| | |
|---|---|
| **From:** | Bennett, Jim |
| **To:** | Trey Driscoll (tdriscoll@dudek.com) |
| **Cc:** | Gungle, Ashley |
| **Subject:** | P12-007 Rugged Solar - Groundwater Comments |
| **Date:** | Thursday, August 08, 2013 1:51:00 PM |
| **Attachments:** | Copy of PDS2012-3300-12-007-PDS-PLN-Specialist Checklist-Groundwater.xls<br>Groundwater Demand for 50% Reduction in Storage Calcs.xlsx<br>Drawdown_Calc_Jacob_Eq_RuggedWells6a_6b.xlsx<br>Drawdown_Calc_Jacob_Eq_RuggedWells8.xlsx |

---

Trey,

Comments for Rugged Solar attached. I'm reviewing Pine Valley study next.

Thank you,

Jim Bennett, P.G. #7707, CHG#854
Groundwater Geologist

County of San Diego
Planning & Development Services
5510 Overland Avenue, Suite 110, San Diego, CA 92123
Phone: 858-694-3820 Fax: 858-694-3373

# ATTACHMENT A
## *PROJECT ISSUE CHECKLIST*

| DPLU (Department of Planning and Land Use) Planning and CEQA Comments | | | | | |
|---|---|---|---|---|---|
| **Item** | **No.** | **Subject Area** | **Issue, Revision or Information Required** | **Issue Resolution Summary (Include Conditions)** | **Date Identified** |
| | 1 | Project Description | Project Description, Page 51: The project is proposing to provide groundwater for water uses on the project through two wells. Please identify the location of the two wells. Please also provide any well logs for the wells which would be on file with the Department of Environmental Health, and any other information in regard to the wells (well depth, production characteristics, etc.). | | 6/5/2012 |
| | 2 | Project Description | Project Description, Page 51: The project description indicates that water will be provided by two wells and from other sources if there is not enough water from the two wells. It is possible that the construction water required for this project of 73 acre-feet may not be possible to be produced from just two wells. Please have your hydrogeologist evaluate the total production needs during the construction phase and update your project description to identify all possible sources of water for this project. All sources of water are required to be identified now and evaluation of potential impacts to groundwater resources shall be conducted on these sources now. | | 6/5/2012 |
| | 3 | Project Description | Project Description Page 51: The text indicates that less water intensive methods of dust suppression are currently under review. It is strongly recommended that alternative forms of grading/dust suppression be considered to reduce the amount of groundwater necessary for the construction portion of the project. Please update the project description with any alternatives to reduce the amount of groundwater to be utilized as feasible. | | 6/5/2012 |
| | 4 | Project Description | Project Description, Table 3, Page 52: The number of total gallons for site preparation contains a discrepancy. The total should be 22,374,800 gallons, not 32,585,100 gallons. | | 6/5/2012 |

## ATTACHMENT A
## *PROJECT ISSUE CHECKLIST*

| | | | | | |
|---|---|---|---|---|---|
| | 5 | Groundwater | Jim Bennett, County Groundwater Geologist, has reviewed the Draft Groundwater Resources Investigation Report, Rugged Solar Farm Project, prepared by Dudek dated February 2013. The report is inadequate and requires revisions. Comments are provided as follows. | For information purposes only | 3/12/2013 |
| | 6 | Groundwater | Offsite Well Users: Figure 10 needs to be updated to show the location of all off-site well users including the conservation camp well near Well 8 including the conservation camp well. A map showing all confidential well logs that are within the Department of Environmental Health Database will be given to the consultant. Also, highlight all parcels that have been developed with single-family residences. | Resolved. | 3/12/2013 |
| | 7 | Groundwater | Sections 2.6 and 2.7: Please obtain data from confidential well logs located in the nearby area of Well 6a/6b and Well 8. A spreadsheet of existing confidential well logs will be provided by County staff. Please make a request to the Department of Environmental Health to make copies of well logs for the list given to you. Include this data in the report to augment the discussion in Sections 2.6 and 2.7. The text should discuss the range of well yields reported in the well logs, the lithology (residuum/bedrock contact), and range of depth of wells. Since this data is confidential, do not correlate the data with the mapped well locations. | Resolved. | 3/12/2013 |
| | 8 | Groundwater | Section 2.4.1 Construction Water Demand, Page 2-10: The last paragraph indicates that approximately 47 acre-feet of groundwater will be supplied by on-site wells for the construction phase of the project. This should be stated in the executive summary and throughout the report. This number should be based on what is available from Well 6a/6b and Well 8 taking all other projects into consideration that intend on using these wells. It should also be stated that the remaining water to provide the 90.7 acre-feet of water necessary for the construction phase will be imported by offsite sources (if that it the case). The offsite sources should be named in the report and impacts to groundwater resources from those sources are required to be analyzed now. | Resolved. The report indicates 44 acre-feet of groundwater will be supplied from on-site wells fo the construction phase of the project. Imported water will include up to 15 acre-feet for construction phase. Offsite sources include Pine Valley Mutual Water Company and Padre Dam Municipal Water District. | 3/12/2013 |

## ATTACHMENT A
## *PROJECT ISSUE CHECKLIST*

| | | | | | |
|---|---|---|---|---|---|
| | 9 | Groundwater | Section 2.4.1 Construction Water Demand, Page 2-10: The last paragraph indicates that Rough Acres Ranch Campground is using Well 6a. The campground project (P12-021) is in process at the County and has not yet been approved. Additionally, Tule Wind Farm has been approved to use Well 6, 6a, and Well 8 which needs to be discussed and included as part of the groundwater analysis for this project. A maximum of 56 acre-feet of groundwater can be removed for the Tule project from Well 6/6a and a maximum of 20 acre-feet from Well 8 within a nine month period for construction. These maximum uses should be included in the analysis of this project. An additional 2,500 gpd ongoing O&M water use for Tule Wind project will be provided from Well 6/6a and should be included in the analysis. Revise to include all uses that are currently approved to use these wells and the quantities to be utilized. This may impact the amount of groundwater proposed to be utilized from these wells for this project. **8/6/2013: The well inteference calculations don't incorporate drawdown that will occur from the Tule Wind project pumping for construction of 56 acre-feet in 9 months. There will be residual drawdown after pumping. Since this is a rather unique situation, how to include impacts from the Tule pumping will be discussed in an upcoming working meeting.** | | 3/12/2013<br>**8/6/2013** |
| | 10 | Groundwater | Section 3.1.2.1 Runoff, Page 3-5: The runoff was changed based on utilizing a PZN adjustment factor. This factor should not be used since the study is looking at long-term runoff rates at a monthly time scale. Adjusting the PZN would not be appropriate for this type of application. Please use the published non-adjusted values. | Resolved | 3/12/2013 |
| | 11 | Groundwater | Section 3.1.2.1 Runoff, Calculation Spreadsheet: Runoff was not correctly calculated in the spreadsheet for lower rainfall events due to an incorrect IF statement utilized. The IF statement that was utilized was IF P>0.5. Please revise and use the following: IF P=0.2S. Additionally, the report on Page 3-6 should be updated to discuss the average amount of runoff that was calculated for this study from the water balance calculation spreadsheets. | Resolved | 3/12/2013 |

# ATTACHMENT A
## *PROJECT ISSUE CHECKLIST*

| | | | | | |
|---|---|---|---|---|---|
| | 12 | Groundwater | Section 3.1.2.2 Groundwater Production Area Demand: Table 3-3 Existing Conditions should include the Tule Wind Project which has been approved to use 56 acre-feet from Well 6/6a during the 9-month construction phase of its project. This should be carried over into Table 3-4 and Table 3-5. Also the Tule Wind project was approved to utilize 2,500 gallons per day for their ongoing O&M facility which should be included in Table 3-3, Table 3-4, and Table 3-5. | Resolved | 3/12/2013 |
| | 13 | Groundwater | Section 3.1.2.2 Groundwater Production Area Demand: Table 3-6 Existing Conditions should include the Tule Wind Project which has been approved to use 20 acre-feet from Well 8 during the 9-month construction phase of its project. This should be carried over into Table 3-7 and 3-8. | Resolved | 3/12/2013 |
| | 14 | Groundwater | Section 3.1.2.2. Groundwater Production Area Demand: There are export quantities of groundwater to be provided to the Tierra Del Sol Solar Farm project when this project itself does not appear to have enough groundwater to serve its short-term needs. Additionally, these wells are approved to serve the Tule Wind Project which has not been analyzed and must be included. Lastly, the well field has a limited amount of saturated alluvium (~51 to 56 feet based on recent water level readings) which based on projected drawdown in the wells after one year of pumping will be substantially dewatered (180 feet) at a rate of 39 gallons per minute (less than the projected rate of demand during the first year of groundwater pumping). An analysis needs to be performed now on the production capacity of this well field when the alluvium is dewatered as a result of pumping. Please calculate the quantity of drawdown that is anticipated to occur at the projected pumping rate after the alluvium is dewatered using parameters typical of fractured rock aquifer. If the wells cannot sustain the production proposed, maximum pumping rates must be curtailed accordingly. This analysis should be placed in Section 3.2 Well Testing. Given the potential limitations of multiple project uses on a few wells which may not support the proposed demand, it is requested to remove the exportation option from the report. | Resolved | 3/12/2013 |

# ATTACHMENT A
## *PROJECT ISSUE CHECKLIST*

| | | | | | |
|---|---|---|---|---|---|
| | 15 | Groundwater | Section 3.2.1.1. Well Interference in Fractured Rock: Define in this subsection what the total demand from Well 6/6a/6b and Well 8 will be for the project and all other uses to utilize the well. The well interference calculation should include a short-term demand analysis and an ongoing well interference calculation. The pumping during the construction phase should realistically consider whether the well will be pumped 24 hours a day or whether it will be pumped at higher rates for shorter periods each day. It should be clear to the reader what the amount of demand for the one year projection of drawdown is based upon and what the five year projection of drawdown is based upon. The demand should include all other projects which intend on using these wells. **Update 8/6/2013: The project needs to include pumping from the construction phase of the Tule Wind Farm project in the well interference calculations as well as the entire construction schedule & ongoing use anticipated by the Rough Acres Ranch project. This will be discussed at the working meeting on Friday.** | | 3/12/2013<br>**8/6/2013** |
| | 16 | Groundwater | Section 3.2.1.1 Well Interference in Fractured Rock: Update to include a table of the closest well users within 1 mile of each of well sites indicating the APN, Well Name, distance from proposed pumping wells, and the use of the well. For residential parcels, the nearest property line should be used. APN 611-091-07 (property line) is located 1,742 feet from Wells 6/6a/6b. Please correct the text to include this as the closest residential land use with a well in proximity of the Well 6/6a/6b. | Resolved. | 3/12/2013 |

| | | | | | |
|---|---|---|---|---|---|
| | 17 | Groundwater | Section 3.2.1.2 Groundwater-Dependent Habitat, Page 3-22 and 3-23: The text states that 7.3 feet of drawdown would occur in an area with Coast Live Oaks with the projected water table to be 21.3 feet below ground surface. It was concluded that this would have no impact to the trees since they have been documented to have rooting depths up to 36 feet. There have been documented cases in which sudden decreases in water levels of just 3 feet caused sudden death to phreatophytes in the desert southwest which are the basis of the County's 3-foot threshold within the County Biological Guidelines. This subsection will be required to be reviewed by a County Biologist to determine whether or not the decrease in water levels will result in any impacts to phreatophytes. | Resolved. | 3/12/2013 |
| | 18 | Groundwater | Section 3.2.2.2. Wells 6a and 6b Test Analysis: On Page 3-27 projected drawdown was included at one and five years using the Cooper-Jacob straight line method at 39 gallons per minute which was the rate that the aquifer test was performed. Please update to 88 gallons per minute to match the rate used in the Cooper-Jacob approximation of the Theis Non-Equilibrium Flow Equation and is representative of the project anticipated flow rate. | Resolved. | 3/12/2013 |
| | 19 | Groundwater | Section 3.2.2.2 Wells 6a and 6b Test Analysis, Page 3-28: Include a table with the results of the drawdown analysis at distances of 50, 100, 250, 439, 500, 750, 1000, 1,742, 2,640, and 5,280 feet. For any numbers in which the Coefficient u exceeds the cutoff for method solution, please indicate this as an asterisk or other symbol within the table. Please include both a short-term well interference analysis of one year of pumping at projected rates and a five year projection of drawdown. | Resolved. | 3/12/2013 |
| | 20 | Groundwater | Section 3.2.2.2 Wells 6a and 6b Test Analysis: Include a separate analysis to evaluate impacts on drawdown when this well field dewaters the upper alluvial aquifer. A meeting should be held between the applicant's hydrogeologists and County staff to develop the parameters to be included. | Resolved. | 3/12/2013 |

# ATTACHMENT A
## *PROJECT ISSUE CHECKLIST*

| | | | | | |
|---|---|---|---|---|---|
| | 21 | Groundwater | Section 3.2.2.4 Well 8 Test Analysis, Page 3-32: Include a table with the results of the drawdown analysis at distances of 50, 100, 250, 500, 750,1000, 1,800, 2,640, and 5,280 feet. For any numbers in which the coefficient u exceeds the cutoff for the method solution, please indicate with an asterisk or other symbol within the table. Please include both a short-term interference analysis of one year of pumping at projected rates and a five year projection of drawdown. | Resolved. | 3/12/2013 |
| | 22 | Groundwater | Section 3.2.2.4 Well 8 Test Analysis, Page 3-32: The five year projected drawdown in Well 8 indicates 345 feet of drawdown which would be very close to dewatering the entire well. Considering the interface between broken rocks and D.G. and solid bedrock is at 310 feet, there is likelihood that pumping at depths below 310 may be unproductive. Please revise the report to discuss whether the well will be able to handle the flow rates anticipated based on the lithology and projected drawdown within the well at 5 years. | Resolved. | 3/12/2013 |
| | 23 | MAJOR PROJECT ISSUE, Groundwater | Section 3.2.3. Well Test Analysis, Significance of Impacts Prior to Mitigation, First Paragraph: The first paragraph should be revised to summarize the significance of impacts from the construction phase of groundwater pumping and then the ongoing water use based on well interference calculations. **8/6/2013: Table 3-21, Drawdown calculations contained an error in the formula which resulted in an underestimation of drawdown to occur from project pumping. The formula, s=0.183Q/T * LOG 2.25 T/t2/s included "1,000" instead of "T" in the first part of the formula. All results require to be revised throughout the well interference analysis section.** | | 3/12/2013<br>**8/6/2013** |

| | | | | | |
|---|---|---|---|---|---|
| | 24 | Groundwater | Section 5.5 Mitigation Measures: Based on revised well interference analysis, it will be necessary to develop a maximum amount of groundwater that can be safely pumped during the construction phase without resulting in significant well interference impacts on the closest well users to Well 6a/6b and Well 8. Additionally, a maximum amount of groundwater will also be established for the ongoing water use needed. Development of a Groundwater Monitoring and Mitigation Plan will be required which will require monitoring wells in both locations with thresholds in which pumping shut-down requirements would be included to ensure impacts to off-site wells remain less than significant. After the groundwater investigation is revised with the above changes requested and reviewed by County staff, a meeting will be setup to discuss the details of this plan. The plan will need to consider groundwater pumping from existing groundwater use, Tule Wind Farm (P09-019), Rugged Solar (P12-007), and the Rough Acres Ranch Campground (P12-021). It is clear that these projects during the construction phases will need to be coordinated so as to have no overlap in groundwater pumping since the wells could not support the level of demand required. | Resolved | 3/12/2013 |
| | 25 | Groundwater | Imported Groundwater: Once the groundwater investigation is revised and the amount of water to be produced from Well B is finalized, the amount of water to be imported to the site will be known. Prior to public review, the project will be required to have identified all offsite water sources to provide the imported water to the site. If the water sources are from groundwater dependent entities, a groundwater investigation will be required to evaluate potential groundwater impacts from any of these entities which must be reviewed and approved prior to the project going out for public review. | Resolved. | 3/12/2013 |
| | 26 | Groundwater | Jim Bennett, County Groundwater Geologist, has reviewed the Draft Groundwater Resources Investigation Report, Rugged Solar Farm Project, prepared by Dudek dated July 2013. The report is inadequate and requires revisions. Comments are provided as follows. | For information purposes only | 8/6/2013 |
| | 27 | Groundwater | Executive Summary, Page ES-2: Please remove the second to last bullet from the text. | | 8/6/2013 |

| | | | | | |
|---|---|---|---|---|---|
| | 28 | Groundwater | Executive Summary, Page ES-3: Please remove the last bullet from the text. | | 8/6/2013 |
| | 29 | Groundwater | Section 1.4: Please add the required finding that is required for Major Use Permits from Groundwater Ordinance Section 67.722.B. | | 8/6/2013 |
| | 30 | Groundwater | Tables 3-3 through 3-8, Well 6a/6b and Well 8 Water Demand Scenarios: The water demand for each of these scenarios has been reviewed and changes are requested to each of the scenarios and will be provided in a spreadsheet for your review. These scenarios shall be discussed in the working meeting. | | 8/6/2013 |
| | 31 | Groundwater | 50% Reduction in Storage Results: The results are based on precipitation values that are definitely conservative and perhaps overly conservative given they may be underestimating rainfall by 20 to 25%. It should be discussed in the meeting of adding a scenario to show the results with what is deemed realistic for the project area and also with the more conservative analysis as presented in the report. | | 8/6/2013 |
| | 32 | Groundwater | Table 3-21 and 3-27: Drawdown calculations contained an error in the formula which resulted in an underestimation of drawdown to occur from project pumping. The formula, $s=0.183Q/T * LOG\ 2.25\ Tt/r^2s$ included "1,000" instead of "T" in the first part of the formula. Please revise calculations. | | 8/6/2013 |
| | 33 | Groundwater and Biological Resources | Groundwater Dependent Habitat: Drawdown calculations need to be revised to take into account the error in the drawdown formula as noted above. | | 8/6/2013 |
| | 34 | Groundwater | Well Interference Analysis, Wells 6a/6b: The 60 day, 1-year, and 5-year pumping scenarios have been reviewed and changes are requested to each scenario and will be provided in a spreadsheet for your review. These scenarios shall be discussed in the working meeting. At the nearest property the analysis indicated the pumping will drawdown water levels to below the threshold of 10 feet during the 60-day pumping scenario. This should be discussed within the report. | | 8/6/2013 |

# ATTACHMENT A
## *PROJECT ISSUE CHECKLIST*

| | | | | | |
|---|---|---|---|---|---|
| | 35 | Groundwater | Well Interference Analysis, Well 8: The 60 day, 1-year, and 5-year pumping scenarios have been reviewed and changes are requested to each scenario and will be provided in a spreadsheet for your review. Revised 60-day, 2-year, and 7-year scenarios are provided. For the 2-year scenario there may also be additional demand from a rock crusher/batch plant for the Tule Wind Farm project that have not been analyzed. This will be discussed at the working meeting. | | 8/6/2013 |
| | 36 | Groundwater | Well Interference Analysis, Table 3-20 and 3-26, Hantush Method: The Hantush Method seems potentially like the more appropriate method in which to calculate drawdown for the project. It will be discussed in the working meeting which method is the most appropriate for use on the wells for the project project. It is indicated that the Hantush method was a better fit with drawdown calculations. If that is so, the drawdown calculations should be re-calculated using the Hantush Method. Please only calculate drawdown based on projected amounts to be used in the project scenarios. | | 8/6/2013 |
| | 37 | Groundwater | Page 3-22: Please remove Table 3-22 and 3-28 and all text associated with these tables from the report. Any discussion regarding these tables contained elsewhere in the report should be removed. | | 8/6/2013 |
| | 38 | Groundwater | Jim Bennett, County Groundwater Geologist and Maggie Loy, County staff Biologist, has reviewed the Groundwater Monitoring and Mitigation Plan by Dudek dated July 2013. The report will be required to be revised to take into account changes that will be required within the groundwater investigation report related to the amount of groundwater that can be pumped without causing potentially significant impacts to offsite well users and groundwater dependent habitat. Additional comments are provided below. | | 8/6/2013 |
| | 39 | Groundwater | The number and size of sampling plots should be established for this plan. | | 8/6/2013 |
| | 40 | Groundwater | Add a figure showing the general location of the plots. | | 8/6/2013 |
| | 41 | Groundwater | Consider full data collection on some plots and general health data collection on other plots. | | 8/6/2013 |

# ATTACHMENT A
## *PROJECT ISSUE CHECKLIST*

| | | | | | |
|---|---|---|---|---|---|
| | 42 | Groundwater | The third bullet under Groundwater Mitigation Criteria (Section 3.3) should be: If the groundwater levels drop more than 10 feet below the pre-pumping level and there is evidence of deteriorating oak tree health by the Arborist or Forester, there may be a temporary or permanent cessation of pumping at Well 6a/6b. If the evidence of deterioration persists after the 5 year period, mitigation will consist of off-site wetland/oak woodland credits at a 3:1 ratio. Add the following to the third bullet: "…as long as the wells operate only as intended under the project's conditions of approval. | | 8/6/2013 |
| | 43 | Groundwater | Add to Section 4.0, second paragraph: "… within five working days." | | 8/6/2013 |
| | 44 | Groundwater | Reports are usually due by the end of January of the next calendar year. | | 8/6/2013 |
| | 45 | Groundwater | To ensure you have participation from the individuals noted in the GMMP, please obtain signed letter agreements from offsite well users that they are willing to participate in the groundwater monitoring program for the full duration of the program. Without their participation, the project would require on-site monitoring well(s) to be drilled and monitored. | | 8/6/2013 |
| | 46 | Groundwater | In the working meeting, please be prepared to explain the 15-foot threshold in proposed monitoring well MW-SPB. Additionally, the Hantush Method might be more appropriate to apply a threshold in this monitoring well. | | 8/6/2013 |
| | 47 | Groundwater | Baseline pre-pumping groundwater conditions: Please discuss the fact that there are three projects (Tule, Rugged, and Rough Acres Ranch) which will be utilizing Wells 6a/6b and Well 8. The baseline water levels for the project will be required set prior to pumping from any of these projects. Therefore, it is the responsibility of Rugged Solar to drill the monitoring wells prior to any of the three projects commencing groundwater pumping to establish the baseline at that time. The GMMP should state this as a requirement. | | 8/6/2013 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**ATTACHMENT A**

***PROJECT ISSUE CHECKLIST***

| | | | | | |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |

| SUBMITTAL REQUIREMENTS FOR SCOPING/ITERATION LETTER | | |
|---|---|---|
| **Date Requested** | **Name of Study** | **Number of Copies Required** |
| | Groundwater Investigation Report | Planner (1); Groundwater Geologist (1) |
| | Well Test Plan (submitted via special handling form) | Planner (1); Groundwater Geologist (1) |

| | Scoping | Well Test Plan |
|---|---|---|
| Date Submitted: | N/A | |
| Date of Study: | No Study yet | |
| Name of Specialist Reviewing: | Jim Bennett | |
| Date of Site Visit (if applicable) | N/A | |
| Enter balance of DPLU account (check KIVA financial resp. screen): *If funds are not adequate to complete your review, stop review and email project manager asking how to proceed* | | |
| MOU Required and Submitted? (Yes, No, or N/A) (required if project scoped on or after July 1, 2006) | N/A | |
| Consultant on applicable list? enter "yes", "no" or "N/A" | N/A | |
| Does study comply with applicable Guideline for Determining Significance and Report Format and Content Requirement? (Yes, No, or N/A) *Required if project was scoped after approval of the relevant Guideline* | N/A | |
| Make KIVA entry made in the "comment" field. Enter either "Incomplete","Accepted" or "Accepted with Minor Revisions" | N/A | |
| If study accepted, have you completed Initial Study Responses and provided Project Manager with Conditions and/or Mitigation Measures? w | N/A | |
| Completed Consultant Evaluation Form and emailed to Don Kraft? Always fill out form if Guidelines not followed, for notable poor performance, and when review is accepted. | N/A | |

| First Iteration | Second Iteration | Third Iteration | Fourth Iteration | Fifth Iteration |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |