



Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

Northeast Regional Office • 205B Lowell Street, Wilmington MA 01887 • 978-694-3200

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August 8, 2012

Stephen Zanni, Mayor
Town of Methuen
Searles Building
41 Pleasant Street
Methuen, MA 01844

RE: METHUEN – Solid Waste/COR
Methuen Landfill
Huntington Avenue
FMF# 39495
Post Closure Use – Solar Power Generating Facility
Approval
Transmittal Number: X250696

Dear Mr. Zanni:

The Massachusetts Department of Environmental Protection, Northeast Regional Office, Bureau of Waste Prevention, Solid Waste Section ("MassDEP ") has reviewed the Town of Methuen's (the "City") application for the post-closure use of the closed Huntington Avenue Landfill (the "Landfill") located on Huntington Avenue in Methuen, Massachusetts. The application, category BWPSW36: "Post-Closure Use – Major", Transmittal Number X241512, was prepared and submitted to MassDEP on behalf of the City by Tighe & Bond of Westfield, Massachusetts.

The application includes detailed design plans for the installation of a 1.287 megawatt (MW) solar photovoltaic facility ("PV Facility") on the Landfill. The City has entered a 20 year contract with Borrego Solar Systems, Inc., ("Borrego Solar") of Lowell, Massachusetts for the installation and operation of the PV Facility.

The proposed PV Facility will consist of 5,156 modules attached to aluminum frames. The frames will be supported on concrete pads resting on shallow gravel leveling pads placed on the ground surface. Two inverters will convert the DC power from the modules to AC power for connection to the regional electric power grid at Kensington Avenue.

Modules will be placed on slopes with gradients of up to ten percent (10%). The application includes a stability analysis by Borrego Solar with a calculated Factor of Safety of at least 2.6 for the modules against sliding. The module supporting system will not significantly alter the flow of storm water or snow melt to the existing storm water control basins at the Landfill.

This information is available in alternate format. Call Michelle Waters-Ekanem, Diversity Director, at 617-292-5751. TDD# 1-866-539-7622 or 1-617-574-6868

MassDEP Website: www.mass.gov/dep

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DECISION

MassDEP has determined that the application is administratively and technically complete and that the proposed post-closure use complies with the applicable requirements of 310 CMR 19.000, the Massachusetts Solid Waste Regulations (the “Solid Waste Regulations”), subject to the terms and conditions of this decision and permit. The application demonstrates pursuant to 310 CMR 19.143(3) that the installation of the solar PV arrays as proposed and approved by this decision:

- Will not result in a disturbance of the Landfill cap that could cause an adverse impact to public health, safety or the environment;
- Will not impair the integrity or functioning of the final cover, the components of the containment system, the landfill gas control system, and the environmental monitoring systems; and
- Provides for the maintenance of the Landfill cap’s storm water drainage facilities, basins, swales, and other erosion/sedimentation controls.

Therefore, in accordance with M.G.L. Chapter 111, § 150A and 310 CMR 19.143, MassDEP approves the application and issues this Post-Closure Use Permit subject to the Town’s compliance with 310 CMR 19.000 and the following conditions, imposed by MassDEP pursuant to 310 CMR 19.043(1) *Items Subject to Conditions* and 310 CMR 19.142(7) *Additional Measures*. This decision is a Post-Closure Use Permit pursuant to 310 CMR 19.143 *Post-Closure Use of Landfills*.

1. The City¹ and Borrego Solar² shall comply with this permit and the requirements of 310 CMR 19.000, including, but not limited to, the requirements established at 310 CMR 19.043(5) *Standard Conditions*.
2. The City and Borrego Solar shall assure persons conducting activities³ at the PV Facility and Landfill are familiar with the applicable provisions of this permit and the approved plans, and that all work performed at the Landfill complies with 310 CMR 19.000 and the applicable requirements of this permit.
3. Pursuant to 310 CMR 19.043(5)(a) *Duty to Comply*, this decision does not relieve the City, Borrego Solar, or others, from their obligations to comply with all other applicable federal and state laws and regulations including, but not limited acquiring applicable permits and approvals, including local permits.
4. Not less than seven (7) days prior to commencing construction pursuant to the application and this permit, the City shall notify MassDEP in writing of the scheduled date of the commencement of construction at the site. In addition, the notification shall include:
 - a. The projected schedule for completion of the major construction milestones and the PV Facility;
 - b. The name and contact information of an on-site contact for the construction;
 - c. A health and safety plan for MassDEP’s files that includes, but is not limited to:

¹ Hereinafter, the “City” includes heirs, successors and assigns of the City.

² Hereinafter, “Borrego Solar” includes heirs, successors and assigns of Borrego Solar.

³ Activities include, but are not limited to, the construction, installation, operation, and maintenance of the PV Facility and the Landfill.

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- i. protocols for monitoring for landfill gas (methane, hydrogen sulfide, etc.) as needed,
 - ii. protocols for modifying work practices if landfill gas is detected at levels of concern (action levels),
 - iii. instruction and training of all personnel working on the site regarding the potential health and safety hazards at the Landfill including, but not limited to those associated with landfill gas, and
 - iv. instruction and training of all personnel in compliance with the conditions of this permit and how to perform authorized activities in a manner that is not hazardous to public health, safety, and the environment.
5. The City and Borrego Solar shall not commence construction of the PV Facility until it has provided the notification to MassDEP and the City of Methuen Board of Health pursuant to Condition 4 above.
6. All construction work shall be completed and conducted under the supervision of an independent Massachusetts Registered Professional Engineer (“Engineer of Record”) who shall have sufficient qualified staff on-site to provide field supervision and quality assurance/quality control for all construction activities.
7. The City, the Engineer of Record, and Borrego Solar are responsible to ensure that all necessary precautions are taken to protect the health and safety of workers and the general public during the construction and operation of the PV Facility and during its decommissioning.
8. Prior to commencement of construction activities, all landfill gas system components (vents, piping, etc.), landfill gas and groundwater monitoring wells, and other existing above ground structures on the Landfill’s cap shall be flagged for visibility, and protective barriers shall be placed around such structures, as needed to prevent damage by vehicles accessing the site and from the construction activities.
9. All disturbance of the Landfill shall be limited to the proposed excavations and installations as depicted and described in the application and the approved plans and this permit. Excavations shall be limited to the soil cover (that is, the topsoil and vegetative support layers). No excavations shall penetrate the impermeable FML. The Borrego Solar and any other contractors performing work at the Landfill shall without delay notify the Engineer of Record or his/her on-site representative upon encountering or damaging the FML.
10. If the impermeable flexible membrane liner (“FML”) portion of the cap is damaged the City shall notify MassDEP without delay and in no case more than 24 hours after it becomes aware of the incident. This notification requirement is in addition to any other notification requirements required by statute or regulation including, but not limited to, 310 CMR 19.000 and 310 CMR 40.0000.
11. The City and Borrego Solar shall maintain copies of this decision and permit, the application, the health and safety plan, and documentation that site personnel have been trained pursuant to the health and safety plan at the site during construction of the PV Facility.
12. Pursuant to 310 CMR 19.043 Standard Conditions MassDEP and its agents and employees shall have the right to inspect the Landfill, any equipment, structure or land located thereon, to take

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samples, to perform tests, and have access to and photocopy records, and to otherwise monitor compliance with this permit and all environmental laws and regulations administered by MassDEP.

13. Notice of the landfill located on this site, including this approval, shall be recorded in the applicable Registry of Deeds and/or the Registry Section of the Land, as appropriate, pursuant to the requirements of M.G.L. Chapter 111, § 150A and 310 CMR 19.141.
14. Prior to commencing operation of the PV Facility, and in no event on or before ninety (90) days after the date of completion of the construction of the PV Facility, the City shall submit for review and approval by MassDEP a construction certification report, as an application category BWP SW45 Alternative Review Process, that includes, but is not limited to:
 - a. As-built plans for the final as constructed PV Facility amended to incorporate all modifications and alterations, if any, made during construction;
 - b. A narrative, prepared by the Engineer of Record that discusses in part, any modifications made to the design of the PV Facility;
 - c. A final O&M plan that consolidates inspection and maintenance activities at the Landfill into a consolidated comprehensive plan including any necessary revisions, and
 - d. Certifications by the City and the Engineer of Record pursuant to 310 CMR 19.011.
15. On or before 30 days after the date the PV Facility ceases operation, the City shall submit to MassDEP an application pursuant to 310 CMR 4.00 and 310 CMR 19.000 for the decommissioning of the PV Facility and the restoration of the landfill cap and appurtenances thereto. The application shall include, but not be limited to, a narrative, plans and schedule for the decommissioning of the PV Facility and the restoration of the Landfill's cap and appurtenances⁴
16. MassDEP reserves the right to amend, modify, suspend or revoke this permit pursuant to 310 CMR 19.040 Department's Modification, Suspension, or Revocation of a Permit. This does not limit or restrict MassDEP from implementing any other applicable authority at the Landfill including, but not limited to authority pursuant to 310 CMR 40.0000.
17. This permit is effective on the date signed by MassDEP below, except as provided by the Notice of Appeal Rights below and 310 CMR 19.037(4)(b).
18. This permit shall expire on December 31, 2032, provided that MassDEP may amend the term of permit in accordance with a modification pursuant to 310 CMR 19.039 or 310 CMR 19.040. The City shall submit to MassDEP on or before August 30, 2032 either an application to renew the permit or notice of its intent to close the PV Facility. Wherein the City elects to close the facility, the City shall submit an application for the decommissioning of the PV Facility and the restoration of the landfill cap and appurtenances thereto pursuant to 15, above.
19. The City and Borrego Solar shall not deviate from this permit and the approved design plans. The City shall notify MassDEP prior to any modification(s) of the design and of any significant changes in the project schedule. MassDEP may, at its sole discretion, require the City to submit an application to MassDEP for review and approval for any modification/alteration to the design.

⁴ Appurtenances include, but are not limited to storm water controls, landfill gas control structures, landfill gas and groundwater monitoring wells.

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In the event that MassDEP determines that a permit application is required for a modification; the City shall submit such application to the MassDEP in accordance with the schedule specified by MassDEP.

20. The City shall continue to perform post-closure activities at the Landfill pursuant to 310 CMR 19.142 *Landfill Post-closure Requirements* including, but not limited to, maintenance of the Landfill's cap to prevent growth of trees, brush and other vegetation with root systems that could be detrimental to the cap, and to prevent erosion of the cap.

RIGHT OF APPEAL

The City known as the Town of Methuen (the "City") is hereby notified that it may within twenty-one (21) days file a request that this decision be deemed a provisional decision under 310 CMR 19.037(4)(b), by submitting a written statement of the basis on which the City believes it is aggrieved, together with any supporting materials. Upon timely filing of such a request, the decision shall be deemed a provisional decision with an effective date twenty-one (21) days after the Department's receipt of the request. Such a request shall reopen the administrative record, and the Department may rescind, supplement, modify, or reaffirm its decision. Failure by the City to exercise the right provided in this section shall constitute a waiver of City's right to appeal.

Appeal - Any person aggrieved by the issuance of this decision, except as provided for under 310 CMR 19.037(4)(b), may file an appeal for judicial review of said decision in accordance with the provisions of M.G.L. c. 111, s. 150A, and M.G.L. c. 30A, not later than thirty (30) days following the receipt of the final decision. The standing of a person to file an appeal and the procedures for filing such 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 decision by a court of competent jurisdiction, the decision shall remain effective.

Notice of Appeal – Any aggrieved person intending to appeal the decision to the superior court shall provide notice to the Department of intention to commence such action. Said notice of intention shall identify with particularity the issues and reason(s) why it believed the approval 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 that made the decision. The appropriate addresses to send such notices are:

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

Regional Director
Department of Environmental Protection
Regional Office
205A Lowell Street
Wilmington, MA 01887

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No allegation shall be made in any judicial appeal of this decision unless the matter complained of was raised at the appropriate point in the administrative review procedures established in those regulations, provided that matter may be raised upon 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 public health or environmental impact of the permitted activity.

Should you have any questions relative to this application, please contact David Adams at phone number 978-694-3295.

Sincerely,

Sincerely,

*This final document copy is being provided to you electronically by the
Department of Environmental Protection. A signed copy of this document
is on file at the DEP office listed on the letterhead.*

DCA

JAC

David C. Adams
Environmental Engineer
Solid Waste Management

John A. Carrigan
Section Chief
Solid Waste Management

JAC/DCA/dca

Cc:

Methuen Board of Health
90 Hampshire Street
Methuen MA 01844

Frank Russo, City Engineer
Town of Methuen
Engineering Department
Searles Building, Room 206
41 Pleasant Street
Methuen, MA 01844

Brian Tam
Borrego Solar Systems, Inc.
205 Industrial Avenue, East
Lowell, MA 01852

David A. Murphy
Tighe & Bond
53 Southampton Road
Westfield, MA 01085

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FACT SHEET

Facility: Methuen Landfill

Address: Huntington Avenue
Methuen, MA 01844

Owner: Town of Methuen

Address: Searles Building, Room 206
41 Pleasant Street
Methuen, MA 01844
Contact: Frank Russo

Operator: Borrego Solar Systems, Inc.

Address: 205 Industrial Avenue, East
Lowell, MA 01852
Contact: Brian Tam

Facility Number: 39495

Regulated Object Number: 172724

Permit Number: n.a.

DSWM ID: SL0181.001

Location⁵: 71° 10' 29" West Longitude 42° 44' 35" North Latitude
MSPCS: 226,634 mE 943,657 mN Mainland Zone NAD83
UTM: 322,001 mE 4,734,575 mN Zone 19

Size:

Site: 60 acres
Landfill: 25 acres
PV Array: 4.7 acres

Current Application:

Type: Post Closure Use - Major (BWPSW36)
Transmittal #: X250696
Date: May 2, 2012

⁵ For reference only. Driveway adjacent to scale house. Latitude/Longitude estimated by Tighe & Bond, converted to MSPCS and UTM via MassGIS.

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Engineer of Record:

Tighe & Bond
53 Southampton Road
Westfield, MA 01085
David A. Murphy, P.E.

Borrego Solar Systems, Inc.
1115 Westford Street, 2nd Floor
Lowell, MA 01851
David A. Dutil, P.E.

MEPA: Application does not trigger MEPA review thresholds.

Capacity: 1287 KW DC

Other actions effecting this application:

Corrective Action Design
Construction of Landfill Cover System
Transmittal Number: 126570
Approved: June 17, 1997
Revision Approved: October 7, 1997
Revision Approved: November 5, 1997

Record Notice of Landfill Operation
Recorded: July 27, 1999

Certification of Completion of Closure
Approved: February 12, 2001

Submittals as part of this application:

report:

Methuen Landfill Solar Project
Methuen, MA
Major Post-Closure Use Permit Application
May 2012

plan:

City of Methuen Landfill Solar Project
Huntington Ave.
Methuen MA 01844
1287.000 kW DC STC Rated Solar Electric System
Revised: 02/07/12
Revised: 04/19/12
Revised: 05/03/12

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letter:

Tighe&Bond to MassDEP
June 27, 2012
Re: response to Notice of Technical Deficiency

plan:

City of Methuen Landfill Solar Project
Huntington Ave.
Methuen MA 01844
Electrical Equipment Pad Detail
Rev. 01, 06/27/12, Response to DEP

plan, revised 4/30/12, 5/03/12, 5/07/12, 6/27/12:

Borrego Solar Systems, Inc.
Methuen Landfill
Methuen, Massachusetts
Notes & Details Sheet: C-3

plan, revised 02/07/12, 04/19/12, 05/03/12, 06/13/12:

City of Methuen Landfill Solar Project
Huntington Ave. Methuen MA 01844
Ballast Grounding Detail: S-1.2

Discussion:

The City of Methuen and Borrego Solar Systems, Inc. (Borrego) are proposing to install a 1.3 MW photovoltaic (solar) electric power generating facility (a “solar facility”) on the former Methuen Landfill off Huntington Avenue, Methuen, Massachusetts. The project is proposed jointly between the City of Methuen and Borrego. The City will continue maintenance and monitoring of the landfill. Borrego will construct and operate the solar facility. The contract between the City and Borrego allows for operation of the solar facility for a period of twenty years.

The facility is proposed to include 5,156 solar panels on approximately 4.7 acres of the landfill. The facility will also include two (2) 500 KW inverters to convert the power from the solar panels to AC, and one (1) 1000 KVA transformer.

Interconnection to the National Grid distribution system will occur at Kensington Avenue. Power from the facility will be purchased by the City.

Frames for the solar panels will be supported on concrete ballast blocks of between 24 square feet (interior supports) and 43.75 square feet (exterior supports) surface area each. A pad of crushed stone will be placed on top of the existing landfill surface at each ballast block to provide a firm surface to support the ballast block. The pads may consist, alternatively, of:

1. Individual pads at each ballast block, or
2. A strip of ballast running the length of each row of panels.

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Where the ballast is placed in a strip along a row of panels, a non-woven geotextile will be placed between the stone and the existing topsoil. The existing will not be removed.

Solar panels will be placed on the upper plateau area of the landfill with a maximum ground slope to not exceed ten percent (10%).

The equipment will apply a ground pressure of between 1.6 psi (exterior blast blocks) to 2.6 psi (electrical equipment pad) on the landfill surface. These pressures are identified to be lower than the ground pressure placed on the landfill cap during construction of the cap. The ballast blocks were determined to have a Factor of Safety of 2.6 against sliding.

Power will be transferred from the panels to the inverter by above ground conduits. After the inverter power will be carried by underground conduit to be placed in the access roads. Conduits will be placed above the sand drainage layer of the existing landfill cover.

A new access road will be constructed on the landfill consisting of an 18 inch gravel base and 6 inch dense graded crushed stone wear surface placed over the existing topsoil. The top soil will not be removed. A woven geotextile fabric will be placed between the gravel road base and the existing topsoil. Conduits will be placed within the gravel base above the geotextile.

The existing access road will be improved by the addition of an additional 6 inches (minimum) of gravel and 6 inch dense graded crushed stone wear surface. Conduits will be placed within the existing gravel layer.