

## EXHIBIT V – Application for Site Certificate

### SOLID WASTE AND WASTEWATER

OAR 345-021-0010(1)(v)

#### REVIEWER CHECKLIST

(v) Exhibit V. Information about the applicant's plans to minimize the generation of solid waste and wastewater and to recycle or reuse solid waste and wastewater, providing evidence to support a finding by the Council as required by OAR 345-022-0120. The applicant shall include:

Rule Sections	Section	✓
(A) A description of the major types of solid waste and wastewater that construction, operation and retirement of the facility are likely to generate, including an estimate of the amount of solid waste and wastewater.	V.2	
(B) A description of any structures, systems and equipment for management and disposal of solid waste, wastewater and storm water.	V.3	
(C) A discussion of any actions or restrictions proposed by the applicant to reduce consumptive water use during construction and operation of the facility.	V.4	
(D) The applicant's plans to minimize, recycle or reuse the solid waste and wastewater described in (A).	V.5	
(E) A description of any adverse impact on surrounding and adjacent areas from the accumulation, storage, disposal and transportation of solid waste, wastewater and stormwater during construction and operation of the facility.	V.6	
(F) Evidence that adverse impacts described in (D) are likely to be minimal, taking into account any measures the applicant proposes to avoid, reduce or otherwise mitigate the impacts.	V.7	
(G) The applicant's proposed monitoring program, if any, for minimization of solid waste and wastewater impacts.	NA	



**EXHIBIT V – Application for Site Certificate**

**SOLID WASTE AND WASTEWATER**

OAR 345-021-0010(1)(v)

**TABLE OF CONTENTS**

**V.1 INTRODUCTION..... V-1**

**V.2 MAJOR TYPES OF WASTE PRODUCED WITH QUANTITY ESTIMATES ..... V-1**

    V.2.1 Construction..... V-2

    V.2.2 Operation..... V-2

    V.2.3 Retirement..... V-3

**V.3 STRUCTURES, SYSTEMS, AND EQUIPMENT..... V-4**

**V.4 MEASURES TO REDUCE WATER CONSUMPTION ..... V-5**

**V.5 PLANS TO MINIMIZE, RECYCLE, OR REUSE WASTE..... V-5**

**V.6 IMPACTS OF WASTE ON SURROUNDING AREAS ..... V-5**

**V.7 EVIDENCE OF MINIMAL WASTE IMPACTS..... V-6**

**V.8 PROPOSED MONITORING PROGRAM..... V-6**

**V.9 LAKE COUNTY ORDINANCES..... V-7**

**V.10 SUMMARY ..... V-7**

**V.11 REFERENCES..... V-7**

**TABLES**

Table V-1 Inventory of Waste Materials Associated with Facility Retirement..... V-3

**APPENDICES**

Appendix V-1 Correspondence from Lakeview Sanitation



## V.1 INTRODUCTION

Obsidian Solar Center LLC (Applicant) proposes to construct the Obsidian Solar Center (Facility) in Lake County, Oregon, with an alternating current generating capacity of up to 400 megawatts. Please refer to Exhibit B for Facility layout information and Exhibit C for Facility location information.

Exhibit V provides information about Applicant's plans to minimize and recycle or re-use solid waste and wastewater during construction and operation of the Facility. This exhibit provides the information required by Oregon Administrative Rules (OAR) 345-021-0010(1)(v): *Information about the applicant's plans to minimize the generation of solid waste and wastewater and to recycle or reuse solid waste and wastewater, providing evidence to support a finding by the Council as required by OAR 345-022-0120.*

As described in Exhibit B, this Application for Site Certificate analyzes potential impacts from two design scenarios: a stand-alone photovoltaic (PV) solar power generation build-out and a PV solar power generation plus battery storage build-out. This exhibit analyzes the PV plus battery storage design scenario, which will likely generate a greater amount of solid waste during construction and operation than stand-alone PV, due to the larger footprint and inclusion of battery storage enclosures.

### Executive Summary

The analysis provided in this exhibit demonstrates how the Facility will minimize the generation of solid waste and wastewater during construction and operation of the Facility. Applicant will recycle and reuse solid waste, as outlined in Applicants' solid waste and wastewater plans that are described in this exhibit. In addition, Applicant will manage solid waste in a manner that will result in minimal impacts on surrounding and adjacent areas. Applicant will also manage solid waste consistent with the Lake County Water Waste Ordinance (Ordinance 23) as demonstrated in this exhibit.

Applicant does not propose any specific or unique conditions of approval pertaining to Applicant's solid waste or wastewater plans.

## V.2 MAJOR TYPES OF WASTE PRODUCED WITH QUANTITY ESTIMATES

**OAR 345-021-0010(1)(v)(A)** *a description of the major types of solid waste and wastewater that construction, operation, and retirement of the facility are likely to generate, including an estimate of the amount of solid waste and wastewater.*

Response: The major types of solid waste and wastewater likely to be generated by the Facility are nonhazardous construction or demolition debris, construction and operation-related wastewater, and office waste. The following sections provide additional details of the major types of waste generated and volume estimates.

### **V.2.1 Construction**

As described in Exhibit G, nonhazardous construction waste will be generated. Primary sources of waste include general construction waste, such as scrap metal (steel, copper, aluminum), materials packaging (pallets and cardboard), and excavated soil. Erosion control materials, such as straw and silt fencing, will also be generated during construction. The nonhazardous waste will be accommodated by a local solid waste hauler, Lakeview Sanitation. Refer to Appendix V-1 for correspondence from Lakeview Sanitation confirming its ability to provide necessary services to the Facility during construction and operation. Estimated volume of construction waste will be one 40-cubic-yard roll-off per week during active construction, which could last up to 24 months.

Wastewater generated during construction will result from portable toilets. Portable toilets and handwash stations will be managed by a local solid waste hauler, Lakeview Sanitation, and wastewater will be disposed of in accordance with state law. An average of six portable toilets will be used onsite during construction, including 12 portable toilets during peak construction.

### **V.2.2 Operation**

During operation, the primary waste generated will be office waste in the operations and maintenance building(s) and packaging from equipment used for replacements and repairs. Office waste will be composed primarily of paper, packaging, and food scraps. Disposal of materials for routine maintenance and housekeeping, such as lubrication and cleaning supplies, will be managed according to pertinent regulations and guidelines. For a PV only facility, an estimated 2 yards of solid waste will be generated per month. For a PV plus storage facility, an average of 6 yards of solid waste will be generated per month. Waste such as lightbulbs and batteries will be recycled according to applicable regulations.

Other than washwater periodically generated from washing panels, industrial wastewater will not be generated through Facility operations of a PV only facility. Solar panel washwater has no added cleaning solvents and will be discharged by evaporation and seepage into the ground. Water for panel washing will be covered under an Oregon General Water Pollution Control Facilities 1700-B Permit, which will be obtained by a third-party contractor and is not included in this Application for Site Certificate.

The battery system containers for the flow batteries will likely be shipped and installed dry with the electrolyte added onsite (e.g., water will be brought onsite in water trucks or tanks and added

to the other redox components. Following installation, the electrolyte system will be sealed and require no replacement or additives. Battery components, including the benign redox fluid, will be recycled and disposed of at a permitted facility during operation and at Facility retirement, as applicable.

Applicant does not intend to install a septic system but will instead rely on portable toilets and handwashing stations. In this case, sanitary wastewater generated on site will be confined to portable toilets and handwash stations and will be disposed of by Lakeview Sanitation in accordance with applicable regulations. If a septic system is used, daily sewage flow will be directed to an onsite septic system.

### V.2.3 Retirement

When the Facility is retired, aboveground equipment will be removed and sold for scrap, reused or recycled, or disposed of at a local landfill. Electrical cables will be rendered inert; aboveground cables will be removed and underground cables will be left in place below 3 feet. Table V-1 describes the major types of waste materials associated with retirement of the Facility, including an inventory of estimated waste stream quantities and proposed disposal methods.

**Table V-1 Inventory of Waste Materials Associated with Facility Retirement**

<b>Material/ Chemical</b>	<b>Description</b>	<b>Estimated Quantity Used during Operation</b>	<b>Disposal Method</b>
Buildings	Operations and maintenance buildings and substations	Up to two operations and maintenance buildings and up to four substations	Recycle materials, if feasible, then dispose of in landfill; operation and maintenance buildings may be repurposed.
34.5-kilovolt electrical cable	Solar photovoltaic collection cables	2 million miles	Render cables inert and leave underground cables in place
Solar photovoltaic modules, steel mounting racks and posts, and steel trackers	Up to 160 module blocks for solar generation mounted on up to 234,000 steel mounting racks and posts, and single axis steel trackers	Approximately 234,000 steel mounting racks and posts; 1,745,000 modules, 160 inverters, and 160 transformers	Recycle
115-kilovolt electrical cable	Up to 2 miles of overhead transmission line	Up to 2 miles of overhead transmission line	Re-use if permitted, otherwise, recycle
Transmission poles and associated structures	Connection of Facility substation to the point of interconnection	Up to 2 miles of transmission line with 300-foot spacing (up to 37 poles)	Reuse materials, if feasible, or dispose of in landfill; leave concrete footings and portion of poles more than 3 feet below ground in place

**Table V-1 Inventory of Waste Materials Associated with Facility Retirement**

<b>Material/ Chemical</b>	<b>Description</b>	<b>Estimated Quantity Used during Operation</b>	<b>Disposal Method</b>
Concrete	Foundations for operations and maintenance buildings, collector substations, step-up substation, battery enclosures, transmission poles.	Up to 100 cubic yards per building for operations and maintenance buildings; 500 cubic yards per collector substation, cubic yards for step-up substation, 125 cubic yards for each battery enclosure, and up to 1,846 cubic yards for transmission poles	Grind up concrete materials above 3 feet below ground and dispose of properly; leave other material in place
Rock/gravel aggregate	Road construction and improvement material	110 tons	Recycle
Electrolyte Fluid	Fluid in flow battery tanks	Up to 14,000 gallons	Recycle in accordance with manufacturer's instructions at the end of useful life and upon Facility decommissioning
Battery Storage Enclosures	Enclosures for flow batteries	134	Remove electrolyte fluid and haul enclosures off site to be disassembled and recycled to the greatest extent possible; parts not able to be recycled will be disposed of in accordance with the solid waste disposal rules applicable at that time at an appropriate location.

### **V.3 STRUCTURES, SYSTEMS, AND EQUIPMENT**

**OAR 345-021-0010(1)(v)(B)** *A description of any structures, systems and equipment for management and disposal of solid waste, wastewater and storm water.*

Response: Applicant will implement construction waste minimization practices to minimize the amount of solid waste generated. These practices will include implementing a detailed material usage estimates and procurement system to minimize the amount of excess materials ordered. In addition, a general procedure will be in place to separate recyclable material from solid waste. During construction, Applicant will have a cardboard bailer on site for cardboard waste, and a tub grinder on site for wood waste that can be recycled or re-used on site. During operation, the Facility is expected to generate minimal solid waste. Lakeview Sanitation will handle solid waste



and recyclables generated during construction and operation. Similar waste minimization efforts will be employed during Facility retirement.

Solar panels that are nonfunctional or are retired will be recycled to the maximum extent feasible through the Solar Energy Industries Association National PV Recycling Program (SEIA 2018) or a similar program.

#### **V.4 MEASURES TO REDUCE WATER CONSUMPTION**

*OAR 345-021-0010(1)(v)(C) A discussion of any actions or restrictions proposed by the applicant to reduce consumptive water use during construction and operation of the facility.*

Response: During construction, water will be used only as needed, primarily for dust abatement activities. The Facility site will not be completely cleared of vegetation by grading or excavation, which is also expected to help control dust. Wood waste will be chipped in the onsite grinder and used (together with other measures, such as straw and silt fencing) for road and landscape stabilization in order to reduce water needs for reduction of dust generation. Refer to Exhibit O for further details of water use during construction.

During operation, minimal water use is expected onsite, as explained in Exhibit O.

#### **V.5 PLANS TO MINIMIZE, RECYCLE, OR REUSE WASTE**

*OAR 345-021-0010(1)(v)(D) The applicant's plans to minimize, recycle or reuse the solid waste and wastewater described in (A).*

Response: Waste generated during construction will be minimized by implementing efficient construction practices and detailed estimates of materials needed. Materials used during construction and operation will be recycled or re-used to the greatest extent feasible. Waste that can be recycled includes metals, glass, paper, and yard debris. Lakeview Sanitation will handle all waste disposal and recycling for the Facility during construction and operation. In addition, Lakeview Sanitation will be responsible to providing and disposing of wastewater associated with portable toilets and handwashing stations used during construction and operation of the Facility.

#### **V.6 IMPACTS OF WASTE ON SURROUNDING AREAS**

*OAR 345-021-0010(1)(v)(E) A description of any adverse impact on surrounding and adjacent areas from the accumulation, storage, disposal and transportation of solid waste, wastewater and stormwater during construction and operation of the facility.*

Response: The Facility will not cause adverse impacts on surrounding and adjacent areas during construction or operation. A minimal amount of solid waste, wastewater, and stormwater is anticipated to accumulate, be disposed of, or require transportation during construction or operation. In addition, a hazardous material spill prevention program will be implemented as described in Exhibit G.

Applicant will reduce the amount of materials taken to nearby landfills by implementing recycling and waste minimization practices during construction. Delivery of larger loads of either waste or recyclable materials will be coordinated with Lakeview Sanitation to avoid adverse impacts on local capacity (refer to Exhibit U for more details about waste hauling, recycling, and landfill service providers).

Wastewater produced at the Facility will be minimal. During construction and operation of the Facility, Lakeview Sanitation will provide and maintain, including disposing of wastewater, all portable toilets and handwash stations.

Stormwater generated onsite during construction and operation will be minimal. Stormwater controls will be implemented onsite as needed. During operation, stormwater will infiltrate into the ground.

## **V.7 EVIDENCE OF MINIMAL WASTE IMPACTS**

*OAR 345-021-0010(1)(v)(F) Evidence that adverse impacts described in (D) are likely to be minimal, taking into account any measures the applicant proposes to avoid, reduce or otherwise mitigate the impacts.*

Response: Applicant's proposed measures to avoid, reduce, minimize, and otherwise mitigate any possible adverse impacts on the site and surrounding and adjacent areas (as discussed in this exhibit and Exhibit G) will result in minimal impacts caused by construction, operation, and retirement of the Facility. Applicant confirmed with Lakeview Sanitation its ability and willingness to handle the Facility's waste disposal and recycling needs and expects that Lakeview Sanitation will manage wastewater for the Facility associated with portable toilets and handwashing stations as well. Applicant's construction and operation contractor, Swinerton Builders, has experience and a good working relationship with Lakeview Sanitation.

## **V.8 PROPOSED MONITORING PROGRAM**

*OAR 345-021-0010(1)(v)(G) The applicant's proposed monitoring program, if any, for minimization of solid waste and wastewater impacts.*

Response: Given the minimal generation of solid waste and wastewater and the proposed recycling measures and waste minimization practices, the Facility will not cause adverse impacts onsite or on surrounding areas. Therefore, no monitoring program is proposed. Waste management practices will comply with applicable regulations and will be inspected periodically by Applicant.

## **V.9 LAKE COUNTY ORDINANCES**

Applicant will manage waste consistently with the Lake County Water Waste Ordinance (Ordinance 23). Based on information provided by Lake County, there are no applicable Lake County ordinances governing solid waste management. In 2005, Lake County prepared the Lake County Solid Waste Management Plan. However, this Plan was not adopted by ordinance and is not used as a binding planning document.

## **V.10 SUMMARY**

The evidence provided in this exhibit demonstrates that the Council's waste minimization standard (OAR 345-022-0120) is met because waste will be minimized, reused, or recycled where feasible and because minimal adverse impacts on the surrounding or adjacent areas will result from construction and operation of the Facility. This exhibit also demonstrates compliance with applicable Lake County ordinances.

## **V.11 REFERENCES**

Solar Energy Industries Association (SEIA). 2018. SEIA National PV Recycling Program. <https://www.seia.org/initiatives/seia-national-pv-recycling-program>. Accessed July 5, 2018.



# **Appendix V-1**

## **Correspondence from Lakeview**

### **Sanitation**



**From:** [lakeviewsan@gmail.com](mailto:lakeviewsan@gmail.com) <[lakeviewsan@gmail.com](mailto:lakeviewsan@gmail.com)>  
**Sent:** Thursday, August 2, 2018 8:03 AM  
**To:** Michelle Slater <[mslater@obsidianrenewables.com](mailto:mslater@obsidianrenewables.com)>  
**Subject:** Re: Obsidian Solar Center

Michelle,

We are able to handle the garbage and sanitation needs for your project.

Kevin Sterba  
Lakeview Sanitation Inc  
541-947-2891

**From:** [Michelle Slater](mailto:Michelle.Slater)  
**Sent:** Wednesday, August 01, 2018 5:44 PM  
**To:** [lakeviewsan@gmail.com](mailto:lakeviewsan@gmail.com)  
**Cc:** [Jerime Cope](mailto:Jerime.Cope)  
**Subject:** FW: Obsidian Solar Center

Good afternoon,

Just hoping you have a minute to get to this; I know you have already discussed this with Jerime but an email reply to this message confirming would be very helpful. Please let me know if you have any questions or concerns.

Thank you.  
Michelle

**From:** Michelle Slater  
**Sent:** Thursday, July 19, 2018 4:43 PM  
**To:** 'lakeviewsan@gmail.com' <[lakeviewsan@gmail.com](mailto:lakeviewsan@gmail.com)>  
**Subject:** Obsidian Solar Center

Kevin,

I was given your name by Kevin Hock Lake County Road Superintendent/Landfill Manger, who told me that you are the operator of Lakeview Sanitation. Before I had a chance to contact you I found out you were already talking about solar project waste with Jerime Cope of Swinerton Renewables! I heard from Jerime today that you have confirmed that Lakeview Sanitation is prepared to handle all trash and sanitation needs for the solar project planned for North Lake County (Fort Rock) by Obsidian Solar Center.

We are preparing to file an application for a site certification from the Oregon Department of Energy and, as part of the application, we would like to include your confirmation that Lakeview Sanitation is prepared to provide service to the facility during construction and operation.

Would you mind simply replying with your confirmation so that I can include this email in our filing?

Thank you very much,

Michelle Slater  
Obsidian Renewables, LLC  
(503) 577-1446