US EPA ARCHIVE DOCUMENT

AI 99984

# KPDES FORM HQAA

## Kentucky Pollutant Discharge Elimination System (KPDES)

### High Quality Water Alternative Analysis

The Antidegradation Implementation Procedures outlined in 401 KAR 5:030, Section 1(3)(b)5 allows an applicant who does not accept the effluent limitations required by subparagraphs 2 and 3 of 5:030, Section 1(2)(b) to demonstrate to the satisfaction of the Environmental and Public Protection Cabinet that no technologically or economically feasible alternatives exist and that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the water is located. The approval of a POTW's regional facility plan pursuant to 401 KAR 5:006 shall demonstrate compliance with the alternatives analysis and socioeconomic demonstration for a regional facility. This demonstration shall also include this completed form and copies of any engineering reports, economic feasibility studies, or other supporting documentation

## I. Permit Information

| | | | |
|---|---|---|---|
| **Facility Name:** | | **KPDES NO.:** | KY0107310 |
| **Address:** | 23956 Highway 194 E | **County:** | Pike |
| **City, State, Zip Code:** | Fedscreek, KY 41524 | **Receiving Water Name:** | Millers Creek |

## II. Alternatives Analysis

| | Yes | No |
|---|---|---|
| 1. Has discharge to other treatment works been investigated? (If yes, then indicate which treatment works were considered and the reasons why that discharge to these works is not feasible.) | ☒ | ☐ |

**Reference Attachment II (1)**

| | Yes | No |
|---|---|---|
| 2. Have other discharge locations been evaluated? (If yes, then indicate what other discharge locations have been evaluated and the reasons why these locations are not feasible.) | ☒ | ☐ |

**Reference Attachment II (2)**

**Alternative Treatment Analysis**

Alternative treatment analysis has been considered consisting of pumping the discharge to the nearest municipal wastewater treatment facility. However, municipal treatment is not available in this area and the anticipated cost of extending the service line is prohibitive. The service line would need to be extended from the job site at Long Fork to the Pikeville Municipal Treatment plant. The estimated cost for extending the service line the needed 29.6 miles would be approximately: $31/ft x 5280 ft/mi x 29.6 mi = $4,844,928. Additionally, the wastewater treatment facility is not designed to handle the anticipated peak flows and would require system upgrades exceeding $1,000,000. Subsequently, this alternative is not feasible for this small mining operation. No other conceivable treatment alternatives are available other than the proposed gravity settling provided by the sediment ponds.

**Alternative Discharge Locations**

Another alternative would be to pump the discharge water to the head of Second Fork which is located approximately 1 mile from Millers Creek. This alternative discharge consists of collecting the runoff from each affected watershed and pumping it into an adjacent watershed stream. However, this is cost prohibitive. The cost for this alternative pumping would be estimated at approximately $154,500.00 ($12,500 for one pump, $20/ft x 5,350ft = $107,000, $35/hr x 1000 hr = $35,000 for labor and maintenance for the term of the pumping period. This cost is not feasible for the proposed mining operation in comparison to the cost for construction of the proposed facilities. However, a review of streams adjacent to the permit area indicates that these adjacent streams are also high quality in nature. Subsequently, this is not considered a viable alternative due to the fact that degradation of another high quality stream may occur.

Another alternative would be to pump the discharge water to any another location but after evaluating the area this option would not be feasible as it is believed most of the surrounding mines are currently being drained. Due to the increase of water from the natural aquifer system in the mine works to over five billion pumped gallons would lead to mass flooding or even blowouts in other areas. Also, a review of streams adjacent to the permit area indicates that these adjacent streams are also high quality in nature. Subsequently, this is not considered a viable alternative due to the fact that degradation of another high quality stream may occur.

## II. Alternatives Analysis - continued

| | Yes | No |
|---|---|---|
| 3. Has water reuse or recycle been investigated as an alterative to discharge? (If yes, then provide the reasons why it is not a feasible alternative | ☒ | ☐ |

**Reference Attachment II (3)**

| | Yes | No |
|---|---|---|
| 4. Have alternative process or treatment options been evaluated? (If yes, then indicate what process or treatment options have been evaluated and provide the reasons they were not feasible.) | ☒ | ☐ |

**Reference Attachment II (4)**

**Alternative Water Reuse/Recycle**

Water may be used on a limited basis for the watering of roads to reduce the potential of fugitive dust and other dust problems associated with surface mining. There are no other uses for water on surface mines. This amount of water usage is negligible in comparison to the total amount of water required to be processed and discharged. The estimated amount of water to be treated is approximately 5.83 billion gallons over the period of 5 years. It is estimated that approximately 19.5 million gallons of water (30,000 gallons/day x 5 days/week x 26 weeks/year x 5 years) could be used for road watering and dust control. The cost for collection and distribution is estimated to be $300,000.00 ($40,000 for collection station + $260,000.00 distribution cost) The distribution cost was calculated utilizing 1 truck at $50.00 per hour for 8 hours per day for 5 days a week 26 weeks per year times five years. It is evident that this alternative use is not sufficient to reuse or recycle all of the water to be treated, due to the size of the watershed affected.

A second alternative use would be to use the water during reclamation activities. These activities could include dust control and hydroseeding. This usage would only account for less than 0.1% of the total amount of water estimated to be processed. It is estimated that the total amount of water used during reclamation would be 418,000 gallons or less. Such usage would equate to a cost of $80,000 (8 hours x 197 days x $50/hour + $1,200 equipment cost). This is not a viable alternative for the project.

## Alternative Process/Treatment Options

Alternative processes and treatments have been considered. However, these alternatives are not feasible due to practicability and cost. One alternative would be filtering of the discharge using commercial filter systems. These systems are estimated to cost approximately $0.50 per thousand gallons. The estimated amount of water to be treated is approximately 5.83 billion gallons over the period of five years. This results in a cost of approximately $2,915,000 over the life of the operation, not including any unforeseen repairs, maintenance or labor and energy costs.

Another alternative would be the use of coagulants. Coagulant treatment is anticipated to cost $0.70 per thousand gallons, resulting in a cost of $4,081,000 over the life of the operation not including the cost for labor or for the cost of disposal of precipitates. These costs are not feasible for this small mining operation considering the cost of the proposed method of treatment.

Other alternatives have also been considered. These alternatives consist of different mining methods which may generate a smaller amount of water to be treated. One of these alternatives consists of underground mining operations. A smaller amount of surface disturbance would be required and subsequently a smaller amount of water to be treated would be generated. However, this alternative mining method would only recover approximately half of the affected coal reserves. This alternative method is not desirable as a significant investment has been made in the coal reserves and the maximum amount of recovery is necessary to be economically viable. Other mining methods have been considered but were not deemed feasible due to regulatory limitations and economic profitability. Furthermore, the area is surrounded by previous and current underground mining, which reduces the underground area to be mined.

The final alternative considered would be no mining. However, as above, significant investments have been made and the local economy is dependent upon the mining industry for generation of revenue. This aspect is discussed further in Item III(5).

## II. Alternatives Analysis - continued

| | Yes | No |
|---|---|---|
| 5. Have on-site or subsurface disposal options been evaluated? (If yes, then indicate the reasons they were not feasible.) | ☒ | ☐ |

**Reference Attachment II (5)**

| | Yes | No |
|---|---|---|
| 6. Have any other alternatives to lowering water quality been evaluated? (If yes, then describe those alternatives evaluated and provide the reasons why these alternatives were not feasible.) | ☒ | ☐ |

**Reference Attachment II (6)**

## Alternative Disposal Options

Alternative on-site and subsurface disposal options have been considered. A review of these alternatives indicates that one subsurface disposal option is available, pumping the discharge water to an abandoned underground mine. However, as discussed in attachment II (2), this is not a feasible option. The cost, $168,500.00 ($12,500 for one pump, $20/ft x 5350 ft = $107,000 for pump line, $35/hr x 1400 hr = $49,000) is excessive for this mining operation.

On-site disposal is not a feasible alternative due to the fact that the sheer volume of water, 5.83 BG, is enormous and there are no safe methods available for storing this amount of water. The topography of the area is not suitable for on-site disposal due to the steepness of the terrain. For example, there is not enough flat land for the creation of leach beds or reservoirs where this amount of water could be stored. Approximately 41 acres of flat land would be needed to provide on site disposal. Currently, there is no flat land available for such construction without displacing residential areas. The approximate cost if such land were available would be $692 thousand (132,000 cubic yards x $5/yd excavation cost = $660,000 for site construction, $600/ac x 12.3 acres = $7,380 for revegetation, 1000 hours labor x $25/hour = $25,000 for maintenance. Additionally, storing of this amount of water would be detrimental to the local aquifer system by depriving a portion of the natural recharge water to the system. Run-off from rainfall is a natural process that would occur whether mining is being conducted or not. Diverting runoff from receiving streams would have detrimental impacts to the aquatic environment by effectively dewatering streams and the associated valley floor aquifer.

## Alternatives to Lowering Water Quality

Alternatives to lowering water quality have been considered. Some of the alternatives considered are discussed below.

One alternative would be no mining. However, this alternative would result in lost jobs and wages which would adversely impact the local economy. The operation anticipates hiring approximately 40 miners at an average salary of $50,000 annually. This equates to $10,000,000 dollars injected into the general tax base and local economy over the term of the permit. Also, the proposed operation would result in 7.56 million dollars of coal severance tax monies that could be realized by the local community. This amount is based upon approximately 8.4 million tons of coal being mined at $1.80 per ton with 50% severance tax money being returned to the community. Additionally, substantial economic investments have been made by the applicant that would be lost without mining the coal reserves.

A second alternative would be the underground only method of mining. Underground mining only would have the possibility of reducing the amount of water generated by having a smaller surface disturbance. However, this alternative mining method would only recover approximately half of the affected coal reserves. Also, it is anticipated that fewer jobs could be created using this method of mining.

A third alternative would be discharging water under lower effluent limitations. This alternative would require additional treatment methods other than those described previously. These additional methods would consist of a higher level of filtration systems which would significantly increase the cost of treatment. The alternative would consist of using a high volume reverse osmosis filtration system. It is estimated that this alternative would cost approximately $1.25 per thousand gallons of water. The total cost associated with this alternative would be approximately $7,412,500 (5.83BG x $1.25/1000G). Such treatment may only yield limited results. The effectiveness of a higher level of treatment would be affected by the variable rate of treatment that would be encountered. Due to the fact that surface discharge occurs during precipitation events it could be assumed that the treatment system would overwhelmed during large rainfall events.

## III. Socioeconomic Demonstration

1. State the positive and beneficial effects of this facility on the existing environment or a public health problem.

**Reference Attachment III (1)**

2. Describe this facility's effect on the employment of the area

**Reference Attachment III (2)**

3. Describe how this facility will increase or avoid the decrease of area employment.

**Reference Attachment III (3)**

4. Describe the industrial or commercial benefits to the community, including the creation of jobs, the raising of additional revenues, the creation of new or additional tax bases.

**Reference Attachment III (4)**

5. Describe any other economic or social benefits to the community.

**Reference Attachment III (5)**

## Positive Effects of Proposed Operation

The proposal of the sediment control facilities within this mining permit will also aid in treating existing surface disturbances that have occurred in years past. The watersheds treated by these facilities have been logged within the last ten years. Of the watersheds affected by this proposal, approximately 240 acres have been previously disturbed. This equates to approximately 30% of the previously disturbed areas in the vicinity of the proposed operation. The level of disturbance varies from watershed to watershed but each watershed has some level of impact. The sediment control structures will receive runoff from the proposed disturbances along with the degraded water quality from such logging operations.

Also, tax revenue generated from wages earned can be used for local improvement projects, such as municipal water supplies, sanitary sewer projects, transportation and other infrastructure. These water related projects are sorely needed in Eastern Kentucky where clean drinking water supplies and adequate sanitation are needed badly.

**Effect on Employment**

As before, this operation proposes approximately forty jobs with an average of $50,000 in annual wages each. This results in approximately $2,000,000 in wages annually and $10,000,000 over the estimated life of the mine. It is estimated that fifteen percent of this amount ($1,500,000) will be generated in state and federal taxes. Additionally, another thirty-five to fifty percent ($3,500,000 to $5,000,000) will be spent in the local economy on things such as food, housing, entertainment and other durable goods.

According to the Office of Employment and Training, the unemployment rate for the state of Kentucky in 2006 was 5.7%. Last year 16,600 individuals were directly employed in the coal mining industry in Kentucky.

**Additional Effects on Employment**

As discussed previously, the proposed operation will provide approximately forty jobs that are sustainable for at least five years. This proposal will provide a continuation of existing jobs within the coal company. As existing operations approach completion, the majority of the employees will be reassigned to this operation. Additionally, it is anticipated that approximately ten new positions will be created in the transition to the new operation. Subsequently, a decrease in employment will be avoided for approximately 30 jobs as the existing operations mine out. These jobs would otherwise be laid off.

It is also anticipated that support industries would be affected by the potential lay-offs. It is estimated that five to ten jobs will be created or at least sustained in support industries such as supplies, retail, restaurants, etc.

If this operation can generate jobs for another 40 individuals, then the unemployment rate for Pike County would decrease to 5.5% thus lowering it from 5.8% reported in April of this year.

## Industrial and Commercial Benefits

As before, this proposed operation will provide approximately forty jobs sustainable for five years or more. Given that the average coal miner earns approximately $50,000 annually, this equals to $10,000,000 dollars injected into the general tax base and local economy. This money provides for better living conditions, improvements in infrastructure and support of ancillary industries including supplies, retail and services in the local area.

The proposed operation would result in 7.56 million dollars of coal severance tax monies that could be realized by the local community. This amount is based upon approximately 8.4 million tons of coal being mined at $1.80 per ton with 50% severance tax money being returned to the community.

## Other Economic and Social Benefits

The proposed operation will provide approximately sixty jobs and numerous other jobs that support the mining industry. As before, approximately $1,500,000 will be paid in taxes over the life of the operation. This money can be used to provide better schools, roads, housing, water supplies and sanitary sewer facilities. Additionally, up to $5,000,000 in wages will be spent in the local economy, thereby supporting additional jobs and generating additional tax revenue.

The continuation and creation of jobs by the proposed operation will aid in sustaining the local economy and sociological progress of the community. Due to the fact that the local economy is dependent upon the mining industry and all of the other economic impacts that mining creates, a loss of jobs or potential jobs has a very large detrimental impact upon the social condition of the region. It is anticipated that a loss of forty jobs could also affect the loss of another fifty-five jobs in support sectors. When these jobs are lost, most people seek employment in other regions. This results in a decline in population which directly affects the quality of the regions health care system, road system and educational facilities.

In 2005, Pike County had a population of 66,754 with per capita income averaging $23,673.00 as provided by the Office of Employment and Training. This operation would employ approximately 40 individuals. In 2006, miners earned an average of $47,000.00 per year which is approximately double the earnings for the average individual in Pike County. According to the Kentucky Coal Association, at least three additional indirect jobs are created for every one coal job. If sixty miners are employed by this operation, then approximately 120 jobs may be indirectly created from this operation which would further lower the unemployment rate for Pike County.

In addition to the economic benefits of this operation, the post mining land use of forestland will enable the permittee to generate flat land and new roads for potential residential development or recreational areas such as campgrounds for hunting or fishing. The possibility exists to create walking trails or ATV trails using the old haul roads in order to promote tourism.

## III. Socioeconomic Demonstration - continued

| | Yes | No |
|---|---|---|
| 6. Will this project be likely to change median household income in the county? | ☒ | ☐ |
| 7. Will this project likely change the market value of taxable property in the county? | ☒ | ☐ |
| 8. Will this project increase or decrease revenues in the county? | ☒ | ☐ |
| 9. Will any public buildings be affected by this system? | ☐ | ☒ |

10. How many households will be impacted by this project? **40 (Forty households)**

11. How will those households be impacted?

**Reference Attachment III (11)**

| | Yes | No |
|---|---|---|
| 12. Does this project replace any other methods of sewage treatment to existing facilities? ( if so describe how) | ☐ | ☒ |

**Reference Attachment III (12)**

| | Yes | No |
|---|---|---|
| 13. Does this project treat any existing sources of pollution more effectively? (If so describe how.) | ☒ | ☐ |

**Reference Attachment III (13)**

## Impacted Households

As many as forty households will be directly impacted with many more indirectly impacted by increased tax revenues in the county. The tax revenue and retail spending lead to improved social conditions with the advancement of the health care system, educational system and the improvement of local infrastructure. The overall quality of life in the region will be improved with the sustained economic growth. This economic growth leads to clean water supply systems and sanitary sewer systems to places where these facilities do not currently exist.

The proposed mining operation will continue to provide jobs, income and tax revenue for the county. In addition, much of the local wages earned are spent within the community, thereby supporting the local economy not directly employed by the mining operation. As before, up to $10,000,000 in wages will be generated by the sixty or so jobs provided by the operation. This money will be paid into the local tax base ($1,500,000) and the local economy ($5,000,000). These wages have a trickle down effect to all aspects of the economy, thereby supporting as many as another fifty jobs not directly related to the mining operation.

**Impacts to Sewage Facilities**

While this project does not directly provide sewage treatment facilities, the taxes paid by employees can be used to provide or improve existing municipal water and sewage treatment facilities. Approximately, $1,500,000 will be generated in taxes by the forty or so jobs provided by the operation. These improvements in municipal facilities are sorely needed in the Eastern Kentucky region.

## Treatment of Existing Pollution

The proposed sediment control structures will indirectly treat existing pre-law mining disturbances, gas and oil production disturbances and extensive logging disturbances. These disturbances exist within the watersheds where the proposed structures are located. The sediment control structures will aid in reducing sedimentation and water quality pollution to the receiving stream caused by the existing disturbances. Of the areas affected by this proposal, approximately 240 acres have been previously disturbed. This equates to approximately 30% of the previously disturbed areas in the vicinity of the proposed operation.

Additionally, this project will indirectly treat existing sources of pollution by the creation of improved sanitary sewage systems. Up to $1,500,000 will be generated for the state and federal tax base: This money can be used for providing municipal sanitary sewer facilities for the area. Due to the general topography and varying individual economic statuses, individual sewage facilities are often inadequate. This results in many "straight pipe" discharges to local streams and rivers. Generated tax revenues can be used for improvements in these public facilities.

## III. Socioeconomic Demonstration - continued

| | Yes | No |
|---|---|---|
| 14. Does this project eliminate any other sources of discharge or pollutants? (If so describe how.) | ☒ | ☐ |

Reference Attachment III (14)

15. How will the increase in production levels positively affect the socioeconomic condition of the area?

Reference Attachment III (15)

16. How will the increase in operational efficiency positively affect the socioeconomic condition of the area?

Reference Attachment III (16)

**IV Certification:** I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

| | | | |
|---|---|---|---|
| **Name and Title:** | **J.J. Shackleford / President** | **Telephone No.:** | (606)835-4006 |
| **Signature:** | J.J. Shackleford | **Date:** | 10/20/06 |

## Treatment of Other Pollution Sources

This project will provide sediment ponds that will intercept runoff from existing pre- and post-law mining operations, as well as, logging and gas extraction operations. In association with the mining proposed by this project, approximately 4,200 feet of degraded streams will be restored during final reclamation. Also, approximately 240 acres of previously disturbed areas will be reclaimed by the proposed operation.

**Positive Affects to Socioeconomic Conditions**

New employment opportunities would also be created by the proposed operation in the supporting industries. According to the Kentucky Coal Association, approximately 3 additional indirect jobs are created for every one coal job. If we assume 40 coal jobs will be created by this operation, then approximately 120 additional jobs could potentially be created. These opportunities consist of meeting the health care and educational needs of the individual families. Additionally, the retail and food industry will be supported.

According to the U.S. Census Bureau, the number of Kentuckians living in poverty in 2004 was 16.3% of the total population. Kentucky had the fourth highest poverty rate in the nation for the year. For 2007, the federal poverty level is $20,650.00 for a family of four as published by the National Center for Children in Poverty. This project could potentially decrease the poverty level in Pike County by employing approximately sixty individuals at an average annual salary of $47,000.00, which is approximately twice the median wage of $23,673.00 reported in Pike County Kentucky in 2005.

The coal mining operation will generate approximately $7,560,000 (8.4 million tons of coal x $1.80/ton x 50% being returned to the community) in coal severance taxes that will be spent toward regional development. These funds are generally used for economic and infrastructure improvement. The projects will provide additional employment and job opportunities.

## Other Positive Effects

An increase in operational efficiency will have a positive effect on jobs and subsequent socioeconomic conditions by providing a sustainable mining operation. A more stable mining operation adds longevity to the job market, allowing for additional mining operations and subsequent jobs. These all have a positive effect on the community by providing long term employment and a stable tax base.

Approximately forty jobs will be directly affected and as many as one hundred twenty other jobs may be indirectly affected. These long-term jobs have overall positive effect on the lives and general welfare of everyone in the region.

The proposed surface mining operation will recover coal reserves that could not be mined by any other method. Therefore, more jobs and more taxes will be generated where it would not be otherwise. This leads to a more efficient recovery of the coal reserves with less impact on the environment.