



State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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Governor

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Salt Lake City, Utah 84180-1203

801-538-5340

August 27, 1992

TO: Daron Haddock, Permit Supervisor

FROM: Priscilla Burton, Soils Reclamation Specialist

RE:  Mid-term Review. Wellington Preparation Plant. Castle Valley Resources. ACT/007/012. Carbon County. UT. Folder #2.

SUMMARY:

The Castle Valley Resources Mining and Reclamation Plan does not adequately demonstrate that the fine slurry, coarse slurry, coarse refuse and spoil piles can be reclaimed with the reclamation techniques proposed. The Division should recommend further demonstrations of reclamation success prior to lowering the four foot requirement over slurry and refuse (R645-301-553.250). These demonstrations should include sampling of the material for acid/toxic characteristics, re-designing test-plots, and establishing a reference area.

TECHNICAL ANALYSIS:

121.100. Contain current information, as required by R645-200, R645-300,

Proposal:

The List of Tables includes Tables 2-1 through 2-10, soils analysis, found within Chapter 2.

Analysis:

Analysis of Local disturbed soils, refuse, coarse material and borrow soils are alluded to in Chapters 2 and 3. The location of some of these analyses is sited as section 2.22. No analyses could be found in Chapter 2 or Chapter 3.

Deficiency:

1. The MRP must provide Tables 2-1 through 2-10 in Chapter 2 and other analytical information alluded to in the MRP which will provide descriptive information on the native and disturbed soils, the coarse refuse and slurry

information on the native and disturbed soils, the coarse refuse and slurry characteristics; and which is crucial to the evaluation of the reclamation plan.

122. **If used in the permit application, referenced materials will either be provided to the Division by the applicant or be readily available to the Division.**

Proposal:

Section 3.41, page 11 of the MRP refers to Donahue, et al. for gypsum treatment methodology. A full citation for this author was not found.

Analysis:

Castle Valley Resources should include a references cited section in the MRP.

Deficiency:

1. References cited within the MRP should be reiterated with a full citation in a "Literature Cited" section of the MRP.

140. Maps and Plans.

Proposal:

Map E9-3341 illustrates a permit area which is different than that shown on maps E9-3343 and G9-3510 (and possibly other maps). Permit and disturbed area boundaries must be consistently illustrated on all maps submitted with the MRP.

Two soils maps are listed in the List of Drawings. The legend of Drawing G9-3510 specifies that it replaces Drawing E9-3339. However, Drawing E9-3339 shows more detail with regard to topsoil salvage and borrow sites, but these differ slightly from the topsoil borrow area (symbol NN) and the future topsoil stripping area (symbol OO) shown on Drawing E9-3341.

Analysis:

Castle Valley Resources (CVR) is not in compliance with regulation R645-301-142.

Deficiency:

1. Permit and disturbed area boundaries must be consistently illustrated on all maps submitted with the MRP.
2. Drawing E9-3339 should be deleted from the List of Drawings in the MRP if it has been superceeded or the reason for its inclusion in the MRP should be stated. If Map E9-3339 is kept within the MRP, it should be revised to clearly illustrate the permit and disturbed area boundaries.

221. Prime Farmland Investigation.

Proposal:

The 1982 SCS letter of non-prime farmland determination cites saline soils and lack of irrigation water as the basis of conclusion. Page 2, Section 2.2, states that a land use for soils in the area is irrigated crops.

Analysis:

Castle Valley Resources is in compliance with this regulation.

The Division should note that Farmland of Statewide Importance and Prime Farmland have been designated immediately adjacent to the northern mine permit boundary (Utah Agricultural Experiment Station Research Report No. 76, "Important Farmlands of Parts of Carbon, Emery, Grand, and Sevier Counties").

222. Soil Survey.

Proposal:

Soils information is derived from the SCS Carbon County Survey. Soils are fine-silty, mixed (calcareous), mixed Typic Torrifluvents (Billings series) and mesic Typic Torifluvents (Ravola series); fine-silty, mixed (calcareous), mesic Aquic Ustifluvents (Hunting series). Typical pedon descriptions provided are not located within the 392 acre disturbed area.

Map G9-3510 illustrates the following map units within the permit area: #35, Gerst-Badland-Stormitt complex; #41, Green River-Juva Variant Complex; #55, Hunting Loam; #58 Juva Variant, fine sandy loam; #80, Persayo-Chipeta Complex; #93, Ravola-Slickspots complex;

#94, Riverwash. The text defines the dominant soils as Gerst (a topsoil borrow source), Juva Variant (a topsoil borrow source), and Ravola loam (also a topsoil borrow source).

Map E9-3339 identifies borrow sites and topsoil salvage sites.

Analysis:

Soils listed as lying within the permit area will change with the revision of the permit and disturbed area boundaries according to Deficiencies listed under R645-301-140.

Productivity information is summarized from work conducted in the summer of 1983 in section 3.11, Tables 1 through 14.

232.500. Subsoil Segregation.

Proposal:

The MRP states that this regulation is not applicable to the Wellington site.

Analysis:

R645-301-232.500 states:

The Division may require that the B horizon, C horizon, or other underlying strata, or portions thereof, be removed and segregated, stockpiled, and redistributed as subsoil in accordance with the requirements of R645-301-234 (topsoil storage) and R645-301-242 (soil redistribution) if it finds that such subsoil layers are necessary to comply with the revegetation requirements of R645-301-353 (Revegetation: General Requirements) through R645-301-357 (Revegetation; Extended Responsibility Period).

The Division should not exempt the Wellington Preparation Plant from the performance standard of this regulation by allowing this disclaimer to remain in the plan.

Deficiency:

1. The disclaimer regarding the performance standard of R645-301-232.500 should be removed from the MRP.

232.720. Fulfilling requirements of Substitute Soil materials.

Proposal:

The MRP contains a statement exempting Castle Valley Resources from this regulation.

Analysis:

R645-301-232.720 follows regulations which pertain to an exemption from the requirement to salvage topsoil and/or subsoil. This regulation also pertains to the importation of substitute soil material when the requirements of cover have not been met, as follows:

That the requirements of R645-301-233 (topsoil substitutes and supplements) have been or will be fulfilled with regard to the use of substitute soil materials unless no available material can be made suitable for achieving the revegetation standards of R645-301-356 (Revegetation, Standards for Success), in which event the operator will, as a condition of the permit, be required to import soil material of the quality and quantity necessary to achieve such revegetation standards.

The Division should not exempt Castle Valley Resources from this requirement, since there presently does not appear to be adequate cover available for reclamation of the site.

Deficiency:

1. The statement in the MRP regarding exemption from R645-301-232.720 should be removed from the plan.

233. Topsoil Substitutes and Supplements.

Proposal:

The addition of gypsum to localized areas of sodicity is discussed within the plan.

A description of reclamation treatment which included 2 Tons of hay amendment incorporated into the soil prior to seeding/fertilization/and mulching was found in the 1986 Annual Report. This treatment appeared to provide successful results in reclamation on some of the areas contemporaneously reclaimed in 1986 (see map attached to 1986 Annual Report).

In the 1989 Annual Report, chemical analysis of the native soils (locations shown on Drawing 4067-6-8B) indicate that below two feet, the soils are fine textured and sodic. The recommendation for topsoil salvage was 6 inches (0-15cm) along the access road and the screening facility.

Analysis:

A reclamation treatment which should be utilized at Wellington Preparation Plant is the incorporation of organic matter into the soil prior to seeding and fertilizing. The benefits of organic matter addition are well known: increased water holding capacity; improved structure; increased fertility (depending upon the type of OM); adsorption of soil salts; improvement or micro-organism population etc.

An organic amendment treatment was used on the slurry and refuse testplots. Information on the type of organic matter application, the depth of incorporation and the amount of fertilization is lacking. The Division is unable to reach a conclusion on the appropriateness of the organic matter treatment for the site. No advantage was apparent in the 1990 evaluation of these test plots, but the value of organic matter was assessed in terms of shrub establishment and not its other values such as lowering soil temperature, and increasing soil moisture and improving tilth.

Vegetation test plots at Wellington have revealed one truth, that water capturing strategies will aide plant establishment in this harsh environment. The Division strongly recommends that an organic amendment is incorporated into the soil prior to seeding. The Division would also recommend experimenting with dried, digested sewage sludge as a source of structure building fertilization for the refuse, slurry, and surface facilities area reclamation.

Native soils in the area are limited for their use as topsoil borrow material. The topsoil 6 inches has been salvaged in the areas of disturbance. If CVR were to attempt removal of 2' of topsoil/subsoil for cover, the remaining ground would be difficult to reclaim. The sampling conducted and reported in the 1989 Annual Report went down four feet. A deeper excavation may reveal a buried horizon which is not sodic which could be utilized for cover. The MRP should evaluate the available cover in terms of location, volumes and quality.

Deficiencies:

1. The incorporation of organic matter into the soil as an amendment to improve water holding capacity and fertility should be incorporated into the reclamation plan for the entire site.
2. Refer to deficiency #2 under R645-301-240.

240. Reclamation Plan.

Proposal:

The reclamation plan calls for the use of topsoil and substitute material. An estimated total of 5,553 yd³ has been salvaged and stored on site (pg 3, Section 2.31).

A topsoil borrow area has been identified on Drawing E9-3341. Further topsoil borrow areas are shown on Drawing E9-3339.

Twelve inches of coarse refuse slurry will be used on the fine slurry ponds, the coal screening area, and the coarse refuse pile as a subsoil treatment and covered with 6 inches of topsoil. The lower three inches of topsoil will be incorporated in to the coarse refuse slurry cover.

No topsoil will be placed on the regraded surface facilities site.

Analysis:

Total volumes of topsoil required are not stated. Total volumes of borrow material and depth of borrow is not stated. The quality of the borrow material is not provided.

The qualities of the coarse refuse slurry which will enhance the reclamation are not found within Chapter 2 or 3.

Deficiencies:

1. The MRP should state the total area requiring topsoil and the volume of topsoils and substitutes required to achieve the reclamation plan.
2. The MRP should also provide information on the depth of borrow disturbance, acreage of disturbance, quality of material obtained, as well as the ability of subsoils remaining to be reclaimed.

242. Soil Redistribution.

Proposal:

The soil will be ripped in areas of high compaction such as the surface facilities areas and the roads across the coarse slurry and the top of the regraded coarse refuse pile (south of the Price River), and the coal screening area. The depth of ripping was not indicated.

Analysis:

A depth of 18-24 inches is recommended for obtaining adequate root penetration and water

infiltration as well as providing a suitable surface for topsoil adherence. A depth of ripping should be indicated within the plan (Section 2.42) for adequate performance standard determination.

Deficiency:

1. Please provide an estimated depth of ripping of the redistributed or regraded surface to be reclaimed (Section 2.42). The depth estimated will provide a performance standard during final reclamation.

243. Soil Nutrients and Amendments.

Proposal:

The possibility of using gypsum as a soil amendment will depend upon the exchangeable sodium found within the soil.

After seedbed preparation, the soil will be sampled for fertility and toxicities (pg 10, Section 3.41).

Analysis:

Exchangeable sodium and Cation Exchange Capacity should be added to the list of parameters tested during the final reclamation soil testing program described on pg 4 of Section 2.31.

The MRP should outline final reclamation sampling for fertility and soil amendments as follows: frequency (number of tests and spacing of tests within each acre); depth of sampling; and type of sampling (composite or depth segregated).

Deficiencies:

1. Exchangeable sodium and Cation Exchange Capacity should be added to the list of parameters tested during the final reclamation soil testing program described on pg 4 of Section 2.31.
2. The MRP should outline final reclamation sampling as follows: frequency (number of tests and spacing of tests within each acre); depth of sampling; and type of sampling (composite or depth segregated). The sampling outline will provide a performance standard during final reclamation.

244. Soil Stabilization.

Proposal:

Section 2.44 calls for mulch on all topsoiled areas.

Analysis:

The plan should indicate that mulch will be used on all regraded areas.

Details are not provided, although a mulching step during the seeding process is described. However, seeding may follow soil redistribution by as much as four months (Revegetation Timetable, Section 3.41). The plan should state measures to control erosion in the interim.

The mulching recommended by the Division for this purpose is the incorporation of alfalfa hay during ripping of the regraded spoil or scarification of the topsoil. This step will provide some erosion control while also providing a source of nitrogen and microbial life in the spoil.

Deficiency:

1. The plan must indicate that there will be mulching of the regraded spoils and topsoiled areas and provide an indication of the type of mulch and coverage which will be used for a soil stabilization performance standard.

R645-301-410. Land Use

Proposal:

Farmland historically used as cropland lies immediately adjacent to north of the permit area. However, cropland use was not illustrated on Map E9-3343.

The Post-mining land use description includes cropland, controlled grazing, and industrial uses. The areas which will be devoted to each post-mining land use are not outlined in the narrative or on a map.

Analysis:

CVR is not in compliance with R645-301-411.110 which requires a map and narrative of

present land uses within the permit area. The MRP should provide available information on the concurrent cropland use (within the permit area) to aid in determining the reference area selection and/or standards of success for the cropland post-mining land use (R645-301-356.220).

Deficiency:

1. Map E9-3343 should be revised to illustrate adjacent cropland and the MRP should describe this pre-mining land use within the MRP. ie, What crops are grown and at what production level and intensity of management?
2. The achievement of the cropland post-mining land use should be clearly described within the plan as to the post-mining cropland location and the proposed standards for reclamation success for this land use.

553.250. Refuse Piles.

Proposal:

The Coarse Refuse Area will have "significant" (pg 24, section 3.41) side slopes at final reclamation. These slopes will be broken by trenches at 15' intervals which are 10 inches deep.

Analysis:

The slope is not specified, however, the angle must not exceed 2h:1v as per R645-301-553.251. The record of test plots at Wellington Prep Plant illustrates that a configuration which allows for maximum water retention would be the best scenario for reclamation purposes. Creating flatter slopes would be recommended and encouraged.

A discussion of testing of the coarse refuse pile in accordance with R645-301-553.252 has not been conducted. This regulation states that four feet of cover is required over the final grade of a refuse pile, unless the Division receives physical and chemical evidences that the reclamation can be achieved and erosion controlled with less cover.

An alternative to reclaiming the coarse refuse in its present location and configuration is removing the coarse refuse from the location on this pad and layering it on the fine slurry pond (s). There are two merits to this suggestion. First, it would consolidate the area of toxic material to be reclaimed. Second, it would provide a layer of coarse and fine mixture which would provide aeration of the fine slurry and a capillary barrier for the fine slurry

which is high in boron and selenium. This technique has been utilized in the slurry plots with coarse slurry. The advantages of the coarse slurry would be similar to those of the coarse refuse.

Castle Valley Resource's present reclamation plan of 6 inches of topsoil cover over 12 inches of coarse slurry refuse on the coarse refuse pile and slurry piles is not well substantiated by the past five years of evaluations of test plots (see Annual Reports). Further evaluation of refuse characteristics, reclamation methods and treatments, and reclamation scenarios is needed. Deficiencies written below pertain to the reclamation plan as it is presently written.

Soil sampling submitted with the 1986 annual report indicates that the spoil pile (located in the surface facilities area) is high in pH (8.7), EC (16.8 mmhos), and SAR (41.5). In 1986, Kaiser and the Division agreed that contemporaneous reclamation of the spoil pile as planned would be unsuccessful. Reclamation of the spoil pile must be addressed within the surface facilities reclamation plan.

Deficiencies:

1. The final slope angle for the Coarse Refuse Pile should be stated within the plan for performance standard evaluation during final reclamation.
2. Castle Valley Resources must provide information to address the requirements for requesting less than four feet of cover over the spoil and refuse stored in the surface facilities area as per R645-301-553.252.
3. Information concerning the reclamation of the spoil pile located within the surface facilities area must be addressed within the MRP.

R645-301-553.260 Coal Processing Waste.

Proposal:

Fine slurry ponds will be covered with 12 inches of coarse slurry followed by 6 inches of topsoil or substitute material upon final reclamation. The Annual Reports from 1986 to 1991 track the progress of test plots on a simulated fine slurry site.

The 1991 Annual Report concludes that there were no treatment differences due to irrigation, topsoil depth or organic matter addition and that six inches of topsoil over coarse slurry is the recommended reclamation treatment.

Analysis:

The conclusions concerning the best reclamation methodology (1990 Annual Report and 1991) are stated too definitively, considering the high standard of deviation within treatments, the variation in topsoil quality between plots, irregularity of irrigation, the possible mislabeling of plots, and the simulated design of the fine-slurry plots (please refer to the 1986 through 1991 Annual Reports and the MRP for the basis of these comments). The test plots have provided a beginning for planning reclamation strategy for the fine-slurry plots. Further plots should follow.

Analysis of the soil materials from the fine slurry and coarse slurry test plots was found in the 1987 Annual Report. The analyses displayed very erratic SAR values within the test plots. The variability may result from salts accumulating on the surface from the variable content of the fine slurry below. The questions arise: why does the quality of the topsoil change so much across and within treatments? What were the original analyses of the borrowed topsoil? Did the original sampling indicate uniform soils were used?

Soil Analysis from the 1988 Annual Reports were not found, although the locations were diagrammed on Plate D4-0141 (2 of 2) in the Annual Report.

The fine slurry was sampled December 21, 1990 by Mt. Nebo Scientific. The results are not in the plan. However, my copy of the results indicates that Boron and Selenium levels found in the two drill holes exceed Division guidelines for overburden adequacy characteristics. The soils may be considered toxic to vegetation and wildlife. (Erratic levels of boron in the fine slurry may have caused the variable results in the test plots, although boron was not sampled for the test plot characterization.) A comparison of boron concentration in the slurry with coarse refuse, coarse slurry, spoil or native soils is not possible, since no samples have been taken of any of the above. Tests of the native soils were conducted and submitted in the 1989 Annual Report, however, the boron and selenium analyses were to have been submitted at a later date. These were not found.

Regulation R645-301-553.260 requires covering coal mine waste with 4' of non-toxic/non-acidic material, by reference to R645-301-553.250. Regulation R645-301-528.350 requires that all toxic material is disposed of with four feet of cover, by reference to R645-301-553.250. Castle Valley Resources has not adequately demonstrated the ability of the reclaimed fine-slurry to meet a reference comparison standard for vegetative cover and diversity and to control erosion using less than four feet of cover.

Deficiencies:

1. Castle Valley Resources should provide information to address the

requirements for requesting less than four feet of cover over the fine and coarse slurry as per R645-301-553.252.

CONCLUSIONS:

Portions of the Mining and Reclamation plan were reviewed, including Chapters 1 through 4 and Appendix A. Annual Reports from 1986 through the present were reviewed as well.

The plan does not adequately demonstrate that less than four feet of cover is warranted over the coal mine waste and refuse. Fine slurry material should be considered toxic due to high boron and selenium values. Water depth in the fine slurry is at approximately 3 or 4 foot depth. The capillary rise of salts from the slurry into the cover material must be avoided. It is recommended that Castle Valley Resources establish reference areas and re-design the test plots on the coal mine waste and refuse in cooperation with the Division to enable demonstration of the adequacy of lesser cover for reclamation success. Some reclamation has been achieved on the fine-slurry and this commendable effort should be improved upon.

The soils of the access road and surface facilities area are saline and from 2 to 4 feet deep are sodic and fine textured, unsuitable as borrow material. Exploration of deeper soils for non-sodic borrow material was suggested. The possibility of importing cover material (either soil or dried, digested sewage sludge or other composted organic matter) is suggested to aide in achieving the cover requirement, fertility and water retention of the available soil material.



NOT
John

NO. N92-38-3-2

notice of violation

To the following Permittee or Operator:

Name Castle Valley Resources
 Mine Wellington Prep Plant Surface Underground Other
 County Carbon State UT Telephone 607-9714
 Mailing Address P.O. Box 766, Wellington UT 84524
 State Permit No. Act 1007/012
 Ownership Category State Federal Fee Mixed
 Date of inspection August 19, 1992, 19____
 Time of inspection 8:45 a.m. p.m. to 5:10 a.m. p.m.
 Operator Name (other than Permittee) General
 Mailing Address P.O. Box 1201, Hemmington, UT 84528

Under authority of the Utah Coal Mining and Reclamation Act, Section 40-10-1 et seq., *Utah Code Annotated*, 1953, the undersigned authorized representative of the Division of Oil, Gas & Mining has conducted an inspection of above mine on above date and has found violation(s) of the act, regulations or required permit condition(s) listed in attachment(s). This notice constitutes a separate Notice of Violation for each violation listed.

You must abate each of these violations within the designated abatement time. You are responsible for doing all work in a safe and workmanlike manner.

The undersigned representative finds that **cessation of mining** is **is not** expressly or in practical effect required by this notice. For this purpose, "mining" means extracting coal from the earth or a waste pile, and transporting it within or from the mine site.

This notice shall remain in effect until it expires as provided on reverse side of this form, or is modified, terminated or vacated by written notice of an authorized representative of the director of the Division of Oil, Gas & Mining. Time for abatement may be extended by authorized representative for good cause, if a request is made within a reasonable time before the end of abatement period.

Date of service/ mailing 8/19/92 Time of service/ mailing 5:10 a.m. p.m.

LARRY W. JOHNSON Permittee/Operator representative ENGINEER Title

Larry W. Johnson
Signature

Sharon K. Falvey Division of Oil, Gas & Mining representative Reclamation Specialist Title

Sharon K Falvey Signature 38 Identification Number

SEE REVERSE SIDE

WHITE-DOG M YELLOW-OPERATOR PINK-OSM GOLDENROD-NOV FILE



NOTICE OF VIOLATION NO. N92-38-3-1

Violation No. 1 of 1

Nature of violation

Failure to Follow approved plan
Failure to Provide Application for Change of Ownership or
Effective Control

Provisions of act, regulations or permit violated

Identification of Operator and Resident Agent
at CVR Wellington

Portion of operation to which notice applies

R645-301-100's R645-300-142
R645-303-300's

Remedial action required (including any interim steps)

Provide to the Division an application correcting
information relative to CVR operations.

Abatement time (including interim steps)

Three weeks, September 2, 1992



John

NO. N92-38-4-1

notice of violation

To the following Permittee or Operator:

Name Castle Valley Resources

Mine Wellington Preparation Plant Surface Underground Other

County Carbon State UT Telephone 607-9714

Mailing Address P.O. Box 766, Wellington UT 84524

State Permit No. Act / 007 / 012

Ownership Category State Federal Fee Mixed

Date of inspection August 19, 1992, 19

Time of inspection 8:45 a.m. p.m. to 5:10 a.m. p.m.

Operator Name (other than Permittee) ~~General~~ General

Mailing Address P.O. Box 1201 Huntington, UT 84528

Under authority of the Utah Coal Mining and Reclamation Act, Section 40-10-1 et seq., *Utah Code Annotated*, 1953, the undersigned authorized representative of the Division of Oil, Gas & Mining has conducted an inspection of above mine on above date and has found violation(s) of the act, regulations or required permit condition(s) listed in attachment(s). This notice constitutes a separate Notice of Violation for each violation listed.

You must abate each of these violations within the designated abatement time. You are responsible for doing all work in a safe and workmanlike manner.

The undersigned representative finds that **cessation of mining** is is not expressly or in practical effect required by this notice. For this purpose, "mining" means extracting coal from the earth or a waste pile, and transporting it within or from the mine site.

This notice shall remain in effect until it expires as provided on reverse side of this form, or is modified, terminated or vacated by written notice of an authorized representative of the director of the Division of Oil, Gas & Mining. Time for abatement may be extended by authorized representative for good cause, if a request is made within a reasonable time before the end of abatement period.

Date of service/ mailing 8/19/92

Time of service/ mailing 5:10 a.m. p.m.

LARRY W. JOHNSON
Permittee/Operator representative

ENGINEER
Title

Larry W. Johnson
Signature

Sharon Falvey
Division of Oil, Gas & Mining representative

Reclamation Specialist
Title

Sharon K. Falvey
Signature

39
Identification Number

SEE REVERSE SIDE

WHITE-DOG M YELLOW-OPERATOR PINK-OSM GOLDENROD-NOV FILE



NOTICE OF VIOLATION NO. N 92-38-4-1

Violation No. 1 of 1

Nature of violation

Failure to have access to monitoring records.

Provisions of act, regulations or permit violated

~~MSHA Weekly Inspection~~
R645-400-221,200

Portion of operation to which notice applies

Weekly Inspection Report for MSHA Requirements (Permit, Funds)
K,

Remedial action required (including any interim steps)

- Submit Photo Copy to the Division

Abatement time (including interim steps)

1 week - August 26, 1992