



COLORADO

Division of Reclamation,
Mining and Safety

Department of Natural Resources

MINERALS PROGRAM INSPECTION REPORT

PHONE: (303) 866-3567

The Division of Reclamation, Mining and Safety has conducted an inspection of the mining operation noted below. This report documents observations concerning compliance with the terms of the permit and applicable rules and regulations of the Mined Land Reclamation Board.

MINE NAME: Speer Mining Resource	MINE/PROSPECTING ID#: M-1983-176	MINERAL: Gravel	COUNTY: Adams
INSPECTION TYPE: Monitoring	INSPECTOR(S): Jared L. Ebert	INSP. DATE: March 16, 2017	INSP. TIME: 09:00
OPERATOR: Asphalt Specialties Co., Inc.	OPERATOR REPRESENTATIVE: Rob Laird and Gary Stillmunks	TYPE OF OPERATION: 112c - Construction Regular Operation	

REASON FOR INSPECTION: Normal I&E Program	BOND CALCULATION TYPE: Complete Bond	BOND AMOUNT: \$678,169.00
DATE OF COMPLAINT: NA	POST INSP. CONTACTS: County	JOINT INSP. AGENCY: None
WEATHER: Cloudy	INSPECTOR'S SIGNATURE: 	SIGNATURE DATE: March 21, 2017

The following inspection topics were identified as having Problems or Possible Violations. OPERATORS SHOULD READ THE FOLLOWING PAGES CAREFULLY IN ORDER TO ASSURE COMPLIANCE WITH THE TERMS OF THE PERMIT AND APPLICABLE RULES AND REGULATIONS. If a Possible Violation is indicated, you will be notified under separate cover as to when the Mined Land Reclamation Board will consider possible enforcement action.

INSPECTION TOPIC: Backfilling & Grading

PROBLEM/POSSIBLE VIOLATION: Problem: The approved reclamation plan requires Asphalt Specialties Co., Inc. to backfill concrete material at least one foot above the water table. At the time of the inspection it was observed that concrete was being placed at or below the water table. This issue is cited as a problem for failure to comply with the conditions of the reclamation permit in accordance with C.R.S. 34-32.5-109(2)(a).

CORRECTIVE ACTIONS: Submit a technical revision to the reclamation plan to allow concrete to be placed below the water table. The operator will need to revise the relevant permit text and both the Mine Plan Map and Reclamation Plan map to reflect this change.

CORRECTIVE ACTION DUE DATE: 5/19/17

OBSERVATIONS

This was a monitoring inspection of the Speer Mining Resource site, DRMS Permit No. M-1983-176, operated by Asphalt Specialties Co. Inc. (ASCI). I, Jared Ebert of the Colorado Division of Reclamation, Mining and Safety (Division) conducted the inspection. Mr. Rob Laird and Gary Stillmunkes with ASCI accompanied me during the inspection. The weather was cloudy and cool at the time of the inspection.

This is a 75.5 acre 112c operation. Mining is complete at the site and ASCI is utilizing the site as a recycling center for construction materials and as an inert fill operation. Through the approval of Amendment No. 4 (AM04) in 2010, the operator changed the post mining land use for the site from a water storage reservoir to a backfilled pit with a small 7 acre clay lined pond remaining. At the time AM04 was submitted, about 26 acres of open pit remained to be backfilled. At the time of this inspection, the Division estimates about 13 acres of open water remain leaving 6 acres to be backfilled with inert material.

On March 1st, 2017 the Division received a copy of a Compliance Advisory issued to ASCI from the Colorado Department of Public Health and the Environment, Hazardous Materials and Waste Management Division (CDPHE). The Compliance Advisory was the result of an inspection conducted at the site on February 8th, 2017 by the CPHE and Adams County. Two deficiencies were cited in the compliance advisory. The first deficiency indicated that the operator is not monitoring wind speeds, and unable to determine if operation need to be ceased during period of high wind warnings. The second deficiency indicated the operator is accepting rebar and other metals for final disposal and that they consider metals as not being inert material. The Colorado Division of Reclamation, Mining and Safety does not regulate the issue regarding the first deficiency regarding wind speed. However we do have regulations regarding inert fill as defined by Rule 1.1(20) and 3.1.5(9) of the Mineral Rules and Regulations of the Colorado Mined Land Reclamation Board for the Extraction of Construction Materials. As a result of the second deficiency, the Division conducted this inspection to determine compliance with our regulations.

Backfilling and Grading:

According to the approved reclamation plan, ASCI is approved to backfill the pit with clean fill dirt and what they called in the AM04 application as "solid waste" which consists of asphalt and concrete. According to the approved plan, ASCI is to only fill the pit with clear fill dirt to one foot above the water table and the "solid waste" was only to be backfilled above this point. Given this, concrete and asphalt is only to be placed one foot above the water table. Asphalt was not observed being backfilled below the water level. According to Mr. Laird, the asphalt that is brought into the site is processed, recycled and sold and that they are no longer using asphalt as fill material. At the time of the inspection the Division observed concrete being placed at or below the water level. According to Rule 1.1(20) and Rule 3.1.5(9) concrete which has been in a hardened state for at least sixty days can be used as inert fill. The Division believes as long as the concrete material meets this requirement, it may be placed below the water table. However, ASCI will need to submit a Technical Revision to the reclamation plan to revise the current plan to allow concrete to be placed below the water table. This issue is cited as a problem at the beginning of the report.

As cited above, the CDPHE issued ASCI a Compliance Advisory dated February 15, 2017. The Compliance Advisory indicated the operator was accepting rebar and other metals for final disposal and that metals are not considered inert material. They required the operator to immediately cease the disposal of rebar and/or other metal items at the facility and remove all rebar and metals from the pond that are visible and

retrievable. At the time of this inspection the Division observed the operator actively separating rebar from the concrete and piling the rebar at the south end of the site to be taken to a metal recycle facility off-site. A very minor amount of rebar was observed protruding out of the concrete that was observed near the disposal pit.

Financial Warranty:

The current financial warranty held by the Division for the site is \$678,169.00. The cost estimate was last evaluated during the review of AM04 in 2009 and approved on January 29, 2010. The Division could not locate the cost estimate that formed the basis of the financial warranty held. Given this, a cost estimate based on the current conditions of the site and the required reclamation to be completed was conducted. The Division estimated the cost to complete reclamation to be \$679,106.15. The reclamation cost estimate is attached. Given the small differences in the amount estimated by the Division and the current bond held, the Division will not require a surety increase at this time.

Hydrologic Balance:

The Phase I portion of the French Drain has been installed and the cleanout locations were observed. The outlet of the French Drain was observed and water was discharging out of the pipe into the pit. The pond outlet to the South Platte River is located at the north end of the pond. A wire screen is in place before the outlet pipe where debris is caught and removed before water is discharged to the river. According to Mr. Stillmunks, ASCI cleans out this wire screen several times per day. According to the AM04 correspondence, ASCI committed to inspecting the operations of the drain system once every two years to insure proper operations of the system. Based on the Division's records the Phase I portion of the French Drain was completely installed at the end of April 2015. Given this, ASCI should conduct the required inspection of the drain system and report their findings to the Division.

ASCI monitors the groundwater level at two monitoring wells on the east side of the site. Based on the bi-monthly water level data submitted to the Division between June 9, 2014 and November 11, 2016 it appears the water levels in these two wells have stabilized to a fairly consistent level.

The operator intends on completing backfilling of the site by the end of this year. Given this, they will be constructing the second phase of the French Drain in the near future. ASCI is reminded that they are required to submit an engineered certification of this phase of the French Drain within 60-days of installation of the French Drain.

Gen. Compliance With Mine Plan:

Mining is complete at the site.

Revegetation:

A portion of the site was mined and backfilled on the west side of the site within the Urban Drainage and Flood Control District High Water Bank line shown on the Reclamation and Mining Plan Maps. This area has been revegetated. The area appears stable and dense vegetation has established. The operator conducts weed monitoring and mitigation within this area.

Topsoil:

Topsoil/grow medium material is stockpiled at the southern end of the site.

PHOTOGRAPHS



Figure 1. From the southeast end of the pond looking west.



Figure 2. Concrete/dirt being backfilled into the pit.



Figure 3. Concrete backfill



Figure 4. Pit outlet to the South Platte River, northwest end of the pond.



Figure 5. Water discharged to the South Platte River.



Figure 6. Backfilled portion of the site on the west end.

GENERAL INSPECTION TOPICS

The following list identifies the environmental and permit parameters inspected and gives a categorical evaluation of each

(AR) RECORDS----- <u>N</u>	(FN) FINANCIAL WARRANTY----- <u>Y</u>	(RD) ROADS----- <u>N</u>
(HB) HYDROLOGIC BALANCE----- <u>Y</u>	(BG) BACKFILL & GRADING----- <u>PB</u>	(EX) EXPLOSIVES----- <u>NA</u>
(PW) PROCESSING WASTE/TAILING---- <u>Y</u>	(SF) PROCESSING FACILITIES----- <u>NA</u>	(TS) TOPSOIL----- <u>Y</u>
(MP) GENL MINE PLAN COMPLIANCE- <u>Y</u>	(FW) FISH & WILDLIFE----- <u>NA</u>	(RV) REVEGETATION---- <u>Y</u>
(SM) SIGNS AND MARKERS----- <u>Y</u>	(SP) STORM WATER MGT PLAN---- <u>NA</u>	(CI) COMPLETE INSP---- <u>Y</u>
(ES) OVERBURDEN/DEV. WASTE----- <u>NA</u>	(SC) EROSION/SEDIMENTATION--- <u>Y</u>	(RS) RECL PLAN/COMP-- <u>NA</u>
(AT) ACID OR TOXIC MATERIALS----- <u>Y</u>	(OD) OFF-SITE DAMAGE----- <u>Y</u>	(ST) STIPULATIONS----- <u>NA</u>

Y = Inspected and found in compliance / N = Not inspected / NA = Not applicable to this operation / PB = Problem cited / PV = Possible violation cited

Inspection Contact Address

Rob Laird
Asphalt Specialties Co., Inc.
10100 Dallas St.
Henderson, CO 80640

Enclosure: 1.) *Reclamation Cost Estimate, March 20, 2017*

CC: Jen Rutter, Adams County via e-mail.
Gary Stillmunks, ASCI via e-mail

COST SUMMARY WORK

Task description: Cost Summary

Site: Speer Mining Resource

Permit Action: March 2017

Permit/Job#: M1983176

PROJECT IDENTIFICATION

Task #: 000

State: Colorado

Abbreviation: None

Date: 3/20/2017

County: Adams

Filename: M176-000

User: JLE

Agency or organization name: DRMS

TASK LIST (DIRECT COSTS)

Task	Description	Form Used	Fleet Size	Task Hours	Cost
001	Backfill and Grade remaining portion of the pit.	TRUCK1	1	248.30	\$295,941.00
002	Rip Clay for Liner	RIPPER	1	79.36	\$19,701.00
003	Place and Compact Clay for Liner	SCRAPER1	2	31.08	\$51,362.00
004	Replace Topsoil over affected Area	SCRAPER1	2	59.19	\$94,651.00
005	Revegetation of Affected Land	REVEGE	1	22.50	\$25,373.00
006	Mobilization of Equipment	MOBILIZE	1	4.88	\$15,928.00
007	Dewatering the Pond	PUMPING	1	348.46	\$8,795.00
008	Phase II - Install French Drain	NA	1	113.60	\$15,056.00
<u>SUBTOTALS:</u>				907.37	\$526,807

INDIRECT COSTS

OVERHEAD AND PROFIT:

Liability insurance:	2.02	Total =	\$10,641.50
Performance bond:	1.05	Total =	\$5,531.47
Job superintendent:	453.68	Total =	\$33,141.32
Profit:	10.00	Total =	\$52,680.70
		TOTAL O & P =	\$101,994.99
		CONTRACT AMOUNT (direct + O & P) =	\$628,801.99

LEGAL - ENGINEERING - PROJECT MANAGEMENT:

Financial warranty processing (legal/related costs):	0.00	Total =	0.00
Engineering work and/or contract/bid preparation:	3.00	Total =	\$18,864.06
Reclamation management and/or administration:	5.00		\$31,440.10

CONTINGENCY: 0.00 Total = \$0.00

TOTAL INDIRECT COST = \$152,299.15

TOTAL BOND AMOUNT (direct + indirect) = \$679,106.15

TRUCK/LOADER TEAM WORK

Task description: Backfill and Grade remaining portion of the pit.

Site: Speer Mining Resource

Permit Action: March 2017

Permit/Job#: M1983176

PROJECT IDENTIFICATION

Task #: 001

State: Colorado

Abbreviation: None

Date: 3/20/2017

County: Adams

Filename: M176-001

User: JLE

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Shift basis: 1 per day

Equipment Description	
Truck Loader Team -Truck:	Cat 740
-Loader:	CAT 990H
Support Equipment -Load Area:	NA
-Dump Area:	Cat D9T - 9SU
Road Maintenance -Motor Grader:	CAT 14M
-Water Truck:	Water Tanker, 5,000 Gal.

Cost Breakdown:

	Truck/Loader Team		Support Equipment		Maintenance Equipment	
	Truck	Loader	Load Area	Dump Area	Motor Grader	Water Truck
%Utilization-machine:	100	100	NA	100	100	100
Ownership cost/hour:	\$67.61	\$126.84	NA	\$100.59	\$54.68	\$24.01
Operating cost/hour:	\$53.30	\$118.18	NA	\$87.23	\$46.99	\$34.13
%Utilization-riper:	NA	0	NA	NA	NA	NA
Ripper own. cost/hour:	NA	\$0.00	NA	\$0.00	\$0.00	\$0.00
Ripper op. cost/hour:	NA	\$0.00	NA	\$0.00	\$0.00	\$0.00
Operator cost/hour:	\$25.65	\$41.46	NA	\$40.52	\$38.16	\$39.38
Unit Subtotals:	\$146.56	\$286.48	NA	\$228.34	\$139.83	\$97.52
Number of Units:	3	1	0	1	1	1
Group Subtotals:	Work: \$726.16		Support: \$228.34		Maint: \$237.35	

Total work team cost/hour: \$1,191.85

MATERIAL QUANTITIES

Initial volume: 214,285

CCY

Swell factor: 1.000

Loose volume: 214,285

LCY

Source of estimated volume: Division of Reclamation, Mining & Safety

Source of estimated swell factor: Cat Handbook

Material Purchase Cost: \$0.00

Total Cost: \$0.00

HOURLY PRODUCTION

Truck Capacity:

Truck Payload (weight) Basis:

Material weight: 2,650 Pounds/LCY

Description: Decomposed rock - 25% Rock, 75% Earth

Rated Payload: 87,000 Pounds

Payload Capacity: 32.83 LCY

Truck Bed (volume) Basis:

Struck Volume:	<u>24.20</u>	LCY
Heaped Volume:	<u>31.40</u>	LCY
Average Volume:	<u>27.80</u>	LCY
Adjusted Volume:	<u>31.40</u>	LCY

Final Truck Volume Based on Number of Loader Passes: 24.75 LCY

Loading Tool Capacity

Bucket Size Class: NA

Rated Capacity:	<u>11.250</u>	LCY (heaped)
Bucket Fill Factor:	<u>1.100</u>	Other - rock/dirt mixtures (100-120%) 1.100
Adjusted Capacity:	<u>12.375</u>	LCY

Job Condition Corrections:

Site Altitude (ft.): 5015 feet

	Truck	Loader	Source
Altitude Adj:	0.960	1.000	(CAT HB)
Job Efficiency:	0.830	0.830	(CAT HB)
Net Correction:	0.797	0.830	

Loading Tool Cycle Time:

Number of Loading Tool Passes Required to Fill Truck: 2 passes

Excavators and Front Shovels:

Machine Cycle Time vs. Job Condition Rating: NA
 Selected Value within this Basic Rating: NA

Track Loaders – Material Description: _____

Cycle Time Elements (min.):

Load: NA Maneuver: NA Dump: 0.100

Wheel and Track Loaders - Unadjusted Basic Loader Cycle Time (load, dump, maneuver): 0.600 minutes

Cycle Time Factors		Factor (min.)	Source
Material:	Mixed material 0.02	0.020	(Cat HB)
Stockpile:	Dumped by truck 0.02	0.020	(Cat HB)
Truck Ownership:	Common ownership of trucks and loaders - 0.04	-0.040	(Cat HB)
Operation:	Constant operation -0.04	-0.040	(Cat HB)
Dump Target:	Nominal target 0.00	0.000	(Cat HB)
Net Cycle Time Adjustment:		<u>-0.040</u>	minutes
Adjusted Loader Cycle Time:		<u>0.560</u>	minutes
Net Load Time per Truck:		<u>0.660</u>	minutes

Truck Cycle Time:

Truck Exchange Time:	<u>0.60</u>	Minutes	Adjusted for site altitude:	<u>0.625</u>	Minutes
Truck Load Time:	<u>0.660</u>	Minutes	Adjusted for site altitude:	<u>0.660</u>	Minutes
Truck Maneuver and Dump Time:	<u>1.00</u>	Minutes	Adjusted for site altitude:	<u>1.042</u>	Minutes

Truck Travel (Haul & Return) Time:
maintained 3.0

Road Condition: Firm, smooth, rolling, dirt/lt. surfaced, watered.

Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	1500.00	0.00	3.00	3.00	3005	1.292

Haul Time: **1.292** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	1500.00	0.00	3.00	3.00	3005	0.666

Return Time: **0.666** minutesTotal Truck Cycle Time: **4.285** minutes

Loading Tool unit

Production 1,155.64 LCY/HourAdjusted for job efficiency: 959.18 LCY/Hour

Truck Unit Production

346.58 LCY/HourAdjusted for job efficiency: 287.67 LCY/HourOptimal No. of Trucks: 3 Truck(s)Selected Number of Trucks: 3 Truck(s)Adjusted hourly truck team production: 863.00 LCY/HourAdjusted single truck/loader team production: 863.00 LCY/HourAdjusted multiple truck/loader team production: **863.00** LCY/Hour**JOB TIME AND COST**Fleet size: 1 Team(s)Total job time: **248.30** HoursUnit cost: \$1.381 /LCYTotal job cost: **\$295,941**

BULLDOZER RIPPING WORKTask description: **Rip Clay for Liner**Site: **Speer Mining Resource**Permit Action: **March 2017**Permit/Job#: **M1983176****PROJECT IDENTIFICATION**Task #: **002**State: **Colorado**Abbreviation: **None**Date: **3/20/2017**County: **Adams**Filename: **M176-002**User: **JLE**Agency or organization name: **DRMS****HOURLY EQUIPMENT COST**Basic Machine: **Cat D9T - 9SU**Horsepower: **405**Ripper Attachment: **1-Shank Ripper**Shift Basis: **1 per day**Data Source: **(CRG)****Cost Breakdown:**

		Utilization %
Ownership Cost/Hour:	\$100.59	NA
Operating Cost/Hour:	\$87.23	100
Ripper Ownership Cost/Hour:	\$12.57	NA
Ripper Operating Cost/Hour:	\$7.32	100
Operator Cost/Hour:	\$40.52	NA
Total Unit Cost/Hour:	\$248.23	
Total Fleet Cost/Hour:	\$248.23	

MATERIAL QUANTITIESSelected estimating method: **Seismic****Alternate Methods:**

Seismic: **79,800** BCY Bank Volume: **79,800** BCY Midrange
 Area: **NA** acres Rip Depth (ft): **NA** Volume: **NA** BCY or CCY

Source of estimated quantity: **AM04 - November 30, 2009 Adequacy Review Response****HOURLY PRODUCTION****Seismic:**Seismic Velocity: **4,300** feet/second**Area:**

Average Ripping Depth: **NA** mph
 Average Ripping Width: **NA** degrees
 Average Ripping Length: **NA** feet
 Average Dozer Speed: **NA** feet
 Average Maneuver Time: **NA** feet
 Production per unit area: **NA** acres/hour

Job Condition Correction FactorsUnadjusted Hourly Unit Production: **1,211.40** Cu. yds./hrSite Altitude: **5,015** feetAltitude Adj: **1.00** (CAT HB)Job Efficiency: **0.83** (1 shift/day)Net Correction: **0.83** multiplierAdjusted Hourly Unit Production: **1,005.46** Cu. yds./hrAdjusted Hourly Fleet Production: **1,005.46** Cu. yds./hr**JOB TIME AND COST**Fleet size: **1** Grader(s) Total job time: **79.37** Hours

Unit cost:	<u> \$0.247 </u>	Per cu. yd.	Total job cost:	<u> \$19,701 </u>
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SCRAPER TEAM WORKTask description: **Place and Compact Clay for Liner**Site: **Speer Mining Resource**Permit Action: March 2017Permit/Job#: M1983176**PROJECT IDENTIFICATION**Task #: 003State: ColoradoAbbreviation: NoneDate: 3/20/2017County: AdamsFilename: M176-003User: JLEAgency or organization name: DRMS**HOURLY EQUIPMENT**COSTShift basis: 1 per day

	Equipment Description
-Scraper:	Cat 637G w/push-pull
-Dozer:	NA
Support Equipment -Load Area:	NA
-Dump Area:	CAT PS-360C
Road Maintenance -Motor Grader:	CAT 14M
-Water Truck:	Water Tanker, 5,000 Gal.

Cost Breakdown:

	Scraper Work Team		Support Equipment		Maintenance Equipment	
	Scraper	Dozer	Load Area	Dump Area	Motor Grader	Water Truck
%Utilization-machine:	100	NA	NA	100	25	25
Ownership cost/hour:	\$152.84	NA	NA	\$16.54	\$54.68	\$24.01
Operating cost/hour:	\$158.39	NA	NA	\$16.82	\$11.75	\$8.53
%Utilization-ripper:	NA	NA	NA	NA	NA	NA
Ripper own. cost/hour:	NA	NA	NA	\$0.00	\$0.00	\$0.00
Ripper op. cost/hour:	NA	NA	NA	\$0.00	\$0.00	\$0.00
Operator cost/hour:	\$41.46	NA	NA	\$31.87	\$38.16	\$39.38
Unit Subtotals:	\$352.69	NA	NA	\$65.23	\$104.59	\$71.93
Number of Units:	4	0	0	1	1	1
Group Subtotals:	Work:	\$1,410.76	Support:	\$65.23	Maint:	\$176.52

Total work team cost/hour: **\$1,652.51****MATERIAL QUANTITIES**Initial volume: 79,800

CCY

Swell factor: 1.000Loose volume: **79,800**

LCY

Source of estimated volume: Division of Reclamation, Mining & SafetySource of estimated swell factor: Cat Handbook**HOURLY PRODUCTION****Scraper Bowl (volume) Basis:**

Material weight:	<u>2,800 lbs/LCY</u>	Struck Volume:	<u>24.00</u>	LCY
Material description:	<u>Clay - Natural bed</u>	Heaped Volume:	<u>34.00</u>	LCY
Rated Payload:	<u>81,600 pounds</u>	Average Volume:	<u>29.00</u>	LCY
Payload Capacity:	<u>29.14 LCY</u>	Adjusted Capacity:	<u>29.00</u>	LCY

Cycle Time:

Scraper Loading Time: 1.00 Minutes
 Maneuver and Spread Time: 0.60 Minutes

Job Condition Correction:

Site Altitude: 5015 feet

	Scraper	Push Dozer	Source
Altitude Adj:	1.000	NA	(CAT HB)
Job Efficiency:	0.830	NA	(CAT HB)
Net Correction:	0.830	NA	

Travel Time:Road Condition: Firm, smooth, rolling, dirt/lt. surfaced, watered, maintained 3.0Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	300.00	0.00	3.00	3.00	2800	0.40

Haul Time: 0.40 minutesReturn Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	300.00	0.00	3.00	3.00	2949	0.25

Return Time: 0.25 minutes

Total Scraper team cycle time: 2.25 minutes
 Adjusted for job conditions: 1,283.73 LCY/Hour
 Selected Number of Scrapers: 2 Scraper(s)
 Adjusted single scraper team (unit) hourly production: 1,283.73 LCY/Hour
 Adjusted multiple scraper team (fleet) hourly production: 2,567.47 LCY/Hour

Unadjusted unit production/hour: 1,546.67 LCY/Hour
 Optimal Number of Scrapers per push
 dozer: _____

JOB TIME AND COST

Fleet size: 2 Team(s) Total job time: 31.08 Hours
 Unit cost: \$0.644 /LCY Total job cost: \$51,362

SCRAPER TEAM WORKTask description: Replace Topsoil over affected AreaSite: Speer Mining ResourcePermit Action: March 2017Permit/Job#: M1983176PROJECT IDENTIFICATIONTask #: 004State: ColoradoAbbreviation: NoneDate: 3/20/2017County: AdamsFilename: M176-004User: JLEAgency or organization name: DRMSHOURLY EQUIPMENTCOSTShift basis: 1 per day

	Equipment Description
-Scraper:	Cat 637G w/push-pull
-Dozer:	NA
Support Equipment -Load Area:	NA
-Dump Area:	CAT 14M
Road Maintenance -Motor Grader:	NA
-Water Truck:	Water Tanker, 5,000 Gal.

Cost Breakdown:

	Scraper Work Team		Support Equipment		Maintenance Equipment	
	Scraper	Dozer	Load Area	Dump Area	Motor Grader	Water Truck
%Utilization-machine:	100	NA	NA	50	NA	25
Ownership cost/hour:	\$152.84	NA	NA	\$54.68	NA	\$24.01
Operating cost/hour:	\$158.39	NA	NA	\$23.50	NA	\$8.53
%Utilization-ripper:	NA	NA	NA	NA	NA	NA
Ripper own. cost/hour:	NA	NA	NA	\$0.00	NA	\$0.00
Ripper op. cost/hour:	NA	NA	NA	\$0.00	NA	\$0.00
Operator cost/hour:	\$41.46	NA	NA	\$38.16	NA	\$39.38
Unit Subtotals:	\$352.69	NA	NA	\$116.33	NA	\$71.93
Number of Units:	4	0	0	1	0	1
Group Subtotals:	Work:	\$1,410.76	Support:	\$116.33	Maint:	\$71.93

Total work team cost/hour: \$1,599.02MATERIAL QUANTITIESInitial volume: 108,900

CCY

Swell factor: 1.000Loose volume: 108,900

LCY

Source of estimated volume: Division of Reclamation, Mining & SafetySource of estimated swell factor: Cat HandbookHOURLY PRODUCTIONScraper Bowl (volume) Basis:

Material weight:	<u>1,600 lbs/LCY</u>	Struck Volume:	<u>24.00</u>	LCY
Material description:	<u>Top Soil</u>	Heaped Volume:	<u>34.00</u>	LCY
Rated Payload:	<u>81,600 pounds</u>	Average Volume:	<u>29.00</u>	LCY
Payload Capacity:	<u>51.00 LCY</u>	Adjusted Capacity:	<u>29.00</u>	LCY

Cycle Time:

Scraper Loading Time: 1.00 Minutes
 Maneuver and Spread Time: 0.60 Minutes

Job Condition Correction:

Site Altitude: 5015 feet

	Scraper	Push Dozer	Source
Altitude Adj:	1.000	NA	(CAT HB)
Job Efficiency:	0.830	NA	(CAT HB)
Net Correction:	0.830	NA	

Travel Time:Road Condition: Firm, smooth, rolling, dirt/lt. surfaced, watered, maintained 3.0Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	1700.00	0.00	3.00	3.00	2800	0.82

Haul Time: 0.82 minutesReturn Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	1700.00	0.00	3.00	3.00	2949	0.72

Return Time: 0.72 minutes

Total Scraper team cycle time: 3.14 minutes
 Adjusted for job conditions: 919.87 LCY/Hour
 Selected Number of Scrapers: 2 Scraper(s)
 Adjusted single scraper team (unit) hourly production: 919.87 LCY/Hour
 Adjusted multiple scraper team (fleet) hourly production: 1,839.75 LCY/Hour

Unadjusted unit production/hour: 1,108.28 LCY/Hour
 Optimal Number of Scrapers per push
 dozer: _____

JOB TIME AND COST

Fleet size: 2 Team(s) Total job time: 59.19 Hours
 Unit cost: \$0.869 /LCY Total job cost: \$94,651

REVEGETATION WORKTask description: **Revegetation of Affected Land**Site: **Speer Mining Resource**Permit Action: March 2017Permit/Job#: M1983176**PROJECT IDENTIFICATION**Task #: 005State: ColoradoAbbreviation: NoneDate: 3/20/2017County: AdamsFilename: M176-005User: JLEAgency or organization name: DRMS**FERTILIZING****Materials**

Description	Units / Acre	Unit	Cost / Unit	Cost /Acre
			\$	\$
			Total Fertilizer Materials Cost/Acre	\$0.00

Application

Description	Cost /Acre
	\$
Total Fertilizer Application Cost/Acre	\$0.00

TILLING

Description	Cost /Acre
Disc harrowing, 6" deep (MEANS 32 91 13.23 6100)	\$106.29
Total Tilling Cost/Acre	\$106.29

SEEDING

Seed Mix	Rate – PLS LBS / Acre	Seeds per SQ. FT	Cost /Acre
Blue Grama - Hachita	1.50	24.48	\$24.41
Sideoats Grama - Vaughn	4.50	14.77	\$45.00
Western Wheatgrass - Arriba	8.00	20.20	\$64.64
Totals Seed Mix	14.00	59.46	\$134.05

Application

Description	Cost /Acre
Drill Seeding (DRMS Survey Cost)	\$232.00

Total Seed Application Cost/Acre	\$232.00
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MULCHING and MISCELLANEOUS**Materials**

Description	Units / Acre	Unit	Cost / Unit	Cost /Acre
			\$	\$
Total Mulch Materials Cost/Acre				\$0.00

Application

Description	Cost /Acre
	\$
Total Mulch Application Cost/Acre	\$0.00

NURSERY STOCK PLANTING

Common Name	No / Acre	Type and Size	Planting Cost	Fertilizer Pellet Cost	Cost /Acre
					\$
Totals Nursery Stock Cost / Acre					\$0.00

JOB TIME AND COST

No. of Acres:	45	Cost /Acre:	\$472.34
Estimated Failure Rate:	25%	Cost /Acre*:	\$366.05
*Selected Replanting Work Items:	SEEDING		

Initial Job Cost:	\$21,255.30
Reseeding Job Cost:	\$4,118.06
Total Job Cost:	\$25,373
Job Hours:	22.50

EQUIPMENT MOBILIZATION/DEMOBILIZATIONTask description: **Mobilization of Equipment**Site: **Speer Mining Resource**Permit Action: **March 2017**Permit/Job#: **M1983176****PROJECT IDENTIFICATION**Task #: **006**State: **Colorado**Abbreviation: **None**Date: **3/20/2017**County: **Adams**Filename: **M176-006**User: **JLE**Agency or organization name: **DRMS****EQUIPMENT TRANSPORT RIG COST**Shift basis: **1 per day**Cost Data Source: **CRG Data**Truck Tractor Description: **GENERIC ON-HIGHWAY TRUCK TRACTOR, 6X4, DIESEL POWERED,
400 HP (2ND HALF, 2006)**Truck Trailer Description: **GENERIC FOLDING GOOSENECK, DROP DECK EQUIPMENT
TRAILER (25T, 50T, AND 100T)****Cost Breakdown:**

Available Rig Capacities	0-25 Tons	26-50 Tons	51+ Tons
Ownership Cost/Hour:	\$16.63	\$18.37	\$22.33
Operating Cost/Hour:	\$44.38	\$46.13	\$50.07
Operator Cost/Hour:	\$27.66	\$27.66	\$27.66
Helper Cost/Hour:	\$0.00	\$25.39	\$25.39
Total Unit Cost/Hour:	\$88.67	\$117.55	\$125.45

NON ROADABLE EQUIPMENT:

Machine Description	Weight/ Unit (TONS)	Owner ship Cost/hr/ unit	Haul Rig Cost/hr/unit	Fleet Size	Haul Trip Cost/hr/ fleet	Return Trip Cost/hr/ fleet	DOT Permit Cost/ fleet
CAT 990H	83.34	\$126.84	\$125.45	1	\$252.29	\$125.45	\$250.00
Cat D9T - 9SU	60.01	\$100.59	\$125.45	1	\$226.04	\$125.45	\$250.00
CAT PS-360C	9.37	\$16.54	\$88.67	1	\$105.21	\$88.67	\$250.00
CAT 14M	23.57	\$54.68	\$88.67	2	\$286.70	\$177.34	\$500.00
Cat 637G w/push-pull	59.59	\$152.84	\$125.45	4	\$1,113.16	\$501.80	\$1,000.00
Drill/Broadcast Seeder with Tractor	25.00	\$12.22	\$88.67	1	\$100.89	\$88.67	\$250.00
Centrifugal pump - 200M, 10 in.	1.95	\$0.00	\$88.67	1	\$88.67	\$88.67	\$250.00

Subtotals: **\$2,172.96** **\$1,196.05** **\$2,750.00****ROADABLE EQUIPMENT:**

Machine Description	Total Cost/hr/ unit	Fleet Size	Haul Trip Cost/hr/ fleet	Return Trip Cost/hr/ fleet
Cat 740	\$146.56	3	\$439.68	\$439.68
Water Tanker, 5,000 Gal.	\$97.52	1	\$97.52	\$97.52

Subtotals: **\$537.20** **\$537.20**

EQUIPMENT HAUL DISTANCE and Time

Nearest Major City or Town within project area region:	<u>HENDERSON</u>	
Total one-way travel distance:	<u>10.00</u>	miles
Average Travel Speed:	<u>45.00</u>	mph

Total Non-Roadable Mob/Demob Cost *	<u>\$15,689.18</u>
'* two round trips with haul rig:	
Total Roadable Mob/Demob Cost **	<u>\$238.76</u>
** one round trip, no haul rig:	

Transportation Cycle Time:

	Non-Roadable Equipment	Roadable Equipment
Haul Time (Hours):	<u>0.22</u>	<u>0.22</u>
Return Time (Hours):	<u>0.22</u>	<u>0.22</u>
Loading Time (Hours):	<u>1.00</u>	<u>NA</u>
Unloading Time (Hours):	<u>1.00</u>	<u>NA</u>
Subtotals:	<u>2.44</u>	<u>0.44</u>

JOB TIME AND COST

Total job time:	<u>4.89</u>	Hours
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Total job cost:	<u>\$15,928</u>
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PUMPING WORKTask description: **Dewatering the Pond**Site: **Speer Mining Resource**Permit Action: **March 2017**Permit/Job#: **M1983176****PROJECT IDENTIFICATION**Task #: **007**State: **Colorado**Abbreviation: **None**Date: **3/20/2017**County: **Adams**Filename: **M176-007**User: **JLE**Agency or organization name: **DRMS****HOURLY EQUIPMENT COST**

	Description	Quantity
Make and Model:	Centrifugal pump - 200M, 10 in.	1
Attachment 1:	Suction hose - 6 in. diam., 25 ft.	1
Attachment 2:	Discharge hose - 6 in. D., 25 ft.	1
Labor Unit 1:		0

Horsepower: **70**Shift Basis: **1 per day**Weight: **1.95**

(US Tons)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	\$8.43	NA
Operating Cost/Hour:	\$16.81	100
Operator Cost/Hour:	\$0.00	NA
Total Unit Cost/Hour:	\$25.24	

Total Fleet Cost/Hour: **\$25.24****PUMPING QUANTITIES**

Initial Pond Volume:	140.00		Conversion factor:	325850.5800
Final Pond Volume:	45,619,081.20	gallons		
Total Pond Inflow Surface Area:	304,920	Sq. ft.	Unit inflow rate in gph/sq. ft.:	0.3516
Total Pond Inflow Volume per Hour:	107,209.87	gallons		

Source of estimated volume: **7 acre pond about 20 feet deep****PUMPING TIME**

Maximum Pump Capacity:	200,000	gph/pump
Estimated Suction Head:	10	feet
Estimated Discharge Head:	15	feet
Total Head:	25	feet
CPB Pump Capacity:	180,000	gph/pump
Site Altitude:	5,015	feet
Adjusted Pumping Capacity:	180,000	gph
Initial Unadjusted Pumping Time:	253.44	hours
Inflow during Initial Pumping:	27,171,199	gallons
Net Unadjusted Pumping Time:	404.39	Hours
Altitude Adjustment Factor:	0.9400	(3% rule)
Pump Efficiency Factor:	0.9167	(55 min./hr.)
Total Adjusted Pumping Time:	348.46	hours

JOB TIME AND COSTUnit cost: \$0.000121 /GallonTotal job time: 348.46 HoursTotal job cost: \$8,795

Task 008**Phase II – Install French Drain****Length of Drain - 1,600 feet**

- Cost to lay 12” HDPE Pipe per RSMeans Site Work and Landscape 2016 Bare Cost = \$9.41 per LF, .071 LF per hour. (33 41 1350 1040)
- Total Cost = \$15,056.00
- Time = 113.6 Hours