



Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

Western Regional Office • 436 Dwight Street, Springfield MA 01103 • 413-784-1100

Charles D. Baker
Governor

Karyn E. Polito
Lieutenant Governor

Matthew A. Beaton
Secretary

Martin Suuberg
Commissioner

Citizens Oak Street Solar, LLC
88 Black Falcon Ave., Suite 342
Boston, MA 02210
Attention: Emily Byrne, Manager of Solar Development

Aug. 17, 2018

RE: Springfield-DSWM-Landfill
Oak Street
Crane Foundry Sand Landfill
Post Closure Use – Solar Power
Permit Approval
BWPSW36
Accela Application ID #18-SW36-000007-APP
Accela Permit ID #EEA SW36-0000004
SW File #18-281-047

Dear Ms. Byrne:

On April 20, 2018, the Massachusetts Department of Environmental Protection (the Department), Solid Waste Section, received the BWPSW36 Major Post Closure Use permit application (the application) for the construction and operation of a Solar Farm at the closed and capped Crane Foundry Sand Landfill (the landfill), located off Oak Street in Springfield (Indian Orchard), MA. The application was prepared and submitted by Tighe & Bond, Inc. (T&B) on behalf of the applicant, Citizens Oak Street Solar, LLC (Citizens Oak). The application was signed and stamped by Brian S. Huntley, Massachusetts-registered Professional Engineer (P.E.) #46272, of T&B, and the application was also signed and certified by Emily Byrne (née Emily Mann), Manager of Solar Development for Citizens Energy. The engineering drawings were signed and stamped by Brian S. Huntley or Francis J. Hoey III, Massachusetts-registered P.E. #40111, of T&B.

MassDEP requested additional information for the application, and on July 10, 2018 and July 23, 2018, MassDEP received Addendums containing additional supporting information from T&B. The application consists of the completed transmittal form, application form, the Addendums, text describing the proposed use, engineering calculations, and nine engineering drawings.

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Summary of Proposal

The City of Springfield (the City) is the current owner of three parcels encompassing the majority of the landfill, and Robert Pafumi, Jr. is the current owner of a 2-acre parcel encompassing a portion of the landfill. These landfill properties are in the process of being sold by the City and Robert Pafumi, Jr. to Facta Non Verba, LLC (Facta Non Verba). The applicant and permittee for the Solar Farm Post-Closure use permit is Citizens Oak, which will lease the property from Facta Non Verba, and construct and operate the Solar Farm.

The landfill is approximately 17 acres in size, and was closed and capped in 2012 in accordance with MassDEP regulations and requirements, as an alternative soil cap in accordance with 310 CMR 19.113. The cap consists of 24-inches of clean soil fill, with the top 6 inches amended with compost and fertilizer, seeded with grass. MassDEP approved the Closure Certification for the landfill on December 7, 2012. A Comprehensive Site Assessment (CSA) was completed for the landfill in 2010, and environmental monitoring has been completed on an annual basis for the landfill since 2010.

The application proposes the construction and maintenance of a 3.5 megawatt (MW) AC photovoltaic solar farm, located on the 17 acres of the landfill, and also on approximately 5 acres of landfill property, off the landfill. In total, the Solar Farm will occupy approximately 22 acres of the 25-acre properties. Massachusetts Environmental Policy Act (MEPA) review is not required, as no MEPA thresholds are triggered. There are no Endangered Species habitats mapped on-site, according to the Massachusetts National Heritage and Endangered Species Program (NHESP), and there are no wetlands or waterbodies on or adjacent to the property.

The Solar Farm will be constructed as follows:

- A 15-foot wide access road will be constructed on the top of the soil cap, consisting of a woven geotextile and 12 inches of gravel. The road will begin at the existing landfill access entrance on Oak Street and will extend approximately 1300 feet into the north-central portion of the landfill, ending at a turnaround there.
- Photovoltaic (PV) panel racks are proposed to be installed on driven posts or ground screws both on the landfill and off the landfill, within the landfill property. Within the landfill cap area, the panel racks will only be installed in areas less than 15 % grade;
- Approximately 13,300 solar panels (PV modules) will be installed on the panel racks;
- Four electrical equipment pads will be installed on the landfill cap, and one pad off the landfill cap, where DC electrical power from the panels will be conveyed, converted to AC power, and stepped up to the line voltage of the utility grid;
- Low-voltage electrical power output from the solar panels will be conveyed to the transformer pads via above-ground electrical cables on above-ground cable trays;
- Medium-voltage electrical power will be conveyed off the landfill from the transformer pad via above-ground electrical cables in steel conduit on cable trays, in accordance with electrical code, to the National Grid utility connection at new utility poles to be installed off Oak Street, near the landfill entrance.

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- A 7-foot tall chain-link fence will be installed on driven posts around the entire perimeter of the property; and
- A new, locking security gate will be installed at the access road entrance.

As part of Solar Farm construction, areas of the existing cap which exhibit seasonal stormwater ponding will be remediated by addition of soil fill, graded to ensure stormwater flow off the landfill cap.

The existing access road entrance off Oak Street will be used for delivery of materials, including photovoltaic panels, panel racks, and electrical equipment. A 50-foot long by 15-foot wide stone tracking pad will be installed just inside the entrance to mitigate tracking of dirt onto Oak Street, consisting of 6 inches of 2-inch stone over a woven geotextile. The access road will include six modified rock-fill low-flow stormwater crossings (to enable stormwater to flow through the access road and prohibit stormwater ponding), consisting of 8 inches of modified rockfill and 2 inches of crushed stone, over a woven geotextile. Construction staging, parking and stockpiling of materials will be located on the landfill property; the specific location was not included in the Application.

Only low-ground pressure equipment, 7 pounds per square inch (PSI) or less will be used on the landfill cap for repetitive travel use, such as delivering construction materials. T&B proposes that tracked equipment with ground pressures greater than 7 PSI be used for the purpose of driving piles or installing ground screws for the solar panel racks. Field personnel from T&B will be on-site during all construction activities on the cap, to oversee construction activities and monitor for potential damage to the cap.

Solar panels will be placed over all areas of the landfill cap not exceeding 15% grade, and in the stormwater retention basin off the northeast perimeter of the landfill. Solar panels will not be placed over the large, central stormwater detention basin, the stormwater swales on the landfill, or over the sewer line easements which cross the landfill and landfill property. T&B submitted the following information supporting the installation of solar panels in the northeast stormwater basin:

- All electrical equipment, including panels and wiring, will be located a minimum of 1 foot above the outlet elevation (maximum potential water level) of the basin;
- All electrical equipment will meet electrical code;
- The contractor will be required to address construction in the basin as part of the site specific Health & Safety Plan.
- Access will be provided for maintenance of the stormwater basin.

MassDEP notes that, to date, ponded water has not been observed in the northeast stormwater basin.

Photovoltaic panel racks manufactured by RBI will be bolted to the driven posts or ground screws, and the photovoltaic panels will be mounted to the racks. The photovoltaic panels will be installed at a tilt angle of 30 degrees, with the lower edge approximately 3 feet above ground level, and the upper edge approximately 10 feet above ground level. DC electrical transmission wiring from the panels will run in cable trays to the equipment pads, where DC power will be converted to AC power.

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The five concrete equipment pads will be 20 feet wide, 30 feet long, and 1.0 to 1.5 feet thick. The equipment pads will include inverters, transformers, switchgears, and electrical panels; the total weight of equipment on each pad is estimated to be 30,000 pounds. Concrete delivery trucks and crane trucks will access the pad areas from the improved, 12-inch gravel access road. Geotechnical analyses for the loading of the equipment pads on the landfill cap were not included in the application.

As part of the Application, T&B performed updated stormwater analyses for changes from the proposed work, for the 2-year, 10-year, 25-year and 100-year storm events. T&B concluded that there will only be small changes in stormwater runoff, and the stormwater control system can handle the flows. T&B states that the proposed construction and operation of the Solar Farm will not alter the conclusions of the previous Qualitative Risk Assessment for the landfill (completed as part of the Comprehensive Site Assessment); i.e. that there are no significant risks to human health and the environment posed by the landfill, or by the presence of the Solar Farm on the landfill.

There are no proposed changes to the existing, long-term maintenance and monitoring program for the landfill. Annual groundwater monitoring, and annual third-party O&M inspections of the entire landfill are proposed to be performed by the property owner as required by MassDEP. The permittee (Citizens Oak) is proposed to be responsible to: ensure that the area within the Solar Farm will be mowed a minimum of annually; repair erosion within the Solar Farm area; and perform inspections within the Solar Farm area. If erosion is observed, the surface will be repaired, stabilized and reseeded with grass.

Decommissioning of the Solar Farm, if required in the future, would be performed by Citizens Oak, and would consist of removal of all structures, including driven posts or ground screws, and restoration of the landfill cap to its original condition, including filling of all driven post or ground screw holes with bentonite. The property owner is proposed to be responsible for: post-closure maintenance and monitoring of the landfill; and establishing a Financial Assurance Mechanism (FAM) for post-closure maintenance and monitoring of the landfill. Citizens Oak will submit to MassDEP a draft FAM for decommissioning of the Solar Farm, in the amount of \$90,000 per megawatt AC (if the property owner has not yet established the maintenance and monitoring FAM), or \$70,000 per megawatt AC (if the property owner has established the maintenance and monitoring FAM at the time of submittal), and Citizens Oak will establish the decommissioning FAM prior to the start of construction of the Solar Farm.

The application states that construction of the solar farm will begin in 2018/2019 and will be completed in 2019.

MassDEP Determinations

Personnel of MassDEP have reviewed the Post-Closure Use permit application for the Crane Foundry Sand Landfill (the landfill) in accordance with MGL c. 111 s. 150A, MGL c. 30A, 310 CMR 19.000, and MassDEP's publication Landfill Technical Guidance Manual (the LAC), revised in May, 1997. MassDEP has determined that the application is approved in accordance with MGL

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c. 111, s. 150A and MGL c. 30A, subject to the conditions outlined below.

1. Citizens Oak Street Solar, LLC (Citizens Oak) is the permittee for the Solar Farm construction and operation.
2. A third-party, independent Massachusetts-registered professional engineer knowledgeable in landfill design and construction (the "Engineer") shall supervise the overall construction of the Solar Farm. The Engineer and/or a qualified QA/QC officer shall be present at the site at all times during road building, installation of driven posts, installation of the electrical equipment pads, and rack/panel construction, when construction equipment is operating on the landfill. The QA/QC officer shall work under the direct supervision of the Engineer.
3. The Engineer's duties shall include, but not be limited to: oversee installation and construction of the components of the Solar Farm as outlined above; oversee quality assurance/quality control (QA/QC) testing and verify all data generated through the testing program; document all construction and QA/QC activities; and submit monthly construction progress reports to the MassDEP, which shall summarize the work performed during the month.
4. The Engineer's monthly construction report shall include at a minimum the following:
 - (A) Any deviation from compliance with requirements approved or set forth in this Permit;
 - (B) Any actions taken to correct such deviations, as required by MassDEP or recommended by the Engineer;
 - (C) Schedules to correct identified problems;
 - (D) Review of quality assurance/quality control (QA/QC) testing data generated, and documentation for construction and QA/QC activities;
 - (E) The inspection report shall be signed and dated by the Engineer certifying that to the best of his/her knowledge all information is accurate and complete; and
 - (F) The Engineer shall submit one copy of the monthly report to the MassDEP no later than seven (7) days following the end of the previous month.
5. Upon completion of the Solar Farm installation, the Engineer shall submit to MassDEP a completion report, signed and sealed by a Massachusetts-registered P.E., certifying that the work was completed in accordance with the application and the conditions of this permit.
6. Citizens Oak and the Engineer shall be considered operators with respect to the construction of the Solar Farm and compliance with plans and specifications. Citizens Oak shall also be considered an operator during the operational life and decommissioning of the Solar Farm. As such, the Department may take enforcement action against Citizens Oak or the Engineer, consistent with its authority under applicable Massachusetts law and regulation, for any failure to construct the Solar Farm in accordance with approved plans and specifications of which Citizens Oak or the Engineer

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were, or should have been, aware.

7. Construction work for the Solar Farm on the landfill cap shall not commence until:
 - A. The landfill properties (the three City parcels and the Robert Pafumi, Jr. parcel) are transferred to the new owner (Facta Non Verba) and proof of the property transfers (i.e. copies of the deeds) are submitted to MassDEP.
 - B. The December 7, 2012 Closure Certification permit for the landfill is transferred to the new owner (Facta Non Verba) in accordance with the requirements of 310 CMR 19.044, and the permit transfer certification is submitted to MassDEP in accordance with 310 CMR 19.044 and 310 CMR 19.011(1).
 - C. The post-closure maintenance and monitoring Financial Assurance Mechanism (FAM) for the landfill is approved by MassDEP, established in accordance with 310 CMR 19.051 by Facta Non Verba, and submitted to MassDEP
 - D. The Record Notice(s) of Landfill Operation for the entire landfill is completed in accordance with 310 CMR 19.141, recorded at the Hampden County Registry of Deeds, and a copy submitted to MassDEP with proof of recording.
 - E. The decommissioning FAM for the Solar Farm project is established by Citizens Oak, in the amount of \$70,000 per megawatt AC (assuming the property owner has established the maintenance and monitoring FAM for the landfill at the time of establishment of the decommissioning FAM). Citizens Oak shall submit to MassDEP at least 60 days prior to the expected start of construction a draft FAM proposal for decommissioning of the solar farm.
8. The permittee and their contractor(s) are responsible to ensure that all necessary precautions are taken to protect the health and safety of workers and the general public during both construction and maintenance of the solar farm. A copy of the site-specific Health & Safety Plan for the construction and maintenance of the Solar Farm shall be submitted to the MassDEP prior to the beginning of any construction work, which shall include specific protocols for the installation and maintenance of solar panels, wiring and electrical equipment in the northeast stormwater basin, and documentation that such work meets electrical code.
9. Either prior to, or as part of, the Solar Farm construction, the two areas of the cap which exhibit seasonal stormwater ponding, in the northern and southeastern portions of the cap, shall be remediated by Citizens Oak by the addition of soil fill, graded to shed stormwater, and seeded with grass. The Engineer shall submit a written plan to MassDEP for the completion of such work. MassDEP reserves the right to require, as may be deemed necessary, remediation of any other ponded areas on the landfill cap, during or following Solar Farm construction.
10. Staging and stockpiling of construction materials, and parking of vehicles during construction, shall only be allowed and performed on areas of the landfill property off the landfill cap or on the access road, unless otherwise approved by MassDEP. Prior to the

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start of construction, the Engineer shall submit to MassDEP a plan showing the proposed location for staging and stockpiling of construction materials, and parking of vehicles.

11. All disturbance of the landfill cap shall be limited to the proposed installations on the soil layer of the cap. All concrete footings for the equipment pads on the cap shall be placed on top of the soil layer of the cap. If ground screws are utilized on the landfill cap, a written protocol shall be submitted to MassDEP prior to the start of construction, to ensure that foundry sand is not exposed at the surface by the installation of ground screws.
12. As proposed, solar panels and equipment pads shall not be placed over the sewer line or sewer line easement on the landfill and landfill property, and construction of the Solar Farm shall not cause damage to the sewer line. Citizens Oak shall comply with the requirements of the Springfield Water & Sewer Commission regarding the sewer line on the property.
13. If MassDEP determines that nuisance noise conditions are being created off the landfill property by the electrical equipment of the Solar Farm, MassDEP reserves the right to require noise studies and/or the installation of noise mitigation measures.
14. All necessary precautions shall be taken to ensure that the proposed construction and maintenance work associated with the Solar Farm shall not in any way damage the landfill stormwater control structures, or landfill monitoring wells located within the landfill property. If any damage occurs to any of the above-listed landfill components, T&B or Citizens Oak shall notify MassDEP immediately (within 24 hours maximum), a written plan for repair of the components shall be submitted to MassDEP within 48 hours, and any repair work shall be completed on the schedule determined by MassDEP. Prior to the commencement of construction activities, all groundwater monitoring wells shall be flagged for visibility, and protective barriers shall be placed around the wells as needed to prevent damage by vehicles accessing the landfill property area.
15. Vehicles operating on the landfill cap, off the access road, for repetitive travel use, such as delivering construction materials, shall only be low-pressure construction equipment (with ground pressures of 7 PSI or less). Prior to the start of construction, the Engineer shall submit to MassDEP for review and approval a technical proposal for the use of tracked equipment with ground pressures greater than 7 PSI to be used for the purpose of driving piles for the solar panel racks. All operators of vehicles entering the cap 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 cap.
16. Low ground-pressure construction equipment operating off the access road shall limit turning by tracks on the vegetative support layer and repeated passes over the same areas as much as possible. In no case shall rutting or other disturbance extend more than 6 inches down into the soil of the landfill cap. If MassDEP determines that the use of equipment is creating rutting greater than 6 inches in depth, the usage of such equipment shall cease immediately upon notification by MassDEP, and alternative work practices for operation of equipment on the cap in the affected area(s) shall be instituted. Construction of the Solar

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Farm shall not create areas of ponded stormwater on the landfill cap, and any such ponded areas shall be remediated as part of the Solar Farm construction or operation.

17. If Citizens Oak intends to use different solar panels, panel racks, ladder racks, or electrical equipment other than that detailed in the application, Citizens Oak shall notify MassDEP and provide documentation that the alternative equipment does not increase calculated ground pressures or decrease calculated Factors of Safety for solar array stability.
18. The following documentation shall be submitted to MassDEP for review (and approval, as deemed necessary by MassDEP) prior to the start of construction of the Solar Farm:
 - A. A detailed plan for the remediation of stormwater ponding areas of the cap, as outlined at Condition 9;
 - B. The plan showing the proposed location for staging and stockpiling of construction materials, and parking of vehicles, as outlined at Condition 10;
 - C. Loading calculations and cross-section details for the equipment pads on the cap, and a description of the type and weight of equipment to be placed on the pads; and
 - D. The technical proposal for the use of tracked equipment with ground pressures greater than 7 PSI to be used for the purpose of driving piles for the solar panel racks, as outlined at Condition 15.
19. Citizens Oak and their contractor(s) are responsible to ensure that the proposed work (including the installation and maintenance of solar panels in the northeast stormwater retention basin) complies with all applicable local, state and federal electrical codes and permits, including the National Electrical Code (NEC), 2011 Edition, Article 690 –“Solar Photovoltaic (PV) Systems”, Citizens Oak and their contractor(s) are also responsible to ensure that the proposed work complies with all other applicable local, state and federal regulations.
20. Herbicides shall not be used on the landfill property during the construction or operational life of the solar array, except with written permission from MassDEP.
21. Following completion of installation, Citizens Oak shall ensure that inspections of the Solar Farm are performed on a quarterly basis by a qualified, third-party inspector, and quarterly inspection reports shall be submitted to MassDEP. After one year of quarterly inspections, Citizens Oak may petition MassDEP in writing to reduce the frequency of such inspections. Citizens Oak shall ensure that: certified, third-party inspections of the Solar Farm portion of the landfill are performed on an annual basis; the Solar Farm portion of the landfill is maintained (mowed) on a minimum of an annual basis; and any erosion problems, settlement problems, or other issues observed on the Solar Farm portion of the landfill cap are reported to MassDEP and repaired immediately.
22. This post-closure use permit shall be valid for a period of 30 years from the date of this permit, provided that MassDEP may amend the term of the permit in accordance with an approved modification pursuant to either 310 CMR 19.039 or 19.040. This permit is

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issued to Citizens Oak for the Solar Farm construction and operation. **If Citizens Oak intends to transfer this permit to any other entity for operation of the Solar Farm, the requirements at 310 CMR 19.044, Transfer of Permits, shall be satisfactorily completed.** If the permittee discontinues operation of the Solar Farm, the permittee is responsible to perform decommissioning activities as outlined in the permit application, including removal of the solar array equipment. If Citizens Oak intends to operate the Solar Farm after the expiration of this permit, Citizens Oak is required to submit a request for a renewal of the permit at least 90 days prior to the expiration of the permit.

23. MassDEP and its agents and employees shall have the right to enter upon the landfill at all reasonable times, 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. This right of entry and inspection shall be in addition to MassDEP's access authorities and rights under applicable federal and states laws and regulations, as well as any permits or other agreements between the Permittee and MassDEP.

24. MasDEP reserves the right to require the permittee to perform additional or increased monitoring or maintenance activities in the event that the post-closure use is or may be having a detrimental effect on the landfill cap or appurtenances. MassDEP reserves all rights to suspend, modify or rescind this permit, should the conditions of this permit not be met, should the Solar Farm create nuisance conditions or threats to public health, safety or the environment, or should MassDEP otherwise determine that continued post-closure use is negatively impacting the landfill cap or appurtenances.

Pursuant to 310 CMR 19.033(5), any person aggrieved by the issuance or denial of this permit decision, except as provided for under 310 CMR 19.033(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 c. 30A not later than thirty [30] days following the receipt of the final permit. 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. 30 A. 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 30 day period.

Any aggrieved person intending to appeal the decision to the superior court shall provide notice to MassDEP of said intention to commence such action. Said Notice of Intention shall include the MassDEP File Number (18-281-042) and shall identify with particularity the issues and reason(s) why it is believed the approval 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 made the decision. The appropriate addresses to which to send such notices are:

General Counsel
Department of Environmental Protection
One Winter Street-Third floor

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Boston, 02108

Regional Director
Department of Environmental Protection
436 Dwight Street - Fifth Floor
Springfield, MA 01103

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 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 public health or environmental impact of the permitted activity. This approval pertains only to the Solid Waste Management aspects of the proposal and does not negate the responsibilities of the owners or operators to comply with any other local, state or federal laws and regulations now or in the future.

If you have any questions about this matter, please contact Larry Hanson of this office at 413-755-2287.

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.

Daniel Hall
Section Chief, Solid Waste Management

cc: City of Springfield – Office of the Mayor
City of Springfield - Health Department
City of Springfield Planning Department - Shayvonne Plummer, Brian Connors
City of Springfield – Water & Sewer Commission
Facta Non Verba – Robert Roberge
Tighe & Bond – Brian Huntley, P.E.
Crane & Co. – Anthony Pantaleoni, Vice President
Christopher Myhrum, Esq.