



Commonwealth of Massachusetts  
Executive Office of Energy & Environmental Affairs

## Department of Environmental Protection

Central Regional Office • 8 New Bond Street, Worcester MA 01606 • 508-792-7650

Charles D. Baker  
Governor  
  
Karyn E. Polito  
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Matthew A. Beaton  
Secretary  
  
Martin Suuberg  
Commissioner

### **BWP SW 36 POST-CLOSURE USE – MAJOR**

Groton Landfill, Cow Pond Brook Road  
Solar Panel Array Installation

Permit Issuance Date: January 22, 2016

Permit Revision Date: June 22, 2016

Names of Permittees: Town of Groton (“Town” or “Permittee”)  
173 Main Street  
Groton, MA 01450

Groton Landfill Solar LLC (“Permittee”)  
111 Speen Street, Suite 410  
Framingham, MA 01701

Name of Facility: Groton Landfill (“Facility” or “Landfill”)  
600 Cow Pond Brook Road  
Groton, Massachusetts 01450

MassDEP Region: Central Regional Office (CERO), Worcester (“MassDEP” or  
“Department”)  
Solid Waste Management Program

Permit Number: X267868R (Revised)

Facility Number: 39315

MassDEP Classification: CLF

### **I. FACILITY AND PROJECT DESCRIPTION AND OUTSTANDING APPROVAL STATUS**

#### **A. Facility and Solar Project**

1. Landfill Owner: Town of Groton  
173 Main Street  
Groton, MA 01450

2. Solar Panel Array Owner: Groton Landfill Solar LLC  
111 Speen Street, Suite 410  
Framingham, MA 01701
3. Solar Panel Array Operator: Groton Landfill Solar LLC  
111 Speen Street, Suite 410  
Framingham, MA 01701
4. Description: The Landfill occupies approximately 12.5 acres of a 43 acre parcel of land owned by the Town of Groton in Groton, Massachusetts. The Landfill was capped in 2003. The proposed solar panel array will encompass approximately 8 acres of the Landfill site. The Solar Panel Array project will be owned and operated by Groton Landfill Solar LLC of Framingham, Massachusetts.

**B. Title of Approved Plans/Permits Affecting Proposed Operation.**

Permit for BWP SW 25 - Corrective Action Design, Groton Sanitary Landfill Closure, Transmittal No. P20960  
Issued by MassDEP-CERO: May 30, 2001

“Town of Groton, Landfill Closure Certification Report, September 2004”  
Prepared by Camp Dresser & McKee, Inc.

MassDEP “Final Approval, Landfill Closure Completion Letter  
Groton Municipal Landfill, Flavell Road / Cow Pond Brook Road, Groton, MA”  
Issued by MassDEP-CERO: July 27, 2015

**C. Permit Application Information for BWP SW 36 Post-Closure Use – Major**

1. Applicant Name:  
  
Town of Groton  
173 Main Street  
Groton, MA 01450
2. Transmittal Number: X267868 (Permit No.)
3. Start Date of Application: October 20, 2015  
Permit Issuance Date: January 22, 2016
4. Consulting Registered Professional Engineer:  
  
AMEC Massachusetts, Inc.

271 Mill Road  
Chelmsford, MA 01824  
Contact: Robert Bukowski, P.E.  
Tel.: 978-692-9090

5. Title of Plans & Reports, Submission and Date of Receipt at MassDEP-CERO:  
“Massachusetts Department of Environmental Protection, BWP SW 36 Major Post-Closure Use Permit Application for a 2.93 Megawatt Solar Voltaic Installation, Groton Landfill, Town of Groton, Massachusetts”  
Prepared by: AMEC Massachusetts, Inc.  
Dated: October 2015  
Received by MassDEP-CERO: October 16, 2015

Supplemental Information:

Project Notification Form dated November 17, 2015 from the Massachusetts Historical Commission (MHC) indicating that after review of the MHC files and the submitted materials, that the Solar Panel Array Project **is unlikely to affect significant historic or archaeological resources.**

Correspondence dated November 20, 2015, NHESP No.12-31353, from the Natural Heritage & Endangered Species Program (NHESP) of the Massachusetts Division of Fisheries & Wildlife (“the Division”) to Jim Walker of Ameresco, Inc. indicating that the subject property is located within the actual habitat of the Blanding’s Turtle, a species listed as “Threatened” and protected pursuant to the Massachusetts Endangered Species Act. The correspondence requires that the Solar Panel Array Project as currently proposed **must be conditioned in order to avoid a prohibited “take” of state-listed rare species** and provided that noted conditions are implemented and there are no changes to the project plans, the project will not result in a “take” of state-listed species.

Additional e-mail correspondence dated January 7, 2016, NHESP No.12-31353, from the Natural Heritage & Endangered Species Program (NHESP) of the Massachusetts Division of Fisheries & Wildlife (“the Division”) to Robert Bukowski of AMEC Massachusetts, Inc. regarding the development and approval of a turtle protection plan for the southern L shaped open area array on the Groton Landfill Solar Panel Array Project.

Follow-up e-mail correspondence dated June 1, 2016 from Robert Bukowski of AMEC Foster Wheeler to James McQuade of MassDEP confirming the request to revise the current post closure use permit to

reflect that Ameresco's LLC, identified as Groton Landfill Solar LLC, operates the solar PV system and not the landfill.

6. Project Description:

The post-closure use request is for the installation and operation of a 2.93 Megawatt (DC) solar photovoltaic (PV) array ("Solar Panel Array") on three sections of land, two on the capped Landfill sections and one section on the open area to the south and adjacent to the Landfill. The two Landfill sections are referred to as the "North" Array and the "South" Array respectively. Those solar panels will encompass most of the capped area of the Landfill. The remaining section off of the Landfill on the open area to the south is referred to as the "open area" array.

In the Application, the Applicant proposes to construct and maintain the Solar Panel Array, which will consist of the following components:

- Approximately 9,310 photovoltaic (PV) modules on panels supported by mounted racking systems on concrete ballast blocks underlain by gravel installed above the existing surface of the capped Landfill cover system, and by ground screw foundations on the open area to the south and off of the Landfill. The surface-mounted ballast blocks will not penetrate the Landfill cover system;
- Cable trays and conduit lines from the panels mounted mostly on the racking systems and/or on above grade pre-cast concrete ballasts which will not impact the Landfill cap. Conduits between the inverter stations and interconnection points will be installed above grade mounted to the array ballasts and on concrete and Unistrut (or equivalent) supports as applicable. Between rows, low and medium voltage conduit or cable trays will be fastened to pre-cast concrete ballasted supports above ground. Ballasted conduit supports will be pre-cast concrete blocks;
- Approximately eighty-four "string" inverters, located throughout the array on and off the Landfill cap to be supported on concrete pads;
- Eight AC combiner panels and four transformers on concrete pads (2 on the Landfill and 2 on the open area to the south and off of the Landfill) and associated interconnect equipment. Medium voltage power from the transformer will run in approximately 195 feet of surface mounted medium voltage line on the Landfill, approximately 475 feet of underground medium voltage line beyond the landfill limits of waste, and approximately 40 feet of overhead medium voltage line. No excavation on

the Landfill shall exceed twelve (12) inches below grade or be allowed to penetrate the low permeability layer of the Landfill without prior approval;

- Installation of four utility poles beyond the limits of waste to allow connection to the existing local utility grid; and
- A fence will be placed around the perimeter of the north landfill solar PV system, and around the south landfill and the adjacent open parcel solar PV systems.
- An access road is also proposed onto the Landfill to provide equipment access during construction, as well as for long term maintenance of the array. Additional temporary access roads and staging areas may be required for contractor use during construction. These roads and staging areas would be constructed the same as the permanent access road shown on Drawing C-101 of the application plans. The locations of the additional temporary access roads and staging areas will be shown on the Issued for Construction Drawings that will be submitted to MassDEP prior to the start of construction.

This post-closure use permit authorizes the installation and maintenance of the proposed Solar Panel Array on the Groton Landfill and appurtenances thereto. A post closure use permit authorizing these activities was first issued on January 22, 2016.

A revised permit is now being issued to clarify that the Town of Groton is the owner of the facility and Groton Landfill Solar LLC is the owner and operator of the Solar Panel Array on the facility.

## **II. POST-CLOSURE USE – MAJOR, APPLICATION REVIEW AND APPROVAL**

The post-closure use application complies with the application requirements set forth at 310 CMR 19.030: Application for a Solid Waste Management Facility Permit and 310 CMR 19.033: Permit Procedure for an Application for a Permit Modification or Other Approval, and was reviewed in accordance with 310 CMR 19.038: Review Criteria for a New or Expanded Facility Permit or Permit Modification, 310 CMR 19.143: Post-closure Use of Landfills, and MassDEP's Landfill Technical Guidance Manual (May 1997).

Based on the information presented in the plans and reports referenced in Section I. C. 5. above and subject to the condition(s) imposed by NHESP, including an approved Turtle Protection Plan, as noted in the correspondence referenced in Section I.C. above, MassDEP approves the Applicant's request for a post-closure use permit at the Facility.

This document is a Permit, issued pursuant to M.G.L. c. 111, Section 150A, and 310 CMR 19.000 et seq., the "Solid Waste Management Facility Regulations", and it is subject to the conditions set forth below.

### III. GENERAL PERMIT CONDITIONS

- A. Compliance with Plans** - The Permittees shall conduct operations in accordance with approved plans, reports, and other submissions described in Section I.C. above, except as may be modified by the conditions set forth in Section IV. No material changes in the design or activities described in the approved documents shall be performed without prior written Department approval.
- B. Compliance with Other Laws and Regulations** - The construction, operation, maintenance and closure of this Facility shall be performed in compliance with other applicable local, state and federal laws, regulations, and bylaws.
- C. Standard Conditions** - The Permittees shall maintain the Facility in accordance with the conditions set forth at 310 CMR 19.007-19.011 and 19.043(5).
- D. Joint Liability** - This Permit is issued subject to the conditions of joint liability of the Facility owner and operator in accordance with 310 CMR 19.043(3).
- E. Right of Access** - MassDEP and its agents and employees shall have the right to enter upon the Facility site at all reasonable times and without notice, to inspect the Facility and any equipment, structure or land located thereon, take samples, recover materials or discharges, have access to and copy records, to perform tests and to otherwise monitor compliance with this approval, or any and all permits relative to the operation of the Facility, and all environmental laws and regulations. This right of entry and inspection shall be in addition to MassDEP's access authorities and rights under applicable federal and state laws and regulations, as well as any permits or other agreements between the Permittee and MassDEP.
- F. Transfer** - No transfer of this permit shall be permitted except in accordance with the requirements of 310 CMR 19.044.
- G. Permit Modification** - The Department reserves the right to rescind, suspend or modify this Permit by the imposition of additional conditions based upon a determination of actual or the threat of adverse impacts from the construction, operation, maintenance or closure of the Facility.
- H. Other MassDEP Permits or Approvals** - In the event this Permit conflicts with all or parts of prior plan approvals or permits issued pursuant to Chapter 111, Section 150A, the terms and conditions of this Permit shall supersede the conflicting provisions of the prior permits and/or approvals. This Permit does not convey property rights of any sort or any exclusive privilege. This Permit supersedes in its entirety Permit No. X267868 issued on January 22, 2016.

- I. Notice of Landfill Operation** – The Town of Groton has provided MassDEP with written proof that a Record Notice of Landfill Operation for the Facility was recorded in the Middlesex South Registry of Deeds, Bk: 67159 Pg: 424, on April 28, 2016 in compliance with 310 CMR 19.141.

#### **IV. SPECIFIC PERMIT CONDITIONS**

- A. Criteria for Post-Closure Use** - This approval for post-closure use of the Groton Landfill shall be accomplished such that the Permittees ensure that no activity associated with the Facility, or with the Solar Array and appurtenances thereto as described in the Application, shall in any way alter the integrity of the Landfill cover system or any of the site environmental monitoring systems located on the site assigned land on Cow Pond Brook Road.
- B. Other Post-Closure Use** - The Permittees shall not use the Landfill for any post-closure activity other than that approved by this permit without submittal and Department approval of a Post-Closure Use Permit Application in accordance with 310 CMR 19.143: Post-Closure Use of Landfills.
- C. Inspection and Repair of Settlement Areas** - Prior to constructing the Landfill Array, the Permittees shall survey any suspect settlement areas on the Landfill to determine the lowest spot. The Permittees shall then survey the surrounding area 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”. For purposes of this permit, minor settlement shall be defined as a pond value of less than 12 inches. Prior to constructing the Landfill Array, the Permittees shall correct any area that has undergone minor settlement by the placement of additional vegetative support soil to promote runoff and shall reseed the area. The Permittees shall survey any area repaired and mark the location on a plan with the pond value. Any future settlement shall be recorded cumulatively.

If/when the total settlement reaches 12 inches the area will be considered to have suffered major settlement and the Permittees must undertake appropriate repairs to eliminate ponding. Any minor settlement repair may be done as routine maintenance, provided that the owner and/or operator reports the settlement to MassDEP and states its intent to perform repairs, and provides MassDEP with final survey (as-built) results and a summary write-up.

Major settlement is defined as a pond value of greater than 12 inches. When this occurs, the Permittees must repair the final cover system subject to MassDEP approval to prevent surface water ponding. The Permittees must submit any proposal to remedy a major settlement repair within a Corrective Action Design (BWP SW 25) permit application since disruption of the final Landfill cover

system will take place and repair details must be submitted to and approved by MassDEP.

The Permittees shall provide for continued monitoring for potential differential settlement due to the Landfill Array during Facility operations along with established provisions for addressing and adjusting for such settlement within the Landfill cover system and/or the Solar Panel Array system.

- E. Additional Inspections and Monitoring** - During the first year of operation of the Solar Panel Array, the Permittees shall perform inspections of the Landfill and the Landfill cover system beneath the solar array on a monthly basis and also following major storm events. After the first year of the Landfill Array's operation, these additional inspections may be incorporated into the existing Landfill inspection and monitoring program subject to MassDEP approval. In accordance with 310 CMR 19.018 and 310 CMR 19.142(6), the inspections shall be performed by a Third-Party Inspector who is registered with the Department. The Permittees shall ensure that the inspection reports are submitted to MassDEP-CERO within fourteen (14) days of the inspection.
- F. Vehicles Operating on the Landfill Final Cover System** - Vehicles operating on the Landfill final cover system shall only operate on the proposed access road(s), except for low ground pressure construction equipment in accordance with the conditions of this permit. Low-pressure construction equipment operating off the proposed access road(s) shall limit turning on the vegetative support layer as much as possible. If MassDEP determines that the use of excavation equipment is creating the potential for damage to the Landfill's liner system, 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 regarding 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 included in the certification report required by Specific Permit Condition IV.L.
- G. Permanent and Temporary Roads and Low Ground Pressure Equipment** - The Permittees shall ensure that low ground pressure equipment shall not access the Landfill 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 to accommodate the low ground pressure equipment.
- H. Integrity of the Final Cover System** - The Permittees shall limit all disturbances of the Landfill to the proposed installations on top of the vegetative cover of the capped Landfill that are described in the Application. No significant excavations or



other penetrations shall be performed into the final cover system during construction or during operation and maintenance of the Solar Panel Array without prior MassDEP approval. The Permittees shall ensure that vehicles operating on the Landfill do not damage or compromise the Landfill final cover system integrity and that there are no penetrations of any kind of the Landfill final cover system.

**I. Construction Precautions -**

1. The Permittees shall take all necessary precautions to ensure that the proposed construction and maintenance work associated with the Solar Panel Array does not damage the environmental monitoring network at the Landfill. Prior to the commencement of construction activities, the Permittees shall ensure that environmental monitoring locations are flagged for visibility and protective barriers are placed around such structures, as needed, to prevent damage by vehicles accessing the area. If any damage occurs to the environmental monitoring network components, the Permittees or their contractor(s) shall notify James McQuade, Section Chief, MassDEP - CERO at 508 767-2759 within 24 hours and provide a written plan for repairs, including a schedule.
2. The Permittees shall take all necessary precautions to protect the Landfill storm water control system, including but not limited to swales, structures, and any and all conveyance systems. If any damage occurs to the storm water control system, the Permittees or their contractor(s) shall notify James McQuade, Section Chief, MassDEP - CERO at 508 767-2759 within 24 hours and provide a written plan for repairs, including a schedule.
3. This Permit requires that any inverter/ transformer pad or appurtenances must be designed so as not to create a potential fire safety hazard. Potential design features may include but are not limited to the installation of fully sealed conduits, explosion proof connections, and fittings. The Permittees shall also ensure that utility trenches are designed so they do not act as a conduit for landfill gas migration.
4. All excavations and construction 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 associated with the project. The Permittees shall report any erosion problems, settlement problems, security or other issues observed at the Landfill to James McQuade, Section Chief, MassDEP-CERO at 508 767-2759 and repair them immediately.

**J. Array Setbacks:** The Permittees shall maintain a minimum ten (10) foot radius buffer between the closest edge of the Solar Panel Array and all landfill gas vents.

- K. Notification of Construction** - The Applicant shall notify MassDEP in writing when the post-closure use construction authorized by this permit commences and is completed.
- L. Certification Report** - Within ninety (90) days of completing the installation of the Solar Panel Array, the Permittees shall provide MassDEP 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 associated with the project. The certification report shall be signed and stamped by a Massachusetts Registered Professional Engineer and include, at a minimum, written certification from the supervising engineer that the project was performed in accordance with MassDEP regulations, applicable requirements and this Permit. The certification report shall include as-built drawings depicting all pertinent site features and the extent of the Facility, Solar Panel Array and appurtenances thereto.
- M. Personnel Training** - The Permittees and their contractor(s) shall instruct all Solar Panel Array 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 this Permit to carry out the authorized activity in a manner that is not hazardous to public health, safety, welfare or the environment. Training shall be provided to workers conducting monitoring and maintenance activities for the Landfill regarding potential hazards associated with the Solar Panel Array, including but not limited to electrical hazards.
- N. Health and Safety** - The Permittees and their contractor(s) are responsible for ensuring that all necessary precautions are taken to protect the health and safety of workers and the general public during construction, operation, and maintenance of the Solar Panel Array.
- O. Proposed Inverter/Transformer Pad and Interconnection Equipment** - The Permittees shall ensure that a copy of the final design for the transformer pad and any other electrical and protective switchgear (interconnection equipment) for the Solar Panel Array project is submitted to MassDEP for its files within 15 days of construction. The Permittees and their contractor(s) are responsible to ensure that utilities/structures will not accumulate landfill gas during construction and operation of the Landfill Array.
- P. Electrical Design Plans** - The Permittees shall submit electrical design plans stamped by a Registered Massachusetts Electrical Engineer to MassDEP for its files within 15 days of construction. The electrical design, including the grounding

design, shall meet applicable National Electrical Code (NEC) and local electrical code requirements including but not limited to Article 690 – “Solar Photovoltaic (PV) Systems” of the NEC (2011 Edition). If any grounding rods are installed as part of the grounding system, the rods shall not be driven through the Landfill final cover system.

**Q. Landfill Gas Notification Requirements -**

1. As specified in solid waste management regulations at 310 CMR 19.132 (5) (g): Gas Monitoring,

When, at any time, the concentration of explosive gases exceeds 10% of the lower explosive limit (LEL) in any building, structure, or underground utility conduit at the Facility, excluding gas control, gas recovery and leachate collection system components, the Permittees shall:

- a) take immediate action to protect human health and safety;
- b) notify the Department’s Solid Waste Section Chief, James McQuade at 508 767-2759 within two hours of the finding; and
- c) undertake the actions specified under 310 CMR 19.150: Landfill Assessment Requirements and 310 CMR 19.151: Corrective Action Requirements as required by the Department.

2. Pursuant to 310 CMR 40.0321(1)(a), if at any time, monitoring detects the presence of any combustible gases at or in excess of 10% of the LEL at any location within a building or within any utility conduits at the Facility, the owner/operator shall notify the local fire department and MassDEP’s Bureau of Waste Site Cleanup-Emergency Response Section at 888-304-1133 within two (2) hours of the exceedance.

**R. Post-Closure Environmental Monitoring** - The Permittees shall maintain the existing and/or any future environmental control or monitoring systems in accordance with 310 CMR 19.133: Maintenance of Environmental Control and Monitoring Systems.

**S. Site Security** - The Permittees are required to provide sufficient fences or other barriers to prevent unauthorized access to the Landfill. The owner/operator must continually monitor and evaluate the potential for unauthorized access to the Landfill and institute all appropriate measures to prevent unauthorized access during the post-closure period.

**T. Decommissioning Plan** - If the proposed Solar Panel Array project is abandoned, during or after completion of construction, the Applicant shall submit to MassDEP for review and prior approval a detailed decommissioning and site

restoration plan, which includes, at a minimum: dismantling and removal of all panels and supporting equipment, transformers, overhead cables, foundations and buildings; and restoration of the roads to restore the Landfill to substantially the same physical condition that existed prior to post-closure use construction.

- U. **Other Requirements** - The Permittees and their contractor(s) are responsible to ensure that the proposed work complies with all applicable local, state and federal codes, requirements, conditions, determinations, regulations and permits.

V. **RIGHT OF APPEAL**

- A. **Request for Provisional Decision** - An applicant aggrieved by the Department's permit decision, within 21 days of the issuance of the Department's permit decision to the applicant, may file a written request, with the appropriate regional office of the Department, that the permit decision be deemed a provisional decision, and a written statement of the basis on which the applicant believes it is aggrieved, together with any supporting materials. Upon timely filing of such a request, the permit decision shall be deemed a provisional decision. Such a request shall reopen the administrative record, and the Department shall issue a final permit decision after the end of the comment period. **Failure by an applicant to exercise the right provided in 310 CMR 19.033(4)(b) shall constitute a waiver of the applicant's right to appeal.**
- B. **Right to Appeal** - Any person aggrieved by the final permit decision, except as provided for under 310 CMR 19.033(4)(b), may file an appeal for judicial review of said permit decision in accordance with the provisions of M.G.L. c. 111, § 150A and M.G.L. c. 30A no later than thirty (30) days following the date of issuance of the final permit decision to the applicant. Unless the person requesting an appeal requests and is granted a stay of the terms and conditions of the final permit decision by a court of competent jurisdiction, the final permit decision shall be effective in accordance with 310 CMR 19.033(3).
- C. **Notice of Appeal** - Any aggrieved person intending to appeal a final permit decision to the Superior Court shall first provide notice of intention to commence such action. Said notices of intention shall include the Department file number (Transmittal No. X267868R) and shall identify with particularity the issues and reason why it is believed the final permit decision was not proper. Such notice shall be provided to the Office of General Counsel of MassDEP and the Regional Director for the regional office which processed the permit application at least five (5) days prior to the filing of an appeal:

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

and

Mary Jude Pigsley, Regional Director  
Department of Environmental Protection  
8 New Bond Street  
Worcester, MA 01606

No allegation shall be made in any judicial appeal of a final 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.

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James A. McQuade  
Section Chief  
Solid Waste Management Program