

# STATE OF COLORADO

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## DIVISION OF RECLAMATION, MINING AND SAFETY

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**TO: Water Quality Control Commission (WQCC)**

**FROM: Ronald W. Cattany, Division Director  
Division of Reclamation, Mining and Safety (DRMS)**

**DATE: November 6, 2006**

**RE: FY 2005-2006 SB 181 Annual Report**

The Division of Reclamation, Mining and Safety (DRMS) is pleased to submit its SB 181 Report for FY 2005-2006. The division's implementation of its authorities reflects our dual role of promoting the development and use of Colorado's mineral and energy resources while protecting the public health, safety and the environment. I appreciate the working relationship between my staff and the Water Quality Control Division (WQCD).

## **SB 181 Annual Report FY 2005-2006 SB**

This annual report to the Water Quality Control Commission (WQCC) is required under the provisions of SB 181 and the MOU adopted by the Mined Land Reclamation Board (MLRB) and the Water Quality Control Commission (WQCC). DRMS is an implementing agency under the provisions of SB 181. As such, we are responsible for ensuring that mine operators comply with state ground water quality standards. It is the responsibility of the WQCC to classify ground waters and set standards for those classified waters.

If the WQCC has not set standards, DRMS is to use the numeric protection levels, referenced in the WQCD-adopted ground water regulations, to set appropriate permit conditions to protect ground water uses. The division analyzes all operations that have the potential to be classed as Designated Mining Operations (DMO) to ensure that their operations are protective of ground waters. The division also requires non-DMO mining operations to initiate ground water sampling in those instances where there is a potential for impacts to ground water quality. Examples would be those rare instances where an aggregate operation has an identified problem with solid waste disposal or where there has been an unauthorized release of hydrocarbons, such as a fuel spill.

The division has also required some aggregate operations to conduct ground water monitoring in order to document ground water elevations. This has been done to ensure that these operations do not expose tributary ground water to evaporation, rather than for water quality protection purposes.

### **Minerals Programs**

As of this reporting period, the Minerals Program requires approximately 32 mine sites to conduct some type of ground water quality monitoring. Of the approximately 32 sites, 24 are hard rock mining operations, and eight are construction material extraction operations. The San Luis Project (Permit No. M-1988-112 - Battle Mountain Resources Inc.) in Costilla County, is conducting a remedial action to correct a ground water problem that was discovered in July 1998. Two sites, the Pitch Project (Permit No. M-1977-004HR - Homestake Mining Co) in Saguache County and the Idarado Mine (Permit No. M-1977-403 - Idarado Mining Co) in San Miguel County, have combined ground and surface water monitoring programs that are directly under the regulatory supervision of the Water Quality Control Division. They report directly to them. The Schwartzwalder Mine (Permit No. M-1977-300) in Jefferson County,

which samples eight wells quarterly for various radioactive parameters, is regulated under the terms of Colorado Radioactive Materials License (CO-369-03S).

The Minerals Program and Mined Land Reclamation Board in 2002 adopted a new policy entitled, "Minerals Program Notification of Toxic or Hazardous Materials Spills at Mine Sites." That policy has been incorporated into the Construction Materials and Hard Rock Rules. The new rules require all permitted operators to notify the division in the event of a toxic or hazardous materials spill that has the potential to impact ground waters quality.

### *Hardrock Mining Operations*

#### **ANGLO GOLD USA, CRESSON PROJECT (Permit M-1080-244) Teller County**

With the approval of Amendment 8 on August 23, 2000, the operator of the Cresson Project, Cripple Creek and Victor Gold Mining Co., was approved to monitor ground water in the permit area on a quarterly basis by means of nine wells. With the exception of one well that monitors only pH and WAD cyanide around the Adsorption/Desorption Recovery (ADR) processing ponds, ground water at all wells is analyzed for all regulated parameters (except organics) including free, WAD and total cyanide. Five of the nine monitor wells, including the ADR well, have been established as points of compliance. Permit conditions for five parameters have been set for all points of compliance except the well at the ADR. The permit conditions applicable at the ADR well involve only pH and WAD cyanide.

The operator has constructed a 19.2 million gallon pond outside the cyanide containment system for emergency storage of process water in the event of system failure. A compliance monitoring well monitors this pond for pH, WAD cyanide, zinc, manganese and sulfate. The pond is triple lined and is outfitted with a low volume solution collection pump and pump-back system with a dedicated power source.

The mine was in compliance with its monitoring plan during the reporting year, and there were no ground water excursions. Since last year the Carlton Tunnel discharge permit has been approved by CDPHE.

#### **BATTLE MOUNTAIN INC., SAN LUIS PROJECT (Permit M-1988-112) Costilla County**

Monitoring activities at the site have continued unchanged during the past year. The operator continues to pump and treat ground water from the West Pit and from two capture wells completed in the alluvial aquifer. The treated water is discharged to the Rito Seco.

Flushing of the waste rock backfill in the West Pit has dramatically improved water quality, but the improvement has leveled out and appears to have reached equilibrium. DRMS has determined that West Pit ground water quality now meets pre-mine ambient water quality conditions. Sulfate and TDS levels are near or below table value standards. Manganese and TDS concentrations at the SF-1 monitoring well came back into compliance with permit standards as of March 2002. Fluoride concentrations are elevated above drinking water standards, but are in line with pre-mine ambient conditions for the area.

Ground water monitoring is conducted at this site primarily: (1) to assure there is no leakage of cyanide solution from the lined mill tailings facility; and (2) to assess the progress of ground water cleanup in the West Pit. The tailings facility was designed to collect entrained solution and route it to a triple lined collection pond from where it is recycled back to the tailings pond. It is presumed that, in time, solution drain down will cease and the tailings facility can then be closed. Ground water monitoring at the West Pit is part of the WQCC action requiring that seepage from the West Pit to the Rito Seco be stopped and that ground water in the West Pit be treated prior to discharge.

No processing with cyanide solution has taken place at this site since 1996. Cyanide concentrations are within all acceptable use standards. Drain down volumes have leveled out, and are controlled by direct precipitation on the reclaimed tailings. Until the tailings impoundment is breached, according to the reclamation plan, drain down is expected to continue. Preliminary talks about final closure of the tailings impoundment have begun, and these are expected to lead to closure of the drain collection pond.

Including those on and off-site, there have been in operation at one time or another as many as 86 wells associated with this operation. These include wells used for monitoring water quality, piezometry, water supply, water augmentation, and de-watering. On-site wells monitor or monitored seepage or potential seepage from the tailings facility, the West Pit, and the East Pit. Pit wall wells were used for dewatering during operations. Off-site wells that have been monitored at one time may include the City of San Luis water well, wells on adjacent properties, water supply, and water augmentation wells.

The monitoring wells assess water quality in the Precambrian bedrock, the Santa Fe formation water bearing strata. During mining and milling operations and until the summer of 2003, there were 26 monitoring wells, including several off-site wells. Twelve of these were points of compliance. In addition there were six lysimeters, all of which were points of compliance. Approval of Technical Revision TR-32 reduced the number of monitoring wells to twenty. There are two ground water wells outside the permit area that are monitored (results are reported) -- Shalom Ranch and San Luis Town Wells.

Monitoring is conducted and reported on a quarterly basis. All regulated contaminants except organic compounds are monitored. Permit conditions for the protection of ground water quality were established for six parameters. One of these parameters, weak acid dissociable cyanide, is applicable only in the area of the tailings impoundment.

As part of the remediation plan approved under Technical Revision TR-26, two interceptor wells in the Rito Seco alluvial aquifer are pumped to prevent the advance of contamination from the West Pit and to remove the contaminated water for treatment. Water recovered from these wells is pumped into the West Pit to assist in the flushing of soluble metals and salts from the body of waste material in the pit. These are ultimately reduced to acceptable levels by the nanofiltration unit before being discharged into the Rito Seco.

The balance of the points of compliance (except for the M-11R well located in the zone of alluvial contamination) have remained in compliance with the approved permit conditions. It should be noted that the two capture wells down gradient of M-11R do appear to be capturing the contaminated plume in the alluvium. Two additional monitoring wells further down-gradient of the two capture wells show no sign of contamination, and one monitoring well up gradient of the capture wells (M-21) has shown significant reductions of TDS, sulfate, manganese and iron.

With geochemical equilibrium in the two-backfilled pits, extensive discussions with the operator have been held on permanent solutions to the disposition of ground water at the site, and WQCD personnel have participated regularly. In July 2006, Amendment AM-02 to the mined land reclamation permit was submitted by the operator proposing to use West Pit water for irrigation of ranchland. The AM-02 application has not yet been found complete for technical review, and the public comment period for the application will not commence until it is. WQCD will be notified through standard channels of communication at that time.

**LKA INTERNATIONAL, INC., GOLDEN WONDER MINE (Permit No. M-1978-091 UG) Hinsdale County**

Prior to the reporting year 2002-03, the operator collected five quarters of baseline ground water quality data from a draining adit, and has since been collecting adit water from an off-site adit and from Lake Fork above and below the off-site portal, with sample results provided to the division. Adit discharge has not been observed or reported for several years, although the underground workings are wet. There is no CDPHE discharge permit as the operator maintains this as a "no discharge" site. Ground water monitoring locations were shallow sumps, acting as wells. Water sampling for the reporting year again showed no water in the sampling wells, so no analyses were submitted. The operator has been notified to submit annual analyses if conditions change and water re-appears in the sumps. In November 2004, the operator discussed scoping options for extending an adit approximately 1000' beneath the present workings. In 2006, the site operator (AU Mining, Inc.) obtained a BLM permit for drilling two holes near the site of the future lower adit, to investigate potential percolation and groundwater levels. To date, the division has not received any follow-up data or an application for permitting a lower adit.

**LKA INTERNATIONAL, INC., UTE MINE AND MILL (Permit No. M-1978-092) Hinsdale County**

The permittee and owner of this operation, LKA International, Inc., completed an initial five quarters of baseline ground water quality data monitoring per the approved Environmental Protection Plan (EPP) and results of the 2001 sampling were provided to the division. The site is not active at this time and is precluded from operations unless improvements are completed in production, containment, and storage operations. The site is stable. No water quality sampling is presently required.

It is possible that part of this site will be considered for cleanup by BLM under their CERCLA authority.

Recently, the operator has begun discussions with the division about amending several more acres to the permit to expand the mill tailings capacity and reactivate the mill. Water quality sampling requirements have been communicated to the operator. To date, the division has not received any application materials or sampling results.

**INCAS MINE (Permit No. M-1986-076) La Plata County**

Incas is a small operating gold mine located on very steep slopes south of Hesperus near USFS management areas. The facility utilizes a cyanide vat leach system to leach gold and silver and thus far has produced small (~10 tons per year) quantities of tailings. The original batches of tailing sands went into concrete floors and stem walls of the leach plant; however, since 2003 they have been placed in the approved tailings pond onsite. Leached tailings from the vat are treated with sodium hypochlorite to “kill” the cyanide, dewatered, and then transported in small batches to tailings facilities on site.

Prior to reporting year 2002-03, the operator gathered baseline surface and ground water quality data and has sampled since that time only during periods of intermittent operation. The approved plan requires that a surface water and ground water sample be taken during the summer and fall of each year that the site is operated. The ground water monitoring point is located in an historic discharging adit on the permit area approximately 500 feet directly downhill from the surface workings and mill; and a (surface) compliance point is located in the first stream downgradient.

The site is monitored for pH, EC, TDS, sulfate and WAD cyanide. Limited operations were conducted during the current reporting year. Water quality samples met the ground water NPL’s and were well within state-wide standards for both ground water and streams. The site has an NPDES permit for historic adit discharge.

**SUNNYSIDE GOLD CORP., SUNNYSIDE MINE (Permit No. M-1977-378)  
San Juan County**

Approximately 36 spring/seep locations are monitored semi-annually in accordance with the DRMS/WQCD Consent Decree for drainage associated with the mine pools of the American & Terry tunnels. American Tunnel Bulkhead No. 1 was closed May 14, 2001; Bulkhead No. 2 was closed August 31, 2001; and Bulkhead No. 3 was closed on December 3, 2002. Terry Tunnel bulkhead final closure occurred on October 5, 2000.

In January 2003, CDPS permit No. 0027529 for the American Tunnel adit discharge was transferred from Sunnyside Gold Corp (Sunnyside) to Gold King Mines Corp. (Gold King) under Amendment 4 to the Consent Decree, thus transferring responsibility for treatment of the American Tunnel discharge to Gold King. As part of Amendment 4, Gold King installed a 3500-foot pipeline to convey adit discharge from the Gold King mine downhill to the American Tunnel water treatment plant. Neither the pipeline nor treatment of discharge from the Gold King adit were required by DRMS, and would not have been

required lest Gold King actually conducted underground operations that could have had the potential to adversely affect ambient water quality.

In July 2003, the Consent Decree between Sunnyside Gold Corporation and WQCD was terminated.

The initial treatment portion of the American Tunnel water treatment plant lay on ground owned by Gold King while the downstream sludge settling ponds lay on properties owned by San Juan Corporation. In mid-2004, DRMS was notified that San Juan Corporation intended to have the settling ponds moved off its property, thus incapacitating the water treatment plant.

In September 2004 and later, WQCD issued violations against Gold King Mine Corporation for failure to comply with permit conditions at the American Tunnel treatment facility. In October 2004, Gold King Mines Corporation was evicted, by District Court Order, from the settling ponds for the water treatment facility. Since the eviction, drainage from the American Tunnel and Gold King Mine have discharged (untreated) into Cement Creek. Gold King Mines Corporation apparently has not complied with the corrective actions associated with the WQCD violation(s).

During the summer of 2006, ownership of private lands at the American Tunnel and Gold King Mine areas transferred from Gold King Mines Corporation to San Juan Corporation. Gold King Mines Corporation no longer owns any of the lands in the area but still holds the WQCD permit. Sunnyside Gold Corporation no longer owns any of the lands in the area but still holds the DRMS reclamation permit and continues its monitoring program in accordance with DRMS permit conditions.

Sunnyside Gold Corporation has removed the water treatment plant and continues to progress towards completion of final reclamation, release of warranties, and termination of its reclamation permit. As Sunnyside no longer has responsibility for the American Tunnel water treatment system, there are no remaining groundwater issues associated with the still active Sunnyside reclamation permit for the American Tunnel area.

**PRIDE OF THE WEST MILL (previously named HOWARDSVILLE MILL)  
(Permit No. M-1984-049) San Juan County**

Operations at the Pride of the West (Howardsville) Mill site are both historic and modern. The site is beside the Animas River at the ghost town of Howardsville, comprising a few historic abandoned mill buildings and other historic structures plus a modern multi-purpose mill. The modern mill is



capable of significant thru-put of ore and has gravity separation, flotation, and cyanidation capabilities. Historic tailings from the historic mill, which are complexly mixed with fluvial tailings mostly from the Eureka district farther upstream, occupy wetlands between the mill buildings and the Animas River. The site is currently in compliance with a Cease and Desist Order from the Board; they are precluded from operations due to failure of the tailings facility and are permitted to conduct reclamation only.

The mill is currently precluded from operations and the tailings facility is no longer allowed by DRMS to receive tailings. The mill has been placed up for sale and the operator has considered offers to sell it either in pieces or as part of the property.

**GOLD KING MINES, INC., GOLD KING MINE (Permit No. M-1986-013)  
San Juan County**

In December 2004, the Colorado Mined Land Reclamation Board revoked the permit for failure to comply with corrective actions of a previous violation. The previous violation was issued to Gold King Mines Corporation for failure to maintain the financial warranty. In February 2005, the Board forfeited the financial warranty for the operation.

The mine currently is under violation for failure to maintain adequate bond. No excavation has occurred at this site for more than 15 years. The division may initiate surface reclamation on this property in the near future.

**HOMESTAKE, BULLDOG MINE (Permit No. M-1977-215) Mineral County**

All required ground water samples have been collected. The operator has installed a concrete hydraulic bulkhead seal inside the lowest portal (9360 portal). The seal valve was closed on April 1, 1999. There are no signs of new seeps or springs, nor have there been increased flows at the existing monitoring points. Hydraulic pressure on the bulkhead reached a high of 10.1 psi in June 2000. A two-year revised water-monitoring program began in 1999 to determine if the water impounded behind the portal seal was communicating with the surface flows in Windy Gulch. No surface expression of this ground water was detected at any of the monitoring points during the monitoring program. The two-year monitoring program is now complete. No changes or events of note occurred at this facility in the reporting year.

**MOUNT ROYALE VENTURES, LLC, GOLD HILL MINE AND MILL  
(Permit No. M-1994-117) Boulder County**

The operation conducts quarterly sampling and reporting requirements for the four monitoring wells (Wells #1-4) down gradient from the existing tailings pond. Voluntary sampling and recording (in order to establish a better baseline) include the tailings pond, the Times Mine, the Hazel A Adit, and Left Hand Creek. Parameters include Al, As, Cd, Cr, Cu, Fe, Pb, Mn, Hg, Se, Ag, U, and Zn.

**COMSTOCK MINING AND MILLING, PHIL SHERIDAN LODGE (Permit No. M-1988-081) Boulder County**

The mine is not currently in operation; however in 1995, a shaft was sunk on the mine site in order to connect with the historic Phil Sheridan Tunnel. The tunnel is located approximately 100 feet below the surface at the shaft collar location. The portal is down the hill from the permit area, across the county road, and at the east end of the Harry Covey property. Several puddles of water are outside of the portal making its way through a grassy ditch to a dilapidated building. From there the water seeped back into the subsurface, and no surface discharge was noted. Adjacent to the portal is an ephemeral stream that is tributary to Fourmile Canyon Creek.

**FRANKLIN CONSOLIDATED MINING COMPANY, FRANKLIN MINE AND MILL (Permit No. M-1983-083) Clear Creek County**

The last available water quality data submitted for DRMS review was collected in 2001. The mining and reclamation permit contains a Ground Water Monitoring Plan with quarterly monitoring and annual reporting requirements. The operator began final reclamation activities at the site during the preceding year. Based on information provided by the landowner, it appears the operator has lost legal right of entry to continue reclamation activities. The division will be pursuing enforcement action regarding the right of entry concern at the December 2006 Board Meeting. If this concern is found to be a violation and is not resolved in a timely manner, the division will pursue permit revocation and bond forfeiture in 2007.

**CLIMAX MOLYBDENUM COMPANY, HENDERSON MINE AND MILL (Permit No. M-1977-342) Clear Creek and Grand Counties**

Permit conditions protective of ground water established at the Henderson Mine and Mill include:

- A ground water interception well field operates in a zone of relatively permeable alluvium located below the tailing pond to pump potentially contaminated ground water back to the tailing pond.
- Seepage from No. 3 Tailing Dam was historically collected and pumped back to the pond. During 2001, a redundant pipeline system was installed to route the 3-Dam seepage to the main seep water system below No. 1 Tailing Dam. Annual leak down testing of the pipeline is required.

The active ground water monitoring program includes quarterly monitoring of one well at the mine, and two wells at the mill. A third well has been established at the mill to gather ambient ground water quality information ahead of tailing pond expansion.

**CLIMAX MOLYBDENUM COMPANY, CLIMAX MINE (Permit No. M-1977-493) Summit, Lake, and Eagle Counties**

Permit conditions protective of ground water established at the Climax Mine include:

- Ground water cutoff wall and pump back station located below the Robinson Lake process water impoundment in the Eagle River basin; and
- Subsurface pump station located in the No. 5-Shaft, Arkansas River basin, maintains the mine pool elevation in the flooded underground workings below the level where seepage could occur that would have the potential to impact Arkansas River water quality.

The active ground water monitoring program includes quarterly monitoring of two wells in the Ten Mile Creek drainage basin, one well in the Arkansas River basin, and one well in the Eagle River basin.

**ASARCO INC., LEADVILLE UNIT (Permit No. M-1977-218-UG) Lake County**

The approved ground water monitoring plan specifies quarterly monitoring of six wells and one surface water sampling station cross gradient and down gradient from the tailing impoundment. A point of compliance is established down gradient of the impoundment and numeric protection levels established.

With the completion of mining, underground dewatering ceased and the mine re-filled with water, eventually reaching and exceeding the Yak Tunnel level. In the 2004-2005 reporting year, it became clear that the Yak Tunnel is plugged

at some point between the Black Cloud and the Yak Portal. To relieve hydrostatic pressure on the tunnel collapse or roof fall, under EPA's direction a pipe and pump system has been installed to convey ground water from the Black Cloud workings and Yak Tunnel to the Yak water treatment plant.

**LEADVILLE CORPORATION, SHERMAN MINE AND MILL (Permit No. M-1977-249) Lake County**

The Sherman property consists of mine portals and a mine portal dump at the headwaters of Iowa Gulch and a multi-purpose mill at Stringtown, on the hill south of Malta Gulch, and tailings facilities in Malta Gulch. Mining and milling have been inactive since the 1980's. Water discharges from one of two portals at the Sherman Mine. This is apparently sampled under an NPDES discharge permit, and water quality appears to meet regulated parameters.

No monitoring data has been submitted since 1998 because EPA is monitoring the site. Monitoring by EPA includes one down gradient and one up gradient well, ground water here is a part of Operable Unit 10.

In the 2004-2005 reporting year, DRMS initiated actions to increase the bond to cover removal of buildings at the Sherman Mine and reclaim the tailings according to the approved reclamation plan. As a result of these actions, the permit was revoked and the bond forfeited in November 2005. Despite the status of the permit, the mine and mill are stable with respect to ground water issues.

**LEADVILLE CORPORATION, DIAMOND RESURRECTION SHAFT (Permit No. M-1986-141) Lake County**

The Diamond Shaft is in the headwaters of Evans Gulch, more or less at the end of the Yak Tunnel. No excavation has been reported since about 1986. Until the recent blockage of the Yak Tunnel, the underground workings appear to have been passable, but apparently are now flooded.

The operator was required to submit annual reports of the monthly Yak Mine tunnel sampling results. Parameters in the 1987 report include Cd (total and dissolved), Cu (total and dissolved), Pb (total and dissolved), pH, Mn (total and dissolved), Hg (total and dissolved), Zn (total and dissolved) and TSS. The site has not been in operation for several years, and thus no sampling has been done since 1996.

In the 2004-2005 reporting, DRMS took action to put the Diamond Shaft into a legal state of temporary cessation. The operator failed to comply with the

Board's order regarding status of the site and the permit was revoked and the bond forfeited in January of 2006.

**AMERICAN SODA, LLC, YANKEE GULCH PROJECT (Permit No. M-1999-002) Rio Blanco County**

The Mined Land Reclamation Board approved three ground water monitoring plans on August 24, 2000. It includes continued monitoring of close-in wells to use as an early warning network in advance of potential contamination at the point of compliance wells.

American Soda ceased production in 2004 and started reclamation of the site in order to mothball the operators. In a technical revision, American Soda proposed new Numeric Protection Levels (NPL) and Early Warning Indicators (EWI) standards for a number of water quality permit condition values. Ground water quality monitoring is continuing at a reduced rate for both the interim status period and for commercial production once operations resume.

**NATURAL SODA, INC. (FORMERLY AMERALIA), ROCK SCHOOL LEASE PROJECT, (PERMIT NO. M-1999-051) Rio Blanco County**

According to the 2006 Annual Report, there have not been any mine related disturbances at this site and there are no immediate plans for mine development.

**WHITE RIVER NAHCOLITE MINERALS, NAHCOLITE PROJECT, FILE NO. M-1983-194, Rio Blanco County**

Dedicated monitoring wells have been constructed to monitor four water-bearing zones -- the Dissolution surface, B-Groove, A-Groove and Perched aquifers. The aquifers are monitored at four sites: immediately down gradient of the mining operation, up gradient (two locations) and remote down gradient. Fifteen monitoring wells were completed with water quality samples obtained from discrete zones. A total of seventeen wells are equipped with continuous water level measurement transducers and data acquisition and storage systems.

Four down gradient wells were completed in 1989, and samplers/pressure transducers installed in February and March of 1990. Therefore, data were obtained prior to ground water pumping and 1991-2001 mining activities. The operator is required to prepare a comprehensive annual report including surface and ground water monitoring. Ground water monitoring includes water levels and over 50 water quality parameters. A copy of this report is submitted to DRMS, the BLM and the EPA.

**EXXON, COLONY SHALE OIL PROJECT Permit No. M-1980-047 Garfield County**

There has been no further disturbance in the past year, with the exception of surface maintenance. From time to time in the past, the operator has conducted ground and surface water-monitoring programs of varying scopes with various objectives. However, the only reporting requirements were for surface discharge at Pond 5 as specified by the NPDES program.

**OCCIDENTAL OIL SHALE, INC., LOGAN WASH (Permit No. M-1977-424) Garfield County**

The operator submitted a formal closure plan during 1999. Final reclamation of the main facilities began during the summer of 2003 and has continued through 2005. Discharge of water from within the sealed mine consists of mine water and retort water. Mine water from the lower portal (to outfall 001) and the research portal (to outfall 002) are monitored for flow rate and sampled on a weekly, monthly and quarterly schedule (depending on analyte) when the site is accessible and flow is present at the outfall. Mine water and retort water are monitored monthly at the portal locations for flow rate. The retort water discharges to an evaporation pond.

**CATHEDRAL BLUFFS SHALE OIL CO. (OCCIDENTAL OIL SHALE), C-B OIL SHALE SITE (Permit No. M-1977-530) Rio Blanco County**

The operation has been conducting an extensive ground and surface water-monitoring program; but the only reporting requirements were for the NPDES program for discharging the treated shaft dewatering discharge. Shaft dewatering was discontinued in 1991.

The five years of data collection has been completed. All closures, including the demolition of the towers and capping of the shafts have been completed; but the site has not been released at this time.

**MIDAS MINING COMPANY, OPHIR LODGE (Permit M-2001-063); Hinsdale County**

The operation has not been active to date.

*Construction Materials Operations*

**FRONT RANGE AGGREGATES, LLC, PARKDALE PROJECT (Permit M-1997-054) Fremont County**

The former operator, Agile Stone Systems, Inc., has succeeded this permit to Front Range Aggregates, LLC. The operator is required to monitor springs and two wells semi-annually as a condition of the permit. Neither the springs nor the wells are established as points of compliance. While the determination of flow rate and static water elevation are required at the springs and wells, respectively, determination of only one ground water quality parameter, 2,4-D content, is required by the monitoring plan. The initial results of that monitoring were reported in early 2001, as required; and no 2,4-D was detected in the samples taken.

Agile Stone Systems was in bankruptcy all through the fiscal year and was prevented by the court from going onto the mine site. No monitoring was done. Front Range Aggregates, through the bankruptcy proceedings, took over the permit effective July 23, 2004. They are now responsible for the monitoring. The Rider to the Mining permit required Front Range Aggregates to monitor two spring flow rates identified by the original applicant's consultant, Azurite Inc, along with the monitoring of the static water table elevation in the two monitoring wells located along the southern pit boundary.

#### **CENTENNIAL MATERIALS, MCLAIN PIT (Permit No. M-1977-117) Douglas County**

The operator submitted ground water monitoring data through at least 2006. As a result of the approval of Amendment No. 3 on May 27, 1999, the operator monitors six alluvial ground water wells semi-annually and monitors the exposed pit ground water quarterly. The operator sampled monthly for dissolved phosphate as PO<sub>4</sub>, phosphate as P and quarterly for gross alpha. The operation also samples semi-annually for various hydrocarbons, nitrate/nitrite, ammonia, alkalinity, TDS, and total organic carbon. No standards have been set. The operator was also required to conduct possible upward trends of phosphates due to the mining activity. Data submitted to date have not shown any upward trends of phosphates due to mining. A contingency plan, in case of any oil or grease spills, has also been submitted and approved.

Because water monitoring data were not submitted for the 2004-2005 reporting year, the situation was under investigation. It appears that the operator's consultant did collect the water quality data and submit it to DRMS, but, the data was misfiled. Once it was discovered it was reviewed and was found to be in compliance with the approved conditions. Mining on site has been completed and reclamation is in progress. The operator plans to submit a Technical Revision to discontinue the monitoring plan in the near future.

**HOLCIM, INC., BOETTCHER QUARRY (Permit No. M-1977-348) Larimer County.**

The Boettcher Quarry and cement plant were permanently closed in 2002; as of summer 2004, the cement plant has been demolished. The CKD disposal site has been capped and revegetated. Monitoring to date indicates no impact to ground water quality from the CKD disposal cell.

**CONNELL RESOURCES, TELLIER GRAVEL PIT (PERMIT NO. M-1998-058) Routt County**

The applicant has proposed constructing a monitoring well between the pit area and a domestic well prior to excavation. All requirements associated with the Routt County monitoring condition (contained in the county's Special Use Permit) will be applied to the DRMS monitoring well. The requirements are to monitor the well on a quarterly basis for water quantity and water quality. The results of the water monitoring information will be submitted to the division with the required Annual Reclamation Report. In the event the monitoring data shows dramatic declines in either water quality or quantity, the division will be notified.

A permit was issued to Connell Resources on June 30, 1999. Water information has been submitted as required.

**CEMEX, INC. (FORMERLY SOUTHDOWN, INC.), LYONS QUARRY, (Permit M-1977-208) Boulder County**

The operator has collected five quarters of water quality data and analyzed these for Se and Tl. Se and Tl appeared as slightly elevated in SPLP leach tests, so are monitored. Samples are collected from the A Pit, an abandoned mine pit pond that receives CKD, and from two down gradient wells. Under TR-01, water accumulation in the C-Pit is monitored twice a year for thallium and selenium and the A-Pit is monitored twice a year for thallium and selenium (pH and Conductivity) to establish an "up gradient" water quality. Monitoring results are submitted to the division with the Annual Report. The numeric protection levels (NPL's) include:

pH	6.5-8.5 std. units
Conductivity	Measure and report
Se	0.02 mg/L
Tl	0.002 mg/L



CEMEX notified the division on May 17, 2004, of a potential exceedance of the numeric protection level (NPL) for selenium based upon sampling conducted on April 16, 2004. The results indicate the presence of selenium at 0.069 mg/L, which is above the 0.02 mg/L NPL established by the permit under Technical Revision 01 (TR-01). The division notified CEMEX that the sample might be in error due to the analytical method. The lab report indicates selenium was measured by the total selenium method. However, selenium is regulated based on dissolved selenium. CEMEX resampled the C-Pit water on June 2, 2004, using the analytical method of dissolved selenium. On June 21, 2004, CEMEX reported the results of the sample at 0.186 mg/L. In both samples no selenium was detected in the A-Pit, which is down gradient from the C-Pit.

On June 24, 2004, the division obtained water samples from the C-Pit to be evaluated at the laboratory at the Colorado Department of Health and Environment (CDPHE). CEMEX obtained a split sample to run at a lab of their choice. Selenium was detected at 0.184 mg/L and the pH was at 12.5. CEMEX monitored the A and C Pits weekly for the parameters established under the permit for two months to determine if there was a change in the selenium concentration, consulted with a wildlife biologist to determine the impacts to wildlife as a result of the configuration and selenium concentration of the C-Pit, and provided a ground water response plan to the division by August 26, 2004. The groundwater monitoring and response technical revision was approved on February 28, 2005, and required continued monitoring of the C-Pit water and installation of new ground water sampling wells. At the end of 2005, CEMEX submitted a revision to address the bonding requirements for any remaining water in C-Pit.

In addition, the division and CEMEX are currently addressing a possible change to the ground water monitoring program with the burning of tires as a supplemental fuel source.

### **HOLCIM US, INC.; PORTLAND LIMESTONE (Permit M-1977-344) Fremont County**

The Holcim Portland operation started an initial phase of a ground water-monitoring plan to evaluate potential release of contaminants from cement kiln dust, which is stored on site. Under the terms of TR-6, "Cement Kiln Dust Disposal and Ground Water Monitoring Plan," Holcim analyzed leach tests of CKD and continues to sample and analyze six monitoring wells for baseline water quality. Leach tests indicated a very slight potential for contaminant release from contact of rain and snowmelt with the stored CKD. However, Holcim has since altered their production process to recycle CKD, so have foregone their ground water monitoring.

Some of the available monitoring well locations established were absorbed by changes in mining operations, thus resulting in delays in submission of useful baseline monitoring data. Holcim completed the collection of five quarters of baseline data and submitted their report June 7, 2004. DRMS has not set any of the wells as points of compliance or determined the need for points of compliance. The water quality data will be evaluated and if applicable, points of compliance will be set with numeric standards based on the five quarters of water quality data that have been collected to date.

**AGGREGATE INDUSTRIES, 83<sup>RD</sup> JOINT VENTURE PIT (Permit M-1992-069) Weld County**

As a result of a diesel fuel leak of up to 10,840 gallons from an above ground storage tank at the site, confirmed on May 7, 2001, the operator incorporated a ground water-monitoring plan following excavation of the contaminated materials. Quarterly ground water monitoring was conducted at the site via five monitoring wells installed to identify and characterize any plume that may have resulted from the fuel leak. Monitoring continued for two quarters beyond the sampling event that rendered results with TEPH and BETX levels all below the detection limit. Under TR-003, the operator was released from further monitoring responsibilities with the understanding that they would excavate all of the potentially contaminated material prior to cessation of dewatering at the site. The operator, however, conducted further testing and submitted a TR (TR-04) that released them from the obligation to remove the material prior to cessation of dewatering. Included in TR-04, however, is a monitoring plan that will be incorporated when dewatering at the site ceases, to assure that the rebounding ground water is not coming into contact with contaminated materials that may remain. The monitoring plan calls for installation of two additional monitoring wells. The two new wells and existing wells will be sampled and tested weekly from the time dewatering ceases until the ground water level reaches the top of the screened intervals of the monitoring wells. The samples collected from these wells will be analyzed for BTEX and total petroleum hydrocarbons. If free-phase product is observed in the samples or if the analysis of any sample reaches or exceeds the Maximum Contaminant Level, dewatering of the pit will recommence so that other remediation measures can be incorporated.

**GCC RIO GRANDE, INC; RED ROCK PLANT AND LIMESTONE MINE,  
(Permit No. M-2001-004) Pueblo County**

This operation was permitted in 2003. During the 2004-2005 reporting year, the company installed production wells, began construction of the road infrastructure, installed an upland drainage diversion ditch, and started building construction.

To satisfy conditions of the permit application, GCC installed five monitoring wells. Baseline sampling was collected for all wells. Ground water was not detected in one of the wells, so samples were not collected. For baseline sampling, all regulated parameters except organics were analyzed. Nothing was detected in concentrations exceeding drinking water standards. DRMS will establish permit conditions after more baseline data are collected and before excavation of the limestone deposit begins.

## **Coal Program**

The DRMS Coal Program serves as the primary regulatory authority for coal mines in Colorado and functions under the Colorado Surface Coal Mining Reclamation Act (C.R.S. 34-33-101 et. seq.). In 1990, the Department of Public Health and Environment and the Department of Natural Resources entered into a "Memorandum of Agreement for the Implementation of SB 181 Amendments to the Colorado Water Quality Control Act Pertaining to the Regulation of Coal Mines." Section 5.1(h) of the Agreement requires that the DRMS Coal Program provide an annual update of its activities pertaining to water quality matters to the Water Quality Control Commission. This Annual Report describes the Coal Program's accomplishments during the last year, and objectives for the next year.

As of July 1, 2006, the Colorado Coal Program regulates a total of 47 coal mines, of which 10 are actively producing mines. The producing mines are both surface pit and underground operations. Approximately 70 percent of Colorado's coal production derives from underground operations. The predominant method of underground mining is longwall mining. Of the 47 mines, 12 are reclaimed mines for which the permits were revoked. The remaining 25 of 50 mines are in various phases of reclamation or temporary cessation.

### **Accomplishments**

During Fiscal Year (FY) 2005 (July 1, 2005 - June 30, 2006), the Coal Program accomplished the following functions:

1. The Coal Program effectively implemented various rules pertaining to ground water protection at Colorado coal mines. The Coal Program's

current requirements for monitoring and detailed pre-disturbance permitting should continue to provide proper ground water quality protection.

2. The Coal Program conducted reviews of Annual Hydrologic Reports submitted by operators. This allows for timely identification of hydrology sampling anomalies and deficiencies, in addition to water quantity and quality trends.
3. The Coal Program continued to focus coal mine permitting activities on minimization of impacts to the hydrologic balance and prevention of material damage. These activities included the ongoing review and update of Cumulative Hydrologic Impact Analyses (CHIA).
4. The Coal Program continued to focus regular coal mine field inspections and monitoring activities on minimization of impacts to the hydrologic balance and prevention of material damage. During FY 2005, the Coal Program conducted 508 inspections.
5. The Coal Program and Water Quality Division communicated periodically during the last year to discuss specific issues of mutual concern.

### Objectives

1. The existing Cumulative Hydrologic Impact Analyses for the various river basins that contain coal mining will be reviewed and upgraded on an ongoing basis.
2. The Coal Program will continue to focus regular field inspection and monitoring activities, as well as permitting activities, on minimization of impacts to the hydrologic balance and prevention of material damage.
3. The Coal Program will continue to communicate with the Water Quality Control Division, as needed, for the purpose of discussing and resolving issues of mutual concern.