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FACT SHEET

KENTUCKY POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT TO DISCHARGE TREATED WASTEWATER INTO WATERS OF THE COMMONWEALTH

KPDES No.: KY0107808 **Permit Writer:** Heather Dodds **Date:** April 13, 2010
AI No.: 97743

1. SYNOPSIS OF APPLICATION

a. Name and Address of Permittee

Enterprise Mining Company LLC
117 Madison Ave Ste B
Whitesburg, KY 41858

b. Facility Location

DNR Permit No.: 860-0448 NW through AM-04
Trace Fork Surface Mine
Lakeshore Rd
Amburgey, Knott County, Kentucky

c. Description of Permittee's Operation

Existing surface and underground mine includes 178.10 acres of surface disturbance, 164.74 acres of auger mining area, and 602.12 acres of underground mining area. Surface disturbance includes mining / face up (114.56 acres), roads (31.59 acres), ponds (5.00 acres), spoil storage (35.73 acres, and access areas (1.40 acres). The permittee proposes to add 212.87 acres of surface disturbance and subtract 24.45 acres of auger mining area and 27.34 acres of underground mining area. The modified surface disturbance includes additional mining / face up (217.70 acres), spoil storage (117.55 acres) and access areas (1.00 acres) and removes roads (27.56 acres) and ponds (3.00 acres). Total disturbance includes 390.97 acres surface disturbance, 140.29 acres auger mining area, and 574.78 acres underground mining area.

d. Production Capacity of Facility

Not Applicable

e. Description of Existing Pollution Abatement Facilities

Sedimentation

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f. Permitting Action

First issuance of a minor individual KPDES permit to a "new source" coal mining operation. The mining operation proposes to discharge to a direct first-order tributary of and within one (1) mile of the confluence with a "Publicly-owned Lake".

2. RECEIVING WATERS

a. Receiving Water Name

Facility discharges to the following:

Table 1

Receiving Water	Pond No.	Latitude (N)	Longitude (W)
Kelly Fork	BS21	37-16-08	83-00-59
	BS22	37-16-14	83-00-57
	BS23	37-16-16	83-00-47
	BS24	37-16-18	83-00-41
	BS25	37-16-23	83-00-41
	BS25	37-16-23	83-00-41
	BS26	37-16-11	83-01-04
	SS5	37-16-18	83-00-57
Left Fork Trace Fork	BS9	37-15-58	83-00-38
	BS10	37-15-56	83-00-38
	BS11	37-15-40	83-00-28
	BS12	37-15-37	83-00-18
	BS13	37-15-35	83-00-09
	SS2A	37-15-48	83-00-28
	SS3	37-15-46	83-00-33
Trace Fork	BS14	37-15-43	83-00-04
	BS15	37-15-49	83-00-07
	BS16	37-15-59	83-00-09
	BS17	37-16-05	83-00-13
	BS18	37-16-13	83-00-15
	BS19	37-16-21	83-00-19
	BS20	37-16-25	83-00-18

b. Stream Segment Use Classifications

Pursuant to 401 KAR 10:026, Section 5, Kelly Fork, Left Fork Trace Fork and Trace Fork carry the following classifications: Warm Water Aquatic Habitat, Primary Contact Recreation, Secondary Contact Recreation, Domestic Water Supply

c. Stream Segment Antidegradation Categorization

Pursuant to 401 KAR 10:030, Section 1 Trace Fork is categorized as an "Impaired Waters" for fecal coliform.

Pursuant to 401 KAR 10:030, Section 1 Kelly Fork and Left Fork Trace Fork are categorized as "High Quality Waters".

d. Stream Low Flow Condition

The 7-day, 10-year low flow and harmonic mean conditions of Kelly Fork, Left Fork Trace Fork and Trace Fork are 0.0 and 0.0 cfs, respectively.

The 7-day, 10-year low flow condition of North Fork Kentucky River at hazard Water Department intake is 2.30 cfs.

The 7-day, 10-year low flow condition of North Fork Kentucky River at Jackson Municipal Water Works intake is 42.0 cfs.

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3. REPORTED DISCHARGE LEVELS

The proposed mining activity is an expanded mine that includes 22 discharge points to three (3) receiving waters: Kelly Fork, Left Fork Trace Fork and Trace Fork. The Division of Water's procedures for determining "reasonable potential" require a minimum of five (5) effluent samples for analysis. The permittee in conformance with the application requirements of Form C submitted one effluent analysis. Therefore insufficient effluent data from the operation is available to determine the "reasonable potential" for the permittee to cause or contribute to an excursion above a water quality standard. The permit has been conditioned to require the collection and submission of this analytical data within two (2) years of its effective date.

Table 2

Effluent Characteristics	Minimum	Average	Maximum
Flow (cfs)	NA	NA	NA
Total Suspended Solids (mg/l)	NA	NA	NA
pH (standard units)	NA	NA	NA
Chlorides (mg/l)	NA	NA	NA
Hardness (as mg/l $CaCO_3$)	NA	NA	NA
Sulfate (as mg/l SO_4)	NA	NA	NA
Total Magnesium (µg/l)	NA	NA	NA
Total Recoverable Iron (mg/l)	NA	NA	NA
Total Recoverable Manganese(mg/l)	NA	NA	NA
Total Recoverable Antimony (µg/l)	NA	NA	NA
Total Recoverable Arsenic (µg/l)	NA	NA	NA
Total Recoverable Beryllium (µg/l)	NA	NA	NA
Total Recoverable Cadmium (µg/l)	NA	NA	NA
Total Recoverable Chromium (µg/l)	NA	NA	NA
Total Recoverable Copper (µg/l)	NA	NA	NA
Total Recoverable Lead (µg/l)	NA	NA	NA
Total Recoverable Mercury (µg/l)	NA	NA	NA
Total Recoverable Nickel (µg/l)	NA	NA	NA
Total Recoverable Selenium (µg/l))	NA	NA	NA
Total Recoverable Silver (µg/l)	NA	NA	NA
Total Recoverable Thallium (µg/l)	NA	NA	NA
Total Recoverable Zinc (µg/l)	NA	NA	NA
Total Cyanide (µg/l)	NA	NA	NA
Total Phenols (µg/l)	NA	NA	NA
Specific Conductance (µS/cm)	NA	NA	NA
Total Dissolved Solids (mg/l)	NA	NA	NA
Total Calcium (µg/l)	NA	NA	NA
Total Sodium (µg/l)	NA	NA	NA
Total Potassium (µg/l)	NA	NA	NA
The term NA means not available			

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4. PROPOSED EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

a. Applicable to all sediment control structures

The following effluent requirements apply to all discharges from "active mining areas", and underground "post-mining areas".

Table 3					
Effluent Characteristic	**Minimum**	**Average**	**Maximum**	**Sample Type**	**Monitoring Frequency**
Flow (cfs)	NA[6]	Report	Report	Instantaneous	2/Month
Conductivity (µS/cm)	NA[6]	Report	Report	Grab	2/Month
Acidity[1]	NA[6]	Report	Report	Grab	1/Month
Alkalinity[1]	NA[6]	Report	Report	Grab	1/Month
Oil & Grease (mg/l)[2]	NA[6]	10	15	Grab	1/Month
Iron (mg/l)[3]	NA[6]	3.0	4.0	Grab	2/Month
Manganese (mg/l)[3]	NA[6]	2.0	4.0	Grab	2/Month
TSS (mg/l)[4]	NA[6]	35.0	70.0	Grab	2/Month
pH (standard units)[5]	6.0		9.0	Grab	2/Month
Total dissolved solids or specific conductance shall not be changed to the extent that the indigenous aquatic community is adversely affected.					
[1]At all times Acidity shall be less than Alkalinity and shall be measured as (mg/l $CaCO_3$)					
[2]The limits and monitoring for Oil & Grease do not apply if the permittee has developed and implemented a "Best Management Practices" (BMP) plan as required by this permit. The BMP plan shall include a specific section that addresses the handling, storage and disposal of petroleum products and the maintenance procedures for mining equipment.					
[3]Iron and Manganese shall be reported as Total Recoverable					
[4]TSS means Total Suspended Solids					
[5]Discharges from this operation shall not cause more than a 1.0 standard unit fluctuation of the receiving stream pH over a period of 24 hours.					
[6]NA means not applicable.					

The following effluent requirements apply to all discharges from "post-mining areas" excluding underground areas.

Table 4					
Effluent Characteristic	**Minimum**	**Average**	**Maximum**	**Sample Type**	**Monitoring Frequency**
Flow (cfs)	NA[5]	Report	Report	Instantaneous	1/Month
Conductivity (µS/cm)	NA[5]	Report	Report	Grab	1/Month
Acidity[1]	NA[5]	Report	Report	Grab	1/Month
Alkalinity[1]	NA[5]	Report	Report	Grab	1/Month
Oil & Grease (mg/l)[2]	NA[5]	10	15	Grab	1/Month
Settleable Solids (ml/l)[3]	NA[5]	Report	0.5	Grab	1/Month
pH (standard units)[4]	6.0		9.0	Grab	1/Month
Total dissolved solids or specific conductance shall not be changed to the extent that the indigenous aquatic community is adversely affected.					
[1]At all times Acidity shall be less than Alkalinity and shall be measured as (mg/l $CaCO_3$)					
[2]The limits and monitoring for Oil & Grease do not apply if the permittee has developed and implemented a "Best Management Practices" (BMP) plan as required by this permit. The BMP plan shall include a specific section that addresses the handling, storage and disposal of petroleum products and the maintenance procedures for mining equipment.					
[3]The limit for Settleable Solids is an instantaneous maximum					
[4]Discharges from this operation shall not cause more than a 1.0 standard unit fluctuation of the receiving stream pH over a period of 24 hours.					
[5]NA means not applicable.					

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b. Justification of requirements for all sediment control structures

Pursuant to 40 CFR 122.44, as incorporated by 401 KAR 5:065, Section 2(4) each federally or delegated state issued NPDES permit shall include conditions meeting technology-based effluent limitations and standards and water quality standards and state requirements. Coal mining effluents are subject to the Coal Mining Point Source Category BPT, BAT, BCT Limitations and New Source Performance Standards as promulgated (40 CFR 434). Subpart A states that discharges from any coal mine at which the extraction of coal is taking place or is planned to be undertaken and coal preparation plants and associated areas are subject to the requirements of Part 434. Subpart A defines the term "active mining area" as the area, on and beneath land, used or disturbed in activity related to the extraction, removal, or recovery of coal from its natural deposits. The term excludes coal preparation plants, coal preparation plant associated areas, and post-mining areas.

Active mining areas are classified as either "alkaline mine drainage" or "acid or ferruginous mine drainage". "Alkaline mine drainage" is defined as mine drainage which, before any treatment, has a pH equal to or greater than 6.0 standard units and a total iron concentration of less than 10 mg/l. "Acid or ferruginous mine drainage" is defined as mine drainage which, before any treatment, either has a pH of less than 6.0 or a total iron concentration equal to or greater than 10 mg/l. Unless the permittee specifically requests and sufficiently justifies in the application process that the drainage is "alkaline mine drainage", DOW categorizes the drainage as "acid or ferruginous mine drainage".

The requirements for "acid or ferruginous mine drainage" are dependent upon whether the activity is categorized as an "existing source", "new discharger" or "new source". "Existing source" is defined in 40 CFR 122.29 as any source which is not a new source or a new discharger. "New discharger" is defined in 40 CFR 122.2 as any building, structure, facility, or installation from which there is or may be a discharge of pollutants that did not commence the discharge of pollutants at a particular site prior to August 13, 1979, which is not a "new source", and which has never received a finally effective NPDES permit for discharges at the site. "New Sources" are defined by 40 CFR 434.11(j) as a coal mine (excluding coal preparation plants and coal preparation plant associated areas), including an abandoned mine which is being re-mined, on which construction commenced after May 4, 1984 or which is determined to constitute a "major alteration". Within the definition of a "new source", the term "major alteration" is defined as one (1)or more of the following events resulting in a new, altered, or increased discharge of pollutants has occurred after May 4, 1984: a) extraction of a coal seam not previously extracted by that mine; b) discharge into a drainage area not previously affected by wastewater discharge from the mine; extensive new surface disruption at the mining operation; construction of a new shaft, slope, or drift; and such other factors the permit-issuing authority deems relevant.

The proposed coal mining activity commenced after May 4, 1984 and did not provide justification for an alkaline mine determination. Therefore this coal mining operation is subject to the requirements of 40 CFR 434.35 New Source Performance Standards for Acid or Ferruginous Mine Drainage. Table 5 summarizes these standards.

Table 5

Pollutant or pollutant property	Maximum for any 1 day	Average of daily values for 30 consecutive days
Iron, Total (mg/l)	6.0	3.0
Manganese, Total (mg/l)	4.0	2.0
Total Suspended Solids (mg/l)	70.0	35.0
pH (standard units)	Within the range 6.0 to 9.0 at all times	

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The Coal Mining Point Source Category BPT, BAT, BCT Limitations and New Source Performance Standards provide for a change in effluent requirements for sediment control structures as the status of the mine moves from “active mining” to “post-mining”. Subpart A defines the term “post-mining area” as a reclamation area or the underground workings of an underground coal mine after the extraction, removal, or recovery of coal from its natural deposit has ceased and prior to bond release. “Reclamation area” is defined in Subpart A as the surface area of a coal mine which has been returned to the required contour and on which revegetation (specifically, seeding or planting) work has commenced.

During the normal progression of a coal mine, the areas where coal extraction has ceased are to be reclaimed contemporaneously in accordance with the requirements of the Surface Mining Control and Reclamation Act (SMCRA). SMCRA allows for a phased bond release process whereby the completion of staged performance standards results in the return of portions of bond monies posted by the permittee. The performance standards for Phase I bond release under SMCRA is equivalent to the requirements defined as a “reclamation area” pursuant to 40 CFR 434. The proposed mine includes 140.29 acres of auger mining, which is a method of mining coal at a cliff or highwall by drilling up to 200 feet laterally into the exposed coal seam and transporting the coal to the surface via an auger bit. The 1982 Development Document for the Coal Mining Point Source Category includes auger mining as a surface mining technique. Those post-mining surface areas which have achieved Phase I bond release are considered reclamation areas. Therefore this coal mining operation is subject to the requirements of 40 CFR 434.55(a) New Source Performance Standards for Reclamation Areas. Table 6 summarizes these standards.

Table 6	
Pollutant or pollutant property	**Limitations**
Settleable Solids	0.5 ml/l maximum not to be exceeded
pH	Within the range 6.0 to 9.0 at all times

The proposed mine also includes 574.78 acres of underground mining. Unlike surface mining activities, SMCRA does not require the bonding of underground workings. Discharges from underground works where coal extraction has ceased are subject to the requirements of 40 CFR 434.55(b)(1) New Source Performance Standards for Post-Mining Areas, Underground Mine Drainage Acid or Ferruginous. These standards apply to discharges from underground workings until Phase III bond release is received on the entire SMCRA permit. Table 7 summarizes these discharge requirements.

Table 7		
Pollutant or pollutant property	**Maximum for any 1 day**	**Average of daily values for 30 consecutive days**
Iron, Total (mg/l)	6.0	3.0
Manganese, Total (mg/l)	4.0	2.0
Total Suspended Solids (mg/l)	70.0	35.0
pH (standard units)	Within the range 6.0 to 9.0 at all times	

As previously stated, 40 CFR 122.44 requires NPDES permits to contain effluent limitations and conditions that are protective of water quality. In developing appropriate water quality-based effluent limitations, the permit-issuing authority is required by 40 CFR 122.44(d) to determine if the discharge has a “reasonable potential” to cause or contribute to an excursion above any water quality standard, including narrative standards. In response to this requirement, DOW developed and received approval from EPA Region 4 for a “reasonable potential” analysis procedure. The procedure requires the comparison of the statistical evaluation of a minimum of five (5) effluent samples to the calculated water quality-based effluent limitations. Should this comparison indicate the concentration of the discharge is 90% or greater of the calculated limit then a “reasonable potential” exists and water quality-based effluent limitations are required.

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Kentucky's state water quality standards are found in 401 KAR 10:031. Table 8 is a summarization of the water quality-based standards for the pollutants addressed in the effluent guidelines (Table 5, Table 6, Table 7).

Table 8			
Pollutant or pollutant property	**Human Health**	**Warm Water Aquatic Habitat**	
	DWS	**Acute**	**Chronic**
Iron, Total Recoverable (mg/l)	0.3	4.0	1.0[1]
Manganese, Total Recoverable (mg/l)	No water quality standard or conditions		
Total Suspended Solids (mg/l)	Narrative standard		
Settleable Solids (ml/l)	Narrative standard		
pH (standard units)	Shall not be less than 6.0 nor more than 9.0 and shall not fluctuate more than 1.0 pH unit over a period of 24 hours		
[1]The chronic criterion for iron shall not exceed 3.5 mg/l if aquatic life has not been shown to be adversely impacted.			

Total Recoverable Iron

The effluent guideline requirement for iron is expressed as "total iron" and the water quality-based requirement is expressed as "total recoverable iron". Until EPA memorandums dated August 13, 1998 and May 21, 1996 were provided, DOW had interpreted the requirements for iron to be two separate conditions. However the aforementioned memorandums documented EPA's evaluation of the analytical methodology and determination that "total" and "total recoverable" are synonymous therefore the technology-based and water quality-based requirements can be compared directly.

As illustrated in Table 8, the requirements for iron are divided into three criteria. The human health domestic water supply criterion relates to the protection of domestic water supplies and, in accordance with 401 KAR 10:031, Section 3(c), is applied at the point of withdrawal of a domestic water supply using the source water harmonic mean for cancer-linked substances and the 7Q10 low flow condition for non-cancer-linked substances. To determine the water quality-based effluent that is protective of the human health domestic water supply criterion, the following formula is used:

$$C_T = \left[\frac{\left(C_{HHDWS}\left(Q_T + Q_{IW7Q10}\right)\right) - C_U Q_{IW7Q10}}{Q_T} \right]$$

Where
- C_T End-of-pipe concentration/effluent limit
- C_{HHDWS} Human health domestic water supply criterion
- C_U Instream background concentration
- Q_T Discharge flow
- Q_{IW7Q10} Intake water body 7Q10 low flow condition

The nearest downstream public water supply intake from Left Fork Trace Fork and Trace Fork is Hazard Water Department, located at mile 104.1 of North Fork Kentucky River, approximately 20.0 miles downstream. The nearest downstream public water supply intake from Kelly Fork is Jackson Municipal Water Works, located at mile 47.3 of North Fork Kentucky River, approximately 66.6 miles downstream. Substituting the following information into the formula yields an end-of-pipe concentration/effluent limit of 3.6 mg/l for the Hazard intake and 61.1 mg/l for the Jackson intake.

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C_{HHDWS} 0.300 mg/l.
C_U Unknown. The segments of North Fork Kentucky River where the intakes are located are not impaired for iron; therefore DOW has assumed a background concentration of 0.0 mg/l.
Q_T The discharges are assumed to be precipitation-dependent; however, to perform this derivation, DOW has calculated a theoretical flow of 0.134 MGD (0.207 cfs). See below for assumptions and derivation.
Q_{IW7Q10} Intake water body 7Q10 low-flow conditions are as follows: Hazard Water Department 2.30 cfs; Jackson Municipal Water Works 42.0 cfs.

The discharge flow was calculated using the following equation:

$$Q = CIAF$$

Where
Q Discharge flow, MGD
C Coefficient of runoff (0.1)
I Annual average rainfall, inches /year (45.97)
A Area, acres (390.97 acres)
F Unit conversion factor (0.000074390)

In choosing the coefficient of runoff, DOW reasoned that a mining activity would be similar to an unimproved area, i.e. no impervious surfaces. The typical range of coefficients for these types of areas is 0.1 to 0.3. DOW selected the lower value due to the runoff being collected in sediment control structures to control the volume and velocity. Since the surface disturbance overlaps the underground area, DOW assumed no additional contribution of flow from the underground area.

As previously stated, the discharges from the active mining area are assumed to be precipitation-dependent and therefore are not regular or continuous. By using the annual average rainfall in the calculation DOW has normalized these probable discharges into a theoretical daily flow to be used in this calculation.

Moving to the application of the warmwater aquatic habitat criterion, 401 KAR 10:031, Section 3(3) requires derivation of effluent limitations using the 7Q10 low flow condition of the immediate receiving water. Section 4(2) of 401 KAR 10:031 prohibit concentrations of pollutants to exceed the acute criteria within an assigned mixing zone unless a zone of initial dilution (ZID) is assigned. To receive an assigned ZID, the discharge must install a high-rate subsurface multiport diffuser. The permittee has not sought to install such features on the proposed discharges; therefore the acute criterion of 4.0 mg/l applies as an end-of-pipe limitation.

In regard to the chronic criterion, 401 KAR 10:029, Section 4(b) requires the criterion to be met at the edge of the assigned regulatory mixing zone. Regulatory mixing zones are assigned by the cabinet in accordance with the requirements of 401 KAR 10:029, Section 4 and cannot exceed 1/3 of the width of the receiving water when the receiving water is a stream or river. The following equation is used to develop chronic criterion-based effluent limitations.

$$C_T = \left[\frac{\left(C_C\left(Q_T + (MZ)Q_{RW7Q10}\right)\right) - C_U(MZ)Q_{RW7Q10}}{Q_T} \right]$$

Where
C_T End-of-pipe concentration/effluent limit
C_C Aquatic life chronic criterion
C_U Instream background concentration
Q_T Discharge flow
Q_{RW7Q10} Receiving water body 7Q10 low flow condition
MZ Assigned regulatory mixing zone

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Substituting the following information into the formula yields an end-of-pipe concentration/effluent limit of 3.5 mg/l for all receiving streams.

C_C 3.5 mg/l - DOW does not have evidence that the aquatic community in the receiving streams has been impacted by iron.

C_U Unknown - None of the receiving waters is listed as impaired for iron; therefore DOW has assumed a background concentration of 0.0 mg/l.

Q_T The discharges are assumed to be precipitation-dependent; however, to perform this derivation, DOW has calculated a theoretical flow of 0.134 MGD (0.207 cfs). See previous discussion for assumptions and derivation.

Q_{RW7Q10} 7Q10 low flow condition is 0.0 cfs for all receiving streams.

MZ 1/3 - For purposes of this calculation DOW has assigned the maximum allowable mixing zone.

The final step in determination of the iron limitations is to compare the technology-based effluent limits to the water quality-based. Table 9 summarizes this comparison.

Table 9		
Regulatory Requirement	**Monthly Average**	**Daily Maximum**
40 CFR 434.35	**3.0 mg/l**	6.0 mg/l
WQS Human Health Domestic Water Supply	3.6 mg/l	Not Applicable
WQS Aquatic Life Chronic Criterion	3.5 mg/l	Not Applicable
WQS Aquatic Life Acute Criterion	Not Applicable	**4.0 mg/l**
The selected effluent limits are denoted by bold letters.		

Total Recoverable Manganese

Kentucky's water quality standards, 401 KAR 10:031 do not contain a numeric or a narrative standard for manganese; therefore the technology-based standard found in 40 CFR 434.35 applies to these discharges.

Total Suspended Solids (TSS)

As previously noted, TSS has both a numeric effluent guideline requirement of 35.0 mg/l as a monthly average and 70.0 mg/l as a daily maximum and a narrative water quality standard found at 401 KAR 10:031, Section 4(g) that states "total suspended solids shall not be changed to the extent the indigenous aquatic community is adversely affected". In accordance with 40 CFR 122.44(d)(1)(i), the permit-issuing authority is required to determine if the discharge has a "reasonable potential" to cause or contribute to an excursion above any water quality standard including narrative standards.

In order to perform a "reasonable potential" analysis in accordance with DOW's EPA-approved methodology, a numerical interpretation of the narrative standard would be required. However, when evaluating waters of the Commonwealth for compliance with this narrative standard, DOW does not develop a numerical interpretation but rather takes into consideration biological indicators such as the taxonomic richness of macroinvertebrates and level of siltation.

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In an attempt to perform a "reasonable potential" analysis for this pollutant DOW reviewed literature on the impacts of TSS on freshwater aquatic life. DOW learned that depending on the concentration and the composition of TSS and the aquatic organism and its life stage, the effects vary from the extremes of no effect observed to mortality. A technical memorandum titled "Suspended Solids and Turbidity Requirements of Freshwater Aquatic Life and Example Relationship Between TSS (mg/l) and Turbidity (NTUs)for a Treated Municipal Effluent" (Robertson-Bryan, Inc., March 2006) was the primary source of data and supportive literature utilized by DOW to reach its conclusion. The data presented in the technical memorandum and supportive literature related predominately to instream levels of TSS. The technical memorandum cited a study performed downstream of a limestone quarry which concluded that impact to benthic macroinvertebrates was observed when the instream concentration of TSS was increased by 40 mg/l or more. The study also indicated a change in the taxa of the benthic macroinvertebrates from net-spinning species to those preferring silt and mud.

The mine proposes to discharge to Kelly Fork, Left Fork Trace Fork and Trace Fork. Carr Creek Reservoir is listed on Kentucky's 2008 303(d) List of Waters as impaired for sedimentation. The cumulative discharges of the mine to Left Fork Trace Fork and Trace Fork must be considered when evaluating the "reasonable potential" of the mine to contribute to the existing impairment of Carr Creek Reservoir.

The concentration required to increase the instream concentration of TSS in the receiving stream by 40 mg/L can be calculated in the following way:

$$C_T = C_U + 40 + 40\left[\frac{Q_U}{Q_T}\right]$$

Where C_T End-of-pipe concentration/effluent limit
C_U Instream background concentration
Q_T Discharge flow
Q_U Receiving water body average flow condition

Substituting the following information into the formula yields an end-of-pipe concentration/effluent limit of 40 mg/l for all receiving streams.

C_U Unknown. Assuming the worst case scenario of a pristine stream, this is assumed to be 0.0 mg/l.
Q_T The discharges are assumed to be precipitation-dependent; however, to perform this derivation, DOW has calculated a theoretical flow of 0.134 MGD (0.207 cfs). See above for assumptions and derivation.
Q_U Receiving water body average flow condition is 0.0 for all receiving streams.

The scenario of a pristine stream with an average flow condition of 0.0 cfs yields a concentration/effluent limit under of 40 mg/l. Increased flow in the receiving stream or increased background concentration only serve to increase this limit, which is greater than the numeric effluent guideline requirement of 35.0 mg/l monthly average. Therefore DOW concludes that the numeric effluent guideline requirement prevails.

DOW has determined that coal mine sediment control structures designed, constructed, operated and maintained to comply with the effluent guideline requirements do not have a reasonable potential to cause or contribute to an excursion above the narrative water quality standard for total suspended solids. Therefore DOW is not proposing any additional requirements for this parameter.

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Settleable Solids

Settleable solids have both a numeric effluent guideline requirement of 0.5 ml/l maximum not to be exceeded and a narrative water quality standard found at 401 KAR 10:031, Section 4(g) that states "the addition of settleable solids that may alter the stream bottom so as to adversely affect productive aquatic communities shall be prohibited." The 1982 Development Document for the Coal Mining Point Source Category defines settable solids as that matter in wastewater which settles to the bottom of a one-liter Imhoff cone in one (1) hour. The result of the settleable solids test is a volumetric measure of the amount of settleable matter in one (1) liter of wastewater. EPA based the 0.5 ml/l effluent limitation for post-mining areas on the capability of a sediment pond designed to contain the runoff from a 10-year, 24-hour precipitation event.

In accordance with 40 CFR 122.44(d)(1)(i) the permit-issuing authority is required to determine if the discharge has a "reasonable potential" to cause or contribute to an excursion above any water quality standard including narrative standards. In order to perform a "reasonable potential" analysis in accordance with DOW's EPA approved methodology, a numerical interpretation of the narrative standard would be required. However, when evaluating waters of the Commonwealth for compliance with this narrative standard, DOW does not develop a numerical interpretation but rather takes into consideration biological indicators such as the taxonomic richness of macroinvertebrates and level of siltation.

The mine proposes to discharge to Kelly Fork, Left Fork Trace Fork and Trace Fork. Carr Creek Reservoir is listed on Kentucky's 2008 303(d) List of Waters as impaired for sedimentation. The cumulative discharges of the mine to Left Fork Trace Fork and Trace Fork must be considered when evaluating the "reasonable potential" of the mine to contribute to the existing impairment of Carr Creek Reservoir.

The threshold diameter between settleable and suspended solids is generally accepted in the engineering community to be 0.005 mm; therefore settleable solids consist mostly of silts and sand. According to an EPA report entitled "Evaluation of Performance Capability of Surface Mine Sediment Basins", under the 2-year, 5-year, and 10-year 24-hour storm events, ponds designed to meet OSM criteria remove 100% of solids greater than 0.005 mm in diameter, i.e. settleable solids. This means that under average rainfall conditions as well as extreme storm events, a 100% removal rate should be achieved in a functioning sediment pond. The effluent limitation of 0.5 ml/l is equivalent to a 99.95% removal rate; therefore it is the finding of DOW that the effluent limitation of 0.5 ml/l maximum is a sufficient check on pond function to achieve protection of aquatic communities during average and extreme storm events.

Settleable solids, like total suspended solids, are a contributor to the level of siltation of a stream. Like total suspended solids, the effects on the aquatic community by settleable solids are dependent upon composition of the matter comprising the settleable solids and the life stages of the aquatic community affected. Therefore, using the same reasoning as with TSS, DOW has determined that coal mine sediment control structures designed, constructed, operated and maintained to comply with the effluent guideline requirements do not have a reasonable potential to cause or contribute to an excursion above the narrative water quality standard for total suspended solids. Therefore DOW is not proposing any additional requirements for this parameter.

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pH

This pollutant characteristic has both an effluent guideline-based requirement and a Kentucky water quality standards requirement. At 40 CFR 434.35, the requirement for pH is that the discharge must be within the range of 6.0 to 9.0 standard units at all times. This requirement is equivalent to that found in Kentucky's water quality standards at 401 KAR 10:031, Section 4(1)(b). However the water quality standard also requires the instream pH not fluctuate more than one and 1.0 standard unit over a period of twenty-four (24) hours. Therefore pursuant to 40 CFR 122.44(d) this additional requirement has been imposed to address water quality standards.

Acidity and Alkalinity

The proposed requirement for alkalinity to be greater than acidity at all times originated with EPA Region 4 during the period in which NPDES permits were being issued for Kentucky by the region. The development of the requirement was a "Best Professional Judgment" of EPA Region 4, developed in accordance with 40 CFR 125.3, which predated the 1982 Coal Mining Point Source Effluent Guidelines. The objective of the requirement was to promote the development of buffering in the sediment control structures to prevent the discharge of acid mine drainage. Additionally, Kentucky's water quality standards at 401 KAR 10:031, Section 4(a) state that natural alkalinity shall not be reduced by more than 25% and that alkalinity shall not be reduced or increased to a degree that may adversely affect the aquatic community. As with other pollutants and pollutant characteristics, DOW is required by 40 CFR 122.44(d) to determine if a "reasonable potential" exists for the discharge to cause or contribute to an excursion of the water quality standard. By requiring the development of buffering in the sediment control structure, it is the determination of DOW that a "reasonable potential" to cause the lowering of the receiving water's natural alkalinity by more than 25% does not exist. However, caution by the permittee must be exercised to prevent the natural alkalinity from being increased to levels which would have an adverse affect on the aquatic community.

Conductivity (Specific Conductance (SC)/Total Dissolved Solids (TDS))

Pursuant to 40 CFR 122.44 (d)(1)(i)NPDES/KPDES permits shall include limitations to control all pollutant and pollutant parameters which the permit-issuing authority determines "are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an excursion above any State water quality standard", including narrative standards. Kentucky's water quality standards at 401 KAR 10:031, Section 4(f) include a human health domestic water supply standard of 250 mg/l for TDS applied at the point of withdrawal and a narrative standard for TDS and specific conductance which state that the TDS or specific conductance shall not be changed to the extent that the indigenous aquatic community is adversely affected.

As with total recoverable iron; DOW performed a "reasonable potential" analysis of TDS to determine if the discharges would cause or contribute to an excursion of the water quality standards. To determine the water quality-based effluent that is protective of the human health domestic water supply criterion, the following formula is used:

$$C_T = \left[\frac{\left(C_{HHDWS}\left(Q_T + Q_{IW7Q10}\right)\right) - C_U Q_{IW7Q10}}{Q_T} \right]$$

Where
- C_T End-of-pipe concentration/effluent limit
- C_{HHDWS} Human health domestic water supply criterion
- C_U Instream background concentration
- Q_T Discharge flow
- Q_{IW7Q10} Intake water body 7Q10 low flow condition

The nearest downstream public water supply intake from Left Fork Trace Fork and Trace Fork is Hazard Water Department, located at mile 104.1 of North Fork Kentucky River, approximately 20.0 miles downstream. The nearest downstream public water supply intake from Kelly Fork is Jackson Municipal Water Works, located at mile 47.3 of North Fork Kentucky River, approximately 66.6 miles downstream. Substituting the following information into the formula yields an end-of-pipe concentration/effluent limit of 3,025 mg/l for the Hazard intake and 50,917 mg/l for the Jackson intake. Therefore, DOW does not believe that a "reasonable potential" exists for discharges to cause or contribute to an excursion of this water quality standard for this pollutant.

C_{HHDWS} 250 mg/l.
C_U Unknown. The segments of North Fork Kentucky River where the intakes are located are not impaired for TDS; therefore DOW has assumed a background concentration of 0.0 mg/l.
Q_T The discharges are assumed to be precipitation-dependent; however, to perform this derivation, DOW has calculated a theoretical flow of 0.134 MGD (0.207 cfs). See below for assumptions and derivation.
Q_{IW7Q10} Intake water body 7Q10 low-flow conditions are as follows: Hazard Water Department 2.30 cfs; Jackson Municipal Water Works 42.0 cfs.

The flow of the discharges was calculated using the equation:

$$Q = CIAF$$

Where
Q Discharge flow, MGD
C Coefficient of runoff (0.1)
I Annual average rainfall, inches /year (45.97)
A Area, acres (390.97 acres)
F Unit conversion factor (0.000074390)

In choosing the coefficient of runoff, DOW reasoned that a mining activity would be similar to an unimproved area, i.e. no impervious surfaces. The typical range of coefficients for these types of areas is 0.1 to 0.3. DOW selected the lower value due to the runoff being collected in sediment control structures to control the volume and velocity. Since the surface disturbance overlaps the underground area, DOW assumed no additional contribution of flow from the underground area.

As previously stated, the discharges from the active mining area are assumed to be precipitation-dependent and therefore are not regular or continuous. By using the annual average rainfall in the calculation DOW has normalized these probable discharges into a theoretical daily flow to be used in this calculation.

In accordance with 40 CFR 122.44(d)(1)(ii), when determining the "reasonable potential" for an excursion of a narrative standard, "the permitting authority shall use procedures which account for existing controls on point and nonpoint sources of pollution, the variability of the pollutant or pollutant parameter in the effluent, the sensitivity of the species to toxicity testing (when evaluating whole effluent toxicity) and where appropriate, the dilution of the effluent in the receiving stream."

Specific conductance (conductivity) is a measure of water's ability to conduct an electrical charge. Conductivity is directly related to the total dissolved ionized solids in the water. Conductivity is also related to salinity and is influenced by pH, hardness and temperature. Changes in conductivity may result in modifications to the makeup of the aquatic biological community of a water body. Depending on the severity of the alteration in conductivity, some species of aquatic organisms may no longer be present, thus reducing the taxa richness of the benthic macroinvertebrate community. Taxa richness is defined as the number of species in a given community, and is influenced by the water body size, temperature, reproductivity, water chemistry, etc.

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Common constituents of total dissolved solids are sulfates, chlorides, calcium, sodium, magnesium, potassium and metals. The presence and concentration of these ionized solids released during coal mining activities is dependent upon a number of factors, including: 1) the chemical constituency of geological formations being disturbed; 2) the degree of pulverization of these materials during the mining process; 3) the methods for managing spoil and overburden; and 4) treatment techniques utilized to neutralize acid mine drainage such as the use of alkaline materials to create buffering. Other common sources of total dissolved solids/conductivity include: 1) other forms of mining such as limestone quarrying, sand and gravel, clay mining, oil shale, and tar sands; 2) oil extraction; 3) road construction; 4) other construction activities; 4) urban runoff; 5) sewage; 6) road salting and deicing efforts; 7) abandoned mine lands; and 8) other industrial activities.

Based on these factors, DOW does not believe that a statewide or regional numerical interpretation of the narrative standard is appropriate. In DOW's determination, a site-specific interpretation is necessary to determine if the proposed activity has a "reasonable potential" to cause or contribute to an excursion of this water quality standard. DOW currently does not possess sufficient site-specific ambient data or discharge data for this proposed activity to determine if such a "reasonable potential" exists. In order to acquire sufficient data DOW is proposing a three-pronged approach which includes: 1) imposing conductivity monitoring on all outfalls; 2) monitoring specific chemical constituents and toxicity testing of representative outfalls; and 3) development of a stream assessment plan to evaluate the physical, chemical and biological condition of the receiving waters. DOW believes this approach is consistent with the comments received from EPA in comment letters dated December 12, 2009 through February 5, 2010. More details regarding items 2 and 3 will be provided later in this fact sheet.

Regarding the selection of conductivity monitoring in lieu of TDS monitoring for all outfalls, DOW took into consideration the sample methodologies and the large number of outfalls normally associated with a coal mining activity. Conductivity can be determined by use of a meter in the field whereas TDS requires laboratory analysis involving filtration; therefore conductivity was selected as the more efficient approach.

Sulfate

There are no technology-based standards in 40 CFR 434.35 for this pollutant. Kentucky's water quality standards, 401 KAR 10:031, Section 4 includes a human health domestic water supply standard of 250 mg/l applied at the point of withdrawal but no aquatic life criteria or narrative standard. As with total recoverable iron, DOW performed a "reasonable potential" to determine if the discharges would cause or contribute to an excursion of the water quality standards. To determine the water quality-based effluent that is protective of Human Health DWS criteria the following formula is used:

$$C_T = \left[\frac{\left(C_{HHDWS}\left(Q_T + Q_{IW7Q10}\right)\right) - C_U Q_{IW7Q10}}{Q_T} \right]$$

Where
- C_T End-of-pipe concentration/effluent limit
- C_{HHDWS} Human health domestic water supply criteria
- C_U Instream background concentration
- Q_T Discharge flow
- Q_{IW7Q10} Intake water body 7Q10 low flow condition

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The nearest downstream public water supply intake from Left Fork Trace Fork and Trace Fork is Hazard Water Department, located at mile 104.1 of North Fork Kentucky River, approximately 20.0 miles downstream. The nearest downstream public water supply intake from Kelly Fork is Jackson Municipal Water Works, located at mile 47.3 of North Fork Kentucky River, approximately 66.6 miles downstream. Substituting the following information into the formula yields an end-of-pipe concentration/effluent limit of 3,025 mg/l for the Hazard intake and 50,917 mg/l for the Jackson intake. Therefore, DOW does not believe that a "reasonable potential" exists for discharges to cause or contribute to an excursion of this water quality standard for this pollutant.

C_{HHDWS} 250 mg/l.
C_U Unknown. The segments of North Fork Kentucky River where the intakes are located are not impaired for sulfates; therefore DOW has assumed a background concentration of 0.0 mg/l.
Q_T The discharges are assumed to be precipitation-dependent; however, to perform this derivation, DOW has calculated a theoretical flow of 0.134 MGD (0.207 cfs). See below for assumptions and derivation.
Q_{IW7Q10} Intake water body 7Q10 low-flow conditions are as follows: Hazard Water Department 2.30 cfs; Jackson Municipal Water Works 42.0 cfs.

The flow of the discharges was calculated using the equation:

$$Q = CIAF$$

Where
Q Discharge flow, MGD
C Coefficient of runoff (0.1)
I Annual average rainfall, inches /year (45.97)
A Area, acres (390.97 acres)
F Unit conversion factor (0.000074390)

In choosing the coefficient of runoff, DOW reasoned that a mining activity would be similar to an unimproved area, i.e. no impervious surfaces. The typical range of coefficients for these types of areas is 0.1 to 0.3. DOW selected the lower value due to the runoff being collected in sediment control structures to control the volume and velocity. Since the surface disturbance overlaps the underground area, DOW assumed no additional contribution of flow from the underground area.

As previously stated, the discharges from the active mining area are assumed to be precipitation-dependent and therefore are not regular or continuous. By using the annual average rainfall in the calculation DOW has normalized these probable discharges into a theoretical daily flow to be used in this calculation.

Flow

In accordance with 40 CFR 122.44(i) (ii), all permits must include monitoring of the volume of effluent from each outfall.

c. Applicable to representative sediment control structures

As previously stated in Part 4 b of this fact sheet, DOW is proposing a three-pronged approach to acquiring sufficient data to determine if a "reasonable potential" for the discharges from this proposed mining activity to cause or contribute to an excursion of either numerical or narrative water quality standards. This approach includes: 1) imposing conductivity monitoring on all outfalls; 2) monitoring of specific chemical constituents and toxicity testing of representative outfalls; and 3) the development of a stream assessment plan to evaluate the physical, chemical and biological condition of the receiving waters. This section of the fact sheet will address the second information-gathering process in this proposed plan of action.

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This portion of the information-gathering plan imposes a requirement to collect samples from representative outfalls to provide effluent data to supplement the application submitted for this permit. Consistent with 40 CFR 122.21(g)(7), "when a permittee has two or more outfalls with substantially identical effluents, the Director may allow the permittee to test only one (1) outfall and report that quantitative data as applying to the substantially identical outfall." The proposed mining activity includes 22 outfalls, of which 19 are on-bench structures and three (3) are instream structures downstream of hollow fills. All of these outfalls have substantially similar effluents as the source of wastewater for each outfall is coal mine drainage.

The receiving waters affected by the proposed mining activity: 1) Kelly Fork; 2) Left Fork Trace Fork; and 3) Trace Fork. The selection of the representative outfall will be the responsibility of the permittee who will provide DOW a list of the selected outfalls within 30 days of the effective date of the permit. In selecting the representative outfalls the permittee shall use the following criteria: 1) one (1) outfall per receiving water in order for the impacts on each affected receiving water can be accurately evaluated; 2) receives drainage from a hollow fill as these types of ponds are more likely to have discharges than on-bench structures; and 3) the first outfalls that meet conditions 1 and 2 so as to obtain the required information as expeditiously as possible.

The objectives of the additional monitoring requirements for these representative sediment control structures is to collect information necessary to determine if a "reasonable potential" exists for the discharges to cause or contribute to an excursion of either a numeric or narrative water quality standard, to ascertain the flow regime of these structures, and to determine the chemical composition of the total dissolved solids/conductivity of the discharges. Table 10 summarizes the additional monitoring requirements for these three representative sediment control structures that are necessary for the determination of the flow regime and the chemical composition of the total dissolved solids/conductivity.

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Table 10				
Effluent Characteristic	**Average**	**Maximum**	**Sample Type**	**Monitoring Frequency**
Duration of Discharge (days)	Report	Report	Instantaneous	2/Month
TDS (mg/l)	Report	Report	Grab	2/Month
Sulfates (as mg/l SO_4)	Report	Report	Grab	2/Month
Chlorides (mg/l)	Report	Report	Grab	2/Month
Total Calcium (µg/l)	Report	Report	Grab	2/Month
Total Magnesium (µg/l)	Report	Report	Grab	2/Month
Total Sodium (µg/l)	Report	Report	Grab	2/Month
Total Potassium (µg/l)	Report	Report	Grab	2/Month
Acute Whole Effluent Toxicity		Report	Grab	1/Quarter
Antimony (µg/l)	Report	Report	Grab	1/Quarter
Arsenic (µg/l)	Report	Report	Grab	1/Quarter
Beryllium (µg/l)	Report	Report	Grab	1/Quarter
Cadmium (µg/l)	Report	Report	Grab	1/Quarter
Chromium (µg/l)	Report	Report	Grab	1/Quarter
Copper (µg/l)	Report	Report	Grab	1/Quarter
Lead (µg/l)	Report	Report	Grab	1/Quarter
Mercury (µg/l)	Report	Report	Grab	1/Quarter
Nickel (µg/l)	Report	Report	Grab	1/Quarter
Selenium (µg/l)	Report	Report	Grab	1/Quarter
Silver (µg/l)	Report	Report	Grab	1/Quarter
Thallium (µg/l)	Report	Report	Grab	1/Quarter
Zinc (µg/l)	Report	Report	Grab	1/Quarter
Hardness (as mg/l $CaCO_3$)	Report	Report	Grab	1/Quarter
After a minimum of five (5) samples DOW will determine if the discharge has reasonable potential to cause or contribute to an excursion of either a narrative or numeric water quality standard. If reasonable potential is demonstrated then DOW shall reopen the permit to include limitations and monitoring as justified by the reasonable potential analysis. However should no reasonable potential be demonstrated then DOW shall reopen the permit to terminate the instream biological and chemical monitoring and the representative outfall monitoring.				

DOW believes aforementioned approach is consistent with the comments received from EPA in letters dated December 12, 2009 through February 5, 2010.

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d. Justification of requirements for representative sediment control structures

Duration of Discharge

One of EPA's primary concerns regarding this permit relates to the performance of a "reasonable potential" analysis for a number of pollutants having either numeric or narrative water quality standards. A key element in performing a "reasonable potential" analysis is the flow regime of the discharge. If the discharge is episodic and of short duration, i.e. less than four days, then the "reasonable potential" analysis should address only acute effects of the discharge. However, if the discharge is episodic and of a longer duration, i.e. four days or greater or continuous, then the "reasonable potential" analysis should address both acute and chronic concerns. Therefore the inclusion of this monitoring requirement is necessary to determine the type of "reasonable potential" analysis that should be conducted and is justified by 40 CFR 122.48(b) which requires permits to specify monitoring requirements sufficient to yield data which is representative of the monitored activity. DOW is proposing the duration be determined for each discharge that is sampled in accordance with the standard effluent limitations and monitoring requirements.

Total Dissolved Solids, Sulfates, Chlorides, Total Calcium, Total Sodium, Total Magnesium, and Total Potassium

Specific conductance is a measure of a substance, in this case water, to conduct an electrical charge. This conductivity is directly related to the total dissolved ionized solids in the water. Common constituents of total dissolved solids are sulfates, chlorides, calcium, sodium, magnesium and potassium. By determining the predominate ion comprising the total dissolved solids concentration, the source of the ion and the impacts on the aquatic community can be ascertained. Therefore the inclusion of these parameters as part of the monitoring scheme for mine discharges is necessary to characterize the sources and impacts of the total dissolved solids and is justified by 40 CFR 122.48(b, which requires permits to specify monitoring requirements sufficient to yield data which is representative of the monitored activity. In order to accurately document the correlation between conductivity and these pollutants, the monitoring frequency shall be the same as the conductivity monitoring requirement of twice per month. In the event a "reasonable potential" does exist for the discharges to cause or contribute to an excursion of the conductivity narrative standard, DOW shall reopen the permit to include such requirements as necessary to protect water quality. However, should a "reasonable potential" not exist, then DOW shall reopen the permit to terminate these requirements.

Antimony, Arsenic, Beryllium, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Silver, Thallium, Zinc and Hardness

With the exception of hardness, all of these pollutants have numeric water quality standards which require an analysis in accordance with 40 CFR 122.44(d) to determine if a "reasonable potential" for the discharge to cause or contribute to an excursion of water quality standards. DOW's EPA Region 4 approved "reasonable potential" analysis procedure requires the comparison of the statistical evaluation of a minimum of five (5) effluent samples to the calculated water quality-based effluent limitations. Should this comparison indicate the concentration of the discharge is 90% or greater of the calculated limit, then a "reasonable potential" exists and water quality-based effluent limitations are required.

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The numeric water quality standards for a number of these pollutants are hardness-dependent, therefore hardness monitoring is necessary. Calculation of the water quality standards shall be performed as follows. The application of the Warmwater Aquatic Habitat criteria, 401 KAR 10:031, Section 3(3), require derivation of effluent limitations using the 7Q10 low flow condition of the immediate receiving water. Section 4(2) of 401 KAR 10:031 prohibit concentrations of pollutants to exceed the acute criteria within an assigned mixing zone unless a zone of initial dilution (ZID) is assigned. To receive an assigned ZID, the discharge must install a high-rate subsurface multiport diffuser. The permittee has not sought to install such features on the proposed discharges; therefore the acute criteria apply as an end-of-pipe limitation.

In regard to the chronic criteria, 401 KAR 10:029, Section 4(b) requires the criteria to be met at the edge of the assigned regulatory mixing zone. Regulatory mixing zones are assigned by the cabinet in accordance with the requirements of 401 KAR 10:029, Section 4 and cannot exceed 1/3 of the width of the receiving water when the receiving water is a stream or river. In its comment letter, EPA has raised the issue of the application of chronic criteria to episodic short-duration discharges. EPA contends that such discharges lasting four days or more are subject to chronic criteria and therefore should be included in the "reasonable potential" analysis. When the flow regime of the representative outfall necessitates a "reasonable potential" analysis for the chronic criteria, following equation shall be use to develop the chronic criteria-based effluent limitations.

$$C_T = \left[\frac{\left(C_C\left(Q_T + (MZ)Q_{RW7Q10}\right)\right) - C_U(MZ)Q_{RW7Q10}}{Q_T} \right]$$

Where
- C_T End-of-pipe concentration/effluent limit
- C_C Aquatic life chronic criterion
- C_U Instream background concentration
- Q_T Discharge flow
- Q_{RW7Q10} Receiving water body 7Q10 low flow condition
- MZ Assigned regulatory mixing zone

Insufficient effluent data from the operation is available to determine the "reasonable potential" for the permittee to cause or contribute to an excursion above a water quality standard. Therefore DOW is requiring the permittee to collect a minimum of five (5) quarterly samples of these pollutants to be used by DOW to perform a "reasonable potential" analysis for these pollutants. In the event the analysis should indicate that one or more of these pollutants require additional monitoring or the imposition of effluent limitation, DOW shall reopen the permit to include such requirements. However, should the analysis reveal indicate that a "reasonable potential" does not exist, then DOW shall reopen the permit to terminate these requirements.

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Whole Effluent Toxicity (WET) Testing

The inclusion of WET testing is to address two issues related to the determination of a "reasonable potential" to cause or contribute to an excursion of either a numeric or narrative water quality standard. EPA Region 4 raised these issues in comment letters received December 12, 2009 through February 5, 2010. Kentucky's water quality standards for toxicity include both numeric and narrative standards. The narrative standard at 401 KAR 10:031, Section 2(d) states that surface waters shall not be degraded by substances which injure, are chronically or acutely toxic to or produce adverse physiological or behavioral responses in humans, animals, fish and other aquatic life. The numeric standards at 401 KAR 10:031, Section 4(j) establish a chronic toxicity criteria of 1.0 chronic toxicity units (TU_c) and an acute toxicity criteria of 0.3 acute toxicity units (TU_a) using representative indigenous species. Kentucky's water quality standards also include a narrative standard for total dissolved solids (TDS) or specific conductance (SC), previously discussed under Part 4 b and c of this fact sheet.

40 CFR 122.44(d)(1)(iv) states "when the permitting authority determines, using the procedures in paragraph (d)(1)(ii) of this section, that a discharge causes, has "reasonable potential" to cause, or contributes to an instream excursion above the numeric whole effluent toxicity, the permit must contain effluent limits for whole effluent toxicity." Further at 40 CFR 122.44(d)(1)(v) "when the permitting authority determines, using the procedures in paragraph (d)(1)(ii) of this section, toxicity testing data, or other information, that a discharge causes, has the "reasonable potential" to cause, or contributes to an instream excursion above a narrative criterion within an applicable state water quality standard, the permit must contain effluent limits for whole effluent toxicity."

EPA has concluded that a "reasonable potential" exists for discharges from coal mines to violate the narrative standard for TDS or SC. This determination was based on the EPA Region 3 report authored by Gregory J. Pond, Margaret E. Passmore, Frank A. Borsuk, Lou Reynolds, and Carole J. Rose titled "Downstream effects of mountaintop coal mining: comparing biological conditions using family- and genus-level macroinvertebrate bioassessment tools," and referenced a number of similar reports. This report indicates a correlation between discharges from surface disturbances of strata and benthic macroinvertebrate taxa richness. EPA has concluded that a reduction in certain species of these organisms indicates an excursion of the narrative water quality standard or impairment. In accordance with 40 CFR 122.44 (d)(1)(v),such a determination by EPA would necessitate the inclusion of WET testing.

DOW does not concur with EPA's conclusion that a "reasonable potential" exists based solely on the aforementioned report. In accordance with 40 CFR 122.44(d)(1)(ii), when determining the "reasonable potential" for an excursion of a narrative standard "the permitting authority shall use procedures which account for existing controls on point and nonpoint sources of pollution, the variability of the pollutant or pollutant parameter in the effluent, the sensitivity of the species to toxicity testing (when evaluating whole effluent toxicity) and where appropriate, the dilution of the effluent in the receiving stream." The aforementioned report does not address any of these requirements, nor has EPA provided additional supportive data providing such analysis. As previously stated in the discussion related to conductivity found in Part 4(b) of this fact sheet, DOW does not believe that sufficient site-specific data has been provided to determine if a "reasonable potential" exists.

Therefore, in order to resolve this issue, DOW is proposing the permittee to conduct Acute WET testing at representative outfalls. Upon completion of five (5) quarterly WET tests, DOW shall determine if a "reasonable potential" exists, utilizing its 2000 EPA-approved "Permitting Procedures for Determining 'Reasonable Potential'". Should DOW determine that a "reasonable potential" does exist, then DOW shall reopen the permit to include appropriate effluent limitations or should DOW determine that a "reasonable potential" does not exist then DOW shall reopen the permit to terminate the requirement.

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e. Instream monitoring requirements

The third and final element of DOW's proposal for gathering sufficient data to determine if a "reasonable potential" exists for these discharges to cause or contribute to an excursion of the narrative water quality standards is a physical, chemical and biological assessment of the affected watersheds. Within 30 days of the effective date of the permit the permittee shall submit to DOW for review and approval a study plan to determine pre-mining conditions of the affected watersheds and to evaluate the impact of the discharges upon the affected watersheds. The study plan shall be developed in accordance with appropriate protocols and quality assurance requirements as specified in "Quality Assurance Project Plan for Individual Coal-mining Permits: Focus Monitoring for Water Quality, Biological Communities and Habitat Conditions." The number of instream monitoring locations will be dependent upon the size and number of watersheds involved and the number of outfalls associated with each watershed. The permittee should propose a sufficient number of monitoring locations to adequately document the pre-mining conditions and to evaluate the effects the mining activity is having on the watersheds involved. Monitoring locations in the receiving stream above and below the impacted watershed shall be included.

Biological sampling shall be conducted at each of the instream monitoring locations proposed in the approved study plan. Sample collection shall be conducted during the appropriate index period commensurate with size of the stream. Standard operating procedures that shall be used to conduct individual permit intensive surveys can be found in "Methods for Conducting Resource Extraction Individual Permit Intensive Surveys on non-OSRW streams in the Eastern Kentucky Coalfields."

The permittee will provide DOW with a paper and an electronic version of an annual intensive survey report by July 31st of the following year. Tables and charts within the electronic version of the report must be in spreadsheet format. This report shall be sent directly to the Surface Water Permit Branch for review. Annual reporting requirements can be found in "Methods for Conducting Resource Extraction Individual Permit Intensive Surveys in non-OSRW Streams in the Eastern Kentucky Coalfields,"

The protocols referenced in the preceding paragraphs are available on DOW's website at www.water.ky.gov/permitting/wastewaterpermitting/KPDES/mining/coal.

Table 11 summarizes the physical and chemical monitoring requirements to be conducted at each of the instream sample locations proposed in the study plan.

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Table 11					
Characteristic	**Minimum**	**Average**	**Maximum**	**Sample Type**	**Monitoring Frequency**
Flow (cfs)		Report	Report	Instantaneous	2/Month
Dissolved Oxygen (mg/L)		Report	Report	Grab	2/month
Temperature (^{0}F)		Report	Report	Grab	2/month
Conductivity (µS/cm)		Report	Report	Grab	2/Month
Alkalinity (as mg/l CaCO3)		Report	Report	Grab	2/Month
pH (standard units)	Report		Report	Grab	2/Month
TDS (mg/l)		Report	Report	Grab	2/Month
Sulfates (as mg/l SO_4)		Report	Report	Grab	2/Month
Chlorides (mg/l)		Report	Report	Grab	2/Month
Total Calcium (µg/l)		Report	Report	Grab	2/Month
Total Magnesium (µg/l)		Report	Report	Grab	2/Month
Total Sodium (µg/l)		Report	Report	Grab	2/Month
Total Potassium (µg/l)		Report	Report	Grab	2/Month
Antimony[1] (µg/l)		Report	Report	Grab	1/Quarter
Arsenic[1] (µg/l)		Report	Report	Grab	1/Quarter
Cadmium[1] (µg/l)		Report	Report	Grab	1/Quarter
Copper[1] (µg/l)		Report	Report	Grab	1/Quarter
Iron[1] (µg/l)		Report	Report	Grab	1/Quarter
Lead[1] (µg/l)		Report	Report	Grab	1/Quarter
Manganese(µg/l)		Report	Report	Grab	1/Quarter
Mercury[1] (µg/l)		Report	Report	Grab	1/Quarter
Nickel[1] (µg/l)		Report	Report	Grab	1/Quarter
Selenium[1] (µg/l)		Report	Report	Grab	1/Quarter
Thallium[1] (µg/l)		Report	Report	Grab	1/Quarter
Zinc[1] (µg/l)		Report	Report	Grab	1/Quarter
Hardness[1] (as mg/l $CaCO_3$)		Report	Report	Grab	1/Quarter
[1]Monitoring required only at those instream monitoring locations that are upstream of a representative outfall.					
After a minimum of five (5) samples DOW will determine if the discharge has reasonable potential to cause or contribute to an excursion of either a narrative or numeric water quality standard. If reasonable potential is demonstrated then DOW shall reopen the permit to include limitations and monitoring as justified by the reasonable potential analysis. However should no reasonable potential be demonstrated then DOW shall reopen the permit to terminate the instream biological and chemical monitoring and the representative outfall monitoring.					
Beryllium, Chromium, Silver monitoring are not necessary and have been omitted from the list of pollutants to be monitored at the instream monitoring points.					

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f. Justification of requirements for instream monitoring

Alkalinity, Total Dissolved Solids, Sulfates, Chlorides, Total Calcium, Total Sodium, Total Magnesium, and Total Potassium

Specific conductance is a measure of a substance, in this case water, to conduct an electrical charge. This conductivity is directly related to the total dissolved ionized solids in the water. Common constituents of total dissolved solids are sulfates, chlorides, calcium, sodium, magnesium and potassium. By determining the predominate ion comprising the total dissolved solids concentration, the source of the ion and the impacts on the aquatic community can be ascertained. Therefore, the inclusion of these parameters as part of the monitoring scheme for mine discharges is necessary to characterize the sources and impacts of the total dissolved solids and is justified by 40 CFR 122.48(b), which requires permits to specify monitoring requirements sufficient to yield data which is representative of the monitored activity. In order to accurately document the correlation between the discharge and the effects on the receiving stream quality, the instream monitoring shall be conducted concurrently with the representative outfall monitoring.

Flow

As discussed Parts 4c and 4d of this fact sheet, 40 CFR 122.44(d) necessitates that DOW determine if a "reasonable potential" exists for the discharges from the proposed mining activity to cause or contribute to an excursion of the water quality criteria. The flow of the receiving stream upstream of the discharge is a component of the formula for calculating effluent limitations protective of human health fish consumption criteria or aquatic life chronic criteria, as both of these criteria are applied at the edge of the regulatory mixing zone pursuant to 401 KAR 10:029, Section 4. Receiving stream flow is a component in the calculation of limits based on aquatic life acute criteria when a zone of initial dilution (ZID) is granted as the result of the installation of a high-rate multiport diffuser. The permittee does not propose any such discharge structures. The inclusion of flow is also justified by 40 CFR 122.48(c).

Antimony, Arsenic, Cadmium, Copper, Lead, Mercury, Nickel, Selenium, Thallium, Zinc and Hardness

These pollutants have criteria protective of either human health fish consumption or aquatic life chronic effects, or both. In developing effluent limits based on either of these criteria, DOW must take into consideration the concentration of these pollutants in the receiving water. Development of these limitations is a necessary component of Kentucky's EPA methodology for determining "reasonable potential". Kentucky's methodology requires a minimum of 5 samples to make this determination. Once the applicant has submitted the requisite number of samples, further instream monitoring of these pollutants may be terminated. Therefore the imposition of monitoring of these pollutants is justified by 40 CFR 122.44(d).

Silver

Instream monitoring of this pollutant is unnecessary as Kentucky's water quality standards contain only an aquatic life acute criterion for silver. Such criteria apply as end-of-pipe limits without consideration of background conditions. Therefore DOW does not agree with EPA that background monitoring is necessary for this pollutant.

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Beryllium and Chromium

Instream monitoring at the points of discharge for these two pollutants is unnecessary. Kentucky's water quality standards contain only criteria for human health domestic water supply protection which, in accordance with 401 KAR 10:031 Section 3, applies at the point of withdrawal. The nearest downstream domestic water intake from Kelly Fork is located at Jackson Municipal Water Works, and the nearest downstream domestic water supply intake from Left Fork Trace Fork and Trace Fork is located at Hazard Water Department. Both are located on North Fork Kentucky River. Although the intakes are on a water body at locations 20.0 and 66.6 miles downstream of this mining activity, respectively, the appropriate background water quality to use in the calculation of effluent limits would be that of the intake water. Therefore DOW does not agree with EPA that background monitoring within watersheds directly influenced by the mining activity is necessary for this pollutant.

Biological Assessments

While water chemistry is an essential component for sustaining aquatic life and assessing water quality, it only gives a temporal "snapshot" of stream health. Biological data integrates months or even years of water quality impacts, as these organisms are year-round residents of the stream. Additionally, aquatic biota integrates the cumulative effects of multiple stressors and pollutants instead of examining particular stressors individually. Certain organisms are indicators of clean water, whereas some thrive under degraded conditions. Thus, the presence or absence of these indicator species can be used to assess the ecological health of the waterbody. DOW uses biological indicators to determine the use attainability of a water of the Commonwealth as it relates to Kentucky's narrative water quality standards. Therefore, in order to adequately determine the impact a mining activity may have on the ability of a waterbody to attain its designated use and compliance with the narrative standards, biological assessment of these streams are necessary. Biological assessment will provide a more accurate evaluation of "reasonable potential" than the development of a numerical interpretation of the narrative standard. The imposition of this requirement is consistent with 40 CFR 122.48.

5. BEST MANAGEMENT PRACTICES (BMP) PLAN

In accordance with 40 CFR 122.44(k), permits are to include Best Management Practices (BMPs) to control or abate the discharge of pollutants when: 1) authorized under section 304(e) of the CWA for the control of toxic pollutants and hazardous substances from ancillary industrial activities; 2) authorized under Section 402(p) of the CWA for the control of storm water discharges; 3) numeric effluent limitations are infeasible; or 4) the practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA. As previously indicated in this fact sheet, it is DOW's determination that control of specific conductance and total dissolved solids is not feasible through the application of a numerical effluent limit. Therefore the permittee shall develop a Best Management Practices (BMP) plan to control these pollutants. The effectiveness of the BMPs will be determined by the annual biological assessments. If these assessments indicate that impacts to the aquatic community are occurring, then the permittee shall evaluate the BMPs employed and determine if modifications to the BMP plan and selected BMPs are required.

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6. ANTIDEGRADATION

The conditions of 401 KAR 10:029, Section 1 have been satisfied. This permitting action is the issuance of a new KPDES permit authorizing expanded discharges. This permit will meet the requirements of intergovernmental coordination in the Cabinet's public participation process. The Cabinet finds that the lowering of water quality in this/these receiving waters accommodates important economic and social development in the area in which these waters are located. This finding is based on the information submitted by the permittee in the form of a socioeconomic demonstration and alternatives analysis (SDAA) pursuant to 401 KAR 10:030, Section 1(3).

7. PROPOSED COMPLIANCE SCHEDULE FOR ATTAINING EFFLUENT LIMITATIONS

Permittee shall comply with the effluent limitations by the effective date of the permit.

8. PROPOSED SPECIAL CONDITIONS WHICH WILL HAVE A SIGNIFICANT IMPACT ON THE DISCHARGE

Alkaline Mine Reclassification

The procedures for reclassifying an operation from "acid or ferruginous" mine drainage to "alkaline" mine drainage are consistent with the requirements of 401 KAR 5:065, Section 2, 4 and 5. "Alkaline mine drainage" is defined in the Coal Mining Point Source Category Effluent Guidelines (General Definitions – 40 CFR 434.11) as mine drainage which prior to any treatment has a pH equal to or greater than 6.0 standard units and a Total Recoverable Iron concentration of less than 10 mg/l.

Alternate Effluent Limitations - pH

The procedures for requesting an alternate pH final effluent limit to allow for removal of total recoverable manganese are consistent with the requirements of 401 KAR 5:065, Section 2(1), 4 and 5. In accordance with the Coal Mining Point Source Category Effluent Guidelines (alternate effluent limitation for pH – 40 CFR 434.61) the permit-issuing authority may allow the pH level in the final effluent to exceed 9.0 standard units to a small extent in order that total recoverable manganese limitations may be achieved when the application of neutralization and sedimentation treatment technology results in the inability to comply.

Alternate Effluent Limitations - Precipitation

The procedures for requesting an alternate precipitation effluent limit are consistent with the requirements of 401 KAR 5:065, Section 2(1), 4 and 5. In accordance with the Coal Mining Point Source Category Effluent Guidelines (Alternate effluent limitation for precipitation events – 40 CFR 434.63) the permit-issuing authority may grant on an event-by-event basis alternate effluent limitations based on type of discharge and preceding 24-hour precipitation.

Authorization to Discharge

The permittee is authorized to discharge under the terms of the permit upon receipt of written notification by the KYDOW and upon the issuance of a fully effective permanent program permit by DNR.

Commingling of Waste streams

Where wastestreams from any facility covered by this permit are combined for treatment or discharge with wastestreams from another facility, the concentration of each pollutant in the combined discharge may not exceed the most stringent limitations for that pollutant applicable to any component wastestream of the discharge. This requirement is consistent with the requirements of 401 KAR 5:065, Sections 2, 4 and 5 (40 CFR Part 434.61).

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Department of the Army, Corps of Engineers Condition

Pursuant to the requirements of 40 CFR 124.59(a) and 401 KAR 5:075, Section 9 the following special condition is applicable to certain coal mining operations, which affect anchorage and navigation of any waters of the United States, which are under the jurisdiction of the Corps of Engineers. The applicability of this condition to specific dischargers will be included in the written notice from the DOW that authorizes discharge under this permit.

The permittee shall undertake erosion control practices which utilize proper sedimentation control measures in order to minimize resultant sedimentation in navigable waters which occur as a result of discharges from both point and non-point sources connected with the overall operations. The practices will apply to existing and future facilities and activities, and will, at a minimum, provide for the control of erosion and runoff from access and haul roads, coal handling structures, utility right-of-way easements, and excavations. The permittee will also provide adequate ditching, culverts, sediment traps and ponds, and other structures or procedures necessary to minimize sedimentation in navigable waters. The DOW shall have the right to inspect the sediment control measures being undertaken by the permittee and, in consultation with the U.S. Army Corps of Engineers, direct any additional measures which are necessary to comply with the requirements of this condition. Should this discharge result in sufficient deposition of solids material to create a hazard to anchorage or navigation on any navigable water, such deposits will be removed by the permittee without expense to the United States Government. Further, the time and manner of such removal, as well as the location and manner of its disposal, must receive the prior written approval by the District Engineer of the Corps of Engineers.

Instream Treatment or Disposal Facilities

This permit does not authorize the construction or use of instream treatment or disposal facilities (sediment ponds, hollow fills, valley fills, slurry ponds, etc.) Such authorization is within the jurisdiction of the Corps of Engineers (COE) and is implemented through the Section 404 permitting program of the Clean Water Act. Since the COE is a federal agency, this permitting action requires the issuance of a Section 401 Water Quality Certification by the DNR. The requirements of the 401 Water Quality Certification issued for this operation are hereby incorporated by reference into the KPDES permit as enforceable requirements.

Public-Owned Lake Requirement

Pursuant to the requirements of 401 KAR 5:026, Section 7, 401 KAR 5:031, and 40 CFR 125.3(c)(2) as incorporated by reference in 401 KAR 5:080, Section 2(3), those operations which discharge directly to, or to a first or second order tributary of a publicly owned lake are not eligible for coverage under the KPDES coal general permit, therefore an individual permit is required.

9. PERMIT DURATION

Five (5) years. This facility is in the Kentucky Basin Management Unit as per the Kentucky Watershed Management Framework.

10. PERMIT INFORMATION

The application, draft permit fact sheet, public notice, comments received and additional information is available by writing the Division of Water at 200 Fair Oaks Lane, Frankfort, Kentucky 40601.

11. REFERENCES AND CITED DOCUMENTS

All material and documents referenced or cited in this fact sheet are parts of the permit information as described above and are readily available at the Division of Water Central Office. Information regarding these materials may be obtained from the person listed below.

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12. CONTACT

For further information contact the individual identified on the Public Notice or Heather Dodds at (502) 564-8158 extension 4953, or by e-mail at: heather.dodds@ky.gov.

13. PUBLIC NOTICE INFORMATION

Please refer to the attached Public Notice for details regarding the procedures for a final permit decision, deadline for comments, and other information required by 401 KAR 5:075, Section 4(2)(e).

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KPDES

KENTUCKY POLLUTANT DISCHARGE ELIMINATION SYSTEM

PERMIT

PERMIT NO.: KY0107808
AI NO.: 97743

AUTHORIZATION TO DISCHARGE UNDER THE KENTUCKY POLLUTANT DISCHARGE ELIMINATION SYSTEM

Pursuant to Authority in KRS 224,

Enterprise Mining Company LLC
117 Madison Ave Ste B
Whitesburg, KY 41858

is authorized to discharge from a facility located at

DNR Permit No.: 860-0448 NW through AM-04
Trace Fork Surface Mine
Lakeshore Rd
Amburgey, Knott County, Kentucky

to receiving waters named

Kelly Fork, Left Fork Trace Fork, and Trace Fork

in accordance with effluent limitations, monitoring requirements, and other conditions set forth in PARTS I, II, III, and IV hereof. The permit consists of this cover sheet, and PART I 14 pages, PART II 1 page, PART III 3 pages, and PART IV 2 pages.

This permit shall become effective on.

This permit and the authorization to discharge shall expire at midnight,

{Date}
Date Signed

{Signature}
Sandra L. Gruzesky, Director
Division of Water

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PART I. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

A. REQUIREMENTS FOR ALL SEDIMENT CONTROL STRUCTURES

Table 1lists the outfalls authorized by this permit, the latitude and longitude of each, the pond number, and the DOW assigned KPDES outfall number.

Table 1			
Receiving Water	**Pond No.**	**Latitude (N)**	**Longitude (W)**
Kelly Fork	BS21	37-16-08	83-00-59
	BS22	37-16-14	83-00-57
	BS23	37-16-16	83-00-47
	BS24	37-16-18	83-00-41
	BS25	37-16-23	83-00-41
	BS25	37-16-23	83-00-41
	BS26	37-16-11	83-01-04
	SS5	37-16-18	83-00-57
Left Fork Trace Fork	BS9	37-15-58	83-00-38
	BS10	37-15-56	83-00-38
	BS11	37-15-40	83-00-28
	BS12	37-15-37	83-00-18
	BS13	37-15-35	83-00-09
	SS2A	37-15-48	83-00-28
	SS3	37-15-46	83-00-33
Trace Fork	BS14	37-15-43	83-00-04
	BS15	37-15-49	83-00-07
	BS16	37-15-59	83-00-09
	BS17	37-16-05	83-00-13
	BS18	37-16-13	83-00-15
	BS19	37-16-21	83-00-19
	BS20	37-16-25	83-00-18

Beginning on the effective date and lasting through either Phase I bond release or the term of this permit discharges from those outfalls listed in Table 1 that receive drainage from "active mine areas" shall comply with the effluent limitations, monitoring frequencies, sample type and other requirements as specified in Table 2.

Beginning on the date of Phase I bond release and lasting through either Phase III bond release or the term of this permit discharges from those outfalls listed in Table 1 that receive drainage from "reclamation areas" shall comply with the effluent limitations, monitoring frequencies, sample type and other requirements as specified in Table 3.

There shall be no discharge of floating solids or visible foam or sheen in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location: nearest accessible point prior to discharge to or mixing with the receiving waters or wastestreams from other outfalls.

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Table 2					
Effluent Characteristic	**Minimum**	**Average**	**Maximum**	**Sample Type**	**Monitoring Frequency**
Flow (cfs)		Report	Report	Instantaneous	2/Month
Conductivity (µS/cm)		Report	Report	Grab	2/Month
Acidity[1]		Report	Report	Grab	1/Month
Alkalinity[1]		Report	Report	Grab	1/Month
Oil & Grease (mg/l)[2]		10	15	Grab	1/Month
Iron (mg/l)[3]		3.0	4.0	Grab	2/Month
Manganese (mg/l)[3]		2.0	4.0	Grab	2/Month
TSS (mg/l)[4]		35.0	70.0	Grab	2/Month
pH (standard units)[5]	6.0		9.0	Grab	2/Month
Total dissolved solids or specific conductance shall not be changed to the extent that the indigenous aquatic community is adversely affected.					
[1]At all times Acidity shall be less than Alkalinity and shall be measured as (mg/l $CaCO_3$)					
[2]The limits and monitoring for Oil & Grease do not apply if the permittee has developed and implemented a "Best Management Practices" (BMP) plan as required by this permit. The BMP plan shall include a specific section that addresses the handling, storage and disposal of petroleum products and the maintenance procedures for mining equipment.					
[3]Iron and Manganese shall be reported as Total Recoverable					
[4]TSS means Total Suspended Solids					
[5]Discharges from this operation shall not cause more than a 1.0 standard unit fluctuation of the receiving stream pH over a period of 24 hours.					

Table 3					
Effluent Characteristic	**Minimum**	**Average**	**Maximum**	**Sample Type**	**Monitoring Frequency**
Flow (cfs)		Report	Report	Instantaneous	1/Month
Conductivity (µS/cm)		Report	Report	Grab	1/Month
Acidity[1]		Report	Report	Grab	1/Month
Alkalinity[1]		Report	Report	Grab	1/Month
Oil & Grease (mg/l)[2]		10	15	Grab	1/Month
Settleable Solids (ml/l)[3]		Report	0.5	Grab	1/Month
pH (standard units)[4]	6.0		9.0	Grab	1/Month
Total dissolved solids or specific conductance shall not be changed to the extent that the indigenous aquatic community is adversely affected.					
[1]At all times Acidity shall be less than Alkalinity and shall be measured as (mg/l $CaCO_3$)					
[2]The limits and monitoring for Oil & Grease do not apply if the permittee has developed and implemented a "Best Management Practices" (BMP) plan as required by this permit. The BMP plan shall include a specific section that addresses the handling, storage and disposal of petroleum products and the maintenance procedures for mining equipment.					
[3]The limit for Settleable Solids is an instantaneous maximum					
[4]Discharges from this operation shall not cause more than a 1.0 standard unit fluctuation of the receiving stream pH over a period of 24 hours.					

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B. REQUIREMENTS FOR REPRESENTATIVE SEDIMENT CONTROL STRUCTURES

Beginning on the effective date and lasting through the term of this permit, discharges from those outfalls listed in Table 1 that have been designated as "representative sediment control structures" shall comply with the additional monitoring requirements specified in Table 4. The permittee shall select these representative outfalls using the following criteria: 1) one (1) outfall per receiving water in order for the impacts on each affected receiving water can be accurately evaluated; 2) receives drainage from a hollow fill as these types of ponds are more likely to have discharges than on-bench structures; and 3) the first outfalls that meet conditions 1 and 2 so as to obtain the required information as expeditiously as possible. Within 30 days of the effective date of this permit, DOW shall receive written notification identifying those ponds selected as "representative sediment control structures".

Table 4

Effluent Characteristic	Average	Maximum	Sample Type	Monitoring Frequency
Duration of Discharge (days)	Report	Report	Instantaneous	2/Month
TDS (mg/l)	Report	Report	Grab	2/Month
Sulfates (as mg/l SO_4)	Report	Report	Grab	2/Month
Chlorides (mg/l)	Report	Report	Grab	2/Month
Total Calcium (µg/l)	Report	Report	Grab	2/Month
Total Magnesium (µg/l)	Report	Report	Grab	2/Month
Total Sodium (µg/l)	Report	Report	Grab	2/Month
Total Potassium (µg/l)	Report	Report	Grab	2/Month
Acute Whole Effluent Toxicity		Report	Grab	1/Quarter
Antimony (µg/l)	Report	Report	Grab	1/Quarter
Arsenic (µg/l)	Report	Report	Grab	1/Quarter
Beryllium (µg/l)	Report	Report	Grab	1/Quarter
Cadmium (µg/l)	Report	Report	Grab	1/Quarter
Chromium (µg/l)	Report	Report	Grab	1/Quarter
Copper (µg/l)	Report	Report	Grab	1/Quarter
Lead (µg/l)	Report	Report	Grab	1/Quarter
Mercury (µg/l)	Report	Report	Grab	1/Quarter
Nickel (µg/l)	Report	Report	Grab	1/Quarter
Selenium (µg/l)	Report	Report	Grab	1/Quarter
Silver (µg/l)	Report	Report	Grab	1/Quarter
Thallium (µg/l)	Report	Report	Grab	1/Quarter
Zinc (µg/l)	Report	Report	Grab	1/Quarter
Hardness (as mg/l $CaCO_3$)	Report	Report	Grab	1/Quarter
After a minimum of five (5) samples DOW will determine if the discharge has reasonable potential to cause or contribute to an excursion of either a narrative or numeric water quality standard. If reasonable potential is demonstrated then DOW shall reopen the permit to include limitations and monitoring as justified by the reasonable potential analysis. However should no reasonable potential be demonstrated then DOW shall reopen the permit to terminate the instream biological and chemical monitoring and the additional outfall monitoring.				

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C. REQUIREMENTS FOR INSTREAM MONITORING

Within 30 days of the effective date of the permit, the permittee shall submit to DOW for review and approval a study plan to determine pre-mining conditions of the affected watersheds and to evaluate the impact of the discharges upon the affected watersheds. The study plan shall be developed in accordance with appropriate protocols and quality assurance requirements as specified in "Quality Assurance Project Plan for Individual Coal-mining Permits: Focus Monitoring for Water Quality, Biological Communities and Habitat Conditions". The number of instream monitoring locations will be dependent upon the size and number of watersheds involved and the number of outfalls associated with each watershed. The permittee should propose a sufficient number of monitoring locations to adequately document the pre-mining conditions and to evaluate the effects the mining activity is having on the watersheds involved. Monitoring locations in the receiving stream above and below the impacted watershed shall be included.

Biological sampling shall be conducted at the each of the instream monitoring locations proposed in the approved study plan. Sample collection shall be conducted during the appropriate index period commensurate with size of the stream. Standard operating procedures that shall be used to conduct individual permit intensive surveys can be found in "Methods for Conducting Resource Extraction Individual Permit Intensive Surveys on non-OSRW streams in the Eastern Kentucky Coalfields."

The permittee will provide DOW with a paper and an electronic version of an annual intensive survey report by July 31st of the following year. Tables and charts within the electronic version of the report must be in spreadsheet format. This report shall be sent directly to the Surface Water Permit Branch for review. Annual reporting requirements can be found in "Methods for Conducting Resource Extraction Individual Permit Intensive Surveys in non-OSRW Streams in the Eastern Kentucky Coalfields,"

The protocols referenced in the preceding paragraphs are available on DOW's website at www.water.ky.gov/permitting/wastewaterpermitting/KPDES/mining/coal.

Table 5 summarizes the physical and chemical monitoring requirements to be conducted at each of the instream sample locations proposed in the approved study plan.

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Table 5					
Characteristic	**Minimum**	**Average**	**Maximum**	**Sample Type**	**Monitoring Frequency**
Flow (cfs)		Report	Report	Instantaneous	2/Month
Conductivity (µS/cm)		Report	Report	Grab	2/Month
Dissolved Oxygen (mg/L)		Report	Report	Grab	2/month
Temperature (^{0}F)		Report	Report	Grab	2/month
Alkalinity (as mg/l CaCO3)		Report	Report	Grab	2/Month
pH (standard units)	Report		Report	Grab	2/Month
TDS (mg/l)		Report	Report	Grab	2/Month
Sulfates (as mg/l SO_4)		Report	Report	Grab	2/Month
Chlorides (mg/l)		Report	Report	Grab	2/Month
Total Calcium (µg/l)		Report	Report	Grab	2/Month
Total Magnesium (µg/l)		Report	Report	Grab	2/Month
Total Sodium (µg/l)		Report	Report	Grab	2/Month
Total Potassium (µg/l)		Report	Report	Grab	2/Month
Antimony[1,2] (µg/l)		Report	Report	Grab	1/Quarter
Arsenic[1,2] (µg/l)		Report	Report	Grab	1/Quarter
Cadmium[1,2] (µg/l)		Report	Report	Grab	1/Quarter
Copper[1,2](µg/l)		Report	Report	Grab	1/Quarter
Lead[1,2](µg/l)		Report	Report	Grab	1/Quarter
Mercury[1,2](µg/l)		Report	Report	Grab	1/Quarter
Nickel[1,2](µg/l)		Report	Report	Grab	1/Quarter
Selenium[1,2](µg/l)		Report	Report	Grab	1/Quarter
Thallium[1,2](µg/l)		Report	Report	Grab	1/Quarter
Zinc[1,2] (µg/l)		Report	Report	Grab	1/Quarter
Hardness[1,2] (as mg/l $CaCO_3$)		Report	Report	Grab	1/Quarter
[1]Monitoring required only at those instream monitoring locations that are upstream of a representative outfall.					
After a minimum of five (5) samples DOW will determine if the discharge has reasonable potential to cause or contribute to an excursion of either a narrative or numeric water quality standard. If reasonable potential is demonstrated then DOW shall reopen the permit to include limitations and monitoring as justified by the reasonable potential analysis. However should no reasonable potential be demonstrated then DOW shall reopen the permit to terminate the instream biological and chemical monitoring and the additional outfall monitoring.					

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D. OTHER REQUIREMENTS

Alkaline Mine Reclassification

Title 40 Chapter I Subpart 434.11 "General Definitions" defines "alkaline mine drainage" as mine drainage, before any treatment, has a pH equal to or greater than 6.0 standard units and a total iron concentration of 10 mg/l. As information is unavailable at the time the permittee submits an application for an individual permit, the default classification for all mine drainage is "acid or ferruginous". Should the permittee have reason to believe the drainage from an operation would be more appropriately classified as "alkaline," the permittee must satisfactorily demonstrate to DOW that the mine drainage, prior to treatment, has a pH greater than or equal to 6.0 standard units and a total recoverable iron concentration less than 10 mg/l.

This demonstration shall consist of a mine map with the monitoring locations clearly labeled, including the latitude and longitude in decimal degrees. There shall be a sufficient number of monitoring locations to adequately characterize any variations within the drainage from all parts of the mining activity. These monitoring locations **CANNOT COINCIDE** with any sediment structure discharge point, as untreated drainage must be collected for the demonstration. At least six (6) months of data to characterize the flow, pH and the total recoverable iron concentration of the influent or untreated effluent shall be collected and submitted as part of this demonstration.

The effect of reclassifying the mine from "acid or ferruginous" to "alkaline" is to remove the effluent limitations and monitoring requirements for total recoverable manganese, which constitutes a major modification and necessitates the reopening of the KPDES permit.

Alternate Effluent Limitations - pH

Pursuant to 401 KAR 5:065, Sections 4 and 5 (40 CFR Part 434.62), the permit-issuing authority may allow the pH level in the final effluent to exceed 9.0 standard units to a small extent in order that the manganese limitations may be achieved when the application of neutralization and sedimentation treatment technology results in the inability to comply. This alternate pH limitation shall be granted upon request for a specific discharge, provided the operator submits sufficient documentation, with the Discharge Monitoring Report (DMR), that an effluent pH of greater than 9.0 standard units was required to achieve the manganese limitation. However, under no circumstances shall the pH exceed 10.0 standard units.

This documentation shall include sample results utilized to determine that additional pH adjustment to between 9.0 and 10.0 standard units was required. This data shall include flow, pH, and total recoverable manganese concentration. In the event the Cabinet determines this condition to be chronic, the permittee shall submit plans for a permanent a solution.

Alternate Effluent Limitations - Precipitation

Pursuant to the requirements of 401 KAR 5:065, Section 4(2) (40 CFR Part 434.63), precipitation-induced discharges are eligible for alternate effluent limits. The applicable alternate limits are a function of the size of the precipitation event and the type of operation, and shall be granted on an event-by-event basis, provided the operator requests alternate precipitation limitations and provides sufficient proof that the discharge or increase in the discharge was caused by the applicable precipitation event described. This could be in the form of precipitation data, weir flow measurements, dated photographs, or equivalent proof of record. This information shall be submitted with the Discharge Monitoring Report (DMR). The following alternate limitations are available:

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(a)(1) The alternate limitations specified in paragraph (a)(2) of this section apply with respect to:

(i) All discharges of alkaline mine drainage except discharges from underground workings of underground mines that are not commingled with other discharges eligible for these alternate limitations;

(ii) All discharges from steep slope areas, (as defined in section 515(d)(4) of the Surface Mining Control and Reclamation Act of 1977, as amended (SMCRA)), and from mountaintop removal operations (conducted pursuant to section 515(c) of SMCRA);

(iii) Discharges from coal preparation plants and preparation plant associated areas (excluding acid or ferruginous mine drainage from coal refuse disposal piles).

(2) Any discharge or increase in the volume of a discharge caused by precipitation within any 24 hour period less than or equal to the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume) may comply with the following limitations instead of the otherwise applicable limitations:

EFFLUENT LIMITATIONS DURING PRECIPITATION	
POLLUTANT OR POLLUTANT PROPERTY	**EFFLUENT LIMITATIONS**
Settleable Solids	0.5 ml/l maximum not to be exceeded
pH	6.0 to 9.0 at all times

(b) The following alternate limitations apply with respect to acid or ferruginous drainage from coal refuse disposal piles:

Any discharge or increase in the volume of a discharge caused by precipitation within any 24 hour period greater than the 1-year, 24-hour precipitation event, but less than or equal to the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume) may comply with the following limitations instead of the otherwise applicable limitations:

EFFLUENT LIMITATIONS DURING PRECIPITATION	
POLLUTANT OR POLLUTANT PROPERTY	**EFFLUENT LIMITATIONS**
Settleable Solids	0.5 ml/l maximum not to be exceeded
pH	6.0 to 9.0 at all times

(c) The following alternate limitations apply with respect to acid or ferruginous mine drainage, except for discharges addressed in paragraphs (a) (mountaintop removal and steep slope areas), (d) (controlled surface mine discharges) and (f) (discharges from underground workings of underground mines) of this section:

(1) Any discharge or increase in the volume of a discharge caused by precipitation within any 24 hour period less than or equal to the 2-year, 24-hour precipitation event (or snowmelt of equivalent volume) may comply with the following limitations instead of the otherwise applicable limitations:

EFFLUENT LIMITATIONS DURING PRECIPITATION	
POLLUTANT OR POLLUTANT PROPERTY	**EFFLUENT LIMITATIONS**
Total Recoverable Iron	7.0 mg/l maximum for any 1 day
Settleable Solids	0.5 ml/l maximum not to be exceeded
pH	6.0 to 9.0 at all times

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(2) Any discharge or increase in the volume of a discharge caused by precipitation within any 24 hour period greater than the 2-year, 24-hour precipitation event, but less than or equal to the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume) may comply with the following limitations instead of the otherwise applicable limitations:

EFFLUENT LIMITATIONS DURING PRECIPITATION	
POLLUTANT OR POLLUTANT PROPERTY	**EFFLUENT LIMITATIONS**
Settleable Solids	0.5 ml/l maximum not to be exceeded
pH	6.0 to 9.0 at all times

(d)(1) The alternate limitations specified in paragraph (d)(2) of this section apply with respect to all discharges described in paragraphs (a), (b) and (c) of this section and to:

(i) Discharges of acid or ferruginous mine drainage from underground workings of underground mines which are commingled with other discharges eligible for these alternate limitations; and

(ii) Controlled acid or ferruginous surface mine discharges; and

(iii) Discharges from reclamation areas.

(2) Any discharge or increase in the volume of a discharge caused by precipitation within any 24 hour period greater than the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume) may comply with the following limitations instead of the otherwise applicable limitations:

EFFLUENT LIMITATIONS DURING PRECIPITATION	
POLLUTANT OR POLLUTANT PROPERTY	**EFFLUENT LIMITATIONS**
pH	6.0 to 9.0 at all times

(e) The operator shall have the burden of proof that the discharge or increase in the discharge was caused by the applicable precipitation event described in the previous paragraphs. Such proof shall take the form of a daily precipitation log maintained in accordance with the requirements of 401 KAR 5:065, Section 1(10) or local NOAA weather station records or equivalent. For alternate precipitation event limits related to self monitoring this information shall be submitted with the Discharge Monitoring Report at the end of the monthly monitoring period. For compliance samples collected by any representative of the EEC the permittee has 7 calendar days from the date of the mine inspection report to submit proof of a qualifying event has occurred. For all other events the precipitation logs shall be provided upon request to any representative of the EEC.

(f) Discharges of mine drainage from underground workings of underground mines, which are not commingled with discharges eligible for the alternate limitations, shall in no event be eligible for the alternate limitations.\

(g) The applicable alternate limits are a function of the size of the precipitation event and the type of operation. These alternate limits shall be granted on an event-by-event basis, provided the operator requests them and submits sufficient documentation as specified above in paragraph (e) above. Alternate limits are not available for the parameters of Flow, Oil & Grease, Acidity, and Alkalinity.

Table 6 summarizes these alternate precipitation effluent limitations.

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Table 6 – ALTERNATE PRECIPITATION EVENT EFFLUENT REQUIREMENTS				
TYPE OF DISCHARGE	**PRECIPITATION EVENT**			
	Discharge Caused by Precipitation	**1-yr, 24-hr Event**	**2-yr, 24-hr Event**	**10-yr, 24-hr Event**
Discharges from underground workings of underground mines not commingled including alkaline mines	**NO ALTERNATE LIMITATIONS**	**NO ALTERNATE LIMITATIONS**	**NO ALTERNATE LIMITATIONS**	**NO ALTERNATE LIMITATIONS**
Discharges of dredge return water	**NO ALTERNATE LIMITATIONS**	**NO ALTERNATE LIMITATIONS**	**NO ALTERNATE LIMITATIONS**	**NO ALTERNATE LIMITATIONS**
Discharges from underground workings of underground mines commingled	**NO ALTERNATE LIMITATIONS**	**NO ALTERNATE LIMITATIONS**	**NO ALTERNATE LIMITATIONS**	pH
Controlled surface mine drainage (except steep slope and mountaintop removal)	**NO ALTERNATE LIMITATIONS**	**NO ALTERNATE LIMITATIONS**	**NO ALTERNATE LIMITATIONS**	pH
Non-controlled surface mine drainage (except steep slope and mountaintop removal)	SS, pH, Fe	SS, pH, Fe	SS, pH	pH
Discharges from coal refuse disposal piles	**NO ALTERNATE LIMITATIONS**	SS, pH	SS, pH	pH
Discharges from steep slope and mountaintop removal areas	SS, pH	SS, pH	SS, pH	pH
Discharges from preparation plant associated areas (excluding coal refuse disposal piles)	SS, pH	SS, pH	SS, pH	pH
Alkaline Mine Drainage	SS, pH	SS, pH	SS, pH	pH
Reclamation Areas	SS, pH	SS, pH	SS, pH	pH
The abbreviations Fe and SS mean Total Recoverable Iron and Settleable Solids, respectively.				
The applicable alternate limits are a function of the size of the precipitation event and the type of operation and shall be granted on an event-by-event basis, provided the operator requests alternate precipitation limitations and provides sufficient proof that the discharge or increase in the discharge was caused by the applicable precipitation event described.				
These alternate limits do not affect the parameters of Flow, Oil & Grease, Acidity, Alkalinity, or Conductivity				

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Authorization to Discharge
The permittee is authorized to discharge under the terms of the permit upon receipt of written notification by the DOW and upon the issuance of a fully effective permanent program permit by DNR.

Commingling of Wastestreams
Where wastestreams from any facility covered by this permit are combined for treatment or discharge with wastestreams from another facility, the concentration of each pollutant in the combined discharge may not exceed the most stringent limitations for that pollutant applicable to any component wastestream of the discharge. This requirement is consistent with the requirements of 401 KAR 5:065, Sections 4 and 5 (40 CFR Part 434.61).

Instream Treatment or Disposal Facilities
This permit does not authorize the construction or use of instream treatment or disposal facilities (sediment ponds, hollow fills, valley fills, slurry ponds, etc.) Such authorization is within the jurisdiction of the Corps of Engineers (COE) and is implemented through the Section 404 permitting program of the Clean Water Act. Since the COE is a federal agency, this permitting action requires the issuance of a Section 401 Water Quality Certification by the DNR. The requirements of the 401 Water Quality Certification issued for this operation are hereby incorporated by reference into the KPDES permit as enforceable requirements.

Department of the Army, Corps of Engineers Condition
The following special condition is applicable to certain coal mining operations, which affect anchorage and navigation of any waters of the United States, which are under the jurisdiction of the Corps of Engineers. The applicability of this condition to specific dischargers will be included in the written notice from the DOW that authorizes discharge under this permit.

The permittee shall undertake erosion control practices which utilize proper sedimentation control measures in order to minimize resultant sedimentation in navigable waters which occur as a result of discharges from both point and non-point sources connected with the overall operations. The practices will apply to existing and future facilities and activities, and will, at a minimum, provide for the control of erosion and runoff from access and haul roads, coal handling structures, utility right-of-way easements, and excavations. The permittee will also provide adequate ditching, culverts, sediment traps and ponds, and other structures or procedures necessary to minimize sedimentation in navigable waters. The DOW shall have the right to inspect the sediment control measures being undertaken by the permittee and, in consultation with the U.S. Army Corps of Engineers, direct any additional measures which are necessary to comply with the requirements of this condition. Should this discharge result in sufficient deposition of solids material to create a hazard to anchorage or navigation on any navigable water, such deposits will be removed by the permittee without expense to the United States Government. Further, the time and manner of such removal, as well as the location and manner of its disposal, must receive the prior written approval by the District Engineer of the Corps of Engineers.

Public-Owned Lake Requirement
Left Fork Trace Fork is a first-order tributary to Carr Creek reservoir which is classified as a Public-owned lake. Mining activities that take place in such watersheds present the greatest potential for degradation of the lake's water quality. In order to adequately protect this classification, the following special conditions are being imposed:

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A 100-FOOT BUFFER ZONE ABOUT THE STREAM SHALL BE MAINTAINED, THUS PROHIBITING ANY INSTREAM DISTURBANCES OR STRUCTURES. The permittee may request a variance from this condition provided an alternative analysis is performed and appropriate mitigation is proposed and implemented. This variance shall be in the form of a 401 Water Quality Certification, if a USCOE permit is obtained or similar Division of Water approval. The conditions of the 401 Water Quality Certification or Division of Water approval shall be automatically incorporated as conditions of this permit.

Prior to commencement of any mining related activity, the background biological, chemical and physical conditions of the impacted water bodies shall be established. To effectively determine these conditions, the permittee shall develop and submit a Plan of Study to the Division of Water for review and concurrence. The development of this Plan of Study shall be in accordance with the requirements of the Publicly Owned Lake Protocols (Latest Revision Date), developed by the Standards and Specifications Section of the Water Quality Branch of the Division of Water. A copy of these protocols can be found at the following Division of Water website:
http://www.water.ky.gov/permitting/wastewaterpermitting/KPDES/mining/coal.htm.htm
.

During mining the permittee shall continue to collect data in accordance with the Plan of Study and the Publicly Owned Lake Protocols and submit to the Division of Water for review. Submission of all related reports, studies, etc., shall be to the Inventory and Data Management Section of the KPDES Branch. All documents are to include the KPDES and DNR permit numbers on the title pages.

E. SCHEDULE OF COMPLIANCE

The permittees shall attain compliance with all requirements of this permit on the effective date of this permit unless otherwise stated.

F. MONITORING AND REPORTING

Samples and measurements taken in accordance with the requirements of PART I shall be representative of the volume and nature of the monitored discharge and shall be taken at the following location: at nearest accessible point after final treatment, but prior to actual discharge to or mixing with the receiving waters. For sediment control structures the spillway/discharge pipe of the structure shall be designated as the compliance point unless the permittee has constructed and bonded a discharge channel from the sediment control structure to the receiving water. For discharge channels the compliance point shall be that point along the discharge channel that the permittee and the Cabinet have agreed upon. **SAMPLES ARE NOT TO BE TAKEN FROM THE SEDIMENT STRUCTURE WHEN THERE IS NO DISCHARGE.**

Discharge monitoring results obtained during the previous month shall be summarized for each outfall and reported using only KDOW approved Discharge Monitoring Report (DMR) forms and formats. DMRs for each calendar quarter shall be postmarked no later than the 28th day of the month and submitted to the appropriate Department for Natural Resources Regional Office for your operation.

“Representative Outfall”, “Instream Monitoring” and “Biological Assessment” related monitoring and reporting shall be submitted to the Division of Water’s Surface Water Permits Branch.

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G. DEFINITIONS

The terms **"1-year, 2-year, and 10-year, 24-hour precipitation events"** mean the maximum 24-hour precipitation event with a probable recurrence interval of once in one (1), two (2), and ten (10) years, respectively, as defined by the National Weather Service and Technical Paper No. 40, "Rainfall Frequency Atlas of the U.S.," May 1961, or equivalent regional or rainfall probability information developed there from.
The term "abandoned mine" means a mine where mining operations have occurred in the past and (1) the applicable reclamation bond or financial assurance has been released or forfeited, or (2) if no reclamation bond or other financial assurance has been posted, no mining operations have occurred for five (5) years or more.

The term "acid or ferruginous mine drainage" means mine drainage which, before any treatment, has a pH of less than 6.0 or has a total recoverable iron concentration equal to or greater than 10.0 mg/l.

The term "active mining area" means the area, on and beneath land, used or disturbed in activity related to the extraction, removal, or recovery of coal from its natural deposits. This term excludes coal preparation plants, coal preparation plant associated areas, and post-mining areas.

The term "alkaline mine drainage" means mine drainage, which before any treatment, has a pH equal to or greater than 6.0 and Total Recoverable Iron Concentration of less than 10.0 mg/l.

The term “calendar day” means, for the purpose of this permit, any 24-hour period.

The term "coal preparation plant" means a facility where coal is subjected to cleaning, concentrating, or other processing or preparation in order to separate coal from its impurities and then is loaded for transit to a consuming facility.

The term "coal preparation plant associated areas" means the coal preparation plant yards, immediate access roads, coal refuse piles, and coal storage piles and facilities.

The term "coal preparation plant water circuit" means all pipes, channels, basins, tanks, and all other structures and equipment that convey, contain, treat, or process any water that is used in coal preparation processes within a coal preparation plant.

The term "coal refuse disposal pile" means any coal refuse deposited on the earth and intended as permanent disposal or long-term storage (greater than 180 days) of such material, but does not include coal refuse deposited within the active mining area or coal refuse never removed from the active mining area.

The term “coal remining operation” means a coal mining operation at a site on which coal mining was previously conducted and where the site has been abandoned or the performance bond has been forfeited.

The term "controlled surface mine drainage" means any surface mine drainage that is pumped or siphoned from the active mining area.

The term “daily maximum concentration” means the daily determination of concentration as an instantaneous maximum that cannot be exceeded by any sample.

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The term “daily precipitation log” means a daily record of precipitation levels maintained by the permittee to provide proof that a qualifying event has occurred within the preceding 24 hours. This may take the form of daily readings of local rain gages, National Oceanic and Atmospheric Administration data, etc.

The term “existing source coal mine” means a coal mine, which the KYDOW determines is neither a “new source coal mine” nor a “new discharger coal mine.”

The term “expanded operation” means any amendment or revision of a mining plan, which meets conditions 2, 3, or 5 of the term “major alteration”.

The term "final bond release" means the time at which the Department for Surface Mining Reclamation and Enforcement returns any remaining reclamation or performance bond based upon its determination that reclamation work (including, in the case of underground mines, mine sealing, and abandonment procedures) and revegetation requirements have been satisfactorily completed.

The term “grab sample” means a single influent or effluent portion collected in less than fifteen (15) minutes at the period most representative of the total discharge.

The term “instantaneous maximum” means the maximum value not to be exceeded at any time.

The term “major alteration” means a coal mine for which the KYDOW determines that a new, altered, or increased discharge of pollutants has occurred after May 29, 1981, in connection with the mine for which the KPDES permit is being considered. In making this determination, the KYDOW shall take into account one or more of the following events: 1) Extraction of a coal seam not previously extracted by that mine; 2) Discharge into a drainage area not previously affected by wastewater discharges from the mine; 3) Extensive new surface disturbance at the mining operation; 4) Construction of a new shaft, slope, or drift; and 5) Such other factors as the Director of the KYDOW deems relevant.

The term "mine drainage" means any drainage and any water pumped or siphoned from an active mining area or a post-mining area.

The abbreviation "ml/l" means milliliters per liter.

The term “monthly average concentration” means the arithmetic average of all sample concentrations collected during a calendar month.

The term “new discharger coal mine” means a coal mine: 1) from which there is or may be a new or additional discharge of pollutants at a site at which on August 13, 1979, it had never discharged pollutants; and 2) which has never received a finally effective KPDES or NPDES permit for discharge at that site; and 3) which is not a new source.

The term "new source coal mine" means a coal mine (excluding coal preparation plants and coal preparation plant associated areas), including an abandoned mine, which is being re-mined, on which construction is commenced after May 4, 1984; or which is determined by the Director of the KYDOW to constitute a "major alteration."

The term “phase I reclamation bond release” means release by the Department for Surface Mining Reclamation and Enforcement of a portion of the performance bond after the following work has been completed: backfilling, re-grading, top soil replacement, drainage control work, including soil preparation, re-grading, seeding, planting, and mulching in accordance with the approved reclamation plan.

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The term “point source” means any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, culvert, tunnel, conduit, well, discrete fissure, container, wet seals, mine adits, seeps, or sumps, from which pollutants are or may be discharged.

The term "post-mining area" means: 1) A reclamation area; or 2) The underground workings of an underground coal mine after the extraction, removal, or recovery of coal from its natural deposit has ceased and prior to bond release.

The term "reclamation area" means the surface area of a coal mine, which has been returned to required contour and on which revegetation (specifically, seeding or planting) work has commenced.

The term "settleable solids" is that matter measured by the volumetric method specified in PART I, F of the permit.

The terms "treatment facility" and "treatment system" mean all structures, which contain, convey, and as necessary, chemically or physically treat coal mine drainage, coal preparation plant process wastewater, or drainage from coal preparation plant associated areas, which remove pollutants regulated by this part from such waters. This includes all pipes, channels, ponds, basins, tanks, and all other equipment serving such structures.

The term “underground workings of an underground mine” means the underground workings including shafts, adits, support facilities, etc. of an underground mine, but excludes surface disturbances associated with the underground mine.

H. TEST PROCEDURES

Test procedures for the analysis of pollutants shall conform to all regulations published pursuant to KRS 224 (401 KAR 5:065, Section 1(10)).

Settleable Solids

Test procedures for the determination of settleable solids, as described in c., shall conform to 40 CFR 434.64 as adopted by 401 KAR 5:065, Section 4(2).

Fill an Imhoff cone to the one (1)-liter mark with a thoroughly mixed sample. Allow to settle undisturbed for 45 minutes. Gently stir along the inside surface of the cone with a stirring rod. Allow to settle undisturbed for 15 minutes longer. Record the volume of settled material in the cone as milliliters per liter. Where a separation of settleable and floating materials occurs do not include the floating material.

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I. REOPENER CLAUSE

This permit shall be modified, or alternatively revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved in accordance with 401 KAR 5:050 through 5:080, if the effluent standard or limitation so issued or approved:

1. Contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or

2. Controls any pollutant not limited in the permit.

This permit may be reopened to implement the findings of a reasonable potential analysis performed by the Division of Water.

This permit shall be reopened if Division of Water determines surface waters are aesthetically or otherwise degraded by substances that:

(a) Settle to form objectionable deposits;
(b) Float as debris, scum, oil, or other matter to form a nuisance;
(c) Produce objectionable color, odor, taste, or turbidity;
(d) Injure, are chronically or acutely toxic to or produce adverse physiological or behavioral responses in humans, animals, fish, and other aquatic life;
(e) Produce undesirable aquatic life or result in the dominance of nuisance species; or
(f) Cause fish flesh tainting

The permit as modified or reissued under this paragraph shall also contain any other requirements of KRS Chapter 224 when applicable.

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PART II STANDARD CONDITIONS FOR KPDES PERMIT

This permit has been issued under the provisions of KRS Chapter 224 and regulations promulgated pursuant thereto. Issuance of this permit does not relieve the permittee from the responsibility of obtaining any other permits or licenses required by this Cabinet and other state, federal, and local agencies.

It is the responsibility of the permittee to demonstrate compliance with permit parameter limitations by utilization of sufficiently sensitive analytical methods.

The permittee is also advised that all KPDES permit conditions in KPDES Regulation 401 KAR 5:065, Section 1 will apply to all discharges authorized by this permit.

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PART III - BEST MANAGEMENT PRACTICES

The permittee shall develop and implement a Best Management Practices Plan (BMPP) consistent with 40 CFR 122.44(k) for the control of acid mine drainage, conductivity, total dissolved solids and sediment released from the operation. Additionally the BMPP shall address the use, storage, and disposal of petroleum-based products, toxic or hazardous substances. The BMPP shall include: erosion prevention measures; sediment control measures; fill minimization and optimization measures; and other site management practices that are protective of the instream water quality and the "designated use" of the receiving waters affected by the mining operation. The BMPP shall include the following components:

- Site description
- Site Maps
- BMP Selection
- Evaluation of BMP Effectiveness
- Modification for Ineffectiveness
- Implementation
- Documentation

Site Description

The BMPP shall include a copy of the Department for Natural Resources (DNR)-approved mine plan submitted as part of the Surface Mining Control and Reclamation Act (SMCRA) permit. In addition to the DNR approved mine plan, the BMPP shall include:

- List of outfalls (latitude, longitude, receiving water, DNR Pond Number, KPDES Outfall Number, and projected activation date)

- List of representative outfalls (latitude, longitude, receiving water, DNR Pond Number, KPDES Outfall Number, and projected activation date)

- List of instream monitoring locations (latitude, longitude, and water body name)

Site Maps

The BMPP shall include:

- Mining and Reclamation Plan (MRP) map;

- Environmental Resources Information (ERI) map; and

- Site map indicating the location of any and all storage and disposal areas for petroleum base products or toxic or hazardous substances utilized at the mine.

BMP Selection

Best Management Practices (BMPs) shall be selected to address the major areas of concern related to mining activities: acid mine drainage; sediment control; total dissolved solids and conductivity control; and the management of petroleum-based products and toxic or hazardous substances. The selection, design, construction, implementation, operation, maintenance, and effectiveness of best management practices is a critical component to the mine's successful compliance with the SCMRA and Clean Water Act (CWA) requirements. The permittee must be judicious in the selection of BMPs to prevent incompatible or counterproductive results. The BMPP shall describe the selected BMPs, provide the rationale for selection, and discuss the objective of the BMPs.

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Evaluation of BMP Effectiveness

The BMPP shall establish protocols, procedures, and a schedule of review for the evaluation of the effectiveness of the selected BMPs.

Protocols: The protocols are a set of performance benchmarks which may be narrative, numeric, or a combination thereof, against which the effectiveness of the BMPs are to be judged. Due to the variability of a number of factors influencing the selection of BMPs, universal performance benchmarks are not feasible therefore site-specific standards shall be developed. The performance benchmarks are to be consistent with the goals of the CWA and SMCRA

Procedures: The procedures shall document the process for comparing the success of the actual BMP performance versus the stated benchmark. Discharge data, receiving stream assessments, inspections, etc., are among the tools to be utilized in this evaluation process. If these assessments indicate that impacts to the aquatic community are occurring, then the permittee shall evaluate the BMPs employed and determine if modifications to the BMP plan and selected BMPs are required.

Schedule of Review: The schedule of review shall include both fixed and episode-derived dates for review. Quarterly and annual evaluations of the effectiveness of the BMPs shall be performed. Episodic events, such as precipitation events of 1 inch or more, changes in the mine plan, inspections by regulatory agencies, etc., may necessitate a review of BMP performance.

Modification for Ineffectiveness

The BMPs and the BMPP shall be reviewed and appropriate modifications implemented if any of the following events occur:

- As a result of either a fixed or episodic event-driven evaluation, the permittee determines the selected BMPs are not achieving the established performance benchmarks; or
- As a result of an evaluation or inspection by Cabinet personnel; or
- If biological assessments indicate the indigenous aquatic community are being adversely affected; or
- If discharge and instream data indicate a negative trend in water quality; or
- A release of any petroleum-based product, toxic or hazardous substance.

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Implementation

The BMPP shall be developed and submitted to the Division of Water and the Department for Natural Resources within 90 days of the effective date of the permit. Implementation shall be within 180 days of that submission. Modifications to the plan as a result of ineffectiveness or plan changes to the facility shall be submitted to the Division of Water and the Department for Natural Resources and implemented as soon as possible.

Documentation

The permittee shall maintain a copy of the BMPP at the mine and shall make the plan available upon request to EEC personnel. Initial copies and modifications thereof shall be provided to the following agencies:

Department for Natural Resources
No 2 Hudson Hollow Road
Frankfort, Kentucky 40601

Division of Water
Surface Water Permits Branch
Operational Permits Section
200 Fair Oaks Lane
Frankfort, KY 40601

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PART IV - BIOMONITORING - ACUTE CONCERNS - PRECIPITATION DEPENDENT DISCHARGES

In accordance with Part I of this permit, the permittee shall initiate, within 90 days of the effective date of this permit, the series of tests described below in order to evaluate wastewater toxicity of the discharge from the representative outfalls.

TEST REQUIREMENTS

The permittee shall perform a 48-hour static non-renewal toxicity test with water flea (Daphnia Magna or D. pulex) and a 48-hour static non-renewal toxicity test with fathead minnow (Pimephales promelas). Tests shall be conducted on each of two grab samples collected over the period of discharge (i.e., discrete sample #1 taken at commencement of discharge, sample #2 taken approximately 12 hours later, sooner if discharge is expected to cease). Testing of the effluent shall be initiated within 36 hours of each sample collection. Tests shall be conducted using at least five (5) effluent concentrations: 6.25%, 12.50%, 25.00%, 50.00% and 100.00% using synthetic water dilution. Selection of the effluent concentrations is subject to revision by the Division. Control testing using synthetic water shall be conducted concurrently with effluent testing. The toxicity test will be deemed reasonable and good only if control survival is 90% or greater in test organisms. Any test that does not meet the control acceptability criteria shall be invalid and repeated as soon as practicable within the permit required monitoring period (e.g., within the month or quarter). Failure of the test shall be demonstrated if the LC_{50} of either species test of either sample is less than 100% effluent.

Tests shall be conducted on both species at once per quarter for a minimum of five (5) quarters. Testing may cease upon written notification from DOW that a “reasonable potential” for an excursion of either a narrative or numeric standard does not exist.

If testing is required to continue for the duration of the permit, and after at least six (6) consecutive tests it can be determined that (Daphnia Magna or D. pulex) or the fathead minnow is more sensitive and all tests have passed, a request for testing with only the most sensitive species can be submitted to the Division. Upon approval, the most sensitive species may be chosen as representative and all subsequent compliance tests may be conducted using only that species unless directed at any time by the Division to change or revert to testing of both species.

REPORTING REQUIREMENTS

Results of all toxicity tests conducted with any species shall be reported according to the most recent format provided by the Division of Water. Notification of a failed test shall be made to the Division’s Surface Water Permits Branch within five (5) days of test completion. Test reports shall be submitted to the Division’s Surface Water Permits Branch within thirty (30) days of completion of the test.

ACUTE TOXICITY

Due to the discharge being precipitation-dependent, if the initial test fails (i.e., the LC_{50} for either species in either grab sample is less than 100% effluent), the permittee must perform a series of two (2) follow-up tests using new grab samples collected approximately 12 hours apart and within ten (10) days of completing the initial failed test if discharge of effluent is occurring; follow-up sampling and testing may be extended as necessary to obtain the grab during a discharging period. The follow-up tests shall include both species unless approved for only the most sensitive species by the Division. Results of the follow-up testing will be used to evaluate the persistence of the toxic event and the possible reopening of the permit to incorporate toxicity limits.

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TEST METHODS

All test organisms, procedures, and quality assurance criteria used shall be in accordance with "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms," EPA-821-R-02-012 (5th edition), the most recently published edition of this publication, or as approved in advance by the Division of Water.

Toxicity testing for compliance to KPDES discharge limits shall be performed by a laboratory approved by the Division of Water to conduct the required toxicity tests. Within each toxicity report to the Division of Water, the permittee must demonstrate successful performance of reference toxicant testing by the laboratory that conducts their effluent toxicity tests. Within thirty (30) days prior to initiating an effluent toxicity test, a reference toxicant test must be completed for the method used; alternatively, the reference toxicant test may be run concurrent with the effluent toxicity test. In addition, for each test method, at least five (5) acceptable reference toxicant tests must be completed by the laboratory prior to performing the effluent toxicity test. A control chart including the most recent reference toxicant test endpoints for effluent test method (minimum of five [5], up to twenty [20] if available) shall be part of the report.

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