

## Appendix A17

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**M. Cepak, M. Keenhihan, M. Nelson, “*DENR Underground Inspection, May 28 and 29, 2003*”**

## **HOMESTAKE UNDERGROUND INSPECTION**

**May 28 and 29, 2003**

### **Executive Summary**

On May 28 and 29, 2003, DENR staff inspected portions of the Homestake Underground Mine. Staff conducted the inspection in two parts including the actual mine inspection on May 28, and the review of Homestake closure documentation on May 29. The main purposes of the inspection were to determine:

- Whether Homestake has done what it said it would do in preparation for mine closure; and
- Whether Homestake's mine closure activities comply with environmental laws.

The inspectors did not look specifically at mine geochemistry during this inspection, although they collected some water samples that will provide limited information on ground water quality and water draining from mine workings. Department personnel are involved in discussions with Homestake personnel and contractors regarding ongoing modeling of ground water quality following closure of the underground mine. It was also noted in various parts of the mine, there are white and reddish precipitates. The inspectors collected a sample of the white precipitate. The precipitates are thought to be magnesium sulfate and iron hydroxides.

The underground inspection priority was the deepest part of the mine, the area that will flood first after the pumps are turned off. The inspection targeted fuel storage areas, maintenance shops, electrical substations, abandoned equipment, and the neutrino lab formerly operated by the University of Pennsylvania. The inspectors checked for substances of concern, including petroleum products, solvents, chemicals, explosives, etc.

The original inspection plan was to go the 6500 or 6800 Level and walk the 21 Ledge ramp system down to the 8000 Level, inspecting facilities along the way. However, during the morning of the inspection, a 12 KV electric line in No. 6 Shaft failed, and the inspectors could not access the lower part of mine until the afternoon. During the morning the inspectors instead checked the Neutrino Chamber and the 17 Ledge Ramp area on the 4850 Level. In the afternoon the inspectors walked the 21 Ledge Ramp system from the 7400 Level down to the 8000 Level. It should be noted the inspections covered only a small portion of the mine.

Based on the inspections and document reviews completed to date, it is the opinion of the DENR inspectors that the quality of the closure work appears to be adequate. Homestake has followed its internal mine closure protocol and the closure work was found to be consistent among the

areas inspected. DENR personnel only observed small quantities of potential contaminants related to mining equipment, primarily oil and grease residues. Evaluation of potential contaminants related to backfilled tailings or other mine rock geochemical issues were not specifically addressed during this inspection.

Homestake officials stated that they plan to shut off the 8000 Level pumps on June 10, 2003, which would shut down the portion of the mine below the 4850 Level. Homestake also plans to close the entire mine by June 27, 2003. No one would be allowed to enter the mine after that date.

The DENR inspectors are planning to return to Homestake to inspect the upper part of the mine on Friday, June 13, 2003. We plan to inspect the mechanized ramp area in 9 Ledge between the 1700 and 2300 Levels at that time. On these levels we will pass through Main Ledge, and we hope to collect some water samples from old Main Ledge backfilled areas. We will also have time to inspect another area, possibly the 3800 to 4100 Level ramp area in 11 Ledge.

## Inspection Report

**Operator:** Homestake Mining Company  
**Project:** Homestake Underground Mine Inspection  
**DENR Inspectors:** Mike Cepak, Mark Keenihan and Mark Nelson (Minerals and Mining Program)  
Don Rosowitz and Gary Haag (Ground Water Quality Program)  
Kevin Christensen (Waste Management Program)  
**Operators Present:** Karl Burke, Steve Mitchell, Matt Zietlow, Todd Duex, Tom Regan, and Jim Jenetto  
**Other Present:** Jim Butler (attorney)  
**Inspection Dates:** May 28 and 29, 2003

At 7:00 a.m. MDT, on Wednesday, May 28, 2003, the DENR inspectors arrived at Homestake's Yates Mine Office and proceeded to the Yates Dry to receive safety training. Afterward we met with Karl Burke, Steve Mitchell, Todd Duex, Jim Butler (attorney) and Tom Regan (Closure Manager) before going into the mine. We planned to go to the 6500 or 6800 Level and walk the 21 Ledge ramp system down to the 8000 Level, inspecting facilities along the way. However, just before going into the mine, we learned a 12 KV electric line in No. 6 Shaft failed, and we would be unable to use No. 6 Shaft for some time. We revised our plans to go to the Neutrino Chamber on the 4850 and then to the 17 Ledge Ramp area on the 4850.

At 8:45 a.m. MDT we went underground at the Yates Shaft with Burke, Mitchell, Butler, Regan, and Jim Jenetto (safety man), and proceeded to the neutrino lab on the 4850 Level. Mitchell and Jenetto had scaling bars for barring loose rock, and Regan had an oxygen meter.

### **4850 Level - University of Pennsylvania Neutrino Lab Closed Mine Area Inspected**

The neutrino lab is just off the Yates Shaft lift area on the 4850 Level. Some equipment remains in the drift between the Yates shaft and the lab including rail, steel, and various cables and hoses. Within the lab, nearly all electrical and testing equipment had been removed. The 100,000-gallon capacity perchloroethylene tank, a few other small tanks that contained potassium hydroxide or mineral oil during the lab operations, some small pumps, piping, and structural steel infrastructure remain in the lab area. These tanks have been drained, and mercury and lead used as shielding for the experiments have been removed from the mine. Within the tank room white precipitates were observed on the floor. In addition, orange-colored water was observed in the tank room and within a floor sump at the base of the access drift. The pH of this water was measured at 6.3. The composition of the white precipitates and orange water is unknown, but are likely the result of calcium and sulfate mineral precipitates and iron from the rusting of infrastructure components. The neutrino lab area was decommissioned by Tier De, an environmental consulting firm, as part of the mine closure activities. The tanks and piping were cut open to facilitate and verify the removal of the contents. Wipe tests were reportedly conducted in the area where mercury flasks were stored. Homestake personnel reported they are currently reviewing a draft version of the Tier De closure report for the underground neutrino lab.

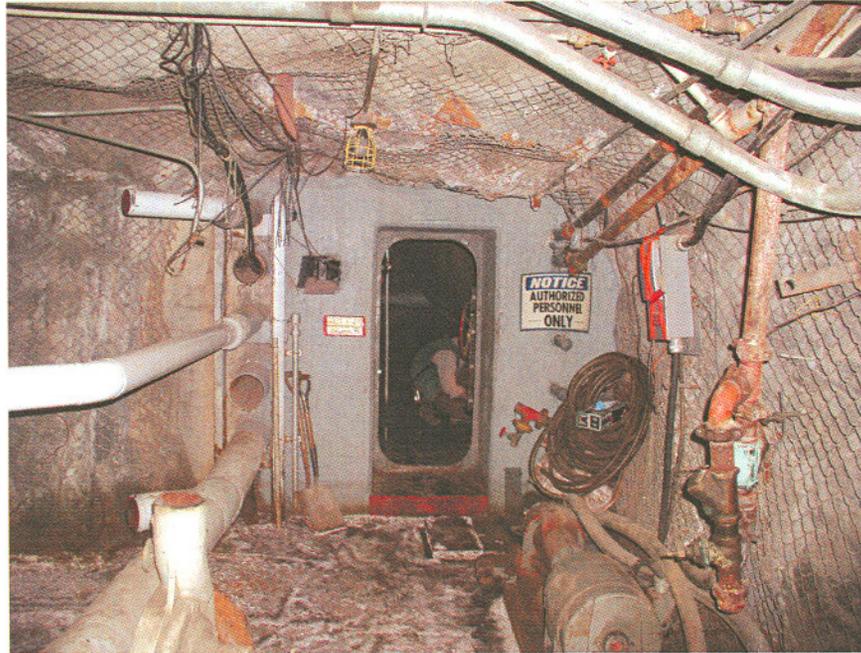


Photo 1. Pump room at 4850 Neutrino Chamber (bottom of ramp).

#### **4850 Level, No. 6 Shaft Area - Closed Homestake Mine Areas Inspected**

4850 Electrical Shop. From the neutrino lab we walked over to No. 6 Shaft on the 4850 Level. One battery powered locomotive was present in the drift. Homestake personnel stated this locomotive will be removed prior to mine closure. In addition, several 55-gallon drums were present. These were reported to be drums that formerly contained magnesium chloride, which is used as dust suppressant within the mine. Abundant white mineral precipitates, possibly calcium or magnesium sulfates are present within the drifts. DENR personnel collected a sample of these precipitates. A pH of 7.6 was measured in water within the drift.

Electricians were still working on the 12 KV line, so at 9:30 a.m. we proceeded to the 4850 Electrical Shop near the shaft station. A sign going into the shop read "4850 Electrical Shop Unmaintained Area Clean for Closure 4-29-03 TR". Air handling equipment, electric motors, piping, storage cabinets, workbenches; along with electrical conduit, wiring, and junction boxes remain in this area. The overall condition of this area was clean. The floor had been swept and lighting fixtures were removed. No oil or chemicals were found.

A broken fluorescent light bulb was noted in a trash can. Homestake personnel verified their closure procedures for bulbs included the removal of hazardous waste fluorescent and sodium lamps and lamp ballasts, but that some non-hazardous waste fluorescent lamps and incandescent bulbs may remain. The bulb type was not verified. This was the only spent fluorescent lamp noted in underground mine areas during the inspection. During the subsequent records review on May 29<sup>th</sup>, Homestake personnel stated they were removing this bulb from the mine.

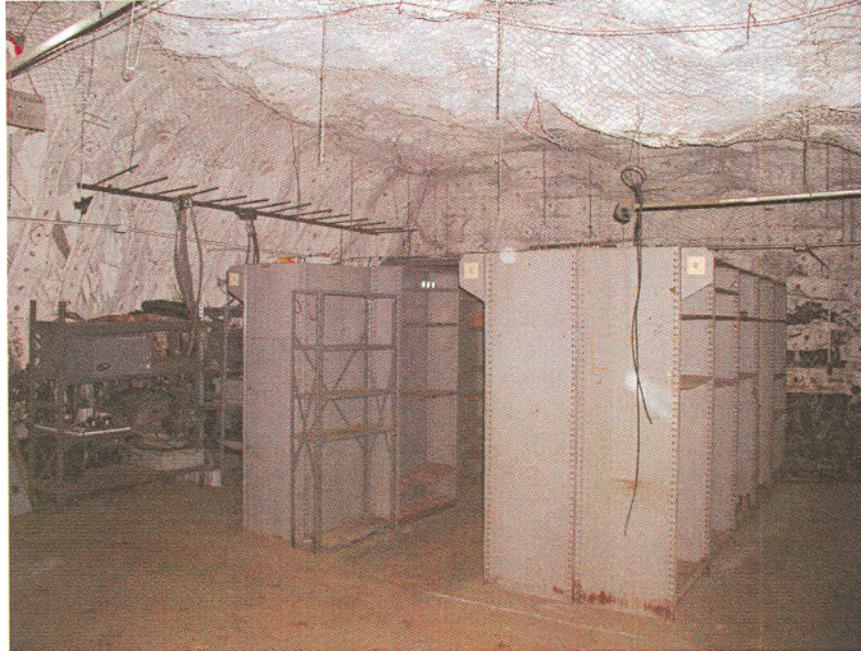


Photo 2. 4850 Electrical Shop. All remaining equipment and materials to be abandoned in place.

#### **4850 Level, 17 Ledge - Closed Homestake Mine Areas Inspected**

Load-Haul-Dump (LHD) Shop. From the electrical shop we walked to the 17 Ledge area, going through a warning brattice that stated the area beyond was okay for closure and was no longer maintained. At 10:00 a.m. we inspected the LHD shop area on the 4850 Level. This shop area had been thoroughly cleaned. Homestake had removed oils and solvents from the shop area. Homestake spread floor dry on oily areas, swept it up, and then applied “Spill Shark” to the spill areas. Spill Shark is a commercial oil-absorbent material that polymerizes with oil to reduce the mobility of residual petroleum contamination. There was a holding tank floor sump in the shop. This sump had been thoroughly cleaned. After cleaning, Homestake placed absorbent materials in the sump. The shop warehouse was mostly empty, however, Homestake is leaving assorted parts (much of which was still in the packaging) that have no salvage value. A five-ton hoist is also being left.

Fuel Storage Area. We inspected a fuel storage area near the LHD shop. Fluid and decking plates had been removed; and soil and loose rock had been mucked out of the area. Homestake personnel reported they removed residues from the floor of the storage area for treatment at a petroleum contaminated soil land farm. After the removal, they placed absorbent onto the floor areas to collect remaining residues and repeated this process until observations indicated they were no longer removing visual contamination. They left clean absorbent and Spill Shark on the floor of this area after the clean-up. During a previous DENR inspection of underground mine areas, strong petroleum odors were noted in similar fuel storage areas. Only a slightly noticeable petroleum odor was present during this inspection. The floor areas appeared stained, but observations indicated the cleaning operations had been thorough. There was no water accumulating on the floor of this area. A diesel fuel tank was abandoned in place inside this storage area. This fuel tank had been emptied by pumping. One end of the tank remained

propped up from fuel removal operations. Homestake personnel reported they also placed Spill Shark absorbent into the tank bottom after pumping. The tank was not cut open, so visual inspection of the interior was not possible. The inspectors did not notice increased petroleum odors from the tank. Homestake personnel said this particular fuel storage area took three to four weeks to clean, and this was typical for the fuel storage areas. A sign on the area said “2-14-02 clean TR”.

4850 45-Crosscut 17L Electrical Substation. Homestake personnel removed an oil-filled transformer from this site during closure operations. Equipment remaining in this area after sampling and remediation operations consisted of gutted electrical switching boxes and the cleared concrete pad. Drill holes in the pad from the PCB sampling were still visible. Sampling results for this pad indicated less than 1 ppm PCB. Therefore, the concrete pad was left in place consistent with the Homestake remediation plan.

At this location the inspectors noted a slight sheen on water in an adjacent drainage ditch. Homestake personnel said they mucked approximately 300 feet of drainage ditch in the area of the LHD shop, and then applied Spill Shark absorbent. The Spill Shark could be seen floating on the water surface. Homestake personnel said the Spill Shark would still work in wet conditions. The inspectors collected a sample of the water in the ditch to test for hydrocarbons. The pH of the water was 7.8 with an electrical conductivity of over 2000 uS/cm.

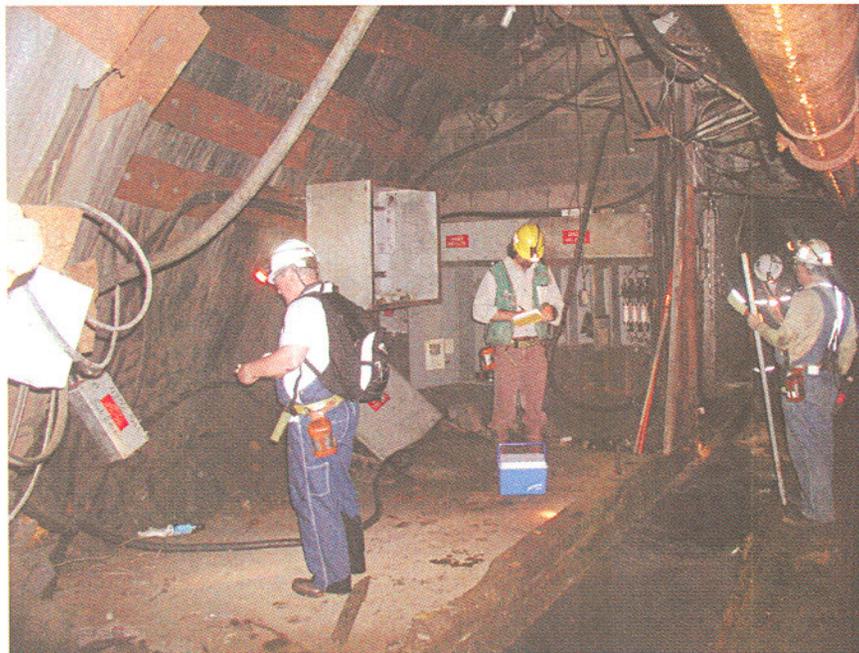


Photo 3. 4850 Level, 45 crosscut electrical substation. All remaining equipment abandoned in place.

4850 100-foot Subsill Bone Yard and Backfilled Mine Stope Areas. We walked up a ramp to a subsill 100 feet above the 4850 Level. Painted on the wall of this subsill was “42A”. Homestake used this subsill as a small equipment abandonment area. We observed an old steam-cleaning unit that Homestake personnel said they decommissioned and abandoned due to poor condition. Homestake reportedly evaluated other steam-cleaning units on a case-by-case basis. There were

a few old Load-Haul-Dump (LHD) chassis and a truck abandoned in this area. Observations indicated Homestake removed engines, transmissions, pumps, hoses, radiators, and other parts that typically contained vehicle fluids. Batteries and tires were also removed from the equipment and taken out of the mine during closure activities. Hydraulic fluid reservoirs and hydraulic cylinders were left in place. Homestake personnel stated that these components were drained. It is probable that there are grease and lubricant residues on some of the remaining chassis components in areas that were not visible, but overall these abandoned chassis did not contain significant quantities of residues. The inspectors also observed the sand backfill walls for some of the old backfilled mine stopes in this general area. The backfill walls were dry and did not afford the opportunity for collecting a water sample.

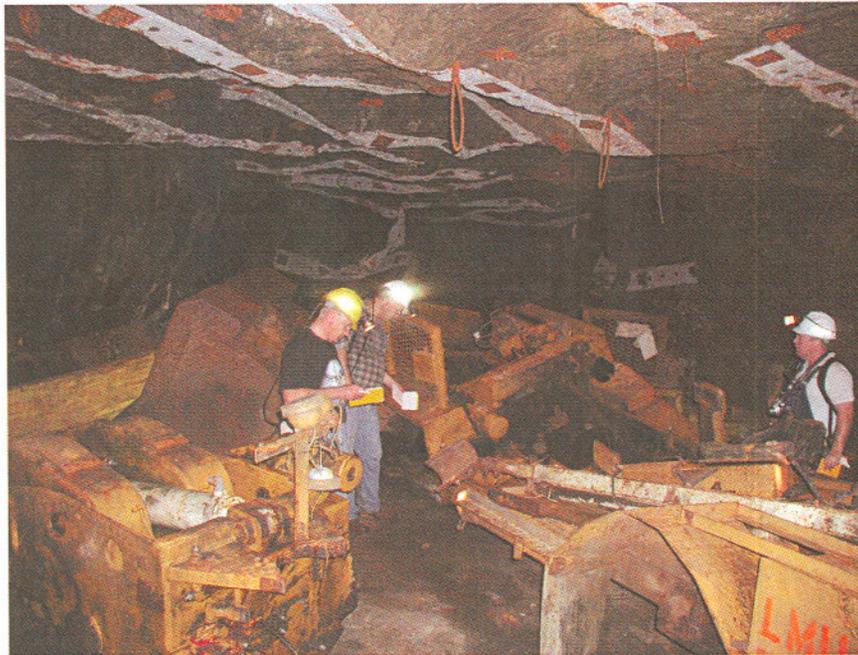


Photo 4. 4850 100-foot subsill equipment bone yard. Abandoned in place.

Mine Water Sample Location. On the way back to the 4850 Level hoist area, DENR personnel collected a water sample from water flowing down the ramp. There was a visible reddish mineral precipitate in the bottom of the ditch at this location. Homestake personnel said this water came from the 4100 Level, adding that they thought it was groundwater, but that it could also be from a broken pipe. Inspectors sampled the flow for the normal suite of parameters and for cyanide.

The pH of this water was 8.7 and the conductivity was 1755 uS/cm. The water exceeded ground water standards for pH, fluoride and total dissolved solids. The water contained arsenic at a concentration of 0.016 mg/l, which meets current ground water standards. The relatively lower conductivity of this water as compared to previous samples from Homestake indicates fresh water may be contributing to the flow.

We walked back to #6 Shaft, arriving at 11:00 a.m. The power problem was nearly fixed, so we took a lunch and water break, and waited until 11:30 a.m. for the lift (cage).

## **21 Ledge Ramp System 7400 to 8000 Levels - Closed Homestake Mine Areas Inspected**

7400 Level 52 Crosscut Ore Chute Bypass. After getting off the cage at the 7400 Level, the inspectors walked to the LHD shop, passing another five-ton hoist (abandoned in place). We also walked by the abandoned 52 crosscut ore and waste rock bypasses. These bypasses or chutes were used to collect and transfer ore and waste rock down to the 8000 Level. Equipment abandoned in place included the metal chute infrastructure, pneumatic cylinders for the bypass gates, pneumatic cylinders for lifting and closing the screens, and rubber air line hoses. The inspectors noted white precipitates on the floor in this area. Some local zones of orange colored colloidal iron had precipitated from solution in the ditches. The inspectors measured a pH of 7.8 with conductivity of over 2000 uS/cm within a ditch along the cross-cut.

7400 Level 52 Crosscut Dry Core Transformer Pad. During the closure work, Homestake removed a transformer from 52 crosscut and abandoned the concrete pad in place. Homestake documentation verified no oil transformers were used in this location. Therefore, this pad was not tested for PCBs before abandonment.

7400 Level 43 Crosscut 21 Ledge Settling Dam. This settling dam was used to catch silt from collected mine water. During use, Homestake placed oil-absorbent booms in the settling dams. They periodically removed the used booms and accumulated solids. The booms had been removed from this dam during final closure work. Water was flowing from the dam at approximately 10 gallons per minute. Homestake personal reported this water drained from a number of locations from the 6800 Level to the 7400 Level. DENR personnel collected a sample of the water in this settling dam.

The pH of this water was 7.2 and the conductivity was 6400 uS/cm. The water exceeds the groundwater sulfate standard by approximately 10 times. It also exceeds the groundwater standard for total dissolved solids. Trace amounts of total cyanide were detected, but no WAD cyanide was present. Dissolved arsenic was quite low in this sample at 0.006 mg/l. Lead was present in the total form at a concentration of 0.017, but the dissolved lead concentration was less than detection.

7400 Level, 21 Ledge LHD Shop. A sign at the entrance of this shop read "7400 LHD Shop Unmaintained Area Clean for Closure 3-18-03 TR; QA 4-3-03 TR & MZ OK". The shop storage room had the metal shelving abandoned in place, but the parts had been removed and the shelving was clean. The shop area had metal gas cylinder cages, an overhead crane, exhaust ventilation system ducting, electrical conduit, and other infrastructure components abandoned in place. A metal structure used to drain used oil filters and collect the used oil had been cleaned for closure and abandoned in place. DENR personnel noted the cleaning job was fairly thorough, and an attached note indicated the structure was treated with Spill Shark absorbent. The inspectors noted some parts of this cabinet still had residual oil detectable by feel. Gutted electrical junction boxes were abandoned in place just outside the shop area.



Photo 5. 7400 LHD shop. All remaining equipment and materials to be abandoned in place.

7400 Level, 21 Ledge Fuel Storage Area. This fuel storage area was located next to the 21 Ledge LHD shop. Homestake personnel cleaned this area similarly to the 4850 Level 17 Ledge Fuel Storage Area discussed previously. They reportedly removed bulk residues from the floor of this area, then placed absorbent on the floor and collected the contaminated absorbent after allowing it to set. They repeated this process until visual observations indicated significant quantities of additional petroleum residue were not being collected. Homestake left Spill Shark absorbent on the floor of this area after closure. During the inspection, only a slight petroleum odor was present in this abandoned fuel storage area (note; this fuel storage was inspected on April 26, 2002 and the odor was much stronger then). The floor areas were still visibly stained, but observations indicated the cleaning operations appeared thorough. The diesel fuel tank had been removed to facilitate the floor cleaning work but was observed abandoned nearby (see below). There was water accumulating in the floor of this area. Due to poor lighting, the inspectors could not verify whether the standing water had an oil sheen. DENR personnel collected a sample of the water accumulated on the floor of this fuel storage area. The water was estimated to be about six inches deep over an area of about 15 feet by 25 feet. A sign on the area said "2-11-02 clean TR".



Photo 6. Sampling water in bottom of 7400 Level fuel storage area.

7400 Level, 21 Ledge Explosives Storage Area. We inspected an explosive storage area near No. 7 Shaft. Homestake had removed explosives from this storage area. Homestake personnel reported they typically detonated any unused explosives in mine areas during the closure activities.

7400 Level, 21 Ledge Fuel Storage Area Diesel Fuel Tank. Homestake had removed this diesel fuel tank from the 7400 Level, 21 Ledge fuel storage area during the closure activities (see above). Homestake personnel reported they abandoned the tank by pumping it with one end of the tank raised to facilitate product recovery, then placing Spill Shark absorbent into the tank bottom. The tank was not cut open, so visual inspection of the interior was not possible. There were no strong petroleum odors noted from the tank.

7400 Level, 21 Ledge Parking and Fuel Storage Area. A second fuel storage area was inspected on the 7400 Level. There was not any mining equipment abandoned in the parking area. The fuel storage area had been abandoned consistent with the two observed previously, although the metal floor grating under the fuel tank remained in this storage area. The diesel fuel tank was also abandoned inside this storage area. The inspectors could not verify by observation if any cleaning of the floor had been done under the metal grate. Spill Shark was observed on the floor under this grate. The diesel fuel tank and hose take up reels will be abandoned in place. Spill Shark had been applied to the tank area. A slightly stronger odor of fuel was present here compared to the other fuel storage areas. A sign at the site read "Cleaned and Ready for Closure Unmaintained Area 12-18-01 TR; QA 4-3-03 OK TR & MZ".

7400 Level Ditch Cleaning Area. Homestake personnel reported they had cleaned out a small ditch in this area during closure activities.

7400 Level, 7 Shaft Substation. The inspectors observed an electrical substation transformer pad in this area. Homestake personnel said this substation had previously held a transformer with PCB-contaminated oil. During mine closure, sampling detected PCB levels above Homestake's internal abandonment standard of five ppm PCB in some of the samples taken from this concrete pad. Therefore, Homestake conducted PCB remediation work in this area. The inspectors noted Homestake removed over half of this concrete pad during closure work.

Abandoned Storage Area. We walked down the 21 Ledge ramp to the 8000 Level. Along the way we came across an abandoned storage area. Material left in this area consisted of pallets of bagged cement product and wood. Because of the high humidity, the cement was already hardening in the bags.

Abandoned Rock Pick. Below the 7550 Level we stopped at 38 Rock Pick, which Homestake had abandoned in place. This was a stationary hydraulic rock pick on a boom approximately 20 feet long that was used to break oversize ore. Homestake personnel reported that during decommissioning, they retracted the hydraulic cylinder rams fully, and completely drained the hydraulic oil. The hydraulic cylinders were left on the pick. The hydraulic reservoir was inspected, it was empty. Homestake had also left clean absorbent on the floor in this area after decommissioning the rock pick. Photos show the rock pick surfaces still have residual oil grime on them.

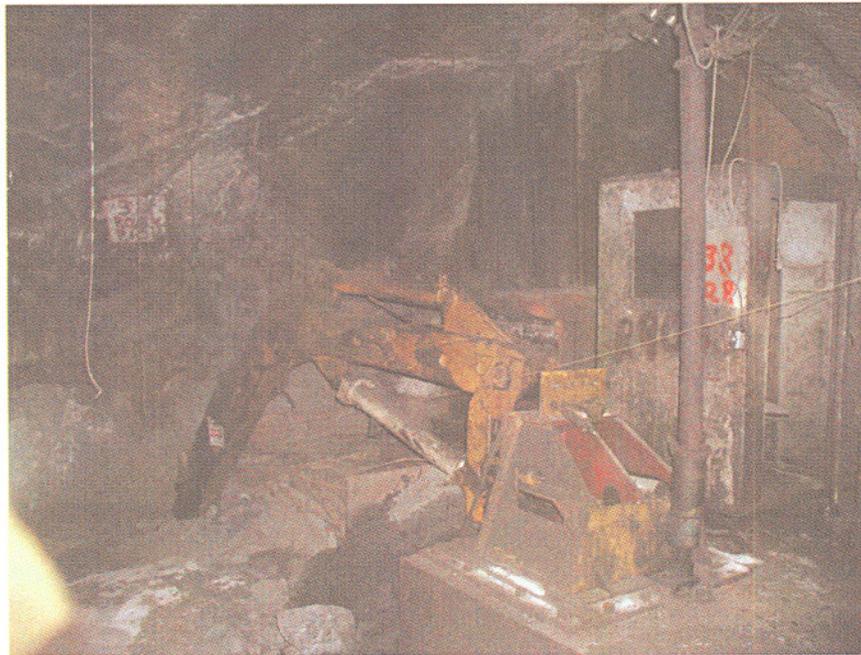


Photo 7. 38 Rock Pick below 7550 Level. Abandoned in place.

Backfilled Mine Openings and Stopes. Numerous sand backfill walls were noted along the ramp. The walls were built using cinder blocks. The inspectors noted unused cinder blocks were left abandoned on pallets at several locations. No water was observed draining from these backfills, although mineral precipitates were present indicating that water had drained from the backfills previously. No samples were collected at these locations due to time constraints.



Photo 8. Typical sand backfill wall along 21 Ledge ramp system.

7700 Level Rail Car Shop. At 1:15 p.m. we inspected the car repair shop on the 7700 Level. Ten ton Granby ore cars were used for haulage on the 7700, and those cars were serviced in this shop. Considerable equipment and material was left in this shop and in an adjacent storage area: bins and shelves were stacked with spare parts (bearings, bolts, etc.), rail car wheels, tools, etc. The phone still worked. The oil reservoir of a pneumatic hoist (“tugger”) was checked, it had been drained, and only a slight oil residue remained. The inspectors noted grease on bearings of railcar wheels that were abandoned in the area. Outside the shop in the adjacent storage area there was a cabinet that had oil grime on the lower shelves. During the review of paperwork documentation on May 29, Homestake personnel said a crew was returning to that shop to clean the rail car wheels with solvent to remove the grease residue, and would clean the oily residue from the cabinet shelves. Some abandoned radiators from “swamp cooler” type air conditioning equipment were also abandoned in this area. Homestake had removed fluids from these radiators during the closure work.

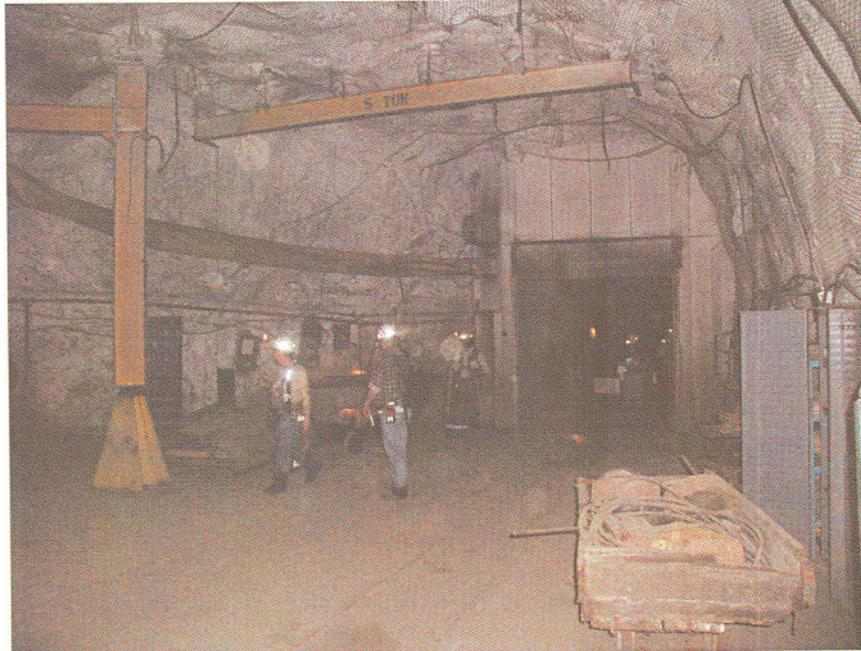


Photo 9. 7700 Level rail car repair shop. All equipment and materials to be abandoned in place.

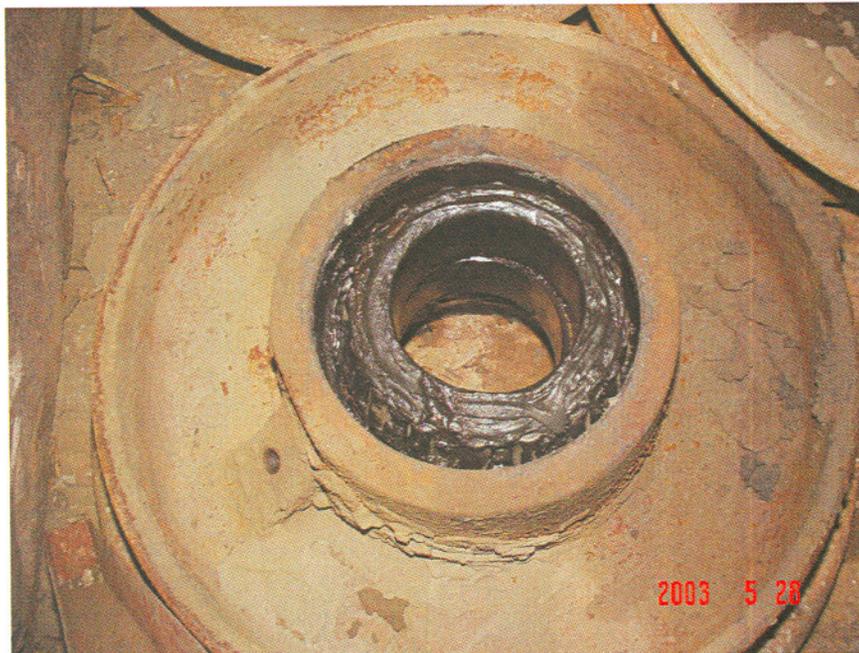


Photo 10. 7700 Level rail car repair shop, grease on rail car wheels.

7700 Level Explosives Storage Area. This was another bulk explosives storage area that Homestake had cleaned out and marked for closure.

7700 Level Storage Area. This storage area contained about four full pallets of the concrete blocks used to construct the sand backfill walls noted in previous locations.

#### 7700 Level to 8000 Level Ramp

The lower portion of the mine became increasingly wetter as the inspectors approached the 8000 Level. Due to time constraints, water samples were not collected at most locations. One wall rock seep at the 7850 Level was investigated with orange precipitates forming in the region where water entered the ramp. The inspectors measured the pH of this water at 7.8.

8000 Level 31 Crosscut Diamond Drill Hole. At 1:40 p.m. we reached the 8000 Level. We were rushed at this point as it was nearly shift change and we needed to be at the No. 6 Shaft station for the 2:00 p.m. cage. Near the bottom of the ramp was a diamond drill hole discharging hot water (132 degrees Fahrenheit). DENR personnel collected a sample of the water discharging from the drill hole.

The temperature and chemistry of this water indicates that the water did not interact significantly with mined areas prior to discharging. This water may represent ambient water quality in the deep mine levels. The water is a sodium bicarbonate-type water which was not observed in other areas of the mine. The pH of this water was 7.9 and the conductivity was 1310 uS/cm. The sulfate content of the water was 15.2 mg/l, which is very low compared to other waters in the mine. The water had a dissolved arsenic content of 0.026 mg/l. This water exceeds groundwater standards only for fluoride, which was present at a concentration of 3.84 mg/l. There was also an old water collection tank used to collect hot water from behind the backfill face during the mine operations for pumping and removal from the mine.

8000 Level 31 Crosscut Brattice Dam. On the 8000 Level, Homestake built a brattice dam near 31 cross cut on the main line. When the No. 6 Shaft 12 KV line failed in the morning, power was lost to the 8000 Level electric pumps. Homestake personnel used a pneumatic pump to pump ditch water to the brattice dam for storage during the power outage. After power was restored, water from the brattice was being released back into the 8000 Level mainline ditch.

8000 Level Dry Core Transformer Pad. While heading to the 8000 Level cage, we saw another dry core transformer location. The transformer had been removed.

8000 Level Ore Car Train. Homestake abandoned several 5-ton Granby ore cars and ore handling infrastructure in this area (see photo next page).

8000 Level Dunn-Bush Refrigeration Plant. We observed abandoned refrigeration and air handling equipment in this area. Homestake salvaged the units, but the piping remains in place.

High Voltage Switch Box near 8000 Pump Room. The inspectors observed what we thought to be a dry transformer remaining on a pad near the pump room. DENR personnel later learned the unit was a switch box. This switch box and few other similar switch boxes near the 8000 Level pump room will be abandoned in place.

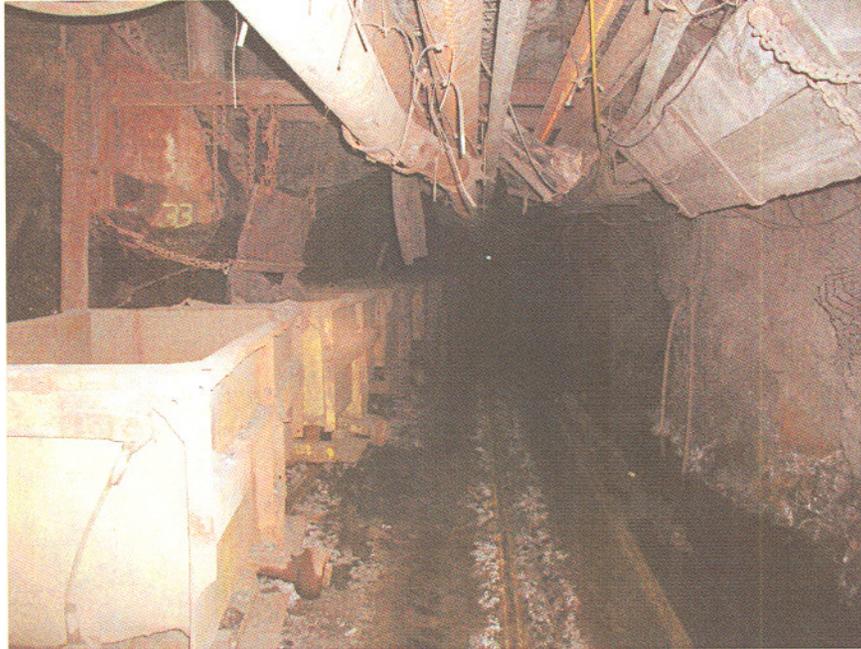


Photo 11. 8000 Level ore cars and chute. Abandon in place.

8000 Level Pumps. We did not have time to inspect the 8000 Level pump room. Homestake had set up a pump along the 8000 Level main line. Homestake personnel reported the oil would be removed from this pump during closure activity, but the pump would be abandoned in place. Near the No. 6 Shaft station Homestake had mounted the transformer for the 8000 Level pumps on a rail car (see below). When the pumps are shut off, Homestake will disconnect the transformer, roll it onto the No. 6 Shaft cage, and hoist it out. Homestake personnel told the inspectors they planned to cease pumping the lower levels on June 10, and close the entire mine by June 27. No one would be allowed in the mine after that date.



Photo 12. 8000 Level pump. Homestake will drain oil and abandon in place.

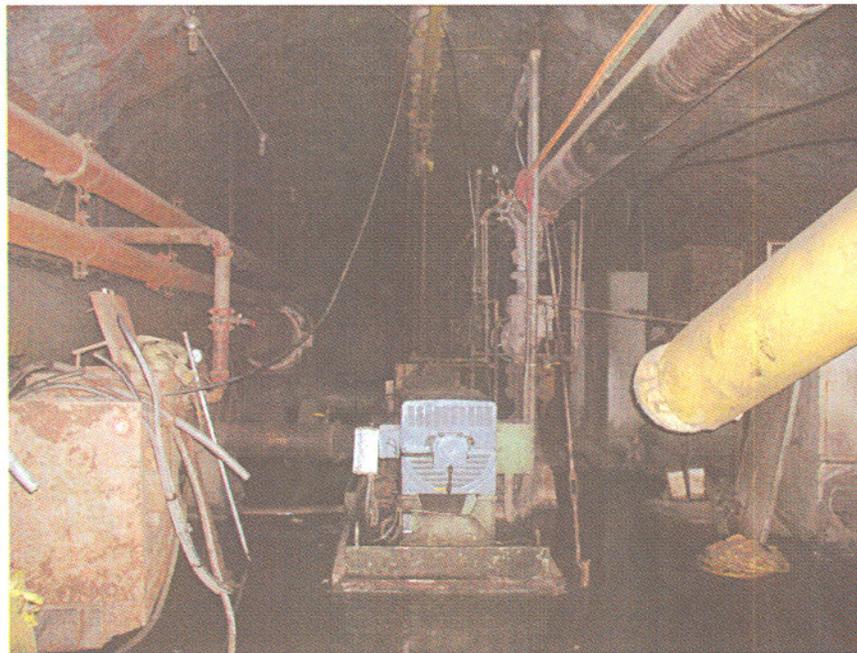


Photo 13. 8000 Level pump station. Homestake will drain oil and abandon in place.

8000 Level Operational Transformer. Homestake had installed this transformer on a rail car for running the 8000 Level pumps during the mine closure period. Upon final closure, they will remove this transformer and bring it back to the surface.



Photo 14. 8000 Level, transformer for pump room on rail car for quick removal.

This ended the underground inspection and we returned to the surface via No. 6 Shaft and the Yates Shaft. We were back on the surface at 2:40 p.m. MDT. The inspectors then held a closeout meeting with Homestake personnel. We discussed the closure work we had observed with Homestake personnel and the inspectors noted the quality of the closure work appeared adequate and was consistent among the areas inspected. DENR and Homestake personnel also discussed observations indicative of the small quantities of contaminants left in mine areas during the closure process. These included the grease observed on rail car wheels and the abandoned cabinet in the 7700 Level rail car shop and the broken fluorescent lamp from the 4850 electrical shop. We also discussed scheduling another underground inspection trip for mid-June to look at some of the closed areas on mine levels above the 4850 Level.

We left the site at 4:00 p.m. MDT.

Water chemistry data for the samples collected during this inspection and discussion of the data from this inspection as well as for subsequent June 6 and June 13 inspections will be discussed in a separate mine water quality report.

### **Mine Closure Documentation Review**

On May 29, 2003, the DENR inspection team returned to Homestake's Yates Mine Office at 8:00 a.m. MDT. Kevin Christensen, Don Rosowitz, Mike Cepak and Mark Keenihan traveled to the Ross Mine Office to meet with Tom Regan, Steve Mitchell and Matt Zietlow. Mark Nelson and Gary Haag stayed at the Yates and spoke with Todd Duex and Karl Burke about the water quality model for the underground mine.

The DENR personnel at the Ross Office conducted a review of closure documentation for the underground mine areas. During the review, Homestake personnel said they had crews returning to the 7700 Level rail car shop to clean up the grease observed on rail car wheels and the abandoned cabinet that were discussed during the inspection close-out meeting on May 28. Homestake personnel said they would be cleaning these items with solvent to remove gross petroleum residuals and removing the broken fluorescent lamp from the 4850 electrical shop. DENR personnel noted they had not requested Homestake remove these items, but rather were pointing out these items seemed representative of small amounts of potential contaminants that will remain in various mine areas after Homestake completes the underground mine closure operations.

Homestake has assembled a large database system of spreadsheets, photographs, and paperwork documentation of the mine closure work. Homestake personnel estimated there were 300 to 350 miles of drifts and ramps to inspect during closure activities. Not all of the underground workings were accessible for closure activities or final inspections. Homestake personnel reportedly inspected each accessible area when it was ready for final closure. In addition to the final closure inspection, Homestake personnel said about 20 percent of the closed areas were given an additional quality control inspection conducted by Homestake personnel not directly associated with the closure work. During the underground inspection, DENR personnel observed closure signs posted at some shop areas had notations regarding both the final closure and quality control inspections.

DENR personnel reviewed a Homestake document titled Underground Mine Checklist for Abandonment that was included in a general mine closure policy document. Homestake personnel said this was an initial version of the document, and it was modified somewhat for use in individual closure areas. This document consisted of a checklist denoting items to be abandoned in place or removed from the mine in conjunction with closure operations. In reviewing this checklist, DENR personnel noted it listed aerosol cans and computers as items that could be abandoned in the mine. Homestake personnel verified they removed all fouled or plugged aerosol containers and all computer equipment from the mine during closure operations. Homestake personnel said some empty aerosol containers would have been disposed with other waste materials in the mine areas, per their normal mine operating procedures.

Homestake prepared work plans for individual underground mine closure areas. During the closure work, Homestake personnel compiled extensive documentation, including area maps, digital photographs, test results, and documentation of waste removal and management. Homestake personnel tracked the progress of closure activities on color-coded maps and spreadsheet databases. As they completed closure of individual areas, Homestake personnel inspected the work areas and completed documents verifying the work conducted. Homestake personnel said they are still compiling some closure documentation, but estimated they had collected about 22,000 digital photographs and over 800 spreadsheet database entries documenting the closure work to date. DENR personnel reviewed copies of selected documentation for some of the underground mine closure areas. This documentation included a decommissioning checklist for the fuel storage area on the 7400 Level, a signature log for the 7550 Level 21 Ledge Stope 45-47 LHD Shop, closure work documentation for the 6950

Refrigeration Shop, uniform hazardous waste manifest forms, and documents of used oil shipments.

DENR personnel conducted additional review of documentation for remediation work on polychlorinated biphenyl (PCB) contaminated concrete pads associated with old electrical transformers. Homestake personnel verified they sampled and tested all concrete pads located beneath electrical transformers with a documented history of PCB concentrations greater than 50 ppm PCB. Homestake previously retrofitted all oil-filled transformers remaining in use with oil containing less than 50 ppm PCB in the period from 1993 to 1994. Homestake notified EPA of the mine closure PCB remediation work in letters dated January 9 and February 14, 2003, and transmitted copies of the remediation work plan and sample test results to EPA. Homestake personnel said they did not receive any comments or requests for additional information from EPA regarding the PCB remediation work. Independent contractors performed the remediation, sampling, and laboratory testing work for the transformer locations. Homestake also conducted air monitoring at all PCB work sites. Homestake determined the number of sample locations for individual transformer locations by the greater of a minimum of three sample results or one sample composite per 30 square feet of concrete pad surface area. DENR personnel reviewed documentation for PCB remediation work at the No. 4 Winze 4850 2300V Substation and the No. 6 Shaft 5900 46 Crosscut Substation. The documentation reviewed included sampling location maps, laboratory test results, contaminated material logs, and manifest documentation for shipments of PCB-contaminated debris to the permitted US Ecology facility in Beatty, Nevada.

The documentation reviewed showed initial sampling and testing of the concrete pad at the No. 4 Winze 4850 2300V Substation, conducted December 12, 2002, included three sample locations. Two of the test results for these locations showed PCB contamination levels less than one part-per-million (ppm) PCB. The remaining test result showed a PCB concentration of 6 ppm. Because this test result was above Homestake's internal standard of 5 ppm PCB, they conducted remediation work to remove the contaminated concrete. After remediation work, subsequent sampling and testing performed May 6, 2003 showed the three sample locations tested had less than one ppm PCB. Documentation showed the contaminated materials removed from this location consisted of one drum of personal protective equipment and plastic, and one drum of PCB-contaminated rubble removed from the pad area. Homestake assigned these drums internal tracking numbers 00651-1 and 00651-2, respectively. Shipping documentation verified these drums were transported off-site as part of manifest number UG004 on May 8, 2003.

Initial sampling and testing of the concrete pad at the No. 6 Shaft 5900 46 Crosscut Substation, conducted January 13, 2003, included six sample locations. Test results for each of these locations showed PCB contamination levels ranging from 25 ppm to 40,000 ppm. Therefore, Homestake conducted remediation work to remove the contaminated materials. During the remediation work for this location, Homestake conducted intermediate sampling and testing on March 20 and April 2, 2003. Homestake conducted final clearance sampling of this area on April 9, 2003. Documentation showed Homestake placed the contaminated materials removed from this location into 30 drums assigned internal tracking numbers 00657-1 to 00657-30. Shipping documentation verified these drums were transported off-site as part of manifest

number UG003 on April 8, 2003. Homestake personnel verified the documentation reviewed for these locations was representative of all the electrical transformer sites they remediated.

The inspectors asked about asbestos and mercury switch removal work conducted in conjunction with the underground mine closure. Homestake personnel said there was no asbestos in a friable form in the underground mine. Only non-friable forms, such as epoxy coated transit boards (used at substations) and arc chutes (electrical switches), were present in the mine. Homestake personnel verified these materials were removed from the mine and disposed of in the permitted Open Cut Waste Cell. Homestake personnel also verified they removed mercury switches from mine equipment, such as sump pump switches, during the closure work. Homestake shipped the mercury switches off-site as hazardous waste for recycling at a permitted facility.

Regarding other materials, Homestake personnel stated that all lead batteries will be removed from the mine. All tires are being removed also, except for a tire still on a piece of equipment on the 2300 Level. The area was deemed unsafe and the tire was left. Homestake personnel also mentioned that the machinery in the 6950 ventilation plant was to be abandoned in place. Oil and refrigerant have been removed from this machinery. Homestake personnel added that the No. 7 shaft hoist had been removed years before, however, during mine closure; they removed a few transformers and fluids from motors. The hoists for No. 6 Shaft and No. 4 Winze will remain in the mine.

Before departing the site on May 29, 2003, DENR and Homestake personnel discussed the documentation reviewed for the mine closure activities. DENR personnel noted the closure documentation reviewed appeared to be extensive and complete. On June 5, 2003, DENR staff requested some summaries of this information from Homestake.

The DENR inspection team plans to return to Homestake to inspect the upper part of the mine on Friday, June 13 (note we are planning our annual audit of the surface mine on June 12). We will inspect the mechanized ramp area in 9 Ledge between the 1700 and 2300 Levels. On these levels the inspectors will pass through the Main Ledge area, and we hope to collect some water samples from old backfilled areas in Main Ledge. We should also have time to inspect another area, possibly the 3800 to 4100 Level ramp area in 11 Ledge.

## **Conclusions and Findings**

Although the DENR inspectors covered only a small part of the mine, it was sufficient to determine that Homestake was making a conscientious effort to properly close the mine. The inspection was done for two purposes:

- To determine whether Homestake has done what it said it would do in preparation for mine closure; and
- To determine whether Homestake's mine closure activities comply with environmental law.

Based on the inspections and document reviews completed to date, it is the opinion of the DENR inspectors that Homestake is following its internal mine closure protocol for the underground mine closure, and that the closure activities observed appear to be adequate. The inspectors found the quality of the closure work was consistent among the areas inspected. Only small quantities of potential contaminants related to mining equipment were noted, such as oil and grease residues. Also, the closure work conducted by Homestake is well documented. Homestake has assembled an extensive database system of spreadsheets, photographs, and paperwork documentation of the mine closure work.

The inspectors did not look specifically for potential contaminants related to backfilled tailings or other mine rock geochemical issues, although some water samples were taken that may provide information on ground water quality and water draining from mine workings. Department personnel are involved in discussions with Homestake personnel and contractors regarding ongoing modeling of ground water quality following closure of the underground mine.