

## 2(h) Compliance with Clean Water and Air Acts

The Applicant has valid Discharge and Air permit(s) issued the Colorado Department of Public Health and Environment. The Applicant abides by the conditions of the permits to assure compliance with Clean Air Act (42 U.S.C. Sec. 7401 et seq.), the Clean Water Act (33 U.S.C. Sec. 1251 et seq.), and other applicable air and water quality laws and regulations. The applicant also abides by its safety standards and those required by MSHA to assure compliance with applicable health and safety standards.

### 2.05.5 Post-Mining Land Use

Similar to the pre-mining land use as determined by the Las Animas County Board and coal rule definitions, the post-mining land use will consist of rangeland and wildlife habitat.

Reclamation of the disturbed areas will provide a permanent cover of plant species which are consistent with the planned post-mining land use. Particularly where wildlife habitat is a post-mining land use, care will be taken to ensure that the growth of plant species will attract and support wildlife will be carried out. Achievement of the post-mining land use consisting of rangeland and wildlife habitat will be by the grading and backfilling plan and the revegetation plan reviewed in Section 2.05.4 of this application. Upon release of bond and final revegetation, the land will be returned to each of these uses, similar to the process which NECC currently uses on other adjacent surface. NECC currently owns all of the surface which is affected by the New Elk mining operations (excluding the pond 4 and DWP area owned by Colorado Parks and Wildlife) and plans to retain ownership. Therefore, upon completion of final reclamation and revegetation, the land use will be returned to each specific use and utilized by lessees or renters. NECC will continue to maintain control over these areas consistent with the post-mining land uses. Access to the revegetated area will be controlled to ensure that the post-mining land uses are achieved as soon as possible. Roads through the reclaimed disturbed areas will be retained as permanent structures and will provide access to the State Wildlife area.

### 2.05.6 Mitigation of Surface Coal Mining Operation Impacts

The following sections discuss mitigation measures that will be implemented to reduce or eliminate potential impacts of coal mining operations.

#### Air Pollution Control Plan

A determination has been made by the Colorado Department of Health that an air emission permit is not required and that the New Elk Mine is "Grandfathered" from this portion of the Colorado Air Pollution Control Act. Correspondence from the Colorado Department of Health is shown in Exhibit 23, Air Emission Permits. However, new facilities associated with the prep plant and refuse disposal area have been permitted through the Department of Health. Exhibit 23, Air Emission Permits, presents correspondence from the Colorado Department of Health indicating status of these permits for The New Elk preparation plant. Potential fugitive dust from haul roads will be mitigated by watering the roads as needed.

#### Fish and Wildlife Plan

Mitigation of impacts to fish and wildlife, which currently and historically have used the area around the New Elk Mine consists of minimizing the total disturbed area during the life of the operation and by continuous efforts to minimize disturbance and pollution to the existing environmental

resources during the life of the operation. A description of the fish and wildlife resources in the permit area and adjacent areas is shown in Exhibit 16, Fish and Wildlife Information. Because the New Elk Mine is an underground operation, it is possible for NECC to minimize the total disturbed area for the surface facilities and structures and thereby minimize the disturbances to habitats, which are used by fish and wildlife. Proper location of new additional structures such as fans, haul roads, access roads, and light use roads, as reviewed in Section 2.05.4 of this application, will be carried out to ensure minimized disturbance to habitat. Utilization of the haul road and the railroad from the mine to the Jensen Rail Yard will lessen and eliminate the potential for wildlife collisions with haul trucks currently running on Highway 12. Due to the maturity of the New Elk operation, additional required disturbed areas are expected to be very small in size and thereby will serve to mitigate the impact on the fish and wildlife of the area. Enhancement of the habitat in the vicinity of the disturbed area is increased during the life of the mine due to limited access to those areas, which are disturbed by the surface mining operations associated with the New Elk Mine. Return of the land to its pre-mining land use after reclamation, as described in Section 2.05.5, will enhance the fish and wildlife resources for the permit area and adjacent areas. Enhancement of this area is due primarily to limited access, which NECC currently plans to continue to utilize for its mining operations.

Reclamation procedures as reviewed in Section 2.05.4 and associated revegetation procedures will enhance habitat for use by fish and wildlife.

During the operation of the New Elk Mine, particular care is currently being exercised to minimize the effect on the wildlife, which utilize the area surrounding the New Elk Mine. In fact, any power lines which are constructed during the permit term will be built following the Rural Electrification Bulletin No. 61-10 to protect eagles and other large birds from electrocution on power lines. Figures 17 and 17a, Raptor Proof Power pole Design, shows a typical design of these power lines. The effect to the stream and riparian communities associated with the Purgatoire River and its drainages will be minimized during the life of the operation.

Disturbance of soils and vegetation during the mine operation will be minimized. The inherent advantages to underground mining will be utilized to minimize these disturbances. Surface structures and facilities associated with the New Elk Mine do not occupy a significant portion of the total affected area.

During the collection and preparation of data to show the existing environmental resources at and surrounding the New Elk Mine, the Operator has not encountered any threatened or endangered species of plants or animals, which will be affected by the New Elk Mine operation.

Bald eagles have been reported in the vicinity, but there are no known active or inactive eagle nests in the mine affected area or its immediate surrounding areas. Therefore, no impact to threatened or endangered species is expected.

The habitat associated with the Purgatoire River and its surrounding areas will be protected by the Operator under the current plans.

#### Protection of Hydrological Balance

##### Probable Hydrologic Consequences

Probable hydrologic consequences of the mine are attributable to the following operations:

- Consumption of water to run the preparation plant
- Dust control during mining
- Subsidence
- Surface disturbances
- Operation of the RDA
- Mine dewatering.

Surface disturbances at the facilities area and coal shipping operations will result in an increase in total suspended solids (TSS), which will be treated by sedimentation ponds prior to discharge to the Middle Fork of the Purgatoire River. Water quality impacts to the Purgatoire River and the alluvial aquifer from surface operations are expected to be similar to those currently observed from the mine (i.e., an average increase of about 40 mg/l TDS in river water downstream from the mine, and 400 to 500 mg/l TDS increase over background in alluvium down gradient of the RDA).

The mining method and extraction of coal will use room and pillar mining. For the Blue Seam, no secondary or retreat mining is planned and subsidence is not anticipated. Mining in the PR-6 area will occur in only the Blue Seam. This area was previously included in the Golden Eagle permit area where mining occurred only in the Maxwell Seam and mining in this seam did not occur in the PR-6 area. As a result, there are no seams above or below the Blue Seam that may contribute to potential subsidence. Thus, impacts to surface water resources or groundwater wells in the area of mining should not occur but monitoring of these resources and subsidence will identify any effects of mining.

For mining in the Apache or Allen Seams where secondary coal recover may occur, the area overlying the mine workings has the potential to subside. The maximum extent of subsidence fracturing with increased vertical transmissivity is projected to extend 195 feet above the top of the highest mined coal. A minimum thickness of 450 feet of overburden lies between the top of the Apache Seam and the base of area drainages. The zone of increased vertical transmissivity is not expected to impact surface water. A zone of continuous deformation will be present from about 195 feet above the coal to 50 feet below ground surface. No hydrologic impacts or only temporary minor changes in water level are expected to occur in the continuous zone. No flow or water quality impacts are expected to occur to surface water including springs and seeps due to subsidence from mining in the Allen, and Apache Seams.

Well records from CDWR indicate that there are 19 permitted wells in the Raton Formation within a one mile radius of the permit boundary. The wells vary in depth from 30 to 750 feet and have completion water levels ranging from 5 to 598 feet bgs. A study by Watts (reference 2006b in exhibit 8(4)) evaluated the potential for groundwater pumping from coal seams in Las Animas County to impact water levels in wells that are used for water supply. He noted that because the permeability of stratified sedimentary rocks generally is greater parallel to bedding than across bedding, the drawdown of water levels in coal

seams would have the greatest potential for interfering with nearby water-supply wells in areas where there is little vertical separation between the coal seam and the well production intervals. The analysis assumed that a vertical separation of 100 feet between coal seam and water supply wells would be protective of water supplies, but it was careful to note that the required separation would depend on local geologic conditions. Mining related subsidence will increase vertical permeability for up to 195 feet above the highest mined coal. Wells that produce from 100 feet or higher above the zone of increased vertical permeability are not likely to be adversely impacted by mining.

Two bedrock wells are located near the planned mining area in the Allen Seam. The wells are in the northeast half of Section 24, T33S, R68W. Well number 284213 is a monitoring well owned by NECC and is completed in the Allen Seam. The well is 442 feet deep and is designated as NE-1-10 for the monitoring program. The other bedrock well (permit number 264440) is 200 feet deep and is completed in an unidentified coal bed. The owner of record for the well is Helen Armstrong. Four shallow alluvial wells (12, 13, 14 and PAW-9 on Map 8) are also located in the northeast half of Section 24, T33E, R68W. Wells 12, 13, and 14 are on land owned by J.I. Vialpando. Well PAW-9 is a monitoring well owned by NECC. Mining of the Allen Seam may have the potential to reduce water levels and impact water quality in the Armstrong well. In the event that water in the well is impacted by mining, the water supply will be replaced with water from the city of Trinidad (city water). Well NE-1-10 is designed to monitor potential impacts to groundwater in the mining horizon, and impacts to water levels or water quality in the well are not an issue with respect to water supply. Wells 12, 13, 14 and PAW-9 are situated more than 400 feet above the planned mining horizon, and impacts to water quality and availability are not anticipated to these wells. In the event that unanticipated impacts occur the water supply will be replaced with city water as discussed in 2.04.7(3).

Based on the previously observed groundwater inflows to the Golden Eagle and New Elk mines, inflow to the New Elk Mine during mining of the Allen and Apache seams is expected to be between 0.04 and 0.1 gpm/acre. Inflow along faults (to the extent that they are present) could modify the range upward. The maximum observed inflow along a fault is 100 gpm at the Golden Eagle Mine. It is likely, however, that mine inflow will be less than predicted based on historical observations because of extensive dewatering of the coal seams related to CBM production. Mine dewatering has the potential to draw water levels down in Allen and Apache seams by 200 or more feet in the permit area. Water levels in the coal seams are currently depressed by groundwater pumping for CBM production. Mine dewatering will incrementally increase the currently observed drawdown in the Allen and Apache coal seams. Water level data from packer testing indicate that steep vertical gradients currently exist in the strata adjacent to coal seams. The steep gradients are related to mine dewatering and/or CBM production and suggest that there is limited potential for propagation of

drawdown across bedding. No flow or water quality impacts are expected to occur to surface water including springs and seeps due to mine dewatering.

Approximately half of the groundwater wells located within a one-mile radius of the permit boundary are completed in alluvium at depths less than 66 feet. No impacts to water level or water quality are expected to occur in alluvial wells. Bedrock wells within the one-mile radius have completion depths varying from 30 to 750 feet bgs. Only the Armstrong well is predicted to have increased potential for impacts by mining.

Dewatering discharge from the mine will be treated before being released to the Purgatoire River, and impacts to water quality in the river from discharged water are expected to be similar to those currently observed (i.e., an average increase of about 40 mg/l TDS downstream from the mine). Water quality in the mined coal seams in the permit area is expected to be impacted by the mining operation. Impacts to water quality will include an increase in TDS, mainly in the form of sodium and bicarbonate. Background TDS concentrations in the Blue, Allen and Apache coal seams are estimated to be about 585 mg/L, 435 mg/L and 774 mg/L respectively based on the electrical conductivity (EC) of groundwater from monitoring wells NE-6-10b (836 uS/cm-Blue), NE-1-10 (623 uS/cm-Allen), and NE-6-10a (1,106 uS/cm-Apache) and the assumption that TDS is equal to about 70% of EC. Observed TDS in the sealed portion of the New Elk Mine has averaged 1,628 mg/L. After mining, the TDS concentration of groundwater in the Blue, Apache and Allen coal seams near the underground workings is expected to be similar to water in the sealed mine.

Water Consumption. Water is required in the underground mine for dust control in the mining sections, along roadways and on the conveyor belt line. Water is consumed on the surface in the preparation plant, bathhouse, and surface roadways. Water is sourced from the mine inflow and the Purgatoire River. Water consumption is dependent on production rates and employment levels.

The preparation plant uses a closed-circuit design to recover and re-use water in the benefaction process. However, some moisture is lost both to the clean coal and refuse. The preparation plant has the potential to process 650 raw tons per hour for a maximum tonnage of 3.0 million raw tons of coal per year. The Operator estimates that 11 gallons/raw ton for make-up water is required in the processing, while utilizing 21.0 gallons/raw ton. In the event that all of the additional make-up water is acquired from the river, the New Elk Mine would consume 97 acre-feet annually. The recycling of thickener slurry through the New Elk Mine workings will decrease the amount of water consumed from the Middle Fork of the Purgatoire River. Updated well permits are required to initiate recycling of slurry. The Operator is currently working with the Division of Water Resources on the requirements to update the slurry injection well permits.

Approximately 856,048 tons were processed through the New Elk Mine preparation plant during 1993. An estimated 52.8 acre-feet were used in the preparation plant. Metering of water taken at the New Elk Mine for domestic use was calculated as 0.25 acre-feet for 1993.

Water utilized in and around the mine for dust control is estimated to be a maximum of 50 acre-feet annually. Bathwater requirements, based on 180 employees and a consumption of 70 gallons per minute per man-day is estimated at 1.1 acre-feet.

New Elk Coal Company has two water leases, Hill Ranch and the City of Trinidad. Hill Ranch is 180 acre-feet approved for diversion at the mine and storage when in priority. The City of Trinidad lease is 50 acre-feet up to 200 additional acre-feet if needed and available in Trinidad Reservoir as per lease and an Administrative Exchange issued by the District Water Engineer. A 6-inch pipeline for domestic water supplied by the City of Trinidad water is expected to be extended to the mine when mining resumes.

Two dewatering wells may be necessary as mining moves north and east in the Allen Seam. They are required only if the separation pillar between sealed and flood old workings is insufficient to prevent seepage into new areas of mining. If the wells are required, the appropriate permits will be applied for through the Colorado Division of Water Resources. Consumption of underground mine water in the coal preparation process will require an Augmentation Plan approved by CDWR. The augmentation plan does not increase the amount of water available for mine use, but instead allows the mine flexibility to use mine water instead of diverting leased river water.

**Sediment Control.** Changes to the surface water regime during mining will include an increase in flow to the surface water drainage system from the pumping of mine flows, and a change in the peak hydrograph of waters flowing through the disturbed portions of the permit area. Changes in the amount of flow will vary due to an increase in the disturbance area and greater runoff, but downstream, the presence of sediment ponds will decrease the peak and extend the release of these waters to the Middle Fork of the Purgatoire over a longer period of time than a typical storm event. Qualitative changes will include minor increase in Total Suspended Solids (TDS) from increased weathering of disturbed areas. The increased disturbance will result in an increase in Total Suspended Solids (TSS) in surface waters within the disturbed area, but an overall lower TSS level in surface waters below the sediment ponds.

The plan for control of surface water across the mine facilities area is shown on Map 13 – Sediment and Surface Water Control.