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***Via Electronic Mail (siting.council@ct.gov)***

May 14, 2021

Melanie Bachman
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

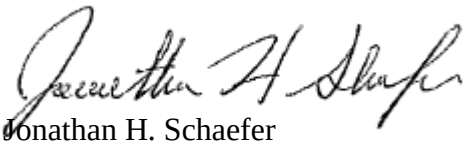
Re: **PETITION NO. 1442 - SR Litchfield, LLC petition for a declaratory ruling, pursuant to Connecticut General Statutes §4-176 and §16-50k, for the proposed construction, maintenance and operation of a 19.8-megawatt AC solar photovoltaic electric generating facility on 6 contiguous parcels located both east and west of Wilson Road south of the intersection with Litchfield Town Farm Road in Litchfield, Connecticut, and both east and west of Rossi Road, south of the intersection with Highland Avenue in Torrington, Connecticut, and associated electrical interconnection**

Dear Attorney Bachman:

SR Litchfield, LLC hereby submits its supplemental responses to the Connecticut Siting Council's (Council) Interrogatories 10, 21, 25, 26, 34, 36, 37, 38, 40, 42, 43, 44, 45, 46, 47, 48, 53, 58, 59, 64, 65, 67, 68, 69, and 73, as well as Attachment S-1 and S-2, issued on March 12, 2021 in connection with the above-referenced Petition. The written responses and Attachment S-1 and S-2 are attached hereto. These supplemental responses are in connection with the Project redesign being submitted this same date under separate cover.

If you have any questions concerning this submittal, please contact me at your convenience.

Sincerely,



Jonathan H. Schaefer

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Enclosures (Supplemental Responses to Interrogatories 10, 21, 25, 26, 34, 36, 37, 38, 40, 42, 43, 44, 45, 46, 47, 48, 53, 58, 59, 64, 65, 67, 68, 69, and 73, as well as Attachment S-1 and S-2)

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

| | | |
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| IN RE: | : | |
| | : | |
| A PETITION FOR A DECLARATORY RULING, PURSUANT TO CONNECTICUT GENERAL STATUTES §4-176 AND §16-50K, FOR THE PROPOSED CONSTRUCTION, MAINTENANCE AND OPERATION OF A 19.8-MEGAWATT AC SOLAR PHOTOVOLTAIC ELECTRIC GENERATING FACILITY ON 6 CONTIGUOUS PARCELS LOCATED BOTH EAST AND WEST OF WILSON ROAD SOUTH OF THE INTERSECTION WITH LITCHFIELD TOWN FARM ROAD IN LITCHFIELD, CONNECTICUT, AND BOTH EAST AND WEST OF ROSSI ROAD, SOUTH OF THE INTERSECTION WITH HIGHLAND AVENUE IN TORRINGTON, CONNECTICUT, AND ASSOCIATED ELECTRICAL INTERCONNECTION. | : | PETITION NO. 1442 |
| | : | MAY 14, 2021 |

SUPPLEMENTAL RESPONSES OF SR LITCHFIELD, LLC
TO CONNECTICUT SITING COUNCIL INTERROGATORIES, SET ONE

On March 12, 2021, the Connecticut Siting Council ("Council") issued Interrogatories, Set One to SR Litchfield, LLC ("Petitioner"), relating to Petition No. 1442. The Petitioner submitted responses to Council Interrogatories 1-34, 36-39, 41, 42, 44-46, 48, 52-59, 63-73, and 75-80 on April 2, 2021. A supplemental response to Interrogatory 31 and the responses to Council Interrogatories 35, 40, 43, 47 and 51 were submitted on April 16, 2021.

The supplemental responses to Interrogatories 10, 21, 25, 26, 34, 36, 37, 38, 40, 42, 43, 44, 45, 46, 47, 48, 53, 58, 59, 64, 65, 67, 68, 69, and 73 below reflect the modifications the Petitioner made to the Petition Exhibit A (Preliminary Site Plan) and submitted to the Council and further described in a letter submitted this same date

## Proposed Site

Question No. 10

For the solar array areas proximate to residential areas, provide the distance, direction and address of the nearest property line and nearest off-site residence from the solar field perimeter fence.

Response

The perimeter fence along the easterly side of the northeast solar arrays extends to within nine (9) feet of the property line and within seventy-eight (78) feet of the residence at 517 Wimbledon Gate North in Torrington.

**Supplemental Response**

**As a result of the redesign of the Project, the perimeter fence along the easterly side of the northeast solar arrays extends within ten feet (10') of the property line and the nearest off-site residence from the perimeter fence is now 377 Wimbledon Gate North in Torrington at approximately seventy-eight (78) feet.**

## Site Components and Solar Equipment

Question No. 21

Referring to Petition p. 7, provide more information regarding "additional energy harvesting from the rear side of the modules". Would the use of bifacial modules allow the facility to produce more power over the course of a day? If so, would this have an effect on the Renewable Energy certificates sold for this project? Is the module output rating based on mono-facial or bi-facial sunlight exposure?

Response

Yes, the use of bifacial modules allows the Project to produce more power over the course of a day. This additional capability does not have an effect on Renewable Energy Credits because the Project's output rating was based on the use of bi-facial sunlight exposure.

**Supplemental Response**

**A significant driver of the Petitioner's redesign of the Project was the ability to secure a newer module that has higher output than the module referenced in the Petition. The new model is a Hanwha QCell Q.Peak Duo XL-G10.3/BFG 475. This new module is also bifacial. The introduction of the new module has allowed for a redesign of the Project , resulting in a significant reduction in the limits of disturbance and the overall impact the Project will have on the Property. A specification sheet for the new solar module is included in Attachment S-1.**

Question No. 25

Referring to Site Plan C-504- what does the hatched area east of Basin 8/10 represent?

Response

This area is a temporary laydown area, which will be restored following completion of construction activities.

**Supplemental Response**

**This equipment laydown area has been removed as a result of the Project redesign.**

Question No. 26

Why are 16-foot wide gravel access roads required for a majority of the project if a 12-foot wide road can be utilized in the northern array area?

Response

The Petitioner's "standard" road width is sixteen feet (16'). The Petitioner made an exception in the northerly array area to reduce impacts to wetlands in that area.

**Supplemental Response**

**The Petitioner would add that a sixteen-foot (16') wide road is needed to safely navigate the Site with trucks and a crane needed to carry transformers and other large pieces of equipment.**

## Public Safety

Question No. 34

Has the manufacturer of the selected solar panels conducted Toxicity Characteristic Leaching Procedure (TCLP) testing to determine if the panels would be characterized as hazardous waste at the time of disposal? If so, please submit relevant information. If the project is approved, would the Petitioner commit to the installation of solar modules that are not classified as hazardous waste through TCLP testing?

Response

The selected module manufacturer is Longi. On behalf of Longi, ICP-OES conducted a Toxicity Characteristic Leaching Procedure (Test Method USEPA 1311:1992). The results show that the metals used to construct the panels are not present in levels that would be considered toxic by the USEPA. A copy of the TCLP report provided by Longi is included as Attachment 1.

**Supplemental Response**

**A significant driver of the Petitioner's redesign of the Project was the ability to secure a newer module with higher energy output than the module referenced in the Petition and Petitioner's initial response above. The new model is a Q.Peak Duo XL-**

**G10.3/BFG 475. The manufacturer of these modules is Hanwha QCells. Hanwha provided the Petitioner with results of a Toxicity Characteristic Leaching Procedure (Test Method USEPA 1311:1992). This TCLP report included as Attachment S-2, shows results for modules that Hanwha confirmed are substantially equivalent to the Q.Peak Duo XL-G10.3/BFG 475 modules. The results show that the metals used to construct the modules are not present at levels that would be considered toxic by the USEPA**.

**Environmental**

Question No. 36

Different tree clearing quantities are provided in the Petition narrative (40 acres) and Exhibit L- Tree Analysis (30 acres). Please clarify.

Response

The Project will require clearing of a total of forty (40) acres of trees (approximately 2,640 trees).

**Supplemental Response**

**As a result of the redesign, the Project will now require clearing of only approximately fifteen (15) acres of trees (approximately 990 trees larger than six inches (6") diameter at breast height), a reduction of more than sixty-two percent (62%) from the originally Project design.**

Question No. 37

Petition p. 6 states 4.8 acres of tree clearing would occur around the periphery of the solar fields to reduce project shading effects. Page 17 states the shading analysis used a tree height of 45 feet. Why was this height selected when the visibility analysis used actual tree measurement that determined tree heights were an average of 75 feet in the Project area?

Response

Default assumptions used for design did not contemplate the field survey data as it was not known at the time of design. This will be updated accordingly through detailed design.

**Supplemental Response**

**The Petitioner used eighty-two feet (82') as the assumed tree height for purposes of the shading analysis conducted in connection with the Project's redesign.**

Question No. 38

Different wetland disturbance quantities are provided in the Petition narrative (10,000 square feet) and Exhibit V- Stormwater Pollution Control Plan (8,000 square feet). Please clarify.

Response

The reference to approximately 10,000 square feet of wetland disturbance included approximately 1,300 square feet of temporary impacts. The 8,000 square feet referenced in the Stormwater Pollution Control Plan is a reference to permanent wetland disturbances.

**Supplemental Response**

**As a result of the Project redesign, total wetland disturbance will be reduced from approximately 10,000 square feet to 4,850 square feet, a portion of which will be temporary in nature (*i.e.*, establishment of erosion controls at wetland crossings and to allow for construction of crossings, which will be restored). This is more than a fifty percent (50%) reduction from the originally submitted Project design.**

Question No. 40

Why was a 25-foot wetland setback established for the entire project rather than a qualitative buffer design that accounts for existing disturbance, forested areas and wetland quality

Response

The minimum 25-foot buffer did account for existing conditions including current limits of agricultural disturbance, lack of mature woody vegetated buffers, relatively quality of wetland resources, etc. It is not uncommon for buffers to be evaluated as having two or more sub-areas based on their primary function, or as a hierarchy to the buffer zone. The first 25± feet of upland adjacent to a wetland or watercourse are usually the most important. For example, this inner buffer zone can include stream banks that may be subject to periodic inundation and may convey and or store floodwaters. Bank vegetation provides root mass that stabilizes banks and the canopy reduces rainfall energy. This inner buffer zone also often supports an interface between aquatic and terrestrial habitat and its vegetation that provides shade to moderate water temperature fluctuations. Vegetative zones up to 50± feet serve important sources of coarse woody debris, detritus and organic matter that serves as the base of the food chain. The first 50 feet adjacent to a wetland also serves important surface water runoff treatment through filtration, absorption, infiltrations and attenuation of runoff through vegetation. As the buffer zone expands beyond 50± feet, benefits to nearby wetlands and watercourses begin to diminish and are less focuses on direct water resources protection.

For these reasons, avoiding or minimizing encroachment within 25 feet of wetland resource areas served as an initial design constraint for the Project. In those areas of the Project where the existing conditions consisted of maintained agricultural field (which comprises the majority of the Project where the Facility is proposed) and there is a lack of mature woody vegetation buffering nearby wetland resources, providing a 25-foot buffer was considered sufficient to maintain the principal functions and values of those buffer zones. The Project also attempted to increase those buffers where forested upland habitat buffering wetland areas would require clearing to accommodate those portions of the Facility since those buffer areas can

sometimes serve more functions and values by comparison to a maintained agricultural field. Also, the Project increased those buffers in sensitive aquatic habitat areas such as the forested riparian corridor to Gulf Stream.

The Project is currently evaluating the ability to further increase those buffers with consideration given to more ecologically sensitive aquatic resources such as the Gulf Stream riparian corridor, higher functioning wetland areas, vernal pool habitats, etc. and anticipates submitting a revised Facility layout that affords improved protections to wetland and watercourse resources.

**Supplemental Response**

**The Petitioner, as part of the Project redesign, evaluated the ability to further increase buffers in sensitive aquatic habitat areas with consideration given to more ecologically sensitive aquatic resources such as the Gulf Stream riparian corridor, higher functioning wetland areas, vernal pool habitats, etc. As a result of this focused redesign effort, the Project has made significant strides in avoiding and minimizing activities within Gulf Stream, its buffers, and the buffers of other sensitive wetland resources on the Property. For example, the redesigned Project now eliminates all crossings of Gulf Stream (*see* Supplemental Response to Interrogatory No. 47) and avoids any disturbance within the one hundred foot (100') forested upland buffer along the Gulf Stream riparian corridor (*see* Supplemental Response to Interrogatory No. 43). Also, wetland buffers have been expanded to fifty feet (50') in many locations across the Project. In the limited remaining areas of the Project where a twenty-five-foot (25') buffer remains, such areas are generally associated with topography that drains away from the wetland resource, thereby**

**minimizing the potential for impact and allowing for a narrower buffer while still preserving those important buffer functions.**

Question No. 42

How many acres of the Project Limit of Disturbance occur within the 100-foot buffer of Gulf Stream?

Response

Approximately 0.83 acres.

**Supplemental Response**

**As a result of the Project redesign, no portion of the Project's Limit of Disturbance is now located within the one hundred-foot (100') buffer of Gulf Stream.**

Question No. 43

Site Plan C-402 shows clearing and construction within the 100-foot buffer of Gulf Stream for Stormwater Basin 8/10. Can the Project be modified to avoid any work within the 100-foot buffer of Gulf Stream, a cold-water fishery, as recommended by the *2004 Connecticut Stormwater Quality Manual* and as required by the DEEP *General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities*, effective December 31, 2020?

Response

The Project is currently evaluating the ability to further increase the buffer to Gulf Stream to minimize or avoid entirely any working within 100 feet of the Gulf Stream riparian corridor and anticipates submission of a revised Facility layout that afford improved protection to Gulf Stream. The Project is particularly focused on the eastern side of Gulf Stream in the proposed Stormwater Basin 8/10 area where a much wider forested buffer currently exists compared to the western side

where an agricultural field has resulted in minimal forest buffer to the stream. The Petitioner requests additional time to respond to this question.

**Supplemental Response**

**The redesigned Project provides a one hundred-foot (100') buffer along Gulf Stream and entirely avoids any activity within one hundred feet (100') of the Gulf Stream riparian corridor. This will conserve the bordering forest uplands that provide important functions to this cold-water fisheries resource. In particular, the area on the eastern side of Gulf Stream near the Stormwater Basin 8/10 area now includes a much wider forested upland buffer compared to the western side where the extension of an existing agricultural field has resulted in minimal forest buffer to the Gulf Stream.**

Question No. 44

The site plans show an underground electric line extending from the solar array east of Rossi Road to the solar array south of Town Farm Road. The proposed route of the electric line traverses a wetland and a tributary of Gulf Stream. How will this line be installed? Describe the amount of clearing/disturbance to wetlands required to install the line.

Response

This line will be installed as shown on Plan Sheet PV-104 – Array Details using the open cut trenching method. Prior to clearing, grubbing, and cable installation, Petitioner will install silt fencing around the proposed construction area. Taking into consideration that the construction area will include a wetland area associated with a tributary of Gulf Stream, if possible, Petitioner will perform this work during the dry seasons to minimize the environmental impact. Groundwater may be encountered in this area and, if necessary, minor pumping of water will be performed within the trench. Pumped water will be discharged to a small sediment basin built out of stone

and surrounded by haybales for filtration. Sand bags will also be used if necessary. A combination of stone and sand will be used in the bottom of the trench for bedding and trench bottom stabilization.

For the crossing of the tributary of the Gulf Stream, Petitioner plans to, if necessary based on water levels, construct a small sandbag dam upstream and downstream of the crossing and installing an eighteen inch (18") (or other required size) temporary pipe to carry the water from the upstream dam to the downstream dam. The proposed cable will be installed under the temporary pipe. Once backfilled, the temporary dams and temporary pipe will be removed, and the tributary will be restored to its original location. All disturbed areas will be seeded and stabilized, as necessary

**Supplemental Response**

**The redesigned Project eliminated this underground electric line. Instead, if this electric line is necessary, it would now be placed overhead. The overhead electric line would have a clear span over Gulf Stream and the bordering wetlands in order to avoid any impact within the one hundred-foot (100') Gulf Stream buffer. This overhead line would also be positioned along the existing farm road that crosses Gulf Stream, an area that is already cleared of vegetation, to avoid the need for any additional tree or vegetation clearing within or bordering Gulf Stream. These modifications eliminated activity with the Gulf Stream riparian corridor.**

Question No. 45

The Site Plans show three bottomless arch culverts to cross watercourses on the site. Describe how the culverts would be constructed. What are anticipated wetland and watercourse

impacts from construction? Quantify the amount of tree clearing in wetlands that is necessary to install each culvert.

Response

The bottomless culverts will be concrete arches set on stone pads on either side of the stream. The roadway will be backfilled up to grade as segmental walls are constructed. This process will not impact the stream. Wetland impact & tree clearing in wetland areas is approximately 9,357 square feet.

**Supplemental Response**

**As a result of the Project redesign, only one (1) bottomless culvert will be required, thus, reducing the wetland impact and tree clearing in wetland areas to approximately 250 square feet. This is more than a ninety-seven percent (97%) reduction from the originally Project design.**

Question No. 46

Does the design of the culverts comply with the 2008 DEEP Habitat Conservation and Enhancement Program, Stream Crossing Guidelines?

Response

Yes, culverts have been designed to comply with the 2008 DEEP Habitat Conservation and Enhancement Program, Stream Crossing Guidelines. All culverts are bottomless and have the minimum span required along with vertical headwalls.

**Supplemental Response**

**Yes, the redesigned culvert will continue to comply with the 2008 DEEP Habitat Conservation and Enhancement Program, Stream Crossing Guidelines. The culvert is bottomless and has the minimum span required along with vertical headwalls.**

Question No. 47

Will the Project require a U.S. Army Corps of Engineers permit/notification for work within wetlands/watercourses?

Response

The Project will result in approximately 10,000 square feet of permanent and temporary direct wetland impacts with the majority of that impact area associated with the proposed Gulf Stream crossing. With the perennial stream crossing design complying with the DEEP Inland Fisheries Division Habitat Conservation and Enhancement Program Stream Crossing Guidelines (February 26, 2008), the proposed wetland impacts would be eligible under the Department of the Army General Permits for the State of Connecticut ("GP"). Under the eligibility requirements of the GP, the Project would require a Pre-Construction Notification ("PCN") application likely under General Permit Nos. 17 and 19. The PCN application would be filed with the U.S. Army Corps of Engineers New England District ("Corps") under Section 404 of the federal Clean Water Act ("CWA") and DEEP for administration of the Water Quality Certification under Section 401 of the CWA for coordinated agency review under the GP with the Corps serving as the lead agency.

**Supplemental Response**

**The redesigned Project has reduced the direct wetland impacts by more than fifty percent (50%) (approximately 5,150 square feet). This reduction is largely due to the**

**elimination of the previously proposed Gulf Stream crossing and other design modifications. The redesigned Project now has only 4,850 square feet of direct wetland impacts, some of which will be temporary in nature. As a result of this substantial reduction, the remaining wetland impacts qualify under the Department of the Army General Permits for the State of Connecticut ("GP"). Under the eligibility requirements of the GP, the Project is now eligible as a Self-Verification Notification Form ("SVNF") simplified review application likely under General Permit No. 17, and possibly General Permit No. 19. The SVNF application will be filed with the U.S. Army Corps of Engineers New England District ("Corps") under Section 404 of the federal Clean Water Act ("CWA") and DEEP for administration of the Water Quality Certification under Section 401 of the CWA for coordinated agency review under the GP with the Corps serving as the lead agency.**

Question No. 48

Is it possible to relocate the Rossi Road Access Road to the solar arrays to a location on Wilson Road, south of where Gulf Stream crosses the road? Please explain.

Response

Yes, although this would have a larger impact than the designed crossing of the Gulf Stream. The proposed location of the access road has already been in use as an unimproved road for farming without a culvert or bridge for crossing (*see, e.g.,* Attachment 2, Part 2 of 11 (Photo 7)). The area referenced for possible relocation is one of the steepest on Site, with a twenty percent (20%) slope in some areas, and is known to have a rock outcropping. Thus, Petitioner would either have large fill and cut slopes, disturbing more area in proximity of the stream and wetlands than

currently designed, and most likely would also involve either blasting or major ripping of the bedrock outcropping.

**Supplemental Response**

**As part of the Project redesign effort, the Petitioner took the Council's inquiry seriously and conducted a comprehensive evaluation of this approach. As a result, the Project redesign reflects the elimination of the Site access road that previously crosses Gulf Stream and the relocation of this access road from the east side of Wilson Road south of the Gulf Stream. This new access roadway will have grades up to twenty percent (20%), will require cut and fill slopes in previously undisturbed and forested areas, and will result in a Limit of Disturbance fifty feet (50') from two separate wetland areas. However, the Petitioner believes that these impacts are preferable to the direct impact to Gulf Stream that was contemplated in the original Project design. In addition, this alternative design approach has allowed the Petitioner to remove other roadways within the Project area and reduce the Limit of Disturbance in several locations. It is also a crucial part of the redesign that has allowed the Petitioner to eliminate all activity within the one hundred-foot (100') buffer of Gulf Stream.**

Question No. 53

Referring to Petition pp. 23-25 and Exhibit Y, how many abutting residences would have year-round views of the facility?

Response

Fourteen (14) abutting residences may have a year-round view of some portion of the solar facility. Those residences are located at 1167 Highland Avenue, 1119 Highland Avenue, 517 Wimbledon Gate North, 431 Wimbledon Gate North, 417 Wimbledon Gate North, 403

Wimbledon Gate North, 389 Wimbledon Gate North, 377 Wimbledon Gate North, 361 Wimbledon Gate North, 347 Wimbledon Gate North, 66 Town Farm Road, 236 Rossi Road, 229 Rossi Road, and 255 Rossi Road.

**Supplemental Response**

**As a result of the Project redesign, 517 Wimbledon Gate North will no longer have a year round view of the solar facility.**

Question No. 58

Referring to Site Plan C-600, can the security fence along the Rossi Road Access Road 1 culvert crossing of Gulf Stream be eliminated to facilitate wildlife movement along the stream corridor?

Response

Yes, Petitioner will remove the security fence to facilitate wildlife movement along the stream corridor and will install gates at each end of the Limit of Disturbance to close off the array.

**Supplemental Response**

**As a result of the Project redesign, the Rossi Road Access Road 1, including the culvert and the security fence have been removed from the Project plans. The Project no longer includes any activity within one hundred feet (100') of the Gulf Stream.**

Question No. 59

Can another location for a laydown area at the site be developed to avoid disturbance to the 100-foot vernal pool envelope at VP-01?

Response

Yes, Petitioner will remove the laydown yard within the vernal pool envelope at VP-01 and reduce the laydown area to be exclusively outside of the vernal pool envelope. Flagging will be used to demarcate the envelope prior to construction.

**Supplemental Response**

**As part of the Project redesign effort, the Petitioner took the Council's inquiry seriously and was able to remove the laydown area from the one hundred foot (100') vernal pool envelope at VP-01. With this adjustment, the Project will have no activity occurring within the one hundred foot (100') vernal pool envelope for either VP-01 or VP-02.**

## Facility Construction

Question No. 64

Referring to the Stormwater Pollution Control Plan, the amount of land disturbance on p. 3 and on Sheet C 002 does not match. Please clarify.

Response

The amount of land disturbance in the Civil Quantities on Sheet C 002 are meant for a grading contractor to bid on the approximate area of grading acreage. The land disturbance in the Stormwater Pollution Control Plan is the correct overall disturbance with clearing, grading, fence, etc. and is ninety-nine (99) acres.

**Supplemental Response**

**As a result of the extensive Project redesign efforts undertaken by the Petitioner, the overall area of disturbance (clearing, grading, fence, etc.) has been reduced to seventy-four (74) acres. This reflects more than a twenty-five percent (25%) reduction from the original Project design.**

Question No. 65

How many acres of the site require re-grading? What is the purpose of the site grading as shown on the Site Plans? Why can't existing grades be utilized to a greater extent to minimize soil disturbance?

Response

There are approximately seventy-three (73) acres of the Site that require grading. Due to the guidelines outlined in Draft Appendix I, Stormwater Management at Solar Array Construction Sites and the requirements to treat the solar panels as impervious area, stormwater basins were required for treatment of the runoff. Placement of these basins on the downhill portions of the Site created significant grading of these slopes to provide areas for the basins, this then has an affect across the area designed for the solar arrays, which needs to stay under fifteen percent (15%) for the solar racking system specifications. There are equipment solutions available with up to twenty-five (25%) slope tolerance and would reduce the amount of grading required. Petitioner intends to request DEEP to consider this as an alternative solution to the extensive grading required to meet the fifteen percent (15%) criteria in Appendix I.

**Supplemental Response**

**As a result of the extensive Project redesign efforts undertaken by the Petitioner, the portion of the Project Site requiring regrading has been reduced from seventy-three (73) acres to fourteen (14) acres, an eighty percent (80%) reduction from the original Project design. In addition, as part of the Petitioner's efforts to reduce the overall Limit of Disturbance at the Site, the redesigned Project utilizes a racking solution with up to twenty percent (20%) slope tolerance, which assists in the reduced amount of grading required.**

Question No. 67

What areas of the site have post-construction slopes that are equal to or greater than 15%?

Response

The only post construction areas which are greater than or equal to fifteen percent (15%) are the tie-in slopes for the site grading and detention basin side slopes.

**Supplemental Response**

**As mentioned in several supplemental responses above, the Petitioner, as part of the Project redesign effort, was able to minimize overall grading and land disturbance at the Property. As a result, acceptable grades on the Site were increased to twenty percent (20%) with the slopes tying into existing grades at 3:1.**

Question No. 68

According to the Petition, the Petitioner filed for a Stormwater Permit on October 20, 2020. The submitted Stormwater Pollution Control Plan (Ex. V) contains no mention of Draft Appendix I, Stormwater Management at Solar Array Construction Projects. Has the project been designed to conform to Draft Appendix I? If so, list measures that were incorporated into the Project design.

Response

As currently designed, the Project was designed to confirm with the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities and Stormwater Pollution Control Plan in effect in 2020. The current design treats the panels as impervious area and diversion ditches were designed to direct runoff to stormwater basins for treatment. The Petitioner understands that as currently designed, the Project may require an individual permit from DEEP.

**Supplemental Response**

**As mentioned in several of the supplemental responses above, the Petitioner, as part of the Project redesign effort, was able to minimize overall grading and land disturbance at the Property. In addition to minimizing overall grading and land disturbance, the Project redesign effort was able to meet the requirement for Appendix I for approximately ninety-five percent (95%) of the Site. The only area of the Site currently is unable to conform to the requirements of Appendix I is in the locations that drain to Ponds 2A and 2B and the newly delineated intermediate watercourse (*see* Response to Interrogatory No. 49).**

Question No. 69

What effect would runoff from the drip edge of each row of solar panels have on the site drainage patterns? Would channelization below the drip edge be expected? Are energy dissipators, as depicted in DEEP's draft Appendix I, Stormwater Management at Solar Array Construction Projects-Figure 2, proposed for this Project? If not, why not?

Response

The rows of solar panels are not considered "closed systems," because there are gaps between each module (both north/south and east/west). As such, the drip edge of each solar panel will not have an impact on the Site's drainage patterns, as stormwater will flow off the panels at multiple locations as the panels follow the contours of the existing land. For the same reason, after construction is complete and the Site is fully stabilized, channelization along the drip edge is not expected.

**Supplemental Response**

**The Petitioner would like to add to its initial response to clarity that for the reasons set forth therein energy dissipators, as depicted in DEEP's draft Appendix I, Stormwater**

**Management at Solar Array Construction Projects-Figure 2, are not proposed for this Project and are not required.**

Question No. 73

The Site Plans (C-402) show reinforced concrete pipe (RCP) outlets extending from Stormwater Ponds 2 and 7 into wetland areas. Why was a direct wetland discharge point chosen? The Site Plans do not include any construction details for the RCPs. Provide construction details including excavation and site clearing information.

Response

To meet the requirements of discharging water onto slopes equal to or less than five percent (5%), discharges were moved to the bottom of the slopes which placed them next to the wetland areas. Discharge pipes were designed to have proper velocity dissipation to prevent erosion. Also, by still discharging upstream of the wetlands, it was designed to maintain the existing runoff to these wetlands. Construction details for the RCP pipe will be provided to the Council when they are available.

**Supplemental Response**

**As part of the Project redesign, the Stormwater Pond 7 was decreased in size and moved to the north. These changes now allow Stormwater Pond 7 to meet the discharge requirement of discharging onto five percent (5%) slopes without being piped to the wetlands at the bottom of the hill. Also, as part of the Project redesign, Stormwater Pond 2 was split into two smaller ponds. This change results in a reduction in grading necessary for these ponds and removes the ponds from the one hundred-foot (100') Gulf Stream buffer.**

CERTIFICATE OF SERVICE

I hereby certify that on the 14th day of May 2021, a copy of the foregoing was sent, via electronic mail, to:

Dominick J. Thomas, Esq.
Cohen and Thomas
315 Main Street
Derby, CT 06418
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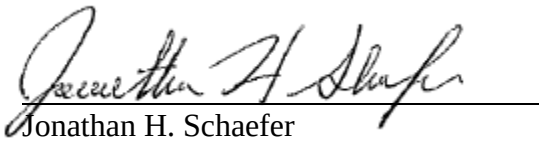
djt@cohen-thomas.com



Jonathan H. Schaefer

# PRODUCT SAFETY DATA SHEET

**HANWHA Q CELLS SOLAR PV MODULES ARE ARTICLES AS DEFINED BY THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION HAZARD COMMUNICATION STANDARD (HCS), 29 C.F.R. § 1910.1200 AND ARE EXEMPT FROM THE LABELING AND SAFETY DATA SHEETS (SDS) REQUIREMENTS OF THE STANDARD.**

**Hanwha Q CELLS provides this product safety data sheet only for convenience of interested parties in the United States of America who are used to the format of safety data sheets in order to assess the product safety. This product safety data sheet does not replace any other documents provided by Hanwha Q CELLS such as Safety Information, Installation and Operation Manual, Packaging and Transport Information, Product Data Sheet as well as Warranty Terms of the respective product.**

## SECTION 1: IDENTIFICATION

Solar PV modules convert light into electricity. Light-sensitive cells are electrically interconnected in series and sealed between glass and plastic foils for this purpose. This product safety data sheet is applicable to the following solar PV modules of the Q CELLS brand made by Hanwha Q CELLS:

- Q.PLUS-G4.X, Q.PLUS BFR-G4.X, Q.PLUS L-G4.X, Q.PEAK-G4.X, Q.PEAK BLK-G4.X, Q.PEAK L-G4.X,
- Q.PLUS DUO-G5, Q.PLUS DUO BLK-G5, Q.PLUS DUO L-G5, Q.PLUS DUO-G5.X, Q.PLUS DUO BLK-G5.X, Q.PLUS DUO L-G5.X,
- Q.PEAK DUO-G5, Q.PEAK DUO BLK-G5, Q.PEAK DUO L-G5, Q.PEAK DUO-G5.X, Q.PEAK DUO BLK-G5.X, Q.PEAK DUO L-G5.X,
- Q.PEAK DUO-G6, Q.PEAK DUO BLK-G6, Q.PEAK DUO L-G6, Q.PEAK DUO-G6.X, Q.PEAK DUO BLK-G6.X, Q.PEAK DUO L-G6.X

Minor variations within the product families listed above can be identified by a versioning system which replaces character “X” with numerals of either “1”, “2” or “3” to form G4.1, G4.2, G4.3, G5.1, G5.2, G5.3, G6.1, G6.2 and G6.3, respectively. All of these variants as well as the ones with additional suffix “/TAA” are covered by this product safety data sheet. This is also true for B-grade modules which have minor optical imperfections. Product names of these replace “Q.” with “B.LINE”. B-grade modules of Q.PEAK-G4.1 are named B.LINE PEAK-G4.1 for example.

**Responsible Party as Importer:**
Name: Hanwha Q CELLS America
Address: 300 Spectrum Center Drive, Suite 1250, Irvine, CA 92618
Phone: 1-949-748-5996

## SECTION 2: IDENTIFICATION OF SAFETY RISKS (HAZARDS IDENTIFICATION)

Hanwha Q CELLS solar PV modules do not pose any risk of hazardous chemicals. Hazard symbols and precautionary hazard statements for hazardous chemicals are not applicable. No symptoms or effects – neither acute nor delayed – have to be expected when Hanwha Q CELLS solar PV modules are handled as stipulated in the Installation and Operation Manual. Hanwha Q CELLS provides a Safety Information sheet with all modules shipments. This document contains detailed risk statements and recommendations for installation and operation. Before installing the module, read the Installation and Operation Manual for Q CELLS modules carefully. You can obtain the complete Installation and Operation Manual from your retailer.

**Attention:** Only qualified and authorized specialists may install modules and put them into operation. Keep children and unauthorized persons away from the modules.

Risks:
- Risk of death from electrocution! Solar modules generate electricity and are energized as soon as they are exposed to light.
- In rare cases, solar PV modules – as any other electrical device – can cause fire due to worn electrical contacts which result in electrical arching.
- Solar PV modules can reach high temperatures which can cause skin burns.
- Sharp edges, corners and broken glass can cause injuries.
- Solar PV modules can cause Injuries due to their weight.
    - Falling solar PV modules can cause injuries.
    - Lifting solar PV modules can cause injuries.

For precautionary statements, please refer to the Installation and Operations Manual of the respective product.

MISUSE OR INCORRECT USE OF SOLAR MODULES VOIDS THE LIMITED WARRANTY AND MAY CREATE A SAFETY HAZARD AND RISK PROPERTY DAMAGE. THIS INCLUDES IMPROPER INSTALLATION OR CONFIGURATION, IMPROPER MAINTENANCE, UNINTENDED USE, AND UNAUTHORIZED MODIFICATION.

# PRODUCT SAFETY DATA SHEET

## SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Safety data sheets are only required for hazardous chemicals covered by the Hazard Communication Standard (HCS). Solar PV modules made by Hanwha Q CELLS are not covered by HCS. The following table provides an overview of materials solar PV modules by Hanwha Q CELLS are made of. The values given for the share of weight are targets and can vary for the products covered by this Product Safety Data Sheet.

| COMPONENT | MATERIAL | TOTAL SHARE | REMARK |
|---|---|---|---|
| FRAME | Aluminum | 8 % – 16 % | not hazardous |
| | Silicone | <2 % | not hazardous, see section 8 |
| LAMINATE | Glass | 60 % – 80 % | not hazardous |
| | Plastics (EVA, PET, PE, PPE, PC) | 8 % – 16 % | no hazards known |
| | Silicon | 2 % – 4 % | not hazardous |
| | Metals (Aluminum, Copper, Tin) | 1 % – 3 % | not hazardous |
| | Lead | <0,1 % | hazardous |
| | Silver | <0,05 % | not hazardous |

## SECTION 4: FIRST-AID MEASURES

In case of electrocution:

- Always protect yourself by taking all necessary safety precautions before rescuing persons injured.
- Attention: Stay away from sources of high voltage and leave the rescue to qualified personnel with appropriate personal protection equipment!
- Call emergency rescue services.
- Do not touch live parts. Qualified personnel should shut down the PV system as far as possible – e.g. disconnect the modules at the inverter before uncovering any live electrical parts. Be sure to observe the specified time intervals after switching off the inverter. Highvoltage components need time to discharge. Follow OSHA requirements for control of hazardous energy at 29 C.F.R. § 1910.147.
- In the event a person is electrocuted or affected by electrical energy of the solar PV module, CALL 911. Before attempting rescue, SHUTDOWN THE POWER SOURCE.
- Remove the victim from the power source using only insulated tools ONLY IF CONTACT WITH LIVE ELECTRICAL COMPONENTS CAN B PREVENTED.
- Carefully move the injured from the zone of danger.
- After moving to a safe location, check heartbeat, respiration and consciousness of the injured person.
- Apply appropriate life-saving measures (CPR) accordingly before taking care of minor injuries.
- Consult a medical professional even if there are no visible injuries.
    - Flush thermal skin burns caused by touching hot surfaces of solar PV modules with cool water. Consult a medical professional.
    - Injuries due to sharp edges, corners and broken glass need to be appropriately treated. Consult a medical professional.
    - Other types of injuries need to be treated appropriately as well. Consult a medical professional.

## SECTION 5: FIRE-FIGHTING MEASURES

- Hanwha Q CELLS solar PV modules are fire rated as Class C according to IEC and UL 1703 as well as Type 1 according to UL 1703.
- Hanwha Q CELLS solar PV modules are extensively tested at the factory to ensure electrical safety of the product before shipment.
- In rare cases, solar PV modules – as any other electrical device – can cause fire due to worn electrical contacts which result in electrical arching.
- In case solar PV modules which are not part of an array are on fire, USE FIRE EXTINGUISHERS RATED FOR ELECTRICAL EQUIPMENT, Class C.
- IN CASE A SOLAR PV MODULE ARRAY IS PRESENT, ANY FIRE SHOULD ONLY BE FOUGHT BY PROFESSIONAL FIREFIGHTERS. FIREFIGHTERS NEED TO TAKE PRECAUTIONS FOR ELECTRICAL VOLTAGES UP TO 1,500 VOLTS (DC).
- Some components of the modules can burn. Potential combustion products include oxides of carbon, nitrogen and silicon.
- In case of prolonged fire, solar PV modules may lose their structural integrity.

General recommendations from the below-mentioned reports:

- Fire service personnel should follow their normal tactics and strategies at structure fires involving solar power systems, but do so with awareness and understanding of exposure to energized electrical equipment. Emergency response personnel should operate normally, and approach this subject area with awareness, caution, and understanding to assure that conditions are maintained as safely as possible.
- Care must be exercised during all operations, both interior and exterior.
- Responding personnel must stay back from the roofline in the event modules or sections of an array may slide off the roof.
- Contacting a local professional PV installation company should be considered to mitigate potential hazards.
- Turning off an array is not as simple as opening a disconnect switch. As long as the array is illuminated, parts of the system will remain energized.
- When illuminated by artificial light sources such as fire department light trucks or an exposure fire, PV systems are capable of producing electrical power sufficient to cause inability to let go from electricity as a result of stimulation of muscle tissue, also known as lock-on hazard.
- Firefighting foam should not be relied upon to block light.
- The electric shock hazard due to application of water is dependent on voltage, water conductivity, distance and spray pattern.
- It is recommendable to fight fire with water instead of foam if a PV system is present. Salt water should not be used.
- Firefighter's gloves and boots afford limited protection against electrical shock provided the insulating surface is intact and dry. They should not be considered equivalent to electrical personal protection equipment.

Readers interested in more details may refer to the following reports:

- National Fire Protection Association, Fire Protection Research Foundation report "Fire Fighter Safety and Emergency Response for Solar Power Systems" issued May 2010, revised October 2013
- Important recommendations from a report called "Firefighter Safety and Photovoltaic Installations Research Project" issued by Underwriters Laboratories on November 29, 2011

## SECTION 6: FIRE-FIGHTING MEASURES

This section is not applicable.

## SECTION 7: HANDLING AND STORAGE

Before installing the module, read the Installation and Operation Manual for Q CELLS modules carefully. Noncompliance with the instructions may result in damage and physical injury or death. Only qualified and authorized specialists may install modules and put them into operation. You can obtain the complete installation manual from your retailer.

Details about transport and storage of palletized Hanwha Q CELLS solar PV modules can be found in the Packaging and Transport Information of the respective module type.

Storage, transport and unpacking:

- Store the module dry, well-ventilated and properly secured. The original packaging is not weatherproof.
- Always transport the module in its original packaging.
- Do not stack the modules. This prevents damage of the junction box.
- The module is made of glass. Take great care when unpacking, storing and transporting it.
- Do not subject the module glass to any mechanical stress (e.g. through torsion or deflection). Do not step on the module or place any objects onto the module.
- Protect both sides of the module against scratching and other damage.
- Carry the module by holding the edges with both hands, or use a glass suction lifter.
- Never lift or carry the module using the module junction box or wiring. Avoid pulling on the wiring at all costs.

# PRODUCT SAFETY DATA SHEET

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Before installing the module, read the Installation and Operation Manual carefully. Noncompliance with the instructions may result in damage and physical injury. Only qualified and authorized specialists may install modules and put them into operation. You can obtain the complete installation manual from your retailer.

- Please follow the valid national regulations and safety guidelines for the installation of electrical devices and systems.
- Please make sure to take all necessary safety precautions.
- Ensure that all personnel are aware of and adhere to accident-prevention and safety regulations.
- For handling of modules wear suitable protective gloves.
- Do not install damaged modules. Ensure that all electrical components are in a proper, dry, and safe condition.
- Do not modify the module (e.g. do not drill any additional holes). Never open the junction box.
- Ensure that modules and tools are not subject to moisture or rain at any time during installation. Only use dry, insulated tools for electrical work.
- Only connect cables with plugs. Ensure for a tight connection between the plugs. Plugs click together audibly.
- Cover the modules with an opaque material during installation. Cover the modules to be disconnected.

Silicones used in manufacturing release methanol during curing. Once cured, no additional methanol is released during use. Small amounts of these chemicals may be present in shipping cartons. Upon receipt, open container in a well ventilated location and allow to stand for 5 minutes before removing units from cartons. Exposures above recommended limits for methanol of 200 ppm eight-hour time-weighted-average (TWA) will not occur.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

- Physical state: solid
- Voltage: refer to data sheet (below 50 volts for a single module)

**Attention:** Voltage of single modules add up when modules are electrically connected in series. Hanwha Q CELLS solar PV modules are designed and certified for voltages up to 1,000 volts or even up to 1,500 volts. Connection of modules in series is only permitted up to the maximum system voltage as listed in the applicable data sheet.

- Weight: refer to data sheet
- Solubility in water: insoluble in water

## SECTION 10: STABILITY AND REACTIVITY

Under normal operating conditions as specified in the Product Data Sheet, Hanwha Q CELLS solar PV modules are chemically stable.

- Hanwha Q CELLS solar PV modules are tested for salt spray and ammonia resistance according to IEC 61701 and IEC 62716, respectively.
- Hanwha Q CELLS solar PV modules support ambient operating temperatures from –40 °C to +85 °C (–40 °F to +185 °F).
- Do not install modules above 13.120 ft (4000 m) altitude above sea level.
- Some components of the modules can burn. Potential combustion products include oxides of carbon, nitrogen and silicon.
- Do not scratch off dirt. Use a soft cellulose cloth or sponge to carefully wipe off stubborn dirt. Do not use micro fleece wool or cotton cloths.
- Rinse dirt off with lukewarm water (dust, leaves, etc.)
- Use an alcohol based glass cleaner. Do not use abrasive detergents or tensides.
- Isopropyl alcohol (IPA) can be used selectively to remove stubborn dirt and stains within one hour after it appeared.
- Follow the safety guidelines provided by the IPA manufacturer.
- Do not let IPA run down between the module and the frame or into the module edges.

# PRODUCT SAFETY DATA SHEET

## SECTION 11: TOXICOLOGICAL INFORMATION

Small amounts of methanol may be present inside shipping cartons. Open cartons and allow to vent before removing units. No exposure to hazardous chemicals will occur when the units are in use.

## SECTION 12: ECOLOGICAL INFORMATION

Hanwha Q CELLS solar PV modules are designed to withstand outdoor operating conditions for 25 years. Biodegradation is not expected due to high chemical stability of the components.

## SECTION 13: DISPOSAL CONSIDERATIONS

Hanwha Q CELLS solar PV modules should be recycled rather than dumped in a landfill. Raw materials of the product can be recovered by recycling companies. Disposal must be in accordance with national and local laws and regulations for electric/electronic waste.

## SECTION 14: TRANSPORT INFORMATION

Hanwha Q CELLS solar PV modules can be shipped via standardized container freight. Regulations for hazardous goods do not apply. For further details, please refer to the Packaging and Transport Information which can be provided as a separate document by Hanwha Q CELLS.

## SECTION 15: REGULATORY INFORMATION

- Hanwha Q CELLS solar PV modules are tested according to international standards IEC 61215, IEC 61730 as well as US standards UL 1703.
- Please refer to the Installation and Operation Manual and Product Data Sheet of the respective Hanwha Q CELLS solar PV module.

## SECTION 16: OTHER INFORMATION

- Date of initial creation of this product safety data sheet: July 1, 2016
- Date of last revision: August 14, 2018



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# Toxicity Characteristic Leaching Procedure (TCLP) Regulatory Levels

| METALS | TCLP Regulatory Level, mg/L | EPA Hazardous Waste Number | Recommended Test Method |
|---|---|---|---|
| Arsenic | 5.0 | D004 | 7061 |
| Barium | 100.0 | D005 | 7080 |
| Cadmium | 1.0 | D006 | 7130 |
| Chromium | 5.0 | D007 | 7190 |
| Lead | 5.0 | D008 | 7420 |
| Mercury | 0.2 | D009 | 7471 |
| Selenium | 1.0 | D010 | 7741 |
| Silver | 5.0 | D011 | 7760 |

| VOLATILE ORGANICS | TCLP Regulatory Level, mg/L | EPA Hazardous Waste Number | Recommended Test Method |
|---|---|---|---|
| Benzene | 0.5 | D018 | 8260B |
| Carbon Tetrachloride | 0.5 | D019 | 8260B |
| Chlorobenzene | 100.0 | D021 | 8260B |
| Chloroform | 6.0 | D022 | 8260B |
| 1,4-Dichlorobenzene | 7.5 | D027 | 8260B |
| 1,2-Dichloroethane | 0.5 | D028 | 8260B |
| 1,1-Dichloroethylene | 0.7 | D029 | 8260B |
| Methyl Ethyl Ketone | 200.0 | D035 | 8260B |
| Tetrachloroethylene | 0.7 | D039 | 8260B |
| Trichloroethylene | 0.5 | D040 | 8260B |
| Vinyl Chloride | 0.2 | D043 | 8260B |

| SEMIVOLATILE ORGANICS | TCLP Regulatory Level, mg/L | EPA Hazardous Waste Number | Recommended Test Method |
|---|---|---|---|
| o-Cresol | [1] 200 | D023 | 8270C |
| m-Cresol | [1] 200 | D024 | 8270C |
| p-Cresol | [1] 200 | D025 | 8270C |
| Cresol | [1] 200 | D026 | 8270C |
| 2,4-Dinitrotoluene | 0.13 | D030 | 8270C |
| Hexachlorobenzene | 0.13 | D032 | 8270C |
| Hexachlorobutadiene | 0.5 | D033 | 8270C |
| Hexachloroethane | 3.0 | D034 | 8270C |
| Nitrobenzene | 2.0 | D036 | 8270C |
| Pentachlorophenol | 100.0 | D037 | 8270C |
| Pyridine | 2 5.0 | D038 | 8270C |
| 2,4,5-Trichlorophenol | 400.0 | D041 | 8270C |
| 2,4,6-Trichlorophenol | 2.0 | D042 | 8270C |

[1]If Cresols cannot be differentiated, total cresol may be used.

| ORGANOCHLORINE PESTICIDES | TCLP Regulatory Level, mg/L | EPA Hazardous Waste Number | Recommended Test Method |
|---|---|---|---|
| Chlordane | 0.03 | D020 | 8081A |
| Endrin | 0.02 | D012 | 8081A |
| Heptachlor (and its Epoxide) | 0.008 | D031 | 8081A |
| Lindane | 0.4 | D013 | 8081A |
| Methoxychlor | 10.0 | D014 | 8081A |
| Toxaphene | 0.5 | D015 | 8081A |

| CHLOROPHENOXY ACID HERBICIDES | TCLP Regulatory Level, mg/L | EPA Hazardous Waste Number | Recommended Test Method |
|---|---|---|---|
| 2,4-D | 10.0 | D016 | 8150 |
| 2,4,5-TP (Silvex) | 1.0 | D017 | 8150 |

Reference: 40 CFR 261, Appendix II, 1993 ed., as amended by 58 FR 46040, August 31, 1993.

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**JONES ENVIRONMENTAL**
**LABORATORY RESULTS**

| | | | |
|---|---|---|---|
| **Client:** | Hanwha Q CELLS America Inc. | **Report date:** | 4/4/2019 |
| **Client Address:** | 400 Spectrum Center Dr., Suite 1400<br>Irvine, CA 92618 | **JEL Ref. No.:** | ST-13602 |
| **Attn:** | Ralph Alvarado | **Date Sampled:** | 4/1/2019 |
| | | **Date Received:** | 4/1/2019 |
| | | **Date Analyzed:** | 4/3-4/2019 |
| | | **Physical State:** | Solar Panel<br>Q.PEAK DUO<br>L-G5.2 XXX |

**ANALYSES REQUESTED**

1. TCLP Metals by ICP-OES

**Approval:**

Angela Haar, Ph. D.
Mobile Lab Manager

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# JONES ENVIRONMENTAL LABORATORY RESULTS

**Client:** Hanwha Q CELLS America Inc.
**Client Address:** 400 Spectrum Center Dr., Suite 1400, Irvine, CA 92618

**Attn:** Ralph Alvarado

**Report date:** 4/4/2019
**Jones Ref. No.:** ST-13602

**Date Sampled:** 4/1/2019
**Date Received:** 4/1/2019
**Date Analyzed:** 4/3-4/2019
**Physical State:** Solar Panel - Q.PEAK DUO L-G5.2 XXX

**Sample ID:** Sample 1 **Jones ID:** ST-13602-01

## TCLP Metals by ICP-OES

| | Result | Dilution | Batch | Prepared | Analyzed | Reporting Limit | Units |
|---|---|---|---|---|---|---|---|
| **Analytes:** | | | | | | | |
| **Silver, Ag** | **0.01** | 1 | TCLP_040219-01 | 4/2/2019 | 4/3/2019 | 0.01 | mg/L |
| Arsenic, As | ND | 1 | " | " | " | 0.01 | mg/L |
| **Barium, Ba** | **0.10** | 1 | " | " | " | 0.01 | mg/L |
| Cadmium, Cd | ND | 1 | " | " | " | 0.01 | mg/L |
| Chromium, Cr | ND | 1 | " | " | " | 0.01 | mg/L |
| Selenium, Se | ND | 1 | " | " | " | 0.01 | mg/L |
| **Lead, Pb** | **1.48** | 1 | " | " | " | 0.01 | mg/L |

## EPA 7471A - Mercury by Cold Vapor Atomic Absorption

| | Result | Dilution | Batch | Prepared | Analyzed | Reporting Limit | Units |
|---|---|---|---|---|---|---|---|
| Mercury, Hg | ND | 1 | TCLP_040219-01 | 4/2/2019 | 4/4/2019 | 100 | mg/L |

ND= Not Detected

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# JONES ENVIRONMENTAL LABORATORY RESULTS

| | | | |
|---|---|---|---|
| **Client:** | Hanwha Q CELLS America Inc. | **Report date:** | 4/4/2019 |
| **Client Address:** | 400 Spectrum Center Dr., Suite 1400<br>Irvine, CA 92618 | **Jones Ref. No.:** | ST-13602 |
| **Attn:** | Ralph Alvarado | **Date Sampled:** | 4/1/2019 |
| | | **Date Received:** | 4/1/2019 |
| | | **Date Analyzed:** | 4/3-4/2019 |
| | | **Physical State:** | Solar Cell |

**Sample ID:** **Sample 2** **Jones ID:** **ST-13602-02**

## TCLP Metals by ICP-OES

| | Result | Dilution | Batch | Prepared | Analyzed | Reporting Limit | Units |
|---|---|---|---|---|---|---|---|
| **Analytes:** | | | | | | | |
| Silver, Ag | ND | 1 | TCLP_040219-01 | 4/2/2019 | 4/3/2019 | 0.01 | mg/L |
| Arsenic, As | ND | 1 | " | " | " | 0.01 | mg/L |
| **Barium, Ba** | **0.07** | 1 | " | " | " | 0.01 | mg/L |
| Cadmium, Cd | ND | 1 | " | " | " | 0.01 | mg/L |
| Chromium, Cr | ND | 1 | " | " | " | 0.01 | mg/L |
| Selenium, Se | ND | 1 | " | " | " | 0.01 | mg/L |
| **Lead, Pb** | **1.36** | 1 | " | " | " | 0.01 | mg/L |

## EPA 7471A - Mercury by Cold Vapor Atomic Absorption

| | Result | Dilution | Batch | Prepared | Analyzed | Reporting Limit | Units |
|---|---|---|---|---|---|---|---|
| Mercury, Hg | ND | 1 | TCLP_040219-01 | 4/2/2019 | 4/4/2019 | 100 | mg/L |

ND= Not Detected

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# JONES ENVIRONMENTAL LABORATORY RESULTS

**Client:** Hanwha Q CELLS America Inc.
**Client Address:** 400 Spectrum Center Dr., Suite 1400, Irvine, CA 92618

**Attn:** Ralph Alvarado

**Report date:** 4/4/2019
**Jones Ref. No.:** ST-13602

**Date Sampled:** 4/1/2019
**Date Received:** 4/1/2019
**Date Analyzed:** 4/3-4/2019
**Physical State:** Solar Panel - Q.PEAK DUO L-G5.2 XXX

**Sample ID:** Sample 3 **Jones ID:** ST-13602-03

## TCLP Metals by ICP-OES

| | Result | Dilution | Batch | Prepared | Analyzed | Reporting Limit | Units |
|---|---|---|---|---|---|---|---|
| **Analytes:** | | | | | | | |
| Silver, Ag | ND | 1 | TCLP_040219-01 | 4/2/2019 | 4/3/2019 | 0.01 | mg/L |
| Arsenic, As | ND | 1 | " | " | " | 0.01 | mg/L |
| **Barium, Ba** | **0.12** | 1 | " | " | " | 0.01 | mg/L |
| Cadmium, Cd | ND | 1 | " | " | " | 0.01 | mg/L |
| Chromium, Cr | ND | 1 | " | " | " | 0.01 | mg/L |
| Selenium, Se | ND | 1 | " | " | " | 0.01 | mg/L |
| **Lead, Pb** | **1.07** | 1 | " | " | " | 0.01 | mg/L |

## EPA 7471A - Mercury by Cold Vapor Atomic Absorption

| | Result | Dilution | Batch | Prepared | Analyzed | Reporting Limit | Units |
|---|---|---|---|---|---|---|---|
| Mercury, Hg | ND | 1 | TCLP_040219-01 | 4/2/2019 | 4/4/2019 | 100 | mg/L |

ND= Not Detected

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# JONES ENVIRONMENTAL LABORATORY RESULTS

| | | | |
|---|---|---|---|
| **Client:** | Hanwha Q CELLS America Inc. | **Report date:** | 4/4/2019 |
| **Client Address:** | 400 Spectrum Center Dr., Suite 1400<br>Irvine, CA 92618 | **Jones Ref. No.:** | ST-13602 |
| **Attn:** | Ralph Alvarado | **Date Sampled:** | 4/1/2019 |
| | | **Date Received:** | 4/1/2019 |
| | | **Date Analyzed:** | 4/3-4/2019 |
| | | **Physical State:** | Solar Cell |

**Sample ID:** Sample 4 **Jones ID:** ST-13602-04

## TCLP Metals by ICP-OES

| | Result | Dilution | Batch | Prepared | Analyzed | Reporting Limit | Units |
|---|---|---|---|---|---|---|---|
| **Analytes:** | | | | | | | |
| Silver, Ag | ND | 1 | TCLP_040219-01 | 4/2/2019 | 4/3/2019 | 0.01 | mg/L |
| Arsenic, As | ND | 1 | " | " | " | 0.01 | mg/L |
| **Barium, Ba** | **0.11** | 1 | " | " | " | 0.01 | mg/L |
| Cadmium, Cd | ND | 1 | " | " | " | 0.01 | mg/L |
| Chromium, Cr | ND | 1 | " | " | " | 0.01 | mg/L |
| Selenium, Se | ND | 1 | " | " | " | 0.01 | mg/L |
| **Lead, Pb** | **1.04** | 1 | " | " | " | 0.01 | mg/L |

## EPA 7471A - Mercury by Cold Vapor Atomic Absorption

| | Result | Dilution | Batch | Prepared | Analyzed | Reporting Limit | Units |
|---|---|---|---|---|---|---|---|
| Mercury, Hg | ND | 1 | TCLP_040219-01 | 4/2/2019 | 4/4/2019 | 100 | mg/L |

ND= Not Detected