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: Crystal Pit	**MINE/PROSPECTING ID#:** M-1989-116	**MINERAL:** Gravel	**COUNTY:** Teller
INSPECTION TYPE: Surety Release Inspection	**INSPECTOR(S):** Timothy A. Cazier	**INSP. DATE:** November 10, 2016	**INSP. TIME:** 09:55
OPERATOR: City of Colorado Springs	**OPERATOR REPRESENTATIVE:** Dave Jordan & Sarah Hunke	**TYPE OF OPERATION:** 110c - Construction Limited Impact	

REASON FOR INSPECTION: Surety Release Requested	**BOND CALCULATION TYPE:** IT.Bondcalculationtype.CD.Desc	**BOND AMOUNT:** $0.00
DATE OF COMPLAINT: NA	**POST INSP. CONTACTS:** U.S.Forest Service	**JOINT INSP. AGENCY:** U.S.Forest Service
WEATHER: Clear	**INSPECTOR'S SIGNATURE:** 	**SIGNATURE DATE:** December 5, 2016

GENERAL INSPECTION TOPICS

This list identifies the environmental and permit parameters inspected and gives a categorical evaluation of each. No problems or possible violations were noted during the inspection. The mine operation was found to be in full compliance with Mineral Rules and Regulations of the Colorado Mined Land Reclamation Board for the Extraction of Construction Materials and/or for Hard Rock, Metal and Designated Mining Operations. Any person engaged in any mining operation shall notify the office of any failure or imminent failure, as soon as reasonably practicable after such person has knowledge of such condition or of any impoundment, embankment, or slope that poses a reasonable potential for danger to any persons or property or to the environment; or any environmental protection facility designed to contain or control chemicals or waste which are acid or toxic-forming, as identified in the permit.

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

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

OBSERVATIONS

This inspection was conducted as part of the request for final release of reclamation liability SL-01). The Operator (City of Colorado Springs) was represented by Mr. Dave Jordan and Ms. Sarah Hunke who were present for the inspection. Jeff Hovermale with the US Forest Service was also present for the inspection. This is a 110c gravel mine. The site was not active at the time of the inspection.

The Crystal Pit entrance is accessed from the Pikes Peak Toll Road.

Inspection:
Reclamation: Mr. Jordan stated the City of Colorado Springs brought in mulch to place in the bottom drainage ways of the two pits the day before the inspection (East Pit, see **Photo 1**; West Pit, see **Photo 2**). Reclamation performed to date appears to conform to the approved reclamation plan with slopes no steeper than 2H:1V and small rises and catchments created in the valley bottoms.

Revegetation:
Vegetation appears to be establishing well on the flatter upper slopes and north facing steeper slopes, but not as well on the steeper south facing slopes. The few small patches of Canada Thistle observed during the previous inspection were gone. However, Common Mullein (a Colorado List C noxious weed) were observed in large numbers on the south facing slopes of the West Pit (see **Photo 3**) and to a lesser extent on the south facing slopes of the east/lower end of the east Pit (see **Photo 4**). Mr. Hovermale suggested planting a sterile crop to help control the mullein. The Division's vegetation specialist concurs, suggesting a triticale hybrid be used. As a sterile crop is a single season application and does not contribute to the available seed bank, a revision to the permit is not required for its implementation.

The City representatives indicated the site has been seeded four or five times. As discussed above, the south facing slopes have been unsuccessful in establishing vegetation (see **Photo 5**). While in the field, both this inspector and Mr. Hovermale made it clear that implementing some best management practices (BMPs) such as contour furrowing, straw wattles, and/or placing logs on contour would be helpful in retaining moisture on these slopes and encourage seed germination. **Attachment A** presents some guidelines from the Montana NRCS for "contour log felling". Upon further permit review, TR-01 approved by the Division in 1998, committed to placing a 4 to 6 inch layer of vegetative media comprised of a mixture of stormwater sediment, seasoned horse manure, and tree compost on the slopes for reclamation (see "Records" discussion below). We recommend this approach be implemented as was committed to in 1998. The City may also consider revisiting the seed mix. If it is desired to modify the seed mix again, a new technical revision to the permit is required.

Current Stipulations:
None.

Records:
- Revisions: **Technical Revision 1** (TR-01) was approved in 1998 to change the seed mix; allow the establishment of small detention ponds; and apply a mixture of sediments from the stormwater drainage system, seasoned horse manure, and tree composting in a 4 to 6-inch thickness for growth media. A copy of the February 29, 1998 TR request is included as **Attachment B**. Please also note the seed mix.
- Commitments/Stipulations: None

- Other Records
  a) The previous inspection was conducted 9/3/2013. No problems were cited.
  b) The permit anniversary date is March 26. The Operator is current with annual fees and reports.
  c) The pre- and post-mine land use is wildlife habitat.

Bond:
As this is a city pit, no bond is required.

Summary and Recommendations:

1. The Common Mullein needs to be controlled before becoming a problem. The Division and USFS recommends adding a sterile crop to help control it. Implementing a noxious weed control program, developed with input from the local or county extension office is also recommended.
2. The City should add the vegetative media discussed above and committed to in 1998 (TR-01) on the south facing slopes to aid vegetation establishment.
3. Best management practices (BMPs) should be implemented on the south facing slopes until the vegetation becomes established.
4. The Division will deny the request for release from reclamation liability.

PHOTOGRAPHS

Photo 1. Typical mulch/wood chip placement in East Pit.

PHOTOGRAPHS (cont.)

Photo 2. Typical mulch/wood chip placement in West Pit (looking west).

Photo 3. Common Mullein observed on the south facing slopes of West Pit (looking south).

PHOTOGRAPHS (cont.)

Photo 4. Common Mullein observed on the south facing slopes of East Pit (looking west).

Photo 5. Typical poorly vegetated south facing slopes (West Pit – looking west).

Inspection Contact Address

Dave Jordan
City of Colorado Springs
P.O. Box 1575
Colorado Springs, CO 80901

Enclosures

ec: DRMS File
Elliott Russell, DRMS
Sarah Hunke, Colorado Springs Utilities
Jeff Hovermale, USFS

Programs

- Farm Bill
- Financial Assistance
- Easements
- Landscape Initiatives
- Landscape Planning
  - Emergency Watershed Protection Program
  - Watershed Protection and Flood Prevention Program
  - Watershed Surveys and Planning
  - Watershed Operations
  - Watershed Rehabilitation

Back To...

Wildfire Rehabilitation Assistance

Contour Log Felling

What is Contour Log Felling?

Contour log felling is a way to reduce the amount of water that runs down a slope by cutting trees so that they fall perpendicular to the main direction of the slope (to lie along the contour).

When is Contour Log Felling Used?

Contour log felling is used on burned slopes where there are a number of dead trees that have little alternative value. When the original ground cover is lost after a wildfire, the soil is at risk for erosion. Additionally, drainageways may flood more frequently due to increased runoff from the burned slopes. Contour log felling is a way to use the dead timber for some beneficial purpose. Consider leaving some dead trees for wildlife habitat.

Also, note that contour log felling in burned areas is dangerous due to a significant risk that trees may fall down or drop branches on workers with little or no warning. If you do not have the equipment or skills to do this work, you can hire experienced contractors.

Logs or slash from the felling should not be placed in drainageways or swales. When unanchored, the logs or debris may be washed downstream, causing damage to drainage improvements or blocking natural channels, resulting in increased erosion.

How is Contour Log Felling Accomplished?

Trees are cut so that the trunks drop across the slope perpendicular to the flow of water. Stumps should be left about 12 inches high to be used along with stakes or stable, standing trees at each end of the log to brace it from sliding downhill. Tree limbs are removed to the extent necessary for the log to lie flat on the ground, encouraging the collection of water and trapping debris moving down the slope. A trench eight to 12 inches deep should be dug on the uphill side of each log to catch debris. This soil should be tamped into gaps between the log and the ground to prevent water from eroding under the log.

For this practice to be most effective, enough trees must be felled to create a barrier that interrupts the movement of water down the slope.

How Effective is Contour Log Felling?

When there are 400 to 600 feet of logs available per acre (about 30 logs 20 feet long and 10 inches in diameter), contour log felling may significantly increase infiltration, add surface roughness, and replace some lost cover, thus reducing erosion potential. At best, contour log felling provides short-term protection on slopes that require reestablishment of permanent vegetation for long-term erosion control.

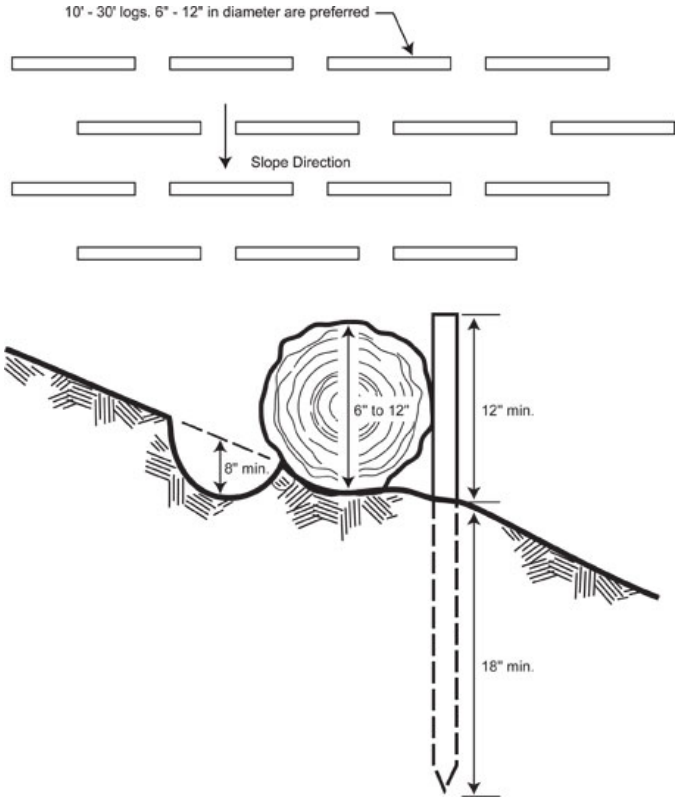
Contour log felling has little effect when logs are oriented up and down the slope instead of across it, when felled logs are not in contact with the soil, where the slope is steeper than 50 percent, and where the density of logs is less than 400 feet per acre.

Recommended Horizontal Spacing

Slope Gradient (percent)	Low Fire Intensity	Medium Fire Intensity	High Fire Intensity
<5%	250 feet	160 feet	130 feet
5-10%	200 feet	120 feet	90 feet
10-20%	120 feet	60 feet	40 feet
20-50%	60 feet	30 feet	20 feet
>50%	40 feet	20 feet	20 feet

With contour log felling, trees are placed directly on the ground and staked in or wedged behind stumps.

Contour Log Felling Illustrations



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Colorado Springs Utilities
It's how we're all connected

ATTACHMENT B

Environmental Services

110c
Teller County

February 26, 1998

RECEIVED
MAR 02 1998
Division of Minerals & Geology

TR-001

Berhan Keffelew
Division of Minerals and Geology
Department of Natural Resources
1313 Sherman Street, Room 215
Denver, CO 80203

Subject: Technical Revision Request
Permit M-89-116, Crystal Gravel Mine

Certified # P 382 940 545

Dear Mr. Keffelew:

The City of Colorado Springs - Pikes Peak Highway requests approval for a technical revision of Mining Permit M-89-116, for the Crystal Gravel Mine. This revision pertains to the reclamation plan for the pit.

The changes are based on recommendations made by yourself and by John Valentine (Soil Conservation Service) during site tours. The following reclamation plan changes are requested:

1. A seed mixture change is requested:

Recommended Mix		Former Mix	
35%	Smooth Brome (Lincoln Manchar)	25%	Slender Wheatgrass
25%	Intermediate Wheat (Tegmar)	19%	Intermediate Wheatgrass
25%	Sheep Fescue (Covar)	19%	Pubescent Wheatgrass
10%	Timothy (Climax)	19%	Western Wheatgrass
5%	White Dutch Clover	10%	Hard Fescue
1#/acre	Bandera Rocky Mtn. Penstomen	5%	Timothy
	(Wild flower mix - for aesthetic purposes)	3%	Yellow Sweetclover

   This new mix is based on the growth success from the North Catamount site seeding and on John Valentine's experience in this area. The Forest Service was consulted and agreed to the viability of this mix. (Note that the former mix was used to revegetate the West Phase of this pit and the recommended mix is for the East Phase.)

2. Grading will be performed to establish small detention ponds along the valley floor to minimize erosion. As appropriate, straw bales will be secured at the bottom of these ponds to aid in solids retention.

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P.O. Box 1103, Mail Code 1505
Colorado Springs, CO 80947-1505

Phone 719-448-8688
Fax 719-448-8666
http://www.csu.org

3. Due to the minimal amount of original topsoil, no topsoil was retained during the mining operations. Thus, it is recommended that topsoil replacement be done using sediments recovered from a City storm water drainage system (West Phase) and a mixture of seasoned horse manure and tree composting (East Phase). These amendments will be applied at a 4-6" thickness.

If you have any questions please call me at (719) 448-8699.

Sincerely,

Carol Marie Baker.

Carol M. Baker, PE

C: Dave Jordan
Preston Kimler
Don Scherer
Alan Goins
File # 6401 - 16 - 2
CMB Day File # 0 - 8 - 2