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's Mine File (#5)
cc R. Summers
S. Linner

Utah Fuel Company
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GLEN A. ZUMWALT
Vice President and
General Manager

November 10, 1988

Lowell P. Braxton
Administrator, Reclamation Program
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

Dear ~~Mr. Braxton~~ Lowell:

Re: Cessation Order C-88-15-1-1, Skyline Mine Act/007/005

This letter is in response to the commitments which we made in our October 14, 1988 letter and to satisfy the terms for termination of Cessation Order C-88-15-1-1 as outlined in the Division memo from Rick P. Summers to Susan C. Linner dated October 17, 1988 and sent to us in your November 2, 1988 letter.

In the Fall of 1986 a longwall system was installed in our Mine No. 3. In order to meet the MSHA Fire protection requirements, a water oil emulsion is used in the longwall hydraulic system. The oil selected to be used in the system was Solcenic 3A, manufactured by Century Lubricating Oils, Inc. A mixture of 5% Solcenic 3A is mixed with 95% water.

An emulsion make-up and pump room has been established underground in the longwall panel areas. The (undiluted) Solcenic 3A is transported to this pump room in fully enclosed tank trailers. The tank trailers are then connected with pipe lines to the mixing tanks where the neat product is diluted to obtain the 5% emulsion. The emulsion then goes into high pressure pumps (approximately 5000 psi) where the emulsion is then pumped in high pressure lines to the longwall face area. The emulsion then returns back to the pump room via a gravity return pipe line.

In the early stages of the longwall operation it was recognized that if a spill occurs or an emulsion line is broken, an excessive amount of oil emulsion could reach our mine water discharge system, and our normal oil skimmers will not remove the oil emulsion. In our NPDES discharge permit, we are limited to a maximum discharge of oil and grease to 10 ppm.

We began investigations with a chemical company to develop a method of removing the oil from the emulsion so as not to exceed our NPDES limits. A floculant was developed that would successfully remove the oil. A system was developed in our underground sump to meter in the floculant in the event an oil emulsion spill did occur. As with all mechanical systems, failures occur, resulting in emulsion spillage. When this happened, floculant was fed into the water collection system, successfully preventing the oil emulsion from being discharged from the mine.

During the operation of the longwall system no unusual water quality constituents in the NPDES tests have been found.

In late June and early July 1987, a dark colored slime growth developed in Eccles Creek. The growth was occurring from the mine down stream. Some green filamentous algae was growing in the creek and in the mine sedimentation pond. Both of these growths are usually associated with the presence of sewage. The sewage system at the mine was immediately investigated. Samples were collected from the sedimentation pond and tested for B.O.D. fecal coliform and a tracer dye that was put into the sewage system. The tracer dye was not detected and the B.O.D. and coliform levels were similar to the levels occurring in the streams above the mine. During the investigation of the sewage system, the possibility for some limited sewage leakage was found, although no evidence was present that leakage had occurred. Measures were immediately taken to eliminate this possibility. The consulting firm of Brown and Caldwell was retained to help with the problem. It was found that the mineral phlogopite mica had entered the discharge water system from an igneous dike intrusion that had been mined through in the Mine No. 3 coal seam. The mineral was not settling in the sedimentation pond and was being carried by the discharge water into Eccles Creek. Once in the creek it was being trapped by the algaes and other growths in the stream. The mineral turns the stream growths slimey and dark in color.

To resolve the problem the mine changed the underground water drainage system to avoid the phlogopite dike and found that treating the water with the same floculant that was used to treat the oil emulsion would settle the phlogopite. Within a few days after starting to treat the water with floculant and changing the underground water system, the sedimentation pond and the water in Eccles Creek cleared up.

Testing in cooperation with DWR indicated that the fish populations in the creek had not been affected. However, there appeared to be some degradation in the quality of the macro-invertebrate population in the creek. The dark colored slime seemed to be persisting in the stream bed. It was felt that a good stream flush in the spring of 1988 would take care of the problem.

Precipitation during the winter of 1987-1988 was below normal and very little if any spring flush occurred. During the summer of 1988 the dark colored slime persisted and the green filamentous algae seemed to be increasing. Fish sampling in lower Eccles Creek by the DWR in September showed abundant fish population. The summer of 1988 was a dry summer and resulted in very low natural stream flows. It was estimated that by mid-September the mine discharge was accounting for 60-70 percent of the flow in Eccles Creek.

During late September surface sudsing along the full length of Eccles Creek was observed by DOGM personnel. At that time extensive water sampling and an investigative search was started by mine personnel.

On October 5, 1988 Utah Fuel personnel assisted DWR personnel in fish sampling of Eccles Creek. DWR personnel indicated during the fish sampling that the conditions of the Creek were similar to conditions that existed when high levels of sewage are present. Upon completion of the fish sampling the water of Eccles Creek was tested with a "Field" Nitrate test kit for the presence of nitrates. Approximately 8 to 9 ppm nitrates was indicated just below the

mine. Since nitrates are normally indicative of sewage, we felt that there was a strong possibility that the sewage holding tanks for the mine were leaking. We then tested all of the incoming waters that are coming into the sedimentation pond. All of them tested "0" for nitrates except the Mine #3 discharge, and it indicated approximately 13 ppm nitrates. There is no cross connection between the Mine #3 discharge line and the sewage holding tanks.

Potential sources for the nitrate loading Mine No. 3 discharge water were discussed with various mine personnel. Several products that are used in the mine (cleaners, degreasers, sealants, etc.) were investigated. Safety data sheets indicated that they did not contain nitrogen compounds. Current mine employment is approximately 230 people. During the recent longwall move it would have been impossible to have more than 80 people in Mine No. 3 on a single shift. Porta-potties are provided in the mine; however, it is possible underground water could have been contaminated by personnel not using these units. Since this source is a potential for nitrate contamination, it was not ruled out.

On Thursday October 6th, water samples were collected from various water sources in Mine #3. The samples from the returns in the mined out areas showed no nitrates. This same water is used for make-up water for the longwall emulsion system. The overflow water coming out of the emulsion pump room showed a nitrate level of approximately 2 ppm nitrates. The water in the return in the active mine section showed approximately 3 ppm nitrates. Part of the water in this return comes off from the longwall section. The water coming off the longwall section showed a nitrate level of approximately 5 ppm.

From these water samples it appeared that there was no real clear cut source of high level nitrate contamination; however, there was some indication that there was some contamination coming from the longwall mining area.

A review was made of products used in the longwall section. The only product used in sufficient quantity to cause the type of contamination we were looking for was the longwall emulsion oil. A call was made to the emulsion oil manufacturer and they indicated that their product did contain nitrogen compounds.

Since the oil does produce an oil emulsion, the mine has been concerned about potential spill, and the potential for high levels of oil and grease in our discharge water. A floculant was developed which would settle the oil out of the emulsion. During our longwalling operation spills have occurred of the emulsion oil. They have always been treated to remove the excess oil from our discharge waters. Up to this point in time we had tested our discharge waters for normal NPDES constituents which do not include nitrates or nitrites.

A sample of the emulsion oil water mixture was obtained and a field test run on it. The results indicated nitrate and nitrite levels in excess of the capabilities of the test kit. Samples from various sources were then collected and sent in to CT&E Laboratory for analysis. The complete results, which were received on October 11, 1988, are shown below in PPM.

	Nitrate	Nitrite	Phos.
Mine #3 Discharge	2.28	.08	.04
Sediment Pond Discharge	3.39	.04	.06
Shop Discharge	3.18	.03	.36
5% Emulsion Mixture	872.00	182.0	No Test
100 ppm Emulsion Mixture Treated with T. Floculant	1.73	.42	.08
100 ppm Emulsion Mixture Treated with Amer. Floculant	1.58	.40	.07
100 ppm Emulsion Mixture - Untreated	1.61	.37	.07
Neat Emulsion Oil	17235.00	3765.00	No Test

From these laboratory results, it is evident that the emulsion oil has the potential to contaminate the Mine No. 3 water discharge with high levels of nitrates and nitrites. The intermittent emulsion oil spills that we have experienced in our longwall mining section would explain why we do not see a continuous high level of nitrates and nitrites in the Mine No. 3 discharge water.

Once it was evident that the emulsion oil was the source of the nitrates and nitrites, a meeting was held with DWR and DOGM personnel, and they were informed of our findings on October 12th. Simultaneously different emulsion oils were investigated to determine if there was a better product available. Products from several different oil companies were investigated through direct contact with manufacturers and their representatives. An emulsion oil produced by the Texaco Company was found meeting lubrication requirements and was selected. The Texaco product does not contain any nitrogen compounds and is compatible with our equipment and existing Solcenic 3A emulsion oil. All of the neat Solcenic 3A product was returned to the distributor and replaced with Texaco code 1670 LWM concentrate. The decision was made not to replace Solcenic 3A emulsion already in the system. This decision was based upon the facts that 1) the Texaco oil would mix with the Solcenic 3A; 2) the potential for spillage while draining the complete longwall system was far greater than normal machine and pipe line breakage; 3) no practical way existed to remove nitrates and nitrites from the water system if such spillage occurred; and 4) disposing of approximately 4500 gallons of emulsion oil mixture was not practical in that we have not determined how it could be properly done.

An extensive "no spill" program has been implemented by the longwall mining and maintenance personnel. If a spill does occur, the water containing the emulsion oil will be pumped into abandoned mined areas and will not be pumped to the surface.

We have the oil emulsion spills under control and have switched to a product that contains no nitrates or nitrites, which have resulted in the lowering of the nitrate and nitrite levels in the discharge water. We will probably continue to see a slight elevation in the nitrate and nitrite levels above the normal background levels. This is occurring, due to the inherent contamination in the areas that have already been mined out. This contamination is already at a low level and will continue to decrease over time.

In the October 12th meeting with DWR and DOGM, Utah Fuel Company committed to purchase a field test kit and test for nitrates and nitrites twice a week until the problem is completely resolved. The following is a tabulation of the results of the field testing to date.

DATE	LOCATION	NITRATES (MG/L)	NITRITES (MG/L)
10-13-88	Pond Discharge	2.9	--
10-13-88	Mine No. 3 Discharge	1.5	--
10-18-88	Pond Discharge	1.0	.10
10-18-88	Mine No. 3 Discharge	1.13	.17
10-19-88	Pond Discharge	1.0	.10
10-19-88	Mine No. 3 Discharge	1.17	.13
10-20-88	Pond Discharge	1.05	.05
10-20-88	Mine No. 3 Discharge	1.1	.10
10-25-88	Pond Discharge	1.0	.10
10-25-88	Mine No. 3 Discharge	1.11	.09
10-26-88	Pond Discharge	1.0	.10
10-26-88	Mine No. 3 Discharge	1.12	.08
10-28-88	Pond Discharge	1.02	.08
10-28-88	Mine No. 3 Discharge	1.13	.07
10-31-88	Pond Discharge	.92	.08
11-03-88	Pond Discharge	1.0	.10
11-03-88	Mine No. 3 Discharge	1.01	.09
11-04-88	Pond Discharge	.92	.08
11-04-88	Mine No. 3 Discharge	1.02	.08
11-07-88	Pond Discharge	.93	.07
11-07-88	Mine No. 3 Discharge	1.5	.05
11-08-88	Pond Discharge	1.04	.06
11-08-88	Mine No. 3 Discharge	1.05	.05
11-10-88	Pond Discharge	1.14	.06
11-10-88	Mine No. 3 Discharge	1.05	.05

There have been some additional samples that have been sent into a certified laboratory, but these results have not yet been received.

Sudsing in Eccles Creeek was the condition that triggered this investigation. Increased levels of nitrates and nitrites did not cause the sudsing. The water in Eccles Creek was tested for surfactants and phosphates, along with samples from the sedimentation pond, Mine No. 3 discharge, and discharge from the shop. The results of these samples are as follows:

	Eccles Creek	Sediment Pond	Mine Discharge	Shop Discharge
Phos. Total PO_4 mg/L	.04	.04	.04	.50
Surfactants	.90	1.33	.87	1.33

From this data it is apparent that the water coming from the shop is the main source of phosphates and surfactants. Investigations found that soaps were entering the drainage system from two sources: 1) soap being used in the shop steam cleaner; and 2) janitors dumping their mop buckets into the shop floor drains.

We stopped the use of soap in our steam cleaner at the time the sudsing was discovered and have not used soap since. We have identified a soap that contains no phosphates and is a low sudsing product, which will be used when needed in the shop cleaner in the future. A new janitor sink has been installed which drains into our regular sewage system and we are requiring the janitors to use this sink. Since the implementation of these actions, phosphate levels have dropped to below detection levels.

We believe our actions were immediate and responsive to the identified problems. Testing of the pond effluent indicates a significant lowering of the concerned contaminants. Skyline is meeting the commitments made in our October 14th letter and will continue to make a diligent effort to insure nitrate, nitrite, and phosphate contamination of Eccles Creek from our operations has been eliminated and will not reoccur.

We will continue to send you the nitrate and nitrite information on a monthly basis until the problem is completely resolved.

Sincerely,

for Glen A. Zumwalt
Vice President/General Manager

GAZ:KZ:lm

xc: Keith Welch
Larry Dalton, DWR
Ira Hatch, USFS