Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection
Southeast Regional Office • 20 Riverside Drive, Lakeville MA 02347 • 508-946-2700

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December 3, 2012

Peter Buttkus, Director
Duxbury Department of Public Works
878 Tremont Street
Duxbury, MA 02332

and

Eric T. McLean, P.E.
American Capital Energy
15 Tyngsboro Road, Suite 4A
North Chelmsford, Massachusetts 01863

RE: Approval with Conditions
Application for: BWP SW 36 Post-Closure Use - Major
0.5 Megawatt Solar Photovoltaic Array
Transmittal #:X251914

AT: Duxbury Landfill
Mayflower Street
Duxbury, Massachusetts
Facility ID#: 39225, Regulated Object#: 172474

Dear Mr. Buttkus and Mr. McLean:

The Massachusetts Department of Environmental Protection, Solid Waste Management Section ("MassDEP"), has completed its review of the referenced Post-Closure Use permit application (Application) for the Duxbury landfill ("Landfill"). The Application was prepared and submitted on behalf of the Town of Duxbury and American Capital Energy ("Applicants") by Weston & Sampson Engineers, Incorporated ("Weston" or "Engineer") of Peabody, Massachusetts.

MassDEP has determined that the Application is administratively and technically complete and hereby approves the Post-Closure Use of the Landfill for a 0.5 Megawatt (MW) solar photovoltaic (PV) array subject to the conditions specified herein.

I. SUBMITTALS

MassDEP has reviewed the Application pursuant to 310 CMR 19.000: *Solid Waste Regulations*, 310 CMR 19.143: *Post-Closure Use of Landfills* and MassDEP's *Landfill Technical Guidance Manual, May 1997* (Manual). The Application consists of the following:

A. The permit transmittal, application forms for Post-Closure Use - Major (BWP SW 36), narrative describing the proposed use, engineering calculations, seven (24" x 36") engineering drawings and documents received by MassDEP on August 13, 2012.

The Application is signed and stamped by Duane C. Himes, Massachusetts Professional Civil Engineer No. 32336.

II. SITE DESCRIPTION

The Duxbury Sanitary Landfill is an unlined landfill located off Mayflower Street on a Town owned parcel of land encompassing approximately 19 acres, in Duxbury (the "Site"). The Landfill final cover system encompasses approximately 12 acres. The Site also contains the Town's solid waste transfer station constructed in 1976 and a composting operation. The Landfill was operated as a burn dump from approximately 1904 until 1968 and as a sanitary landfill until 1976, for the disposal of residential, commercial and demolition waste. Between 1986 and 1987, the Town disposed of wood waste material in the adjacent area located south of the western end of the municipal solid waste disposal area.

The northern edge of the Site is bounded by Mayflower Street, with residentially zoned property and the Mayflower Cemetery (across Mayflower Street) to the north and east. The privately owned, inactive Duxbury Landfill, Inc. landfill abuts the Site to the south/southeast. Property to the southwest and west is privately owned and zoned for residential development.

Existing Final Cover System Design: The Landfill was closed in two phases. The PV array is proposed to be constructed on the final cover system for parts of both phases of the Landfill.

The Landfill closure was originally performed in 1977 and consisted of capping the area of municipal solid waste disposal. The final cover system in this area consisted of:

- 18 inches of low permeability soil; overlain by
- 6 inches of vegetative support material.

The additional Landfill area that received wood waste for disposal in 1987 was capped in 1998 with a final cover system consisting of:

- 6 inches of daily cover soil; overlain by
- 12 inches of low permeability soil; overlain by
- 6 inches of vegetative support material.

The closure plans for the 1 acre area were approved by the Department on October 11, 1995, as amended on March 24, 1998. A closure construction certification report for the 1 acre wood waste area was submitted in September 1999.

Post-Closure Environmental Monitoring & Maintenance: On April 6, 2011, MassDEP approved revisions to the Landfills post closure monitoring plan. Post-closure environmental monitoring (groundwater and soil gas monitoring) is currently conducted by the Town. The Town currently monitors 10 groundwater monitoring wells (8 semi-annual basis and 2 monitoring wells on an annual basis). The Town collects soil-gas samples from 15 existing gas monitoring wells. The Applicants have not proposed any changes to the post closure environmental monitoring plan based on the proposed Post-Closure Use. Currently, the Landfill final cover system is inspected semiannually.

III. POST-CLOSURE USE PROPOSAL SUMMARY

American Capital Energy ("ACE" or "Developer"), through an agreement with the Town of Duxbury ("Town") proposes to develop 0.5 MW solar photovoltaic installation on the Landfill. Hereinafter, the Town of Duxbury, American Capital Energy and all construction and maintenance personnel associated with the Town's Landfill shall be referred to as the "Applicants' Contractors". ACE in conjunction with the Town is proposing to construct and maintain a PV array on the capped Landfill, consisting of the following components:

- Construction of a permanent on Landfill access road and additional temporary access roads;
- Approximately 490 precast concrete ballasts (6 feet-8 inches x 3 feet-4 inches by 14 inches thick) will be placed within the topsoil support layer of the final cover system;
- Approximately 245 PV panel support racks (SunLink Corporation) installed on the concrete ballasts;
- Approximately 1,837 PV modules (Yingli Solar Modules) will be placed on the PV panel support racks;
- One electrical equipment concrete pad (approximately 20 feet-7 inches long by 11 feet-5 inches wide by 6 inches thick) will be installed on the final cover system. The electrical equipment concrete pad will support the electrical equipment, including inverters, transformers, switchboards and switchgear;
- The photovoltaic panel support racks will be interconnected and connected to the inverter/transformer using above-ground cables;
- The output from the inverter/transformer will be connected via overhead lines to the grid at an NSTAR interconnection point; and
- Four new utility poles will be installed outside the limits of the landfill final cover system.

Temporary access roads will be constructed, if needed, during construction to minimize impact to the Landfill's final cover systems. *Section 4.3 Temporary and Permanent Roads* of the Application narrative indicates that the temporary access roads will be constructed by placement of a woven filter fabric over the vegetative support layer, and the addition 12 inches of compacted dense graded crushed stone. The cross-section in Appendix C of the Application depicts 18 inches of crushed stone above the geotextile. The roadway detail on drawing D-2 depicts 12 inches of dense graded crushed stone above the geotextile (**refer to condition #12**). The temporary access roads will be removed within six months of completion of construction and the road areas will be restored to meet the specifications of the final cover system.

A permanent access road will be constructed by placing a woven filter fabric above the existing vegetative support layer and adding 12 inches of dense graded crushed stone or gravel above the woven filter fabric. Section 4.3 of the Application narrative indicates 3 feet of material will be placed above the "geomembrane". The final cover system for the Landfill does not include a geomembrane (**refer to condition #12**).

Most of the array will be on areas of the Landfill with a slope of less than 5% (2.9 degrees) but the edges may expand into areas where there is up to a 15% (8.6 degrees**)** slope.

The solar array will utilize PV modules (3.25-foot by 6.5-foot) mounted on galvanized steel or aluminum framed racks attached to the precast concrete ballasts. The racking system will hold the panels at a fixed tilt of 20 degrees from horizontal. The PV array will use multicrystalline PV modules mounted on racks consisting of nine modules in a single row (panel layout 1 x 9) with two ballasts per rack. Each panel support rack or assembly will utilize a fully ballasted mounting system with no penetrations of the low permeability layer of the final cover systems. The modules and the associated racking will be approximately 3 feet-4 inches high in the front (south edge) and 5 feet high in the rear. The rows of PV panels will be oriented east-west and the typical spacing between each row will be approximately 7 feet 9 inches (north-south measurement). The Landfill contours are not aligned with the east-west axis of the PV racks, therefore the rows will be at a slight cross-slope angle.

The existing elevation and grade of the Landfill will be minimally altered. The proposed design will impact limited portions of the topsoil layer of the final cover system. The impacts result from the installation of rack ballasts, installation of the inverter/transformer concrete pads, and installation of above grade electrical wiring.

The precast concrete ballasts will be placed by excavating 2 inches of topsoil at the proposed ballast locations, placing a geotextile fabric, and then placing a layer of compacted crushed stone or gravel in preparation for the installation of the concrete ballasts. Crushed stone or gravel will be installed such that the concrete ballasts are at a maximum slope of 5 percent. Once this is accomplished, the vegetation and topsoil surrounding each ballast will be restored.

The support racks will house all wiring between the modules. The electrical transmission wiring will run within cable conduits above grade, mounted on the rack assemblies where applicable, or mounted on conduit supports (block assemblies) above grade to keep the cables off the ground surface. At permanent and temporary access road crossings, the electrical wiring will run below ground and will have gas tight fittings and flexible connectors. The electrical wiring that will be placed below these roads will be placed in fiberglass reinforced epoxy (FRE) or equivalent cable conduits, at a minimum depth of 2 feet below the road surface.

One 6-inch thick reinforced concrete electrical equipment pad for the inverters/transformer will be formed and cast on site at the northern end of the wood waste disposal area of the Landfill (west end of the municipal solid waste disposal area). Conduits will not enter the concrete pad from beneath but will run into the side of the inverter/transformer and other equipment with the use of flexible gas-tight connections. A geotextile fabric will be placed on the existing vegetative

support layer and be overlain by a minimum of 12 inches of crushed stone to support the 6-inch concrete slab.

Four new power poles, located outside the limits of the final cover system, will be installed to support overhead wires and connect the switchgear to interconnection points, which are existing utility poles. Two new utility poles will be installed adjacent to Mayflower Street. A recloser (circuit breaker) will be installed on one new pole. The utility primary metering cluster will be installed on a second new pole in this area, which will mark the ownership demarcation point between the utility and the Applicants. The third new pole will house a disconnect switch to provide protection to the primary cable. The fourth new pole, to be located adjacent to the equipment pad, will house the Applicant's metering cabinet. *Section 3.8 Interconnection* of permit Application indicates that an underground conduit cable will be installed between the utility pole housing the disconnect switch and the inverter/transformer pad. Drawing D-2 indicates above grade cables will be used (**refer to condition #16).**

There are no subsurface penetrations at the inverters/transformers concrete pad. Conduits will not enter the concrete pads from beneath the pad. Conduits will be mounted on aboveground supports except at subsurface road crossings. Conduits will run into the side of the inverters/transformers and other equipment with the use of flexible gas tight connections. All underground conduits will be sealed, have gas tight fittings and will include flexible connections at transition points. All electrical work will be designed for the most recent version of the Massachusetts Electrical Code (MEC) which includes and incorporates the requirements of the National Electric Code (NEC). The developer proposes to use PV modules and wires that will contain a latching type connector that requires a special tool to reopen. In addition all the wires are to be fastened to the back of the modules in the recessed spaces and under the mounting system to prevent any free or hanging portions of wires from being accessible. All other wiring besides homeruns string wiring are enclosed in conduit and therefore not readily accessible. Prior to construction, an electrical permit will be obtained from the local building department official, and the project will incorporate any additional electrical requirements stipulated by the building department official (**refer to condition #1 and #16**).

Appendix F includes a transformer pad detail which depicts grounding rods driven vertically into the soils adjacent to the inverter/transformer concrete pad. Drawing D-2 indicates the inverter/transformer pad will be grounded off the Landfill. MassDEP does not approve grounding rods to be driven through the final cover system (**refer to condition #16**).

The existing landfill gas collection and management system will not be modified by the installation of the solar array. The arrays will be set back from the passive gas vents a minimum of 5 feet. The inverters will be installed a minimum of 20 feet from any gas vent.

Geotechnical Evaluation: The Application included a geotechnical evaluation for the installation of the array and supporting structures on the final cover systems.

The Application included an analysis of the foundations for the PV array that will bear on the final cover system and has considered the dead load, snow load and wind loading. The results of the geotechnical evaluation are as follows:

- The modules, panel support racks, and ballasts do not exceed the loading criteria for the Landfill.
- The electrical equipment concrete pad (inverters/transformers) does not exceed the recommended loading criteria for the Landfill.
- The PV array will not cause adverse Landfill settlement.
- The Engineer determined the potential vehicle loading on the proposed permanent and temporary access roads would not produce unacceptable loading on the Landfill final cover systems.
- The PV array is stable on a slope up to 15%.
- The 4 inch FRE electrical cables conduit buried under the proposed permanent and temporary access roads, and the road base soil surrounding the conduit, will support the applied vehicle loads.

The anticipated maximum loading scenario (ballasts, racking system, and modules) on the Landfill surface will result in a bearing pressure of approximately 379 pounds per square foot (psf) (<3 pounds per square inch (psi).

The estimated settlement resulting from the static loads increase of the PV array ballasts was 0.28 inches for the final cover systems. The Engineer has stated the final cover systems can undergo this distortion without impacting the integrity of the cover.

A block analysis was performed to evaluate the sliding stability of the ballasts. A maximum slope of 15% was evaluated. The Engineer determined the factor of safety for sliding of the PV ballasts and the underlying soils was approximately 2.1 on a 15% slope. The supporting compacted crushed stone or gravel will be placed level such that the concrete pad will not slide. Should the pads not be placed level, MassDEP will requiring sliding calculations be performed for this interface.

Storm Water: The Engineer performed calculations using Hydro CAD modeling software (TR-20) analysis for the 24-hour, 25 year storm and again under the 24-hour, 100 year storm. The PV array will modify run off characteristics of a limited portion of the Landfill by changing some of the landfill grass cover to impervious surfaces increasing stormwater runoff. The additional impervious surfaces (i.e. ballasts and electrical equipment concrete pads) represents less than 5% of the closed Landfill surface that is to be covered by the PV array. In addition at this Site, selecting clearing of trees and brush will be performed to reduce shading on the PV array, reducing stormwater runoff. The capacity of various elements of the Landfill storm water conveyance systems were reviewed including, swales, stoned line ditches, storm water piping and detention basins. The Engineer concluded there should be adequate capacity to properly manage the post development at the Landfill: therefore there is no need to modify the existing storm water management system.

Post Closure and Post-Closure Use Operations and Maintenance: The Town currently implements the Landfill's post closure monitoring and maintenance plan. The Town is to continue to perform all post closure environmental monitoring (groundwater and soil-gas monitoring) for the Landfill. Operations and maintenance for the Landfill for the area where the PV array is located up to a distance of 10 feet away from the edge of the PV array is to be the

responsibility of the project Developer: American Capital Energy. The Town is to maintain responsibility for the remainder of the Landfill outside the 10 foot buffer around the PV array.

There are no proposed changes to the post closure operation and maintenance plan for the area to be maintained by the Town and not used for the PV array. Currently, cover system inspections are conducted semiannually.

A Post-Closure Use operation and maintenance plan for the area used for the PV array was submitted with the Application. The Developer proposes to provide: site security; electrical maintenance; module cleaning; and final cover system maintenance including but not limited to, mowing, undergrowth control, pest control, and erosion control. The Developer proposes to conduct monthly inspections for the first year after construction of the PV array to check the landfill final cover system for erosion and changes in vegetative growth (**refer to condition #17**).

The Application included a Health and Safety Plan for operation and maintenance activities to be performed by employees at the Duxbury landfill solar project for the operation and maintenance of the proposed PV array. The Application did not include a health and safety plan for the construction of the proposed PV array (**refer to condition #8).**

Site Security: The Landfill is fenced along Mayflower Street. There are two access points to the Landfill off of Mayflower Street. Both of these access points are gated. The Applicants do not propose additional security measures at this time but will monitor the Site for the need for additional fencing or other security measures. The Applicants have committed to building the PV array system in a manner fully compliant with the safety requirements of the National Electrical Code. PV modules and wires will contain latching type connectors that require special tools to open. All PV module wires will be securely fastened to the back of the modules. All other wiring will be enclosed in conduit. (**refer to condition #18**).

Decommissioning Plan: Decommissioning and site restoration will include dismantling and removal of all panels and supporting equipment, transformers, overhead cables and foundations and restoration of the roads, and modules sites to substantially the same physical condition that existed immediately before construction of the PV array (**refer to Condition #20**).

IV. PERMIT DECISION

MassDEP, having determined the information in the Application is satisfactory and in accordance with its authority granted pursuant to M.G.L. c.111, s. 150A, and 310 CMR 19.000, hereby **APPROVES** the Post-Closure Use of the Duxbury Landfill for a Solar Photovoltaic Array subject to the conditions identified herein.

V. GENERAL PERMIT CONDITIONS

1) Permit Limitations: The issuance of this approval is limited to the proposed solar photovoltaic array at the Duxbury Landfill as detailed in the Application and does not relieve the Applicants from the responsibility to comply with all other regulatory or permitting requirements. Post-Closure Use construction shall proceed in complete compliance with the approved plans, MassDEP's regulations and requirements, the Manual or as required by this Approval. There shall be no deviation from this Approval without prior consent from MassDEP. MassDEP shall be consulted prior to any deviation from the approved design. MassDEP may require a permit modification application for significant design modifications. Construction shall incorporate all the recommendations of the design engineers, including but not limited to the recommended material type and compaction requirements for fill material.

2) Regulatory Compliance: The Applicants, Engineers and Applicants' Contractors shall fully comply with all applicable local, state and federal laws, regulations and policies, by-laws, ordinances and agreements. This includes but is not limited to, 310 CMR 19.142: *Post-Closure Requirements*, 310 CMR 19.143: *Post-Closure Use of Landfills*, and 310 CMR 19.043: *Standard Conditions*. Applicable federal regulations include, but are not limited to, 29 CFR Part 1910, OSHA standards governing employee health and safety in the workplace and all applicable local, state and federal electrical codes and permits, including National Electrical Code (NEC).

3) Preconstruction Requirements: Final layout and equipment specifications made as part of the final design shall be submitted to MassDEP for review, prior to the start of site construction. MassDEP reserves the right to request additional information and require design modifications based on submitted information. At a minimum, submitted information shall include:

    1) Manufacturer's catalog cuts for all final equipment;
    2) Revised geotechnical calculations if changes in equipment selection change the design assumptions in the previously submitted design calculations;

        Geotechnical calculations submitted within the Application assumed the use of Yingli YL265C-30B panels (65" x 39", 42 pounds). The Applicant stated that Yingli 285 W modules may be used (77.5 " x 39", 59 pounds). Upon determination of the final PV array and energy equipment to be utilized on site, and prior to installation of these materials, the sizes and weights of this equipment shall be compared to the sizes and weights used in all calculation performed within the permit Application. The Engineer shall either certify that there are no changes, the changes are minor and not significant or shall redo the calculations based on the final design information and certify that the design is adequate. The certification shall be submitted to MassDEP prior to installation of these materials.

    3) Electrical Design Plans (refer to condition #16);
    4) Health and Safety Plan for Construction (refer to condition #8); and
    5) Temporary and Permanent Access Road Details (refer to condition #12).

4) Inspection and Repair of Settlement Areas: Prior to construction of the PV array, any suspect settlement areas on the Landfill project area shall be surveyed to determine the lowest spot. The surrounding area should be then surveyed to find the "relief point" defined as the lowest surrounding area where ponded water would flow out. The elevation difference is defined as the "pond value". Minor settlement shall be defined as less than a 12-inch pond value. Any landfill project area that has undergone minor settlement shall be corrected by the placement of addition vegetative support soil to promote runoff and the area shall be reseeded. Any area repaired should be surveyed and the location marked on a plan with the pond value. Any future settlement should be recorded cumulatively. If/when the total settlement reaches 12-inches, the area will be considered to have suffered major settlement and appropriate repairs to eliminate ponding shall be performed.

   Major settlement is defined as a pond value of 12-inches or more. When this occurs, the final cover system must be repaired to prevent water from ponding above the low permeability layer. The Applicant may either:

   1) Strip off the final cover soils above the low permeability layer, inspect and repair the low permeability layer if/as necessary, place low permeability soil as necessary to promote runoff, replace final cover soils; or

   2) Expose the low permeability soil or geomembrane in a trench around the perimeter of the settled area. Fill the area with soil to form slopes promoting runoff. Cap the area with a new low permeability membrane, GCL, or low permeability soil layer that ties into the existing low permeability layer at the identified perimeter. Place new drainage sand and vegetative support material over the new cap area.

   Any proposal to repair minor settlement may be done as routine maintenance, provided that the owner reports the settlement to MassDEP and states the intent to perform repairs and provides MassDEP with final survey results and a summary write-up.

   Any proposal to do a major settlement repair must be submitted within a Corrective Action Design (BWP SW 25) application since disruption of the final cover system will take place and repair details must be submitted and approved.

5) Notification of Construction: The Applicants shall notify MassDEP in writing (e-mail is acceptable) when the Post-Closure Use construction commences and is completed.

6) Certification Report: Within ninety (90) days of completing the installation of PV array, MassDEP shall be provided with a certification report. All construction work shall be completed under the supervision of a Massachusetts Registered Professional Engineer who shall have sufficient staff on-site to provide quality assurance/quality control (QA/QC) oversight for all construction work at the Landfill. The report shall include, at a minimum, written certification from the supervising engineer that the project was performed in accordance with MassDEP regulations, requirements and the approved Post-closure Use permit application. The report shall include as-built drawings depicting all pertinent site features and the extent of the lease area.

7) Preconstruction Work: Prior to commencement of construction activities all landfill gas passive vents, soil-gas monitoring wells, groundwater monitoring wells and other existing above ground structures on the Landfill cap and appurtenances shall be flagged for visibility, and protective barriers shall be placed around such structures as needed to prevent damage by vehicles accessing the area.

8) Health and Safety: The Applicants and the Applicants' Contractors are responsible to ensure all necessary precautions are taken to protect the health and safety of workers and the general public during both the construction phase and during the operation and maintenance phase of the PV array. A copy of the site-specific health and safety plan for the CONSTRUCTION phase of the PV array shall be submitted to MassDEP (for its files) prior to the beginning of any construction work. The health and safety plan shall include at a minimum:

- protocols for monitoring of landfill gas as needed;
- protocols for modifying work practices if landfill gas is detected at levels deemed unsuitable; and
- training for all workers conducting maintenance activities at the Landfill regarding hazards associated with the PV array including electrical hazards.

9) Personnel Training: The Applicants and the Applicants' Contractors shall instruct all construction and maintenance personnel regarding the potential hazards associated with landfill gas and shall instruct or give on-the-job training to all personnel involved in any activity authorized by this permit. Such instruction or on-the-job training shall teach personnel how to comply with the conditions of the permit and carry out the authorized activity in a manner that is not hazardous to public health, safety, welfare or the environment. PV array construction and operation and maintenance shall not include any excavations or penetrations of the low permeability layers of the final cover system.

10) Landfill Gas Notification Requirements:

a. As specified in solid waste management regulations at 310 CMR 19.132 (4) (g),

> *"When, at any time, the concentration of explosive gases exceeds 10% of the lower explosive limit (LEL) in any building, structure, or underground utility conduits, excluding gas control, gas recovery and leachate collection system components, the owner/operator shall:*
>
> 1. *Take immediate action to protect human health and safety;*
> 2. *Notify the Department within two hours of the findings; and*
> 3. *Undertake the actions specified under 310 CMR 19.150, Landfill Assessment and 310 CMR 19.151: Corrective Action, as required by the Department."*

b. If at any time monitoring detects the presence of any combustible gases at or in excess of 10% of the lower explosive limit at any location within a building or within any utility conduits on site or off-site, the Town shall notify MassDEP's Bureau of Waste Site Cleanup-

Emergency Response Section (508) 946-2714 within two (2) hours of the exceedance as per 310 CMR 40.0321(1) (a) of the regulations.

11) Vehicles Operating on the Landfill Final Cover System: Vehicles operating on the Landfill final cover system shall only operate on the designated permanent and temporary access roads, except for low-pressure construction equipment (with ground pressures of **7 psi** or less) in accordance with the remaining conditions of this permit. Low-pressure construction equipment operating off the access roads shall limit turning on the vegetative support layer as much as possible. If MassDEP determines the use of excavation equipment is creating the potential for damage to the FML, the usage of such equipment shall immediately cease upon notification by MassDEP. All operators of the vehicles entering the final cover system area shall be clearly instructed by the on-site engineer and/or the contractor of the requirements of this permit prior to arrival, to avoid damage to the Landfill final cover system components. A list of low ground pressure equipment used and the pressure rating of each vehicle shall be indicated in the certification report required in Condition #6. Additionally, the low ground pressure equipment shall not access the final cover system from permanent and temporary roads where the transition will result in excessive pressure and wear on the Landfill vegetative service. The on-site engineer may construct ramps as necessary.

12) Permanent and Temporary Roads Construction: Prior to commencement of construction submit a response indicating whether 12 inches or 18 inches of soil is proposed to be placed over the existing Landfill surface for temporary access road construction. Additionally, the Applicants shall submit a revised narrative for Section 4.3 regarding the permanent access road for a final cover system that does not include a geomembrane and revise the detail for permanent access roads on drawing D-2, if necessary.

13) Integrity of the Final Cover System: All disturbances of the Landfill shall be limited to the proposed excavations and installations as depicted and described within the Application and approved plans. Excavations shall be limited to the topsoil layer. No excavations shall penetrate the low permeability layer without written approval by MassDEP. The Engineer and Applicant's Contractors shall ensure that vehicles operating on the Landfill surface do not compromise the integrity of the Landfill final cover system.

14) Construction Precautions: All excavations and construction shall be supervised by a Massachusetts Registered Professional Engineer who shall have sufficient staff on-site to provide oversight for all construction work. All necessary precautions shall be taken to protect the Landfill storm water control system, environmental monitoring network, gas vents, and other on site structures. All operators of vehicles entering the area should be clearly instructed by the on-site engineer and/or the Applicants' Contractor of the permit requirements to avoid damage to the Landfill components. The on-site engineer shall observe the extent of each excavation performed on the Landfill capping system. If any damage occurs to any Landfill components, the Applicants' Engineer shall notify MassDEP within 24 hours and provide a written plan with a schedule for repairs.

15) Proposed Inverter/Transformer Pad and Interconnection Equipment: The Applicants stated within the Application that manufacturers "cut sheets" for the electrical equipment were

included in Appendix B for informational purposes only and were only representative of equipment that is proposed. Final equipment selection may vary based on availability and other factors at the time of construction.

If the Applicants or Applicants' Contractors propose to change the electrical equipment a copy of the final design for the inverter/transformer pad and any other electrical pads and protective switchgear (interconnection equipment) proposed on-site shall be submitted to MassDEP for review and approval. The Applicant, Engineers and Applicants' Contractors are responsible to ensure that utilities/structures will not accumulate landfill gas during construction and operation. There shall be no penetrations (utility, conduits or other) at the base of any concrete pads or foundations. There shall be no penetration of any kind of the impermeable layer of the final cover system.

16) Electrical Design Plans: The Applicants shall submit final electrical design plans, stamped by a Registered Massachusetts Electrical Engineer prior to commencing construction activities. The design plans shall clarify whether underground cable conduit are proposed. If underground cable conduits are proposed the design shall be submitted to MassDEP for review. The electrical design, including the complete grounding design, shall meet applicable NEC and local electrical code requirements. Grounding rods shall not be driven through the final cover system low permeability layer. The location of grounding rods, off the final cover system, shall be clearly depicted on the site plan submitted with the Certification Report.

17) Post-closure Use Operation and Maintenance Plan: During the first year after completion of construction of the PV array, inspections of the Landfill final cover system shall be performed on a monthly basis. Monthly inspection reports shall be submitted to MassDEP within **fourteen (14) days** of completion. Following the first year of operation of the PV array, and if no problems have been documented, inspections of the Landfill shall be performed on a quarterly basis and shall be submitted to MassDEP within **fourteen (14) days** of completion. Pursuant to 310 CMR 19.142(6) inspections shall be conducted by a third-party consulting Massachusetts Registered Professional Engineer, or other qualified solid waste professional. The Applicants, Engineers and Applicants' Contractors shall monitor the effectiveness of the storm water management system which should include; swales, structures and any and all conveyance systems. MassDEP shall be consulted prior to any deviation from the approved storm water design. MassDEP may require a permit modification application for significant design modifications. Any erosion, settlement, security problems or other issues observed at the Landfill shall be reported to MassDEP and repaired immediately.

18) Site Security: Pursuant to 310 CMR 19.130(23) the Applicants are required to provide sufficient fences or other barriers to prevent unauthorized access to the Landfill. The Applicants and Applicants' Contractors must continually monitor and evaluate the potential for unauthorized access and institute all appropriate measures to prevent unauthorized access during construction and operation of the PV Array.

19) Selective Clearing: This Approval does not authorize any work on property not owned by the Town. Authorization from the landowner should be sought by the Town prior to any selective clearing of trees and brush on property not owned by the Town.

20) Decommissioning Plan: If the proposed project is abandoned, during or after completion of construction, the Applicants shall submit a decommissioning plan. The decommissioning and site restoration plan should include dismantling and removal of all panels and supporting equipment, transformers, overhead cables, foundations and buildings and restoration of the roads to restore the Site to substantially the same physical condition that existed prior to Post-Closure Use construction. Disturbed earth shall be graded and seeded.

21) Entries and Inspections: In accordance with *310 CMR 19.043: Standard Conditions*, MassDEP and its agents and employees shall have the right to inspect the Landfill and any equipment, structure or land located thereon, take samples, recover materials or discharges, have access to and photocopy records, to perform tests and to otherwise monitor compliance with this permit and all environmental laws and regulations.

22) Reservation of Rights: MassDEP reserves the right to require additional assessment or action, as deemed necessary to protect and maintain an environment free from objectionable nuisance conditions, dangers or threats to public health, safety and the environment. MassDEP reserves all rights to suspend, modify or rescind this permit if it determines the PV array compromises the integrity of the final cover system and/or results in a threat to public health, safety or the environment.

This approval pertains only to the Solid Waste Management aspects of the proposal does not negate the responsibility of the owners or operators to comply with any other local, state or federal laws, statutes and regulations or enforcement actions, including orders issued by another agency now or in the future. Nor does this approval limit the liability of the owners or otherwise legally responsible parties from any other applicable laws, statutes or regulations now or in the future.

RIGHT OF APPEAL

Right to Appeal – This approval has been issued pursuant to M.G.L. Chapter 111, Section 150A, and 310 CMR 19.037: Review Procedures for Permit Modifications, Permit Renewals and other Approvals, of the "Solid Waste Management Regulations". Pursuant to 310 CMR 19.037(5), any person aggrieved by the issuance of this determination may file an appeal for judicial review of said decision in accordance with the provisions of M.G.L. c. 111, § 150A and M.G.L. c. 30A not later than thirty (30) days following receipt of the final permit. The standing of a person to file an appeal and the procedures for filing such an appeal shall be governed by the provisions of M.G.L. c. 30A. Unless the person requesting an appeal requests and is granted a stay of the terms and conditions of the permit by a court of competent jurisdiction, the permit decision shall remain effective or become effective at the conclusion of the thirty (30) day period.

Notice of Appeal - Any aggrieved person intending to appeal a grant of a permit to the Superior Court shall first provide notice of intention to commence such action. Said notice of intention shall include the Department transmittal number X251914 and shall identify with particularity the issues and reason why it is believed the permit decision was not proper. Such notice shall be

provided to the Office of General Counsel of the Department and the Regional Director for the regional office which processed the permit application at least five days prior to the filing of an appeal.

Office of General Counsel
Department of Environmental Protection
One Winter Street
Boston, MA 02108

Philip Weinberg, Regional Director
Department of Environmental Protection
20 Riverside Drive
Lakeville, MA 02347

No allegation shall be made in any judicial appeal of a permit decision unless the matter complained of was raised at the appropriate point in the administrative review procedures established in 310 CMR 19.000, provided that a matter may be raised upon a showing that it is material and that it was not reasonably possible with due diligence to have been raised during such procedures or that matter sought to be raised is of critical importance to the environmental impact of the permitted activity.

Please direct any questions regarding this matter to me at (508) 946-2847 or to Dan Connick (508) 946-2884, or write to the letterhead address.

Very truly yours,

Mark Dakers, Acting Chief
Solid Waste Management Section

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\mdakers\energy\Duxbury\Duxbury LF PV Array PCU 120312.docx

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Board of Health, fax (781) 934-1118
Scott Lambiase, Director of Inspectional Services fax (781) 934-1118

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