Introduction

This chapter presents the updated air quality study conducted for the Project located in Swansea, Massachusetts as described in Chapter 1 Project Summary. The air quality study presented in both the June 2008 Expanded ENF included an analysis of the ozone precursor emissions (mesoscale analysis) as well as the Greenhouse Gas (GHG) mobile and stationary source emissions, including an evaluation of the mitigation measures developed to reduce emissions.

The Executive Office of Energy and Environmental Affairs (EEA) has recently developed and issued a policy that requires project proponents to identify and describe the feasible measures to minimize GHG emissions. The Policy requires that projects undergoing review by the MEPA Office at the EIR level and meeting specific criteria (e.g., generation of 3,000 or more vehicle trips per day) to quantify the Project's GHG emissions and identify measures to avoid, minimize, or mitigate such emissions. In addition to quantifying project-related GHG emissions, the Policy also requires proponents to quantify the impact of proposed mitigation in terms of emissions and energy savings. The goal of the Policy is to identify measures to reduce or minimize the GHG emissions. While GHG emissions include several gases, Carbon Dioxide (CO2) was selected for evaluation because it is the most significant component of project-related GHG emissions. EPA has not set NAAQS for GHGs; however, they do encourage strategies to reduce emissions and save fuel.

The Secretary's MEPA Certificate on the Expanded ENF, dated July 18, 2008, requested that the Proponent consider evaluating additional mitigation measures and Transportation Demand Management (TDM) measures. The purpose of this section is to address the Secretary's Certificate by updating the Project's GHG emissions analysis accordingly. The Project consists of a retail building with garden center, retail building, a restaurant, wastewater treatment facility, and associated parking and utilities.
Summary of Mesoscale Analysis

The Expanded ENF mesoscale analysis evaluated the change in emissions from Project-related traffic for the 2007 Existing, 2012 No-Build, and 2012 Build, and 2012 Build with Mitigation conditions. The mesoscale analysis demonstrates that the Project meets the Massachusetts Department of Environmental Protection (MADEP) air quality criteria. The following is a summary of the results. Under the Build Condition, the VOC emissions were estimated to increase by \(8.3 \text{ kg/day}\) and the NO\(_x\) emissions by \(13.6 \text{ kg/day}\) from the No-Build Condition. However, with the recommended physical and operational mitigation measures and measures associated with the TDM program, the VOC and NO\(_x\) emissions are estimated to be reduced by \(0.6 \text{ kg/day}\) and \(0.4 \text{ kg/day}\), respectively, from the 2012 Build Condition, therefore, demonstrating compliance with the transportation conformity criteria.

Summary of Greenhouse Gas Emissions Analysis

In compliance with the MEPA Greenhouse Gas Emissions Policy and Protocol, the air quality analysis calculates GHG emissions from mobile and stationary sources for the Project (including the Lowes, Target, sewage plant, and restaurant). While GHG emissions include several gases, Carbon Dioxide (CO\(_2\)) was selected for evaluation because it is the most significant component of development project-related GHG emissions.

The mobile source emissions were calculated by performing a yearly GHG emissions mesoscale analysis to evaluate the changes in CO\(_2\) emissions for the existing and future conditions within the study area. Similar to the mesoscale analysis for ozone, the year 2012 was selected as the future year of analysis because MEPA's policy requires that a project look five years into the future from the current year of analysis. The mobile source analysis traffic (volumes, delays, and speeds) and emission factor data were developed for four conditions: 2007 Existing, 2012 No Build, 2012 Build, and 2012 Build with Improvements.

In addition to mobile sources, direct and indirect CO\(_2\) emissions from the Project's proposed building sources were calculated using the computer-based EQUEST model\(^1\). Direct emissions included those emissions from the Project itself such as boilers, heaters, and internal combustion engines. Indirect emissions included CO\(_2\) emissions from the consumption of electricity, heat, or cooling from off-site sources such as electrical utility or district heating and cooling systems.

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\(^1\) EQUEST (the Quick Energy Simulation Tool), version 3.60 release from James J. Hirsch, DBA James J. Hirsch & Associates, Camarillo, CA
Total CO2 emissions were determined by evaluating the CO2 results from the mobile source analysis and the CO2 emissions from the proposed direct and indirect building sources.

Refer to Table 2-1 below for a summary of the mobile source CO2 emissions analysis results. Currently, 2007 Existing Condition traffic emits 123,742.1 tons per year of CO2. Under the 2012 No-Build Condition, CO2 emissions increase to 144,296.4 tons per year compared to the 2007 Existing Condition due to projected growth of the area (not including the Project). Under the 2012 Build Condition, the Project-related traffic is projected to increase CO2 emissions by 5,337.5 tons per year for a total of 149,633.9 tons per year compared to the 2012 No-Build Condition. However, under the 2012 Build with Improvements Condition, the proposed physical roadway improvements and TDM mitigation measures are projected to reduce CO2 emissions by 158.0 tons per year, resulting in a total of 149,475.9 tons per year. This represents an approximately 0.11% percent reduction of the 149,633.9 tons per year (2012 Build Condition). The mobile source CO2 emissions percent reduction is due to the proposed improvements and was calculated as follows:

\[
Reduction\% = \frac{Total\ \text{Reductions Due to Project Improvements}}{2012\ \text{Build Condition}}
\]

The percent reduction in mobile source emissions due to Project improvements is: 158.0 / 149,633.9 = 0.0011 x 100 = 0.11% (Table 2-1).

**Stationary Source CO2 Emissions Results**

Refer to Table 2-2 below for a summary of the stationary source CO2 emissions analysis results. Under the Existing Condition, the CO2 emissions were assumed to be 0.0 tons per year since the current site is vacant. The 2012 Build Condition (which meets minimum building code requirements) is projected to generate 1,673.6 tons per year of CO2 emissions. The actual total 2012 Project Emissions is 1,673.6 tons per year. Under the 2012 Build with Improvements Condition, the CO2 emissions were estimated to be reduced by 206.9 tons per year for a total of 1,466.7 tons per year compared to the 2012 Build Condition due to building and operational improvements, such as motion sensors for lighting and an energy demand management system. The 206.9 tons per year represents an approximately 12 percent reduction of the 2012 Build Condition. The stationary source CO2 emissions percent reduction was calculated as follows:

\[
Reduction\% = \frac{Total\ \text{Reductions Due to Project Improvements}}{2012\ \text{Build Conditions}}
\]

The percent reduction in stationary source emissions (direct and indirect) due to Project improvements is: 206.9 / 1,673.6 = 0.124 x 100 = 12.4% or 12% (Table 2-2).
Updated Greenhouse Gas Emissions Analysis

As mentioned above, the Secretary’s MEPA Certificate on the Expanded ENF, dated July 18, 2008 requested that the Proponent consider/evaluate the additional GHG mitigation measures.

Mobile Source Methodology

The GHG mobile source analysis was conducted following procedures similar to the ozone mesoscale analysis. The mobile source analysis estimated the area wide CO2 emissions from vehicle traffic for a time period of one year. The change in CO2 emissions from traffic were based on the average yearly traffic volumes, roadway lengths and vehicle emissions factors for existing and new trips for weekday and weekend conditions. The GHG analysis also calculated the changes in CO2 emissions due to the roadway mitigation measures and TDM program using the EPA’s COMMUTER2 model Version 2. Mobile source GHG emissions are based upon the traffic volumes, the distance traveled and the GHG emission rate (in grams per vehicle mile traveled). The COMMUTER model evaluates the study area and the proposed Project to identify measures that would reduce or eliminate vehicle trips and GHG emissions. The TDM measures described in the ‘Proposed Project Improvements, Mobile Source-Related Improvements’ would be promoted by the Proponent to further reduce peak employee traffic demand on the roadway system and encourage alternative transportation modes for serving the on-site retail customers. The Proponent will implement an additional, non-traditional TDM measure - the SmartWay Transport Partnership for delivery trucks, which aims to reduce trips and provide for more fuel efficient trucking operations. Refer to the 'Additional Project Improvements' section below for further details.

Mobile Source Emission Rates

Currently MOBILE6.2 has a simple estimate of CO2 emissions factors that do not vary by speed, temperature, fuel content, or the effects of vehicle inspection maintenance programs. It was determined that the study area was large enough to assume that variation in these parameters does not have a significant net effect. The emission rates calculated in this air quality study are adjusted to reflect Massachusetts specific conditions. A detailed presentation of the MOBILE6.2 input and output data are presented in Appendix D.
Traffic Data

The air quality study used traffic data (volumes, delays, and speeds) developed for each analysis condition. The mobile source analysis for \( \text{CO}_2 \) emissions used a yearly traffic volume for weekday and weekend periods. Vehicle speeds are developed based upon traffic volumes, observed traffic flow characteristics, and roadway capacity. The traffic data used in the air quality study are presented in Appendix D. The detailed traffic analysis is presented in Chapter 5 Transportation.

Stationary Source Methodology

The Project would generate GHG emissions through the use of electricity and fossil fuels. The stationary source analysis calculated project-related \( \text{CO}_2 \) emissions from these building sources using the computer-based EQUEST model. These building sources included boilers, heaters and internal combustion engines. While the proposed Project is in the planning stage, assumptions were made regarding the type of building construction, window and wall treatment, and rooftop equipment that would likely be used. The stationary source analysis calculated GHG emissions for all four build conditions: 2007 Existing, 2012 No-Build, 2012 Build, and 2012 Build with Improvements. The 2012 Build Condition represents the stationary source emissions that would occur if the Project were to be built using typical construction materials and rooftop equipment per the Massachusetts Building Code. The 2012 Build with Improvements Condition represents the Project-related emissions based upon the use of improved building materials and rooftop equipment.

Existing \( \text{CO}_2 \) Emissions

The calculation of 2007 Existing Condition emissions provides a base for which future years can be evaluated.

Existing Mobile Source \( \text{CO}_2 \) Emissions

The mobile source analysis calculated the 2007 Existing Condition \( \text{CO}_2 \) emissions from the major roadways in the study area. These emissions, estimated to be 123,752.1 tons/year, establish a baseline to which future emissions can be compared. Table 2-1 below presents the existing \( \text{CO}_2 \) analysis results for the 2007 Existing Conditions.

Existing Stationary Source \( \text{CO}_2 \) Emissions

The GHG analysis calculated the 2007 Existing Condition \( \text{CO}_2 \) emissions for direct and indirect emissions from the existing stationary sources. Under the Existing
Condition, the C02 emissions were assumed to be 0.0 tons per year since the current site is vacant.

### Future Greenhouse Gas Emissions

Future Project-related emission calculations are based upon changes in traffic and emission factor data as well as the Project's building sources. The traffic data include traffic volumes, vehicle-miles-of-travel, roadway operations, and physical roadway improvements. The emission factor data included emission reduction programs, years of analysis, and roadway speeds. The Project's building sources included direct emissions such as boilers, heaters, and internal combustion engines as well as indirect emissions from the consumption of energy. The following section reports the findings of the mobile source and stationary source analyses for the Project.

### Future Mobile Source CO2 Emissions

The mobile source analysis estimated the future study area CO2 emissions due to the changes in traffic and emission data. Under the 2012 No-Build Condition, CO2 emissions were estimated to be 144,296.4 tons per year (Table 2-1).

Under the 2012 Build Condition, the CO2 emissions were estimated to be 149,633.9 tons per year (Table 2-1). Under the 2012 Build Condition with Improvements, the CO2 emissions were estimated to be 149,475.9 tons per year (Table 2-1). This results in a decrease of 158.0 tons per year in CO2 emissions as compared to the 2012 Build Condition. This reduction is due to the geometric and operational improvements of the study area roadways and the TDM program. This represents an approximately 0.11 percent reduction in of the 149,633.9 tons per year (2012 Build Condition) The mobile source CO2 emissions percent reduction is due to the proposed improvements and was calculated as follows:

\[
\text{Reduction \%} = \frac{\text{Total Reductions Due to Project Improvements}}{2012 \ Build \ Condition} \times 100
\]

Therefore, the percent reduction in mobile source emissions due to project improvements is: 158.0 / 149,633.9 = 0.0011 x 100 = 0.11\% (Table 2-1). The percent reduction for mobile sources is low because of the type (home improvement retail store) and location (fairly rural area) of the Project—both of which are not conducive to major mobile source improvements. Office-type developments in more urban settings are ideal in achieving major mobile source reductions. Specific details of these proposed improvements are discussed below in the 'Mobile Source-Related Improvements' section below. Table 2-1 below presents CO2 emissions from mobile sources under all conditions.
### Table 2-1
Mobile Source CO2 Analysis Results (tons per year)

<table>
<thead>
<tr>
<th>Year</th>
<th>Existing Condition</th>
<th>2012 No-Build</th>
<th>2012 Build</th>
<th>2012 Project Emissions</th>
<th>2012 Reductions Due to Project Improvements</th>
<th>2012 Build w/ Improvements Condition</th>
<th>Percent Reduction of Project Improvements to Project Emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>123,742.1</td>
<td>144,296.4</td>
<td>149,633.9</td>
<td>5,337.5</td>
<td>158.0</td>
<td>149,475.9</td>
<td>-0.1%</td>
</tr>
</tbody>
</table>

Note: 1. The proposed improvements are described in 'Proposed Project Improvements' section below. Mobile source improvements include roadway traffic improvements, TDM measures and the Lowe’s corporate SmartWay Transport Partnership Program.

The Lowe’s corporate SmartWay Transport Partnership Program for delivery trucks was quantified (described further below), which would result in an additional reduction in mobile source CO2 emissions of 11.2 tons per year. Therefore, as represented in Table 2-1 above, a total reduction of 158.0 tons per year of mobile source CO2 emissions would result under the 2012 Build with Improvements Condition.

### Future Stationary Source CO2 Emissions

The Project would generate GHG emissions thru the use of electricity and fossil fuels. The air quality analysis calculated the direct and indirect stationary source CO2 emissions for the 2012 No-Build, the 2012 Build, and 2012 Build with Improvements conditions. Direct emissions include those from stationary sources such as boilers, heaters and internal combustion engines. Indirect emissions includes those from the consumption of electricity, heat, or cooling from off-site sources such as electrical utility or district heating and cooling systems.

Under the 2012 Build Condition, the stationary source CO2 emissions were estimated to be 1,673.6 tons per year (Table 2-2). Under the 2012 Build Condition with Improvements, the CO2 emissions were estimated to be 1,466.7 tons per year (Table 2-2). This results in a decrease of 206.9 tons per year in CO2 emissions as compared to the 2012 Build Condition. This reduction in stationary source emissions is due to the proposed building and operational improvements (discussed in the 'Proposed Project Improvements' section below) and represents an approximately 12 percent reduction of the 1,673.6 tons per year 2012 Build Condition. The stationary source CO2 emissions percent reduction was calculated as follows:

\[
\text{Reduction} \% = \frac{\text{Total Reductions Due to Project Improvements}}{\text{2012 Build Condition}}
\]

Therefore, the percent reduction in stationary source emissions due to Project improvements is: 206.9 / 1,673.6 = 0.124 X 100 = 12.4% (Table 2-2). Reductions are due to the proposed building improvements discussed in the 'Proposed Project Improvements' section below.
Table 2-2 below presents CO2 emissions from direct and indirect stationary sources under all conditions.

### Table 2-2
Stationary Source CO2 Analysis Results (tons per year)

<table>
<thead>
<tr>
<th></th>
<th>2012</th>
<th>2012 Build Condition</th>
<th>2012 Project Emissions</th>
<th>2012 Reductions Due to Project Improvements</th>
<th>2012 Build w/ Improvements Condition</th>
<th>Percent Reduction of Project Improvements to Project Emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007 Existing Condition</td>
<td>0.0</td>
<td>0.0</td>
<td>1,673.6</td>
<td>-206.9</td>
<td>1,466.7</td>
<td>12.4%</td>
</tr>
</tbody>
</table>

Notes:
1. The 2012 Build Condition is assumed to meet the minimum requirements of the MA Building Code.
2. The proposed improvements are described in 'Proposed Project Improvements' section below. Improvements include building design efficiencies as well as other GHG-related corporate-wide programs.

The Secretary's MEPA Certificate on the Expanded ENF requested that the Project evaluate and include additional GHG mitigation measures. The Proponent has provided a list and a discussion of additional GHG mitigation measures (presented in sections 'Proposed Project Improvements' and 'Additional Project Improvements' below). The results in Table 2-2 above reflect this update.

As a result of refining the building source assumptions and improvements in the model and identifying additional GHG mitigation measures, the building mitigation number changed from 1,586.7 tons per year to 1,481.2 tons per year. It was then reduced further by 14.5 tons per year to 1,466.7 tons per year for the Green Power Purchase and Energy Management Programs, which are discussed below. The GHG total mitigation reductions of 206.9 tons per year (which includes the above-mentioned additional operational measures) increased from the reductions presented in the Expanded ENF (86.9 tons per year) due to the updated GHG analysis and additional mitigation measures.

### Proposed Project Improvements

The Proponent has developed both physical and operational mitigation energy efficient measures to be included in the Project. The following presents those mitigation measures evaluated in the GHG analysis/model.

### Mobile Source-Related Improvements

As presented in Chapter 5 Transportation of the Expanded ENF, the Proponent will implement roadway improvements, including modifications to signal phasing and timing plan to increase capacities and reduce delays of the intersection. Additionally, a TDM program will be implemented as part of the Project in an effort to reduce Project-generated vehicle trips and to minimize peak-period traffic demands in the study area. The implementation of the TDM program is expected to improve air
quality in the study area by increasing the number of persons in a vehicle, and promoting the use of alternative modes of travel. The following TDM measures will be promoted and/or funded by the Proponent to further reduce peak employee traffic demand on adjacent roadways, encourage alternative transportation modes for serving the on-site customers, and improving air quality:

- Provide improved accessibility via new pedestrian walkways and crossings. For example, pedestrian crosswalks and wheelchair ramps will also be provided across the southerly and easterly legs of the G.A.R. Highway (Route 6)/Swansea Commons Driveway intersection. The crossing will accommodate pedestrians using the SRTA system in either the northbound or southbound directions.

- To facilitate both employee and customer bicycle access to the site, secure bicycle storage racks can be provided near the front doors of the retail stores.

- As part of mitigation for the Project, bicycle detection loops will be installed on all approaches of the proposed traffic signal at the G.A.R. Highway (Route 6)/Swansea Commons Site Driveway intersection.

- Provide improved access from the Project to transit, specifically to the Southeast Regional Transit Authority (SRTA) bus services. The Proponent will coordinate with the SRTA to determine the feasibility of providing access to the site via SRTA Route 14 which currently provides service between the Swansea Mall and Fall River. Providing a bus service and pedestrian accommodations is expected to encourage the use of SRTA buses by those employed at the Site.

- Appoint an Employee Transportation Coordinator (ETC) (*will encourage all tenants);

- Post available information on alternative modes of transportation, such as transit or bicycling, where applicable (*will encourage all tenants);

- Allow employees to work non-standard hours to reduce peak period traffic volumes. (*will encourage all tenants);

- Offer direct deposit of paychecks to their employees (*will encourage all tenants);

- Provide on-site services such as on-site break rooms with refrigerators and lockers, ATMs/banking services, etc. to reduce the need for employees to leave the center (*will encourage all tenants); and

- The Corporation will promote the use of internet sites as a shopping alternative (Lowe's and Target).

To ensure the success of these programs, participation from all project tenants and businesses will be encouraged.

\[^{3}\text{Almost 90\% of Lowe's employees corporate-wide currently utilize the direct deposit option.}\]
Additionally, the Proponent will implement a non-traditional TDM measure as part of the Project: the SmartWay Transport Partnership for delivery trucks. This program aims to reduce trips and provide for more fuel efficient trucking operations. Refer to the 'Additional Project Improvements' section below for further details.

**Temporary Construction-Related Mobile Sources**

In an effort to reduce GHG emissions from temporary construction activities, the Proponent will contractually require the construction contractors to adhere to all applicable regulations regarding control of construction vehicle emissions. This will include, but not be limited to, maintenance of all motor vehicles, machinery, and equipment associated with construction activities and proper fitting of equipment with mufflers or other regulatory-required emissions control devices. Also, the prohibition of excessive idling of construction equipment engines will be implemented, as required by MADEP regulation 310 CMR 7.11. Additionally, construction specifications will require that all diesel equipment used on-site will be fitted with after-engine emission controls such as oxidation catalysts or diesel particulate filters. Additionally, the Proponent will contractually require the construction contractors to utilize ultra-low sulfur diesel fuel for all off-road construction vehicles as an additional measure to reduce air emissions from construction activities. The Proponent will post idling restriction signs on the premises to remind drivers, patrons and delivery personnel of the state's idling regulation.

**Stationary Source-Related Improvements**

The Proponent will implement specific building design and operation measures in an effort to reduce stationary source CO2 emissions. The following section presents the specific building improvements (and their correlating EQUEST modeling parameters for reference where applicable) that are assumed to be included as part of the Project for the purpose of this analysis. It should be noted that the improvements presented below are a result of specific potential tenants known at this time. If these tenants are substituted by different tenants at a later date the specific commitments may change. The Policy does recognize that "numerous assumptions" have to be made and that the buildings are at a "relatively conceptual level of design."

The Proponent will also implement specific building design and operation measures in an effort to reduce GHG emissions. The following are the mitigation measures (and their correlating EQUEST modeling parameters for reference where applicable) that will be included in the Project:
Proponent Building Improvements
(Restaurant)

The following is a list of proposed improvements to buildings that the Proponent will construct, lease and maintain:

- High-efficiency Energy Star-compliant packaged HVAC systems (EER =10)
- Heat efficiency = 80 percent
- Motion sensors in the restrooms to reduce energy consumption (Approximately 25 percent reduction of those areas' lighting)
- White colored thermoplastic olefin (TPO) membrane roofing to reduce heat island effect on rooftop
- Efficient roof insulation (R=36)

Tenant Building Improvements

As stated above, the improvements presented below are a result of specific potential tenants known at this time. If these tenants are substituted by different tenants at a later date the specific commitments may change.

A. Buildings that would be constructed and maintained by tenants (Anchor Retail Store A) (Lowe's)

- High-efficiency Energy Star-compliant packaged HVAC systems (EER =11.4)
- Heat efficiency = 80 percent
- Motion sensors in the non-display areas such as restrooms, stocking area, and offices to reduce energy consumption (Approximately 25 percent reduction of those areas' lighting)
- Efficient lighting to reduce energy consumption by 10 percent
- White colored thermoplastic olefin (TPO) membrane roofing to reduce heat island effect on rooftop
- Partial skylights at the garden center to reduce electrical usage

B. Buildings that would be constructed and maintained by tenants (Anchor Retail Store B) (Target)

- High-efficiency Energy Star-compliant packaged HVAC systems (EER =10)
- Heat efficiency = 80 percent
- Motion sensors in the non-display areas such as storage areas and restrooms to reduce energy consumption (Approximately 25 percent reduction of those areas' lighting)
- Efficient lighting to reduce energy consumption in sales floor areas by 22 percent
Additional Project Improvements

In effort to reduce GHG emissions corporate-wide, Lowe’s and Target have introduced several programs design to reduce energy usage. The Tenants will implement additional energy consumption/GHG-reducing programs (both at the Project and at other retail stores off-site) that further reduce mobile and stationary sources. The following is a list and description of these measures:

- Lowe’s SmartWay Transport Partnership Program
- Green Power Purchasing Programs
- Energy Management Programs
- Lowe’s Energy Star Partnerships
- Lowe’s Energy Awareness Delivers Savings (LEADS)
- Target’s Commitment to Reducing Energy Use
- Target’s Waste Reduction Program
- Target’s Carbon Footprint and Carbon Disclosure Projects
- Building Systems Commissioning

Combined, the above-mentioned measures that have been quantified would result in an estimated reduction 11.2 tons per year of mobile source CO2 emissions and 14.5 tons per year of stationary source CO2 emissions.4

Lowe’s SmartWay Transport Partnership Program (Mobile Source)

Lowe’s currently implements a program to reduce energy usage of their trucking operations corporate-wide through the SmartWay Transport Partnership with the U.S. Environmental Protection Agency (EPA), which is an innovative collaboration between EPA and the freight industry to increase energy efficiency while significantly reducing greenhouse gases and air pollution. There are three primary components of this program:

- Create partnerships;
- Reduce all unnecessary engine idling; and
- Increase the efficiency and use of rail and intermodal operations.

Lowe’s set a goal to have 90 percent of products shipped by SmartWay Transport Partners by 2010. At the end of 2007, over 85 percent of product was being shipped.

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4 These reductions are estimates only as they cannot be modeled as part of EQUEST. Back-up calculations are provided in Appendix D of this SEIR.
under this program. Since Lowe's has joined the SmartWay Partnership in 2004, they have reduced carbon emissions by more than 466,000 tons and saved 42 million gallons of diesel fuel. A preliminary estimate of the mobile source CO2 emissions reduction due to the implementation of this program activity at the Project is 11.2 tons per year.

**Green Power Purchasing Program**  
(Stationary Source)

Lowe's purchases green power that is generated from renewable resources such as solar, wind, geothermal, biomass and biogas, as well as low-impact hydropower. Lowe's accounts for approximately 2 percent of total electric energy consumption in the form of green power purchasing credits to each store nation-wide, including stores in Massachusetts. A preliminary estimate of the stationary source CO2 emissions reduction due to the use of Green Power at the Project is 11.7 tons per year.

Target is evaluating the use of green power corporate-wide. Target has also been purchasing power generated from renewable resources in Oklahoma (wind) and California and Arizona (solar). These latter renewable purchases account for approximately 14 percent of Target's Direct Access energy purchases in California.

**Energy Management Programs**  
(Stationary Source)

Lowe's currently implements an energy management system to reduce energy usage at each of their stores, including those in Massachusetts. This program includes:

- Operating the sales floor lights using a computer program coordinated to their operating hours;
- Setting display lights to shut off 15 minutes after store closing;
- Use of photo sensors and store operating hours to control Garden Center lights turning them on only when needed; and
- Use of photo sensors and store operating hours ("time of day scheduling") to control display lighting, exterior store signs, parking lot lights, and security lights.

A preliminary estimate of the stationary source CO2 emissions reduction due to the implementation of this program at the Project is 2.8 tons per year.

To effectively manage the consumption of energy (electricity and natural gas), Target is taking steps to more actively integrate, monitor and control the energy efficient
Technologies in stores. Target recently expanded its Demand Management program to refocus on proactively managing energy demand. Based at Target headquarters, Target has implemented an Energy Management program to control and minimize the use of heat and electricity at more than 1,600 stores and 35 distribution centers.

The Target Demand Management program has evaluated and/or implemented the following initiatives:

- Demand-response programs aimed at reducing instantaneous demand for energy during peak periods through temporary adjustments to the operation of energy-consuming building systems;
- Re-evaluating standards for temperature set points, lighting levels, and equipment run times to identify energy-reduction opportunities;
- Expanding the use of electricity and natural-gas meters in stores to assist in performance diagnostics, operational improvements, and measurement and verification; and
- Working to evaluate the feasibility of retrofitting existing stores' on-site energy-generation systems with renewable sources, such as solar panels and fuel cells.

**Lowe’s Energy Star Partnership (Stationary Source)**

Lowe’s has been recognized by the EPA and the Department of Energy for its efforts to protect for the environment. Since 2001, Lowe’s have been raising awareness of energy efficient products and renovation or improvement projects for its customers (most of which are homeowners) by promoting the use of new energy efficient products such as compact fluorescent light bulbs. Lowe’s educates through their 'Partner Websites' and in their retail stores.' Lowe’s has qualified for the EPA Retail Partnership Program, was named the "Energy Star Retail Partner of the Year" by the US EPA in 2003, 2004 and 2005 and has won the "Energy Star Award for Excellence in Retail Commitment" for six consecutive years. A variety of Energy Star products are available at Lowe’s, these products ranges from fans, dishwashers, lighting units, programmable thermostats to sealing and insulation products.

**Lowe’s Energy Awareness Delivers Savings (LEADS) (Stationary Source)**

In February 2008, Lowe’s introduced an energy awareness program (Lowe’s Energy Awareness Delivers Savings, or LEADS) to all of their employees in effort to reduce...

Lowe’s "Efficient Home" program promotes the use of Energy Star products and educates homeowners on ways to reduce demands on energy and water.

http://lowe.com/energy/
greenhouse gas emissions and water waste. The LEADS Program is an informational program to increase energy and water awareness of Lowe's store managers, management team and sales associates. The objective is to increase energy and water utilization efficiency by encouraging employees to embrace "Best Practices." By improving operational efficiency (such as refraining from leaving overhead doors open for extended periods of time) can significantly reduce energy and water consumption and associated costs saving Lowe's millions in heating and cooling expenses.

Under the energy awareness program, Lowe's benchmarks all stores regarding their energy and water usage. Energy usage is weather and calendar normalized and stores' current performances are compared to their historical performances as well as other stores. Participating stores are provided with LEADS energy savings documents, including a checklist (including items of energy consuming opportunities, which are translated into energy reduction results), educational materials, factoids, and associated reports. Each participating store will determine the electrical and water maintenance issues and report any energy anomalies on-site. A complete energy and water consumption analysis will be performed and baseline consumptions and trends of each store will be recorded and compared against the benchmarks to monitor the progress of the program's success.

From March 2008 through June 2008, Lowe's has documented an energy savings of 3.4 percent, which equals a reduction of approximately 180 billion BTUs. This is reduction is consistent with the benchmark, which was set at 2 percent energy reduction in FY 2008. A revised benchmark of 5 percent in energy reduction has been set for FY 2009. The water use tracking is still undergoing some development modifications and is not available at this time. A specific target for water is being formulated for FY 2009.

**Target's Commitment to Reducing Energy Use (Stationary Source)**

Over the past 20 years, Target has worked closely with local partners to develop initiatives focused on reducing energy consumption. On September 8, 2008, Target Corporation was awarded with the “2008 Environmental Leadership Award” Xcel Energy of Minnesota for their continued partnership in the reduction of carbon emissions in several Minnesota Target stores. In 2007, Xcel Energy partnered with Target to design and implement energy efficiency programs, utilizing the Energy Design Assistance Program (EDA) to surpass MN Energy code requirements by 42 percent in five new Super Target Prototype stores in Minnesota. The estimated annual reduction of carbon emissions in those stores totaled 19,317,646 pounds, the equivalent of removing 1,605 cars from the road for one year. These energy savings are accomplished by such measures as; the installation of two-lamp fixtures rather than three, stepped lighting at night, high efficiency heating/cooling HVAC and refrigeration systems, occupancy sensors in all backrooms and office areas and
window glazing. Target will continue to apply the lessons learned in Minnesota to its ongoing store development program, including this Project.

**Target’s Waste Reduction Program (Mobile Source)**

Decades ago, Target was one of the first large retailers to commit to a philosophy and practice of reducing, reusing and recycling. This approach is now integrated into all areas of the company including store planning and design, construction, and merchandising. Target’s solid-waste program is centrally managed from the Minneapolis headquarters, which allows Target to track performance for all stores and distribution centers. By collecting data such as compactor weights, Target’s Waste Reduction Program ensures compactor loads are full, resulting in fewer trips to landfills, while reducing vehicle emissions. Performance metrics compare sales volume to the weight and frequency of compactor loads, and allow each store to measure its performance in comparison with all other stores. Through this commitment to reduce waste, Target has also been able to reuse, recycle or rethink the end-of-life use for 70 percent of materials that would previously have been sent to a landfill.

**Target’s Carbon Footprint and Carbon Disclosure Projects (Stationary Source)**

Target undertook a review of corporate wide operations and the development of a greenhouse-gas inventory to understand the Corporation’s carbon footprint. First developed in 2004, the inventory was prepared in partnership with the U.S. EPA voluntary Climate Leaders program and in accordance with Climate Leaders guidelines, which are based on the Greenhouse Gas (GHG) Protocol. The inventory revealed a carbon footprint consisting mainly of indirect emissions related to Target’s consumption of energy required to light and heat its facilities, and to a lesser degree, direct emissions associated with the generation of power by natural gas.

Target’s total greenhouse gas emissions in 2006 were 2.63 million metric tons of CO2-equivalent (CO2e). This includes all direct and indirect emissions from facilities that are under Target’s operational control. GHG Protocol emissions by source are as follows:

- **Scope 1**, Direct emissions: 140,000 metric tons of CO2e
- **Scope 2**, Indirect emissions: 2.49 million metric tons
- **Scope 3**, Other emissions: not applicable

This data has been reviewed for accuracy by U.S. EPA’s technical assistance contractor as part of Target’s participation in Climate Leaders.
Since 2005, Target has reported its annual greenhouse gas emissions and climate-change risks to the Carbon Disclosure Project, a group of institutional investors worldwide, representing $41 trillion in funds under management. The group assesses the potential business risks and opportunities related to climate change based on responses to a questionnaire completed by the largest quoted companies in their portfolio.

**Building Systems Commissioning**  
*(Stationary Source)*

More than 80 percent of the energy consumed in a typical Target store is used by heating and cooling systems, lighting systems, and refrigeration systems. As such, optimizing the operational performance and efficiency of these systems is paramount to managing Target’s carbon footprint. Target views the commissioning process as a means to achieve this objective. In 2007, Target launched a new **working group** focused on the development, implementation, and management of a commissioning program for new and existing stores. The commissioning process will be used to verify that energy consuming systems are operating as efficiently as possible throughout the life of the store. This process will also work to continuously improve the way Target designs, builds, operates, and maintains our stores with a focus on reducing ongoing maintenance and extending the service life of equipment.

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**Alternative Project Improvements**

**MEPA’s GHG Policy** calls for providing data for an alternative that result in greater GHG reductions than the preferred alternative. As discussed above, the Proponent and the identified tenants are committed to reducing electrical usage at the Project where practical and feasible. **Lowe’s** is also currently testing Photovoltaic (PV) demonstration projects in California and Hawaii, and is gathering information on energy performance and operating costs.

Target has employed the use of PV panels in approximately nineteen stores, with three more scheduled to go online in the next six months. The majority of these arrays occur in California or other west coast stores. Solar resource is more plentiful in those states than in New England, and the use of PV cells will be more efficient. In the future, ongoing research and testing will provide retailers such as Lowe’s and Target with specific life cost data to evaluate whether PV systems are feasible for store design at other locations in the country. Target’s policy on PV is to use it where it is most effective.

**Analysis of a PV Alternative**

For the purposes of an alternative analysis, a facility of the proposed size of either retailer on the Site could utilize a 50 kW solar PV system. In Massachusetts, a 50 kW
solar PV installation is projected to generate approximately 5,180 kWh per month, which equates to approximately 34.4 tons per year in GHG emissions reductions.

The estimated installed cost of the system is $7 to $9 per rated Watt, which gives a cost range of $350,000 to $450,000 for each system. The payback period for the proposed 50kW PV installation was calculated using the Massachusetts Technology Collaborative "Non-Residential Rebate and Savings Estimator," a financial payback calculator provided through the Commonwealth Solar Initiative. Examples of the payback calculator inputs/assumptions include:

- Availability of solar resource;
- Size of installation;
- Estimated cost of the system;
- Available rebates scenarios;
- Net capacity/system efficiency;
- Projected long-term annual operations and maintenance cost;
- Estimated electricity revenue; and
- Inflation rate.

Despite the potential state rebates, such as the Massachusetts Commonwealth Solar Program, or the state and federal tax incentives, the payback period on the proposed solar PV system is estimated to be approximately seven years, at best. Based on market research, almost 90 percent of corporate entities would consider a payback of 4 years, but acceptance begins to drop rapidly once paybacks reach 5 years.10 Refer to Appendix D for supporting documentation on the estimated payback for the PV system.

While GHG emissions could be reduced for the Project, the PV system was determined to not be feasible or cost-effective at this time because of one or more of the following reasons:

- The technology is not cost-effective for the proposed building type and location; and
- From a business standpoint, the alternative is cost-prohibitive for a project of this scale, due to the projected rate of return.

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9 Non-Residential PV Pro-Forma calculator used can be found at: http://masssite.org/cleanenergy/andc/howto.html#ret
10 Assessment of California CHP Market and Policy Options for Increased Penetration. Final Report, July, 2005 Cospnors Public Interest Energy Research Program (PIER) and California Energy Commission
The air quality study demonstrates that the Project complies with the Clean Air Act Amendments (CAA), the State Implementation Plan (SIP), and the Executive Office of Energy and Environmental Affairs (EEA) policy on Greenhouse Gas emissions. The ozone mesoscale analysis demonstrates that the Project will result in an increase of VOC and NOx emissions, as compared to the No-Build Condition.

Consistent with the guidelines of the MADEP, the Project will incorporate reasonable and feasible mitigation measures to reduce VOC and NOx emissions. These mitigation measures include roadway improvements, traffic signal improvements and a TDM program. The implementation of these mitigation measures will help reduce the VOC and NOx emissions associated with the Project. The GHG emissions analysis demonstrates that the Project meets the EEA draft policy on GHG emissions because it includes mobile and stationary source mitigation measures that will reduce the GHG emissions from levels expected from a project without mitigation.

The air quality study demonstrates that the Project conforms to the CAAA, the SIP, and EEA GHG policy because:

- It will implement reasonable and feasible emission reduction mitigation measures;
- No new violation of the NAAQS will be created;
- No increase in the frequency or severity of any existing violations will occur; and
- No delay in attainment of any NAAQS will result.

In compliance with the MEPA Greenhouse Gas Emissions Policy and Protocol, the air quality analysis calculated GHG emissions from mobile and stationary sources for the Project (including the Lowes, Target, sewage plant, and restaurant). A number of Project improvements have been included in this analysis since the Expanded ENF. The percent reduction in combined mobile and stationary source emissions from the 2012 Build Condition, due to Project improvements is approximately 12.5 percent.