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## DNR Updates Fill Minimization Process

On October 30, 2009, the Kentucky DNR issued Reclamation Advisory Memorandum (RAM) 145 which announced the new Fill Placement Optimization Process or FPOP procedures. FPOP provides an objective and systematic process for achieving approximate original contour (AOC) on steep slope surface mine (exceeding 20 degrees) operations while providing a means for determining excess spoil quantities in such a way that maximizes the amount of mine spoil returned to the mined area while minimizing the amount of mine spoil places in excess spoil disposal sites (valley fills). Coal permit applicants are encouraged to use this process as it may facilitate in the issuance of 404 permits.

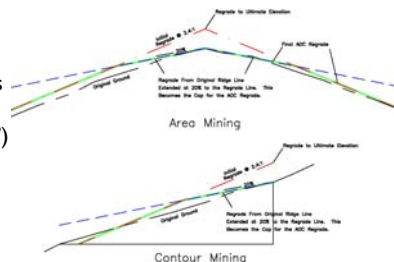
The key variables in AOC are configuration, stability, and drainage. These variables are viewed through a formula-like model to determine if the post-mining configuration will meet the AOC definition. Thus, applying this process during mine planning will determine the amount of total spoil material that can be retained in the mined out area.

RAM 145 defines configuration as regarding, "the shape of the regraded or reclaimed area. In addition to complying with the definition of AOC, the reclaimed configuration must comply with performance standards, such as ensuring stability, controlling drainage, and preventing stream sedimentation." Further, stability is defined as relating "to the placement of material in the regraded or reclaimed area in the manner that achieves a minimum long-term static safety factor, prevents slides, and minimizes erosions." Finally, drainage is defined as relating "to moving water from and within the regraded or reclaimed area. Reclaimed drainage configurations must comply with performance standards, such as minimizing sedimentation, and restoring water quality and quantity."

This new process includes the development of a volumetric model referred to as the AOC Model which provides a definitive and reproducible means to calculate the volumes of material that can be backfilled or placed in excess spoil areas. Volumes obtained through the AOC Model are used as a volumetric basis for the actual mine configuration. By portraying performance standards as variables in a model or formula, an objective process is provided for determining a post-mining surface configuration that meets the AOC definition.

## Fill Placement Optimization Steps Per RAM 145

- Step 1: Determination of overburden/interburden quantity
- Step 2 – Determination of anticipated swell factor
- Step 3 – Initial backfill
- Step 4 – Determination of excess spoil volume
- Step 5 – Excess spoil disposal locations
- Step 6 – Valley fill volumetrics – non-optimized
- Step 7 – Identification of off-site disposal options
- Step 8a – Adjusted fill deck elevation ("area")
- Step 8b – Adjusted fill deck elevation ("contour")
- Step 9 – Valley fill volumetrics
- Step 10 – Valley fill selection
- Step 11 – Mine design
- Step 12 – Mine limitations
- Step 13 – Certifications
- Step 14 – AOC variance



The Guy Cove project was constructed in 2008 and is located in Breathitt County, Kentucky. This stream restoration project involved 3,480 linear feet of stream and was the first of its kind. The project was an experiment by the University of Kentucky to restore stream function and enhance water quality in an economically feasible manner on the top of a hollowfill as well as determine new types of hollowfill designs for landforming. Aquatic Resources assisted in the design of the wetland, placement of the bioreactors, cut fill analysis, as well as the final detailed drawings for the designed stream. This project involved the cut and fill of approximately 149,000 cubic yards of material, the removal of an existing pond and embankment, and the construction of a new embankment, wetland, and stream placement. The material excavated to form the channel requirements was "loose dumped" on top of compacted material to form a seal to stop water infiltration. The loose dumped material was utilized to create landforming while creating a groundwater source and optimum habitat for tree growth. The designed wetland and bioreactors were implemented to treat the water gathering at the hollowfill under drain. It is expected to release water slowly over the next couple of years before draining completely. Aquatic Resources's primary responsibilities were to ensure plans were interpreted and implemented correctly. Moreover, the design and implementation was undertaken on the construction of the ephemeral channel at a 15% slope to make certain that water was conveyed efficiently and naturally without aggrading or degrading.

The design plan for optimum habitat growth is garnishing some on-the-ground results as vegetation is taking root and benthic life and macroinvertebrates are present. Because of the obvious healthiness of the stream, even atop a hollowfill, many members of the coal industry are hopeful that the Environmental Protection Agency (EPA) will rethink the affects of coal mining on stream health.



## EPA, DOI, and Corps Issue Memorandum of Understanding

A Memorandum of Understanding (MOU) issued on June 11, 2009, amongst the Department of the Interior (DOI), Environmental Protection Agency (EPA), and U.S. Army Corps of Engineers (Corps) announced an Interagency Action Plan (IAP) amongst aforementioned three entities to reduce harmful environmental consequences of Appalachian surface mining while ensuring future mining remains consistent with federal law. The IAP includes both short-term actions to be implemented in 2009 to existing guidance and long-term process for gathering public input, assessing effectiveness of current policy, and developing regulatory actions. One of the main focuses of the IAP is to stimulate clean enterprise and green job development.

The IAP is broken up into subsections: coordination of regulatory programs, short-term actions to minimize environmental harm, development of longer term regulator actions to better manage Appalachian surface mining, and interim interagency coordination procedures.

The goals of the coordination of regulatory programs are to minimize adverse environmental consequences of Appalachian surface mining and show a commitment by three aforementioned agencies to investigate and undertake longer term regulatory actions related to Appalachian surface mining. Further, the DOI, EPA, Corps want to show a commitment to public participation through public comments and outreaches so as to keep the public informed of federal, state, and local decisions.

As far as short-term actions to minimize environmental harm go, the aforementioned three agencies will develop guidance to strengthen the environmental review of proposed surface mining projects in Appalachia under CWA § 404(b)(1). The EPA will improve oversight and review of water pollution permits for discharges from valley fills under CWA § 402 and of state water quality certifications under CWA § 401 by taking appropriate steps to assist states to strengthen regulation, enforcement, and permitting of surface mining operations. Additionally, the EPA, Corps, and DOI will jointly issue guidance clarifying how impacts to streams should be evaluated as well as how to evaluate proposed mitigation projects to improve the ecological performance of such mitigation in such a way to compensate for losses of the waters of the U.S. authorized by 404 permits. Further, the EPA and Corps will clarify applicability of the CWA

waste treatment exemption for treatment facilities constructed in waters of the U.S. to minimize temporary impacts of mining operations on streams. Finally, the Office of Surface Mining (OSM) will reevaluate and determine how it will more effectively oversee state permitting, state enforcement, and regulatory activity under SMCRA.

In order to develop longer term regulatory actions to better manage Appalachian surface mining, the aforementioned three agencies will review existing regulations to determine if modifications need to be made to better protect the environment from impacts resulting from Appalachian coal mining. The agencies will consider revising current SMCRA regulations like the Stream Buffer Zone Rule and AOC requirements; eliminating Nationwide Permit (NWP) 21 in connection with Appalachian surface mining when NWP program is reauthorized in 2012; and revising how coal mining activities are regulated under the CWA. Also, the agencies will ensure public involvement in development of proposed regulatory reform.



As far as interim interagency coordination procedures go, the EPA and Corps will implement joint procedures for 404 permit review for Appalachian surface mining commenced prior to the issuance of the MOU to ensure timely, consistent, transparent, and environmentally effective review of permit applications. Pending 404 permits related to Appalachian surface mining activities will continue to be evaluated on a case by case basis. The review of permits will focus on likely environmental impacts with the goal of avoiding, minimizing, and mitigating such impacts to the extent practical under 404(b)(1). Finally, the OSM will issue guidance concerning application of Stream Buffer Zone rule.

## EPA Updates KPDES General Permit Requirements

In 2009 many changes occurred in the regulatory environment. One major change that affects every coal mining applicant is the new Kentucky Pollutant Discharge Elimination System requirements (KPDES). Primarily, the KPDES general permit now requires items such as water sample testing for specific metals and a one-time macroinvertebrate study.

The applicant is required to, if possible, retrieve from an outfall a one-time water sample representative of the proposed mining project. This representation needs to be identical to the coal seams mined and correspond to the same methods of mining for those particular coal seams. If there is not a pond that meets these requirements, a letter must be submitted with the NOI stating reasons why discharge was unable to be obtained. The applicant has two years to submit a water sample from one of its discharge locations. Within the sample testing, many metals have an acute value established. If any metal exceeds 90% of the value set forth and the water sample has been submitted to KPDES, four more samples from the same location will need to be retrieved that do not the acute value limits. If the limits are never met, it is likely the applicant will be required to submit an individual KPDES permit with an enhanced Best Management Plan.

Additionally, a one-time macroinvertebrate study must be submitted within the life of the general permit. The only requirement for the study is that each 14-digit Hydrologic Unit Code (HUC) within the permitted boundary must have a separate benthic study. Each permit will have at least one macroinvertebrate sampling site, but in most cases, several sites will be required to meet the KPDES requirements.

## Corps Announces New In-Lieu Fee Rule Modifications

Three changes to the Kentucky in-lieu fee program were announced in order to facilitate compliance with the Compensatory Mitigation for Losses of Aquatic Resources (Mitigation Rule) established by the EPA on April 10, 2008.

The first change is with respect to the cost for all applications submitted on or after Nov. 10, 2009, in that the cost has increased. The cost per EIU (Ecological Integrity Unit) in Eastern Kentucky Coalfield Region (EKCR) is \$475. The cost per AMU (Adjusted Mitigation Unit) for the rest of Kentucky is \$170. The cost per AMU for wetland mitigation will remain \$30,000 for all of Kentucky.

The second change is with regard to the method for determining the cost per credit. In EKCR the method for determining EIUs will not change, but the in-lieu fee calculator will no longer be used. Outside of Eastern Kentucky, credits for stream impacts as well as wetland impacts will be measured in AMUs. Outside of Eastern Kentucky, AMUs will equal the linear feet of stream impacted multiplied by the stream flow and stream quality, and the in-lieu fee will equal the AMUs multiplied by one plus the Cumulative Impacts and Temporal Loss multiplied by \$170. Within EKCR, the in-lieu fee will equal the EIUs multiplied by one plus the Cumulative Impacts and Temporal Loss multiplied by \$396. Wetland AMUs in Kentucky will equal the area of the wetland fill multiplied by two. In-lieu fees for wetlands will equal the AMUs multiplied by one plus the Cumulative Impacts and Temporal Loss multiplied by \$30,000.

The third change is with respect to the way that the Corps directs payment if in-lieu fees to the in-lieu fee sponsors will be changed. The Corps will immediately provide Permittees and in-lieu fee sponsors with the number of credits necessary to compensate for impacts associated with U.S. Department of the Army permits along with a receipt for credit purchases.



## Enhanced Coordination Procedures for 404 Permits

On June 11, 2009, the EPA and U.S. Army Corps of Engineers (Corps) announced an Enhanced Coordination Process (ECP) regarding pending 404 permits involving Appalachian surface coal mining. The purpose of the ECP is to expedite the review of pending permits; ensure coordination between agencies; provide transparency to public; and provide timely resolutions of permits containing issues in which the EPA has concerns.

The ECP is as follows:

◆ Each Corps District is to provide a written notice to the relevant EPA Region based on consideration of workload, completeness of information on each application, and other factors. When the Corps determines that a permit is

ready for coordination, that permit will be posted on the EPA Regional website.

◆ Immediate coordination with EPA will commence and a 60 day coordination period will be given to resolve permit application concerns. The 60 day period will begin on the date the EPA receives the Corps's written notice. If workload or issue resolution dictates, the EPA or Corps may seek a 15 day extension.

◆ If the Corps chooses to issue a permit after the conclusion of the coordination period where there are unresolved issues, the Corps will provide within ten days after the close of the 60 day period a written notice of its decision to issue a permit which details how the district is

responding to concerns raised by the EPA.

◆ Within ten days after written notice of the Corps's decision, the EPA Region will either advise the Corps District that it does not intend to pursue further action and that the Corps is free to make a permit decision or initiate its veto power with respect to the permit under CWA § 404(c).

These procedures and timeframes are intended to facilitate effective and timely coordination between the EPA and Corps but are not legally binding requirements on the agencies and do not restrict the authority of the employees of the EPA and Corps to make discretionary decisions based on their judgment about the specific facts of an application.

## Patriot Coal Reaches Agreement with EPA Regarding Stream Impacts

Patriot Coal has reduced the stream impacts in half on its Hobet 45 mountaintop removal mine and will likely retain the same amount of coal to be mined as its original mine plan. Patriot Coal's modification of its mine plan served to facilitate cooperation with the EPA. The basic project modifications call for increased monitoring of water quality impacts, paying particular attention to conductivity caused by mine runoff. However, instead of discontinuing the mining operation if the monitoring reports yield pollution data, the agreement would allow Patriot Coal to continue mining as long as it conducts increased mitigation projects. By Patriot Coal and the EPA coming to an agreement regarding the stream impacts, Patriot Coal will be able to provide for the continuation of 350 jobs.

For more information regarding this deal, please visit the January 5, 2010, newspaper issue from the Charleston Gazette which served as the source for the above data.



ErMC<sup>2</sup> is a full service engineering consulting firm. ErMC<sup>2</sup> is licensed as an engineering firm in Kentucky and has additional registrations in West Virginia, Tennessee, Ohio, Alabama, Indiana, Illinois, and Pennsylvania. Using the latest software available in AutoCAD, SurvCADD, Sedcad, and REAME, we are able to provide services for the coal industry including mine permitting and design, reserve modeling, and mineral property evaluation. Other environmental services are also available for the extractive mineral and construction industries. Our specialties lie in mining engineering issues such as regulatory compliance, mine planning, mine seal construction, and ventilation and roof support designs. However, in addition to our mining engineers we also have civil, geotechnical, and environmental engineers; 404 experts; and an insurance agent experienced in coal reclamation bonding issues.

ErMC<sup>2</sup> is also a leader in electronic surface mine permitting in Kentucky. ErMC<sup>2</sup> worked closely with the Kentucky Division of Mine Permits personnel in the development of the file structure and standard operating procedure that has since been implemented as standard practice for all companies using the DMP electronic format. ErMC<sup>2</sup>'s system of electronic permitting has saved clients thousands of dollars in paper, supplies, and time.

Aquatic Resources Management is a stream restoration consulting, permitting, and design firm based out of Lexington, Kentucky. Aquatic Resources is highly experienced with both federal and state regulatory programs for individual and general permitting applications relative to sections 401, 402, and 404 of the Clean Water Act (CWA).

One specialization that Aquatic Resources implements in every project is 3-D stream restoration design based on natural channel design methodology. 3-D stream restoration design possesses a number of benefits, including its optimization of project reach which allows for a visual rapid review of project designs based on proposed or current stream conditions. 3-D design offers a precise estimation of construction requirements and quantities which affords ease in the preparation of construction bid documents. Future stream design iterations or revisions are also made easier with 3-D technology.

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