishment of on-site buffers, buffer areas or setbacks shall be required for all development proposals and activities in or adjacent to wetlands, streams, fish and wildlife habitat conservation areas, and geologic~~ally~~ hazard~~ous~~ areas. The purpose of the buffer shall be to protect the integrity, function, value, and resources of the subject critical area

(in the case of wetlands, streams, and/or fish and wildlife habitat conservation areas), and/or to protect life, property and resources from risks associated with development on unstable or critical lands (in the case of geologically hazardous areas). Buffers shall typically consist of an undisturbed area of native vegetation retained or established to achieve the purpose of the buffer. No buildings or structures shall be allowed within the buffer unless as otherwise permitted by this section. If the site has previously been disturbed, the buffer area shall be revegetated pursuant to an approved enhancement plan. Buffers shall be protected during construction by placement of a temporary barricade, notice of the presence of the critical area and implementation of appropriate erosion and sedimentation controls. Restrictive covenants or conservation easements may be required to provide long-term preservation and protection of buffer areas.

B. Required buffer widths shall reflect the sensitivity of the particular critical area and resource or the risks associated with development and, in those circumstances permitted by these regulations, the type and intensity of human activity proposed to be conducted on or near the critical area.

C. Buffers shall be measured as follows:

1. Wetland buffers – the buffer shall be measured perpendicular from the wetland edge as delineated and marked in the field using the approved federal wetland delineation manual and the Western Mountains, Valleys, and Coast Regional supplement. Wetland delineations are valid for five years; after such date the city shall determine whether a revision or additional assessment is necessary;

2. Stream buffers – the buffer shall be measured perpendicular from the ordinary high water mark;

3. Geologically hazardous area buffers shall be required for critical landslide hazard areas and shall be measured from the top and toe and along the sides of the slope.

D. *Buffer Width Variances.* A variance from buffer width requirements may be granted by the city subject to the variance criteria set forth in ACC 16.10.160. Minor variances, defined as up to and including 10 percent of the requirement, shall be considered by the director. Variance requests which exceed 10 percent shall be considered by the hearing examiner. Variances to buffer widths can only be made to the standard buffer widths noted in ACC 16.10.090(E)(1)(a)(ii) and cannot be combined with buffer averaging provisions of ACC 16.10.090(E)(1)(b).

E. Buffer widths shall be established for specific critical areas according to the following standards and criteria:

1. Wetland buffers shall be established per the following table. Different buffer width requirements may apply to various portions of a site, without requiring averaging or variances, based on the site plan, the intensity of land uses in various locations, and differences in the category of wetland.

Wetland Category	Minimum Buffer Width (in feet) with Minimization Measures Listed in ACC 16.10.090(E)(1)(a)(iii)			Minimum Buffer Width (in feet) without Minimization Measures Listed in ACC 16.10.090(E)(1)(a)(iii)		
	Habitat Score*			Habitat Score*		
	Low (3-5)	Medium (6-7)	High (8-9)	Low (3-5)	Medium (6-7)	High (8-9)
Category I	75	110	225	100	150	300
Category II	75	110	225	100	150	300
Category III	60	110	225	80	150	300
Category IV	40	40	40	50	50	50

***** As determined per ACC 16.10.080(C).

a. Standard buffer widths as noted in subsection (E)(1) of this section in the table heading "without Minimization Measures" may be reduced to the buffer width in the table heading "with Minimization Measures," if all of the following minimization measures are implemented and as follows:

i. The reduced buffer widths from implementing the minimization measures in table ACC 16.10.090E(1)(a)(ii) cannot be further reduced by critical areas variance or buffer averaging.

ii.~~For~~For wetlands that score six points or more for habitat function, a relatively undisturbed, vegetated riparian corridor at least 100 feet wide between the wetland and any other priority habitat as defined by the Washington Department of Fish and Wildlife (WDFW). ~~is protected between the wetland and any other~~

~~Priority Habitats as defined by the Washington State Department of Fish and Wildlife~~. The corridor must be protected for the entire distance between the wetland and the Priority Habitat consistent with ACC 16.10.110(E~~D~~). Presence or absence of a nearby habitat must be confirmed by a qualified biologist.

iii. For wetlands that score three to five habitat points, only the minimization measures are required. The following minimization measures are applicable to wetlands and streams and stream buffers (riparian management zones).

~~Disturbance~~	~~Required Measures to Minimize Impacts~~
~~Lights~~	~~- Direct lights away from wetland~~
~~Noise~~	~~- Locate activity that generates noise away from wetland~~ ~~- If warranted, enhance existing buffer with native vegetation plantings adjacent to noise source~~ ~~- For activities that generate relatively continuous, potentially disruptive noise, such as certain heavy industry or mining, establish an additional 10-foot heavily vegetated buffer strip immediately adjacent to the activity~~
~~Toxic runoff~~	~~- Route all new, untreated runoff away from wetland while ensuring wetland is not dewatered~~ ~~- Establish covenants limiting use of pesticides within 150 feet of wetland~~ ~~- Apply integrated pest management~~
~~Storm water runoff~~	~~- Retrofit storm water detention and treatment for roads and existing adjacent development~~ ~~- Prevent channelized flow from lawns that directly enters the buffer~~ ~~- Use Low Intensity Development techniques~~
~~Change in water regime~~	~~- Infiltrate or treat, detain, and disperse into buffer new runoff from impervious surfaces and new lawns~~

~~Disturbance~~	~~Required Measures to Minimize Impacts~~
~~Pets and human disturbance~~	~~- Use privacy fencing or plant dense vegetation to delineate buffer edge and to discourage disturbance using vegetation appropriate for the ecoregion~~ ~~- Place wetland and its buffer in a separate tract or protect with a long-term conservation easement~~
~~Dust~~	~~- Use best management practices to control dust~~

Examples of disturbances	Activities and uses that cause disturbances	Examples of measures to minimize impacts
Lights	• Parking lots • Commercial/Industrial • Residential • Recreation (e.g., athletic fields) • Agricultural buildings	• Direct lights away from wetland/stream • Only use lighting where necessary for public safety and keep lights off when not needed • Use motion-activated lights • Use full cut-off filters to cover light bulbs and direct light only where needed • Limit use of blue-white colored lights in favor of red-amber hues • Use lower-intensity LED lighting • Dim light to the lowest acceptable intensity
Noise	• Commercial • Industrial • Recreation (e.g., athletic fields, bleachers, etc.) • Residential • Agriculture	• Locate activity that generates noise away from wetland/stream • Construct a fence to reduce noise impacts on adjacent wetland/stream and buffer • Plant a strip of dense shrub vegetation adjacent to wetland/stream buffer
Toxic runoff	• Parking lots • Roads • Commercial/industrial • Residential areas • Application of pesticides • Landscaping • Agriculture	• Route all new, untreated runoff away from wetland and/or stream and buffer while ensuring wetland and/or stream is not dewatered • Establish covenants limiting use of pesticides within 150 ft. of wetland and/or stream and buffer • Apply integrated pest management (Note: These examples are not necessarily adequate for minimizing

		toxic runoff if threatened or endangered species are present at the site.)
Stormwater runoff	• Parking lots • Roads • Residential areas • Commercial/industrial • Recreation • Landscaping/lawns • Other impermeable surfaces, compacted soil, etc.	Retrofit stormwater detention and treatment for roads and existing adjacent development • Prevent channelized or sheet flow from lawns that directly enter the buffer • Infiltrate or treat, detain, and disperse new runoff from impervious surfaces and lawns
Pets and human disturbances	• Residential areas • Recreation	• Use privacy fencing • Plant dense native vegetation to delineate buffer edge and to discourage disturbance • Place wetland/stream and its buffer in a separate tract • Place signs around the wetland and/or stream and buffer every 50-200 ft., and for subdivisions place signs at the back of each residential lot • When platting new subdivisions, locate greenbelts, stormwater facilities, or other lower-intensity land uses adjacent to wetland/stream and buffers
Dust	• Tilled fields • Roads	• Use best management practices to control dust

b. Buffer averaging to improve wetland protection may be permitted when all of the following conditions are met:

i. The wetland has significant differences in characteristics that affect its habitat functions, such as a wetland with a forested component adjacent to a degraded emergent component or a “dual-rated” wetland with a Category I area adjacent to a lower-rated area.

ii. The buffer is increased adjacent to the higher-functioning area of habitat or more sensitive portion of the wetland and decreased adjacent to the lower-functioning or less sensitive portion as demonstrated by a critical areas report from a qualified wetland professional.

iii. The total area of the buffer after averaging is equal to the area required without averaging.

iv. The buffer at its narrowest point is never less than either 75 percent of the required width or 75 feet for Category I and II, 50 feet for Category III, and 25 feet for Category IV, whichever buffer is greater.

v. Averaging applies only to standard buffer widths, not reduced widths.

c. Certain uses and activities which are consistent with the purpose and function of the wetland buffer and do not detract from its integrity may be permitted by the director within the buffer depending on the sensitivity of the wetland. Examples of uses and activities with minimal impacts which may be permitted in appropriate cases include permeable pedestrian trails, viewing platforms, and utility easements. Trails and easements should be limited to minor crossings having no adverse impact on water quality. They should be generally parallel to the perimeter of the wetland, located only in the outer 25 percent of the wetland buffer area, and located to avoid removal of significant trees. Trails should be limited to pervious surfaces no more than eight feet in width for pedestrian use only. Raised boardwalks utilizing nontreated pilings may be acceptable.

d. Where existing buffers are degraded, the director may allow limited filling within the buffer when the applicant demonstrates that the buffer will be enhanced according to standards of this chapter, including revegetation, appropriate soil preparation, will not result in slopes exceeding 25 percent, and there will be no net loss of wetland or buffer functions and values.

e. *Functionally Disconnected Buffer Areas*. Buffers may exclude areas that are functionally and effectively disconnected from the wetland by an existing public or private road or legally established development, as determined by the director. Functionally and effectively disconnected means that the road or other significant development blocks the protective measures provided by a buffer.

Significant developments shall include built public infrastructure such as roads and railroads, and private developments such as homes or commercial structures. The director shall evaluate whether the interruption will affect the entirety of the buffer. Individual structures may not fully interrupt buffer function. In such cases, the allowable buffer exclusion should be limited in scope to just the portion of the buffer that is affected. Where questions exist regarding whether a development functionally

disconnects the buffer, or the extent of that impact, the director may require a critical area report to analyze and document the buffer functionality.

2. Stream buffers (riparian management zones) shall be established as follows:

Stream Type	**Minimum Buffer Width (in feet)**	**Increased Buffer Width (in feet)[1]** **(Applicable when the buffer does not meet vegetation standards of ACC 16.10.090(E)(2)(a)**
Type S	Per SMP	Per SMP
Type F	150~~00~~	200
Type Np	100~~50~~	133
Type Ns	100~~50~~	133

1 In addition to ESA review, an increase applies if the applicant does not implement applicable minimization measures under ACC 16.10.090(E)(1)(a)(iii) and does not meet vegetated buffer standards.

a. The applicable minimum buffer for Type S streams is listed in the city's shoreline master program (SMP). Required buffer widths for all other types are established based upon stream type. The minimum buffer widths in the table above assume the buffer is vegetated with a native plant community appropriate for the ecoregion. To be considered fully functioning, a stream buffer (riparian management zone) must contain:

i. An average of eighty percent (80%) native vegetation cover, with no more than ten percent (10%) noxious weed cover; and

ii. A native plant community that includes tree, shrub, and groundcover strata in proportions that mimic native forest for the region.

b. If the existing buffer does not meet the vegetative buffer standards above, the buffer must be:

i. Densely planted to create the appropriate native plant community through the implementation of a buffer enhancement plan per ACC 16.10.110;

ii. Include impact minimization measures described in ACC 16.10.090(E)(1)(a)(iii); and

iii. If applicable, a habitat corridor is provided connecting the habitats described in ACC 16.10.090(E)(a)(ii); or

iv. Be widened by thirty-three percent (33%) to ensure that the buffer provides adequate functions to protect the stream.

c~~b~~. The minimum buffer widths required in this section may be increased by the director up to a maximum of 33~~50~~ percent for Type F, ~~and~~ Ns, and Np streams ~~and up to 100 percent for Type Np streams~~ in response to site-specific conditions and based on the report information submitted to characterize the functions and values of the stream. This includes, but is not limited to, situations where the critical area serves as habitat for areas where endangered, threatened, and sensitive species have a primary association ~~threatened, endangered or sensitive species~~. The applicant may propose to implement one or more enhancement measures, listed in order of preference below, which will be considered in establishing buffer requirements:

i. Removal of fish barriers to restore accessibility to anadromous fish.

ii. Enhancement of fish habitat using log structures incorporated as part of a fish habitat enhancement plan.

iii. Enhancement of wildlife habitat by adding structures that are likely to be used by wildlife, including wood duck houses, bat boxes, nesting platforms, snags, root wads/stumps, birdhouses, and heron nesting areas.

iv. Additional mitigating measures may include but are not limited to:

(A) Landscaping outside the buffer area with native vegetation or a reduction in the amount of clearing outside the buffer area;

(B) Planting native vegetation within the buffer area, especially vegetation that would increase value for fish and wildlife, increase stream bank or slope stability, improve water quality, or provide aesthetic/recreational value;

(C) Creating a surface channel where a stream was previously culverted or piped;

(D) Removing or modifying existing stream culverts (such as at road crossings) to improve fish passage and flow capabilities which are not detrimental to fish;

(E) Upgrading retention/detention facilities or other drainage facilities beyond required levels; or

(F) Similar measures determined applicable by the director.

c. No structures or improvements shall be permitted within the stream buffer area, including buildings, decks, docks, except as otherwise permitted or required under the city's adopted shoreline master program, or under one of the following circumstances:

i. When the improvements are part of an approved enhancement, restoration or mitigation plan; or

ii. For construction of new public roads and utilities, and accessory structures, when no feasible alternative location exists; or

iii. Construction of foot trails, according to the following criteria:

(A) Designed to minimize impact of permeable materials;

(B) Designed to minimize impact on the stream system;

(C) Of a maximum width of 12 feet;

(D) Located within the outer half of the buffer, i.e., the portion of the buffer that is farther away from the stream; or

iv. Construction of footbridges; or

v. Construction of educational facilities, such as viewing platforms and informational signs.

d. Buffer width averaging may be allowed for Type F and Type Np streams only; provided, that all of the following are demonstrated by the applicant:

i. One or more of the enhancement measures identified in subsections (E)(2)(b)(i) through (E)(2)(b)(iv) of this section are implemented;

ii. The total area contained within the buffer after averaging is no less in area than contained within the standard buffer prior to averaging;

iii. The buffer width averaging will result in stream functions and values equal or greater than before averaging; and

iv. The buffer width is not reduced by more than 25 percent in any location than the buffer widths established by this chapter.

~~e. Stream buffer widths may be reduced by the director on a case-by-case basis by up to 25 percent if an applicant demonstrates that a reduction will not result in any adverse impact to the stream. Further, if an existing buffer is vegetated, a buffer enhancement plan may be required to demonstrate how the function and values of the buffer and stream will be improved. If the existing buffer has been disturbed and/or is not vegetated, an enhancement plan shall be required that identifies measures to enhance the buffer functions and values and provide additional protection for the stream function and values. Enhancement plans are subject to approval by the director.~~

e. *Functionally Disconnected Buffer Areas*. If a portion of a stream buffer (riparian management zone) is determined to be functionally disconnected or isolated and physically separated from the watercourse due to existing, legally established public roadways public roadways, railroads, or other legally established structures, the director may exclude this area from a riparian management zone provided:

i. The area does not provide any of the primary riparian management zone functions of bank stability, shade, pollution control, wildlife habitat corridor connection, or recruitment of large woody debris;

ii. A critical areas report confirms the area of the riparian management zone as being functionally isolated and physically separated from the watercourse.

3. Fish and *Wildlife Habitat Conservation Areas.*

a. Buffer widths for critical habitat areas shall be determined by the director based on consideration of the following factors: species recommendations of the Department of Fish and Wildlife; recommendations contained in the wildlife report and the nature and intensity of land uses and activities occurring on the site and on adjacent sites. ~~Buffers shall not be required for secondary or tertiary habitat.~~ When designated Priority Habitat or Species are present, buffer widths shall conform to the best available science guidance. The director may require a critical area report prepared by a qualified professional to document compliance.

~~b. Buffer widths for critical habitat areas may be modified by averaging buffer widths or by enhancing or restoring buffer quality.~~

b~~c~~. Certain uses and activities which are consistent with the purpose and function of the buffer for critical habitat areas and do not detract from its integrity may be permitted by the director within the buffer depending on the sensitivity of the habitat area. Examples of uses and activities with minimal impact which may be permitted in appropriate cases include permeable pedestrian trails and viewing platforms and utility easements; provided, that any impacts to the buffer resulting from permitted facilities shall be mitigated. When permitted, such facilities shall generally be located as far from the critical habitat area as possible.

4. ~~*Geologically*~~ *Critical Landslide Hazard~~ous~~ Areas.*

a. Required buffer widths for critical landslide~~geologically~~ hazard~~ous~~ areas shall reflect the sensitivity of the critical landslide~~geologically~~ hazard~~ous~~ area in question and the types and the risks associated with development and, in those circumstances permitted by these regulations, the type and intensity of human activity and site design proposed to be conducted on or near the area.

b. ~~Required buffers may vary in width. The widths of the buffer shall reflect the sensitivity of the geologically hazardous area in question and the types and density of uses proposed on or adjacent to the geologic hazard. In determining the appropriate buffer width, the director shall consider the recommendations contained in any geotechnical report required by these regulations and prepared by a qualified consultant.~~ Minimum buffer width from critical landslide hazard areas shall be equal to the vertical height of the landslide hazard or 50 feet, whichever is greater, for all critical landslide hazard areas that measure 10 feet or more in vertical elevation change from

top to toe of slope, as identified in the geotechnical report, maps, and field-checking. No disturbance may occur within the buffer except as provided within this chapter.

c. Buffers may be reduced to a minimum width of 15 feet when the applicant demonstrates through the geotechnical report that the reduction will adequately protect the critical landslide~~geologic~~ hazard area and the proposed development through use of proposed engineering techniques. ~~(Ord. 6733 § 3 (Exh. B), 2019; Ord. 5894 § 1, 2005.)~~

d. To increase the functional attributes of the buffer, the department may require that the buffer be enhanced through planting of indigenous species. (Ord. 6733 § 3 (Exh. B), 2019; Ord. 5894 § 1, 2005.)

16.10.100 Alteration or development of critical areas – Standards and criteria – Prohibited uses.

Alteration of specific critical areas and/or their buffers may be allowed by the director subject to the criteria of this section. Alteration shall implement the mitigation standards as identified in ACC 16.10.110, and the performance standards of ACC 16.10.120 and the monitoring requirements of ACC 16.10.130.

A. *Wetlands.*

1. *Category I Wetlands.* Alterations of Category I wetlands shall be avoided subject to the reasonable use provisions of this chapter.

2. *Category II Wetlands.*

a. Alteration and mitigation shall comply with the mitigation performance standards and requirements of these regulations;

b. Where enhancement, restoration or creation is proposed, replacement ratios shall comply with the requirements of these regulations; and

c. No net loss of wetland functions and values may occur.

3. *Category III and IV Wetlands.*

a. Alteration and mitigation shall comply with the mitigation performance standards and requirements of these regulations;

b. Where enhancement, restoration or creation is proposed, replacement ratios shall comply with the requirements of these regulations; and

c. No net loss of wetland functions and values may occur.

d. The following wetlands may be exempt from the requirement to avoid impacts and they may be filled if the impacts are fully mitigated based on the remaining actions. If available, impacts should be mitigated through the purchase of credits from an in-lieu fee program or mitigation bank, consistent with the terms and conditions of the program or bank. Mitigation requirements may be determined using the credit/debit tool described in Calculating Credits and Debits for Compensatory Mitigation in Wetlands of Western Washington: Final Report (Ecology Publication No. 10-06-011, or as revised and approved by Ecology). In order to verify the following conditions, a critical area report for wetlands meeting the requirements in ACC 16.10.060 must be submitted.

i. All non-federally-regulated Category IV wetlands less than 4,000 square feet that:

(A) Are not associated with riparian areas or their buffers.

(B) Are not associated with shorelines of the state or their associated buffers.

(C) Are not part of a wetland mosaic.

(D) Do not score six or more points for habitat function based on the 2014 update to the Washington State Wetland Rating System for Western Washington: 2014 Update Version 2.0 ~~(Ecology Publication No. 14-06-029~~, or as revised and approved by Ecology~~)~~.

(E) Do not contain a priority habitat or a priority area for a priority species identified by the Washington Department of Fish and Wildlife, do not contain federally listed species or their critical habitat, or species of local importance identified in ACC 16.10.080(E).

ii. Wetlands less than 1,000 square feet that meet the above criteria and do not contain federally listed species or their critical habitat are exempt from the buffer provisions contained in this chapter.

B. *Streams.*

1. Relocation of a Type F, Np and Ns stream exclusively to facilitate general site design shall not be allowed. Relocation of a stream may take place only when it is part of an approved mitigation or enhancement/restoration plan. Consultation with Washington Department of Fish and Wildlife (WDFW) and a functional assessment demonstrating equal or improved aquatic and riparian ecosystem function, and no net loss of stream functions, is recommended. ~~and will result~~The result shall be ~~in~~ equal or better habitat and water quality, and will not diminish the flow capacity of the stream.

2. Bridges shall be used to cross Type S streams; boring/micro-tunneling, or other forms of trenchless technologies may be considered for utility crossings if it would result in the same or lower impacts as bridging.

3. Culverts are allowable only under the following circumstances:

a. Only in Type F, Type Np, and Type Ns streams;

b. When fish passage will not be impaired;

c. When the following design criteria are met:

i. All new culverts shall be designed following guidance provided in the Washington Department of Fish and Wildlife's document: Water Crossing Design Guidelines, 2013 (or most recent version thereof). The applicant shall obtain a HPA from the Department of Fish and Wildlife;

ii. Culverts will include gradient controls and creation of pools within the culvert for Type F streams;

iii. Gravel substrate will be placed in the bottom of the culvert to a minimum depth of one foot for Type F and Type Np streams;

d. The applicant or successors shall, at all times, keep any culvert free of debris and sediment to allow free passage of water and, if applicable, fish. This responsibility shall

be part of the required long-term preservation measure and may be subject to securing all the necessary approvals for any ongoing maintenance.

4. The city may require that an existing culvert be removed from a stream as a condition of approval, unless the culvert is not detrimental to fish habitat or water quality, or removal would be a long-term detriment to fish or wildlife habitat or water quality.

C. *Fish and Wildlife Habitat Conservation Areas.*

1. *Critical Habitat.* Alterations of critical habitat shall be avoided, subject to the reasonable use provisions of this chapter.

2. *Priority ~~Secondary~~ Habitat.* Alterations of ~~secondary~~priority habitat may be permitted; provided, that the applicant consults with Washington Department of Fish and Wildlife (WDFW), demonstrates no net loss of habitat, mitigates adverse impacts consistent with the performance standards of ACC 16.10.120, and other requirements of this chapter.

~~3. *Tertiary Habitat.* Alterations of tertiary habitat are permitted consistent with applicable provisions of these regulations and provided that no other regulated critical area is present.~~

D. *Aquifer Recharge Areas.* The following land uses and activities applied for on or after the effective date of the ordinance codified in this chapter, as amended, shall be prohibited in Type I aquifer recharge areas:

1. Class V injection wells that inject industrial, municipal, or commercial waste fluids (as defined in WAC 173-218-030);

2. Surface impoundments for treating, storing and disposing of dangerous waste (as defined in WAC 173-303-040 and 173-304-100);

3. Waste piles for treating or storing solid waste (as defined in WAC 173-303-040, 173-303-660 and 173-304-420);

4. Hazardous waste treatment, storage, and disposal (as defined in WAC 173-303-040);

5. All types of solid waste landfills (as defined in WAC 173-304-100);

6. On-site sewage systems (as defined in Chapter 246-272A WAC) except as related to R-C, residential conservancy zoned properties and properties located within sole source aquifer

(community well sites not classified as groundwater protection areas) five- and 10-year time of travel areas. On-site sewage systems may be allowed in instances that there are no other means of sewage disposal and the applicant can demonstrate to the King County health department that the system can meet treatment standard N, as provided in WAC 246-272A-0110. Should an on-site sewage system be unable to meet these requirements, the applicant may apply for a critical areas variance in accordance with this chapter.

7. Recycling facilities that accept, store, or use hazardous substances as defined in WAC 173-218-030.

8. Underground storage of hazardous substances as defined in WAC 173-218-030, excluding the underground storage of petroleum and other substances as regulated by Chapter 173-360A WAC;

9. Use, storage, treatment, or production of perchlorethylene (PCE) or tetrachloroethylene (PERC), other than in closed-loop systems that do not involve any discharge of chemicals;

10. Petroleum refining, reprocessing, and storage, excluding the underground storage of petroleum products and other substances as regulated by Chapter 173-360A WAC;

11. Petroleum-product pipelines not associated with underground storage of petroleum and other regulated substances as regulated by Chapter 173-360 WAC; and

12. Storage or distribution of gasoline treated with the additive methyl tertiary butyl ether (MTBE).

E. *Geologic~~ally~~ Hazard~~ous~~ Areas.*

1. *General Standards.*

a. The city may approve, condition or deny proposals for the alteration of geologically hazardous areas, as appropriate, based on the degree to which the significant risks posed by critical hazard areas to public and private property and to public health and safety can be mitigated. The objective of mitigation measures shall be to render a site containing a critical geologic hazard as safe as one not containing such hazard or one characterized by a low hazard. In appropriate cases, conditions may include limitations of proposed uses, modification of density, alteration of site layout and other appropriate changes to the proposal. Where potential impacts cannot be effectively

mitigated or where the risk to public health, safety and welfare, public or private property, or important natural resources is significant notwithstanding mitigation, the proposal shall be denied.

b. When development is permitted in geologic hazard areas by these regulations, an applicant and/or its qualified professional shall provide assurances which, at the city's discretion, may include one or more of the following:

i. A letter from the geotechnical engineer and/or geologist who prepared the geotechnical report required by these regulations, stating that the risk of damage from the proposal, both on site and off site, is minimal subject to the conditions set forth in the report, that the proposal will not increase the risk of occurrence of the potential geologic hazard, and that measures to eliminate or reduce risks have been incorporated into its recommendations;

ii. A letter from the applicant, or the owner of the property if not the applicant, stating its understanding and acceptance of any risk of injury or damage associated with development of the site and agreeing to notify any future purchasers of the site, portions of the site, or structures located on the site of the geologic hazard;

iii. A legally enforceable hold harmless agreement, which shall be recorded as a covenant and noted on the face of the deed or plat, and executed in a form satisfactory to the city, acknowledging that the site is located in a geologic hazard area; the risks associated with development of such site; and a waiver and release of any and all claims of the owner(s), their directors, employees, or successors, or assigns against the city of Auburn for any loss, damage, or injury, whether direct or indirect, arising out of issuance of development permits for the proposal; and

iv. Posting of a bond, guarantee or other assurance device approved by the city to cover the cost of monitoring, maintenance and any necessary corrective actions.

2. *Specific Standards.*

a. *Critical~~Class IV~~ Landslide Hazard Areas.* ~~Alteration shall be prohibited subject to the reasonable use provisions of this chapter.~~

i. Alterations to landslide hazard areas may be permitted based on the findings and recommendations of a geotechnical engineer (report, letter, etc.) that is prepared consistently with the requirements of this chapter and certifying that the development complies with the criteria in subsection (1) of this section.

ii. Unless otherwise provided or as a necessary part of an approved alteration, removal of any vegetation from a critical landslide hazard area or buffer shall be prohibited, except for removal of dead or diseased trees as verified by an arborist that pose danger to life or property or except for removal of tree(s) within the public right-of-way by order of the City Engineer to address public safety.

iii. Vegetation on slopes within a landslide hazard area or buffer which has been damaged by human activity or infested by noxious and invasive weeds may be replaced with native vegetation pursuant to an enhancement plan. The use of hazardous substances, pesticides, and fertilizers in landslide hazard areas and their buffers is prohibited, unless otherwise approved by the director.

iv. All alterations shall be undertaken in a manner to minimize disturbance to the landslide hazard area, slope, and vegetation, unless the alterations are necessary for slope stabilization.

b. *Critical Seismic Hazard Areas.*

i. For one-story and two-story residential structures, the applicant shall conduct an evaluation of site response and liquefaction potential based on the performance of similar structures under similar foundation conditions; or

ii. For all other proposals, the applicant shall conduct an evaluation of site response and liquefaction potential including sufficient subsurface exploration to provide a site coefficient (S) for use in the static lateral force procedure described in the International Building Code.

c. *Erosion Hazard Areas.*

i. Clearing in an erosion hazard area is not limited to time of year, except when such restrictions are recommended in the geotechnical report and approved by the City.

~~When development is permitted in geologically hazardous areas by these regulations, an applicant and/or its qualified consultant shall provide assurances which, at the city's discretion, may include one or more of the following:~~

~~i. A letter from the geotechnical engineer and/or geologist who prepared the geotechnical report required by these regulations, stating that the risk of damage from the proposal, both on site and off site, is minimal subject to the conditions set forth in the report, that the proposal will not increase the risk of occurrence of the potential geologic hazard, and that measures to eliminate or reduce risks have been incorporated into its recommendations;~~

~~ii. A letter from the applicant, or the owner of the property if not the applicant, stating its understanding and acceptance of any risk of injury or damage associated with development of the site and agreeing to notify any future purchasers of the site, portions of the site, or structures located on the site of the geologic hazard;~~

~~iii. A legally enforceable hold harmless agreement, which shall be recorded as a covenant and noted on the face of the deed or plat, and executed in a form satisfactory to the city, acknowledging that the site is located in a geologically hazardous area; the risks associated with development of such site; and a waiver and release of any and all claims of the owner(s), their directors, employees, or successors, or assigns against the city of Auburn for any loss, damage, or injury, whether direct or indirect, arising out of issuance of development permits for the proposal; and~~

~~iv. Posting of a bond, guarantee or other assurance device approved by the city to cover the cost of monitoring, maintenance and any necessary corrective actions.~~

F. *Flood Hazard Areas.* Development standards are defined by Chapter 15.68 ACC. (Ord. 6733 § 3 (Exh. B), 2019; Ord. 5894 § 1, 2005.)

16.10.110 Mitigation standards, location, and timing, wetland replacement ratios, and long-term protection requirements.

A. *Mitigation Standards.* Adverse impacts to critical area functions and values shall be mitigated. Mitigation must follow the sequence of avoidance, minimization, rectification/rehabilitation, reduction of impacts over time, and compensation, in that order. Proposals relying on compensatory mitigation shall demonstrate ~~Mitigation actions shall generally be implemented in the preferred sequence identified in this chapter. Proposals which include less preferred and/or compensatory mitigation shall demonstrate that:~~

1. All feasible and reasonable measures as determined by the department have been taken to avoid~~reduce~~ impacts ~~and losses~~ to the critical area; including, where applicable; ~~or to avoid impacts where avoidance is required by these regulations;~~

a. Alternative building locations on the property;

b. Adjustments to the project footprint and orientation;

c. Modification of building setbacks where feasible, as a first option before encroaching into critical areas and/or buffer; and

d. Multi-story design or alternate building design.

2. The restored, created or enhanced critical area or buffer will be as viable and enduring as the critical area or buffer area it replaces; and

3. No overall net loss will occur in wetland or stream functions and values. The mitigation shall be functionally equivalent to or greater than the altered wetland or stream in terms of hydrological, biological, physical, and chemical functions.

4. Mitigation shall occur within the same drainage basin using a watershed approach. However, when the applicant can demonstrate that a mitigation site in a different sub-drainage basin is ecologically preferable, it should be used.

B. *Location and Timing of Mitigation.*

1. The preferred location of mitigation is on site when ecologically preferable to other identified alternatives. Mitigation may be allowed off site when it is determined by the director that on-site mitigation is not ecologically preferable to other identified alternatives, or, in the case of wetlands, where the affected site is identified as appropriate for off-site mitigation in the Mill Creek Special Area Management Plan (SAMP), April 2000. The burden of proof shall be on the applicant to demonstrate that mitigation cannot be provided on site or is consistent with the SAMP. If it is determined that on-site mitigation is not ecologically preferable to other identified alternatives, mitigation shall be provided in the same drainage basin as the permitted activity on property owned, secured, or controlled by the applicant, or provided by the applicant using alternative mitigation options such as mitigation banking or in-lieu fee programs. The mitigation should result in no net loss to the critical area functions impacted and associated watershed. Where mitigation is authorized to be located outside the city limits, the applicant shall assure to the satisfaction of the director that other requirements of this chapter will be met, including but not limited to, monitoring and maintenance.

2. ~~In-kind mitigation shall be provided except when the applicant demonstrates, and the director concurs, that greater functional and habitat value can be achieved through out-of-kind mitigation.~~ All off-site mitigation must provide equivalent or greater ecological functions and be consistent with the provisions of this chapter. Where mitigation is located outside the city limits, the applicant shall demonstrate to the satisfaction of the director that long-term protection, maintenance, and monitoring requirements of ACC 16.10.110 and ACC 16.10.130 will be met

3. ~~When wetland, stream or habitat mitigation is permitted by these regulations, the mitigation project shall occur near an adequate water supply (river, stream, groundwater) with a hydrologic connection to the critical area to ensure a successful mitigation or restoration. A natural hydrologic connection is preferential as compared to one which relies upon manmade or constructed features requiring routine maintenance.~~ In-kind mitigation shall be provided unless the applicant demonstrates, and the director concurs, that on-site mitigation is not feasible and out-of-kind mitigation will result in equal or greater ecological or habitat function. Out-of-kind mitigation may be approved only where it provides equal or greater benefits to critical area functions.

4. ~~Any mitigation plan shall be completed before initiation of other permitted activities, unless a phased or concurrent schedule that assures completion prior to occupancy has~~

~~been approved by the department.~~ Mitigation for wetlands, streams, and habitat conservation areas shall occur in a location that has a sufficient and reliable water source, including surface water or groundwater, with a hydrologic connection to the impacted critical area. Preference shall be given to locations with natural hydrologic connections over those that rely on artificial or constructed systems requiring regular maintenance.

5. Timing of Compensatory Mitigation. It is preferred that compensatory mitigation projects be completed prior to activities that will impact wetlands. At the least, compensatory mitigation shall be completed immediately following wetland impacts and prior to use or occupancy of the action or development. Construction of mitigation projects shall be timed to reduce impacts to existing fisheries, wildlife, and flora.

6. The applicant shall provide documentation demonstrating that the chosen mitigation location and schedule will achieve no net loss of ecological functions and values and that the mitigation site will be protected in perpetuity consistent with ACC 16.10.130.

C. *Wetland and Buffer Replacement Ratios.*

1. ~~Where wetland alterations are permitted by the director, the applicant shall enhance or create areas of wetlands in order to compensate for wetland losses. The compensation shall be determined according to acreage, function, type, location, timing factors and projected success of enhancement or creation.~~ Wetland compensatory mitigation ratios shall account for the wetland category, the proposed impact area and functions, the quality and functions of the mitigation site, location factors, and timing of mitigation. To protect functions and values more fully, and as an alternative to the mitigation ratios found in Section ACC 16.10.110(C)(2) of this Chapter, the director may allow mitigation based on the Credit-Debit Method developed by the Department of Ecology in Calculating Credits and Debits for Compensatory Mitigation in Wetlands of [Western Washington (Ecology Publication # 10-06-011), see ACC 16.10.110(D) for information on credits from an approved in-lieu fee program.

2. ~~The following acreage replacement and enhancement ratios shall be implemented; however, the department may vary these standards if the applicant can demonstrate and the director agrees that the variation will provide adequate compensation for lost wetland area, functions and values, or if other circumstances as determined by the director justify the variation. In no case shall the amount of mitigation be less than the area of affected wetland. The director may at his discretion increase these standards where mitigation is to~~

~~occur off-site or in other appropriate circumstances.~~ The following acreage replacement ratios shall be used when impacts to wetlands are permitted. These ratios are based on the category of the wetland and the type of mitigation proposed. Ratios apply to permanent, direct impacts to wetlands.

~~3. Category IV wetlands can be mitigated by either: (a) meeting one of the replacement ratios listed in the following table; or (b) filled and mitigated consistent with ACC 16.10.100(A)(3)(d).~~

~~Category and Type of Wetland~~Category of impacted wetland (based on score for function)	Creation or Reestablishment	Rehabilitation	Preservation*	Enhancement
~~Category I: Bog, Natural Heritage Site~~	~~Not considered possible~~	~~Case by case~~		~~Case by case~~
~~Category I: Mature Forested~~	~~6:1~~	~~12:1~~		~~24:1~~
Category I~~: Based on Functions~~	4:1	8:1	16:1	16:1
Category II	3:1	6:1	12:1	12:1
Category III	2:1	4:1	8:1	8:1
Category IV	1.5:1	3:1	6:1	6:1

*Preservation ratios apply only when used in combination with reestablishment or creation at no less than a 1:1 ratio.

3. Category IV wetlands may be mitigated either by using the replacement ratios identified in subsection (2) or, when permitted by state and federal regulatory agencies, through authorized fill and compensatory mitigation.

4. Buffer Mitigation Ratios. Impacts to buffers shall be mitigated at a minimum 1:1 ratio. Compensatory buffer mitigation shall replace those buffer functions lost from development.

D. *In-Lieu Fee (ILF) Mitigation:* Credits from an approved in-lieu fee program may be used when all the following apply:

1. The director determines that it would provide appropriate compensation for the proposed impacts and on-site mitigation is infeasible.

2. The proposed use of credits is consistent with the terms and conditions of the approved ILF program instrument.

3. Projects using ILF credits shall have debits associated with the proposed impacts calculated by the applicant's qualified wetland professional using the credit assessment method specified in the approved instrument for the ILF program.

4. The impacts are located within the service area specified in the approved ILF instrument.

E~~D~~. Long-term protection of regulated wetlands, streams, fish and wildlife habitat conservation areas, geologically hazardous areas, aquifer recharge areas, and any associated buffer(s) shall be provided by one of the following methods:

1. For subdivisions, short subdivisions, and binding site plans, the critical area and its buffer shall be protected long-term by one of the following measures in the following order of preference:

a. The critical area and its buffer shall be placed in a separate tract on which development is prohibited and a note shown on the face of the plat indicating that the homeowners or homeowners' association is responsible for maintenance of the tract. If the city agrees to accept dedication of the tract, a city-approved note shall be shown on the face of the plat indicating that the city is responsible for long-term ownership and maintenance of the tract and there shall be adequate provisions for city access to the tract from a public street, as approved by the director.

b. The critical area and its buffer shall be protected by execution of an easement dedicated to the city, a conservation organization or land trust, or similarly preserved

through a permanent protective mechanism acceptable to the city. Access to the easement must be assured from the public street.

2. For all other developments, the critical area and its buffer shall be protected by execution of an easement dedicated to the city, a conservation organization, or land trust or similarly preserved through a permanent protective mechanism acceptable to the city. The legal description, depicted location, limitations associated with the critical area and its buffer, and access from the public street shall be included within the easement document. The easement provisions shall be reviewed and acceptable to the city prior to recording with the King County recorder or Pierce County auditor. (Ord. 6733 § 3 (Exh. B), 2019; Ord. 6476 § 1, 2013; Ord. 5894 § 1, 2005.)

3. For any critical area mitigation site required by this chapter, long-term protection shall be provided using one of the protective mechanisms described in subsections (E)(1) or (E)(2) of this section and recorded prior to final plat approval or issuance of any occupancy permit.

F. *Mitigation Plan Requirements.* All required mitigation plans shall meet the requirements of RCW 90.74.020. When a project involves wetland, streams, and/or buffer impacts, a mitigation plan prepared by a qualified wetland professional shall be required, meeting the following minimum standards:

1. The report shall include a written plan and plan sheets that contain, at a minimum, the elements listed below. Full guidance can be found in Wetland Mitigation in Washington State–Part 2: Developing Mitigation Plans (Version 1) (Ecology Publication #06-06-011b, or as revised).

a. The written report shall be prepared by a qualified wetland professional and contain, at a minimum:

i. The name and contact information of the applicant; the name, qualifications, and contact information of the primary author(s) of the compensatory mitigation plan; a description of the development proposal; a summary of the impacts and proposed compensation concept; identification of all the local, state, and federal wetland-related permits required for the project; and a vicinity map for the project.

ii. Description of how the development project has been designed to avoid, minimize, or reduce adverse impacts to wetlands.

iii. Description of the existing wetland and buffer areas proposed to be altered. Include acreage or square footage, water regime, vegetation, soils, functions, landscape position, and surrounding land uses. Also describe impacts in terms of acreage by Cowardin classification, hydrogeomorphic classification, and wetland rating.

iv. Description of the compensatory mitigation site, including location and rationale for selection. Include an assessment of existing conditions, including acreage or square footage of wetlands and uplands, water regime, sources of water, vegetation, soils, functions, landscape position, and surrounding land uses. Estimate future conditions in this location if the compensation actions are not undertaken.

v. Surface and subsurface hydrologic conditions, including an analysis of existing and proposed hydrologic regimes for enhanced, established, or restored compensatory mitigation areas. Include illustrations of how data for existing hydrologic conditions were used to determine the estimates of future hydrologic conditions.

vi. A description of the proposed actions for compensation of wetland and buffer areas affected by the project. Include overall goals of the proposed mitigation, including a description of the targeted functions, hydrogeomorphic classification, and expected categories of wetlands.

vii. A description of the proposed mitigation construction, activities and timing of activities and where appropriate as determined by the director a description and documentation of the as-built conditions.

viii. Performance standards (measurable standards for years post-installation) for wetland and buffer areas, a monitoring schedule, a maintenance schedule, and actions proposed by year.

ix. A discussion of ongoing management practices that will protect wetlands after the development project has been implemented, including proposed monitoring and maintenance programs (for remaining wetlands and compensatory mitigation wetlands).

x. A bond estimate for the entire compensatory mitigation project, including the following elements: site preparation, plant materials, construction materials, installation and oversight, maintenance at least twice per year for up to ten years, annual monitoring field work and reporting, contingency actions for a maximum of the total required number of years for monitoring, and removal of all non-natural site implements (e.g., irrigation equipment, construction fencing, plant protectors, weed barrier fabric) by the end of the monitoring period.

xi. Proof of establishment of Notice on Title for the remaining wetlands and buffers on the development project site (if any) and a legal site protection mechanism for the compensatory mitigation areas.

b. The scaled plan sheets shall contain, at a minimum:

i. Mapped, ground-verified edges of the existing wetland and buffers, proposed areas of wetland and/or buffer impacts, and location of proposed wetland and/or buffer compensation actions.

ii. Existing topography, ground-verified, at two-foot contour intervals in the zone of the proposed compensation actions if any grading activity is proposed in the compensation area(s). Also include existing cross-sections (estimated one-foot intervals) of wetland areas on the development site that are proposed to be altered and of the proposed areas of wetland and buffer compensation.

iii. Conditions expected from the proposed actions on site, including future hydrogeomorphic classes, vegetation community types (e.g., Cowardin class), and future hydroperiods.

iv. Required wetland buffers for existing wetlands and proposed compensation areas. Also identify any zones where buffers are proposed to be reduced or enlarged outside of the standards identified in this Chapter.

v. A planting plan for the compensation area, including all species by proposed community type and hydroperiod, size and type of plant material to be installed, spacing of plants, typical clustering patterns, total number of each species by community type, and timing of installation.

16.10.120 Performance standards for mitigation planning.

The performance standards in this section shall be incorporated into mitigation plans submitted to the city for impacts to critical areas.

A. *Wetlands and Streams.*

1. Use plants native to the Puget Lowlands or Pacific Northwest ecoregion; non-native, introduced plants or plants listed by the Washington State Department of Agriculture as noxious weeds (Chapter 16-750 WAC) shall not be used;

2. Use plants adapted to and appropriate for the proposed habitats and consider the ecological conditions known or expected to be present on the site. For example, plants assigned a facultative wetland (FACW) wetland indicator status should be used for sites with soils that are inundated or saturated for long periods during the growing season. Use nearby reference wetlands or aerial photos to identify plants suitable to the site conditions and hydrologic regimes planned for the mitigation site. Avoid planting significant areas of the site with species that have questionable potential for successful establishment, such as species with a narrow range of habitat tolerances;

3. Utilize plant species' heterogeneity and structural diversity that emulates native plant communities described in "Natural Vegetation of Oregon and Washington" (Franklin, J.F. and C.T. Dyrness, 1988) or other regionally recognized publications on native landscapes;

4. Specify plants that are commercially available from native-plant nurseries or available from local sources. If collecting some or all native plants from donor sites, collect in accordance with ecologically accepted methods, such as those described in the "Washington Native Plant Society's Policy on Collection and Sale of Native Plants," that do not jeopardize the survival or integrity of donor plant populations;

5. Use perennial plants in preference to annual species; the use of annual species should be limited to a temporary basis in order to provide erosion control, support the establishment of perennial plants, or if mitigation monitoring determines that native plants are not naturally colonizing the site or if species diversity is unacceptably low compared to approved performance standards;

6. Use plant species high in food and cover value for native fish and wildlife species that are known or likely to use the mitigation site (according to reference wetlands, published information, and professional judgment);

7. Install a temporary irrigation system and specify an irrigation schedule and responsible party to maintain unless a sufficient naturally occurring source of water is demonstrated. Temporary irrigation facilities shall be removed after the time specified by the qualified professional~~consultant~~;

8. Identify methods of soil preparation. For stream substrate or wetland soils, at least one foot of clean inorganic and/or organic materials, such as cobble, gravel, sand, silt, clay, muck, soil, or peat, as appropriate, shall be ensured. The stream substrate or wetland soils shall be free from solid, dangerous, or hazardous substance as defined by Chapter 70.105 RCW and implementing rules;

9. Confine temporary stockpiling of soils to upland areas. Identify construction access routes and measures to avoid resultant soil compaction. Unless otherwise approved by the director, comply with all applicable best management practices for clearing, grading, and erosion control to protect any nearby surface waters from sediment and turbidity;

10. Show densities and placement of plants; these should be based on the ecological tolerances of species proposed for planting, as determined by a qualified professional~~consultant~~;

11. Provide sufficient specifications and instructions to ensure proper placement and spacing of seeds, tubers, bulbs, rhizomes, springs, plugs and transplanted stock, and other habitat features, and to provide a high probability of success, and to reduce the likelihood of prolonged losses of wetland functions from proposed development;

12. Do not rely on fertilizers and herbicides to promote establishment of plantings; if fertilizers are used, they must be applied per manufacturer specifications to planting holes in organic or controlled release forms, and never broadcast on the ground surface; if herbicides are used to control invasive species or noxious weeds and to help achieve performance standards, only those approved for use in aquatic ecosystems by the Washington Department of Ecology shall be used; herbicides shall only be used in conformance with all applicable laws and regulations and be applied per manufacturer specifications by an applicator licensed in the state of Washington; and

13. Include the applicant's mitigation plan consultant in the construction process to ensure the approved mitigation plan is completed as designed. At a minimum, the consultant's participation will include site visits to inspect completed rough and final grading, installation of in-water or other habitat structures, and to verify the quality and quantity of native plant materials before and after installation;

14. *Signs and Fencing of Wetlands and Streams Critical Areas.*

a. *Temporary Markers.* The outer perimeter of the critical area or buffer and the limits of those areas to be disturbed pursuant to an approved permit or authorization shall be marked in the field in such a way as to ensure that no unauthorized intrusion will occur, and verified by the department prior to the commencement of authorized activities. This temporary marking shall be maintained throughout construction, and shall not be removed until permanent signs, if required, are in place.

b. *Permanent Signs.* As a condition of any permit or authorization issued pursuant to this chapter, the department may require the applicant to install permanent signs along the boundary of a critical area or buffer. Permanent signs shall be made of metal face and attached to a metal post, firmed anchored, or other materials of equal durability approved by the director. Signs must be posted at an interval of one per lot or every 50 feet, whichever is less, and must be maintained by the property owner in perpetuity. The sign shall be worded as follows or with alternative language approved by the director:

Sensitive Area Boundary

"Help protect and care for this area. Trampling or cutting vegetation, placing fill or garbage, and any other activities that may disturb the sensitive area are prohibited, as regulated under Auburn City Code Chapter 16.10.

Please contact city of Auburn at 253-931-3090 with questions or concerns."

c. *Fencing.*

i. The director shall condition any permit or authorization issued pursuant to this chapter to require the application to install a permanent fence at the edge of the critical area or buffer, when fencing will prevent future impacts on the critical area.

ii. The applicant shall be required to install a permanent fence around the critical area or buffer when domestic grazing animals are present or may be introduced on site.

iii. Fencing installed as part of a proposed activity or as required in this subsection shall be designed so as to not interfere with species migration, including fish runs, and shall be constructed in a manner that minimizes habitat impacts.

iv. Fencing shall include a permanent natural wood split-rail fence, such as cedar or other non-pressure-treated wood, with fence posts set in concrete footings, or similar, as approved by the director.

B. *Wetlands.* Do not exceed a maximum water depth of 6.6 feet (two meters) at mean low water unless approved as part of a planned interspersion of wetland vegetation classes and deep-water habitats.

1. Do not exceed a slope of 25 percent (4H:1V) in the wetland unless it can be clearly demonstrated by supporting documentation that wetland hydrology and hydric soils capable of supporting hydrophytic (wetland) vegetation will be created on steeper slopes;

2. Do not exceed a slope of 25 percent (4H:1V) in the wetland buffer; and

3. Limit deep-water habitat (greater than 6.6 feet at mean low water) in compensatory wetland to no more than 60 percent of the total area, and approach this limit only when deep-water habitat is highly interspersed with wetland vegetation classes, including aquatic bed, emergent, scrub-shrub, and forested.

C. *Fish and Wildlife Habitat Conservation Areas.*

1. Incorporate relevant performance standards from subsections A and B of this section, as determined by the director;

2. Include the following additional mitigation measures in mitigation planning:

a. Locate buildings and structures in a manner that minimizes adverse impacts on critical habitats used by threatened or endangered species and identified by the Washington State Department of Fish and Wildlife, NOAA Fisheries, and U.S. Fish and Wildlife Service;

~~b. Integrate retained habitat into open space and landscaping;~~

b~~c~~. Wherever possible, consolidate critical habitats into larger, unfragmented, contiguous blocks;

c~~d~~. Use native plant species for landscaping of disturbed or undeveloped areas and in any habitat enhancement or restoration activities;

d~~e~~. Create habitat heterogeneity and structural diversity that emulates native plant communities described in Natural Vegetation of Oregon and Washington (Franklin, J.F. and C.T. Dyrness, 1988) or other regionally recognized publications on native landscapes;

e~~f~~. Remove and/or control any noxious weeds or exotic animals which are problematic to the critical habitat area as determined by the director or consultant hired by the city to review the mitigation plan; and

f~~g~~. Preserve significant or existing native trees, preferably in stands or groups, consistent with achieving the goals and standards of this chapter; the plan shall reflect the report prepared pursuant to ACC 16.10.070.

D. *Geologic~~ally~~ Hazard~~ous~~ Areas.*

1. Incorporate relevant performance standards from the preceding subsections, as determined by the director;

2. The following additional performance standards shall be reflected in proposals within geologically hazardous areas:

a. A geotechnical report shall be prepared to identify and evaluate potential hazards and to formulate mitigation measures;

b. Construction methods will not adversely affect geologic hazards or will reduce adverse impacts on geologic hazards;

c. Site planning shall minimize disruption of existing topography and natural vegetation;

d. Impervious surface coverage shall be minimized;

e. Disturbed areas shall be replanted with permanent vegetation as soon as feasible pursuant to a mitigation or landscape plan;

f. Clearing and grading shall be limited to between April 1st and October 31st unless the geotechnical report specifically addresses measures necessary to perform clearing and grading during other portions of the year;

g. The limited use of retaining walls that minimize disturbance or alteration of existing natural slope areas is preferred over graded slopes;

h. Temporary erosion and sedimentation controls, pursuant to an approved plan, shall be implemented during construction;

i. A drainage plan shall be prepared for large projects as required by the city engineer;

j. Development shall not increase instability or create a hazard to the site or adjacent properties, or result in a significant increase in sedimentation or erosion.

E. *Aquifer Recharge Areas.* Protective measures are required of all development except an individual single-family or two-family (duplex) dwelling unit. Development applications shall include the following minimum measures and incorporate the appropriate responses:

1. *Type I Aquifer Recharge Areas.*

a. Indicate how hazardous substances shall be stored and used such that any unauthorized release or discharge of the hazardous substances is prevented.

b. Specify that pesticides, herbicides, and fertilizers shall be applied in strict conformance with manufacturer's instructions and by persons licensed to perform such applications, if applicable.

c. Document hazardous substances management procedures, including, but not limited to, operations plans, drawings and as-built diagrams, emergency response and spill cleanup plans, and employee training documentation. This information can be provided in the form of copies of permits or other documentation required by other authorities.

d. Indicate that any fill material shall be documented to be free of contaminants that exceed Method A and Method B soil cleanup standards specified in Chapter 173-340 WAC prior to placement on the ground, if applicable.

e. Specify that any contaminant release reported to the Washington State Department of Ecology (Ecology) per Chapter 173-340 WAC shall also be reported to the city of Auburn public works department concurrent with notification of Ecology.

f. Include a provision that the implementation of the protective measures will be maintained during the life of the project. Updates shall occur whenever there is a change in use or business occupancy or when there are significant changes in facility operations or hazardous substances management. A copy of the plan is to be available for review by city inspectors at the business or businesses within the development. The plan should cover the facility site in general as well as have a section(s) specific to any tenants within the development.

2. *Type II Aquifer Recharge Areas.* Property owners shall implement best management practices for water resource protection. (Ord. 6733 § 3 (Exh. B), 2019; Ord. 5894 § 1, 2005.)

16.10.130 Monitoring program and contingency plan.

A. For all actions requiring a mitigation plan, a monitoring program shall be prepared and implemented by the applicant to evaluate the success of the mitigation project and to determine necessary corrective actions. This program shall determine if the original goals and objectives are being met. The monitoring program shall be reviewed and approved by the city prior to implementation. The monitoring program shall include a contingency plan in the event that implementation of the mitigation plan is inadequate or fails.

B. A performance and maintenance security is required to ensure the applicant's compliance with the terms of the approved mitigation plan. The amount of the performance security shall equal 125 percent of the cost of the mitigation project for to be provided prior to construction commencing and for the length of the monitoring period after construction is complete; the director may agree to reduce the security in proportion to work successfully completed over the period of the security.

C. Incorporate the following into monitoring programs prepared to comply with this chapter:

1. Appropriate, accepted, and unbiased qualitative or precise and accurate quantitative sampling methods to evaluate the success or failure of the project compared to performance standards approved by the city;

2. Quantitative sampling methods that include permanent photopoints installed at the completion of construction and maintained throughout the monitoring period and shall also include permanent transects, sampling points (e.g., quadrants or water quality or quantity monitoring stations), and wildlife monitoring stations;

3. Clearly stipulated qualitative and quantitative sampling methods that are approved by the city before implementation by the project proponent;

4. Appropriate qualitative and/or quantitative performance standards that will be used to measure the success or failure of the mitigation. For wetlands, streams and habitat areas these will include, at a minimum, standards for plant survival and diversity, including structural diversity, the extent of wetland hydrology, hydric soils, and habitat types and requirements as appropriate; all proposed standards are subject to review and approval by the city or the professional consultant selected by the city to review the mitigation monitoring plan. The qualitative and/or quantitative performance standards shall generally address the following subject areas:

a. Requirements for survival of plantings;

b. Requirements for plant density or percentage cover by plants;

c. Requirements for plant diversity (species composition diversity, structural diversity – tree, shrub, and groundcover layers, deciduous and evergreen, etc.);

d. Requirements that are staged over time so that different performance standards must be met as the mitigation area matures;

e. Measures to verify that the type and amount of functional areas that are part of the mitigation plan are successfully established (e.g., identify steps that will be implemented to confirm that the amount and type of created wetland meets the criteria of a wetland);

f. Requirements specifically limiting occurrence of exotic and nuisance plant species;

g. Requirements for ongoing preservation and protection measures such as continued existence in good condition of fencing and critical area signage. Also, avoidance of disturbance, trampling and the accumulation of litter or debris within the critical area and its buffer.

5. Monitoring programs for a minimum period of five years for buffer enhancement and other types of mitigation programs that include, at a minimum, preparation of an as-built plan upon completion of construction; biannual monitoring and preparation of annual monitoring reports following implementation; and a maintenance plan. More stringent monitoring requirements or longer monitoring periods may be required on a case-by-case basis for more complex mitigation plans (e.g., ten~~10~~ years or more when forested or scrub-shrub wetlands are the intended result);

6. Monitoring reports shall be submitted to the director by December 1st of the year in which monitoring is conducted. The reports are to be prepared by a qualified professional~~consultant~~ and must contain all qualitative and quantitative monitoring data, photographs, and an evaluation of each of the applicable performance standards. If performance standards are not being met, appropriate corrective or contingency measures must be identified and communicated to the director and upon concurrence, implemented to ensure that performance standards will be met;

7. Provision for the extension of the monitoring period beyond the minimum time frame if performance standards are not being met at the end of the initial five-year period; and provision for additional financial securities or bonding to ensure that any additional monitoring and contingencies are completed to ensure the success of the mitigation. (Ord. 6733 § 3 (Exh. B), 2019; Ord. 5894 § 1, 2005.)

16.10.140 Procedural provisions.

A. *Interpretation and Conflicts.* The director shall have the authority to administer the provisions of this chapter, to make determinations with regard to the applicability of the regulations, to interpret the intent of unclear provisions, to require additional information, to determine the level of detail and appropriate methodologies for critical area reports and studies, to prepare application forms and informational materials as required, and to promulgate procedures and rules for unique circumstances not anticipated within standards and procedures contained in

this section. The director shall also determine whether critical area review is required based on the presence or proximity of mapped critical areas or indicators on a project site. Administrative interpretations may be appealed to the hearing examiner as prescribed in ACC 18.70.050.

B. *Penalties and Enforcement.* Compliance with these regulations and penalties for their violation shall be enforced pursuant to the procedures set forth in Chapter 1.25 ACC.

C. *Appeals of Critical Area Review Decisions.* Appeals of critical area review decisions shall be governed by the procedures set forth in ACC 18.70.050. (Ord. 6733 § 3 (Exh. B), 2019; Ord. 5894 § 1, 2005.)

16.10.150 Reasonable use provision.

A. The standards and requirements of these regulations are not intended, and shall not be construed or applied in a manner, to deny all reasonable use of private property. If an applicant demonstrates to the satisfaction of the hearing examiner that strict application of these standards would deny all reasonable economic use of a property, development may be permitted subject to appropriate conditions.

B. Applications for a reasonable use exception shall be processed as a Type III decision, pursuant to ACC 14.03.030 and Chapter 2.46 ACC.

C. An applicant for relief from strict application of these standards shall demonstrate that all of the following criteria are met:

1. ~~No reasonable use with less impact on the critical area and its buffer is possible.~~

   There is no feasible and reasonable on-site alternative to the activities proposed, considering possible changes in site layout, reductions in density, configuration, and/or building size, that would allow a reasonable and economically viable use with fewer adverse impacts to critical areas and buffers. ~~and similar factors, that would allow a reasonable and economically viable use with fewer adverse impacts;~~

2. The proposed development activities, as conditioned, will result in the minimum possible impacts to affected critical areas;

3. All reasonable mitigation measures have been implemented or assured;

4. The proposal is consistent with the general purposes and intent of this chapter and the public interest.

5~~The~~. The inability to derive reasonable use is not the result of the applicant's actions or that of a previous property owner, such as by segregating or dividing the property and creating an undevelopable condition; and

6~~5~~. The applicant shall demonstrate that the use would not cause a hazard to life, health or property.

D. ~~Any alteration of a critical area approved under this section shall be subject to appropriate conditions and will require mitigation construction authorized by an approved mitigation plan.~~ Any authorization of a reasonable use exception shall be the minimum necessary to allow for reasonable economic use of the property, and shall include conditions of approval and mitigation as necessary to protect critical areas and their functions and values to the maximum extent practicable.

E. The burden of proof shall be on the applicant to provide evidence in support of the application and to provide sufficient information on which any decision has to be made.

F. Any alteration of a critical area approved under this section shall be subject to an approved mitigation plan consistent with ACC 16.10.110 and 16.10.120.

G~~F~~. Approval of a reasonable use exception shall not eliminate the need for any other permit or approval otherwise required for a proposal by applicable city codes.

H~~G~~. Except when application of this title would deny all reasonable use of a site, an applicant who seeks an exception from the regulations of the title shall pursue a variance as provided in ACC 16.10.160. (Ord. 6733 § 3 (Exh. B), 2019; Ord. 6442 § 13, 2012; Ord. 5894 § 1, 2005.)

16.10.160 Variances.

Applications for variances to the strict application of the terms of this chapter to a property may be submitted to the city. Minor variances, defined as up to and including 10 percent of the requirement, may be granted by the director as a Type II decision as defined by Chapter 14.03

ACC. Variance requests which exceed 10 percent may be granted by the hearing examiner as a Type III decision, pursuant to ACC 14.03.030 and Chapter 2.46 ACC. Approval of variances from the strict application of the critical area requirements shall conform to the following criteria:

A. There are unique physical conditions peculiar and inherent to the affected property which make it difficult or infeasible to strictly comply with the provisions of this section;

B. The variance is the minimum necessary to accommodate the building footprint and access;

C. The proposed variance would preserve the functions and values of the critical area, and/or the proposal does not create or increase a risk to the public health, safety and general welfare, or to public or private property;

D. The proposed variance would not adversely affect surrounding properties adjoining;

E. Adverse impacts to critical areas resulting from the proposal are minimized; and

F. The special circumstances or conditions affecting the property are not a result of the actions of the applicant or previous owner. (Ord. 6733 § 3 (Exh. B), 2019; Ord. 6442 § 14, 2012; Ord. 5894 § 1, 2005.)

16.10.170 Special exception for public agencies and utilities.

A. If the application of this chapter would prohibit a development proposal by a public agency or public utility, the agency or utility may apply for an exception pursuant to this section.

B. *Exception Request and Review Process.* An application for a public agency and utility exception shall be made to the city and shall include a critical area identification form; critical area report, including mitigation plan, if necessary; and any other related project documents such as permit applications to other agencies, special studies, and environmental documents prepared pursuant to the State Environmental Policy Act (Chapter 43.21C RCW and Chapter 197-11 WAC). The director shall prepare a recommendation to the hearing examiner based on review of the submitted information, a site inspection, and the proposal's ability to comply with public agency and utility exception review criteria in subsection D of this section.

C. *Hearing Examiner Review.* The hearing examiner shall review the application and director's recommendation, and conduct a public hearing pursuant to the provisions of Chapter 2.46 ACC.

The hearing examiner shall approve, approve with conditions, or deny the request based on the proposal's ability to comply with all of the public agency and utility exception criteria in subsection D of this section.

D. *Public Agency and Utility Review Criteria.* The criteria for review and approval of public agency and utility exceptions follow:

1. There is no other practical alternative to the proposed development with less impact on critical areas;

2. The application of this chapter would unreasonably restrict the ability to provide utility services to the public;

3. The proposal does not pose an unreasonable threat to the public health, safety, or welfare on or off the development proposal site;

4. The proposal protects critical area functions and values to the extent feasible and provides for mitigation in accordance with the provisions of this chapter; and

5. The proposal is consistent with other applicable regulations and standards.

E. *Burden of Proof.* The burden of proof shall be on the applicant to bring forth evidence in support of the application and to provide sufficient information on which any decision has to be made on the application. (Ord. 6733 § 3 (Exh. B), 2019; Ord. 6442 § 15, 2012; Ord. 5894 § 1, 2005.)

16.10.180 Severability.

If any provision of these regulations or its application to any person or circumstance is held invalid by a court of competent jurisdiction, the remainder of these regulations or the application to other persons or circumstances shall not be affected. (Ord. 6733 § 3 (Exh. B), 2019; Ord. 5894 § 1, 2005.)

Disclaimer: The city clerk's office has the official version of the Auburn City Code. Users should contact the city clerk's office for ordinances passed subsequent to the ordinance cited above.

City Website: www.auburnwa.gov

Hosted by General Code.

FACET

TECHNICAL MEMORANDUM

Date:	February 20, 2026
To:	Steven Sturza – City of Auburn
Cc:	Alyssa Tatro, Alexandria Teague – City of Auburn
From:	Nell Lund, Sr. Ecologist
Project Name:	Auburn CAO Update - Streams
Facet Number:	2510.0746.00

CAO Update – Stream Regulations Review

Introduction

The City of Auburn is going through the periodic update process for their Critical Areas Ordinance (CAO). To align with requirements under the Growth Management Act, the City of Auburn must include best available science (BAS) when developing policies and development regulations. Based on comments received from the Washington Department of Fish and Wildlife (WDFW), the City is conducting a targeted review of proposed draft stream regulations.

The purpose of this memorandum is to provide a high-level summary of stream and riparian BAS, document the City's GIS analysis of conditions in Auburn, summarize City proposed stream regulations, and document how BAS was considered and incorporated in the CAO update.

Best Available Science Review Summary

Streams are a type of Fish and Wildlife Habitat Conservation Area (FWHCA) as defined by the Revised Code of Washington (RCW 36.70A.030). WDFW provides BAS summary in their publication, *Riparian Ecosystems, Volume 1: Science Synthesis and Management Implications* (Quinn et al. 2020). Based on Volume 1, WDFW provides guidance in *Riparian Ecosystems, Volume 2: Management Recommendations* (Rentz et al. 2020). Other cited publications are provided in the reference list.

STREAM & RIPARIAN FUNCTIONS & VALUES

Composition, structure and functions of streams are tied to watershed and riparian conditions. Riparian ecosystem functions include stream morphology (e.g. streamflow and sedimentation processes), woody debris recruitment, microclimate and in-stream temperature, pollutant removal, and nutrient cycling. Streams and their associated riparian areas also provide important habitat for diverse terrestrial and aquatic wildlife species (Quinn et al. 2020).

Commonly recognized functions and processes that influence the habitat conditions within aquatic areas are briefly summarized below.

Water Quality: Metrics for water quality include temperature, sediment, and pollutants. Wildlife, including fish and amphibians, require cool clean water to meet their life history needs.

- Riparian vegetation influences stream temperatures and microclimate conditions such as air temperature, wind, light, and moisture. Factors affecting water temperature and microclimate include shade, orientation, relative humidity, ambient air temperature, wind, channel dimensions, groundwater, the hyporheic exchange zone where surface and groundwater interact (Quinn et al. 2020).
- Salmonids and amphibians are relatively sensitive to high temperatures, and have narrow thermal tolerance (Quinn et al. 2020, Bury 2008).
- A 100-foot-wide buffer is estimated to achieve 95 percent pollution removal and approximately 85 percent removal of surface nitrogen (Rentz et al. 2020).

Hydrologic Functions: Streams and riparian areas have complex and extensive connections to other surface waters and groundwater resources in a watershed (Quinn et al. 2020).

- Fish and wildlife are adapted to, and in some instances reliant upon, the natural variability in seasonal and flood flows within a system.
- Riparian vegetation reduces the quantity of surface water runoff through rainwater capture and evapotranspiration (Wynn and Mostaghimi 2006).
- Floodplains, wetlands, riparian vegetation and sinuous stream channels attenuate flood flows, which protects downstream areas from flooding.

Physical Habitat Characteristics: Riparian microclimate affects many ecological processes and functions, including plant growth, decomposition, nutrient cycling, succession, productivity, migration and dispersal of flying insects, soil microbe activity, and fish and amphibian habitat (Quinn et al. 2020; Brosofske, et al. 1997).

- Large woody debris (LWD) plays a significant role in the geomorphic formation of stream channels and in the creation of diverse channel habitat morphologies (Quinn et al. 2020).
- Streams migrate naturally which often results in complex natural geomorphology, floodplains, and heterogeneous ecosystems (Quinn et al 2020).

URBAN AREA IMPACTS

Water Quality Impacts:

- Urban areas tend to contribute a disproportionate amount of sediment and contaminants to receiving waters (Soranno et al. 1996). Some contaminants have significant effects on aquatic organisms. For example, coho salmon pre-spawn mortality is caused by a breakdown product of tire wear, 6PPD-quinone (Tian et al. 2021).
- Increased erosion and bank instability coupled with a reduction of forest cover simplify stream morphology, leading to incised, wider, and straighter stream channels (Konrad and Booth 2005).

- Removal of riparian vegetation impacts water quality by increasing stream temperatures (Murray et al. 2000, Moore et al. 2005, Gomi et al. 2006).

Hydrologic Function Impacts: Impervious surface area within a watershed impacts hydrologic functions.

- Impervious surface is positively correlated with high flow volumes, daily streamflow variability and negatively correlated with groundwater recharge rates and summer low flow volumes (Burges, Wigmosta, and Meena 1998; Cuo et al. 2009; Jones 2000; Konrad and Booth 2005).
- Urban development impacts stream flow by changing key metrics, including peak discharge, lag time, flood frequency and total runoff (Quinn et al. 2020).
- Less dynamic stream morphology is linked to accelerated water transport and reduced temporary instream flood storage capacity (Kaufmann and Faustini 2012).

Habitat Fragmentation & Degradation: Habitat loss, degradation, and fragmentation have profound impacts on wildlife and their ecosystems (Gaston 2010; Wiegand, Revilla, and Moloney 2005; Young et al. 2016).

- Habitat loss and fragmentation reduce biodiversity (MacArthur and Wilson 1967).
- Cumulative impacts of direct and indirect habitat alterations tend to reduce the habitat functions and values of wetlands and riparian areas (Azous and Horner 2010; Sheldon et al. 2005).

KEY PROTECTION STRATEGIES

Identification, classification, buffering and restrictions on adjacent land use are a common approach to critical area protections.

Identification: The ordinary high-water mark (OHWM) is typically used to determine the edge of surface waters for jurisdictional purposes. The OHWM should be determined in the field by a qualified biologist using appropriate resources.

- Those resources include *National Ordinary High Water Mark Field Delineation Manual for Rivers and Streams* (David et al. 2025), *Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State* (Anderson et al. 2016), and *A Guide to Ordinary High Water Mark (OHWM) Delineation for Non-perennial Streams in the Western Mountains, Valleys, and Coast Region of the United States* (Mersel and Lichvar 2014).

Classification: DNR classifies streams and other water bodies using a "water typing system" based on various characteristics, fish use, and functions of a natural water feature (WAC 222-16-030). This system was developed by Department of Natural Resources as part of forest management practices. Many local jurisdictions have previously incorporated use of this water typing system in their CAOs for applying buffer widths to streams.

The latest riparian management zone guidance from WDFW does not use the water typing system but instead treats all streams equally and differentiates protection based on soil type and associated

dominant tree species (Rentz et al. 2020). More information on this approach is summarized under the Riparian Management Zones header below.

Buffers: Historically, most local jurisdictions in Washington state have managed stream and riparian habitats using fixed- or standard-width stream buffers. Using this approach, buffer widths have typically been determined based upon stream type characteristics and site-specific factors following WAC 222-16-030. The latest WDFW guidance recommends a conceptual shift from the fixed-width buffer approach regarding the way that streams and riparian areas are protected, as described in the next section.

Riparian Management Zones: WDFW's current recommendations for establishing RMZ widths are based primarily on a site potential tree height (SPTH) framework, where the width of the RMZ would be equivalent to one 200-year SPTH. The SPTH framework is based on a 1993 model developed by the Forest Ecosystem Management Assessment Team (FEMAT) to understand how riparian functions change with distance from a stream channel. This model, or relationship, is known as the FEMAT curves and it demonstrates that most riparian ecosystem functions occur within one 200-year SPTH (Figure 1).

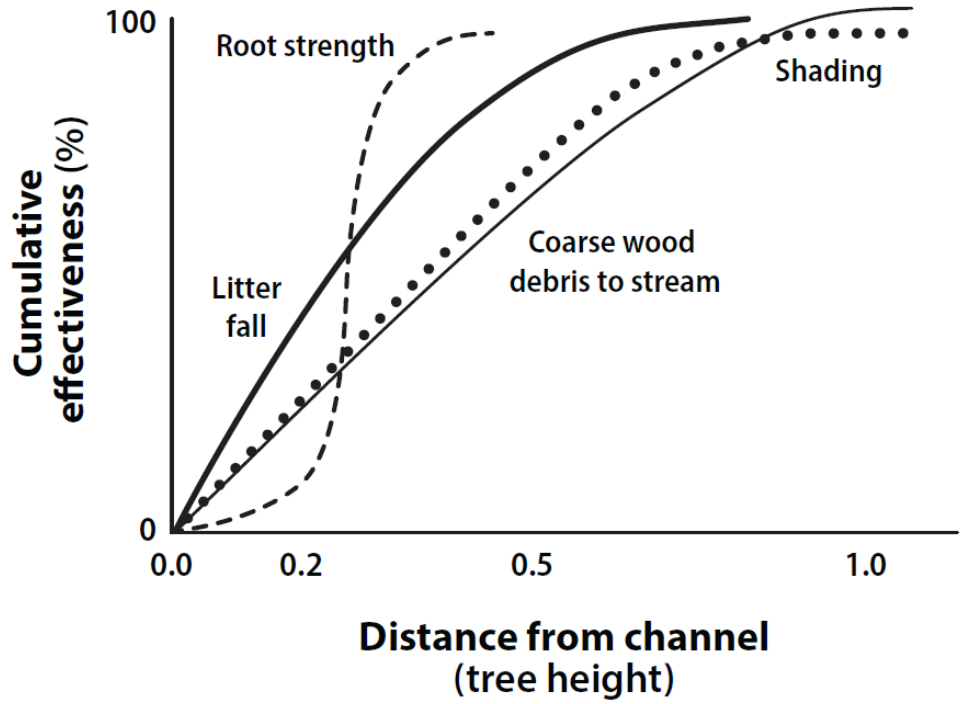


Figure 1. FEMAT curves figure, reproduced from Quinn et al. 2020 and Rentz et al. 2020.

Based on this model, WDFW recommends using tree height to estimate RMZ widths using their Riparian Ecosystems and Online SPTH Mapping Tool (WDFW Riparian Ecosystems Maps and Assistance) or *Guidelines for Determining Site Potential Tree Height from Field Measurements* (WDFW January 2025). The intent is to base protections on site potential to perform full riparian ecosystem

functions. To manage and protect riparian ecosystems, WDFW recommends measuring the RMZ from the ordinary high-water mark or channel migration zone, whichever is greater (Quinn et al. 2020; Rentz et al. 2020).

Other Stream Management Recommendations

The following WDFW riparian management recommendations for urban areas should also be considered for implementation (Rentz et al. 2020):

- maintaining and improving functions through regulatory and voluntary means,
- identifying and prioritizing restoration,
- maintaining and improving riparian connections, and
- applying stormwater management.

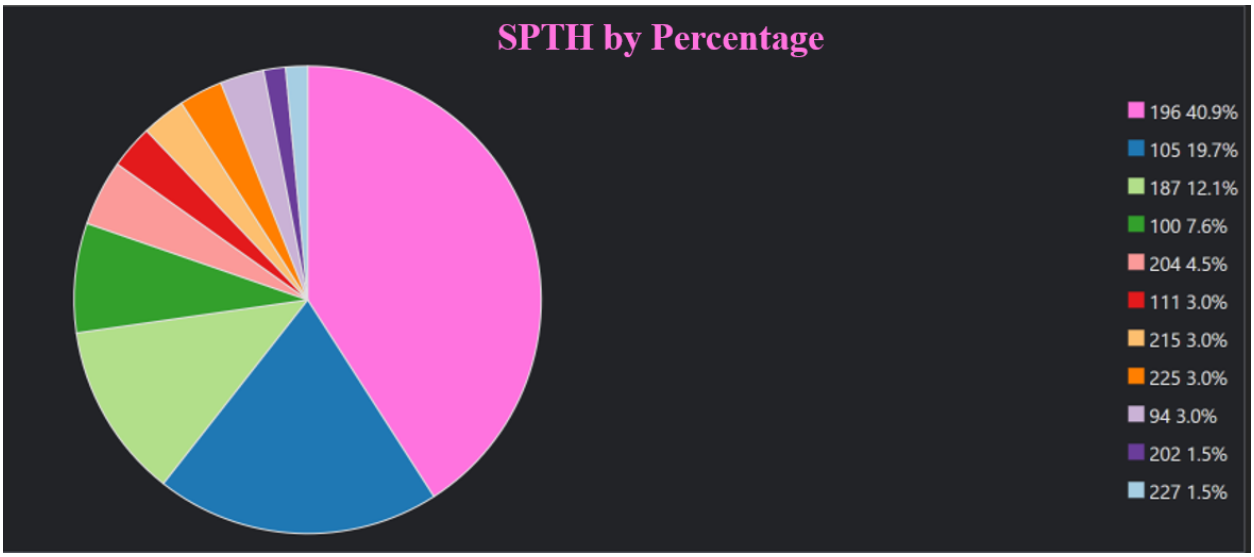
Auburn Streams / RMZ Review

ASSESSMENT APPROACH

City of Auburn planning staff and their GIS specialist compared SPTH values to current buffer widths and potential riparian buffer increases. Since the Green River and White River are regulated under the Shoreline Master Program (SMP), those waterbodies were excluded from the assessment. Streams within the City that are not mapped by DNR or are designated 'unknown' are presumed non-fish bearing for this assessment. Mapped wetlands and geologic hazard areas were included to show where critical area protections overlap.

SPTH VALUES

SPTH values in the City of Auburn range from 94 feet to 227 feet with a mean of 166 feet and a median of 196 feet (See enclosed 'SPTH Buffers Map' exhibit). The distribution of SPTH values is shown in the pie chart below.



The SPTH for Mill Creek along State Route 167 is 105 feet for most of the reach, which is mostly surrounded by wetlands. Green River tributaries on the east side of the City commonly have a SPTH value of 196 feet and have some overlap with landslide hazard areas. White River tributaries at the south end of the City are highly variable and range from 105 feet to 204 feet. Some overlap with wetlands that are mapped in the White River tributaries.

SPTH values are recommended by WDFW to achieve full riparian function for each stream segment based on site potential. Currently, stream buffers in Auburn are below the currently recommended SPTH values for full riparian functions. Non-fish bearing stream (Type Np and Ns) buffers, for example, are below the 100-foot minimum recommended to support water quality functions.

City Proposed Stream Regulations

The City did not propose substantive changes to stream protections in the October 2025 draft update of the Auburn Municipal Code (AMC), Chapter 16.10 Critical Areas. However, based on this BAS review and WDFW SPTH recommendations, the City is now proposing the following:

- Update riparian stream buffer widths as documented in Table 1 below.
- Measure riparian stream buffers from the ordinary high water mark. [Note: The Green River is regulated by the SMP. This update would only apply to streams regulated under the CAO.]
- Add minimization measures for streams to the code, similar to the wetlands section. These include directing lights away from the stream, routing untreated runoff away from the stream, following stormwater best management practices (BMPs), and keeping pets and people out of the buffer.
- Provide dense native vegetated buffer standards in the code.
- Require stream buffers to meet criteria for vegetation conditions and implement applicable minimization measures or be subject to a width increase.
- Incorporate the term 'riparian' into the stream code section to acknowledge the critical ecosystem functions riparian buffers provide.

The City plans to retain their existing classification system, consistent with the water typing system provided in WAC 222-16-030 as Type S, Type F, Type Np or Type Ns (AMC 16.10.080.E). This classification system is based on presence or absence of fish habitat, flow conditions, and location relative to shoreline jurisdiction. Note: The current code update does not review shoreline regulations under the City's Shoreline Master Program (SMP).

Auburn measures stream buffers from the ordinary high-water mark (OHWM) and assigns stream buffer widths based on the stream type under AMC 16.10.090.C.2 and 16.10.090.E.2, respectively.

Stream buffers under the current City code and proposed update are summarized in Table 1 below and in the enclosed exhibits. Under current City code, minimum buffer widths may be increased up to the maximum buffer value by the Director based on site-specific conditions, such as where endangered, threatened, or sensitive (ESA-listed) species have a primary association with critical area habitat. The

City code (AMC 16.10.090.E.2.b) provides a list of enhancement options an applicant can propose to justify a buffer width less than the maximum. These enhancement options include removal of fish barriers, adding in-stream log structures and habitat features, stream daylighting, and culvert improvements for fish passage. Under proposed code changes, minimization measures and vegetated buffer condition standards would be added to these buffer provisions.

Table 1. Stream Types and buffer widths under current and 10-2025 draft AMC 16.10.080 and 090.

Stream Type	10-2025 Draft Code		02-2026 Proposed Code	
	Minimum buffer	Maximum buffer[1]	Standard Buffer[1]	Increased Buffer[2]
Type S	Per SMP	Per SMP	Per SMP	Per SMP
Type F	100 ft	150 ft	150 ft	200 ft
Type Np	50 ft	100 ft	100 ft	133 ft
Type Ns	50 ft	75 ft	100 ft	133 ft

1 Director decision based on site-specific conditions, such as presence of critical habitat for ESA species.

2 In addition to ESA review, an increase applies if the applicant does not implement applicable minimization measures and does not meet vegetated buffer standards.

Auburn allows stream buffer averaging for Type F and Type Np waters that meet code criteria under AMC 16.10.090.E.2.d. Buffer averaging requires implementation of one or more stream enhancement measure, maintains the same total buffer area as the standard buffer, limits reduction at any given point to 25 percent, and results in equal or greater functions and values. Auburn proposes to retain this flexibility in their code update. The City adopted Ecology's 2024 Stormwater Management Manual for Western Washington and those best practices will be applied to maintain water quality standards.

Newly added provision AMC 16.10.090.E.2.e addresses functionally disconnected buffer areas, to exclude disconnected or functionally isolated stream buffer areas. A critical areas report is required to confirm such functional disconnectedness. The functionally disconnected buffer provision will be retained under the proposed update.

Discussion

As Auburn considers BAS for streams and riparian areas, we recognize stream regulations will be reviewed from an implementation feasibility perspective and are balanced with other Growth Management Act requirements. For example, the City considered zoning, existing land uses, and environmental permit administration when evaluating regulatory options.

The GIS analysis was conducted to support the City's review of stream / riparian protections relative to Comprehensive Planning goals and existing land uses (see enclosed exhibits). The proposed 150-foot Type F stream buffer is 77 percent of the median SPTH value of 196. As the FEMAT curve shows, the relationship between buffer width and cumulative effectiveness is not linear. The proposed buffer increase is near the point where width increases start to yield diminished returns in cumulative

effectiveness. The minimum 100-foot buffer is proposed for Type Np and Ns streams to maintain water quality.

Additionally, City of Auburn's 2024 Comprehensive Plan identifies urban separators. Urban separators are areas designated for low-density uses and are intended to protect resource lands, rural areas, and environmentally sensitive areas. Urban separators also create open space and wildlife corridors within and between communities.

The City of Auburn is incorporating BAS in their proposed CAO Stream update through the following measures.

- Riparian stream buffer widths are increasing to better align with SPTH values. The 150-foot riparian buffer for Type F streams is representative of average SPTH values in Auburn and aligns with highly effective riparian function per the FEMAT curve (see Figure 1 above). A 100-foot buffer will be applied to non-fish bearing streams to protect water quality consistent with BAS.
- Measure riparian stream buffers from the ordinary high water mark. [Note: Mapped channel migration zones (CMZ) in Auburn are along the Green River; those areas are regulated by the SMP.]
- The City plans to add minimization measures to the stream buffer code, by cross referencing or repeating those listed for wetlands under AMC 16.10.090.E.1.
- Auburn plans to add vegetation condition standards to stream buffer / riparian regulations under AMC 16.10.090.E.2.
- The City plans to apply a riparian buffer width increase if an applicant's project does not implement applicable minimization measures, and/or does not meet vegetation condition standards for buffers (Table 1 above).
- Where appropriate, use the term 'riparian' to document the importance of both in-stream and riparian areas as an ecosystem.

The following additional BAS-based recommendations for updates to the Auburn CAO are in review.

- Review AMC 16.10 for the use of the terms stream, stream type, stream buffer, riparian, and riparian management zone. After updates to stream classification (AMC 16.10.080) and stream buffers (16.10.090) are complete, review use of the above terms throughout the code for consistency and clarity.
- Cross-reference City stormwater management code requirements where applicable to strengthen critical area protections. Auburn has adopted Ecology's 2024 Stormwater Management Manual for Western Washington.

The proposed updates to Auburn stream regulations are the product of a thorough review of BAS and City-specific considerations for administration and implementation.

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ATTACHMENT 4

State of Washington
Department of Fish and Wildlife, Region 4
Region 4 information: 16018 Mill Creek Blvd, Mill Creek, WA 98012 | phone: (425)-775-1311

September 12, 2025

City of Auburn
Alyssa Tatro, Senior Planner
25 W Main Street
Auburn, WA 98001

RE: Submittal ID 2025-S-9767, WDFW's comments for Auburn Critical Area Ordinance amendments

Dear Ms. Tatro,

On behalf of the Washington Department of Fish and Wildlife (WDFW), thank you for the opportunity to comment on Auburn's draft Critical Area Ordinance (CAO) amendments as part of the current periodic update.

Within the State of Washington's land use decision-making framework, WDFW is considered a technical advisor for the habitat needs of fish and wildlife and routinely provides input into the implications of land use decisions. We provide these comments and recommendations in keeping with our legislative mandate to preserve, protect, and perpetuate fish and wildlife and their habitats for the benefit of future generations – a mission we can only accomplish in partnership with local jurisdictions.

Table 1. Recommended changes to proposed code language.

Code Section	Code Language (with WDFW suggestions in red)	WDFW Comment
16.10.010 Purpose and intent	A....Such areas within the city include wetlands, ~~streams, wildlife habitat~~ fish and wildlife habitat conservation areas, aquifer recharge areas, geologic hazard areas, and...	Jurisdictions are required to address five types of critical areas in their regulations, as outlined in WAC 365-196-830. We recommend revising this section to explicitly list *Fish and Wildlife Habitat Conservation Areas* (FWHCAs) to ensure consistency with state terminology. Because streams are included under this designation, there is no need to list them separately within this section, though jurisdictions may choose to

		do so if they wish to emphasize this type of FWHCA.
16.10.010 Purpose and intent	B(2.) ~~Streams. Streams and their associated riparian corridors~~ Riparian Management Zones (RMZs) provide important fish and wildlife habitat; help to maintain water quality; store and convey storm water and flood water; recharge groundwater; recruit large woody debris to create habitat structure; provide shade to maintain water temperatures and dissolved oxygen levels; support bank integrity and root reinforcement to reduce erosion; and serve as areas for recreation, education and scientific study and aesthetic appreciation. ~~Stream buffers serve to moderate runoff volume and flow rates; reduce sediment, chemical nutrient and toxic pollutants; provide shading to maintain desirable water temperatures; provide habitat for wildlife; and protect stream resources from harmful intrusion.~~	As noted above, streams are already included within the FWHCA designation. The streams and wildlife habitat sections here (B.2. and B.3.) could be merged if desired. Additionally, we recommend substituting stream and stream buffer terminology throughout this chapter with 'Riparian Management Zone (RMZ),' consistent with WDFW's Best Available Science (BAS) and guidance document. RMZs better capture the ecological scope and functions of these areas, which extend beyond the stream channel itself and include the adjacent riparian corridor necessary to sustain fish and wildlife populations and overall watershed health. RMZs support five key ecological functions: (1) recruitment of large woody debris to create habitat structure, (2) shading to maintain water temperatures and dissolved oxygen levels, (3) bank integrity and root reinforcement to reduce erosion and maintain habitat quality, (4) filtration of nutrients and sediments in surface and subsurface flows to protect water quality, and (5) provision of diverse riparian habitat for fish and wildlife species. Updating this terminology will ensure your code reflects current science and aligns with WDFW recommendations for protecting Fish and Wildlife Habitat Conservation Areas .
16.10.010 Purpose and intent	B(3.) Wildlife Habitat and Wildlife Habitat Corridors.	We appreciate the language within this section that references the need for connectivity between habitat areas and the coordination for connected open spaces, as required by WAC 365-196-335. We recommend including *Wildlife Habitat Corridors* as a distinguished type of FWHCA here and later in this chapter to further align with these requirements.
16.10.010 Purpose and intent	E. *Best Available Science* - The city intends to review and monitor implementation of its critical areas regulations and to use an adaptive management approach. It will make adjustments to the regulations, as appropriate, in response to changing conditions, new information about best available science, or empirical	We appreciate the inclusion of adaptive management in this section. Does the city currently have a reporting process or adaptive management plan that tracks the CAO's effectiveness in achieving no net loss, evaluates whether exemptions and variances may cumulatively affect critical area functions and values, and measures improvements in permit implementation? For more info, see Commerce's Critical Areas Handbook, Chapter 7.

	data indicating the effectiveness of its regulatory program.	Additionally, please see WDFW's current best available science standards and management recommendations (released in 2020) for riparian management zones (RMZs)
16.10.020 Definitions	"Channel Migration Zone" means the area within which a river channel is likely to move laterally over a specified period (e.g., 100 years).	Local governments should identify and limit development within Channel Migration Zones (CMZs)(WAC 173-26-221). Additionally, identifying CMZs helps guide development away from high-risk areas and reduces flood hazards. CMZs are critical for maintaining the dynamic processes that support riparian ecosystems. Without addressing CMZs, the CAO may fail to fully protect the functional riparian areas that naturally shift over time. We encourage the city to incorporate this CMZ definition as well as delineate riparian management zones (RMZs) from the edge of the CMZ if present. For further information, please see the WA Department of Ecology's (DOE) informational webpage as well as WDFW's *Riparian Ecosystems, Volume 2: Management Recommendations.*
16.10.020 Definitions	"Ecosystem functions" are the products, physical and biological conditions, and environmental qualities of an ecosystem that result from interactions among ecosystem processes and ecosystem structures. Ecosystem functions include, but are not limited to, sequestered carbon, attenuated peak streamflow, aquifer water level, reduced pollutant concentrations in surface and ground waters, cool summer in-stream water temperatures, and fish and wildlife habitat functions.	We suggest including the adjacent definition of 'Ecosystem Functions.' 'Functions' as a standalone term is defined later in this section, but we suggest alignment with language found in WAC 365-196-210 (14).
16.10.020 Definitions	"Ecosystem values" are the cultural, social, economic, and ecological benefits attributed to ecosystem functions.	See comment above and WAC 365-196-210 (15).
16.10.020 Definitions	"Fish habitat" or "habitat that supports fish life" means habitat, which is used by fish life at any life stage at any time of the year including potential habitat likely to be used by fish life, which could	We recommend that the city include the WAC 220-660-030(52) definition of "fish habitat" to ensure consistency with state regulations and provide comprehensive protection of aquatic ecosystems. "Fish Habitat" is also mentioned

	reasonably be recovered by restoration or management and includes off-channel habitat.	later in this chapter for categorizing "Type F" streams.
16.10.020 Definitions	"Hazard tree" is considered a threat to life, property, or public safety. Due to their high habitat value, hazard tree removal shall not adversely affect ecosystem functions to the extent practicable, encourage the creation of snags (Priority Habitat features) rather than complete tree removal, involve an avoidance and minimization of damage to remaining trees and vegetation, and require a qualified arborist to evaluate requests for hazard tree removal.	We recommend defining "Hazard Tree" in order to designate regulations that guide removal and mitigation if necessary.
16.10.020 Definitions	"Monitoring and Adaptive Management" means the process of monitoring and improving permits, regulations, and programs to ensure the protection of critical areas.	This definition comes from the Department of Commerce. See further info in the comments given above for 16.10.010 Purpose and intent, section E.
16.10.020 Definitions	"No Net Loss of Critical Areas" refers to the actions taken to achieve and ensure no overall reduction in existing ecosystem functions and values or the natural systems constituting the protected critical areas. This may involve fully offsetting any unavoidable impacts to critical area functions and values pursuant to the Growth Management Act, WAC 365-196-830 'Protection of critical areas,' or as amended.	We recommend including this definition, as it is referenced throughout this chapter.
16.10.020 Definitions	"Riparian management zone" (RMZ) means the area that has the potential to provide full riparian functions. In many forested regions of the state, this area occurs within one 200-year site-potential tree height measured from the edge of the stream channel. In situations where a	We suggest adding 'Riparian Management Zone' as its own definition, to replace 'stream buffer' terminology. This is especially important when considering RMZs as a type of critical area and not buffers to critical areas. For further related management recommendations, see WDFW's *Riparian Ecosystems, Volume 2: Management Recommendations.*

	CMZ is present, this occurs within one site potential tree height measured from the edges of the CMZ. In non-forest zones, the RMZ is defined by the greater of the outermost point of the riparian vegetative community or the pollution removal function, at 100 feet.	
16.10.020 Definitions	"Watershed Plan" means a plan developed by federal, tribal, state, and/or local government agencies and/or appropriate non-governmental organizations, in consultation with relevant stakeholders, for the specific goal of aquatic resource restoration, establishment, enhancement, and preservation. A watershed plan addresses aquatic resource conditions in the watershed, multiple stakeholder interests, and land uses. Watershed plans may also identify priority sites for aquatic resource restoration and protection.	Including a definition for "Watershed Plan" provides clarity when referencing locally or regionally adopted plans that guide aquatic resource restoration and protection. It helps ensure consistency in implementation, supports landscape-scale planning, and allows jurisdictions to align CAO decisions, such as mitigation, restoration priorities, and buffer considerations, with established, stakeholder-informed watershed efforts. This definition also acknowledges the role of collaborative, science-based planning in achieving long-term ecological outcomes.
16.10.040 Exemptions and nonconforming uses	A(4.) Minor Utility and Street Projects. Utility or street projects which have minor or short duration impacts to critical areas, as determined by the director in accordance with the criteria below, and which do not significantly impact the functions or values of a critical area(s); provided, that such projects are constructed with best management practices and additional restoration measures are provided.	Critical area reports shall be required for all projects that impact critical areas in order to demonstrate that mitigation will reach no net loss standards. Part A of this section describes no intent to require a critical area report. A(4.) indicates allowance for impacts to critical areas with no formal mitigation plan. This is not in alignment with no net loss principles and state requirements (per WAC 365-196-830 and WAC 365-190-080).
16.10.040 Exemptions and nonconforming uses	A(7.) Additions to a legally established single-family residential structure in existence before May 13, 2005, with a wetland or stream buffer located within the property, may be	Buffers exist to maintain the ecological functions and values of a critical area, including water quality, habitat, and bank stability. Allowing new impervious surfaces within a buffer directly undermines these purposes by increasing runoff, reducing infiltration, and degrading habitat. For this reason, we recommend removing any

	permitted if all of the following criteria are met: a. The addition is no greater than 500 square feet of building footprint over that in existence as of May 13, 2005; b. The addition is not located closer to the critical area than the existing structure; c. Impacts on critical area functions are avoided consistent with the purpose and intent of this title and as demonstrated in a critical area report by a qualified consultant; and	provisions that allow additions of hardscape within buffers. It is also difficult to track the cumulative impacts of these incremental additions of impervious surface over time, especially given that many properties have undergone multiple alterations across decades (often 50+ years), making it challenging to assess the true extent of buffer loss and ecological degradation. At a minimum, we recommend that this section clearly state that no development or structures are allowed within 100 feet of a stream, as this is the minimum width identified by WDFW's BAS to effectively filter pollutants if fully vegetated.
16.10.040 Exemptions and nonconforming uses	A(12.) Activities in storm and water quality basins and "wetlands" created by poorly maintained or plugged culverts or pipes, and artificially created ditches that are not used by fish ~~salmonids~~;	This section currently allows work in areas of plugged culverts without a permit unless there is salmonid use. We recommend clarifying that such activities are not exempt from Hydraulic Project Approval (HPA) requirements under state law, and that applicants should contact WDFW to determine HPA applicability prior to beginning work. In addition, we suggest revising the language to reference "fish" rather than "salmonid" to align with state requirements to protect all fish species.
16.10.040 Exemptions and nonconforming uses	A(13.) Minor activities not mentioned above and determined by the director to have no ~~minimal~~ impacts to a critical area and will result in no net loss of ecological values and functions.	State law requires no net loss of ecological values and functions to critical areas (per WAC 365-196-830 and WAC 365-190-080). If impacts are unavoidable, mitigation must be outlined within a plan completed by a qualified professional.
16.10.050 Critical areas maps	General Comment	We recommend including WDFW's 200-year Site-potential Tree Height (SPTH200) and Riparian Management Zone (RMZ) Values mapping resource and WDFW's PHS map within the city's mapping resources.
16.10.070 Critical area review process and application requirements	C. Consultant Qualifications and City Review. All reports and studies required of the applicant by this section shall be prepared by a qualified consultant as that term is defined in these regulations.	For delineating RMZs, we recommend pointing the applicant towards the qualified professional resources in Appendix A of WDFW's *Guidelines for Determining Site Potential Tree Height from Field Measurements*.
16.10.080 Classificati	E(5.) ...Intentionally created streams are excluded from regulation under this section,	It is important to note that all waterways supporting fish must be protected. Where a waterway has been intentionally created for

on and rating of critical areas	except manmade streams that provide "critical habitat," as designated by federal or state agencies, for salmonids, or streams that contain fish. Intentionally created streams must install fish exclusion devices when applicable to protect fish life.	irrigation or similar purposes and does not follow the historic path of natural water flow, appropriate fish exclusion devices should be installed, where applicable, to prevent fish from entering these areas. WDFW is available to plan and permit new fish exclusion devices.
16.10.080 Classificati on and rating of critical areas	F. Wildlife Habitat Classification. Wildlife habitat areas shall be classified as critical, secondary or tertiary according to the criteria in this section:	Critical areas listed under the FWHCA designation must be fully protected as critical areas, ensuring that there is no net loss of ecological values and functions within these areas. Please review WAC 365-190-130 and incorporate all FWHCA's required for protection within this section that exist within Auburn. We also recommend including 'Riparian Management Zones' and 'Wildlife Habitat Corridors' as distinct types of critical areas under the FWHCA designation.
16.10.080 Classificati on and rating of critical areas	F(e.) Riparian Management Zones ~~Buffers for critical habitat shall be consistent with Washington Department of Fish and Wildlife Riparian Ecosystems.~~ (f.) Wildlife Habitat Corridors	Although appreciated, this addition seems out of place. The FWHCA section of the CAO should first outline the types of FWHCAs and later define the requirements for protecting each type within dedicated sections.
16.10.080 Classificati on and rating of critical areas	~~2. "Secondary habitat"~~ ~~3. "Tertiary habitat"~~	We do not recommend using ratings to distinguish different requirements for FWHCAs. All critical areas are subject to the same protection standard of no net loss.
16.10.090 Buffer areas and setbacks	A. General Provisions. The establishment of on-site buffers, buffer areas or setbacks shall be required for all development proposals and activities in or adjacent to wetlands, streams, fish and wildlife habitat conservation areas, and geologically hazardous areas...	We suggest aligning this chapter with state language that describes the five types of critical areas that require protection, including Fish and Wildlife Habitat Conservation Areas (FWHCAs).
16.10.090 Buffer areas and setbacks	C. Buffers shall be measured as follows: ...2. Stream buffers – the buffer shall be measured perpendicular from the channel migration zone if present. If a channel migration zone is not present, the ordinary high water mark shall be used;	Local jurisdictions should identify and limit development within Channel Migration Zones (CMZs)(WAC 173-26-221). We encourage the City to incorporate a CMZ definition as well as delineate riparian management zones (RMZs) from the edge of the CMZ if present, as outlined in WDFW's *Riparian Ecosystems, Volume 2: Management Recommendations.* The CMZ reflects where the river is most likely to erode

<table>
<tr><td></td><td></td><td>banks, flood, or change course. Limiting development within the CMZ reduces risks to public safety, property, and infrastructure, while also protecting riparian functions. If RMZs are measured only from the ordinary high-water mark, development may be permitted in areas highly prone to channel movement and flood hazards, creating long-term safety and liability issues for the jurisdiction.</td></tr>
<tr><td>16.10.090
Buffer areas and setbacks</td><td>E(2.) Riparian Management Zones ~~Stream buffers~~ shall be established as follows:</td><td>WDFW’s BAS and management recommendations (Riparian Ecosystems Vol. 1 & 2, 2020) emphasize that riparian areas are not just buffers but critical habitats in their own right. Although riparian ecosystems constitute a small portion of the surface landscape, approximately 85% of Washington’s wildlife species are known to use riparian areas associated with rivers and streams. Of these, 170 species may be riparian obligates, i.e., require riparian habitat to survive.
Recognizing RMZs as a type of critical area rather than simply a buffer is necessary to reflect their ecological importance and align with WDFW’s BAS.</td></tr>
<tr><td>16.10.090
Buffer areas and setbacks</td><td>2.
<table><tr><td>Stream Type</td><td>Minimum Riparian Management Zone ~~Buffer Width~~ (in feet)</td></tr><tr><td>Type S</td><td>Per SMP</td></tr><tr><td>Type F</td><td>SPTH ~~100~~</td></tr><tr><td>Type Np</td><td>SPTH ~~50~~</td></tr><tr><td>Type Ns</td><td>SPTH ~~50~~</td></tr></table></td><td>The widths in this table do not represent sufficient protection standards for riparian areas. All streams, independent of fish use, shall have protection measures that ensure no net loss of ecological values and functions. WDFW’s current best available science standards and management recommendations outline the need to use the Site Potential Tree Height at 200 years ($SPTH_{200}$) to measure RMZ widths (see WDFW’s mapping tool and field delineation guidance).
To stop pollutants from entering streams, RMZs must be 100 feet wide and fully vegetated at a minimum. Meeting RMZ standards is especially critical in highly developed areas like Auburn, where elevated levels of impervious surface contribute to increased stormwater runoff and water quality degradation. The importance of addressing water quality concerns is demonstrated by the listing of many water bodies within the city on Ecology’s 303(d) list, which outlines a trend of continued degraded biological integrity over time.
The GMA also requires jurisdictions to give "special consideration" to conservation or protection measures necessary to preserve or</td></tr>
</table>

		enhance anadromous fisheries (WAC 365-195-925) as well as incorporate regulations to address issues at the watershed scale (WAC 365-196-830(6)). **This is especially relevant to Auburn and echoes the commitments made by the city in the WRIA 9 Interlocal Agreement.** Stream-related critical area regulations within Auburn are instrumental in the recovery of federally listed Chinook salmon species. As outlined very clearly in the WRIA 9 Salmon Habitat Plan 2021 Update, Auburn has many priority projects that, if completed, would greatly benefit the watershed.
16.10.090 Buffer areas and setbacks	General comment	According to WDFW's SPTH map, many RMZ widths look to be around 100 feet within Auburn. This means that it is likely that only a very small number of property owners would experience new critical area restrictions on their properties. These property owners also have the option to apply for reasonable use exemptions. We also recommend adding a section outlining the allowance for decreased widths for areas that are isolated from the critical area, similar to the wetlands section. For instance, Woodinville outlines "if a portion of a riparian management zone is determined to be functionally isolated and physically separated from the watercourse due to existing, legally established public roadways, railroads or other legally established structures or paved areas...the director may exclude this area from a riparian management zone provided...," which can be found in the July 24th, 2025 **planning commission packet.**
16.10.090 Buffer areas and setbacks	2(b.) The buffer widths required in this section may be increased by the director up to a maximum of 50 percent for Type F and Ns streams and up to 100 percent for Type Np streams in response to site-specific conditions and based on the report information...	This seems voluntary. We recommend language, such as "standard RMZ widths are based on the assumption that the area is densely vegetated with a native plant community appropriate for the ecoregion, consisting of an average of 80% native cover comprised of trees, shrubs, and groundcover plants. If the existing RMZ is sparsely vegetated or vegetated with invasive species, the RMZ must either be enhanced through an approved mitigation plan or increased by 33%." Covington (Planning Commission meeting), Woodinville (planning commission packet), Skagit County (meeting agenda packet (14.24.530)), and other jurisdictions all utilize some version of the above language to incentivize healthy critical area buffers.

16.10.090 Buffer areas and setbacks	2(c.)(ii.) For construction of new public roads and utilities~~, and accessory structures,~~ when no feasible alternative location exists; or...	See comments for 16.10.040 Exemptions and nonconforming uses, A(7.) above.
16.10.090 Buffer areas and setbacks	2(d.) Buffer width averaging may be allowed for Type F and Type Np streams only; provided, that all of the following are demonstrated by the applicant:	We do not recommend stream buffer averaging. WDFW has found no scientific evidence supporting the idea that reducing a riparian buffer in one area while expanding it elsewhere achieves no net loss of ecological functions and values. WDFW's *Riparian Ecosystems, Volume 1: Science Synthesis and Management Implications* (2020) shows that riparian buffer widths are established based on the specific ecological functions they are intended to support, **which are directly tied to the width**, continuity, and quality of vegetation within the buffer. If buffer averaging is retained, we recommend adding a provision within this section that no width can be below 100 feet at any one point to ensure adequate pollution removal.
16.10.090 Buffer areas and setbacks	~~2(e.) Stream buffer widths may be reduced by the director on a case-by-case basis by up to 25 percent if an applicant demonstrates...~~	See comment above. No RMZ/stream buffer should be reduced.
16.10.090 Buffer areas and setbacks	3. Wildlife Habitat Areas. a. Buffer widths for critical habitat areas shall be determined by the director based on consideration of the following factors: species recommendations of the Department of Fish and Wildlife; recommendations contained in the wildlife report and the nature and intensity of land uses and activities occurring on the site and on adjacent sites. ~~Buffers shall not be required for secondary or tertiary habitat.~~ When designated Priority Habitat or Species are present, buffer widths shall conform to the best available science guidance ~~in WDFW's Riparian Ecosystems, Volume 2: Management Recommendations (2020), or as updated~~. The director may require a critical area	Riparian protection should be defined in the section above. Section 3 should be specific to other wildlife habitats.

	report prepared by a qualified professional to document compliance.	
16.10.090 Buffer areas and setbacks	~~3(b.) Buffer widths for critical habitat areas may be modified by averaging buffer widths or by enhancing or restoring buffer quality.~~	See comments for 16.10.090 Buffer areas and setbacks. 2(d.) above.
16.10.100 Alteration or development of critical areas – Standards and criteria – Prohibited uses	B(3.) Culverts are allowable only under the following circumstances: c. When the following design criteria are met: IV. Future climate-related impacts, such as projected high flows, shall be considered when reviewing proposals. This should be done in accordance with the Washington Department of Fish and Wildlife's guidance document *Incorporating Climate Change into the Design of Water Crossing Structures: Final Project Report* and the accompanying *Culvert and Climate Change* web application.	It's important to include climate-related impacts in Critical Areas development regulations because projected changes in streamflow, such as higher peak flows and more frequent flooding, could directly affect the stability and function of water crossings and riparian systems. Designing for future conditions reduces the risk of infrastructure failure, prevents costly retrofits, and ensures continued protection of fish habitat and water quality.
16.10.100 Alteration or development of critical areas – Standards and criteria – Prohibited uses	~~C(2.) Secondary Habitat...~~ ~~(3.) Tertiary Habitat...~~	See comments for 16.10.080 Classification and rating of critical areas, part F, above.
16.10.110 Mitigation standards, location, and timing, wetland replacement ratios, and long-term protection requirements	1. All feasible and reasonable measures as determined by the department have been taken to ~~reduce impacts and losses to the critical area, or~~ avoid impacts ~~where avoidance is required by these regulations~~ including, where applicable; I) Alternative building locations on the property; II) Adjustments to the project footprint and orientation;	We recommend this section specify the avoidance measures applicants must consider. Avoidance of impacts is the most critical step in the mitigation sequence, and applicants should be required to demonstrate that they have taken meaningful steps to avoid impacts. This often necessitates clear, specific criteria to show that avoidance was fully evaluated before moving on to other steps within the mitigation sequence.

	III) Modification of setbacks, where feasible, as a first option before encroaching into critical areas or their buffers; IV) Multi-story design or alternate building design	
16.10.110 Mitigation standards, location, and timing, wetland replacement ratios, and long-term protection requirements	B(3.) In-kind mitigation shall be provided unless the applicant demonstrates, and the director concurs, that on-site mitigation is not feasible and out-of-kind mitigation will result in equal or greater ecological or habitat function. Out-of-kind mitigation may be approved only where it provides equal or greater benefits to critical area functions.	For streams, it is essential that ecosystem functions and values be replaced on-site. The removal of trees adjacent to a stream can immediately results in increased water temperatures, reduced bank stability, and a loss of habitat complexity, impacts that cannot be effectively replicated elsewhere. Off-site mitigation does not restore these site-specific processes. We recommend that this section specify off-site mitigation guidance specific to the critical area type.
16.10.110 Mitigation standards, location, and timing, wetland replacement ratios, and long-term protection requirements	D(a.) The director determines that it would provide appropriate compensation for the proposed impacts and on-site mitigation is infeasible.	Including the adjacent edit ensures that in-lieu fee mitigation is only used as a last resort, consistent with the mitigation sequence. On-site mitigation is critical because many ecological functions cannot be adequately replaced elsewhere because they support the wider ecosystem at that specific location. Without this clause, applicants could more easily bypass on-site mitigation thereby weakening protections and undermining no net loss standards.
16.10.110 Mitigation standards, location, and timing, wetland replacement ratios, and long-term protection requirements	F. Mitigation Plan Requirements. When a project involves critical area or critical area ~~wetland and/or~~ buffer impacts, a mitigation plan prepared by a qualified ~~wetland~~ professional shall be required, meeting the following minimum standards:	This language should be edited to represent the requirements to protect all types of critical areas, including those listed within the FWHCA section.
16.10.110 Mitigation standards, location, and timing, wetland replacement ratios, and long-term protection requirements	F. Mitigation Plan Requirements.	This section should specify mitigation plan requirements for all critical areas, not just wetlands. The principle of no net loss of ecological functions and values applies to every critical area type, and protections must be consistent across them.

16.10.120 Performance standards for mitigation planning	C. Fish and Wildlife Habitat Conservation Areas.	Edit to align language with state requirements.
16.10.120 Performance standards for mitigation planning	C(2.)(b.) Integrate retained habitat into open space and landscaping;	Open space and landscaping areas should be planted with native vegetation and designed to include habitat features. However, the current language implies that FWHCAs can be treated as open space or landscaping, which is inappropriate. FWHCAs must remain distinct and protected, separate from lawns and other residential use areas, unless the city protects open spaces as a type of FWHCA for habitat connectivity purposes.
16.10.120 Performance standards for mitigation planning	3. Where WDFW-designated critical habitat or Priority Habitat/Site (PHS) areas are present adjacent to mitigation sites, buffer widths must be consistent with WDFW Riparian Ecosystems, Volume 2: Management Recommendations (2020).	We appreciate this addition and recommend the stream buffer/RMZ inclusions above to align this chapter with WDFW's riparian protection standards.
16.10.160 Variances	...Minor variances, defined as up to and including 10 percent of the requirement, may be granted by the director as a Type II decision as defined by Chapter 14.03 ACC...	A 10% variance, such as a 10% reduction of a critical area buffer, does not align with no net loss principles required by state law.

Thank you for taking the time to consider our recommendations to better reflect the best available science for fish and wildlife habitats and ecosystems. We value the relationship we have with your jurisdiction and the opportunity to work collaboratively with you throughout this periodic update cycle. If you have any questions or need our technical assistance or resources at any time during this process, please don't hesitate to contact me or the Regional Land Use Lead, Morgan Krueger (morgan.krueger@dfw.wa.gov).

Sincerely,

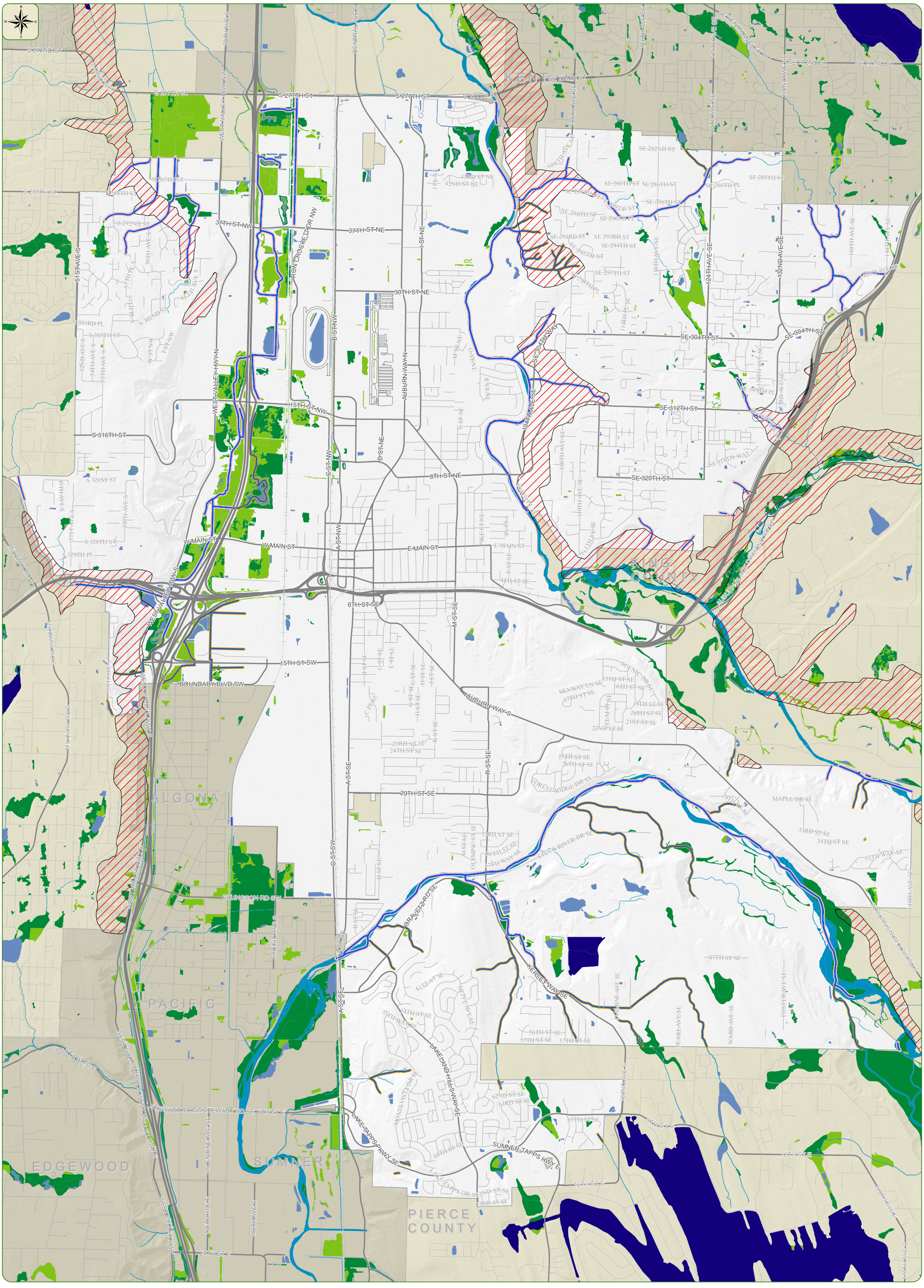


Marcus Reaves, Regional Habitat Program Manager (Marcus.Reaves@dfw.wa.gov)

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Region 4 Southern District Planning Inbox (R4SPlanning@dfw.wa.gov)
Eric Guida, WA Department of Commerce (eric.guida@commerce.wa.gov)

ATTACHMENT 5

Existing Stream Buffers



Streams

Landslide Hazard

Fish Bearing Streams WDFW 100 Feet Buffer

Non Fish Bearing Streams Ecology 50 Feet Buffer

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake

Other

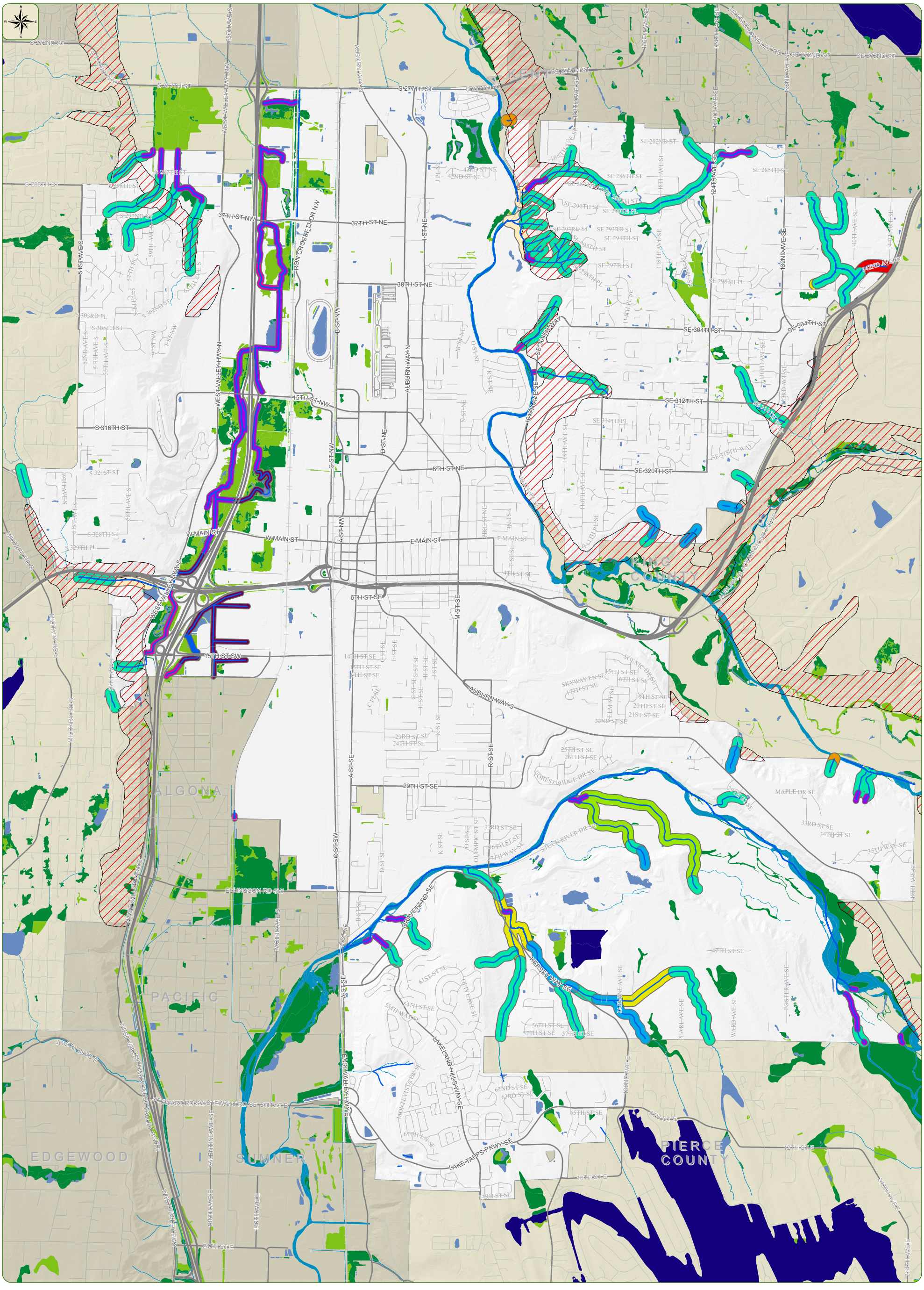
Riverine

Printed On: 2/17/2026
Map ID: 6366

Information shown is for general reference purposes only and does not necessarily represent exact geographic or cartographic data as mapped. The City of Auburn makes no warranty as to its accuracy.

ATTACHMENT 6

S P T H B u f f e r s



Printed On: 2/17/2026
Map ID: 6368

- Streams
- Landslide Hazard
- Streams SPTH 94 Feet Buffer
- Streams SPTH 100 Feet Buffer
- Streams SPTH 105 Feet Buffer
- Streams SPTH 111 Feet Buffer
- Streams SPTH 187 Feet Buffer
- Streams SPTH 196 Feet Buffer
- Streams SPTH 202 Feet Buffer
- Streams SPTH 204 Feet Buffer
- Streams SPTH 215 Feet Buffer
- Streams SPTH 225 Feet Buffer
- Streams SPTH 227 Feet Buffer

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

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ATTACHMENT 7

Proposed Stream Buffers

Printed On: 2/17/2026
Map ID: 6367

Streams
Landslide Hazard
Non Fish Bearing Streams 100 Feet Buffer
Fish Bearing Streams 150 Feet Buffer

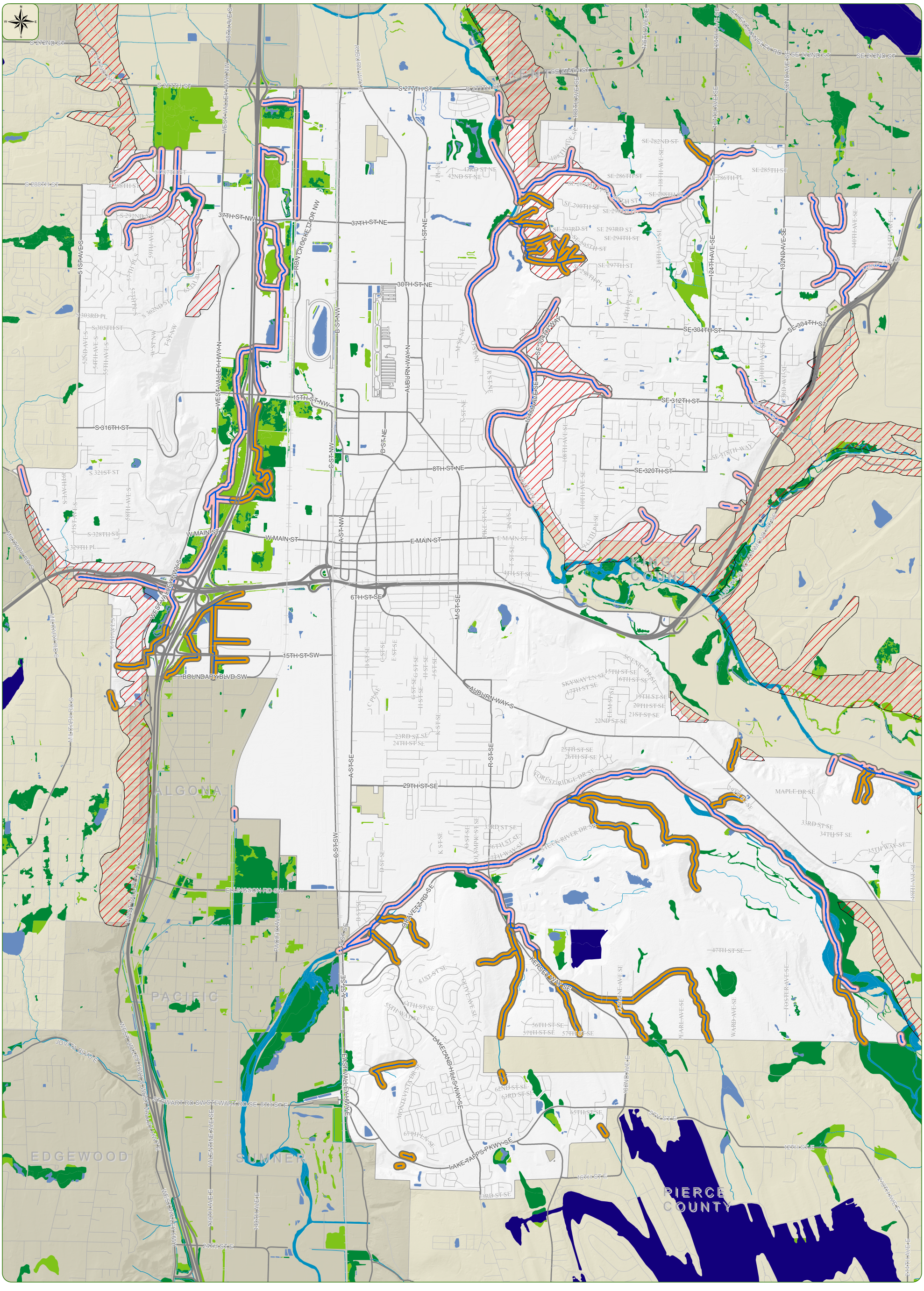
Wetlands
Estuarine and Marine Deepwater
Estuarine and Marine Wetland
Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland

Freshwater Pond
Lake
Other
Riverine

Information shown is for general reference purposes only and does not necessarily represent exact geographic or cartographic data as mapped. The City of Auburn makes no warranty as to its accuracy.

ATTACHMENT 8

Proposed Increased Stream Buffers



Printed On: 2/18/2026
Map ID: 6369

- Streams
- Landslide Hazard
- Fish Bearing Streams 200 Feet Buffer
- Non Fish Bearing Streams 133 Feet Buffer

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland

- Freshwater Pond
- Lake
- Other
- Riverine

Information shown is for general reference purposes only and does not necessarily represent exact geographic or cartographic data as mapped. The City of Auburn makes no warranty as to its accuracy.

CITY OF AUBURN WASHINGTON

AGENDA BILL APPROVAL FORM

Agenda Subject:
Downtown Design Standards and Code Update
Staff Introduction/Presentation (Tatro)
Staff will provide an update on the public outreach conducted for the draft Downtown Design Standards and provide an overview of the changes made to Chapter 18.29 ACC.

Meeting Date:
March 3, 2026

Department:
Community Development

Attachments:
Planning Commission Memorandum, Attachment 1 - Chapter 18.29 ACC Text Amendment, Attachment 2 - ACC Section 18.02.070 Text Amendment, Attachment 3 - DUC Zoning Districts Map

Budget Impact:

Administrative Recommendation:

Background for Motion:

Background Summary:
See attached Planning Commission Memorandum

Councilmember:

Staff: Jason Krum

PLANNING COMMISSION MEMORANDUM

TO: Judi Roland, Chair Planning Commission
Bill Stewart, Vice Chair Planning Commission
Planning Commission Members

FROM: Alyssa Tatro, Senior Planner
Dept. of Community Development

DATE: February 18, 2026

RE: **ZOA26-0003 – Chapter 18.29 DUC Downtown Urban Center District Update**

I. BACKGROUND & PURPOSE

The City of Auburn is currently undertaking a comprehensive update of the Downtown Urban Center Zoning Code (Chapter 18.29 ACC) and the Downtown Design Standards in association with the recently adopted Downtown Subarea Plan. The Downtown Urban Center zone establishes the land use framework, development standards, and district structure for downtown Auburn. These regulations are intended to support a concentration and mixture of commercial, residential, civic, and industrial uses, consistent with the vision set forth in the Downtown Subarea Plan. The zoning development standards are intended to support business and economic development and a connected, pedestrian-focused environment.

In December 2025, the City adopted the updated Downtown Subarea Plan. The plan establishes a long-term vision for downtown as a walkable, economically vibrant, and people-centered hub. The code update is intended to align the Downtown Urban Center zoning district with the land use framework, development patterns, and policy direction of the Subarea Plan.

The purpose of this memorandum and the Planning Commission meeting is to introduce the draft code amendment and receive feedback prior to a future public hearing. Feedback from the Commission will be used to refine the draft code as necessary. An update on public engagement for the Downtown Design Standards will also be provided at this meeting.

II. SUMMARY OF PROPOSED CODE CHANGES

At a high level, the proposed Downtown Urban Center zoning code update:

- Aligns zoning districts and development standards with the recently adopted Downtown Plan;
- Updates use regulations to better reflect intended land use patterns within each district;
- Revises parking standards to reduce minimum requirements;
- Clarifies applicability;

- Adds a new Planned Action Standards section to implement the Downtown Subarea Planned Action Environmental Impact Statement (EIS); and

- Includes overall changes to ensure clarity and consistency with state law.

III. KEY CHANGES FROM THE EXISTING CODE

1. *Expanded and Refined Implementing Districts*
   The Downtown Urban Center remains a single zone, but the proposed revisions refine the implementing district structure. These districts are more clearly defined with specific purposes and development expectations. Each district now includes clearer intent language and specific density and height limits, helping align zoning with the Downtown Plan's land use framework.

2. *Updated Use Regulations by District*
   The existing code generally prohibits a list of uses across the entire Downtown Urban Center. The proposed code reorganizes use limitations so that prohibited uses are identified by district rather than applied uniformly. The update also adds a new section for uses requiring a Conditional Use Permit.

3. *Revisions to Parking Standards*
   The proposed code significantly updates parking requirements across the Downtown Urban Center. Changes include:

   - Reducing or eliminating minimum parking requirements for several residential uses;

   - Establishing no minimum parking requirements for affordable housing, senior housing, and small commercial uses; and

   - Eliminating parking requirements for ground-floor nonresidential uses in mixed-use buildings.

4. *District Development Standards*
   The proposed code reorganizes development standards so that they are clearly applied by district. For example:

   - Core districts continue to use the FAR-based system with bonuses;

   - The Neighborhood Residential district includes minimum density, lot size, and setback standards tailored to middle housing; and

   - Commercial and industrial districts include standards that address compatibility with adjacent residential areas.

5. *Addition of Planned Action Standards*
   The proposed code adds a new section establishing Planned Action Standards for the Downtown Urban Center. This text is taken directly from the Planned Action Ord. (No. 7006) adopted by Council on December 15, 2025. The purpose of adding the text in code is for ease of access for staff and the public. This section implements the Downtown Subarea Planned Action EIS and allows qualifying projects to rely on the existing environmental review rather than completing separate SEPA review.

6. *Minor Text and Process Updates*
   Additional updates include:

- Updating references and internal cross-references;
- Adjusting applicability and exemption language;
- Ensuring compliance and consistency with state law; and
- These changes are primarily administrative and intended to improve clarity and consistency.

IV. RELATIONSHIP TO THE DOWNTOWN PLAN

The Downtown Plan establishes the long-term vision and policy direction for downtown Auburn. The Downtown Urban Center zoning code is one of the primary regulatory tools used to implement that vision. The updated Downtown Design Standards and the zoning code revisions are intended to ensure that future development reflects the community's vision for a walkable, vibrant, and economically strong downtown.

V. ATTACHMENTS

1) Chapter 18.29 ACC Text Amendment
2) ACC Section 18.02.070 Text Amendment
3) DUC Zoning Districts Map

Chapter 18.29
DUC DOWNTOWN URBAN CENTER DISTRICT

Sections:

18.29.010 Intent.
18.29.020 Scope.
18.29.030 Process.
18.29.040 Definitions.
18.29.050 Use limitations.
18.29.053 Uses/activities requiring an administrative use permit.
18.29.054 Uses/activities requiring a conditional use permit.
18.29.055 Deviation from development standards.
18.29.04557 Implementing districts.
18.29.060 Development standards.
18.29.070 Design standards.
18.29.080 Planned action standards.

18.29.010 Intent.

The downtown urban center ~~zone~~ is intended to create a distinct and strong identity for downtown Auburn by establishing land use and design standards for review of development proposals within the core area of the city of Auburn's designated urban center, in order to implement the city of Auburn downtown plan and the goals, policies and objectives of the Auburn comprehensive plan. The downtown urban center~~is zone~~ is intended to produce a concentration and mixture of commercial, office, medical, retail, residential and civic uses within the downtown area; to encourage private and public investment, attract shoppers and visitors, and appeal to existing and new residents; to provide a development pattern that supports pedestrian movement, bicycles and use of public transit; and to provide opportunities to increase the city's tax base, thereby helping to fund public improvements and public services. (Ord. 6071 § 6 (Exh. A), 2007.)

18.29.020 Scope.

A. AThe downtown urban center district zone may be applied to any property designated as "Downtown" on the Auburn comprehensive plan map.

B. Site plan and building design review and approval shall be required for all public and private development activities requiring permits within athe downtown urban center districtzone unless exempted under subsection C of this section. The planning and development director is given the authority to require building design and site plans consistent with the design standards contained or referenced herein and to require revisions as necessary in order to ensure development is consistent with the purpose of this chapter.

C. The following activities, as determined by the director, shall be exempt from the provisions of this chapter if the property has frontage on a pedestrian street as defined in the downtown urban center design standards:

1. Interior alterations that do not alter the exterior appearance of a structure or modify an existing site condition;

2. Normal or routine building and site maintenance/repair that is exempt from permit requirements; and

3. Any remodeling or expansion of existing single-unit detached residences and middle housing developments. with no change in use or addition of dwelling units involved.

D. The following activities, as determined by the director, shall be exempt from the provisions of this chapter if the property does not have frontage on a pedestrian street as defined in the downtown urban center design standards:

1. Interior alterations that do not alter the exterior appearance of a structure or modify an existing site condition;

2. Site and exterior alterations that do not exceed 10 percent of the assessed valuation of the property (building or land) per the most recent county records;

3. Building additions that are less than 10 percent of the existing floor area of the existing building(s). Any cumulative floor area increase (from the adoption date of the ordinance codified in this chapter) that totals more than 10 percent shall not be exempt; unless the

~~director determines compliance with these standards would be unfeasible and/or unreasonable;~~

~~4. Normal or routine building and site maintenance/repair that is exempt from permit requirements;~~

~~5. Any remodeling or expansion of existing single-unit detached residences with no change in use or addition of dwelling units involved.~~ ~~(Ord. 6959 § 1 (Exh. A), 2024; Ord. 6287 § 2, 2010; Ord. 6230 § 1, 2009; Ord. 6071 § 6 (Exh. A), 2007.)~~

18.29.030 Process.

A. Compliance with all development and design standards contained or referenced herein shall occur in conjunction with any required permit process. The director shall provide appropriate forms that shall accompany a permit application. The director may approve, approve with conditions, or deny a building or site development permit application to ensure compliance with these standards. Any decision regarding a permit application shall be set forth in writing and contain findings of fact and conclusions that support the decision made.

B. The decision of the director shall be final unless the applicant or any affected party appeals the decision to the hearing examiner. All appeals shall be in accordance with ACC 18.70.050(B) through (E). (Ord. 6071 § 6 (Exh. A), 2007.)

18.29.040 Definitions.

These words shall have the following meanings for the purposes of this chapter:

A. “Canopy” means a cover over a sidewalk providing protection from the rain, which is constructed of durable, permanent materials.

B. “Director” means the director of the Auburn ~~d~~Department of Community ~~planning and d~~Development.

C. "Green roof" means a roof designed with principles of environmental sustainability, involving the use of vegetation and storm water collection and cleaning. It may or may not be accessible.

D. "Health club" means a use that offers exercise and recreational activities for tenants and/or the general public, either with or without a fee.

E. "Parking, below grade" means any portion of a structure containing parking that is located below the average finished grade around a building.

F. "Parking, structured" means parking contained within an enclosed building, designed to appear like it is part of the larger building complex, or a freestanding structure devoted exclusively to above-grade parking.

G. "Performing space" means any interior or exterior area designated for live performing and entertainment.

H. "Public art" means any form of painting, mural, mosaic, sculpture, or other work of art, so long as it can be appraised as a work of art and its value as such documented, displayed on the exterior of a building, at or near the pedestrian entrance, or on a public plaza, and visible to users of the public right-of-way at all times.

I. "Public meeting room" means a space that can be used by the general public and having a capacity of at least 50 people. It may operate under a reservation or nominal fee system and must be easily accessible from a lobby or plaza.

J. "Public plaza" means an open space that is visible and accessible to the public at all times, predominantly open to the sky, and for use principally by people, as opposed to merely a setting for the building.

K. "Street level retail" means uses providing goods and services, including food and drink, adjacent to, visible from, and directly accessible from the public sidewalk.

~~L. "Water feature" means a fountain, cascade, stream, fall, pond of water, or combination thereof, that serves as a focal point, located outside of a building, publicly visible and accessible, and active during daylight hours.~~ ~~(Ord. 6287 § 2, 2010; Ord. 6071 § 6 (Exh. A), 2007.)~~

18.29.050 Use limitations.

Hereafter, all buildings, structures or properties may be used for any use, unless specifically prohibited herein. Ground floor retail, restaurants and/or office use is required for all building frontages facing Main Street. All uses shall be subject to review and approval by the director.

A. The following uses are prohibited in all DUC zoning districts:

~~A. Sexually oriented businesses as defined in Chapter 18.74 ACC.~~

~~B. All industrial uses as defined in the North American Industrial Classification System (2022 Edition), categories 48 through 49 (transportation), 31 through 33 (manufacturing) and 42 (wholesale trade).~~

~~C. Outdoor storage of materials and equipment (except during active construction projects).~~

~~D. New automobile maintenance and repair businesses.~~

~~E. Work release facilities; secure community transition facilities.~~

~~F. Wrecking yards.~~

~~G. Solid waste transfer stations.~~

~~H. Car washes.~~

~~I. New gasoline stations.~~

~~J. Street-level ministorage.~~

~~K. Outdoor sales of vehicles, boats or equipment.~~

~~L. Drive-in/drive-through facilities with direct vehicular driveway access onto Main Street.~~

~~M. All marijuana-related businesses and marijuana cooperatives.~~

~~N. New single-unit detached dwellings; except for DUC neighborhood residential district.~~

1. Battery Energy Storage Systems, Tier III.

2. New motor freight terminals.~~O. Other uses may be prohibited by the director if the use is determined to be inconsistent with the intent of this zone or is of the same general character of the other prohibited uses listed in this section. (Ord. 6959 § 1 (Exh. A), 2024; Ord. 6642 § 10, 2017; Ord. 6071 § 6 (Exh. A), 2007.)~~

3. Other uses may be prohibited by the director if the use is determined to be inconsistent with the intent of the downtown urban center or is of the same general character of the other prohibited uses listed in this section.

4. Solid waste transfer stations.

5. Use as dwelling units of (1) recreational vehicles that are not part of an approved recreational vehicle park, (2) boats, (3) automobiles, and (4) other vehicles.

6. Work release facilities; secure community transition facilities.

B. The following uses are prohibited in the DUC Core 75, Core 125, and H-W Districts:

1. All industrial uses as defined in the North American Industrial Classification System (2022 Edition), categories 48 through 49 (transportation), 31 through 33 (manufacturing) and 42 (wholesale trade), except wine production facility, small craft distillery, small craft brewery with a tasting room and/or tourism.

2. All marijuana-related businesses and marijuana cooperatives.

3. Car washes.

4. Drive-in/drive-through facilities with direct vehicular driveway access onto Main Street.

5. New automobile maintenance and repair businesses.

6. New fueling stations.

7. New single-unit detached dwellings.

8. Outdoor sales of vehicles, boats or equipment.

9. Outdoor storage of materials and equipment (except during active construction projects).

10. Sexually oriented businesses as defined in Chapter 18.74 ACC.

11. Street-level ministorage.

12. Wrecking (tow) yards.

C. The following uses are prohibited in the DUC N-R District:

1. Agricultural enterprises.
2. All industrial uses as defined in the North American Industrial Classification System (2022 Edition), categories 48 through 49 (transportation), 31 through 33 (manufacturing) and 42 (wholesale trade).
3. All marijuana-related businesses and marijuana cooperatives.
4. Apartments (more than 20 units).
5. Battery Energy Storage System, Tier II.
6. Café, or coffee shop over 4,000 sf in floor area.
7. Car washes.
8. Civic, social and fraternal clubs.
9. Co-living (more than 80 sleeping units).
10. Commercial over 4,000 sf in floor area.
11. Convenience store over 4,000 sf in floor area.
12. Drive-in/drive-through facilities with direct vehicular driveway access onto Main Street.
13. Group residence facilities (7 or more residents).
14. Hospitals (except animal hospitals).
15. Library, museum.
16. New automobile maintenance and repair businesses.
17. New fueling stations.
18. Outdoor sales of vehicles, boats or equipment.
19. Outdoor storage of materials and equipment (except during active construction projects).
20. Nursing homes.
21. Sexually oriented businesses as defined in Chapter 18.74 ACC.
22. Street-level ministorage.

23. Use as dwelling units of (1) recreational vehicles that are not part of an approved recreational vehicle park, (2) boats, (3) automobiles, and (4) other vehicles.

24. Wrecking (tow) yards.

D. The following uses are prohibited in the DUC M-1 District:

1. Apartments, standalone.

2. Live/work unit, standalone.

3. Manufacturing, assembling and packaging – Heavy intensity.

4. Marijuana cooperative.

5. New single unit detached dwellings.

6. Nursing home, assisted living facility.

7. Pharmacies.

8. Senior housing, except developments vested prior to Resolution No. 5187.

9. Work/live unit, standalone.

10. Youth community support facility.

E. The following uses are prohibited in the DUC C-1 District:

1. All industrial uses as defined in the North American Industrial Classification System (2022 Edition), categories 48 through 49 (transportation), 31 through 33 (manufacturing) and 42 (wholesale trade).

2. All marijuana-related businesses and marijuana cooperatives.

3. Ambulance, taxi, and specialized transportation facility.

4. Apartment units, as part of a mixed-use development.

5. Apartments, standalone.

6. Building and landscape materials sales.

7. Car washes.

8. Commercial recreation facility, outdoor.

9. Construction and heavy equipment sales and rental.

10. Drive-in/drive-through facilities with direct vehicular driveway access onto Main Street.

11. Equipment rental and leasing.

12. Heliport.

13. Kennel, animal boarding.

14. Mobile home, boat, or RV sales

15. Nursery.

16. Outdoor sales of vehicles, boats or equipment.

17. Outdoor storage of materials and equipment (except during active construction projects).

18. Regional retail establishment.

19. Senior housing, except developments vested prior to Resolution No. 5187.

20. Sexually oriented businesses as defined in Chapter 18.74 ACC.

21. Sports and entertainment assembly facility.

22. Street-level ministorage.

23. Vehicle services – Repair/body work

24. Wrecking (tow) yards.

F. The following uses are prohibited in the DUC C-2 District:

1. All marijuana-related businesses and marijuana cooperatives.
2. Apartments, standalone.
3. Building contractor, heavy
4. Construction and heavy equipment sales and rental
5. Live/work unit, standalone.
6. Manufacturing, assembling and packaging – Heavy intensity.
7. New single unit detached dwellings.

8. Nursing home, assisted living facility.
9. Pharmacies.
10. Senior housing, except developments vested prior to Resolution No. 5187.
11. Warehousing and distribution.
12. Work/live unit, standalone.
13. Wrecking (tow) yards.
14. Youth community support facility.

G. The following uses are prohibited in the DUC F-R District:

1. All marijuana-related businesses and marijuana cooperatives.
2. Apartments, standalone.
3. Battery Energy Storage System, Tier II.
4. Co-living units, more than 80 sleeping units.
5. Live/work unit, standalone.
6. Manufacturing, assembling and packaging – Heavy intensity.
7. Mixed-use, more than 20 units.
8. Nursing home, assisted living facility.
9. Pharmacies.
10. Senior housing, except developments vested prior to Resolution No. 5187.
11. Work/live unit, standalone.
12. Wrecking (tow) yards.
13. Youth community support facility.

18.29.053 Uses/activities requiring an administrative use permit.

A. The following uses/activities may be permitted in the DUC Core 75, Core 125, and H-W Districts when an administrative use permit has been issued pursuant to the provisions of Chapter 18.64 ACC:

1. Animal daycare businesses that feature outdoor exercise areas and/or kennels.

2. Battery Energy Storage System, Tier II.

3. ~~A.~~ Expansions of existing automobile maintenance and repair businesses.~~;~~

4. ~~B.~~ Expansions of existing gasoline (fueling) stations.~~;~~

~~1. C. Animal daycare businesses that feature outdoor exercise areas and/or kennels;~~

~~1. D. Wine production facility; small craft distillery; small craft brewery; and a tasting room is an outright allowed use in the DUC zone. (Ord. 6368 § 8, 2011; Ord. 6269 § 32, 2009.)~~

B. The following uses/activities may be permitted in the DUC N-R District when an administrative use permit has been issued pursuant to the provisions of Chapter 18.64 ACC:

1. Government facilities.

2. Grocery or specialty food store.

3. Neighborhood recreational buildings and facilities owned and managed by the neighborhood homeowners' association.

4. Personal service shop, over 4,000 sf in floor area.

5. Privately owned and operated parks and playgrounds and not homeowners' association-owned recreational area.

6. Religious institutions, less than one acre lot size. Reference ACC 18.31.165 for standards related to homeless encampments hosted by a religious organization.

7. Restaurant.

C. The following uses/activities may be permitted in the DUC M-1 District when an administrative use permit has been issued pursuant to the provisions of Chapter 18.64 ACC:

1. Any commercial use abutting a residential zone which has hours of operation outside of the following: Sunday: 9:00 a.m. to 10:00 p.m. or Monday – Saturday: 7:00 a.m. to 10:00 p.m.
2. Battery Energy Storage System, Tier II.
3. Conference/convention facility.
4. Construction and heavy equipment sales and rental.
5. Entertainment, commercial.
6. Government facilities; this excludes offices and related uses that are permitted outright.
7. Indoor emergency housing or shelter. Reference ACC 18.31.160 for specific standards.
8. Kennel, animal boarding.
9. Library, museum.
10. Lodging – Hotel or motel.
11. Religious institutions, lot size less than one acre.
12. Religious institutions, lot size more than one acre.
13. Sports and entertainment assembly facility.
14. Supportive housing (permanent). Reference ACC 18.31.160 for specific standards.
15. Transitional housing. Reference ACC 18.31.160 for specific standards.
16. Utility transmission or distribution line or substation.
17. Wrecking (tow) yard.

D. The following uses/activities may be permitted in the DUC C-1 District when an administrative use permit has been issued pursuant to the provisions of Chapter 18.64 ACC:

1. Animal daycare (excluding kennels and animal boarding).

2. Any commercial use abutting a residential zone which has hours of operation outside of the following: Sunday: 9:00 a.m. to 10:00 p.m. or Monday – Saturday: 7:00 a.m. to 10:00 p.m.

3. Auto parts sales with installation services.

4. Auto/vehicle sales and rental.

5. Automobile washes (automatic, full or self-service).

6. Battery Energy Storage System, Tier II.

7. Drive-through espresso stands.

8. Drive-through facility, including banks and restaurants.

9. Entertainment, commercial.

10. Fueling station.

11. Government facilities; this excludes offices and related uses that are permitted outright.

12. Library, museum.

13. Printing and publishing (of books, newspaper and other printed matter).

14. Private school – Specialized education/training (for profit).

15. Repair service – Equipment, appliances.

16. Utility transmission or distribution line or substation.

E. The following uses/activities may be permitted in the DUC C-2 District when an administrative use permit has been issued pursuant to the provisions of Chapter 18.64 ACC:

1. Ambulance, taxi, and specialized transportation facility.

2. Any commercial use abutting a residential zone which has hours of operation outside of the following: Sunday: 9:00 a.m. to 10:00 p.m. or Monday – Saturday: 7:00 a.m. to 10:00 p.m.

3. Battery Energy Storage System, Tier II.

4. Commercial recreation facility, outdoor.

5. Conference/convention facility.

6. Government facilities; this excludes offices and related uses that are permitted outright.

7. Kennel, animal boarding.

8. Library, museum.

9. Manufacturing, assembling and packaging – Medium intensity.

10. Senior housing, except developments vested prior to Resolution No. 5187.

11. Sports and entertainment assembly facility.

12. Utility transmission or distribution line or substation.

F. The following uses/activities may be permitted in the DUC F-R District when an administrative use permit has been issued pursuant to the provisions of Chapter 18.64 ACC:

1. Civic, social and fraternal clubs.

2. Commercial retail establishment, over 4,000 sf in floor area.

3. Government facilities.

4. Grocery or specialty food store, over 4,000 sf in floor area.

5. Religious institutions, less than one acre lot size. Reference ACC 18.31.165 for standards related to homeless encampments hosted by a religious organization.

~~1.~~6. Restaurant, café, or coffee shop, over 4,000 sf in floor area.

18.29.054 Uses/activities requiring a conditional use permit.

A. The following uses/activities may be permitted in the DUC N-R District when a conditional use permit has been issued pursuant to the provisions of Chapter 18.64 ACC:

1. Religious institutions, one acre or larger lot size. Reference ACC 18.31.165 for standards related to homeless encampments hosted by a religious organization.
2. Transmitting towers.
3. Utility facilities and substations. Excludes all public and private utility facilities addressed under ACC 18.02.040(E).

B. The following uses/activities may be permitted in the DUC M-1 when a conditional use permit has been issued pursuant to the provisions of Chapter 18.64 ACC:

1. Heliport.
2. All marijuana-related businesses.

C. The following uses/activities may be permitted in the DUC C-2 District when a conditional use permit has been issued pursuant to the provisions of Chapter 18.64 ACC:

1. Heliport.
2. Marijuana retailer.

D. The following uses/activities may be permitted in the DUC F-R District when a conditional use permit has been issued pursuant to the provisions of Chapter 18.64 ACC:

1. Hospitals (except animal hospitals).
2. Nursing homes.
3. Religious institutions, one acre or larger lot size. Reference ACC 18.31.165 for standards related to homeless encampments hosted by a religious organization.
4. Transmitting towers.

5. Utility facilities and substations. Excludes all public and private utility facilities addressed under ACC 18.02.040(E).

18.29.055 Deviation from development standards.

Any development project that seeks to deviate from any development standard listed in ACC 18.29.060 must be granted an administrative variance or variance, depending on the threshold of relief, pursuant to the provisions of Chapter 18.70 ACC. (Ord. 6959 § 1 (Exh. A), 2024; Ord. 6269 § 12, 2009; Ord. 6071 § 6 (Exh. A), 2007.)

18.29.04557 Implementing districts.

~~Downtown urban center zone is intended to create a distinct and strong identity for downtown Auburn by establishing land use and design standards for review of development proposals within the core area of the city of Auburn's designated urban center. This zone is intended to produce a concentration and mixture of commercial, office, medical, retail, entertainment, residential and civic uses within the downtown area; to encourage private and public investment, attract shoppers and visitors, and appeal to existing and new residents; to provide a development pattern that supports pedestrian movement, bicycles and use of public transit; and to provide opportunities to increase the city's tax base, thereby helping to fund public improvements and public services.~~ In order to implement the city of Auburn Downtown Plan and the goals, policies and objectives of the Auburn Comprehensive Plan, the ~~zone~~ downtown is divided into the following districts:

A. ~~*DUC Downtown Core 125 District.* DUC~~ The Core 125 district ~~is implemented only in the downtown urban center and~~ is intended for higher density residential and mixed-uses and commercial activity. Storefronts in this district that are located on a Pedestrian I street are required to contain retail, residential, or personal services uses. The DUC Core is subject to uses and development standards of this chapter and the downtown urban design guidelines. Development in the DUC downtown Core 125 district shall not exceed 125 feet in vertical height and is subject to other applicable height restrictions found in Chapter 18.38 ACC.

B. *DUC ~~Downtown~~ Core ~~-~~75 District.* The ~~DUC downtown core~~Core ~~-~~75 district ~~zone~~ is consistent with requirements described in the DUC downtown ~~c~~Core ~~-~~125, ~~except a maximum 75-vertical-foot height limit shall apply.~~

~~C. *DUC Downtown Core-55 District.* The DUC downtown core-55 zone is consistent with the requirements described in the DUC downtown core-125 except a maximum 55-vertical-foot height limit shall apply.~~

D. *DUC N-R Neighborhood Residential District.* The N-R district overlaps with residential areas of downtown and is intended to support moderate density residential housing types such as fourplexes, sixplexes, townhomes, and small apartment buildings. The N-R district allows for middle housing options, which are designed to support gradual infill development. The district does allow for limited non-residential uses. This district is subject to uses and development standards of this chapter and the downtown urban design guidelines. ~~R-2 uses per ACC Table 18.07.020 allowed subject to the development standards of this chapter and the downtown urban design guidelines.~~Development in the N-R district shall not exceed 45 feet in vertical height.

C~~E~~. *DUC H-W Health and Wellness District.* This district~~zone~~~~district~~ is to be used exclusively for the hospital area, located in the vicinity of 2nd Street NE and Auburn Avenue, and is intended to be used for medical and related uses and those uses compatible with the medical community. Residential may be included as part of vertical mixed-use development with medical being the primary development use. Storefronts in this district that are located on a Pedestrian I street are required to contain retail, residential, or personal services uses. This district is subject to the uses and development standards of this chapter and the downtown urban design guidelines. Developments in the DUC H-W district shall not exceed 125 feet in vertical height.

E~~F~~. *DUC M-1 Light Industrial District.* The DUC M-1 district is intended to accommodate a variety of light to medium intensity industrial and manufacturing uses. The primary goal of the district is to preserve land for industrial use; however, some commercial uses are also allowable. While allowed, outdoor storage will be regulated in a manner that mitigates visual impacts, taking surrounding uses and vehicular corridors into consideration. This district is subject to uses and development standards of this chapter and the downtown urban design guidelines. ~~M-1 zone uses allowed per ACC Table 18.23.030, subject to the development standards of this chapter and the downtown urban design guidelines.~~ Developments in the DUC M-1 45 feet in vertical height.

F. *DUC C-1 Light Commercial District.* The DUC C-1 district is intended for lower intensity commercial uses that are adjacent and compatible with residential neighborhoods. This district represents the primary commercial designation for small- to moderate-scale commercial activities that are developed in a manner which is consistent with and attracts pedestrian-oriented activities. This district encourages a broad mix of small-scale uses that are conducive to attracting shoppers and pedestrians. This district is subject to uses and development standards of this chapter and the downtown urban design guidelines. Developments in the DUC C-1 district shall not exceed 45 feet in vertical height.

G. *DUC C-2 Heavy Commercial District.* The DUC C-2 district is intended to allow for medium-to-high intensity commercial uses, primarily uses that are oriented to automobiles. The uses in this classification may be larger in scale and building size and have more potential for impacts to surrounding properties and street systems than those uses permitted in the more restrictive commercial classifications. This district is subject to uses and development standards of this chapter and the downtown urban design guidelines. Developments in the DUC C-2 district shall not exceed 75 feet in vertical height.

H~~G~~. *DUC F-R ~~Residential~~ Flex Residential District.* The DUC F-R ~~is district~~zone is intended to promote craft industrial ~~/commercial~~and commercial uses that are compatible with residential areas (i.e., workshop, brewery, etc.). This district is subject to uses and development standards of this chapter and the downtown urban design guidelines.~~R-F zone uses allowed per ACC Table 18.07.020, subject to the development standards of this chapter and the downtown urban design guidelines~~. Developments in the DUC F-R district shall not exceed 45 feet in vertical height. (Ord. 6959 § 1 (Exh. A), 2024.)

18.29.060 Development standards.

A. The following zoning development standards apply to the DUC Core 75, Core 125, and H-W Districts:

1. ~~A.~~ *Minimum lot area*: none.
2. ~~B.~~ *Minimum lot width*: none.
3. ~~C.~~ *Minimum lot depth*: none.
4. ~~D.~~ *Floor Area Ratio.* Floor area ratio is the cumulative amount of floor area within a building as a multiple of the lot area.

Floor Area Ratio (FAR)[1]

Basic Allowable "As of Right"		Maximum Allowable ~~W~~with Bonuses		
Nonresidential[2]	Residential[2]	Nonresidential	Residential[3]	Combined[4]
3.0	2.0	4.0	3.5	5.0

1 Floor area is measured to the inside face of exterior walls. The following shall be excluded from floor area calculation:

a All space below finished grade.

b Space dedicated to structured parking.

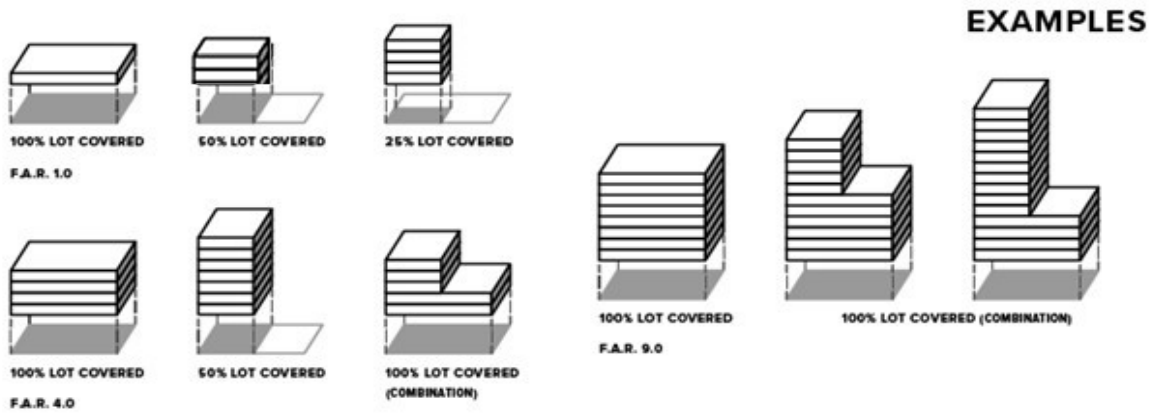
c Space used for any bonus feature listed in subsection E of this section.

2 Minimum required FAR is 0.75; basic allowable FAR is 1.0.

3 Hotels, nursing homes, assisted living centers, etc., shall be considered residential for the purpose of calculating FAR.

4 Allowable FAR for nonresidential and residential uses may be added together within a project, for a combined total.

5 FAR for the DUC H-W district based on mixed use development.



~~1.~~5. ~~*E.*~~ *Bonus Features Allowing Increased Floor Area Ratio*. An applicant may be required to provide a legally binding agreement or easement to ensure any of the below features is maintained over the life of the project.

Feature	Additional Gross Floor Area for Each Feature
Street level retail	100 sf of floor area for each linear foot of retail frontage
Restaurant	100 sf of floor area for each linear foot of restaurant frontage
Public plaza	5 sf of floor area for each sf of plaza
Widening public sidewalk	4 sf of floor area for each sf of sidewalk made available for public use
Canopy	4 sf of floor area for each sf of canopy
Daycare	10~~4~~ sf of floor area for each sf of daycare
Health club	2 sf of floor area for each sf of health club
Performing space	2 sf of floor area for each sf of performing space
Public meeting room	2~~5~~ sf of floor area for each sf of meeting room

Feature	Additional Gross Floor Area for Each Feature
Public art (arts commission approval required)	10 sf of floor area for each $100 of valuation
~~Water feature~~	~~10 sf of floor area for each $100 of valuation~~
Structured parking	10.5 sf of floor area for each sf of required parking above grade
Below grade parking	1 sf of floor area for each sf of required parking below grade (including half-level plate below grade)
Green roof	2 sf of floor area for each sf of green roof
Public restrooms	~~10~~ 5 sf of floor area for each sf of public restroom
Contribution to a public park or cultural facility such as a library, museum or theater within 0.5 miles of the DUC zone; also, any project including a performance or entertainment venue is eligible for these	10 sf of floor area for each $100 of contribution towards acquisition or development. This can be used to exceed both maximum FAR and maximum building height by up to 25%.

Feature	Additional Gross Floor Area for Each Feature
bonuses, based upon the value of construction	
Development of open space such as open roof decks, balconies, lanais or parts of the building and improved for outdoor living; including rooftop daycare play areas, dog walking areas, etc.	~~5~~ 10 sf of floor area for each sf of open space

~~F. *Maximum Building Height.* Maximum building height within the DUC zone shall be based on each zoning district 75 feet, unless bonus height is permitted per subsection E of this section.~~

~~1. If retail uses occupy the ground floor, the minimum height for that floor shall be 14 feet.~~

~~2. Mechanical penthouses, stair/elevator overruns, and antennas may be excluded from building height calculation, provided they extend no more than 20 feet above the roof deck.~~

~~3. Maximum building height may be increased by up to 20 percent if the top is designed as a nonhabitable, architectural element. This element may extend above the increased height limit.~~

6. ~~G.~~ *Minimum Building Height.* The minimum height for any new structure shall be two stories for the full extent of the building footprint.

7. *Signs*. The design of all signs shall be in conformance with the design standards referenced in ACC 18.29.070. Any permanent or permanently affixed sign that projects into the public right-of-way is subject to a right-of-way use permit. Allowable types, numbers and sizes of signs shall be as follows:

a. *Freestanding:* not allowed, except for monument signs as described within the downtown Auburn design standards; no more than one per street frontage; maximum size: 64 square feet, calculated at a rate of one square foot of sign area per lineal foot of site frontage; minimum entitlement shall be 32 square feet; maximum height: five feet.

b. *Wall signs:* maximum area of 150 square feet per building facade, calculated at a rate of one square foot of sign area for every lineal foot of facade; minimum entitlement shall be 16 square feet.

c. *Suspended signs:* attached under a marquee or canopy: one double-faced sign, no greater than three square feet per face allowed for each building entrance; minimum clearance above grade: eight feet.

d. *Portable Signs:* may be allowed for each business entrance, subject to the following:

i. Signs may be placed within the public right-of-way, within 12 feet of a business entrance, subject to the guidelines provided by the director in consultation with the city engineer such that sign placement does not interfere with pedestrian or vehicular traffic, does not create a sight hazard, and conforms to the requirements of the Americans with Disabilities Act. Additional portable signage may be authorized in order to support downtown events that are permitted or sanctioned by the city.

ii. The sign shall be in accordance with the provisions of ACC 18.56.030(L).

iii. The sign area cannot exceed 42 inches in height, 32 inches in width, and be limited to two faces.

iv. Portable signs are not permitted to be affixed to city infrastructure located within the right-of-way (e.g., street lights, fire hydrants, public art). This includes a prohibition of chaining or otherwise securing portable signs to such infrastructure.

v. Signs may be displayed during business hours and shall not be displayed when the business is closed.

vi. No landscaping may be covered, cut, damaged, or modified to accommodate a portable sign. The city may require replacement of any damaged landscaping pursuant to Chapter 18.50 ACC.

vii. All portable signs shall have the permit number affixed to the back of the sign.

e. *Temporary signs:* allowed subject to the provisions provided in ACC 18.56.030(B).

B. The following zoning development standards apply to the DUC N-R District:

1. Minimum lot area: new lots shall be a minimum of 2,000 square feet.
2. Minimum density: 7 units or lots per acre.
3. Minimum lot width: 20 feet, 35 for corner lots.
4. Minimum lot depth: none.
5. Maximum impervious surface: 75%.
6. Setbacks:
    a. Front: 10 feet.
    b. Front, garage: 20 feet.
    c. Side, street: 10 feet.
    d. Side, interior: 5 feet.
    e. Rear: 5 feet.
    f. Rear, garage: 20 feet.
7. Units per lot: subject to the standards contained in ACC 18.07.030(D)(1), (2), and (3).
8. Signs: subject to the signs standards contained in ACC 18.56.040(A).

C. The following zoning development standards apply to the DUC M-1 District:

1. Minimum lot area: none.
2. Minimum lot width: none.
3. Minimum lot depth: none.
4. Maximum impervious surface: none.
5. Setbacks:
    a. Front: none.
    b. Side, street: none, subject to the Engineering Design Standards.
    c. Side, interior: none, 25 feet when adjacent to a residential zone.
    d. Rear: none, 25 feet when adjacent to a residential zone.
6. Apartment buildings and mixed-use developments: subject to the zoning development standards of ACC 18.29.060(A).

~~1.~~7. Signs: subject to the signs standards contained in ACC 18.56.040(D).

D. The following zoning development standards apply to the DUC C-1 District:

1. Minimum lot area: none.
2. Minimum lot width: none.
3. Minimum lot depth: none.
4. Maximum impervious surface: none.
5. Setbacks:
    a. Front: none.
    b. Side, street: none, subject to the Engineering Design Standards.
    c. Side, interior: none, 25 feet when adjacent to a residential zone.
    d. Rear: none, 25 feet when adjacent to a residential zone.
6. Apartments buildings and mixed-use developments: subject to the zoning development standards of ACC 18.29.060(A).
7. Signs: subject to the signs standards contained in ACC 18.56.040(B).

D. The following zoning development standards apply to the DUC C-2 District:

1. Minimum lot area: none.
2. Minimum lot width: none.
3. Minimum lot depth: none.
4. Maximum impervious surface: none.
5. Setbacks:
    a. Front: none.
    b. Side, street: none, subject to the Engineering Design Standards.
    c. Side, interior: none, 25 feet when adjacent to a residential zone.
    d. Rear: none, 25 feet when adjacent to a residential zone.
6. Apartments buildings and mixed-use developments: subject to the zoning development standards of ACC 18.29.060(A).
7. Signs: subject to the signs standards contained in ACC 18.56.040(E).

E. The following zoning development standards apply to the DUC F-R District:

1. Minimum lot area: new lots shall be a minimum of 3,000 square feet.
2. Minimum density: 7 units or lots per acre.
3. Minimum lot width: 20 feet, 35 for corner lots.
4. Minimum lot depth: none.
5. Maximum impervious surface: 75%.
6. Setbacks:
    a. Front: none.
    b. Side, street: none, subject to the Engineering Design Standards.
    c. Side, interior: none.
    d. Rear: none, 25 feet when adjacent to a residential zone.
7. Units per lot: see R-F zone under ACC 18.07.030.
8. Mixed-use developments: subject to the zoning development standards of ACC 18.29.060(A).
~~1.~~9. Signs: subject to the signs standards contained in ACC 18.56.040(B).

F. The following zoning development standards apply to all DUC districts:

1. *Maximum Building Height.* Maximum building height within the DUC shall be based on each zoning district, subject to the airport overlay and Part 77 Surfaces, unless bonus height is permitted per subsection E of this section.
    a. Mechanical penthouses, stair/elevator overruns, and antennas may be excluded from building height calculation, provided they extend no more than 20 feet above the roof deck.
    ~~a.~~b. Maximum building height may be increased by up to 20 percent if the top is designed as a nonhabitable, architectural element. This element may extend above the increased height limit.

2. ~~H.~~*Parking Ratios.* The following parking standards shall apply within ~~the~~ a DUC district~~zone~~ in lieu of any standard noted in ACC 18.52.020 or provision of ACC 18.52.030:

Use Type	Minimum Required	Maximum Allowed for Surface Parking Lots
~~Retail~~	~~2 stalls/1,000 nsf~~	~~4 stalls/1,000 nsf[1]~~
~~Office~~	~~2 stalls/1,000 nsf~~	~~4 stalls/1,000 nsf~~
Residential (mixed-use, apartment, live/work, work/live)	0.5~~1~~ stall per dwelling unit	2 stalls per dwelling unit
Residential (middle housing)	1 stall per dwelling unit outside of one-half mile walking distance of a major transit stop	2 stalls per dwelling unit outside of one-half mile walking distance of a major transit stop
Residential (single unit detached) over 1,200 nsf	1 stall per residence	N/A
Residential (single unit detached), 1,200 nsf and under	0	N/A
Affordable housing units	0	N/A
Senior housing	0	1 stall per unit
Child care centers (including home based daycares)	0	N/A

Use Type	Minimum Required	Maximum Allowed for Surface Parking Lots
Commercial (nonresidential business purposes, including retail, office, wholesale, general merchandise, and food services) over 3,000 nsf	2 stall per 1,000 nsf	4 stalls per 1,000 nsf[a]
Commercial (nonresidential business purposes, including retail, office, wholesale, general merchandise, and food services) 3,000 nsf and under	0	N/A
Ground floor nonresidential in mixed use buildings	0	N/A
~~Restaurant~~	~~0.5 stall per 4 seats~~	~~1 stall per 4 seats~~
Industrial	0.5 stall per 1,000 nsf	N/A

1 nsf = net square feet

a. ~~1.~~ Parking requirements for uses not listed shall be determined by a study of parking demand for that use, as prepared by a qualified professional and as accepted by the director.

~~2. Retail and restaurant uses less than 3,000 nsf in area shall be exempt from parking requirements.~~

b. ~~3.~~ Uses sharing a common parking facility may reduce the required number of stalls by 25 percent.

c. ~~4.~~ Required parking may be located off site, so long as it is: (a) located within ~~the~~ a DUC ~~zone~~district, (b) within 1,000 feet of the property, (c) connected to the property by streets improved with sidewalks or walkways, and (d) tied to the site by a

contractual agreement reviewed and approved by the city attorney that is filed with the city and deed of record at the county.

~~5. On-street parking that is located directly adjacent to a development site may be used to satisfy minimum parking requirements and shall not be included in determining maximum surface parking allowances.~~

d. ~~6.~~ If subject to the standards provide in ACC 18.29.060(A), ~~D~~dedicated off-site parking provided within a parking structure may be used to provide FAR bonuses for a project on a separate site, provided the parking structure is located consistent with this chapter.

e. ~~7.~~ The maximum standards noted in the table above may be exceeded if all stalls above the maximum limit are provided within a parking structure.

f. ~~8.~~ Compliance with these standards is not required for a change of use within an existing building or whenever there is an expansion of an existing building or a new building replaces an existing building that does not increase the floor area by more than 25 percent.

~~*9. In lieu of providing the minimum parking required by this section, an applicant may request to pay for each required parking stall into a special fund that will be used to provide and upgrade municipal parking to serve the DUC zone. The per-stall fee shall be as specified in the city's fee schedule.*~~

~~*I. Signs. The design of all signs shall be in conformance with the design standards referenced in ACC 18.29.070. Allowable types, numbers and sizes of signs shall be as follows:*~~

~~*1. Freestanding: not allowed, except for monument signs as described within the downtown Auburn design standards; no more than one per street frontage; maximum size: 64 square feet, calculated at a rate of one square foot of sign area per lineal foot of site frontage; minimum entitlement shall be 32 square feet; maximum height: five feet.*~~

~~*2. Wall signs: maximum area of 150 square feet per building facade, calculated at a rate of one square foot of sign area for every lineal foot of facade; minimum entitlement shall be 16 square feet.*~~

~~*3. Suspended signs attached under a marquee or canopy: one double-faced sign, no greater than three square feet per face allowed for each building entrance; minimum clearance above grade: eight feet.*~~

~~*4. Portable Signs. Portable signs may be allowed for each business entrance, subject to the following:*~~

~~*a. Signs may be placed within the public right-of-way, within 12 feet of a business entrance, subject to the guidelines provided by the director in consultation with the city engineer such that sign placement does not interfere with pedestrian or vehicular traffic, does not create a sight hazard, and conforms to the requirements of the Americans with Disabilities Act. Additional portable signage may be authorized in order to support downtown events that are permitted or sanctioned by the city.*~~

~~*b. The sign shall be in accordance with the provisions of ACC 18.56.030(L).*~~

~~*c. The sign area cannot exceed 42 inches in height, 32 inches in width, and be limited to two faces.*~~

~~*d. Portable signs are not permitted to be affixed to city infrastructure located within the right-of-way (e.g., street lights, fire hydrants, public art). This includes a prohibition of chaining or otherwise securing portable signs to such infrastructure.*~~

~~*e. Signs may be displayed during business hours and shall not be displayed when the business is closed.*~~

~~*f. No landscaping may be covered, cut, damaged, or modified to accommodate a portable sign. The city may require replacement of any damaged landscaping pursuant to Chapter 18.50 ACC.*~~

~~*g. All portable signs shall have the permit number affixed to the back of the sign.*~~

3. ~~*J.*~~ *Landscaping*. Landscaping shall be provided as defined in the downtown ~~Auburn~~ design standards, except for development subject to the middle housing and single unit detached design standards.
4. *Fences*: Fencing shall be subject to the standards in ACC 18.31.020(A) through (F); except for the DUC M-1 district in which the standards of ACC 18.31.020 (G) and (H) also apply. Where there is a conflict between ACC 18.31.020 and the downtown design standards shall govern.
5. *Outdoor lighting*: Outdoor lighting shall be subject to the standards in Chapter 18.55 ACC. Where there is a conflict between Chapter 18.55 and the downtown design standards shall govern.

18.29.070 Design standards.

Adopted by reference are the downtown Auburn design standards ~~and the Auburn Junction design standards~~, a copy of which shall be maintained by the city clerk. These documents contain standards for development of the built environment in the DUC zoning districts~~e~~. The director shall have the authority to apply the standards to specific development proposals. These standards may be amended upon approval by the community development director. (Ord. 6828 § 1 (Exh. A), 2021; Ord. 6532 § 29, 2014; Ord. 6419 § 2, 2012; Ord. 6287 § 2, 2010; Ord. 6190 § 1, 2008; Ord. 6071 § 6 (Exh. A), 2007.)

18.29.080 Planned action standards.

A. *Purpose of the planned action.* The purpose of this section is to:

1. Set forth a procedure designating certain project actions within a specific subject site as "planned actions" consistent with state law, RCW 43.21C.031; and
2. Provide the public with an understanding as to what constitutes a planned action and how land use applications which qualify as planned actions will be processed by the city; and
3. Streamline and expedite the development review process for this designated planned action by relying on completed and existing detailed environmental analysis for the subject site; and
4. Combine environmental analysis with land use planning; and
5. Apply the city's development regulations together with the mitigation measures described in the environmental impact statement (EIS) and this chapter to address the impacts of future development contemplated by the planned action.

B. *Findings*. The city council makes the following findings:

1. The City is subject to the requirements of the GMA (Chapter 36.70A RCW) and is applying Planned Action to an Urban Growth Area (UGA).
2. The procedural requirements of Chapter 36.70A RCW have been complied with.
3. The procedural and substantive requirements of SEPA (Chapter 43.21C RCW) have been complied with.

4. The City has an adopted Comprehensive Plan complying with the GMA and is replacing the 2001 Auburn Downtown Plan with the 2024 Auburn Downtown Subarea Plan.
5. An EIS has been prepared for the Planned Action Area and the City Council finds that the EIS adequately identifies and addresses the probable significant environmental impacts associated with the type and amount of development planned to occur in the designated Planned Action Area.
6. The 2024 Auburn Downtown Subarea Plan and Planned Action EIS, together with adopted City development and environmental regulations, will adequately mitigate significant impacts from development within the Planned Action Area.
7. The regulation of land and development is subject to the authority and general police power of the City, and the City reserves its powers and authority to appropriately amend, modify, and revise such land use controls in accordance with applicable law.
8. The 2024 Auburn Downtown Subarea Plan and EIS identify the location, type, and amount of development contemplated by the Planned Action.
9. Essential public facilities defined in RCW 47.06.140 are excluded from the Planned Action and are not eligible for review or permitting as Planned Action Projects unless they are an accessory to or part of a project that otherwise qualifies as a planned action.
10. The Planned Action is located entirely within a UGA and applies to a defined area that is smaller than the overall City boundary.
11. Public services and facilities are adequate to serve the proposed Planned Action with implementation of the City's adopted Engineering Design Standards and the Comprehensive System Plans.
12. The City has provided several opportunities for meaningful public involvement in the 2024 Auburn Downtown Subarea Plan and EIS including a community meeting consistent with RCW 43.21C.440, and has considered all comments received, and, as appropriate, has modified the proposal or mitigation measures.
13. Future projects that are implemented consistent with the Downtown Subarea Planned Action EIS and mitigation measures will protect the environment, benefit the public, and enhance economic development.

C. *Applicability of the Planned Action.*

1. *Planned Action Area.* This section applies to approximately 360 acres included in the Auburn downtown subarea project area as described in the Downtown Subarea Planned Action EIS issued by the City on January 22, 2025 (and any addenda thereto) and shown in Exhibit A of Ord. No. 7006 are designated as the Downtown Planned Action Area.
2. *Environmental Document.* A Planned Action Project determination for a site-specific project application within the Downtown Planned Action Area shall be based on the environmental analysis contained in the Downtown Subarea Planned Action EIS. The mitigation measures contained in this section, as well as Exhibit B of Ord. No. 7006, are based upon the findings of the Downtown Subarea Planned Action EIS and shall, along with adopted City regulations, provide the framework the City will apply appropriate conditions on qualifying Planned Action Projects within the Downtown Planned Action Area.
3. *Planned Action Designated.* Uses and activities described in the Downtown Subarea Planned Action EIS (and any addenda thereto), subject to thresholds (ACC 18.29.080(D)) and the mitigation measures contained in this section, are designated Planned Action Projects pursuant to RCW 43.21C.440. A development application for a site-specific project located within the Downtown Planned Action Area that meets the criteria in ACC (ACC 18.29.080(D) and (E) may be designated a Planned Action Project pursuant to the process in ACC 18.28.080(I).

D. *Planned Action Thresholds*. Subject to the zoning regulations for the site and the mitigation measures described in this chapter, the maximum levels of development described below have been evaluated in the Downtown Subarea Planned Action EIS, as described in the EIS (and any addenda thereto), and are planned actions pursuant to RCW 43.21C.031. In order to qualify as a planned action, total cumulative development within the Downtown Planned Action Area that has been permitted under this chapter shall meet all of the following criteria:

1. *Land Use*. The following general types of land uses are considered Planned Actions:
    a. Single-unit detached housing and middle housing;
    b. Multi-family housing (apartments and co-living housing);
    c. Mixed-use (vertical or horizontal);
    d. Retail, commercial, office, services;
    e. Restaurants and bars;

f. Craft industry/light industrial, small food production;

g. Arts/entertainment (gallery, theater, fine arts studios);

h. Medical offices and hospital;

i. Open space, passive or active parks, trails, recreation;

j. Civic, cultural, government, and utility facilities as identified in the Plan and allowed in the Auburn Zoning Code;

k. Uses allowed in the Zoning Code provided for each implementing district (Chapter 18.29 DUC);

l. Other uses applicable to the 2024 Auburn Downtown Subarea Plan that are similar to uses listed above as determined by the Community Development Director or designee;

m. Multi-modal transportation improvements consistent with the Comprehensive Transportation Plan and the Planned Action EIS; and

n. Enlargement or intensification of uses existing at the time the Planned Action Area is approved, so long as such enlargement or intensification complies with the Zoning Code to the extent practical.

2. *Planned Action Uses.* A land use shall qualify as a Planned Action Project land use when:

a. It is within the Downtown Planned Action Area; and

b. It is within one or more of the land use categories described above; or

c. It is a common accessory use or appurtenance to a permitted use.

3. A Planned Action Project may be a single Planned Action land use, or a combination of Planned Action land uses in a mixed-use development.

4. *Development Thresholds*. The following amount of new various land uses are contemplated by the Planned Action (*Table 2 Ord. No. 7006*):

Planned Action Development Limits: 2024 – 2044: Preferred Alternative.

	Current (2021)			Preferred Alternative (2044)		
	Jobs	Population	Housing	Jobs	Population	Housing
Downtown Planned Action Area	4,799	3,708	1,724	**8,185**	**15,478**	**7,603**

a. Shifting development amounts between land use identified above may be permitted provided the transportation thresholds are not exceeded and the development impacts identified in the Downtown Subarea Planned Action EIS are mitigated consistently with the mitigation measures.

b. Further environmental review may be required pursuant to WAC 197-11-172, if any individual Planned Action Project or combination of Planned Action Projects exceed the development thresholds specified above and/or alter the assumptions and analysis in the Downtown Subarea Planned Action EIS.

5. *Transportation Thresholds.*

a. *Level of Service Threshold.* The City uses an LOS rating system to evaluate the operations of its roadway system. LOS is a concept used to describe traffic operations from the driver's perspective. LOS ratings are defined by intersection delay in seconds—LOS ranges from LOS A, which signifies no congestion and little delay, to LOS F, which signifies substantial congestion and delay. All intersections currently meet the City's minimum LOS standards. As of Dec. 2025, one intersection does not meet the City's minimum LOS standards: C Street NW & 3rd Street NW – LOS F. This intersection is currently identified in the Comprehensive Transportation Plan and 6-Year Transportation Improvement Plan for future mitigation.

b. *Concurrency*. All Planned Action Projects shall meet the City's transportation concurrency requirement standards and the level of service thresholds according to the Comprehensive Transportation Plan and Engineering Design Standards. Applicants shall be required to document that the project meets concurrency standards.

c. *Impact Fee*. In order to mitigate transportation related impacts, all Planned Action Projects shall pay impact fees, with adjustments made for any applicable credits.

d. *Mitigation*. Each Planned Action Project shall provide its proportionate share of transportation capital improvements analyzed in the Planned Action EIS. The City Engineer shall have the discretion to adjust the allocation of responsibility for required improvements between individual Planned Action Projects based on their identified impacts.

e. *Discretion*. The City Engineer shall have discretion to determine incremental and total trip generation, consistent with Chapter 19.04 ACC for each Planned Action Project proposed under this Planned Action.

E. Elements of the Environment and Degree of Impacts. A Planned Action Project that would result in a significant change in the type or degree of adverse impacts to any element(s) of the environment analyzed in the Planned Action EIS will not qualify as a Planned Action Project.

F. Changed Conditions. Should environmental conditions change significantly from those analyzed in the Downtown Subarea Planned Action EIS, the City's SEPA Responsible Official or designee may determine that the Planned Action designation is no longer applicable until supplemental environmental review is conducted.

G. Review Criteria for Planned Actions. The City's SEPA Responsible Official or designee may designate projects as "Planned Action Projects", pursuant to RCW 43.21C.030, applications that meet the following conditions:

1. The proposal is located within the Planned Action Area identified above.
2. The proposed uses and activities are consistent with those described in the Downtown Subarea Planned Action EIS and this Section.
3. The proposal is within the Planned Action thresholds and other criteria of this Section.
4. The proposal is consistent with the Auburn Comprehensive Plan and the 2024 Auburn Downtown Subarea Plan.
5. The proposal's significant adverse environmental impacts have been identified in the Downtown Subarea Planned Action EIS.
6. The project's significant impacts will be mitigated by application of the measures identified ACC 18.29.080(J) and other applicable City regulations, together with any conditions, modifications, variances, design review, or special permit that may be required.
7. The project complies with all applicable local, state, and/or federal laws and regulations, and the SEPA Responsible Official or designee determines that these laws and regulations constitute adequate mitigation.

8. The project is not an essential public facility as defined by RCW 36.70A.200 unless the essential public facility is an accessory to or part of a development that is designated as a Planned Action Project.

H. Effect of Planned Action Designation. Designation as a Planned Action Project by the City's SEPA Responsible Official or designee means that a qualifying proposal has been reviewed in accordance with this Section and found to be consistent with the development parameters and thresholds established herein and with the environmental analysis contained in the Downtown Subarea Planned Action EIS

I. *Planned Action Permit Process.* Applications for Planned Action Projects shall be reviewed pursuant to the following process:

1. Development applications shall meet all applicable requirements of the Auburn Municipal Code and this Section in place at the time of the Planned Action Project application.
2. Applications for Planned Action Projects shall:
   a. Be made on forms provided by the City;
   b. Include the SEPA checklist in WAC 197-11; and
   c. Meet all applicable requirements of the Auburn Municipal Code and this Section.
3. The City's SEPA Responsible Official or designee shall determine whether the application is complete as provided in Title 14 ACC.
4. If the application for a project within the Planned Action Area, as defined in Exhibit A of Ord. No. 7006, then the application will be reviewed to determine if it is consistent with the criteria of this ordinance and thereby qualifies as a Planned Action Project.
5. The decision of the City's SEPA Responsible Official or designee determining if a project is a Planned Action Project is a Type 1 decision. The City's SEPA Responsible Official or designee shall notify the applicant of their decision in writing to the applicant or project representative, as listed on the application, and federally recognized tribal governments and agencies with jurisdiction over the Planned Action Project pursuant to RCW 43.21C.440.
6. If the project is determined to qualify as a Planned Action Project, it shall proceed in accordance with the applicable permit review procedures specified in Title 14 ACC,

except that no SEPA threshold determination, EIS, or additional SEPA review shall be required.

7. Notice of application for a Planned Action Project shall be consistent with Title 14 ACC.
8. If notice is otherwise required for the underlying permit, the notice shall state that the project has qualified as a Planned Action Project. If notice is not otherwise required for the underlying permit, no special notice is required by this Ordinance.
9. To provide additional certainty about applicable requirements, the City or applicant may request consideration and execution of a development agreement for a Planned Action Project, consistent with RCW 36.70B.170.
10. If a project is determined to not qualify as a Planned Action Project, the City SEPA Responsible Official or designee shall notify the applicant and prescribe a SEPA review procedure consistent with the City's SEPA regulations and requirements of state law. The notice shall describe the elements of the application that result in failure to qualify as a Planned Action Project.
11. Projects that fail to qualify as Planned Action Projects may incorporate or otherwise use elements of the Downtown Subarea Planned Action EIS, as well as other relevant SEPA documents, to meet their SEPA requirements. The City SEPA Responsible Official or designee may limit the scope of SEPA review for the non-qualifying project to those issues and environmental impacts not previously addressed in the Downtown Subarea Planned Action EIS.

J. *Planned Action Mitigation Measures*. The planned action mitigation measures set forth in Exhibit B attached to Ord. No. 7006 and codified in this chapter and incorporated herein by this reference shall apply to the project identified therein. Exhibit B shall not be codified with the provisions of this chapter but shall be on file and available for review in the office of the city clerk.

K. Amendments. Amendments to this chapter may be initiated by the city, the proponent, or the proponent's successor, and shall occur as follows:

1. The director may interpret the words and meaning of certain conditions in order to resolve conflicts in implementation. All words in the ordinance codified in this chapter shall carry their customary and ordinary meaning.

2. If changes to the language of the ordinance codified in this chapter are required, such proposed changes shall be reviewed by the director. If, in the estimation of the director, the proposed change is minor, then the proposed change shall be forwarded directly to the city council for its consideration. If, in the estimation of the director, the change is major, the proposed change shall be referred to the planning commission which shall conduct a public hearing and make a recommendation to the city council.

18.02.070 Establishment of zones.

A. The city is divided into the following classes of zones:

1. RC, residential conservancy zone (one dwelling unit per four acres);
2. R-1, residential one unit per acre zone;
3. R-2, residential low zone;
4. R-3, residential moderate zone;
5. R-4, residential high zone;
6. R-MHC, manufactured/mobile home community zone;
7. R-F, residential flex zone;
8. R-NM, residential neighborhood mixed-use zone;
9. C-1, light commercial zone;
10. C-2, heavy commercial zone;
11. C-AG, auburn gateway zone;
12. M-1, light industrial zone;
13. M-2, heavy industrial zone;
14. L-F, airport landing field zone;
15. P-1, public use zone;
16. UNC, unclassified use zone;
17. I, institutional use zone;
18. DUC, downtown urban center, 125 District;
19. DUC, downtown urban center, 75 District;
~~19. DUC, downtown urban center, 55 District;~~

20. DUC, neighborhood residential district;

21. DUC, health and wellness district;

22. DUC, residential-flex district;

23. DUC, light commercial district;

24. DUC, heavy commercial district;

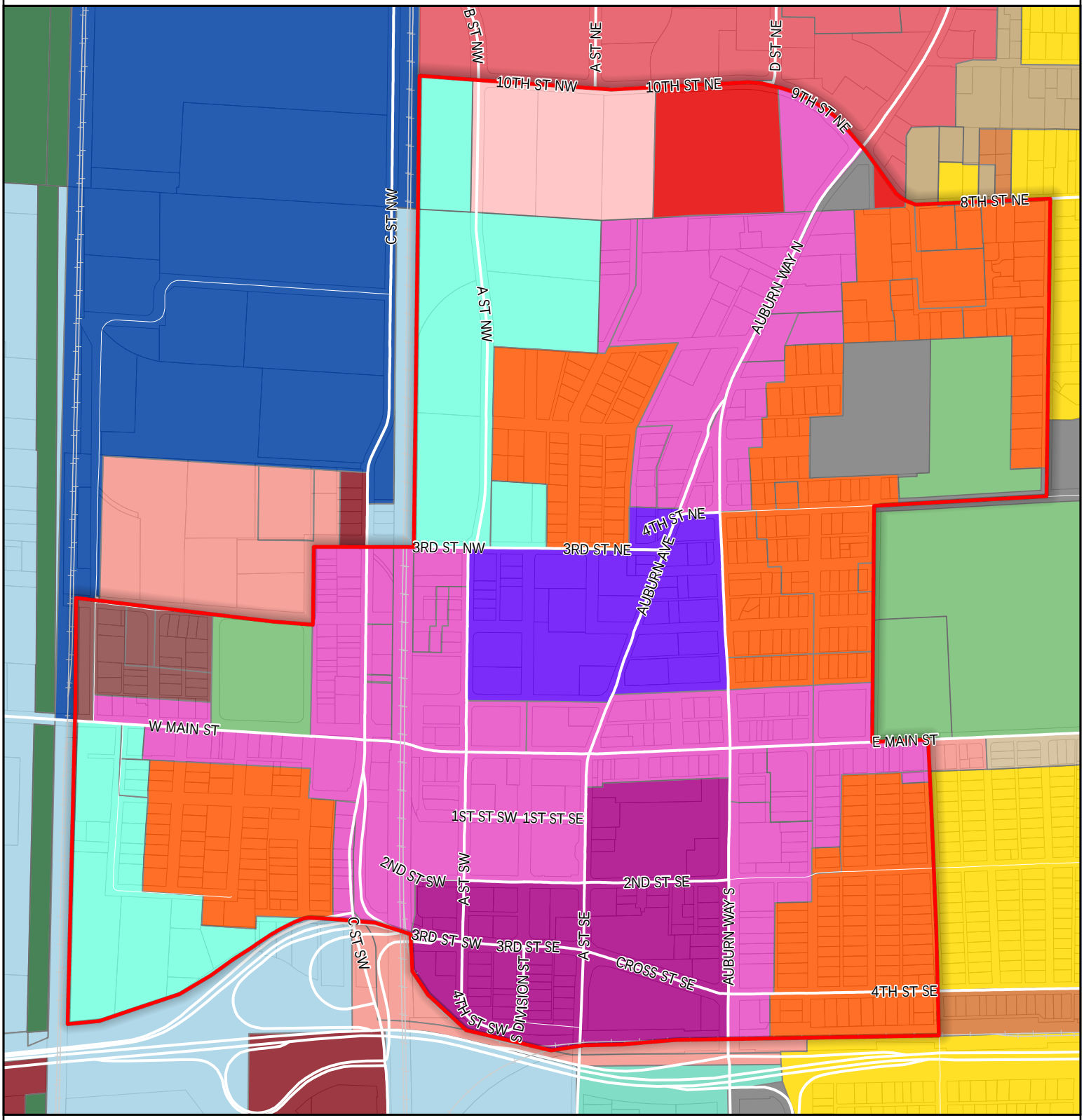
25. DUC, light industrial district;

26. OS, open space zone.

B. The zones set out in subsection A of this section are established as the designations, locations, and boundaries thereof as set forth and indicated on the zoning map.

C. The intent statement for each zone set forth in this title shall be used to guide the application of the zones to all lands in the city of Auburn. The intent statements shall guide interpretation and application of land use regulations within the zones, and any change to the range of allowed uses within each zone through amendment to this title. (Ord. 6959 § 1 (Exh. A), 2024; Ord. 6885 § 1 (Exh. A), 2022; Ord. 6677 § 1, 2018; Ord. 6245 § 2, 2009.)

City of Auburn Downtown Urban Center Zoning Districts



- DUC - Core 125
- DUC - Core 75
- DUC - FR Flex Residential
- DUC - Health & Wellness 125
- DUC - C-1 Light Commercial
- DUC - C-2 Heavy Commercial
- DUC - M-1 Light Industrial
- DUC - NR Neighborhood Residential
- DUC - Downtown Urban Center
- C-AG - Auburn Gateway
- C-1 - Light Commercial
- C-2 - Heavy Commercial
- I - Institutional
- M-1 - Light Industrial
- M-2 - Heavy Industrial
- LF - Airport Landing Field
- OS - Open Space
- P-1 - Public Use
- Planned Unit Development District
- R-1 - Residential 1 DU/Acre
- R-2 - Residential Low
- R-3 - Residential Moderate
- R-4 - Residential High
- Lakeland Hills PUD
- R-MHC - Residential Manufactured/Mobile Home Community
- R-NM - Nieghborhood Mixed-Use
- RC - Residential Conservancy
- R-F - Residential Flex
- Terrace View District
- Unclassified Use District
- Downtown Urban Center

0 0.13 0.25

Miles

Updated On: 12/30/2025

Printed On: 1/8/2026

Map ID: 6356

Information shown is for general reference purposes only and does not necessarily represent exact geographic or cartographic data as mapped. The City of Auburn makes no warranty as to its accuracy.

CITY OF AUBURN WASHINGTON

AGENDA BILL APPROVAL FORM

Agenda Subject:
Citywide Design Standards and Code Update
Staff Introduction/Presentation (Reed)
Staff will provide an update on the public outreach conducted for the draft Citywide Design Standards and provide an overview of the associated code updates.

Meeting Date:
March 3, 2026

Department:
Community Development

Attachments:
Attachment 1 - ACC Section 18.31.200 Text Amendment,
Attachment 2 - ACC Section 18.23.040 Text Amendment,
Attachment 3 - ACC Section 18.07.030 Text Amendment,
Memorandum

Budget Impact:

Administrative Recommendation:

Background for Motion:

Background Summary:
See attached Memorandum

Councilmember:

Staff: Jason Krum

18.31.200 Architectural and site design review standards and regulations.

A. *Intent and Purpose.* The architectural and site design regulations provide an administrative review process for evaluating the design and arrangement of development. The architectural and site design regulations are intended to be consistent with and implement the policies of the comprehensive plan. The purposes of these design review regulations are to:

1. Foster good decision-making for development through architectural and site design within the context of the community's built and natural environmental character, scale and diversity;

2. Promote the use of appropriate scale of buildings and the configuration of open space and parking areas for development to safely and comfortably accommodate pedestrian activities;

3. Coordinate the interrelationship of buildings and public and private open space;

4. Discourage monotony in building design and arrangement, while promoting harmony among distinct building identities; and

5. Mitigate, through design and site plan measures, the visual impact of large building facades, particularly those which have high public visibility (encourage the creative use of architectural and landscape features in order to reduce the actual and perceived scale and bulk of structures).

B. *Applicability.* The following land uses, types of development activities, including all related site improvements, and geographic areas, are subject to the architectural and site design standards and the processes and regulations for conducting design review contained in this chapter:

1. *Apartment* *buildings, ~~s (Formerly Multiple-Family) and~~ Mixed-Use Developments, Congregate living development, and Non-residential development. The* following land uses and types of development are subject to the ~~city's apartment and mixed-use~~ design standards document unless addressed by a different set of architectural and site design standards applicable to a specific geographic area:

a. Apartment buildings, containing seven or more units on a single lot, ~~development inclusive of seven or more units~~ in all zones in the city where ~~permitted outright or as a conditional use~~allowed ~~and not otherwise addressed through the city's residential infill development standards (Chapter 18.25 ACC)~~; and

b. *Mixed-Use Residential Development.* Mixed-use development containing residential living units in all zones in the city where allowed ~~permitted outright or as a conditional use~~; and

c. Retirement apartments, congregate living facilities and senior housing complexes in all zones in the city where ~~permitted outright or as a conditional use~~allowed; and

d. Non-residential development, except for development within the M-1 and M-2 zones.

2. *Downtown Urban Center.* The following locations of development activities are subject to the city's downtown urban design standards document:

a. Properties located within the boundaries of the DUC, downtown urban center ~~zoning district~~ boundary, as identified on the comprehensive zoning map.

~~3. *Auburn Junction.* The following locations of development activities are subject to the city's Auburn Junction design standards document:~~

~~a. Properties located within the boundaries of West Main Street, 2nd Street SE/SW, A Street SE, and A Street SW as identified with ACC 18.29.070, downtown urban design standards.~~

4. *Northeast Auburn Special Planning Area.* The following locations of development activities are subject to the city's Auburn Gateway architectural and site design standards document:

a. Properties located within the boundaries of the Auburn Gateway Project as defined by the development agreement approved by city Resolution No. 4756, or as may be subsequently amended. The Auburn Gateway architectural and site design is addressed in Section 4 of that resolution and provided as Attachment 4 to the resolution.

C. *Exemptions.* The following activities as determined by the community development director shall be exempt from the provisions of the design standards:

1. Any building activity that does not require a building permit; or

2. Interior construction work which does not alter the exterior of the structure; or

3. Normal or routine building and site maintenance/repair that is exempt from issuance of a permit, including the repair or maintenance of structural members; or

4. Interior alterations that do not modify an existing site condition.~~; or~~

~~5. Site and exterior alterations that do not exceed 10 percent of the assessed valuation of the property building or land per the most recent county records; or~~

~~6. Building additions that are less than 10 percent of the existing floor area of the existing building. Any cumulative floor area increase from the adoption date of the ordinance establishing the architectural and site design standard that totals more than 10 percent shall not be exempt unless the community development director determines compliance with these standards would be infeasible and/or unreasonable.~~

D. *Design Standard Documents.* Adopted by reference are the following architectural and site design documents, copies of which shall be maintained by the city clerk. These documents contain the standards for the design and development of the built environment. The community development director or designee shall have the authority to apply the standards to specific development proposals. The following specific architectural and design standards documents may be amended upon approval by the community development director:

1. ~~Mixed-use and apartment (formerly multiple-family) development~~Citywide design standards.

2. Auburn Gateway architectural and site design standards.

3. Downtown urban design standards.

~~4. Auburn Junction design standards.~~

E. *Timing of Administrative Design Review.*

1. Design review shall be conducted by the community development director or designee prior to or concurrent with the processing of building permits and/or review of discretionary land use approvals/permits.

2. The decision on the administrative design review shall be issued prior to issuance of the building permits and/or issuance of discretionary land use approvals/permits.

F. *Pre-Application Meeting Recommendation with– ~~When Required Associated With a~~ Design Review.* A pre-application conference is recommended for all other projects subject to the city's architectural and site design review but is not required.

1. A pre-application conference is ~~required~~strongly recommended for the following instances:

a. ~~For a~~Apartments ~~in the R-3 and R-4 residential zones~~buildings; and

b. ~~For m~~Mixed-use development; and ~~containing residential living units located within R-3 and R-4 residential zones; and~~

~~c. For mixed-use development containing residential living units located within commercial zones; and~~

cd. For retirement apartments, congregate living facilities and senior housing complexes. ~~located within R-3 and R-4 residential zones, and all commercial zones.~~

~~2. A pre-application conference is strongly recommended for all other projects subject to the city's architectural and site design review but is not required.~~

G. *Design Review Submittal Requirements.* In addition to any other documentation required for submittal of a complete application for building permit or discretionary land use approvals/permits, the following items shall be required for the architectural and site design review:

1. Elevation drawings prepared by an architect licensed in the state of Washington of all proposed construction, including dimensional drawings at one-eighth inch equals one foot or comparable scale showing the type of exterior materials, color (where applicable), exterior finishes for buildings and accessory structures, location and elevations of exterior lighting for buildings, the type, style and model of exterior lighting fixtures (where applicable), parking areas, and fenestration details;

2. A to-scale landscape plan prepared by a landscape architect licensed in the state of Washington showing existing vegetation to be retained and proposed vegetation to be

installed inclusive of the common and botanical name of all vegetation, the location and quantity of vegetation, the initial planting size and methods of irrigation;

3. A context vicinity map that shows all structures on the property and within 200 feet in each direction of the subject property drawn approximately to scale;

4. A neighborhood circulation plan consistent with the provisions of Chapter 17.16 ACC (Neighborhood Circulation Plan); and

5. Conceptual plans for any public infrastructure, including roads, water, sewer, and storm facilities.

H. *Interpretations.*

1. The community development director shall be authorized to interpret the meaning of words, phrases and sentences which relate to the implementation of the specific architectural and design standards document. Any interpretations regarding implementation of the specific architectural and design standards document shall be made in accordance with its intent or purpose statements and the intent and purpose statements of this chapter. For interpretations, life safety and public health regulations shall be given priority over all other regulations.

2. Administrative interpretations may be appealed to the hearing examiner as prescribed in ACC 18.70.050.

I. *Design Review Departures~~Adjustments~~.*

1. *Authority for Design Review Departures~~Adjustments~~.* The community development director or designee shall have the authority, subject to the provisions for departures within design standard documents~~of this section and upon such conditions as the community development director or designee may deem necessary to comply with the provisions of this section~~, to approve design departures or alternative design treatments. ~~adjustments as follows:~~

~~a. An adjustment to architectural or site design requirements such that no more than two of the total number of required menu items in the city of Auburn apartment and mixed-use design standards are out of compliance.~~

~~b. An adjustment to required building wall and roof modulation standards, as contained in the city of Auburn apartment and mixed-use design standards, up to 20 percent of the amount of any quantified standards contained therein.~~

~~c. An adjustment to the architectural or site design requirements that remains consistent with the purpose and intent of the architectural and site design standards.~~

2. *Required Findings to Grant Design Review Departures~~Adjustments~~.* Each determination granting a departure~~an adjustment~~ by the community development director or designee shall be supported by written findings showing specifically wherein all of the following conditions exist:

a. That the granting of such departure ~~adjustment~~ meets the purpose of the standards and any other applicable departure criteria that applies to the specific standard~~does not constitute a grant of special privilege inconsistent with the limitations upon uses of other properties in the vicinity and/or zone of the subject site~~; and

b. That the granting of such departure ~~adjustment~~ will not ~~adversely affect the established character of the surrounding neighborhood,~~ discourage maintenance or upgrades on surrounding properties ~~nor result in perpetuation of those design qualities and conditions which the comprehensive plan intends to eliminate or avoid~~; and

c. That the project incorporates alternate design characteristics that are equivalent or superior to those otherwise achieved by strict adherence to the standard. ~~stated menu options; and~~

~~3. *Public Notification and Action on Design Review Adjustment Applications.* Upon the filing of a properly completed application and associated request for a design review adjustment, the community development director or designee shall comply with the city's Type II land use review requirements for issuance of a properly noticed and appealable land use decision.~~

34. *Appeal of Director's Decision on Design Review Departures. ~~Adjustment~~*

a. If a written objection to the initial determination notice is filed within 14 business days of said notification, the community development director or designee shall

reconsider the initial determination in light of the objection(s) as raised and render a final decision on the permit. This final decision shall result in either the community development director's affirmation of the original determination of approval, the approval with additional modifications or denial.

b. Upon completion of the community development director's reconsideration, all parties notified of the original determination shall receive notification of the community development director's final decision. Any party aggrieved by the community development director's final decision may file an appeal of that decision to the hearing examiner in accordance with the city's land use appeal provisions. Such appeals for hearing examiner review must be filed within 14 business days from the date the written decision was made and shall include the following:

i. The appeal shall be filed on forms provided by the department of planning and development.

ii. The appeal shall clearly state the decision being appealed, setting forth the specific reason, rationale, and/or basis for the appeal.

iii. Fees associated with the appeal shall be paid to the city upon filing of the appeal in accordance with a fee schedule established by resolution.

5. Upon filing of a timely and complete appeal, the hearing examiner shall conduct a public hearing to consider the merits of the appeal. This hearing shall be subject to the city's public noticing and public hearing requirements and shall include notification of all parties notified of the community development director's final decision. The hearing examiner may affirm the community development director's decision or may remand the matter to the community development director for further review in accord with the examiner's direction.

6. If no written objection is filed to the initial determination within the specified time limits, the community development director shall render a final decision on the permit in accord with the initial determination.

J. *Approval Criteria for Design Review.* The community development director or designee may approve, modify and approve, or deny an application for an administrative design review. Each

determination granting approval or approval with modifications shall be supported by written findings showing the applicant satisfies all the following criteria:

1. The plans and supplemental materials submitted to support the plan meet the requirements of the specific architectural and site design documents; and

2. The proposed development is consistent with the comprehensive plan.

~~3. The proposed development meets required setback, landscaping, architectural style and materials, such that the building walls have sufficient visual variety to mitigate the appearance of large facades, particularly from public rights-of-way, single-unit detached dwellings and middle housing.~~

~~4. In addition to the criteria in subsections (J)(1) through (J)(3) of this section, for apartments and retirement apartment projects, the director or designee must determine that the following key review criteria have been met:~~

~~a. The proposed development is arranged in a manner that either:~~

~~i. Provides a courtyard space creating a cohesive identity for the building cluster and public open space furnished to facilitate its use; or~~

~~ii. Possesses a traditional streetscape orientation that provides clearly identifiable and visible entries from the street, views from residential units onto the street and reinforces pedestrian-oriented streetscape characteristics (e.g., building edge abutting sidewalk, entries onto the street); or~~

~~iii. Faces and facilitates views of a major open space system;~~

~~b. The proposed development provides a variety in architectural massing and articulation to reduce the apparent size of the buildings and to distinguish vertical and horizontal dimensions;~~

~~c. The proposed development contains a combination of elements such as architectural forms, massing, assortment of materials, colors, and color bands sufficient to distinguish distinct portions and stories of the building;~~

~~d. Residential buildings in large apartment projects or mixed-use projects are physically integrated into the complex possessing sufficiently different appearance or placement to be able to distinguish one building from another;~~

~~e. Unit entrances are individualized by use of design features that make each entrance distinct or which facilitate additional personalization by residents;~~

~~f. Areas dedicated to parking are sufficiently visually broken up and contain a complement of vegetative materials to project a landscaped appearance;~~

~~g. Where applicable, a transition is created that minimizes impacts from apartments and mixed-use development projects on neighboring lower density residential dwelling units; and~~

~~h. Where applicable, in cases of granting density or height bonuses, the project has provided community benefits, facilities or improvements above and beyond those required in the municipal code and supports the goals, objectives and policies of the comprehensive plan.~~ ~~(Ord. 6959 § 1 (Exh. A), 2024; Ord. 6728 § 4 (Exh. D), 2019; Ord. 6408 § 1, 2012; Ord. 6287 § 2, 2010; Ord. 6245 § 15, 2009.)~~

18.23.040 Development standards.

A. Hereafter, no use shall be conducted and no building, structure and appurtenance shall be erected, relocated, remodeled, reconstructed, altered or enlarged unless in compliance with the requirements in Tables 18.23.040A (C-1, C-2, and C-AG Zone Development Standards) and 18.23.040B (M-1 and M-2 Zone Development Standards) and in compliance with the provisions of this title, and then only after securing all permits and approvals required hereby. These standards may be modified through either an administrative variance or variance, subject to the procedures of Chapter 18.70 ACC.

Table 18.23.040A. C-1, C-2 and C-AG Zone Development Standards

Development Standard	Requirement by Zone		
	C-1 Light Commercial	**C-2 Heavy Commercial**	**C-AG Mixed-Use Commercial**
Minimum lot area	None	None	None[1]
Minimum lot width, depth	None	None	None
Maximum lot coverage	None	None	None
Minimum setbacks	*Minimum setbacks required for structures. See also ACC 18.31.070 for specific exceptions to these setback standards.*		
Front	~~20 ft~~None[4]	~~20 ft~~None[4]	20 ft
Side, Interior	None[2]	None[2]	None[2]
Side, Street	15 ft	15 ft	15 ft
Rear	None[2]	None[2]	None[2]
Height limit	*Maximum allowable height of structures. See also ACC 18.31.030*		

Development Standard	Requirement by Zone		
	C-1 **Light Commercial**	**C-2** **Heavy Commercial**	**C-AG** **Mixed-Use Commercial**
	(Height limitations – Exceptions) for specific height limit exceptions.		
Maximum height	45 ft[3]	75 ft	75 ft
Additional development standards	None	None	None
Fences and hedges	See Chapter 18.31 ACC		
Landscaping	See Chapter 18.50 ACC		
Parking	See Chapter 18.52 ACC		
Signs	See Chapter 18.56 ACC		
Lighting	See Chapter 18.55 ACC		
Nonconforming structures, land and uses	See Chapter 18.54 ACC		

Notes:

1 Residential uses: no minimum lot size; provided, that residential density does not exceed 20 units per gross acre (this includes privately owned open space tracts but excludes dedicated public roads).

2 A 25-foot setback is required when adjacent to a residential zone.

3 Buildings within the Auburn north business area, as established by Resolution No. 2283, may exceed 45 feet if one additional foot of setback is provided from each property line (or required minimum setback) for each foot the building exceeds 45 feet in height.

4 In addition to meeting setback requirements, all structures must meet sight distance requirements in accordance with city engineering design and construction standards.

Table 18.23.040B. M-1 and M-2 Zone Development Standards

Development Standard	Requirement by Zone	
	M-1 **Light Industrial**	**M-2** **Heavy Industrial**
Minimum lot area	None	None
Minimum lot width, depth	None	None
Maximum lot coverage	None	None
Minimum setbacks	*Minimum setbacks required for structures. See also ACC 18.31.070 for specific exceptions to these standards.*	
Front	~~20 ft~~None	30 ft
Side, Interior	None[1]	None[1]
Side, Corner	20 ft	30 ft
Rear	None[1]	None[1]
Height limit	*Maximum allowable height of structures. See also ACC 18.31.030 (Height limitations – Exceptions) for specific height limit exceptions*	
Maximum height	45 ft[2]	45 ft[2]
Additional development standards	None	None

Development Standard	Requirement by Zone	
	M-1 **Light Industrial**	**M-2** **Heavy Industrial**
Fences and hedges	See Chapter 18.31 ACC	
Landscaping	See Chapter 18.50 ACC	
Parking	See Chapter 18.52 ACC	
Signs	See Chapter 18.56 ACC	
Lighting	See Chapter 18.55 ACC	
Nonconforming structures, land and uses	See Chapter 18.54 ACC	

Notes:

1 A 25-foot setback is required when adjacent to a residential zone.

2 Buildings may exceed 45 feet if one foot of setback is provided from each property line (or required minimum setback) for each foot the building exceeds 45 feet.

(Ord. 6959 § 1 (Exh. A), 2024; Ord. 6885 § 1 (Exh. A), 2022; Ord. 6728 § 3 (Exh. C), 2019; Ord. 6433 § 26, 2012.)

18.07.030 Development standards.

Table 18.07.030. Residential Development Standards

	Standard	RC	R-1	R-2	R-3	R-4	R-NM	R-F
A	Minimum density units or lots per acre (lot area per unit)[1, 5]	0.25 (174,000 sf of lot area per unit)	1 (43,500 sf of lot area per unit)	7 (6,222 sf lot area per unit)	12 (3,630 sf lot area per unit)	16 (2,723 sf lot area per unit)	30 (1,452 sf lot area per unit)	7 (6,222 sf lot area per unit)
B	Minimum lot size (square feet)[8]	174,000	43,500	4,400	2,700	2,200	2,200	4,400
C	Minimum lot width (feet)[2, 5, 7]	125	125	40	20 for interior lots; 35 for exterior lots	20 for interior lots; 35 for exterior lots	20 for interior lots; 35 for exterior lots	40
D	Units allowed							
1	Base units allowed per lot [6]	4	4	4	4	4	4	4
2	Base units per lot allowed with transit or affordability bonus [6]	6	6	6	6	6	6	6
3	Lot area per unit above base (B1 or B2 as applicable) allowance (square feet) [6]	X	X	1,250	750	N/A	N/A	1,250
4	Maximum units per lot [6]	6	6	6	20	N/A	N/A	6

	Standard	RC	R-1	R-2	R-3	R-4	R-NM	R-F
E	Minimum setbacks (feet)[2, 3, 10]							
1	Residence front setback[3]	35	35	10	10[9]	~~10~~None	~~10~~None	10[9]
2	Garage (minimum front setback required from street access)[3]	20	20	20	20	20	20	20 unless alley-loaded then 15 provided there are 20 feet from any garage
3	Setback to any property line for barns, stables, or similar structures for enclosure of large domestic animals For other animals, see the supplemental development standards for animals in ACC 18.31.220	75	X	X	X	X	X	X
4	Setback to any property line for any corral, exercise yard, or arena for large domestic animals For other animals, see the supplemental development standards for animals in ACC	35	X	X	X	X	X	X

	Standard	RC	R-1	R-2	R-3	R-4	R-NM	R-F
	18.31.220							
5	Interior side setback	20	10	5	5	5	5	5
6	Street side setback[3] In all zones, 20 feet minimum street side setback required from street access.	35	20	10	10	10	10	10
7	Rear setback[3]	35	20	15	15	10	10	15
8	Rear setback, detached structure[3], [8] In all zones, 20 feet minimum street side setback required from street access.	15	15	10	5	5	5	10
F	Maximum impervious area (%)	25	50	75	80	90	90	75
G	Maximum building height (feet)	35	35	35	45	75	75	45
H	Maximum height of accessory buildings and structures	35[4]	35	24	24	24	24	24
I	Minimum front setback area landscape strip (feet)	N/A	N/A	N/A	5	10	10	N/A
J	Minimum side setback area landscape strip	N/A	N/A	N/A	5	10	10	N/A

	Standard	RC	R-1	R-2	R-3	R-4	R-NM	R-F
	(feet)							
K	Minimum landscaped open space (%)	N/A	N/A	See Chapter 18.50 ACC	See Chapter 18.50 ACC	See Chapter 18.50 ACC	See Chapter 18.50 ACC	N/A

1 See Chapter 18.32 ACC for calculating density.

2 All minimum lot widths, setbacks, and landscaping strips are subject to demonstration to the satisfaction of the city engineer that all required utility infrastructure, access requirements, and street elements can be accommodated in accordance with the city engineering design ~~standards~~ and construction standards.

3 In addition to meeting setback requirements, all structures must meet sight distance requirements in accordance with city engineering design and construction standards.

4 Barns and other specialized structures used for agricultural purposes may exceed the height limits.

5 Provision applicable to residential subdivision.

6 See ACC 18.02.067 for calculating units allowed per lot.

7 Applies to new parent lots within a unit lot subdivision.

8 When abutting an alley, detached accessory dwelling units are allowed within the rear setback.

9 Non-residential, mixed use, and apartment buildings may have either no or a reduced front setback if the applicable Citywide "Storefront" design standards are met.

10 Minimum setbacks required for structures. See also ACC 18.31.070 for specific exceptions to these setback standards.

(Ord. 6959 § 1 (Exh. A), 2024; Ord. 6661 § 3, 2018; Ord. 6600 § 10, 2016; Ord. 6245 § 5, 2009.)

CITY OF AUBURN WASHINGTON

Memorandum

TO: Judi Roland, Chair, Planning Commission
Bill Stewart, Vice Chair
Planning Commission Members

FROM: Alexandria Teague, Planning Services Manager
Dinah Reed, Senior Planner
Department of Community Development

DATE: February 18, 2026

RE: **ZOA26-0002 – Design Standards Related Standards Code Update**

I. BACKGROUND & PURPOSE

House Bill (HB) 1293, an Act relating to streamlining development regulations for design review, was passed by the Legislature in the 2023 Regular Session. HB 1293 requires counties and cities planning under RCW 36.70A.040 to have clear and objective development regulations governing the exterior design of new development.

On the February 3rd regular meeting staff introduced the revised Citywide Design Standards (formerly the Multifamily and Mixed-Use Design Standards). The purpose of this memorandum and the March 3rd Planning Commission meeting is to introduce the draft code amendment and receive feedback prior to a future public hearing. Feedback from the Commission will be used to refine the draft code as necessary. An update on public engagement for the Downtown Design Standards will also be provided at this meeting.

II. SUMMARY OF PROPOSED CODE CHANGES

Section ACC 18.31.200 Architectural and site design review standards and regulations

The purpose of the revisions in this section are as follows:

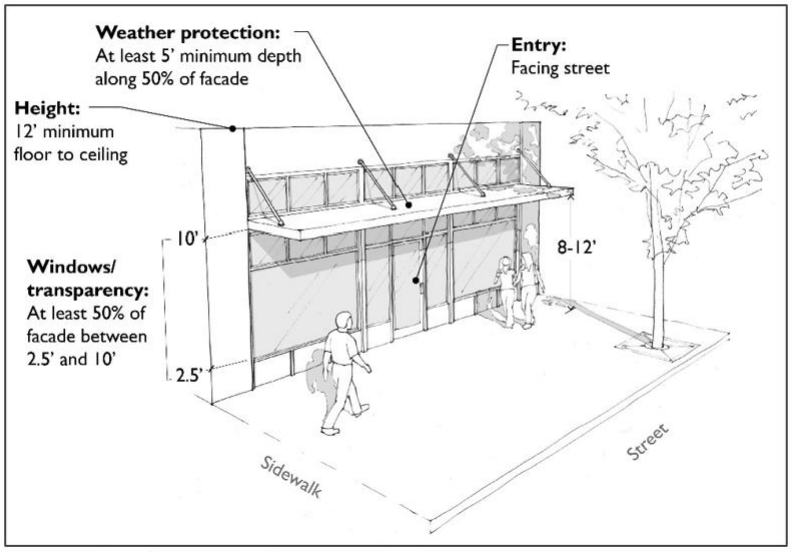
1) ACC 18.31.200(B)(1) clarifies for the types of new development that are applicable to the design standards
2) ACC 18.31.200(B)(1)(a), (b), (c), (d) defines apartment buildings, mixed-use residential development, retirement apartments, congregate living facilities and senior housing are no longer subject to conditional use permits, and non-residential development, except for development within the industrial zones.
3) ACC 18.31.200(B)(3) removes Auburn Junction as a design review document. Auburn Junction is a specific area defined in the downtown area. The Downtown Urban Center Design Standards have largely superseded the Auburn Junction Design Standards and they are no longer needed.
4) ACC 18.31.200(C) removes standard (5) and (6) related to the threshold of a site and exterior alteration. The specific threshold or levels of site and exterior alteration that would trigger design review are now contained in the Citywide Design Standards.

5) ACC 18.31.200(F) pre-application meetings are no longer mandatory (required) but are recommended. This update is related to HB 5290 in which cities should no longer make pre-application meetings mandatory.
6) ACC 18.31.200(I) updates the requirements for design review departures (formerly called adjustments). The Citywide Design Standards now contain specific departures for specific design standards. The proposed standard-specific departures will allow for flexibility for each development, while ensuring that the overall design of the development meets the purpose and intent of the design standards. Applicants are still required to make findings (explain) why the departure is necessary. This section also removes the requirement for public notice for departures. Public notice is only required when a design review application triggers a state environmental policy act review or exceeds 40 units. Therefore, it should not be triggered for a design review departure.
7) ACC 18.31.200(J) updates the approval criteria for design review applications. The specific standards listed in this section are no longer necessary. The proposed development must be consistent with the standards contained in the Citywide Design Standards in order for it to be approved.

Section ACC 18.07.030 Development standards (Residential Zones)

The proposed revision to ACC 18.07.030 is to reduce the front setback in the R-4, Residential High and R-NM, Residential Neighborhood Mixed-Use zones to zero to allow for the "Storefront" option in the Citywide Design Standards. This update allows for a storefront for a mixed-use or non-residential use in the R-4 and R-NM zones to abut public sidewalks help to create vibrant and active pedestrian-oriented shopping and dining areas within Auburn. Note – that a zero front lot line is allowed only if all structures must meet sight distance requirements in accordance with city engineering design and construction standards.

Storefront vision and key standards.



Section ACC 18.23.040 Development standards (Commercial & Industrial Zones)

These revisions reduce the front setback in the C-1, Light Commercial, C-2, Heavy Commercial, and M-1, Light Industrial zones to zero to allow for the "Storefront" option in the Citywide Design Standards.

III. TEXT AMENDMENT

The text amendment is shown by strikeout/underline and is attached to this memo as Attachments 1 through 3.

IV. COMMENTS FROM PUBLIC OPEN HOUSE

On February 4th, staff held an open house at the Auburn Resource Center from 4pm to 6pm. The open house was well attended; approximately 11 people signed in. Staff did not receive formal comments at the open house, and as of the date of this memo, no written comments have been received.

V. STAFF REQUEST

To move forward with the proposed Citywide Design Standards and associated text amendments to ACC 18.31.200, ACC 18.23.040 and ACC 18.07.030 to a public hearing on April 7, 2026.

VI. ATTACHMENTS

1 ACC Section 18.31.200 Text Amendment
2 ACC Section ACC 18.23.040 Text Amendment
3 ACC Section 18.07.030 Text Amendment