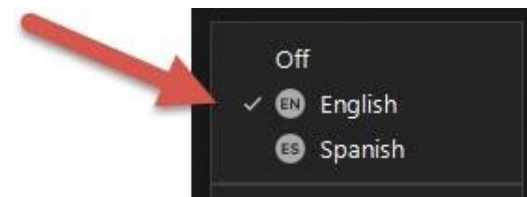
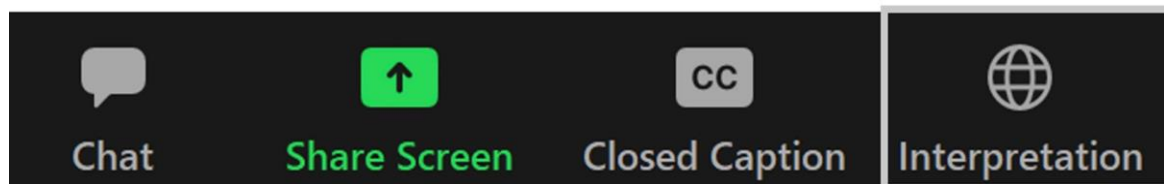


# Interpretación

Está disponible interpretación en idioma español durante esta reunión. En los controles de la reunión en la barra de herramientas ubicada en la parte inferior de la pantalla, oprima el icono **Interpretation** (interpretación) (globo pequeño) y después sobre el idioma que quiere escuchar.

# Interpretation

Spanish interpretation is available during this meeting. In your meeting controls on the toolbar at the bottom of the screen, click the **Interpretation** icon (the small globe) and click the language that you would like to hear.



# Welcome to the meeting!

Thank you for joining us! We appreciate your participation and interest in the Salem Offshore Wind Terminal Project.

This meeting will be recorded so that it can be shared with people that were unable to attend but are interested in learning more about the project.

All participants will be muted so that only the presenters can be heard to avoid excessive background noise.

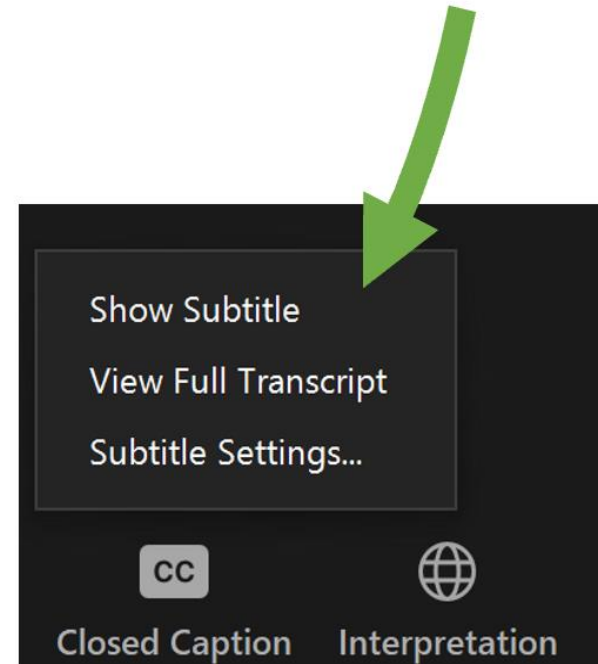
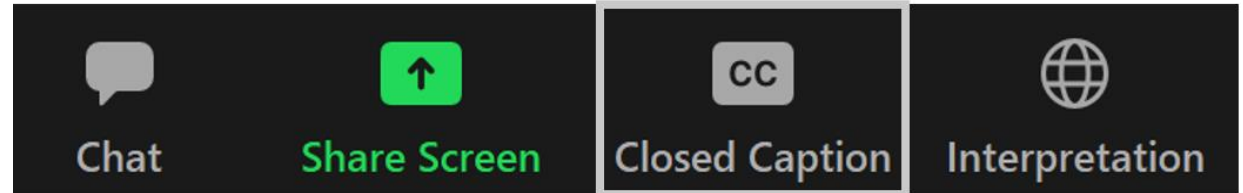
# Captioning

You can view closed captions by clicking the **Closed Caption** icon on the toolbar at the bottom of your screen and selecting from the options offered.

**Show Subtitle** will display a caption at the bottom of the screen.

**View Full Transcript** will display the meeting's audio transcription in a window to the right.

To adjust the size of the text, click the upward arrow next to **Start Video / Stop Video**. Click **Video Settings** then **Accessibility**. Move the slider to adjust the caption size.



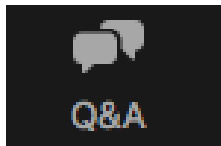
# Participating in the meeting – Questions and Answers

## In Person



- During the Q&A session, in-person participants should raise your hand if you would like to comment
- A member of the project team will come to you with a microphone to give your remarks

## Virtually (in Zoom)



- Use the Zoom Q&A feature
- Type your questions in at any point during the meeting
- A member of the project team will read your question and direct it to the appropriate team member for an answer



# Salem Offshore Wind Terminal

Salem Academy Charter School

May 2, 2023

# Agenda

- INTRODUCTIONS
- OFFSHORE WIND INTRODUCTION
- SALEM WIND PORT TERMINAL OPERATIONS
- DESIGN AND CONSTRUCTION
- ENVIRONMENTAL IMPACTS
- COMMUNITY OPPORTUNITIES

# Introductions and Intro to Offshore Wind

# Salem Offshore Wind Terminal Development



- Port Design/Construction
- Port Operations
- Vessel Operations and Management



- Public-private partnership to secure funding and develop site with Crowley
- Advocacy for Salem as one of the state's offshore wind marshaling ports



City of Salem

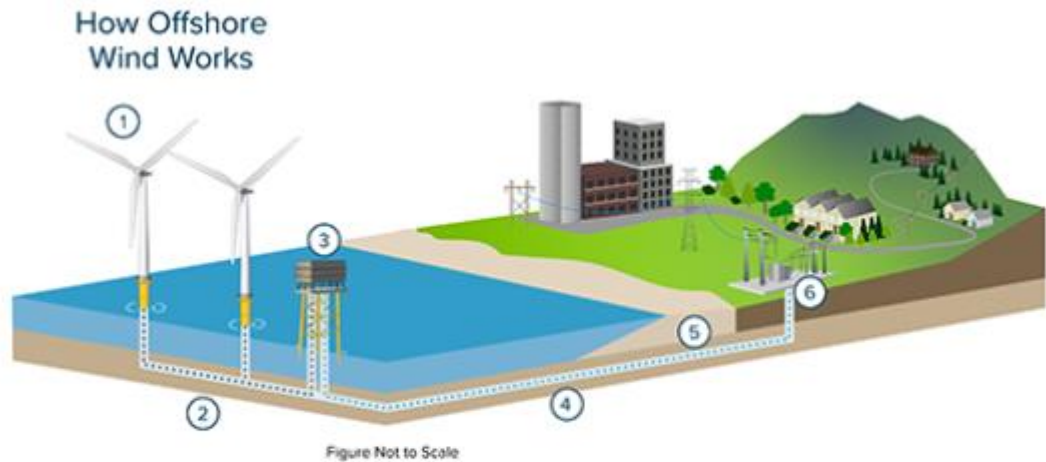
- Salem Harbor Port Authority
- Cruise Operations
- Community Benefits Agreement

\* All parties will share in workforce development, community engagement, grants/funding, etc.



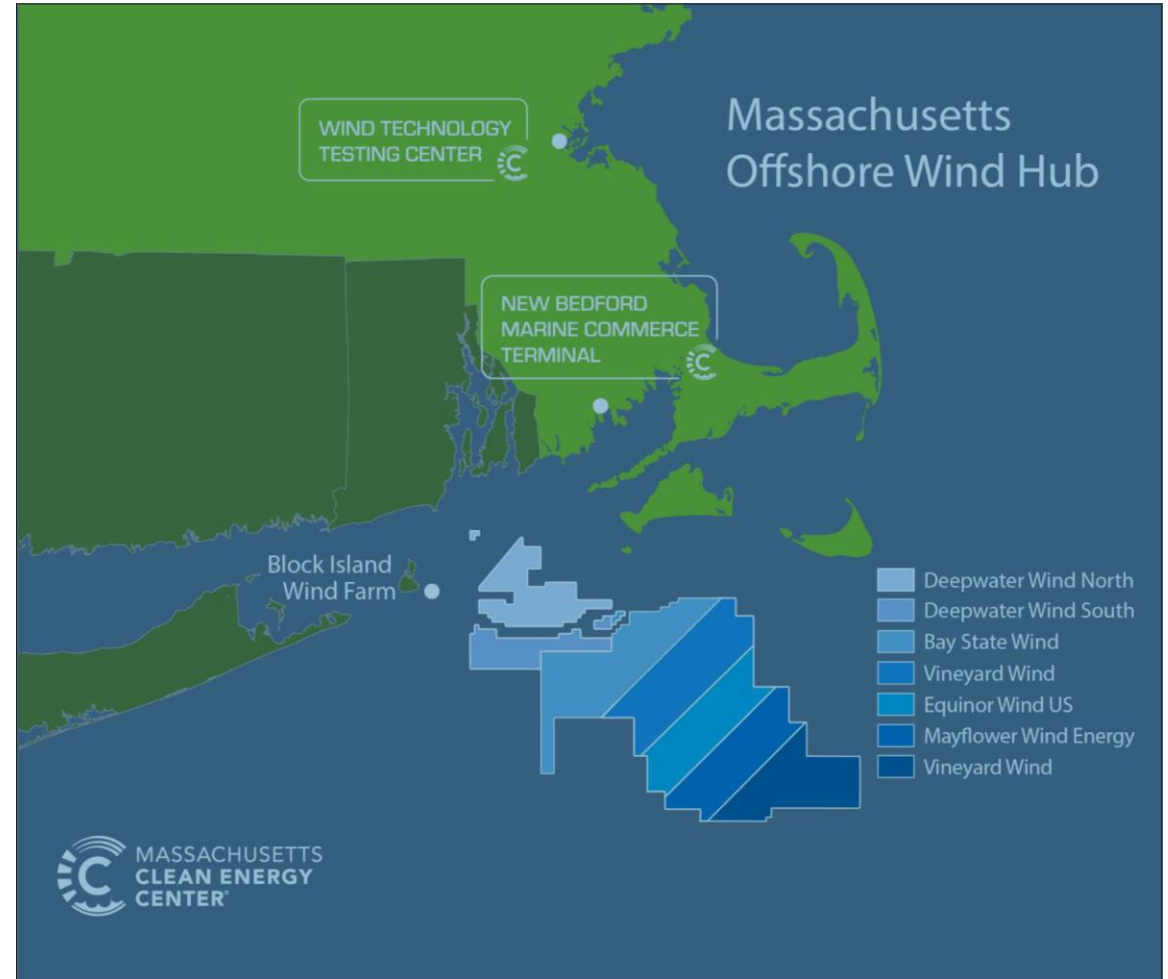
# What is Offshore Wind?

- Power Generation (Electricity)
- U.S. Department of Energy set a goal to deploy 30 Gigawatts by 2030
- Transition away from fossil fuel to generate electricity



1. **Offshore Turbines** capture the wind's energy and generate electricity.
2. **Foundations** secure turbines to the ocean floor and cables transmit electricity to an offshore substation
3. **Electricity** flows through a buried cable to an onshore substation and is transferred to the existing transmission network.

*\*NYSERDA Offshore Wind 101*



# Former Coal Fired Power Plant in Salem



# Salem Offshore Wind Terminal



# Salem Offshore Wind Terminal Operations



# Operations

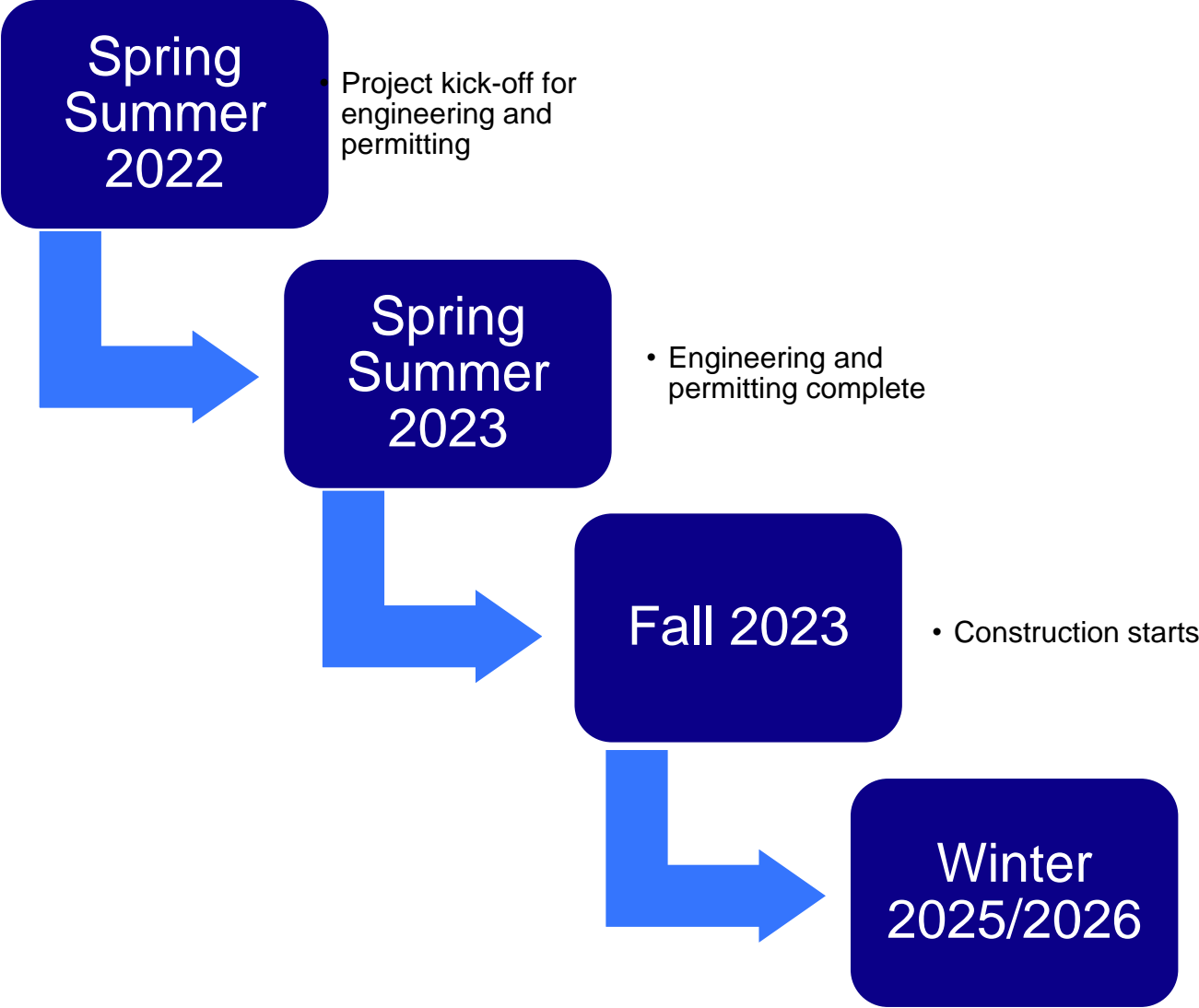
- Staging and for the wind turbine components (blades, towers, nacelles)
- Pre-assembly of some components
- Delivery berth: Components will be delivered from manufacturing facilities
- Loadout berth: Pre-assembled components delivered to installation locations via vessels
- Every effort to minimize emissions through electrification of equipment will be made

# Salem Offshore Wind Terminal Operations



# Current Project Status – Permitting, Design and Construction

# Phasing & Timeline

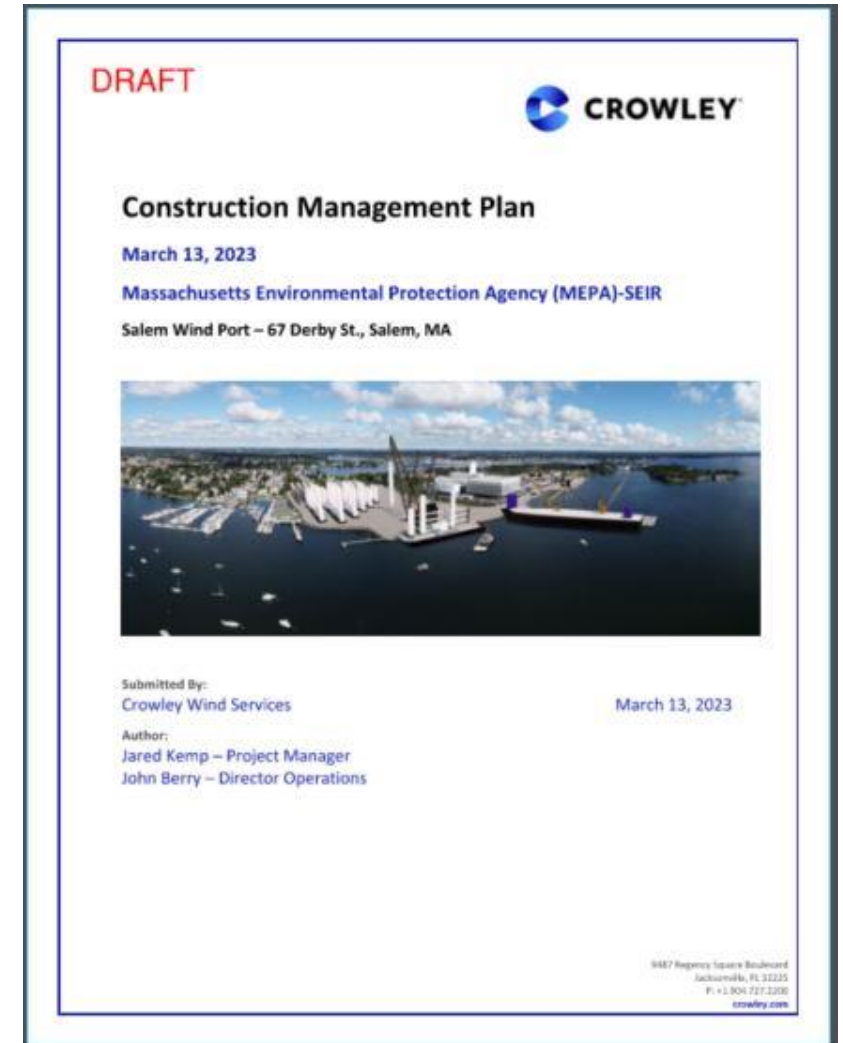




# Salem Offshore Wind Terminal Construction Management Plan & Construction Phase

## Construction Management Plan:

- Traffic Study Conducted – Updated from EENF
- Material Deliveries via Water vs Streets
- Allowable Working Hours (*anticipated*)
  - 7:30 am to 3:30 pm
  - Work with City on approved hours
  - Traffic Impact Mitigation
- Point of Contact – project site specific
- Prior to Construction Commencement –
  - Document Neighborhood and Local Structures
  - Noise Study & Mitigation Measures
  - Air Quality Study (in SEIR)
- During Construction –
  - Coordination with City & Neighborhoods on activities & impacts
  - Look-ahead schedules



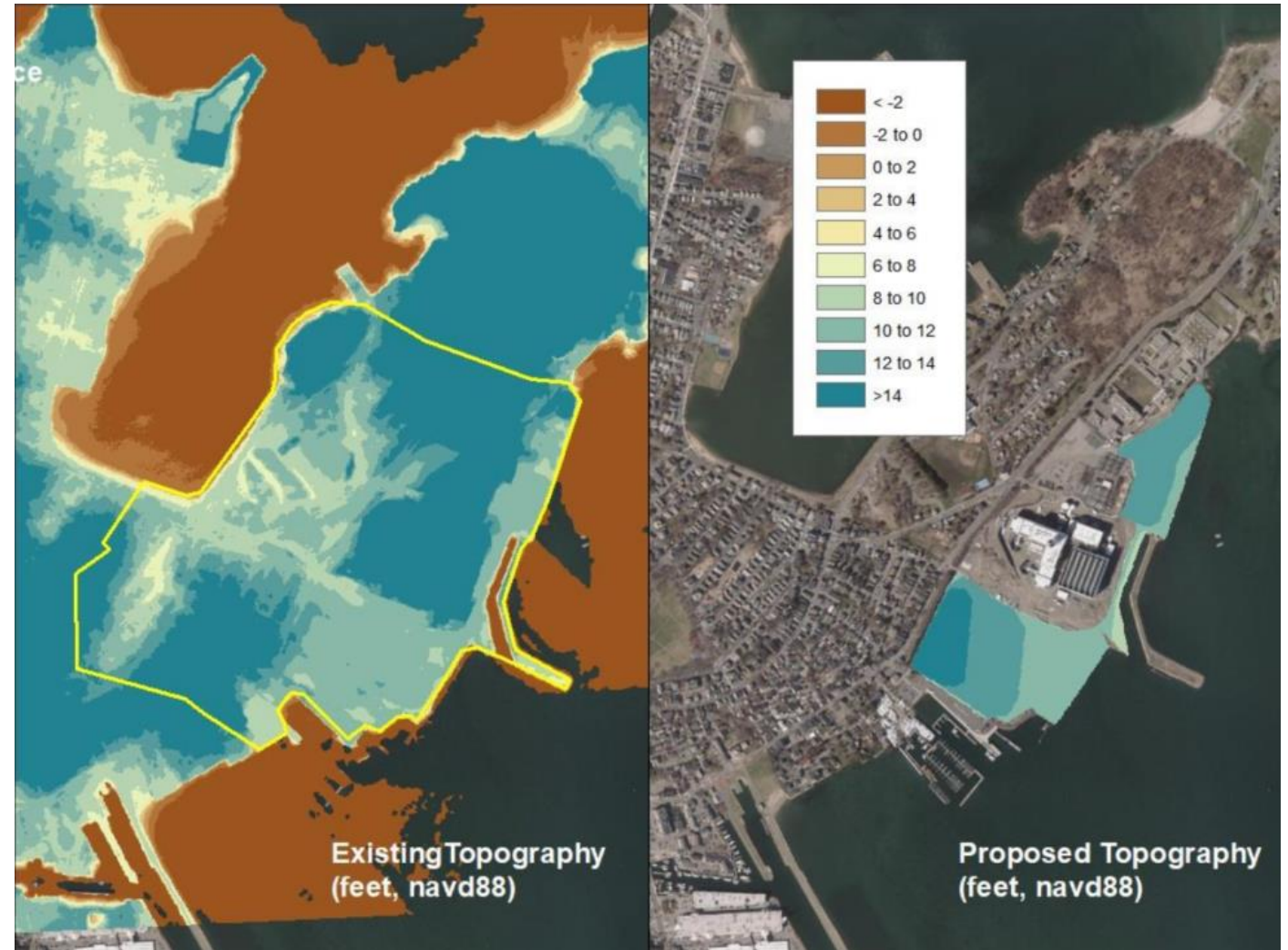
# Environmental Impact Analysis

# Flood Analysis



# Flood Analysis Methodology

- Hydrodynamic modeling
- Examine potential changes to flooding due to the project
- Six simulations based on MA Coast Flood Risk Model
  - Existing conditions
  - Proposed conditions
- Approach coordinated with MA CZM



# Flood Analysis Findings/Conclusion

Outputs showed the differences expected for flood extent, depth, and velocity for three storm event cases due to raised site topography

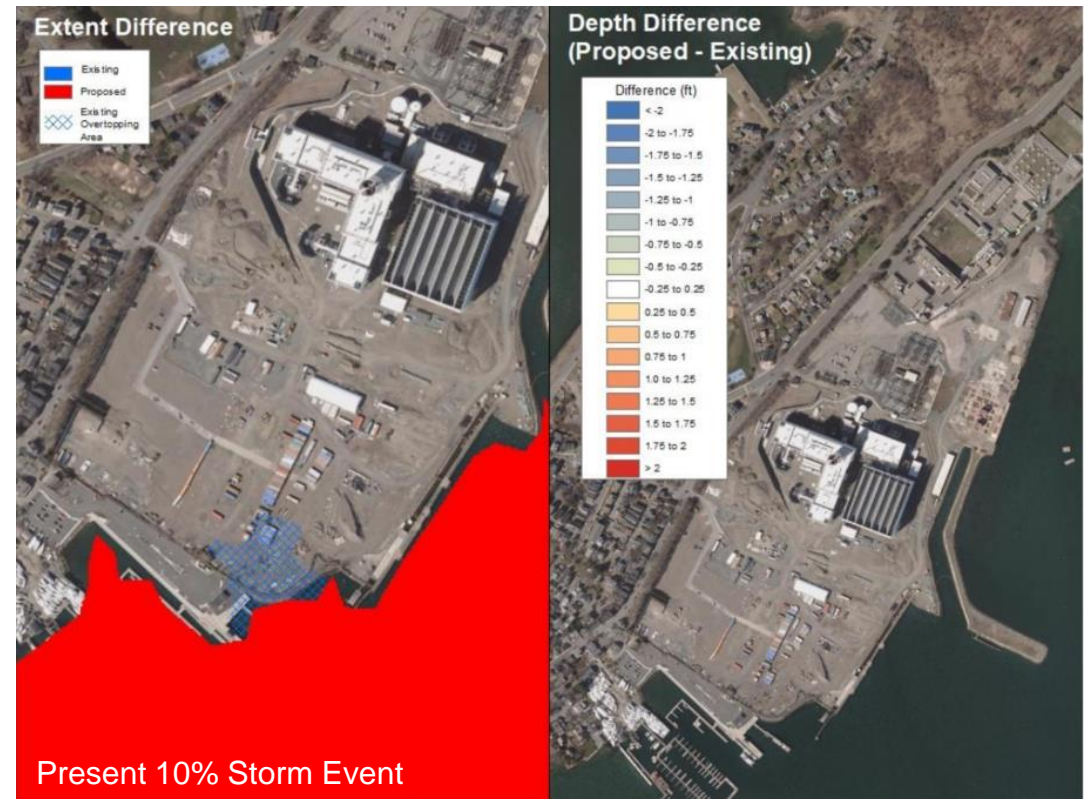
## 10% and 1% Present Day Flood Event Results

- No change to the flood extent, depth, or velocity on neighboring properties

## 1% 2050 Flood Event Results

- Minor reductions to the flood extent, depth, and velocity on neighboring properties

| Storm Event Case (Annual Exceedance) | Year        | Peak Water Level (ft, NAVD88) |
|--------------------------------------|-------------|-------------------------------|
| 10%                                  | Present Day | 7.7                           |
| 1%                                   | Present Day | 8.9                           |
| 1%                                   | 2050        | 11.7                          |



# Traffic Analysis

# Construction Truck Route

- Established construction truck route to determine impacts on traffic
- Route includes Webb Street, Bridge Street, and Route 114
- Assigns trip distribution for employees and trucks





# Construction Traffic

- The project is not expected to impact study area intersections
- Will not result in any material changes in traffic operations
- 85 daily diesel truck trips during peak construction
- Implementation of Construction Management Plan
  - Construction and delivery periods
  - Prioritization of barges
  - All employee construction parking on-site
  - On site waiting and staging areas
  - Consider enhanced mitigation during Salem events



# Operational Traffic

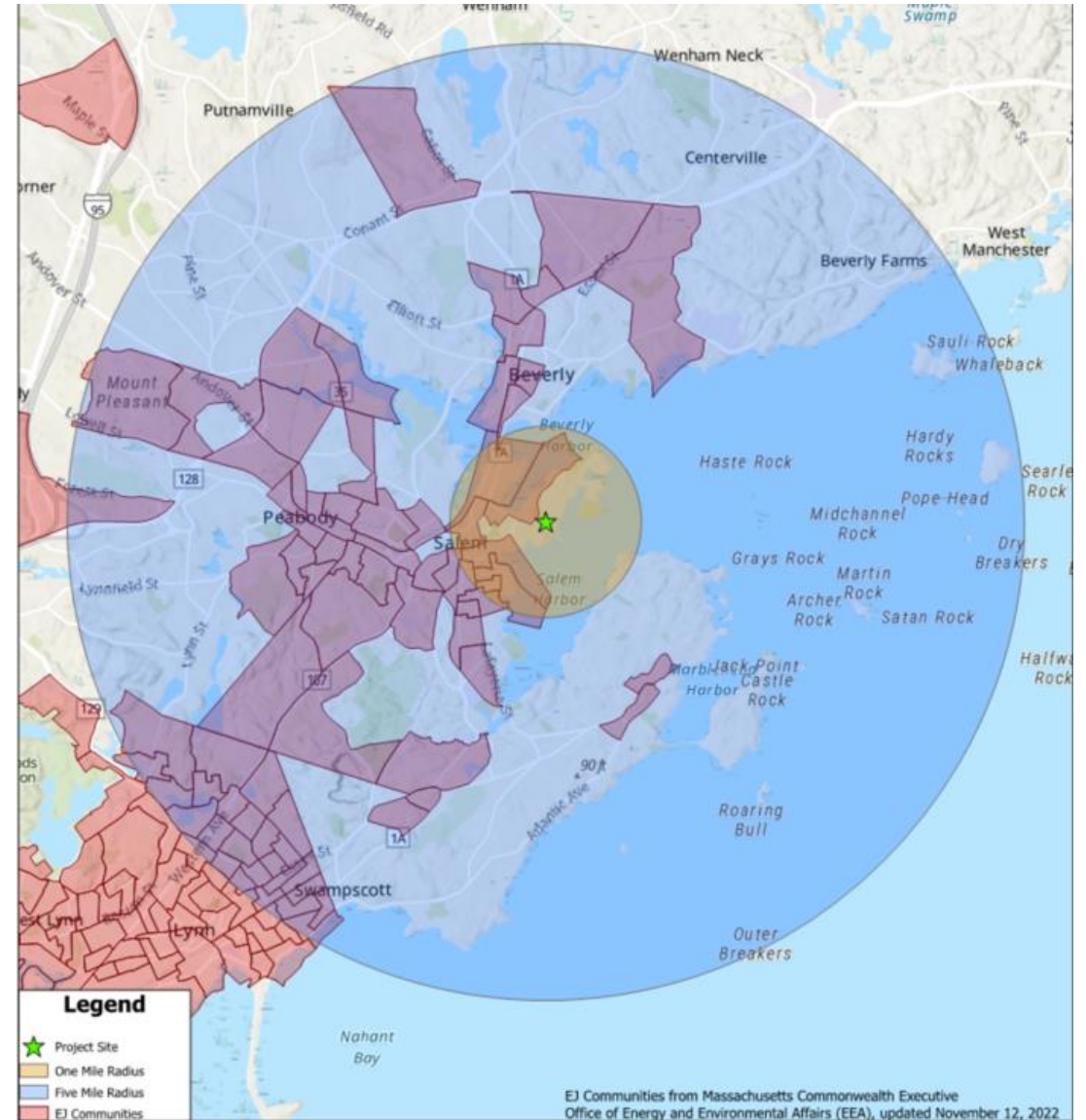
- Incremental traffic not expected to degrade intersection operating conditions
- In 2029 Build Conditions, it is estimated to generate approximately 440 vehicle trips on a weekday with 50 percent entering and exiting
- 12 daily diesel truck trips during future operations
- Trip Distribution results in:
  - 60% to/from Bridge Street – south
  - 25% to/from Derby Street – south
  - 15% to/from Bridge Street - north



# Air Quality Analysis

# Mesoscale Analysis Methodology

- Mesoscale analyses performed to quantify possible health effects from diesel trucks used for the project's construction and operations
  - Specifically, diesel particulate matter (DPM/PM10), nitrogen dioxide (NOx), and fine particulate matter (PM2.5)
- Study area consisted of roadway segments within EJ and Non-EJ Communities



# Mesoscale Analysis Construction Phase

- The Project's emissions represents an insignificant area-wide increase of the projected 2022 Essex County emissions.
- EPA predicts further declines in truck emission rates through 2029 due to more stringent EPA standards.
- Project construction truck traffic volumes will not have an adverse impact on regional air quality and or within the EJ community.
- Anticipated 85 average daily diesel truck traffic trips

MESOSCALE CONSTRUCTION DIESEL TRUCKS NO<sub>x</sub> EMISSIONS SUMMARY  
(kg/day)

| Locations        | 2022 Existing   | 2022 Construction Without Mitigation | 2022 Construction With Mitigation |
|------------------|-----------------|--------------------------------------|-----------------------------------|
| Non-EJ Community | 2.91E-03        | 1.47E-02                             | 1.45E-02                          |
| EJ Community     | 1.31E-01        | 1.82E-01                             | 1.81E-01                          |
| <b>Total</b>     | <b>1.34E-01</b> | <b>1.97E-01</b>                      | <b>1.95E-01</b>                   |

MESOSCALE CONSTRUCTION DIESEL TRUCKS PM<sub>2.5</sub> EMISSIONS SUMMARY  
(kg/day)

| Locations        | 2022 Existing   | 2022 Construction Without Mitigation | 2022 Construction With Mitigation |
|------------------|-----------------|--------------------------------------|-----------------------------------|
| Non-EJ Community | 1.35E-04        | 6.77E-04                             | 6.66E-04                          |
| EJ Community     | 5.84E-03        | 8.14E-03                             | 8.10E-03                          |
| <b>Total</b>     | <b>5.98E-03</b> | <b>8.82E-03</b>                      | <b>8.77E-03</b>                   |

MESOSCALE CONSTRUCTION DIESEL TRUCKS DPM/PM<sub>10</sub> EMISSIONS SUMMARY (kg/day)

| Locations        | 2022 Existing   | 2022 Construction Without Mitigation | 2022 Construction With Mitigation |
|------------------|-----------------|--------------------------------------|-----------------------------------|
| Non-EJ Community | 1.47E-04        | 7.36E-04                             | 7.24E-04                          |
| EJ Community     | 6.35E-03        | 8.85E-03                             | 8.80E-03                          |
| <b>Total</b>     | <b>6.50E-03</b> | <b>9.59E-03</b>                      | <b>9.53E-03</b>                   |

# Mesoscale Analysis Operations Phase

- The Project's emissions represents an insignificant area-wide increase of the projected 2029 Essex County emissions
- EPA predicts further declines in truck emission rates through 2029 due to more stringent EPA standards
- Project operations truck traffic volumes will not have an adverse impact on regional air quality and or within the EJ community
- Anticipated 12 average daily diesel truck traffic trips

MESOSCALE OPERATIONS DIESEL TRUCKS NO<sub>x</sub> EMISSIONS SUMMARY  
(kg/day)

| Locations        | 2022 Existing   | 2029 No-Build   | 2029 Build      | 2029 Build With Mitigation |
|------------------|-----------------|-----------------|-----------------|----------------------------|
| Non-EJ Community | 2.02E-02        | 1.21E-02        | 1.30E-02        | 1.30E-02                   |
| EJ Community     | 1.94E-01        | 1.11E-01        | 1.16E-01        | 1.15E-01                   |
| <b>Total</b>     | <b>2.14E-01</b> | <b>1.23E-01</b> | <b>1.29E-01</b> | <b>1.28E-01</b>            |

MESOSCALE OPERATIONS DIESEL TRUCKS PM<sub>2.5</sub> EMISSIONS SUMMARY  
(kg/day)

| Locations        | 2022 Existing   | 2029 No-Build   | 2029 Build      | 2029 Build With Mitigation |
|------------------|-----------------|-----------------|-----------------|----------------------------|
| Non-EJ Community | 9.38E-04        | 3.54E-04        | 3.81E-04        | 3.80E-04                   |
| EJ Community     | 8.63E-03        | 3.22E-03        | 3.35E-03        | 3.34E-03                   |
| <b>Total</b>     | <b>9.57E-03</b> | <b>3.57E-03</b> | <b>3.73E-03</b> | <b>3.72E-03</b>            |

MESOSCALE OPERATIONS DIESEL TRUCKS DPM/PM<sub>10</sub> EMISSIONS SUMMARY  
(kg/day)

| Locations        | 2022 Existing   | 2029 No-Build   | 2029 Build      | 2029 Build With Mitigation |
|------------------|-----------------|-----------------|-----------------|----------------------------|
| Non-EJ Community | 1.02E-03        | 3.85E-04        | 4.14E-04        | 4.13E-04                   |
| EJ Community     | 9.38E-03        | 3.50E-03        | 3.64E-03        | 3.64E-03                   |
| <b>Total</b>     | <b>1.04E-02</b> | <b>3.88E-03</b> | <b>4.05E-03</b> | <b>4.05E-03</b>            |

# Vessel Emissions Study

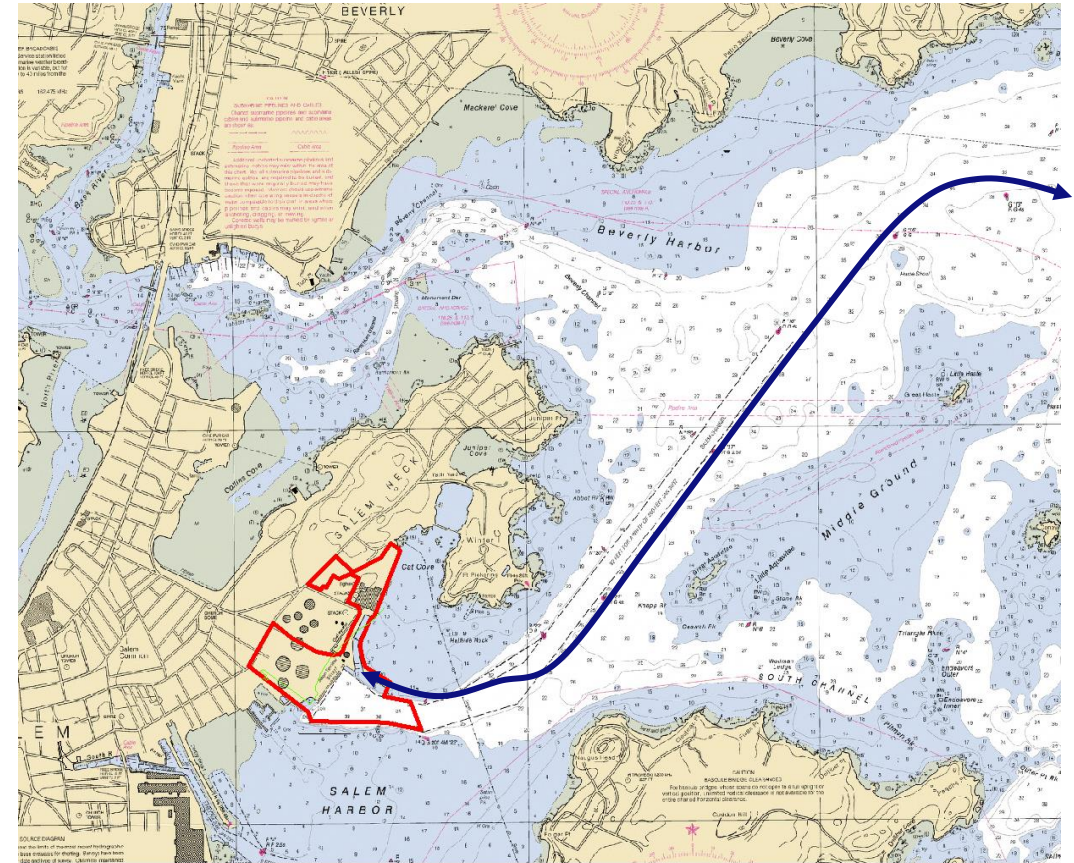
# Vessel Emissions

## Vessel Emissions Study

- Emissions estimates calculated using U.S. EPA's 2022 Port Emissions Inventory Guidance methodology\*
- 3 vessel types, emissions from vessels arriving and docking at port
- Approximately 85 trips per month
- Resulted in options for some vessels to connect to shore power
- No significant levels of emissions

## Vessel Impacts to EJ Communities

- Address vessels traveling along navigation route within 1-mile of EJ communities
- Only one EJ community in Beverly, closest point is more than 1/3 mile away
- No impacts vessels traveling to and from the Port.



\*See [Port Emissions Inventory Guidance: Methodologies for Estimating Port-Related and Goods Movement Mobile Source Emissions](#)



# Assessed Prototype Vessels\*



## INBOUND FREIGHT: JUMBO JUBILEE

- Heavy lift freighter
- Tier I MDO engine
- Total propulsion engine power: 9,000 kW
- 59 port calls



## OUTBOUND FREIGHT OPTION 1: OCEAN SKY

- Tug/barge combo
- Tier II MDO engine
- Total propulsion engine power: 8,113 kW
- 54 port calls



## OUTBOUND FREIGHT OPTION 2: SEAJACKS CHARYBDIS

- Wind turbine installation vessel (WTIV)
- Tier III MDO engine
- Total propulsion engine power: 12,000 kW
- 14 port calls

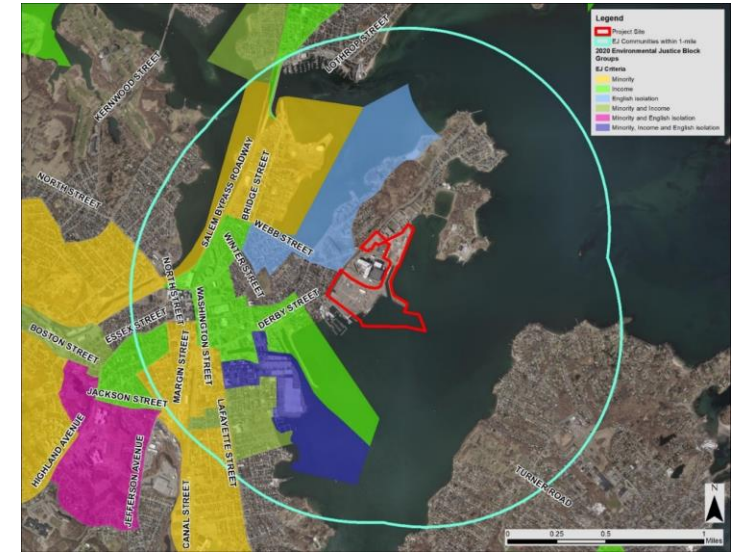
\*Prototypes reflect the typical characteristics of vessels used for OSW projects, but were selected for assessment purposes only; actual vessels may differ

# Study Results

| Vessel  | NO <sub>x</sub> | PM <sub>2.5</sub> | CO <sub>2</sub>     | SO <sub>2</sub> | Unit      |
|---|-----------------|-------------------|---------------------|-----------------|-----------|
| Jumbo Jubilee<br>(inbound freight)                | 4.79            | 0.08              | 258.86              | 0.21            | tons/year |
| Ocean Sky<br>(outbound freight Option 1)          | 1.02            | 0.02              | 63.17               | 0.08            | tons/year |
| Seajacks Charybdis (outbound freight<br>Option 2) | 0.96            | 0.05              | 182.64              | 0.13            | tons/year |
| <b>Total</b>                                      | 5.75 to 5.81    | 0.10 to<br>0.13   | 322.03 to<br>441.50 | 0.29 to 0.34    | tons/year |

# Conclusions

- No significant levels of emissions
- Less than 0.14% of Salem Harbor Power Plant CO<sub>2</sub> emissions
- Similar impacts to EJ and non-EJ communities
- Low emissions during transit due to low horsepower required to propel the vessels at expected operating speeds



| Vessel  | NO <sub>x</sub> | PM <sub>2.5</sub> | CO <sub>2</sub>  | SO <sub>2</sub> | Unit      |
|---|-----------------|-------------------|------------------|-----------------|-----------|
| <b>Jumbo Jubilee (inbound freight)</b>                  | 4.79            | 0.08              | 258.86           | 0.21            | tons/year |
| <b>Ocean Sky (outbound freight Option 1)**</b>          | 1.02            | 0.02              | 63.17            | 0.08            | tons/year |
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| <b>Total**</b>  | 5.75 to 5.81    | 0.10 to 0.13      | 322.03 to 441.50 | 0.29 to 0.34    | tons/year |

\*See [EPA Clean Air Markets Program Data](#); PM<sub>2.5</sub> emissions unavailable

\*\*Total estimate ranges are the sum of inbound freight and each outbound freight option

# Mitigation Measures

- Provisions for cold ironing:
  - Electrical power to be provided to dock for tug/barge combo, eliminating direct hotelling emissions while berthed
  - Electrical conduit to be installed to both docks for future power for cold ironing as vessels adapt
- Use of ultra-low sulfur diesel fuel rather than traditional bunker fuel
  - Sulfur content in low sulfur diesel fuel: 1,000 ppm
  - Sulfur content in bunker fuel: 50,000 ppm
- Use of vessels with Tier III engines as procurement and availability allows





# Next Steps

- MEPA Single Environmental Impact Report
- Site Plan Review

# Community Opportunities

# Outreach Activities and Meetings

- **Lt. Gov. Kimberly Driscoll**
- **Historic Derby Street Neighborhood**
- **Willows Neighborhood**
- **Point Neighborhood**
- **Salem Rotary**
- **Salem Chamber**
- **Salem Partnership**
- **Salem City Council**
- **Marblehead Town Meeting**
- **Youth Build North Shore Community Development Coalition**
- **Salem Alliance for the Environment (Letter of support for grant)**
- **Virtual Public Meetings**
- **Salem News interviews**
- **MASSHIRE North Shore Workforce Board**
- **Mass Bay Harbor Safety Committee**
- **Congressman Seth Moulton**
- **Senator Elizabeth Warren**
- **United Kingdom General Counsel**
- **Salem Harbor Port Authority**
- **Essex County Community Foundation**
- **Senator Joan Lovely and Representative Manny Cruz**

# Community Outreach

## Memberships

- Salem Partnership
- Salem Chamber of Commerce

## Supporting

- Salem Pantry
- Destination Salem
- Salem Main Streets

## Participation

- Farmers Market
- Salem Maritime Festival
- Salem 400
- Move to number 1 LEAP Summer Work Program – Mentor





# Workforce Development and Training



## Salem High School Career Technical Education

- Letter of Support: Massachusetts Skills Capital Grant Program
- MOU: Crowley to provide support of CTE programs



## Essex North Shore Agricultural and Technical School

- Electrical Program Advisory Committee
- Crowley to Support Career Technical Education programs with site visits and introduction to the offshore wind industry



## Salem State University, Massachusetts Maritime Academy

- Offshore Wind industry training



# Question and Answers

# MEPA Comments:

By Mail:

Secretary of Energy and  
Environmental Affairs  
Executive Office of Energy and  
Environmental Affairs (EEA)  
Attn: MEPA Office  
Alex Strysky, EEA No. 16618  
100 Cambridge Street, Suite 900  
Boston MA 02114

Online

MEPA Public Comment Portal:

[Mass.Gov - MEPA Public  
Comments \(state.ma.us\)](https://www.mass.gov/info-details/mepa-public-comments)

[https://eeaonline.eea.state.ma.us/EA/  
PublicComment/Landing/](https://eeaonline.eea.state.ma.us/EA/PublicComment/Landing/)

By Email:

[alexander.strycky@mass.gov](mailto:alexander.strycky@mass.gov)



Contact us:

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