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FACT SHEET

Matt/Co Inc

KPDES No.: KY0107212

AI No.: 81656

Permit Writer: Heather Dodds

Date: April 16, 2012

Public Notice Information

Public Notice Start Date:

Comment Due Date:

Information concerning the public notice process may be obtained on the Division of Water's Public Notice Webpage at the following address:

http://dep.gateway.ky.gov/eSearch/Search_Pending_Approvals.aspx?Program=Wastewater&NumDaysDoc=30

Comments may be filed electronically at the following e-mail address: DOWPublicNotice@ky.gov

Or by sending written comments to:

Division of Water
Surface Water Permits Branch
200 Fair Oaks Lane
Frankfort, Kentucky 40601

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DEFINITIONS, ABBREVIATIONS, AND ACRONYMS

10-year, 24-hour precipitation event - mean the maximum 24-hour precipitation event with a probable recurrence interval of once in 10 years 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.

1-year, 24-hour precipitation event - mean the maximum 24-hour precipitation event with a probable recurrence interval of once in a year 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.

2-year, 24-hour precipitation event - mean the maximum 24-hour precipitation event with a probable recurrence interval of once in 2 years 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.

401(a) Certification - A requirement of CWA section 401(a) that all federally issued permits be certified by the state in which the discharge occurs. The state certifies that the proposed permit will comply with state water quality standards and other state requirements.

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.

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.

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.

Acute criteria - The highest instream concentration of a toxic substance or an effluent to which an organism can be exposed for one (1) hour without causing an unacceptable harmful effect.

Acute effect - The effect of a stimulus severe enough to rapidly induce an effect; in aquatic toxicity tests, an effect generally observed in 96 hours or less is typically considered acute. When referring to aquatic toxicology or human health, an acute effect is not always measured in terms of lethality.

Acute toxicity - Lethality or other harmful effect sustained by either an indigenous aquatic organism or a representative indicator organism used in a toxicity test, due to a short-term exposure, of ninety-six (96) hours or less, to a specific toxic substance or mixture of toxic substances.

Acute toxicity unit - The reciprocal of the effluent dilution that causes the acute effect, or LC_{50}, by the end of the acute exposure period.

Acute-chronic ratio - The ratio of the acute toxicity, expressed as an LC_{50}, of an effluent or a toxic substance, to its chronic toxicity. It is used as a factor to estimate chronic toxicity from acute toxicity data.

Administrator - means the Administrator of the United States Environmental Protection Agency, or an authorized representative

Adversely affect or adversely change - Means to alter or change the community structure or function, to reduce the number or proportion of sensitive species, or to increase the number or proportion of pollution tolerant aquatic species so that aquatic life use support or aquatic habitat is impaired.

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.

Anti-backsliding - In general, a statutory provision that prohibits the renewal, reissuance, or modification of an existing NPDES permit that contains effluent limitations, permit conditions, or standards that are less stringent than those established in the previous permit.

Antidegradation - A policy developed and adopted as part of a state's water quality standards that ensures protection of existing uses and maintains the existing level of water quality where that water quality exceeds levels necessary to protect fish and wildlife propagation and recreation on and in the water. This policy also includes special protection of water designated as Outstanding National Resource Waters.

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Applicable standards and limitations - means all standards and limitations to which a discharge or a related activity is subject pursuant to KRS Chapter 224 and 401 KAR Chapters 4 through 11, including effluent limitations, water quality standards, standards of performance, or toxic effluent standards.

Application - means the document submitted by an applicant to the cabinet that provides information used by the cabinet in the issuance of a permit or approval.

Approximate original contour - means that surface configuration achieved by backfilling and grading of the mined area so that the reclaimed area, including any terracing or access roads, (when not necessary to support its approved postmining use) closely resembles the general surface configuration of the land prior to mining and blends into and complements the drainage pattern of the surrounding terrain, with all highwalls and spoil piles eliminated; water impoundments may be permitted where the cabinet determines that they are in compliance with 405 KAR 1:220.

Area of land affected - means the area of land from which overburden is to be or has been removed and upon which overburden is to be or has been deposited and shall include all lands affected by the construction of new roads or the improvement or use of existing roads other than public roads, to gain access and to haul coal.

Auger mining - means a method of mining coal at a cliff or highwall by drilling holes laterally into an exposed coal seam from the highwall and transporting the coal along an auger bit to the surface

Average monthly discharge limitation - The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during that month divided by the number of daily discharges measured during that month.

Balanced indigenous community - means a biotic community typically characterized by diversity, the capacity to sustain itself through cyclic seasonal changes, presence of necessary food chain species, and a lack of domination by pollution tolerant species. The community may include historically nonnative species introduced in connection with a program of wildlife management and species whose presence or abundance results from substantial, irreversible environmental modification. Normally such a community does not include species whose presence or abundance is attributable to the introduction of pollutants that will be eliminated by compliance of all sources with 401 KAR 5:065, and may not include species whose presence or abundance is attributable to alternative effluent limitations imposed pursuant to 401 KAR 5:055.

Bench - means the ledge, shelf or terrace formed in the contour method of strip mining.

Best Available Technology Economically Achievable (BAT) - Technology standard established by the CWA as the most appropriate means available on a national basis for controlling the direct discharge of toxic and nonconventional pollutants to navigable waters. BAT limitations in effluent guidelines, in general, represent the best existing performance of treatment technologies that are economically achievable within an industrial point source category or subcategory.

Best Conventional Pollutant Control Technology (BCT) - Technology-based standard for the discharge from existing industrial point sources of conventional pollutants including BOD, TSS, fecal coliform, pH, oil and grease. The BCT is established in light of a two-part cost reasonableness test, which compares the cost for an industry to reduce its pollutant discharge with the cost to a POTW for similar levels of reduction of a pollutant loading. The second test examines the cost-effectiveness of additional industrial treatment beyond BPT. EPA must find limits which are reasonable under both tests before establishing them as BCT.

Best Management Practice (BMP) - means: (a) For agriculture operations, as defined by KRS 224.71-100(3); or (b) For all other purposes: 1. Schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the commonwealth; and 2. Treatment requirements, operating procedures, practices to control site run-off, pollution of surface water and groundwater from nonpoint sources, spillage or leaks, sludge or waste disposal, or drainage from raw material storage

Best Practicable Control Technology Currently Available (BPT) - The first level of technology standards established by the CWA to control pollutants discharged to waters of the U.S. BPT limitations in effluent guidelines are generally based on the average of the best existing performance by plants within an industrial category or subcategory.

Best Professional Judgment (BPJ) - The method used by permit writers to develop technology-based NPDES permit conditions on a case-by-case basis using all reasonably available and relevant data.

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Bioassay - A test used to evaluate the relative potency of a chemical or a mixture of chemicals by comparing its effect on a living organism with the effect of a standard preparation on the same type of organism.

Biochemical Oxygen Demand (BOD) - A measurement of the amount of oxygen used by the decomposition of organic material, over a specified time (usually 5 days) in a wastewater sample; it is used as a measurement of the readily decomposable organic content of a wastewater.

Bypass - means the intentional diversion of sewage or waste-streams from a portion of a facility or industrial user's treatment facility.

Calendar day - means for the purpose of this permit, any 24-hour period.

Carbonaceous Biochemical Oxygen Demand (CBOD) – means the biochemical oxygen demand of carbonaceous sources. This differs from BOD in that BOD measures both nitrogenous and carbonaceous sources, whereas CBOD excludes nitrogenous sources (e.g., nitrifying bacteria) from determination through the addition of a nitrification inhibitor.

Certified operator - means an individual who holds an active certified operator's certificate issued in accordance with 401 KAR 11:050.

Chronic criteria - means the highest instream concentration of a toxic substance or an effluent to which organisms are able to be exposed for ninety-six (96) hours without causing an unacceptable harmful effect.

Chronic effect - The effect of a stimulus that lingers or continues for a relatively long period, often one-tenth of the life span or more. The measurement of a chronic effect can be reduced growth, reduced reproduction, and such, in addition to lethality.

Chronic toxicity - means lethality, reduced growth or reproduction or other harmful effect sustained by either indigenous aquatic organisms or representative indicator organisms used in toxicity tests due to long-term exposures, relative to the life span of the organisms or a significant portion of their life span, due to toxic substances or mixtures of toxic substances.

Chronic Toxicity Unit (TU_C) - means the reciprocal of the effluent dilution that causes twenty-five (25) percent inhibition of growth or reproduction to the test organisms by the end of the chronic exposure period.

Clean Water Act (CWA) - The Clean Water Act is a statute passed by the U.S. Congress to control water pollution. It was formerly referred to as the Federal Water Pollution Control Act of 1972 or Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500), 33 U.S.C. 1251 *et seq.*, as amended by: Public Law 96-483; Public Law 97-117; Public Laws 95-217, 97-117, 97-440, and 100-04.

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.

Coal preparation plant associated areas - means the coal preparation plant yards, immediate access roads, coal refuse piles, and coal storage piles and facilities.

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.

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.

Coal remining operation - means: (a) A surface coal mining operation, which begins after July 11, 1990, at a site on which a coal mining operation was conducted before August 3, 1977; and (b) A surface coal mining operation existing on July 11, 1990, which receives a permit revision from the DNR in accordance with 405 KAR 8:010, Section 20, for a site on which a coal mining operation was conducted before August 3, 1977.

Code of Federal Regulations (CFR) - A codification of the final rules published daily in the *Federal Register*. Title 40 of the CFR contains regulations for the protection of the environment.

Cold Water Aquatic Habitat (CAH) - means surface waters and associated substrate that are able to support indigenous aquatic life or self-sustaining or reproducing trout populations on a year-round basis.

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Compliance Schedule (or Schedule of Compliance) - A schedule of remedial measures included in a permit, including an enforceable sequence of interim requirements (for example, actions, operations, or milestone events) leading to compliance with the CWA and regulations.
Composite Sample - Sample composed of two or more discrete aliquots (samples). The aggregate sample will reflect the average water quality of the compositing or sample period.
Continuous facility discharge - means a discharge that occurs without interruption throughout the operating hours of the facility, except for infrequent shutdowns for maintenance, process changes, or other similar activities.
Controlled surface mine drainage - means any surface mine drainage that is pumped or siphoned from the active mining area.
Conventional pollutant – KDOW defines as: biochemical oxygen demand (BOD), chemical oxygen demand (COD), total organic carbon (TOC), total suspended solids (TSS), ammonia (as N), bromide, chlorine (total residual), color, fecal coliform, fluoride, nitrate, Kjeldahl nitrogen, oil and grease, E. coli, or phosphorus. EPA defines as: BOD, TSS, fecal coliform bacteria, oil and grease, and pH
Criteria - means specific concentrations or ranges of values, or narrative statements of water constituents that represent a quality of water expected to result in an aquatic ecosystem protective of designated uses of surface waters. Criteria are derived to protect legitimate uses such as aquatic life, domestic water supply, and recreation and to protect human health.
Daily maximum concentration - means the daily determination of concentration as an instantaneous maximum that cannot be exceeded by any sample.
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.
Day - means a twenty-four (24) hour period.
Department for Natural Resources – The Kentucky agency charged with the administration of the Surface Mining Control and Reclamation Act (SMCRA) permitting program.
Designated Uses - Those uses specified in water quality standards for each waterbody or segment whether they are being attained
Development Document - A report prepared during development of an effluent guideline by EPA that provides the data and methodology used to develop effluent guidelines and categorical pretreatment standards for an industrial category.
Direct discharge - means the discharge of a pollutant into waters of the commonwealth if the discharge is not included under the definition of indirect discharger and does not include a discharge of animal waste onto land by land application if the discharge does not reach the waters of the commonwealth.
Disappearing stream - means an intermittent or perennial surface stream that terminates and drains underground through caves, fractures, or swallets in the stream bed.
Discharge monitoring report (DMR) - The state approved form, including any subsequent additions, revisions, or modifications for the reporting of self-monitoring results by permittees.
Discharge or discharge of a pollutant - means the addition of a pollutant or combination of pollutants to waters of the commonwealth from a point source.
Disturbed area - means those lands that have been affected by strip mining and reclamation operations, or by surface operations of underground coal mining.
Diversion - means a channel, embankment, or other manmade structure constructed for the purpose of diverting water from one area to another
Division - means the Kentucky Division of Water, within the Department for Environmental Protection, Energy and Environment Cabinet.
Domestic - means relating to household wastes or other similar wastes. It is used to distinguish municipal, household, or commercial water or wastewater services from industrial water or wastewater services.
Domestic sewage - means sewage devoid of industrial or other wastes and that is typical of waste received from residential facilities. It may include wastes from commercial developments, schools, restaurants, and other similar developments.

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Domestic water supply (DWS) - means surface waters that with conventional domestic water supply treatment are suitable for human consumption through a public water system as defined in 401 KAR 8:010, culinary purposes, or for use in a food or beverage processing industry; and meet state and federal regulations under the Safe Drinking Water Act, as amended, 42 U.S.C. 300f - 300j-26.

Draft permit -means a document prepared pursuant to 401 KAR 5:075 indicating the cabinet's preliminary decision to issue or deny, modify, revoke and reissue, revoke, or reissue a permit. It includes a notice of intent to revoke a permit and a notice of intent to deny a permit as provided in 401 KAR 5:075. It does not include a proposed permit; a denial of a request for modification, revocation, and reissuance; or a denial of a request for revocation.

E. coli or "Escherichia coli" - means an aerobic and facultative anaerobic gram negative, nonspore forming, rod shaped bacterium that can grow at forty-four and five tenths (44.5) degrees Celsius, that is ortho-nitrophenyl-B-D-galactopyranoside (ONPG) positive, and Methylumbelliferyl glucuronide (MUG) positive. It is a member of the indigenous fecal flora of warm-blooded animals.

Effluent ditch - means that portion of a treatment system that is a discrete, person-made conveyance, either totally owned, leased or under valid easement by the discharger that transports a discharge to surface waters of the commonwealth.

Effluent limitation - Any restriction imposed by the KPDES permit on quantities, discharge rates, and concentrations of pollutants which are discharged from point sources into waters of the Commonwealth

Effluent limitations guidelines (Effluent Guidelines or ELG) - A regulation published by the Administrator under CWA section 304(b) to adopt or revise effluent limitations.

Embankment - means an artificial deposit of material that is raised above the natural surface of the land and used to contain, divert, or store water, support roads or railways, or other similar purposes.

Environmental Protection Agency, "EPA", or "U.S.EPA" - means the U.S. Environmental Protection Agency.

Eutrophication means the enrichment of a surface water by the discharge or addition of a nutrient.

Exceptional water (EW) - means a surface water categorized as exceptional by the cabinet pursuant to 401 KAR 10:030.

Existing source coal mine - means a coal mine, which the DOW determines is neither a “new source coal mine” nor a “new discharger coal mine.”

Existing use means a legitimate use being attained in or on a surface water of the commonwealth on or after November 28, 1975, irrespective of its use designation.

Expanded discharge - means an increase in pollutant loading.

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

Facility - means: (a) As used in 401 KAR 5:005 or 401 KAR 5:006, a document issued by the cabinet that authorizes the permittee to construct, modify, or operate a facility; or (b) In 401 KAR 5:050 through 401 KAR 5:080 and if used in conjunction with activity, any KPDES point source, or any other facility, including land or related appurtenances, that is subject to regulation under the KPDES program.

Fact Sheet - A document that must be prepared for all draft KPDES permits, the document summarizes the principal facts and the significant factual, legal, methodological and policy questions considered in preparing the draft permit and explains how the public may comment.

Fecal coliform - means the portion of the coliform group of bacteria that are present in the intestinal tract or the feces of warm-blooded animals. It includes organisms that are capable of producing gas from lactose broth in a suitable culture medium within twenty-four (24) hours at forty-four and five-tenths (44.5) degrees plus or minus two-tenths (0.2) degrees C.

Final bond release (Phase III) - means the time at which the DNR 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.

Final grade - means the finished elevation of any surface disturbance prior to replacement of topsoil.

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Fundamentally Different Factors (FDF) - Those components of a petitioner's facility that are determined to be so unlike those components considered by EPA during the effluent guidelines and pretreatment standards rulemaking that the facility is worthy of a variance from the effluent guidelines or categorical pretreatment standards that would otherwise apply.
Grab sample -A sample taken from a wastestream on a one-time basis without consideration of the flow rate of the wastestream and without consideration of time.
Groundwater - means the subsurface water occurring in the zone of saturation beneath the water table and perched water zones below the B soil horizon including water circulating through fractures, bedding planes, and solution conduits.
Harmonic mean flow - means the reciprocal of the mean of the reciprocal daily flow values.
Hazardous substance Any substance—as designated under Part 116 pursuant to CWA section 311—that presents an imminent and substantial danger to the public health or welfare, including fish, shellfish, wildlife, shorelines, and beaches, upon discharge to navigable waters of the United States.
Highwall - means the face of exposed overburden and coal in an open cut of a surface or for entry to an underground coal mine.
High Quality Water (HQW) - means a surface water categorized as high quality by the cabinet pursuant to 401 KAR 10:030.
Impact - means a change in the chemical, physical, or biological quality or condition of a surface water.
Impairment - means a detrimental impact to a surface water that prevents attainment of a designated use.
Impoundment - means a closed basin formed naturally or artificially built, which is dammed or excavated for the retention of water, sediment, or waste**.**
Indigenous aquatic community - means naturally occurring aquatic organisms including bacteria, fungi, algae, aquatic insects, other aquatic invertebrates, reptiles, amphibians, and fishes. Under some natural conditions one (1) or more of the above groups may be absent from a surface water.
Industrial Wastewater Treatment Plant (IWWTP) - means a privately owned WWTP with more than ninety (90) percent of the influent flow from sources of industrial waste.
Inhibition concentration of twenty-five (25) percent (IC_{25}) - means the concentration that is determined by a linear interpolation method for estimating the concentration at which a twenty-five (25) percent reduction is shown in reproduction or growth in test organisms, and which statistically approximates the concentration at which an unacceptable chronic effect is not observed.
Injection - means a type of land application in which the waste is placed directly beneath the land surface.
Instantaneous maximum limit - The maximum allowable concentration or other measure of a pollutant determined from the analysis of any discrete or composite sample collected, independent of the flow rate and the duration of the sampling event.
Instantaneous minimum limit - The minimum allowable concentration or other measure of a pollutant determined from the analysis of any discrete or composite sample collected, independent of the flow rate and the duration of the sampling event.
Intermittent water - means a stream that flows only at certain times of the year.
Interstate agency - means an agency of which Kentucky and one (1) or more states is a member established by or under an agreement or compact, or any other agency, of which Kentucky and one (1) or more other states are members, having substantial powers or duties pertaining to the control of pollution as determined and approved by the secretary or administrator pursuant to 33 U.S.C. 1251 – 1387 or KRS Chapter 224.
Jurisdictional Determination – The process the USCOE employs to determine if a waterbody is subject to CWA § 404 jurisdiction.
Jurisdictional Waters – means those waters the USCOE has determined are subject to CWA § 404 jurisdiction.
Karst - means the type of geologic terrain underlain by carbonate rocks where significant solution of rock has occurred due to flowing groundwater.
Kentucky Index of Biotic Integrity (KIBI) – fish community assessment tool as incorporated by reference in 401 KAR 10:030.
Kentucky No Discharge Operational Permit (KNDOP) - means a permit issued pursuant to 401 KAR 5:005 for operating a WWTP that does not have a discharge to a stream, including agricultural waste handling systems and spray irrigation systems.

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Kentucky Pollutant Discharge Elimination System (KPDES) - means the Kentucky program for issuing, modifying, revoking and reissuing, revoking, monitoring and enforcing permits to discharge, and imposing and enforcing pretreatment requirements.

KPDES permit - means a Kentucky Pollutant Discharge Elimination System permit issued to a facility, including a POTW, or activity pursuant to KRS Chapter 224 for the purpose of operating the facility or activity.

LC_1 - means that concentration of a toxic substance or mixture of toxic substances that is lethal, or immobilizing if appropriate, to one (1) percent of the organisms tested in a toxicity test during a specified exposure period.

LC_{50} - means that concentration of a toxic substance or mixture of toxic substances that is lethal, or immobilizing if appropriate, to fifty (50) percent of the species tested in a toxicity test during a specified exposure period.

Load Allocation (LA) - The portion of a receiving water's loading capacity that is attributed either to one of its existing or future nonpoint sources of pollution or to natural background sources. Load allocations are best estimates of the loading, which may range from reasonably accurate estimates to gross allotments, depending on the availability of data and appropriate techniques for predicting the loading. Wherever possible, natural and nonpoint source loads should be distinguished.

Macroinvertebrate Bioassessment Index (MBI) – macroinveertebrate community assessment tool as incorporated by reference in 401 KAR 10:030.

Maintain - means to preserve or keep in present condition by not allowing an adverse permanent or long-term change to water quality or to a population of an aquatic organism or its habitat.

Major alteration - means a coal mine for which the DOW 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 DOW 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 deems relevant.

Major facility - means a KPDES facility or activity classified as a KPDES facility by the cabinet in cooperation with the regional administrator. Designation as a major industry as used in KRS 224.70-120, does not indicate automatic classification as a major facility.

Maximum Daily Effluent Limitation (MDEL) – means the highest allowable daily discharge of a pollutant.

Measurement - means the ability of the analytical method or protocol to quantify as well as identify the presence of the substance in question.

Method Detection Limit (MDL) - The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix containing the analyte.

Method of operation - means the method or manner by which the cut or open pit is made, the overburden is placed or handled, water is controlled and other acts are performed by the operator in the process of uncovering and removing the coal.

Milligrams per liter (mg/l) - mean the milligrams of substance per liter of solution and are equivalent to parts per million in water, assuming unit density.

Million gallons per day (or mgd) - A unit of flow commonly used for wastewater discharges. One million gallon per day is equivalent to 1.547 cubic feet per second.

Mine drainage - means any drainage and any water pumped or siphoned from an active mining area or a post-mining area.

Minimum Level (ML) - The level at which the entire analytical system must give a recognizable signal and acceptable calibration point. It is equivalent to the concentration of the lowest calibration standard, assuming that all method-specified sample weights, volumes, and cleanup procedures have been employed.

Mixing zone - means a domain of a water body contiguous to a treated or untreated wastewater discharge with quality characteristics different from those of the receiving water. The discharge is in transit and progressively diluted from the source to the receiving system. The mixing zone is the domain where wastewater and receiving water mix.

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Monthly average concentration - means the arithmetic average of all sample concentrations collected during a calendar month.
National Pollutant Discharge Elimination System (NPDES) The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under CWA sections 307, 318, 402, and 405. The term includes approved program. NPDES permits regulate discharges of pollutants from point sources to waters of the United States. Such discharges are illegal unless authorized by an NPDES permit.
Natural Resources Conservation Service (NRCS) - means the organization created pursuant to 7 U.S.C. 6962 in the U.S. Department of Agriculture.
Natural temperature - means the temperature that would exist in waters of the commonwealth without the change of enthalpy of artificial origin, as contrasted with that caused by climatic change or naturally occurring variable temperature associated with riparian vegetation and seasonal changes.
Natural water quality - means those naturally occurring physical, chemical, and biological properties of waters.
Net discharge - means the amount of substance released to a surface water by excluding the influent value from the effluent value if both the intake and discharge are from and to the same or similar body of water.
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.
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 to constitute a "major alteration."
New Source Performance Standards (NSPS) - Technology standards for facilities that qualify as new sources under § 122.2 and § 122.29. Standards consider that the new source facility has an opportunity to design operations to more effectively control pollutant discharges.
Nonconventional pollutant - KDOW defines as pollutant not considered to be a conventional pollutant, including priority pollutants identified in 401 KAR 5:060. EPA defines as all pollutants that are not included in the list of conventional or toxic pollutants in Part 40, includes pollutants such as chemical oxygen demand (COD), total organic carbon (TOC), nitrogen, and phosphorus.
Nonpoint Source - Diffuse pollution sources (i.e., without a single point of origin or not introduced into a receiving stream from a specific outlet). The pollutants are generally carried off the land by stormwater. Atmospheric deposition and hydromodification are also sources of nonpoint source pollution.
North American Industrial Classification System (NAICS) - The North American Industry Classification System (NAICS) is the standard used by federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy.
Nutrients - Chemical elements and compounds found in the environment that plants and animals need to grow and survive. Nutrients include compounds of nitrogen (nitrate, nitrite, ammonia, organic nitrogen) and phosphorus (orthophosphate and others), both natural and man-made.
Operator - means a person involved in the operation of a facility or activity.
Other wastes - means sawdust, bark or other wood debris, garbage, refuse, ashes, offal, tar, oil, chemicals, acid drainage, wastes from agricultural enterprises, and other foreign substances not included within the definitions of industrial wastes and sewage that may cause or contribute to the pollution of waters of the Commonwealth.
Outfall - means, for municipal separate storm sewers, a point source at the point where a municipal separate storm sewer discharges to waters of the Commonwealth, but does not include open conveyances connecting two (2) municipal separate storm sewers, or pipes, tunnels, or other conveyances that connect segments of the same stream or other waters of the Commonwealth and are used to convey waters of the Commonwealth.
Outstanding National Resource Water (ONRW) - means a surface water categorized by the cabinet as an outstanding national resource water pursuant to 401 KAR 10:030.

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Outstanding State Resource Water (OSRW) means a surface water designated by the cabinet as an outstanding state resource water pursuant to 401 KAR 10:031.

Overburden - means material of any nature, consolidated or unconsolidated, that overlies a mineral deposit, excluding topsoil or similar naturally-occurring surface materials that are not disturbed by mining operations.

Overflow - means any intentional or unintentional diversion of flow from a facility.

Owner - means a person who has legal ownership of a facility or activity regulated pursuant to 401 KAR Chapter 5.

Performance bond -means a surety bond, a collateral bond, or a combination thereof, or bonds filed pursuant to the provisions of the Kentucky Bond Pool Program (405 KAR 10:200, KRS 350.595, and KRS 350.700 through 350.755), by which a permittee assures faithful performance of all the requirements of KRS Chapter 350, 405 KAR Chapters 7 through 24, and the requirements of the permit and reclamation plan.

Permitting Authority - means the agency authorized to issue and enforces specific requirements of the NPDES permit program. The permitting authority may be EPA, or a state, territorial, or tribal agency that has been authorized under CWA section 402(b) to administer the NPDES program within its jurisdiction.

pH - A measure of the hydrogen ion concentration of water or wastewater; expressed as the negative log of the hydrogen ion concentration in mg/L. A pH of 7 is neutral. A pH less than 7 is acidic, and a pH greater than 7 is basic.

Phase I reclamation bond release – Means the release of up to 60% of the total original bond amount on the permit area, section, or increment upon completion of reclamation phase I. (See Reclamation phase definition).

Phase II reclamation bond release – Means the release of additional bond amounts not to exceed 25% of the total original bond amount on the permit area, section, or increment upon completion of reclamation phase II. (See Reclamation phase definition).

Phase III reclamation bond release – Means the release of remaining portion of the total performance bond amount on the permit area, section, or increment upon completion of reclamation phase III. (See Reclamation phase definition).

Plan of study means (1) a report that contains the following information required for a regional facility plan by 401 KAR 5:006, Section 4: (a) Planning area maps; (b) A discussion of the need for sewer service in the area; (c) Population projections; and (d) An estimation of the twenty (20) year cost by category; or (2) a plan required by the permit for the purposes of collecting data to determine background stream physical, chemical and biological conditions and discharge conditions.

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.

Pollutant - Dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials (except those regulated under the Atomic Energy Act of 1954, as amended [42 U.S.C. 2011 *et seq.*)], heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water. It does not mean a. Sewage from vessels. b. Water, gas, or other material that is injected into a well to facilitate production of oil or gas, or water derived in association with oil and gas production and disposed of in a well, if the well used either to facilitate production or for disposal purposes is approved by authority of the state in which the well is located, and if the state determines that the injection or disposal will not result in the degradation of ground or surface water resources.

Pollutant, Conservative - Pollutants that do not readily degrade in the environment and that are mitigated primarily by dilution after entering receiving waters (e.g., metals, total suspended solids).

Pollutant, Non-Conservative - Pollutants that are mitigated by natural biodegradation or other environmental decay or removal processes in the receiving water after mixing and dilution have occurred (e.g., biochemical oxygen demand, pH, volatile organic compounds

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.

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Primary Contact Recreation Water (PCRW) - means those waters suitable for full body contact recreation during the recreation season of May 1 through October 31.

Primary Industry Category - Any industry category listed in the NRDC settlement agreement (*Natural Resources Defense Council et al. v. Train,* 8 E.R.C. 2120 [D.D.C. 1976], modified 12 E.R.C. 1833 [D.D.C. 1979]); also listed in Appendix A of Part 122.

Primary responsibility - means personal, first-hand responsibility to conduct or actively oversee and direct procedures and practices necessary to ensure that the wastewater treatment plant or wastewater collection system is operated in accordance with accepted practices and with KRS Chapter 224 and 401 KAR Chapters 5 and 11 having the authority to conduct the procedures and practices necessary to ensure that the wastewater system or any portion thereof is operated in accordance with accepted practices, laws, and administrative regulations of the commonwealth, or to supervise others in conducting these practices.

Priority Pollutants - Those pollutants considered to be of principal importance for control under the CWA based on the NRDC Consent Decree (*NRDC et al. v. Train,* 8 E.R.C. 2120 [D.D.C. 1976], modified 12 E.R.C. 1833 [D.D.C. 1979]); a list of the pollutants is provided as Appendix A to 40 CFR Part 423.

Privately-owned treatment works - means any device or system which is (a) used to treat wastes from any facility whose operator is not the operator of the treatment works and (b) not a "POTW."

Probable Maximum Precipitation – is the theoretical greatest depth of precipitation for a given duration that is physically possible over a given size storm area at a particular geographical location at a certain time of the year.

Process Wastewater - Any water [that], during manufacturing or processing, comes into direct contact with, or results from the production or use of any raw material, intermediate product, finished product, by-product, or waste product.

Production-Based Standard - A discharge standard expressed in terms of pollutant mass allowed per unit of product manufactured or some other measure of production. 1996 PWM

Productive aquatic community - means an assemblage of indigenous aquatic life capable of reproduction and growth.

Professional engineer or engineer is defined by KRS 322.010(2).

Propagation - means the continuance of a species by successful spawning, hatching, and development or natural generation in the natural environment, as opposed to the maintenance of the species by artificial culture and stocking.

Proposed permit - means a KPDES permit prepared after the close of the public comment period and, if applicable, any public hearing and administrative appeals that is sent to U.S. EPA for review before final issuance by the cabinet. A proposed permit is not a draft permit.

Public water system - means a system for the provision to the public of water for human consumption through pipes or, after August 5, 1998, other constructed conveyances, if such system has at least fifteen service connections or regularly serves an average of at least twenty-five individuals daily at least 60 days out of the year. Such term includes: any collection, treatment, storage, and distribution facilities under control of the operator of such system and used primarily in connection with such system; and any collection or pretreatment storage facilities not under such control which are used primarily in connection with such system. Such term does not include any "special irrigation district." A public water system is either a "community water system" or a "non-community water system."

RCRA - means the Resource Conservation Recovery Act as amended, 42 U.S.C. 6901 - 6992k.

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.

Reclamation phases are defined as follows:

(a) **Reclamation phase I** shall be deemed to have been completed on the entire permit area or increment when the permittee completes backfilling, regrading, topsoil replacement, and drainage control including soil preparation and initial seeding and mulching in accordance with the approved reclamation plan and a report for the area has been submitted to the cabinet in accordance with 405 KAR 16:200, Section 8 or 405 KAR 18:200, Section 8;

(b) **Reclamation phase II** shall be deemed to have been completed on the entire permit area or increment when:

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1. Revegetation has been established in accordance with the approved reclamation plan and the standards for the success of revegetation, except productivity standards, have been met;
2. The lands are not contributing suspended solids to stream flow or run off outside the permit area or increment in excess of the requirements of KRS 350.420, 405 KAR Chapters 16 or 18, or the permit;
3. With respect to prime farmlands, soil productivity has been restored as required by 405 KAR 20:040, Section 6 and the plan approved under 405 KAR 8:050, Section 3; and
4. The provisions of a plan approved by the cabinet for the sound future management of any permanent impoundment by the permittee or landowner have been implemented to the satisfaction of the cabinet.

(c) **Reclamation phase III** will be deemed to have been completed on the entire permit area or increment when the permittee has successfully completed all surface coal mining and reclamation operations in accordance with the approved reclamation plan, such that the land is capable of supporting the postmining land use approved pursuant to 405 KAR 16:210 or 405 KAR 18:220; and has achieved compliance with the requirements of KRS Chapter 350, 405 KAR Chapters 7 through 24, and the permit; and the applicable liability period under 405 KAR 10:020, Section 3(2) has expired. (8 Ky.R. 1519; eff. 1-6-83; Am. 15 Ky.R. 447; 2016; eff. 1-25-89; 17 Ky. R. 2499; eff. 4-24-91.)

Recommencing discharger - means a source that recommences discharge after terminating operations.

Recurring discharge - means, as it relates to a sewer system overflow, a discharge that occurs two (2) or more times in a twelve (12) month period.

Refuse pile - means a surface deposit of coal mine waste that is not retained by an impounding structure and does not impound water, slurry, or other liquid or semi-liquid material.

Regional administrator - means the regional administrator of the Region IV office of the U.S. EPA or the authorized representative of the regional administrator.

Remined area - means only that area of a coal remining operation on which a coal mining operation was conducted before August 3, 1977.

Representative indicator organism - means an aquatic organism designated for use in toxicity testing because of its relative sensitivity to toxicants and its widespread distribution in the aquatic environment.

Road - means a surface right-of-way for purposes of travel by land vehicles used in coal exploration or surface coal mining and reclamation operations. A road consists of the entire area within the right-of-way, including the roadbed, shoulders, parking and side area, approaches, structures, ditches, surface, and contiguous appendages necessary for the total structure. The term includes access and haul roads constructed, used, reconstructed, improved, or maintained for use in coal exploration or surface coal mining and reclamation operations, including use by coal hauling vehicles leading to transfer, processing, or storage areas. The term does not include pioneer or construction roadways used for part of the road construction procedure and promptly replaced by a road pursuant to 405 KAR Chapters 16 and 18 located in the identical right-of-way as the pioneer or construction roadway. The term also excludes any roadway within the immediate mining pit area.

Run-off coefficient - means the fraction of total rainfall that will appear at a conveyance as run-off.

SARA - means the Superfund Amendments and Reauthorization Act, 42 U.S.C. 9601 – 9675.

Schedule of compliance - means a schedule of remedial measures included in a permit, including an enforceable sequence of interim requirements leading to compliance with KRS Chapter 224 and 401 KAR Chapters 4 through 11.

Secondary Contact Recreation Waters (SCRW) - means those waters suitable for partial body contact recreation, with minimal threat to public health due to water quality.

Section 304(a) Criteria - Developed by EPA under authority of CWA section 304(a) based on the latest scientific information on the relationship that the effect of a constituent concentration has on particular aquatic species and/or human health. This information is issued periodically to the states as guidance for use in developing criteria.

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Sedimentation pond - means a primary sediment control structure designed, constructed, and maintained in accordance with 405 KAR 16:090 or 405 KAR 18:090 and including but not limited to a barrier, dam, or excavated depression which slows down water runoff to allow suspended solids to settle out. A sedimentation pond shall not include secondary sedimentation control structures, such as straw dikes, riprap, check dams, mulches, dugouts, and other measures that reduce overland flow velocity, reduce runoff volume, or trap sediment, to the extent that the secondary sedimentation structures drain to a sedimentation pond.
Self-Monitoring - Sampling and analyses performed by a facility to determine compliance with effluent limitations or other regulatory requirements.
Settleable solids - is that matter measured by the volumetric method specified in PART I, F of the permit.
Seven-Q-ten or "$7Q_{10}$" - means that minimum average flow that occurs for seven (7) consecutive days with a recurrence interval of ten (10) years.
Sinkhole - means a naturally occurring topographic depression in a karst area. Its drainage is subterranean and serves as a recharge source for groundwater. It is formed by the collapse of a conduit or the solution of bedrock.
Site - means, as used in 401 KAR 5:060 through 5:080, the land or water area where a facility or activity is physically located or conducted, including adjacent land used in connection with the facility or activity.
Source - means a building, structure, facility, or installation from which there is or may be a discharge of pollutants.
Spill Prevention Control and Countermeasure Plan (SPCC) - A plan prepared by a facility to minimize the likelihood of a spill and to expedite control and cleanup activities if a spill occurs. Such plans are required for certain facilities under the Oil Pollution Prevention Regulations at 40 CFR 112.
Standard Industrial Classification (SIC) Code - A code number system used to identify various types of industries. A particular industry may have more than one SIC code if it conducts several types of commercial or manufacturing activities onsite. An online version of the 1987 SIC Manual <www.osha.gov/pls/imis/sic_manual.html> is available courtesy of the Occupational Safety & Health Administration (OSHA).
Strip mining - means the breaking of the surface soil in order to facilitate or accomplish the extraction or removal of minerals, ores, or other solid matter; any activity or process constituting all or part of a process for the extraction or removal of minerals, ores, and other solid matter from its original location; and the preparation, washing, cleaning, or other treatment of minerals, ores, or other solid matter so as to make them suitable for commercial, industrial, or construction use; but shall not include the extraction of coal by a land owner for his own noncommercial use from land owned or leased by him; the extraction of coal as an incidental part of federal, state, or local government financed highway or other construction under administrative regulations established by the cabinet nor shall it include the surface effects or surface impacts of underground coal mining.
STORET - EPA's computerized STOrage and RETrieval water quality data base that includes physical, chemical, and biological data measured in waterbodies throughout the United States. 1996 PWM
Storm Water (or Stormwater) Stormwater runoff, snow melt runoff, and surface runoff and drainage.
Supernatant - means the water that accumulates in the upper portion of a lagoon and contains not greater than two and zero-tenths (2.0) percent total solids by dry weight analysis.
Surface effects of underground coal mining - means "surface operations of underground coal mining" and the topographical, geological, hydrological, physical, chemical, and biological impacts upon the land, water and air and upon plants, animals and other organisms.
Surface mining operation - means only those facilities required to have a permit by 405 KAR Chapters 7 through 26.
Surface operations of underground coal mining -means activities and associated facilities, equipment, materials and premises on or above the surface of the earth used in connection with or incident to an underground coal mine, and shall include but not be limited to:
(a) Areas of land upon which such activities, facilities, equipment or materials are located or disturb the natural land surfaces;
(b) Adjacent areas of land where use of such adjacent areas is incidental to such activities, facilities, equipment, or materials;
(c) Areas of land disturbed or affected by the construction of new roads or the improvement or use of existing roads for haulage or excavation or for access to the site of such activities, facilities, equipment, or materials;

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(d) Activities, facilities, equipment, materials, and premises for or incidental to the washing, cleaning, concentrating, crushing, preparation, or other processing of coal not involving a change in the chemical composition thereof;
(e) Excavation, haulage, workings, entryways, ventilation shafts, repair areas, storage areas, loading areas, and shipping areas;
(f) Disposal areas for coal waste and preparation plant waste, including solid refuse piles, slurry ponds, dams and impoundments which contain coal waste materials, dumps, culm banks, and tailings;
(g) Disposal areas for rock and earth materials, including spoil piles, overburden piles, and valley and head-of-hollow fills;
(h) Holes, depressions, sedimentation ponds or other impoundments; and
(i) Other areas upon which are situated facilities, equipment, materials, or other property incidental to or resulting from such activities, facilities, equipment or materials.

Surface waters - means those waters having well-defined banks and beds, either constantly or intermittently flowing; lakes and impounded waters; marshes and wetlands; and any subterranean waters flowing in well-defined channels and having a demonstrable hydrologic connection with the surface. Lagoons used for waste treatment and effluent ditches that are situated on property owned, leased, or under valid easement by a permitted discharger are not considered to be surface waters of the commonwealth.

Technology-Based Effluent Limitation (TBEL) – means an effluent limit for a pollutant that is based on the capability of a treatment method to reduce the pollutant to a certain concentration or mass loading level. TBELs for POTWs are derived from the secondary treatment regulations in Part 133 or state treatment standards. TBELs for non-POTWs are derived from effluent guidelines, state treatment standards, or by the permit writer on a case-by-case basis using best professional judgment.

Tiered permit limits - Permit limits that apply to the discharge only when a certain threshold (e.g., production level), specific circumstance (e.g., batch discharge), or time frame (e.g., after 6 months, during the months of May through October) triggers their use. Adapted from 1996 PWM

Total Dissolved Solids (TDS) means the total dissolved solids (filterable residue) as determined by use of the method specified in 40 CFR Part 136.

Total Maximum Daily Load (TMDL) - The sum of the individual wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources and natural background. If a receiving water has only one point source discharger, the TMDL is the sum of that point source WLA plus the LAs for any nonpoint sources of pollution and natural background sources, tributaries, or adjacent segments. TMDLs can be expressed in terms of either mass per time, toxicity, or other appropriate measure. If best management practices (BMPs) or other nonpoint source pollution controls make more stringent load allocations practicable, then wasteload allocations can be made less stringent. Thus, the TMDL process provides for nonpoint source control tradeoffs.

Total Suspended Solids (TSS) - means the total suspended solids (non-filterable residue) as determined by use of the method specified in 40 CFR Part 136.

Toxic Pollutant - Any pollutant listed as toxic under CWA section 307(a)(1) or, in the case of sludge use or disposal practices, any pollutant identified in regulations implementing CWA section 405(d).

Toxic substance - means a substance that is bioaccumulative, synergistic, antagonistic, teratogenic, mutagenic, or carcinogenic and causes death, disease, a behavioral abnormality, a physiological malfunction, or a physical deformity in an organism or its offspring or interferes with normal propagation.

Toxicity Reduction Evaluation (TRE) - A site-specific study conducted in a step-wise process designed to identify the causative agent(s) of effluent toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in effluent toxicity.

Toxicity Test – means a procedure to determine the toxicity of a chemical or an effluent using living organisms. A toxicity test measures the degree of effect on exposed test organisms of a specific chemical or effluent.

Treatability Manual - Five-set library of EPA guidance manuals that contain information related to the treatability of many pollutants. The manual may be used in developing effluent limitations for facilities and pollutants, which, at the time of permit issuance, are not subject to industry-specific effluent guidelines. The

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five volumes that comprise this series consist of Volume I – Treatability Data (EPA-600/8-80-042a); Volume II – Industrial Descriptions (EPA-600/8-80-042b); Volume III – Technologies (EPA-600/8-80- 042c); Volume IV – Cost Estimating (EPA-600/8-80-042d); and Volume V – Summary (EPA-600/8-80-042e).

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.

UIC - means Underground Injection Control.

Underground injection control well - means a well used for the emplacement of fluids into the subsurface.

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.

Upset - means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

Valley fill and head-of-hollow fill -means a structure consisting of any materials other than waste placed so as to encroach upon or obstruct to any extent any watercourse other than those minor watercourses located on highland areas where overland flow in natural rills and gullies is the predominant form of run-off. For example, such fills are normally constructed in the uppermost portion of a V-shaped valley in order to reduce the upstream drainage area (head-of-hollow fills). Fills located further downstream (valley fills) must have larger diversion structures to minimize infiltration. Both fills are characterized by rock underdrains and are constructed in compacted lifts from the toe to the upper surface in a manner to promote stability.

Variance - means a mechanism or provision pursuant to 401 KAR Chapter 5 that allows modification to or waiver of the generally applicable effluent limitation requirements or time deadlines.

Warm water aquatic habitat (WAH) - means a surface water and associated substrate capable of supporting indigenous warm water aquatic life.

Water or Waters of the Commonwealth means and includes any and all rivers, streams, creeks, lakes, ponds, impounding reservoirs, springs, wells, marshes, and all other bodies of surface or underground water, natural or artificial, situated wholly or partly within or bordering upon the Commonwealth or within its jurisdiction

Water quality management plan (WQM plan) - means: (a) A plan consisting of initial plans produced in accordance with 33 U.S.C. 1288 and 1313 and certified and approved updates to those plans; or (b) A state or area-wide waste treatment management plan developed and updated in accordance with 33 U.S.C. 1281, 1285j, 1288, and 1313e and 40 CFR Part 130.

Water quality standard - means an administrative regulation promulgated by the cabinet establishing the designated use of a surface water and the water quality criteria necessary to maintain and protect that designated use.

Water Quality-Based Effluent Limit(s) means effluent limits derived from Kentucky's Water Quality Standards.

Well or water well - means any excavation or opening in the surface of the earth that is drilled, cored, bored, washed, driven, jetted, or otherwise constructed when the actual or intended use in whole or part of an excavation is the removal of water for any purpose, including but not limited to culinary and household purposes, animal consumption, food manufacture, use of geothermal resources for domestic heating purposes and industrial, irrigation, and dewatering purposes, but not including wells to be used for watering stock or for general farmstead use if the wells do not provide water for human consumption

Wellhead protection area - means: (a) The surface and subsurface area surrounding a water well, well field, or spring, supplying a public water system, through which pollutants are reasonably likely to move toward and reach the water well, well field, or spring; or (b) An area defined as a wellhead protection area in a county water supply plan.

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Wetlands - means land that has a predominance of hydric soils and that is inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of hydrophytic vegetation typically adapted for life in saturated soil conditions.
Zone of initial dilution (ZID) - means the limited area permitted by the cabinet surrounding or downstream from a discharge location where rapid, first-stage mixing occurs. The zone of initial dilution is the domain where wastewater and receiving water initially mix.

ACRONYMS AND ABBREVIATIONS			
Acronym or abbreviation	**Full phrase**	**Acronym or abbreviation**	**Full phrase**
7Q10	7-day, 10-year Low Flow	MSHA	Mine Safety and Health Administration
ACR	Acute-to-Chronic Ratio	N/A	Not Applicable
AML	Average Monthly Limitation	NEMI	National Environmental Methods Index
ASR	Alternative State Requirement	NOAA	National Oceanic and Atmospheric Administration
AWL	Average Weekly Limitation	NOEC	No Observable Effect Concentration
BAT	Best Available Technology Economically Achievable	NPDES	National Pollutant Discharge Elimination System
BCT	Best Conventional Pollutant Control Technology	O&G	Oil and Grease
BPJ	Best Professional Judgment	^{o}C	Degrees Centigrade or Celsius
BPT	Best Practicable Control Technology Currently Available	^{o}F	Degrees Fahrenheit
CAH	Cold Water Aquatic Habitat	ONRW	Outstanding National Resource Water
CFR	*Code of Federal Regulations*	OSMRE	Office of Surface Mining Reclamation and Enforcement
cfs	Cubic Feet per Second	OSRW	Outstanding State Resource Water
CWA	Clean Water Act	PCR	Primary Contact Recreation
DMP	Division of Mine Permits	PEP	Protection and Enhancement Plan
DMR	Discharge Monitoring Report	PMP	Probable Maximum Precipitation
		RAM	Reclamation Advisory Memorandum
DMRE	Division of Mine Reclamation and Enforcement	RBP	Rapid Bioassessment Protocol
DNR	Department for Natural Resources	SCMRA	Surface Mining Control and Reclamation Act of 1977 (PL 95-87), as amended
DO	Dissolved Oxygen	SCR	Secondary Contact Recreation
EL	Effluent Limit	SIC	Standard Industrial Classification
ELG	Effluent Limitations Guidelines or Effluent Guidelines	SIU	Significant Industrial User
ELGF	Effluent Limitation Guideline Factor	SPCC	Spill Prevention Control and Countermeasure
EPA	U.S. Environmental Protection Agency	SS	Settleable Solids
ESA	Endangered Species Act	SSO	Sanitary Sewer Overflow
EW	Exceptional Water	STORET	EPA Storage and Retrieval Database
FR	*Federal Register*	SU	Standard Units

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ACRONYMS AND ABBREVIATIONS			
Acronym or abbreviation	**Full phrase**	**Acronym or abbreviation**	**Full phrase**
FWS	U.S. Fish and Wildlife Service	TBEL	Technology-Based Effluent Limit(s)
GC/MS	Gas Chromatography/Mass Spectroscopy	TIE	Toxicity Identification Evaluation
gpd	Gallons per Day	TMDL	Total Maximum Daily Load
HQW	High Quality Water	TRC	Total Residual Chlorine
IC	Inhibition Concentration	TRE	Toxicity Reduction Evaluation
KIBI	Kentucky Index of Biological Integrity	TSD	Technical Support Document for Water Quality-based Toxics Control
LA	Load Allocation	TSS	Total Suspended Solids
lbs/day	Pounds per Day	TTO	Total Toxic Organics
LC_1	Lethal Concentration to 1% of test organisms	TU	Toxic Units
LC_{50}	Lethal Concentration to 50% of test organisms	TU_A	Toxic Units – Acute
LOEC	Lowest Observed Effect Concentration	TU_c	Toxic Units – Chronic
LTA	Long-Term Average	TWTDS	Treatment Works Treating Domestic Sewage
LTCP	Long-Term Control Plan	U.S.C.	*United States Code*
MBI	Macroinvertebrate Bioassessment Index	USFWS	US Fish and Wildlife Service
MDEL	Maximum Daily Effluent Limitation	UAA	Use Attainability Analysis
MDL	Method Detection Limit	USGS	United States Geological Survey
MEP	Maximum Extent Practicable	WET	Whole Effluent Toxicity
mg/L	milligrams per liter	WLA	Waste Load Allocation
MGD	Million Gallons per Day	WQBEL	Water Quality-Based Effluent Limit(s)
ML	Minimum Level	WQS	Water Quality Standard(s)
MOA	Memorandum of Agreement	µg/L	Micrograms per Liter
MRP	Mining Reclamation Plan Map	ρCi/l	Pico Curies per Liter

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1. GENERAL PROCEDURES FOR LIMITATIONS AND REQUIREMENTS DEVELOPMENT

This section of the fact sheet provides information regarding the general process for the development of limits and requirements for most KPDES permits. Some processes and requirements are universal and apply to all permits, while others are specific to particular categories of permits. Section 2 presents permit-specific information regarding the development of effluent limitations and requirements.

Pursuant to 401 KAR 5:065 Section 2(4) [40 CFR 122.44], 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. For new sources or new dischargers, these technology-based limitations and standards are subject to the provisions of 401 KAR Section 6 [40 CFR 122.29].

1.1. Technology-Based Effluent Limitations

401 KAR 5:065 Section 2(4) [40 CFR 122.44(a)(1)] requires the imposition of effluent limitations and standards promulgated under Section 301 of the Clean Water Act (CWA), or new source performance standards promulgated under section 306 of the CWA, on a case-by-case determination under Section 402(a)(1) of the CWA, or a combination of the three, in accordance with 401 KAR 5:080 Section 2(3) [40 CFR 125.3]. In accordance with Section 301(b) of the CWA, 401 KAR 5:080 Section 2(3) [40 CFR 125.3] establishes the minimum technology-based treatment requirements which are to be imposed on permits issued under section 402 of the CWA. These standards are divided into two categories: Publicly Owned Treatment Works (POTWs) and dischargers other than POTWs (Industrial).

Industrial dischargers are categorized as either an “existing source,” “new discharger” or “new source”. A “new source” is defined as any building, structure, facility, or installation from which there is or may be a discharge of pollutants, the construction of which commenced: (1) after promulgation of applicable New Source Performance Standards (NSPS) in the Effluent Limitation Guideline (ELG) or (2) after proposal of applicable NSPS requirements in an ELG but only if the standards are promulgated within 120 days of proposal. A “new discharger” is defined as any building, structure, facility, or installation: (1) from which there is or may be a discharge of pollutants, (2) that did not commence the discharge of pollutants at that particular site prior to August 13, 1979, (3) is not a new source, and (4) has never received a finally effective NPDES permit for discharges at that site. An “existing source” is defined as any building, structure, facility or installation from which there is or may be a discharge of pollutants which is not a new source or a new discharger.

The following table summarizes the requirements for non-POTW or industrial dischargers.

TECHNOLOGY-BASED TREATMENT REQUIREMENTS FOR INDUSTRIAL DISCHARGERS					
Technology-Based Control Level	Type of Discharger	Type of Pollutant			Compliance Deadline
		Conventional	Nonconventional	Toxic	
Best Practicable Control Technology Currently Available (BPT)	Direct Existing	X	X	X	July 1, 1977
Best Conventional Pollutant Control Technology (BCT)	Direct Existing	X			March 31, 1989
Best Available Technology Economically Achievable (BAT)	Direct Existing		X	X	March 31, 1989
New Source Performance Standards (NSPS)	Direct New	X	X	X	Commencement of discharge

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TECHNOLOGY-BASED TREATMENT REQUIREMENTS FOR INDUSTRIAL DISCHARGERS					
Technology-Based Control Level	**Type of**	**Type of Pollutant**			**Compliance Deadline**
Pretreatment Standards for Existing Sources (PSES)	Indirect Existing-	X	X	X	Date specified in regulation
Pretreatment Standards for New Sources (PSNS)	Indirect New	X	X	X	Commencement of discharge

BPT is the first level of technology-based standards established by the CWA to control pollutants discharged to waters of the US and is generally based on the average of the best existing performance by plants within an industrial category or subcategory.

BCT are technology-based standards for the discharge of existing industrial point sources of conventional pollutants.

BAT are technology-based standards that are the most appropriate means available on a national basis for controlling the direct discharge of toxic and nonconventional pollutants to navigable waters and generally represent the best existing performance of treatment technologies that are economically achievable within an industrial point source category or subcategory. Toxic pollutant means any pollutant listed as toxic under Section 307(a)(1) or, in the case of sludge use or disposal practices, any pollutant identified in regulations implementing Section 405(d) of the CWA. Nonconventional pollutants are not listed as conventional or toxic pollutants.

Unlike BPT, BCT, and BAT, the imposition of which in permits is authorized by 401 KAR 5:080 Section 2(3) [40 CFR 125.3(a)], NSPS requirements are required by Section 306 of the CWA. 401 KAR 5:080 Section 6 [40 CFR 122.29(d)] establishes the compliance date for achieving the pollutant reduction levels specified by the NSPS. 401 KAR 5:080 Section 6 [40 CFR 122.29(d)(1)] states that a new source which meets the applicable promulgated NSPS before commencement of discharge, may not be subject to any more stringent NSPS or to any more stringent technology-based standards under Section 301(b)(2) of the CWA for the soonest ending of the following periods:

(1) Ten years from the date that construction is completed;
(2) Ten years from the date the source begins to discharge process or other non-construction related wastewater; or
(3) The period of depreciation or amortization of the facility for the purposes of Section 167 or 160 or both of the Internal Revenue Code of 1954.

Pursuant to 401 KAR 5:080 Section 6 [40 CFR 122.29(d)(2)], the protection afforded by the aforementioned deadlines do not apply to more stringent limits of performance based on the following criteria:

(1) The limitations are not technology-based; or
(2) Additional conditions in accordance with 401 KAR 5:080 Section 2(3) [40 CFR 125.3] controlling toxic pollutants or hazardous substances which are not controlled by NSPS, including those controlling pollutants other than those identified as toxic pollutants or hazardous substances when control of these pollutants has been specifically identified as the method to control the toxic pollutants or hazardous substances.

Section 306(c) provides for a state to develop and submit to the EPA Administrator a procedure under state law for applying and enforcing standards of performance for new sources located in the state. If the Administrator finds the state procedure requires the application and enforcement of standards of performance to at least the same extent as by Section 306 then the state is authorized to apply and enforce those performance standards on new sources in the state, except those owned or operated by the United States.

The PSES and PSNS technology-based effluent requirements are applied by POTWs with an approved Pretreatment Program via local limits and user permits.

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1.1.1. Methods of Imposing

Pursuant to 401 KAR 5:075 Section 1 [40 CFR 122.3(c)], technology-based treatment requirements may be imposed through one of three methods:

(1) The application of EPA promulgated effluent limitations developed under Section 304 of the CWA to dischargers by category or subcategory (i.e., ELGs);
(2) On a case-by-case basis under Section 402(a)(1) of the CWA to the extent that EPA-promulgated effluent limitations are inapplicable. The permit writer shall apply the appropriate factors listed in 401 KAR 5:080 Section 2(3) [40 CFR 125.3(d)] and shall consider (a) the appropriate technology for the category or class of point sources of which the applicant is a member, based upon all available information, and (b) any unique factors relating to the applicant using best professional judgment (BPJ), including, where appropriate, limitations expressed in terms of toxicity;
(3) Through a combination of methods (1) and (2) where promulgated ELGs only apply to (a) certain aspects of the discharger's operation, (b) to certain pollutants, or (c) other aspects or activities are subject to regulation on a case-by-case basis in order to carry out the provisions of the CWA.

1.1.1.1. Effluent Limitation Guidelines

EPA has developed effluent limitation guidelines (ELGs) for 56 specific point source categories. These guidelines typically referred to as ELGs are found in 401 KAR 5:065 Section 2(9)[Title 40, Chapter I Subchapter N (40 CFR Parts 400 thru 471)]. The ELG typically establishes numeric requirements for one or more of the technology-based requirements discussed under Section 1.1.2. These numeric requirements may be in the form of: (1) mass based, production normalized, (2) mass based, flow normalized, (3) concentration based, (4) zero discharge of pollutants, or (5) other numeric limitations, e.g. pH, temperature.

1.1.1.1.1. Mass Based, Production Normalized Numeric Limitations

To calculate mass based, production normalized numeric limitations, the formula

$$EL = (LAPR) \times (ELGF)$$

is used, where the following is true:

EL is the calculated effluent limit expressed as lbs/day.

LAPR is the long-term average daily production rate. The LAPR can be expressed in various units such as 1,000 lbs/day, 102 square feet/day, barrels/day, etc. The LAPR is not the maximum or design production rate for the facility but an average daily, average monthly, or other mean production rate. Typically DOW considers long-term to be equivalent to the term of the permit which is usually 5 years.

ELGF is the effluent limit guideline factor found in the ELG and is expressed in various units such as lbs/1000 lbs, lbs/102 square feet, etc.

1.1.1.1.2. Mass Based, Flow Normalized Numeric Limitations

To calculate these types of limitations the formula

$$EL = (LAF) \times (ELGF) \times (UCF)$$

is used where the following is true:

EL is the calculated effluent limit expressed as lbs/day.

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LAF is the long-term average daily flow and is expressed in terms of million gallons per day (MGD). The LAF is not the maximum or design flow for the facility but an average daily, average monthly, or other mean flow rate. Typically DOW considers long-term to be equivalent to the term of the permit which is usually 5 years.

ELGF is the effluent limit guideline factor found in the ELG and is expressed in mg/l.

UCF is a unit conversion factor equivalent to 8.34 (L-lbs/MG-mg).

1.1.1.1.3. Concentration Based, Zero Discharge of Pollutants, and Other Numeric Limitations

These types of limitations are directly applied without modification due to production rate or flow of the facility.

1.1.1.2. Best Professional Judgment

The second method for the imposition of technology-based effluent limitations is through a process known as BPJ. As previously stated in 4.1.2.1 Methods of Imposing, the BPJ process may be used on a case-by-case basis to the extent that EPA-promulgated effluent limitations are inapplicable. The NPDES permit writers handbook and NPDES permit writers training course states that "promulgated effluent limitations are inapplicable" when: (1) EPA has not developed effluent guidelines that apply to the discharge (industry or specific process); or (2) there is an applicable effluent guideline, but pollutants or processes are present that were not considered when the effluent guideline was developed.

401 KAR 5:080 Section 2(3)[40 CFR 125.3 (d)] establishes technical criteria for the permit writer to follow in the development of a case-by-case BPJ determination of appropriate technology-based effluent limitations. These procedures are similar to those utilized by EPA to develop national ELGs. The permit writer determines BPT, BCT, and BAT on a case-by-case basis considering any unique factors related to the facility. The permit writer must develop BPT and BCT criteria for conventional pollutants or BPT and BAT criteria for toxic and nonconventional pollutants.

Technical criteria common to BPT, BCT and BAT include: (1) age of equipment and facilities involved; (2) process or processes employed; (3) engineering aspects of the application of various types of control techniques; (4) process changes; and (5) non-water quality environmental impact including energy requirements. Where the BPJ determination differs for these three levels of technology-based standards is in the area of economic criteria. The following table illustrates these differences.

BPJ ECONOMIC CRITERIA	
Required Technology	**Economic Test**
BPT	Total cost in relation to effluent reduction benefits achieved
BCT	Two part test:
	POTW Cost Test – compares the cost-effectiveness of an upgrade by the facility to meet BCT to the benchmark cost-effectiveness of a similar POTW upgrade (from secondary to advanced treatment)
	Industry Cost-Effectiveness Test – compares the ratio of the incremental cost of going beyond BPT and the incremental cost of going from no treatment to BPT to an industry benchmark
BAT	Economic Achievability – determination of whether the cost of achieving the effluent reduction feasible

It should be noted that 401 KAR 5:080 Section 2(3) [40 CFR 125.3 (d)] does not establish technical criteria or economic criteria for the development of a BPJ equivalent of NSPS. Therefore, based on the requirements of Section 306 of the CWA, 401 KAR Section 6 [40 CFR 122.29(d)] and 401 KAR 5:080 Section 2(3) [40 CFR 125.3(d)], DOW has concluded that EPA did not intend for the permit writer to develop a BPJ-equivalent of NSPS.

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1.1.1.3. Combination of ELGs and BPJ Determinations

The third option for imposing technology-based limitations is a combination of the application of an ELG and of a BPJ determination of appropriate technology-based effluent limitations. This option is the most frequently used option of the three. Although EPA has developed and promulgated a significant number of ELGs, these guidelines are not comprehensive of all dischargers. In many cases a facility may have several wastestreams that are commingled for ease and cost of treatment, known as "co-treatment facilities". In such cases there may be a promulgated ELG for one or more of the wastestreams, there may be wastestreams for which an ELG does not exist, and there may be wastestreams that contain pollutants that EPA did not consider in its analysis when the ELG was being developed and promulgated. In such cases it is necessary for the permit writer to determine an aggregate technology-based effluent on the combined wastestream.

The process for developing an aggregate technology-based effluent is straightforward. The permit writer begins by analyzing each wastestream individually to determine if an ELG is applicable to each wastestream. For those wastestreams subject to an applicable ELG the permit writer determines the appropriate contribution using the methods described in Section 1.1.1.1. For those wastestreams where an applicable ELG does not exist the permit writer determines the appropriate contribution by developing a BPJ based technology requirement and applying to the wastestream. The following example illustrates this process.

Example: A discharger commingles three wastestreams in a single treatment unit for ease of treatment. Wastestream one (W_1) is process water subject to an applicable ELG. Wastestream two (W_2) is a non-process wastewater for which no ELG has been developed and promulgated. Wastestream three (W_3) is a pollution-control wastewater that is subject to an applicable ELG; however, the pollutant in question was not addressed by EPA in the development of the ELG.

The permit writer, following the procedures outlined in Sections 1.1.1.1 and 1.1.1.2, has determined the contributions from each wastestream for the pollutant of concern is:

W1 = 105 lbs/day
W2 = 20 lbs/day
W3 = 5 lbs/day

The aggregate limit then is the summation of these three contributing wastestream loads, or 130 lbs/day, to be applied at the point of discharge. It should be noted that wastestream concentrations are never cumulative.

1.1.2. Coal Mining Point Source Category 401 KAR 5:065 Section 2(9) [40 CFR 434]

EPA promulgated an ELG for the coal mining point source category on October 9, 1985 and amended the ELG on January 23, 2002. The ELG applies to discharges from any coal mine at which the extraction of coal is taking place or is planned to be undertaken and to coal preparation plants and associated areas. In its development of the ELG, EPA took into consideration that the waste stream from active mining areas is different than from post-mining areas, and The ELG is divided into eight (8) subparts applicable to specific operations or parts of operations based on type of activity taking place and phase of mining. These subparts and their applicable technology-based limitations are summarized below.

Subpart A	General Provisions
Subpart B	Coal Preparation Plants and Coal Preparation Plant Associated Areas
Subpart C	Acid or Ferruginous Mine Drainage
Subpart D	Alkaline Mine Drainage
Subpart E	Post-Mining Areas
Subpart F	Miscellaneous Provisions

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Subpart G Coal Remining
Subpart H Western Alkaline Coal Mining

BPT EFFLUENT LIMITATIONS			
Active Mining Discharges and Underground Mining Discharges (Subparts B, C, D, E)			
EFFLUENT CHARACTERISTIC	**Units**	**Monthly Average**	**Daily Maximum**
Iron, Total	mg/l	3.5	7.0
Manganese, Total*	mg/l	2.0	4.0
TSS	mg/l	35	70
pH	SU	Within the range of 6.0 to 9.0 at all times	
*Does not apply to Subpart D – Alkaline Mine Drainage			
Post-Mining Discharges Excluding Underground Mining Discharges (Subpart E)			
EFFLUENT CHARACTERISTIC	**Units**	**Monthly Average**	**Daily Maximum**
SS	ml/l	0.5 maximum not to be exceeded	
pH	SU	Within the range of 6.0 to 9.0 at all times	

BAT EFFLUENT LIMITATIONS			
Active Mining Discharges and Underground Mining Discharges (Subparts B, C, D, E)			
EFFLUENT CHARACTERISTIC	**Units**	**Monthly Average**	**Daily Maximum**
Iron, Total	mg/l	3.5	7.0
Manganese, Total*	mg/l	2.0	4.0
*Does not apply to Subpart D – Alkaline Mine Drainage			
Post-Mining Discharges Excluding Underground Mining Discharges (Subpart E)			
EFFLUENT CHARACTERISTIC	**Units**	**Monthly Average**	**Daily Maximum**
SS	ml/l	0.5 maximum not to be exceeded	
pH	SU	Within the range of 6.0 to 9.0 at all times	

NSPS EFFLUENT LIMITATIONS			
Active Mining Discharges and Underground Mining Discharges (Subparts B, C, D, E)			
EFFLUENT CHARACTERISTIC	**Units**	**Monthly Average**	**Daily Maximum**
Iron, Total	mg/l	3.0	6.0
Manganese, Total*	mg/l	2.0	4.0
TSS	mg/l	35	70

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NSPS EFFLUENT LIMITATIONS			
Active Mining Discharges and Underground Mining Discharges (Subparts B, C, D, E)			
EFFLUENT CHARACTERISTIC	**Units**	**Monthly Average**	**Daily Maximum**
pH	SU	Within the range of 6.0 to 9.0 at all times	
*Does not apply to Subpart D – Alkaline Mine Drainage			
Post-Mining Discharges Excluding Underground Mining Discharges (Subpart E)			
EFFLUENT CHARACTERISTIC	**Units**	**Monthly Average**	**Daily Maximum**
SS	ml/l	0.5 maximum not to be exceeded	
pH	SU	Within the range of 6.0 to 9.0 at all times	

EPA also recognized that multiple waste streams to which different limitations apply may be combined before discharge. Where waste streams from any coal mining activity are combined for treatment or discharge with waste streams from another coal mining activity, the concentration of each pollutant in the combined discharge may not exceed the most stringent limitations for that pollutant applicable to any component waste stream of the discharge.

EPA also recognized that pH alteration may be required to meet applicable manganese limitations. Where the application of neutralization and sedimentation treatment technology results in an inability to comply with the otherwise applicable manganese limitations, the permittee may request a pH level in the final effluent up to 10.0 as a technology-based effluent standard.

Finally, EPA's 1982 *Development Document for the Coal Mining Point Source Category* states:

> The major sources of wastewater in the coal mining category include precipitation, surface runoff, ground water infiltration, and effluents from coal preparation plants. No process water is used in the mining phase, except for minor consumption in dust suppression, pump coolants, and firefighting needs. Therefore, pollution abatement in this industry must be approached differently than with other industries, with reliance on operating and management practices for wastewater source control as well as end-of-pipe treatment technologies. In the preparation phase, water is used to clean the raw coal. Water usage is typically 350 gallons per ton and is laden with coal and refuse fines which must be removed prior to discharge or reuse.

As a consequence of this understanding, EPA allowed for certain alternate effluent limitations based on large precipitation events, summarized in the table below. These alternate limits are only applicable to technology-based limitations and must be requested on a case-by-case basis.

TYPE OF DISCHARGE	PRECIPITATION EVENT			
	Discharge Caused by Precipitation	**1-yr, 24-hr**	**2-yr, 24-hr**	**10-yr, 24-hr**
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

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TYPE OF DISCHARGE	PRECIPITATION EVENT			
	Discharge Caused by Precipitation	**1-yr, 24-hr**	**2-yr, 24-hr**	**10-yr, 24-hr**
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, Iron	SS, pH, Iron	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 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.				

1.2. Water Quality Based Effluent Limitations

401 KAR 5:065 Section 2(4) [40 CFR 122.44(d)(1)] requires the imposition of water quality standards and state requirements to consider any requirements in addition to or more stringent than promulgated effluent limitations guidelines or standards under Sections 301, 304, 306, 307, 318 and 405 of the CWA necessary to achieve water quality standards established under Section 303 of the CWA, including state narrative criteria for water quality.

401 KAR 5:065 Section 2(4) [40 CFR 122.44(d)(1)(i)] stipulates that limitations must control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic) which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality.

When determining whether a discharge causes, has the reasonable potential to cause, or contributes to an instream excursion above a narrative or numeric criteria within a state water quality 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 water, pursuant to 401 KAR 5:065 Section 2(4) [40 CFR 122.44(d)(1)(ii)]. For any discharge causing, having the reasonable potential to cause, or contribute to an instream excursion above the allowable ambient concentration of a state numeric criteria within a state water quality standard for an individual pollutant, the permit must contain effluent limits for that pollutant.

When the permitting authority determines that a discharge causes, has the reasonable potential to cause, or contributes to an instream excursion above the numeric criterion for whole effluent toxicity, the permit must contain effluent limits for whole effluent toxicity.

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401 KAR 5:065 Section 2(4) [40 CFR 122.44(d)(1)(vi)] requires the permitting authority to establish effluent limits for a specific chemical that is present in an effluent at a concentration that causes, has the reasonable potential to cause, or contribute to an excursion above a narrative criterion within the state water quality standard.

1.2.1. Reasonable Potential Analysis

In late 1999 and early 2000, the Division of Water (DOW) documented its procedures for conducting a reasonable potential analysis. In June 2000, this documentation entitled *Permitting Procedures for Determining Reasonable Potential* (Natural Resources and Environmental Protection Cabinet, Division of Water, May 1, 2000) was submitted to EPA Region IV for review. On July 7, 2000, EPA issued a letter approving the Division of Water's procedures. Both chemical-specific numeric and whole effluent toxicity (WET) procedures were developed.

1.2.1.1. Chemical-specific Procedures

When conducting a chemical-specific reasonable potential analysis DOW must first determine the pollutants of concern. Depending on the type of facility being permitted, the wastewaters discharged and the source of the pollutants, this analysis may be performed on a select number of pollutants or may be performed on the entire list of water quality standards found in 401 KAR 10:031. DOW determines the pollutants of concern through the review of the permit application, applicable effluent guidelines, the water quality standards, Discharge Monitoring Reports (DMRs) for existing facilities, etc. For municipal permits this review will include verification of industrial user contribution and, for those with approved pretreatment programs, toxic scans of influent, effluent, and sludge in addition to audits and inspections.

1.2.1.1.1. Numeric Procedures

If DOW determines that a promulgated Effluent Limitation Guideline (ELG) applies or has developed limits for a pollutant based upon its Best Professional Judgment (BPJ), then reasonable potential is considered to exist and effluent limitations and monitoring are imposed in the permit. For pollutants where neither an ELG nor BPJ developed limits apply DOW shall develop a Waste Load Allocation (WLA) for the pollutant to determine if reasonable potential exists. DOW utilizes one or more of the computer models in subsequent sections to develop WLAs, taking into account site-specific background receiving water conditions.

The models use actual or predicted background data and discharge data. In running these models, DOW considers five (5) data points as sufficient dataset in most cases. In cases where insufficient data is available, DOW may condition the permit to include a monitoring-only requirement to generate the data; to require additional data collection prior to the development of the permit; or, in cases where the pollutant concentration in the wastewater is not highly variable, a single data point may be used. While most effluents exhibit a lognormal distribution relative to concentrations of constituents being released, DOW has elected not to assume any coefficient of variation for the data set and instead prefers to use the average concentration or loading as indicative of future discharge.

The output of the WLA is compared to the discharge quality to determine reasonable potential using the following criteria: If the average discharge quality is less than 70% of the WLA then monitoring may not be required; if within the range of 70% to 90% then monitoring shall be required; if greater than 90% then a limit shall be required. In the case where insufficient data, i.e. less than 5 data points, exists, or where predicted values were used the permit shall require monitoring for the pollutants at a frequency of once per month for the first year at the end of which a new reasonable potential analysis shall be conducted and the permit may be reopened to modify the conditions.

1.2.1.1.2. Narrative Procedures

DOW uses biotic indices, as discussed in 1.2.2.1.3.3, to assess streams to determine the level of support for aquatic life. These indices are used to implement Kentucky's narrative criteria. DOW also uses these indices to determine the reasonable potential for the effluent to adversely affect the aquatic community.

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Site-specific data is necessary in order to address reasonable potential to cause or contribute to an excursion from narrative criteria. DOW uses a single baseline data point to determine the level of existing support prior to commencement of the permitted activity. In cases where baseline data is unavailable, DOW may require data collection prior to the development of the permit or condition the permit to include a requirement to generate the data. Additional sample data is required to determine whether reasonable potential to cause an excursion from the narrative standard exists after the permitted activity commences. DOW compares the additional data to baseline biotic indices. Should negative changes in the biotic indices occur, then reasonable potential may exist and DOW may require either an action by the permittee or modification of the permit. Should the negative change in the biotic indices be of sufficient scale as to cause a categorical decline, e.g. moving from the Fair category to the Poor category, then reasonable potential has been demonstrated. A categorical decline is an excursion of the narrative criteria and a violation of the permit unless demonstrated by the permittee that the categorical decline is a result of other causes.

1.2.1.2. Whole Effluent Toxicity Procedures

Complex wastestreams have a number of variable contributing sources which may be individually toxic or collectively act synergistically to cause toxicity and therefore have present a reasonable potential to cause or contribute to instream toxicity. Those industrial facilities which have been rated as "majors" using EPA's major rating protocols and municipalities with approved pretreatment programs are considered to have a reasonable potential by DOW and therefore have whole effluent toxicity (WET) testing included in the permit.

Additionally, 401 KAR 5:065 Section 2(4) [40 CFR 122.44(d)(vi)(C)] allows for the establishment of limits on an indicator parameter for narrative water quality standards. 401 KAR 10:031 Section 4 (1)(f) and (g) include Kentucky's narrative standards for TDS or SC and TSS respectively, which should not be changed to the extent that the indigenous aquatic community is affected. Coupled with site-specific biotic surveys, DOW uses WET testing as an indicator parameter for these pollutants.

1.2.2. Derivation of Limitations

1.2.2.1. Chemical-specific Criteria

The allowable instream concentrations for specific pollutants are found in 401 KAR 10:031, Section 6(1) Table 1. These water quality criteria are divided into the categories of those for the protection of human health and aquatic life. These categories are further divided into the subcategories of Domestic Water Supply (C_{HHDWS}) and Fish Consumption (C_{HHFC}) for human health and Acute Criteria (C_A) and Chronic Criteria (C_C) for aquatic life. Section 4(2) of 401 KAR 10:029 specify the points within the receiving stream where AC, CC, and FC criteria apply. The point where DWS criteria apply is specified by 401 KAR 10:031, Section 3. This section also specifies the stream flows that are used in derivation of water quality based effluent limitations. The following summarizes these requirements.

CHEMICAL-SPECIFIC CRITERIA APPLICATION CONDITIONS			
Criteria	**Sub-Criteria**	**Point of Application**	**Stream Flow**
Aquatic Life	Acute	No Diffuser – End-of-pipe	Not applicable
		Diffuser – Edge of the ZID Receiving Water	7Q10
	Chronic	Edge of Mixing Zone Receiving Water	7Q10
Human Health	Fish Consumption	Edge of Mixing Zone Receiving Water	Harmonic Mean
	Domestic Water Supply	Point of Withdrawal Intake Water	Carcinogen – Harmonic Mean
			Non-Carcinogen – 7Q10

The following figure illustrates the application points for these criteria.

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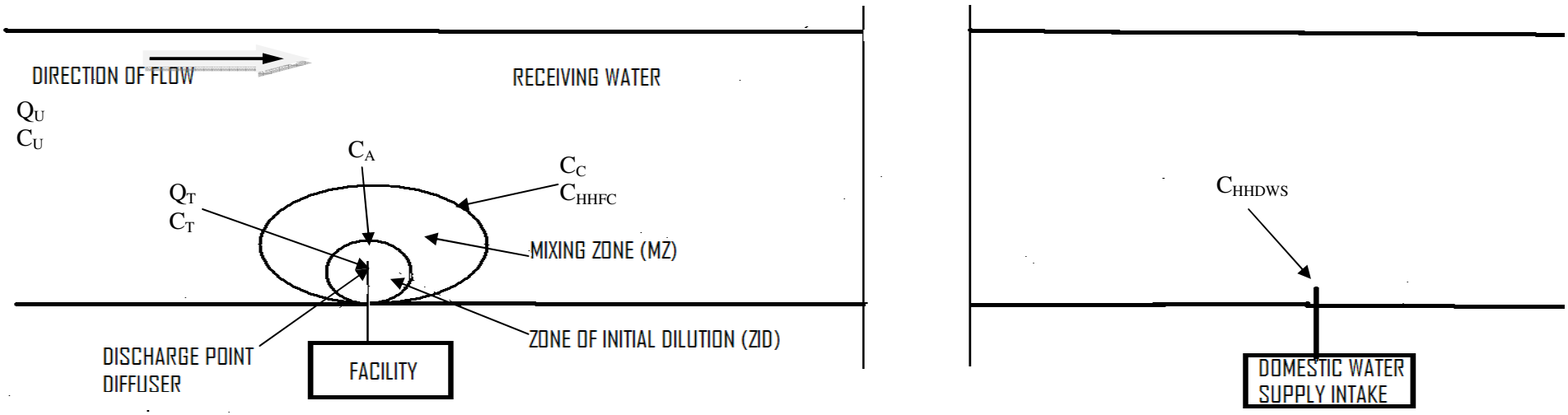

C_A – Acute criteria for aquatic life

C_C – Chronic criteria for aquatic life

C_{HHDWS} - Human Health criteria domestic water supply

C_{HHFC} - Human Health criteria fish consumption

C_T – End-of-pipe effluent limit

C_U – Background pollutant concentration

Q_T – Total Effluent Flow

Q_U – Upstream Flow

1.2.2.1.1. Mass-balance Equation

The chemical-specific water quality limitations are calculated using the following mass-balance equation:

$$(C_U)(Q_U)+(C_T)(Q_T)=(C_D)(Q_U+Q_T)$$

Where:

C_D = pollutant concentration downstream (water quality criteria)
C_T = End-of-pipe effluent limit
C_U = pollutant concentration upstream (stream background condition)
Q_T = wastewater flow
Q_U = receiving stream flow upstream

Solving the equation for C_T first requires rearranging the equation as

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$$C_T = \frac{[(C_D)(Q_T + Q_U) - (C_U)(Q_U)]}{Q_T}$$

In the event that the applicable Q_U is zero, $C_T = C_D$.

1.2.2.1.2. Mixing Zones and Zones of Initial Dilution

A mixing zone (MZ) is an area where effluent discharge undergoes dilution and is extended to cover the secondary mixing in the ambient waterbody. It is also an allocated impact zone where water quality criteria can be exceeded as long as acutely toxic conditions are prevented. 401 KAR 10:029, Section 4 sets forth the requirements for the granting of mixing zones, zones of initial dilution (ZIDs) and the application point of the aquatic life and human health criteria found in Kentucky's Water Quality Standards at 401 KAR 10:031. 401 KAR 10:029 Section 4(1) establishes requirements for the granting of an MZ, and Section 4(2) establishes the points of application for the aquatic life and human health criteria and the requirements and restrictions associated with a ZID.

When granting an MZ, DOW must assign definable geometric limits including the linear distance from the point of discharge, the surface area involved, and the volume of the receiving water, and shall take into account other nearby MZs. For streams and rivers, the assigned MZ shall not exceed 1/3 of the width of the waterbody nor 1/2 of the waterbody's cross-sectional area in any spatial direction. For lakes and reservoirs, the assigned MZ shall not exceed 1/10 of width of the waterbody in any spatial direction. The MZ shall not adversely affect the designated uses of the receiving stream nor adversely affect an established community of aquatic organisms. The location of an MZ shall not interfere with fish spawning or nursery areas, fish migration routes, public water supply intakes, or bath areas; preclude the free passage of fish or aquatic life, or jeopardize the continued existence of endangered or threatened aquatic species or result in the destruction or adverse modification of their critical habitat. Unless assigned by the Cabinet on or before September 8, 2004, there shall be no MZ for bioaccumulative chemicals of concern. Existing MZs assigned by the Cabinet for bioaccumulative chemicals of concern shall expire no later than September 8, 2014. The dilution afforded by an MZ is not allowed unless the applicant requests an MZ and DOW assigns the geometric limits.

A ZID is a regularly-shaped area surrounding the discharge structure that encompasses the regions of high pollutant concentrations under design conditions. ZIDs are restricted to facilities with a submerged high-rate multi-port outfall structure (diffuser). Within the ZID, acutely-toxic concentrations may exist; as such, the acute criteria must be met at the edge of the defined ZID. When determining the size of the ZID, DOW evaluates three cases, the most restrictive of which is used to establish the dimensions of the ZID and the allowable dilutions. The three cases that are evaluated are as follows: (1) within 10% of the distance from the edge of the outfall to the edge of the assigned mixing zone in any spatial direction; (2) within 50 times the square root of the cross-sectional area of a discharge port in any spatial direction; and (3) horizontally within 5 times the natural water depth that prevails under mixing zone design conditions, and exists before the installation of a discharge outlet. Unless assigned on or before December 8, 1999, a ZID for a pollutant shall not be allowed in an Exceptional Water. Like MZs, the dilution afforded by a ZID is not allowed unless the applicant requests a ZID and DOW assigns the geometric limits.

1.2.2.1.2.1. Mixing Zone

When an MZ is granted, the available upstream flow Q_U is modified by the MZ factor (MZF). The MZF represents the maximum proportion of the flow allowed to be used for the MZ. The mass-balance equation becomes

$$C_T = \frac{[C_D(Q_T + (MZF)(Q_U)) - C_U(MZF)(Q_U)]}{Q_T}$$

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Assuming that the depth is much smaller than width and that the flow is therefore width-dependent, the MZF cannot exceed 0.333 for most streams and rivers. For larger rivers, the cross-sectional limitation of 0.5 is allowed, but 0.333 is generally used to be conservative. Because of the low-flow regime present in lake systems, 0.1 is the maximum MZF for lakes. The MZ dilution (MZD) is then defined as product of the MZF and the ratio of the downstream flow to the upstream flow, or

$$MZD = \frac{MZF(Q_T + Q_U)}{Q_T}$$

Substituting MZD into the prior equation yields

$$C_T = \left[MZD\left(C_D - C_U\left(\frac{(MZF)Q_U}{Q_T + (MZF)Q_U} \right) \right) \right]$$

In the case where the receiving water flow condition is many times greater than the discharge flow, $\frac{(MZF)Q_U}{(Q_T + (MZF)Q_U)}$ approaches 1, which is a conservative assumption since it results in smaller values of C_T. The mass-balance equation can be approximated as

$$C_T = (C_D - C_U)\,MZD$$

1.2.2.1.2.2. Zone of Initial Dilution

A ZID is granted when a high rate multi-port submerged diffuser is installed on the effluent pipe. In such cases the ZID dilution (ZIDD) is defined as the ratio of the downstream flow to the upstream flow, or

$$ZIDD = \frac{(Q_T + Q_U)}{Q_T}$$

And the mass-balance equation is expressed as

$$C_T = \left[ZIDD\left(C_D - C_U\left(\frac{Q_U}{Q_T + Q_U} \right) \right) \right]$$

In cases where the receiving water flow condition is many times greater than the discharge flow, $\frac{Q_U}{(Q_T + Q_U)}$ approaches 1, which is a conservative assumption since it results in smaller values of CT. The mass-balance equation can be approximated as

$$C_T = (C_D - C_U)\,ZIDD$$

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1.2.2.1.3. Aquatic Life Criteria

Effluent discharge limitations for a particular constituent for the aquatic live criteria are based on the instream pollutant concentration limits for both acute conditions (C_A) and chronic conditions (C_C) and an associated ZIDD and/or MZD. The numerical values of the effluent discharge limits for a particular constituent are determined using the following equations. The 7Q10 low-flow condition of the receiving stream is used in place of Q_U when calculating these criteria.

1.2.2.1.3.1. Acute Aquatic Life Criteria

The acute aquatic life criterion (C_A) is applied at either the edge of the ZID or at the end of the discharge pipe. When a ZID is granted, the mass-balance equation is written as

$$C_T = (LC_1 - C_U)(ZIDD)$$

Where LC_1 is the concentration of toxic substance or mixture of toxic substances which is lethal (or immobilizing, if appropriate) to one (1) percent of the organisms tested in a toxicity test during a specified exposure period. The LC_{50} is the concentration of toxic substance or mixture of toxic substances which is lethal (or immobilizing, if appropriate) to fifty (50) percent of the organisms tested in a toxicity test during a specified exposure period. Due to the difficulty in deriving an LC1, the equivalent value of the LC_{50}, i.e. 1/3 LC_{50}, is used instead. The equation can thus be rewritten as

$$C_T = (0.333LC_{50} - C_U)(ZIDD)$$

The acute criteria listed in Table 1 in 401 KAR 10:031, Section 4 is the LC_{50} values for those specific pollutants therefore the equation is ultimately written as

$$C_T = (C_A - C_U)(ZIDD)$$

In the case where a ZID has not been granted, the equation becomes:

$$C_T = (C_A - C_U)$$

1.2.2.1.3.2. Chronic Aquatic Life Criteria

As previously stated, the chronic criterion (C_C) is applied at the end of the discharge pipe or at the edge of the assigned regulatory MZ. When an MZ is granted, the mass-balance equation for non-bioaccumulative or non-persistent chemicals is

$$C_T = (0.1LC_{50} - C_U)(MZD)$$

And for bioaccumulative or persistent chemicals is

$$C_T = (0.01LC_{50} - C_U)(MZD)$$

The chronic criteria listed in Table 1 in 401 KAR 10:031, Section 4 is the $0.1LC_{50}$ and $0.01LC_{50}$ values for those specific pollutants therefore the mass-balance equation is ultimately written as

$$C_T = (C_C - C_U)(MZD)$$

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In the case where a MZ has not been granted, the equation becomes

$$C_T = (C_C - C_U)$$

Note: As previously stated in Section 1.2.2.1.2, unless granted prior to September 8, 2004, no new MZs shall be granted for bioaccumulative chemicals and any existing MZ shall expire no later than September 8, 2014. The following table lists those chemicals which are currently defined under 401 KAR 10:029, Section 4(1)(h)2b as bioaccumulative chemicals.

BIOACCUMULATIVE CHEMICALS OF CONCERN		
alpha-Hexachlorocyclohexane	Hexachlorobenzene	Pentachlorobenzene
beta-Hexachlorocyclohexane	Hexachlorobutadiene	Photomirex
Chlordane	Hexachlorocyclohexane	Toxaphene
DDD	Lindane	1,2,3,4-Tetrachlorobenzene
DDE	Mercury	1,2,4,6-Tetrachlorobenzene
DDT	Mirex	2,3,7,8-TCDD (Dioxin)
delta-Hexachlorocyclohexane	Octachlorostyrene	
Dieldrin	PCBs	

1.2.2.1.3.3. Narrative Criteria

40 CFR 131.11 requires that states must identify water bodies where toxic pollutants may be adversely affecting water quality or the attainment of such designated use, or where the level of such toxic pollutants are at a level to warrant concern and must adopt criteria for such toxic pollutants applicable to the water body sufficient to protect the designated use. In establishing narrative criteria, 40 CFR 131.11(b)(2) specifies that criteria should be based on biomonitoring methods where numerical criteria cannot be established or to supplement numerical criteria. Kentucky has developed criteria to protect aquatic life in 401 KAR 10:031 Section 4, including narrative criteria related to total dissolved solids or specific conductance, total suspended solids, settleable solids, and flow.

Aquatic community integrity may be assessed by monitoring biological indicators, including benthic macroinvertebrates (benthics), fish, and related habitats. KDOW utilizes the Kentucky MBI and KIBI developed by KDOW to assess benthic and fish communities, respectively, in conjunction with the RBP habitat field methods developed by USEPA to evaluate stream conditions for meeting the designated uses of warm and cold water aquatic life, including the narrative criteria, as cited in 401 KAR 10:026 Section 3.

The Kentucky MBI and KIBI include metric scores based on bioregions across the state for benthics and fish, respectively. Numeric metric scores relate to five (5) narrative categories that determine whether the stream meets its designated use for aquatic life. The categories are Excellent, Good, Fair, Poor, and Very Poor. Categories Excellent and Good indicate full support of the designated use; Fair, Poor, and Very Poor indicate non-support of the designated use.

The four (4) bioregions for MBI metrics are the Bluegrass, the Mountains, the Pennyroyal, and the Mississippi Valley and Interior Rivers, as illustrated in the following figure. Associated MBI ranges for each category based on stream size are listed in the following table.

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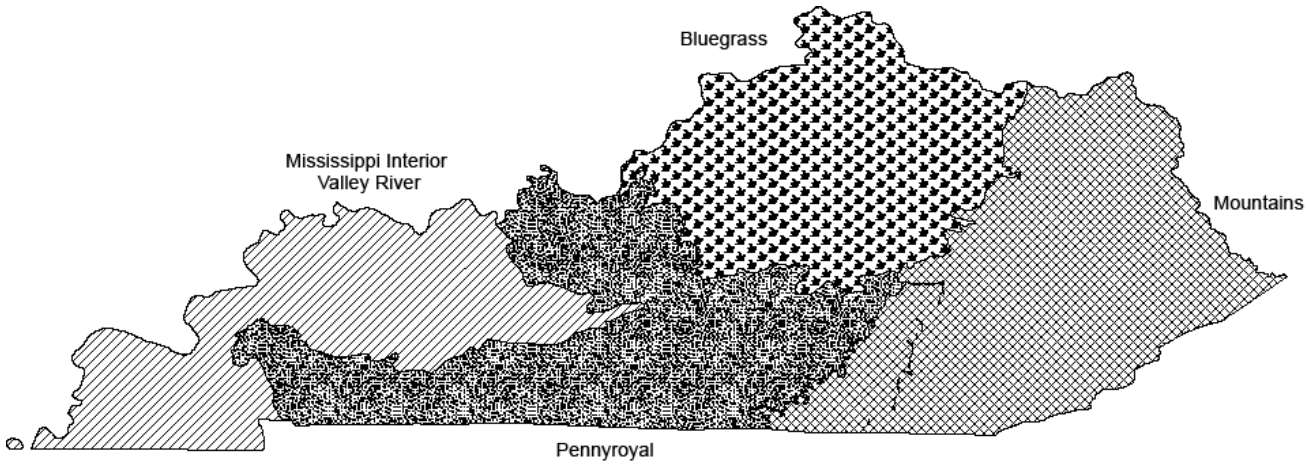

Stream Size	MBI Category	Bluegrass	Mountains	Pennyroyal	Mississippi Valley – Interior River
Headwater (< 5 mi^2 drainage)	Excellent	≥ 58	≥ 83	≥ 72	≥ 63
	Good	51 - 57	72 - 82	65 - 71	56 - 62
	Fair	39 - 50	48 - 71	43 - 64	35 - 55
	Poor	19 - 38	24 - 47	22 - 42	19 - 34
	Very Poor	0 - 18	0 - 23	0 - 21	0 - 18
Wadeable (≥ 5 mi^2 drainage)	Excellent	≥ 79	≥ 82	≥ 81	≥ 58
	Good	61 - 79	75 - 81	72 - 80	48 - 57
	Fair	41 - 60	50 - 74	49 - 71	24 - 47
	Poor	21 - 40	25 - 49	25 - 48	13 - 23
	Very Poor	0 - 20	0 - 24	0 - 24	0 - 12

The six (6) bioregions for the KIBI metrics for fish are Bluegrass, Mountains, Pennyroyal, Mississippi Valley and Interior Rivers, Cumberland River above the Falls, and the Green River Valley, as illustrated in the following figure. Associated KIBI ranges for each category are listed in the following table.

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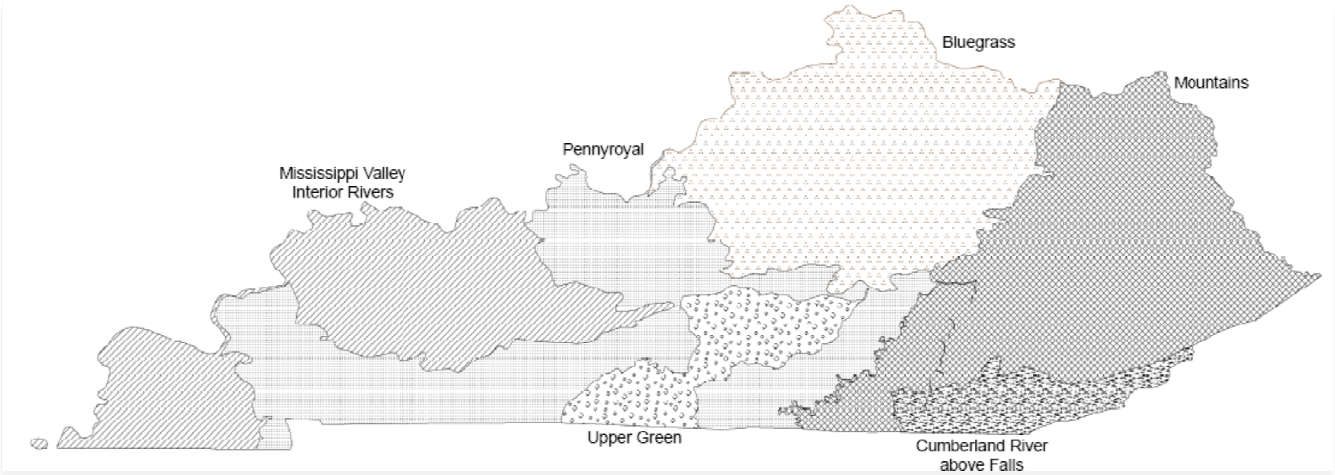

KIBI Category	Bluegrass	Mountains	Pennyroyal	Mississippi Valley – Interior River	Cumberland river above Falls	Upper Green
Excellent	≥ 52	≥ 71	≥ 67	≥ 67	≥ 56	≥ 86
Good	47 - 51	59 - 70	53 - 66	48 - 66	47 - 55	76 - 85
Fair	31 - 46	39 - 58	35 - 52	32 - 47	31 - 46	51 - 75
Poor	16 - 30	19 - 38	17 - 34	16 - 31	16 - 30	26 - 50
Very Poor	0 - 15	0 - 18	0 - 16	0 - 15	0 - 15	0 - 25

1.2.2.1.4. Human Health Criteria

For the purposes of protecting human health there are two criteria that must be satisfied, one for fish consumption (C_{HHFC}) and one for domestic water supply (C_{HHDWS}). Either the 7Q10 low-flow condition or harmonic mean stream flow of the receiving water or the source water of the nearest downstream public water supply is used in place of QU when calculating effluent limits based on these criteria, as stated below.

1.2.2.1.4.1. Fish Consumption Criteria

Like CC, CHHFC is applied at the edge of the assigned regulatory MZ. However, the harmonic mean flow of the receiving water is used when calculating effluent limits based on these criteria. When an MZ is granted, the mass-balance equation is written as

$$C_T = (C_{HHFC} - C_U)(MZD)$$

In the case where an MZ has not been granted, the equation becomes

$$C_T = (C_{HHFC} - C_U)$$

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1.2.2.1.4.2. Domestic Water Supply Criteria

The domestic water supply criteria (C_{HHDWS}) may apply to a pollutant that is categorized as a carcinogen or a non-carcinogen, based on a one-in-a-million or 10^6 cancer risk-protection level. C_{HHDWS} is applied at the point of withdrawal of the nearest downstream public water supply intake using appropriate flow regime of the source water for the public water supply, i.e. the harmonic mean stream flow for carcinogens and the 7Q10 low-flow condition for non-carcinogens. Table B found in 401 KAR 10:026, Section 5(2)(b) lists the surface water intakes for domestic water supply use. Because of this application point, C_{HHDWS} is calculated assuming a complete mix. The mass-balance equation is written for a carcinogen as

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

And for a non-carcinogen as

$$C_T = \frac{[(C_{HHDWS})(Q_T + Q_{SW7Q10}) - (C_U)(Q_{SW7Q10})]}{Q_T}$$

1.2.2.1.5. Waste Load Allocation Models

DOW uses the models QUAL2K, CORMIX and SSTWAM models to assist in the development the WLA. The QUAL2K model develops effluent limitations for biochemically degradable wastewaters from residential types of effluents. CORMIX is a mixing zone analysis model used to determine the size and effect of a mixing zone. SSTWAM is a WLA model that generates effluent limits for toxic pollutants which have water quality criteria. These models are detailed below.

1.2.2.1.5.1. CORMIX v7.0

CORMIX is an EPA-supported simulation and decision support system developed by MixZon for environmental impact assessment of mixing zones resulting from continuous point-source discharges. The system emphasizes the role of boundary interaction to predict mixing behavior and plume geometry.

The CORMIX methodology contains systems to model and design single-port, multiport diffuser discharges and surface discharge sources. Effluents considered may be conservative, non-conservative, heated, dense brine discharges or contain suspended sediments. Advanced information systems provide documented water quality modeling, NPDES regulatory decision support, visualization of regulatory mixing zones, and tools for outfall specification.

DOW primarily utilizes this model to determine plume geometry, i.e., allowable MZ and ZID, for multi-port high-rate submerged diffusers with conservative discharges.

1.2.2.1.5.2. River and Stream Water Quality Model

The River and Stream Water Quality Model (QUAL2K) is a non-uniform, steady-state mass-balance model that assumes mixing vertically and laterally. The model has the ability to accept many combinations of point or nonpoint sources or withdrawals.

QUAL2K was developed by EPA to modernize QUAL2E, developed by Brown and Barnwell in 1987.

DOW primarily uses the model to develop effluent limitations for biochemically-degradable wastewaters, including BOD, pH, and DO (DO).

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1.2.2.1.5.3. Steady-State Toxics Wasteload Allocation Model

The Steady-State Toxics Wasteload Allocation Model (SSTWAM) models is a uniform, steady-state mass-balance model that models water quality using the formulas developed above.

SSTWAM was originally developed by DOW in the 1990s as a steady-state mass-balance workbook in Microsoft Excel. The format was updated in 2010 to a Microsoft Access 2007 database that allows more flexibility to update and distribute the application when new water quality standards are promulgated, when there is a new interpretation of an existing standard, or when state flow data is updated.

1.2.2.2. Whole Effluent Toxicity Criteria

In addition to chemical-specific criteria, 401 KAR 10:031 contain whole effluent toxicity (WET) criteria that necessitate the evaluation of complete effluents. Like the chemical-specific aquatic life criteria, the WET criterion is divided into two categories – acute and chronic. However, WET criteria are not measured in pollutant concentrations but rather in toxicity units (TUs). Toxicity Units are defined mathematically as 100 defined by a specific toxic effect. Acute toxicity is expressed in units of TU_A and is defined as $100/LC_{50}$ (in percent). Chronic toxicity is expressed as TU_C and is defined as $100/IC_{25}$. The IC_{25} is concentration at which a twenty-five (25) percent reduction is shown in reproduction or growth in test organisms.

Additionally, a relationship between TU_A and TU_C must be defined. This relationship is known as the acute to chronic ratio and is defined as the ratio of acute toxicity, expressed as an LC_{50}, of an effluent to its chronic toxicity. It is used as a factor to estimate chronic toxicity from acute toxicity data. DOW has defined two factors, one for bioaccumulative or persistent and one for non-accumulative or non-persistent effluents. For bioaccumulative or persistent constituents,

$TUC = 0.01\ TU_A$

For non-bioaccumulative or non-persistent constituents,

$TU_C = 0.1\ TU_C$

1.2.2.2.1. Acute Whole Effluent Criteria

Like C_A, C_{AWET} is applied at either the edge of the ZID or at the end of the discharge pipe. Pursuant to 401 KAR 10:029, Section 4(2) and 401 KAR 10:031, Section 4(1)(j), acute toxicity shall not exist within an assigned mixing zone or in the discharge itself unless a ZID has been assigned. Or, more simply stated, C_{AWET} shall not exceed $1.00TU_A$ unless a ZID has been assigned, in which case C_{AWET} shall not exceed $0.3\ TU_A$. The mass-balance equation is written with no ZID as

$$C_T = C_{AWET} = 1.00TU_A$$

And with a ZID assigned as

$$C_T = (0.3C_{AWET} - C_U)(ZIDD)$$

Or

$$C_T = (0.3TU_A - C_U)(ZIDD)$$

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1.2.2.2.2. Chronic Whole Effluent Criteria

Pursuant to 401 KAR 10:031, Section 4(j), the allowable instream concentration of toxic substances or whole effluents containing toxic substances shall not exceed a TU_C of 1.00, utilizing the IC_{25}. Like C_C, C_{CWET} is applied at the edge of the assigned regulatory MZ. When an MZ is granted the mass-balance equation is written as

$$C_T = (C_{CWET} - C_U)(MZD)$$

The equation can be rewritten substituting 1.00 TU_C for C_{CWET} as

$$C_T = (1.00TU_C - C_U)(MZD)$$

In order to compare C_{CWET} to C_{AWET}, the equation can be rewritten substituting the acute-to-chronic ratio and C_{AWET} for C_{CWET} for a non-bioaccumulative or non-persistent pollutant as

$$C_T = (0.1C_{AWET} - C_U)(MZD)$$

And for a bioaccumulative or persistent pollutant as

$$C_T = (0.01C_{AWET} - C_U)(MZD)$$

In the case where an MZ has not been granted the equation becomes

$$C_T = (C_{CWET} - C_U)$$

If no background data is available for the specific pollutant then C_U is assumed to be zero (0) and C_{CWET} is applied as an end-of-pipe effluent limit.

1.2.3. Coal Mining Point Source Category

1.2.3.1. Reasonable Potential following Phase II Bond Release

This point source category is subject to effluent limitations based on a combination of technology-based and water quality-based requirements. Activities within this category include active mining areas and reclamation areas. Areas that qualify for Phase II bond release, which corresponds with the CWA definition of reclamation area, demonstrate that the discharges from these areas no longer exhibit a reasonable potential to cause or contribute to an excursion of either numeric or narrative water quality standards.

In order for a permittee to achieve Phase II bond release, the permittee must demonstrate compliance with the KPDES permit requirements for at least 6 months without treatment. Such demonstration also indicates that there is no longer a reasonable potential for the discharge to exceed water quality standards for the parameters regulated during active mining.

1.2.3.2. Mixing Zones

The discussion regarding chronic effluent limits in previous draft permits was intended to clarify that even if a mixing zone of the maximum size allowable (in accordance with 401 KAR 10:029) was granted, the effluent limitations for iron could not have exceeded those required by the effluent guidelines. However, to date,

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no mixing zone has ever been requested by an applicant in this point source category, nor has a mixing zone ever been granted by DOW to an applicant in this point source category. Therefore the applicable water quality criteria have been applied at the end of the pipe.

1.2.4. Antidegradation

The CWA requires each State to develop an Antidegradation Policy and associated implementation procedures for the protection and maintenance of a waterbody's existing water quality. Kentucky's Antidegradation Policy is found in 401 KAR 10:029, Section 1. The antidegradation policy implementation methodology is contained in 401 KAR 10:030.

1.2.4.1. Antidegradation Policy

The purpose of 401 KAR 10:026 through 401 KAR 10:031 is to safeguard the surface waters of the commonwealth for their designated uses, to prevent the creation of new pollution of these waters, and to abate existing pollution.

Where the quality of surface waters exceeds that necessary to support propagation of fish, shellfish, wildlife and recreation in and on the water, that quality shall be maintained and protected unless the Cabinet finds, after full satisfaction of the intergovernmental coordination and public participation provisions of the Cabinet's continuing planning process, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located.

For point source discharges, water quality shall be maintained and protected in these waters according to the procedures specified in 401 KAR 10:030, Section 1(2)(b) or (3)(b).

In allowing degradation or lower water quality, the Cabinet shall assure water quality adequate to protect existing uses fully.

The Cabinet shall assure that there shall be achieved the highest statutory and regulatory requirements for waste treatment by all new and existing point sources and that nonpoint sources of pollutants be controlled by application of all cost effective and reasonable best management practices.

Water quality shall be maintained and protected in a water categorized as an outstanding national resource water according to the procedures specified in 401 KAR 10:030, Section 1(1)(b).

Water quality shall be maintained and protected in those waters designated as outstanding state resource waters according to the procedures specified in 401 KAR 10:031, Section 8.

If potential water quality impairment associated with a thermal discharge is involved, a successful demonstration conducted under Section 316 of the Clean Water Act, 33 U.S.C. 1326, shall be in compliance with this section.

1.2.4.2. Implementation Methodology

All surface waters of the commonwealth have been assigned to an antidegradation category based on specific criteria. These categories are: Outstanding National Resource Water (ONRW), Exceptional Water (EW), Impaired Water (IW) and High Quality Water (HQW).

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1.2.4.2.1. Outstanding National Resource Water

An ONRW is surface water that at minimum meets the requirements to be designated an Outstanding State Resource Water (OSRW) pursuant to 401 KAR 10:031, Section 8 and demonstrates national ecological or recreational significance. Kentucky has eight (8) such categorized as ONRWs. A list of these waters can be found in 401 KAR 10:030, Section 1(1) Table 1. The implementation methodology for this category of waters is as follows:

(1) The water quality shall be maintained and protected;
(2) New or expanded discharges that result in permanent or long-term changes in water quality are prohibited; and
(3) Temporary or short term changes in water quality may be approved if the changes do not have a demonstrable impact on the ability of the water to support its designated uses.

1.2.4.2.2. Exceptional Water

The Cabinet has categorized over 250 surface waters as EW. To be categorized as EW, a surface water must meet one of the following criteria:

(1) Designated as a Kentucky Wild River and is not categorized as an ONRW;
(2) Designated as an outstanding state resource water as established in 401 KAR 10:031, Section 8(1)(a)1, 2, and 3 and Section 8(1)(b);
(3) Contains a fish community that is rated "excellent" by the use of the Index of Biotic Integrity included in Development and Application of the Kentucky Index of Biotic Integrity (KIBI), 2003;
(4) Contains a macroinvertebrate community that is rated "excellent" by the Macroinvertebrate Bioassessment Index included in "The Kentucky Macroinvertebrate Bioassessment Index," 2003; or
(5) Included in the Cabinet's reference reach network.

The implementation methodology for new or expanded discharges to an EW is the same as the implementation methodology for an HQW except where the surface water's stream use designation may require more stringent requirements or maintenance of current water quality.

1.2.4.2.3. Impaired Water

Surface waters that have been identified pursuant to 33 U.S.C. 1315(b) are categorized as impaired waters. Impaired waters are those waters which have been assessed by the Cabinet as not fully supporting any applicable designated use unless the designated is OSRW or the impairment is for fish consumption due to mercury contamination. Surface waters categorized as impaired are listed in DOW's biannual *Integrated Report to Congress on the Condition of Water Resources in Kentucky*. The implementation methodology for new or expanded discharges to this category of waters is as follows:

(1) All existing uses shall be protected and the level of water quality necessary to protect those existing uses shall be assured in impaired water; and
(2) The process to allow a discharge into an impaired water and to assure protection of the water shall be regulated by the requirements in the Kentucky Pollution Discharge Elimination System Program, 401 KAR 5:050-5:080.

1.2.4.2.4. High Quality Water

The largest of all of the antidegradation categories is the High Quality Water (HQW) group. It consists of all surface waters that have not been categorized as an ONRW, EW or IW; it is therefore the default category for any surface water that has not been assessed by the Cabinet. The implementation methodology for new or expanded discharges to HQWs consists of the following requirements:

(1) Existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected;

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(2) An application for a KPDES permit for a new or expanded discharge shall contain information demonstrating that the lowering of water quality is necessary to accommodate important economic or social development in the area in which the water is located, utilizing Form SDAA;
(3) A permit applicant who has failed to demonstrate the necessity and social or economic development importance for lowering water quality shall not receive a permit unless (a) The applicant submits a revised SDAA that demonstrates the necessity for lowering water quality, or (b) The applicant demonstrates that the discharge shall not consume more than ten (10) percent of the available assimilative capacity of the receiving stream outside of a designated mixing zone or zone of initial dilution for each new or increased pollutant in the discharge;
(4) A permit applicant who demonstrates the necessity and social or economic development importance for lowering water quality shall meet the requirements of the KPDES program, 401 KAR 5:050 through 5:080; and
(5) The Cabinet's determination shall be documented in the permit Fact Sheet and included in the administrative record for the permit or action.

1.2.4.2.5. Socioeconomic Demonstration and Alternates Analysis

1.2.4.2.5.1. Socioeconomic Demonstration

The socioeconomic demonstration portion of this requirement shall consider the following factors:

(1) The boundaries of the affected community;
(2) The potential effect on employment, including a comparison of local unemployment rates and state and national unemployment rates;
(3) The potential effect on median household income levels, including a comparison of the present median household income level, projected median household income level, and number of households affected in the defined community;
(4)) The potential effect on tax revenues, including current tax revenues in the affected community compared to projected increase in tax revenues generated by the permitted project;
(5) The potential effect of the facility on the environment and public health; and
(6) Other potential economic or social effect to the community that the applicant includes in the application.

1.2.4.2.5.2. Alternatives Analysis

The alternatives analysis shall consider the following factors:

(1) Pollution prevention measures, such as changes in plant processes, source reductions, or substitution with less toxic substances;
(2) The use of best management practices to minimize impacts;
(3) Recycle or reuse of wastewater, waste by-products, or production materials and fluids;
(4) Application of water conservation methods;
(5) Alternative or enhanced treatment technology;
(6) Improved operation and maintenance of existing treatment systems;
(7) Seasonal or controlled discharge options;
(8) Land application or infiltration to capture pollutants and reduce surface runoff, on-site treatment, or alternative discharge locations; and
(9) Discharge to other treatment facilities.

1.2.4.2.5.3. Activities Not Subject to Antidegradation Implementation

The following activities are not subject to the EW or HQW antidegradation implementation procedures include:

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(1) The renewal of a KPDES permit that does not authorize pollutant loading to the receiving stream in excess of that previously authorized;
(2) An increase in pollutant loading within the limits previously approved by the KPDES permit; or
(3) A new or expanded discharge that the applicant demonstrates shall not consume more than ten (10) percent of the available assimilative capacity of the receiving stream outside of a designated mixing zone or zone of initial dilution for each new or increased pollutant in the discharge.

1.3. Effluent Limitations and Monitoring Requirements

Having completed an evaluation of the applicable technology-based effluent requirements and applicable water quality based effluent requirements, the permit writer determines (1) the pollutants that are to be controlled by chemical-specific numeric effluent limits, (2) if WET testing is appropriate, (3) the type and frequency of self monitoring, and (4) for permit renewals if anti-backsliding applies. .

1.3.1. Chemical-specific Numeric Effluent Limitations

The imposition of chemical-specific numeric effluent limitations is necessary when reasonable potential has been demonstrated. Pursuant to 401 KAR 5:065 Section 2(4) [40 CFR 122.44] the permit must contain effluent limitations that satisfy both technology and water quality based concerns. To comply with this requirement a comparison of the calculated technology-based effluent limitations to the calculated water quality based effluent limitations is required. When performing such a comparison there must be consistency in the units and the chemical species. Direct comparisons of different speciations of a pollutant are irrelevant and produce illogical results; therefore e.g. calculated technology-based effluent requirements for total chromium must be compared to the calculated water quality based effluents for total chromium not trivalent chromium.

In general technology-based effluent limitations are expressed in terms of mass, i.e. lbs/day, whereas most water quality based effluent limitations are expressed in terms of concentration, i.e. mg/l. The permit writer must convert from lbs/day to mg/l or mg/l to lbs/day using the following formulas in order to perform a comparison of the calculated effluent limitations:

$$\text{Load} = \text{Flow} \times \text{Concentration} \times 8.34, \text{ or}$$

$$\text{Concentration} = \frac{\text{Load}}{\text{Flow} \times 8.34}$$

8.34 is a conversion factor with units of l·lbs/MG·mg

Where load is expressed in lbs/day, flow is expressed in MGD, and concentration is expressed in mg/l.

The final effluent limits for a selected pollutant of concern shall be expressed in appropriate units, i.e. mass, concentration or a combination of the two. 401 KAR 5:065 Section 2(4) [40 CFR 122.44 (f)] requires all pollutants limited in permits to be expressed in terms of mass except for pollutants which cannot appropriately be expressed by mass or the applicable requirements are more appropriately expressed in terms of concentrations. Pollutants limited in terms of mass additionally may be limited in terms of other units of measurement, and the permit shall require the permittee to comply with both limitations.

1.3.2. Monitoring, Analytical and Reporting Requirements

All permits are required by 401 KAR 5:070 Section 3 [40 CFR 122.48] and 401 KAR 5:065 Section 2(4) [40 CFR 122.44(i)] to include monitoring and reporting requirements designed to measure compliance with permit conditions.

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1.3.2.1. Monitoring Requirements

The permit must include monitoring requirements for each pollutant limited in the permit and the volume of effluent discharged from each outfall. When establishing monitoring requirements, the permit writer must determine the type, intervals, and frequency of monitoring. The monitoring program is required to be sufficient to yield data that is representative of the monitored activity. In regards to the type of monitoring required, the permit writer must decide if effluent monitoring alone is sufficient or if other monitoring is required. Examples of other types of monitoring and when they are required include:

(1) Influent monitoring when permit conditions are written in the form of a pollutant reduction;
(2) Source water monitoring when permit limits are expressed in the form of net limits;
(3) Internal monitoring when it is infeasible or impractical to monitor at the outfall, i.e. when outfall may be flooded or when it is necessary to demonstrate compliance with a technology-based effluent limit when wastestreams are combined for treatment and discharge; and
(4) Ambient monitoring when permit contains conditions that are measured by changes in receiving water conditions, i.e. hydrographically controlled releases, etc.

In determining the frequency of monitoring, the permit writer considers: size and design of the facility, type of treatment, location of discharge, frequency of discharge (batch, continuous), compliance history, nature of pollutants, number of monthly samples used in developing permit limit, and cost. The frequency of sampling must be of sufficient regularity to provide adequate data to evaluate compliance with the permit limits.

In addition to frequency, the permit writer must specify sample collection requirements. In determining the appropriate sample type, the permit writer considers pollutant characteristics, analytical method requirements, frequency of discharge (batch, continuous), etc. Types of samples most often required are: grab, composite, continuous, and instantaneous.

Grab samples are taken on a one-time basis without consideration of flow rate and time. This sample type is typically used for monitoring batch discharges. Grab samples are required for pollutants that are affected by changes in ambient conditions. Composite samples are made up of two or more discrete aliquots collected over a period of time. They provide a more representative measure of the discharge of pollutants over a given period of time and account for variability in pollutant concentration and discharge rate. Composite samples are defined by the time interval between aliquots and volume of each aliquot and are typically used for pollutants with varying concentration over the period of discharge, i.e. BOD, TSS, chronic toxicity, etc. Continuous and instantaneous samples are used primarily for flow measurements.

1.3.2.2. Analytical Methods Requirements

Pursuant to 401 KAR 5:065 Section 2(4) [40 CFR 122.44(i)(1)(iv)], pollutant analysis shall be according to test procedures approved under 401 KAR 5:065 Section 2(8) [40 CFR 136] or other methods approved under 401 KAR 5:065 Section 2(9)-(10) [40 CFR subchapters N or O]. 401 KAR 5:065 Section 2(9) [Subchapter N] establishes the ELGs and 401 KAR 5:065 Section 2(10) [Subchapter O] establishes requirements for sewage sludge. When two or more approved analytical methods are available for a pollutant of concern, the method selected must be sufficiently sensitive to demonstrate compliance with the assigned effluent limitation. DOW includes a general statement requiring the permittee to utilize such methods. However, in cases where DOW has determined that a specific analytical method or method detection level (MDL) is required, language is included in the permit requiring that analytical method or MDL, e.g. EPA Method 200.8 for metals, and EPA Method 1631E for mercury.

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1.3.2.3. Reporting Requirements

All permits must contain reporting requirements based upon the impact of the regulated activity. At a minimum, monitoring reports must be submitted annually. In accordance with 401 KAR 5:065 Section 2(4) [40 CFR 122.41(l)(4)], DOW requires analytical results to be reported on Discharge Monitoring Report (DMRs) form and submitted on a schedule commensurate with the frequency of monitoring, e.g. monthly monitoring equals monthly submission, etc.

1.3.3. Anti-backsliding Provision

Pursuant to 401 KAR 5:065 Section 2(4) [40 CFR 122.44(l)], when a permit is renewed or reissued, interim effluent limitations, standards or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit.

In the case of effluent limitations established on the basis of ELG, a permit may not be renewed, reissued, or modified on the basis of effluent guidelines promulgated subsequent to the original issuance of such permit, to contain effluent limitations which are less stringent than the comparable effluent limitations in the previous permit.

Exceptions to the anti-backsliding provision include:

(1) Material and substantial alterations or additions to the permitted facility occurred after permit issuance which justify the application of a less stringent effluent limitation;
(2) Information is available which was not available at the time of permit issuance (other than revised regulations, guidance, or test methods) and which would have justified the application of a less stringent effluent limitation at the time of permit issuance;
(3) Technical mistakes or mistaken interpretations of law were made in issuing the permit under Section 402(a)(1)(b) of the CWA;
(4) A less stringent effluent limitation is necessary because of events over which the permittee has no control and for which there is no reasonably available remedy;
(5) The permittee has received a permit modification under section 301(c), 301(g), 301(h), 301(i), 301(k), 301(n), or 316(a); or
(6) The permittee has installed the treatment facilities required to meet the effluent limitations in the previous permit and has properly operated and maintained the facilities but has nevertheless been unable to achieve the previous effluent limitations, in which case the limitations in the reviewed, reissued, or modified permit may reflect the level of pollutant control actually achieved (but shall not be less stringent than required by effluent guidelines in effect at the time of permit renewal, reissuance, or modification).

In no event may a permit be renewed, reissued, or modified to contain an effluent limitation which is less stringent than required by effluent guidelines in effect at the time the permit is renewed, reissued, or modified. In no event may a permit to discharge into waters be renewed, issued, or modified to contain a less stringent effluent limitation if the implementation of such limitation would result in a violation of a water quality standard under Section 303 applicable to such waters.

1.4. Standard Conditions

All permits issued by DOW include language specific to 401 KAR 5:065 Section 2(1) [40 CFR 122.41], schedules of compliance, and reopener clauses.

1.4.1. Conditions applicable to all permits

All permits shall either expressly or by reference include the conditions established by 401 KAR 5:065 Section 2(1) [40 CFR 122.41]. These standard conditions or “boiler plate language” address (1) duty to comply with all conditions of the permit, (2) duty to reapply, (3) need to halt or reduce activity not a defense, (4) duty to

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mitigate, (5) proper operation and maintenance of treatment facilities and systems, (6) permit actions, (7) property rights, (8) duty to provide information, (9) inspection and entry, (10) monitoring and records, (11) signatory requirements, (12) reporting requirements, (13) bypasses, and (14) upsets.

1.4.2. Additional Conditions Specific to Existing Mining Dischargers

401 KAR 5:065 Section 2(2) [40 CFR 122.42(a)] requires adequate notification be given to the Director of any activity may result in the routine or non-routine discharge of any toxic pollutant which is not limited in the permit if the discharge would exceed the applicable notification level.

1.4.3. Schedules of Compliance

All permits contain a general compliance schedule requiring the permittee to be in compliance with all conditions of the permit upon the effective date of the permit. 401 KAR 5:070 Section 2 [40 CFR 122.47] authorizes specific schedules of compliance for the first issuance of a permit to a new source or new discharger when necessary to allow a reasonable opportunity to attain compliance with requirements issued or revised after commencement of construction and for water quality based effluent limitations for water quality standards adopted after July 1, 1977. Such schedules of compliance must include a final date for achieving compliance and interim compliance and reporting dates if the final compliance date is more than one year from the effective date of the permit.

1.4.4. Reopener Clause

In accordance with 401 KAR 5:070 Section 6(1) [40 CFR 122.62(a)(7)], a permit may be reopened for modification or revoked and reissued when required by the reopener conditions of 401 KAR 5:065 Section 2(4) [40 CFR 122.44(b)]. A 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;
(2) Controls any pollutant not limited in the permit; or
(3)This permit may be reopened to implement the findings of a reasonable potential analysis performed by the DOW.

A permit shall be modified, or alternatively revoked and reissued, if DOW determines surface waters are aesthetically or otherwise degraded by substances that:

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

1.5. Special Conditions

Special conditions are used to address unique situations, incorporate preventative requirements and incorporate other programmatic requirements. Typical special conditions are (1) best management practices, (2) pretreatment programs, (3) sludge disposal, (4) combined sewer overflows, and (5) incorporation by reference.

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1.5.1. Best Management Practices Plan

Best management practices (BMPs) are defined at 401 KAR 5:080 Section 2(1) [40 CFR 122.2] as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of "waters of the United States." BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. Pursuant to 401 KAR 5:065 Section 2(4) [40 CFR 122.44(k)] BMPs are to be used to 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.

DOW includes requirements to develop, implement, and maintain effective BMPs and a BMP Plan for individual and general permits.

1.5.2. Incorporation by Reference

When necessary to implement conditions or requirements that have not been directly developed through the permitting process, the permit may be conditioned to implement these conditions or requirements through incorporation by reference. Documents typically referenced by reference include: (1) consent orders, (2) agreed orders, (3) water quality certifications, and (4) other permits or authorizations.

1.6. State Conditions

State conditions are those conditions DOW has determined that are necessary to implement requirements promulgated under state or federal laws and regulations

1.6.1. Certified Operators

Pursuant to 401 KAR 5:010 wastewater treatment plants and wastewater collection systems that accept wastewaters containing domestic sewage are to be operated by a certified operator. In accordance with KRS 224.10-110 and KRS 224.73-110 the Cabinet has established an operator's certification program that is administered by the Division of Compliance Assistance. Specific requirements of this program are found in 401 KAR 11:001 through 11:060.

1.6.2. Outfall Signage

KRS 224.18-760 establishes Kentucky as a member of the Ohio River Valley Water Sanitation Compact (ORSANCO). Article I of the Compact pledges faithful cooperation between the signatory states. Article IV authorizes the Commission to adopt, prescribe and promulgate rules, regulations and standards for administering and enforcing the Compact. Part V, Section A.3 of the ORSANCO pollution control standards for discharges to the Ohio River require that holders of an individual NPDES permit post and maintain a permanent marker having specific dimensions at each Ohio River outfall. DOW includes language in permits for discharges to the Ohio River requiring compliance with the ORSANCO signage requirements. For discharges to receiving waters other than the Ohio River DOW includes language recommending the installation of a permanent marker at each of the monitoring to better document and clarify these locations.

1.6.3. Disposal of Non-Domestic Wastes

For non-POTWs that treat domestic waste from residential and commercial activities, DOW includes language advising the permittees that pass-through or non-treatment by the wastewater treatment plant of chemicals or compounds which may injure, be chronically or acutely toxic to or produce adverse physiological or behavioral responses in humans, animals, fish and other aquatic life is not desirable. DOW recommends the permittee should educate users of its system that

introduction of such chemicals or compounds as acids, caustics, herbicides, household chemicals or cleansers, insecticides, lawn chemicals, non-biodegradable products, paints, pesticides, pharmaceuticals, and petroleum-based products that may not be treatable by the wastewater treatment plant could result in an adverse environmental impact.

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2. PERMIT-SPECIFIC LIMITS AND REQUIREMENTS DEVELOPMENT

This section of the Fact Sheet presents the limitations and conditions specific to the permitted facility and the specific process and procedures utilized by DOW in the development of the permit.

2.1. Synopsis of Application

2.1.1. Name and Address of Applicant

Matt/Co Inc
439 Meadows Branch Rd
Prestonsburg, Kentucky 41653

2.1.2. Facility Location

DNR Permit No.: 836-0317 NW
KY 338
Prestonsburg, Floyd County, Kentucky

2.1.3. Description of Applicant's Operation

DISTURBANCE DETAILS				
Usage	**Currently Permitted**	**Added**	**Deleted**	**Total Acreage**
Mining Area	-	408.88	-	408.88
Drainage Corridor	-	0.92	-	0.92
Spoil Storage Area	-	104.92*	-	38.65
Sediment Ponds	-	5.18	-	5.18
Roads	-	7.08**	-	0.52
Total Surface Disturbance	**-**	***454.15***	**-**	***454.15***
Auger Area	-	340.69†	-	165.26
Total Underground Area	**-**	***165.26***	**-**	***165.26***
Total Permit Area	**-**	**619.41**	**-**	**619.41**

Acreage from MRP provided for application for 836-0317 NW.
*Total includes 66.27 acres overlying mining area and not included in totals.
**Total includes 6.56 acres overlying mining area and not included in totals.
†Total includes 175.43 acres overlying surface mining area and not included in totals.

2.1.4. Permitting Action

First issuance of a minor individual KPDES permit to a new "new source" coal mining operation. Mining area covered by this permit includes direct discharges from new sedimentation ponds to first-order tributaries of Dewey Lake.

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2.2. Receiving / Intake Waters

2.2.1. Receiving Waters

RECEIVING WATERS				
Receiving Water Name	**Use Classification**	**Antidegradation Categorization**	**7Q10 Low Flow (cfs)**	**Harmonic Mean Flow (cfs)**
Clarks Branch	WAH PCR SCR DWS	HQ	0.0	0.0
Corn Fork	WAH PCR SCR DWS	HQ	0.0	0.0
Thompson Fork	WAH PCR SCR DWS	HQ	0.0	0.0
Souders Branch	WAH PCR SCR DWS	HQ	0.0	0.0

2.2.2. Intake Waters – Nearest Downstream Intake

INTAKE WATERS						
Intake Water Name	**Public Water Supply Name**	**River Mile**	**Miles Downstream**	**County**	**7Q10 Low Flow (cfs)**	**Harmonic Mean Flow (cfs)**
Levisa Fork	Paintsville Utilities Commission	38.9	23.3	Johnson	206	853

2.3. Outfalls/Internal Monitoring Points/Instream Monitoring Points

2.3.1. Outfalls

OUTFALLS						
Number	**Description Of Wastewater**	**Receiving Water**	**Latitude**	**Longitude**	**Status**	**Type**
001	Pond 1 Sedimentation	Corn Fork	37° 40' 27"	82° 41' 21"	Not Constructed	Instream
002	Pond 2 Sedimentation	Thompson Fork	37° 40' 20"	82° 40' 42"	Not Constructed	Instream
003	Pond 3 Sedimentation	Thompson Fork	37° 40' 41"	82° 40' 32"	Not Constructed	Instream
004	Pond 4 Sedimentation	Corn Fork	37° 40' 22"	82° 41' 14"	Not Constructed	Bench
005	Pond 5 Sedimentation	Corn Fork	37° 40' 18"	82° 41' 04"	Not Constructed	Bench
006	Pond 6 Sedimentation	Corn Fork	37° 40' 12"	82° 40' 53"	Not Constructed	Bench
007	Pond 7 Sedimentation	Souders Branch	37° 40' 13"	82° 40' 40"	Not Constructed	Bench

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OUTFALLS						
Number	**Description Of Wastewater**	**Receiving Water**	**Latitude**	**Longitude**	**Status**	**Type**
008	Pond 8 Sedimentation	Souders Branch	37° 40' 14"	82° 40' 19"	Not Constructed	Bench
009	Pond 9 Sedimentation	Souders Branch	37° 40' 18"	82° 40' 12"	Not Constructed	Bench
010	Pond 10 Sedimentation	Souders Branch	37° 40' 29"	82° 40' 06"	Not Constructed	Bench
011	Pond 11 Sedimentation	Thompson Fork	37° 40' 54"	82° 40' 22"	Not Constructed	Bench
012	Pond 12 Sedimentation	Thompson Fork	37° 40' 56"	82° 40' 41"	Not Constructed	Bench
013	Pond 13 Sedimentation	Thompson Fork	37° 41' 00"	82° 40' 40"	Not Constructed	Bench
014	Pond 14 Sedimentation	Thompson Fork	37° 41' 05"	82° 40' 38"	Not Constructed	Bench
015	Pond 15 Sedimentation	Thompson Fork	37° 41' 11"	82° 40' 33"	Not Constructed	Bench
016	Pond 16 Sedimentation	Thompson Fork	37° 41' 11"	82° 40' 19"	Not Constructed	Bench
017	Pond 17 Sedimentation	Clarks Branch	37° 40' 43"	82° 41' 16"	Not Constructed	Bench

2.3.2. Representative Outfalls

Representative outfalls were monitored to provide data to perform the RPA.

OUTFALLS						
Number	**Description of Wastewater**	**Receiving Water**	**Latitude**	**Longitude**	**Status**	**Type**
001	1 Sedimentation	Receiving Water Name	37° 25' 29"	82° 19' 29"	Active Mining Area	Instream

2.3.3. Instream Monitoring Points

INSTREAM MONITORING POINTS				
Number	**Location (Upstream/Downstream)**	**Stream Name**	**Latitude**	**Longitude**
901	Downstream CF1	Corn Fork	37° 40' 19"	82° 43' 47"
902	Reference for Dewey Lake CF2	Corn Fork	37° 40' 18"	82° 41' 14"
903	Downstream SB1	Souders Branch	37° 40' 56"	82° 40' 02"
904	Upstream SB2	Souders Branch	37° 39' 54"	82° 40' 07"
905	Reference for Levisa Fork Downstream TF1	Thompson Fork	37° 41' 05"	82° 40' 11"

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INSTREAM MONITORING POINTS				
Number	**Location (Upstream/Downstream)**	**Stream Name**	**Latitude**	**Longitude**
906	Reference for Dewey Lake TF2	Thompson Fork	37° 40' 43"	82° 40' 32"
907	Downstream CB1	Clarks Branch	37° 41' 09"	82° 41' 14"

2.4. Facility Description

This permit authorizes discharges related to surface coal mining conducted by Matt/Co, Inc., under DNR Permit # 836-0317 NW. This application adds three (3) instream discharge and fourteen (14) bench discharges. This permit includes four (4) new hollow fills. Due to the nature of the hydrology in the permit area and the operations conducted under the permit, discharges from the outfalls covered by this permit only occur during precipitation events.

Once Phase III bond release is complete, permittee may notify the Division of Water and have the affected outfalls removed from this permit.

2.5. Proposed Effluent Limitations and Monitoring Requirements

2.5.1. All Outfalls

The following tables identify the proposed effluent limitations and monitoring requirements for all outfalls, either on-bench or instream.

Outfall Effluent Limitations and Monitoring Requirements – Active Mining							
Effluent Characteristic	**Effluent Limitations**					**Monitoring Requirements**	
	Units	**Minimum**	**Monthly Average**	**Daily Maximum**	**Maximum**	**Frequency**	**Sample Type**
Acidity[1]	mg/l CaCO3	N/A	Report	Report	N/A	1/Month	Grab
Alkalinity[1]	mg/l CaCO3	N/A	Report	Report	N/A	1/Month	Grab
Dissolved Oxygen	mg/l	4.0	5.0	N/A	N/A	2/Month	Grab
Flow	cfs	N/A	Report	Report	N/A	2/Month	Instantaneous
Oil & Grease[2]	mg/l	N/A	10	15	N/A	1/Month	Grab
pH[3]	SU	6.0	N/A	N/A	9.0	2/Month	Grab
SC[4]	µS/cm	N/A	Report	N/A	N/A	2/Month	Grab
TDS	mg/l	N/A	Report	Report	N/A	2/Month	Grab
Temperature	°C	N/A	Report	Report	N/A	2/Month	Grab
Total Hardness	mg/l $CaCO_3$	N/A	Report	Report	N/A	2/Month	Grab
Total Recoverable Iron	mg/l	N/A	3.0	4.0	N/A	2/Month	Grab
Total Recoverable Manganese	mg/l	N/A	2.0	4.0	N/A	2/Month	Grab
Total Recoverable Zinc	mg/l	N/A	N/A	Report	N/A	1/Quarter	Grab

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Outfall Effluent Limitations and Monitoring Requirements – Active Mining							
Effluent Characteristic	Effluent Limitations					Monitoring Requirements	
	Units	Minimum	Monthly Average	Daily Maximum	Maximum	Frequency	Sample Type
TSS	mg/l	N/A	35.0	70.0	N/A	2/Month	Grab

[1]At all times Acidity shall be less than Alkalinity.
[2]The limits and monitoring 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]Discharges from this operation shall not cause a fluctuation of more than 1.0 standard unit in ph of the receiving stream over a period of 24 hours.
[4]Subject to management described in Section 2.9.2.1.

Outfall Effluent Limitations and Monitoring Requirements – Post-Mining							
Effluent Characteristic	Effluent Limitations					Monitoring Requirements	
	Units	Minimum	Monthly Average	Daily Maximum	Maximum	Frequency	Sample Type
Acidity[1]	mg/l $CaCO_3$	N/A	Report	Report	N/A	1/Month	Grab
Alkalinity[1]	mg/l $CaCO_3$	N/A	Report	Report	N/A	1/Month	Grab
Flow	cfs	N/A	Report	Report	N/A	1/Month	Instantaneous
Oil & Grease[2]	mg/l	N/A	10	15	N/A	1/Month	Grab
pH[3]	SU	6.0	N/A	N/A	9.0	1/Month	Grab
SS	ml/l	N/A	N/A	0.5	N/A	1/Month	Grab

[1]At all times Acidity shall be less than Alkalinity.
[2]The limits and monitoring 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]Discharges from this operation shall not cause a fluctuation of more than 1.0 standard unit in ph of the receiving stream over a period of 24 hours.

2.5.2. Instream Outfalls

Instream outfalls shall be subject to the following additional conditions.

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Instream Outfall Effluent Limitations and Monitoring Requirements – Active Mining							
Effluent Characteristic	Effluent Limitations					Monitoring Requirements	
	Units	Minimum	Monthly Average	Daily Maximum	Maximum	Frequency	Sample Type
Acute WET[1]	TU_A	N/A	N/A	N/A	1.00	1/Quarter	Grab
Chronic WET[1]	TU_C	N/A	N/A	N/A	Report	1/Quarter	Grab
Discharge Duration[2]	Hours	Report	N/A	N/A	Report	2/Month	Timed
Total Calcium	µg/l	N/A	Report	Report	N/A	2/Month	Grab
Total Chloride	mg/l	N/A	Report	Report	N/A	2/Month	Grab
Total Magnesium	µg/l	N/A	Report	Report	N/A	2/Month	Grab
Total Potassium	µg/l	N/A	Report	Report	N/A	2/Month	Grab
Total Sodium	µg/l	N/A	Report	Report	N/A	2/Month	Grab
Total Sulfate	mg/l SO_4	N/A	Report	Report	N/A	2/Month	Grab

[1]WET testing shall be performed simultaneously from a single discharge event, as discussed in Section 2.6.5.1.1.
[2]Discharge Duration shall be determined by daily visual inspections of the outfall from commencement of a discharge event until cessation of that discharge event. The duration shall be reported in increments of 24 hours on the DMR for that outfall, For example an outfall begins discharging, the time is noted and visual inspection the next day is conducted to determine status of the discharge. Should the discharge have ceased, then '24 hours' shall be reported on the DMR for Discharge Duration. However, should the daily visual inspections verify that a discharge event of longer duration, each subsequent day of discharge will result in an additional 24 hours being added to the Discharge Duration. For example, if a discharge is verified each day for 4 days after commencement of the discharge event for a total of 5 consecutive days of discharge, then '96 hours' shall be reported on the DMR for that outfall. The permittee may propose an alternate method of determining the discharge duration.

2.5.3. Instream Monitoring Requirements

The requirements in the following table apply to instream monitoring points. These requirements do not apply to instream outfalls.

Instream Monitoring Requirements							
Effluent Characteristic	Effluent Limitations					Monitoring Requirements	
	Units	Daily Minimum	Monthly Average	Daily Maximum	Maximum	Frequency	Sample Type
Alkalinity	mg/l $CaCO_3$	N/A	Report	Report	N/A	2/Month	Grab
Biological Assessment	None	See Section 2.6.5.1	N/A	N/A	N/A	1/Year	N/A
Dissolved Oxygen	mg/l	4.0	5.0	N/A	N/A	2/Month	Grab

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Instream Monitoring Requirements							
Effluent Characteristic	Effluent Limitations					Monitoring Requirements	
	Units	Daily Minimum	Monthly Average	Daily Maximum	Maximum	Frequency	Sample Type
Flow	cfs	N/A	Report	Report	N/A	2/Month	Instantaneous
pH	SU	6.0	N/A	N/A	9.0	2/Month	Grab
SC	µS/cm	N/A	Report	Report	N/A	2/Month	Grab
TDS	mg/l	N/A	Report	Report	N/A	2/Month	Grab
Temperature	°C	N/A	Report	Report	N/A	2/Month	Grab
Total Calcium	µg/l	N/A	Report	Report	N/A	2/Month	Grab
Total Chloride	mg/l	N/A	Report	Report	N/A	2/Month	Grab
Total Hardness	mg/l $CaCO_3$	N/A	Report	Report	N/A	2/Month	Grab
Total Magnesium	µg/l	N/A	Report	Report	N/A	2/Month	Grab
Total Potassium	µg/l	N/A	Report	Report	N/A	2/Month	Grab
Total Recoverable Zinc	µg/l	N/A	N/A	Report	N/A	1/Quarter	Grab
Total Sodium	µg/l	N/A	Report	Report	N/A	2/Month	Grab
Total Sulfate	mg/l SO_4	N/A	Report	Report	N/A	2/Month	Grab

2.6. Limits Development

The proposed effluent limitations and monitoring requirements were developed using the processes and procedures detailed in Section 1. Coal mining effluents are subject to the technology-based effluent limitations of the Coal Mining Point Source Category BPT, BAT, BCT Limitations and New Source Performance Standards promulgated on May 4, 1984 at 40 CFR Part 434 (applicable under state regulation at 401 KAR 5:065), as well as water quality-based effluent limitations.

2.6.1. Specific Technology-Based Effluent Requirements

Active mining areas are classified as either “alkaline mine drainage” or “acid or ferruginous mine drainage.” 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.”

Coal mining activity commenced on this permit after May 4, 1984 and did not provide justification for an alkaline mine determination. Therefore this coal mining operation is subject to the permitting requirements applicable to a new source as promulgated in 401 KAR 5:065 Section 2(9) [40 CFR 434.35] during the active phase of mining. Preparation plants and associated areas are subject to the permitting requirements applicable to a new source as promulgated in 401 KAR 5:065 Section 2(9) [40 CFR 434.25].

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ACID OR FERRUGINOUS MINE DRAINAGE NSPS – ACTIVE MINING AND PREPARATION PLANTS AND ASSOCIATED AREAS 401 KAR 5:065 Section 2(9) [40 CFR 434.25 and 40 CFR 434.35]				
Effluent Characteristic	**Units**	**Minimum**	**Average**	**Maximum**
Iron	mg/l	N/A	3.0	6.0
Manganese	mg/l	N/A	2.0	4.0
TSS	mg/l	N/A	35.0	70.0
pH	SU	Within the range 6.0 to 9.0 at all times		

The Coal Mining Point Source Category BPT, BAT, BCT limitations and NSPS provide for a change in effluent requirements for sediment control structures as the status of the mine moves from "active mining" to "post-mining". 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 II bond release under SMCRA are equivalent to the requirements for a "reclamation area" pursuant to 401 KAR 5:065 Section 2(5) [40 CFR 434]. Auger mining 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 II bond release are considered reclamation areas. Therefore, this coal mining operation is subject to the requirements of 401 KAR 5:065 Section 2(9) [40 CFR 434.55] during reclamation.

ACID OR FERRUGINOUS MINE DRAINAGE NSPS – POST-MINING 401 KAR 5:065 Section 2(9) [40 CFR 434.55]				
Effluent Characteristic	**Units**	**Minimum**	**Average**	**Maximum**
SS	mg/l	0.5 ml/l maximum not to be exceeded		
pH	SU	Within the range 6.0 to 9.0 at all times		

Where waste streams from any facility covered by this part are combined for treatment or discharge with waste streams from another facility covered by this part, the concentration of each pollutant in the combined discharge may not exceed the most stringent limitations for that pollutant applicable to any component waste stream of the discharge.

2.6.2. Specific Water Quality-Based Effluent Requirements

APPLICABLE WATER QUALITY CRITERIA				
Effluent Characteristic	**Criteria**			
	Human Health		**Aquatic Life**	
	DWS	**FC**	**Acute**	**Chronic**

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APPLICABLE WATER QUALITY CRITERIA				
Effluent Characteristic	**Criteria**			
	Human Health		**Aquatic Life**	
	DWS	**FC**	**Acute**	**Chronic**
Alkalinity 401 KAR 10:031 Section 4(1)(a)	Natural alkalinity as $CaCO_3$ shall not be reduced by more than 25%. If natural alkalinity is below 20 mg/l as $CaCO_3$, there shall not be a reduction in the natural level. Alkalinity shall not be reduced or increased to a degree that may adversely affect the aquatic community.			
Ammonia 401 KAR 10:031 Section 4(1)(i)	The concentration of the un-ionized form shall not be greater than 0.05 mg/l at any time instream after mixing. Un-ionized ammonia shall be determined from values for total ammonia-N, in mg/l, pH and temperature, by means of the following equations: $Y = \frac{1.2(\text{Total ammonia - N})}{1+10^{(pK_a - pH)}}$ $pK_a = 0.902 + \left(\frac{2730}{273.2+T_c}\right)$ Where: T_c = temperature, degrees Celsius. Y = un-ionized ammonia (mg/l);			
Antimony 401 KAR 10:031 Section 6	5.6	640	N/A	N/A
Arsenic 401 KAR 10:031 Section 6	10.0	N/A	340	150
Beryllium 401 KAR 10:031 Section 6	4	N/A	N/A	N/A
Cadmium 401 KAR 10:031 Section 6	5	N/A	$e^{[1.0166\ln(Ha)-3.924]}$	$e^{[0.7409\ln(Ha)-4.719]}$
Chloride 401 KAR 10:031 Section 6	250,000	N/A	1,200,000	600,000

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APPLICABLE WATER QUALITY CRITERIA				
Effluent Characteristic	**Criteria**			
	Human Health		**Aquatic Life**	
	DWS	**FC**	**Acute**	**Chronic**
Chromium 401 KAR 10:031 Section 6	100	N/A	N/A	N/A
Copper 401 KAR 10:031 Section 6	1,300	N/A	$e^{[0.9422\ln(Ha)-1.700]}$	$e^{[0.8545\ln(Ha)-1.702]}$
DO 401 KAR 10:031 Section 4(e)	Shall be maintained at a minimum concentration of 5.0 mg/l as a 24-hour average and shall not be less than 4.0 mg/l as an instantaneous minimum.			
Escherichia coli 401 KAR 10:031 Section 7(1)(a)	Shall not exceed 130 colonies per 100 ml as a geometric mean based on not less than 5 samples taken during a 30 day period. Shall not exceed 240 colonies per 100 ml in 20% or more of all samples taken during a 30 day period.			
Iron 401 KAR 10:031 Section 6	300	N/A	4,000	1,000; 3,500 if aquatic life has not shown to be adversely affected
Lead 401 KAR 10:031 Section 6	15	N/A	$e^{[1.273\ln(Ha)-1.460]}$	$e^{[1.273\ln(Ha)-4.705]}$
Mercury 401 KAR 10:031 Section 6	2.0	0.051	1.4	0.77
Minimum Criteria 401 KAR 10:031 Section 2	Waters shall not be aesthetically or otherwise degraded by substances that: settle to form objectionable deposits; float as debris, scum, oil, or other matter to form a nuisance; produce objectionable color, odor, taste, or turbidity; injure, are chronically or acutely toxic to or produce adverse physiological or behavioral responses in humans, animals, fish, and other aquatic life; produce undesirable aquatic life or result in the dominance of nuisance species; or cause fish flesh tainting. The concentration of phenol shall not exceed 300 mg/l as an instream value.			
Nickel 401 KAR 10:031 Section 6	610	4,600	$e^{[0.8460\ln(Ha)+2.255]}$	$e^{[0.8460\ln(Ha)+0.0584]}$

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APPLICABLE WATER QUALITY CRITERIA				
Effluent Characteristic	**Criteria**			
	Human Health		**Aquatic Life**	
	DWS	**FC**	**Acute**	**Chronic**
Nutrients 401 KAR 10:031 Section 1	In lakes and reservoirs and their tributaries, and other surface waters where eutrophication problems may exist, nitrogen, phosphorus, carbon, and contributing trace element discharges shall be limited in accordance with: the scope of the problem; the geography of the affected area; and relative contributions from existing and proposed sources.			
pH 401 KAR 10:031 Section 4 (1)(b)	Shall not be less than 6.0 or more than 9.0 and shall not fluctuate more than 1.0 pH unit over a period of 24 hours.			
Phenol 401 KAR 10:031 Section 6	21,000	1,700,000	N/A	N/A
Selenium 401 KAR 10:031 Section 6	170	4,200	20	5.0
Silver 401 KAR 10:031 Section 6	N/A	N/A	$e^{[1.72\ln(Ha)-6.59]}$	N/A
SS 401 KAR 10:031 Section 4(1)(h)	The addition of SS that may alter the stream bottom so as to adversely affect productive aquatic communities shall be prohibited.			
Sulfate 401 KAR 10:031 Section 6	250,000	N/A	N/A	N/A
Temperature 401 KAR 10:031 Section 4(1)(c)	Shall not exceed 31.7° C (89° F). The normal daily and seasonal temperature fluctuations that existed before the addition of heat due to other than natural causes shall be maintained. The Cabinet may determine allowable surface water temperatures on a site-specific basis utilizing available data that shall be based on the effects of temperature on the aquatic biota that utilize specific surface waters of the Commonwealth that may be affected by person-induced temperature changes.			
Thallium 401 KAR 10:031 Section 6	0.24	0.47	N/A	N/A
TDS or SC 401 KAR 10:031 Section 4(1)(f)	Shall not be changed to the extent that the indigenous aquatic community is adversely affected. Constituents of TDS include calcium, magnesium, sodium, and potassium, as well as chloride and sulfate.			

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APPLICABLE WATER QUALITY CRITERIA				
Effluent Characteristic	**Criteria**			
	Human Health		**Aquatic Life**	
	DWS	**FC**	**Acute**	**Chronic**
TDS 401 KAR 10:031 Section 6	250,000	N/A	N/A	N/A
Total Residual Chlorine 401 KAR 10:031 Section 4(1)(k)	Shall not exceed an acute criteria value of 19 µg/l or a chronic criteria value of 11 µg/l.			
TSS 401 KAR 10:031 Section 4(1)(g)	Shall not be changed to the extent that the indigenous aquatic community is adversely affected.			
Toxic Pollutants & Nonconventional Pollutants 401 KAR 10:031 Section 4(1)(j) 401 KAR 10:031 Section 6	The allowable instream concentration of toxic substances, or whole effluents containing toxic substances, which are noncumulative or nonpersistent with a half-life of less than 96 hours, shall not exceed 0.1 of the 96-hour LC_{50} of representative indigenous or indicator aquatic organisms, or a chronic toxicity unit of 1.00 utilizing the LC_{25}. The allowable instream concentration of toxic substances, or whole effluents containing toxic substances, which are bioaccumulative or persistent, including pesticides, if not specified elsewhere in 401 KAR 10:031 Section 4, shall not exceed 0.01 of the 96-hour LC_{50} of representative indigenous or indicator aquatic organisms, a chronic toxicity unit of 1.00 utilizing the IC_{25}. In the absence of acute criteria for pollutants listed in 401 KAR 10:031 Section 6, for other substances known to be toxic but not listed in 401 KAR 10:031, or for whole effluents that are acutely toxic, the allowable instream concentration shall not exceed the LC_1 or 1/3 the LC_{50} concentration derived from toxicity tests on representative indigenous or indicator aquatic organisms or exceed 0.3 acute toxicity units. If specific application factors have been determined for a toxic substance or whole effluent such as an acute to chronic ratio or water effect ratio, they may be used instead of the 0.1 and 0.01 factors listed in this subsection upon demonstration by the applicant that the application factors are scientifically defensible. Allowable instream concentrations for specific pollutants for the protection of warm water aquatic habitat are listed in 401 KAR 10:031 Section 6. These concentrations are based on protecting aquatic life from acute and chronic toxicity and shall not be exceeded. Specific pollutants expected in the wastewater have been highlighted in this table.			
Zinc 401 KAR 10:031 Section 6	7,400	26,000	$e^{[0.84736\ln(Ha)+0.884]}$	$e^{[0.84736\ln(Ha)+0.884]}$
(Ha) indicates hardness in mg/l as $CaCO_3$.				

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2.6.3. Specific Biologic Categories

In establishing narrative criteria, 40 CFR 131.11 (b) (2) also specifies that criteria should be based on bio-monitoring methods where numerical criteria cannot be established or to supplement numerical criteria.

The Kentucky MBI, as incorporated by reference in 401 KAR 10:030 Section 3, lists the following ranges of scores to evaluate stream conditions for meeting the designated uses for streams supporting macroinvertebrate communities.

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MBI Ranges by Category, Mountain Bioregion				
Category	Headwater Streams		Wadeable Streams	
	Minimum	Maximum	Minimum	Maximum
Excellent	83		82	
Good	72	82	75	81
Fair	48	71	50	74
Poor	24	47	25	49
Very Poor	0	23	0	24

The KIBI, as incorporated by reference in 401 KAR 10:030 Section 3, lists the following ranges of scores to evaluate stream conditions for meeting the designated uses for streams supporting invertebrate communities.

IBI Ranges by Category, Mountain Bioregion		
Category	Minimum	Maximum
Excellent	71	
Good	59	70
Fair	39	58
Poor	19	38
Very Poor	0	18

2.6.4. Reported Discharge and Instream Levels

The permittee did not have any discharges to report from this permit as no ponds are constructed; however, the permittee submitted data from outfall 003 for the application for KY0107760 and asked that this data be utilized as representative of discharges from KY0107212 because the pond was constructed and operated by the same company. The permittee also reported five (5) samples at each instream location during the sampling period. Instream metals were not collected at any site as there are currently no discharges onsite; therefore background concentrations for these pollutants are assumed to be zero.

REPORTED DISCHARGE LEVELS KY0107760 003				
Effluent Characteristics	Units	Minimum	Average	Maximum
Alkalinity	mg/l $CaCO_3$	92	123	172
Ammonia	N/A	N/A	N/A	N/A
Antimony	µg/l	0	1	4
Arsenic	µg/l	0	1	4
Beryllium	µg/l	0	0	0
Cadmium	µg/l	0	0	0
Calcium	mg/l	70.3	85.0	105.0

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REPORTED DISCHARGE LEVELS KY0107760 003				
Effluent Characteristics	**Units**	**Minimum**	**Average**	**Maximum**
Chloride	mg/l	3	6	9
Chromium	µg/l	0	0	0
Copper	µg/l	0	1	3
DO	mg/l	N/A	N/A	N/A
Escherichia coli	100/ml	N/A	N/A	N/A
Flow	cfs	0.0089	1.0684	4.5000
Hardness	mg/l $CaCO_3$	95.4	119.0	148.5
Iron	mg/l	0.100	1.106	1.950
Lead	µg/l	0	0.7	1.2
Magnesium	mg/l	25.1	34.0	43.5
Manganese	mg/l	1.64	3.82	5.91
Mercury	µg/l	0.00227	0.00443	0.00720
Nickel	µg/l	10.3	13.5	17.7
Nutrients	N/A	N/A	N/A	N/A
pH	SU	7.15	7.38	7.81
Phenol	µg/l	0	0	0
Potassium	mg/l	6.80	8.08	9.66
Selenium	µg/l	0	1	2
SS	ml/l	N/A	N/A	N/A
Silver	µg/l	0	0	0
Sodium	mg/l	21.2	30.2	40.4
Sulfate	mg/l SO_4	255	290	340
Temperature	°C	9.9	11.5	12.8
Thallium	µg/l	0	0	0
SC	µS/cm	626	703	792
TDS	mg/l	310	340	412
Total Residual Chlorine	µg/l	N/A	N/A	N/A
TSS	µg/l	15	27	41
Zinc	µg/l	3.5	32.1	51.0

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REPORTED INSTREAM LEVELS, MINIMUM								
Instream Characteristics	**Units**	**CF1**	**CF2**	**SB1**	**SB2**	**TF1**	**TF2**	**CB1**
Alkalinity	mg/l $CaCO_3$	124	72	98	24	30	26	16
Ammonia	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Calcium	mg/l	68.5	75.6	30.5	4.64	6.61	5.91	8.32
Chloride	mg/l	21.5	5.5	13.0	3.5	3.0	2.0	1.5
DO	mg/l	7.96	6.77	7.56	6.10	5.34	5.67	5.50
Escherichia coli	100/ml	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flow	cfs	0.2317	0.0089	0.0535	0.0045	0.0067	0.0033	0.0006
Hardness	mg/l $CaCO_3$	99.30	118.80	35.43	7.43	11.27	10.62	11.41
Magnesium	mg/l	30.8	43.2	4.93	2.79	4.66	4.09	3.09
Nutrients	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
pH	SU	7.40	7.44	7.29	7.11	6.73	6.91	6.98
Phenol	µg/l	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Potassium	mg/l	3.27	3.38	1.92	1.52	0.93	1.72	0.93
SS	ml/l	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sodium	mg/l	27.90	8.64	5.05	1.04	2.55	2.95	3.39
Sulfate	mg/l SO_4	170	240	2	7	16	16	13
Temperature	°C	931	9.0	10.4	11.0	9.3	9.4	8.8
SC	µS/cm	674	634	195	77	109	99	96
TDS	mg/l	292	299	106	43	49	39	87
Total Residual Chlorine	µg/l	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TSS	µg/l	N/A	N/A	N/A	N/A	N/A	N/A	N/A

REPORTED INSTREAM LEVELS, AVERAGE								
Instream Characteristics	**Units**	**CF1**	**CF2**	**SB1**	**SB2**	**TF1**	**TF2**	**CB1**
Alkalinity	mg/l $CaCO_3$	146	91	126	37	44	39	21
Ammonia	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Calcium	mg/l	76.5	89.5	40.5	5.3	7.1	6.7	127.8
Chloride	mg/l	28.8	10.2	17.8	10.7	5.9	6.0	4.7
DO	mg/l	8.25	7.58	7.91	7.34	6.50	6.68	6.27

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REPORTED INSTREAM LEVELS, AVERAGE								
Instream Characteristics	**Units**	**CF1**	**CF2**	**SB1**	**SB2**	**TF1**	**TF2**	**CB1**
Escherichia coli	100/ml	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flow	cfs	0.5485	.0383	0.0918	0.0299	0.0312	0.0198	0.0656
Hardness	mg/l $CaCO_3$	113	143	47	9	13	12	17
Magnesium	mg/l	36.6	53.4	6.0	3.2	5.4	4.9	4.0
Nutrients	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
pH	SU	762	7.55	7.58	7.60	6.95	7.12	7.09
Phenol	µg/l	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Potassium	mg/l	4342	4.30	2.60	2.60	2.36	2.60	1.57
SS	ml/l	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sodium	mg/l	31.0	9.6	7.5	2.3	2.9	3.7	4.9
Sulfate	mg/l SO_4	185	270	5	11	25	22	16
Temperature	°C	10.7	10.4	11.5	11.4	10.3	11.1	9.9
SC	µS/cm	688	721	268	87	116	113	127
TDS	mg/l	369	363	148	56	68	53	99
Total Residual Chlorine	µg/l	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TSS	µg/l	N/A	N/A	N/A	N/A	N/A	N/A	N/A

REPORTED INSTREAM LEVELS, MAXIMUM								
Instream Characteristics	Units	**CF1**	**CF2**	**SB1**	**SB2**	**TF1**	**TF2**	**CB1**
Alkalinity	mg/l $CaCO_3$	160	138	144	46	62	52	28
Ammonia	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Calcium	mg/l	85.1	102.0	46.0	7.57	8.06	7.25	15.00
Chloride	mg/l	40.0	26.0	26.0	20.5	12.5	13.0	10.5
DO	mg/l	8.47	8.3	8.15	8.57	8.29	8.43	6.77
Escherichia coli	100/ml	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flow	cfs	1.5329	0.0557	0.1626	0.0557	0.0802	0.0535	0.2540
Hardness	mg/l $CaCO_3$	129.10	171.90	52.90	11.64	13.99	12.86	19.74
Magnesium	mg/l	44.00	69.90	6.90	4.07	6.05	5.61	4.74
Nutrients	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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REPORTED INSTREAM LEVELS, MAXIMUM								
Instream Characteristics	Units	**CF1**	**CF2**	**SB1**	**SB2**	**TF1**	**TF2**	**CB1**
pH	SU	7.87	7.70	7.79	7.96	7.22	7.27	7.18
Phenol	µg/l	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Potassium	mg/l	6.54	6.39	3.91	3.26	5.00	4.67	2.51
SS	ml/l	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sodium	mg/l	33.10	10.60	8.80	2.95	4.21	4.76	6.26
Sulfate	mg/l SO_4	200	305	10	14	30	27	20
Temperature	°C	12.1	11.9	12.8	12.5	11.3	12.9	10.9
SC	µS/cm	702	772	305	94	123	128	143
TDS	mg/l	404	402	177	67	79	65	109
Total Residual Chlorine	µg/l	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TSS	µg/l	N/A	N/A	N/A	N/A	N/A	N/A	N/A

2.6.5. Reasonable Potential

In accordance with the EPA approved reasonable potential procedures outlined in Section 1.2.1, DOW has conducted an analysis to determine whether there is a reasonable potential that the proposed discharge will violate water quality standards. Based on that analysis, DOW imposes the following requirements.

RPA RESULTS						
Effluent Characteristics	**Units**	**Chronic Limitation**	**Average Discharge %**	**Acute Limitation**	**Maximum Discharge %**	**Requirement**
Acidity	mg/l $CaCO_3$	N/A	N/A	N/A	N/A	Monitor – Active Mining Areas Only
Alkalinity	mg/l $CaCO_3$	N/A	N/A	N/A	N/A	Monitor – Active Mining Areas Only
Ammonia	N/A	N/A	N/A	N/A	N/A	No Requirement
Antimony	µg/l	640	0.63	N/A	N/A	No Requirement
Arsenic	µg/l	150	0.96	340	1.18	No Requirement
Beryllium	µg/l	775	0.00	N/A	N/A	No Requirement
Biological Assessment	N/A	N/A	N/A	N/A	N/A	Requirement – Active Mining Areas Only (Instream)
Cadmium	µg/l	0.308	0.00	0.9856	0.00	No Requirement
Calcium	mg/l	N/A	N/A	N/A	N/A	Monitor – Active Mining Areas Only
Chloride	mg/l	600,000	1.00	1,200,000	0.75	Monitor – Active Mining Areas Only

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RPA RESULTS						
Effluent Characteristics	**Units**	**Chronic Limitation**	**Average Discharge %**	**Acute Limitation**	**Maximum Discharge %**	**Requirement**
Chromium	µg/l	19,381	0.00	N/A	N/A	No Requirement
Copper	µg/l	6.845	8.76	6.845	43.82	No Requirement
DO	mg/l	5.0	N/A	4.0 (minimum)	N/A	Limit – Active Mining Areas Only
Escherichia coli	100/ml	130	N/A	240	N/A	No Requirement
Flow	cfs	N/A	N/A	N/A	N/A	Monitor
Hardness	mg/l $CaCO_3$	N/A	N/A	N/A	N/A	Monitor – Active Mining Areas Only
Iron	mg/l	3.500	31.60	4.000	48.75	Limit – Active Mining Areas Only
Lead	µg/l	3.970	18.13	31.057	3.86	No Requirement
Magnesium	mg/l	N/A	N/A	N/A	N/A	Monitor – Active Mining Areas Only
Manganese	mg/l	N/A	N/A	N/A	N/A	Limit – Active Mining Areas Only
Mercury	µg/l	0.051	8.69	1.4	0.51	No Requirement
Nickel	µg/l	60.433	22.37	246.810	7.17	No Requirement
Nutrients	N/A	N/A	N/A	N/A	N/A	No Requirement
pH	SU	N/A	N/A	N/A	N/A	Limit
Phenol	mg/l	1,700	0.00	N/A	N/A	No Requirement
Potassium	mg/l	N/A	N/A	N/A	N/A	Monitor – Active Mining Areas Only
SC	µS/cm	N/A	N/A	N/A	N/A	Requirement – Active Mining Areas Only
Selenium	µg/l	5	12.00	20	10.00	No Requirement
Silver	µg/l	N/A	N/A	1.025	0.00	No Requirement
Sodium	mg/l	N/A	N/A	N/A	N/A	Monitor – Active Mining Areas Only
SS	ml/l	N/A	N/A	N/A	N/A	Limit – Reclamation Areas Only
Sulfate	mg/l SO_4	48,452,018	0.70	N/A	N/A	Monitor – Active Mining Areas Only
TDS	mg/l	48,452,018	0.70	N/A	N/A	Requirement – Active Mining Areas Only
Temperature	°C	N/A	N/A	N/A	N/A	Monitor – Active Mining Areas Only
Thallium	µg/l	0.47	0.00	N/A	N/A	No Requirement
Toxicity, Acute	TU_A	N/A	N/A	1.00	N/A	Limit – Active Mining Areas Only
Toxicity, Chronic	TU_C	1.00	N/A	N/A	N/A	Monitor – Active Mining Areas Only

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RPA RESULTS						
Effluent Characteristics	**Units**	**Chronic Limitation**	**Average Discharge %**	**Acute Limitation**	**Maximum Discharge %**	**Requirement**
TRC	µg/l	11	N/A	19	N/A	No Requirement
TSS	µg/l	N/A	N/A	N/A	N/A	Limit– Active Mining Areas Only
Zinc	µg/l	62.967	50.98	62.967	80.99	Monitor – Active Mining Areas Only

2.6.5.1. SC and TDS

TDS are that portion of wastewater that, when passed through a filter, does not remain on the filter. SC is a measure of water's ability to conduct an electrical charge. SC is directly related to the total dissolved ionized solids in the water. Common constituents of TDS are sulfates, chlorides, calcium, sodium, magnesium, potassium and metals. SC is also related to salinity and is influenced by pH, hardness and temperature. The presence and concentration of the ionized solids released during coal mining activities is dependent upon a number of factors, including but not limited to: chemical constituency of geological formations being disturbed; the degree of pulverization of these materials during the mining process; the methods for managing spoil and overburden; and treatment techniques utilized to neutralize acid mine drainage such as the use of alkaline materials to create buffering.

Changes in SC may result in modifications to the makeup of the aquatic biological community of a water body. Depending on the severity of the alteration in SC, 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. Therefore, in order to determine if reasonable potential exists, the baseline biological conditions of the intended receiving streams are compared to the biological conditions of the receiving streams during active mining.

The biological conditions prior to and during the permitted activity are determined by the permittee using the methods established in Kentucky's IBI and MBI procedures. Comparing the baseline biological assessment score to the tables provided in Section 2.6.3, the biological condition or category of the receiving waters is determined. Annual biological assessments are conducted to determine the impact of the mining activity on the receiving waters. The annual score is compared to the baseline condition. If the annual score(s) are lower than the baseline score but within the baseline category, then reasonable potential may exist. If the annual score(s) indicate the receiving water has declined in category, then reasonable potential has been demonstrated. An excursion of the narrative water quality criteria and a violation of the permit have occurred unless the permittee can demonstrate that causes other than the discharge of pollutants from the permitted activity were the principal source. In addition to biological assessment, DOW shall require quarterly WET testing as required by 401 KAR 5:065 Section 2(4) [40 CFR 122.44(d)].

2.6.5.1.1. Toxicity and Duration of Discharge

EPA's 1982 *Development Document for the Coal Mining Point Source Category* states:

> The major sources of wastewater in the coal mining category include precipitation, surface runoff, ground water infiltration, and effluents from coal preparation plants. No process water is used in the mining phase, except for minor consumption in dust suppression, pump coolants, and firefighting needs … In the preparation phase, water is used to clean the raw coal. Water usage is typically 350 gallons per ton and is laden with coal and refuse fines which must be removed prior to discharge or reuse.

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DOW interprets this statement to mean that discharges from coal mining operations are precipitation-driven unless a) groundwater has permeated the seal of an underground mine or otherwise been introduced into a coal removal area or b) a coal preparation plant is operating with a positive water balance. Generally, neither of these two conditions applies. 405 KAR 1:180 and 405 KAR 3:150 require that surface and underground operations, respectively, minimize adverse affects on groundwater flow and quality. Permittees are required to monitor groundwater levels, subsurface flow, storage and quality of groundwater as well as any other applicable requirements. The permittee avoids the disruption of the subsurface hydrological balance by regulation. Further, coal wet preparation plants are required to operate as a closed circuit such that clarified water is recirculated to the head of the plant for reuse. Water in the system is lost to slurry disposal, but is often made-up using stormwater collected onsite, so that the plant operates with a negative balance.

As stated in Section 2.6.5.1, DOW is required to apply WET limits to these discharges in accordance with 401 KAR 5:065 Section 2(4) [40 CFR 122.44(d)]. As discussed in Section 1.2.2.2, there are two types of toxicity, acute and chronic. Acute toxicity is determined by conducting a short-term exposure lethality test (i.e., less than 96 hours in duration). Chronic toxicity is determined by measuring inhibition concentration through a long-term exposure test (i.e., greater than 96 hours in duration). It is DOW's understanding that stormwater and precipitation-driven effluents treated by retention or detention will discharge in less than 96 hours based on the design of the treatment systems. As such, an acute WET limit is appropriate. However, should it be shown through monitoring over the course of the permit term that any discharge is chronic in nature, a chronic WET limit will be required.

In order to determine whether acute or chronic WET limits apply to the discharge, a semimonthly requirement to measure discharge duration shall be included. Additionally, a hybrid acute-chronic WET procedure has been adopted to allow for the reporting of chronic results should the discharge duration be sufficient to complete the chronic test. The first 48 hours of the WET test shall constitute performance of an acute test and shall be subject to the acute WET limitation. If the discharge is of sufficient duration to complete the WET test in order to obtain a chronic endpoint by the procedures required by the permit, the chronic endpoint result shall be reported on the DMR. If the discharge is not of sufficient duration to complete the chronic test, then the applicant shall report 'no discharge' on the DMR and shall have met the requirements for chronic WET testing for that reporting period.

After one year of monitoring, the monitoring requirements imposed by the permit may be reviewed and, if reasonable potential to produce a chronic effect has been demonstrated to exist, the permit will be reopened to apply the appropriate limitation.

2.6.5.1.2. Alkalinity, Biological Assessment, Calcium, Chloride, Hardness, Magnesium, Potassium, Sodium, Sulfate

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 401 KAR 5:070 Section 3 [40 CFR 122.48].

2.6.5.2. Ammonia, *Escherichia coli*, DO, Nutrients, and TRC

These effluent characteristics are generally associated with sanitary wastewaters and organic effluents. Because this industrial activity does not include domestic wastewater and does not include organic processes, these constituents are not expected to be present in the wastewater and are therefore excluded from the RPA.

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2.6.5.3. Antimony, Arsenic, Beryllium, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Phenol, Selenium, Silver, and Thallium

DOW assesses the reasonable potential of the 137 pollutants listed in Table 1 of 401 KAR 10:031, Section 6 using a steady state toxics wasteload allocation model that first calculates WQBELs that are protective of the acute, chronic, human health fish consumption and human health domestic water supply criteria for each pollutant. The calculated WQBELs for the pollutants applicable to this discharge are compared to the discharge levels measured in the effluent.

For all pollutants listed, the reported average discharge was less than 70% of the calculated protective WQBEL(s); therefore no further monitoring is required for these pollutants.

2.6.5.4. Zinc

Zinc monitoring is required for all permitted outfalls. The reasonable potential analysis shows that the facility discharges zinc at 80.99% and 50.98% of the acute and chronic WQBEL, respectively. Therefore it is DOW's decision that monitoring will be required as described in Section 2.5.

2.6.5.5. Iron

While the stream segment partially supports its aquatic life designated use, this impairment has not been shown to be related to iron, so the applicable chronic criterion is 3,500 µg/l. The acute WQBEL was calculated to be 4.000 mg/l, using the procedures outlined in Section 1.2.2.1.1 and the 7Q10 low flow of zero cfs.

2.6.5.6. SS

As with SC and TDS, SS is a narrative standard in Kentucky's water quality standards. As such, when evaluating waters of the Commonwealth for compliance with this narrative standard, DOW takes into consideration biological indicators, such as the taxonomic richness of macroinvertebrates and level of siltation. These indicators are embodied in the same biotic indices used to determine compliance with the SC and TDS narrative standard, as discussed in Section 2.6.5.1. However, unlike SC and TDS, TBELs have been developed and promulgated by EPA for the Coal Mining Point Source Category, therefore SS has a reasonable potential in accordance with DOW's reasonable potential procedures discussed in Section 1.2.1.

As discussed in Section 1.2.3.1, 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 SS during active mining. Therefore, DOW is not proposing any additional requirements for this parameter through Phase II bond release.

2.6.5.7. TSS

As with SC and TDS, TSS is a narrative standard in Kentucky's water quality standards. As such, when evaluating waters of the Commonwealth for compliance with this narrative standard, DOW takes into consideration biological indicators, such as the taxonomic richness of macroinvertebrates and level of siltation. These indicators are embodied in the same biotic indices used to determine compliance with the SC and TDS narrative standard, as discussed in Section 2.6.5.1. However, unlike SC and TDS, TBELs have been developed and promulgated by EPA for the Coal Mining Point Source Category, therefore TSS has a reasonable potential in accordance with DOW's reasonable potential procedures discussed in Section 1.2.1.

As discussed in Section 1.2.3.1, 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 TSS after Phase II bond release. Therefore, DOW is not proposing any additional requirements for this parameter

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2.6.5.8. Minimum Criteria

The minimum criteria for all waters specified in 401 KAR 10:031, Section 2 are categorical and not pollutant-specific except for phenol, which has an instream criteria of 300 mg/l; therefore the selection of an indicator pollutant or pollutant characteristic that would adequately address the criteria is not feasible. However, DOW has determined that a reasonable potential exists with all dischargers to cause or contribute to an excursion of these categorical requirements. As specific indicator pollutants and limitations are not feasible DOW has included these criteria as part of the reopener required in all permits.

2.6.5.9. pH

pH is subject to the technology-based effluent standards for this industrial category. In accordance with Kentucky's EPA-approved RPA procedures, if a promulgated technology-based effluent standard exists, then the discharge has reasonable potential, and therefore effluent limitations and monitoring requirements shall be applied for those effluent characteristics addressed by the technology-based standard.

2.6.5.10. Dissolved Oxygen and Temperature

Mining activities discharge directly to publicly-owned lakes or to their first- or second-order tributaries present the greatest potential for degradation of the lake's water quality. In order to adequately protect this classification, temperature and dissolved oxygen are required to be monitored and limited, respectively, pursuant to the requirements of 401 KAR 5:065 Section 2(4) [40 CFR 122.44(d)], 401 KAR 10:026 Section 5, 401 KAR 10:030 Section 1, and 401 KAR 10:031 Section 4(1).

2.6.6. Final Determination of Limits

2.6.6.1. Iron

Iron has a numeric active-mining NSPS limitation of 3.0 mg/l as a monthly average, a calculated human health domestic water supply WQBEL of 58.142 mg/l, and a chronic aquatic life WQBEL of 3.5 mg/l. DOW has set the most stringent average limitation of the NSPS limitation as the monthly average. Iron also has both a numeric active-mining NSPS limitation of 6.0 mg/l as a daily maximum and an acute aquatic life WQBEL of 4.000 mg/l. DOW has set the most stringent maximum limitation of the acute criterion as the monthly average.

2.6.6.2. SS

DOW is imposing the numeric TBEL and the narrative WQBEL to address this pollutant.

2.6.6.3. pH

The water quality standard, the active mining NSPS requirement, and the post-mining NSPS requirement for pH are the same; therefore no additional analysis is required.

2.6.6.4. TSS

DOW is imposing the numeric TBEL and the narrative WQBEL to address this pollutant.

2.6.6.5. SC & TDS

Compliance with the narrative water quality standard and permit requirements for these parameters shall be determined by comparing the baseline biological assessment score(s) with annual score(s) determined during the term of the permit as well as WET testing. The tables in Sections 2.6.3 and 2.6.4 will be used in the

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permit in determining compliance. The BMP requirements of the permit include benchmarks that are clear, specific, measurable, and enforceable permit requirements for these parameters. These benchmarks are as follows:

1) **Single annual score lower than the baseline score but in the same baseline category:**
   a) Does not constitute a violation of the permit.
   b) Within thirty (30) days of the determination of the annual score, the permittee shall evaluate the effectiveness of BMPs for SC control.
   c) Within sixty (60) days of the determination of the annual score, the permittee shall submit to DOW the findings of this evaluation.
   d) Within one-hundred-eighty (180) days of the determination of the annual score, the permittee shall implement any proposed modifications to the BMPs that do not require modification of the SMCRA permit. If modifications of the SMCRA permit are required, the permittee shall implement the modified BMPs as soon as practicable after authorization by DNR.
2) **Two consecutive annual scores lower than the baseline score but in the same baseline category:**
   a) Does not constitute a violation of the permit.
   b) Within thirty (30) days of the determination of the annual score, the permittee shall evaluate the effectiveness of BMPs for SC control and propose BMP modifications.
   c) Within sixty (60) days of the determination of the annual score, the permittee shall submit to DOW the findings of this evaluation.
   d) Within one-hundred-eighty (180) days of the determination of the annual score, the permittee shall implement any proposed modifications to the BMPs that do not require modification of the SMCRA permit. If modifications of the SMCRA permit are required, the permittee shall implement the modified BMPs as soon as practicable after authorization by DNR.
3) **Single annual score lower than the baseline category, or two consecutive failed acute WET tests:**
   a) Constitutes a violation of the permit unless the permittee can show that causes other than the discharge of pollutants from the permitted activity were the principal source of the categorical decline.
   b) Within five (5) days of the determination of the annual score or the second of two consecutive failed acute WET tests, the permittee shall notify DOW that the event has occurred.
   c) Within thirty (30) days of the determination of the annual score or the second of two consecutive failed acute WET tests, the permittee may attempt to demonstrate that causes other than the permitted activity were the source of the categorical decline or shall otherwise commence evaluation of the effectiveness of the current BMPs employed and propose BMP modifications.
   d) Within sixty (60) days of the determination of the annual score or the second of two consecutive failed acute WET tests, the permittee shall submit to DOW the findings of this evaluation.
   e) Within one-hundred-eighty (180) days of the determination of the annual score or the second of two consecutive failed acute WET tests, the permittee shall implement any proposed modifications to the BMPs that do not require modification of the SMCRA permit. If modifications of the SMCRA permit are required, the permittee shall implement the modified BMPs as soon as practicable after authorization by DNR.

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2.7. Antidegradation

The conditions of 401 KAR 10:029, Section 1 have been satisfied. This permitting action is a modification of a KPDES that includes the authorization of new/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) and supportive information pursuant to 401 KAR 10:030, Section 1(3).

For those discharges subject to the provisions of 401 KAR 10:030 Section 1(3)(b)5, the permittee shall install, operate, and maintain wastewater treatment facilities consistent with those identified below:

- Sedimentation
- Water reuse for dust suppression

2.8. Schedule of Compliance

The permittee will comply with all effluent limitations by the effective date of the permit except as allowed pursuant to 401 KAR 5:080, Section 6. Special KPDES program requirements related to new sources and new discharges shall be as established in 40 CFR 122.29, effective July 1, 2008.

2.9. Special Conditions

2.9.1. 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 at 401 KAR Section 2(9) [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.

2.9.2. BMP Plan

In accordance with 401 KAR 5:065 Section 2(4) [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. Therefore the permittee is required to prepare and implement a BMP plan to identify measures it will take to prevent discharge of pollutants. The permittee shall submit the BMP Plan to DOW for its review at least 90 days prior to the start of active coal removal. The effectiveness of the BMPs will be determined by the annual biological assessments as well as any other parameters specified by the permittee. 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.

2.9.2.1. SC Benchmark and Management

As discussed in Section 2.6.5.1, this permit does not contain a numeric limit on SC. However, the permit requires monitoring of SC and the implementation of an instream biological assessment. This assessment will include a benchmark based on the baseline biological assessment(s) performed prior to permit issuance. RPA will be performed on annual assessments based on the procedures in Section 1.2.1.1.2.

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2.9.2.1.1. SC BMP Plan Evaluation

At a minimum, the findings of this evaluation shall include:

(1) A list of known, practicable measures to reduce SC in discharges from surface coal mining, including measures to sequester known sources of high SC to prevent entrance to the sedimentation ponds;
(2) Identification of the order of implementing identified SC control measures;
(3) Monitoring plans and schedules to support evaluating the effectiveness of each control measure;
(4) A description of decision-making criteria and timelines for evaluating whether a particular measure has been effective and whether additional or different measures are required, including instream or effluent monitoring; and
(5) Identification of a process for revising the BMP Plan should data obtained from monitoring the effectiveness of particular SC control measures warrant such revisions.

2.9.2.1.2. SC BMP Plan Modification

At this time, there is no completed, conclusive research evaluating the environmental impact of SC or the effectiveness of source-control measures in reducing SC from mining operations, and SMCRA law precludes others from being used. Accordingly, the options available to permittees to reduce SC in discharges may be currently limited. The implementation of the BMP is an iterative process and provides an opportunity to evaluate potential SC control measures for wider applicability within the mining community.

2.9.3. 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 at 401 KAR 5:065 Section 2(4) [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.

2.9.4. 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 at 401 KAR 5:065 Section 2(4) [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.

2.9.5. 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.

2.9.6. 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 Section 2(4) [40 CFR Part 434.61].

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2.9.7. Department of the Army, Corps of Engineers Condition

Pursuant to the requirements of 401 KAR Section 9 [40 CFR 124.59(a)], 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.

2.9.8. 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.

2.9.9. Publicly-Owned Lake

Clarks Branch from mouth to headwaters, Thomson Fork from the confluence with Souder Branch to headwaters, and Souder Branch from the confluence with Thompson Fork to headwaters are recognized by DOW as first-order tributaries to a Publicly-Owned Lake. Reduction in stream canopy (shading), increased sediment loading, and hydrological alterations may result in impacts to the lake. Activities such as channel relocations, low-water crossings, instream sediment ponds, hollow fills, etc. may have deleterious impacts on the lake. Therefore, a 100-foot horizontal buffer zone and 150-foot vertical about the lake and its first- and second-order blue-line tributaries shall be maintained, thus prohibiting any instream disturbances or structures.

2.10. State Conditions

2.10.1. Outfall Signage

DOW recommends the installation of a permanent marker at each of the monitoring to better document and clarifies these locations for operational staff and agency inspectors.

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3. 3 OTHER INFORMATION

3.1. Permit Duration

The permit shall have a duration of five (5) years from the effective unless modified or reissued. This facility is in the Big & Little Sandy / Tygarts Basin Management Unit as per the Kentucky Watershed Management Framework.

3.2. Permit and Public Notice Information

The application, draft permit, fact sheet and public notice are available on the DOW Public Notice web page and the Department of Environmental Protection's Pending Approvals Search web page at:

http://water.ky.gov/Pages/PublicNotices.aspx:

http://dep.gateway.ky.gov/eSearch/Search_Pending_Approvals.aspx?Program=Wastewater&NumDaysDoc=30

Comments may be filed electronically at the following e-mail address: DOWPublicNotice@ky.gov

Or by sending written comments to:

Division of Water
Surface Water Permits Branch
200 Fair Oaks Lane
Frankfort, Kentucky 40601

3.3. 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 Division of Water's Open Records Coordinator at (502) 564-3410, or by e-mail dowopenrecords@ky.gov.

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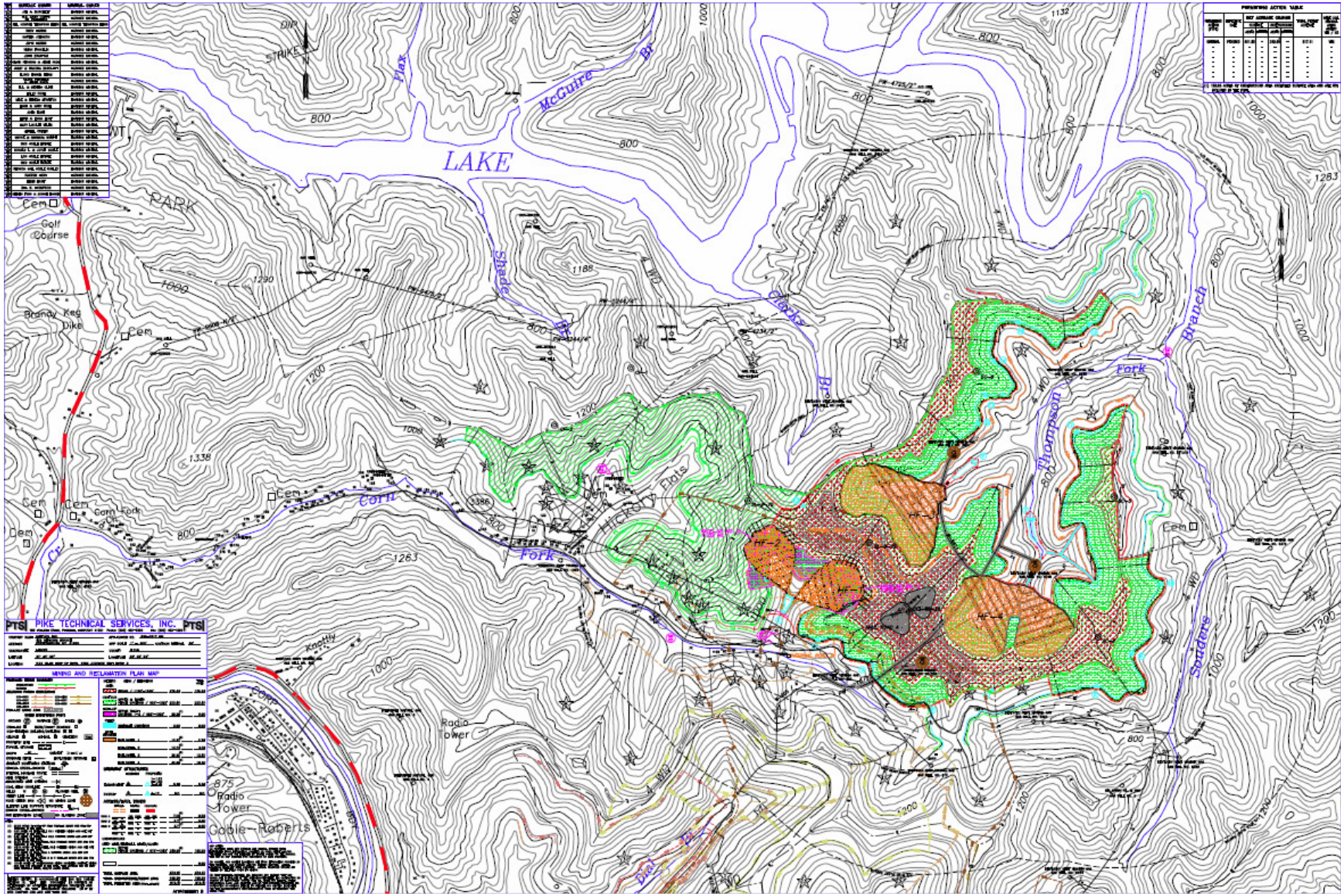
3.4. Location Map



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3.5. QAPP Map