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The Zoghlin Group,
PLLC, 300 State
Street, Suite 502
Rochester, NY 14614

At: Frances M. Kabat, Esq.
Re: Delaware River Solar (DRS), LLC Solar Energy Facilities, Town of Farmington, Ontario County New, York
Professional Engineering review and comment on Updated Site Plan and Preliminary SWPPP (Storm Water Pollution Prevention Plan) report

Dear Frances:
I have reviewed the Preliminary SWPPP report, Environmental Assessment Form (EAF), Preliminary Site Plan, correspondence and other information recently provided by DRS, the project developer.

SWPPP Report Review
Section 2.15.1 This section refers to permanent storm water management facilities shown on the Preliminary Site Plan; however, no such facilities are depicted on that plan. What are the developer's intentions for permanent facilities to capture and attenuate the increase in storm water runoff following full development of the site, especially with regard to hard surface roadways discharge in the vicinity of the Fox Road entrance? Where are details of the permanent facilities shown?

Section 2.16.1 This section states that there will be no increase in 'CN' (US Dept. Of Agriculture Soil Conservation Service Storm Water Runoff 'Curve Number') value after development of the site. The 'CN' is basically the coefficient of the imperviousness of the site. In other words, the CN value is a numeric value used to predict storm water runoff. The CN is determined from soil type, land use, land condition and land treatment variables. It rises in value with the imperviousness of the site, '0' representing no runoff from the site and '100' means the entire rainfall becomes runoff from the site. Vegetated surfaces have lower CN values than impervious surfaces, which have much higher CN values. This makes sense because impervious surfaces generate more storm water runoff.

The report states that the project site's current vegetated pasture (which has a CN of 71) will become a meadow (which has a lower CN of 62) after development of the site. It is my opinion that this assumption makes incorrect generalizations about future site conditions. There is no basis for a significant decrease in CN after site development nor for the major change of land use proposed be the DRS engineer. Therefore, the actual computed post development model results are in substantial error and these computations appear to be far lower than the correct value would be. Typically, the

additions of hard surfaced roadways and other improvements causes the runoff curve number to increase rather than decrease.

Schultz Associates provided calculations at the end of the report which indicate that the one year 24 hour peak storm flows will be REDUCED by approximately 85% AFTER development is completed. Larger storms resulted in runoff differences from pre to post development of even larger gross numerical values than the one year storm. For the two year storm, ten year storm and one hundred year storm, decreases of 73%, 49% and 36% respectively were reported. In my opinion, these results were not based upon sound engineering judgment. Again, the basic storm water model is based on incorrect generalizations about the future site conditions and fails to properly account for the additional impervious surfaces which will cause the runoff curve number to increase rather than decrease.

The effect of the impervious solar panel hard surfaces continues to be totally ignored. The model should treat them similarly to roof surfaces which are also completely impervious. Sound engineering judgment requires that a compromise CN value be used for areas where solar panels are located. Additionally, it should be assumed that the construction traffic (foot traffic and equipment traffic) between the solar arrays will compact soils in such a way to surely increase runoff characteristics.

Section 2.15.3 states that there will be no significant changes in project hydraulic characteristics after development, a statement that is drastically contradicted by this report's own results. In order to support this assumption the site would have the same land use both before and after construction whether or not a vegetated pasture or meadow is chosen for the analyses. The reduction of the CN from 71 preconstruction to 62 post construction is based upon model numerical results which are not supported by my general engineering experience. Typically, the additions of hard surfaced roadways and other improvements causes the runoff curve number to increase rather than decrease.

The model should be reworked as follows:

1. Better discretize the site area into subcatchment areas which mirror the areas for which specific times of concentration have been determined.
2. Define and calculate the entire drainage basin flow characteristics including upland areas. Ignoring upland areas could inaccurately skew the model results.
3. Better determine the areas that drain directly to wetlands as again this may have an impact on the results. The wetlands themselves should be included in the storm water model where outflow is directed towards the Fox Road site entrance location.
4. Results of the model should be reviewed to determine if results are reasonable. If, as the case is now, results are not reasonable, model input needs to be reevaluated until the model results are determined acceptable.

Section 2.16.2 and 2.16.3
The SWPPP report now says that only 1,065 Sq Ft. or 0.024 acres of the site are impervious. Previously 1.1 acres and then 2.6 acres were reported impervious and/or disturbed in the original Environmental Assessment Form and description for the project.

Increased imperviousness and disturbed areas are generally known to increase the potential for additional storm water runoff.

The developer first proposed roadways that were impervious and now indicates, based upon minor material changes only, that the roads can be made pervious. Again, engineering judgment requires that a compromise be made in determining this CN value and the model input should be so adjusted. Roadways need to be treated specially when considering drainage design impacts. Roadways substantially increase storm water runoff as well as concentrate the flow into a smaller area with substantial decreases in times of concentration. The increased flow rates following development will generally require additional improvements including roadside swales and roadway culverts as necessary. Without such treatment the roadways and surrounding areas are in danger of being washed out under a significant storm event. No such improvements nor information is shown on the Preliminary Plan which again we believe lacks the necessary site grading and details to make the plan complete.

Section 3.1.A.1.
The geotechnical report indicated that rock is part of the spoil to be removed from the site. The geotechnical report also indicated that rock would likely be encountered during the course of the work, especially when auguring for the solar cell foundation structure. How will the rock be handled on and off the site? It is likely that heavy equipment including augers and drilling equipment, excavators and/or backhoes minimum will be needed when rock is encountered. The heavy equipment along with construction and solar cell array delivery and solar cell mounting equipment will be substantial and will likely destabilize the native fragile ground and ground cover. This can be expected to create mud, vehicle tire ruts and conditions which we believe will be nearly impossible to deal with without at least some improvement of the lanes between solar array rows. The statement in the SWPPP report that construction vehicles and equipment between solar arrays should avoid compacting soils is of course absurd and impossible to control. Currently, no topsoil stripping nor stone utilization is proposed in these areas which is unrealistic in this climate. Of course, the creation of such hard surfaces will greatly increase the storm water runoff from the site after development unless the same hard surfaces are removed after completion of the work.

The only temporary soil erosion control method referred to is the temporary seeding to be used in disturbed areas. The plans also indicate filter fabric silt fencing along portions of the boundary of the site and topsoil stock pile locations. A stabilized construction entrance is proposed that will likely become overwhelmed with the mud and debris created by the construction in the manner in which it is proposed. This could cause tracking of large amounts of mud on public roadways.

This section also indicates that bituminous pavement will be used for roadways in contradiction of other areas in the report and on the plans. The Town may wish to consider reinforcing its own Fox Road pavement in the area where heavy construction vehicle traffic will enter and leave the site.

The plans provide no facilities for soil sediment control basins, rock dams, staked straw bales, storm water retention basins nor any other such facilities. Such erosion management controls would deal with construction and/or permanent changes in the character of the solids bearing and increased storm water runoff from the site even if

only storm water retention swales, rain gardens or infiltration basins were specified and located. In my opinion that these changes will become necessary during the course of the work to properly treat the site storm water runoff.

Section 3.10 Final Landscaping, seeding, etc. does not appear to match plans for final treatment of grassed surfaces as discussed elsewhere in the report. The seeding is of typical household variety rather than a 'meadow mix' elsewhere proposed by DRS.

Section 4.1. States that if the project contains any traditional impervious areas after development, these need to be addressed in post construction storm water management controls. The proposed roadway falls into this category and requires some permanent method of storm water management. Such improvements need to be shown on the plans with proper detailing included. Also, significant changes in topography require addressing storm water runoff quantity control structures and sizing. We have not yet seen a final grading plan for the site so it is impossible to know the level of required grading for the work. Grading work will be required for the access road and solar pv system installations. Major areas of the site have 7.5% to 15% + grades which preclude basic solar panel installation as this requires relatively level surfaces.

Section 4.1.C. Hydrologic and Hydraulic Summary Results
We do not believe that the Hydrocad model has received proper input in order to determine with reasonable accuracy the final pre and post development storm water conditions of the site. Each of the storm conditions was modeled in a way which drastically underestimates the amount of storm water runoff following project development. We recommend this portion of the study be entirely redone taking into account the items we discussed earlier.

Please contact me with any questions.

Sincerely,

Rod Prosser

Rod Prosser, PE, President, Lakeside Engineering, PC