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INCOMING
C0070005

PACIFICORP
POWER SUPPLY

Mr. Daron R. Haddock
Department of Natural Resources
Division on Oil, Gas and Mining
1594 West North Temple, Suite 1210
P.O. Box 145801
Salt Lake City, Utah 84114-5801

November 12, 2003

RE: **Review and Comments regarding Revised Cumulative Hydrologic Impact Assessment (CHIA), Canyon Fuel Company, Skyline Mine, C/007/0005.**

Dear Mr. Haddock:

A few weeks ago PacifiCorp requested the engineering firm of Hansen, Allen & Luce, Inc. (HAL) review and comment on the August 26, 2003 CHIA submitted to Mr. Dan Meadors of Canyon Fuel Company. As part of their review, HAL was asked to identify those items and issues which in their opinion were of concern, or which they believed needed clarification. PacifiCorp has reviewed the observations and conclusions made by HAL (see Attachment), and the opinions stated therein generally reflect the position of PacifiCorp as they relate to the CHIA. To summarize, Pacificorp believes that the storage capability of Electric Lake, and the Huntington Creek drainage have been adversely impacted by mining activities and the CHIA does not appear to evaluate all of the existing data.

It is important to note that a significant issue identified in the CHIA was that a regional ground water model was in the process of being finalized by the mine. It was further indicated that information provided therein might shed additional light on local and regional ground water conditions. It would appear from our review of the CHIA that this model was being awaited with interest, and that it might add significantly to opinions regarding local and regional hydrogeology.

PacifiCorp has just recently obtained a copy of the modeling report mentioned in the CHIA but were disappointed to find that little to no specific documentation related to the model was submitted. It is our understanding that the submission of the model, including theories, methodologies, equations, input, outputs, and support data are required by the regulatory agency before the model and related conclusions can be accepted. It is PacifiCorp's position that it is imperative that any model generated and submitted be provided for review and comment.

We look forward to discussing these issues further with you after you have taken opportunity to review the materials and requests made herein.

Sincerely;

David Sharp
Plant Managing Director, Huntington Plant

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HANSEN ALLEN & LUCE inc
ENGINEERS

Mr. David Sharp
PacifiCorp Power
Huntington Canyon Power Plant
P.O. Box 680
Huntington, Utah 84528

November 11, 2003

RE: Review and Comments regarding Utah Division of Oil, Gas, and Mining CHIA dated August 26, 2003.

Dear Mr. Sharp:

As requested, we have reviewed the CHIA referenced above and have prepared this summary response for the purpose of 1) identifying issues which we believe to be of importance to a proper understanding of hydrogeologic conditions near Electric Lake, Utah, and 2) clarifying our understanding of PacifiCorp's position regarding statements made within the CHIA. This summary has been prepared to follow the outline presented in the CHIA as we received it so that direct references can be made to specific pages and paragraphs.

Page 3, Paragraph 4

* In our opinion, this paragraph does not adequately portray the issues at hand, and in fact downplays the nature of the event that occurred in 10 Left (10L) in August of 2001. The statement that "...Mine discharges increased incrementally to approximately 11,900 gpm..." gives a feeling that only small, routine, predictable flows were encountered whereas flows were found to increase dramatically at many of the faults encountered. The majority of inflows encountered within the mine in 10 and 11 Left were very large in comparison to other flows encountered historically within the Skyline and adjacent mines. Base flows prior to 1999 (see CHIA Figure 10) were on the order of 400 gpm. All flows encountered and reported in Table 1 (CHIA Page 14) originating from 10 or 11 Left exceeded 900 gpm (over twice the total mine inflow prior to 1999).

* An apparent numerical error has also been made within the paragraph wherein it states that 12,900 gpm was discharged from the mine of which 8,700 gpm went to Eccles Creek and 3,200 went to Electric Lake. Adding 8,700 gpm and 3,200 gpm gives 11,900 gpm, not 12,900 as stated.

* The second to last sentence indicates that "Importantly, the increased flows also increase the water volumes to the reservoir and provide considerably more water to the Price River drainage than natural runoff". Basic engineering principals would seem to indicate that this would constitute a "Trans-basin" diversion of water.

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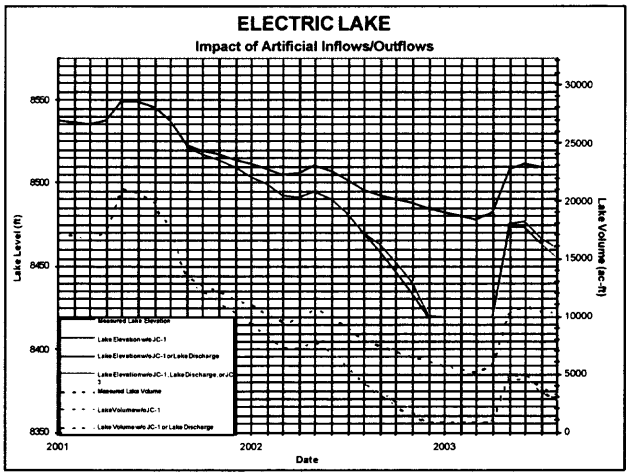
Page 5, Paragraph 3

* Paragraph 3 states that approximately 7,900 acre-feet of water have been pumped to Electric Lake as of August of 2003. Calculations prepared by Hansen, Allen & Luce, Inc. (HAL) show that there has been a total of approximately 10,355 acre-feet inflow from JC-1 and JC-3 during this period of time and another 4,819 acre-feet increased storage impact due to reduced discharges from Electric Lake. According to an agreement between PacifiCorp and the regulatory agencies, discharges from Electric Lake were reduced in September of 2002 from 12 cfs to 6 cfs in an effort to help ensure continued lake discharges.



Plots over time showing recorded lake level and volume, as well as calculated lake level and volume, show total beneficial impacts to Electric Lake (due strictly to mans influence via JC-1, JC-3, and reduced outflows) of only 7,614.3 acre-feet. This data, shown in the inserted graph illustrates conclusively that a significant quantity of the water (± 50%) being either pumped into Electric Lake or stored through reduced discharges was lost from the lake.

It is acknowledged that data shown in the graph does not include other factors which could be used to refine the loss estimate such as the added incremental effects of changed surface area on precipitation, inflow and evaporation loss, and incremental impacts to seepage gains or losses due to changed head conditions. It is our opinion that these impacts are relatively minor when compared to other inflows and discharges, and therefore were not included in this simple evaluation. Although the above graph was not specifically included within the June 25, 2003 "Data and Finding Summary" submitted by PacifiCorp to DOGM, the data and similar graphs were available from which the same conclusion could be inferred. The question that remains is, where is the approximate 7,560 acre-feet of unaccounted water that was either pumped into the lake by JC-1 and JC-3, or stored through reduced discharges?

* Paragraph 3 further states that average annual flows within Eccles and Mud Creeks have increased 10 times and 3 times respectively. It is our opinion that these increases are substantial and warrant significant review. The increases documented to Eccles Creek for example are 1,000% of historic normals. It is our opinion that these increases are hydrologic significant and somewhat contradictory to the Statement of Findings that "No evidence of material damage from the actual mining operations has been found..." and "The actual and proposed coal mining and reclamation operations have been designed to prevent material damage to the hydrologic balance outside the permit area". Significant discharges are changing the hydrology of the area by impacting the deep aquifer system that feeds both the Huntington and Price River drainages. It is believed that noted discharges will have both short and long term effects on the regional systems. In summary, it is our opinion that the conditions and impacts outlined within the CHIA are at times contradictory in this regard and need further review and

clarification.

Page 5, Paragraph 4

* Paragraph 4 contains an error. Electric Lake is owned and operated by PacifiCorp, not Huntington Cleveland Irrigation Company. As a point of clarification, PacifiCorp also owns all storage rights within the reservoir.

Page 6, Paragraph 3

* A review of referenced Figure 3a provided in the CHIA shows that the figure is approximately 3 ½ years out of date and does not show current mine workings. The same finding was made for Figure 3b. Hydrogeologic investigations must consider the size, positions, orientations, and locations of important features (including the mine), and their proximity to each other and Electric Lake. It is our opinion the current mine workings and approved buffer zones must be properly shown so that a complete picture is provided regarding interactions of these features.

* Figure 4 shows a water table aquifer significantly above the spillway of Electric Lake. It is our understanding that this represents near surface perched aquifers. As such, water contained within these perched systems at times has been known to move vertically downward and enter mined sections. When encountered, this water usually is characterized by rapidly diminishing roof leakage. Although the water table of the current regional deep aquifer of the Star Point Sandstone is significantly below the spillway elevation of Electric Lake, the historic deep water table appears (based on data available to PacifiCorp) to have been very near the water surface elevation of Electric Lake, indicating a consistent hydraulic link between surface and deep ground waters.

Page 6, Paragraph 5

* Paragraph 5 states that "Information discussed later in this CHIA suggests water may flow through some faults more readily than usually observed." We agree. Findings completed by HAL seem to indicate that the southern and western portions of the permit and surrounding area have greater water movement and potential impact to Electric Lake than areas to the north and east.

Page 8, Paragraph 6

* This paragraph states that "Other major faults in the CIA are high-angle, normal, and run north-south to northeast-southwest. Movement is dominantly down to the west." This statement clearly states that movement is toward Electric Lake. This being the case, then it would be our opinion that the discharge of this westward moving water into Eccles Creek would constitute a "trans-basin" diversion of said water.

Page 9, Paragraph 3

* The last sentence of the paragraph states "The perched systems may provide some flow directly to alluvial and colluvial fill in canyon bottoms…" We agree. In fact, no data has been provided, nor is any available, that would show whether the ±300' drop in regional aquifer has affected these alluvial and colluvial fill flows. It is our opinion that there is a high likelihood that there has been impact but it

can not be demonstrated due to a lack of local data. To our knowledge, no monitoring stations exist that could resolve this issue.

Page 10, Paragraph 1

* Paragraph 1 states "The potentiometric surface follows the topography, with a ground water divide roughly beneath the surface divide, and flow is to the southwest and northeast." This statement conclusively states that there is ground water flow to the southwest, which would be into the Huntington Creek drainage. This being the case, pumping these intercepted ground waters into the Price drainage would constitute a trans-basin diversion of water.

* In discussing the "regional ground water system" the paragraph further states "Water levels in Skyline's monitoring wells fluctuate seasonally, the changes lagging snowmelt and rainfall events by up to two months." Although the CHIA repeatedly claims no influence or interaction (or at least very little) between surface and deeper ground waters, fluctuations of this order and character would suggest a hydraulic connection with the surface. This is emphasized by the fact that only one well was reported in the CHIA to be completed within the upper portions of the Blackhawk above coal mine workings.

* "Until August 2001, a long-term decline of water levels in the wells, typically less than 3 feet per year, was attributed to long-term decreases in precipitation and to dewatering of the aquifer by mining." Data we reviewed shows much more significant declines than that identified prior to August of 2001, and shows that the declines can not be related to precipitation. For example, well 79-35-1A, having data available since 1982 shows an approximate 310 foot decline between 1982 and 2001. Of that amount, 260 feet occurred between 1999 and 2001 (an average of 130 feet/year).

  Observations we see in the data are that 1) the graphs shows continued and relatively consistent declines over the entire 20 year period of record, 2) drought periods are sporadic and intermixed with heavy rainfall periods, and 3) available water level data don't show significant impacts due to flood or drought? It is our opinion that drought has little to do with continued declines, and that noted declines are mostly the result of mine dewatering.

  As a point of clarification, we believe we see two different hydrologic effects resulting from the mining operation. First, general long term aquifer dewatering due to mining, and second, the sudden breakthrough and response in fault/fracture zones resulting from the August 2001 10 Left event. Aquifer systems north of 10 Left appear to have been impacted by general mine dewatering over the past several years, however, they don't appear to be responding to significant changes noted within 10 Left, nor to changes in wells JC-1 and JC-3. Monitoring stations however on the south and west of 10 Left do generally show measurable impacts from JC-1 and JC-3.

Page 10, Paragraph 4

* The paragraph states "...clay content of the Star Point Sandstone is low, fractures are not as readily sealed by clay as in the Blackhawk, and secondary permeability created by fracturing increases the mobility of water through the regional system." We agree, and believe that this supports PacifiCorp's position.

Page 11, Paragraph 2

* We are very interested in reviewing the computer model discussed but reserve comment until we have had an opportunity to review the model, its inputs and outputs. With the magnitude of the issues discussed in the CHIA, we believe it will be imperative that the model and its inputs be provided for review by PacifiCorp and their consultants. Furthermore, it is our understanding of the regulations that the model can not be considered by the Division until all inputs, outputs, methodologies and equations of the model are fully defined and provided. This would clearly include the submission of the model to DOGM for analysis and review.

Page 12, Paragraph 5

* Paragraph 5 states that "Loss of flow just above Electric Lake is attributed to recharge into the alluvium." It is our position that there is a potential for increased alluvial loss due to dewatering of the regional deep aquifer. With faulting and fracturing, dewatering of the deep aquifer in turn has the potential for impacting (through reversed or increased vertical gradients) downward flow through either the regional formations or through faulting and fracturing. Without hard data to prove otherwise, this scenario must be considered as having a likely potential to impact subsurface inflows into Electric Lake.

Page 12, Paragraph 6

* The continued long term decreases (which have spanned 20 years) noted in paragraph 6 are not likely due to drought. A similar conclusion was made in our response to Page 10, Paragraph 1.

* Paragraph 6 states "Ground water flow into the mines can be characterized as: 1) seepage from the coal seams and associated channel sandstones, 2) flow for Blackhawk channel sandstones that have been fractured by faulting and folding, or 3) flow up from the Star Point Sandstone through the Blackhawk by way of faults and fractures." Although flow can originate within the mine under the three scenarios presented, it has been represented by the mine and the CHIA that the great majority of flows are originating under pressure from the floor of the mine and the underlying faulted and fractured Star Point Sandstone. It is this formation that has the highest potential for impact upon Electric Lake, and the formation in which PacifiCorp has identified via recent investigations as containing saturated water flow paths between Electric Lake and points northward.

Page 13, Paragraph 1

* The general content of this paragraph has been extracted from findings within the adjacent White Oak mine and do not relate to the Skyline Mine. Mine inflows encountered prior to 1999 within the Skyline mine did mimic those described within this paragraph, however, large inflows encountered within 10 and 11 Left do not. A plot entitled "Cumulative Ground-Water Inflow to Skyline Level-2 Mine" provided by Skyline Mine, of which DOGM has a copy, shows 14-Left, 16-Left and Diagonal Flt flows significantly decreasing over time. Flows however from the Gob, 10-Left, East Sub-x5, 11-Left-x24, 11-Left-su, and 11-Left-x40 all show relatively constant flows throughout their entire period of record. In-house hydraulic calculations prepared by Hansen, Allen & Luce, Inc. (HAL) demonstrate very effectively that the majority of flow declines are not likely attributed to dewatering or draining of a local perched aquifer, but instead are due to a general lowering of the ground water

potentiometric surface due to mining activities. Although some variation has been noted, net flows from the Gob have actually increased over time.

Page 13, Paragraph 4

* The paragraph states that "In addition, the no mining buffer zone ***should*** (bold, underlining, and italics added) separate mine workings from main sections of the fault along Huntington Creek and Electric Lake." With the data and studies that were presented to DOGM it is our opinion that it is supposition on the part of Skyline Mine and DOGM that it hasn't already impacted the hydrology of Electric Lake. No data exists that prove that the "no mining buffer zone" is properly functioning.

Page 14, Table 1.

* Data presented in the table is contradictory to data found in the July 2002 PHC per information provided by the mine. The following table generated by HAL illustrates the conflicts. The majority of the discrepancies show that the CHIA has used a lower initial flow estimate than earlier numbers. Why have these changed?

Inflow Location	Date	Estimated Initial Flow, gpm	
		July 2002 PHC	Aug 26, 2003 CHIA
14-Left HG	03/1999	1,800	1,600
16-Left HG	12/1999	1,600	1,200
W. Submains (Diagonal)	03/2000	1,200	1,000
10-Left	08/2001	6,000	6,500
E. Submain XC5	10/2001	???	1,000
11-Left HG XC24	02/2002	1,000	1,000
11-Left HG XC40	02/2002	1,000	1,000
11-Left Setup Rm.	02/2002	???	1,500

Page 14, Paragraph 1

* Paragraph 1 states "Of the five (5) major inflows encountered between March 1999 and October 2001, total inflows have decreased from 11,000 gpm to 4,470 gpm as of June 2003; a 59 percent decrease." Although this appears to be technically true, there are some underlying issues that are not discussed. First, the CHIA indicates that flows decreased from 11,000 gpm, and by so doing makes the statement that 11,000 gpm was the peak inflow during that period of time. Data provided by the mine in August of 2003 as referenced above in response to Page 13, Paragraph 1, only shows a peak flow of just over 9,000 gpm through the winter of 2001 and a peak inflow of just over 10,000 gpm in the March period of 2002. Earlier statements in the CHIA also indicated a peak inflow of 11,900 gpm. Data shown in the CHIA when compared to that received from the mine are inconsistent. Inconsistencies within the data raise questions as to the validity of the data itself. Which data set is correct, and why the discrepancy?

  Second, the first three inflows encountered have seen the great majority of the decreased flows. The CHIA make it sound like all flows have followed the pattern described. Such is not the case. Of the 4,000+ gpm initial inflow from the Gob, 14-Left and 16-Left stations, only 1,145 gpm is recorded to

be flowing as of July 2003, whereas the great bulk of flows encountered from the 10-Left, East Sub-X5, 11-L:eft-XC24, 11-L:eft-su, and 11-L:eft-XC40 are flowing at or near their original inflow rates. Changes that are noted can easily be attributed to area wide decreases in potentiometric surface rather than aquifer dewatering, and the effects of mine dewatering either through the Eccles discharge or through wells JC-1 and JC-3. The consistency of inflows which have been encountered since August 2001 demonstrate 1) that the inflows are generally of a different nature than inflows previously encountered, and 2) the presence of a continued and renewing water resource.

Third, it is unclear as to what the precise amount of initial inflow into 10-Left was. The graph provided by the mine showing "Cumulative Ground-Water Inflow to Skyline Level-2 Mine" shows it was only approximately 5,500 gpm, however, we have been told at other times that there was significantly more than this amount in the initial inflow. We would like to clarify this issue.

* The last sentence in the paragraph states "Based on ^{14}C age dating and Tritium analysis, the water in the Star Point Sandstone is believed to be of ancient origin and represent an isolated groundwater storage volume that is not in direct connection with the surface." We have two comments regarding this statement. First, tritium data (as discussed elsewhere in the CHIA) has shown a significant increasing trend within the mine indicating an increasing contribution of surface waters. Second the statement itself is inconsistent with an earlier statement made in the CHIA regarding seasonal variation in water levels and surface water influence. This later issue was brought up via our response to Page 10, Paragraph 1.

Page 14, Paragraph 2

* The paragraph makes the statement that "Only one well, JC-1, produced appreciable water and is currently pumping at about 4,000 gpm. This pumping was only marginally successful at reducing inflow waters and was estimated to reduce the inflow no more than 800 gpm while the well was pumping 2,200 gpm (HCI)." Well and orifice flow equations prepared by HAL show that this is as expected. A reduction in head caused by pumping of JC-1 in the immediate vicinity of the 10-Left inflow is expected to produce a decrease in flows within the mine on the order of that identified. This fact helps confirm 1) the interconnected nature of the local geology and that the hydraulic characteristics of the area are such that there is a high potential for the mine to impact adjacent areas, and 2) that Well JC-1 does not intercept all the water within the fault fracture system connected to the mine.

Page 15, Paragraph 3

* Paragraph 3 attempts to illustrate through example, the relative impermeability between upper and lower geologic units. A review of regional wells by HAL seems to indicate that wells generally south and west of well 79-35-1A show a response to mine inflows and mine dewatering, whereas wells to the north and east do not. This is 1) consistent with comments in the CHIA that the faults and fractures appear to tighten to the north, and 2) that nowhere does the CHIA or mine data show that impacts *are not* being noted at Electric Lake.

Page 16, Paragraph 2

* The second to last sentence indicates that both JC-1 and JC-3 have UPDES discharge permits. This is

not the case. The Utah Division of Water Quality considers Well JC-1 a ground water source and consequently has not required a UPDES discharge permit.

Page 17, Paragraph 1

* The data presented in paragraph 1 averages and utilizes data between 1978 and 2001 which is skewed. If a comparison is to be made showing what base versus impacted conditions are, then the creek drainage data should either only show flows prior to mine discharges, or correct the flows by subtracting out known discharges. Without doing so distorts the data and naturally draws the conclusion that impacts are less than they really are.

Page 18, Paragraph 2

* Paragraph 2 states that "The additional 19 cfs encountered from August 2001 through July 2003 represents 10-times the normal flow encountered in Eccles Creek. The reduction of mine discharge to approximately 6 cfs will represent twice the normal flow (12 cfs) and 17 percent of the maximum flow." Note that the flows discharged are diverting the water from distant underground sources and are well beyond the natural flows of the receiving streams. In fact, the underground sources are west of the ground water drainage divide referenced earlier within the CHIA. It is also important to note that the flows estimated to be lost from Electric Lake are well within the quantities being reported as being discharged into Eccles Creek.

Page 21, Paragraph 1

* Paragraph 1 confirms that the general dip of the geologic strata is to the west when it states "...westward dip of the strata." The natural flow tendency, especially with secondary permeability created by faults and fractures, would be therefore to the west toward the Huntington Creek drainage and not eastward toward the Price River drainage.

Page 21, Paragraph 3

* The paragraph states "In July 2003, PacifiCorp submitted a report to the Division suggesting Electric Lake has been losing a disproportionate amount of water since August 2001, based primarily on the reaction of the lake (Pacificorp – Investigation of Technical Issues related to the Electric Lake and Huntington Creek Controversy June 25, 2003). No number calculation reflecting the calculated volume loss from Electric Lake was provided in the report. The report provides numerous graphs illustrating how the Lake, intuitively appears to be losing water. However, it is hard to have complete confidence in the graphs because the majority of inflow are a "back-calculation" of data (with the exception of the June 19, 2002, through mid-April 2003 time period). Stage volumes, the leakage of the lake/reservoir, and the effects of the drought all contribute to the response being seen in the lake elevations. Whether the inflows encountered in the Skyline mine are associated with this apparent loss of water, and to what degree, is still being evaluated."

  A significant amount of data and study results were provided to the Division which in our opinion appear to have been generally ignored in the CHIA. No mention was found at all to the studies completed and hard data that we believe is very relevant (including lake levels and volumes) to the conditions. When data is lacking, as is the case with both the PacifiCorp and Skyline Mine positions,

it is common practice to approximate and/or evaluate the data to the extent completed in the DOGM submittal. In any event, all factors of the data must be reviewed and considered in their totality. The approximation or back calculation of numbers has no effect on the outcome of the evaluation since we were identifying changes in trends, not hard number impacts. Under these conditions, changes in trends become obvious, and even more pronounced when compared to similar historic periods wherein lake levels, lake discharges, and climatological conditions were similar, or in some instances less impacting, thus refuting the claim that the loss is solely due to drought.

In addition, the report did provide, contrary to the claim, calculations or estimates of water loss. These can easily be inferred from Figure 23 and data submitted. It is further the understanding that DOGM has an electronic version of the data from which the graph was derived. If this is not the case, or if it can not be located, PacifiCorp will resubmit the electronic file upon request.

Page 46, Paragraph 1

* The paragraph states "Note that the number of tritium units has increased, yet potentially stabilized over time. The presence of tritium currently observed suggests there is some component / percentage of modern water present in the water being discharged from Well JC-1." We agree, however, this statement is contradictory to earlier statements made within the CHIA wherein the aquifer was defined as an isolated aquifer. It is further our understanding that there has been a substantial amount of tritium testing completed which would appear to be far in excess of that presented in the CHIA. We believe it is important and critical that PacifiCorp be allowed to review and consider all data from all sources sampled.

Page 46, Paragraph 2

* Reference is made in paragraph 2 to the fact that Helium isotope ratios suggest that the water in the 10 Left area is about 2 to 8 years old. This being the case, one must conclude that 1) there is a connection with surface waters, and 2) that the aquifer is not isolated as earlier claimed or stated in the CHIA. The paragraph appears to conflict with earlier statements regarding the isolated yet interconnected status of the deep aquifer.

Page 46, Paragraph 3

* Paragraph 3 states "The 10-Left and JC-1 are the only areas of the mine where a component of modern water has been observed based on age-dating methods." It is important to recognize that inflows within the Skyline mine do not fit the typical profile of inflows encountered elsewhere either locally or regionally. We firmly believe that 10 Left inflows are in direct connection to surface sources, i.e.: Electric Lake, and that this statement is another confirming finding.

  As a point of clarification, it was stated that the 10-Left and JC-1 areas are the only areas wherein modern water was encountered. The CHIA shows very little data to support this statement. It is our understanding that other areas have been evaluated, but little to no data was provided in the CHIA that substantiates the findings and conclusions.

Page 47, Paragraph 1

* The statement was made herein that "Through the 1st quarter of 2003, no obvious changes in flow in the springs, seeps, or elevation in the groundwater wells located in the Blackhawk Formation have been noted due to the significant mine inflows encountered in the Skyline Mine since 2001." It has been our observation that the great majority of mine dewatering of the regional ground water table (± 85%) occurred prior to the 10-Left inflow event of August 2001. We would request a review of all the data to consider impacts over the entire period of record, and that those impacts consider hydraulics and system response to lowered heads. Any long term changes thus noted can not be assigned to drought if they last for periods longer than historic droughts. For example, we have seen continued long term declines in regional water table data that extend for time periods far in excess of the current drought period, and that appear to be clearly connected to mining impacts.

  As stated earlier, we believe that there may indeed have been two hydrologic events that have occurred as a result of mining. The first was and is an ongoing regional dewatering of the aquifer system, and the second, a more measurable impact on surface waters via a direct connection between the deeper aquifer system and Electric Lake.

  In addition, the CHIA says "groundwater wells" when referring to those in the Blackhawk Formation. We have been consistently told that there is only one well located in the Blackhawk, P79-35-1B. Are there more? If so, the CHIA should clarify where said wells are and clarify specifically how the conclusions were made throughout the CHIA based on the hard data.

Page 48, Paragraph 3

* Paragraph 3 states that "Hydrologic impacts to Electric Lake affect everything from wildlife, to agriculture, to power generation along the Wasatch Front." We agree, but were disappointed that more was not said regarding this issue.

Page 50, Paragraph 3

* Paragraph 3 states that "Flows into the mines that persist for more than 30 days should be considered as possibly intercepting surface water through a natural or subsidence induced fracture system." We agree that this is a reasonable scenario for perched or isolated aquifer systems. Consistent with this statement, a look at the graph entitled "Cumulative Ground Water Inflow to Skyline Level-2 Mine" provided by the mine shows that inflows from 14-Left, 16-Left, and Diagonal Flt have all decreased significantly. However, data from the Gob, 10-Left, East Sub–x5, 11-Left-x24, 11-Left-su, and 11-Left-x40 don't show the same significant decrease. They are responding differently indicating a deeper source, and one that may be in contact with the surface.

Page 50, Paragraph 5

* While discussing mine drawdown effects on the perched aquifers of the Blackhawk, the CHIA states "This would have a minimal, probably undetectable effect on perched aquifers or soil moisture… However, if the area involved were large enough, it could be one process leading to measurable interbasin transfer of water. The cone of depression and resulting effects on the overlying unsaturated strata will diminish with time after mining ceases."

Two comments. First, the area is large enough. Even low permeability rates can have a significant impact over a wide area. When considering impacts, we need to continue to think about flow volumes, not flow velocities. One cannot consider velocity alone without evaluating volumes since a low velocity applied over a large area can produce a significant quantity of water.

Second, it is unlikely that pre-mined water tables will ever be restored subsequent to mining. This statement is made by the simple fact that there are 1) more flow paths within abandoned mine workings through which stored water can escape, and 2) mine tunnels have introduced fixed points of overflow into other mine sections that are significantly below pre-mined water table elevations, thus creating a fixed long term water surface elevation. It is highly unlikely that pre-mined water table conditions, and hence, hydrology, will ever be fully restored. This concept was not found within the CHIA.

Page 55, Paragraph 3

* "A longterm increase or decrease of flow in Mud Creek of at least 0.45 cfs would be detected 68% of the time by correlating the October flows of Mud and Fish Creeks." Has this been done, and if so, what were the results?

Page 55, Paragraph 5

* Information provided to date is precisely that requested by this paragraph. We fully expect that continued data collection will only reinforce our conclusion that Electric Lake has been impacted by the Skyline Mine.

Page 57, Paragraph 2

* We strongly disagree with the statement made in this paragraph that "Current information indicates the water being discharged is not adversely impacting the receiving streams/reservoirs, or diminishing flows within the respective basins." Among other things, we firmly believe that 1) there is an inter-basin transfer of water occurring out of the Huntington Creek drainage, 2) that the Price River drainage is receiving the direct benefit of that inter-basin transfer of water, and 3) that there has been, and continues to be a significant impact to the Huntington Creek drainage due to mining impacts.

* Figure 11 uses projected data for the time period subsequent to the submittal of the CHIA. It should be pointed out that this information is not accurate since discharge conditions have changed significantly.

Page 57, Paragraph 4

* Paragraph 4 states "...the increased discharge of mine inflows to the Mud Creek and Huntington Creek drainages are considered to have a positive impact, providing additional water to the Scofield and Electric Lake reservoirs." Data now available and presented earlier in graphical form shows that only approximately 1/2 of all JC-1 and JC-3 artificial inflows are remaining in lake storage. One half (1/2) of the total inflows are being lost through seepage from the reservoir. It is our position therefore that the Huntington Creek drainage is only receiving (through JC-1 and JC-3) a portion of the water that is being lost from the lake as a result of mining. In other words, inflow benefits from JC-1 and

JC-3 do not cover increased lake losses.

It is highly probable, and consistent with conclusions we have in response to reviews to date, that the extreme volumes of water being pumped from the mine into Eccles Creek to maintain mining levels will have a very long impact on the regional hydrology.

Page 58, Paragraph 3

* Paragraph 3 states that "Most of the water currently being encountered by mining is believed to be generated from the deeper regional Star Point aquifer. This deeper aquifer does not contribute directly to the water budget of the Mud Creek or Upper Huntington Creek basins. However, changes in the potentiometric surface may influence recharge and movement of ground water through the overlying unsaturated zone. Because the potentiometric surface is expected to recover to approximate pre-mining conditions after mining ceases, the overlying unsaturated zone should also be expected to recover to approximate pre-mining conditions."

  We disagree with both main points made by this paragraph. First, as stated earlier, pre-mining water table conditions are not expected to be restored. Second, water extracted out of the deep aquifer will be replaced by overlying or underlying water. It has been our finding to date that water being extracted from the mine is likely being replaced by surface water, primarily that of Electric Lake.

Page 58, Paragraph 4

* Paragraph 4 states that "Information provided by the mine indicates the primary source of the mine in-flows is isolated storage in the Star Point Sandstone located beneath the coal seams. When mining ceases, the ground-water balance should return to pre-mining conditions, with no long-term impacts or material damage. The water being pumped from wells JC-1 and JC-3 to Electric Lake occurs to assist the mining operation and will cease when the mining operation is complete." According to information we have, it was PacifiCorp's understanding that the pumping from JC-1 and or JC-3 would continue after mining ceases to maintain water levels within the mine per MSHA requirements.

Page 58, Paragraph 5

* We strongly disagree with the statement "Current information suggest no adverse impacts are being observed in Eccles Creek/Mud Creek or Electric Lake due to the increase discharges of water." We believe the data show a clear impact to waters of the Huntington Creek drainage and in particular to waters of Electric Lake.

Page 59, Paragraph 5

* The paragraph states "There should be no noticeable change of flow in streams in the Huntington Creek drainage. In Electric Lake however, the JC-1 and JC-3 wells have a potential to provide roughly 46 percent of the total volume of the lake on an annual basis should pumping continue." The calculation provided in the CHIA assumes 100% of the inflows remain in the lake. It has been found however after a closer review of recent data (see prior graph) that approximately 1/2 of all pumped inflows appear to be re-circulated. Therefore only approximately 4,800 ac-ft/year storage would be realized by pumping both wells continuously. This amount is far below the additional Electric Lake

losses estimated by PacifiCorp due to mining activities.

* The statement "When current drought conditions reverse and mind*(e)* discharges continue, excessive flows entering the lower Huntington drainage could potentially become an issue." This statement, with respect to continued mine discharges, is in direct conflict with that statement made earlier on Page 58, paragraph 4 wherein it states that "The water being pumped for wells JC-1 and JC-3 to Electric Lake occurs to assist the mining operation and will cease when the mining operation is complete." One states that pumping will continue, the other that it will cease. It is PacifiCorp's understanding, and the basis for a significant portion of the decision to make the investment in wells JC-1 and JC-3, that pumping could continue to help maintain reasonable Electric Lake operations. It is possible that if significantly wetter hydrologic conditions are experienced in the future that could help mitigate losses, that pumping could either be reduced or temporarily suspended by PacifiCorp. However, the possibility that pumping may be required indefinitely to maintain a hydrologic balance similar to historic conditions should be considered.

  Furthermore it should be obvious that any impacts that could be noted within the downstream Huntington Creek drainage would be far less than those currently being experienced by either Eccles or Mud Creeks. This conclusion is made based on the simple observation that flows within Huntington Creek are 1) significantly more than those in Eccles or Mud Creeks, and 2) flows within Huntington Creek are controlled via the reservoir.

Page 60, Paragraph 5

* In reference to Scofield Reservoir paragraph 5 states "...in the short term the increased flow has been beneficial in maintaining water above the dead-storage level during the recent four years of drought." It is our observation and position that the operation of Scofield Reservoir has basically continued on an "operate as normal" basis without significant change. This observation is made by comparing historic versus recent reservoir discharges. Under significant drought conditions, operators of local reservoirs would normally reduce outflows to help preserve storage, thus ensuring a continued source of water. A review of discharges from Scofield Reservoir however don't appear to reflect the type of change in operation which would be expected under drought conditions. A lack of significant change in operation indicates that reservoir inflows and storage volumes are not representative of conditions found regionally nor locally. We agree with the CHIA statement in that Scofield Reservoir is being artificially maintained. Furthermore, it is our opinion that Scofield Reservoir is being maintained via mine discharges at the detriment to the Huntington Creek drainage.

Page 62, Paragraph 1

* We disagree with the Statement of Findings provided in the CHIA that says "No evidence of material damage from the actual mining operations has been found. No probability of material damage from actual or anticipated mining operations has been found. The actual and proposed coal mining and reclamation operations have been designated to prevent material damage to the hydrologic balance outside the permit areas."

  We take opposition to this statement and believe that the evidence is clear as provided in the June 25, 2003 Data and Finding Summary submitted by PacifiCorp to DOGM. Furthermore we believe that there is strong evidence to demonstrate that significant hydrologic and financial impacts have occurred

to Electric Lake and the Huntington drainage.

In summary, we feel that the CHIA as prepared 1) either downplays or does not adequately take into account information provided to DOGM by PacifiCorp, 2) makes concluding statements based on inconsistent and conflicting data, and 3) makes inconsistent statements, findings and conclusions within the document. Because of the inconsistencies found, we recommend that PacifiCorp request that the PHC and supporting data submitted by both the mine and PacifiCorp be re-evaluated by the regulatory agency and that modifications to the CHIA be considered.

Sincerely;

HANSEN, ALLEN & LUCE, INC.

By:

David E. Hansen, Ph.D., P.E.
Principal / Project Manager