

ACT/007/035  
#2

June 7, 1994

## MEMORANDUM

TO: Director, Albuquerque Field Office

FROM: Karen F. Jass, Mining Engineer  
Engineering Support Section

THROUGH: Michael F. Rosenthal, Chief  
Physical Sciences Branch

SUBJECT: Sunnyside Cogeneration Associates (SCA) Refuse Area  
Bond Cost Evaluation

Attached are copies of SCA's bond estimate and an independent estimate of the same property, developed by OSM. The difference between the two estimates is about 8%, with the SCA estimate being the greater of the two. SCA's present estimate of \$1,436,673 is adequate at this time for the reclamation of the refuse areas, formerly of Sunnyside Mines.

Direct Costs

Regrade

|                                                        |              |           |
|--------------------------------------------------------|--------------|-----------|
| Rip and Scarify<br>(6.22 miles road, 8 AC refuse pile) |              | \$ 36,645 |
| Spread Avail Topsoil, Borrow Material                  | 88,531 CY    | \$ 47,710 |
| Haul from Borrow areas                                 | 1,024,620 CY | \$355,435 |
| Spread Borrow materials                                | 1,024,620 CY | \$172,634 |

Revegetation

|           |        |           |
|-----------|--------|-----------|
| Broadcast | 33 AC  | \$287,496 |
| Hydroseed | 162 AC | \$259,200 |

Pond Removal

|                                |  |           |
|--------------------------------|--|-----------|
| Pond Removal (SCA estimate)    |  | \$ 48,715 |
| Culvert Removal (SCA estimate) |  | \$ 4,492  |

Subtotal Reclamation Costs \$1,208,327

Indirect Costs

|                                  |  |            |
|----------------------------------|--|------------|
| Mobilization/Demobilization (3%) |  | \$ 30,850  |
| Contingency Allowance (7%)       |  | \$ 71,983  |
| Engineering Redesign fee (5.8%)  |  | \$ 59,643  |
| Profit & Overhead (8.8%)         |  | \$ 90,493  |
| Reclamation Management (4.4%)    |  | \$ 45,247  |
| Subtotal Indirect Costs          |  | \$ 298,216 |

Total Bond Estimate \$1,326,543

FIGURE 8-1  
**SUNNYSIDE COGENERATION ASSOCIATES  
 PROPOSAL FOR BOND AMOUNT**

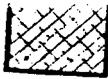
| ITEM                                        | DESCRIPTION                                                                    | QUANTIT | UNIT | UNIT PRICE | AMOUNT             |
|---------------------------------------------|--------------------------------------------------------------------------------|---------|------|------------|--------------------|
| <b>REGRAIDING DISTURBED AREAS</b>           |                                                                                |         |      |            |                    |
| 1                                           | ROUGH GRADE & SCARIFY SUBSOIL                                                  | 134     | AC   | \$148      | \$19,857           |
| 2                                           | *REGRAIDING - LOAD & SPREAD TOPSOIL OR BORROW MATERIAL (1.5 FEET)              | 161,656 | C.Y. | \$1.01     | \$163,273          |
| 3                                           | REGRAIDING - LOAD & SPREAD TOPSOIL OR BORROW MATERIAL (2.0 FEET)               | 41,946  | C.Y. | \$1.01     | \$42,365           |
| 4                                           | REGRAIDING REFUSE AREAS - LOAD & SPREAD TOPSOIL OR BORROW MATERIAL (4.0 FEET)  | 367,840 | C.Y. | \$1.01     | \$371,518          |
| <b>REVEGETATION</b>                         |                                                                                |         |      |            |                    |
| 5                                           | BROADCAST SEEDING INCL FERTILIZER & SEED (W/ EQUIP.) (SLOPES 2.0:1 OR GREATER) | 24      | AC   | \$7,841    | \$184,264          |
| 6                                           | HYDROSEED INCL MULCH, FERTILIZER, SEED (W/ EQUIP.)                             | 188     | AC   | \$1,440    | \$271,152          |
| <b>POND RECLAMATION AND CULVERT REMOVAL</b> |                                                                                |         |      |            |                    |
| 7                                           | IMPOUNDMENT/POND REMOVAL                                                       | 97,430  | C.Y. | \$0.50     | \$48,715           |
| 8                                           | CULVERT REMOVAL                                                                |         | LUMP |            | \$4,492            |
| <b>SUBTOTAL RECLAMATION COSTS</b>           |                                                                                |         |      |            | <b>\$1,105,636</b> |
| <b>INDIRECT COSTS</b>                       |                                                                                |         |      |            |                    |
| 9                                           | MOBILIZATION (INCL ALL LARGE EQUIP. TO BE USED DURING RECLAMATION)             |         | LUMP |            | \$10,000           |
| 10                                          | MAINTENANCE AND MONITORING (10%)                                               |         | LUMP |            | \$110,564          |
| <b>TOTAL RECLAMATION COSTS</b>              |                                                                                |         |      |            | <b>\$1,226,199</b> |
| 11                                          | CONTINGENCY (10%)                                                              |         | LUMP |            | \$122,620          |
| <b>TOTAL (1993 Dollars)</b>                 |                                                                                |         |      |            | <b>\$1,348,819</b> |
| <b>TOTAL BOND AMOUNT (1998 Dollars)</b>     |                                                                                |         |      |            | <b>\$1,436,673</b> |

The total bond amount was escalated at the "Means" suggested inflation rate of 1.27% per year.

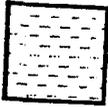
NOTE: All costs have been adjusted to represent average costs for Utah Unit Costs have been verified by Means Cost Data

as 8-1 through 8-7 for details

and borrow material to be used is available on the site. No topsoil or borrow material will be purchased for the purposes of reclamation.



AREAS TO BE RECLAIMED DURING YEARS 12-16



AREAS TO BE RECLAIMED DURING YEARS 17-21



AREAS TO BE RECLAIMED DURING FINAL RECLAMATION

----- PERMIT AREA



LEGEND

----- PERMIT BOUNDARY

150 300 450 600



SCALE: 1" = 300'

SUNNYSIDE COGENERATION ASSOCIATES  
FACILITY, CARBON COUNTY, UTAH  
RECLAMATION SEQUENCING

Sheet Number

9 - 1b

319.75 AC  
Permit

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JAN 29 1993

DIVISION OF  
OIL, GAS & MINING

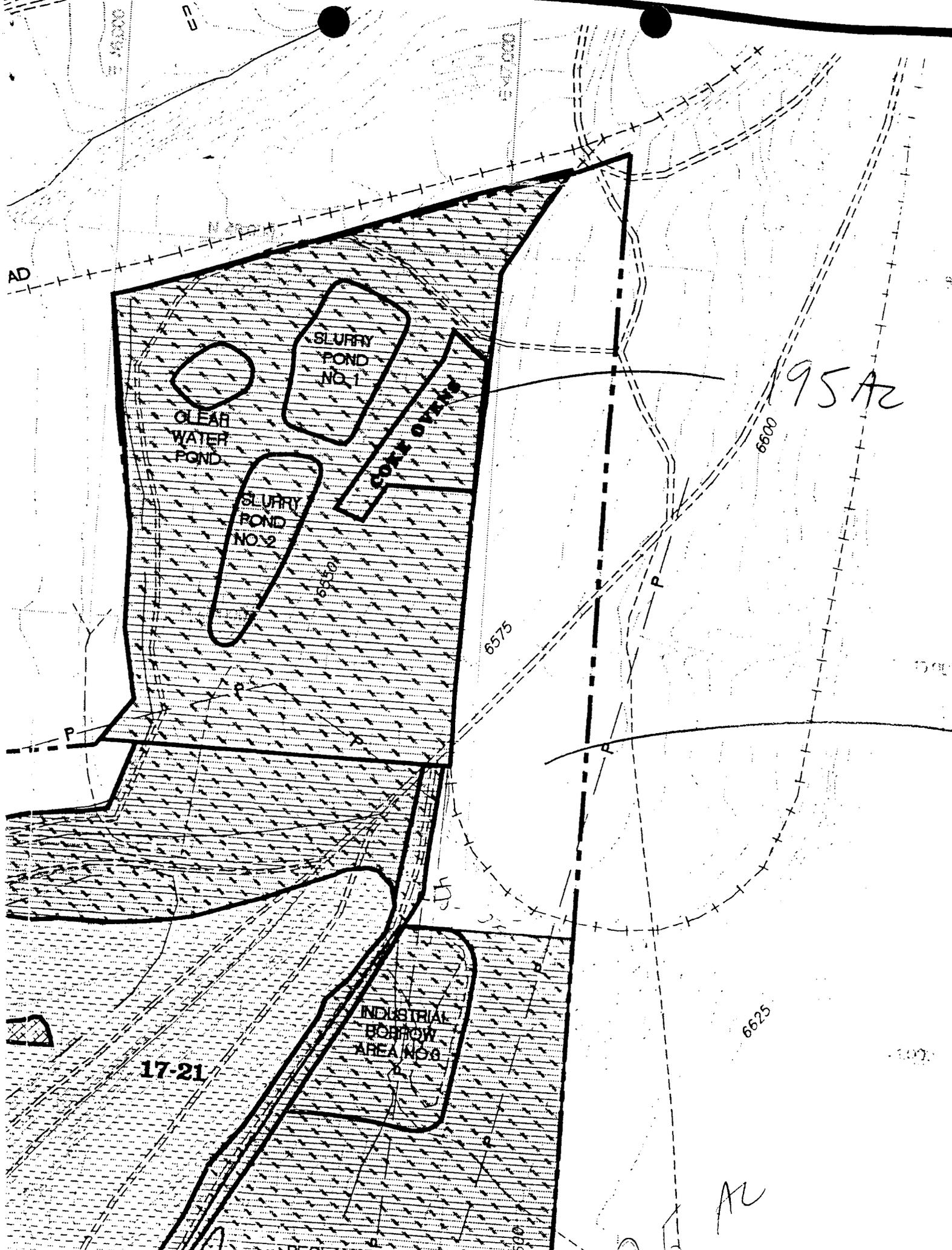
LEGEND



AREAS TO BE RECLAIMED DURING YEARS 0-5



AREAS TO BE RECLAIMED DURING YEARS 6-11



AD

CLEAN  
WATER  
POND

SLURRY  
POND  
NO. 1

SLURRY  
POND  
NO. 2

COLE OFFERS

INDUSTRIAL  
BORROW  
AREA NO. 6

17-21

95AZ

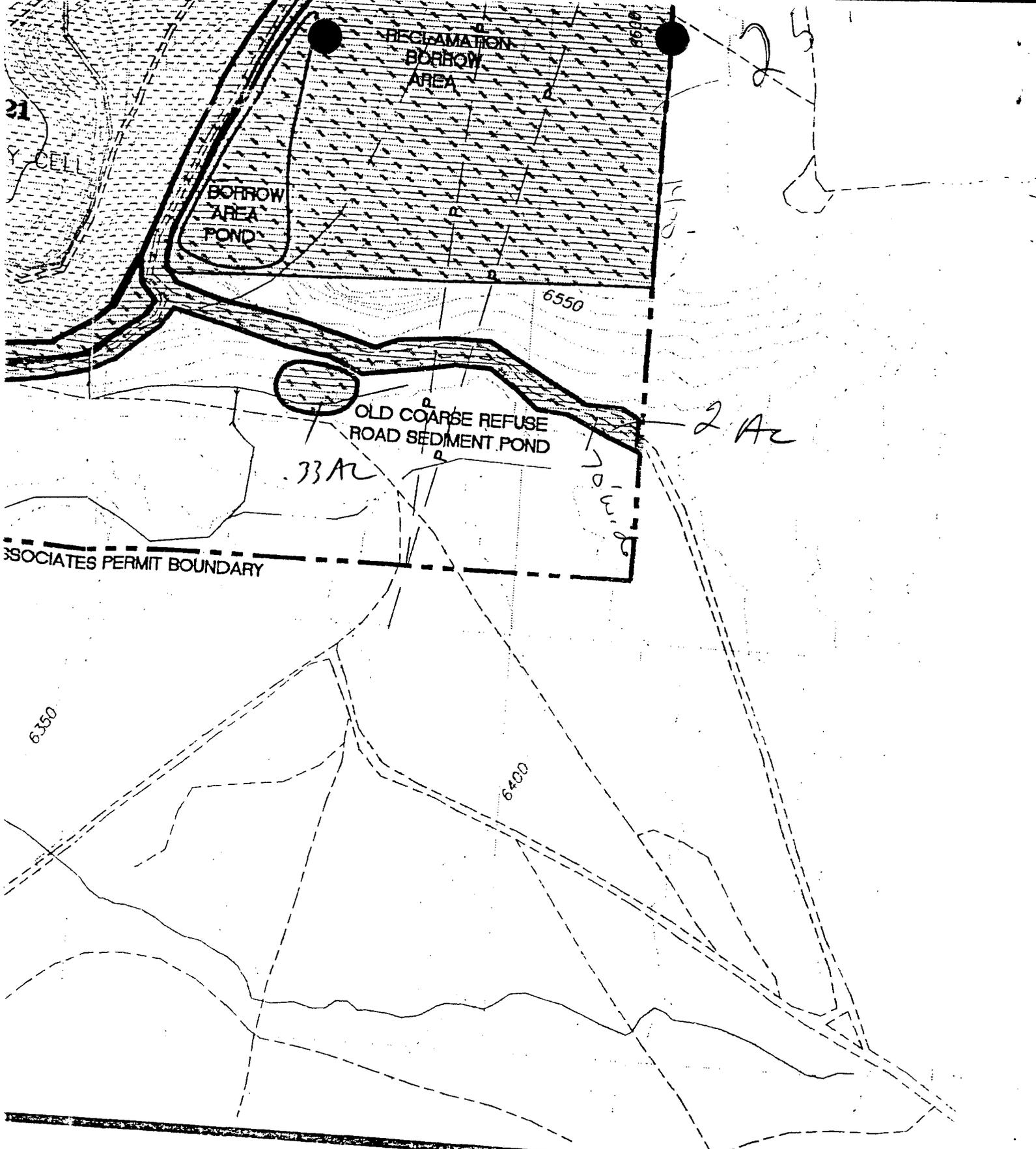
AZ

6575

6625

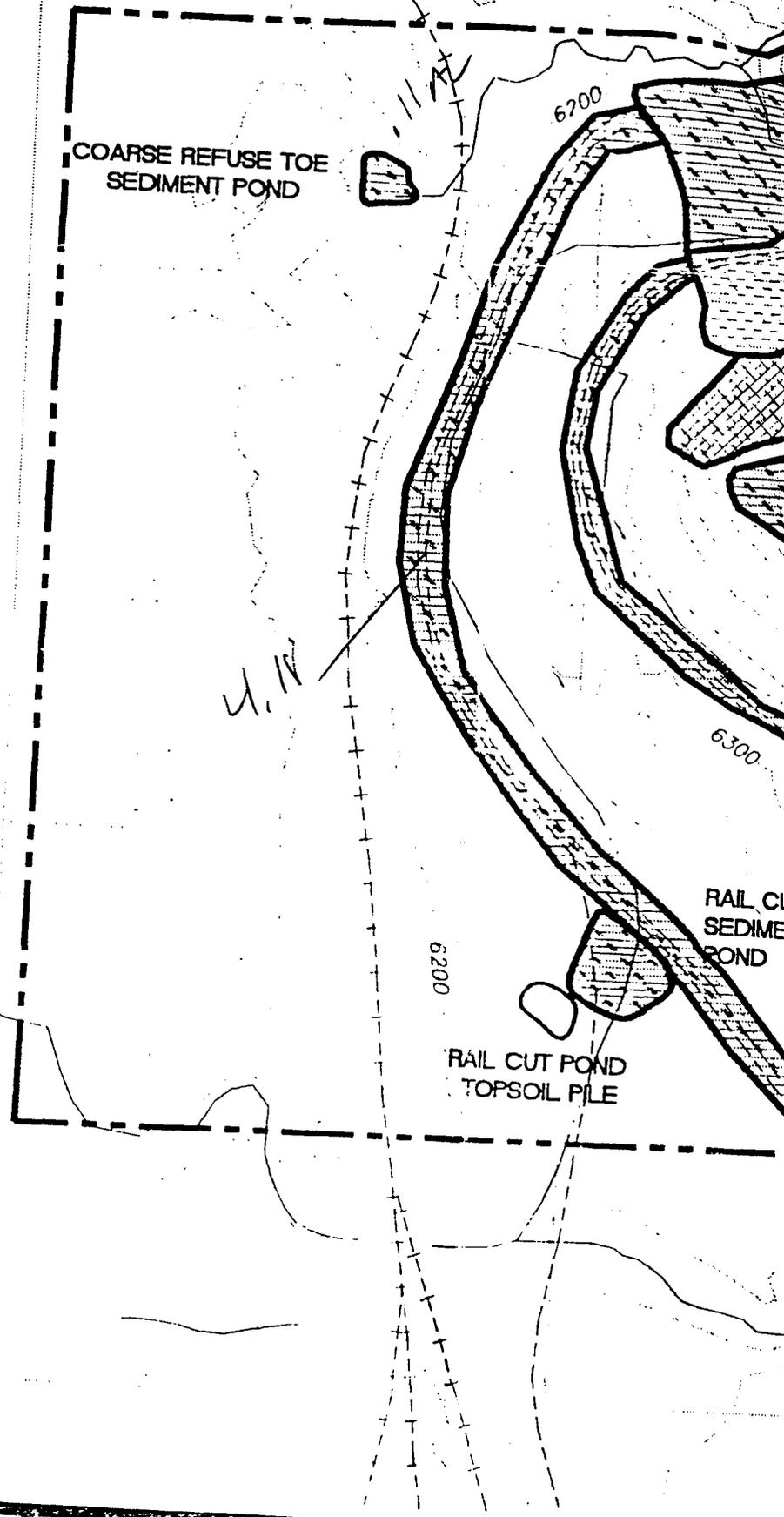
6680

6680



**N AND PREATOR ENGINEERING**  
SURVEYORS  
SALT LAKE CITY

SUNNYSIDE COGENERATION



COARSE REFUSE TOE  
SEDIMENT POND

RAIL CUT  
SEDIMENT  
POND

RAIL CUT POND  
TOPSOIL PILE

4.14



DENVER AND RIO GRANDE WESTERN RAILROAD

6475

6500

PASTURE  
SEDIMENT  
POND

INDUSTRIAL BORROW  
AREA NOT

REFUSE

17-21

12-18

REFUSE

17-21

WEST SLURRY CELL

6450  
6500

12-18

6-11

12-18

17-21

EAST SLURRY CELL

6325

70



ber EC450392

AEB

JWS

AEB Date 12/92



**ECKHOFF WATSON AND PARTNERS**

ENGINEERS PLANNERS SURVEYORS

SCA.

200 Ac distributed - 25 bonus  
175 Ac

4' - 1129333  
2' - 564667

if one bonus area.  
25 Ac -

10' t - 404333  
15' t - 605000  
20' t - 806667  
25' t - 1008333  
27' t - 1089000  
30' t - 1,210,000

Avail - Borrow  $79424 \text{ yd}^3$   $\leq$   $100000 - 32525 \text{ yd}^3$   
 + S -  $.9107 \text{ yd}^3$  Rail cut  
 Slurry  $15700 \text{ ft}^3$   
 Haul Rd  $127900 \text{ ft}^3$   
 $102200 \text{ ft}^3$  from SS per

4' cover

Need (9-15 man) measured  
 $195 \text{ AC} - 24A + 2.3 + 2.73 + 1 - 10.5 - 11A - 5.5 +$   
 $- 8.81 \text{ AC} + 7.8 = 150.36 \times 4' \text{E} = 970,323$

~~18" -  $11 \text{ AC} + (10.5 - 27 - .33) + (24 - 2.73 - 2.3) +$   
 $(14A - 1.34 \text{ AC}) + [(8.8 + 5.5) - (5.5 \times 1.5)] + 1 +$   
 $+ .01 = 59.02 \text{ AC} \times 1.8' \text{E} = 142,828 \text{ yd}^3$   
 $195 - 150.36 \text{ AC} - 45 \text{ AC} @ 18" \text{E} = 108,900 \text{ cy}$~~

need total  $1,113,151 \text{ cy}$

have Avail  $88531 \text{ cy}$

$1,024,620 \text{ yd}^3$  to borrow from RR loop area

use  $25 \text{ AC} - 26' \text{E} = 1048667 \text{ yd}^3$   
 use  $\rightarrow 25.5 \text{E} = 1028500 \text{ yd}^3$

Assum. haul distance  $2500'$



Project \_\_\_\_\_

Date \_\_\_\_\_

WORKSHEET NO. 7

PRODUCTIVITY AND HOURS REQUIRED FOR RIPPER-EQUIPPED DOZER USE

Ripping Activity:

D-10 - rip refuse embank 8 Ac

Characterization of Dozer and Ripper Used:

Description of Ripping (ripping depth, cut spacing, cut length, and material to be ripped):

Productivity Calculations:

$$\text{Cycle time} = \left( \frac{900 \text{ ft}}{\text{cut length}} \div \frac{88 \text{ fpm}}{\text{speed}} \right) + \frac{25}{\text{turn time}} = 10.48 \text{ min/pass}$$

$$\text{Passes/hour} = \frac{50 \text{ min/hr}}{\text{work hour factor}} \div \frac{10.48 \text{ min/pass}}{\text{cycle time}} = 4.77 \text{ passes/hr}$$

$$\text{Volume cut per pass} = \left( \frac{2' \text{ ft}}{\text{tool penetration}} \times \frac{1.44 \text{ ft}}{\text{cut spacing}} \times \frac{900 \text{ ft}}{\text{cut length}} \right) \div \frac{27 \text{ ft}^3}{\text{yd}^3} = 96 \text{ bank yd}^3/\text{pass}$$

$$\text{Ripping Production} = 96 \text{ bank yd}^3/\text{pass} \times 4.77 \text{ passes/hr} = 457.9 \text{ bank yd}^3/\text{hr}$$

$$\text{Hours Required} = \frac{25813 \text{ bank yd}^3}{\text{volume to be ripped}} \div \frac{458 \text{ bank yd}^3/\text{hr}}{\text{hourly production}} = 56 \text{ hrs}$$

$\times \frac{(142.10)}{26.77} \text{ 1/4}$   
9457

Calculate separate dozer hauling of ripped material in each lift on Worksheet No. 5, using material factor to account for swell.

Data Sources:

$$8 \text{ Ac} \times \frac{43560 \times 2'}{27} = 25813$$

Project \_\_\_\_\_

Date \_\_\_\_\_

WORKSHEET NO. 7

PRODUCTIVITY AND HOURS REQUIRED FOR RIPPER-EQUIPPED DOZER USE

Ripping Activity:

D-10 multishank Roads

Characterization of Dozer and Ripper Used:

E 9 + 8/hr  
oper/hr

13.67 + 142.10  
13.10  
155.77/hr

Description of Ripping (ripping depth, cut spacing, cut length, and material to be ripped):

37"

52"

road

Productivity Calculations:

Cycle time = (500 ft / 88 fpm) + .25 = 5.93 min/pass

Passes/hour = 50 min/hr ÷ 5.93 min/pass = 8.43 passes/hr 8.5

Volume cut per pass = (3 ft x 144 ft x 500 ft) / 27 ft³ = 80.25 bank yd³/pass

Ripping Production = 80.25 bank yd³/pass x 8.5 passes/hr = 682.1 bank yd³/hr

Hours Required = 109472 bank yd³ ÷ 682.1 bank yd³/hr = 160.49 hrs

10/1 hr X  
26.77 + 142  
\$27188

Calculate separate dozer hauling of ripped material in each lift on Worksheet No. 5, using material factor to account for swell.

Data Sources:

6 22 miles X 5280 ft/m X 30' wide X 3' deep

10,472 cu yd

Reveg \$ / Ac.      \$1600 / Ac - hydroseed

slope < 2:1 - \$8712 / Ac

$$\begin{array}{r} \text{slope } \$8712 \times \\ \text{hydroseed } \$1600 \times \end{array} \left( \begin{array}{c} B \\ 8 \text{ Ac} + 10 + 9.5 \text{ F } 5.5 \end{array} \right) = \begin{array}{r} \$287496 \\ \$259200 \\ \hline \$546696 \end{array}$$

Project \_\_\_\_\_

Date \_\_\_\_\_

WORKSHEET NO. 5

PRODUCTIVITY AND HOURS REQUIRED FOR DOZER USE

Earthmoving Activity:

spread area TS + borrow

Characterization of Dozer Used (type, size, etc.):

D-10 "u" blade 500 push 0 grade

Description of Dozer Use (origin, destination, grade, haul distance, material, etc.):

Productivity Calculations:

*med loose subgrade*

$$\text{Operating Adjustment Factor} = \frac{1.0}{\text{operator factor}} \times \frac{1.1}{\text{material factor}} \times \frac{.83}{\text{work hour factor}} \times \frac{1}{\text{grade factor}} \times \frac{2400}{2650} \times \frac{.91}{\text{weight correction factor}} \times \frac{1.2}{\text{production method/blade factor}} \times \frac{.95}{\text{visibility}} \times \frac{1}{\text{elevation}} \times \frac{1}{\text{direct drive transmission}} = .95$$

$$\text{Net Hourly Production} = \frac{325}{\text{normal hourly production}} \text{ yd}^3/\text{hr} \times \frac{.95}{\text{operating adjustment factor}} = 307.82 \text{ yd}^3/\text{hr}$$

$$\text{Hours Required} = \frac{\text{Avalanche } 88531 \text{ yd}^3}{\text{volume to be moved}} \div \frac{307.82 \text{ yd}^3/\text{hr}}{\text{net hourly production}} = 287.60 \text{ hrs} \approx 288 \text{ hrs}$$

$$142.14 + 13.10 = 155.24/\text{hr} \times 288 \text{ hrs} = \$44709.7$$

\$44710

Data Sources:

Project \_\_\_\_\_

Date \_\_\_\_\_

WORKSHEET NO. 5

PRODUCTIVITY AND HOURS REQUIRED FOR DOZER USE

Earthmoving Activity:

spread <sup>borrow</sup> ~~replacement~~ materials

Characterization of Dozer Used (type, size, etc.):

D10 - 4 blade

Description of Dozer Use (origin, destination, grade, haul distance, material, etc.):

200' 0

Productivity Calculations:

$$\text{Operating Adjustment Factor} = \frac{1.0}{\text{operator factor}} \times \frac{1.1}{\text{material factor}} \times \frac{.83}{\text{work hour factor}} \times \frac{1}{\text{grade factor}} \times \frac{.91}{\text{weight correction factor}} \times \frac{1.2}{\text{production method/blade factor}} \times \frac{.95}{\text{visibility}} \times \frac{1}{\text{elevation}} \times \frac{1}{\text{direct drive transmission}} = .95$$

$$\text{Net Hourly Production} = \frac{950}{\text{normal hourly production}} \text{ yd}^3/\text{hr} \times \frac{.95}{\text{operating adjustment factor}} = 902.5 \text{ yd}^3/\text{hr}$$

$$\text{Hours Required} = \frac{102462 \text{ yd}^3}{\text{volume to be moved}} \div \frac{902.5}{\text{net hourly production}} \text{ yd}^3/\text{hr} = 1135.3 \text{ hrs} \approx 1135$$

172634

$$142.10 + 10 = 152.10 \text{ hr}$$

Data Sources:



SCALE: 1" = 300'

*Refuse area*

LEGEND

- PERMIT BOUNDARY
- - - - - COLLECTOR DITCH
- ===== ROAD
- P----- POWER
- RAILROAD
  
-  BORROW AREAS

SUNNYSIDE COGENERATION ASSOCIATES  
 RATION FACILITY, CARBON COUNTY, UTAH  
 AREAS FOR BOND QUANTITIES

Sheet Number  
 8 - 1

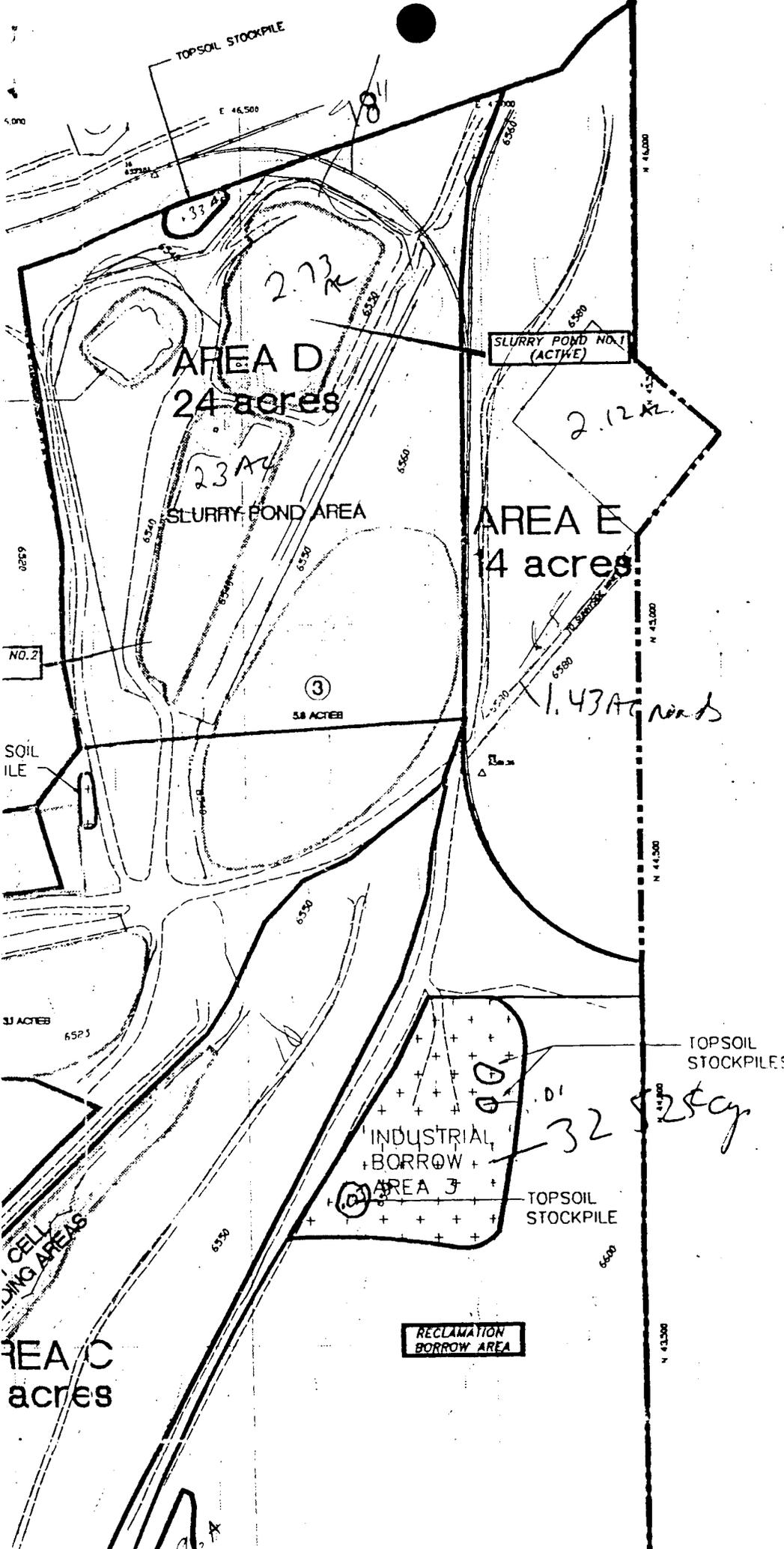
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DIVISION ( )  
OIL, GAS & MI

| ACREAGE    | DESCRIPTION                            |
|------------|----------------------------------------|
| 58 ACRES   | WEST SLURRY CELL AND SURROUNDING AREAS |
| 19 ACRES   | REFUSE PILE #1 AND SURROUNDING AREAS   |
| 22 ACRES   | EAST SLURRY CELL AND SURROUNDING AREAS |
| 24 ACRES   | SLURRY POND AREA                       |
| 11 ACRES   | NORTHEASTERN MOST AREA                 |
| 10.5 ACRES | BORROW AREA #1 AND SURROUNDING AREAS   |
| 10 ACRES   | REFUSE PILE #2 AND SURROUNDING AREAS   |
| 7.8 ACRES  | EASTERNMOST ROAD                       |
| 5.5 ACRES  | REFUSE ROAD                            |

100



Roads  
 $\frac{109.5''}{32850} = 6.22 m$

| AREA   |
|--------|
| AREA A |
| AREA B |
| AREA C |
| AREA D |
| AREA E |
| AREA F |
| AREA G |
| AREA H |
| AREA I |

32.5 ac

RECLAMATION BORROW AREA

AREA C  
 acres

CELL DIVIDING AREAS

3.1 ACRES  
 6523

NO. 2

SOIL FILL

TOPSOIL STOCKPILE

SLURRY POND NO. 1 (ACTIVE)

AREA D  
 24 acres

AREA E  
 14 acres

SLURRY POND AREA

3  
 3.8 ACRES

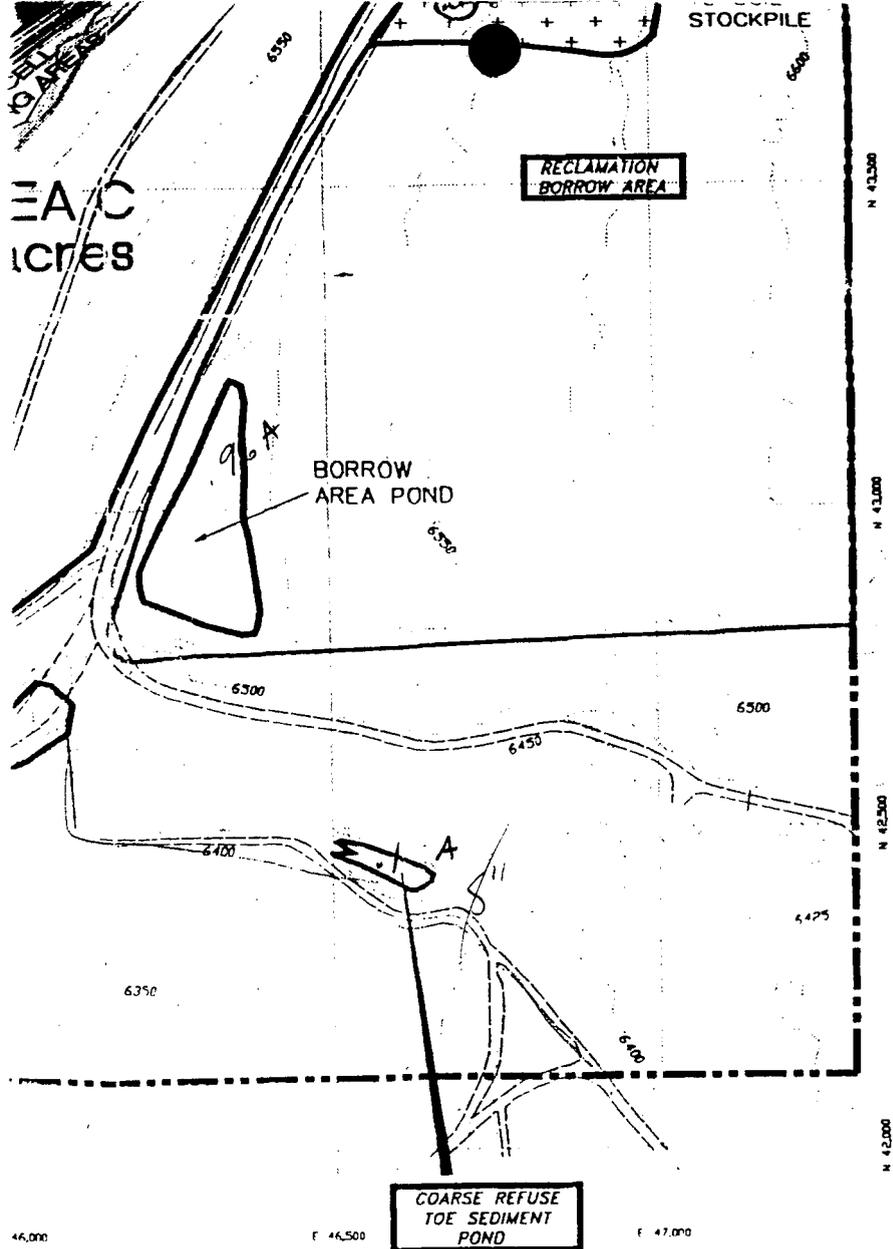
1.43 ACRES

INDUSTRIAL BORROW AREA 3

TOPSOIL STOCKPILES

TOPSOIL STOCKPILE

AREA X  
 3.5 A



WEST SLURRY CELL  
AND SURROUNDING AREAS

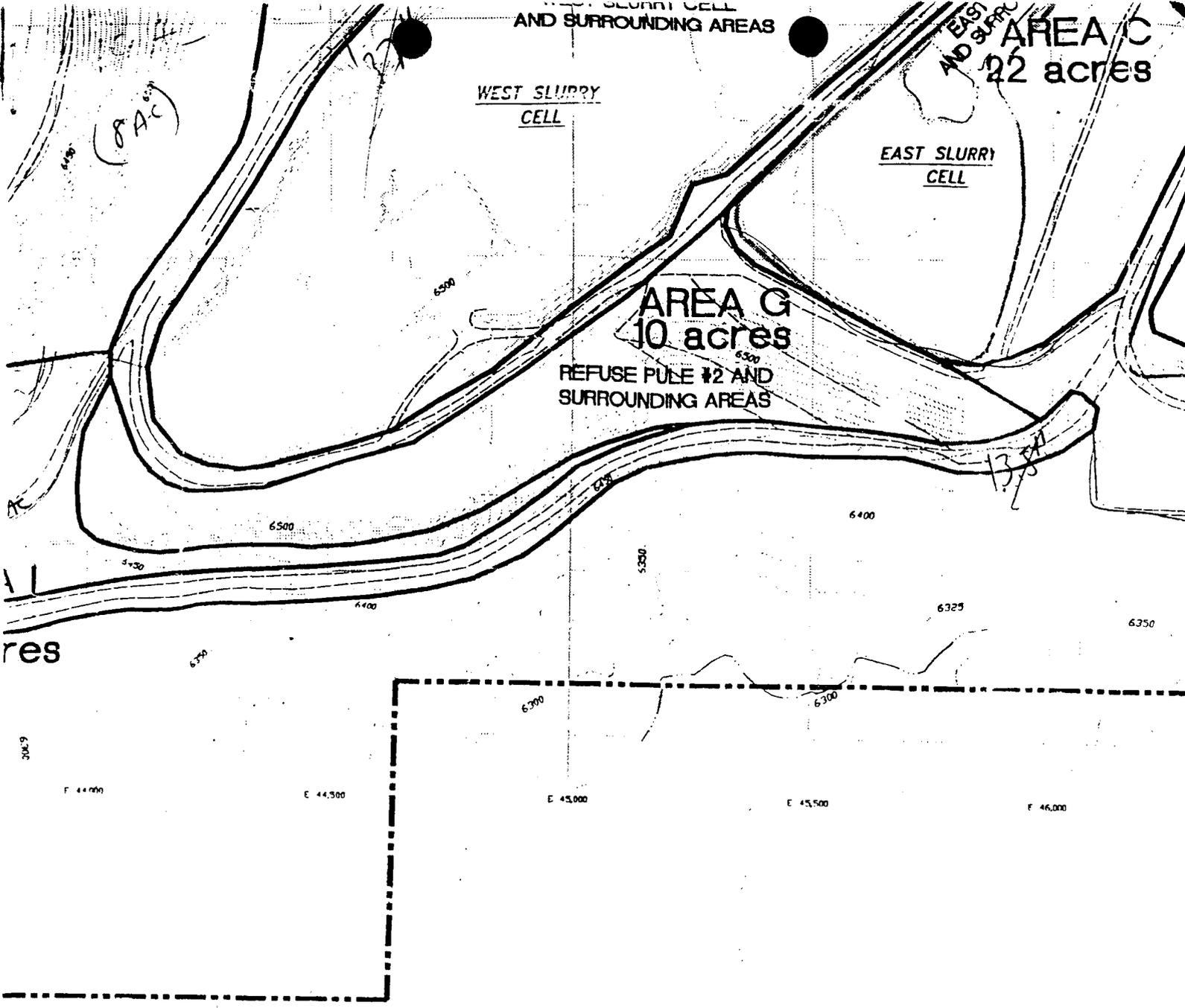
EAST SLURRY CELL  
AND SURROUNDING AREAS  
**AREA C**  
22 acres

WEST SLURRY CELL

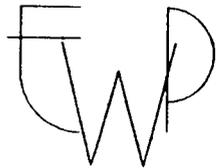
EAST SLURRY CELL

**AREA G**  
10 acres

REFUSE PILE #2 AND  
SURROUNDING AREAS



Project Number EC450593  
 Designed By \_\_\_\_\_  
 Drawn By JWS  
 Checked By AEB Date 6/93



**ECKHOFF WATSON**

ENGINEERS PLANNERS S

E 44,500

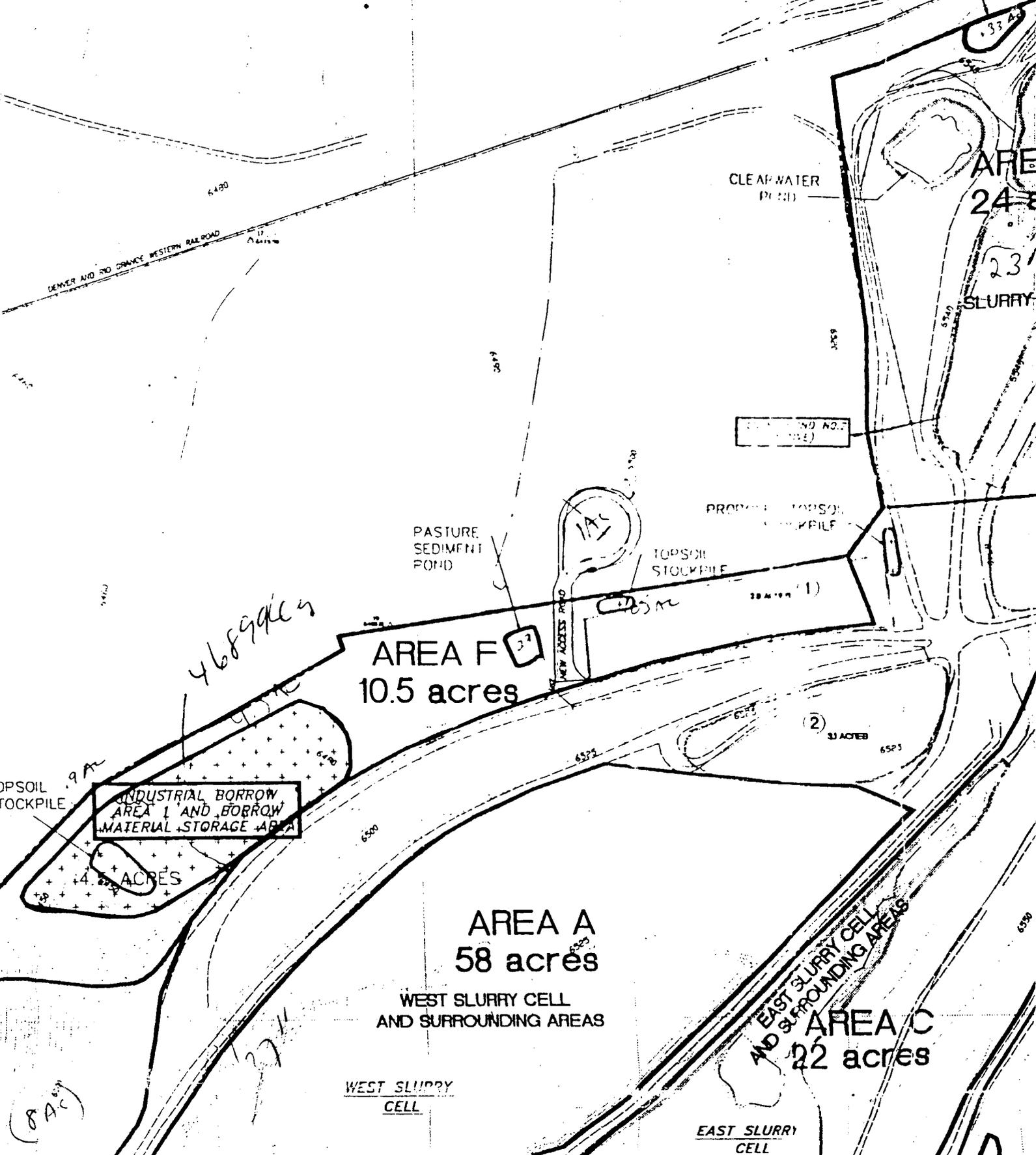
E 45,000

E 45,500

E 46,000

E 46,500

TOPSOIL STOCKPILE



AREA F  
10.5 acres

AREA A  
58 acres

AREA C  
22 acres

AREA 24

AREA 23  
SLURRY

INDUSTRIAL BORROW  
AREA 1 AND BORROW  
MATERIAL STORAGE AREA

WEST SLURRY CELL  
AND SURROUNDING AREAS

EAST SLURRY CELL  
AND SURROUNDING AREAS

WEST SLURRY  
CELL

EAST SLURRY  
CELL

TOPSOIL  
STOCKPILE

PASTURE  
SEDIMENT  
POND

TOPSOIL  
STOCKPILE

CLEAR WATER  
POND

DENVER AND RIO  
GRANDE WESTERN  
RAILROAD

NEW ACCESS ROAD

4.2 ACRES

31 ACRES

(8 AC)

4689 acres

37

37

37

23

24

TOPSOIL STOCKPILE

E 46,500

E 46,000

E 45,500

E 45,000

E 44,500

E 44,000

E 43,500

E 43,000

E 42,500

E 42,000

E 41,500

E 41,000

E 40,500

E 40,000

E 39,500

E 39,000

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100



**SUNNYSIDE COGENERATION ASSOCIATES  
PROPOSAL FOR BOND AMOUNT**

| ITEM                                        | DESCRIPTION                                                                    | QUANTIT | UNIT | *UNIT PRICE | AMOUNT             |
|---------------------------------------------|--------------------------------------------------------------------------------|---------|------|-------------|--------------------|
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| <b>INDIRECT COSTS</b>                       |                                                                                |         |      |             |                    |
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| <b>TOTAL BOND AMOUNT (1998 Dollars)</b>     |                                                                                |         |      |             | <b>\$1,436,673</b> |

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as 8-1 through 8-7 for details

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12/22/82

C:\JESS\SUNNY\FIG8-1.XLS

EWP Engineering

**FIGURE 8-2 - BOND ESTIMATE INFORMATION**

| Reference Item                                                        | Reference                                  | Page # | Reference #            | Description                                                                                                 | Unit | Cost          | *Cost adjusted for Utah |
|-----------------------------------------------------------------------|--------------------------------------------|--------|------------------------|-------------------------------------------------------------------------------------------------------------|------|---------------|-------------------------|
| 1. Rough Grade & Scarify Topsoil                                      | 1991 Means Landscape Cost Data             | 81     | 3200                   | 135 H.P. grader with scarifier                                                                              | AC   | \$164.65      | \$148.19                |
| 2, 3, and 4. Regrading - Load and Spread Topsoil or Borrow Material   | 1991 Means Landscape Cost Data             | 21     | 4220                   | 200 H.P., 150' Haul - Common Earth                                                                          | C.Y. | \$1.12        | \$1.01                  |
| 5. Broadcast Seed incl. Fertilizer & Seed with equipment (slopes 2:1) | 1992 Means Building Construction Cost Data | 74     | 0310                   | Fine grading and seeding incl. lime, fertilizer, and seed with equipment                                    | AC   | \$8,712.00    | \$7,840.80              |
| 6. Hydroseed incl. Mulch, Fertilizer & Seed (with equipment)          | 1992 Means Building Construction Cost Data | 74     | 1000                   | Hydro or air seeding for large areas, incl. seed and fertilizer with wood fiber mulch added                 | AC   | \$1,600.00    | \$1,440.00              |
| 7. Pond Removal                                                       | 1991 Means Landscape Cost Data             | 21     | 4020                   | 200 H.P., 60' Haul - Common Earth                                                                           | C.Y. | \$0.56        | \$0.50                  |
| 8. Culvert Removal                                                    | 1991 Means Landscape Cost Data             | 14     | Varies                 | Varies with Pipe Diameter                                                                                   | L.F. | Varies        | Varies                  |
| 9. Mobilization                                                       | 1992 Means Building Construction Cost Data | 47     | 0020, 0600, 0900, 1200 | Dozer or loader (105 H.P.), Self-Propelled Scraper (15 c.y.), Backhoe (3/4 c.y.), Front End Loader (1 c.y.) | EACH | \$920-\$1,320 | \$820-\$1,176           |
| 10. Monitoring (10%)                                                  | Handbook for calculation of Reclamation    | N/A    | N/A                    | Maintenance and Monitoring (10% of total bond amount)                                                       | L.S. | app. \$95,000 | app. \$95,000           |

\*Costs have been adjusted by a regional adjustment factor of 0.80 obtained from the Means Cost Data

**APPENDIX 8-1**  
**BOND ESTIMATE VERIFICATION**

## RECLAMATION INFORMATION FOR THE PURPOSES OF BOND ESTIMATION

The following discussion is a list of reclamation activities that shall be accomplished should remaining activities cease. Therefore, the bond estimate shown in Figure 8-1 is for a "worst case scenario". It takes into account the existing condition of the Sunnyside Cogeneration Associates (SCA) Permit Area and uses this condition for the basis of determining bond amounts.

It is important that the quantities outlined in Chapter 8 for the purposes of bond estimation not be confused with quantities outlined in other chapters of this permit application. Reclamation operations and quantity estimates are discussed in other chapters and should be carefully read in order to determine whether the discussion is referring to the existing condition of the mine or on the 30 year life of the mine.

The final reclamation and revegetation plans are designed to return the disturbed lands to reproductive uses once remaining activities have ceased. The postmine land uses will be similar to the pre-mine land uses, i.e., wildlife habitat.

The final reclamation plan is presented in Plate 10-1. This plan outlines (to the best extent possible) final elevations, detailed revegetation specifications, depths of topsoil or borrow material required, and areas where noncombustible material will be placed for final disposal.

The final reclamation plan takes into consideration the fact that little topsoil was saved for purposes of revegetation. Research into improvement of materials and improvement of techniques for reclamation of disturbed lands is continually ongoing and this reclamation plan can be expected to be revised as new information becomes available.

Areas adjacent to future disturbances will be revegetated as part of contemporaneous reclamation. Contemporaneous reclamation will occur on the coarse refuse pile and slurry ponds as soon as the native material is reached (approximately the elevations shown in the reclamation plan in Plate 10-1). Because of the enormous size of the coarse refuse pile and slurry cells, no final or contemporaneous reclamation is planned within the 5-year permit period for these areas. Chapter 9 outlines the reclamation activities in further detail while Plate 9-1b graphically outlines the sequence in which reclamation activities will occur.

The coarse refuse pile will be in a state of ongoing excavation throughout the permit period. A side view of the coal mine waste excavation is shown in Figure 5-1. Noncombustible material will be separated from the combustible material that is to be used in the Cogeneration Plant. The noncombustible (waste) material will be placed in the area shown in Plate 10-1. The noncombustible waste pile will be built and compacted in approximate 2-foot lifts. It is estimated that 199,430 cubic yards of material will be noncombustible and therefore will need to be disposed of in this manner. The waste pile will be approximately 8.24 acres and 15 feet deep at the end of the project. Grading of this structure will be a continual process until the end of the project. Material will be placed so as to control water runoff and erosion. Final grading will include blending this pile into the natural surroundings and reclaiming as detailed in Plate 10-1.

Details for Final Reclamation can be found in Chapter 10, Final Reclamation. Chapter 9 includes details for mining operations including contemporaneous reclamation.

The extent of reclamation (for bonding purposes) to be performed on specific areas of the SCA Permit Area has been determined using many different factors. Each specific site requiring reclamation has been considered for determining the bond amount. Plate 8-1 outlines each pond and labels all other areas as AREAS "A" through "I". Table 8-1 gives a description for each corresponding area and shows the total number of disturbed acres contained in each area.

**TABLE 8-1  
AREA DESIGNATIONS**

| <b>Area</b>  | <b>Description</b>                                | <b>Total Disturbed Acres (ac)</b> |
|--------------|---------------------------------------------------|-----------------------------------|
| AREA A       | West Slurry Cell and Surrounding Areas            | 56                                |
| AREA B       | West Slurry Cell Embankment and Surrounding Areas | 19                                |
| AREA C       | East Slurry Cell and Surrounding Areas            | 22                                |
| AREA D       | Slurry Ponds and Surrounding Areas                | 23                                |
| AREA E       | Northeastern Most Area                            | 16                                |
| AREA F       | Area Surrounding Industrial Borrow Area 1         | 9.4                               |
| AREA G       | East Slurry Cell Embankment and Surrounding Areas | 14                                |
| AREA H       | Eastern Most Road                                 | 2.8                               |
| AREA I       | Refuse Road                                       | 4                                 |
| N/A          | Industrial Borrow Area 1                          | 3.42                              |
| N/A          | Industrial Borrow Area 2                          | 3.3                               |
| N/A          | Industrial Borrow Area 3                          | 3.4                               |
| N/A          | Pasture Sediment Pond                             | 0.2                               |
| N/A          | Borrow Area Pond                                  | 0.87                              |
| N/A          | Railcut Sediment Pond                             | 1.9                               |
| N/A          | Old Coarse Refuse Road Sediment Pond              | 0.5                               |
| N/A          | Coarse Refuse Toe Sediment Pond                   | 0.21                              |
| <b>TOTAL</b> |                                                   | <b>202.00 ACRES</b>               |

The following section outlines how each quantity, used for the purposes of bond estimation, was obtained.

**REGRADING DISTURBED AREAS**

**ROUGH GRADE & SCARIFY TOPSOIL**

Rough grading and topsoil scarifying consist of grading the areas in order to achieve natural texture and prepare them for final regrading. The amount of 134 acres was obtained from quantities listed on Table 8-2, **ROUGH GRADE & SCARIFY TOPSOIL**, shown below. These areas are also outlined on Plate 8-1.

**TABLE 8-2  
ROUGH GRADE AND SCARIFY TOPSOIL**

| <b>AREA<br/>from Plate<br/>8-1</b> | <b>Description</b>                                                                   | <b>Acres</b> | <b>Cost/Acre</b> | <b>Total Cost</b> | <b>*Utah<br/>Cost</b> |
|------------------------------------|--------------------------------------------------------------------------------------|--------------|------------------|-------------------|-----------------------|
| Areas C<br>and A                   | 1. East & West<br>Slurry Cells &<br>Surrounding Areas                                | 78           | \$164.65         | \$12,843          | \$11,558              |
| Areas G<br>and B                   | 2. East & West<br>Slurry Cell<br>Embankments &<br>Surrounding Areas                  | 33           | \$164.65         | \$5,433           | \$4,890               |
| Area D                             | 3. Slurry Pond Area<br>(incl. Slurry Pond 1,<br>Slurry Pond 2 &<br>Clear Water Pond) | 23           | \$164.65         | \$3,787           | \$3,408               |
| <b>TOTALS</b>                      |                                                                                      | <b>134</b>   |                  |                   | <b>\$19,857</b>       |

\*All costs have been adjusted by a factor of 0.90 to reflect costs for Utah.  
Costs were obtained from "1991 Means Landscape Cost Data"

**REGRADING - LOAD & SPREAD TOPSOIL OR BORROW  
MATERIAL**

Regrading involves redistribution of noncombustible material and regrading exposed surface areas that will be reclaimed. The objective of these activities is to restore each site to topographic configurations and geomorphic conditions similar to premining conditions. Final grading of all areas will include blending materials into the surrounding areas and reclaiming as detailed in Plate 10-1.

The amount of 422,209 cubic yards was obtained from adding quantities listed on Table 8-3, **REGRADING**. Volumes were obtained by assuming either 1.5 feet, 2.0 feet or 4.0 feet of topsoil or borrow material would be used during final reclamation.

Approximately 50% of the West Slurry Cell Embankment and approximately 25% of the East Slurry Cell Embankment have been covered with 2 feet of material by Sunnyside Coal Company (SCC). The material that has been used to cover portions of the East and West Slurry Cell Embankments has been obtained from Borrow Area #2 which was previously approved as

adequate borrow material as stated in the original SCC Permit. Thus, these areas will only require an additional 2 feet of material upon final reclamation. The portions of the East and West Slurry Cell Embankments that have not yet been covered will require 4 feet of additional material during final reclamation. The quantities below reflect these activities. The remaining areas will be covered with 18 inches of material as shown.

**TABLE 8-3  
REGRADING**

| Area from Plate 8-1 | Description                                                                             | Acres        | CY Regrade     | Cost/CY | Total Cost | *Regrading Cost for Utah |
|---------------------|-----------------------------------------------------------------------------------------|--------------|----------------|---------|------------|--------------------------|
| Area B              | 1a. West Slurry Cell Embankment (24" depth)                                             | 9.5          | 30,653         | \$1.12  | \$34,332   | \$30,899                 |
| Area B              | 1b. West Slurry Cell Embankment (48" depth)                                             | 9.5          | 61,307         | \$1.12  | \$68,663   | \$61,797                 |
| Area G              | 2a. East Slurry Cell Embankment (24" depth)                                             | 3.5          | 11,293         | \$1.12  | \$12,649   | \$11,384                 |
| Area G              | 2b. East Slurry Cell Embankment (48" depth)                                             | 10.5         | 67,760         | \$1.12  | \$75,891   | \$68,302                 |
| Areas A             | 3a. East & West Slurry Cells (48" depth)                                                | 37.0         | 238,773        | \$1.12  | \$267,426  | \$240,684                |
| Area C              | 3b. and Surrounding Areas                                                               | 41.0         | 99,220         | \$1.12  | \$111,126  | \$100,014                |
| Area D              | 4. Slurry Pond Area excl. Slurry Pond 1, Slurry Pond 2 and Clear Water Pond (18" depth) | 19.0         | 45,980         | \$1.12  | \$51,498   | \$46,348                 |
| Areas H,I           | Exterior Roads-(18" depth)                                                              | 6.8          | 16,456         | \$1.12  | \$18,431   | \$16,588                 |
| <b>TOTALS</b>       |                                                                                         | <b>136.8</b> | <b>571,442</b> |         |            | <b>\$576,014</b>         |

\*All costs have been adjusted by a factor of 0.90 to reflect costs for Utah. Costs were obtained from "1991 Means Landscape Cost Data"

## REVEGETATION

### HYDROSEED AND BROADCAST SEED

Table 8-4 includes costs for mulch, fertilizer, seed and the use of equipment for both the hydroseeding and broadcast seeding procedures.

The areas listed on Table 8-4 are the areas that will be revegetated during reclamation. The areas that will be broadcast seeded are those that have slopes equal to or greater than 2:1. The remaining areas will be hydroseeded. Table 8-4, REVEGETATION COST SUMMARY, which is shown on the following page, lists quantities and costs for this reclamation activity and Plate 10-1 outlines these areas.

**TABLE 8-4  
REVEGETATION COST SUMMARY**

| Area from Plate 8-1 | Area Description                                | Proposed Vegetation Type | HYDROSEEDING |           |           | BROADCAST SEEDING |           |           | *Revegetation Cost for Utah |
|---------------------|-------------------------------------------------|--------------------------|--------------|-----------|-----------|-------------------|-----------|-----------|-----------------------------|
|                     |                                                 |                          | AC           | Cost/Acre | Cost      | AC                | Cost/Acre | Cost      |                             |
| Areas B,G           | 1. East and West Slurry Cell Embankments        | Pinyon-Juniper/Grass     | 33.0         | \$1,600   | \$52,800  |                   |           |           | \$47,520                    |
| N/A                 | 2. Sediment Ponds                               | Pinyon-Juniper/Grass     | 12.1         | \$1,600   | \$19,424  |                   |           |           | \$17,482                    |
| N/A                 | 3. Industrial Borrow Areas                      | Pinyon-Juniper/Grass     | 11.0         | \$1,600   | \$17,600  |                   |           |           | \$15,840                    |
| Areas C,A           | 4. East and West Slurry Cells                   | Pinyon-Juniper/Grass     | 78.0         | \$1,600   | \$124,800 |                   |           |           | \$112,320                   |
| Areas H,I           | 5. Exterior Roads                               | Pinyon-Juniper/Grass     | 6.8          | \$1,600   | \$10,880  |                   |           |           | \$9,792                     |
| Areas E,F           | 6. Areas E and F                                | Pinyon-Juniper/Grass     | 25.4         | \$1,600   | \$40,640  |                   |           |           | \$36,576                    |
| N/A                 | 7. Reclamation Borrow Area                      | Pinyon-Juniper/Grass     | 22.0         | \$1,600   | \$35,200  |                   |           |           | \$31,680                    |
| N/A                 | 8. Areas w/ Slopes greater than or equal to 2:1 | Pinyon-Juniper/Grass     |              |           |           | 23.5              | \$8,712   | \$204,732 | \$184,259                   |
| <b>TOTALS</b>       |                                                 |                          | <b>188.3</b> |           |           | <b>23.5</b>       |           |           | <b>\$455,468</b>            |

\*All costs have been adjusted by a factor of 0.90 to reflect costs for Utah  
Costs were obtained from "1992 Means Building Construction Cost Data"

**POND RECLAMATION AND CULVERT REMOVAL**

**IMPOUNDMENT/POND REMOVAL**

Ponds will be regraded by filling them with topsoil or borrow material that is available on the site. The borrow material will be distributed by end-dumping, and minimal grading will be utilized to redistribute the dumped materials sufficient to cover the reclaimed sites. The borrow materials will be spread unevenly which will result in a rough surface. The small ruts and ridges will serve as catchment for water during the revegetation process. The ponds listed below are outlined on Plate 8-1.

The amount of 97,429 cubic yards used for the purposes of best estimation was obtained from quantities listed on Table 8-5. These quantities were taken directly from previous calculations provided in the original SCC Permit. Eckhoff, Watson and Preator Engineering (EWP) has reviewed the calculations and revised them where necessary.

Changes that were made are reflected in the following volume quantities.

**TABLE 8-5  
IMPOUNDMENT/POND REGRADING COST**

| Pond Description                                                                                          | Capacity<br>C.Y. | Dozer<br>Push<br>Distance | Cost/CY | Total Cost | *Removal<br>Cost for Utah |
|-----------------------------------------------------------------------------------------------------------|------------------|---------------------------|---------|------------|---------------------------|
| 1. Coarse Refuse Toe<br>Sediment Pond                                                                     | 3,711            | 50                        | \$0.56  | \$2,708    | \$1,870                   |
| 2. Railcut Sediment Pond                                                                                  | 24,216           | 50                        | \$0.56  | \$13,561   | \$12,205                  |
| 3. Pasture Sediment Pond                                                                                  | 1,258            | 50                        | \$0.56  | \$705      | \$634                     |
| 4. Old Coarse Refuse<br>Road Sediment Pond                                                                | 2,920            | 50                        | \$0.56  | \$1,635    | \$1,472                   |
| 5. Borrow Area Sediment<br>Pond                                                                           | 7,405            | 50                        | \$0.56  | \$4,147    | \$3,732                   |
| 6. Coal Slurry Water<br>Sediment Ponds (incl.<br>Slurry Pond 1, Slurry<br>Pond 2 and Clear Water<br>Pond) | 57,919           | 50                        | \$0.56  | \$32,434   | \$29,191                  |
| <b>TOTALS</b>                                                                                             | <b>97,429</b>    |                           |         |            | <b>\$49,104</b>           |

\*All costs have been adjusted by a factor of 0.90 to reflect costs for Utah  
Costs were obtained from "1991 Means Landscape Cost Data"

## CULVERT REMOVAL

The number of culverts to be removed from within the SCA Permit Boundary is listed on Table 8-6. The size of the culverts range from 12 inches to 48 inches i.d. There is a total of eight culverts on the SCA Permit Area. Upon reclamation, each culvert will be removed and the ground will be regraded so as to return the surface back to its original state.

**TABLE 8-6  
CULVERT REMOVAL**

| Culvert I.D.  | Diameter (inches) | Length (feet) | Cost/LF | Removal Cost | *Removal Cost for Utah |
|---------------|-------------------|---------------|---------|--------------|------------------------|
| C-14          | 36                | 226           | \$9.95  | \$2,249      | \$2,024                |
| C-15          | 36                | 42            | \$9.95  | \$418        | \$376                  |
| C-17          | 48                | 50            | \$9.95  | \$498        | \$448                  |
| RCO1-4        | 12                | 60            | \$5.10  | \$306        | \$275                  |
| RCO1-5        | 12                | 63            | \$5.10  | \$321        | \$289                  |
| RCO1-6        | 12                | 60            | \$5.10  | \$306        | \$275                  |
| RCO2-1        | 24                | 80            | \$7.45  | \$596        | \$536                  |
| RCO2-2        | 24                | 40            | \$7.45  | \$298        | \$268                  |
| <b>TOTALS</b> |                   |               |         |              | <b>\$4,492</b>         |

\*All costs have been adjusted by a factor of 0.90 to reflect costs for Utah.  
Costs were obtained from "1991 Means Landscape Cost Data"

## MOBILIZATION

As required by Office of Surface Mining Reclamation and Enforcement (OSM) indirect costs must be included in the bond estimate. These indirect costs include such items as mobilization, maintenance, monitoring and a contingency fee.

Mobilization costs were estimated using 1992 Means Building Construction Cost Data and are shown in Table 8-7. Only large equipment was included in the mobilization estimates because small equipment such as that used for revegetation is included in Means unit costs (Neil Smit, Means representative). Table 8-7 summarizes the cost for mobilization for each piece of equipment that shall be used during reclamation. The costs are based on a 100 mile travel distance.

**TABLE 8-7  
MOBILIZATION COSTS**

| Description                        | Distance  | Unit | No. of Units | Unit Cost for 25 miles | Total Cost for 100 miles | *Mobilization Cost for Utah |
|------------------------------------|-----------|------|--------------|------------------------|--------------------------|-----------------------------|
| 1. Dozer or loader, 105 h.p.       | 100 miles | Each | 2            | \$255                  | \$2,040                  | \$1,836                     |
| 2. Self-Propelled Scraper, 15 c.y. | 100 miles | Each | 2            | \$330                  | \$2,640                  | \$2,376                     |
| 3. Front End Loader, 1 c.y.        | 100 miles | Each | 2            | \$230                  | \$1,840                  | \$1,656                     |
| 4. Backhoe                         | 100 miles | Each | 2            | \$285                  | \$2,280                  | \$2,052                     |
| <b>TOTALS</b>                      |           |      |              |                        |                          | <b>\$7,920</b>              |

\*All costs have been adjusted to reflect costs for Utah.

Costs for Table 8-7 were obtained from "1992 Means Building Construction Data"

Maintenance, monitoring and the contingency costs were approximated at 10% of the subtotal bond amount. In addition, the total bond amount was increased by a factor of 1.27% based on the Means 1992 escalation factor. These additional expenses are included in the total bond amount shown in Figure 8-1.

The quantities listed above are shown on either Plate 8-1 or Plate 10-1 and outlined on Tables 1 through 6. Figure 8-1 is the actual bond estimate and Figure 8-2 details the cost estimation process. The quantities used for the purposes of bond estimation were obtained from previous designs and calculations from the original SCC Permit. These quantities have been revised by EWP in order to make them consistent with the current condition of the SCA Permit Area, therefore, they may differ from quantities contained in the original SCC Permit.

The final bond estimate of \$1,436,673 includes costs necessary to reclaim the SCA Permit Area within the bond period. This amount will be revised as operations begin and conditions of the SCA Permit Area change. DOGM will be notified of all revisions before they are implemented.

## 9.2 DESCRIPTION OF PRESENT DISTURBANCE

Presently approximately 57% of the SCA Permit Area is disturbed. The disturbances have been caused from 1) coal mine waste disposal, 2) roads, and 3) sedimentation ponds and ditches. The majority of the impacted land was disturbed prior to the present resource protection laws. The future activities of the SCA cogeneration facilities are expected to cause little or no new disturbances to vegetated areas as the permit activities will be located mainly in areas that have been disturbed in the past.

All facilities are shown on Plate 5-1. Plate 3-1 outlines the areas of pre- and post-law disturbances.

## 9.3 RECLAMATION ACCOMPLISHED TO DATE

Interim reclamation was conducted in the fall of 1992 on the faces of lifts one through four of the coarse refuse pile. Approximately two feet of borrow material was placed on these areas to control fires that had been burning within the coarse refuse pile. This project was conducted by SCC in cooperation with DOGM.

## 9.4 GENERAL RECLAMATION OBJECTIVES

The reclamation activities proposed in this chapter are intended to meet the following specific objectives:

- Regrading of the areas within the coarse refuse pile, slurry cells and other disturbances to achieve a stable, post-mining contour which will be compatible with the surrounding area, similar to the original pre-mining contour, free-draining, and conducive to revegetation.
- Restoration of the natural drainage pattern through the disturbed area to the extent practicable while maintaining appropriate sediment controls at the periphery of the disturbed areas.
- Covering areas that have been cleaned of refuse or slurry with topsoil or borrow material to allow revegetation of these surfaces.
- Reseeding the regraded surfaces with a species mix designed to re-establish the surrounding native vegetation on the reclaimed areas and provide for wildlife habitat.
- Monitor and maintain the reclaimed property until the reclamation success standards are achieved and the bond is released.

## 9.5 AREAS TO BE RECLAIMED AND PLANNED RECLAMATION

There are approximately 202 acres of disturbance within the SCA Permit Area of which all areas will eventually be reclaimed. The area of reclamation and reclamation sequencing is shown in Plate 9-3.

During the remaining plan phase of the project the coarse refuse pile and East and West Slurry Cells will

## CHAPTER NINE

### 9.1 MINING PLANS

Sunnyside Coal Company's (SCC) refuse disposal area has been acquired by Sunnyside Cogeneration Associates (SCA) to serve as a long-term supply of waste fuel for its coal mine waste-to-energy facility, located adjacent to the SCA Permit Area. SCA has contracted with SCC to provide alternative disposal for coal mine waste generated by SCC, both past and future. SCA's alternative energy project has been approved by the Federal Energy Regulatory Commission as a Qualifying Facility, based on the usage of coal mine waste as fuel in its fluidized-bed combustion boiler. SCA will use both "active waste", from the processing plant, and "accumulated waste", from the refuse pile, as sources of waste fuel for the facility.

Based on SCA's contract for the sale of electricity to Utah Power and Light, handling coal mine waste to serve as an alternative energy fuel will be a consistent and continuous process. Coal mine waste that continues to be generated by SCC's preparation plant will also be factored into SCA's fueling strategy, which can allow direct acceptance of coal mine waste at the facility, or temporary placement within the refuse disposal area prior to utilization.

SCA will excavate coal mine waste from the refuse disposal area based on detailed sampling and analyses and a materials handling plan which will be continuously updated by SCA. Excavation of the coal mine waste will be considerate of material quality, pile and embankment stability, and mine operation. Over the life of SCA's facility, nearly all of the coal mine waste will be burned to generate electricity, resulting in significantly less material that will need final reclamation. Final reclamation of the refuse pile will be accomplished after all of the coal mine waste is either burned as a fuel, or repositioned within the refuse disposal area for final disposal, if determined to be non-combustible (i.e., ashes, rock).

SCC will continue to dispose of the coal mine waste and slurry within the SCA Permit Area. The East Slurry Cell, and Slurry Ponds One and Two will continue to accept slurry from the SCC's coal processing facility. Figure 9-2 outlines SCA's mining process in relation to SCC's and Savage's operations.

Appendix 9-1 presents the mine plan for SCA. Data, including boring logs, to substantiate the conclusions of the Mine Plan are included in Appendix 9-3. The mine plan includes:

- Cross sections of the refuse pile.
- A detailed mine plan for year one. A moderately detailed plan for years two through ten. A general plan for years 11 through 20. The critical issues of the mine plan address:
  1. Optimization of blending to provide consistent quality fuel over the life of the project.
  2. Utilization of fines
  3. Minimization of material handling
  4. Characterization and handling of nonfuel zones in the refuse pile
  5. Compliance with reclamation and regulatory requirements
- Recommended equipment types, methods of mining and locations of mining.

As discussed under section 9.6.1, the Industrial Waste Dump will be closed prior to grading the site for temporary storage of coarse and fine refuse. Additional grading will be necessary to establish the storage areas. Grading will be required for Storage Areas One and Two, whereas Storage Area Three does not require additional grading. Grading requirements for each storage area are specified under section 9.6.1 and 9.6.3.

## 9.8 TOPSOIL AND BORROW MATERIAL HANDLING

Mining operations began at the Sunnyside Mines prior to implementation of topsoil salvage requirements. Therefore, borrowed soil materials will be required in most locations in order to achieve successful reclamation on areas affected by the remaining operations. A complete discussion of the materials used for topsoil and borrow material is included in Chapter Two, R645-301-200, Soils.

### 9.8.1 AREAS TO RECEIVE TOPSOIL OR BORROW MATERIAL

Areas within the SCA Permit Area that will receive an application of topsoil will be all reclaimed areas. Areas of contemporaneous reclamation are outlined in Plate 9-3. Depths of topsoil are shown in Plate 10-1. Application of the topsoil or borrow material are outlined below.

- The noncombustible material pile will be covered with ~~four feet of material~~ during the final reclamation phase.
- The coarse refuse remaining below elevation 6210 (shown in Plate 10-1 as Area 2) will be covered with ~~four feet of material~~. This coarse refuse may not be mineable because of questionable access (i.e., the excessive depth of the narrow valley).
- Any other areas located at the time of final reclamation that are occupied by unsuitable plant growth medium as determined from testing, will be covered with four feet of borrow material.
- All other disturbed areas within the SCA Permit Area will be covered with 18-inches of borrow material.
- Subgrade will be cleaned of waste material, scarified and pulverized before covering with topsoil or borrow material.

### 9.8.2 BORROW MATERIAL REMOVAL

Because very little topsoil has been saved during the SCC mining activities, borrow material will need to be substituted for topsoil in order to establish vegetative growth on reclaimed areas. Detailed descriptions of topsoil handling on any newly disturbed sites is discussed in R645-301-232, Topsoil and Subsoil Removal. The following discussion pertains to the borrow area removal that will be necessary for reclamation.

Approximately 460,000 cubic yards of borrow material will be needed for all reclamation activities to cover the area delineated in Plate 9-3. This borrow material will be obtained from the borrow areas outlined in Chapter Two, R645-301-224, Substitute Topsoil. The borrow material that will be utilized

is the best available within the SCA Permit Area which lies close to the existing disturbed areas. Borrow material will be removed from these sites and contoured such that each acts as a catchment basins. This will be done to control run-off from each borrow area and provide water for wildlife species.

A sufficient amount of material will be left in the bottom of each borrow area for reclamation, and each borrow area will be permanently revegetated according to the procedures discussed in section 9.9.

The borrow material stripping depths will be confirmed by qualified personnel in the field prior to actual disturbance. Salvageable topsoil will be removed from the borrow areas as described in Chapter Two, R645-301-232, Topsoil and Subsoil Removal.

### **9.8.3 TOPSOIL STORAGE**

Detailed descriptions of topsoil handling on any newly disturbed sites is discussed in R645-301-232, Topsoil and Subsoil Removal.

### **9.8.4 TOPSOIL AND BORROW MATERIAL REDISTRIBUTION**

The recontoured surfaces of disturbed areas that will receive borrow material or topsoil will be cleaned of waste material including the hardpan material that has formed between the refuse and soil layers. The subgrade will be prepared by ripping to a minimum depth of 18-inches. Ripping will alleviate compaction caused by equipment and will also provide a roughened surface for bonding with the borrow material. All roadbeds will be ripped twice, once each in opposite directions.

After appropriate surface regrading and ripping is completed, borrow material will be applied. The borrow material will be distributed by end-dumping, and minimal grading will be utilized to redistribute the dumped materials sufficient to cover the reclaimed sites. The borrow materials will not be evenly distributed as to depth, thus the materials will be unevenly distributed and result in a rough uneven surface. The small ruts and ridges will serve as catchment for water during the revegetation process. The average borrow material depths are outlined in Section 9.8.1.

On slopes greater than 2:1 the end-dumped topsoil materials will be pushed onto the slopes with a dozer and a backhoe will be used to systematically gouge depressions from four (4) to eight (8) inches deep on 30% of the slope surface or as needed to roughen smoothed surfaces. The footprints of the workers installing the erosion matting will also provide numerous small depressions.

Prior to seeding, the topsoil and other regraded surfaces will receive a light disking, or be scarified along the contour if a crust has developed since final grading or other soil preparation activities. Otherwise, no special soil preparation will be necessary.

### **9.8.5 AMENDMENTS**

It is expected that the applied borrow material will require fertilizer amendments at the time of reclamation. Soil testing at the time of reclamation will be conducted according to DOGM Topsoil Guidelines to determine appropriate fertilizer rates. SCA will work with DOGM to ensure that the redistributed soils are analyzed according to DOGM Guidelines and that the tests are performed by an approved laboratory. In general, soil amendments will be applied during the fall concurrent with reseeding operations to maximize plant response.

**JOHN T. BOYD COMPANY**

**MINING AND  
GEOLOGICAL  
ENGINEERS**

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Mellon Square  
535 Smithfield Street  
Pittsburgh, PA 15222-2384  
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Senior Vice Presidents  
Ronald L. Lewis  
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Vice Presidents  
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David M. Carris  
Phillip D. Clady  
Russell P. Moran  
Robert M. Quinlan  
James J. Schaeffer, Jr.  
George V. Weisdack

DRAFT

November 16, 1992

File: 2339

9-1  
APP

Sunnyside Cogeneration Associates  
P. O. Box 58087  
Salt Lake City, UT 84158-0087

Attention: Mr. David R. Pearce  
Authorized Member, Management Committee

Gentlemen:

This report presents a conceptual mine plan for Sunnyside Cogeneration Associates' (SCA) Sunnyside Mine coal refuse pile in Carbon County, Utah. The plan is developed to provide 8.2 million tons of blended fuel for SCA's 58 MW electric generating station over a 20-year period. Raw data generated from drilling, sampling and follow-up testing programs were compiled and evaluated to provide our estimate of waste coal reserves on the property.

In our opinion waste coal production from this property can provide SCA with a reliable, consistent quality, long-term fuel source for the generating station.

Respectfully submitted,

JOHN T. BOYD COMPANY

James W. Boyd  
President

## SUMMARIZED FINDINGS

The following sections of this report with a figure, tables, appendices and exhibits support these summarized statements.

- The Sunnyside Mine refuse pile consists of recoverable coarse and fine (less than 28 mesh) coal refuse and noncombustible material in the following proportions:

| <u>Type Material</u> | <u>Tons (000)</u> | <u>Percent</u> |
|----------------------|-------------------|----------------|
| Coarse Refuse        | 6,816*            | 73.5           |
| Fine Refuse          | 1,998             | 21.5           |
| Noncombustible       | <u>460</u>        | <u>5.0</u>     |
|                      | 9,274             | 100.0          |

\*Includes 70,000 tons expected to be added between July 31, 1992, and January 1, 1993.

- The average heating value of the waste coal fuel components and total Btu's in the pile as of January 1, 1993, are:

| <u>Type Material</u> | <u>Tons (000)</u> | <u>Average Btu/lb<br/>(As Received)</u> | <u>Total Btu's<br/>(10<sup>12</sup>)</u> |
|----------------------|-------------------|-----------------------------------------|------------------------------------------|
| Coarse Refuse        | 6,816             | 5,132                                   | 70.0                                     |
| Fine Refuse          | <u>1,998</u>      | <u>8,272</u>                            | <u>33.1</u>                              |
| Total Pile           | 8,814             | 5,850                                   | 103.1                                    |

- Based on current SCC mine production, approximately 264,000 tons per year of waste material (198,000 tons of coarse material and 66,000 tons of fines) will be added to the pile during the remaining life of the mine.

mine. Conversations with SCC engineering personnel suggested that the ratio of coarse to fine reject material resulting from current washing operations is 3:1, or 198,000 tons of coarse material and 66,000 tons of fines on an annual basis.

We estimate 70,000 tons of material will be added to the active coarse refuse area from August to December 1992. As requested by Savage Industries Inc., we increased the amount of coarse refuse available January 1, 1993, by this amount (to 6,816,000 tons).<sup>2</sup> The quality of this material is estimated to be the same as the top 10-ft samples of the drill holes located in that area (92-1, 92-5, 92-6 and 92-7), increasing the total Btu's in the pile to  $103.1 \times 10^{12}$ .

#### Noncombustible Material

Noncombustible material in the refuse pile encountered during the drill exploration programs is classified as follows:

- Nontoxic reclamation cover placed in four subareas as identified on Exhibit 1.
- Nontoxic West Slurry Cell dike (now buried) as shown in Exhibit 2 cross sections and Exhibits 7 through 15 of the conceptual mine plan covering Years 1 through 4.
- Buried clay and sand layers probably used as fire control materials when sections of the pile were burning.

These noncombustibles and burned sections are estimated to compose five percent of the total pile, or 460,000 tons. The cover and cell dike materials were investigated and relatively reliable estimates were made totaling 336,000 tons. The remaining 124,000 tons have been allocated to the fire control materials

### Assigned Reserves for Mining

The refuse reserves in the pile available for mining as of January 1, 1993, are estimated at 8,814,000 tons; 6,816,000 tons of coarse material and 1,998,000 tons of fines. The conceptual 20-year mine plan proposed in this report consumes 8,200,000 tons (410,000 tons per year x 20 years) down to a cutoff mine bench elevation of 6,290 ft. This includes all of the fines contained in the pile and 6,202,000 tons of coarse material, leaving 614,000 tons of coarse material in the pile after 20 years.

At the end of 20 years, fine material will be available for blending since the following categories have not been accounted for:

- Fines added to pile since July 14, 1990, date of aerial photographs used to generate pile topography.
- Fines stored in areas other than the refuse pile (i.e., around and near active slurry ponds 1 and 2).
- Fines contained in slurry ponds 1 and 2.
- Future fines generated from washing operations at a rate of 66,000 tons annually for the remaining life of the mine.

The coarse refuse remaining below the 6,290 ft mine bench elevation totals 294,000 tons down to an elevation of 6,210 ft or contained in eight 10-ft mine bench levels (see Table 3.1). At this time the refuse reserve may not be mineable because of questionable access (i.e., the excessive depth of the narrow valley makes haul road construction difficult).

However, refuse deposited in the future at a rate of 264,000 tons per year (assuming SCC mine continues to operate at its current production level) will be readily accessible.

### Mining Schedule and Equipment Considerations

Savage Industries, Inc., as the materials handling contractor, has proposed a waste coal excavation schedule of one 10-hour shift per day, five days per week. The equipment proposed for loading and hauling services are one Caterpillar 980C type front-end loader with a modified 7.0 cubic yard bucket and one hauler with dual trailers rated at 60 tons capacity.

Fuel plan consumption and delivery parameters are as follows:

| <u>Generating Station Consumption</u> | <u>Tons</u>   |              |              |
|---------------------------------------|---------------|--------------|--------------|
|                                       | <u>Coarse</u> | <u>Fines</u> | <u>Total</u> |
| Average annual fuel requirement       | 310,102       | 99,898       | 410,000      |
| Average daily basis (365 days)        | 850           | 273          | 1,123        |
| Average hourly basis (8,760 hours)    | 35.4          | 11.4         | 46.8         |
| <u>Mine Plan Deliveries</u>           |               |              |              |
| Average annual fuel requirement       | 310,102       | 99,898       | 410,000      |
| Average daily basis (240 days)        | 1,292         | 416          | 1,708        |
| Average hourly basis (1,920 hours)*   | 161.5         | 52           | 213.5        |
| Number of trips per day (56.5 tons)   | 23            | 7            | 30           |
| Trips per operating hour              | 3             | 1            | 4            |

\*Based on 8 available operating hours per shift.

Based on these considerations and applying varying haul distances from the pile to the station truck dump, Appendix C presents the development of the refuse loading capacity. This analysis demonstrates that the mine work schedule and the

III REVISIONS - JUNE 29, 1989

3, 5, 1, 2  
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Study p

REMOVAL OF ALL SURFACE STRUCTURES

- Page 7 - Acreage revised for reclamation to include all structures, with the exception of those pe: structures marked on Plate III-1 and noted or III-1.
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State office  
SSCC

AMENDMENT TO  
APPROVED  
Mining & Reclamation Plan  
Division of Oil, Gas & Mining  
by [Signature] date 7/17/89

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AC x t <sup>need</sup> - ~~need~~ - Avail = need d'l

Area I - Surf Area 72.3 AC = 466576 yd<sup>3</sup>  
 (- .39 AC TS = 156 cy) <sup>4' x 2'</sup> <sub>18"</sub>  $\Rightarrow$  need 466420 cy buy  
 233132  
 209883

Area II FAD Cuy 3.3 AC = 21296 yd<sup>3</sup>  $\checkmark$  need  
 21296 yd<sup>3</sup> - 4'  
 10648 yd<sup>3</sup> - 2'  
 9583 yd<sup>3</sup> - 18"

Area III what more than 7.2 AC = 46464 yd<sup>3</sup>  $\checkmark$  need  
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 65179 4'  
 32590 2'  
 29331 18"

Area VI - 8500 cy borrow 11.7 AC = 75504 yd<sup>3</sup>  $\checkmark$  need  
 67004 - 4'  
 29252 - 2'  
 25477 - 18"

Area VII RR loop 13 AC = 83893 yd<sup>3</sup>  $\checkmark$  need  
 0 extra - 4'  
 0 - 5'  
 0 - 5'  
 - 2.30 AC TS = 1356 cyd  
 - 6.2 AC TS = 2550 cyd  
 - 550726 borrow (3' d'l)

Area VIII Ditch exp 19.22 AC = 124033 yd<sup>3</sup>  $\checkmark$  need  
 124033  
 62017 -  
 55815 -

Area IX pipe exp - 7.6 AC = 120022 yd<sup>3</sup>  $\checkmark$  need  
 118824  
 58809  
 52815 -  
 - 2.95 AC TS = 11207 cyd<sup>3</sup>

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if use avail +  
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\$ 362126 - to more  
Account  
\$ 2646975 to buy  
need  
\$ 311710 more  
bought  
3320811

2' Have - 316163

18' now \$ 293829

\$ 3930803

...that all of the borrow material is required, Reclamation Area 1 can be expanded to the south for a considerable distance. Grassy Trail Dam Borrow Area will be used only if conditions at the end of mining warrant.

Available Industrial and Reclamation Borrow Material

| <u>Borrow Area</u>                     | <u>Acres</u> | <u>Depth (ft.)</u> | <u>Cubic Yards Available</u> |
|----------------------------------------|--------------|--------------------|------------------------------|
| (1) Industrial Area 1 <i>0.1</i>       | 3.42 (1)     | 8.5                | 46,899                       |
| (2) Industrial Area 2 <i>0.2</i>       | 3.25 (1)     | 0.0                | -0-                          |
| (3) Industrial Area 3 <i>0.2</i>       | 3.36 (2)     | 12.0               | 32,525                       |
| (4) Reclamation Area 1- <i>EA 21-7</i> | 30.14        | 12.0               | 550,726                      |
| (5) Grassy Trail Borrow (3)            | -----        | ----               | 8,500                        |
|                                        |              |                    | <u>559,226</u>               |
|                                        |              |                    | <u>638,650</u>               |

TOTAL

- (1) Industrial Borrow Area 2 has been used for industrial purposes and is substantially gone.
- (2) Approximately 10 ft. of this material has been used and 6 ft. remains in place.
- (3) Grassy Trail Dam Borrow Area is a slide area and the acres and depth have not been determined. This area was approved by DOGM in a letter dated November 27, 1984 (Figure III-4).

Some of the borrow owned by Sunnyside Fuel ator has rights to acc subsoil for reclamation contemporaneous or final

*need*  
*169.5 AC* (TS)  
*\* 3" =*  
*68 365 cy*  
*169.5 AC*  
*\* 3.75'*  
*need*  
*1025,475*  
*total 1093,840*

Test pits were dug to identify and evaluate the soil materials in these borrow areas. Information concerning the test methods, laboratory procedures, and results are discussed in Chapter VIII. It should be noted that the extent and quantity of these borrow materials is limited, and the material available will not adequately cover all areas that have been disturbed. In order to cover the entire 282.55 acres of disturbance with 12" of topsoil, 455,847 cu. yds. of material would be required.

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DIVISION OF OIL GAS & MINING

...determine the extent of the in-place  
 several test pits were dug around the fa-  
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...soil pit, soil samples were taken at twelve inch  
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QUANTITIES OF STOCKPILED TOPSOIL

| <u>Stockpile Location</u>              | <u>Quantity</u>                                                                                     |
|----------------------------------------|-----------------------------------------------------------------------------------------------------|
| East Borrow Pit <i>Area 8</i>          | 36,600 cu ft <i>3.36 AC.</i>                                                                        |
| No. 3 Hoisthouse Pond <i>Area 1</i>    | 4,200 cu ft <i>1.39 AC</i>                                                                          |
| <del>Slurry Pond Pile</del> <i>out</i> | <del>127,900 cu ft</del>                                                                            |
| <del>Haul Road Pile</del> <i>out</i>   | <del>102,200 cu ft</del>                                                                            |
| Reclamation Test Plot <i>Area 8</i>    | 67,500 cu ft <i>6.20 AC</i>                                                                         |
| Twinshaft Pond <i>Area 8</i>           | 32,600 cu ft <i>2.99 AC</i>                                                                         |
| Rail Cut Pile <i>out</i>               | <del>15,800 cu ft</del> <i>3 Avail</i>                                                              |
| <u>Total</u>                           | <del>386,800 cu ft</del> <i>5219 yds</i><br>$140,900 + 3 = 5219$<br><i>will cover 12.94 AC @ 3"</i> |

The soils contained in these stockpiles are currently committed for use in topsoiling the sites from where the soils were removed.

Several borrow areas have been identified for use in future reclamation (Plate III-1). The quantity of material that will be required to cover the portals and defined by reclamation area in Table III-9. The material that is available is identified by

*Total*  
*TS + borrow mat'l*  
*564,445 Avail*  
*Need*  
*→ 529,395*  
*BCY*

Area I (Facil)  
✓ Spoil pile

Area 2

Industrial Borrow 2

Rail Cut Pond T.S. - (below ref area)

Crane Ref. toe - T.S. pile - below ref X rd.

New House Rel T.S. - top of mesa - E of SC

Industrial Borrow 1 - " " " "

part ✓ Slurry Pond T.S. pile - No plant  
Borrow areas - W of RR loop - N of V E

test plot T.S. - of RR loop

Slurry pond T.S. - (near Borrow 3)

Hoist T.S. -

✓ Indust Borrow 3 - marked

Soil Borrow area - E of Slurry pond

Seal Pond - Borrow area

inside RR loop - 14 1/2"

outs RR loop - 20"

Area 3 - white re T.S. 1" - SW of load out

III REVISIONS - JUNE 29, 1989

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 by [Signature] date 7/17/89

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AC x t <sup>need</sup> - ~~need~~ - Avail = need d'l

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| <del>Slurry Pond Pile</del> <i>out</i> | <del>127,900 cu ft</del>                                                                            |
| <del>Haul Road Pile</del> <i>out</i>   | <del>102,200 cu ft</del>                                                                            |
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✓ Spoil pile

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Industrial Borrow 1 - " " " "

part ✓ Slurry Pond TS pile - No plant  
Borrow areas - W of RR loop - N of V E

test plot TS - of RR loop

Slurry pond TS - (near Borrow 3)

Hoist TS -

✓ Indust Borrow 3 - marked

Soil Borrow area - E of Slurry pond

Seal Pond - Borrow area

inside RR loop - 14 1/2"

outs RR loop - 20"

Area 3 - white re TS. 1" - SW of load out

Buy  
 When have  
 mat'l - but  
 need more

extra after  
 used borrow

Project \_\_\_\_\_  
 Date \_\_\_\_\_

WORKSHEET NO. 8  
 PRODUCTIVITY AND HOURS REQUIRED FOR LOADER USE

Have 54445  
 buy 529395

4' long need to buy -

Characterization of Loader Used (type, size, etc.):

have total avail of 564445

need 529395

Description of Loader Use (origin, destination, grade, haul distance, etc.):

see  
 info where buy mat'l

Productivity Calculations:

$$\text{Cycle time} = \frac{\text{haul time (loaded)}}{\text{haul time (loaded)}} + \frac{\text{return time (empty)}}{\text{return time (empty)}} + \frac{.5}{\text{basic cycle time}} = .5 \text{ min}$$

$$\text{Net Bucket Capacity} = \frac{525}{\text{heaped bucket capacity}} \text{ yd}^3 \times \frac{1}{\text{bucket fill factor}} = 525 \text{ yd}^3$$

$$\text{Net Hourly Production} = \frac{525}{\text{net bucket capacity}} \text{ yd}^3 \div \frac{.5}{\text{cycle time}} \text{ min} \times \frac{50 \text{ min/hr}}{\text{work hour factor}} = 525 \text{ yd}^3/\text{hr}$$

$$\text{Hours Required} = \frac{529395}{\text{volume to be moved}} \text{ yd}^3 \div \frac{525}{\text{net hourly production}} \text{ yd}^3/\text{hr} = 1008.37 \text{ hrs}$$

1008 hrs @ 34.00  
 \$36332

to → buy mat'l → ± 200 - 1220  
 95792 need - 4269 avail @ 34 =  
 need to buy 86723

Data Sources:

@ 15/cy = 2646975

4' all bought after use avail  
 Σ 8 3 11710  
 move 3 2646975  
 buy 7 362126  
 332081

Project \_\_\_\_\_  
Date \_\_\_\_\_

11  
*RR loop used mat'l in area - none needed to buy*

WORKSHEET NO. 9

PRODUCTIVITY AND HOURS REQUIRED FOR TRUCK USE

Earthmoving Activity:

Truck #3 from Buy pit to #2 camp -  
 some mat'l used from RR area - 424 yd<sup>3</sup> used

Characterization of Truck Used (type, size, etc.):

*Meas. 86723 yds*

Description of Truck Use (origin, destination, grade, haul distance, truck capacity, etc.):

Productivity Calculations:

$$\text{Cycle time} = \frac{8.2}{\text{haul time}} + \frac{6}{\text{return time}} + \frac{9}{\text{total loading time}} + \frac{1.2}{\text{dump and maneuver time}} = \frac{24.4}{\text{min}}$$

$$\text{Number of Trucks Required} = \frac{24.4}{\text{truck cycle time}} \div \frac{9}{\text{total loading time}} = \frac{271}{}$$

$$\text{Production Rate} = \frac{18}{\text{truck capacity}} \text{ yd}^3 \times \frac{271}{\# \text{ of trucks}} \div \frac{24.4}{\text{cycle time}} \text{ min} = \frac{2}{\text{yd}^3/\text{min}}$$

$$\text{Hourly Production} = \frac{2}{\text{production rate}} \text{ yd}^3/\text{min} \times \frac{50}{\text{work hour factor}} \text{ min/hr} = \frac{100}{\text{yd}^3/\text{hr}}$$

$$\text{Hours Required} = \frac{86723}{\text{volume to be moved}} \text{ yd}^3 \div \frac{100}{\text{hourly production}} \text{ yd}^3/\text{hr} = \frac{807}{\text{hrs}}$$

Data Sources:

*for rest of area need 4' core*

*for rest of area need 4' core*  
 pit → material 906 hrs  
 Ho + Fan removal 1038 hrs  
 Fuel - NO - avoid used  
 Outcrop 1488 hrs  
 ...  
 P.O.C. Chy  
 P.O. None

$$\sum \text{hrs} = 6327$$

$$\text{@ } 31.00/\text{hr} =$$

$$\text{196137}$$

move add bought material to + brass nails  
 after used away

Project \_\_\_\_\_  
 Date \_\_\_\_\_

WORKSHEET NO. 5

PRODUCTIVITY AND HOURS REQUIRED FOR DOZER USE

Earthmoving Activity:

Characterization of Dozer Used (type, size, etc.):

4'x

Description of Dozer Use (origin, destination, grade, haul distance, material, etc.):

Productivity Calculations:

$$\text{Operating Adjustment Factor} = \frac{\text{operator factor}}{\text{operator factor}} \times \frac{\text{material factor}}{\text{material factor}} \times \frac{\text{work hour factor}}{\text{work hour factor}} \times \frac{\text{grade factor}}{\text{grade factor}} \times \frac{\text{weight correction factor}}{\text{weight correction factor}} \times \frac{\text{production method/blade factor}}{\text{production method/blade factor}} \times \frac{\text{visibility}}{\text{visibility}} \times \frac{\text{elevation}}{\text{elevation}} \times \frac{\text{direct drive transmission}}{\text{direct drive transmission}} = .82$$

- see permit copy

$$\text{Net Hourly Production} = \frac{500 \text{ yd}^3/\text{hr}}{\text{normal hourly production}} \times \frac{.82}{\text{operating adjustment factor}} = 410 \text{ yd}^3/\text{hr}$$

$$\text{Hours Required} = \frac{52930 \text{ yd}^3}{\text{volume to be moved}} \div \frac{410 \text{ yd}^3/\text{hr}}{\text{net hourly production}} = 1291 \text{ hrs}$$

@ 61.38  
 = \$79241

Data Sources:

General Decision Number UT930009

Superseded General Decision No. UT910009

State: Utah

Construction Type:  
Heavy

County(ies):

|          |          |            |
|----------|----------|------------|
| BEAVER   | IRON     | SEVIER     |
| CARBON   | JUAB     | UINTAH     |
| DAGGETT  | KANE     | WASHINGTON |
| EMERY    | PIUTE    | WAYNE      |
| GARFIELD | SAN JUAN |            |
| GRAND    | SAN PETE |            |

HEAVY CONSTRUCTION PROJECTS

| Modification Number | Publication Date |
|---------------------|------------------|
| 0                   | 02/19/1993       |
| 1                   | 02/19/1993       |
| 2                   | 09/10/1993       |
| 3                   | 10/08/1993       |

USDOL

~~Employ~~

General Wage Determinations Issued Under  
The Davis-Bacon and Related Acts.

COUNTY(ies):

|          |          |            |
|----------|----------|------------|
| BEAVER   | IRON     | SEVIER     |
| CARBON   | JUAB     | UINTAH     |
| DAGGETT  | KANE     | WASHINGTON |
| EMERY    | PIUTE    | WAYNE      |
| GARFIELD | SAN JUAN |            |
| GRAND    | SAN PETE |            |

BOIL0182B 04/01/1993

|              |       |         |
|--------------|-------|---------|
| BOILERMAKERS | Rates | Fringes |
|              | 19.27 | 6.86    |

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CARP0722B 01/01/1991

|             |       |         |
|-------------|-------|---------|
| MILLWRIGHTS | Rates | Fringes |
|             | 15.85 | 2.90    |

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\* IRON0027G 08/01/1993

|              |       |         |
|--------------|-------|---------|
| IRONWORKERS: | Rates | Fringes |
| Structural   | 17.65 | 4.31    |

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SUUT2007A 03/01/1988

|                            |       |         |
|----------------------------|-------|---------|
| CARPENTERS                 | Rates | Fringes |
| CEMENT MASONS              | 10.81 |         |
| ELECTRICIANS               | 11.52 |         |
| IRONWORKERS:               | 14.52 | 2.71    |
| Reinforcing                | 11.00 |         |
| LABORERS (including        |       |         |
| pipelayers)                | 7.65  | 1.60    |
| PIPEFITTERS                | 12.60 |         |
| POWER EQUIPMENT OPERATORS: |       |         |
| Backhoes                   | 10.00 |         |
| Cranes                     | 10.43 |         |
| Dozers                     | 13.10 |         |
| Graders                    | 12.67 |         |
| Loaders                    | 11.26 |         |
| Scrapers                   | 10.00 |         |
| Trackhoes                  | 10.00 |         |
| Tractors                   | 9.42  |         |
| TRUCK DRIVERS              | 9.42  |         |

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WELDERS - Receive rate prescribed for craft performing operation  
to which welding is incidental.

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Unlisted classifications needed for work not included within