HEALTH IMPACT ASSESSMENT of the PROPOSED COMPRESSOR STATION WEYMOUTH, MA

Advisory Committee Meeting #6

November 7, 2018

Agenda

- Welcome and Agenda Overview
- Impact Assessment Discussion:
  - Review of Projected Changes in Air Quality
  - Projected Changes in Noise - New
  - Projected Changes in LU/NR - New
  - Impact Characterization
- Discussion of Potential Recommendations
- Meeting Evaluation and Next Steps

Meeting Objectives

- Understanding of anticipated impacts so that advisors can provide feedback on impact findings and inform direction of potential recommendations
- List of outstanding questions and additional sources of information

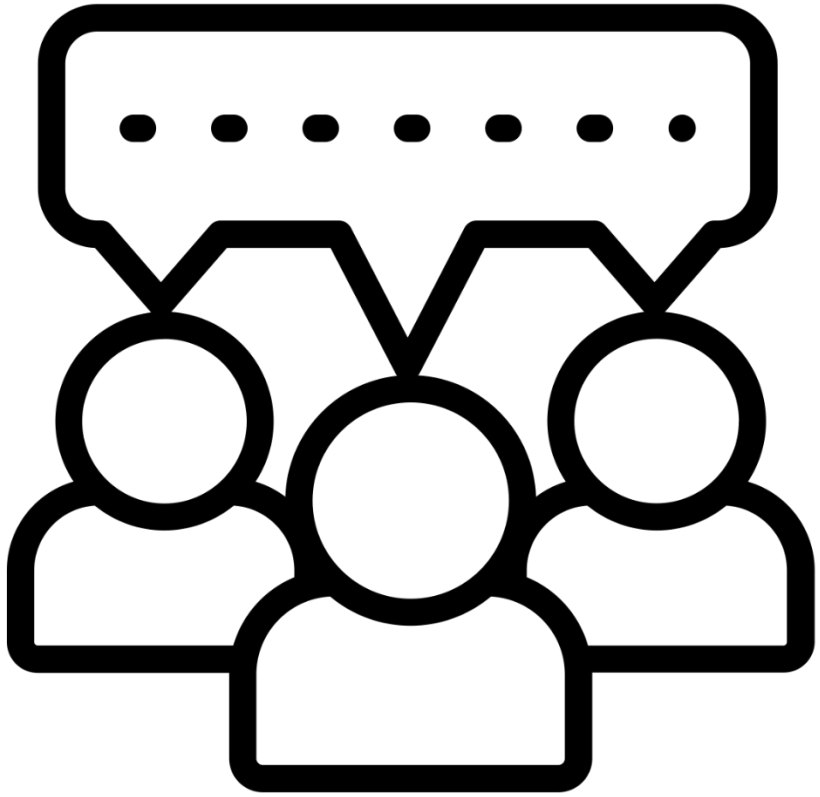
HIA Project Team

- Massachusetts Department of Public Health (MDPH)
- Massachusetts Department of Environmental Protection (MassDEP)
- Metropolitan Area Planning Council (MAPC)

Advisory Committee Member Introductions

- Name

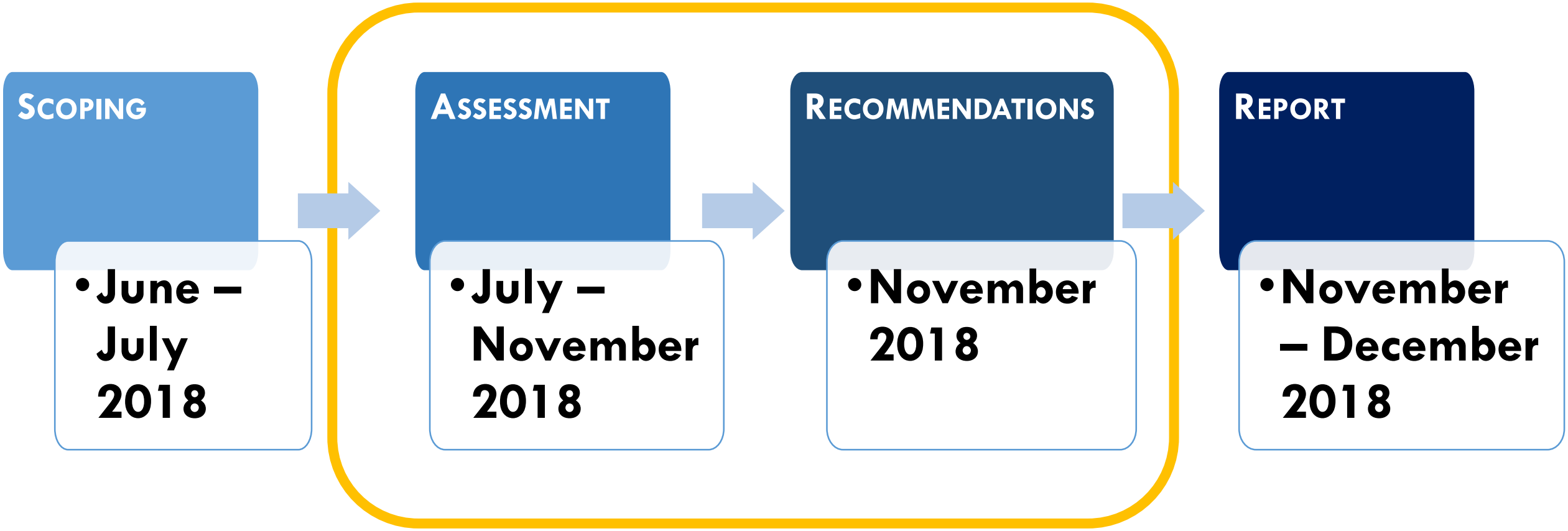
- Where from/Who Representing



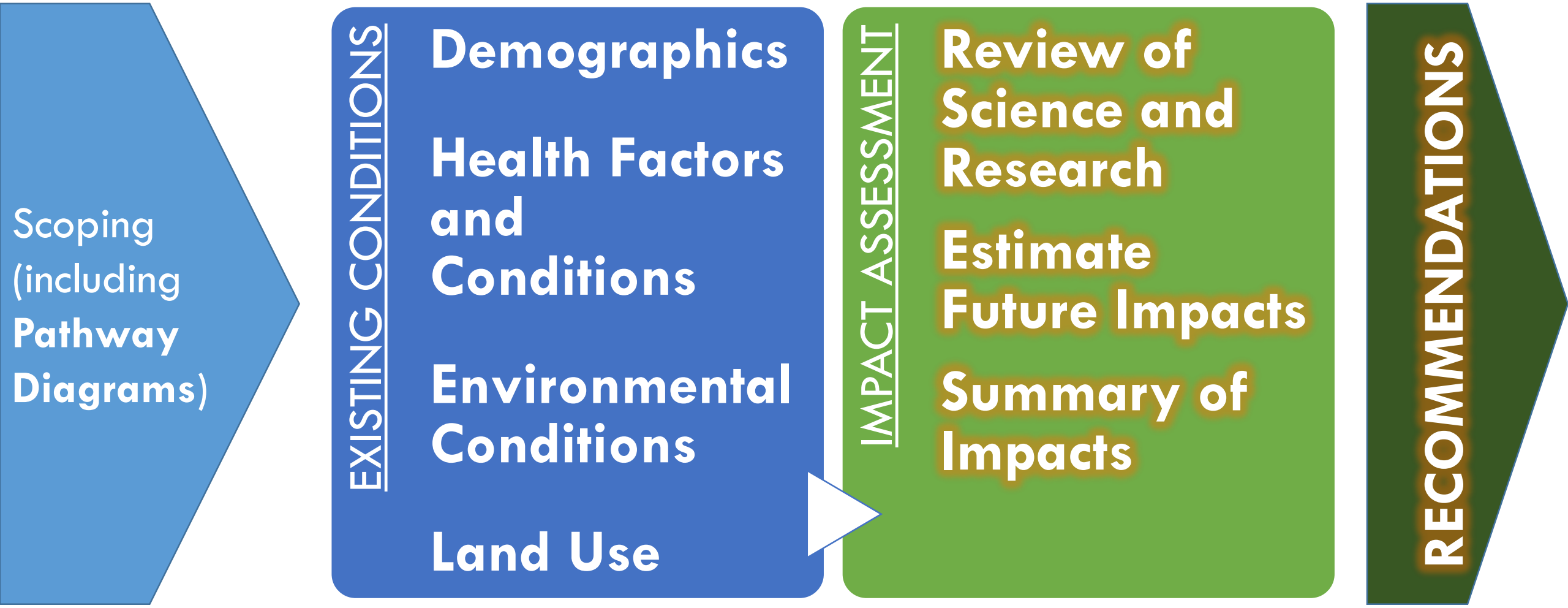
Advisory Committee Roles and Responsibilities

- Advise the project team during all phases of the HIA (e.g., scoping the HIA, assessment of health impacts)
- Share expertise and range of experiences and perspectives related to the HIA
- Consultation by phone and email

HIA Timeline



Assessment Step of HIA



HIA Advisors Update

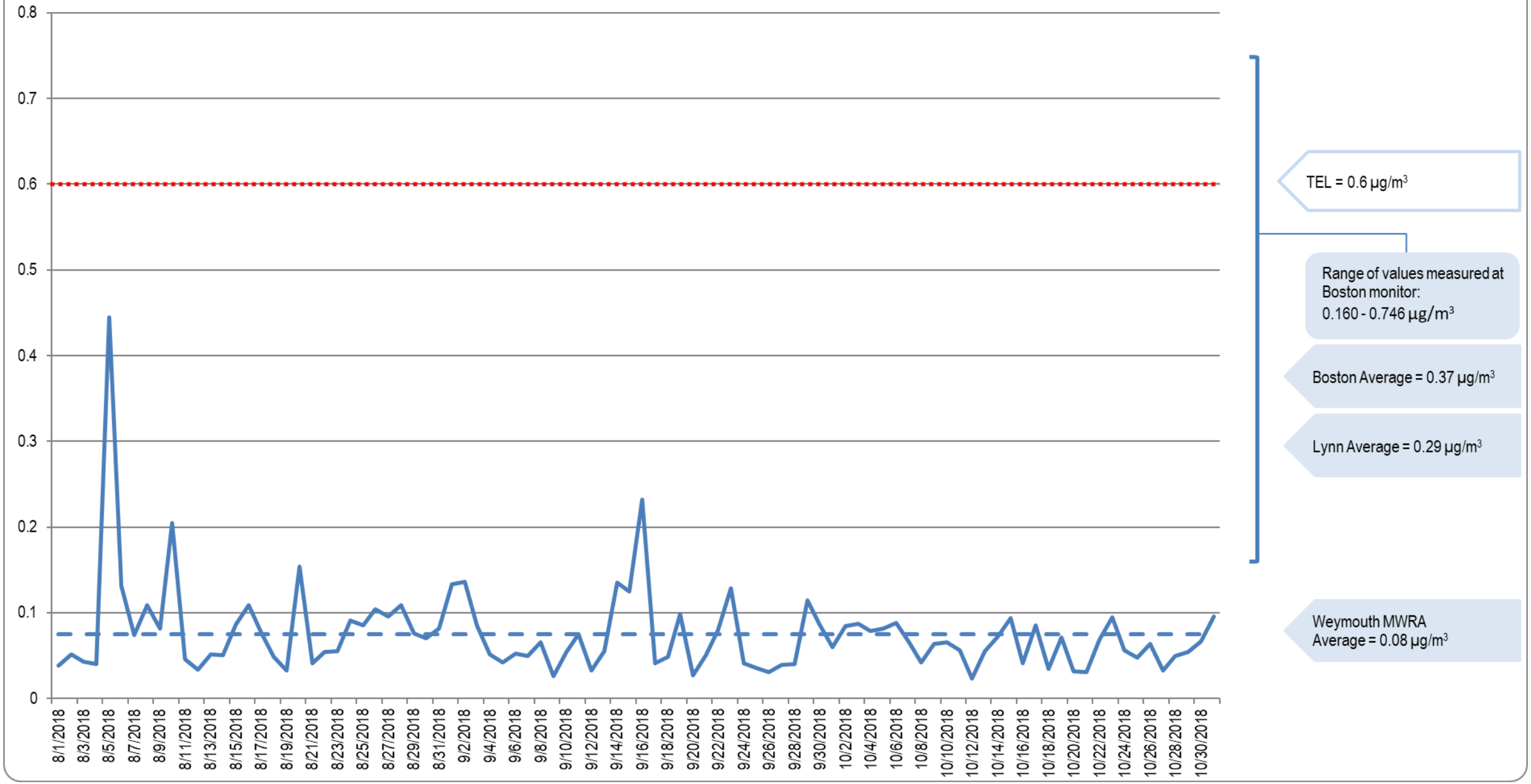
Participant updates and information sharing

Potential Impacts: Changes in Air Quality

Participatory discussion and preliminary assessment of potential effects of projected changes in air quality due to the proposed compressor station

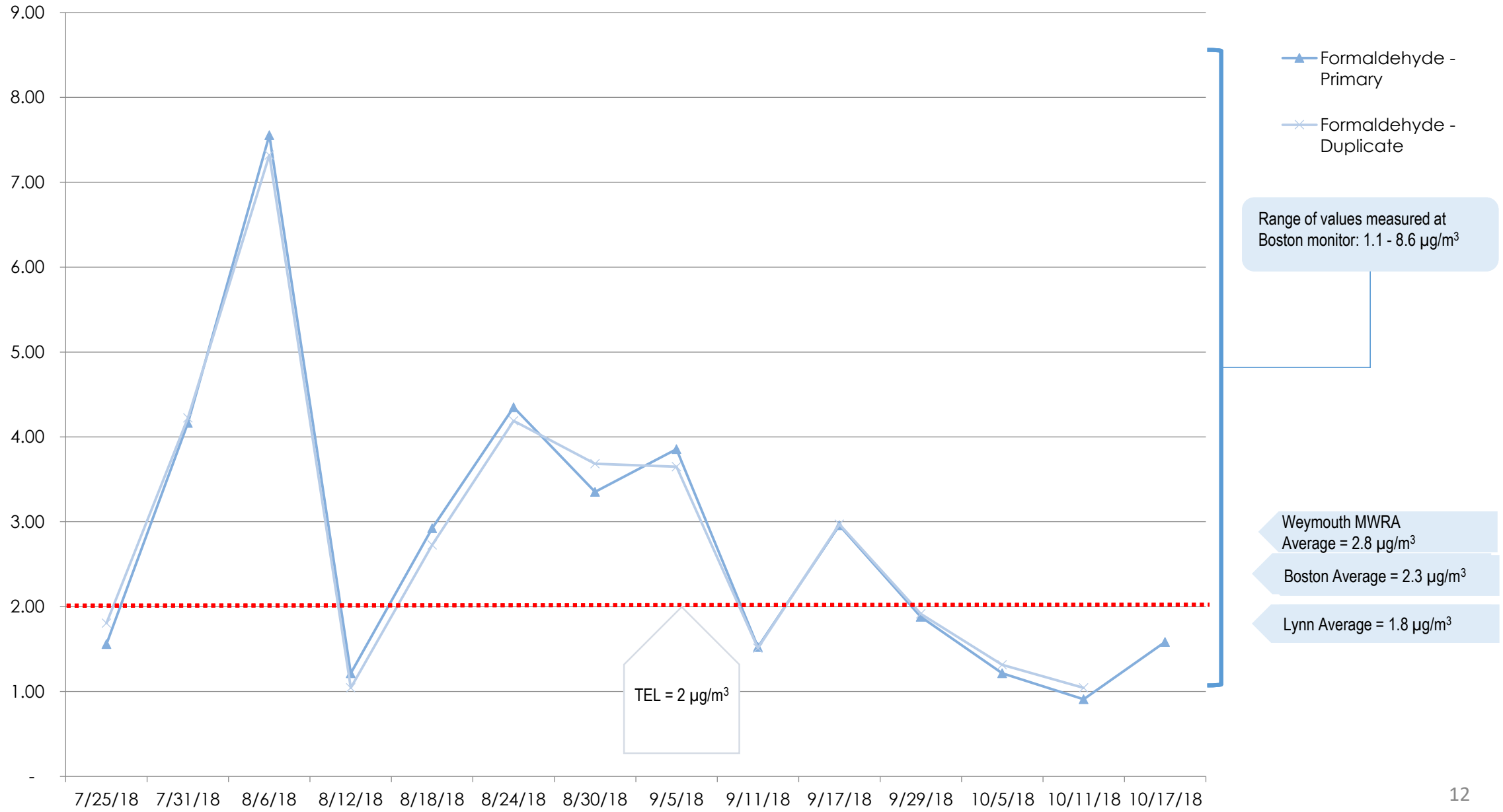
Benzene Concentrations Relative to TEL

Gas Chromatorgraph Hourly Monitoring Reported as 24-hr Average Concentrations for August -October 2018 (µg/m³)
Weymouth MWRA Pump Station



Formaldehyde Concentrations Relative to TEL

Weymouth MWRA Pump Station 24 hour samples (µg/m^3)



Max Cumulative Modeled NO_2

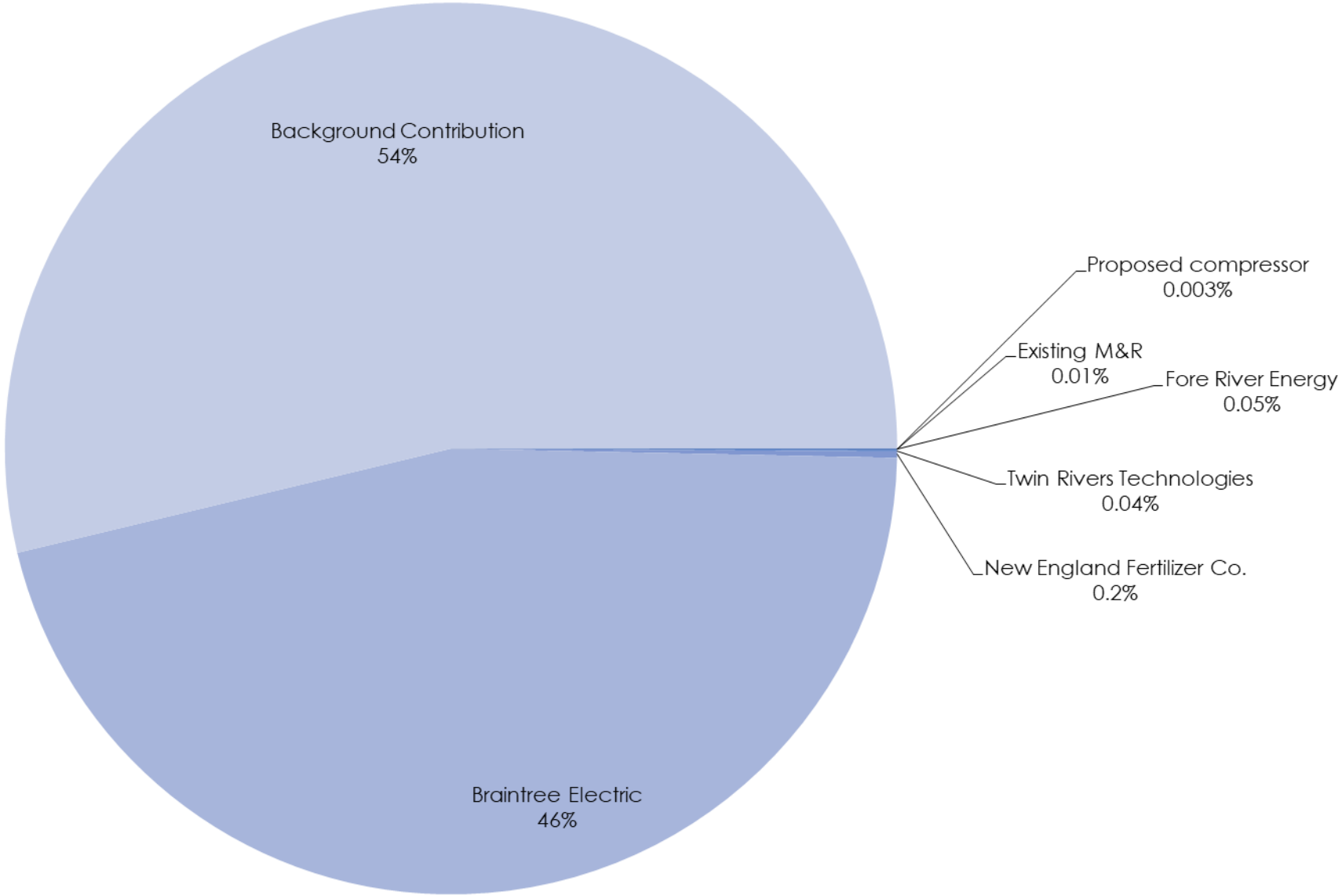
($\mu g/m^3$)

Source	1-hr NO_2	Annual NO_2
Proposed compressor	0.004	0.177
Existing M&R	0.010	7.317
Fore River Energy	0.093	0.124
Twin Rivers Technologies	0.066	0.476
New England Fertilizer Co.	0.410	0.068
Braintree Electric	80.823	0.355
Background Contribution	94.63	32.88
Total Max NO_2	176.04	41.4
NAAQS	188	100
Total Max NO_2 as % of NAAQS	94%	41%

$\mu g/m^3$ = micrograms per cubic meter

Max Cumulative Modeled 1-hour NO_2

($\mu g/m^3$)



Max Cumulative Modeled $PM_{2.5}$

(µg/m3)

Source	24-hr $PM_{2.5}$	Annual $PM_{2.5}$
Proposed compressor	0.005	0.043
Existing M&R	0.002	0.980
Fore River Energy	0.098	0.004
Braintree Electric	6.733	0.137
Twin Rivers Technologies	0.061	0.262
New England Fertilizer Co.	0.233	0.047
Background Contribution	15.30	6.50
Total Max $PM_{2.5}$	22.43	7.97
NAAQS	35	12
Total Max $PM_{2.5}$ as % of NAAQS	64%	66%

µg/m^3 = micrograms per cubic meter

Max Modeled vs. Actual Emissions

	Modeled Emissions (equivalent tpy)	Actual Emissions (equivalent tpy)	Actual as % of Modeled
$PM_{2.5}$ 24-hour			
Fore River Energy	240	20	9%
Braintree Electric	648	1	0.2%
Twin Rivers Technologies	33	1	2%
New England Fertilizer Co. (MWRA)	33	7	22%
NO_x 1-hour			
Fore River Energy	191	104	55%
Braintree Electric	2,077	25	1%
Twin Rivers Technologies	206	16	8%
New England Fertilizer Co. (MWRA)	48	11	22%

Modeled emissions in equivalent tons per year (tpy) = max (grams per second) for 1 year

Actual emissions is average of emissions for 2013-2015

Modeling - Toxics Closest to TEL/AAL

24-Hour average ($\mu g/m^3$)

Compound	TEL	Highest 24-hour Modeled Concentration	Kings Cove Walking Path Concentration	Nearest Residences Concentration
Benzene	0.6	0.217	<0.09	<0.03
Formaldehyde	2	0.386	<0.2	<0.1
Acrolein	0.07	0.0371	<0.014	<0.0088

Annual average ($\mu g/m^3$)

Compound	AAL	Highest Annual Modeled Concentration	Kings Cove Walking Path Concentration	Nearest Residences Concentration
Benzene	0.1	0.0426	<0.015	<0.005
Formaldehyde	0.08	0.0554	<0.028	<0.016
Acrolein	0.07	0.0049	<0.0035	<0.0035

Concentrations for Kings Cove path and the nearest residences estimated from isopleths; areas outside of an isopleth band are less than the indicated concentration

Nearest Residences are south and east of the proposed facility

Potential Impacts: Changes in Noise

Participatory discussion and preliminary assessment of potential effects of projected changes in sound levels and noise due to the proposed compressor station

Estimated Ambient Sound Levels

Town of Weymouth Study (Apr 2017)

Location	Lowest Daytime Ambient Sound Level (L90 1hr, dBA)	Lowest Nighttime Ambient Sound Level (L90 1hr, dBA)
Monitor 1	41	37
Monitor 2	44	33
Monitor 3	36	30
Monitor 4	31	28

Updated Proponent Submission (Sept 2018)

Loc. ID	Description	Daytime L90 dBA	Nighttime L90 dBA
M1	King's Cove PL	44	40
M2	Bridge St.	48	36
M3	Monatiquot St.	44	45
M4	King's Cove Beach Road	40	37
M5	Quincy Park	45	34
M6	O'Brien Towers	42	41

Not comparable measures but similar locations:

Monitor 1 and M1 approximately same location (King's Cove)

Monitor 2 and M2 in nearby residential areas on Bridge Street (back yard and front yard, respectively)

Monitor 3 and M3 in residential neighborhood south of Bridge Street (different streets, blocks)

Monitor 3 and M3 in King's Cove Neighborhood (different streets, blocks)

Estimated Sound from Compressor Station

Anticipated changes - Construction

- Equipment: Diesel Generator, Bulldozer, Grader, Backhoe, Front End Loader, Truck Loaded
- If a single piece of each were in operation,
  - The initial estimated total: 113 dBA at 50' from source
  - At nearest residence (approx. 650') attenuation of sound and use of berm reduce to 56 dBA

Estimated Sound from Compressor Station

Anticipated changes - Operation

Equipment:

- Gas turbine exhaust system
- Gas turbine air intake filter system
- Lube oil cooler
- Gas cooler
- Aboveground gas piping and associated components (e.g., valves, suction filter separators)
- Compressor Unit with Turbine

Estimated Sound from Compressor Station

Anticipated changes – Mitigation of Sounds from Operation

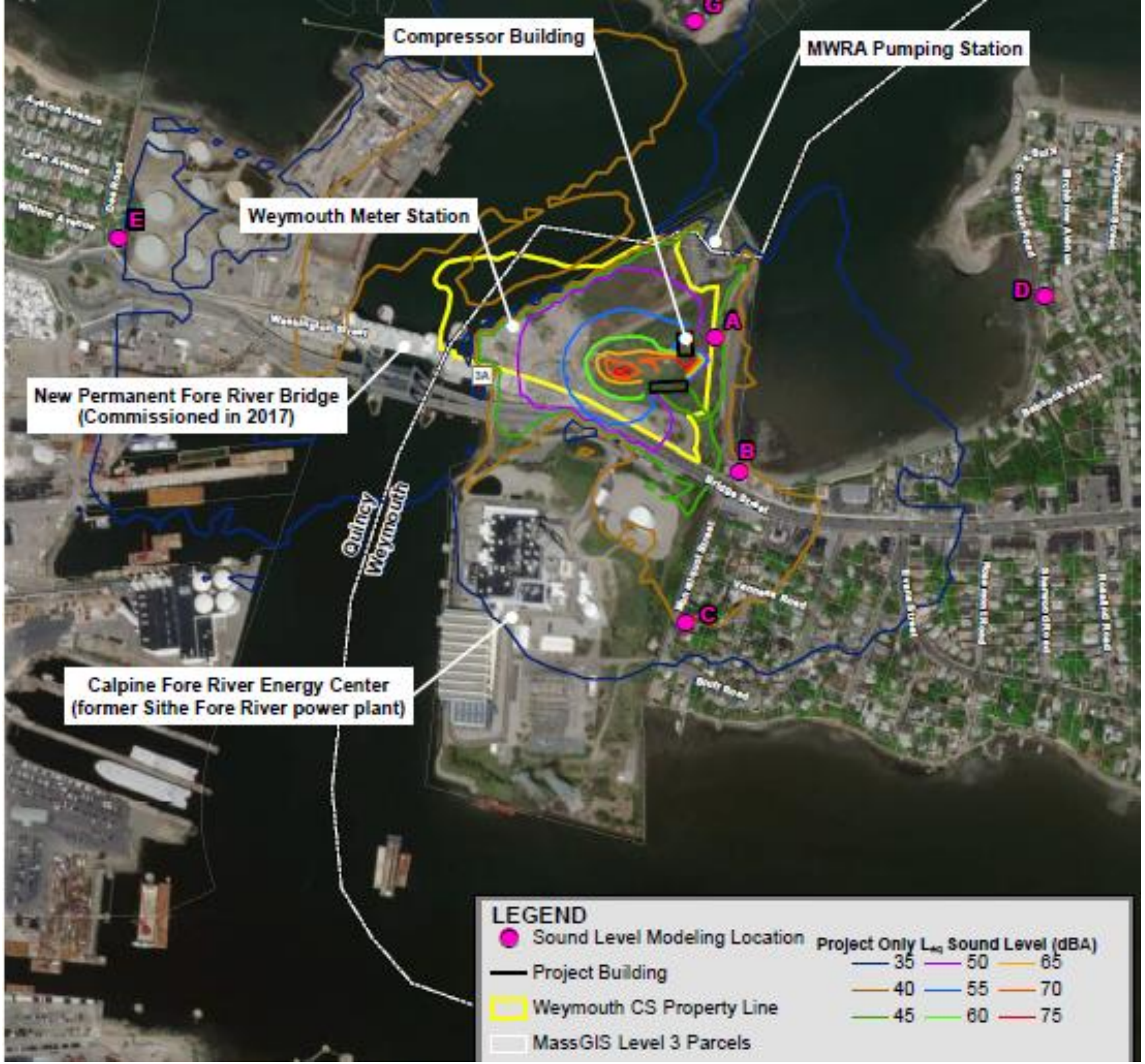
- Gas turbine exhaust – 2-stage silencer
- Gas turbine air intake – 5-foot silencer; air intake filter
- Lube oil cooler – quieter model; behind courtyard barrier wall (8.5-inch concrete)
- Gas cooler - behind courtyard barrier wall (8.5-inch concrete) (replaces gas cooler)
- Aboveground piping – acoustical pipe insulation; courtyard barrier wall (8.5-inch concrete)
- Gas turbine and compressor – 8.5-inch thick concrete block building; double insulated roll-up doors; no windows (replaces metal gauge building with insulation)

Estimated Sound from Compressor Station

Anticipated changes – Operation: Daytime level (7am – 10pm)

Description	Land Use	Estimated Ambient Background Noise Level	Modeled Project- Only Noise Level (Proposed)	Combined Project + Background Noise Level	Increase Above Background
		dBA	dBA	dBA	dBA
King's Cove PL	Public	44	47	49	5
Bridge St.	Residence	48	44	49	1
Monatiquot St.	Residence	44	40	46	2
KCBR	Residence	40	31	41	1
Quincy Park	Residence	45	35	45	0
O'Brien Towers	Residence	42	36	43	1
Germantown	Residence	42	38	44	2

ANS L_{90} sound levels



Compressor Building
MWRA Pumping Station
Weymouth Meter Station
New Permanent Fore River Bridge
(Commissioned in 2017)
Calpine Fore River Energy Center
(former Sithe Fore River power plant)
Quincy
Weymouth
A
B
C
D
E
LEGEND
Sound Level Modeling Location
Project Building
Weymouth CS Property Line
MassGIS Level 3 Parcels
Project Only L_{eq} Sound Level (dBA)
35
40
45
50
55
60
65
70
75

Estimated Sound from Compressor Station

Anticipated changes – Operation: Nighttime level (10pm – 7am)

Description	Land Use	Estimated Ambient Background Noise Level	Modeled Project- Only Noise Level (Proposed)	Combined Project + Background Noise Level	Increase Above Background
		dBA	dBA	dBA	dBA
King's Cove PL	Public	40	47	47	7
Bridge St.	Residence	36	44	44	8
Monatiquot St.	Residence	45	40	46	1
KCBR	Residence	37	31	38	1
Quincy Park	Residence	34	35	37	3
O'Brien Towers	Residence	41	36	42	1
Germantown	Residence	41	38	43	2

ANS L_{90} sound levels

Estimated Sound from Compressor Station

- Stand-by emergency generator
  - Expected to run once per month for one hour of routine maintenance and readiness testing
  - To occur during weekday daytime hours, 7 AM and 5 PM
  - MassDEP allows up to 100 hours/year for this type of testing
- Case vent blowdown
  - Proposed less than 20 times per year
  - Duration of less than three minutes each
  - To be fitted with an exhaust silencer designed to limit sound to 49 dBA at 300 feet
  - The current configuration indicates the case vent separator-silencer will be approximately 100 feet from the east property line

Estimated Sound from Compressor Station

- Daytime increase range 0-5 dBA (max at King's Cove)
- Nighttime increase range 1-8 dBA (max at Bridge St)
- Blowdown: 49 dBA at 300 feet
- EPA Recommended levels
  - 55 dBA outdoor exposure limit (EPA, limits identified for speech interference and annoyance)
  - 45 dbA nighttime (WHO, 2018 guidance)

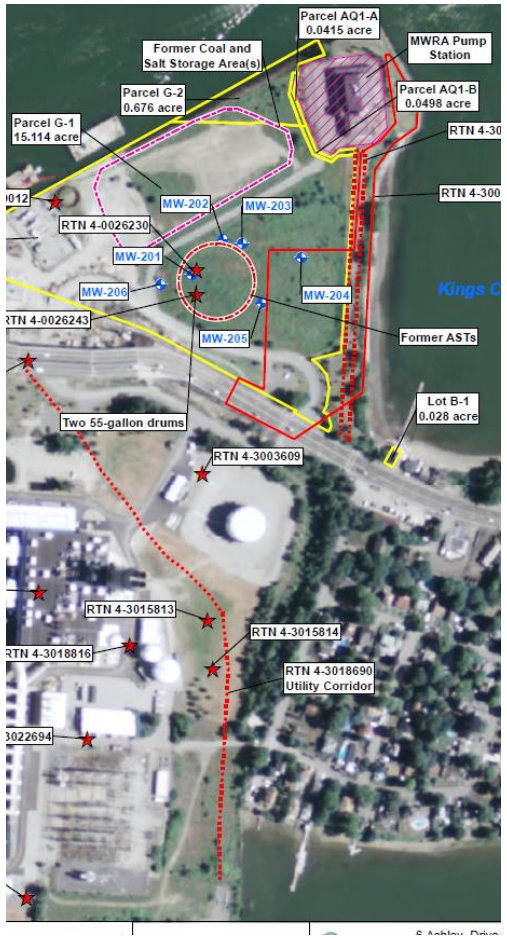
Potential Impacts: Changes in Land Use and Natural Resources

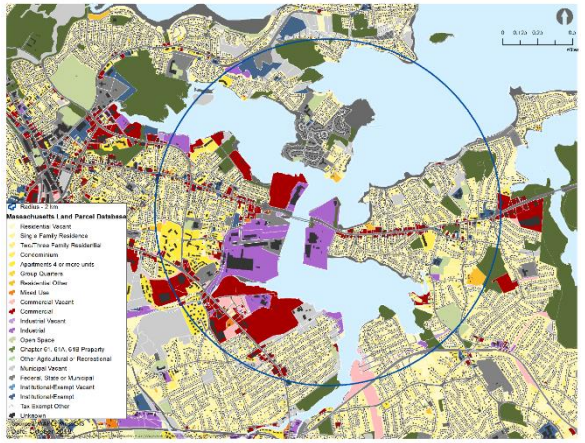
Participatory discussion and preliminary assessment of potential effects of projected changes in land use and natural resources due to the proposed compressor station

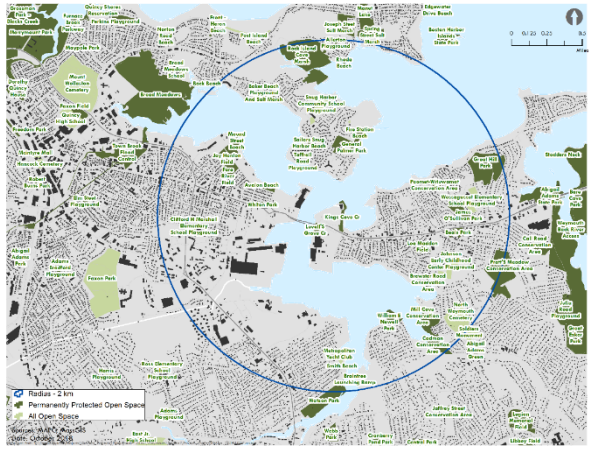
Land Use and Natural Resources

Existing Conditions Summary

- Proposed location is a brownfield site
- Focus area mixture of industrial, commercial, and residential land uses
- Adjacent and nearby recreational and conservation lands
- Fore River water resource; not an Area of Critical Environmental Concern (ACEC) at this time or a habitat for protected species (e.g., piping plover)
- Energy Facilities Siting Board (EFSB) 2000 decision – reuse in accordance with Town



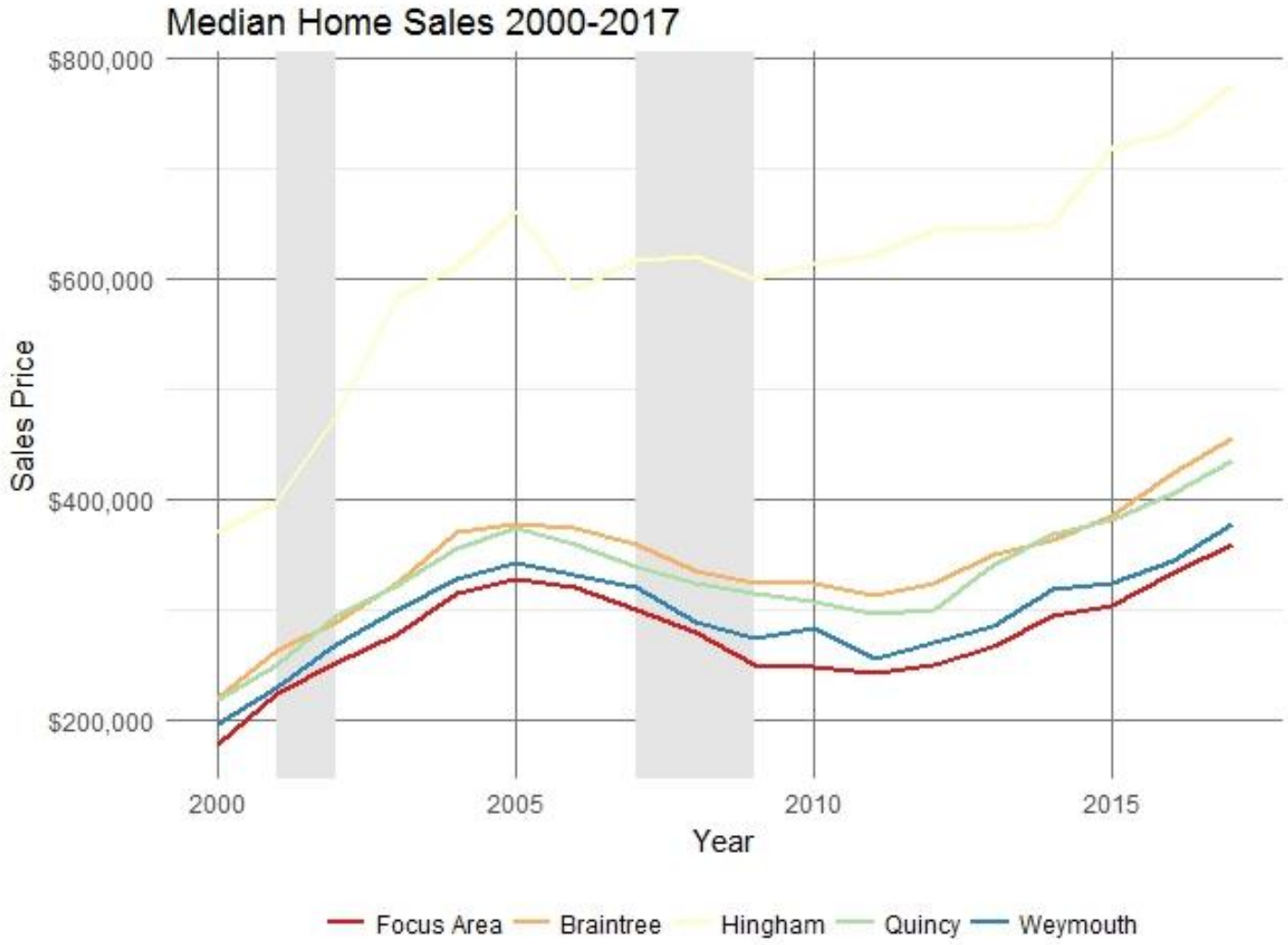




Land Use and Natural Resources

Existing Conditions Summary

- Since 2000, real estate value (as measure by single family home prices) has risen, fallen and then risen again.
- Most recently(2015-17) each municipality has recorded double digit percentage increases in median single family home prices
  - Exception of Hingham: 8% increase
- Focus area has seen similar changes
  - 2017 median single family homes price: ~$370,000,



Estimated Changes to Existing Land Uses and Natural Resources

Anticipated changes - Construction

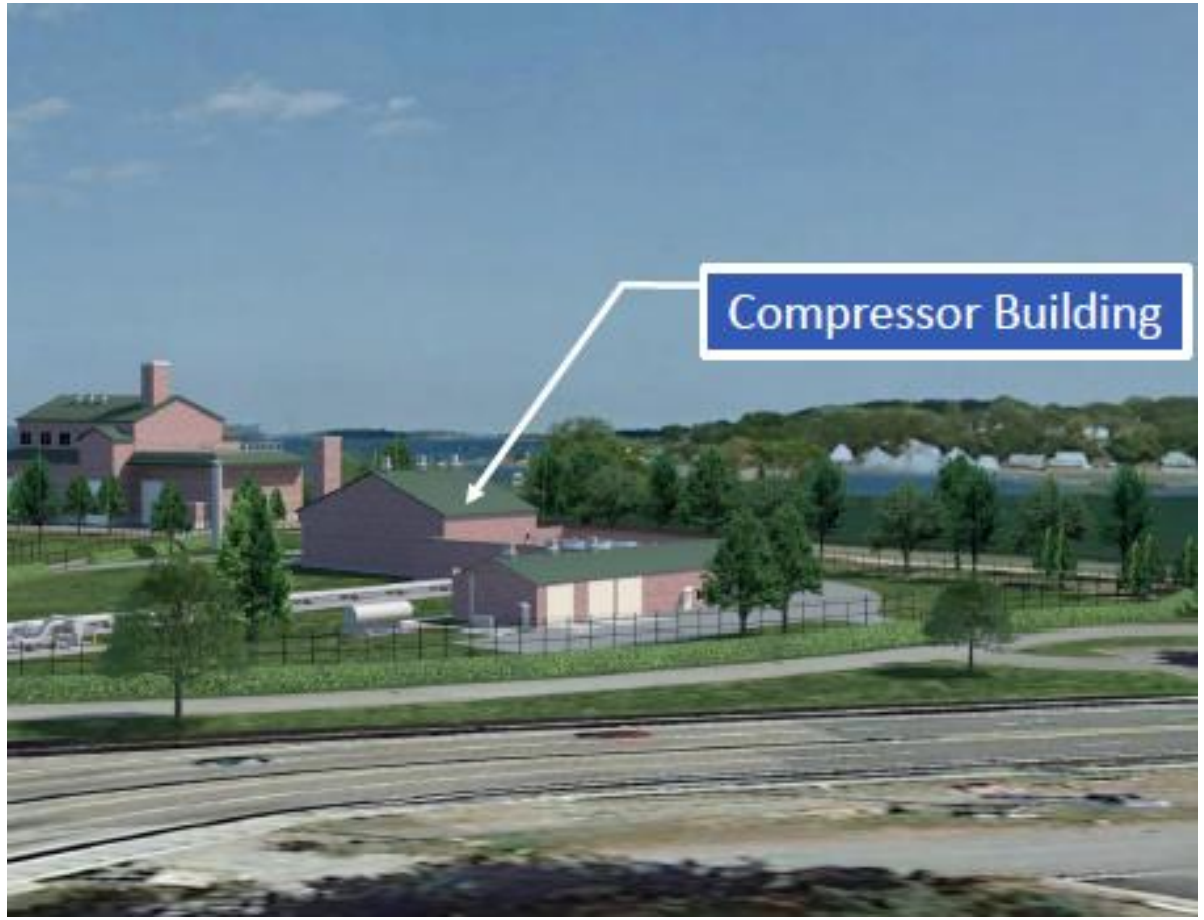
- Activity and Use Limitation: No disturbance of underground pollutants (e.g., petroleum compounds)
- Construction activities to occupy ~12 acres of property
- Employment of 75-110 employees over construction period
- Erosion and Sediment Control Plan (E&SCP) (e.g., dust, stormwater runoff)
- Time period of construction (not available)

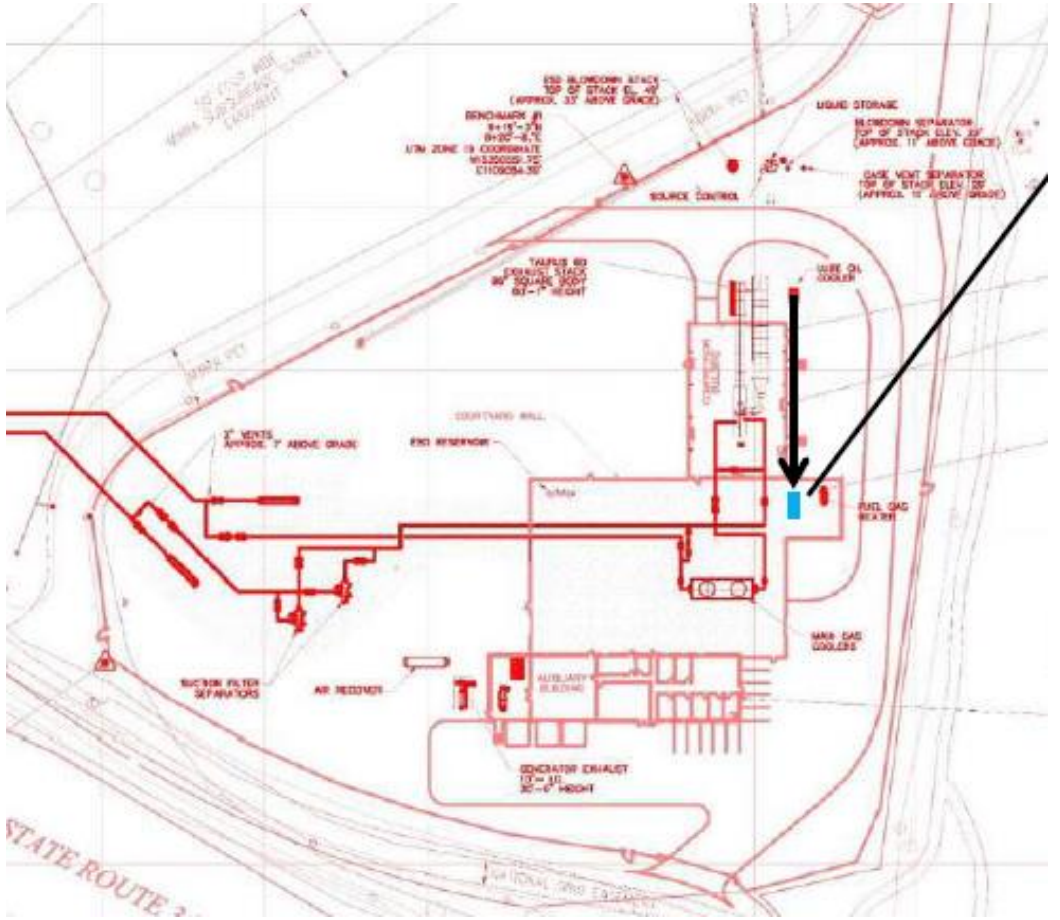
Estimated Changes to Existing Land Uses and Natural Resources

Anticipated changes - Operation

- Activity and Use Limitation: caps and restricts use of site
- Introduction of a new industrial use occupying ~4 acres of currently vacant site
- Property to be fenced
- Two new buildings
  - Use of architectural elements to mirror MWRA building (i.e., brick façade)
  - Height of buildings 56' (compressor building) and 38' (auxiliary building)
  - Foundation ~19' above sea level
- No new plantings identified for site
- Reuse not judged favorable by Town (re: EFSB 2000 decision)

Estimated Changes to Existing Land Uses and Natural Resources





Characterization of Potential Health Impacts

Preliminary assessment and discussion of potential effects of projected changes on health in surrounding communities

Purpose of Impact Characterization

- Consider existing conditions: demographics, health, air quality, noise and land use and natural resources
- Take into account changes projected to occur were the compressor station to be constructed as proposed
- Provide attributes by which to characterize potential health impacts that may be expected to occur were the compressor station to be constructed as proposed

- *Intended to be project specific and should not be used to compare to other HIAs, risk assessments, or health standards.*
- *Does not represent a quantitative estimate of risk.*

Proposed Approach to Characterization of Potential Impacts

- Impact assessment estimates changes by characterizing:
  - Type of Health Effects
  - Geographic Extent of Health Effects
  - Direction of Health Effects
  - Likelihood of Health Effects
  - Relative Magnitude of Health Effects
  - Vulnerable Populations

Proposed Approach to Characterization of Potential Impacts

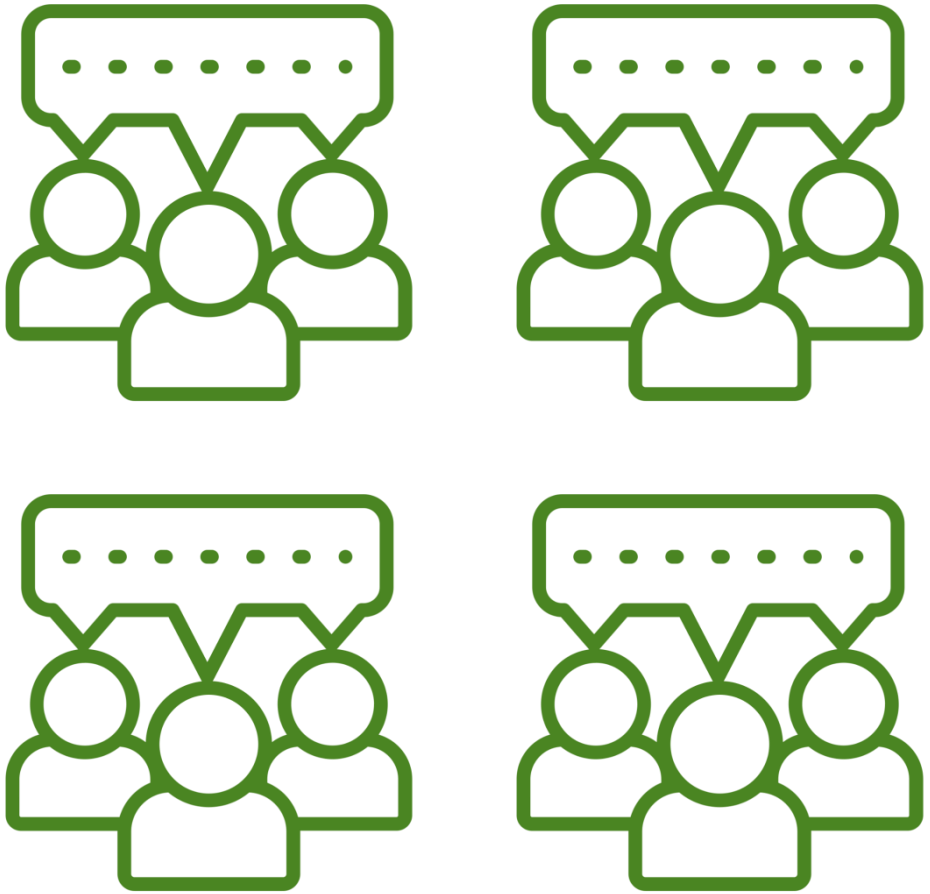
Proposed characterization

Type of Health Effects	Direct: the change occurs through physical exposures	Other: the change occurs through other mechanisms (e.g., perception, awareness)		
Geographic Extent of Health Effects	Local: Effects felt within the focus area	Community-wide: Effects felt in focus and surrounding areas		
Direction of Health Effects	~/Neutral No Meaningful Change Predicted	+/Positive = Change that is predicted to positively impact associated health conditions	-/Negative Change that is predicted to negatively impact associated health conditions	
Likelihood of Health Effects	Uncertain = it is unclear if impacts will occur as a result of the proposal	Unlikely = it is unlikely that impacts will occur as a result of the proposal	Possible = it is possible that impacts will occur as a result of the proposal	Likely = it is likely that impacts will occur as a result of the proposal
Relative Magnitude of Health Effects	Very Low: No cases expected	Low: Individual cases	Medium: Local, small limited impact to households	High: Entire communities affected
Vulnerable Populations	Yes = Disproportionately affects vulnerable populations	No = Affects populations evenly		

Proposed Approach Characterization of Potential Impacts

Assessment Pathway	Type of Health Effects	Geographic Extent of Health Effects	Direction of Health Effects	Likelihood of Health Effects	Relative Magnitude of Health Effects	Vulnerable populations
Air Quality						
Noise						
LU/NR						

Small Group Discussion of Potential Impact Characterization



Assessment Pathway	Type of health effects	Geographical Extent of exposure	Direction of Health Effects	Likelihood of health effects	Relative Magnitude of Effect	Vulnerable populations
Air Quality						
Noise						
LU/NR						

Potential Recommendations

Actions to reduce the potential for negative health outcomes and increase the potential for positive health changes were the proposed station to be constructed

Frame for Recommendations

Recommendations should:

- Flow from the results of the assessment
- Be based on public health principles of harm avoidance
- Be evidence-based
- Both mitigate harms and enhance health benefits
- Be specific and actionable
- Be useable by those who must implement them

Recommendations

Starting points

- Feedback to date
  - Installation of Air Quality Monitor in Fore River Basin
  - Enhanced Notice Schedule of Blowdowns
  - Decommissioning Plan

- Based on Feedback
  - Install plantings on site

Small Group Review and Development of Recommendations

As a group, identify and develop list of potential recommendations for consideration in the HIA.

Reconvene as large group to share ideas

Wrap Up and Next Steps

Upcoming meetings, action items, and meeting evaluation

HIA Timeline