



**COLORADO DIVISION OF RECLAMATION, MINING AND SAFETY**  
**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.

<b>MINE NAME:</b> Worthing Pit	<b>MINE/PROSPECTING ID#:</b> M-1977-526	<b>MINERAL:</b> Sand and gravel	<b>COUNTY:</b> Adams
<b>INSPECTION TYPE:</b> Monitoring	<b>INSPECTOR(S):</b> Tyler V. O'Donnell	<b>INSP. DATE:</b> May 19, 2015	<b>INSP. TIME:</b> 09:00
<b>OPERATOR:</b> Albert Frei & Sons Inc.	<b>OPERATOR REPRESENTATIVE:</b> Ben Frei	<b>TYPE OF OPERATION:</b> 112c - Construction Regular Operation	

<b>REASON FOR INSPECTION:</b> Normal I&E Program	<b>BOND CALCULATION TYPE:</b> None	<b>BOND AMOUNT:</b> \$230,800.00
<b>DATE OF COMPLAINT:</b> NA	<b>POST INSP. CONTACTS:</b> None	<b>JOINT INSP. AGENCY:</b> None
<b>WEATHER:</b> Raining	<b>INSPECTOR'S SIGNATURE:</b> <i>Tyler O'Donnell</i>	<b>SIGNATURE DATE:</b> December 9, 2015

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

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 by Tyler O'Donnell and Wally Erickson of the Division of Reclamation, Mining and Safety (Division). Albert Frei & Sons Inc. (Operator), was represented by Ben Frei during the inspection. Steve O'Brian with Environment, Inc., the consultant representing Albert Frei & Sons Inc., was also present during the inspection. The inspection was conducted as a follow up to the Division's October 6, 2014, inspection. As stated in the October 6, 2014, inspection report, the Division believes alluvial groundwater has mounded against the backfill of fines at the Worthing Pit's southern expansion area, which is contributing to upgradient groundwater mounding between the Stagecoach Pit (operated by Albert Frei and Sons) and Pit 29 (operated by Brannan Sand and Gravel). In the October 6, 2014, inspection report the Division cited a problem for failure to minimize the disturbance to the prevailing hydrologic balance, pursuant to C.R.S. 34-32.5116(4)(h) and for failure to protect areas outside of the affected land from slides or damages occurring during the mining operation, pursuant to C.R.S. 34-32.5116(4)(i). In an attempt to resolve the problem cited in the October 6, 2014, inspection report the Operator submitted Technical Revision No. 4 (TR-04), which contained a groundwater mounding mitigation plan. TR-04 was approved on February 20, 2015. TR-04 targeted lowering the groundwater elevation around monitoring wells 1 and 8 to an elevation between 5,003 to 5,004 feet. The Division considered this target elevation to represent the groundwater elevation prior to the mining disturbances in the area (that is, the "prevailing hydrologic balance"). This inspection was conducted to observe and evaluate the work conducted by Albert Frei and Sons under TR-04 in an attempt to reduce the impacts to groundwater mounding against the Worthing pit Backfill.

The Worthing Pit is located in Adams County approximately 0.75 miles north of Henderson Colorado, just west of Brighton road, and just east of the South Platte River. The Worthing Pit is a 160.9-acre 112 Construction Materials Reclamation Permit. The approved post-mining land uses are residential, recreational, and developed water resource.

The majority of the Worthing Pit had been mined, large portions of reclamation had taken place throughout the site. The northern and southern expansion areas have been backfilled, portions have been graded and seeded. There were approximately 22 acres where top soil had been spread and the area had been seeded. The vegetative cover on the 22 acres had established well. Areas around the plant site, the northern expansion area, and the southern expansion area have minimal grading work left. The operator's representative explained that all exposed groundwater exceeding the 1980s pre law groundwater had been backfilled. The Operator's representative explained that final reclamation would be conducted within the next year or two throughout the majority of the site.

The newly constructed groundwater mounding mitigation ditch was observed during the inspection. The groundwater mounding mitigation ditch was an expansion to an abandoned channel of the South Platte River. The Operator constructed a ditch between the River and the historic abandoned channel. Prior to mining and other land uses in the area the abandoned channel drain to the South Platte River. In review of pre-mining aerial photos it appeared that the abandoned channel normally receive groundwater and conveyed the water to the main channel of the South Platte River. After the mining of the Worthing Pit south expansion area and the construction of the adjoining reservoir's inlet/outlet structure, the flow of the abandoned channel was constricted and lacked a direct path to the river. After the flow path was blocked the abandoned channel backed up with water and became a stagnant bog.

Through the approved plan under TR-04 the Operator restored the flow through the abandoned channel, by excavating a trench from the channel to the river. The trench was excavated in order to reduce the restriction to flow in the abandoned channel thereby reducing the elevation of groundwater in the area located upgradient from the backfill of fines at the Worthing Pit.

After the completion of the groundwater mounding mitigation ditch, the Operator surveyed points along the ditch to demonstrate that the ditch was constructed at the proper elevations as specified in the design. The Operator has increased the frequency of groundwater monitoring, the Operator has also been reporting this information to the Division periodically. The groundwater monitoring data has helped the Division evaluate the effects of the groundwater mounding mitigation ditch.

During the inspection the South Platte River was at a flood stage. The river was at a level such that the water from the river was backing up into the groundwater mounding mitigation ditch. The current flood stage of the river made it hard to evaluate the effectiveness of the groundwater mounding mitigation ditch.

### **CONCLUSION**

The construction of the groundwater mounding mitigation ditch in conjunction with other improvements made up gradient at the Stagecoach Pit (operated by Albert Frei and Sons), have reduced the impacts to the groundwater mounding against the Worthing Pit backfill. Based on observations made during the inspection and review of groundwater monitoring data in the area, the Division believes the impacts to the prevailing hydrologic balance have not been completely eliminated; however, the Operator has taken measures to significantly minimize the impacts to the prevailing hydrologic balance. The Division will continue to work closely with the Operator to monitor the impacts to the prevailing hydrologic balance.

#### **Inspection Contact Address**

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**PHOTOGRAPHS**



**Photo 1:** Backfilled exposed groundwater in the northwestern portion of the site.



**Photo 2:** On going backfilling of the northeastern lined pit.





**Photo 3:** Discharge side of the groundwater mounding mitigation system, the river is at a flood stage level were the pipe is completely submerged.



**Photo 4:** well established vegetative cover in the southern expansion area.