Final

Environmental Assessment

Wind Technology Testing Center

Boston, Massachusetts

August 2009

DOE/EA-1652

Department of Energy
National Renewable Energy Laboratory
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Golden, CO 80401-3393

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Golden Field Office
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DOE/EA 1652

FINDING OF NO SIGNIFICANT IMPACT for the WIND TECHNOLOGY TESTING CENTER BOSTON, MASSACHUSETTS

AGENCY: U.S. Department of Energy, National Renewable Energy Laboratory

ACTION: Finding of No Significant Impact

SUMMARY: The U.S. Department of Energy (DOE), in coordination with the Massachusetts Technology Collaborative (MTC), conducted an Environmental Assessment (EA) that analyzed the potential impacts associated with the construction and operation of the proposed Wind Technology Testing Center (WTTC) in the Charlestown section of Boston, Massachusetts.

DOE, through its National Renewable Energy Laboratory (NREL), proposes to provide funding and technical support through a Cooperative Research and Development Agreement with the MTC for the design, construction and operation of a Large Blade Test Facility, called the WTTC. The proposed blade testing facility would be capable of accommodating 90-meter long wind turbine blades for a full suite of static and fatigue tests. All discussion, analysis, and findings related to the potential impacts of constructing and operating the proposed WTTC, including the MTC-committed environmental protection measures, are documented in the Final EA. The Final EA is hereby incorporated by reference.

The proposed WTTC facility would consist of approximately 50,000 square feet, up to approximately 80 feet in height, containing three bays and office/shop space. These bays would be served by bridge cranes, a control booth, and doors high enough to allow roll-in access for large trucks and dollies. A lower section of the building would house offices, a fabrication shop and pump rooms, and sheltered storage for facility equipment. The building would meet or exceed requirements for sustainable design under Commonwealth of Massachusetts Executive Order 484, "Leading by Example - Clean Energy and Efficient Buildings". Initial staffing is expected to include a WTTC director, two senior test engineers, a facilities manager, design engineer, two technicians and one office manager. Additional employees may be added at a later date if the work load warrants.

The proposed WTTC site is located at 100 Terminal Street, in the Charlestown section of Boston. The site is a paved industrial port facility owned by the Massachusetts Port Authority (Massport), adjacent to the Mystic River portion of Boston Harbor. The site, known as the Boston Autoport, is currently a secure receiving yard for imported automobiles entering the U.S. as well as those that are exported. The current leased uses include the Autoport, and the International Salt Company salt stockpiling and salt mixing. The proposed WTTC building would occupy approximately one acre of the site, with a total leased area between two and five acres (including parking and a storage yard which could be used for future expansion). An additional 1.6-acre "blade turning easement area" would be required just outside the building's hangar doors to maneuver blades through the doors. There are two potential siting options for the WTTC, which are described in detail in Section 2.1.1 of the Final EA.

In accordance with applicable regulations and policies, DOE mailed a public scoping notice to approximately 90 Federal, State, and local government agencies, tribal governments, companies, individuals, and organizations, on May 16, 2008 providing 30 days to submit comments regarding the

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EA's scope. In addition, DOE placed notices of the scoping process in local newspapers. Copies of the public scoping letters including the newspaper notice are presented in Appendix A of the Final EA. DOE did not receive any comments during the scoping period.

The Draft EA was distributed for a 30-day public review period to interested members of the public, and Federal, State, and local agencies, which ended on July 8, 2009. This allowed interested individuals to provide comments for DOE's consideration prior to any final decision on the proposed project. DOE received one comment letter on the Draft EA from the City of Boston Environment Department, which expressed strong support for the development of the WTTC at the Autoport site and confidence that the WTTC would be constructed and operated to the highest environmental protection standards. No revisions to the document were suggested. DOE did not receive any additional comments during the public review period.

DETERMINATION: DOE determines that providing funding and technical support to construct and operate the proposed WTTC in the Charlestown section of Boston, Massachusetts, would not constitute a major Federal Action significantly affecting the quality of the human or natural environment, as defined by the National Environmental Policy Act (NEPA). The MTC-committed environmental protection measures identified in the Final EA shall be incorporated and enforceable through DOE's funding award to the MTC. These measures include:

- MTC will implement a procedure for collecting spray water and debris from outdoor blade cutting.
- MTC will obtain a construction stormwater permit and follow construction Best Management Practices for stormwater pollution prevention.
- MTC will be covered by the Autoport's Stormwater Pollution Prevention Plan and permit when they are finalized. Specific stormwater pollution prevention measures will be developed as necessary to cover MTC-specific processes.
- MTC will ensure project compliance with the Massachusetts Coastal Zone Management polices as described in Appendix E of the Final EA.
- MTC will develop and implement a blade cutting operating procedure to minimize fiberglass-containing airborne dust.
- MTC will utilize Massport construction specifications and construction contractors will control construction-related air emissions through dust suppression and equipment Emission Control Devices (for diesel-powered construction equipment with horsepower [HP] ratings of 60 HP and above that are used on the project in excess of 30 days).
- MTC will obtain the services of a Licensed Site Professional to manage and oversee the removal of contaminated soils from the Activity and Use Limitation area during construction.
- All contaminated soil that is excavated will be segregated and staged on plastic sheeting to avoid contact with surface soils. The soil piles will be covered with plastic sheeting at the end of each work day and will be disposed at appropriate receiving facilities with all necessary manifest documentation.
- MTC will develop and implement a work plan for the safe handling and appropriate disposal of contaminated soil removed during the construction process.
- MTC will manage, test, and dispose of excavated soil consistent with Resource Conservation and Recovery Act and Toxic Substances Control Act regulations.
- MTC will develop a waste minimization program that includes recycling. MTC will investigate and implement ways to recycle otherwise discarded wind turbine blade materials.
- MTC will minimize traffic impacts and reduce road safety hazards by: obtaining appropriate permits for over-sized delivery trucks; ensuring that Federal, State, and local trucking guidelines are observed during blade transport; implementing modifications to intersections to allow oversized trucks to safely make necessary turns (including relocating several utility poles and

modifying an existing traffic light near the project site); and coordinating with City and State officials regarding any intersection modifications that may be necessary for transporting blades to and from the WTTC.

- In the event that potentially significant cultural materials or features are discovered during construction, MTC will obtain the consultation services of an archeologist to assess the significance of the findings.

The preparation of an Environmental Impact Statement is not required and DOE is issuing this Finding of No Significant Impact.

Copies of the Final EA are available at the DOE Golden Field Office Public Reading Room website at http://www.eere.energy.gov/golden/reading_room.aspx or from:

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Issued in Golden, Colorado this 30th day of July, 2009.

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Executive Director for Field Operations

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LIST OF ACRONYMS AND ABBREVIATIONS

ACEC	Area of Critical Environmental Concern
APCC	Air Pollution Control Commission
BMP	Best Management Practice
AUL	Activity and Use Limitation
CEQ	Council on Environmental Quality
CESQG	Conditionally Exempt Small Quantity Generator
CFR	Code of Federal Regulations
CMR	Code of Massachusetts Regulations
CRADA	Cooperative Research and Development Agreement
CZM	Massachusetts Office of Coastal Zone Management
dBA	Decibel, A-scale
DOE	Department of Energy
DPA	Designated port area
EA	Environmental Assessment
EIR	Environmental Impact Review
ENF	Environmental Notification Form
EPA	Environmental Protection Agency
ES&H	Environmental Safety and Health
GIS	Geographic Information System
H.P.	Horsepower
LEED	Leadership in Energy & Environmental Design (U.S. Green Building Council)
LSP	Licensed Site Professional
MassDEP	Massachusetts Department of Environmental Protection
MassGIS	Massachusetts Geographic Information System
Massport	Massachusetts Port Authority
MEPA	Massachusetts Environmental Protection Act
M.G.L.	Massachusetts General Law
MLW	Mean Low Water
MSA	Metropolitan statistical area
MTC	Massachusetts Technology Collaborative
MWRA	Massachusetts Water Resources Authority

NAVD88	North American Vertical Datum of 1988
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
NREL	National Renewable Energy Laboratory
NRHP	National Register of Historic Places
NWTC	National Wind Technology Center
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
PPE	Personal Protective Equipment
RCRA	Resource Conservation and Recovery Act
RET	Renewable Energy Trust
SWPPP	Stormwater Pollution Prevention Plan
TSCA	Toxic Substances Control Act
Ue	Udorthents, wet substratum
U.S.	United States
U.S.C.	United States Code
Uw	Urban Land, wet substratum (soil type)
VOC	Volatile Organic Carbon
VPH	Volatile Petroleum Hydrocarbons
WTTC	Wind Technology Testing Center

SUMMARY

S.1 INTRODUCTION

The National Renewable Energy Laboratory (NREL) is one of ten Department of Energy (DOE) national laboratories and is dedicated to the research, development, and technology transfer of renewable energy and energy efficiency technologies. Among other responsibilities, NREL oversees the National Wind Technology Center (NWTC) located in Jefferson County, Colorado. The NWTC operates with the goal of conducting research that will ultimately help industry reduce the cost of wind energy to compete economically with traditional energy sources.

To further United States (U.S.) wind technology development, DOE, through NREL, proposes to provide funding and technical support through a Cooperative Research and Development Agreement (CRADA) with the Massachusetts Technology Collaborative (MTC) for the design, construction and operation of a Large Blade Test Facility, called the Wind Technology Testing Center (WTTC), in the Charlestown neighborhood of Boston, Massachusetts.

DOE determined the need to prepare an Environmental Assessment (EA) to evaluate the impacts that could result from DOE's Proposed Action. In compliance with the National Environmental Policy Act (NEPA) (42 U.S.C. 4321) and DOE's NEPA implementing regulations (10 CFR section 1021.320), this EA examines the potential environmental impacts of construction and site operations of the proposed WTTC and a No Action Alternative (considered a "no build" scenario).

DOE is the lead agency for this EA, and other Federal, State, and local agencies and the public have been invited to participate in the environmental documentation process.

S1.1 Purpose and Need

The purpose of DOE's Proposed Action is to strengthen U.S. capability to test advanced wind turbine blades necessary to run megawatt-scale wind turbines. Testing facilities for advanced wind turbine blades are needed to provide independent third-party verification required to meet turbine certification and investor requirements. Wind energy production has experienced recent growth in the U.S. due to the increasing cost of natural gas and other petroleum products, and concerns over greenhouse gases produced by fossil-fueled electric plants. Some States have set requirements that a portion of their future energy come from renewable resources, also influencing the growth of wind farms.

Next generation on-shore and off-shore turbine blades will exceed 160 feet (50 meters) in length with future generations expected to reach 295 feet (90 meters) in length. Currently, blades exceeding 50 meters cannot be fatigue tested in the U.S.; therefore U.S. manufacturers test longer blades in Europe and Brazil. If testing is performed overseas, U.S. companies will not have scheduling priority, shipping and travel are costly and cause delays, and confidentiality of new U.S. technologies will be difficult to protect (Cotrell, 2007). The NWTC facility in Colorado was modified in 2005 to test blades up to 50 meters in length. However, this modification is now inadequate for fatigue testing longer blades indoors, although other structural tests can be conducted outdoors in sub-optimal conditions. There is also a backlog of blade testing work at the Colorado facility that is delaying the ability to deploy advanced wind turbine blades.

The 2006 Advanced Energy Initiative increased Federal funds for research in clean coal technology and solar and wind energy as part of a national goal to diversify energy sources. The initiative promotes the accelerated development of wind energy. The WTTC would directly support this initiative by increasing technology reliability, reducing wind turbine blade testing timeframes, and reducing the cost of energy from wind turbines (Cotrell, 2007).

The WTTC is needed to allow the U.S. to:

- Continue providing an independent third-party testing capability required to meet turbine certification and investor requirements;
- Alleviate the current backlog at the National Wind Technology Center blade test facility; and
- Support the development of large land-based and off-shore wind turbines (up to 90 meters in length).

S1.2 Project Site

The proposed WTTC site is located at 100 Terminal Street, in the Charlestown section of Boston. The site is a paved industrial port facility owned by the Massachusetts Port Authority (Massport), adjacent to the Mystic River portion of Boston Harbor. The site, known as the Boston Autoport, is currently a secure receiving yard for imported automobiles entering the U.S. as well as those that are exported. The current leased uses include the Autoport, and the International Salt Company salt stockpiling and salt mixing. The physical configuration of the Autoport's land, its operations, and its existing structures limit the available site options for the proposed WTTC to the northwest and southwest corners of the site. The space available for use/leasing for the WTTC would be a small portion of the 66-acre Autoport site. The proposed WTTC building would occupy approximately 1 acre of the site, with a total leased area between two and five acres (including parking and a storage yard which could be used for future expansion). An additional 1.6-acre "blade turning easement area" would be required just outside the building's hangar doors to maneuver blades through the doors. Figure S-1 shows two potential siting options for the WTTC, which are described in detail in Section 2.1.1 of the EA.

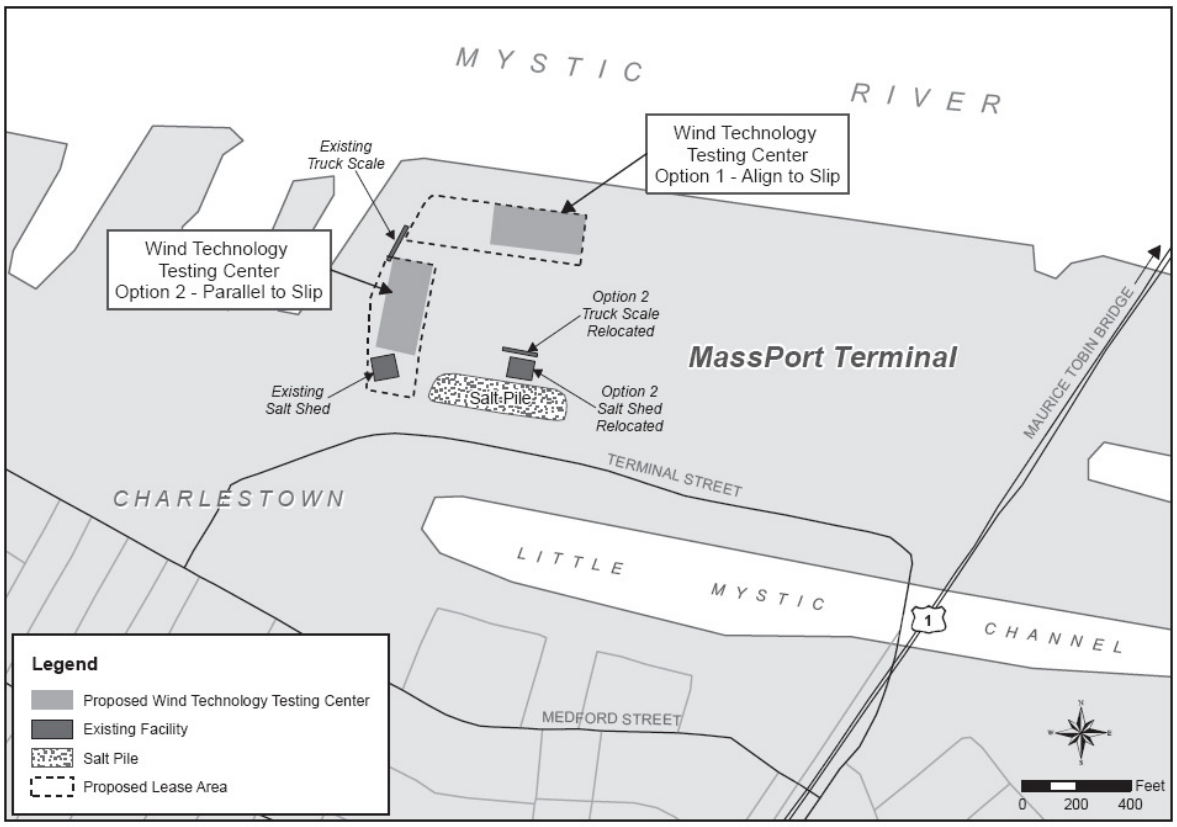


Figure S-1. Proposed WTTC Siting Options

The site is fully fenced and contains areas for surface parking of vehicles, docks and cranes, administrative buildings, a truck scale, salt storage, and a salt and sand mixing shed. There are visible remnants of former rail road tracks on the site, which are not presently operable.

The land uses at and surrounding the site are primarily industrial. To the immediate east of the site at 200 Terminal Street is the now closed U.S. Gypsum Company, whose site contains a gypsum board manufacturing facility and five concrete storage silos. A sand and gravel company, the Suez/Distrigas Liquefied Natural Gas Terminal, a scrap metal wholesaler, and a cargo container shipping/transport company are located to the north of the site, across the Mystic River.

S1.3 Proposed Action

DOE, through NREL, proposes to provide funding and technical support in collaboration (i.e., through a CRADA) with MTC for the design, construction and operation of the WTTC in the Boston, Massachusetts. The proposed blade testing facility would be capable of accommodating 90-meter long wind turbine blades for a full suite of static and fatigue tests. It is important to note that there would be no installation of large-scale operating wind turbines on or near the site under the Proposed Action. Testing would occur indoors on the individual blades to assess their structural integrity; additionally, there may be coupon testing (e.g., testing of small material samples).

The proposed WTTC facility would consist of approximately 50,000 square feet, up to approximately 80 feet in height, containing three bays and office/shop space (Figure S-2 provides an example layout). These bays would be served by bridge cranes, a control booth, and doors high enough to allow roll-in access for large trucks and dollies. A lower section of the building would house offices, a fabrication shop and pump rooms, and sheltered storage for facility equipment. Initial staffing is expected to include a WTTC director, two senior test engineers, a facilities manager, design engineer, two technicians and one office manager. Additional employees may be added at a later date if the work load warrants.

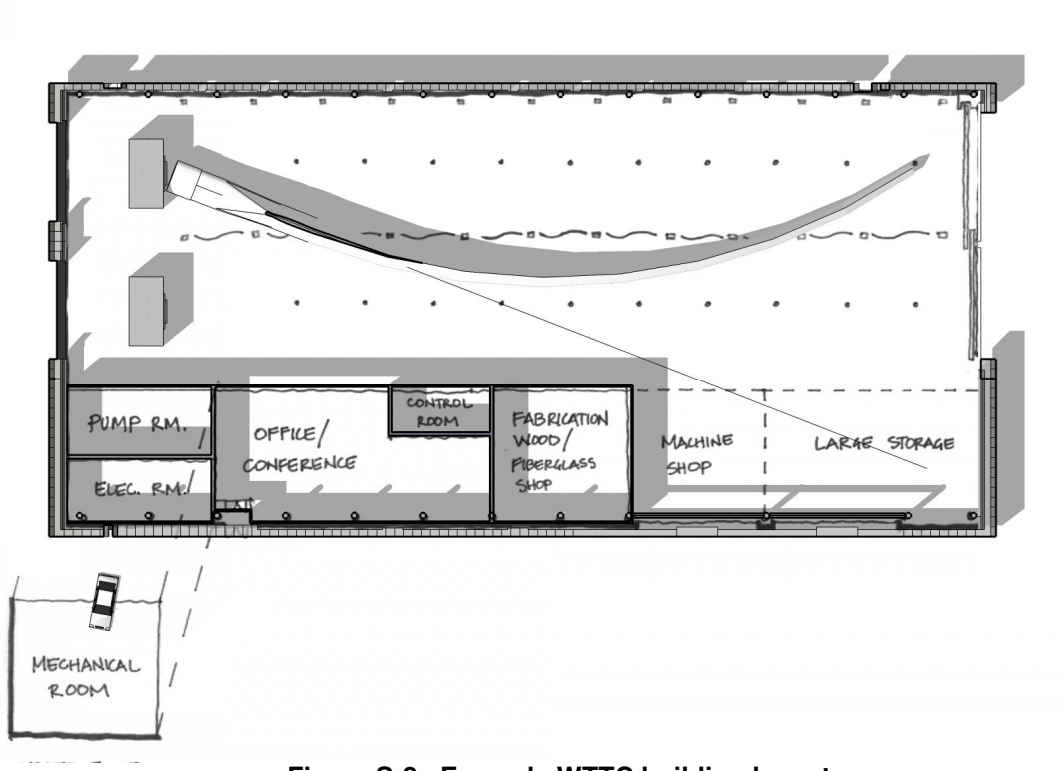


Figure S-2. Example WTTC building layout

Conceptual and preliminary building design is occurring concurrently with this NEPA review. A preliminary Program Definition Report (business confidential) was developed by MTC and Massport in September 2008 that provided recommendations for the design and construction of the proposed WTTC. The findings of this report include relevant design and site features for the project that form the basis for the analysis within the EA. These building and site features are described in Chapter 2. It is important to note that funding for final design and construction of the project would not be provided by NREL until the NEPA process is completed and a Finding of No Significant Impact (if appropriate) is completed.

The building would meet or exceed requirements for sustainable design under Commonwealth of Massachusetts Executive Order 484, "Leading by Example - Clean Energy and Efficient Buildings". This order instructs all State agencies involved in the construction and major renovation projects of over 20,000 square feet to meet "Leadership in Energy and Environmental Design (LEED) Plus" certification, which includes basic LEED elements plus achieving energy performance 20 percent better than the Massachusetts Energy Code, outdoor water reduction requirements, and verification by an independent third party building commissioning authority. A description of LEED Plus requirements is provided in Appendix B and Section 2.1.1 provides details on the sustainable design features that may be included in the building design.

S1.4 Facility Construction

The construction of the facility would occur over approximately 12 months, anticipated to begin in 2009. After installation of equipment in the building and a period of on-site training of personnel, blade testing operations could begin in late 2010 or early 2011. The building would require new utility connections and line extensions. These include power, potable water, sanitary sewer, natural gas, and telecommunication connections. Construction and pre-construction activities are discussed in more detail in Section 2.1.2 of the EA.

S1.5 Facility Operation

The WTTC mission would be to conduct structural testing of wind turbine blades. Structural testing would include both static testing and fatigue testing:

- An ultimate-load static test simulates extreme wind loading and indicates the blade's strength safety margin over the worst winds specified for the turbine design class.

- A fatigue test applies cyclic bending loads to the blade. The fatigue test simulates repetitive high-wind conditions that the turbine might undergo during a 20- to 30-year exposure to the environment.

Static tests would occur over a period of approximately one week, where blades would be maneuvered inside the building, and then weights, pulleys and cables are used to flex the blade, while instrumentation on the blade provides stress data.

Fatigue tests would occur within the test facility over a period of two to three months, 24 hours a day. In these tests, blades are held horizontally and, through the Universal Resonant Excitation system or Blade Resonant Excitation system, are tested in either one or two axes (flap and edge). The building would have two or more test stands.

After testing, blades would either be shipped back to the manufacturer (intact or in sections) or cut up and sent to a landfill. Cutting of blades for either failure analysis (post-mortem inspection) or disposal would be conducted either indoors or outdoors, as is the practice currently at the Colorado NWTC site. The WTTC Management Committee would explore possible recycling opportunities to minimize or avoid landfilling discarded blades.

An estimated 15 blades would be tested at the facility annually. The blades would be transported to the site primarily by ship, but could also be transported by truck (see Figure 2-8). Blades transported to the site by ship or barge would utilize the existing docks at the Autoport site and would be off-loaded by mobile rental cranes. Blades up to 63 meters (207 feet) in length could be transported by truck with some modifications to curb lines and traffic signals. Once off-loaded, blades would be transported within the Autoport site (as described in Section 2.1.4) into the WTTC building for testing, although some blades may be stored outdoors temporarily adjacent to the building.

The facility would also host structural and seismic testing of building materials (primarily structural steel and concrete) in support of university-sponsored research and development. For seismic testing, material samples (such as wood beams, plywood, and concrete slabs) or small-scale building assemblies (such as wall mock-ups or windows) would be subjected to stresses similar to those experienced under earthquake conditions, where hydraulic loads are applied in a cyclic fashion. The equipment and testing operations for this research would be easily accommodated by the space within the building and testing of small-scale materials would not interfere with blade testing operations. No additional full-time personnel would be required to support these tests.

The facility would initially employ about eight employees. Although NREL expects that tours would occasionally be provided to small groups, the number of people on-site at any one time would most likely be less than 40.

S1.6 No Action Alternative

Under the No Action Alternative, DOE would not provide funding for construction or personnel for the operation of a WTTC in Boston, MA. To create the basis for a meaningful analysis, it is assumed that the WTTC would not be constructed at the proposed location. However, it is possible that MTC could construct the facility and license the blade testing technology from NREL using other funds independent of DOE.

S1.7 Organization and Content of the Environmental Assessment

This EA is organized in a manner consistent with NEPA and DOE's NEPA implementing regulations. The EA has this summary, eight chapters, and five appendices:

- Summary
- Chapter 1 – Introduction
- Chapter 2 – Proposed Action and Alternatives
- Chapter 3 – Affected Environment and Environmental Consequences
- Chapter 4 – Secondary and Cumulative Impacts
- Chapter 5 – Irreversible/Irretrievable Commitment of Resources
- Chapter 6 – The Relationship between Local Short-Term Uses of the Human Environment and the Maintenance and Enhancement of Long-Term Productivity
- Chapter 7 – Unavoidable Adverse Impacts
- Chapter 8 – References
- Appendix A – Public Involvement (Letters, Notices, Mailing Lists, and Public Comments)
- Appendix B – Massachusetts LEED Plus Requirements
- Appendix C – Massachusetts Environmental Policy Act Thresholds

- Appendix D – List of Applicable Permits
- Appendix E – Consistency with the Massachusetts Coastal Zone Management Program

S.2 ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION AND ALTERNATIVES

S2.1 Summary of Consultation Process, Input, and Impact Issues

NREL mailed a public scoping notice to approximately 90 Federal, State, and local government agencies, tribal governments, companies, individuals, and organizations, on May 16, 2008 providing 30 days to submit comments regarding the EA's scope. In addition, NREL placed notices of the scoping process in local newspapers.

Copies of the public scoping letters including the newspaper notice are presented in Appendix A. NREL did not receive any comments during the scoping period.

The Draft EA was distributed for a 30-day public review period on June 8, 2009 to interested members of the public, and Federal, State, and local agencies, and for review and comment for DOE's consideration prior to any final decision by DOE on the proposed project. Only one public comment was received on the Draft EA. This comment, from the City of Boston, indicated the City's strong support for the project.

S2.2 Environmental Issues

The scoping letter for the Proposed Action identified the following environmental topics to be addressed in the EA:

- Land Use, Planning;
- Socioeconomics and Environmental Justice;
- Transportation and Traffic;
- Air Quality and Noise;
- Visual Quality/Aesthetics;
- Water Resources;
- Soils and Geology;
- Biological Resources;
- Cultural Resources;
- Waste Management;
- Infrastructure;
- Safety and Risk; and
- Resource Use/Sustainability.

The Proposed Action and the No Action Alternative are the only alternatives addressed in the EA. DOE's Proposed Action is to provide funding and technical support (through NREL) in collaboration (i.e., through a CRADA) with MTC for the design, construction, and operation of the WTTC in the Charlestown neighborhood of Boston, Massachusetts. DOE's No Action Alternative would involve a DOE decision not to provide funding for the project. For purposes of analysis in the EA, the No Action

Alternative is analyzed in a manner that would leave the site in its current configuration; however, it is possible that MTC could construct and operate the facility using other funding should DOE elect not to be a part of the project.

S2.3 Description of the Environmental Consequences of the Proposed Action

The following discussion summarizes findings of this EA with respect to the anticipated environmental impacts of the Proposed Action.

Implementation of the Proposed Action would not result in significant impacts to the environment because the project site and surrounding area generally lack sensitive resources (e.g., threatened or endangered species, cultural resources, low-income or minority groups, etc.) and the proposed future improvements and activities are generally consistent with the existing conditions at the Massport site. Additionally, NREL and MTC have proposed utilizing an extensive set of sustainable building and operational design and management features to meet Massachusetts LEED Plus certification as described in Section 2.1.1.

The direct, indirect, secondary, and cumulative impacts of the Proposed Action are discussed throughout Chapters 3 and 4 and are summarized in Table S-1 below.

Table S-1. Summary of Potential Impacts of the Proposed Action

Resource Area	Potential Impacts
Land Use	Construction and Operation No adverse impacts would be expected. Minor aspects of Autoport operations would be reconfigured, but these could be easily accommodated under either site option.
Water Resources	Construction: There is the potential for surface water contamination from hazardous materials spills that could occur during construction activities; however, BMP's for minimizing the potential for spills would be outlined in the construction-phase Stormwater Pollution Prevention Plan, thus reducing this risk to minor. Operation: Potentially-contaminated stormwater could be generated at the site; however, the WTTC operations would be incorporated into the Autoport's Stormwater Pollution Prevention Plan, which would outline measures to minimize the contamination risk to surface waters.
Air Quality	Construction: A small increase in pollutant emissions would occur from the use of construction equipment and personnel vehicular traffic causing negligible impacts. Operation: Increases in pollutant emissions associated with vehicular transit, the facility's heating system, and outdoor blade cutting would cause negligible to minor impacts.
Geology and Soils	Construction: Wind erosion could occur as a result of exposed soils during construction; however, impacts would be negligible. Operation: No impacts would be expected.
Biological Resources	Construction and Operation: Noise generated onsite may cause some wildlife avoidance of the area; however, these impacts would be negligible.
Waste Management	Construction: Relatively small amounts of construction refuse and debris would be added to the area's waste stream, which would cause minor impacts to disposal facilities. The disposal of excavated contaminated soil would cause minor impacts to waste disposal facilities. Operation: An increase in the amount of solid (non-hazardous) and hazardous waste requiring disposal would cause minor impacts to waste disposal facilities.

Table S-1. Summary of Potential Impacts of the Proposed Action

Resource Area	Potential Impacts
Infrastructure and Energy Use	Construction: Extending potable water, sanitary sewer, natural gas, and telecommunications lines on the site would result in negligible impacts. Operation: Increased demand for utility services would cause negligible to minor impacts to utility systems.
Transportation	Construction: Construction and worker vehicles would add to existing traffic and would potentially cause minor, temporary, and localized congestion along busy roads. Operation: The transport of blades via water transport would cause a minimal increase in boat traffic; however, considering the Autoport has handled high volumes of shipments without problems in the past, minor impacts would be expected. The transport of blades via truck would require modifications to some transportation and utility infrastructure in Boston (e.g., moving utility poles and placing street signals on pivot hinges to accommodate the turning radii required). The transport of blades via truck would be expected to cause minimal increases in traffic congestion and accident risks considering the low frequency of deliveries (approximately 15 per year), resulting in minor impacts. Increased traffic due to worker commuting would cause a negligible increase in traffic congestion and accident risks, resulting in negligible impacts.
Cultural Resources	Construction: No known cultural resources occur in the area and the potential for unknown resources to be unearthed during excavation activities is low considering the historically heavily disturbed nature of the site; therefore, negligible impacts would be expected. Operation: The WTTC would be smaller than other industrial structures in the area and would not change the visual character of the site; therefore, impacts to the visual setting of cultural resources (e.g., the Boston Naval Shipyard) would be negligible.
Noise	Construction: Noise generated by construction equipment would have minor to moderate impacts to nearby residential receptors. Noise generated by construction vehicles would cause temporary, minor impacts to nearby residential receptors. Operation: Noise generated by the operation of equipment at the facility would cause minor impacts to sensitive receptors.

Table S-1. Summary of Potential Impacts of the Proposed Action

Resource Area	Potential Impacts
Aesthetics	Construction: Construction-related noise and activity at the site would cause minor, short-term, and localized impacts. Operation: The placement of the building under either siting option would cause some obstruction of waterfront views from the nearby residential neighborhood, causing minor impacts. Outdoor staging and testing activities would be visible from residential neighborhoods to the north and south of the site causing minor impacts.
Socioeconomics and Environmental Justice	Construction: The construction sector and the regional economy as a whole in the Boston/Cambridge/Quincy Metropolitan Statistical Area would experience a minor positive economic impact. Delivery of blades by truck would require the relocation of a small number of utility poles in Boston, which would cause small, temporary costs to be incurred by utility companies. Minority and low-income populations would not experience disproportionately high and adverse impacts. Operation: A relatively small increase in jobs and economic activity through employment and research would afford minor beneficial impacts to the local economy. Minority and low-income populations would not experience disproportionately high and adverse impacts.
Sustainability	Construction: Construction would result in some construction waste and contaminated soil requiring disposal, resulting in minor impacts. Operation: The facility's design and operation would adhere to LEED Plus certification specifications as well as Massport's Environmental Management System and other environmental initiatives, thus resulting in an overall positive impact.
Safety/Risk Assessment	Construction: A Worker Protection Plan would be developed and adhered to; therefore, minor impacts would be expected. Operation: Standard environmental, safety, and health policies would minimize worker health risks; therefore, negligible to minor impacts would be expected.

None of the impacts described in Table S-1 are considered significant; however, several committed measures will be implemented, as summarized in Table S-2.

Table S-2. Summary of Potential Committed Measures

Resource Area	Potential Committed Measures
Land Use	No committed measures will be required.
Water Resources	MTC will implement a procedure for collecting spray water and debris from outdoor blade cutting. MTC will obtain a construction stormwater permit and follow construction BMPs for stormwater pollution prevention. MTC will be covered by the Autoport's Stormwater Pollution Prevention Plan and permit when they are finalized. Specific stormwater pollution prevention measures will be developed as necessary to cover MTC-specific processes. MTC will ensure project compliance with the Massachusetts CZM polices as described in Appendix E.
Air Quality	MTC will develop and implement a blade cutting operating procedure to minimize fiberglass-containing airborne dust. MTC will utilize Massport construction specifications and construction contractors will control construction-related air emissions through dust suppression and equipment Emission Control Devices (for diesel-powered construction equipment with horsepower [HP] ratings of 60 HP and above that are used on the project in excess of 30 days).
Geology and Soils	MTC will obtain the services of a Licensed Site Professional to manage and oversee the removal of contaminated soils from the Activity and Use Limitation (AUL) area during construction. All contaminated soil that is excavated will be segregated and staged on plastic sheeting to avoid contact with surface soils. The soil piles will be covered with plastic sheeting at the end of each work day and will be disposed at appropriate receiving facilities with all necessary manifest documentation.
Biological Resources	No committed measures will be required.
Waste Management	MTC will develop and implement a work plan for the safe handling and appropriate disposal of contaminated soil removed during the construction process. MTC will manage, test, and dispose of excavated soil consistent with Resource Conservation and Recovery Act (RCRA) and Toxic Substances Control Act (TSCA) regulations. MTC will develop a waste minimization program that includes recycling. MTC will investigate and implement ways to recycle otherwise discarded wind turbine blade materials.
Infrastructure and Energy Use	No committed measures will be required.
Transportation	MTC will minimize traffic impacts and reduce road safety hazards by: obtaining appropriate permits for over-sized delivery trucks; ensuring that Federal, State and local trucking guidelines are observed during blade transport; implementing modifications to intersections to allow oversized trucks to safely make necessary turns (including relocating several utility poles and modifying an existing traffic light near the project site); and coordinating with City and State officials regarding any intersection modifications that may be necessary for transporting blades to and from the WTTC.
Cultural Resources	In the event that potentially significant cultural materials or features are discovered during construction, MTC will obtain the consultation services of an archeologist to assess the significance of the findings.

Table S-2. Summary of Potential Committed Measures

Resource Area	Potential Committed Measures
Noise	MTC will use shielding and other controls to reduce noise levels of the facility's equipment and outdoor operations to protect on-site workers and minimize adverse effects to surrounding neighbors. MTC will avoid conducting high-noise activities (such as outdoor blade cutting) during evening and night-time hours (5:00 p.m. to 7:00 a.m.).
Aesthetics	MTC will conduct review meetings with City officials and hold additional community meetings to keep the public informed and solicit comments regarding the building's design.
Socioeconomics and Environmental Justice	No committed measures will be required.
Sustainability	MTC will design the WTTC to meet Massachusetts LEED Plus criteria.
Safety/Risk Assessment	During construction, MTC will institute a Worker Protection Plan and use a Licensed Site Professional to manage and oversee the excavation and disposal of contaminated soil. MTC will provide secondary containment for all hydraulic fluid reserves and inspect hydraulic lines routinely for leaks. MTC will implement a spill response plan at the WTTC. MTC will design the WTTC so that there are no floor drains in areas where hydraulic fluid or hazardous materials are stored or used. MTC will design the building and configure equipment to incorporate noise shielding and other noise minimization measures to protect worker health in accordance with OHSA regulations.

S.2.4 Comparison of the Proposed Action to the No Action Alternative

The impacts potentially created by the Proposed Action would be avoided if the No Action Alternative were selected as the preferred alternative. However, none of the impacts of the Proposed Action are considered significant, and the No Action Alternative would eliminate the beneficial impacts of the WTTC's operation. Under the No Action Alternative, new wind turbine design certifications would be delayed by the need to ship blades overseas and by the current backlog of testing at the Colorado NWTC. These delays could also delay investments in wind technology and the deployment of large turbine technology. Therefore, the benefits that the WTTC could afford the nation in achieving stated renewable energy production and associated greenhouse gas reduction goals would not be realized (see Section 3.3).

Reference

Cotrell, Jason 2007. DOE/NREL's NWTC Wind Turbine Test Facilities. Presentation dated November 30, 2007.

1.0 INTRODUCTION

The National Renewable Energy Laboratory (NREL) is one of 10 Department of Energy (DOE) national laboratories and is dedicated to the research, development, and technology transfer of renewable energy and energy efficiency technologies. In accordance with the Energy Reorganization Act of 1974 (42United States Code [U.S.C.] 5801), DOE established the Solar Energy Research Institute in 1977. This institute was designated as a national laboratory and became the NREL in 1991. The NREL was established to support DOE's mission to research and develop energy efficiency and renewable energy technologies. Among other responsibilities, NREL oversees the National Wind Technology Center (NWTC) located in Jefferson County, Colorado.

The NWTC operates with the goal of conducting research that will ultimately help industry reduce the cost of wind energy to compete economically with traditional energy sources. Research on advanced wind turbine systems is a key component; as is comprehensive evaluations of utility grid integration issues. The NWTC employs a wide range of testing services and activities that address both the technical and the many nontechnical barriers to the use of wind energy systems. Facilities include systems that allow for testing of components and complete wind energy systems.

To further U.S. wind technology development, DOE, through NREL, proposes to provide funding and technical support through a Cooperative Research and Development Agreement (CRADA) with the Massachusetts Technology Collaborative (MTC) for the design, construction and operation of a Large Blade Test Facility, called the Wind Technology Testing Center (WTTC), in the Charlestown neighborhood of Boston, Massachusetts.

DOE determined the need to prepare an Environmental Assessment (EA) to evaluate the impacts that could result from DOE's Proposed Action. The proposed WTTC would expand NREL's existing wind technology testing capability. A full description on the purpose and need for the project is provided in Section 1.2. In compliance with the National Environmental Policy Act (NEPA) [42 U.S.C. 4321] and DOE's NEPA implementing regulations (10 Code of Federal Regulations [CFR] section 1021.320), this EA examines the potential environmental impacts of construction and site operations of the proposed WTTC and a No Action Alternative (see Section 1.1 for a discussion of the NEPA process).

DOE is the lead agency for this EA, and other Federal, State, and local agencies and the public have been invited to participate in the environmental documentation process.

1.1 THE NATIONAL ENVIRONMENTAL POLICY ACT AND RELATED PROCEDURES

NEPA requires Federal agencies to take into account the potential consequences of their actions on both the natural and human environments as part of their planning and decision-making processes. The DOE is the Federal lead agency for evaluating the project under NEPA, and the DOE must determine whether to provide funding. As required by NEPA, this EA examines the expected individual and cumulative impacts of the proposed project. DOE is the only Federal agency with responsibility to approve or deny the partial funding for the project and therefore is the lead agency in preparing this EA.

DOE/NREL prepared this EA to provide the public and responsible agencies with information about the project and its potential effects on the local and regional environment. This EA was prepared in compliance with NEPA requirements.

NEPA, as amended (42 U.S.C. 4321 et seq.), the President's Council on Environmental Quality (CEQ) regulations for implementing the procedural provision of NEPA [40 CFR 1500-1508], and DOE's implementing procedures for compliance with NEPA (10 C.F.R. 1021) require that DOE, as a Federal agency:

- Assess the environmental impacts of any Proposed Action;

- Identify any adverse environmental effects that cannot be avoided, should the Proposed Action be implemented;
- Evaluate alternatives to the Proposed Action, including a No Action Alternative;
- Describe the cumulative impacts of the Proposed Action and other planned projects in the area of the site;
- Describe the relationship between the local short-term use of the environment and the maintenance and enhancement of long-term productivity; and
- Characterize any irreversible and irretrievable commitments of resources that would be involved should the Proposed Action be implemented.

These provisions must be addressed before the final decision is made to proceed with any proposed Federal action that has the potential to cause impacts to the environment, including providing Federal funding to a project. This EA evaluated the potential individual and cumulative effects of the Proposed Action and the No Action Alternative on the physical, human, and natural environment. The EA is intended to meet DOE's regulatory requirements under NEPA and provide DOE with the information needed to make an informed decision in connection with the proposed project.

Massachusetts has a similar environmental statute to NEPA, the Massachusetts Environmental Policy Act (MEPA). The purpose of MEPA and 301 Code of Massachusetts Regulations (CMR) 11.00 is to provide meaningful opportunities for public review of the potential environmental impacts of projects for which State Agency Action is required, and to assist each Agency in using (in addition to applying any other applicable statutory and regulatory standards and requirements) all feasible means to avoid damage to the environment or, to the extent damage to the environment cannot be avoided, to minimize and mitigate damage to the environment to the maximum extent practicable. MEPA review is intended to facilitate environmental planning for projects requiring Agency Action, including an Agency's programs, regulations, or policies. It enables the Proponent and each Participating Agency to consider the positive and negative, short-term and long-term potential environmental impacts for all phases of a project, and the cumulative impacts of the Project and any other project or other work or activity in the immediate surroundings and region. MEPA regulations establish review thresholds that identify categories of projects or aspects thereof of a nature, size or location that are likely, directly or indirectly, to cause damage to the environment. Except when the Secretary of the Executive Office of Energy and Environmental Affairs requires fail-safe review, the review thresholds determine whether MEPA review is required. The MEPA thresholds are found in 301 CMR 11.03, "Review Thresholds", and are broken down into twelve resource categories and two levels: "Environmental Notification Form (ENF) and Mandatory Environmental Impact Review (EIR)", and "ENF and other MEPA Review if the Secretary So Requires" (MEPAO, 2004). These thresholds are listed in Appendix C. MEPA review is required when one or more review thresholds are met or exceeded and the subject matter of at least one review threshold is within MEPA jurisdiction.

Based on the size and scope of the Proposed Action, this project would not exceed any MEPA thresholds and would not be subject to MEPA review based solely on these thresholds, as shown in Appendix C. However, MEPA applies to projects above a certain size that involve some State Agency Action. That is, they are either proposed by a State Agency or are proposed by municipal, nonprofit or private parties and require a permit, financial assistance, or land transfer from State agencies (MEPAO, 2004).

1.2 PURPOSE AND NEED

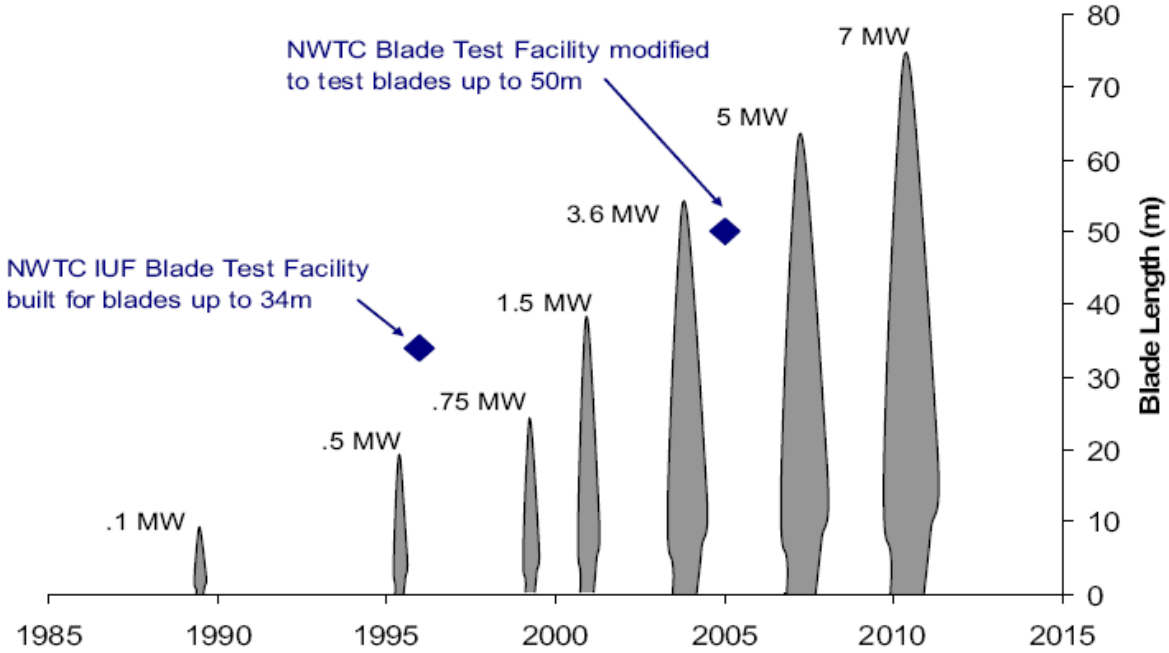
The purpose of DOE's Proposed Action is to strengthen U.S. capability to test advanced wind turbine blades necessary to run megawatt-scale wind turbines. Testing facilities for advanced wind turbine blades are needed to provide independent third-party verification required to meet turbine certification and

investor requirements. Wind energy production has experienced recent growth in the U.S. due to the increasing cost of natural gas and other petroleum products, and concerns over greenhouse gases produced by fossil-fueled electric plants. Some States have set requirements that a portion of their future energy come from renewable resources, also influencing the growth of wind farms. Since 2001, the U.S. has increased wind energy production by more than 300 percent, accompanied by a trend to increase blade size to create higher energy output per wind turbine (White House, 2008). In fact, next generation on-shore and off-shore turbine blades will exceed 50 meters (160 feet) in length with future generations expected to reach 90 meters (295 feet) in length. Currently, blades exceeding 50 meters cannot be fatigue tested in the U.S., therefore U.S. manufacturers test longer blades in Europe and Brazil. If testing is performed overseas, U.S. companies will not have scheduling priority, shipping and travel are costly and cause delays, and confidentiality of new U.S. technologies will be difficult to protect (Cotrell, 2007).

The test bay at the existing NWTC facility in Colorado was modified in 2005 to test blades up to 50 meters in length. However, this modification is now inadequate for testing longer blades indoors, currently forcing longer blades to be tested outdoors in sub-optimal conditions. There is also a backlog of blade testing work at the Colorado facility that is delaying the ability to deploy advanced wind turbine blades.

The rapid growth in wind turbine size over the past two decades warrants large blade testing facilities in the U.S. to compete with foreign markets (see Figure 1-1). Full-scale prototype testing of turbine blades is necessary prior to manufacturing and installation of wind turbine blades on a large scale. Testing allows manufacturers to meet certification requirements and minimize risk of design flaws resulting in costly fleet-wide retrofits.

The 2006 Advanced Energy Initiative increased Federal funds for research in clean coal technology and solar and wind energy as part of a national goal to diversify energy sources. The initiative promotes the accelerated development of wind energy. The WTTC would directly support this initiative by increasing technology reliability, reducing wind turbine blade testing timeframes, and reducing the cost of energy from wind turbines (Cotrell, 2007).



Source: NREL, 2006a

Figure 1-1. Blade and NWTC Test Facility Growth from 1988 to 2006

The WTTC is needed to allow the U.S. to:

- Continue providing an independent third-party testing capability required to meet turbine certification and investor requirements;
- Alleviate the current backlog at the NWTC blade test facility; and
- Support the development of large land-based and off-shore wind turbines (up to 90 meters in length).

1.3 PROJECT DEVELOPMENT PROCESS

Conceptual and preliminary design is occurring concurrently with this NEPA review. A preliminary Program Definition Report (business confidential) was developed by MTC and Massachusetts Port Authority (Massport) in September 2008 that provided recommendations for the design and construction of the proposed WTTC. The findings of this report include relevant design and site features for the project that form the basis for the analysis within this EA. These building and site features are described in Chapter 2. It is important to note that funding for final design and construction of the project would not be provided by NREL until the NEPA process is completed and a Finding of No Significant Impact (if appropriate) is completed.

1.4 PUBLIC INVOLVEMENT

NREL mailed a public scoping notice to approximately 90 Federal, State, and local government agencies, tribal governments, companies, individuals, and organizations, on May 16, 2008 providing 30 days to submit comments regarding the EA's scope. In addition, NREL placed notices of the scoping process in local newspapers.

Copies of the public scoping letters including the newspaper notice are presented in Appendix A. NREL did not receive any comments during the scoping period.

This EA presents DOE's analysis of the Proposed Action and No Action Alternative and findings of the potential environmental effects of the Proposed Action. The Draft EA was distributed for a 30-day public review period on June 8, 2009 to interested members of the public, and Federal, State, and local agencies, and for review and comment for DOE's consideration prior to any final decision by DOE on the proposed project. Only one public comment was received on the Draft EA. This comment, from the City of Boston, indicated the City's strong support for the project.

2.0 PROPOSED ACTION AND ALTERNATIVES

This section discusses the action alternatives being considered in this EA: the Proposed Action and the No Action Alternative. No other alternatives were considered for this project. The description of the Proposed Action includes information regarding the proposed site locations as well as operational characteristics of the proposed facility.

2.1 PROPOSED ACTION

DOE, through NREL, proposes to provide funding and technical support in collaboration (i.e., through a CRADA) with MTC for the design, construction and operation of the WTTC in the Charlestown neighborhood of Boston, Massachusetts. The proposed blade testing facility would be capable of accommodating up to 90-meter long wind turbine blades for a full suite of static and fatigue tests. It is important to note that there would be no installation of large-scale operating wind turbines on or near the site under the Proposed Action. Testing would occur indoors on the individual blades to assess their structural integrity; additionally, there may be coupon testing (e.g., testing of small material samples).

The proposed blade testing facility would consist of a new building with an anticipated footprint of approximately 50,000 sq. ft., including open test bay space capable of accommodating up to 90-meter long wind turbine blades for a full suite of static and fatigue tests. These bays would be served by bridge cranes, a control booth, and doors high enough to allow roll-in access for large trucks and dollies. A section of the building would house offices, a fabrication shop and pump rooms, and sheltered storage for facility equipment. Initial staffing is expected to include a WTTC director, two senior test engineers, a facilities manager, design engineer, two technicians and one office manager. Additional employees may be added at a later date if the work load warrants.

As the testing needs of the wind industry are changing rapidly, siting of the new facility needs to take into account future expansion both for the increasing length of wind turbine blades and additional testing bays to meet growing market demand. This would include the construction of one two-sided test block within the new building that in the future could be used to test outside using a roll-up door installed in the rear of the new building and installing a “tip door” above the sliding hangar door to allow up to 90-meter blade tests mostly indoors.

The proposed WTTC site is located at 100 Terminal Street, in the Charlestown section of Boston (see Figures 2-1, 2-2, and 2-3). The site is a paved industrial port facility owned by Massport, adjacent to the Mystic River portion of Boston Harbor. The site, known as the Boston Autoport, is currently a secure receiving yard for imported automobiles entering the U.S and for those exported from the U.S. The current leased uses include the Autoport, and the International Salt Company salt stockpiling and salt mixing (importer and distributor of road salt).. The physical configuration of the Autoport’s land, its operations, and it’s existing structures (administration buildings, docks, salt pile, salt mixing shed [where sand and other additives like calcium chloride are mixed with the raw salt], and truck scale) limit the available site options for the proposed WTTC to the northwest and southwest corners of the site (see Section 2.1.1 for a description of site options).

The space available for use/leasing for the WTTC would be a small portion of the 66-acre Autoport site. The proposed WTTC building would occupy approximately 1 acre of the site, with a total leased area between two and five acres (including parking and a storage yard which could be used for future expansion). An additional 1.6-acre “blade turning easement area” would be required just outside the building’s hangar doors to maneuver blades through the doors.

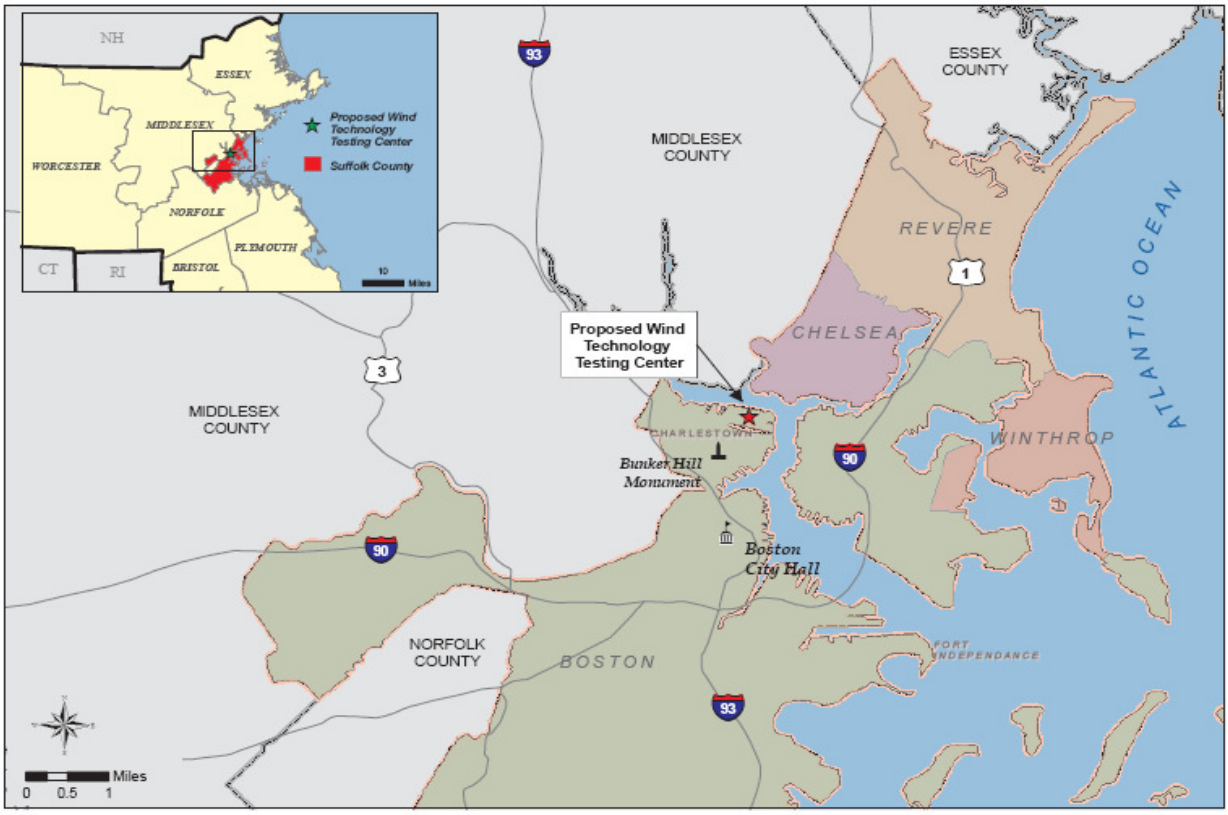


Figure 2-1. General Location Map

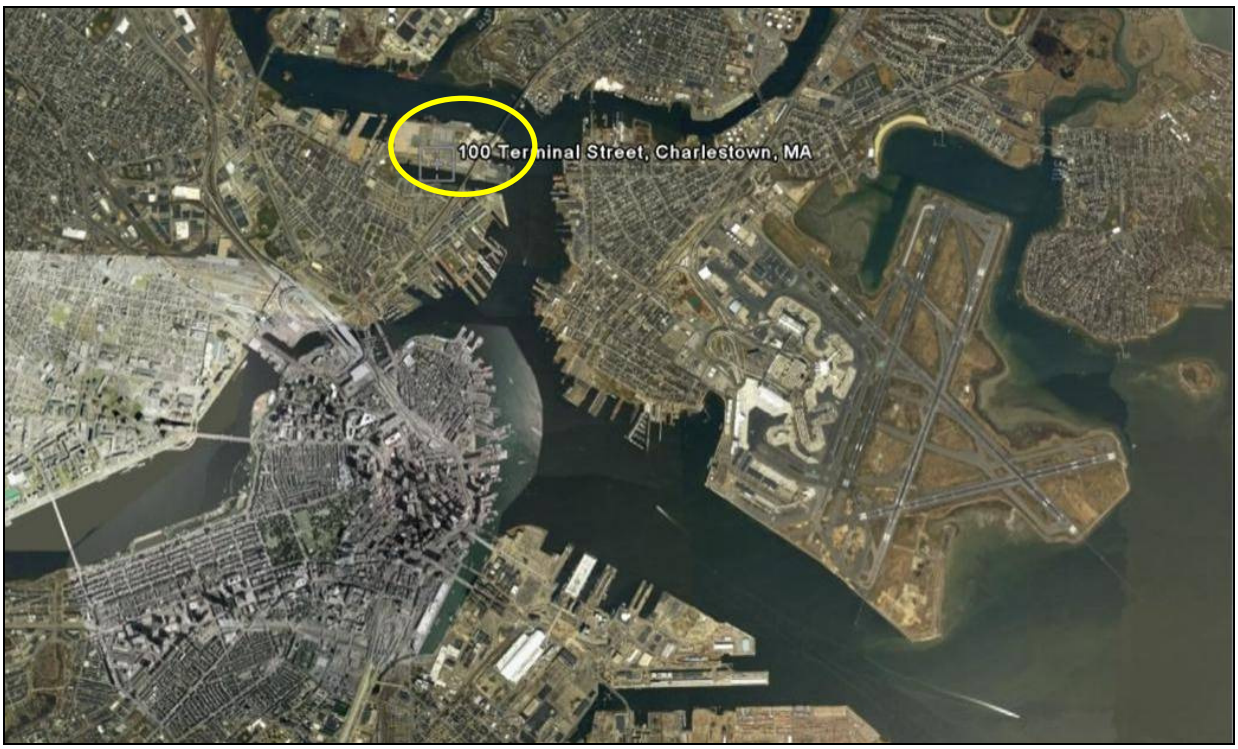


Figure 2-2. Site Location Map

Figure 2-3. Photograph of the Autoport Site and Surrounding Properties

2.1.1 Facility Description

The proposed WTTC facility would consist of approximately 50,000 square feet, up to approximately 80 feet in height, containing three bays. The bays would be served by two bridge cranes (20 – 50 tons), one or two control/observation rooms and doors high enough to allow roll-in access for large trucks and dollies. A lower section of the building would house offices, a fabrication shop and pump rooms, and sheltered storage for facility equipment (Figure 2-4 provides an example layout). This example interior layout is conceptual and is subject to change as the design process progresses.

MTC and Massport evaluated a number of options for locating the facility on the Massport property. Siting considerations included (but were not limited to):

- Minimal disturbance to Autoport operations.
- Minimal impact to salt pile operation.
- Retention of the salt shed and truck scale.
- Maintenance of truck turning clearances around the Autoport perimeter (for fire fighting and salt trucks).
- Adequate space for blade handling.
- Community interests (preserving views to the Mystic River, limiting the apparent size of the building, limiting noise, limiting truck traffic, and ensuring a pleasing architectural design).
- Solar orientation (for daylight and solar energy).
- Expansion strategies (to test longer blades in the future or add test bays to meet future market demand).
- Placement of ancillary spaces and storage yard.

Based on these siting considerations, two site options were found to be the most viable (see Figure 2-5).

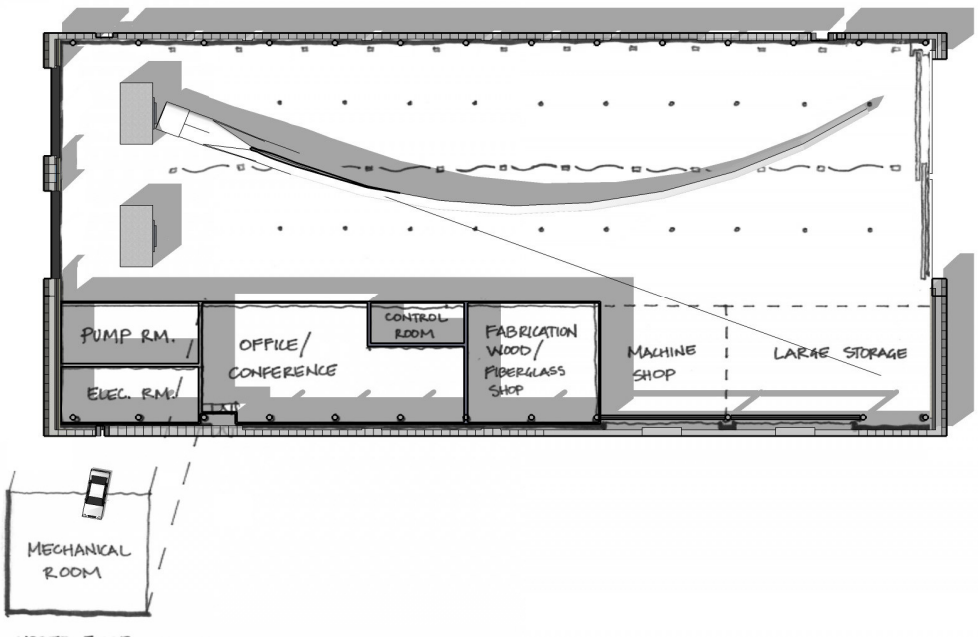


Figure 2-4. Example WTTC Building Layout

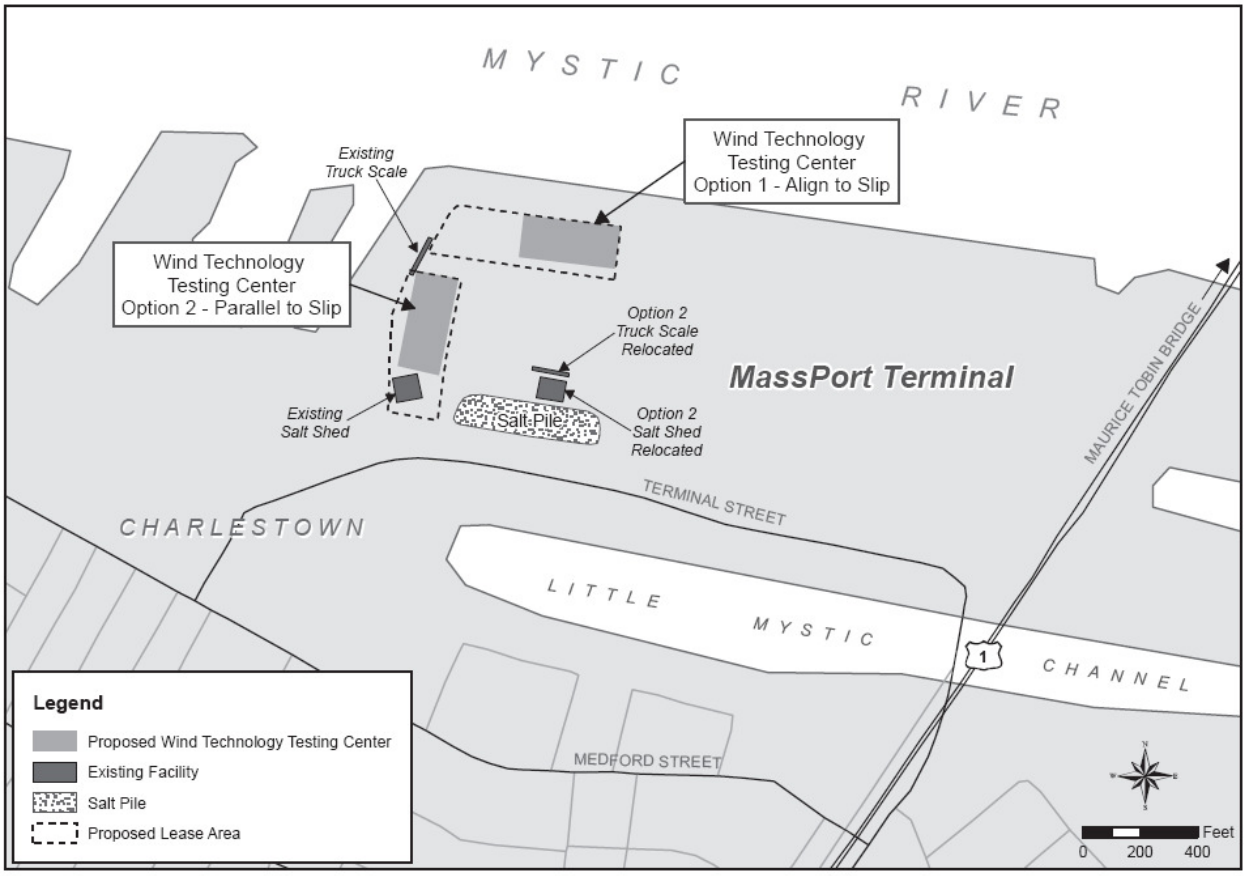


Figure 2-5. Siting Options

Option 1 – Align with River: This option places the facility as close to the Mystic River as possible with the building's long axis parallel to the river's edge. This site offers the most direct route for very large blades from where they would be lifted off ships or barges on the wharf side to the large hangar door of the facility. This location has the least impact on salt stockpiling or Autoport operations. The site has excellent solar orientation, allowing the most efficient shading and daylight harvesting solutions, and is ideal for installation of solar collectors. The building would be highly visible along the Mystic River and from the Tobin Bridge and would block some of the views of the Mystic River from southern residential areas, although it would align closely with the current salt pile from that viewpoint, where the salt pile would continue to be the primary element blocking river views.

Option 2 – Parallel to Slip: This option places the facility with its long axis parallel to the existing boat slip that borders the western edge of the Autoport. The facility would be located as far to the west as practicable and just far enough north as to allow for a work yard (blade testing area) south of the building. One of the main disadvantages of the option is that the building would be within 100 feet of the salt pile, compromising indoor air quality, daylight, ventilation and views. Other disadvantages include poor solar orientation, increased constriction at the southwest corner of the site impacting salt operations, and the need to relocate the salt shed and truck scales if outdoor blade testing off the back of the testing blocks is desired. The site option also brings the building about 300 feet closer to the residential area of Charlestown and the outdoor storage/possible future testing area 500 feet closer.

The building would meet or exceed requirements for sustainable design under Commonwealth of Massachusetts Executive Order 484, "Leading by Example - Clean Energy and Efficient Buildings". This order instructs all State agencies involved in the construction and major renovation projects of over 20,000 square feet to meet "Leadership in Energy and Environmental Design (LEED) Plus" certification, which includes basic LEED elements plus achieving energy performance 20 percent better than the Massachusetts Energy Code, outdoor water reduction requirements, and verification by an independent third party building commissioning authority. A description of the LEED Plus requirements is provided in Appendix B. The design team evaluated a number of alternative building systems to balance the goals of reducing energy demand, achieving energy efficiency and promoting renewable energy within a reasonable budget. Anticipated sustainable design features for the WTTC may include reducing energy demand through:

Leadership in Energy and Environmental Design (LEED) is a third-party certification program and the nationally accepted benchmark for the design, construction and operation of high performance green buildings. LEED promotes a whole-building approach to sustainability by recognizing performance in five key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality.

- High insulating values.
- Limiting air conditioning to offices, conference rooms and the control room.
- Use of advanced ventilation control systems.
- High performance lighting systems (efficient high-bay fluorescent fixtures, optimal zoning capabilities, and daylight dimming of electric light when ambient light is available).
- Recovering waste heat from the hydraulic system to meet most of the heating demand in the winter, when testing is being performed.
- A high-efficiency gas boiler.
- Renewable energy systems such as photovoltaics, solar thermal panels, and voluntary renewable power purchases.

2.1.2 Construction

The construction of the facility would occur over approximately 12 months, anticipated to begin in 2009. After installation of equipment in the building and a period of on-site training of personnel, blade testing operations could begin in late 2010 or early 2011.

The construction of the facility would be accomplished using commonly available construction equipment. Based on projects of similar scale, the average daily construction workforce would be approximately 50 workers, with up to 150 workers anticipated during peak periods. The building would require new utility connections and line extensions. These include power, potable water, sanitary sewer, natural gas, and telecommunication connections.

Prior to construction, the existing storage of automobiles would need to be relocated to another location within the Autoport property. Under Option 2, the salt-mixing shed and truck scale would also need to be relocated within the Autoport.

The Autoport site is covered by an August 7, 1997 Activity and Use Limitation (AUL) which controls and manages on-site activities and limits exposure to regulated materials (e.g., contaminated soils) (see Figure 3-10). Both building site options would fall within the 12.4-acre AUL footprint on the Autoport property. Construction of the WTTC would disturb soils during the installation of the building foundation (drilling dozens of reinforced concrete caissons) and would require removal of the soil displaced by the foundations. Under the provisions of the AUL, excess soils generated during the facility construction would need to be managed by a Licensed Site Professional (LSP) in accordance with Massachusetts Department of Environmental Protection (MassDEP) Massachusetts Contingency Plan regulations, and EPA's Resource Conservation and Recovery Act (RCRA) and Toxic Substances Control Act (TSCA) regulations.

> A **Licensed Site Professional** (LSP) is an experienced professional in the field of hazardous waste site assessment, cleanup and removal. An LSP must have at least 5 years experience conducting and overseeing assessments, removals or cleanups of sites (7 years without an appropriate degree), suitable technical background and good moral character.

Because the proposed project is located in the buffer zone of a coastal resource area, an Order of Conditions would be required prior to construction from the Boston Conservation Commission under the Massachusetts Wetlands Protection Act [Massachusetts General Law (M.G.L.) 131 §40 and regulations at 310 CMR 10.00]. Permit conditions are expected to focus on erosion and sedimentation control during construction and maintenance of stormwater management systems post construction.

In addition, a building permit would be required prior to construction from the Massachusetts Department of Public Safety. A Federal Consistency Review would also be required by the Massachusetts Office of Coastal Zone Management (CZM). A comprehensive list of permits applicable to the project is provided in Appendix D. Appendix E describes the project's consistency with the Massachusetts CZM Program.

2.1.3 Operation

The WTTC mission would be to conduct structural testing of wind turbine blades. It is important to note that there would be no installation of large-scale operating wind turbines on or near the site under the Proposed Action. Testing would occur indoors on the blades to assess their structural integrity and there would be no testing of whole assemblies of wind turbines. Structural testing would include both static testing and fatigue testing:

- An ultimate-load static test simulates extreme wind loading and indicates the blade's strength safety margin over the worst winds specified for the turbine design class.

- A fatigue test applies cyclic bending loads to the blade. The fatigue test simulates repetitive high-wind conditions that the turbine might undergo during a 20- to 30-year exposure to the environment.

Static tests would occur over a period of approximately one week, where blades would be maneuvered inside the building, and then weights, pulleys and cables are used to flex the blade, while instrumentation on the blade provides stress data.

Fatigue tests would occur within the test facility over a period of two to three months, 24 hours a day. In these tests, blades are held horizontally and, through the Universal Resonant Excitation system or Blade Resonant Excitation system, are tested in either one or two axes (flap and edge) (see Figure 2-6). The building would have three test stands.

Figure 2-6. NREL Universal Resonant Excitation System

An estimated 12 to 15 blades would be tested at the facility annually. The blades would be transported to the site primarily by ship but could also be transported by truck (see Figure 2-7). Blades transported to the site by ship or barge would utilize the existing docks at the Autoport and would be off-loaded by mobile rental cranes. Once off-loaded, blades would be transported within the Autoport site (as described in Section 2.1.4) into the WTTC building for testing, although some blades may be stored outdoors temporarily adjacent to the building.

After testing, blades would either be shipped back to the manufacturer (intact or in sections) or cut up and either recycled or sent to a landfill. The WTTC Management Committee would explore possible recycling opportunities to minimize or avoid landfilling discarded blades.

Cutting of blades for either failure analysis (post-mortem inspection) or disposal would be conducted either indoors or outdoors, as is the practice currently at the Colorado NWTC.

Source: EERE, 2005. Photo Credit: Kenneth Newhams/Duluth Shipping News.

Figure 2-7. A Crane Lowers a Wind Turbine Blade onto a Truck in Duluth.

The facility would also host structural and seismic testing of building materials (primarily structural steel and concrete) in support of university-sponsored research and development. For seismic testing, material samples (such as wood beams, plywood, and concrete slabs) or small-scale building assemblies (such as wall mock-ups or windows) would be subjected to stresses similar to those experienced under earthquake conditions, where hydraulic loads are applied in a cyclic fashion. The equipment and testing operations for this research would be easily accommodated by the space within the building and testing of small-scale

materials would not interfere with blade testing operations. No additional full-time personnel would be required to support these tests.

The facility would initially employ about eight employees. Although NREL expects that tours would occasionally be provided to small groups, the number of people on-site at any one time would most likely be less than 40.

2.1.4 Transportation

One of the key features of the Autoport site that makes it suitable for a WTTC is its ease of access by multiple means of transport. An estimated 12 to 15 blades would be tested at the facility annually. Most blades would be transported to the site by ship to the existing Autoport deep-water dock (that provides 40 foot depth of water) and would be off-loaded by the ship crane or a large crane which would be rented the few times a year when blades need to be disembarked. Once the blades are taken off the ship/barge, they would be moved into the test facility by a Shuttlelift (mobile crane), a special dolly, or a self-propelled crawler.

The blades could also be transported to the site by truck, via the local exits off I-93, using the route depicted in Figure 3-4. Access to the site for trucks and trailers transporting up to 63-meter (207-foot) blades would be achievable with some modifications to curb lines and traffic signals. Trucks could approach the site from the west on Terminal Street and from the south via Chelsea Street. A new gate is proposed at the end of Chelsea Street where it meets Terminal Street. MTC estimates that manufacturers would request up to 10 percent of tested blades to be returned in one piece. The mode for returning intact blades would depend on their size and transportation costs.

Trucks carrying intact blades would require oversize load permits from applicable Federal, State, and local agencies along their routes. Before any blades are transported by truck, MTC would submit full route plans to the applicable transportation agencies and obtain all necessary permits.

There is also an inactive railroad right-of-way on the Autoport property that could be reactivated as a means of transporting wind turbine blades. However, this transportation option is not part of the Proposed Action due to the high cost and lengthy process that would be incurred relative to the other readily available transportation options.

2.2 NO ACTION ALTERNATIVE

A No Action Alternative is considered in the EA and provides a benchmark, enabling decision-makers to compare the magnitude of environmental effects of the Proposed Action. Under the No Action Alternative, DOE would not provide funding for construction, nor personnel for the operation of a WTTC in Boston, MA. To create the basis for a meaningful analysis, it is assumed that the WTTC would not be constructed at the proposed location. However, it is possible that MTC could construct the facility and license the blade testing technology from NREL using other funds independent of DOE.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 GENERAL SITE DESCRIPTION

The Autoport site is located in the Charlestown section of Boston, along the southern bank of the Mystic River, west of the Tobin Memorial Bridge. The site is currently a processing facility for imported automobiles entering the U.S. Autoport activities are expected to continue on the Massport land adjacent to that proposed for the WTTC if it is constructed. The site is fully fenced and contains areas for surface parking of vehicles, docks and cranes, administrative buildings, a truck scale, salt storage, and a salt and sand mixing shed. There are visible remnants of former rail road tracks onto the site, which are not presently operable.

The land uses at and surrounding the site are primarily industrial. To the immediate east of the site at 200 Terminal Street is the closed U.S. Gypsum Company, whose site contains a former gypsum board manufacturing facility and five concrete storage silos. A sand and gravel company, the Suez/Distrigas Liquefied Natural Gas Terminal, a scrap metal wholesaler, and a cargo container shipping/transport company are located to the north of the site, across the Mystic River.

3.2 AFFECTED ENVIRONMENT AND CONSEQUENCES OF THE PROPOSED ACTION

3.2.1 Land Use

This section describes the affected environment for and consequences to land use of the Proposed Action. This resource area addresses: compatibility with existing on-site and adjacent land uses, conformance with applicable land use regulations, and compatibility with future land use plans.

3.2.1.1 Affected Environment

The neighborhood of Charlestown was first settled in 1629 and is Boston's oldest neighborhood. It is located in the northern portion of Boston on a peninsula extending southeast between the Charles River and the Mystic River. The neighborhood encompasses approximately 1.4 square miles of land amounting to approximately three percent of Boston's size (City of Boston, 2006). Charlestown has a population of about 15,000 people (City of Boston, 2006).

The Boston Autoport is operated by Massport, and as an Independent Public Authority, Massport is exempt from City zoning. This exemption is based on case law that State agencies and authorities are not subject to local regulations and zoning (Hadden, 2009). While the Autoport property is not subject to Boston zoning regulations, a discussion of zoning requirements surrounding the site are provided to describe the setting and land use of adjacent properties.

The Boston Redevelopment Authority established planning districts for planning and zoning purposes (also referred to as neighborhood planning districts). The Charlestown neighborhood is located in the Charlestown Planning District and consists of the Charlestown Navy Yard, Sullivan Square, the City Square, Bunker Hill Monument and portions of the Mystic River Designated Port Area (DPA).

The proposed site of the WTTC at the Boston Autoport is located within the DPA boundary. DPAs are State-designated areas of concentrated maritime industrial activities, and projects in these areas are required to meet the requirements

Designated Port Areas (DPAs) are the primary working waterfronts within the Commonwealth's developed coastal harbors. DPAs were established on the fundamental premise that it makes both good environmental and good economic sense to encourage maritime business development within harbor areas that have already been altered extensively – at great public expense – to meet the special operational and physical requirements of port-related commerce.

of DPA regulations. Also located in this planning district are residential dwellings that are mostly concentrated in the center of the neighborhood, recreational/public land uses and commercial land uses scattered throughout the neighborhood, and industrial properties adjacent to the water and the northwest portion of the neighborhood. The primary working waterfronts within Charlestown are classified as DPA under the 1972 Coastal Zone Management Act and are located in the Mystic River DPA. Further discussion of the Mystic River DPA is provided in Section 3.2.1.3.

In 2007, Boston's zoning Code Green Building Amendments were approved to ensure that major building projects are planned, designed, constructed, and managed to minimize adverse environmental impact; to conserve natural resources; to promote sustainable development; and to enhance the quality of life in Boston (City of Boston, 2007a). The existing land use designations surrounding the proposed WTTC site are shown in Figure 3-1.

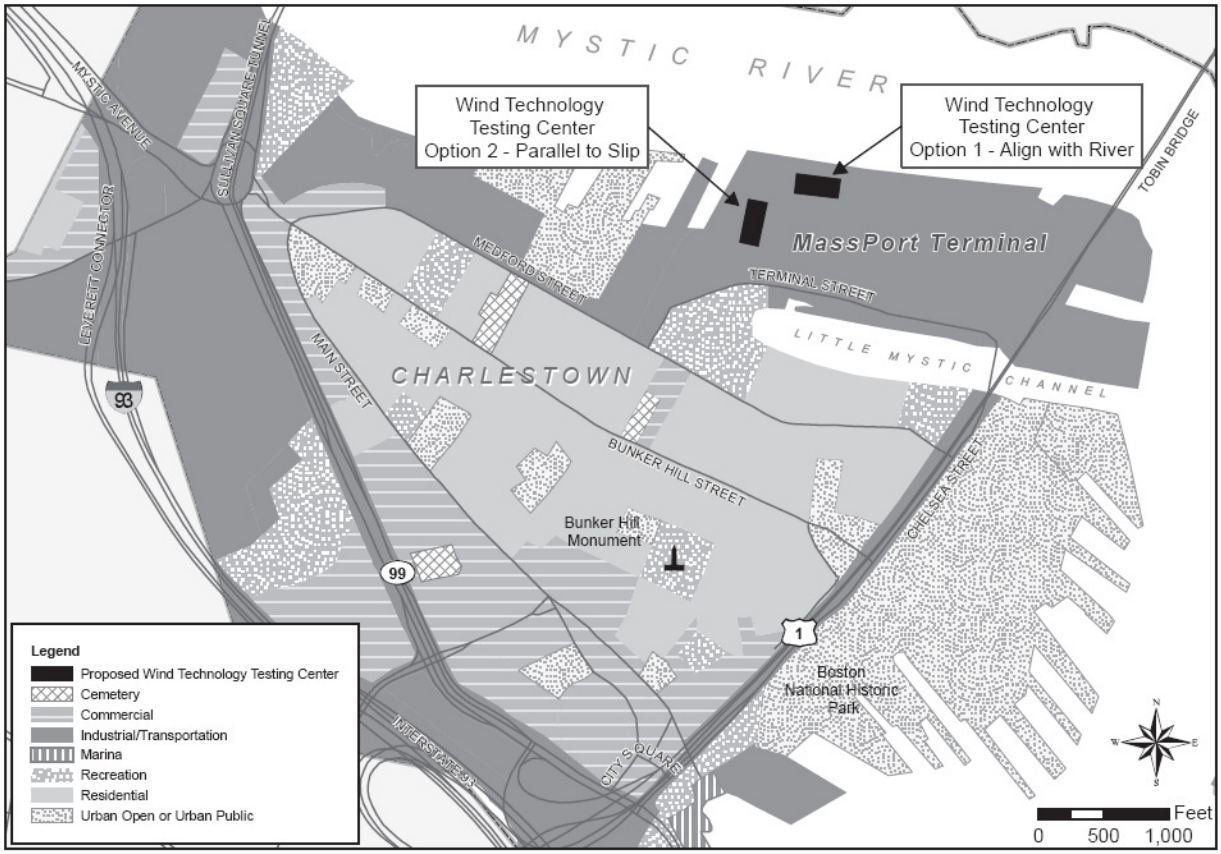


Figure 3-1. Existing Land Use in Charlestown

3.2.1.2 Charlestown Neighborhood District

The Boston Redevelopment Agency developed the Boston Zoning Code for the purpose of establishing regulations for the comprehensive planning policy through the implementation of developmental controls and design guidelines (such as building height, use, dimensional regulations, and buffering requirements). The proposed WTTC location falls within the boundaries of, but is not subject to the Harborpark District Plan which regulates the Charlestown Waterfront District. The Charlestown Waterfront is divided into 10 subdistricts and the proposed WTTC site is located within the Charlestown Maritime Economy Reserve Subdistrict (see Figure 3-2) (City of Boston, 1998).

The Harborpark District is bounded by the Mystic River and Charles River on the north and eastern side and extends southward to Medford Street and follows Chelsea Street and then Constitution Road as the

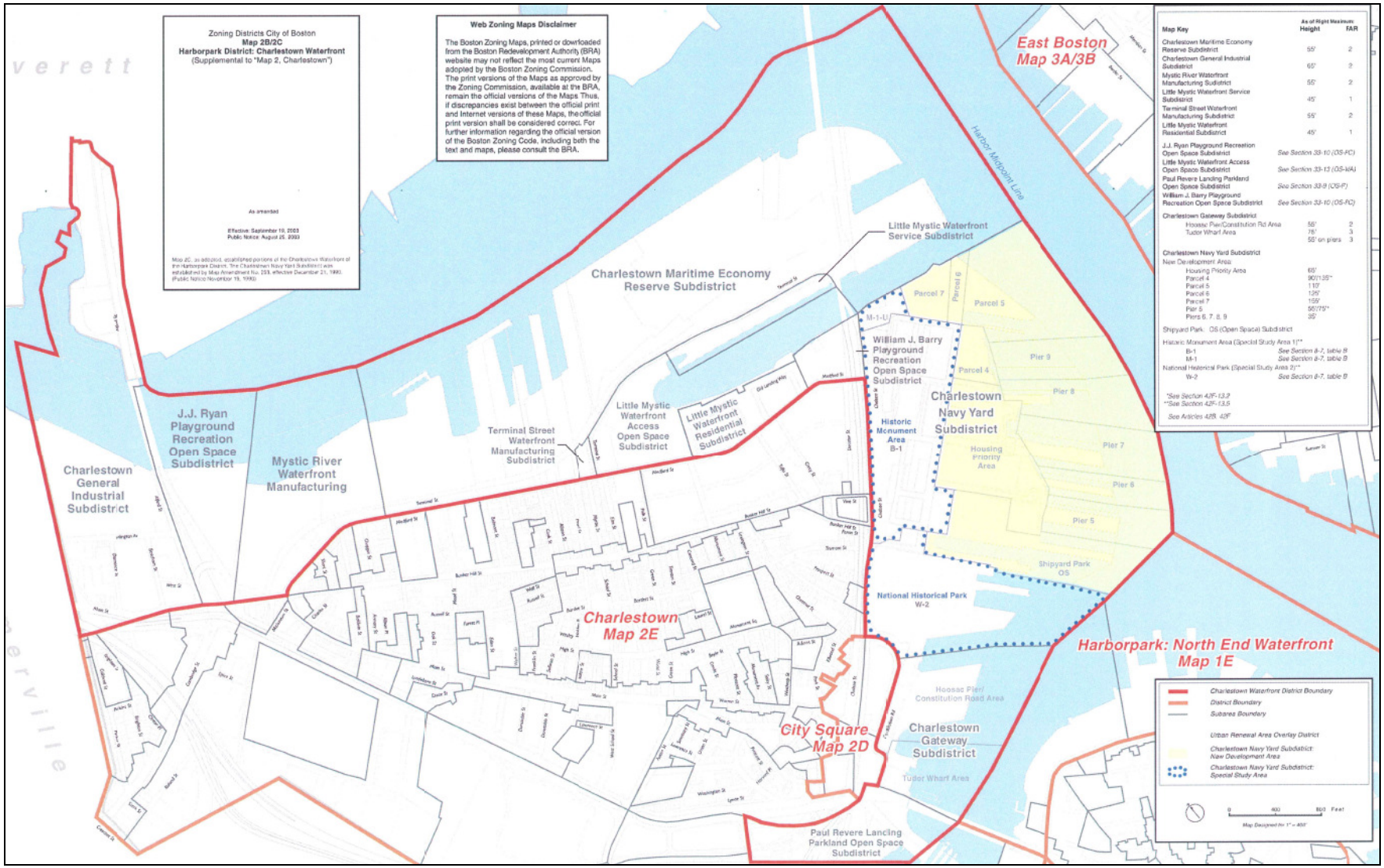


Figure 3-2. Harborpark District: Charlestown Waterfront

western boundary. The Harbor Park District Plan's objectives are to provide adequate density controls that protect residential areas and direct growth to areas that will promote the viable neighborhood economy, including protection from inappropriate land and water uses (City of Boston, 1998).

Within the Charlestown Maritime Economy Reserve Subdistrict, the zoning regulations indicate a maximum building height is 55 feet (except for cranes, silos, storage facilities or other mechanical devices or facilities used for transfer of goods from land to waterborne vessels or for processing of such goods) and a floor area ratio (the ratio of gross floor area of a structure to the total area of the lot) should be a maximum of two (City of Boston, 1998).

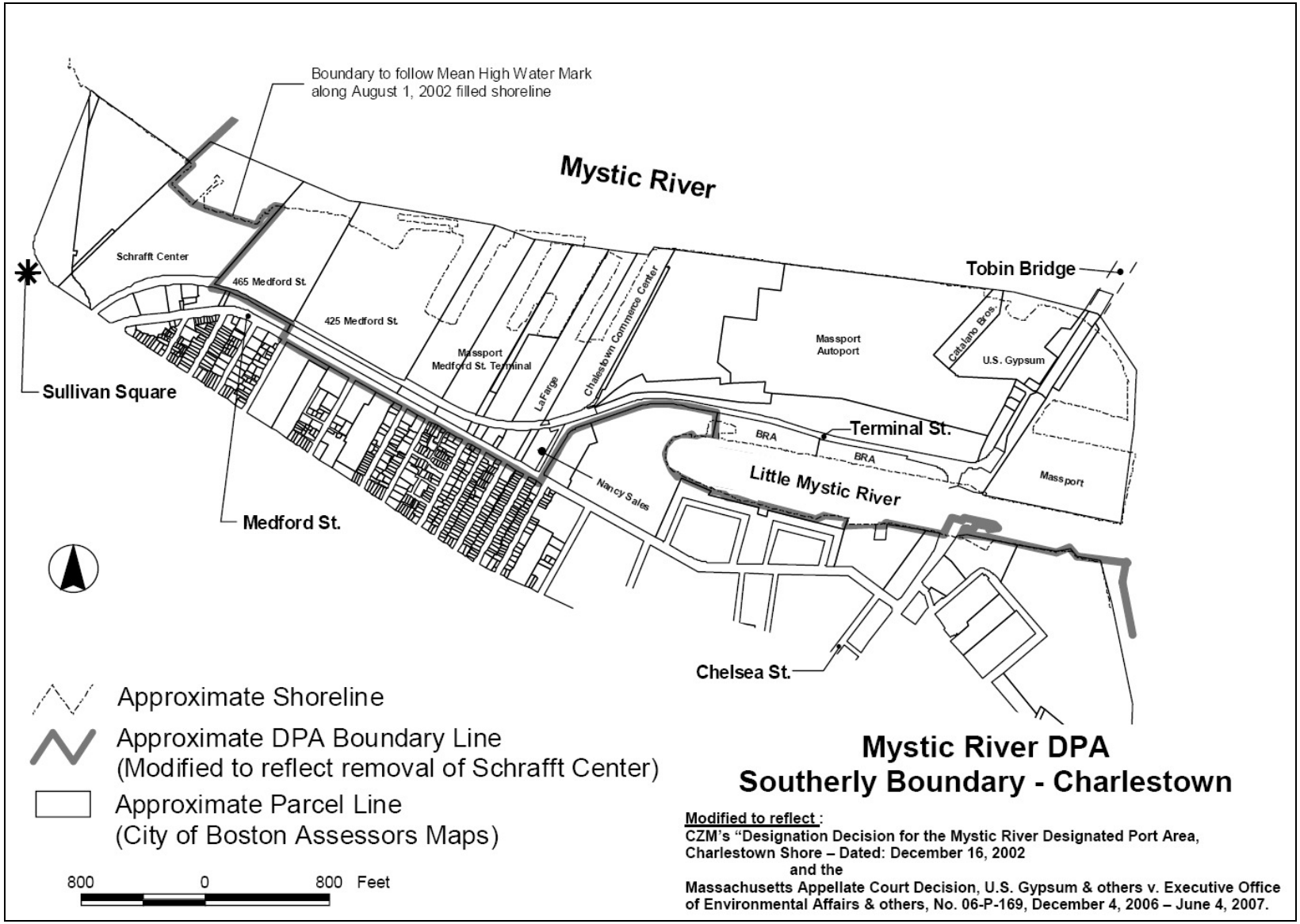
3.2.1.3 Mystic River DPA

The proposed WTTC site at the Autoport property is located within the Mystic River DPA. The DPA land area encompasses approximately 153 acres and has almost 1.8 miles of waterfront land. The purpose of the DPA program is to create State port-related policies and objectives that promote water-dependant industrial uses and contribute to the region's maritime economy for existing and future entities that are along the waterfront. Water-dependant industrial use is described as uses that rely directly on functional connection to the water to exist such as marine terminals, commercial fishing facilities, marine repair and construction, and manufacturing facilities that rely on goods transported by waterborne transportation. Additionally, temporary uses (warehousing, trucking, parking, and other industrial and transportation uses that occupy vacant space) and supporting uses (such as storefront retail and service facilities; and shops operated by self-employed tradesman) are compatible categorical uses of land in the DPA (CZM, 2002).

Adjacent to the Mystic River DPA are the Charlestown neighborhood along the southwestern side of Medford Street, the Charlestown High School and athletic fields along Terminal Street, and the Charlestown housing development along the southern shore of the Little Mystic Channel. The current distribution of land uses in the DPA can be generally characterized as core industrial uses, mixed industrial and commercial uses, and vacant or underutilized historical industrial use properties. Approximately 82 percent of the DPA is maritime industrial or industrial accounting for the majority of land use. Maritime industrial uses generally increase in density moving west to east along the Mystic River, although they are not distributed uniformly (see Figure 3-3) (CZM, 2002).

Massport, created in 1956 to manage public port facilities in the interest of the Commonwealth, is the largest property owner in the Mystic River DPA, leasing a significant acreage to a number of on-going maritime industries. In general, the waterfront parcels maintain significant open space with only approximately 14 percent of the 153 acres of the DPA land occupied by structures. Most of the properties are characterized by a developed waterfront (pier or bulkhead, in various conditions of repair) paved open space, and a large industrial-type structure (with the size depending on the historical use) located towards the landward side of the property and used typically for storage, processing, shipment and administration. The properties at the west end of the DPA were historically industrial or maritime industrial uses and are now in commercial use, with open space that is vacant or used for parking and temporary industrial lay-down (CZM, 2002).

Prior to use by the Autoport, the parcel supported Massport's container terminal operations, now located in South Boston at Conley Terminal. The Autoport receives approximately 30 ships per year and imports approximately 30,000 automobiles per year, exports approximately 15,000 automobiles per year, as well as providing covered storage for automobiles. The Autoport hosts one of the City of Boston's five school bus depots. It also hosts import and distribution of road salt, and operation and maintenance of all Boston Harbor Cruises passenger vessels, among other uses. At capacity, the Autoport generates approximately 20,000 truck trips (car-carriers) on Chelsea Street for 250 days per year. In addition; another 10-15 trucks per day carry miscellaneous materials to and from the Autoport. Cars are trucked offsite 24-hour per day, seven days per week. The Autoport employs approximately 500 people with 125 seasonal/part-time jobs.



Source: CZM, 2007

Figure 3-3. Mystic River DPA Southerly Boundary – Charlestown

3.2.1.4 Massachusetts General Law Chapter 91

Adopted in 1866, Massachusetts General Law Chapter 91 protects the public's interest in waterways of the State. It ensures that public rights to fish, fowl, and boating recreation are not unreasonably restricted and that unsafe or hazardous structures are repaired or removed. Chapter 91 also protects the waterfront property owner's ability to approach his land from the water. Regulatory authority is provided to MassDEP and the Massachusetts Department of Conservation and Recreation. There are several Massachusetts regulations that pertain to Chapter 91, including: 310 CMR 9.00 (Chapter 91 Regulations), 301 CMR 23.00 (Municipal Harbor Plans), 310 CMR 4.00 (Fee Regulations), and 301 CMR 25.00 (Designated Port Areas). Under these regulations, certain development projects in coastal areas require a State permit, although the proposed WTTC would be exempt as it would be a water-dependent use (see Section 3.2.1.6).

3.2.1.5 Properties Adjacent to the Autoport

To the east of the Autoport is U.S. Gypsum, located between the Autoport and Massport's Mystic Terminals since 1929, which formerly produced gypsum wallboard (CZM, 2002).

On the west side of the Autoport is the Charlestown Commerce Center, located in the middle of the DPA, which offers light manufacturing space offering distribution amenities and storage facilities. This land parcel is approximately six acres; approximately two-thirds of the building is occupied and used for moving and storage companies, music studios, woodworkers, and bakeries (CZM, 2002).

LaFarge Building Materials, Inc., is located approximately midway up the Mystic River to the immediate west of the Charlestown Commerce Center and imports cement for wholesale distribution. Approximately 60 barges per year transport cement to LaFarge. LaFarge leases the property from the Charlestown Commerce Center and under agreement, utilizes docking space for its barges. Cement is stored on site within eight silos that range from 150 to 180 feet tall. Truck traffic, operating to and from the cement distributor, averages approximately 135 trucks per day, five days per week, or approximately 35,000 truck trips per year. The Lafarge terminal employs 10 people (CZM, 2002).

The Boston Redevelopment Authority owns two properties on the south side of Terminal Street and the Autoport site. One parcel is leased to the Autoport for vehicle staging and storage, and the other parcel (directly west of the leased property) is the site of a public boat ramp, associated parking, and a grassed area (CZM, 2002).

3.2.1.6 Environmental Consequences of the Proposed Action

Construction Impacts

Section 2.1.2 describes the construction details and assumptions for the facility. The ability to transport very long turbine blades by different modes is a key factor for NREL when deciding where to build new large blade test facilities. Accessibility to waterways for blade transportation was an essential component of the proposal of the Autoport site to host the WTTC (based on the criteria set forth by NREL). Moving very large blades (greater than 60 meters in length) by ship to the testing site would be in many cases more economical and more convenient than trucking. Therefore, the site's accessibility to water would be considered a key aspect of its operation.

The DPA regulations state that new facilities must constitute a water-dependant industrial use. "Water-dependent uses" are described as uses that rely directly on functional connection to the water to exist. The WTTC would be a facility that relies on wind turbine blades transported by waterborne transportation and thus would be compatible with the Mystic River DPA's maritime industrial land uses.

In accordance with Massport's Enabling Act (Chapter 465 of the Acts of 1956), the Chapter 91 regulations under 310 CMR 9.03(3) allow certain Massport activities to take place without written authorization in the form of a license or permit from MassDEP Waterways Regulation Program. These

activities include, among others, projects that consist entirely of water dependant industrial uses or accessory uses thereto within the Port of Boston. In accordance with 310 CMR 9.12(3), an accessory use is customarily associated with and necessary to accommodate a principal water dependant use. More specifically, the use must be:

(a) Integral in the function to the construction or operation of the water dependant use in question, or provide related goods and services primarily to persons engaged in such use; and

(b) Commensurate in scale with the operation of the water dependant use in question (MassDEP, 2008).

Receiving wind turbine blades by water would be an integral and key function of the proposed WTTC. Therefore, the WTTC would meet these two use criteria and would be exempt from licensing under Chapter 91 regulations.

The proposed WTTC would not be subject to Boston zoning regulations. However, as a point of comparison with zoning, the building would be 80 feet tall, where zoning imposes a 55-foot maximum. The proposed WTTC would occupy approximately one acre of land, where over 50 acres of open land are available, which would conform to the Subdistrict floor area ratio zoning requirement (see Section 3.2.1.2). The WTTC would also conform to the Charlestown Maritime Economy Reserve Subdistrict's allowed use of a "research center". Subsequently, the WTTC would meet the City's zoning requirements except for the height limitation.

Under both site options, existing storage of automobiles could be relocated to another portion of the Autoport site or to another nearby Massport property if necessary. Site Option 1 would pose less land use impacts within the Autoport site than Option 2, as the truck scale and salt shed would need to be relocated within the site only under Option 2. Although the existing storage of automobiles, salt shed, and the site's truck scale would need to be relocated to another portion of the Massport property or another nearby Massport property, this relocation would not disrupt or adversely affect Autoport operations or the sites to which they would be relocated. Construction of the WTTC would also not adversely affect adjacent land uses.

Operation Impacts

The operation-related activities that would occur at the WTTC would not substantially change the nature of the land use in the area. The operation of the facility would not physically divide an established community, or prove incompatible with the City of Boston and the CZM plans for current and future uses. Therefore, there would be negligible impacts to land use under the Proposed Action.

Committed Measures

No committed measures will be required.

3.2.2 Water Resources

This section describes the affected environment for and consequences to water resources of the Proposed Action. This resource area addresses: surface water bodies such as rivers, streams and wetlands; groundwater; and stormwater runoff.

3.2.2.1 Affected Environment

Surface Water

The Mystic River basin covers about 66 square miles in northeastern Massachusetts. The Mystic River begins at the outlet of Lower Mystic Lake and flows southeastward to Boston Harbor. The entire length of the Mystic River was originally influenced by tides until 1909 when Craddock Locks (now abandoned), located in Medford, prevented tides from affecting the upper part of the Mystic River, Lower Mystic Lake, and Alewife Brook. Since 1966, the Amelia Earhart Dam, located at the mouth of the Mystic River, has prevented tides from affecting the Malden River and the lower part of the Mystic River (USGS, 1992).

The Autoport site is located within an industrial area zoned as the Charlestown Maritime Economy Reserve Subdistrict, within the Mystic River DPA. The property is bounded by Little Mystic River to the north and the Little Mystic Channel to the south (Weston, 1997). Almost all of the current Mystic River DPA land area is comprised of filled tidelands, reflecting a working waterfront that has been continually built out over the past three and a half centuries to provide access for shipping. The Mystic River area, generally east of what is now the Charlestown Commerce Center and north of what became the Little Mystic Channel, was filled in the late 1800's by the Mystic River Corporation to create terminals serviced by the Boston & Lowell (later the Boston & Maine) Railroad. Piers and wharves were also constructed and expanded along the south side of the Little Mystic, and along Medford Street to accommodate growing exports of pond ice, apples, livestock, grain, lumber, and coal. The filling of tidelands was vital to the fortunes of Charlestown merchants. Shippers needing to reach the navigable waters of the Mystic River sought permission from the Legislature to fill out to low water. Responding to the influence of the railroad as the prime developer of the industrial waterfront, bulk cargoes, which require handling space and rail access, began to dominate Charlestown commerce (CZM, 2002).

The Boston Inner Harbor Channel is the access route by which all vessel traffic enters and reaches Boston Harbor, Chelsea Creek, and Mystic River destinations. In 1998, Massport in conjunction with the U.S. Army Corps of Engineers initiated the "Boston Harbor Navigation Improvement and Berth Dredging Projects." The project involved the deepening of three tributary channels including the Mystic River Channel and two areas in the Main Ship Channel to provide sufficient ship maneuvering areas, as well as the deepening of several berths. All areas were dredged to 40 feet Mean Low Water (MLW). In 1994 the Moran Terminal (now the Autoport) was dredged to 40 feet MLW in advance of the full Federal dredging project (CZM, 2002).

The Mystic River Watershed is one of the most densely populated and urban watersheds in Massachusetts (Mystic River Watershed Association, 2006). As of May 2009, the U.S. Environmental Protection Agency (EPA) gave the Mystic River Watershed a grade of "C", an improvement from the previous year's grade of "D". This indicates that over the past year water quality met swimming standards 59 percent of the time and boating standards 90 percent of the time. The grade is based on bacterial contamination. EPA launched a focused and aggressive effort to coordinate with State agencies, the communities along the Mystic River, and local environmental and community organizations to address water quality issues in the Mystic Watershed. However, even with a low grade, EPA believes that prospects for the river are positive based on the attention now being paid by agencies and concerned citizens (EPA, 2008a).

Groundwater

There are no sole source aquifers, Potentially Productive Aquifers or private wells within 500 feet of the property (Weston, 1997).

The principal aquifers in the Mystic River basin are composed of sand and gravel deposited in stream channels during the last glacial period. The most productive aquifers can sustain well yields of several hundred gallons per minute and are located in the Aberjona, Malden, and Mystic River Valleys. Aquifers that sustain well yields of less than 200 gallons per minute occur in many stream valleys and swampy areas throughout the basins. These aquifers usually cover a small surface area and are less than 50 feet thick, although their size is unknown where they adjoin or underlie fine-grained marine or lake deposits.

Bedrock is around 150 feet deep on this site, and water levels vary from 10 feet to 13 feet (Haley & Aldrich Inc., 2008) and, in most places, can supply the few gallons per minute of water needed from domestic wells. Although bedrock wells can yield up to 110 gallons per minute, they generally yield 10 gallons per minute or less. The groundwater flow regime beneath the site consists of a shallow, unconfined, sandy aquifer. The hydraulic conductivity of the unconsolidated aquifer ranges from 0.2 feet/day to 0.4 feet/day which is typical for sandy aquifers (Stevens, 2008). Based on water level measurements that were collected from existing monitoring wells during a Phase II assessment in 1997 on the Former Schiavone Property (owned and operated by Massport) shallow groundwater flow is radial to the west, north and northeast with groundwater mound in the southeastern corner of the property.

The proposed WTTC site is not located within an Interim Wellhead Protection Area, or a current or potential drinking water source area. The average annual depth to groundwater is less than 15 feet below the ground surface.

Stormwater

A Notice of Intent and Stormwater Pollution Prevention Plan (SWPPP) for Autoport operations was submitted to EPA in December 2008 in compliance with the September National Pollutant Discharge Elimination System (NPDES) Multi-Sector General Permit, Section Q – Water Transportation (Barrett, 2008). Section Q includes marine handling facilities and dock and pier operations associated with domestic and commercial waterborne commerce. Diversified Auto LLC, the operator of the Autoport, currently follows Best Management Practices (BMPs) such as sweeping the lot routinely, inspecting and cleaning out the catch basins as needed, minimizing exposure of pollution sources to precipitation, following specific guidance for managing salt storage areas, and keeping in place spill response procedures to ensure quick and effective response to unexpected spills..

The majority of surface water runoff from paved areas on the Autoport property drains into storm water catch basins. Surface water not intercepted by property catch basins, would travel overland and flow into the Mystic River or Little Mystic Channel. Because of the relatively flat topography of the site, there is no defined overland flow route (Weston, 1997). Some stormwater across the site is also collected in sewer drains that lead to a pump station which channels to the City of Boston Water Resources Authority. Catch basins are used within the portions of the Autoport site where the proposed WTTC would be located (both Options 1 and 2).

3.2.2.2 Environmental Consequences of the Proposed Action

Construction Impacts

Based on the size of the proposed WTTC building, MTC would need to apply for a stormwater permit to cover construction activities. MTC would apply for a stormwater NPDES Construction General Permit (promulgated by EPA in 2008 and whose coverage is available in Massachusetts) prior to the commencement of construction (see Appendix D for a comprehensive list of applicable permits). The General Permit provisions would authorize stormwater discharges from large and small construction-related activities that result in a total disturbance of equal to or greater than one acre, whose discharges

enter surface waters of the U.S. or a Municipal Separate Storm Sewer System. The permit requires operators to implement stormwater controls and develop SWPPPs to prevent sediment and other pollutants associated with construction sites from being discharged to surface waters in stormwater runoff. A Notice of Intent would be filed with EPA, where construction activities could commence after a seven day waiting period from the date the Notice of Intent is posted on the EPA's NPDES website.

Furthermore, an Order of Conditions would be required from the Boston Conservation Commission under the Massachusetts Wetlands Protection Act ([M.G.L. 131 40 and regulations at 310 CMR 10.00), because the proposed project is located in the buffer zone of a coastal resource area. Permit conditions are expected to focus on erosion and sediment control during the construction and maintenance of stormwater management systems. It is likely that the SWPPP developed for the General Construction Permit would meet the requirements of the Order of Conditions. Appendix D also describes these permits.

The proposed project will require federal consistency review with the Massachusetts CZM Program because it includes direct federal assistance to State and local governments and includes activities located within the Massachusetts coastal zone that are proposed seaward of a line 100 feet inland of the 100 year floodplain. Appendix E provides a summary of each of the 25 CZM program policies and three management principles established by 301 CMR 21.98 and describes how the project would be consistent with each applicable policy or management principle.

Construction activities would require water from municipal sources for concrete work and washing machinery and tools. Water for construction could be either trucked to the site as needed or obtained from existing potable water sources on the Autoport site. This water use would be short-term and minor relative to the amount of water available from municipal sources (see Section 3.2.7 "Infrastructure and Energy Use"). There is the potential for surface water contamination from hazardous spills that could occur during construction activities, however, BMPs for minimizing the potential for spills would be outlined in the construction-phase SWPPP as a condition of the General Permit.

Operation Impacts

The building would require minor amounts of municipal potable water for routine office uses (i.e. drinking water, sinks, and toilets). Intermittently, municipal water would be required for spraying to suppress dust from blade cutting. Overall, the water needs of the WTTC could be easily met by available municipal water supplies. The WTTC would direct sanitary wastewater to the municipal sanitary sewer system. Existing municipal water and sanitary sewer utilities are located in Terminal Street and only minor extensions would be needed to support the WTTC (see Section 3.2.7 "Infrastructure and Energy Use"). Neither river water nor groundwater are anticipated to be used for the purposes of cooling the hydraulic system. The Autoport and all of its subtenants are subject to regulation under the NPDES. As stated previously, the Autoport is currently developing a SWPPP covering its operations and those of its subtenants and will soon be submitting an application for a NPDES Multi-Sector General Permit. Based on the location of the Autoport adjacent to the Mystic River and its current impairment rating, there is a high potential for adverse effects to stormwater and surface water if stormwater pollution prevention practices are not followed. Under the Proposed Action, MTC would become a tenant to the Autoport, and the Autoport's SWPPP would be updated to include the operations of the WTTC. The Autoport would provide overall management and monitoring of tenant practices under the SWPPP but would require MTC to follow standard provisions of the plan, including:

- keeping pollution generating activities inside buildings;
- locating materials storage areas associated with the facility inside buildings;
- where pollution generating activities must be conducted outside of buildings, controlling the distribution of materials and cleaning up excess materials afterwards; and

- where materials storage areas must be located outside of buildings, providing a shelter and spill containment to minimize exposure and limit its migration from the source (Barrett, 2008).

Stormwater would be managed in accordance with the NPDES Multi-Sector General Permit that will be applied for by the Autoport as the WTTC would fall under the jurisdiction of this permit. Assuming that this permit is successfully obtained by the Autoport, it will include required measures to control stormwater pollution, which the WTTC would comply with. Additional procedures or BMPs may also be negotiated between the MTC and the Autoport to minimize the potential for stormwater contamination, considering that the WTTC would operate in a different fashion than other Autoport tenants. Specifically, MTC would be required to implement a procedure for collecting spray water and debris during outdoor blade cutting to minimize its contact with stormwater. By adhering to these processes and practices, the proposed WTTC would have minimal impact on stormwater or surface water quality. As the proposed WTTC would not increase the amount of impervious cover on the Autoport site, it would not result in any increased stormwater runoff rates.

Committed Measures

MTC will:

- implement a procedure for collecting spray water and debris from outdoor blade cutting;
- obtain a construction Stormwater permit and follow construction BMPs for stormwater pollution prevention;
- be covered by the Autoport's SWPPP and permit when they are finalized. Specific stormwater pollution prevention measures would be developed as necessary to cover MTC-specific processes; and
- ensure project compliance with the Massachusetts CZM polices as described in Appendix E.

3.2.3 Air Quality and Meteorology

This section describes the affected environment for and consequences to air quality of the Proposed Action. This resource area addresses: conformity to regional air quality plans and standards, emissions of priority pollutants, and dust generation.

3.2.3.1 Affected Environment

The entire Commonwealth of Massachusetts is within non-attainment areas for at least one criteria pollutant. Maintaining good air quality in the Boston area is a continual effort due to its large population, numerous industrial facilities, and high traffic volumes.

The WTTC would be located in the Boston-Lawrence-Worcester (Eastern Massachusetts) 8-hour ozone nonattainment area, which is a moderate nonattainment area. Massachusetts is one of 13 northeastern and Mid-Atlantic States comprising an Ozone Transport Region. The creation of an Ozone Transport Region enables measures which address ozone nonattainment as a regional problem, rather than addressing ozone nonattainment in each urbanized area individually (Section 184 of the Clean Air Act) (U.S. Senate, 2004).

Federal regulations (40 CFR 93 § 153 "Determining Conformity of Federal Actions to State or Federal Implementation Plans") define *de minimis* levels of criteria air pollutants, that is, the minimum threshold for which a conformity determination must be performed, for various criteria pollutants in various areas. The EPA established *de minimis* levels of ozone precursors in a moderate nonattainment area within an Ozone Transport Region are: 100 tons/year for nitrogen oxides (NO_X) and 50 tons/year for volatile organic compounds (VOCs) (EPA, 2007). These levels would apply to the proposed WTTC construction and operations.

The Boston Air Pollution Control Commission (APCC) protects air quality at the local level in the City of Boston. Its programs address:

- air pollution, including dust from construction sites, smoke from industrial sites, and exhaust from idling vehicles;
- parking facilities in downtown Boston, South Boston, and East Boston;
- abrasive blasting; and
- noise from construction sites, ventilation equipment, and other sources.

The APCC writes and enforces regulations, grants permits, advises other City Hall departments, holds public hearings, and cooperates with other local, regional, State, and Federal agencies in the pursuit of common goals. The APCC also administers the City's Transportation and Air Quality Grants program. In addition, a unique partnership between EPA, private companies, schools, universities, hospitals, and local and State governments was formed called Greater Boston Breathes Better to promote strategies and implement projects to reduce air pollution from transportation and construction sources (EPA, 2004). Between 2004 and 2006, this Partnership helped retrofit more than 1,600 diesel vehicles with advanced pollution controls that reduce per-vehicle emissions by 30-90 percent. During 2005 and 2006, the City of Boston retrofitted all 500 of its school buses with this technology and committed to supplying them with ultra-low sulfur diesel fuel.

Massport also has programs to reduce air emissions associated with its operations and increase the use of alternative fuels. In 2004, Massport developed its first Sustainability Plan (see Section 3.2.13).

On April 18, 2007, Governor Deval Patrick signed Executive Order 484, "Leading by Example - Clean Energy and Efficient Buildings". The order instructs all agencies involved in the construction and major

renovation projects of over 20,000 square feet to meet LEED certification, while incorporating specific LEED criteria, including: energy performance 20 percent better than the Massachusetts Energy Code, outdoor water reduction requirements, and verification by an independent third party building commissioning authority. In January 2007, the City of Boston adopted "Code 37 - Green Buildings" which requires new buildings greater than 50,000 square feet to be LEED certifiable. Specifically, these buildings must feature a certain number of Boston Green Building Credits to be approved by Boston's Interagency Green Building Committee (City of Boston, 2007a).

Many of the LEED goals relate to energy efficiency and use of renewable energy resources, which may reduce the demand on regional power plants that are typically large quantity generators of priority air pollutants. The proposed WTTC building would be approximately 50,000 square feet and the design is intended to meet or exceed State and City requirements for sustainable design with a goal to at least achieve Massachusetts LEED Plus requirements

3.2.3.2 Environmental Consequences of the Proposed Action

Construction Impacts

Use of construction equipment would result in emissions of carbon monoxide, nitrogen dioxide, various hydrocarbons, particulate matter, and small amounts of sulfur dioxide. However, these emissions would be highly localized, short-term, and would have a negligible impact on the overall air quality of Charlestown.

Massport requires all contractor and subcontractor diesel-powered non-road construction equipment with engine horsepower (HP) ratings of 60 HP and above, which are used on the project for a period in excess of 30 days, to be retrofitted with emission control devices, in order to reduce diesel emissions. In addition, all motor vehicles and construction equipment shall comply with all pertinent local, State and Federal regulations covering exhaust emission controls and safety. In addition, Massport requires contractors to use methods to control nuisance odors associated with diesel emissions from construction equipment, including: (1) turning off diesel combustion engines on construction equipment not in active use and on trucks that are idling for five minutes or more, while waiting to load or unload material; (2) locating diesel equipment away from the general public and sensitive receptors (e.g., fresh air intakes, air conditioners and windows); and (3) utilizing electronically-powered scissors/man lifts. These contractual requirements would help minimize construction-related air emissions and odors at the site.

There would also be a slight increase in workforce-related vehicular traffic traveling to and from the proposed WTTC site during construction. However, these increased emissions would be so small as compared to the overall traffic-related emissions in the area, that the effects would be negligible on overall air quality.

As the Proposed Action would be a Federal action located in a non-attainment area for ozone, it must be reviewed in accordance with the General Conformity provisions of the Clean Air Act Amendments of 1990 and any relevant State Implementation Plan.

Based on the size of the proposed building, the construction phase of the project would result in emissions of ozone precursors that are less than $1/10^{th}$ of *de minimis* levels, and would not require a conformity analysis under the Clean Air Act.

Operation Impacts

The small workforce and infrequent delivery of blades to and from the WTTC would result in very minor amounts of air pollution from WTTC vehicle traffic. Transporting blades by boat instead of truck would reduce air pollution to varying degrees depending on the length of the routes. For example, on a per ton-mile basis, truck emissions are substantially greater than boat emissions: six times greater for hydrocarbons; eight times greater for carbon monoxide, and 18 times greater for nitrogen oxides (Haulk, 1997). The ability to test large blades from domestic sources in the U.S. instead of transporting them to

European testing sites would have an overall beneficial impact in terms of reducing transportation-related air emissions.

There would be no stationary sources of air pollution in the facility that would require new air permits under the Clean Air Act and MassDEP regulations. The high efficiency heating system would emit only minor levels of air pollutants that would fall below *de minimis* levels of ozone precursors and other criteria pollutants. Equipment would be powered by electricity and there would be no reliance on gas-fired generators for routine operations, which would otherwise be a source of air pollution. However, the cutting of blades for failure analysis (post-mortem inspection) or disposal would generate some fiberglass dust. This cutting would be conducted either indoors or outdoors in accordance with operating procedures developed in coordination with NREL, to minimize airborne dust, similar to the practice currently used at the Colorado NWTC site. These procedures include using a water spray for wire saw cutting and dust collector (ventilator) when cutting with a reciprocating or circular saw. Stormwater BMPs that require the routine sweeping of outdoor areas to remove dust and debris would also minimize the potential for wind-blown dust.

Based on the energy efficiency and renewable energy design features of the building and the use of BMPs to limit dust emissions during blade cutting, there would be negligible to minor impacts to air quality from the Proposed Action.

Committed Measures

MTC will:

- develop and implement a blade cutting operating procedure to minimize fiberglass-containing airborne dust; and
- utilize Massport construction specifications and construction contractors will control construction-related air emissions through dust suppression and equipment Emission Control Devices (for diesel-powered construction equipment with horsepower [HP] ratings of 60 HP and above that are used on the project in excess of 30 days).

3.2.4 Geology and Soils

This section describes the affected environment for and consequences to geology and soils of the Proposed Action. These resource areas address: geologic features (bedrock), soils, and disturbance to these resources.

3.2.4.1 Affected Environment

The Autoport site lies within the Lower New England Physiographic Province (NEsoil, 2008) in the Boston Basin physiographic subregion that consists of a topographic lowland surrounded by a ring of hills (BPRD, 2002a). The bedrock unit at the site consists of the Cambridge and Braintree Argillite. The Cambridge Argillite, classified as a shale or mudstone, is a fine-grained sedimentary unit most likely deposited in deep oceanic waters millions of years ago when the Boston area was below sea level (BPRD, 2002a). The natural surficial material at the site consists of sand and gravel deposits from glacial outwash that was deposited as glacial ice melted (BPRD, 2002a). Major streams in the area are fed by numerous smaller ones with irregular, unsystematic patterns, a common feature of glaciated land. Also, isolated ponds and swamps are numerous in this Province (NEsoil, 2008).

The topography of the Charlestown area typifies a highly urbanized waterfront that has been altered significantly to accommodate industrial activity through the progressive filling of tidelands and subsequent development. Elevations range from approximately 20.2 North American Vertical Datum of 1988 (NAVD88) along Medford Street in the vicinity of 465 and 425 Medford Streets and the Massport Medford Street Terminal to approximately 10.0 NAVD88 along the upland portion of the shoreline. Elevations in the Boston Basin range from approximately sea level to 150 feet (NEsoil, 2008). Glacial landforms dominate the topography of the Boston Basin, with more than 100 drumlins (smooth, oval-shaped hills comprised of glacial till) (BPRD, 2002a), including Breed's Hill and Bunker Hill in Charlestown (NEsoil, 2008).

The proposed WTTC site has been covered with approximately 16 inches of asphalt/concrete (Weston, 1997). Soils at the site are classified as Udorthents, wet substratum (Ue) and Urban Land/wet substratum (Uw) with zero to three percent slopes (WSS, 2008). Table 3-1 lists the soils located in and around the project area.

Table 3-1. Soils Found In and Around the Proposed Project Area

Soil Map Unit	Description
Udorthents, wet substratum (Ue)	This map unit consists of filled areas that were previously tidal marshes, river floodplains, bays, harbors, and swamps. The fill consists of rubble, refuse, and mixed soil material, typically sand, gravel, and channel dredgings. The depth of this map unit ranges from 2 to 20 feet.
Urban Land, wet substratum, 0 to 3 percent slopes (Uw)	This map unit consists of urban land developed in areas of Udorthents, wet substratum. Buildings, industrial areas, pavement, and railroad beds cover more than 75 percent of the land surface. Because most of this map unit is covered with impervious surfaces, almost all rainfall runs off.

Source: Peragallo, 1989

The site was discovered to be contaminated in 1986. Some residual polychlorinated biphenyls, lead, zinc, polycyclic aromatic hydrocarbons, and volatile petroleum hydrocarbons remain in the soils. See Section 3.2.6, "Waste Management", for a full description of the site's contamination and remediation history.

3.2.4.2 Environmental Consequences of the Proposed Action

Construction Impacts

Construction of the WTTC at the Autoport site would require breaking through the protective concrete layer to install a building foundation on reinforced concrete caissons bearing into a Boston blue clay layer which begins 35 feet below grade. This disturbance could temporarily create dust from wind erosion and would require removal of the soil displaced by the foundations. Any soil which needs to be removed would be characterized and disposed of under the oversight of an LSP to minimize potential cross-contamination. The LSP would also ensure proper protocols are followed.

The construction of the WTTC under either site option on the Autoport site would result in negligible impacts to soils and geology due to the highly disturbed nature of the site. The primary concern with respect to the disturbance of contaminated soils would be worker safety (see Section 3.2.14) and waste disposal (see Section 3.2.6).

Operation Impacts

The WTTC would result in negligible impacts to geology and soils in the project area, as ground disturbing activities would not be conducted as part of operations.

Committed Measures

MTC will obtain the services of an LSP to manage and oversee the removal of contaminated soils from the AUL area during construction.

All contaminated soil that is excavated will be segregated and staged on plastic sheeting to avoid contact with surface soils. The soil piles will be covered with plastic sheeting at the end of each work day and will be disposed at appropriate receiving facilities with all necessary manifest documentation.

3.2.5 Biological Resources

This section describes the affected environment for and consequences to biological resources of the Proposed Action. This resource area addresses: wildlife (terrestrial, avian, and aquatic species), habitat, and vegetation.

3.2.5.1 Affected Environment

The Autoport site is located in the Boston Basin Ecoregion. This ecoregion has a long history of human land use and, as a result, natural forests and other native plant communities occur in remnants and small patches (BPRD, 2002a). Due to the heavy industrial use and extensive pavement of the Autoport site, vegetation in the immediate vicinity of the proposed WTTC site options is extremely limited. As a consequence, the site lacks suitable habitat for wildlife except for those species that are highly adaptable to human development. Common urban wildlife species, such as raccoons, opossums, rodents, and pigeons, are likely transient residents of the property. These species have successfully adapted to human habitation and are able to find food and shelter in a variety of urban settings. Use of the site by migratory birds is expected to be minimal or nonexistent considering the lack of vegetation on the site as well as the surrounding urban setting.

The Mystic River runs along Charlestown's north shore for approximately two miles, most of which is dominated by industrial marine transportation enterprises (BPRD, 2002a), including the Autoport site. Fish species in the river include alewife, blueback herring, largemouth bass, bluegill, and carp, but pollution from drainage of nearby cities and dam building have severely damaged the populations by raising bacteria levels and turbidity and restricting the access of anadromous fish (e.g., fish from the sea that migrate up fresh water rivers to breed).

The Endangered Species Act (16 U.S.C. 1531 *et seq.*) prohibits the "taking" (i.e., harming) of any species listed by the U.S. Fish and Wildlife Service as being either threatened or endangered. Harming such species includes not only direct injury or killing, but also disrupting the habitat on which they depend. There are no State or Federally listed or proposed threatened or endangered species or critical habitat located in the project area. The Autoport site does not include any estimated habitat of rare species, vernal pools, priority sites of rare species, or exemplary natural communities, nor is it within or adjacent to an Area of Critical Environmental Concern (ACEC).

3.2.5.2 Environmental Consequences of the Proposed Action

Construction Impacts

Impacts to biological resources generally occur through habitat modification, land disturbance, disturbance to or taking of rare, threatened, or endangered species, or exposure to environmental contaminants. However, the proposed WTTC sites do not contain any natural wildlife habitat and are already intensively developed and paved over. Accordingly, project construction would not require vegetation clearing and thus, no impacts to vegetation or wildlife habitat would occur at the site. Construction noise may temporarily disrupt wildlife, however these impacts would be negligible as the project area is located within an urban, human dominated landscape and any wildlife species present are adapted to developed areas. Therefore, no impacts to wildlife would be anticipated under the Proposed Action.

Operation Impacts

Project operation would not result in any impacts to vegetation. Increased noise in the area from fans for a cooling system or outside blade cutting operations could result in a minor localized disruption to urban wildlife in the immediate vicinity of the site. However, because the proposed site is located in an industrial area with frequent vehicle traffic (cars and trucks), these impacts to wildlife would be negligible.

Committed Measures

No committed measures will be required.

3.2.6 Waste Management

This section describes the affected environment for and consequences to waste management of the Proposed Action. This resource area addresses: handling and generation rates for hazardous, regulated and solid waste, and waste recycling.

3.2.6.1 Affected Environment

Types of Waste

Waste can generally be divided into three broad categories, which include hazardous, nonhazardous, and universal wastes. A hazardous waste is a waste with properties that make it dangerous or potentially harmful to human health and/or the environment. Hazardous wastes are Federally regulated under the Resource Conservation and Recovery Act (RCRA) Subtitle C (EPA, 2008b). In Massachusetts, hazardous wastes are defined and regulated by the MassDEP under 310 CMR 30.000 (2). Hazardous wastes can be liquids, solids, contained gases, or sludges. They can be the by-products of manufacturing processes or simply discarded commercial products, like cleaning fluids or pesticides (EPA, 2008b). Both RCRA and MassDEP define a hazardous waste as a waste that appears on one of the four hazardous wastes lists produced by the EPA, which include the F-list, K-list, P-list, or U-list, or exhibits at least one of four characteristics—ignitability, corrosivity, reactivity, or toxicity (EPA, 2008b).

Nonhazardous wastes are all other wastes that are not defined as a hazardous waste as outlined above, which is what is typically thought of as residential and municipal waste. Used oil and other lubricants (such as hydraulic fluids) are also generally included as nonhazardous wastes when not meeting the ignitability criterion as defined by EPA (EPA, 2008b).

Universal wastes are certain hazardous wastes, such as batteries, certain pesticides, mercury-containing thermometers, and fluorescent lights, which when managed and/or recycled properly, are not included as hazardous waste. Universal wastes were originally designated to encourage facilities to recycle these materials rather than dispose of them as hazardous wastes (EPA, 2008c).

Waste Collection

The City of Boston, Department of Public Works, Sanitation Department, presently provides waste and recycling collection services to residences within the City. There are presently no landfills within the limits or in the vicinity of Boston. Waste collected by the City is transported and disposed of at one of several out-of-State landfills. The City does not currently provide waste collection services to commercial or industrial facilities. Such facilities are required to retain a private collection service. In addition, hazardous wastes which are generated by these facilities must also be collected separately and disposed of properly by a private service. Currently, the City of Boston retains the services of Clean Harbours Environmental Services, Inc., for hazardous waste disposal purposes (Boston DPW, 2008).

Waste Present On-Site

The Autoport site contains confirmed subsurface soil contamination based upon previous environmental investigations by third-parties and is currently regulated under the Massachusetts Contingency Plan (Release Tracking Number 3-694). The site is covered by an August 7, 1997 AUL issued by MassDEP which controls and manages on-site activities which limit exposure to regulated materials. The site was formerly a railroad yard, coal terminal and later used for scrap metal exporting. Polychlorinated Biphenyls (PCBs) were discovered on the site in 1986 and were subsequently removed. Some residual PCBs, lead, zinc, Polycyclic Aromatic Hydrocarbons (PAHs) and Volatile Petroleum Hydrocarbons (VPHs) remain in the soils. Though the highest concentrations of contaminants occur in the northeast portion of the property, all contaminants of concern listed above have been observed throughout the entire AUL area. In general, the contaminated soil within the AUL boundary (which includes site Option 1 and 2) generally extends from just below the surface fill (beneath the concrete) to depths of five to seven feet

below ground surface; however, further characterization would be required under TSCA and would be conducted prior to the start of construction. In the vicinity of the proposed WTTC site options, the Autoport site is covered by a roller-compacted concrete wearing surface, that in some areas is covered by an additional asphalt paved surface layer. Subsurface explorations performed in June 2008 during the WTTC Program Definition Phase revealed that the roller-compacted concrete layer was between 15.6 and 18 inches thick. In general, these surfaces appeared to be in good condition, mostly level, with only minor cracking observed. The AUL indicates that no further action is necessary at the site provided it continues to be used in its current manner. Any changes, construction, or other alterations to the site could require further remedial action (Weston, 1997).

It should be noted that PCBs, while hazardous in nature and meeting the toxicity characteristics defined by RCRA, are regulated by TSCA. PCBs are similarly generally exempt from MassDEP hazardous waste regulations.

3.2.6.2 Environmental Consequences of the Proposed Action

Construction Impacts

During construction, minor amounts of typical construction refuse and debris would be generated and would need to be disposed of properly. However, the site is currently covered with asphalt and concrete and a small portion would be removed and disposed of prior to construction where the foundation caissons would be installed. Although the specific LEED features of the project have not yet been determined, recycling a high percentage (at least 50 percent for LEED credit) of construction waste could be a LEED aspect of the project.

In addition, areas of soil would need to be excavated in order to install the building's foundation and utilities. Soil excavation would result in the generation of hazardous, nonhazardous, and TSCA, regulated waste and would be required to be managed and disposed of off-site at appropriate, permitted landfill facilities. Any activities at the site which would compromise the provisions of the existing AUL would require submittal of the appropriate permits to MassDEP and would need to be performed under the oversight of a Massachusetts LSP as defined by MassDEP. Once soil disturbance activities are completed, the asphalt/concrete cap would be reinstalled to prevent further possibility of worker contact. Either site option would result in minor impacts in terms of generating contaminated soil requiring safe disposal.

Operation Impacts

The NWTC in Colorado currently contains approximately 80 employees. During a five-year period from 1997 through 2001, the NWTC produced an average of approximately 2,300 pounds of nonhazardous waste per year (NREL, 2002). It is estimated that the WTTC would produce only about 10 percent (assuming eight full-time employees and a significantly smaller campus) of that amount, which would be roughly 230 pounds per year. Site operations would require the use of some regulated and/or hazardous materials, such as hydraulic fluid, nitrogen gas (used to charge the hydraulic accumulators on the hydraulic power supply), and minor amounts of cleaners, lubricants and epoxies. The use of these materials would inevitably result in the disposal of minor amounts of hazardous or universal wastes. It is anticipated that the proposed facility would qualify as a Conditionally Exempt Small Quantity Generator (CESQG) of hazardous waste as defined by RCRA. A CESQG is defined as a facility that does not generate more than 220 pounds (or 25 gallons) of hazardous waste per month. Under MassDEP regulations, the facility would be regulated as a Very Small Quantity Generator of hazardous waste (310 CMR 30.353), which is analogous in definition to a RCRA CESQG. If the facility meets the definition of a Very Small Quantity Generator under MassDEP, it would be required to obtain a Massachusetts hazardous waste identification number pursuant to 310 CMR 30.353(5) and must comply with the regulations established at 310 CMR 30.0000. The exact amount of hazardous waste generation is not known at this time. However, for comparison purposes, the NWTC produced an average of 600 pounds

of hazardous waste per year from 1997 through 2001, and was also classified as a CESQG (NREL, 2002). Overall, the WTTC would result in minor impacts in terms of solid and hazardous waste generation.

Committed Measures

MTC will:

- develop and implement a work plan for the safe handling and appropriate disposal of contaminated soil removed during the construction process;
- manage, test, and dispose of excavated soil consistent with RCRA and TSCA regulations; and
- develop a waste minimization program that includes recycling. MTC will investigate and implement ways to recycle otherwise discarded wind turbine blade materials.

3.2.7 Infrastructure and Energy Use

This section describes the affected environment for and consequences to infrastructure and energy use of the Proposed Action. These resource areas address: utility infrastructure such as water, wastewater, electricity and natural gas and the ability to supply energy necessary for the project.

3.2.7.1 Affected Environment

The Boston Water and Sewer Commission provides water supply and sewage disposal services to the Boston area. The Boston Water and Sewer Commission in turn purchases wholesale water and sewage disposal from the Massachusetts Water Resources Authority (MWRA), which supplies water for 41 metropolitan Boston communities. There are two sources of water: the Quabbin Reservoir, which is fed by the three branches of the Swift River, and seasonally by the Ware River; and the Wachusett Reservoir, which receives some of its water from the Quabbin Reservoir and is fed by the Nashua, Quinapoxet, and Stillwater Rivers. Water drawn from the two reservoirs is treated at the John J. Carroll Water Treatment Plant, and then distributed to consumers. The two reservoirs combined supplied an average of 220 million gallons per day to consumers in 2004 (MWRA, 2004).

Sewage is treated at the MWRA Deer Island Sewage Treatment Plant, located on Deer Island which is an island in Boston Harbor. Deer Island is the second largest sewage treatment plant in the U.S. The system can process flows in excess of 1,200 million gallons per day.

NSTAR is the largest Massachusetts-based, investor-owned electric and gas utility. NSTAR transmits and delivers electricity and gas to 1.1 million electric customers in 81 communities and nearly 300,000 gas customers in 51 communities. NSTAR is the exclusive distributor of electric power to the City of Boston, though due to deregulation, customers now have a choice of electric generation companies. Natural gas is distributed by National Grid (formerly KeySpan) and customers may choose an alternate natural gas supplier.

Verizon provides telecommunication services to the area.

3.2.7.2 Environmental Consequences of the Proposed Action

Construction Impacts

Construction of the proposed WTTC at the Autoport site would require the extension of water, sewer, electrical power, natural gas, and telecommunication lines from existing services to the new building and support facilities. In addition, a 2,250-foot feeder from the nearest substation would need to be installed to get electrical power to the building. One or more small transformers may need to be installed at the site to provide necessary electricity to the building. Construction of this feeder would take four to six months and it is expected that NSTAR would provide this infrastructure at no cost, or that grant monies from the Commonwealth (e.g., Community Development Action Grant) could be used to pay for this infrastructure.

Construction of new potable water, sanitary sewer, natural gas for heating, and telecommunication connections at the site would not disrupt adjacent occupied facilities and would have negligible impacts on infrastructure and energy use.

Operation Impacts

The building would be designed to meet LEED Plus criteria under Commonwealth of Massachusetts Executive Order 484, making it a very energy efficient building (see Appendix B for a description of the Massachusetts LEED Plus requirements). The LEED for New Construction Rating System is designed to guide and distinguish high-performance commercial and institutional projects, including office buildings, high-rise residential buildings, government buildings, recreational facilities, manufacturing plants and laboratories.

As a proposed LEED Plus certifiable facility, water conservation would be a key element of the WTTC's building features. Typical water consumption for this research and testing facility would be 15 to 35 gallons per employee per day. Assuming eight full-time employees, annual water consumption would be less than 72,800 gallons/year. To estimate water use for blade cutting, it was assumed that blade cutting would occur no more than 20 times a year, for less than four hours each occurrence, with a water spray of five gallons/minute; for a total of 24,000 gallons/year. Combined, this water use represents less than 0.01 percent of the annual municipal potable water supply. Furthermore, a review of the recent water history of the DPA parcels indicates that with the closing of a candy factory and its sugar refineries, average daily water use for this portion of the DPA has declined by 75 percent since the mid-to-late 1980's. With the conversion to commercial uses and the use of large areas of the DPA for product staging by the Autoport, average daily water use for the entire DPA from 1990 to 2002, has been relatively stable at approximately 130,000 gallons per day (CZM, 2002). With such a decline in water use since the 1980's the proposed project's use of water for potable or sanitary purposes would be minor and would not deplete the available resources. The increased demand for water consumption would be readily met by the Boston Water and Sewer Commission (Bagley, 2008). Associated increases in wastewater discharges would be accommodated by the existing capacities provided by the Deer Island Sewage Treatment Plant.

The WTTC blade testing machinery would utilize substantial amounts of energy, particularly for fatigue tests that operate 24 hours a day for two to three months. However, the electrical load requirements would easily be met by the NSTAR power supply grid. Natural gas would be supplied by National Grid. New telecommunications services would be provided by Verizon. Some minor transportation-related infrastructure impacts (movement of traffic lights or signs at a local intersection) may be necessary to accommodate truck turns (discussed in Section 3.2.8).

The operation of the WTTC at either site option would result in negligible impacts to minor impacts on infrastructure or energy use.

Committed Measures

No committed measures will be required.

3.2.8 Transportation

This section describes the affected environment for and consequences to transportation for the Proposed Action. This resource area addresses: site access, traffic, compatibility with local and regional transportation plans, and transportation infrastructure improvements.

3.2.8.1 Affected Environment

Regional and Local Access

The Autoport is located within the northeastern section of Charlestown on the Boston Harbor, between I-93 and the Tobin Memorial Bridge, and is bounded by the Mystic River to the north and the Little Mystic Channel to the south. The project site can be accessed directly by land- or water-based transportation. For road transportation, the site can be accessed through an existing gate at the southeast corner of the property, just under the Tobin Memorial Bridge and by reactivating an existing gate on Terminal Street. For water-based transportation, the site has direct access to an area with an existing operational port capability with a 1,200-foot long dock and a 40-foot minimum water level. The Autoport imported and exported approximately 50,000 vehicles by water vessel in 2008. Approximately 830 vessels (bulk cargo, container ships, and cruise ships) entered and departed the entire Port of Boston in 2008. Figure 3-4 illustrates the primary routes that vehicles take to access the Mystic River DPA. Two expressways (I-93 and Route 1) run along the borders of Charlestown. I-93 is a north-south highway that provides direct connections to many local and regional destinations, including connections to I-90 and I-95. Rutherford Avenue is a major arterial connecting Route 99 and Mystic Avenue to downtown Charlestown. Highway ramps that are located in City Square provide connections to I-93 to the south and Route 1 to and from the north. The City Square ramps are accessed via Chelsea Street, which also connects to Terminal Street and Medford Street. Chelsea Street is used by car carriers to and from the Autoport.

The Mystic River DPA can be characterized as long and relatively narrow with significant open space for bulk cargo handling that requires large laydown and handling areas, access to rail and truck routes, and parking (CZM, 2002). Historically, the DPA has handled high shipment volumes of automobiles, cement, gypsum, and the importing of heavy industrial machinery. In 1998, Massport, with the U.S. Army Corps of Engineers, initiated the "Boston Harbor Navigation Improvement and Berth Dredging Projects," which involved the deepening of three tributary channels (including the Mystic River channel) to provide sufficient ship maneuvering areas. The Moran Terminal (now the Autoport) was dredged to 40 feet MLW in 1994 in advance of the full Federal dredging project. In general, deep-water access (i.e., 20 feet or deeper) is available for the majority of the Mystic River DPA, including the Moran Terminal.

Roadway Traffic Volumes and Conditions

Along with high active growth and improvements over the last several years in Charlestown, the City has also dealt with increased traffic. Because of increased residential density and planned land uses near the project site, truck traffic from the port along Medford and Terminal Streets has led to concerns from nearby neighborhoods regarding noise and traffic congestion (Rizzo Associates, 2005). The Autoport's tenants in the Mystic River DPA have worked with residents in neighborhoods located across the maritime industrial users (south of Medford Street) to direct traffic to Chelsea Street and reduce truck travel on Medford Street.

In order to take advantage of the city's harbor location while enhancing neighborhood quality of life, the Charlestown Haul Road/Rail Corridor Feasibility Study was conducted for Massport in 2005 (Rizzo Associates, 2005). The study evaluated the future potential for both truck and rail access to the Mystic River DPA and examined conditions of existing transportation infrastructure that serve businesses in a corridor along Medford Street. The study area for this report is an east-west corridor (generally along

Medford Street) that extends from Rutherford Avenue in the west to Terminal Street in the east (near the proposed WTTC facility site). The following lists some key findings relevant to the WTTC project area:

- The peak hours varied by location and illustrate the differences between the eastern and western sections of the study corridor. The peak hours on Terminal Street and Chelsea Street occur between 6:00 a.m. to 7:00 a.m. and approximately 4:00 p.m. to 5:15 p.m. and are influenced by the hours of operation of First Student and the maritime industrial uses at this end of the corridor. The Main Street and Medford Street peak hours occur between 7:45 a.m. to 8:45 a.m. and approximately 4:45 p.m. to 6:00 p.m., coinciding with and influenced by commuting patterns;
- The intersections of Terminal Street/Autoport driveway and Terminal Street/Chelsea Street are characterized by wide-open paved areas and high truck volumes; however, these intersections are generally functioning at levels representing the best operating conditions (e.g., free flow, little delay) during peak traffic hours; and
- The highest number of accidents occurred at the intersections of Rutherford Avenue/Route 1 ramps (just northwest of City Square) and Sullivan Square/Cambridge Street/Maffa Way; however, the accident rates at these intersections (i.e., crashes per million vehicles entering the intersection) still fall below the State-wide and district average accident rates.

Source: Rizzo Associates, 2005

Figure 3-4. Primary Routes and Roadway Access to Mystic River DPA

According to the feasibility study, the highest traffic volumes occur on Main Street eastbound in the morning peak hour, which is a gateway to Charlestown and the maritime industrial uses in the Mystic

River DPA. All of the study intersections along Medford Street and Terminal Street operate with minimal congestion. While recent accident data suggests that the study area intersections do not have significant traffic safety problems, observations indicate that the spacing of the intersection and conflicts between through traffic and vehicles stopped to make left-turns are potential safety concerns (Rizzo Associates, 2005).

Future Transportation Improvement Plans

As a component of the City of Boston's planning initiatives for Charlestown, and in response to community concerns about traffic, the concept of a designated haul road through the waterfront subdistricts of Charlestown has been planned as far back as 1990. In continuing with this concept, the Charlestown Haul Road/Rail Corridor Feasibility Study identified several alternatives for the location of a haul road and connections to existing rail lines and improvements that would benefit existing access and preserve future access opportunities to the Mystic River DPA to enhance the use of Massport and other properties for maritime industrial purposes.

The haul road/rail corridor feasibility study acknowledged that in order to move forward on the concept of a haul road, two previous planning studies should also be regarded for insight to potential connections that may influence the design of a haul road: "Feasibility Study – Proposed Medford Street Bypass Road (Haul Road)" and "The Rutherford Avenue Corridor Transportation Study" (Rizzo Associates, 2005). The Rutherford study contains a design to reconstruct Rutherford Avenue consisting of two components: a new four-lane bypass road adjacent to I-93 to remove regional traffic from Rutherford Avenue and a four-lane roadway for local Charlestown traffic. The project also includes a redesigned Sullivan Square to accommodate the bypass road connection to Route 99 (Rutherford Avenue).

3.2.8.2 Environmental Consequences of the Proposed Action

Construction Impacts

Generally, construction impacts to existing transportation resources would be temporary and localized. At a maximum, it is expected that 150 construction personnel would be working onsite, although closer to 50 would likely be the average. These workers would drive their personally-owned vehicles to and from the site. The addition of these vehicles would cause minor congestion along nearby roadways; however, construction work typically begins early in the morning before peak morning traffic and ends relatively early in the afternoon before peak afternoon traffic. Construction vehicles would add to existing traffic and would potentially cause minor congestion along busy roads. However, because construction vehicles/equipment would be at its peak volume during the beginning and ending of the construction phase (once the construction vehicles and equipment are in the project area they would remain in place during the construction phase – approximately a six-month duration), it is expected that these vehicles would result in temporary and minor impacts on the local traffic. Because the Autoport has a fairly large, open paved area, it is anticipated that adequate space would be available to stage equipment and vehicles. Furthermore, MTC would coordinate construction activities with the other Autoport tenants to minimize disruption of their operations. Therefore, impacts to the circulation of and access to the project area would be minor.

Operation Impacts

An estimated 12 to 15 blades would be tested at the facility annually. The blades would be transported to the WTTC primarily by ship/barge to the existing docks at the Autoport site. Blades delivered by ship would be off-loaded by a rental crane. Figure 3-5 illustrates the potential site access for the proposed WTTC. The figure also shows that blades arriving via water-based transportation would be off-loaded from an ocean vessel and transported across the Autoport as shown. Transport of blades by barge/ship would have negligible impact to water transportation in the area, as 15 annual blade shipments would represent an increase of only 1.5 percent compared to the 2008 vessel traffic in the Port of Boston.

Blades that may be transported by truck would access the site from Terminal Street at a reactivated existing gate or at a proposed new gate where Chelsea Street ends at Terminal Street (see Figure 3-5). Because the Autoport plans to move their equipment/cars as necessary for the project, transportation of the blades from trucks or ships would have negligible impacts to traffic circulation at the site.

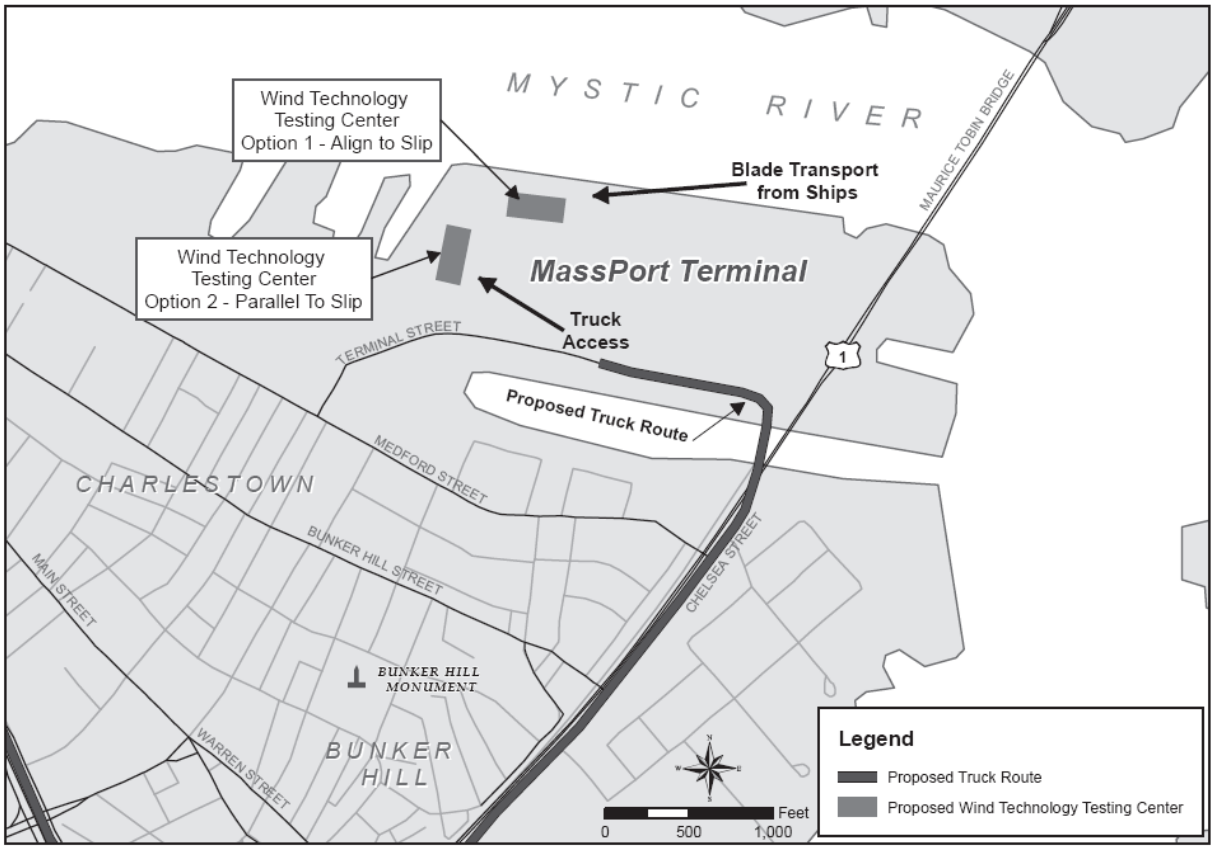


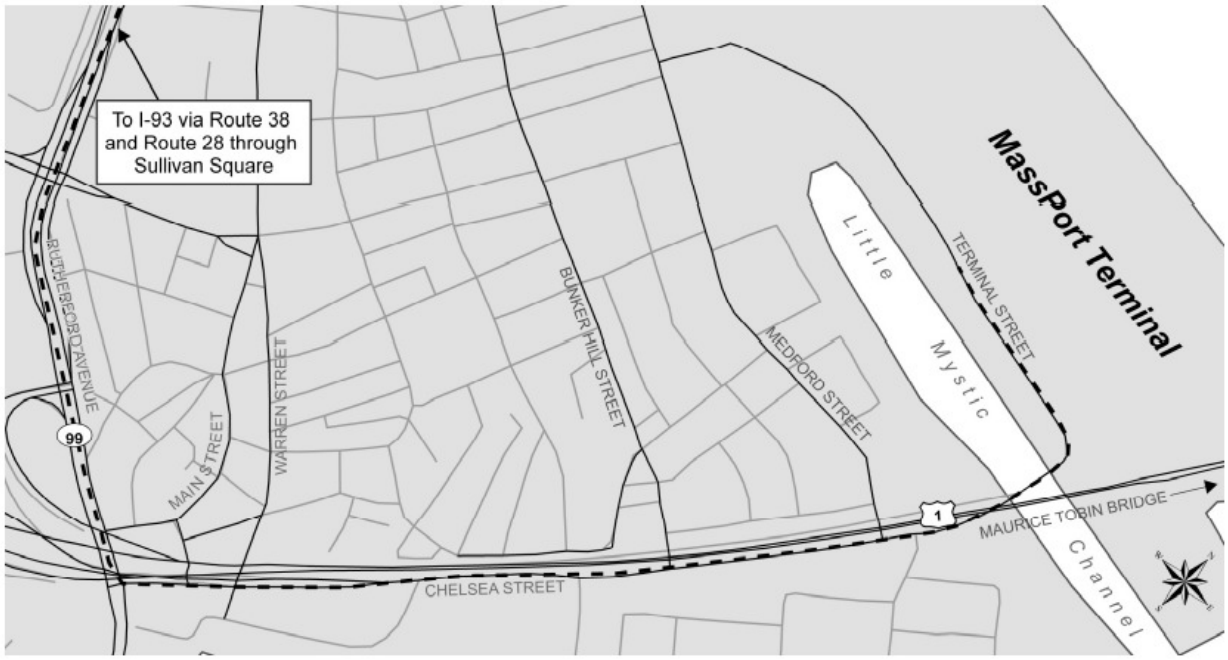
Figure 3-5. Site Access for Land- and Water-Based Transport

A transportation study was conducted for NREL in order to analyze the effectiveness of delivering the wind blades – via water-based transportation or via land– to the project site (VHB, 2007). For water-based transport, the study evaluated the transport of 70-meter (230-foot) blades from four domestic and international ports (Houston, TX; Rhode Island; Amsterdam, Netherlands; and Santos, Brazil). For land-based transport, the study evaluated the costs and feasibility of delivering the 50-meter blades by trucks from three domestic sites (Houston, TX; Cedar Rapids, IA; and Cranston, RI) and The study concluded that the project site could accommodate all three modes of transportation directly to the site and with minimal investment. A second transportation analysis reviewed the maximum sized blade that could use the local roadway system to arrive at the WTTC location. Any blade longer than 63-meters begins to impact roadway objects that are immovable or require adjustments to private properties that cannot be easily accommodated (VHB, 2009).

Constraints that were considered for trucking the blades included: the minimum clearance beneath an interstate highway bridge, the average width of a typical interstate highway lane, and the maximum weight allowed on an interstate highway. Customized delivery trucks and over-sized vehicle permits would be required for the transport of the blades over local, State, and Federal roadways. Within Massachusetts, trucks carrying oversize loads require escort cars in the front and back of the truck and an additional Massachusetts State police escort (Massachusetts Highway Department, 2004). Each state has their own regulations for oversize vehicles and permits would be needed for each state along the route

from the blade manufacturing facility to the WTTC. The commercial trucking company enlisted by the manufacturer to transport the blades would have experience with nationwide oversize load transport. The trucking company would conduct route planning and obtain an oversize load permit for each state along the route.

In light of the constraints, the study indicated that truck deliveries to the Autoport could be accessed through the following route: I-93 (southbound) to Route 38 to Route 28 (through Sullivan Square) to Route 99 (Rutherford Avenue) to Chelsea Street to Terminal Street. Figure 3-6 shows the truck route from Rutherford Avenue to the project site and the turning radius of a 50-meter specialized vehicle at each of the critical intersections along the route.



Source: VHB, 2007

Figure 3-6. Local Truck Route from I-93 to Proposed WTTC Site

The transportation study indicated that there were no significant obstructions within the corridor routes. Up to seven utility/signal poles were identified as being potential obstructions within the local roadway network; however, the study concluded that these obstructions could be relocated with advance notice under proper procedures with the utility company and/or the City of Boston. Because the sidewalks and utility poles are City property, utility companies are obligated, if directed by the city, to move a utility pole at no charge. Typically the utility company passes the costs to the private entity making the request. Based on discussions with the City of Boston, NREL anticipates that the City would grant these requests and does not expect any further issues with relocating the utility poles if needed (Springsteel, 2008a). Figure 3-7 shows the intersection of Route 99 and Chelsea Street that would most likely require a modification to the existing traffic light to provide a clear turning movement for an over-sized truck.

Street signals that need to be modified may be put on pivot hinges, so that a pole can be temporarily collapsed during a truck turn. Street signs may be modified to be temporarily detached from their bases, and then re-erected after a truck turn. Some street lights on the bridge over the turn from Chelsea Street to Terminal Street would most likely be avoided by installing an occasional-use gate directly at the end of Chelsea Street (thus, no turn would be required) (Springsteel, 2008a). At this time no additional details are available on the status of the identified utility poles (whether modification would be necessary) nor, if

required, how the utility poles would be modified. Requests for any changes would not be submitted to the City of Boston until the construction phase begins in 2009. Because it is expected that any modification to the utility poles would be granted by the City, without delays to the project schedule, (VHB, 2008), these changes would not result in any significant impacts to transportation resources.

Other potential impacts to traffic from transporting the blades via truck include increased traffic delays and increased road accident risks; however, these impacts are expected to be minimal because the frequency of transport would be limited to approximately 12 to 15 blades per year to the site and possibly an additional one or two being returned from the site to the manufacturer. Also, the extra transport precautions that would be taken during the transport of oversized equipment (e.g., security vehicles

Figure 3-7. Intersection of Route 99 (Rutherford Avenue) and Chelsea Street

following and/or adjacent to the trucks) would help minimize accident risks. During turn movements, localized delays would occur at intersections, particularly if signals/signs need to be unhinged and traffic signals are interrupted; however, increases to congestion and accident risks would be less than significant due to the time of day (i.e., early morning hours to avoid regular traffic volumes), short duration, and frequency of deliveries (up to 15 per year). It is unknown what additional modifications to local routes would be required to transport blades in the opposite direction (from the WTTC) back to the manufacturers. MTC will evaluate the return routes and coordinate any additional intersection modifications with the City and State. As with incoming blades, outgoing blades transported by truck would be subject to oversize truck regulations and permitting. Constraints that were considered for delivering the blades via water transport included: availability of a viable bulkhead capable of mooring the ship; adequacy of water depth for a ship to navigate to the bulkhead; availability of proper off-loading equipment for the blades; and existence of any clearance issues and/or navigable water constraints en route to the project site. The transportation study found that the Autoport site was more than adequate to handle the blades – existing channel depth and bulkhead length were determined to be in proper condition and therefore, impacts to water-based transportation are expected to be minimal as the Autoport has

handled high volumes of shipments without issues in the past. Specialized heavy-duty rental cranes would be transported to the site on an as-needed basis to aid in the off-loading of the blades.

The number of people at the facility would be at most 40 (employees and visitors) at any given time; therefore, impacts to traffic congestion and accident rates from commuter travel are expected to be negligible.

Committed Measures

MTC will minimize traffic impacts and reduce road safety hazards by:

- obtaining appropriate permits for over-sized delivery trucks;
- ensuring that Federal, State and local trucking guidelines are observed during blade transport; implementing modifications to intersections to allow oversized trucks to safely make necessary turns (including relocating several utility poles and modifying an existing traffic light near the project site); and
- coordinating with City and State officials regarding any intersection modifications that may be necessary for transporting blades to and from the WTTC.

3.2.9 Cultural Resources

This section describes the affected environment for and consequences to cultural resources of the Proposed Action. This resource area addresses: archaeology, historic properties, and historic districts.

3.2.9.1 Affected Environment

Background

Cultural resources consist of historic properties and other archaeological, historical, and cultural artifacts on, or in some cases near, the location of the Proposed Action. The National Historic Preservation Act (16 U.S.C. § 470 *et seq.*) was passed in 1966 to protect irreplaceable historic properties throughout the U.S. Under the National Historic Preservation Act, the Federal government has established the National Register of Historic Places (NRHP). NRHP criteria have been established to determine eligibility for placement on the NRHP for those places that possess integrity of location, design, setting, material, workmanship, feeling, and association.

Section 101(b)(4) of the NEPA requires the Federal government to coordinate and plan its actions to, among other goals, "preserve important historic, cultural, and natural aspects of our national heritage…" the CEQ implementing regulations require that Federal impacts to historic and cultural resources be included as part of the NEPA process.

Regional History

Charlestown was originally settled in 1629 by English colonists and annexed as part of Boston in 1874. At the beginning of the Revolutionary War, Charlestown's population had reached about 2,000 and the town contained as many as 400 buildings. Most townspeople fled the area after the Battles of Lexington and Concord in 1775, when the British troops retreated toward Charlestown. On June 17 of that year, the Battle of Bunker Hill was fought in Charlestown, though it actually occurred on nearby Breed's Hill. Following the battle, British troops burned the oldest section of Charlestown to the ground. Full-fledged reconstruction of the town did not occur until after the war ended in 1781 (BLC, 1995).

In 1800, the U.S. Navy opened the Charlestown Navy Yard (which was later renamed the Boston Navy Yard and finally the Boston Naval Shipyard in 1945), attracting other maritime industry and becoming one of Charlestown's major employers for more than 150 years (BLC, 1995). Due to its access to the Middlesex Canal, which opened in 1803, Charlestown became a key location for industrial development. Around 1825, the first toll-free bridge connecting Charlestown to Boston was built, and beginning in the 1830s, railroads began to eclipse the canal. Between 1830 and 1870, Charlestown's population tripled to more than 28,000, with Irish immigrants comprising almost a quarter of the people in the neighborhood (BLC, 1995).

The Civil War forced rapid growth on the Navy Yard, and the yard's role in repairing and supplying vessels of the Navy continued to expand during the Spanish-American War and World War I, now called the Boston Navy Yard (BLC, 1995). During World War II, the yard employed 47,000 workers, and many of the neighborhood's homes were converted into rooming houses to accommodate this heavy demand. During the immediate post-war period, Charlestown began a decline that did not begin to reverse until the urban renewal efforts of the 1970s. A key part of this new growth has been the closing of the Navy Yard in 1974 for office, research, and residential uses (BPRD, 2002b).

Cultural Resource Aspects of the Project Area

There are no known archaeological resources at the Autoport site. In addition, there is a low potential for significant archaeological remains within the project area because the site is highly disturbed and contains fill material dating from the mid 1800s to the present.

The Autoport does not contain any historic structures and is not located within a historic district. Two NRHP-listed sites are located within a 0.5-mile radius of the proposed project site, both of which are now part of the Boston National Historical Park: The Bunker Hill Monument, a 221-foot granite obelisk erected between 1825 and 1842 to commemorate the 1775 Battle of Bunker Hill, and the Boston Naval Shipyard, one of the most important shipyards in the country from 1800 until it was decommissioned in 1974. The Bunker Hill Monument is visible from the site. The Bunker Hill Burying Ground, a City of Boston historic burying ground, is also located within 0.5 miles of the site (to the east), but is not visible from the Autoport.

3.2.9.2 Environmental Consequences of the Proposed Action

The Proposed Action must be evaluated to determine its effect upon resources listed in or determined eligible for the NRHP. Guidelines for this evaluation are set forth in the regulations of the Advisory Council on Historic Preservation at 36 CFR Part 800. The regulations define an effect on a historic property as "…an alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register." An adverse effect is defined in the regulations as follows:

> ***Criteria of Adverse Effect [36 CFR § 800.5(a)(1)]***
>
> *An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property, location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative [36 CFR 800.5(a)(1)].*
>
> *Adverse effects on historic properties include, but are not limited to:*
>
> *(i) Physical destruction of or damage to all or part of the property;*
>
> *(ii) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access; that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR Part 68) and applicable guidelines;*
>
> *(iii) Removal of the property from its historic location;*
>
> *(iv) Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;*
>
> *(v) Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features;*
>
> *(vi) Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and*
>
> *(vii) Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.*

Construction Impacts

Construction of the WTTC would not impact any known cultural resources. No structures or resources exist on the Autoport site that are listed on, nor believed eligible for listing on the NRHP nor have been

designated as historic by the City, County, or State. Project construction would not alter the viewshed in the area or be incompatible with the existing scenery. There is always potential to encounter archeological or historic artifacts during excavation activities, particularly near shorelines. However, the Autoport site has been so heavily disturbed by human activities since the mid 1800s that the potential for encountering significant archaeological artifacts would be low. Furthermore, the extent of soil disturbance to construct the WTTC would be limited to the extent possible to avoid unnecessary contact with contaminated soils at the site, which would also reduce the possibility of encountering significant archeological artifacts. The impacts to cultural resources of either site option for the WTTC are expected to be negligible.

Operation Impacts

The operation of the WTTC would have negligible impacts to cultural resources, including their setting. The building would be approximately 80 feet tall and either site option would not affect the visual setting of nearby cultural resources, as there are currently many taller industrial features within the area, including the Tobin Memorial Bridge, the bridge crane and administration building at the Autoport site, and the five tall concrete silos at the former U.S. Gypsum Company site immediately to the west of the proposed WTTC site.

Committed Measures

In the event that potentially significant cultural materials or features are discovered during construction, MTC will obtain the consultation services of an archeologist to assess the significance of the findings.

3.2.10 Noise

This section describes the affected environment for and consequences to noise of the Proposed Action. This resource area addresses: existing noise conditions and noise levels anticipated from both construction and operational phases of the project.

3.2.10.1 Affected Environment

Background

Noise, simply defined as unwanted sound, can have an adverse effect on humans and their activities, as well as on the natural environment. The impact of noise is highly dependent upon the characteristics of the noise (e.g., loudness, pitch, time of day, and duration) and the sensitivity (or perception) of the noise receptor. The standard unit of sound amplitude measurement is the decibel; however, since the human ear is not equally sensitive to sound at all frequencies, the decibel A-weighted scale (dBA) is typically used to measure noise as it relates human sensitivity. The EPA has classified noise levels for several common sounds along with typical human responses or perceptions for these noises (see Table 3-2).

Table 3-2. Noise Levels for Common Sounds

Sources[a]	Noise Level (dBA)	Response
Carrier deck, jet operation	140	Painfully loud
Live rock music	130	Limits amplified speech
New York subway station	90	Hearing damage (8 hours)
Dishwasher	80	Annoying
Freeway traffic (50 feet)	70	Telephone use difficult
Air conditioning unit (20 feet)	60	Intrusive
Light auto traffic (100 feet)	50	Quiet
Breathing	10	Just audible
Silence	0	Threshold of hearing

a. Noise levels decrease with distance from the source and can be reduced by barriers, both man-made (e.g., sound walls) and natural (forested areas, hills, etc.).

The way in which sound travels over a distance is acted upon by many factors. Temperature, humidity, wind direction, barriers, and absorbent materials, such as soft ground and light snow, are all factors in how sound will be perceived at different distances. The most significant way that noise is attenuated is from the divergence of sound waves with distance (attenuation by divergence). In general, this mechanism results in a six dBA decrease in the sound level with every doubling of distance from a point source (i.e., rate of dBA decrease from the source is based on a logarithmic scale). For example, the 84 dBA average sound level at 50 feet – associated with clearing and grading during construction – would be attenuated to 78 dBA at 100 feet, 72 dBA at 200 feet, and to 66 dBA at 400 feet.

The Boston Municipal Code sets the general standard for noise that is unreasonable or excessive, while the Boston Air Pollution Control Commission or the Boston Police Department is responsible for enforcing the City's noise ordinance, depending on the noise source. The “Regulations for the Control of Noise in the City of Boston” state that the noise levels shown in Table 3-3 must be maintained for the project, depending on the type of zoning district (APCC, 2003).

Table 3-3. Zoning District Noise Standards for the City of Boston

Residential		Residential / Industrial		Business	Industrial
Daytime	All Other Times	Daytime	All Other Times	Anytime	Anytime
60 dBA	50 dBA	65 dBA	55 dBA	65 dBA	70 dBA

"Daytime" means the period between 7 a.m. and 6 p.m. daily, except for Sunday.
Source: APCC, 2003

Sensitive Receptors and Existing Noise Levels

The Autoport site is located in a highly developed area that supports many maritime industrial activities. Land uses abutting the Autoport include closed U.S. Gypsum site and the Tobin Memorial Bridge (Route 1) adjacent on the east boundary and Charlestown Commerce Center and Lafarge Cement on the west boundary. The main activity at the Autoport is the maintenance, storage and delivery of vehicles. The Autoport is located in an area that is zoned as Industrial.

The closest sensitive receptors are located south of the project site and include: residential properties along the southside of Medford Street (approximately 1,200 feet from Option 1; approximately 500 feet from Option 2); and the Charlestown High School (approximately 1,190 feet from Option 1; approximately 620 feet from Option 2) (see also Section 3.2.1).

Regionally, the largest contributors to background noise levels in Charlestown are vehicular traffic and aircraft traveling to and from Logan Airport (approximately four miles east of the Autoport). Traffic-related noise levels are typically loudest along the heavily traveled roads, including Main Street and roads in the Sullivan Square area. Residents living on and near Mystic Street have complained about noise levels from truck traffic at the intersection of Medford Street and Terminal Street (Rizzo Associates, 2005). First Student, a school bus provider that currently manages almost 200 buses at a depot in the Autoport, has also received complaints from nearby residents over noise levels resulting from bus start-ups and traffic (The Charlestown Bridge, 2006). Additionally, there have been complaints filed to the Federal Aviation Administration by Charlestown residents over the increased aircraft activity at Logan Airport (The Boston Globe, 2008).

No noise data is available for the Autoport area; however, based on environmental reports from other U.S. ports that also support highly industrialized areas, typical noise levels taken from various land use areas (e.g., residential and industrial) located approximately 1,500 feet from the ports ranged between 57 dBA to 75 dBA (Maritime Administration and Port of Anchorage, 2005 and Port of Los Angeles and USACE, 2008). Because the Tobin Memorial Bridge (Route 1) is located directly east of the Autoport and has high traffic volumes at an elevated height, the traffic on the bridge significantly contributes to the noise levels at the site and most likely results in noise levels closer to the 75 dBA range. Night-time ambient noise levels at and around the Autoport would likely be in the range of 40-50 dBA based on the industrial and city setting of the project.

3.2.10.2 Environmental Consequences of the Proposed Action

Construction Impacts

During the construction phase, increases in noise levels would mainly result from the use of heavy construction equipment (e.g., bulldozers, scrapers, dump trucks, and concrete mixers). The noise levels presented in Table 3-4 reflect levels at a distance of 50 feet from the equipment source. Construction noise levels onsite would primarily be limited to the immediate vicinity of the project site and would mainly impact the health of the construction workers. However, adherence to appropriate Occupational Safety and Health Administration standards would protect the workforce from excessive noise.

Table 3-4. Noise Levels of Typical Construction Equipment at 50 feet from Source

Equipment	Noise Level at 50 feet from Source, dBA
Trucks	91
Crane	83
Roller	89
Bulldozers	80
Pickup Trucks	60
Backhoes	85
Jack Hammers	88
Rock Drills	98
Pneumatic Tools	86
Air Compressors	81
Compactor	82
Grader	85
Loader	85

Source: Bolt, Beranek, and Newman, Inc, 1971

Sensitive noise receptors would include the Charlestown High School and the Charlestown housing development. Table 3-5 identifies the distances of receptor locations from the closest edge of the boundary for each site option.

Table 3-5. Locations of Receptors Relative to Site Options

Receptor	Option 1 -Closest edge of WTTC site (feet)	Option 2 -Closest edge of WTTC site (feet)
Northeast corner of Charlestown High School	1,190	620
Closest Residential Receptor	1,220	500

Site Option 2 would place the edge of the construction site more than 700 feet closer to the nearest residential receptor than Option 1 and 570 feet closer to the Charlestown High School.

The distance to the closest sensitive receptor (housing development) to the Option 2 work zone would be 500 feet; therefore, any incremental noise increase from construction work would significantly attenuate with distance from the noise source and would not be discernable above and beyond existing noise conditions at any of the sensitive receptors. For example, a 90 dBA noise source would attenuate over 500 feet to approximately 59 dBA under site Option 2. Under site Option 1, this same noise source would have a longer distance to attenuate (approximately 1,200 feet) and would result in a noise level from the source of approximately 48 dBA. These noise estimates do not take into consideration topography, obstructions, or enclosures that could reduce noise levels further. Assuming the background (existing condition) noise during the daytime is between 57 and 75 dBA (see Section 3.2.10.1), construction noise would likely not be perceptible above background levels at receptor locations most of the time. One exception would be construction related trucks entering the property from Terminal Street that would intermittently result in higher noise levels at receptor locations. Another exception would be during

drilling of caissons that would likely result in noise levels greater than 90 dBA at their source, and noise levels higher than 60 dBA at receptor locations.

Construction activities would be scheduled during daytime hours when background noise levels would generally be higher, and when many people are at work and away from home (i.e., between 7:00 a.m. and 6:00 p.m.) and therefore, fewer potential residential receptors would be affected; however, occupants of the High School would be onsite during daytime construction activities. While noise levels at receptor locations would fall below background levels, there would be minor to moderate impacts to receptors during the construction period, particularly from intermittent high intensity noise sources (e.g., jackhammering, trucks) that can create annoyance.

Potentially the greatest contributor to noise impacts to sensitive receptors would be from construction-related vehicles to and from the site. However, these vehicles would travel intermittently and infrequently and would not represent a significant increase in traffic; thus, noise impacts related to construction vehicles would be temporary and minor.

Operation Impacts

Potential noise sources associated with facility operations would include the operation of equipment within the facility and from the testing and handling of the wind blades inside and outside of the building.

Noise Impacts to Outside Receptors

NREL took noise readings within and outside the existing NWTC blade testing building in March 2009 to provide a basis for estimating noise levels at the proposed WTTC. Noise readings were taken during fatigue testing of blades outside the building's rollup door (door closed) and adjacent to the cooling fans located outside the building. Table 3-6 provides the noise reading results from the NWTC. Table 3-7 provides the distances of receptor locations from anticipated locations of WTTC noise sources.

Table 3-6. Sound Pressure Level Readings at the NWTC

Location at NWTC	No Testing Activity, dBA	During Fatigue Test, dBA
Inside Test Bay	51.1 to 53.0	54.1 to 60.4, up to 72.4 during valve squeak
Inside Pump Room	No reading taken	73.7 with 3 pumps on high, up to 94.2 with all pumps on
Outside Roll-Up Door	38.0	40.3 to 40.4
Outside Adjacent to Fans	No reading taken	41.1 with fan off, 93.0 with fan on
100 Feet from Fans	No reading taken	67.1 with fan on and pumps on, 46.6 with fan off, pumps on
200 Feet from Fans	No reading taken	57.1 with fan on, pumps on

Table 3-7. Distances Between Receptors and Anticipated Noise Sources

Receptor	Option 1 –Outside Building's Rollup Door (feet)	Option 1 –Cooling Fans (Located Outdoors) (feet)	Option 2 - Outside Building's Rollup Door (feet)	Option 2 - Cooling Fans (Located Outdoors) (feet)
Northeast corner of Charlestown High School	1,440	1,500	870	1,000
Closest Residential Receptor	1,310	1,250	870	1,060

Table 3-8 provides the attenuated noise levels at receptor locations for the proposed WTTC. These levels are calculated using the formula:

$$Lp2 = Lp1 - 20 \log10 (r2/r1)$$

where Lp2 is the predicted noise level at the receptor location, Lp1 is the noise level at the measurement location, r2 is the distance from the noise source, and r1 is the distance where the Lp1 reading was taken from the noise source.

Table 3-8. Attenuated Noise Levels at Receptor Locations from WTTC Operations

Receptor	Option 1 – Noise During Fatigue Testing, Door Closed (dBA)	Option 1 – Noise from Cooling Fans (dBA)	Option 2 – Noise During Fatigue Testing, Door Closed (dBA)	Option 2 – Noise from Cooling Fans(dBA)
Northeast corner of Charlestown High School	0 (a)	43.6	<2 (a)	47.1
Closest Housing Receptor	0 (a)	45.2	<2 (a)	46.6

a. The resulting noise level at receptor location would be a composite of ambient/background noise (likely ranging from 40-75 dBA) and noise contribution from WTTC sources (value shown). Based on the amount of attenuation due to distance, there would be negligible noise contribution from fatigue testing at receptor locations.

At the NWTC, during fatigue testing with the hydraulic pump off and the cooling fans off, the noise level outside the rollup door was 40.4 dBA, where the noise inside the test bay ranged from 54.1 to 72.4 dBA (Cotrell, 2009). Therefore, the building itself shields the noise from the testing to a very large degree, to essentially background (non-testing) levels just outside the door. The receptor distances to the rollup door under the site options are several hundred feet, so it is unlikely that receptors would perceive any noise from fatigue testing while the doors are closed. The noise increment at receptor locations from fatigue testing would be less than two dBA as shown in Table 3-7, so that the resulting noise level at receptor locations would essentially consist of existing background noise.

The WTTC would require fans located outdoors for cooling the hydraulic system. Noise readings were taken near the existing cooling fans at the NWTC that would be similar to those required for the proposed WTTC. The noise reading for the fans was 93 dBA, which correlates to manufacturer literature indicating 92 dBA for unshielded fans (MTS Systems Corporation, 2004). At the NWTC, the noise level dropped to 67.1 dBA at 100 feet and 57.1 dBA at 200 feet from these fans (Cotrell, 2009). For the proposed WTTC, the noise levels at receptor locations would range from approximately 43 to 47 dBA. Based on the attenuated noise levels shown in Table 3-7, noise contribution from routine operations at WTTC would not likely result in noise levels above background at receptor locations (daytime or nighttime).

Outside blade cutting/testing operations (which would only occur during typical work hours, such as Monday through Friday, 7:00 a.m. to 5:00 p.m.) would occur intermittently and would produce noise levels at the source of approximately 80 dBA (Bolt, Beranek, and Newman, Inc, 1971). Based on the distances to receptors shown in Table 3-5, the resulting noise at receptor locations under Option 1 would be 38 to 39 dBA and for Option 2 would be 44 to 46 dBA. These levels would be well below background noise levels and Boston's residential noise standards.

Noise Impacts to WTTC Employees

Within the building, the hydraulic power supply would generate high levels of noise (between 73 and 95 dBA) (Cotrell, 2009). However, this power supply would be housed in a dedicated cinder-block-walled hydraulic room to minimize noise levels within the test bay (its contribution reduced to 59 to 67 dBA

outside this room) (Cotrell, 2009). Noise levels within the test bay during fatigue testing (with the hydraulic pumps off) would range between 54 and 61 dBA. Noise levels up to 73 dBA can occur during fatigue testing if there is "valve squeak", which is an intermittent noise, occurring once every two seconds. This squeak is not a normal condition and can be caused by an old or worn servomechanism valves used to control the hydraulic actuator for the fatigue test. The noise can be eliminated by new equipment or can be reduced by altering the control parameters of the actuator (Cotrell, 2009).

Under Occupational Health and Safety Administration regulations (29 CFR 1910.95(d)(1)), employers must implement an effective hearing loss prevention program when any worker's eight-hour time-weighted average noise exposure is equal or greater than 85 dBA. According to the National Institute on Deafness and Other Communication Disorders, prolonged exposure to noise above 85 decibels can cause hearing loss. Based on the noise readings at the NWTC, the only noise levels exceeding that threshold would occur within the pump room, which is not expected to be occupied except during maintenance and repairs. Therefore, workers inside the building would be exposed to moderate noise levels but not levels that would require hearing protection.

Workers conducting blade cutting outdoors would be exposed to temporary and moderate noise levels as well (approximately 80 dBA).

Committed Measures

MTC will use shielding and other controls to reduce noise levels of the facility's equipment and outdoor operations to protect on-site workers and minimize adverse effects to surrounding neighbors. MTC will avoid conducting high-noise activities (such as outdoor blade cutting) during evening and night-time hours (5:00 p.m. to 7:00 a.m.).

3.2.11 Aesthetics

This section describes the affected environment for and consequences to the aesthetic environment of the Proposed Action. This resource area addresses: existing visual setting and viewsheds and the anticipated impacts to visual quality from the project.

3.2.11.1 Affected Environment

The Autoport is located in the Harborpark District and Section 42B-8 of the City of Boston Zoning Code sets forth "urban design guidelines" for new development. These guidelines govern aesthetic qualities of building elements. Relevant guidelines to the Proposed Action are provided below:

- New development and rehabilitation shall reinforce the traditional pattern, height, and massing of the urban waterfront.
- Buildings and spaces shall direct views and pedestrian movements towards the water.
- Buildings shall be sited to provide view and access corridors toward the open water and to preserve views from public access facilities and open space areas at the ends of piers.
- Setbacks, corner treatments, and other design details shall be used to minimize the sense of bulk of structures, and ornamental and decorative elements appropriate to the urban and historical waterfront context are encouraged.
- Design features of a Proposed Project shall take into consideration the special characteristics of the site and its location in the Harborpark District and shall provide opportunities for special amenities, such as panoramic views of the Harbor, and shall enhance and reinforce any historic qualities of existing structures. New development shall be consistent with design guidelines established in the Harborpark District Plan (City of Boston, 1990).

The Autoport is located in a heavily industrialized area of the Charlestown waterfront. Situated immediately on the site are salt/sand piles, covered salt storage, automobile parking and a truck scale. There are currently many tall industrial features within the area, including the Tobin Memorial Bridge, the bridge crane and administration building at the Autoport site, and the five tall concrete silos at the closed U.S. Gypsum Company site immediately to the east of the proposed WTTC site. These tall features dominate the waterfront views both to the south and north of the Autoport.

3.2.11.2 Environmental Consequences of the Proposed Action

Construction Impacts

The construction of the WTTC would result in short-term, localized adverse noise and activity which may result in minor adverse impacts on resident's views of the waterfront, particularly at the High School and the public housing areas to the south (Charlestown Housing Project and Newtowne Development) along Medford Street. However, as the construction would take place in an area currently dominated by aircraft traffic from Logan Airport, vehicular traffic on heavily travelled roads including the Tobin Memorial Bridge, and waterfront activity (e.g., crane operations, loading of cars on transport trucks, and loading of salt and sand trucks), it would pose minor impacts to the aesthetic quality of the area.

Operation Impacts

Once constructed, the WTTC would be approximately 80 feet high. The building would not adversely affect the visual setting, as there are currently many tall industrial features within the immediate area, including the Tobin Memorial Bridge, the bridge crane and administration building at the Autoport site, and the five tall concrete silos at the closed U.S. Gypsum Company plant. Option 1 would place the building's long-axis parallel to the waterfront, potentially blocking views from the local neighborhood to the waterfront. Option 2 would place the building parallel to the slip, to minimize blocking views to the

waterfront. However, with the current salt pile remaining in its current location, Option 1 (which aligns with the salt pile from the primary neighborhood viewpoint) would only present minor impacts to existing waterfront views.

Outdoor storage and testing activities for the WTTC would be visible from residential neighborhoods both to the north and south. Because the nature of the WTTC building and operations would create a similar visual setting to the existing site uses, there would be minor impacts to aesthetic resources from the Proposed Action. In addition, the Charlestown Neighborhood Council has concluded that the WTTC would be compatible with the terminal's activities and there would be no adverse impact to the community (Cuhna, 2007).

Committed Measures

MTC will conduct review meetings with City officials and hold additional community meetings to keep the public informed and solicit comments regarding the building's design.

3.2.12 Socioeconomics and Environmental Justice

This section describes the affected environment for and consequences to socioeconomics and environmental justice of the Proposed Action. These resource areas address: job creation and secondary economic activity, and any disproportionately high or adverse impacts to low income or minority populations.

3.2.12.1 Affected Environment

The proposed WTTC site options are located at the Boston Autoport in the Charlestown section of Boston, part of the Boston, Cambridge, Quincy Metropolitan Statistical Area (MSA), which is the region of influence for socioeconomics. While many of the neighborhoods within Charlestown are considered affluent, to the south of the Autoport site along Medford Street, separated by the Little Mystic Channel, are two public housing projects: The Charlestown Housing Project, established in the 1940s and the Newtowne Development, established in 1962 (both consist of the red brick buildings shown in Figure 3-8).

Environmental Justice means the ***fair treatment*** and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

Fair treatment means that no group of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, State, local, and tribal programs and policies.

The 2006 population in the Boston, Cambridge, Quincy MSA was 4,455,217 (U.S. Census Bureau 2007, Table B01003). Of that population in the MSA, approximately 19 percent are minority and 9.2 percent are determined to be below the poverty level (U.S. Census Bureau 2007, Tables B02001 and B17001). In comparison, the 2006 population in Massachusetts was 6,437,193, of whom approximately 17 percent are minority and 10 percent are determined to be below the poverty level (U.S. Census Bureau 2007, Tables B01003, B02001, and B17001).

Total employment in the Boston-Cambridge-Quincy MSA in 2006 was 3,120,542. Of those, 174,657 were employed in the construction industry, and 333,415 were employed in the professional and technical services sector (BEA 2008, all); these are the two sectors most likely to be affected by constructing and operating the proposed WTTC.

Gross regional product for the Boston-Cambridge-Quincy MSA in 2005 was $261.1 billion, of which $11.2 billion was in construction (BEA 2007, all). All dollar amounts are stated in 2007 dollars.

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, directs Federal agencies to identify and address as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations.

This EA analyzes 2000 Census figures and Massachusetts Geographic Information System (MassGIS) data from the project area to describe environmental justice characteristics. Using this information, poverty statistics and the demographic makeup of the project area were analyzed. The smallest Census unit encompassing the project area is Census Tract 408, Block Group 3, Block 3002. According to the 2000 Census, Block 3002 had a total population of 295. Block 3002 includes the Autoport property, the Charlestown High School and a portion of the Newtowne Development. Table 3-9 compares environmental justice demographics in the project area to the City of Boston and the Commonwealth of Massachusetts.

Figure 3-8. Public (Low-Income) Housing South of the Autoport Site

Table 3-9. Environmental Justice Demographics for the Project Area, the City of Boston, and the Commonwealth of Massachusetts

Demographic	Census Tract 408, Block Group 3, Block 3002 (percent)	City of Boston (percent)	Commonwealth of Massachusetts (percent)
Percentage of Minority Population	33.2	45.5	15.5
Black/African American	0.0	25.3	5.4
American Indian and Alaska Native	2.4	0.4	0.2
Asian	20.7	7.5	3.8
Native Hawaiian and Other Pacific Islander	0.0	0.1	0.0
Other	1.4%	7.8	3.7
Two or more races	8.8	4.4	2.3
Individuals below poverty level	32.5[a]	19.5	9.3
Median household income	$18,598[a]	$39,629	$50,502

a. Data for Census Tract 408, Block Group 3. Income and poverty rate data for the area were not available from the U.S. Census Bureau below the Block Group level, but it is reasonable to assume that Census Tract 408, Block Group 3 data is representative of the immediate project area.

Source: U.S. Census Bureau, 2000

The racial mix within the project area was approximately 66.8 percent white, 20.7 percent Asian, 8.8 percent two or more races, 2.4 percent American Indian or Alaska native, and 1.4 percent some other race.

The median household income in 1999 for Census Tract 408, Block Group 3 was $18,598, which was lower than that for the City of Boston as a whole ($39,629) as well as the Commonwealth of

Massachusetts ($50,502). The poverty rate in Census Tract 408, Block Group 3 was higher than the rates in the City of Boston as a whole and the Commonwealth of Massachusetts. In 1999, 32.5 percent of individuals in Census Tract 408, Block Group 3 were living below the poverty level, the Boston average was 19.5 percent, and the State average was 9.3 percent. MassGIS data (see Figure 3-9) indicates that 60 to 80 percent of households in the project area have low income, that is, below $30,515, which is 65 percent of the State 2000 median household income of $46,947 (MassGIS, 2008). Figure 3-9 displays the percent of low-income households and minority residents in the project area.

3.2.12.2 Environmental Consequences of the Proposed Action

Construction Impacts

The estimated cost for constructing the WTTC facility, with purchase and installation of testing equipment and instrumentation, would be in the range of $30 to 35 million.

Expenditure of these amounts of money, which equate to less that 0.1 percent of the gross regional product for construction, and less than 0.01 percent of the total gross regional product in the Boston, Cambridge, Quincy MSA, would have minimal impact on either the construction sector or on the MSA's economy as a whole.

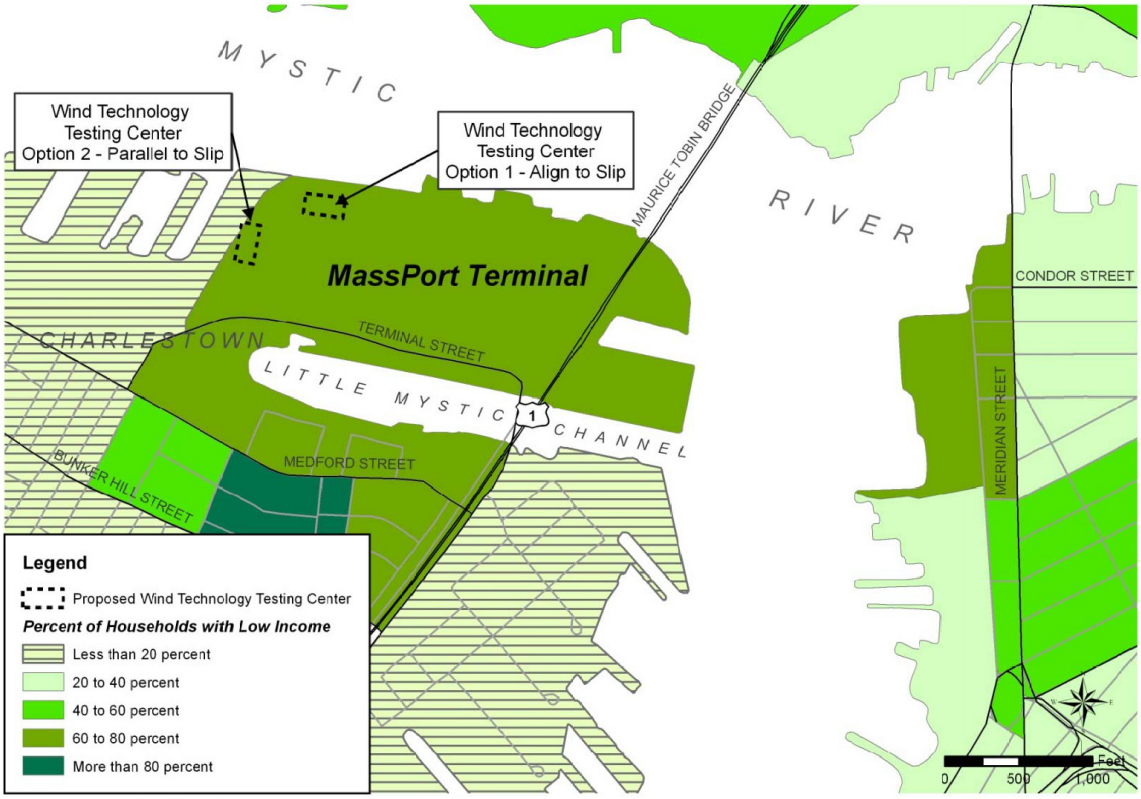
While there would be some small additional activity as a result of the potential need to move the existing salt shed and truck scale (the salt pile would not be moved) at the Autoport to make room for the WTTC facility under site Option 2, this would not add enough activity to raise the overall impact of constructing and equipping the WTTC. Any negative impacts associated with relocating these facilities would be small and temporary.

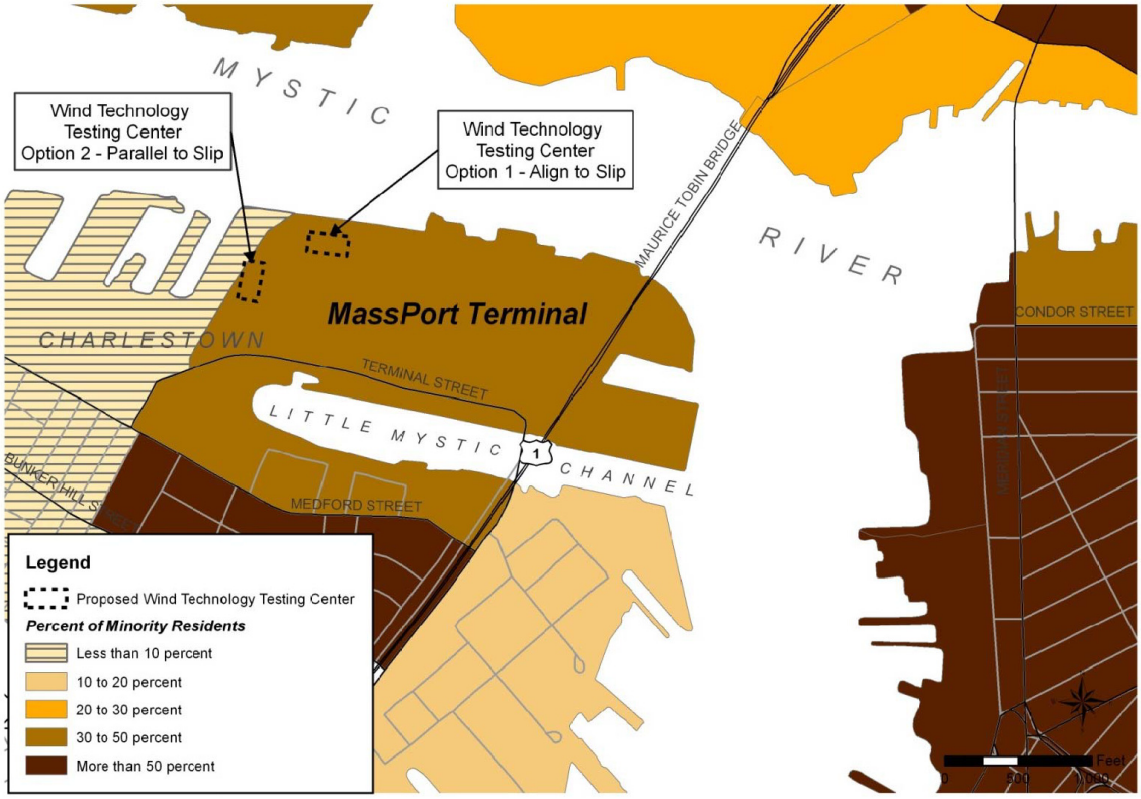
Should delivery of turbine blades need to be by truck, this would require the relocation or modification of some utility poles; but a study by Vanasse Hangen Brustlin, Inc., determined that this could be easily implemented. Economic impacts of moving the utility poles would be temporary and small, with some costs incurred by the utility companies (MA Partnership, 2007).

As discussed in Section 3.2.12.1, minority populations are located in the project area. Block 3002 has 33.2 percent of individuals identifying themselves as minority. This percentage is lower than the minority population for the City of Boston (45.5 percent) and higher than that for the Commonwealth of Massachusetts (15.5 percent), however, it is below the 50 percent threshold as defined by the CEQ in its guidance for implementing Executive Order 12898 (CEQ, 1997). MassGIS data indicates that 60 to 80 percent of households in the project area have low income (MassGIS, 2008). Construction activities may cause minor, temporary air quality, water quality, transportation, and noise impacts; however, no disproportionately high and adverse impacts would be anticipated to minority or low-income populations.

Operation Impacts

The staffing plan for the WTTC calls for eight full time employees: a director, two senior test engineers, a facilities manager/design engineer, two technicians, and an office manager, with an estimated annual salary for the staff of $630,000. In addition to the WTTC staff, the NREL would provide one Full Time Equivalent technical support for training for the first two years, and one-half full time equivalent technical support for the duration of the project.





Source: MassGIS, 2008

Figure 3-9. Percent of Low-Income Households and Minority Residents in the Project Area

Adding this small number of professional and technical jobs into the Boston, Cambridge, Quincy MSA, which already has over 300,000 jobs in this sector, would have minimal impact on the professional and technical services sector or on the MSA's economy as a whole. The small increases in jobs would also lead to very small increases in population that would not require increased government services or infrastructure.

The Autoport is within the Mystic River DPA. Massachusetts established the DPA program in 1978 to take maximum advantage of future economic opportunities in the marine industrial sector and preserve the remains of the industrialized coast to support this sector. Because one of the requirements of the WTTC site would be to provide a means to transport blades by water, utilizing a portion of the Autoport site for the Proposed Action would be consistent with DPA economic goals and would support the marine industrial sector (see Section 3.2.1 "Land Use").

The small increase in jobs and economic activity through employment and research would provide small, positive impacts on the local economy. In keeping with the goals of the WTTC Research Fund, the research at the WTTC may result in spin-off effects for the MTC and its partners in the WTTC.

Noise, aesthetics, and safety/risk impacts (see Sections 3.2.10, 3.2.11, and 3.2.14, respectively) resulting from operation of the WTTC would not have a disproportionately high and adverse impact on minority or low-income populations. The proposed site is located in a highly developed, industrial area and the Proposed Action would be compatible with existing activities in the area. Therefore, the Proposed Action would not cause significant adverse impacts to socioeconomics or in terms of environmental justice.

Committed Measures

No committed measures will be required.

3.2.13 Sustainability

This section describes the affected environment for and consequences to sustainability of the Proposed Action. This resource area addresses: use of green building design, use of renewable energy sources, and the promotion of pollution prevention measures, recycling, and affirmative procurement during facility operation.

3.2.13.1 Affected Environment

The MTC is a part of the Renewable Energy Trust (RET) which seeks to maximize environmental and economic benefits for the Commonwealth's citizens by pioneering and promoting clean energy technologies and fostering the emergence of sustainable markets for electricity generated from renewable sources. The Trust provides financial assistance to individuals and businesses for solar panels and wind turbines at their homes and facilities, works with communities to incorporate green design into schools, helps emerging clean energy businesses flourish in the Commonwealth, and much more. The RET works through a variety of programs geared towards these different groups to provide many avenues for the Commonwealth to become greener.

Massport also strives to be a leader in embracing environmental initiatives with: one of the first and most extensive residential and school sound insulation programs in the nation; the first LEED-certified airport terminal in the world; the first ISO-14001 airport, container terminal, and bridge in the U.S.; and a number of innovative air quality emission reduction programs. In 2004, Massport developed its first Sustainability Plan, building on its 2000 Environmental Policy. The Plan established an internal sustainability team, short-term and long-range goals related to reducing emissions and waste, as well as increasing the use of alternative fuels. Massport has incorporated LEED goals in all new development and redevelopment projects for the past several years (Massport, 2008).

The Autoport operator, Diversified Auto, retained a consultant in 2008 to assess opportunities to improve environmental sustainability at the site, through a portfolio of alternative energy projects and innovative stormwater management practices. These efforts included a Wind Feasibility Study, a Solar Photovoltaic Feasibility Study, and a stormwater management report that assessed the costs and benefits of installing a green (vegetated) roof on a portion of the Moran Terminal Building.

3.2.13.2 Environmental Consequences of the Proposed Action

Construction Impacts

The construction of the WTTC would result in the generation of some construction waste, the use of diesel fuel for construction equipment and gasoline for worker vehicles, water use for cement and general construction activities, and the disposal of some contaminated soil. However, construction waste could be recycled to the extent possible in accordance with LEED principles. Particularly, ferrous and non-ferrous metal waste could be recycled, as well as non-contaminated soil and asphalt. Overall, the construction of the WTTC at either site option location would result in some construction waste and contaminated soil disposal, resulting in minor adverse impacts to sustainability.

Operation Impacts

The facility would meet LEED Plus requirements, in accordance with State Executive Order 484. Although the exact features of the building are not known at this time (e.g. the interior layout), LEED possible systems are described in Section 2.1.1.

The blade testing would require the prolonged use of substantial amounts of electricity. This electricity would be provided by the local utility company through existing Massport contracts. However, 1.5 percent of Massport's competitive electricity supplies come from renewable resources. In other Massport buildings, substantial capital investments in energy efficiency have been made including: lighting retrofits, chilled water variable speed pumping, variable speed drives and automated building controls.

The MTC would incorporate energy efficiency and renewable energy features, as affordable and applicable, into the design of the WTTC.

Because the WTTC would be on Massport property, it would be required to adhere to the Massport's Environmental Management System and its initiatives, which includes reducing waste generation through recycling, promoting use of low emission/alternative fuel vehicles, and implementing air pollution reduction measures. Both site options could include use of solar photovoltaics or passive solar energy use.

Overall, the facility design and operations would adhere to LEED Plus certifiable criteria and existing NREL and Massport sustainability plans and goals would be updated as necessary to address WTTC activities. Therefore, the Proposed Action would have a positive impact with regard to sustainable operations.

Committed Measures

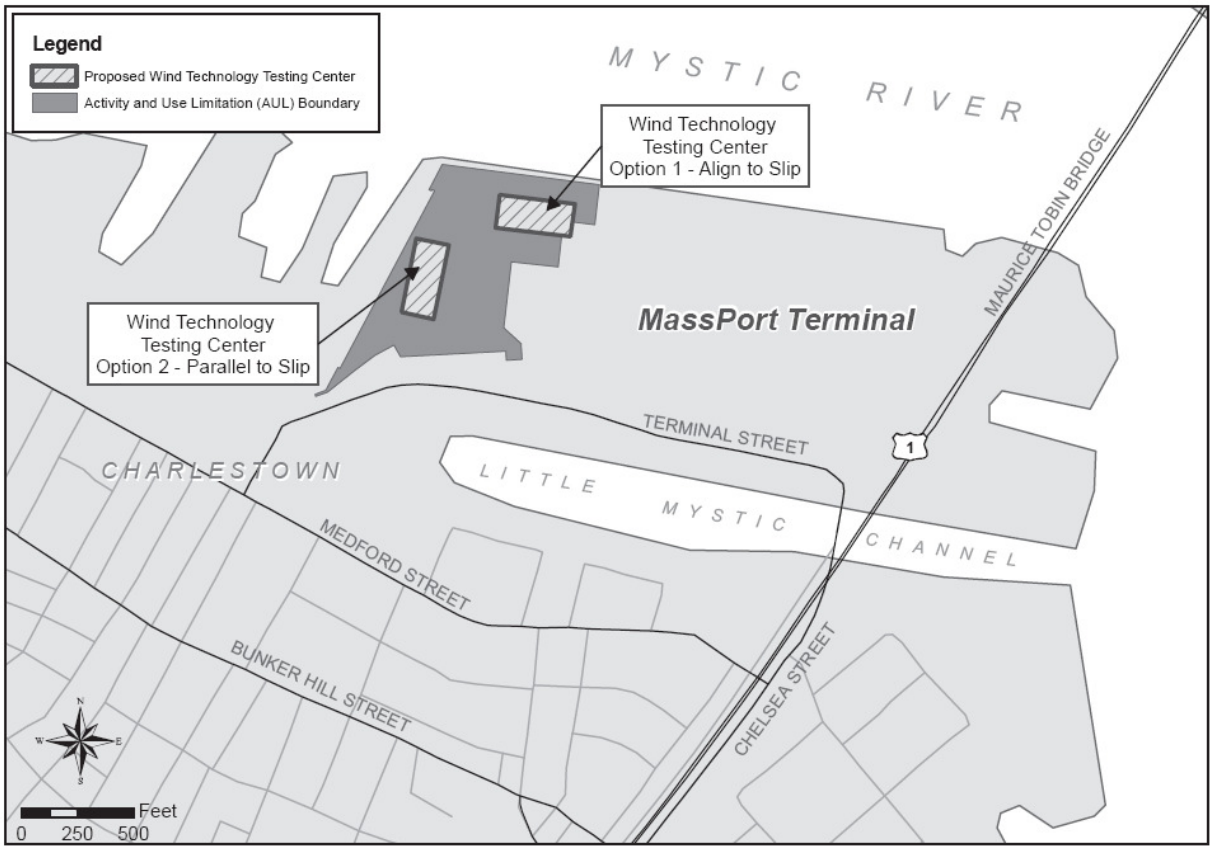
MTC will design the WTTC to meet Massachusetts LEED Plus criteria.

3.2.14 Safety/Risk Assessment

This section describes the affected environment for and consequences to worker safety of the Proposed Action. This resource area addresses: environmental contamination, workplace injuries and safe work practices, noise exposure, and risks of accidents and spills.

3.2.14.1 Affected Environment

As stated earlier, both site options would be located over a portion of the Autoport covered by the August 7, 1997 AUL issued by MassDEP. The AUL controls and manages on-site activities which limit exposure to regulated materials (see Figure 3-10).



Source: MassGIS, 2008

Figure 3-10. Location of AUL on the Autoport Site

PCBs were discovered on the site in 1986 and were subsequently removed. Some residual PCBs, lead, zinc, PAHs and VPHs remain in the soils. The AUL indicates that no further action is necessary and no risk to human health exists at the site provided it continues to be used in its current manner, which includes an approximately 16-inch thick asphalt and/or concrete covering, which prevents exposure at the surface from the underlying soils. Any changes, construction, or other alterations to the site would require further remedial action (Weston, 1997).

3.2.14.2 Environmental Consequences of the Proposed Action

Construction Impacts

Potential occupational health and safety risks during construction of the proposed WTTC are expected to be typical of the risks for any other industrial/commercial construction sites. Health and safety concerns

include: the movement of heavy objects, including construction equipment; slips, trips, and falls; the risk of fire or explosion from general construction activities (e.g., welding); and spills and exposures related to the storage and handling of chemicals and disposal of hazardous waste.

The construction contractor would develop, implement, and maintain a Worker Protection Plan. This plan would implement Occupational Safety and Health Administration requirements (1910 and 1926) and would define policies, procedures, and practices implemented during the construction process to ensure protection of the workforce, environment, and the public.

Based on data compiled by the U.S. Bureau of Labor Statistics, in 2008 within the nonresidential building construction industry, the injury rate for construction workers was 4.3 percent and the fatality rate was 0.01 percent (USBLS, 2008; USBLS, 2008a). Although a specific construction plan has not yet been developed, for purposes of analysis, it is assumed that the number of construction personnel would peak at 150. Therefore, construction-related injuries would be expected to peak at six to seven per year and fatalities would be well below one (0.015). Considering that the aforementioned safety planning would occur, no greater than the industry average for injuries and fatalities would be expected.

According to the Notice of Activity and Use Limitation Opinion, dated August 7, 1997, any activity conducted at the site which is inconsistent with the provisions of the AUL would be regulated and subject to obligations and conditions as specified in the AUL. Removal of any portion of the bituminous asphalt/concrete surface cover would be inconsistent with the current AUL. According to the AUL, this "may result in a significant risk of harm to health, safety, public welfare or the environment or in a substantial hazard" and therefore excavation must be conducted under the guidance of a Massachusetts LSP as defined by MassDEP. MTC plans to drill caissons through the surface cover for foundation support, but would add concrete over the existing slab for the building's floor in order to minimize soil disturbance. Depending on the amount and extent of disturbance to the area of the site governed by the AUL, a Response Action Plan, a revised Response Action Outcome Statement, Amendment of AUL, Termination of AUL, and/or Partial Termination of AUL reports or forms may need to be submitted to MassDEP through the LSP providing oversight at the property.

The Worker Protection Plan would be tailored to address construction activities where the existing asphalt/concrete cap and contaminated soil would be disturbed (such as excavation or drilling). Workers involved in these activities would be required to wear personal protective equipment (PPE), such as chemical protective suits, gloves and full-face respirators. It is anticipated that EPA Level C or B procedures and personal protective equipment would be used for these activities and that an "exclusion zone" would be instituted, where both equipment and personnel would be required to go through a decontamination area prior to leaving the exclusion area to prevent off-site transport of contaminants.

Personal Protective Equipment (PPE) includes all clothing and other work accessories designed to create a barrier against workplace hazards. Examples include chemical protective suits, safety goggles, blast shields, hard hats, hearing protectors, gloves, respirators, aprons, and work boots.

All excavated contaminated soil would be segregated and staged on plastic sheeting to avoid contact with surface soils. The soil piles would be covered with plastic at the end of each day and must be disposed of at appropriate receiving facilities with all necessary manifest documentation.

Overall, with the adherence to a site-specific Worker Protection Plan and guidance of an LSP, safety impacts during construction of the WTTC would be minor.

Operation Impacts

Site operations would require the use of some regulated and/or hazardous materials, such as hydraulic fluid, nitrogen gas, and minor amounts of cleaners, lubricants and epoxies. A health and safety program

would be followed and WTTC employees would be trained annually in the use of Material Safety Data Sheets, appropriate PPE, and the safe storage, labeling and disposal procedures for these materials.

Site operations would be primarily limited to the following blade tests and activities, including: static (ultimate load) testing; fatigue tests; and blade cutting and failure analysis.

Static tests involve applying weighted material to the blades in order to determine the amount of stress that can be placed on each blade type. Fatigue tests include continual (24-hour) operation of a blade on a test turbine for up to two or three months at a time. These operations would include the use and operation of heavy equipment such as forklifts and cranes, operation of pulleys and winches, electrical equipment, compressed gases, and may also include heavy lifting by WTTC personnel. These activities present the risks of crushing/crunching from heavy equipment and heavy loads, injury from improper heavy lifting techniques, and electrocution (NREL, 2008a).

Blade cutting involves the use of a wire saw to cut out-of-service blades into pieces small enough to be properly disposed or easily recycled. Wire sawing is a technique that originated in quarries to extract stone and is ideal for removing large sections of heavily reinforced concrete, such as piers, towers and bridge sections (NREL, 2007).

A wire saw consists of a multi-strand cable with diamond segments that are threaded through a series of pulleys, which are attached to a drive wheel that is powered by a hydraulic power unit. The combination of the spinning wire and constant pulling force cuts a path through the concrete or material of choice, in this case a fiberglass wind turbine blade. A typical wire diameter is 3/8 inch (NREL, 2007). Numerous safety hazards that could cause injury are present when using the wire saw. In addition to the obvious physical hazards associated with large saws, fiberglass dust can be generated as turbine blades are cut for disposal. Furthermore, small pieces of the saw blades may be rendered airborne as a blade nears the end of its useful operational lifespan. PPE requirements for workers include, but would not be limited to: respirators/dust masks, hard hats, safety glasses, suitable work boots (i.e., steel-toed), work gloves, long pants and work shirt (NREL, 2007). Dust suppression techniques (such as using a water spray and/or dust collector [ventilator]) would also be used during wire saw cutting.

If a pressurized hydraulic line from the saw were to burst, additional safety risk could occur from a sudden release of pressure which may cause a burst line to strike a person or object. In addition, leaks from damaged hydraulic lines could create a slipping hazard as well as a potential environmental hazard if the fluid made its way into floor drains or onto the exterior ground surface.

To minimize impacts from releases of hydraulic fluid, secondary containment would be provided for all hydraulic fluid reserves. Hydraulic lines would be inspected routinely for leaks and any leaked material would be disposed in accordance with applicable regulations. The building would not include floor drains in areas where hydraulic lines or hazardous materials are stored or used so that spills or leaks would be contained.

To minimize noise levels and associated worker health risks, the hydraulic power supply would be housed in a dedicated walled room. Additional noise minimization measures (for both indoor and outdoor noise sources) would be implemented through shielding and other controls to the extent possible to protect both on-site workers and reduce impacts to the community (See Section 3.2.10).

The WTTC would have a well-defined Environmental, Safety and Health (ES&H) policy, ES&H procedures, training in those policies and procedures, and monitoring of compliance with those policies and procedures. The director would be responsible for ensuring that there are ES&H policies and procedures in place, and that all of the staff have been adequately trained in their proper implementation (MA Partnership, 2007). The ES&H Procedures would address all safety, health, and environmental hazards associated with site operations. For example, the NWTC has a procedure that addresses potential safety hazards and recommended environmental practices associated with both use of hazardous materials and safe operation of blade testing equipment. Table 3-10 provides a summary of the key safety measures

included in the procedure (NREL, 2008a). A General Safe Work permit is currently in effect and utilized at the NREL's NWTC facility in Boulder, Colorado, as well (NREL, 2007). MTC would develop similar procedures for the proposed WTTC that would be tailored to that site's operations and configuration. The procedures would include provisions for the level of PPE to be worn at the site by employees, which would include eye and inhalation protection for fiberglass dust and other factors, and ear protection for high noise sources.

Overall, the construction and operation of the WTTC would result in negligible to minor (i.e., minimized to the extent that accidents can be controlled) human health impacts when standard environmental, safety, and health policies, procedures and training are followed.

Table 3-10. Potential Accident Scenarios and NWTC Control Measures

Potential Accident Scenario	NWTC Control Measures
Slip and fall accidents due to oil leaks	1. Equipment that is susceptible to leaking shall have drip containment installed. 2. When installing equipment, care should be taken to secure devices, hoses and fittings so they are not easily damaged or broken, resulting in an oil leak. 3. Should an oil leak occur, oil absorbent materials, such as oil dry or cotton rags, should be available for use in the facility's hydraulic room(s). Slippery floors shall be cordoned off and oil-absorbent applied as soon as possible to contain the oil.
Lifting injuries	1. All personnel involved with the movement or loading of blades and blade fixtures must be trained in safe rigging and hoisting procedures (at least once every 3 years), and must use proper equipment when lifting and/or moving blades. All hoisting equipment must meet the requirements of the *DOE Hoisting and Rigging Manual*. 2. All personnel would be required to wear steel-toed shoes while moving or lifting blades, blade fixtures, or any other heavy objects. For modal testing in the field, test personnel shall wear an approved hardhat and safety glasses, when working near an actuator or a tensioned steel cable.
Crushing/crunching hazards due to work around hydraulic equipment	1. Under all circumstances hydraulic pressure must never be applied or removed from the system without considering the possibility of actuator or load movement. Workers should not place hands, head or other body parts in the potential travel path of any actuator piston unless the hydraulic power is off and system pressure has returned to zero pounds per square inch. 2. In an emergency, hydraulic pressure can be immediately relieved by pushing one of the emergency stop buttons located on the outside face of each hydraulic power supply control panel. 3. To prevent damage to hydraulic lines, in each facility the piping from the hydraulic power supply shall be routed through underground trenches to the hydraulic manifold or winches for each test. 4. Work on hydraulic lines shall never be attempted when the high-pressure pump on the hydraulic power supply is turned on or when the hydraulic lines are pressurized. 5. Hydraulic hoses shall not be stepped on, driven over, or routed around sharp objects or corners. Hydraulic lines shall be inspected before every new test for cracks and leaks.
Noise	1. Hearing protection (e.g., ear muffs and ear plugs) shall be used when working around noise levels at or above 85 dBA for an eight-hour time-weighted period. All hearing protection must be obtained through the NREL Environmental.
Electrocution	1. When working on electrical equipment, all electrical cabinets shall be locked following standard procedures outlined in NREL's Electrical Safety Program.

Table 3-10. Potential Accident Scenarios and NWTC Control Measures

Potential Accident Scenario	NWTC Control Measures
Fiberglass dust inhalation during blade cutting	1. A water spray shall be employed at the point of operation to effectively control evolving particulates. If the water spray cannot be employed, workers in the cutting area would wear protective coveralls, gloves, goggles, head covering and respirators to limit dust exposure.
Asphyxiation due to releases of compressed nitrogen gas	1. All employees required to work with compressed gases shall follow NREL and OSHA standards for handling and transporting such materials. Some standard rules include: compressed gas bottles should always be properly supported in a vertical position when stored or in use, bottles should not be transported with a regulator attached, regulators must be used when gas is being discharged from a cylinder, and when using an asphyxiant (e.g., nitrogen gas) avoid use in enclosed areas and ensure the area is sufficiently ventilated.

Sources: NREL, 2008a; NREL, 2007

Transportation-related accidents may result from the transport of wind turbine blades to and from the WTTC. Transport would occur via either ship/barge or truck. Transportation accident statistics for ships/barges and trucks were utilized to estimate accident rates associated with wind turbine blade transport for the proposed WTTC. For each estimate, a conservative scenario was developed to provide an upper bound for accidents, injuries and fatalities.

Based on U.S. Department of Transportation data, in 2005 there were 6,193 marine vessels involved in accidents where all marine vessels delivered 2,527.6 million tons of materials. Therefore, there were 2.45 accidents per million tons of material transported (USDOT, 2008a). For purposes of analysis, it is conservatively assumed that there would be 15, 90 meter blade (round-trip) deliveries per year and each blade weighs 27 tons. This would result in 810 tons of blade material transported per year. Based on the accident rate, there would be far less than one accident per year (0.002 accidents per year or one accident approximately every 630 years). In 2005, those 6,193 accidents resulted in 216 fatalities or injuries (USDOT, 2008a). Therefore, well below one fatality/injury would be expected from WTTC blade deliveries via water transport (0.00007 fatality/injury per year or one every 14,300 years).

Most prominent current wind turbine blade manufacturing facilities are located in Iowa, South Dakota, Ohio, and Arizona. To calculate the potential for accidents related to truck deliveries, this analysis conservatively assumes maximum delivery of 15 blades per year, round-trip, from the furthest blade manufacturing location (Scottsdale, AZ), which would be a 2,700-mile trip each way (5,400 miles round-trip). For up to 125 blades a year, this would be 81,000 vehicle miles per year. Based on U.S. Department of Transportation data, in 2007 the rate of injury-causing truck crashes was 33.4 per 100 million miles travelled (USDOT, 2008). Therefore, far less than one injury-causing truck crash would be expected per year (0.027 per year or one crash in 37 years). In 2007, truck crashes resulted in fatalities at a rate of 2.02 per 100 million miles travelled (USDOT, 2008). Therefore, well below one fatality-causing truck crash would be expected per year (0.0016 per year or one fatality in 611 years). Based on the oversize nature of a truck carrying a turbine blade, in the event of a severe truck accident it is likely that a number of other vehicles or structures surrounding the truck could be damaged and additional injuries/fatalities could occur. Because oversized trucks travel at slower speeds, impede normal traffic flow and need to take special care during turns, the regulations governing oversize truck movements take these factors into account and contain provisions that minimize the possibility for accidents and disruption to traffic flow. These provisions include: escort vehicles, travel during daylight hours (not during rush hour Monday through Friday or after noon on weekends in Massachusetts), weight limits, and restrictions from certain roads.

From these estimates, the likelihood of ship/barge or truck accidents would be very low for the WTTC. Shipments of blades by water would statistically be safer than by truck, although both methods would be very safe and therefore, transportation decisions would be based on cost effectiveness and availability of each method for each circumstance.

Committed Measures

MTC will:

- institute a Worker Protection Plan and use an LSP to manage and oversee the excavation and disposal of contaminated soil during construction;
- provide secondary containment for all hydraulic fluid reserves and inspect hydraulic lines routinely for leaks. MTC would implement a spill response plan at the WTTC. MTC would design the WTTC so that there are no floor drains in areas where hydraulic fluid or hazardous materials are stored or used; and
- design the building and configure equipment to incorporate noise shielding and other noise minimization measures to protect worker health in accordance with OHSA regulations.

3.3 ENVIRONMENTAL CONSEQUENCES OF THE NO ACTION ALTERNATIVE

Under the No Action Alternative, the DOE would not provide funding for the WTTC at the Boston Autoport site. The Autoport would continue to operate in its current configuration and there would be no changes to any of the environmental resource areas discussed in Section 3.2. To support the testing of large wind turbine blades, NREL could either support the construction and operation of the WTTC at another site in the U.S. in the future or utilize existing overseas facilities.

The DOE released a report in May 2008 that examined the technical feasibility of harnessing wind power to provide up to 20 percent of the nation's total electricity needs by 2030. Entitled "20 Percent Wind Energy by 2030," the report identified requirements to achieve this goal, including reducing the cost of wind technologies, siting new transmission infrastructure, and enhancing domestic manufacturing capability. Most notably, the report identifies opportunities for 7.6 cumulative gigatons of carbon dioxide (a notable greenhouse gas) to be avoided by 2030, saving 825 million metric tons in 2030 and every year thereafter if wind energy achieves 20 percent of the nation's electricity mix (NREL, 2008b).

Under the No Action Alternative, new wind turbine design certifications would be delayed by the need to ship blades overseas and by the current backlog of testing at the Colorado NWTC. These delays could also delay investments in wind technology and the deployment of large turbine technology which would otherwise have a positive impact on achieving the energy goal and associated greenhouse gas reduction benefits cited above.

4.0 SECONDARY AND CUMULATIVE IMPACTS

4.1 INTRODUCTION

The CEQ regulations implementing NEPA requires the consideration of cumulative impacts as part of the process. "Cumulative impacts result from the incremental impact of the Proposed Action when added to other past, present and reasonably foreseeable future actions" (40 CFR 1508.7). Secondary impacts are those that are caused by the Proposed Action, but may occur later in time or farther removed in distance, relative to the primary impacts of the Proposed Action. Relevant actions (those that could result in cumulative impacts) include:

- Federal, State and local wind technology research programs and deployment plans;
- Past, ongoing and foreseeable actions in Charlestown relating to transportation (roadway and port) and local community redevelopment initiatives; and
- Massport projects and plans at or affecting the Autoport site.

4.2 FEDERAL WIND INITIATIVES

According to the report by DOE "20 Percent Wind Energy by 2030", it is possible to increase wind power's contribution to the U.S. electric consumption to 20 percent by 2030. The requirements for meeting this goal are reducing the cost of wind technologies, enhancements in new infrastructure, faster permitting and siting, improved wind turbines and system reliability, and increased capacity to manufacturing supplies. This report was initiated under President Bush's Advanced Energy Initiative announced in 2006 for clean, secure and sustainable wind energy and the strategies set forth in the DOE report are important in reaching the long term energy plan set for by the President. Based on the goals of DOE and NREL, it is necessary to improve wind technologies and increase wind energy consumption in the electric grid in the U. S. (EERE, 2008).

In order to meet wind energy demand, new facilities must be created for research and development opportunities to ensure the wind power industry's continued momentum. Currently, NREL's existing wind energy technology research facility, the NWTC, provides the development of advanced wind energy technologies. Research at the NWTC includes turbine research and development and technology application and testing. Currently, NREL and Siemens Power Generation will locate and test commercial scale wind turbines just north of the current testing site. This facility will erect a 2.3 megawatt commercial wind turbine allowing testing and development of the next generation technologies (NREL, 2006a).

Additionally, as a result of the rapid growth in the past several years in the wind energy market, an additional WTTC facility in Texas is planned. DOE has a CRADA with the University of Houston in Texas to build a similar facility to the one analyzed in this EA on the Gulf Coast that would be capable of testing large, megawatt-scale blades, at a site that offers proximity to potential offshore wind tests (NREL, 2008c).

The growth of wind energy capacity worldwide has warranted additional testing facilities in the U.S. to remain competitive with foreign markets involved in the wind technology development. Testing allows manufactures to meet the goals that allow them to remain competitive in the wind industry. There is a significant difference between U.S. installed wind energy capacity (approximately 10,000 megawatts installed) and European installed wind energy capacity (approximately 40,000 megawatts installed with a projected 60,000 megawatt installed by the end of 2008). The evolution of U.S. commercial wind technology began around 1980, when the rotor diameter was less than 20 meters (66 feet) and produced about 50 kilowatts. By the year 2000, rotor diameter increased to about 77 meters (253 feet) and produced

about 1.5 megawatts. The growing demand for larger wind turbine blades and new technologies in the wind industry demand additional testing and research initiatives and blade testing is essential for improving turbine design (NREL, 2006b). Cumulatively, the proposed WTTC would have a beneficial impact on the advancement of U.S. wind technology and the ability to implement future wind farms.

4.3 STATE AND LOCAL WIND INITIATIVES

Massachusetts has several initiatives underway to increase the use of clean energy, including the harnessing of wind for electricity generation. The MTC administers the (RET that makes investments in renewable energy projects throughout the Common and has awarded more than $250 million in financial assistance for clean energy initiatives since 2001. The RET have several programs in place to provide financial assistance to individuals, communities, clean energy entrepreneurs, energy generation project developers, and businesses (MTC RET, 2007). As of May 2008, there were 166 wind energy projects utilizing RET grant assistance and categorized under RET initiatives.

As part of Governor Deval Patrick's vision of making Massachusetts a leader in clean energy sector development, the Governor and the Legislature enacted a wide-ranging program of energy and environmental legislation in 2008. One of these new initiatives, the recently enacted Green Communities Act, provides a comprehensive framework for energy reform in the Commonwealth. It mandates a significant increase in the use of renewable energy as well as the deployment of energy efficiency measures. The Green Communities Act modified the existing governance structure of the Massachusetts RET to ensure a better alignment and coordination of its operations with the Executive Office of Energy and Environmental Affairs, and refined the focus of the RET's activities to concentrate on renewable energy project development. This five-year strategic plan and annual operational plan for Fiscal Year 2009 chart a course to accelerated development and increased production of renewable energy in the Commonwealth. Two of the resource development groups included in this plan are Commonwealth Wind and Offshore Wind and Marine, which will both accelerate wind development in Massachusetts by stimulating new project development activity (MRET, 2008).

The Community Wind Collaborative, created in 2003, is a State-wide initiative to build public support for wind energy and to help cities and towns utilize clean, renewable wind power. Currently, the Community Wind Collaborative is working with 48 communities to construct grid-connected wind turbines. An additional 30 cities and towns have expressed interest in participating in this collaboration with the RET. Nearly $10 million from the RET has supported these communities by providing access to technical assistance, wind monitoring equipment, and data analysis to qualified communities allowing the communities to meet local power needs and generate revenue (MTC RET, 2007).

MTC and its partners developed the framework for an offshore wind collaborative using input from Federal, private, and academic leaders for developing sustainable and technologically sound offshore wind energy resources. To date, no offshore wind developments have been approved for construction. According to MTC, it is estimated that the global energy market will grow from its estimated current annual size of $8 billion to $47 billion in the next 10 years with a major percentage of contribution from offshore facility development and investments (MTC RET, 2007).

The City of Boston, with the assistance of MTC, is promoting pilot projects to study the potential for wind power in the city. One study is assessing the feasibility of installing wind turbines on Long Island in Boston Harbor (RERL, 2003). The MWRA is planning on installing wind turbines on two sewage handling facilities, and several harbor islands are being evaluated for development of wind turbines, including Spectacle Island, which is planning on having pier and marina slips powered by several small wind turbines. The MWRA goal is to implement clean energy technologies on all islands as a way to improve sustainability and reduce environmental impacts (MWRA, 2008).

This CRADA between NREL and DOE and the Partnership would create coordinated efforts among the project participants while protecting the intellectual property and allowing for negotiation for licenses to subject inventions that may arise during the agreement (NREL, 2007).

Under the CRADA agreement between NREL and DOE and MTC the collaboration between these entities would result in substantial support from NREL in the form of training, technology and test consulting, and strategic guidance. It is the goal of Partnership to work closely with NREL and DOE to ensure that that the WTTC helps to advance the goals of the DOE's national wind program and the U.S. based wind turbine industry, with an intentional long-term partnership with NREL and DOE in the future of the WTTC through extending the CRADA as necessary prior to expiration.

The proposed WTTC could aid local and State initiatives to promote the use of wind technology, as the Center would provide testing of commercial blades, as well as support research, development, and testing of new blade configurations developed by the MTC partners. Additionally, the Partner Use Rights under the CRADA agreement between NREL and DOE and the Partnership states that there will be availability for wind turbine blade manufacturers to utilize testing programs at WTTC. DOE funded programs would be given priority and it is anticipated that bookings for testing programs could be multi-year commitments. When uncommitted time is available, the facility would market the space to try to achieve full capacity.

4.4 LOCAL TRANSPORTATION

No major identifiable transportation projects are planned in the vicinity of the project location (BRMPO, 2008). However, to support the draft Massport Strategic Plan (see Section 4.1.4), transportation projects are possible and may include road and rail access and reconfigurations to facilitate the growth and accessibility to businesses and industries along the Mystic River waterfront. Additional vehicular movement resulting from the Proposed Action could interfere with traffic patterns that are being adjusted due to transportation projects. Cumulatively, traveling to the project site or the additional vehicular movement (including large trucks) transporting materials and/or personnel to and from the project location could inhibit traffic flow if construction projects were located in the vicinity of the Charlestown site.

4.5 LAND USE AND COMMUNITY REDEVELOPMENT

The Charlestown Navy Yard (also called the Boston Navy Yard) is located several blocks south of the project site along the Mystic River. The Navy Yard was closed in 1974 and 30 acres became part of Boston National Historical Park and is maintained by the National Park Service, while the remaining 100 acres still remains located in the Historic Preservation District but allows development with major consideration toward preservation. Activity at the Navy Yard includes water shuttles that utilize piers for transportation to the historic site, historic ship preservation activities and the docking of the commissioned U.S.S. Constitution. Redevelopment has or is planned to occur on the 100 acres not designated as the historic park including the construction of retail shops and housing units. The park is undergoing various rehabilitation projects and constructing a new ferry landing to increase accessibility. Currently, no plans for additional water transportation routes exist, however; it is expected to expand terminals and service (City of Boston, 2007b).

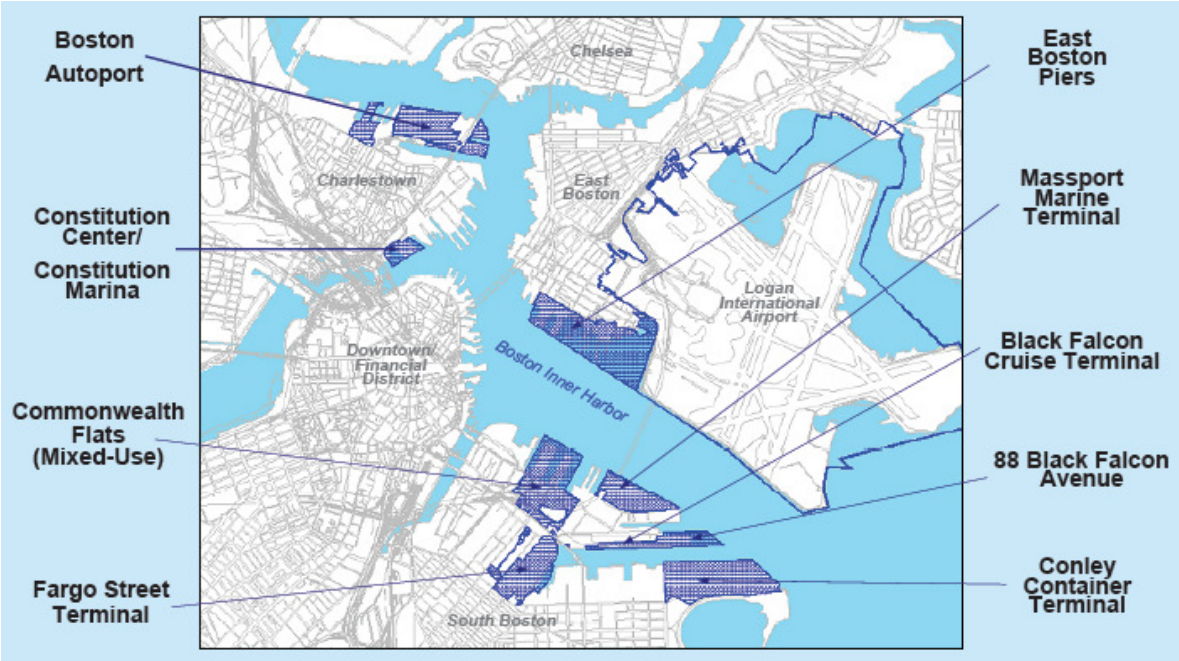
Cumulatively, the construction of the proposed WTTC does not intrude on the plans to preserve, redevelop, and maintain current functions at the Charlestown Navy Yard.

4.6 MASSPORT OPERATIONS

The draft Massport Strategic Plan was developed in March 2007 and identifies the goals and vision for the long term usage for Massport properties. The study area encompassed by the plan is the Massport Marine Terminal, Commonwealth Flats (mixed-use), Fargo Street Terminal, Black Falcon Cruise Terminal, and the Conley Container Terminal (see Figure 4-1).

The primary goals of the plan are listed below:

- Increase the amount of foreign and domestic water-borne commerce through the Port of Boston;
- Develop facilities and related access infrastructure to support growth in container, cruise and bulk cargo business lines;
- Develop other Maritime properties to support core businesses and provide financial return to support ongoing capital investments in port facilities; and
- Operate in a fiscally, environmentally and socially sustainable manner (Massport, 2007).



Source: Massport, 2007

Figure 4-1. Massport Properties Harborwide

The Black Falcon Cruise Terminal, located just south of Massport Terminal, is the second busiest cruise terminal in the northeast and provides $115 million annually to the region and the number of vessels booking the terminal are increasing. Expansion and growth of the cruise business at the terminal would be dependent on the capability of the facility to handle larger vessels and providing modern facilities for the cruise business to utilize (Massport, 2007).

The majority of the key activities to support the implementation of the draft strategic plan exist in the river (dredging and deepening of the river channel) and at the Conley Container Terminal and Falcon Cruise Terminal, neither of which are adjacent to the project site or would be impacted directly by the Proposed Action. Cumulatively, the WTTC would add some ship traffic to the Boston harbor area, although this traffic would be minor compared to the planned growth of shipping activities associated with Massport facilities.

The use of up to five acres for the WTTC on the 66-acre Autoport site would reduce possible expansion of automobile storage in the future, although these impacts would be minor cumulatively considering that Massport has considerable land holdings in the area that could be utilized for storage if necessary. It is also possible that the proposed WTTC could be expanded in the future to support testing of longer blades or additional testing processes. Although such an expansion is undetermined at this point, it is possible that additional land within the Autoport site could be committed to expanding the WTTC facility or outdoor testing areas.

5.0 IRREVERSIBLE/IRRETRIEVABLE COMMITMENT OF RESOURCES

An irreversible commitment of resources is defined as the loss of future options. The term applies primarily to the effects of use of nonrenewable resources such as minerals or cultural resources, or to those factors such as soil productivity that are renewable only over long periods. It could also apply to the loss of an experience as an indirect effect of a "permanent" change in the nature or character of the land. An irretrievable commitment of resources is defined as the loss of production, harvest, or use of natural resources. The amount of production foregone is irretrievable, but the action is not irreversible. If the use changes, it is possible to resume production.

The Proposed Action would not have irreversible impacts because future uses for either site option within the Autoport would remain possible. A future decommissioning process could restore the site for alternative uses, including its present use supporting Autoport operations. The location of the proposed WTTC within the Autoport site is consistent with surrounding industrial land uses and would not affect surrounding land uses. No loss of future land use options would occur.

The primary irretrievable impacts of the Proposed Action would involve the use of energy, labor, material, funds, and the commitment of land for the construction of the WTTC. Irretrievable impacts would occur as a result of construction, facility operations and maintenance activities.

6.0 THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF THE HUMAN ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The Proposed Action would commit resources in the form of energy, labor, materials and funds for the foreseeable future. The justification for these commitments at this time is described in Chapter 1, Purpose and Need for the Proposed Action. Long-term productivity associated with the Proposed Action includes developing the ability to test state-of-the-art wind turbine blades up to 90 meters in length within the U.S. which would lower the testing cost and testing timeframes for manufacturers. This ability would contribute to the long-term productivity of wind energy systems in the U.S.

7.0 UNAVOIDABLE ADVERSE IMPACTS

The Proposed Action under either site option would require the displacement and removal of contaminated soil to construct foundation caissons on the Autoport site. During construction, there would be an unavoidable, although temporary, increase in construction-related noise at the site. There would also be some increased truck and ship travel to and from the site to transport blades and facility waste. This transportation would result in some minor and intermittent traffic impacts and additional noise at the site. Outdoor testing and blade cutting operations would also increase noise during those events, although MTC would use BMPs to mitigate operational noise.

The proposed WTTC would unavoidably consume materials for its construction and consume minor amounts of natural gas, potable water, and electricity for its operations. However, these impacts would be negligible given the energy efficient and sustainable design of the facility.

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Appendix A

Public Involvement (Letters, Notices, Mailing Lists, and Public Comments)

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Scoping Mailing List - January 28, 2009

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(617) 241-7900

Charlestown Waterfront Coalition
P.O. Box 290563
Charlestown, MA 02129
(617) 241-8981

Friends of the Charlestown Navy Yard
PO Box 290787
Charlestown, MA 02129
info@friendscny.org

Charlestown High School
240 Medford Street
Charlestown, MA 02129
(617) 635-9914

Boston Public Library - Charlestown branch
179 Main Street
Charlestown, MA 02129
(617) 242-1248

Roadrunner, Moving and Storage
50 Terminal Street
Charlestown, MA 02129-1973

Commerce Center Café
50 Terminal Street
Charlestown, MA 02129

Super Duck Excursions
100 Terminal Street
Charlestown MA 02129

Boston Housing Authority
138 Medford Street
Charlestown, MA 02129

Catalano Bros Inc.
333 Terminal Street
Charlestown, MA 02129-3901
617-242-3082

City of Boston

Thomas M. Menino, Mayor of Boston
Mayor's Office
1 City Hall Square
Boston, MA 02201

Boston City Council Main Office
5th Floor
1 City Hall Square
Boston, MA 02201

City of Boston
Environment Department
Room 805
1 City Hall Square
Boston, MA 02201
Environment@cityofboston.gov

City of Boston
Transportation Department
Room 721
1 City Hall Square
Boston, MA 02201-1140
BTD@cityofboston.gov

City of Boston
Property & Construction Management
Room 811
1 City Hall Square
Boston, MA 02201
PropertyManagement@cityofboston.gov

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Rep. Eugene L. O'Flaherty
State House, Rm. 136
Boston, MA 02133
(617) 722-2396

State Senator Jarrett Barrios
State House, Rm. 309
Boston, MA 02133
(617) 722-1650

Department of Energy
Golden Field Office
1617 Cole Boulevard
Golden, Colorado 80401-3305

May 15, 2008

DISTRIBUTION LIST

SUBJECT: REQUEST FOR PUBLIC AND AGENCY COMMENTS ON ENVIRONMENTAL ISSUES RELATED TO THE PROPOSED CONSTRUCTION AND OPERATION OF A LARGE BLADE TEST FACILITY (LBTF) AT 100 TERMINAL STREET, CHARLESTOWN, MASSACHUSETTS.

The U.S. Department of Energy (DOE), in compliance with the National Environmental Policy Act of 1969 (NEPA), will be preparing an environmental assessment (EA) for the proposed construction and operation of a Large Blade Test Facility (LBTF) in Charlestown, Massachusetts. This project would be a cooperative effort between DOE's National Renewable Energy Laboratory (NREL), in Golden, Colorado, and the Massachusetts Technology Collaborative (MTC), Westborough, Massachusetts. MTC proposes to operate the LBTF as its Wind Technology Testing Center (WTTC). A detailed description of the site and the proposed LBTF are included in the attachment to this letter.

NREL is one of ten DOE national laboratories and is dedicated to the research, development, and deployment of renewable energy and energy efficiency technologies. The purpose of the proposed effort is to expand upon NREL's existing blade testing capabilities, and to promote additional capacity in the United States for testing advanced wind turbine blades that are necessary to run megawatt-scale wind turbines.

DOE is the lead agency for this EA, and other federal, state, and local agencies are invited to participate in the environmental documentation process. DOE is requesting public input on the proposed NEPA process, proposed actions and alternatives, and the environmental issues to be addressed in the EA. Given the location of the proposed project in Massachusetts, DOE will also coordinate with the Massachusetts Environmental Policy Act (MEPA) requirements, as appropriate.

Pursuant to NEPA requirements and DOE's implementing procedures for compliance with NEPA (10 CFR Part 1021), DOE is preparing a draft EA to:

- Identify any adverse environmental effects that cannot be avoided should this proposed action be implemented;
- Evaluate viable alternatives to the proposed action, including a no action alternative;
- Describe the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity; and
- Characterize any irreversible and irretrievable commitments of resources that would be involved should this proposed action be implemented.

Federal Recycling Program Printed on Recycled Paper

DOE plans to distribute the draft EA for public review and comment in July to August 2008. This letter and the draft EA, when it is available, will be posted on the DOE Golden Field Office electronic reading room at www.eere.energy.gov/golden/reading_room.aspx.

Please direct your written comments to:

NREL_NEPA_comments@NREL.gov

Please provide your input on or before June 20, 2008. We look forward to hearing from you.

Sincerely,

Steve Blazek
NEPA Compliance Officer

Attachment

ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED CONSTRUCTION AND OPERATION OF A LARGE BLADE TEST FACILITY (LBTF) AT 100 TERMINAL STREET, CHARLESTOWN, MASSACHUSETTS

PURPOSE AND NEED

Wind energy has experienced recent growth in the U.S. due to the increasing cost of natural gas and other petroleum products, and concerns over greenhouse gases produced by coal-fired electric plants. Some states have set requirements that a portion of their future energy come from renewable resources, also influencing the growth of wind farms. Since 2001, the U.S. has increased wind energy production by more than 300 percent, accompanied by a trend to increase blade size to create a higher energy output per windmill. In fact, next generation on-shore and off-shore turbine blades will exceed 160 feet (50 meters). Currently, blades exceeding this length can not be fatigue tested in the U.S.

The mission of the DOE Wind Energies Technologies Program is to lead the nation's effort to improve wind energy technology through partnerships that enhance domestic economic benefit from wind power development and coordinate with stakeholders on activities that address barriers to wind energy use. NREL is considering entering into a cooperative agreement for the development of a Large Blade Test Facility (LBTF) in Charlestown, Massachusetts. The purpose of this effort is to ensure the U.S. has additional capacity in place to test advanced wind turbine blades necessary to run megawatt-scale wind turbines. Currently, there is one facility in the U.S., located at NREL's National Wind Technology Center. However, the rapid growth in wind turbine size over the past two decades warrants additional testing facilities for the U.S. to remain competitive with foreign markets involved in wind technology development. The testing of full-scale prototypes of individual turbine blades is fundamental prior to manufacturing and installation of wind turbine blades on a large scale. Testing allows manufacturers to meet certification requirements, minimize risk of design flaws resulting in costly fleet-wide retrofits, and to validate tools, tune models, and evolve codes

Therefore, DOE needs new U.S. Wind Technology Testing Centers to:

- Continue providing an independent third-party testing capability required to meet turbine certification and investor requirements;
- Alleviate the current backlog at the National Wind Technology Center blade test facility;
- Support the development of large land-based and off-shore wind turbines; and
- Support the 2006 Advanced Energy Initiative and 2007 Energy Independence and Security Act of 2007 by increasing technology reliability and reducing the cost of energy from wind turbines.

It is important to note that there will be no installation of operating wind turbines on or near the site under the Proposed Action. Testing will occur on only the blades themselves to assess structural integrity, and there will be no testing of whole windmill assemblies.

PROPOSED ACTION AND ALTERNATIVES

The following presents a summary of the current Proposed Action and No Action alternative descriptions. Other alternatives raised during the scoping period will be considered and may be addressed in the EA if they are consistent with the Proposed Action purpose and need.

PROPOSED ACTION

The Proposed Action is to enter into a cooperative agreement with the Commonwealth of Massachusetts Partnership (MA) and support their efforts to design, construct, and operate the Massachusetts-NREL Large Blade Testing Facility, which would be an advanced blade testing facility capable of testing blades up to at least 230 feet (70 meters) in length, within a newly constructed building. NREL's role would be to provide capital equipment and one or more NREL employees at the facility for training, commissioning, and continued technical assistance. In addition, NREL would provide one or more laboratory staff to assist in facility operation, technical expertise and advice, and training to MA staff. MA would provide all other resources necessary to design, construct and operate the LBTF.

The proposed MA site is located at 100 Terminal Street, in the Charlestown section of Boston. The site is a paved industrial port facility owned by the Massachusetts Port Authority (Massport), adjacent to the Mystic River portion of Boston Harbor. The site, known as the Boston Autoport, is currently an auto processing facility for imported automobiles entering the U.S. The proposed LBTF building would occupy approximately 1 acre of the site, be less than 75 feet tall, and its operation would require less than 3 acres of outdoor storage space. Approximately 8 full-time employees would initially be required to operate the facility.

Notable aspects of the project include:

- Transportation of up to approximately 10 blades (up to 70m in length) annually to the site by truck or water. This would require signal pole relocation or modifications at the intersection of New Rutherford Avenue (U.S. Highway 99) and Chelsea Street (1 mile south of the site).
- Disturbance of potentially contaminated soils at the site, where the site is subject to an Activity and Use Limitation deed notice.
- Relocation of the existing uses from the proposed LBTF site to elsewhere on the Boston Autoport parcel. Depending on the footprint that is identified through the design process for the LBTF, the relocated uses could include auto storage, salt storage or the salt/sand mixing shed.
- Possible use of river water or geothermal wells for cooling.

NO ACTION

Under the No Action Alternative, DOE and NREL would not support the construction of the proposed facility. If MTC chooses to go forward with the project without DOE approval they would do so without federal support or funding.

ENVIRONMENTAL TOPICS TO BE ADDRESSED

The proposed EA will address primary, direct, indirect, secondary and cumulative impacts of the Proposed Action and No Action alternatives. Beneficial and adverse, on-site and off-site, construction, and operation and maintenance impacts will be discussed, as appropriate. The environmental topics to be discussed in the EA include:

- Land Use, Planning
- Socioeconomics and Environmental Justice
- Transportation and Traffic
- Air Quality and Noise
- Visual Quality/Aesthetics
- Water Resources
- Soils and Geology
- Biological Resources
- Cultural Resources
- Waste Management
- Infrastructure
- Safety and Risk
- Resource Use/Sustainability

SCHEDULE

The schedule for key milestones to complete the NEPA review process is:

Close of Scoping Period	June 20, 2008
Public Distribution of the Draft EA	August - September 2008

No formal public scoping meeting is currently planned for this project. This letter and the draft EA, when it is available, will be posted on the Golden Field Office electronic reading room at www.eere.energy.gov/golden/reading_room.aspx.

Please direct written comments to:

NREL_NEPA_comments@NREL.gov

FIGURES:
Figure 1 –WTTC Regional Location Map, Charlestown, MA
Figure 2 – WTTC Site Map, 100 Terminal Street

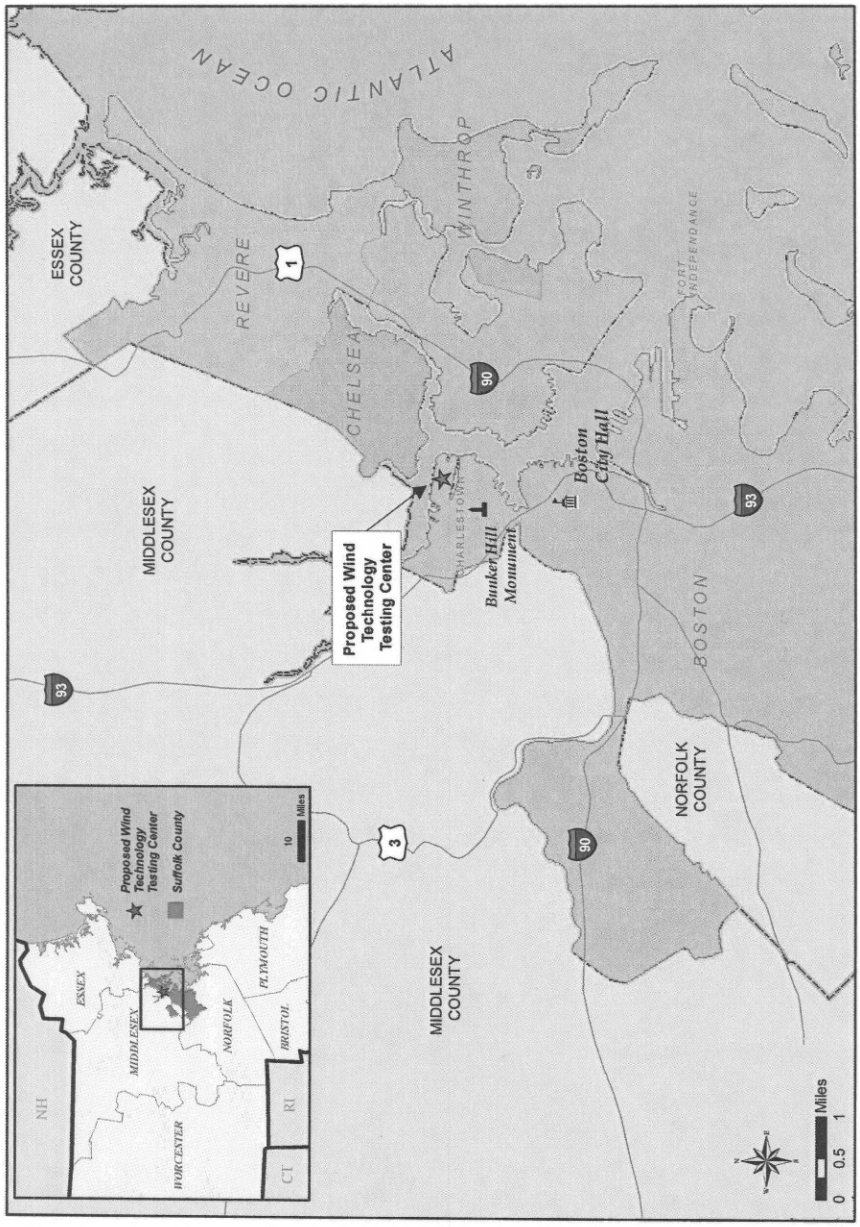

Figure 1 – WTTC Regional Location Map, Charlestown, MA

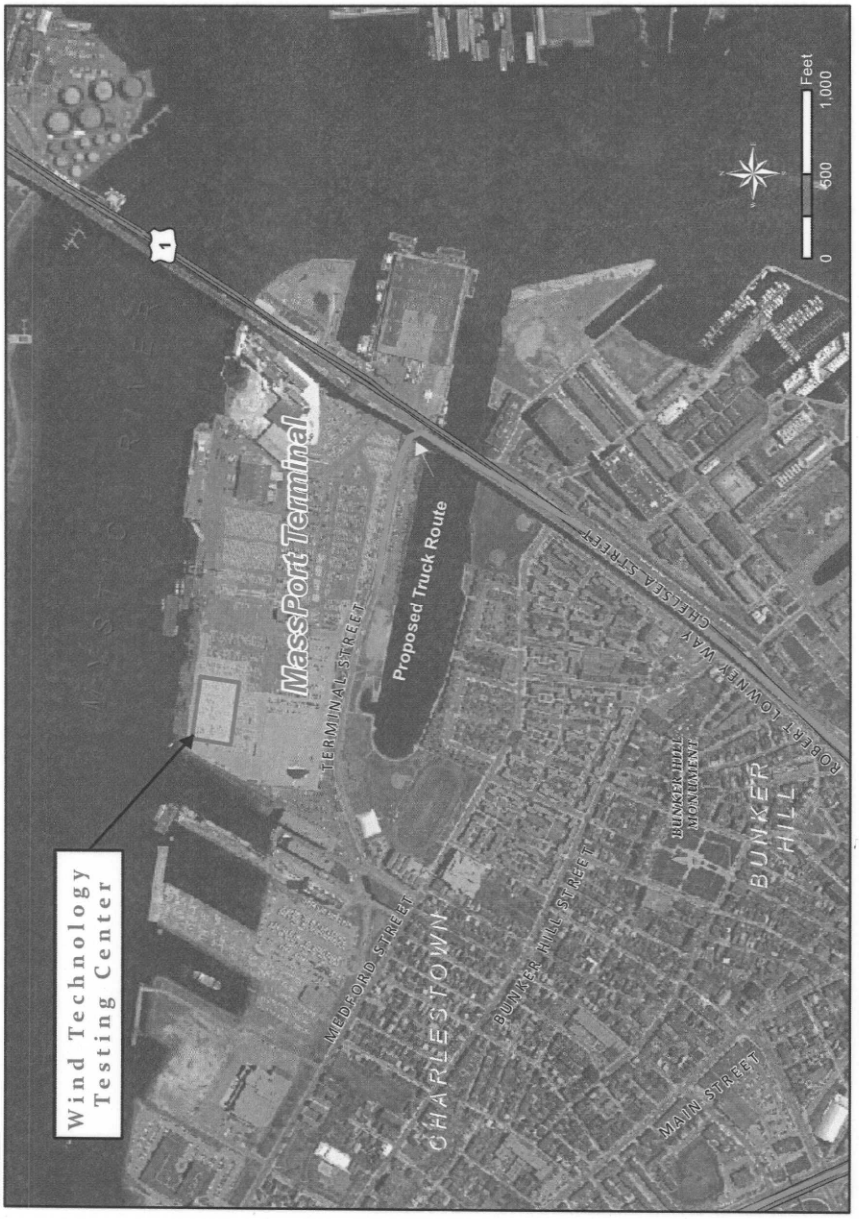

Figure 2 – WTTC Site Map, 100 Terminal Street

Notice of Scoping

NOTICE OF INTENT TO PREPARE AN ENVIRONMENTAL ASSESSMENT FOR A WIND TECHNOLOGY TESTING CENTER IN CHARLESTOWN, MASSACHUSETTS

The U.S. Department of Energy (DOE) is seeking public input on the scope of the environmental assessment (EA) noted above. The notice of intent is available for public review online in the DOE Electronic Public Reading Room (http://www.eere.energy.gov/golden/Reading_Room.aspx).

DOE's Golden Field Office will prepare this document in accordance with the National Environmental Policy Act (NEPA). NREL is a federally owned, contractor-operated research facility that supports renewable energy and energy efficiency technologies. The EA will address proposed operations at the Wind Technology Testing Center in Charlestown, Massachusetts. DOE is seeking public comment on the proposed NEPA process, proposed actions and alternatives, and the environmental issues to be addressed in the EA.

Please submit comments by June 20, 2008, to:

National Renewable Energy Laboratory,
NREL NEPA Comments,
1617 Cole Boulevard, MS 730,
Golden, CO 80401-3393,
or NREL.NEPA.Comments@nrel.gov.

Notice of Scoping placed in the Charlestown Bridge Paper on May 29, 2008

NOTICE OF AVAILABILITY

The U.S. Department of Energy (DOE) has prepared a draft Environmental Assessment (EA) to analyze and describe the potential environmental impacts associated with the:

Wind Technology Testing Center
Boston, Massachusetts (DOE EA #1652)

DOE's Golden Field Office has prepared an EA in accordance with the National Environmental Policy Act (NEPA). This project would be a cooperative effort between DOE's National Renewable Energy Laboratory (NREL), in Golden, Colorado, and the Massachusetts Technology Collaborative (MTC), Westborough, Massachusetts. The EA addresses the proposed construction and operations at the Wind Technology Testing Center, a large blade test facility, in the Charlestown neighborhood of Boston, Massachusetts. DOE is seeking public comment on the proposed actions and alternatives, and the environmental issues addressed in the EA.

The draft EA is available for review on the DOE Golden Field Office website:

http://www.eere.energy.gov/golden/Reading_Room.aspx.

Please submit comments by **July 8, 2009**, to National Renewable Energy Laboratory, NREL NEPA Comments, 1617 Cole Boulevard, MS 730, Golden, CO 80401-3393, or NREL.NEPA.Comments@nrel.gov.

Notice of Availability, Published on the EERE Reading Room Website on June 8, 2009

CITY OF BOSTON
THE ENVIRONMENT DEPARTMENT

Boston City Hall, Room 805 • Boston, MA 02201 • 617/635-3850 • FAX: 617/635-3435

July 8, 2009

Steven Chu, Secretary
U.S. Department of Energy
c/o National Renewable Energy Laboratory
NREL NEPA Comments
1617 Cole Boulevard, MS 70
Golden, CO 80401-3305

Re: Wind Technology Testing Center, DOE/EA #1652
Charlestown, MA

Dear Secretary Chu:

The City of Boston writes in strong support of the construction and operation of a Wind Technology Testing Center (WTTC) proposed for a location at 100 Terminal Street, the Boston Autoport site, in a primarily industrial area of Boston's Charlestown neighborhood. The U.S. Department of Energy (DOE), through the National Renewable Energy Laboratory (NREL), proposes to provide funding and technical support in collaboration (i.e., through a Cooperative Research and Development Agreement [CRADA] with the Massachusetts Technology Center (MTC) for the design, construction and operation of the WTTC.

The purpose of the DOE proposal for the WTTC is to strengthen U.S. capability to test advanced wind turbine blades necessary to run megawatt-scale wind turbines, provide independent third-party verification required to meet turbine certification and investor requirements, alleviate the current backlog at the National Wind Technology Center blade test facility and to support the development of large land-based and off-shore wind turbines.

The proposed blade testing facility would be capable of accommodating up to 90-meter long wind turbine blades for a full suite of static and fatigue tests. It is important to note that there would be no installation of large-scale operating wind turbines on or near the site. Testing would occur indoors on the individual blades to assess their structural integrity; additionally, there may be coupon testing (e.g., testing of small material samples). There would be no installation of large-scale operating wind turbines on or near the site.

The site is located in a Designated Port Area (DPA); the project is described as water-dependent. An Order of Conditions will be sought from the Boston Conservation Commission and a c. 91(Waterways Regulation) license from the Massachusetts Department of Environmental Protection.

The proposed blade testing facility would consist of a new building 80 feet tall with an anticipated footprint of approximately 50,000 sq. ft., including open test bay space capable of accommodating up to 90-meter long wind turbine blades for a full suite of static and fatigue tests. These bays would be served by bridge cranes, a control booth, and doors high enough to allow roll-in access for large trucks and dollies. A section of the building would house offices, a fabrication shop and pump rooms, and sheltered storage for facility equipment. Initial staffing is expected to include a WTTC director, two senior test engineers, a facilities manager, design engineer, two technicians and one office manager. Additional employees may be added at a later date if the work load warrants.

As the testing needs of the wind industry are changing rapidly, siting of the new facility needs to take into account future expansion both for the increasing length of wind turbine blades and additional testing bays to meet growing market demand. This would include the construction of one two-sided test block within the new building that in the

D. Bryan Glascock, Director PRINTED ON RECYCLED PAPER Thomas M. Menino, Mayor

future could be used to test outside using a roll-up door installed in the rear of the new building and installing a "tip door" above the sliding hangar door to allow up to 90-meter blade tests mostly indoors. An additional 1.6-acre "blade turning easement area" would be required just outside the building's hangar doors to maneuver blades through the doors.

An estimated 15 blades would be tested at the facility annually. Static tests would occur over a period of approximately one week, where blades would be maneuvered inside the building, and then weights, pulleys and cables are used to flex the blade, while instrumentation on the blade provides stress data. Fatigue tests would occur within the test facility over a period of two to three months, 24 hours a day. In these tests, blades are held horizontally and, through the Universal Resonant Excitation system or Blade Resonant Excitation system, are tested in either one or two axes (flap and edge). The building would have two or more test stands.

The facility would also host structural and seismic testing of building materials (primarily structural steel and concrete) in support of university-sponsored research and development. For seismic testing, material samples (such as wood beams, plywood, and concrete slabs) or small-scale building assemblies (such as wall mock-ups or windows) would be subjected to stresses similar to those experienced under earthquake conditions, where hydraulic loads are applied in a cyclic fashion. The equipment and testing operations for this research would be easily accommodated by the space within the building and testing of small-scale materials would not interfere with blade testing operations. No additional full-time personnel would be required to support these tests.

The blades would be transported to the site primarily by ship, but could also be transported by truck. Blades transported to the site by ship or barge would utilize the existing docks at the Autoport site and would be off-loaded by mobile rental cranes. Blades up to 63 meters (207 feet) in length could be transported by truck with some modifications to curb lines and traffic signals. Once off-loaded, blades would be transported within the Autoport site into the WTTC building for testing, although some blades may be stored outdoors temporarily adjacent to the building. The transport of blades via truck would be expected to cause minimal increases in traffic congestion and accident risks considering the low frequency of deliveries (approximately 15 per year), resulting in minor impacts. Increased traffic due to worker commuting would cause a negligible increase in traffic congestion and accident risks, resulting in negligible impacts.

After testing, blades would either be shipped back to the manufacturer (intact or in sections) or cut up and sent to a landfill. Cutting of blades for either failure analysis (post-mortem inspection) or disposal would be conducted either indoors or outdoors, as is the practice currently at the Colorado NWTC site. The WTTC Management Committee would explore possible recycling opportunities to minimize or avoid landfilling discarded blades.

The facility would initially employ about eight employees. Although NREL expects that tours would occasionally be provided to small groups, the number of people on-site at any one time would most likely be less than 40.

The following is a Summary of Potential Committed Measures designed to mitigate potential project impacts.

Table S-2. Summary of Potential Committed Measures

Resource Area	Potential Committed Measures
Land Use	No committed measures will be required.
Water Resources	MTC will implement a procedure for collecting spray water and debris from outdoor blade cutting. MTC will obtain a construction stormwater permit and follow construction BMPs for stormwater pollution prevention. MTC will be covered by the Autoport's Stormwater Pollution Prevention Plan and permit when they are finalized. Specific stormwater pollution prevention measures will be developed as necessary to cover MTC-specific processes. MTC will ensure project compliance with the Massachusetts CZM polices as described in Appendix E.

BED comments - Wind Technology Testing Center, DOE/EA #1652
Page 3

Air Quality	MTC will develop and implement a blade cutting operating procedure to minimize fiberglass-containing airborne dust. MTC will utilize Massport construction specifications and construction contractors will control construction-related air emissions through dust suppression and equipment Emission Control Devices (for diesel-powered construction equipment with horsepower [HP] ratings of 60 HP and above that are used on the project in excess of 30 days).
Geology and Soils	MTC will obtain the services of a Licensed Site Professional to manage and oversee the removal of contaminated soils from the Activity and Use Limitation (AUL) area during construction. All contaminated soil that is excavated will be segregated and staged on plastic sheeting to avoid contact with surface soils. The soil piles will be covered with plastic sheeting at the end of each work day and will be disposed at appropriate receiving facilities with all necessary manifest documentation.
Biological Resources	No committed measures will be required.
Waste Management	MTC will develop and implement a work plan for the safe handling and appropriate disposal of contaminated soil removed during the construction process. MTC will manage, test, and dispose of excavated soil consistent with Resource Conservation and Recovery Act (RCRA) and Toxic Substances Control Act (TSCA) regulations. MTC will develop a waste minimization program that includes recycling. MTC will investigate and implement ways to recycle otherwise discarded wind turbine blade materials.
Infrastructure and Energy Use	No committed measures will be required.
Transportation	MTC will minimize traffic impacts and reduce road safety hazards by: obtaining appropriate permits for over-sized delivery trucks; ensuring that Federal, State and local trucking guidelines are observed during blade transport; implementing modifications to intersections to allow oversized trucks to safely make necessary turns (including relocating several utility poles and modifying an existing traffic light near the project site); and coordinating with City and State officials regarding any intersection modifications that may be necessary for transporting blades to and from the WTTC.
Cultural Resources	In the event that potentially significant cultural materials or features are discovered during construction, MTC will obtain the consultation services of an archeologist to assess the significance of the findings.
Noise	MTC will use shielding and other controls to reduce noise levels of the facility's equipment and outdoor operations to protect on-site workers and minimize adverse effects to surrounding neighbors. MTC will avoid conducting high-noise activities (such as outdoor blade cutting) during evening and night-time hours (5:00 p.m. to 7:00 a.m.).
Aesthetics	MTC will conduct review meetings with City officials and hold additional community meetings to keep the public informed and solicit comments regarding the building's design.
Socioeconomics and Environmental Justice	No committed measures will be required.
Sustainability	MTC will design the WTTC to meet Massachusetts LEED Plus criteria.

BED comments - Wind Technology Testing Center, DOE/EA #1652
Page 4

Safety/Risk Assessment	During construction, MTC will institute a Worker Protection Plan and use a Licensed Site Professional to manage and oversee the excavation and disposal of contaminated soil. MTC will provide secondary containment for all hydraulic fluid reserves and inspect hydraulic lines routinely for leaks. MTC will implement a spill response plan at the WTTC. MTC will design the WTTC so that there are no floor drains in areas where hydraulic fluid or hazardous materials are stored or used. MTC will design the building and configure equipment to incorporate noise shielding and other noise minimization measures to protect worker health in accordance with OHSA regulations.

The Environmental Assessment (EA) shows that the proponent has assessed and designed measures to address issues of stormwater management, water conservation, air quality, noise and transportation. There are no potential impacts on archaeological, historic or cultural resources.

We find that the EA reflects DOE's expertise in assessing the potential impacts of a WTTC and we are confident that the Center will be constructed and operated to the highest environmental protection standards.

The City of Boston regards the WTTC as important on national, state and local levels as a means to enhance security, improve air quality, provide an important element in achieving energy independence and minimizing climate change and create jobs. We strongly support the DOE-MTC collaboration and the siting of the WTTC at the proposed site.

We look forward to working with the proponents as the project moves forward.

Thank you for the opportunity to comment.

Sincerely,

Bryan Glascock
Director

Wind Technology Testing Center 7.09.doc.DBG:MTZ.mtz

Appendix B
Massachusetts LEED Plus Requirements

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Massachusetts LEED Plus Requirements

Introduction

The proposed Wind Technology Testing Center (WTTC) would be designed and operated in a manner that would meet the requirements set forth in Massachusetts Executive Order (EO) Number 484 *Leading by Example – Clean Energy and Efficient Buildings*. EO 484 lays out a policy stating that all new construction and renovation of Massachusetts State-managed buildings should meet minimum efficiency, sustainable design, and construction standards. Projects 20,000 square feet or larger are required to meet a "Massachusetts LEED Plus" standard.

The United States (U.S.) Green Building Council created the Leadership in Energy and Environmental Design (LEED) green building rating system, which provides a suite of standards for environmentally sustainable construction to achieve LEED certification.

Massachusetts EO 484 utilizes the Green Building Council's LEED standards as a basis for the State's LEED Plus standards, which include meeting specific parameters considered as options under LEED. The following sections provide a description of the LEED standards and the State requirements.

Leadership in Energy and Environmental Design Standards

LEED certification consists of a scoring system based on a set of required "prerequisites" and a variety of "points" in six major categories. In LEED Version 2.2 for new construction and major renovations there are 69 possible points and buildings must achieve a minimum of 26 points to become certified. The six major categories include the following:

- **Sustainable Sites:** Addresses the size, location, and other effects of the building on its environment. Includes a total of 14 points.
- **Water Efficiency:** Rewards the prudent use of water indoors and outdoors for landscaping. Includes a total of five points.
- **Energy and Atmosphere:** Covers the installation, verification, and monitoring of heating and cooling systems, lighting, and other equipment as well as the use of renewable energy. Includes a total of 17 points.
- **Materials and Resources:** Outlines strategies for using local, renewable, and recycled materials, reducing waste and encouraging recycling. Includes a total of 13 points.
- **Indoor Environmental Quality:** Focuses on reducing indoor gases that can cause harm, incorporating daylight and fresh air, and incorporating lighting and thermal controls for individual occupants. Includes a total of 15 points.
- **Innovation and Design Process:** Provides awards for exemplary performance in any category or a novel and effective technique. Includes a total of five points.

Within each of the major categories described above are specific "credits", awarding one or two points each, which specify a siting or design option and the means to achieve the point(s) for it. For example, under the Sustainable Sites category, Credit 3: Brownfield Redevelopment is meant to encourage the rehabilitation of sites damaged by contamination, thus reducing the pressure on undeveloped land. This credit is worth one point, which can be obtained by either developing a site documented as contaminated or one defined as a brownfield by a local, State, or Federal agency.

LEED Plus Standards

In addition to meeting the LEED certification requirements described above, the Massachusetts LEED Plus standards require the following LEED criteria be met, which are considered optional under LEED:

- **Energy and Atmosphere, Credit 1:** Energy performance exceeding Massachusetts Energy Code requirements by at least 20 percent.
- **Energy and Atmosphere, Credit 3:** Third party building commissioning.
- **Water Efficiency, Credit 1.1:** Reduce potable water consumption for landscaping irrigation by 50 percent from a calculated mid-summer baseline case.
- **Water Efficiency, Credit 3.1:** Incorporate strategies that in aggregate use 20 percent less water than the water use baseline calculated for the building (not including landscaping irrigation).
- **Implementation of at least one of the following:**
    - **Sustainable Sites, Credit 2:** Construct or renovate on a previously developed site either:
        - In a community with a minimum density of 60,000 square feet per acre, or
        - Within one-half mile of 10 basic services and a residential zone or neighborhood with an average density of 10 units per acre; and with pedestrian access between buildings and services.
    - **Sustainable Sites, Credit 3:** Construct or renovate on a brownfields site.
    - **Sustainable Sites, Credit 4.1:** Construct or renovate on a site with public transportation (train or bus) within one-half mile.
    - **Materials and Resources, Credit 1.1:** Maintain 75 percent of existing building structure and envelope.

Appendix C
MEPA Thresholds

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MEPA Thresholds

ENF and Mandatory EIR[1]	ENF and Other MEPA Review if the Secretary So Requires[1]	Threshold exceeded by WTTC?
LAND		
1. Direct alteration of 50 or more acres of land, unless the Project is consistent with an approved conservation farm plan or forest cutting plan or other similar generally accepted agricultural or forestry practices. 2. Creation of 10 or more acres of impervious area.	1. Direct alteration of 25 or more acres of land, unless the Project is consistent with an approved conservation farm plan or forest cutting plan or other similar generally accepted agricultural or forestry practices. 2. Creation of five or more acres of impervious area. 3. Conversion of land held for natural resources purposes in accordance with Article 97 of the Amendments to the Constitution of the Commonwealth to any purpose not in accordance with Article 97. 4. Conversion of land in active agricultural use to nonagricultural use, provided the land includes soils classified as prime, State-important or unique by the United States Department of Agriculture, unless the Project is accessory to active agricultural use or consists solely of one single family dwelling. 5. Release of an interest in land held for conservation, preservation or agricultural or watershed preservation purposes. 6. Approval in accordance with M.G.L. c. 121A of a New urban redevelopment project or a fundamental change in an approved urban redevelopment project, provided that the Project consists of 100 or more dwelling units or 50,000 or more sf of non-residential space. 7. Approval in accordance with M.G.L. c. 121B of a New urban renewal plan or a major modification of an existing urban renewal plan.	No. The proposed WTTC would alter less than 5 acres of existing industrial land that is already covered by a concrete layer (AUL area).
RARE SPECIES		
None.	1. Alteration of designated significant habitat. 2. Taking of an endangered or threatened species or species of special concern, provided that the Project site is two or more acres and includes an area mapped as a Priority Site of Rare Species Habitats and Exemplary Natural Communities.	No. The proposed WTTC site would be located in an existing industrial site with no significant habitat or species of concern present.
WETLANDS, WATERWAYS, and TIDELANDS		
1. Provided that a Permit is required: a. alteration of one or more acres of salt marsh or bordering vegetating wetlands; or b. alteration of 10 or more acres of any other wetlands. 2. Alteration requiring a variance in accordance with the Wetlands Protection Act.	1. Provided that a Permit is required: a. alteration of coastal dune, barrier beach or coastal bank; b. alteration of 500 or more linear feet of bank along a fish run or inland bank; c. alteration of 1,000 or more sf of salt marsh or outstanding resource waters; d. alteration of 5,000 or more sf of bordering or isolated vegetated wetlands; e. New fill or structure or Expansion of existing fill or structure, except a pile-supported	No. The proposed WTTC would use existing docks at the Autoport site, and would not require any disturbance to waterways, such as fill, dredging or installation of new structures in

MEPA Thresholds

ENF and Mandatory EIR[1]	ENF and Other MEPA Review if the Secretary So Requires[1]	Threshold exceeded by WTTC?
3. Construction of a New dam. 4. Structural alteration of an existing dam that causes an Expansion of 20% or any decrease in impoundment Capacity. 5. Provided that a Chapter 91 License is required, New non-water dependent use or Expansion of an existing non-water dependent structure, provided the use or structure occupies one or more acres of waterways or tidelands.	structure, in a velocity zone or regulatory floodway; or f. alteration of one half or more acres of any other wetlands. 2. Construction of a New roadway or bridge providing access to a barrier beach or a New utility line providing service to a structure on a barrier beach. 3. Dredging of 10,000 or more cy of material. 4. Disposal of 10,000 or more cy of dredged material, unless at a designated in-water disposal site. 5. Provided that a Chapter 91 License is required, New or existing unlicensed non-water dependent use of waterways or tidelands, unless the Project is an overhead utility line, a structure of 1,000 or less sf base area accessory to a single family dwelling, a temporary use in a designated port area, or an existing unlicensed structure in use prior to January 1, 1984. 6. Construction, reconstruction or Expansion of an existing solid fill structure of 1,000 or more sf base area or of a pile-supported or bottom-anchored structure of 2,000 or more sf base area, except a seasonal, pile-held or bottom-anchored float, provided the structure occupies flowed tidelands or other waterways.	waterways. Because a key aspect of the Proposed Action is transport of blades by ship, the action would be a water-dependent use, exempt from obtaining a permit or license under Chapter 91.
WATER		
1. New withdrawal or Expansion in withdrawal of: a. 2,500,000 or more gpd from a surface water source; or b. 1,500,000 or more gpd from a groundwater source. 2. New interbasin transfer of water of 1,000,000 or more gpd or any amount determined significant by the Water Resources Commission. 3. Construction of one or more New water mains 10 or more miles in length. 4. Provided that the Project is undertaken by an Agency, New water service to a municipality or water district across a municipal boundary through New or existing pipelines, unless a disruption of service emergency is declared in accordance with applicable statutes and regulations.	1. New withdrawal or Expansion in withdrawal of 100,000 or more gpd from a water source that requires New construction for the withdrawal. 2. New withdrawal or Expansion in withdrawal of 500,000 or more gpd from a water supply system above the lesser of current system-wide authorized withdrawal volume or three-years' average system-wide actual withdrawal volume. 3. Construction of one or more New water mains five or more miles in length. 4. Construction of a New drinking water treatment plant with a Capacity of 1,000,000 or more gpd. 5. Expansion of an existing drinking water treatment plant by the greater of 1,000,000 gpd or 10% of existing Capacity. 6. Alteration requiring a variance in accordance with the Watershed Protection Act, unless the Project consists solely of one single family dwelling. 7. Non-bridged stream crossing 1,000 or less feet upstream of a public surface drinking water supply for purpose of forest harvesting activities.	No. The WTTC would use very small amounts of municipal water and would not require new water mains.

MEPA Thresholds

ENF and Mandatory EIR[1]	ENF and Other MEPA Review if the Secretary So Requires[1]	Threshold exceeded by WTTC?
	WASTEWATER	
1. Construction of a New wastewater treatment and/or disposal facility with a Capacity of 2,500,000 or more gpd. 2. New interbasin transfer of wastewater of 1,000,000 or more gpd or any amount determined significant by the Water Resource Commission. 3. Construction of one or more New sewer mains 10 or more miles in length. 4. Provided that the Project is undertaken by an Agency, New sewer service to a municipality or sewer district across a municipal boundary through New or existing pipelines, unless an emergency is declared in accordance with applicable statutes and regulations. 5. New discharge or Expansion in discharge of any amount of sewage, industrial waste water or untreated stormwater directly to an outstanding resource water. 6. New Capacity or Expansion in Capacity for storage, treatment, processing, combustion or disposal of 150 or more wet tpd of sewage sludge, sludge ash, grit, screenings, or other sewage sludge residual materials, unless the Project is an Expansion of an existing facility within an area that has already been sited for the proposed use in accordance with M.G.L. c. 21 or M.G.L. c. 83, section 6.	1. Construction of a New wastewater treatment and/or disposal facility with a Capacity of 100,000 or more gpd. 2. Expansion of an existing wastewater treatment and/or disposal facility by the greater of 100,000 gpd or 10% of existing Capacity. 3. Construction of one or more New sewer mains: a. that will result in an Expansion in the flow to a wastewater treatment and/or disposal facility by 10% of existing Capacity; b. five or more miles in length; or c. 1/2 or more miles in length, provided the sewer mains are not located in the right of way of existing roadways. 4. New discharge or Expansion in discharge: a. to a sewer system of 100,000 or more gpd of sewage, industrial waste water or untreated stormwater; b. to a surface water of: i. 100,000 or more gpd of sewage; ii. 20,000 or more gpd of industrial waste water; or iii. any amount of sewage, industrial waste water or untreated stormwater requiring a variance from applicable water quality regulations; or c. to groundwater of: i. 10,000 or more gpd of sewage within an area, zone or district established, delineated or identified as necessary or appropriate to protect a public drinking water supply, an area established to protect a nitrogen sensitive embayment, an area within 200 feet of a tributary to a public surface drinking water supply, or an area within 400 feet of a public surface drinking water supply; ii. 50,000 or more gpd of sewage within any other area; iii. 20,000 or more gpd of industrial waste water; or iv. any amount of sewage, industrial waste water or untreated stormwater requiring approval by the Department of Environmental Protection of a variance from Title 5 of the State Environmental Code for New construction. 5. New Capacity or Expansion in Capacity for:	No. The proposed WTTC would result in minor amounts of wastewater that would not require new sewer mains.

MEPA Thresholds

ENF and Mandatory EIR[1]	ENF and Other MEPA Review if the Secretary So Requires[1]	Threshold exceeded by WTTC?
	a. combustion or disposal of any amount of sewage sludge, sludge ash, grit, screenings, or other sewage sludge residual materials; or b. storage, treatment, or processing of 50 or more wet tpd of sewage sludge or sewage sludge residual materials.	
TRANSPORTATION		
1. Unless the Project consists solely of an internal or on-site roadway or is located entirely on the site of a non-roadway Project: a. construction of a New roadway two or more miles in length; or b. widening of an existing roadway by one or more travel lanes for two or more miles. 2. New interchange on a completed limited access highway. 3. Construction of a New airport. 4. Construction of a New runway or terminal at an existing airport. 5. Construction of a New rail or rapid transit line along a New, unused or abandoned right-of-way for transportation of passengers or freight (not including sidings, spurs or other lines not leading to an ultimate destination). 6. Generation of 3,000 or more New adt on roadways providing access to a single location. 7. Construction of 1,000 or more New parking spaces at a single location.	1. Unless the Project consists solely of an internal or on-site roadway or is located entirely on the site of a non-roadway Project: a. construction of a New roadway one-quarter or more miles in length; or b. widening of an existing roadway by four or more feet for one-half or more miles. 2. Construction, widening or maintenance of a roadway or its right-of-way that will: a. alter the bank or terrain located 10 more feet from the existing roadway for one-half or more miles, unless necessary to install a structure or equipment; b. cut five or more living public shade trees of 14 or more inches in diameter at breast height; or c. eliminate 300 or more feet of stone wall. 3. Expansion of an existing runway at an airport. 4. Construction of a New taxiway at an airport. 5. Expansion of an existing taxiway at Logan Airport. 6. Expansion of an existing terminal at Logan Airport by 100,000 or more sf. 7. Expansion of an existing terminal at any other airport by 25,000 or more sf. 8. Construction of New or Expansion of existing air cargo buildings at an airport by 100,000 or more sf. 9. Conversion of a military airport to a non-military airport. 10. Construction of a New rail or rapid transit line for transportation of passengers or freight. 11. Discontinuation of passenger or freight service along a rail or rapid transit line. 12. Abandonment of a substantially intact rail or rapid transit right-of-way. 13. Generation of 2,000 or more New adt on roadways providing access to a single location. 14. Generation of 1,000 or more New adt on roadways providing access to a single location and construction of 150 or more New parking spaces at a single location. 15. Construction of 300 or more New parking spaces at a single location.	No. The truck transportation planned to support the WTTC would not require new roadway or road widening. The project would result in parking spaces for 8 full-time employees and some visitor parking and result in negligible increases in average daily traffic (adt).

MEPA Thresholds

ENF and Mandatory EIR[1]	ENF and Other MEPA Review if the Secretary So Requires[1]	Threshold exceeded by WTTC?
ENERGY		
1. Construction of a New electric generating facility with a Capacity of 100 or more MW. 2. Expansion of an existing electric generating facility by 100 or more MW. 3. Construction of a New fuel pipeline 10 or more miles in length. 4. Construction of electric transmission lines with a Capacity of 230 or more kv, provided the transmission lines are five or more miles in length along New, unused or abandoned right of way.	1. Construction of a New electric generating facility with a Capacity of 25 or more MW. 2. Expansion of an existing electric generating facility by 25 or more MW. 3. Construction of a New fuel pipeline five or more miles in length. 4. Construction of electric transmission lines with a Capacity of 69 or more kv, provided the transmission lines are one or more miles in length along New, unused or abandoned right of way.	No. The WTTC would not require new electric generation, new fuel pipelines, or electric transmission lines.
AIR		
Construction of a New major stationary source with Federal potential emissions, after construction and the imposition of required controls, of: 250 tpy of any criteria air pollutant; 40 tpy of any HAP; or 100 tpy of any combination of HAPs.	1. Construction of a New major stationary source with Federal potential emissions, after construction and the imposition of required controls, of: 100 tpy of PM as PM_{10}, CO, lead or SO_2; 50 tpy of VOC or NOx; 10 tpy of any HAP; or 25 tpy of any combination of HAPs. 2. Modification of an existing major stationary source resulting in a "significant net increase" in actual emissions, provided that the stationary source or facility is major for the pollutant, emission of which is increased by: 15 tpy of PM as PM_{10}; 100 tpy of CO; 40 tpy of SO_2; 25 tpy of VOC or NOx; 0.6 tpy of lead.	No. The proposed WTTC would not result in emissions exceeding MEPA thresholds.
SOLID AND HAZARDOUS WASTE		
New Capacity or Expansion in Capacity of 150 or more tpd for storage, treatment, processing, combustion or disposal of solid waste, unless the Project is a transfer station, is an Expansion of an existing facility within a validly site assigned area for the proposed use, or is exempt from site assignment requirements.	1. New Capacity or Expansion in Capacity for combustion or disposal of any quantity of solid waste, or storage, treatment or processing of 50 or more tpd of solid waste, unless the Project is exempt from site assignment requirements. 2. Provided that a Permit is required in accordance with M.G.L. c. 21D, New Capacity or Expansion in Capacity for the storage, recycling, treatment or disposal of hazardous waste.	No. The proposed WTTC would result in minor amounts of office waste, blade cutting waste and hazardous waste. These levels would not exceed MEPA thresholds.
HISTORICAL and ARCHAEOLOGICAL RESOURCES		
None.	Unless the Project is subject to a Determination of No Adverse Effect by the Massachusetts Historical Commission or is consistent with a Memorandum of Agreement with the Massachusetts Historical Commission that has been the subject of public notice and comment: 1. demolition of all or any exterior part of any Historic Structure listed in or located in any Historic District listed	No. The proposed WTTC is not located in a Historic District nor in areas of historic or archeological assets. Impacts

MEPA Thresholds

ENF and Mandatory EIR[1]	ENF and Other MEPA Review if the Secretary So Requires[1]	Threshold exceeded by WTTC?
	in the State Register of Historic Places or the Inventory of Historic and Archaeological Assets of the Commonwealth; or 2. destruction of all or any part of any Archaeological Site listed in the State Register of Historic Places or the Inventory of Historic and Archaeological Assets of the Commonwealth.	to historical or archaeological resources from the construction of the WTTC would be very unlikely.
AREAS OF CRITICAL ENVIRONMENTAL CONCERN (ACEC)		
None.	Any Project within a designated ACEC, unless the Project consists solely of one single family dwelling.	No. The proposed WTTC would not be located within an ACEC.
REGULATIONS		
None.	Promulgation of New or revised regulations, of which a primary purpose is protecting against Damage to the Environment, that significantly reduce: 1. standards for environmental protection; 2. opportunities for public participation in permitting or other review processes; or 3. public access to information generated or provided in accordance with the regulations.	No. The proposed WTTC would not affect regulations.

1 MEPA thresholds are provided as listed in the regulation (have not be edited).

Source: MEPAO, 2004

Appendix D
List of Applicable Permits

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List of Applicable Permits

Regulating Agency	Permit Title	Threshold Criteria/Applicability
Federal Permits		
U.S. Environmental Protection Agency (EPA) Issued in collaboration with the Massachusetts Department of Environmental Protection (Mass DEP)	NPDES General Permit for Stormwater Discharge from Construction Activities	Required for construction projects which disturb 1.0 or more acres.
	NPDES Remediation General Permit (RGP)	Potentially required for stormwater or dewatering discharges from sites known to contain contaminated groundwater.
Commonwealth of Massachusetts Permits		
Mass DEP	Release Abatement Measure (RAM)	Required for any remedial action within an AUL area which includes the excavation or removal of more than 20 cubic yards (CY) of remediation waste contaminated with hazardous materials or 100 CY of remediation waste contaminated with petroleum contaminated soils.
	10-Day Notice of Commencement of Construction	Required before commencement of construction or demolition of an industrial, commercial or institutional building.
Massachusetts Office of Coastal Zone Management (CZM)	Federal Consistency Review	Required because the project is in the Coastal Zone and includes Federal funds for work within 100 feet landward of the 100 year floodplain [310 Code of Massachusetts Regulations 21.09(2)(a)].
Massport Fire Department	Permit to Install Storage Tank	Required to install a fuel storage tank at the site.
	Cross-Connection Back-Flow Preventer Approval	Required for cross-connections between sprinkler and building water supply.
Massachusetts Department of Public Safety	Building Permit	Required for building construction.
	Plumbing Permit	Required for building construction.
City of Boston		
Boston Inspectional Services Department	Electrical Permit	Required for building construction.
Boston Conservation Commission	Order of Conditions, Massachusetts Wetlands Protection Act	Required for building and construction activities proposed within a 100-foot buffer zone from the water's edge. A Notice of Intent filing and public hearing are required.

Note: This list of applicable permits is based on the conceptual design of the facility and is subject to change as the design progresses.

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Appendix E
Consistency with the Massachusetts Coastal Zone Management Program

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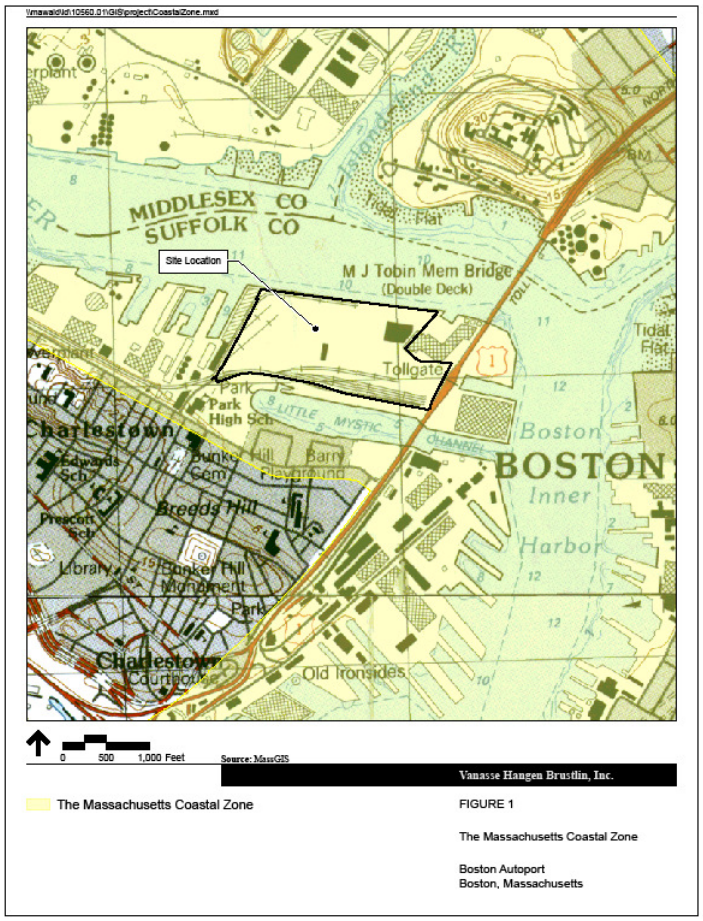
Vanasse Hangen Brustlin, Inc.

Consistency with the Policies of the Massachusetts Coastal Zone Management Program (310 CMR 9.54)

The project site is located within the Massachusetts Coastal Zone as defined by the Massachusetts Coastal Zone Atlas and the regulations at 301 CMR 21.05 and 301 CMR 21.99(4). Figure below depicts the coastal zone boundary as defined therein.



The regulations at 301 CMR 21.00 establish two potential applicable triggers which would require a federal consistency review. Accordingly this Environmental Assessment includes a summary of the jurisdictional threshold triggered and a detailed description of the project's compliance with the regulatory policies and management principles articulated in the CZM regulations at 310 CMR 21.98.

The proposed project will require federal consistency review because it includes direct federal assistance to state and local governments and includes activities located within the Massachusetts Coastal Zone that are proposed seaward of a line 100 feet inland of the 100 year floodplain [301 CMR 21.09(2)(a).] The 100-year floodplain at the site is located along the seaward face of the existing seawalls and solid piers within 100 feet of the proposed building. Accordingly this regulation triggers the need for a federal consistency review.

The following table provides a summary of each of the twenty-five program policies and three management principles established by 301 CMR 21.98 and describes how the project is consistent with each applicable policy or management principle.

Table E-1. Consistency With Massachusetts Coastal Zone Management Policies

MCZM Policy	**Project Compliance**
Water Quality Policy #1 – Ensure that point source discharges in or affecting the coastal zone are consistent with federally-approved state effluent limitations and water quality controls	The proposed facility has been designed to comply with all applicable federal and state effluent limitations and will obtain all necessary permits to discharge treated site stormwater runoff to the Mystic River. Any industrial discharge that may be required will be authorized under the National Pollutant Discharge Elimination System, applicable state regulations or will be conveyed to the Massachusetts Water Resources Authority sewer system. Alternative (if the project team can confirm that no industrial discharge will be required for cutting waste). The proposed facility has been designed to comply with all applicable federal and state effluent limitations and will obtain all necessary permits to discharge treated site stormwater runoff to the Mystic River. No new point source or industrial discharge is proposed.
Water Quality Policy # 2 – Ensure that nonpoint pollution controls promote the attainment of state surface water quality standards in the coastal zone.	The project includes recommended stormwater Best Management Practices to ensure that non-point source pollution is minimized. The project meets all applicable standards through its compliance with the Massachusetts DEP Stormwater Management Regulations.

MCZM Policy	**Project Compliance**
Water Quality Policy # 3 – Ensure that activities in or affecting the coastal zone conform to applicable state requirements governing sub-surface waste discharges and sources of air and water pollution and protection of wetlands.	The project will require numerous state environmental permits and has been designed to comply with all local, state and federal requirements governing sources of air and water pollution as required by these permits. The project does not include any subsurface discharge due to the presence of oil and hazardous materials within the soil at the site. A complete list of anticipated permits and approvals required for the project is provided in Appendix D of the Environmental Assessment.
Habitat Policy # 1 – Protect wetland areas including salt marshes, shellfish beds, dunes beaches barrier beaches, salt ponds, ell grass beds, and freshwater wetlands for their role as natural habitats	The project complies with this standard to the extent applicable. The project site does not include any freshwater or coastal wetlands or wetland impacts. All stormwater discharged from the site will be collected in the existing drainage system and treated in accordance with the recently issued Massachusetts DEP Stormwater Management Regulations prior to discharge. No new point source discharge containing pollutants is proposed.
Habitat Policy # 2 – Promote the restoration of degraded or former wetland resources in coastal areas and ensure that activities in coastal areas do not further wetland degradation but instead take advantage of opportunities to engage in wetland restoration.	The project is located within a developed and active port and does not include any in-water work or anticipated wetland impacts. The project does not include wetland restoration or enhancement but is protective of these resources by reusing an existing developed waterfront site.
Protected Areas Policy # 1 – Assure preservation, restoration and enhancement of complexes of coastal resources or regional or statewide significance through the Areas of Critical Environmental Concern (ACEC) Program.	This policy is not applicable because the project site is not located within any state-designated Area of Critical Environmental Concern (ACEC).
Protected Areas Policy # 2 – Protect state and locally designated scenic rivers and state classified scenic rivers in the coastal zone.	This policy is not applicable because the Mystic River is not a state or locally designated scenic river.

MCZM Policy	**Project Compliance**
Protected Areas Policy # 3 – Review proposed developments in or near designated or registered districts or sites to ensure that the preservation intent is respected by federal, state and private activities and those potential adverse effects are minimized.	The project site does not contain any designated or registered historic district or site and, as examined is detail in Section 3.2.9.2 of this Environmental Assessment, the project is expected to have only negligible effects on any nearby historic properties.
Coastal Hazards Policy # 1 – Preserve, protect, restore and enhance the beneficial functions of storm damage prevention and flood control provided by natural coastal landforms.	The project site consists of a portion of a developed port and is limited to activities landward of the existing bulkheads and seawalls forming the perimeter of the facility. As a completely developed site consisting of pavement above the mapped base flood elevation, the project site does not contain any remaining natural coastal landforms.
Coastal Hazards Policy # 2 – Ensure construction in water bodies and contiguous land areas will minimize interference width water circulation and sediment transport.	This policy is not applicable because the project does not include any work within the Mystic River.

MCZM Policy	**Project Compliance**
Coastal Hazards Policy # 3 – Ensure that publicly funded public works projects requirement proposed for location within the coastal zone will: A. Not exacerbate existing hazards or damage natural buffers or other natural resources; B. Be reasonably safe from flood and erosion related damage; C. Not promote growth and development in hazard-prone or buffer areas, especially in Velocity Zones and ACECs; and D. Not be used on Coastal Barrier Resource Units for new of substantial reconstruction of structures in a manner inconsistent with the Coastal Barrier Resource / Improvement Acts.	The project does not include any public works projects except for the relocation of a portion of existing drain lines within the upland portion of the site. This relocation will include new stormwater treatment devices designed to improve water quality in stormwater discharged from the site, consistent with state regulations and this policy. Additionally, the project complies with each of the four requirements established by this policy as follows: A. The upland project site does not include any existing natural buffers or other natural resources, or work within the Mystic River and therefore is not expected to exacerbate any existing hazards that may exist. B. The proposed facility is located approximately 10.5 feet above the mapped base flood elevation and is therefore reasonably safe from flood or erosion related damage. FEMA flood zone A2 is determined to be elevation 10.5 feet (NGVD'29) in this area. C. The project site is not located within a hazard prone or buffer area, or within an Area of Critical Environmental Concern (ACEC). D. The project site is not located on a Coastal Barrier Unit.
Coastal Hazards Policy # 4 – Prioritization of the use of public funds for acquisition of hazardous coastal areas for conservation or recreation use, and the relocation of structures out of coastal high hazard areas, giving due consideration to the effects of coastal hazards at the location to the use and manageability of the areas.	This policy is not applicable because the project does not include the acquisition of hazardous coastal areas.
Ports Policy # 1 – Ensure that dredging and disposal of dredged material minimize adverse effects on water quality, physical processes, marine productivity and public health.	This policy is not applicable because the project does not include any dredging or dredged material disposal.

MCZM Policy	**Project Compliance**
Ports Policy # 2 – Promote the widest possible public benefit from channel dredging, ensuring that designated ports and developed harbors are given highest priority in the allocation of federal and state dredging funds. Ensure that this dredging is consistent with marine environmental policies.	This policy is not applicable because the project does not include any channel dredging.
Ports Policy # 3 – Preserve and enhance the capacity of Designated Port Areas (DPAs) to accommodate water-dependent industrial uses, and prevent the exclusion of such uses from tidelands and any other DPA lands over which a state agency exerts control by virtue of ownership, regulatory authority or other legal jurisdiction.	The project consists of a water-dependent industrial use because of the need to transport the largest of the proposed wind blades by water. Accordingly, the proposed project promotes appropriate use of the Designated Port Area while preserving the existing capacity of the Autoport to continue supporting its water-dependent industrial use and complies with this policy.
Ports Management Principle # 1 – Encourage, through technical and financial assistance, expansion of water dependent industrial uses in designated ports and developed harbors, redevelopment of urban waterfronts, and expansion of visual access.	The project consists of a water-dependent industrial use within a Designated Port Area and developed harbor and is entirely consistent with the goals of this management principle.
Public Access Management Principle # 1 – Improve public access to coastal recreation facilities and alleviate auto traffic and parking problems through improvements in public transportation. Link existing coastal recreation sites to each other or to nearby coastal inland facilities via trails for bicyclists, hikers, and equestrians, and via rivers for boaters.	This management principle is not applicable to the project because it is a water-dependent industrial use within a Designated Port Area. Public access to and through the site is not permitted in the interest of public safety.
Public Access Management Principle # 2 – Increase capacity of existing recreation areas by facilitating multiple use and by improving management, maintenance and public support facilities. Resolve conflicting uses whenever possible through improved management rather than through exclusion of uses.	This management principle is not applicable to the project because it is a water-dependent industrial use within a Designated Port Area. Public access to and through the site is not permitted in the interest of public safety.
Public Access Management Principle # 3 – Provide technical assistance to developers of private recreational facilities and sites that increase public access to the shoreline.	This management principle is not applicable because the project does not include any public or private recreational facilities. Such uses would not be compatible with the industrial nature of the site or the Autoport.

MCZM Policy	**Project Compliance**
Public Access Management Principle # 4 – Expand existing recreational facilities and acquire and develop new public areas for coastal recreation activities. Give highest priority to expansions or new acquisitions in regions of high need or limited site availability. Assume that both transportation access and the recreational facilities are compatible with social and environmental characteristics of surrounding communities.	This management principle is not applicable because the project does not include any public or private recreational facilities. Such uses would not be compatible with the industrial nature of the site or the Autoport.
Energy Policy # 1 – For coastally dependent energy facilities, consider siting in alternative coastal locations. For non-coastally dependent energy facilities, consider siting in areas outside the coastal zone. Weigh environmental and safety impacts of locating proposed energy facilities at alternative sites.	This standard is not applicable because the project in not a coastally dependent energy facility.
Energy Management Principle # 1 – Encourage energy conservation and the use of alternative sources such as solar and wind power in order to assist in meeting energy needs of the Commonwealth.	The proposed project is consistent with management principle because it provides a needed test facility for wind blades thereby supporting the use of alternative energy and providing needed infrastructure to assist the Commonwealth in meeting its energy needs through sustainable means of generation.
Ocean Resources Policy # 1 – Support the development of environmentally sustainable aquaculture, for both commercial and enhancement purposes.	This policy is not applicable because the project does not include any aquaculture.
Ocean Resources Policy # 2 – Extraction of marine minerals will be considered in areas of state jurisdiction, except where prohibited by the Massachusetts Ocean Sanctuaries Act, where and when the protection of fisheries, air and marine water quality, marine resources, navigation and recreation can be assured.	This policy is not applicable because the project does not include any work within coastal wetlands or any marine mineral extraction.

MCZM Policy	**Project Compliance**
Ocean Resources Policy # 3 – Accommodate offshore sand and gravel mining needs in areas and in ways that will not adversely affect shoreline areas due to alteration of wave direction and dynamics, marine resources and navigation. Mining of sand and gravel, when and where permitted, will be primarily of the purpose of beach nourishment.	This policy is not applicable because the project does not include any offshore sand and gravel mining.
Growth Management Principle # 1 – Encourage, through technical assistance and review of publicly funded development, compatibility of proposed development with local community character and scenic resources.	This management principle is not applicable to the proposed project because the work is limited to the construction of a water dependent industrial building within a developed harbor and Designated Port Area. The proposed use is consistent with the adjacent waterfront industrial uses.
Growth Management Principle # 2 – Ensure that state and federally funded transportation and wastewater projects primarily serve existing developed area, assigning highest priority to projects that meet the needs of urban and community development centers.	The proposed project will, by necessity, include the construction of certain stormwater treatment devices needed to comply with the Massachusetts Stormwater Management Regulations. These improvements will serve the existing developed Autoport, consistent with this management principle.
Growth Management Principle # 3 – Encourage the revitalization and enhancement of existing development centers in the coastal zone through technical assistance and federal state financial support for resident, commercial and industrial development.	The proposed project is consistent with this management principle because it consists of a federally funded activity to provide a facility which increases the presence of water-dependent industrial uses within the developed harbor and Designated Port Area.

Source: Vanasse Hangen Brustlin, Inc. (VHB), 2009. "WTTC – Coastal Zone Management Consistency- Review Draft", April 2009.