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December 6, 1999

Hand Delivered

Utah Coal Program
Division of Oil, Gas and Mining
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DEC - 6 1999
DIVISION OF OIL, GAS & MINING

Copy Daron

Attn: Daron Haddock

Subject: Response to Deficiencies in the Revised Reclamation Plan, PacifiCorp, Deer Creek Mine, ACT/015/018-99C, File #3, Emery County, Utah

#2

PacifiCorp, by and through its wholly-owned subsidiary, Energy West Mining Company ("Energy West") as mine operator, hereby submits responses to the deficiencies of the revised Deer Creek reclamation plan. The revised plan was submitted in May, 1999. PacifiCorp received the deficiencies in the document dated July 7, 1999. Response to the findings was to be completed by August 9, 1999. Because of the extent of the deficiencies, PacifiCorp requested an extension to the response deadline on August 8, 1999. The Division granted the extension request until October 8, 1999.

PacifiCorp again requested an extension to respond to the deficiencies in a letter dated September 30, 1999. This request solicited permission to extend the response period until the end of the year. The Division responded and gave PacifiCorp until December 8, 1999 to resubmit the revised plan.

The reclamation plan for the Deer Creek Mine has been reformatted to the R645 regulations. The remainder of the permit will follow the same format. The permittee realizes that during the interim, several sections of the Deer Creek permit could possibly contain duplicate or conflicting information. The permittee commits to developing a mine reclamation plan that will expedite the review and inspection processes performed by the Division and other agencies.

The attached document attempts to answer the deficiencies in the order they were received beginning with Administrative Information and ending with Hydrologic Information. The Division's findings will be first listed by regulation and explanation. PacifiCorp will follow by a response in *italics*.

Accompanied with this letter are two (2) copies of the reclamation plan. A third copy will be delivered to the United States Forest Serves (Price Field Office) on December 7, 1999.

The following responses to deficiencies are formatted as found in the technical analysis document. They are broken down into logical section headings similar to the R645 regulations. In each section, the regulation number along with the associated deficiency is follow by the permittee's italicized response.

Administrative Information

Application Format and Content

R645-301-121, The applicant did not provide instructions on how to insert some of the material in the application into the mining and reclamation plan. This needs to be done in such a way that page numbers correspond with adjacent portions of the plan and so page numbers are not duplicated.

PacifiCorp, with the agreement of the Division, intended on submitting the revised reclamation plan as a draft plan only. It was assumed that there would be deficiencies in the first submittal of this plan. Therefore, the C1/C2 forms were intentionally not included.

The reclamation plan for the Deer Creek Mine has been reformatted to the R645 regulations. The remainder of the permit will follow the same format. The permittee realizes that during the interim, several sections of the Deer Creek permit could possibly contain duplicate or conflicting information. The permittee commits to developing a mine reclamation plan that will expedite the review and inspection processes performed by the Division and other agencies.

It is the intent of PacifiCorp to submit the revised reclamation plan to supercede all mine reclamation references in Volume 2, Part 4 of the current Deer Creek MRP. The revised reclamation plan will remain separate from the current plan. PacifiCorp commits to a total reorganization of the current MRP incorporating the revised plan after approval

R645-301-123, The Division has no record of receiving a C-1 form with the notarized signature of a responsible official of the applicant indicating the information in the application is true and correct to the best of the offical's information and belief.

As mentioned above, the intent of the first submittal was to submit it as a draft plan only. The second submittal is intended to be an interim plan. When approved, PacifiCorp commits to redeveloping the entire permit to the R645 regulations in which the C1/C2 forms will be included.

If you have any questions or concerns regarding this document, please contact myself at (435) 687-4720 or Dennis Oakley at (435) 687-4825.

Sincerely,

Chuck Semborski
Permitting/Geology Supervisor

Enclosure: Response to Technical Analysis Deficiencies

Cc: Blake Webster
Carl Pollastro
Chuck Semborski
Dennis Oakley
File

Operation Plan

Topsoil and subsoil

R645-301-130, Sampling must be performed by a Certified Professional Soil Scientist or a qualified Soil Scientist. Sufficient information must be submitted with the amendment to enable the division to determine the qualifications of the Soil Scientist for conducting a soil survey.

Nowhere in the R645 regulations can the permittee find that soil sampling must be conducted by a Certified Soil Scientist. R645-301-130 states that technical analysis will be planned by or under the direction of a professional qualified in the subject to be analyzed. All soil samples collected by PacifiCorp employees are sent to a certified laboratory where they are analyzed and reported by professional soils personnel.

R645-301-224 and R645-301-233, The amendment and MRP must follow the Division Guidelines for Topsoil and Overburden to adequately show and delineate the location, acreage, salvage depth and resulting volumes of substitute topsoil areas for both the Reclamation Sampling Program and for the Operation Sampling Program.

The revised reclamation plan has been changed to include an exploration/sampling program. It is proposed that substitute topsoil will be located using a track-hoe excavator at time of reclamation. The plan uses the assumption that there is ample fill material encasing the undisturbed culverts in the Deer Creek and Elk canyons. This material will be removed and stockpiled. Random sampling of this material will be conducted to determine suitability. The Guidelines for the Management Topsoil and Overburden for Surface and Underground Coal Mining (Leatherwood and Duce, 1988) will be used to determine the suitability of this stockpiled substitute topsoil.

PacifiCorp is also committing to sampling the refuse piles in the Deer Creek and Elk canyons. It is proposed to collect samples at 1 foot depth intervals and extend to a depth of four feet below the final contour. The sample locations are identified in the revised plan on Map 2-17, Drawing #CM-10344-DR (submitted as a separate amendment).

Table 2-A-1 contains soil sample data taken in 1980 and 1983. These samples were clearly taken before the Division guidelines were released and are currently included in the existing permit. PacifiCorp feels that although all necessary parameters were not analyzed, this data is pertinent information. Once the sampling of the refuse piles have been sampled and analyzed, the information will be included with Table 200-A-1. Discussion of each of the 1980 – 1983 samples have included in Appendix R645-301-

200-A. Sample locations are included on Drawing 2-17 in Volume 4. This drawing will be updated and submitted as a separate amendment.

Soil samples of the terrace enhancement project will also be included in the above listed table. Samples were collect in November of 1999 and sent to a certified laboratory for analysis. Recall that this project will conduct final reclamation on the pre-SMCRA terraces above the Deer Creek Mine in corporation in Abandoned Mine Reclamation. Reclamation is tentatively scheduled for 2000.

R645-301-232.720, If sufficient substitute topsoil cannot be identified and verified within the disturbance area to achieve successful reclamation, then PacifiCorp will be required to import soil borrow material of the quality and quantity necessary to achieve revegetation standards.

PacifiCorp is confident that an exploration/sampling program, when implemented, will find that the soils within the Deer Creek and Elk canyons will be a suitable topsoil substitute.

PacifiCorp does not find the importation of soil a viable alternative. It is not economical nor practical. If it is required that soils be imported from a borrow area different from the Deer Creek Canyon, non-native vegetation will compete with the intended planted seed mix. Weed seed could also be introduced into the area. Haul distances from a borrow area to the reclamation site would increase the cost of reclamation dramatically.

PacifiCorp commits to an extensive exploration/sampling program. The exploration portion of the program will locate suitable substitute soil to use as cover material where needed. This process will be implemented during the reclamation phase. Sampling will be conducted in the field as the soil is excavated. Determinations for suitability of the soil will me made promptly and all suitable soil will be stockpiled. Sampling data will be recorded and reported to the Division. See R645-301-200: Soils for complete description of the plan.

While the mine is still in an active or operating state, the sampling program will be implemented. Sampling will be conducted on all refuse material locations in the Deer Creek and Elk canyons. Sampling will be conducted according to the approved methods outlined in the Guide Lines for Management of Topsoil and Overburden for Underground and Surface Coal Mining (Leatherwood and Duce, 1988). Once the data is collected, it will be incorporated into the MRP in Table 200-A-1. Sample locations will be included in the plan on Drawing 2-17 in Volume 4 as a separate amendment. Description of this sampling program can also be found in R645-301-200: Soils.

Reclamation Plan

Topsoil and Subsoil

R645-301-242, Clearly and consistently describe within all applicable amendment sections the logistics that will be followed for salvaging and using any identified suitable substitute topsoil during reclamation.

A section is added in the reclamation plan that outlines Topsoil Substitutes and Supplements (see page 2-1 and 2-2 of plan).

R645-301-243, The amendment identifies on-site fills as possible substitute topsoil. However, since sampling is incomplete and does not follow the Division's Guidelines for Topsoil and Overburden, data is inconclusive for making determinations for soil nutrients and amendments.

As reflected above under R645-301-224 and R645-301-233, a soil exploration/sampling is added to the reclamation plan. Refer to the above section for details.

R645-301-244, Define "discontinuous tilling." If tilling is being proposed, the amendment must describe and explain how tilling will be utilized and accomplished in steep terrain reclamation using rocky soils.

Discontinuous tilling was a term used to describe deep gouging or pocking. This is obviously a confusing term and was removed from the plan and replaced with deep gouging (pocking).

R645-301-533.252, R645-301-233 and R645-301-130, the refuse piles and coal mine waste must be covered with a minimum of four feet of the best available, non-toxic and noncombustible material. Since excess fills exist within the Deer Creek portal surface disturbance area, there is no logical reason why a minimum of four feet of material cannot be obtained for covering the refuse. If less than four feet is requested, the amendment and MRP must contain adequate information for the Division to make a determination of waste acceptability. Sampling must follow the Division's Guidelines for Topsoil and Overburden. Sampling protocol must be explained. Sampling must be performed by a qualified person.

This deficiency has been sufficiently explained.

Revegetation Plan

R645-301-341.100, The applicant needs to clarify the reclamation schedule to show compliance with R645-301-354.

Table 3-1 was copied from the currently approved MRP. The intent of the table was to outline reclamation activities over the course of the first year of reclamation. As labeling the header columns as months throughout the year is confusing, Table 3-1 has been changed to indicate the length of time and sequence of each reclamation activity.

R645-301-341, The applicant needs to clarify the sections of the application dealing with surface preparation.

The permittee realizes the confusion using the term "discontinuous tilling". Therefore, "deep gouging" and/or "pocking" have replaced this term.

The section that discusses hay and straw mulches has been changed to properly describe alfalfa hay as a soil amendment and straw as mulch. The word "noxious" has also been added when describing a "certified hay or straw mulch".

The discussion in the TA mentions "It is uncertain what a soil "tackifier" is, how it would be used, and whether it would be beneficial for erosion control and vegetation establishment". A "tackifier" is a bonding or adhesive agent that is used for hydraulic seeding and hay or straw mulch tacking. Wind will often blow hay and straw away, while the impact of rain will often cause breakdown of the surface topsoil allowing fines to seal and promote ponding, encouraging the possibility of erosion. A "tackifier" provides temporary erosion control, moisture retention and a protective "blanket" that protects the seedbed, thereby creating a micro-climate promoting seed germination and seedling growth.

R645-301-341, R645-301-358, The applicant must show how it will use the best technology currently available to restore or replace riparian vegetation. The applicant has designed riprap-lined channels for the entire length of he mine, but riprap-lined channels are not as conducive to vegetation growth and establishment as those designed using soft armoring or bioengineering. Certain parts of the channels presumably need to be riprapped, but it would be feasible to use other designs in less steep areas, such as the one where the grade is about 2%. The applicant needs to investigate these design options.

In the slope areas of less than 5% along the Deer Creek and Elk drainage, channel design will incorporate soft bioengineering. Instead of the use of riprap to protect

channel bed and bank from eroding, alternative instream controls will be utilized. These alternatives include wing deflectors using log litter or riprap piles to direct flow in a meandering fashion and away from the bank; boulder clusters to provide cover, create scours and reduce velocity; "U" and or "V"shaped weirs that will create backwater and facilitate sedimentation. Vegetation will be established on the channel bottom. Banks will be protected primarily with vegetation.

R645-301-341.250, The application needs to discuss density standards for woody plants. For these standards, the applicant could use either the density values shown in the current mining and reclamation plan or could commit to use the values obtained when sampling for bond release. In the latter case, it would be necessary to obtain specific Division and Wildlife Resources approval for the new standard.

Additional discussion has been added to R645-301-350 Performance Standards. Woody species density of the reclaim site will be compared to the reference area density. Reference area information is found in the current MRP, Volume 1, pages 2-135 through 2-171.

R645-301-250, The application dos not discuss success standards for some of the general revegetation requirements in R645-301-353. In particular, it should discuss how diversity and erosion control will be measured and what standards will be used.

As mentioned in the above response, performance standards for vegetation are discussed in more detail in the revised reclamation plan.

Erosion control will be deemed successful when the disturbed/reclaimed area sediment loss is less than or equal to the undisturbed sediment yield. The Revised Universal Soil Loss Equation (RUSLE) is used to model sediment loss from disturbed/reclaimed and undisturbed areas. This model is compared to real TSS data collected between 1984 through 1999. Program parameters are discussed in R645-301-700 Hydrology. Discussion of the RUSLE model is found in R645-301-700: Hydrology.

R645-301-342, The macro invertebrate study conducted in 1991 and in 1994 need to be repeated in Deer Creek and Huntington Creek in the spring and fall the year before reclamation, in the fifth year after reclamation, and in the last year of the extended liability period just before applying for final bond release.

Ecosystems Research Institute of Logan, Utah performed the macro invertebrate study in 1990, 1991, 1992, and 1994. It was conducted because of the concern that increased mine water discharge from the Deer Creek Mine might put Huntington Creek resources at risk. Monitoring data was collected for 1) Stream cross-sections, 2) Water quality, 3) Aquatic macro invertebrates, 4) In-situ bioassays, and 5) Riparian community.

Monitoring of the stream morphology indicated no significant differences in steam geometry during the study period. A total of 14 transects were monitored in Deer Creek.

Water quality monitoring occurred at several stations in Deer Creek and Huntington Canyon Creek. During the period of time in which mine water was discharged into Deer Creek, no changes in water quality in Huntington Canyon Creek were observed as a result of the discharge.

Mine water discharged into Deer Creek underwent significant chemical changes as a result of changes in carbonate chemistry. Although calcium carbonate precipitation was widespread in Deer Creek, in-situ 7-day stonefly bioassays had 90 to 100 percent survival at all stations in Deer Creek and Huntington Canyon Creek when subjected to the ambient conditions in those streams.

However, the lack of macroinvertebrate and riparian ecosystem response in Deer Creek was believed to be the result of calcium carbonate (limestone) precipitation on the stream bottom.

Biological monitoring in Huntington Canyon Creek indicated differences in macroinvertebrate densities between some of the above and below stations. However, the differences in Huntington Creek above and below the confluence with Deer Creek were related to site specific habitat differences between the sites. Comparisons of he treatment site (below Deer Creek confluence) to the other adjacent control sites showed no differences in macroinvertebrate densities. Discharges of Deer Creek water into Huntington Creek did not appear to effect the macroinvertebrate community in Huntington Creek.

To determine if the macroinvertebrate study needs repeated, the justification of need should be presented. Three questions should be answered to determine justification. 1) Will there be mine discharge after mine closure? 2) If so, how much? 3) What will be the quality of the discharge water?

To answer question #1, at time of mine closure, no pumps will be operating. Therefore, at time of reclamation, no mine discharge will be emanating from the Deer Creek Mine. It could take two years or more after reclamation before mine discharge could flow in the Deer Creek. The drainage will return to its natural ephermal state.

The answer to the second question is thought to be a fraction of the current conditions. Currently mine discharge flows approximately 2.0 to 3.0 cfs. When the mine begins to discharge after mine closure, flows will probably average 0.25 cfs and could possibly reach 0.5 cfs.

The quality of mine discharge for question #3 has been consistent since the time of the study. All the parameters presently checked emulate the data that was collected during the study. With this in mind, the study can be referenced. It was found that as water discharges from the mine, pH increases as a result of de-gassing the CO_2-rich groundwater through turbulent mixing with the atmosphere. As CO_2 is lost to the atmosphere, carbonates precipitate out of solution onto the stream bottom. As reported, this process happens relative quick and does not influence the Huntington Creek.

PacifiCorp believes there is no justification to perform a macroinvertebrate study before or after reclamation. PacifiCorp has already committed to performing quarterly quality and quantity monitoring and feels sufficient data has been presented to show little or no impact on Huntington Creek.

Approximate Original Contour Restoration

R645-301-553.500 and R645-301-553.600, The Permittee must demonstrate that the reclamation plan will eliminate all highwall to the extent practical. Highwalls can only be left if there is insufficient material to reclaim them or the reclaimed highwall would not be stable.

The highwall elimination plan developed for the highwalls within the Deer Creek drainage system complies with the above mentioned regulations. All highwalls in the Deer Creek area are pre-SMCRA and will be eliminated to the extent practical.

Portals in Meetinghouse Canyon and Grimes Wash have no highwall associated with them according to the OSM highwall review. Grimes Wash portals are currently being reclaimed with completion scheduled for mid-December of 1999.

The reclamation of the Rilda Canyon breakouts is covered in a separate plan that is referenced in the MRP (Vol. 2, chp 4 pgs 4-54.1 – 4-54.13).

The highwall elimination plan was a requirement by the Division during the mid-term review process (refer to July 16, 1999 Division letter to PacifiCorp). The highwall elimination plan was developed and submitted in August of 1998. By September 4, 1999 the mid-term process was completed and a TA filed. On September 14, 1999 the Division sent a letter to PacifiCorp finding the review complete with one exception. The MRP needed to be amended to incorporate the plan into the present mining and reclamation plan.

At that time, PacifiCorp decided to revise the reclamation plan of the Deer Creek Mine since cut and fill quantities could not be justified in the current plan. PacifiCorp

contends that the plan complies with R645-301-553.500 and R645-301.600 and intends to include the plan in Appendix R645-301-500-B of the revised reclamation plan.

R645-301-537, The Permittee must reclaim the refuse piles to AOC standards unless the areas can be excluded under the settled and revegetated fill provision of R645-301-537.

In the attached revised reclamation plan, PacifiCorp commits to a soil sampling program which includes the refuse pile within the disturbed area of the Deer Creek and Elk Canyon drainages (refer to R645-301-200: Soils section of the revised reclamation plan). PacifiCorp also commits to conducting slope stability analysis on these slopes. Once the sampling and analysis are complete and it is found that the refuse piles are non-toxic and non-acid forming and achieve a safety factor of 1.3, the revised reclamation plan will comply to the R645-301-537 regulations and is therefore, excluded from AOC standards.

R645-301-121.200, The Permittee must identify each existing highwall and each proposed highwall remnants that will be left after final reclamation.

PacifiCorp agrees with this deficiency and has updated maps DS-1782-D through DS-1784-D to show these areas. These areas are also shown of Drawing DS-1796-D in Appendix R645-301-500-A.

Backfilling and Grading

Slope Stability

R645-301-552.130, The Permittee must show that the assumptions used for the stability charts will be homogeneous and dry. The refuse piles will be covered with 4 feet of cover so the slope may not be homogeneous. Also, some slopes have the potential to become saturated such as the areas by the french drain and the intake portal.

PacifiCorp attempted to perform slope stability analysis in-house. Due to project priorities and scheduling restraints, in-house analysis has not produced any data. PacifiCorp is currently attempting to out-source this project and commits to adding all this data and information as it becomes available. This will need to be completed as a separate amendment.

Settled and Revegetated Fills

R645-301-537, The Permittee must either backfill and regrade the refuse piles (waste rock piles) to meet AOC standards or show that the refuse piles meet the requirements of R645-301-537 and should be left as settled and revegetated fills.

Requirements to R645-301-537 were previously covered and will not be repeated here.

Exposed Coal Seams, Acid-and Toxic Forming Materials

R645-301-553.300, The Permittee must show how the requirements of R645-301-553.300 will be met. That regulation requires that all coal seams and acid- and toxic-forming materials will be adequately covered to control surface impact or contaminate surface or groundwater.

PacifiCorp commits to a sampling program of the refuse piles at the Deer Creek Mine. Analysis will be conducted as outlined in the Guidelines for Management of Topsoil and Overburden for Underground and Surface Coal Mining (Leatherwood and Duce, 1988). The reader should refer to R645-301-200: Soils, Sampling Procedures for Refuse Piles for a full explanation of sampling at the Deer Creek Mine.

Mine Openings

R645-301-551, The permittee must provide the Division with portal closure plans for all portals including those not at the Deer Creek site. Those additional portals include but are not limited to the North Fork Meetinghouse Canyon site, the Grimes Wash Canyon site and Rilda Canyon. See the analysis section of the TA for detailed concerns.

The portal reclamation plan for portals outside the Deer Creek site has been included in the revised reclamation plan. These plans can be reviewed in Appendix R645-301-500-B, as they are completed. PacifiCorp commits to incorporating portal reclamation plans for the 9th East Portals in Grimes Wash, North Meetinghouse portals, and Rilda Canyon portal and fan pad.

The 9th East Grimes Wash portal reclamation plan has been completed, approved and has been inserted into the plan temporarily in Appendix XIV in Volume 3. The Rilda Canyon reclamation plan was completed in 1995. The plan is located on pages 4-54.1 through 4-54.13 of the existing reclamation plan and will be moved and inserted into Appendix R645-301-500-B. PacifiCorp commits to incorporating the North

Meetinghouse portal reclamation plan when the plan is developed. This plan will also be inserted into Appendix R645-301-500-B.

R645-301-551, The permittee must show that the designs for the intake portal at the Deer Creek site are adequate for long term discharge from the mine. The Division concerns are if one pipe is used it could get clogged, that a long pipe will clog more easily than a short pipe (see analysis for details), how the system will be monitored and what type of remediation could be done.

The mine discharge has been redesigned as a french drain system. Complete details of the system can be reviewed in R645-301-700: Hydrology. The system is designed to treat the discharge with a sand filter behind the portal seal. Four 6" pipes will discharge mine water through the seal into the french drain system to the surface. Once reaching the surface, the discharge will be routed to the Deer channel through a lightly riprapped depression.

R645-301-542.100, The permittee must include the reclamation of all portal areas in the reclamation timetable.

The reclamation timetable has been reformatted to more easily understand. Since it is not known when the each of the portals of the Deer Creek Mine permit will no longer be needed, the timetable outlines the order and timing when reclamation activities will occur. Therefore, the Deer Creek portals are generalized in the timetable as "Closures – Portals & Ventilation".

Topsoil and Subsoil

NA Engineering

Road Systems and Other Transportation Facilities

R645-301-542.100, The permittee needs to include the reclamation for the C1 and C2 access roads in the reclamation timetable.

The reclamation projects have been generalized in the timetable of R645-301-300: Biology, Table 3-1. Reclamation of the C1 and C2 access roads is included in "Hauling, Backfilling, Compaction & Grading" of the timetable.

R645-301-542.200 and R645-301-533, The permittee must included detailed typical cross sections for the reclamation of the C1 and C2 belt line access road. The cross sections must be drawn to scale and show the county road and the drainage system.

Drawing DS-1782-D of the original submittal illustrates a typical cross-section of the C2 belt-line structure, existing topography, and final topography. This cross-section, however, was not drawn to scale. The cross-section has been redrawn to scale showing the above mentioned features including the county road. See Drawing DS-1780-D in Appendix R645-301-700-B, 5 of 5.

Maps, Plans, and Cross Sections of Reclamation Operations

Bond Area Maps

R645-301-542 and R645-301-521.163, The permittee must show the disturbed area boundaries on the reclamation maps and cross-sections. Some disturbed areas not shown on the Deer Creek mine site include the conveyor from the Deer Creek mine to the power plant, the North Fork Meetinghouse Canyon portal area and the Grimes Wash Canyon portal area. Unless the Permittee identifies the disturbed area boundaries on the maps and cross-sections, the Division will be unable to evaluate the reclamation map.

Drawing DS-1796-D has been added to Appendix R645-301-500-A. The drawing illustrates all pre-reclamation disturbed boundaries, C1 and C2 beltline corridor, coal seam outcrops, and highwall locations.

Remote areas with associated disturbances are showned on separate drawings (i.e. 9th East Portals in Grimes Wash, 9th East Portals in North Fork Meetinghouse Canyon, and Rilda Canyon. The Deer Creek wasted rock facility is found in Volume 10.

Reclamation Backfilling and Grading Maps

R645-301-542.310, The Permittee must show the final surface configuration extending 100 feet outside the disturbed area boundaries for all reclaimed areas. Map DS 1782D does not show the contours in and around the reclaimed areas at the Deer Creek site. Specifically, the Permittee did not show the contour lines in the upper bench at the Deer Creek site, nor at the other portal locations and the conveyor beltline for the mine to the power plant.

All revised reclamation plan drawings have been updated to show contour lines 100 feet outside the disturbed area boundaries. Furthermore, Drawing DS-1782-D does indeed show the contour lines in and around the reclaimed areas. However, this and all other drawings in the revised reclamation plan have been updated to include 5 foot contour intervals instead of 25 foot contour intervals.

R645-301-553.260 and R645-301-542.200, The Permittee must show the location of the coal mine waste disposal areas (refuse piles) on the reclamation maps and cross sections.

Locations of these areas have been included.

R645-301-553.300 and R645-301-542.200, The Permittee must show the location of each coal seam, acid- and toxic-forming materials and combustible materials on the reclamation contour maps and cross sections.

Locations of these areas have been included.

R645-301-553.200 and R645-301-542.200, The Permittee must show the location of all highwalls that will not be fully reclaimed on the final surface maps and cross sections. The Permittee must show the actual cross sections of all highwall remnants that will be left not typical cross sections.

It is unclear how the author of the R645-301-553.200 deficiency relates highwalls with spoil and waste material. However, the highwall locations have been incorporated in the final surface map DS-1782-D. Highwall locations are also included on the cross-section drawings DS-1783-D (1 of 2 and 2 of 2) and DS-1784-D where applicable.

R645-301-542.300, The contour intervals on the reclamation maps must be no greater than 5 feet intervals.

Contour intervals of 25 feet have been replaced with 5 foot intervals.

Reclamation Facilities Maps

R645-301-542.320, The Permittee will show the location of each permanent feature that will be left after final reclamation. Such features include but are not limited to the coal mine waste disposal area (refuse pile and waste rock sites).

Locations of these areas have been included.

Final Surface Configuration Maps

R645-301-521.150 and R645-301-542.300, The Permittee must show the final surface configuration for all reclaimed areas. Drawings DS-1783-D and DS-1784-D do not show the cross sections for all areas of the Deer Creek site. The Permittee did not show the cross sections for the upper bench at the Deek Creek Site, nor at the other portal locations. Specifically, the Permittee did not show the cross section for the upper bench

at the Deer Creek site, nor at the other portal locations and the conveyor belt line from the mine to the power plant.

This deficiency has been previously covered and will not be repeated here.

Reclamation Surface and Subsurface Manmade Features Maps

R645-301-521.123, the Permittee must show the location of each public road that is within 100 feet of the reclaimed areas. The permittee does not show the location of the county road next to the reclaimed conveyor belt.

Locations of these areas have been included.

Hydrologic Information

R645-301-731, Provide a monitoring plan specific to reclamation that: 1) Commits to provide quarterly monitoring for the minewater discharge through bond release and includes a full baseline parameter list for the 5th year of reclamation and the year prior to bond release. Any additional requirements from the Department of Health UPDES permit must also be reported. 2) Commits to survey areas down dip and below the mined seam for springs that may develop or increase in discharge from mining. The survey should at a minimum be conducted during the 5th year and one year prior to bond release. Include water quality and quantity monitoring where flow accumulation is measurable.

1) *PacifiCorp commits to a monitoring program for the mine discharge that is expected to discharge from the Deer Creek intake portal. The monitoring program is outlined in R645-301-500 and 700 sections of the revised reclamation plan. The monitoring includes monthly sampling as required by the current UPDES permit for the first 5 years after reclamation. At year 5, baseline parameters will be sampled as outlined in the Volume 9, Appendix A, Reclamation Monitoring. Reclamation monitoring in Appendix A, of Volume 9 will be submitted as a separate amendment.*

2) *PacifiCorp also commits to seep surveys by analyzing air photos in the 5th and 10th year after reclamation. Seep surveys will also be conducted during the annual subsidence monitoring. When new seeps are located, ground reconnaissance will be conducted to determine if flow is measurable. If measurable flow is found, the new sample point will be added to the East Mountain spring sampling program. Sampling will continue until bond release. The results will be reported in the Annual Report for the Deer Creek Mine.*

R645-301-731.221, Provide a monitoring plan specific to reclamation to assure impacts to hydrologic balance are prevented, and 1) include commitments made in Volume 9, page 17 for continued monitoring of HM-2 and HM-3. 2) describe how the State Water Quality Standards, Utah Administrative Code R317-8, for the Deer Creek, Huntington Creek, and any other stream receiving minewater discharge will be shown to meet water quality standards. The Division recommends a minimum high and low flow season monitoring for (selected) parameters over the full period of reclamation. Parameters should be reflective of all potential in-mine contaminants. 3) Include a map showing flow direction and groundwater divides in the permit and adjacent area for each mined seam which identifies existing mine floor elevations, in-mine discharge locations, pertinent geologic controls, mine controls such as sealed mine sections, and changes to previously existing hydrologic barriers. 4) Provide a water monitoring plan that; a) determines whether changes in flow hydrology will occur along the Straight Canyon Syncline during the time mining has idled, b) determines whether base flows to the Cottonwood Canyon stream increase, c) identifies the difference between changes due to climate, or from ground water discharge by including age dating to be conducted every 2nd year during the low flow period for; radio carbon dating, tritium dating, and stable hydrogen and oxygen isotopes (for meteoric waterline determinations) in the Cottonwood Canyon wells and Cottonwood Creek stream flow below well CCW-1S. 5) Repeat the macroinvertebrate study conducted in 1991 and in1994 in the Deer Creek and Huntington Creek during the spring and fall, the year before reclamation, and in the 5th year and final year prior to bond release.

1) *Maps HM-2 and HM-3 document the locations of the sandstone channels-perched aquifers which directly overlie the coal-bearing horizons of the lower Blackhawk Formation. As stated in Volume 9, "The locations of the channels shown on Maps HM-2 and HM-3 are based on data collected from in-mine mapping and numerous drill holes, both in-mine and surface, that have been completed on the property. These channel systems were part of a deltaic depositional setting active during and after the coal-forming peat accumulation. The largest influx of water encountered during the mining process occurs beneath the fluvial channels." All data collected related to in-mine hydrology, ie in-mine ground water sample and monitoring wells locations (historic and current sampling locations) are recorded on HM-2 and HM-3. PacifiCorp is committed to monitoring (refer to Appendix A in Volume 9) in-mine hydrology characteristics as long as the sites are accessible.*

2) *Ecosystems Research Institute of Logan, Utah performed a comprehensive study from 1990 through 1994 to the effects of minewater discharge on the receiving streams of Deer Creek and Huntington Creek; including macro invertebrates, stream channel configuration - cross-sections, water quality, in-situ bioassays, and riparian community analysis. Water quality monitoring occurred at several stations in Deer Creek and Huntington Canyon Creek. During the period of time in which*

3) *mine water was discharged into Deer Creek, no changes in water quality in Huntington Canyon Creek were observed as a result of the discharge (for complete analysis refer to Volume 9 Hydrologic Section, Hydrologic Support Information 3). PacifiCorp commits to revising Volume 9 Appendix A – Hydrologic Monitoring Plan to include reclamation monitoring (submitted as a separate amendment).*

4) *PacifiCorp commits to revising HM-2 and HM-3 to include floor elevation, potential groundwater flow and post mine discharge locations (submitted as a separate amendment).*

4a-c) *PacifiCorp commits to revising Volume 9 Appendix A – Hydrologic Monitoring Plan to include reclamation monitoring (submitted as a separate amendment). Reclamation monitoring will include wells, surface water sites, groundwater sites currently monitored which will be utilized to document hydrologic trends including climatic variations. Hydrologic studies, (refer to Volume 9 Appendix C and Hydrologic Support Information 11and 1998 Annual Hydrologic Report) conducted by PacifiCorp and consultant companies concluded that the hydrologic system of Cottonwood Canyon and lower Blackhawk Formation (mined interval) are independent hydrologic systems. This conclusion was also supported by the Division (letter dated October 27, 1998).*

5) *This issue has be previously been addressed and will not be repeated here.*

R645-301-742, Details, maps and plans, which indicate how drainage will be conveyed to the pond within the disturbed areas not undergoing reclamation construction during the reclamation period.

Detailed descriptions of the reclamation sequence have been revised and can be reviewed in R645-301-500: Engineering.

R645-301-725.210, A grading plan that considers small tributary ehpemeral drainages for the draws adjacent to Elk Canyon, and the draw above the Storage Dock that will control or prevent erosion.

The ephermal draws above the storage docks in the Deer Creek Canyon have been addressed. The reclaimed area below the natural draw has been recontoured on the hydrology map. The draw in the reclaimed area will be lightly riprapped to control erosion and sediment loss.

R645-301-625, A demonstration showing the proposed method for backfilling the mine portal will not plug from carbonate precipitation. Calcium carbonate precipitate was

identified to be widespread within the Deer Creek drainage through a mcroinvertebrate study done to assess mine water discharge impacts to fisheries.

The mine discharge has been redesigned. This deficiency has already been discussed in R645-301-551 of this response letter and will not be repeated here. Details of the designed mine discharge are presented in the revised reclamation plan in sections R645-301-500: Soils and R645-301-700: Hydrology.

R645-301-752.210 and R645-301-752.250, Address stability of the cut slope across from the mine office and bathhouse area, and its relation to the proposed Deer Creek drainage location. The channel abuts an area that was predisposed to failures in 1992 when a tension crack developed from water ponding in a diversion ditch. Destabilization, or rock fall from this cut slop could cause channel failure.

This issue was looked at more closely and found that there could be a potential for channel failure. Therefore, it was decided that the Deer Creek channel should be moved to reduce this risk. Final reclamation drawings have been changed to show new position of the channel.

R645-301-742.314, 1) Remove item number two on the Final Reclamation Hydrology Map DS1780D or provide additional site specific detail (the practice of using geotextile filter fabric is not an acceptable reclamation practice in the State of Utah because it does not promote channel stability. 2) Provide designs for the channel transition between the uptream and downstream natural channnel and the reclaimed channel.

1) *The filter fabric has been removed from the french drain design.*
2) *Channel transition cross-sections are included on Drawing DS-1780-D, 2 of 2.*

R645-301-742, The applicant needs to provide additional information for the proposed sediment control measures during the reclamation phase to meet BTCA for alternate sediment control measures. Specific issues are identified in the technical assessment.

The proposed sediment control measure or BTCA will be deep gouging (pocking) during the reclamation phase. This information has been included in the 700 section of the revised reclamation plan. The plan states that the undisturbed culvert in the Deer Creek Canyon will be removed in sections at length determined by the contractor. The water in the drainage will be diverted around the reclamation work and back into the undisturbed culvert. It is the intent of the applicant to complete all reclamation work in a section before moving on to the next section. "All" reclamation includes backfilling and grading, riprapping channel, pocking final contoured surface, fertilizing, seeding, and mulching.

Disturbed drainage that occurs in the case of a storm event will also be treated. As disturbed culverts are removed, the remaining end will be left opened. A sediment trap will be constructed so that runoff will be treated before entering the disturbed culvert. The runoff will be treated again as it enters the sediment pond. Complete details are given in R645-301-700: Hydrology of the revised reclamation plan.