

COAL MINING AND RECLAMATION OPERATIONS FOR 1993

(Must be submitted to the Division by April 15, 1994)

State of Utah
Department of Natural Resources
Division of Oil, Gas and Mining
3 Triad Center, Suite 350
355 West North Temple
Salt Lake City, Utah 84180-1203
(801)538-5340

Permittee: Coastal States Energy Company

Mine Name: SUFCO Mine

Mailing Address: 397 South 800 West, Salina, Utah 84654

Company Representative: Wesley K. Sorensen

Resident Agent: Kenneth E. May

Permit Number: ACT/041/00*1

MSHA ID Number 42-00089

Date of Initial Permanent Program Permit: May 19, 1987

Date of Permit Renewal: May 1992

Quantity of Coal Mined (tonnage) 1993: 3,553,009

A. Summarized Water Monitoring Data:

1. Table 3 lists the surface water sampling schedule for samples in the vicinity of the SUFCo Mine. Table 6.4.1-4 lists the ground water sampling schedule. Table 4.7.2-1 lists the ground water sampling schedule for the Waste Rock Disposal Site. Tables 4, 6.4.1-2, and 4.7.2-2 list the parameters to be monitored at the respective sites.
2. A copy of the authorization to discharge under the UPDES is included. The three discharge points are listed by latitude and longitude.
3. The water monitoring data is included as database files.

TABLE 3. WATER QUALITY SAMPLING IN THE VICINITY OF THE SUFCO NO. 1 MINE

SURFACE WATERS SAMPLING SCHEDULE(2)

Site(3) No.	Description	Baseline Period	Operational Period	Post-Mining Period	Flow Measurement Method
006	South Fork Quitcupah Creek	3x/yr	3x/yr	3x/yr	Pygmy Meter where feasible or Cross section/velocity estimate
007	North Fork Quitcupah Creek	3x/yr	3x/yr	3x/yr	Pygmy Meter where feasible or Cross section/velocity estimate
041	Quitcupah Creek above North Fork	3x/yr	3x/yr	3x/yr	Pygmy Meter where feasible or Cross section/velocity estimate
046	Convulsion Canyon above pumphouse	3x/yr	3x/yr	3x/yr	Pygmy Meter where feasible or Cross section/velocity estimate
047A	East Spring Canyon above Convulsion Canyon	3x/yr	3x/yr	3x/yr	Pygmy Meter where feasible or Cross section/velocity estimate
030(4)	East Spring Canyon just above mine(3)	3x/yr	3x/yr	3x/yr	Crest Gage
022(4)	Mud Spring Canyon just above mine(3)	3x/yr	3x/yr	3x/yr	Crest Gage

(Table 3, continued on page 19)

!	REPLACES	!!	TEXT	!
!	Table 3	Page 18	!! Table 3	Page 18 Date 01/08/90 !

TABLE 3. WATER QUALITY SAMPLING IN THE VICINITY OF THE SUFCO NO. 1 MINE (Continued)

GROUNDWATER SAMPLING SCHEDULE(2)

Site(3) No.	Description	Baseline Period	Operational Period	Post-Mining Period	Flow Measurement Method
001	East Spring	3x/yr	3x/yr	3x/yr	Time/Volume
062	#6 Entry - North Main	3x/yr	3x/yr	3x/yr	Time/Volume
021	Mine Effluent(1)	3x/yr	3x/yr	3x/yr	Time/Volume
047	Pumphouse Effluent	3x/yr	3x/yr	3x/yr	Time/Volume

- (1) Does not include sampling to meet NPDES permit requirements.
- (2) Sampling dates are May/June, August/September and October/November.
- (3) Monitoring stations 060, 061 and 062 #1 Entry -2N have been discontinued since they are now inaccessible.
- (4) Ephemeral stream stations 022 and 030 will have flow measurement by crest gages. Water quality monitoring, if flow occurs, will be collected during the scheduled sampling intervals either by mine personnel or by an automatic sampler. Water samples collected automatically will have the parameter list (Table 4) reduced to exclude those constituents requiring special treatment.

!	REPLACES	!!	TEXT	!
!	Table 3	Page 19	!! Table 3	Page 19 Date 01/08/90 !

TABLE 4. WATER QUALITY PARAMETER LIST FOR ROUTINE WATER QUALITY MONITORING IN THE VICINITY OF THE SUFCO NO. 1 MINE NEAR SALINA, UTAH (Revised August, 1981) (1, 2)

PARAMETERS - FIELD

Flow
 Temperature
 Specific Conductance
 Turbidity (estimated)

PARAMETERS - LABORATORY

Specific Conductance	Phosphate (PO ₄ -P)
Turbidity	Nitrate + Nitrite (N)
pH	Iron - total, dissolved
Total Hardness (CaCO ₃)	Manganese - total, dissolved
Total Dissolved Solids (Calculated)	Boron (total)
Calcium	Barium (total)
Magnesium	
Sodium	
Total Alkalinity	
Total Acidity	
Bicarbonate	
Carbonate	
Hydroxide	
Sulfate	
Chloride	

- (1) Routine water quality sampling since 1978 indicates that continued monitoring of several parameters, particularly trace metals, was unwarranted since concentrations have been very low (often less than laboratory detection limits for trace metals).
- (2) Includes surface and groundwater stations but excludes Waste Rock Disposal and Quitcupah Lease site.

!	REPLACES	!!	TEXT	!
!	Table 4 Page 20	!!	Table 4 Page 20 Date 01/08/90	!

TABLE 6.4.1-2
SURFACE WATER BASELINE, OPERATIONAL AND
POSTMINING WATER QUALITY PARAMETER LIST
(Includes Stations GW-13, GW-21, SUFCo-089, SUFCo-090)

Field Measurements:

- * - Water Level (Station SUFCo-089) or Flow
- * - pH
- * - Specific Conductivity (umhos/cm)
- * - Temperature (Co)

Laboratory Measurements: (mg/l) (Major, minor ions and trace elements analyzed in dissolved form only.)

- * - Total Dissolved Solids
- * - Total Hardness (as CaCO₃)
 - Aluminum (Al)
 - Arsenic (As)
 - Barium (Ba)
 - Boron (B)
- * - Carbonate (CO₃ -2)
- * - Bicarbonate (HCO₃ -)
- Cadmium (Cd)
- * - Calcium (Ca)
- * - Chloride (CL-)
- Chromium (Cr)
- Copper (Cu)
- Fluoride (F-)
- * - Iron (Fe)
- Lead (Pb)
- * - Magnesium (Mg)
- * - Manganese (Mn)
- Mercury (Hg)
- Molybdenum (Mo)
- Nickel (Ni)
- Nitrogen: Ammonia (NH₃)
- Nitrite (NO₂)
- Nitrate (NO₃ -)
- * - Potassium (K)
- Phosphate (PO₄ -3)
- Selenium (Se)
- * - Sodium (Na)
- * - Sulfate (SO₄ -2)
- Zinc (Zn)

Sampling Period:

-Baseline

*Operational, Postmining - *Beginning 1992*

Sampling Frequency:

Spring (May - June)

Summer (Aug)

Fall (Oct - Nov)

TABLE 6.4.1-4
GROUND WATER SAMPLING

	Baseline Monitoring	Operational Monitoring	Postmining Monitoring
Type of Sampling Site	Observation Wells	Observation Wells	Observation Well
Field Measurements	Yes	Yes	Yes
Sampling Frequency Each Site	At least two samples - summer and fall.	Three samples per annum - spring (May - June) summer (Aug - Sept) fall (Oct - Nov)	One sample per annum summer (Aug - Sept).
Sampling Duration	1989	Every year until two years after surface reclamation activities have ceased.	Every year until termination of bonding.
Type of Data Collected & Reported	Water levels.	Water levels.	Water levels.

Monitoring data will be submitted to the division within 90 days of the end of each quarter.

Three wells that will be drilled during 1989 (89-18-1, 89-20-2, and 89-16-1) will be included in the ground water monitoring program.

TABLE 4.7.2-2
GROUND WATER BASELINE, OPERATIONAL AND
POSTMINING WATER QUALITY PARAMETER LIST
Waste Rock Disposal Site

Field Measurements:

- * - Water Levels or Flow
- * - pH
- * - Specific Conductivity ($\mu\text{mhos/cm}$)
- * - Temperature ($^{\circ}\text{C}$)

Laboratory Measurements: (mg/l) (Major, minor ions and trace elements are to be analyzed in dissolved form only.)

- * - Total Dissolved Solids
- * - Total Hardness (as CaCO_3)
- Aluminum (Al)
- Arsenic (As)
- Barium (Ba)
- Boron (B)
- * - Carbonate (CO_3^{-2})
- * - Bicarbonate (HCO_3^{-})
- Cadmium (Cd)
- * - Calcium (Ca)
- * - Chloride (Cl^{-})
- Chromium (Cr)
- Copper (Cu)
- Fluoride (F^{-})
- * - Iron (Fe)
- Lead (Pb)
- * - Magnesium (Mg)
- * - Manganese (Mn)
- Mercury (Hg)
- Molybdenum (Mo)
- Nickel (Ni)
- Nitrogen: Ammonia (NH_3)
- Nitrite (NO_2)
- Nitrate (NO_3^{-})
- * - Potassium (K)
- Phosphate (PO_4^{-3})
- Selenium (Se)
- * - Sodium (Na)
- * - Sulfate (SO_4^{-2})
- Sulfide (S^{-})
- Zinc (Zn)

Sampling Period:

-Baseline

*Operational, Postmining - *Beginning Feb. 1990*

Revised 9/88

STATE OF UTAH
DEPARTMENT OF HEALTH
BUREAU OF WATER POLLUTION CONTROL
P.O. BOX - 16690
SALT LAKE CITY, UTAH 84116-0690

AUTHORIZATION TO DISCHARGE UNDER THE
UTAH POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with provisions of the "Utah Water Pollution Control Act", Title 26, Chapter 11, Utah Code Annotated 1953, as amended, the "Act"

SOUTHERN UTAH FUEL COMPANY

is authorized to discharge from it's Convulsion Canyon mine located

approximately six and one half (6.5) miles north of Salina Canyon (Interstate Highway 70), up Convulsion Canyon, Sevier County, Utah, with the outfalls located at latitude 38° 54' 54" and longitude 111° 24' 57", latitude 38° 54' 52" and longitude 111° 24' 58", and 38° 57' 26" and longitude 111° 23' 06".

to

Quitcupah Creek and East Spring Canyon a tributary of Quitcupah Creek

in accordance with discharge point(s), effluent limitations, monitoring requirements and other conditions set forth herein.

This permit shall become effective on

May 1, 1991.

This permit and the authorization to discharge shall expire at midnight,

April 30, 1996.

Signed this 25th day of April 1991


Authorized Permitting Official
Executive Secretary
Water Pollution Control Committee

CLIMATOLOGIC DATA

ALL CLIMATOLOGIC DATA FOR THIS SITE HAVE BEEN INCLUDED ON THE DISKETTE WITH THE WATER QUALITY DATA. SEE SECTION A OF THIS REPORT.

C. Subsidence Monitoring Report:

1. A brief description of the monitoring of subsidence above the SUFCo mine is given in the subsidence report.
2. The displacement over the mining areas is shown on Maps 1 and 2.
3. The control grid for the photogrammetric survey is shown on Map 1. Map 1 also shows the cumulative displacement observed. Map 2 shows the subsidence in reference to the underground workings.

1993 SUBSIDENCE REPORT

SOUTHERN UTAH FUEL COMPANY

MINE NO. 1

by

DALL DIMICK

CHIEF SURVEYOR

INTRODUCTION

Southern Utah Fuel Company's 1993 subsidence report is an update of annual subsidence data which has been accumulated since 1976. Prior to 1985, the data was derived from conventional survey methods. Since then, photogrammetric surveys have been employed to monitor the ground movement.

During 1985, the entire Southern Utah Fuel Company (SUFCO) property was flown to establish a set of baseline photography and a grid of surface elevations. Where possible, an elevation was photogrammetrically determined on an approximate 200 foot grid. These original x, y and z locations serve as a comparative base for determining ground movement in the succeeding years.

Once each year another set of aerial photography is obtained. A new elevation is then found at the same x and y coordinates as all the originals. The new, or current, elevations are compared to the originals and the difference between the two is used to generate a contour map. The result is the subsidence contour map included with each annual subsidence report.

Three maps accompany this report. Map 1 is the main subsidence map showing surface control monuments, overburden contours, subsidence contours and surface tension cracks. Map 2 is a current mine map with the subsidence map superimposed. Map 3 shows a detail of the Northern Experimental Practice Area (longwall mining beyond the escarpment).

SUBSIDENCE HISTORY

SUFCO began operations which cause surface subsidence in June, 1976. Continuous miners were used to extract coal from pillars which were developed as part of a retreating panel. The panels were approximately 650 feet wide and varied in length up to 2,500 feet. The average mining height approached 11 feet and the extraction ratio averaged about 80%.

The resulting subsidence from these continuous miner panels averaged about 4 feet in the plateau areas where overburden was 900 feet thick. In areas where panel boundaries were outside the escarpment and beyond the Castlegate Sandstone, subsidence increased with decreasing overburden thickness. The maximum subsidence measured to date, 8.5 feet, occurred in one of these areas. The overburden was only 600 feet thick.

Retreat mining continued in this manner until October, 1985, when a retreating longwall system was added. Longwall panels have ranged from 550 feet to 710 feet wide and up to 6,500 feet in length. Mining heights have varied from 9.5 feet to 12 feet.

Subsidence above the longwall panels has averaged about 4 feet; but the overburden thickness has been as much as 1,800 feet. The Maximum measured subsidence caused by longwall mining is seven feet. This occurred in an area outside the escarpment very similar to the one mentioned above for the continuous miner panel.

1993 SUBSIDENCE

The 1993 subsidence map (Map 1) was updated using data from current photogrammetric monitoring. Each subsidence area is labeled as an independent block. A brief description of each follows:

AREA 1

This was SUFCO's first subsidence area. Undermining began in June, 1976, and continued into 1979. The area is composed of five continuous miner panels which averaged 650 feet in width. Mining height averaged 11 feet with about an 80% extraction ratio.

Maximum subsidence ranged from 4.5 feet to 8.5 feet. It was first detected in 1976 and continued until 1985. No surface movement was detected in this entire area from 1986 to 1989. Area 1 was not monitored for the 1990 subsidence report and will remain dormant unless a need arises. Photographic coverage, however, has been maintained so that the area can be monitored if necessary.

AREA 2

This is another continuous miner area. The panels here were irregular shaped and the extraction ratio was modest. Undermining ceased in 1984.

Maximum subsidence has been measured at 2 feet. The area has been stable since 1985 and has not been monitored since 1989. The same condition as mentioned in Area 1 applies here.

AREA 3

This area is another continuous miner section, but the extracted area is a portion of mains with protective barriers instead of a panel. Coal recovery was moderate with mined areas which were subcritical. Undermining ceased in 1983.

Maximum subsidence was measured at 2 feet. Because of the limited extraction and subcritical areas, the subsidence occurred slowly with small changes noticeable until 1987. The area appeared stable in 1988 and 1989. It has not been monitored since 1989.

AREA 4

This subsidence area is comprised of three continuous miner panels. The mining height averaged 11 feet with a good extraction ratio. Undermining ceased in 1985.

Maximum subsidence was 5 feet with no detectable change in 1989. This area was monitored again in 1993, and had no detectable changes.

AREA 5

The four continuous miner panels which make up this area were mined from September, 1978, to November, 1981. Mining height averaged 11 feet with an 80% extraction ratio.

Maximum subsidence was 5 feet with no detectable changes from 1985 through 1989. This area has not been monitored since 1991, and will also remain dormant. As with Areas 1 through 4, photographic coverage has been maintained so that monitoring can be done if necessary.

AREA 6

Area 6 is SUFCO's first longwall induced subsidence area. It is comprised of nine longwall panels varying from 540 feet to 700 feet in width and 1,700 feet to 3,900 feet in length. Also, there is a section of recovered mains between two of the longwall blocks. Undermining began in Area 6 during October, 1985, and continued through the mains recovery in March, 1990.

Maximum subsidence measured in areas bounded by the plateau is five feet. There is a location on the map which shows seven feet; but this area is outside the escarpment where the overburden is only 600 feet thick. The subsided escarpment is intentional and is part of a study agreed upon by SUFCO, the Division of Oil, Gas and Mining, the Bureau of Land Management and the U. S. Forest Service. This particular section of escarpment was removed from the "no subsidence zone" to study the effects of longwall mining on the escarpment.

Area 6 will be monitored for several more years. No changes were detected in 1993.

AREA 7

Area 7 was originally planned for no subsidence. Pillars were made to support the overburden but began to fail in the north end in 1984 when the underground workings were flooded. The failures progressed towards the south and by 1986, subsidence was detected over the area.

The map shows up to seven feet of subsidence. There has been no additional subsidence movement detected since 1988.

AREA 8

Undermining this area began in June, 1983, and was sporadic until 1992. Continuous miners were used with extraction ratios over 80% and average mining heights of 10 feet. This is still an active area and will be for several more years. Maximum subsidence to date is five feet.

AREA 9

This area is a longwall mining area which is composed of four panels. The first began in June, 1989 and the block was finished in January 1992. The mining height averaged about 11 feet and the maximum subsidence shown to date is four feet.

AREA 10

Area ten is a new longwall mining block which began in January 1992. The entire surface area above this block was digitized for base-line elevations during 1991. Maximum subsidence shown to date is four feet. This area will be active for several more years.

The experimental mining practice area discussed under "Area 6" was extended, with regulatory approval, to the east side of the canyon under the Southwest corner of "Area 10". An extensive premining survey of this location was conducted late in 1992. A detailed survey of the post-mining subsidence effects is provided in this report, Map 3.

DRAW ANGLE SURVEYS

Several draw angle surveys have been performed during the past years. Completed surveys have been over continuous miner areas and have been oriented both parallel and perpendicular to the long axis of the panel. The average of all measurements is 15°. Individual measurements ranged from 10° to 21°.

SUBSIDENCE TENSION CRACKS

Tension cracks have occurred above most of the subsidence areas. Most have been located by survey and are plotted on Map 2. Their lengths vary from a few feet to nearly two hundred feet. Most are oriented either parallel to the natural jointing pattern or to the boundaries of the underground excavation. Vertical displacement along the cracks is uncommon and horizontal displacement varies from hairline to several inches in width.

The U. S. Forest Service completed a tension crack study in 1978. They monitored twenty-two different cracks (located in Area 1) with widths varying from 1/8 inch to six inches. Results show that most cracks self-heal, or close, from 13% to 100% of their original width.

A detail of some new tension cracks in the "Experimental Area" is shown on Map 3.

DD:jad

VEGETATION REPORT

THE REVEGETATION EFFORTS FOR THE SUFCo MINE DURING 1993 CONSISTED OF:

1. THE ACCESS ROAD TO THE SEDIMENTATION POND WAS OPENED UP TO FACILITATE POND CLEANING. AFTER CLEANING THE ACCESS ROAD WAS SEEDED WITH THE APPROVED SEED MIXTURE AND APPLICATION RATE.

2. A PLAN WAS DEVELOPED AND APPROVED FOR A VEGETATION DEMONSTRATION PLOT. THE INITIAL SEEDING OF THE PLOT WILL BE DONE IN THE SPRING OF 1994.

E. Annual Impoundment Certification:

The annual impoundment certifications for the mine site and waste rock disposal site sedimentation ponds are include. No sign of instability, structural weakness or other hazardous condition were observed.



December 20, 1993

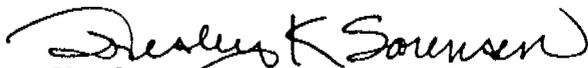
Lowell Braxton
Division of Oil, Gas and Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

Dear Mr. Braxton:

Enclosed are annual certification reports for Southern Utah Fuel Company's Minesite Sedimentation Pond, Waste Rock Disposal Site and the associated Waste Rock Sedimentation Pond.

These certifications are being submitted prior to SUFCo's Annual Report as required by R645-514.

Sincerely,
SOUTHERN UTAH FUEL COMPANY


Wesley K. Sorensen, P.E.
Chief Engineer

WKS:jad

Southern Utah Fuel Company

A SUBSIDIARY OF THE COASTAL CORPORATION

397 SOUTH 800 WEST • SALINA UT 84654 • 801/637-4880 • FAX 801/534-3296

ANNUAL MINESITE SEDIMENTATION POND
CERTIFICATION -- 1993

An inspection of Southern Utah Fuel Company's Minesite Sediment Pond was conducted by Wesley K. Sorensen, P.E. on December 20, 1993.

No signs of structural weakness of the dam or surrounding slopes were observed.

The fill slope above the pond has minor erosion gullies in several locations. No signs of instability of the fill slope were noted.

The sediment pond was cleaned out completely during September of 1993. A new survey was completed detailing the pond surface after cleaning. The low sediment level was at an elevation of 7398.8 ft.

The water level in the pond during the inspection was 7412.98 ft. which is 5.17 feet below the standpipe spillway elevation. An additional 0.94 acre-ft of storage volume was available in the pond above the current water level. The sediment level in the pond was at 7398.8 feet during the September 1993 cleaning, which corresponds to a sediment volume of 0.0 acre-ft based on a level sediment surface and the pond volume in the M&RP.

A copy of the field notes are attached.

I certify that the above description accurately represents the condition of the Minesite Sediment Pond as observed during my inspection on December 20, 1993.



Wesley K. Sorensen, P.E.
Registration No. 5369
State of Utah

WKS:jad

Attachment

SOUTHERN UTAH FUEL COMPANY

Minesite Sediment Pond Quarterly Inspection Report

Inspector Wesley K Sorenson Date 12/20/93

1. Dam Structural Weakness

A. Cracks or scarps on crest Yes No
None observed

B. Cracks or scarps on slope Yes No
None observed

C. Sloughing or bulging on slope Yes No
None observed

2. Major Erosion Problems Yes No

Some ^{erosion} on fill slope above pond.
Rive lets 4-12" deep in places

3. Surface Movements of Surrounding Slopes Yes No

None observed

4. Visible Sumps or Sinkholes in Slurry Surface Yes No

5. Clogging Yes No

A. Spillway channels and pipes Yes No
clear

B. Decant System Yes No
Functional & looked

C. Diversion ditches Yes No

clear

6. Seepage (Specify Location, Color and Approx. Volume) Yes No

None observed

7. Any appearance of instability, structural weakness, or other hazardous conditions Yes No

None observed

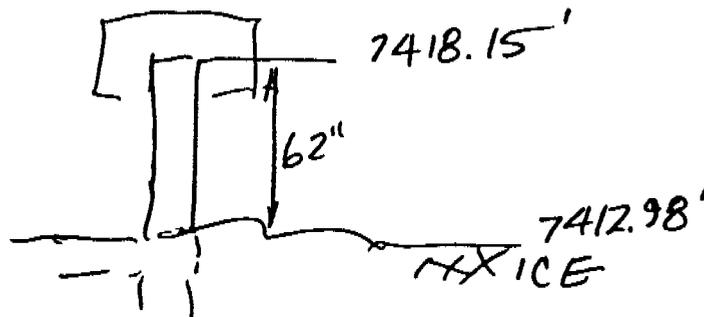
8. Other Comments

clear & sunny

Temp = 25°F

snow 0-3"

ICE LEVEL 62" below stand pipe out flow level
Note: Pond cleaned in Sept-Oct.



ANNUAL WASTE ROCK SEDIMENTATION POND
CERTIFICATION -- 1993

An inspection of Southern Utah Fuel Company's Waste Rock Sediment Pond and associated Decant Impoundment was made on December 20, 1993 by Wesley K. Sorensen, P.E.

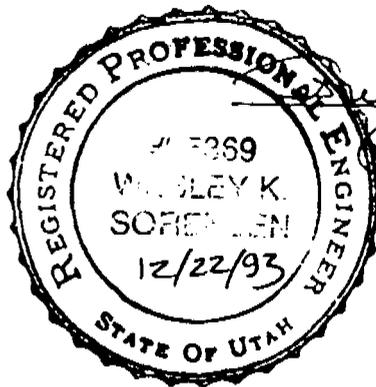
No signs of structural weakness of the sediment pond dam or decant impoundment dam were observed.

The diversion ditches, spillways and decant device are in as-constructed condition and are functional.

The sediment level in the center of the sediment pond is at 7884.16 ft. At the time of the inspection there was snow in the pond. The total storage volume between 7884.16 and 7889.50 (spillway) is 0.72 acre ft. No sediment or water was observed in the decant impoundment.

A copy of the field notes of the inspection are attached.

I certify that the above description accurately represents the condition of the Waste Rock Sedimentation Pond and Decant Impoundment observed during the inspection.



Wesley K. Sorensen
Wesley K. Sorensen, P.E.
Registration No. 5369
State of Utah

WKS:jad

Attachment

SOUTHERN UTAH FUEL COMPANY

Rock Waste Sediment Pond Quarterly Inspection Report

Inspector Wesley K Sorensen Date 12/20/93

1. Dam Structural Weakness

A. Cracks or scarps on crest Yes No
None observed

B. Cracks or scarps on slope Yes No
None observed

C. Sloughing or bulging on slope Yes No
None observed

2. Major Erosion Problems Yes No
None

3. Surface Movements of Surrounding Slopes Yes No
None

Sediment Level center of pond 7884.16'

4. Visible Sumps or Sinkholes in Slurry Surface Yes No
No water in pond

5. Clogging

A. Spillway channels and pipes Yes No
AS DESIGNED - CLEAR

B. Decant System Yes No
Functional AS DESIGNED
LOCKED

C. Diversion ditches Yes No

Edge of debris & sediment

6. Seepage (Specify Location, Color and Approx. Volume) Yes No

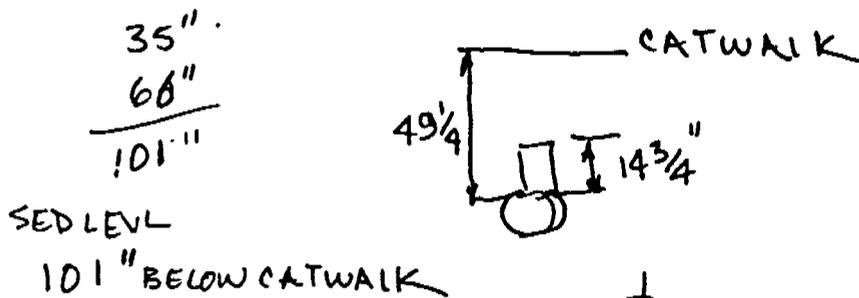
None observed

7. Any appearance of instability, structural weakness, or other hazardous conditions Yes No

None observed

8. Other Comments

Temp: 25^D Clear & sunny
Snow: 0-12"
Deer & Elk wintering in area



Decant impoundment

No cracks

No sloughing

No bulging

No appearance of instability, structural weakness, or other hazardous conditions

in impoundment.

ANNUAL WASTE ROCK DISPOSAL SITE
CERTIFICATION -- 1993

An inspection of Southern Utah Fuel Company's Waste Rock Disposal Site was made by Wesley K. Sorensen, P.E. on December 20, 1993.

The second cell of the waste rock disposal site has been reclaimed using moguls to enhance vegetation growth. The resulting surface of about two acres was hydroseeded in accordance to the M&RP during October 1992. Good vegetative growth was observed. The third cell is being constructed. The height of the third cell is about 18 ft.

The active area pad of the third cell is approximately 240 ft x 75 ft. Underground development waste is end dumped from 10 wheel dump trucks in piles about 3.5 ft high. These piles are leveled with a D-8 Cat dozer. The resulting lift thickness is 18-24 inches. The dozer and loaded trucks are routed over the pad to compact the lift.

Final and intermediate construction slopes were less than the designed 1v:2h. Slopes are constructed such that water cannot pond against the toe. Drainage of the active pad area precludes water ponding on the surface of the fill.

No fires have occurred at the site since it was constructed and none were observed during the inspection.

No significant erosion was observed.

A copy of the field notes are attached.

I certify that the above description accurately represents the conditions observed at the Waste Rock Disposal Site during my inspection on December 20, 1993.



Wesley K. Sorensen, P.E.
Registration No. 5369
State of Utah

WKS:jad

Attachment

SOUTHERN UTAH FUEL COMPANY

Coal Refuse Piles Quarterly Inspection Report

Inspector Wesley K Sorensen Title Chief Engineer
Date 12/20/93 Permit # Act/041/002

- 1. Foundation Preparation (vegetation, topsoil removal?) Yes No
- 2. Lift Thickness (inches) 1 1/2 - 2 ft
- 3. Compaction Yes No
- 4. Burning (specify extent and location) Yes No
None observed throughout year
- 5. Angle of Slope (degrees) ARE 25-27°, S 10-15°, E 20-25°, W 20-24°
- 6. Seepage (specify location, color, & appr. volume) Yes No
- 7. Cracks or Scarps (location, size) Yes No
- 8. Major Erosion Problems (location and extent) Yes No
- 9. Water Impounding Against Toe Yes No
- 10. Any appearance of instability, structural weakness, or other hazardous conditions Yes No
Active pool 75' w x 240' L approx.

Temp: 25° F
Snow cover: None to 4"

Wesley K Sorensen
Wesley K. Sorensen, P.E.
Registration No. 5369
State of Utah



Slope above road to active lift 25-27°

South slope 10-15°

East slope 20-25°

West slope 20-24°

F. Annual Overburden, Spoil, Refuse, Roof, Floor, and Mid-Seam Data.

1. Southern Utah Fuel Company's waste rock disposal site is located 6.4 road miles from the minesite in the NW 1/4 of NE 1/4 of Section 18, Township 22 South, Range 4 East, SLB&M. Because Southern Utah Fuel Company is an underground coal mine that does not wash its product, refuse material is only produced when rehabilitating old work areas and when installing overcasts for ventilation. The refuse produced thus consists predominantly of coal with a small amount of rock from the first foot of floor rock and the first four feet of roof rock. Systematic sampling of roof and floor rock is not done because of the small amount and infrequency in which these materials are encountered.
2. Representative grab samples are taken of all refuse material as it is hauled out of the mine. The samples are composited on a quarterly basis making for a 50-100 pound sample that is analyzed. Sample preparation includes crushing to 4 mesh and riffing to a representative 5-10 pound size for analysis.
3. Laboratory analysis sheets are included.
4. A summary table of analytical results from the quarterly samples is included.

WASTE ROCK DISPOSAL SITE ANALYSES OF MATERIAL

Qtr	Year	pH of Paste Extract (SU)	Alkalinity of P.E. (meq/L)	Electrical Conduct. (mmhos/cm)	Water Satur. (wt.%)	Calcium (meq/L)	Magnesium (meq/L)	Sodium (meq/L)	Sodium Absorp. Ratio	Total Sulfur (wt.%)	Total Sulfur A.B. (T/1000T)	Neutral. Potent. (T/1000T)	Total Sulfur A.B.P. (T/1000T)	-Water Soluble- Boron (ppm)	Selenium (ppm)
1	1993	7.6	2.13	5.75	39.90	26.6	18.3	21.20	4.48	0.51	15.9	205.0	189.0	5.24	0.03
2	1993	7.5	2.36	8.44	38.40	37.4	38.1	20.70	3.36	0.75	23.4	170.0	147.0	3.75	0.02
3	1993	7.3	2.98	7.17	44.30	31.1	26.8	27.00	5.02	0.43	13.4	-0.7	-14.1	6.23	0.03
4	1993	7.5	2.43	7.14	43.40	32.8	29.8	20.10	3.59	0.68	21.2	98.7	77.4	5.48	0.02

- Notes: 1. Absence of a value indicates that the parameter was not analyzed.
2. The detection limit for selenium is 0.02 ppm. Analysis values equal to or less than 0.02 are entered as 0.02.



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SALINA, UTAH

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No.	Location	Depths	Total Sulfur %	T.S. AB t/1000t	Neut. Pot. t/1000t	T.S. ABP t/1000t	Boron ppm	Selenium ppm	Alkalinity PE meq/l
45	WRDS 1QTR 93		0.51	15.9	205.	189.	5.24	0.03	2.13

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Abbreviations for extractants: PE= Saturated Paste Extract, H2OSol= water soluble, AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur,
Neut. Pot.= Neutralization Potential



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No.	Location	Depths	pH	EC µmhos/cm @ 25°C	Satur- ation %	Calcium meq/l	Magnesium meq/l	Sodium meq/l	SAR
45	WRDS IQTR 93		7.6	5.75	39.9	26.6	18.3	21.2	4.48

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Lab No.	Location	Depths	pH	EC µmhos/cm @ 25°C	Satur- ation %	Calcium mg/l	Magnesium mg/l	Sodium mg/l	SAR
92040	WRDS 2 QTR 93		7.5	8.44	38.4	37.4	38.1	20.7	3.36



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Lab No.	Location	Depths	Total Sulfur %	T.S. AB t/1000t	Neut. Pot. t/1000t	T.S. ABP t/1000t	Boron ppm	Selenium ppm	Alkalinity PE meq/l
92040	WRDS 2 QTR 93		0.75	23.4	170.	147.	3.75	<0.02	2.36

Abbreviations for extractants: PE= Saturated Paste Extract, H₂SO₄= water soluble, AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
 Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur,
 Neut. Pot.= Neutralization Potential



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Lab No.	Location	Depths	Total Sulfur %	T.S. AB t/1000t	Neut. Pot. t/1000t	T.S. ABP t/1000t	Pyr+Org Sulfur %	Pyr+Org AB t/1000t	Pyr+Org ABP t/1000t	Boron ppm	Selenium ppm	Alkalinity PE meq/l
98603	WRDS 3QTR 93		0.43	13.4	-0.65	-14.1				6.23	0.03	2.98

Abbreviations for extractants: PE= Saturated Paste Extract, H2OSol= water soluble, AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur,
Neut. Pot.= Neutralization Potential



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November 5, 1993

Lab No.	Location	Depths	pH	EC µmhos/cm @ 25°C	Satur- ation %	Calcium mg/l	Magnesium mg/l	Sodium mg/l	SAR
98603	WRDS 3QTR 93		7.3	7.17	44.3	31.1	26.8	27.0	5.02



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Lab No.	Location	Depths	Pyr+Org Sulfur %	Pyr+Org AB t/1000t	Pyr+Org ABP t/1000t	Boron ppm	Selenium ppm	Alkalinity PE meq/l
103320	WRDS 4 QTR 93					5.48	0.02	2.43

Abbreviations for extractants: PE= Saturated Paste Extract, H2OSol= water soluble, AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur,
Neut. Pot.= Neutralization Potential



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Lab No.	Location	Depths	pH	EC mmhos/cm @ 25°C	Satur- ation %	Calcium meq/l	Magnesium meq/l	Sodium meq/l	SAR	Total Sulfur %	T.S. AB t/1000t	Neut. Pot. t/1000t	T.S. ABP t/1000t
103320	WRDS 4 QTR 93		7.5	7.14	43.4	32.8	29.8	20.1	3.59	0.68	21.2	98.7	77.4

Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur,
 Neut. Pot.= Neutralization Potential
 Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, Exch= Exchangeable, Avail= Available

COASTAL STATES ENERGY COMPANY

LIST OF CORPORATE OFFICERS

AN UPDATED LISTING OF CORPORATE OFFICERS AND CORPORATE STRUCTURE WAS SUBMITTED IN FEBRUARY 1994. AN APPROVAL OF THIS LISTING BY THE DIVISION IS PENDING.

AS PER A TELEPHONE CONVERSATION WITH DARON HADDOCK AND KEITH ZOBELL THE UNAPPROVED LIST WILL NOT BE REPEATED IN THIS ANNUAL REPORT.