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Date: July 28, 2010

Re: PacifiCorp's 2008 Integrated Resource Plan Update, Docket No. 09-2035-01, Geothermal Resource Study

**RECOMMENDATION:** No action at this time is required. The comments herein constitute the Division's preliminary comments on a draft of the Company's geothermal report. Further review will be required when the Company files the final report on August 10, 2010.

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## I. BACKGROUND

On July 19, 2010, the Company submitted to the IRP mailbox its draft report titled "Power Generation, Geothermal Resource Study." The Company requests comments on the draft report by July 28, 2010 and intends to file the final version on August 10, 2010, with the Utah Public Service Commission. The Division provides limited comments on the draft report herein.

## II. DISCUSSION

PacifiCorp (Company) contracted with Black & Veatch and GeothermEx (BVG) to review geothermal resource areas near its service territory and to evaluate the commercial viability of

these projects. This was a high-level review and screening. In particular, site-specific issues, which affect final development costs, are not addressed. Examining over 80 geothermal resource areas near the PacifiCorp system, BVG identified eight high-quality, commercially viable sites. These geothermal sites were then selected for more in-depth analysis. Results for the eight geothermal sites are compiled in a summary table. The estimated levelized cost of energy ranges from \$46/MWh at the Roosevelt site in Southwestern Utah to \$100/MWh at Raft River, Idaho, and Crystal-Madsen, in Northern Utah. Appendix A lists potential geothermal development prospects. Appendix B presents more detailed information on the eight sites that met the commercial viability criteria.

Overall, the report was well-written. Minor editing corrections include: (1) removing the footnote in the Table 4-1 table title in the table of contents; (2) correcting footnote b in Table 1.1 by removing the number “7”; (3) changing “one” to “on” on page 3-8 in the wording “Medicine Lake to come on line ...”; (4) change “position” to “ownership” on page 3-14 so that “The land ownership at Cove Fort is a mix ...”; (5) footnote 4 on page 5-3 should have a comma after “July 9,” not a period; and (6) punctuation and spacing in the “Notes” column of Table 5-1 through 5-8 could be improved.

The section “5.2 Anticipated Importance of Land Use Conflicts” is somewhat uneven. A table that lists and defines government agency acronyms would be helpful. Section 5.2 has the following government agency acronyms that probably should be put into a table and defined: USFS, NLCS, BLM, USGS, NPS, WREZ, and UREZ. A term or concept such as “Citizen-Proposed Wilderness,” should probably drop the reference to a specific state (CA or UT). Also, “Citizen Proposed Wilderness” should be defined and explained more fully, as it is unclear in the draft report how much of a real or potential barrier to development this actually represents. In addition, CA or UT are postal codes, not abbreviations. “Nat’l” should be written as “National.” “Co.” should be written as “County.”

Other more substantive changes include the following items:

- For consistency purposes the report should remove the four sites identified in Appendix A that are in Nevada, outside of PacifiCorp's service region. (It is unclear if they were included only because they were within 100 miles of PacifiCorp's transmission system.)
- Regarding the Crystal-Madsen site in north central Utah, on Page 3-16 BVG states that a discovery well was drilled in 1974. On page 3-2 BGV states that the study only used projects that were in the Confirmation stage or in the Development stage in order to be considered commercially viable or effectively in which a successful Discovery Well has been drilled. However, Appendix A ranks Crystal-Madsen with a maturity index of "1." In this case, Crystal-Madsen would not meet the commercial viability screen. Therefore, the maturity index should be changed to a "2" in Appendix A.
- Appendix A and Figures 2-1 appear to present slightly different information. Possibly this is a result of the printed resolution of the maps. On Figure 2-1 there are two locations, one in southern Utah and one in Oregon that, according to the legend, are 500 MW or above in potential resource capacity. In Appendix A, none of the 84 sites identified are above 500 MW. The two resources with the highest available resource capacity are Medicine Lake, California with 384 MW net capacity, followed by Newberry Caldera, Oregon with 180 MW net capacity. Therefore, either the size of the triangles on Figure 2-1 are incorrect or several sites have been combined to form 500 MW or greater. This is unclear.
- In addition, the legend on Figure 1-1 does not coincide properly with the triangles on the diagram that represent the eight resources selected for in-depth analysis.
- Figure 3-1 is a duplication of Figure 1-1 and has the same schematic problem with the MW potential not matching the proper MW potential of the eight resources.

- Regarding section 5.2, the kind of land use conflicts examined in the BVG report is far from exhaustive (e.g. does not include archaeological, endangered species, military, wilderness, etc.) If these were found not to be problems at any of the eight projects examined, that should be stated.
- Table 5.5 cites the Cove Fort area as being within a national forest. In fact, only a small corner of the area is in forest service land. Moreover, that corner is where an old power plant was located, i.e. it has already been used for generation and is not a greenfield.
- Tables 5-7 and 5-8 cite "WREZ wildlife areas." The report does not explain or describe what this means. Does it present any legal bar to development?
- The report should point out that Blundell is already permitted for existing facilities and (presumably since some new wells have actually been drilled) for expansion. It should also be noted that a 97MW wind farm lies just a few miles from Blundell on private and BLM land, and it was permitted without any wildlife issue, in spite of Blundell's being listed in the report as being in or near both a WREZ wilderness and wildlife area and a "Citizen Proposed Wilderness" area.. It is also fairly near and on land very similar to Thermo. Thermo's facilities - so far – seem not to have raised any environmental issues.
- The report should explain the rationale for assuming dry cooling at Medicine Lake, as well as what effect that assumption has on project economics (dry cooling versus wet cooling).
- The Company (or the BVG report) should explain the rationale for only evaluating projects in the confirmation stage. Why does the report not also examine projects for which a successful exploratory well has been completed?

- BVG did not evaluate any sites for which confirmation wells have not been done, meaning BVG did not look at anything (with the exception of Blundell) that is not already being developed by someone else and that is pretty far along. The Company should explain why, in the BVG report, there is no analysis of places that PacifiCorp might develop on its own (other than Blundell).

### **III. CONCLUSION AND RECOMMENDATION**

A total potential capacity of 800 MW net was identified as commercially viable sites for PacifiCorp. Overall, the BVG report seems modest, reasonable, and not overstated.

The Division recommends that, in the future, the Company include in its continued pursuit of geothermal resources an analysis of site specific issues that affect final development and costs. In addition, the Company should address in the final report the Division's comments described above. Finally, the Division recommends that when the Company files the BVG report with the Commission, it include a thorough explanation of how the findings from the report will be modeled and/or used in the 2011 IRP. The filing should also include a description of how the levelized cost of electricity identified in the BVG report compares to the total resource cost modeled in the current IRP. The Division appreciates this opportunity to provide comments on the draft BVG report and will provide further comments and recommendations to the Commission once the report has been formally filed.

cc: Dave Taylor, PacifiCorp  
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