

From: Bennett, Jim
To: [Trey Driscoll \(tdriscoll@dudek.com\)](mailto:Trey.Driscoll@dudek.com)
Subject: Tierra Del Sol Comments
Date: Thursday, August 08, 2013 10:39:00 AM
Attachments: [Copy of PDS2012-3600-12-005-PDS-PLN-Specialist Checklist-Groundwater.xls](#)

Trey,

Here are the Tierra Del Sol comments including review of the GMMP. I'll be providing Rugged comments hopefully in the next couple of hours.

Thanks,

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

County of San Diego

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**ATTACHMENT A
PROJECT ISSUE CHECKLIST**

| PDS Planning and CEQA Comments | | | | | | |
|--------------------------------|-----|---|--|--|-----------------|---------------|
| Item | No. | Subject Area | Issue, Revision or Information Required | Issue Resolution Summary (Include Conditions) | Date Identified | Date Resolved |
| | 1 | Groundwater- MAJOR PROJECT ISSUE | Groundwater information received from Dudek in a memorandum dated July 23, 2012 indicates the project will require approximately 550,000 gallons per day of water during a 40 day peak demand period. This would equate to 381 gallons per minute of production if wells were pumped 24 hours a day over a 40 day period. It is unlikely that the existing 7 on-site wells would have combined ability to pump 381 gallons per minute. Off-site water will likely be required to supplement on-site groundwater demand. These offsite source(s) need to be identified now and impacts to groundwater from off-site source(s) need to be evaluated. | For information purposes only | 8/15/2012 | |
| | 2 | Groundwater - Well Test Plan | The County Groundwater Geologist has reviewed the Well Test Plan dated July 2012 prepared by Dudek. The plan is accepted with one comment below. | For information purposes only | 8/15/2012 | |
| | 3 | Groundwater - Well Test Plan | Besides the monitoring of on-site wells, It will also be required that ALL property owners located within 1/2-mile radius of the Well B be contacted and asked whether they wish to participate in having any of their wells monitoring during the well testing of Well B. Please send letters to each property owner and include a list of property owners contacted in the groundwater investigation. All groundwter level data collected from each offsite well shall be compiled within the groundwater investigation. | Resolved. Property owners within 1/2-mile radius of Well B were conacted via mail and site visits with the property owners by applicant's hydrologeologist. Wells were monitored for those who volunteered | 8/15/2012 | 8/6/2013 |
| | 4 | Groundwater | Jim Bennett, County Groundwater Geologist, has reviewed the Draft Groundwater Resources Investigation Report, Tierra Del Sol Solar Farm Project, prepared by Dudek dated December 2012. The report is inadequate and requires revisions. Comments are provided as follows. | For information purposes only | 3/12/2013 | |

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|---|-------------|--|------------------------|-----------|----------|
| 5 | Groundwater | Well Interference Analysis, Offsite Well Users: Figure 10 needs to be updated to show the location of all off-site well users. A map showing all confidential well logs that are within the Department of Environmental Health Database will be given to the consultant along with confidential well logs. Figure 10 should be updated to reflect these additional well locations. Also highlight all parcels that have been developed with single-family residences. | Resolved. Map revised. | 3/12/2013 | 8/6/2013 |
| 6 | Groundwater | Sections 2.6 and 2.7: County staff has obtained data from 14 confidential well logs located in the nearby area which will be provided to the consultant. Please 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 | 8/6/2013 |
| 7 | Groundwater | Section 3.1.2.1 Runoff, Page 3-5: Desert scrub was selected as the groundwater cover which has a CN of 49 for A Soils and CN of 68 for B Soils. Please change the numbers in the report to reflect these values. | Resolved. | 3/12/2013 | 8/6/2013 |
| 8 | 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 | 8/6/2013 |

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| 9 | Groundwater | <p>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 3-5 that average runoff would be 2.4 inches or 21% of precipitation. This is incorrect due to adding the amount of runoff that occurred in each of the three soil type areas analyzed and dividing by the total precipitation that fell. Please re-calculate by looking at each individual sub-watershed that was analyzed and comparing the runoff in that sub-watershed to the total precipitation that fell in that sub-watershed. The result will be roughly 1/3 the amount of runoff as compared to what was reported in the study.</p> | Resolved. | 3/12/2013 | 8/6/2013 |
| 10 | Groundwater | <p>Section 3.1.2.2 Groundwater Demand: The project construction water demand appears to be 25.7 acre-feet from Well B as indicated in Table 3-3 and the rest of the water would be imported. However, in the footnote of Table 3-3 it indicates that construction water demand requires a one-time extraction of approximately 39 acre-feet. Please fix this discrepancy. Additionally, under Scenario 4, 21 acre-feet of groundwater is included to be exported to Rugged Solar Farm. Since the project already requires imported water to meet its construction needs, County staff requests that exportation of water to other projects not be included. Please remove exportation of groundwater from Well B from the project.</p> | Resolved. | 3/12/2013 | 8/6/2013 |
| 11 | Groundwater | <p>Section 3.2.1.1. Well Interference in Fractured Rock: Define in this subsection what the total demand of production from Well B is anticipated to be during the project. It is assumed this would be 25.7 acre-feet during the first 11 months of the project and then 4 acre-feet per year for the life of the project. All well interference analysis will be based on the anticipated groundwater demand from Well B.</p> | Resolved. | 3/12/2013 | 8/6/2013 |

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| 12 | Groundwater | <p>Section 3.2.2.3. Well Test Analysis, Significance of Impacts Prior to Mitigation, First Paragraph: A five-year projection of drawdown using the straight line method is the incorrect method to use to evaluate potential well interference impacts on off-site wells. Revise this analysis to evaluate potential well interference impacts on the closest offsite well using the Cooper-Jacob approximation of the Theis non-equilibrium flow equation. Utilize anticipated groundwater demand during the construction period as the first analysis and then a second analysis considering pumping for 5 years at the anticipated ongoing rate of demand. Include distances ranging from 50 feet to 5,280 feet (1-mile) in a Table to summarize potential well interference impacts. 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. A worst-case scenario of how pumping will occur should be evaluated.</p> | <p>Resolved. This was provided in revised groundwater investigation, however additional comments have been made on the results and methodology utilized to calculate drawdown.</p> | 3/12/2013 | 8/6/2013 |
| 13 | Groundwater | <p>Section 3.2.2.3. 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.</p> | <p>Resolved. Revisions still required per comments below</p> | 3/12/2013 | 8/6/2013 |

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| 14 | Groundwater | <p>Section 3.2.2.3. Well Test Analysis, Significance of Impacts Prior to Mitigation, Hydraulic Isolation: Fractured rock aquifer systems are complicated and very difficult to adequately characterize. The spacing, orientation, and interconnectivity of fractures are complex and difficult to thoroughly analyze even with a robust groundwater monitoring network. The pathways of fractured zones at Well B are undefined and may result in potential impacts to nearby wells. Additionally, the well test conducted was for only 72 hours where impacts to wells at the distances monitored for the majority of the wells would be expected to be negligible given the time and the amount of water pumped. Substantial additional characterization of the fractured rock system would be required before the conclusion of hydraulic isolation could be made likely far beyond the scope of a project of this magnitude. Please remove the statement that the project well production will not exceed the County threshold of significance based on hydraulic isolation.</p> | Resolved. Additional analysis conducted. | 3/12/2013 | 8/6/2013 |
| 15 | Groundwater | <p>Section 5.2. Well Interference, Summary of Project Impacts and Mitigation: The fact that there was not drawdown in the monitoring wells during well testing is not a standard the County employs to indicate whether there will be well interference on off-site wells. This would have potentially catastrophic consequences if used as a standard given the nature of fractured rock aquifers. Rather, drawdown calculations as requested above are the standard. Please revise this section along with any mitigation measures necessary.</p> | Resolved. Additional analysis conducted. | 3/12/2013 | 8/6/2013 |

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| 16 | 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 user to Well B. Additionally, a maximum amount of groundwater will also be established for the ongoing water use needed. A monitoring well network will be required to be setup with maximum drawdown thresholds to ensure impacts to offsite wells remain less than significant. Ongoing monitoring of well RM-1 which is located in the Coast Live Woodland will be required during the construction phase of pumping to evaluate potential impacts to the shallow groundwater system beneath the Coast Live Oak Woodland habitat. 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 and any additional wells needed to be installed for monitoring. | Resolved. Groundwater monitoring and mitigation plan included. | 3/12/2013 | 8/6/2013 |
| 17 | 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. The amount of water to be pumped from Well B still remains to be determined based upon well interference calculations. See comments below for details. | 3/12/2013 | 8/6/2013 |
| 17 | Groundwater | Jim Bennett, County Groundwater Geologist, has reviewed the Draft Groundwater Resources Investigation Report, Tierra Del Sol 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 | N/A |
| 18 | Groundwater | Section 1.4: Please add the required finding that is required for Major Use Permits from Groundwater Ordinance Section 67.722.B. | | | |

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| 18 | Groundwater | <p>Section 3.1 50% Reduction of Groundwater in Storage: For Scenario 2 and 3, please move the water demand for the construction portion of the project to have a start time of July 1983 rather than the start time of July 1982 provided in the analysis. This will allow for analysis of the proposed project's impacts through the longest dry period (Spring 1983 to Dec. 1990) in the 30 year period analyzed. This will change the results to 80% and 78% respectively for minimum groundwater in storage for the 30 year period analyzed.</p> | | 8/6/2013 | |
| 19 | Groundwater | <p>Section 3.1.1.1 Well Interference, bottom of page 3-14: The first bullet point indicates that the calculations assume no rainfall recharge occurs over the 5-year period analyzed. This is true but may not be overly conservative given the fact that twice in the 30 year water balance there was no rainfall recharge estimated during two different periods exceeding 5 years (Dec. 1984 to Dec. 1990, 6 years, and Feb. 1984 to Sep. 2004, 6.5 years). Please remove this bullet.</p> | | 8/6/2013 | |
| 20 | <p style="text-align: center;">MAJOR PROJECT ISSUE, Groundwater</p> | <p>Table 3-11 and 3-12: Drawdown calculations contained an error in the formula which resulted in a gross underestimation of drawdown to occur from project pumping. The formula, $s=0.183Q/T * \text{LOG } 2.25 Tt/r^2s$ included "1,000" instead of "T" in the first part of the formula. For the 60 day pumping scenario at 51 gpm, drawdown was calculated to be 48.3 feet at the nearest offsite well 784 feet away which exceeds the 10-foot threshold of significance chosen to be used for this project. For the 1 year pumping scenario at 17 gpm, drawdown was calculated to be 29.6 feet at the nearest offsite well also exceeding the 10-foot threshold. All calculations have been revised and will be provided in a spreadsheet for your review. During a working meeting, we will discuss revisions required to be made within the report.</p> | | 8/6/2013 | |

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| 21 | MAJOR PROJECT ISSUE, Groundwater and Biological Resources | Groundwater Dependent Habitat: The calculation of drawdown in the report of 1.3 feet after 60 days of pumping within the groundwater dependent habitat is a gross underestimation. Drawdown within the groundwater dependent habitat is calculated at 41.6 feet during the 60 day pumping scenario, 27.1 feet during the 1 year pumping scenario, and 9.3 feet during the 5 year pumping scenario. During the working meeting, we will discuss revisions required to be made within the report and development of mitigation strategy as needed. | | 8/6/2013 | |
| 22 | Groundwater | Well Interference Analysis, One Year and Five Year Scenarios: In the one year analysis scenario, pumping is anticipated to be at 51 gpm for 60 days and then 10 gpm for the remaining 305 days of the year. In the report an average value of 17 gpm was used for the one year analysis It should be discussed in the working meeting whether different methodology should be employed to capture the differences in flow rate throughout the 1 year analyzed rather than using an average rate smoothed out over the period analyzed. This discussion also applies to the 5-year analysis where three flow rates are lumped into an average of 4 gpm over the period analyzed. | | 8/6/2013 | |
| 23 | Groundwater | Drawdown Calculations: The transmissivity rate of 33.48ft ² /day was selected in the calculations which appears to be associated with the Gringarten et. Al Solution Method. Please justify the use of this method over the other methods in the report. Additionally, in the executive summary it discusses that transmissivity was 30.48 ft ² /day on average. Please revise to 33.48 ft ² /day if in your professional opinion the Gringarten et al solution method was the best fit of the analysis methodologies. | | 8/6/2013 | |

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| 24 | MAJOR PROJECT ISSUE, Groundwater and Biological Resources | Impacts Prior to Mitigation, Mitigation Measures, and Conclusions: The project pumping as analyzed within the report would result in potentially significant impact to groundwater resources based on the well interference calculations both to nearby well users and to groundwater dependent habitat. Curtailment of on-site groundwater to take into account the drawdown calculations will be necessary to avoid potentially significant impacts. In the working meeting we will discuss revisions required to reduce impacts to groundwater resources and groundwater dependent habitat to a level that is less than significant. | | 8/6/2013 | |
| 25 | Groundwater | Please remove Scenario 4 from the impacts analysis for the 50% Reduction of Groundwater in Storage. Any discussion of Scenario 4 in the report should be removed. | | 8/6/2013 | |
| 26 | Groundwater | Page 3-22: Please remove Table 3-12 and all text associated with this table from the report. Any discussion regarding this table contained elsewhere in the report should be removed. | | 8/6/2013 | |
| 27 | Groundwater | Minor Edit: In Scenario 1 of the cumulative impacts analysis, June 1983 was reported with 16.78" of precipitation which should be reported as 0.00". | | 8/6/2013 | |
| 28 | Groundwater | Minor Edit: Table 3-6 is missing the explanation of footnote a). Please include. | | 8/6/2013 | |
| 29 | 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 | |
| 28 | Groundwater | The number and size of sampling plots should be established for this plan. | | 8/6/2013 | |
| 29 | Groundwater | Add a figure showing the general location of the plots. | | 8/6/2013 | |
| 30 | Groundwater | Consider full data collection on some plots and general health data collection on other plots. | | 8/6/2013 | |

SUBMITTAL REQUIREMENTS FOR SCOPING/ITERATION LETTER

| Date Requested | Name of Study | Number of Copies Required |
|-----------------------|--|--|
| | Revised Groundwater Investigation Report | Planner (1); Groundwater Geologist (1) |
| | Revised Well Test Report | Planner (1); Groundwater Geologist (1) |
| | Revised Groundwater Information | Planner (1); Groundwater Geologist (1) |

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

