

2. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

The Proposed Action is authorization of mining within Areas IV North of Navajo Mine to meet BNCC's coal supply contract obligations through July 6, 2016. The Proposed Action includes the following:

- Authorize a revised mine plan on 830 acres within Area IV North, mining 704 acres
- Realign the Burnham Road in Areas III and IV North
- Place fill material in 1.9 acres of WUS in Areas III and IV North
- Conduct mining activities to achieve maximum economic recovery of available coal

Under NEPA requirements, the agencies must evaluate the environmental impacts of a range of reasonable alternatives that meet the project purpose and need for mining and road realignment. Further, DOI NEPA implementing regulations defines reasonable alternatives as those that are “technically and economically practical or feasible and meet the purpose and need of the proposed action” (46 CFR 43).

Under the 404(b)(1) guidelines pursuant to Section 404 of the CWA, the USACE must evaluate all practicable alternatives and may only select the least environmentally damaging practicable alternative (LEDPA). The practicability of an alternative is based on an in-depth evaluation of cost, logistics, and existing technology in light of the project purpose. The USACE 404(b)(1) alternatives analysis is included in Appendix A. The USACE analysis evaluated the practicability of six alternatives.

Alternatives evaluated for this EA include mining other areas within the Navajo Mine permit area, modifying the existing Area III mine plan, mining other areas outside the permit area but within the lease area, adding conditions to the Proposed Action, employing alternative mining methodologies, and utilizing coal from off-site sources. The USACE's alternatives analysis concludes that the alternatives considered are not “practicable” under the 404(b)(1) factors. Accordingly, the Proposed Action is considered the LEDPA. The results of the USACE alternatives analysis are summarized in Section 2.2 Alternatives Considered but Eliminated from Detailed Evaluation.

The Proposed Action, USACE Evaluated Alternatives, the Proposed Action with Conditions and No Action Alternative are described in Section 2.1. Those alternatives that were considered but eliminated from detailed environmental impact analysis because they were not reasonable or practicable or do not meet the project purpose and need are summarized in Section 2.2.

2.1 Alternatives

2.1.1 Proposed Action

The Proposed Action described below includes BNCC's proposed pre-2016 mine plan revision, consolidation of all Navajo Mine NWP's into a single IP, the proposed R2P2, and realignment of the Burnham Road.

2.1.1.1 Mine Plan Revision for a Portion of Area IV North

BNCC's proposed mine plan revision was submitted to OSM on February 15, 2011. OSM determined BNCC's application was administratively complete on March 18, 2011. The current Proposed Action seeks approval from OSM for when and how to mine in this portion of Area IV North. The decision to include Area IV North in the SMCRA "life of operations permit area" was made when the area was included in Permit No. NM-0003A in 1989.

The proposed mine plan reflects BNCC's historic approach of utilizing two to three draglines in multiple pits for efficiency and safety, and to ensure recovery of sufficient quality coal in sufficient quantities to timely meet contractual obligations through July 6, 2016. The proposed mine plan revision encompasses a total of approximately 830 acres. Figure 2.1-1 shows the proposed activities in Area IV North and includes the existing disturbance areas (cleared lands and constructed infrastructure). Of the total 830 acres, approximately 704 acres are directly related to mining activities including an appropriate perimeter buffer for mining support activities (topsoil removal, haul roads, ponds, etc.). Of those 704 acres, approximately 216 acres are currently disturbed as a result of development activities under the previously approved mine plan (OSM Permit NM-0003-F-R-01) in 2005 (see also Background Section 1.1). Additional existing disturbance in Area IV North initiated in 2005 includes construction of approximately eight miles (20 acres) of access roads and six miles (32 acres) of power lines. The Proposed Action includes several primary components—mining activities, transportation of coal from the mine site to the FCPP, road construction, and site reclamation. These activities are described in the following sections. A more detailed description of activities associated with the proposed mine plan revision are available in BNCC's mine plan revision application that OSM has made publicly available in accordance with 30 CFR 773.6(a)(2), available at:

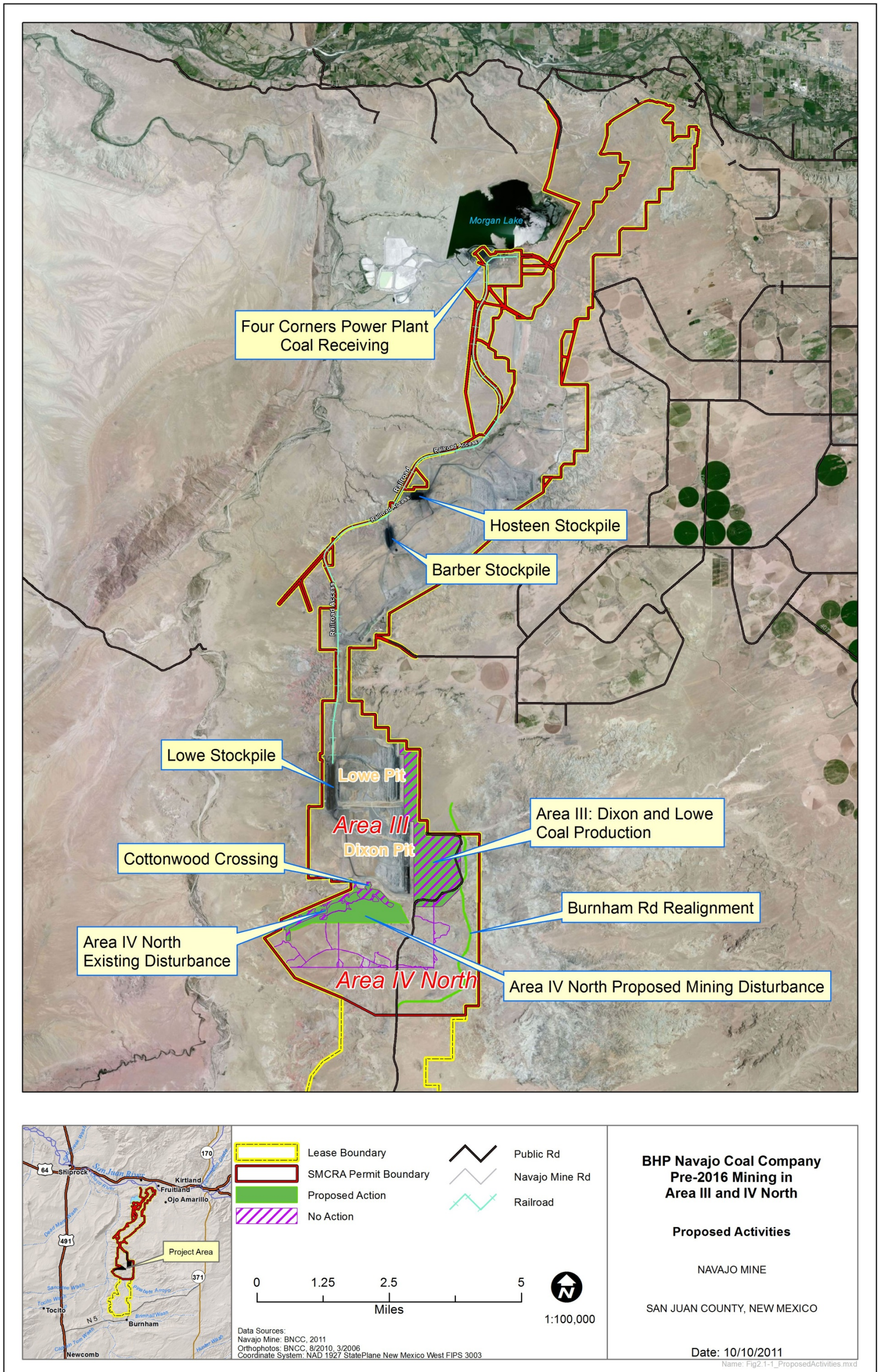
http://www.wrcc.osmre.gov/Current_Initiatives/Navajo_Mine/AreaIVNorth.shtm.

Hard copies are also available at the Farmington Public Library (Farmington, New Mexico), OSM Farmington Field Office (Farmington, New Mexico), OSM Western Region Office (Denver, Colorado), and Navajo Nation Minerals Department (Window Rock, Arizona).

2.1.1.2 Mining Activities

The mining activities described in this section provide the reader descriptions of the mining process at Navajo Mine and those that would be implemented in Area IV North and continued in Area III (as it relates to the USACE's consideration of impacts associated with an IP). The mining process is described from land clearing to resource extraction to reclamation activities in order to provide the reader details important to understanding the frequency, duration, and magnitude of the various mining activities that occur. Most of the detail provided below is also included in BNCC's mine plan revision application. Where appropriate, additional detail is provided to enable a thorough analysis of impacts in this EA.

Figure 2.1-1. Proposed Activities Map



The mining methods that would be employed in Area IV North and would continue in Area III include the following sequence, with steps 5 through 8 repeated for each mineable coal seam:

1. Removal of vegetation.
2. Removal of available topsoil or topdressing.
3. Drilling and blasting of overburden.
4. Removal of overburden.
5. Drilling and blasting of coal.
6. Removal of coal.
7. Drilling and blasting of interburden.
8. Removal of interburden.

This sequence of mining activities is the same that has been employed at Navajo Mine for 50 years. All existing mine equipment such as draglines, haul trunks, loaders, etc., and infrastructure such the coal hauling rail line, and electric, transportation, road, and water networks have been purchased and developed consistent with the gradual progression of mining activities in a southward direction within the lease and permit area.

The following sections provide additional detail for each of the mining methods that occur at Navajo Mine.

2.1.1.3 Vegetation and Topdressing Removal

Topdressing is the unconsolidated soil material typically found within the upper 60 inches of the soil profile. Vegetation and topdressing are removed in advance of mining activities to protect these resources, and in some areas to accommodate mining support infrastructure such as roads and power lines. In accordance with the current mine permit, this activity is permissible up to 1,800 feet ahead of the current active mining pit. The topdressing is removed by one of two methods depending on the thickness and extent of the material. Typically, scrapers remove topdressing from shallow deposits, while off-highway haul trucks loaded by front-end loaders remove topdressing from deeper deposits. Once removed, the suitable topdressing is either stockpiled for future use in reclamation or is immediately spread onto areas being reclaimed. Topdressing stockpiles are commonly placed adjacent to pit spoils where they are efficiently respread during reclamation. The Area IV North mine plan revision forecasts annual removal of approximately 280,000 cubic yards of vegetation and topdressing from Area IV North and 120,000 cubic yards from other Areas. Reference to “other Areas” in this section refers to Areas II and III until about 2014 then only to Area III to July 2016.

2.1.1.4 Drilling and Blasting of Overburden and Interburden

After the suitable topdressing material has been salvaged for use in reclamation, overburden is removed. Overburden is the material—consolidated or unconsolidated rock or soil—overlying the uppermost coal seam. Interburden is defined as material that lies between bedded seams of coal. Removal of interburden can occur using the same methods as those described for overburden removal. In areas where unconsolidated overburden exists, front-end loaders and haul trucks remove this loose material. In other

cases, consolidated overburden is removed using blasting. Two methods of overburden blasting are used at Navajo Mine—cast blasting and stand-off blasting. Stand-off blasting is expected to be the most common method utilized in Area IV North because of the relative shallowness of overburden. For both methods, rotary drills are used to drill overburden blast holes, which range from 6 inches to 12 inches in diameter. Overburden blasting will occur at a frequency that is dependent on the rate of advancement of the mining strips and the nature of the overburden material. On average, the mine plan revision forecasts that there will be 112 hours of drilling effort and 22 hours of blasting effort each week in Area IV North. Approximately 152 hours per week of drilling effort and 30 hours of blasting currently occur at active mining areas outside of Area IV North, in Areas II and III.

In areas of shallow (<60 feet) overburden, stand-off blasting is used to move material off the top of the uppermost coal seam. Stand-off blasting is intended to fragment the overburden material for efficient removal by either the dragline or off-highway haul trucks and front-end loader stripping. In this method, blast holes are drilled vertically to the top of the uppermost mineable coal seam. The holes are then backfilled from one to 10 feet with drill cuttings or gravel. This backfill serves to reduce shattering of underlying coal—minimizing coal loss.

In areas of deep (>60 feet) overburden, cast blasting is used to move some of the overburden material from on top of the uppermost coal seam and into the adjacent mined out strip. In this method, blast holes are typically drilled on an angle (15 to 25 degrees) to a depth approximately three to 10 feet from the top of the uppermost coal (or backfilled to the same depth) to prevent coal shattering and loss. In most areas that employ cast blasting, a “pre-split line” is also drilled and blasted as part of the overburden blasting operation. This involves a single row of closely spaced holes drilled to intersect the top of the uppermost coal seam at the predefined “coal line,” which defines the width of the strip being mined. These holes are very lightly loaded and blasted in a manner that creates a line of breakage. The dragline then strips material back to this line and creates a clean, uniform highwall.

Once blast holes are drilled, they are loaded with explosives. Ammonium nitrate prills and fuel oil (ANFO) or a mixture of ANFO and emulsions are the most widely used blasting agents. The explosive column is detonated by a 1/2 to three-pound primer initiated with non-electric detonating cord or cap.

2.1.1.5 Removal of Overburden, Interburden, and Coal

Overburden and interburden are removed or “stripped” from the mining strip using a dragline, which is positioned to cast spoil material (i.e., overburden and interburden material removed during mining activities) as far as possible from the top most coal seam and to reduce the need to rehandle spoils. The boxcut is the initial phase of all stripping methods in the permit area. The basic boxcut stripping method employed at the Navajo Mine is the side cut with rehandle method. The dragline is positioned on the side of the block to be stripped utilizing a swing angle of 90 to 180 degrees to cast the spoil material as far as possible from the cut over the topmost coal seam. Table 2.1-1 shows the intensity of dragline stripping operations proposed in the mine plan permit revision versus current dragline operations in other areas of Navajo Mine (Areas II and III). The boxcut can be up to 500-feet wide and because of this width the spoil material from the first strip must be rehandled by the dragline. Haulage ramps will be developed by the dragline at appropriate spacing during the boxcut process in order to allow for efficient and safe removal of the coal.

Table 2.1-1. Activity Summary Table – Dragline Stripping (Overburden and Interburden Removal)

Fiscal Year ¹	Area IV North (shifts ²)	Other ³ Mine Areas (shifts)	Total ⁴
FY 12	735	2057	2792
FY 13	843	1829	2672
FY 14	1527	1144	2671
FY 15	1391	890	2281
FY 16	813	939	1752

¹ BNCC's fiscal year is from July 1st through June 30th.

² Shift defined as 8 scheduled hours.

³ Other mine areas refers to Areas II and III until about 2014 then only to Area III to July 2016.

⁴ Annual number shifts needed is calculated based on forecasted coal demands, modeled overburden and interburden volumes, expected equipment productivity, and manning levels.

After the coal is exposed by the overburden/interburden stripping operation, it is either drilled and blasted or ripped by bulldozers before removal. Coal seams that are less than five feet thick are generally ripped, while thicker seams are blasted. Each mineable seam will require a “pass” of the dragline to uncover the coal. This process is repeated for each successive coal seam until the lowest coal seam is exposed.

The coal is mined across the width of the strip and advanced evenly along the length using front-end loaders to load off-highway haul trucks. The entire thickness of the coal seam is mined in one pass except where a major shale parting or coal quality makes a distinct division in the coal seam. In this case, the top part of the seam is mined as usual, and then the parting is ripped by dozers and pushed into the adjoining spoil area, and mining of the lower part of the seam continues. Coal wedges, or coal ribs, are generally left as a wedge on upper seams in multiple seam pits as a safety berm or as a wedge left on spoil encroached seams as a spoil barrier. Once the seam has been mined out, front-end loaders are used to recover as much of the coal wedges as safely possible. Table 2.1-2 shows the tons of coal proposed for mining in the mine plan permit revision versus active mining in other areas of Navajo Mine.

Table 2.1-2. Activity Summary Table – Coal Mining (tons of coal)

Fiscal Year	Area IV North	Other Mine Areas	Total
FY 12	1,220,000	7,428,000	8,648,000
FY 13	959,000	6,973,000	7,932,000
FY 14	4,153,000	5,229,000	9,382,000
FY 15	4,023,000	4,901,000	8,924,000
FY 16	2,408,000	6,323,000	8,731,000
Total	12,763,000	30,854,000	43,617,000

2.1.1.6 Transportation of Coal

Coal would be transported along existing haul roads and electric-powered rail line. A fleet of five coal haulage trucks, such as the Kress coal hauler, have a capacity to haul up to 240 tons of coal in each load. They transport the coal from the pit area to a stockpile area adjacent to railroad loading points. As the coal haulers dump coal onto the stockpile, dozers spread the coal and maintain a smooth surface for effective coal haulage operations. There are three coal stockpile locations along the railroad (refer to Figure 2.1-1): the Hosteen stockpile, the Barber stockpile, and the Lowe Stockpile. Coal from Area IV North would be hauled to the Lowe stockpile where front-end loaders would fill train cars (each car has 100-ton capacity). The train transports the coal to the crushing and blending facilities adjacent to the FCPP. Normally, one electric locomotive pulls approximately 40 railcars carrying 2000 tons of coal each trip to the plant. The proposed mine plan revision estimates that there would be about 80 train trips per week, maintaining the current rail activity. OSM has no legal authority over the transportation and use of coal. No changes to methods currently used to transport coal at Navajo Mine are proposed.

2.1.1.7 Access Roads

Per 30 CFR 816.150 (a), the Navajo Mine roads are classified as primary and ancillary roads. BNCC has recognized two sub-categories of primary roads, access roads and coal mine haul roads. The only notable difference in these roads is usage and width. Access roads average 70-feet wide and are used by mine personnel for direct access to facilities and for transporting coal mining equipment between coal stockpiles or to shop areas. Haul roads average 76-feet wide and are used to transport coal to stockpiles or the dump hopper. Primary roads are constructed to the same standards, whether they are an access road or a haul road.

Currently within Area III and IV North, there are about 19 miles (23 acres) of existing ancillary roads. Under the Proposed Action, no additional ancillary roads would be constructed, but OSM would confirm approval for the existing ancillary roads in Area IV North.

2.1.1.8 Electric Power Lines

APS supplies the mine with power at 69 kilovolts (kV) of electricity. Approximately 31 miles of mainline and nine miles of stublines make up the existing power distribution network for Areas II, III, and IV North. The mainlines originate at the FCPP and branch to the east and west sides of the pits in Areas II, and III, and IV North. Stublines service the pits about every 5,000 feet from the east side. On the west, the power line follows the railroad's catenary—the overhead line that supplies electrical power to the railcars. Existing power lines were constructed to meet the recommended design criteria (APLIC 2006) to prevent the electrocution of raptors. Within the proposed Area IV North mine plan area, approximately six miles of power lines, resulting in approximately 32 acres of disturbance, were constructed in Area IV North following OSM's 2005 permit revision approval.

2.1.1.9 Reclamation

BNCC is required by SMCRA regulations to reclaim all areas disturbed during strip mining operations as contemporaneously as practical (30 CFR 816.100). BNCC has determined practicability based on operational needs and company manning levels. SMCRA requires that diverse, effective, and permanent vegetative plant communities, native to the BNCC permit area, will be established on all affected lands.

OSM requires these areas to be reclaimed to support the designated post-mining land use (PMLU). The designated PMLU for the BNCC coal lease is livestock grazing. Therefore, reclamation and re-vegetation activities are designed to support that PMLU.

The reclamation plan included in BNCC's SMCRA permit and the Area IV North permit revision, has been developed in compliance with the requirements of the SMCRA regulations. Figure 2.1-2 shows representative photos of pre-mining topography, active mining, and reclamation activities. Reclamation consists of the following activities:

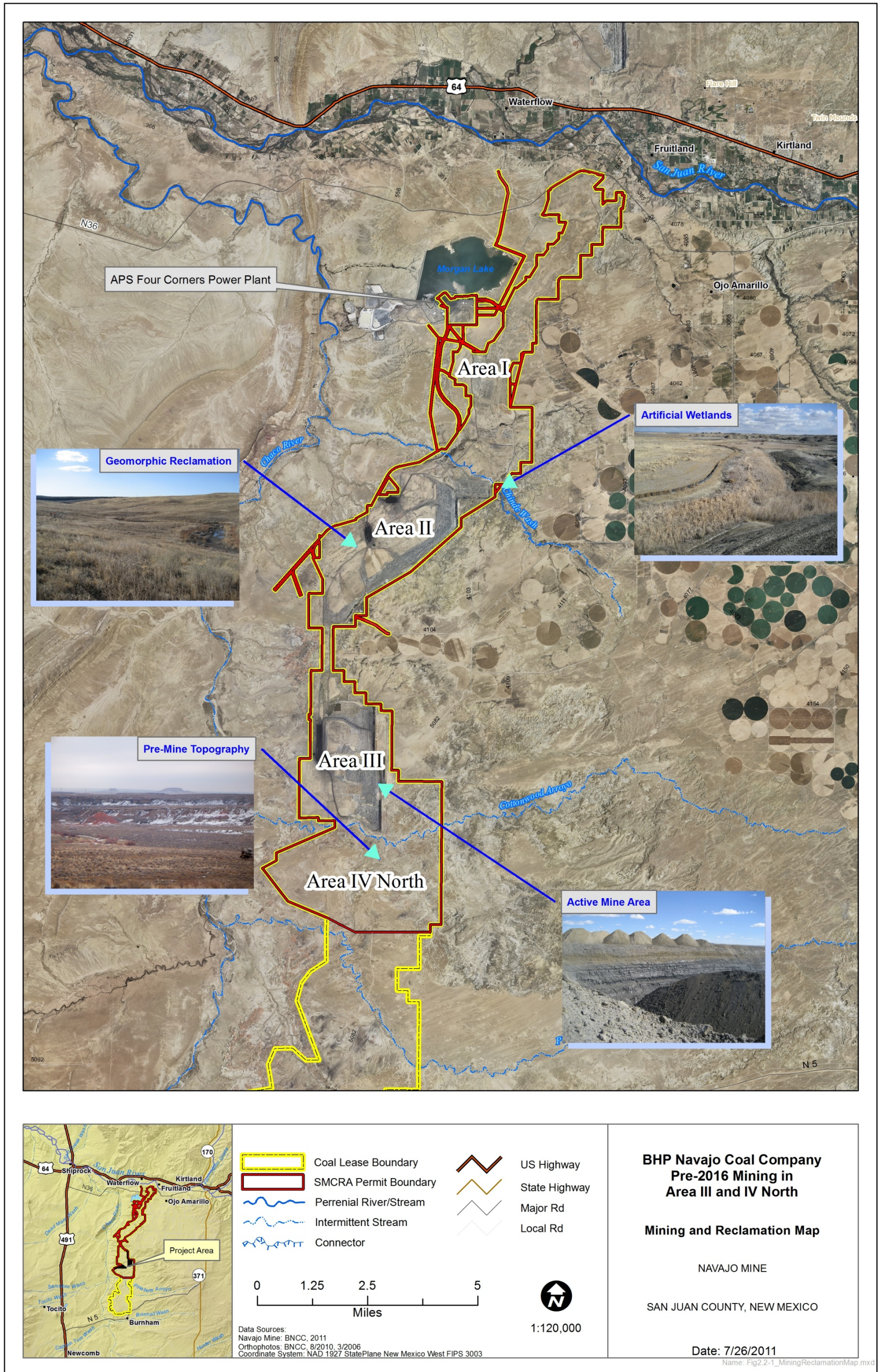
- Backfilling and grading
- Replacement of topdressing
- Revegetation
- Reclamation monitoring

2.1.1.10 Backfilling and Grading

Spoil materials are regraded with dozers, front-end loaders, haul trucks, or draglines to an approved final surface configuration (FSC) topography. Regrading generally consists of both primary and secondary regrading activities. Primary regrading typically utilizes track dozers to level off the spoil ridges. Some areas and ramps might not have sufficient backfill material readily available for track dozers to adequately regrade the area. In these instances, supplemental equipment may be used to facilitate primary regrading activities and haul additional material from other areas within the mine permit boundary. This equipment includes, but is not limited to, scrapers, draglines, and front-end loaders and end-dump haul trucks. Secondary regrading may, if needed, follow primary grading for additional contouring of the land surface to accommodate topdressing replacement.

Once the area has been regraded to the FSC topography, the regraded spoil is systematically sampled for vegetation root-zone suitability. Areas not meeting the OSM-approved vegetation root-zone criteria are mitigated as required with up to four feet of suitable vegetation root-zone material.

Figure 2.1-2. Mining and Reclamation Map



2.1.1.11 Replacement of Topdressing

Areas disturbed by mining or mining-related activities (e.g., ramps, primary haulroads, and support facilities) will have topdressing material replaced for the purpose of reclamation. Topdressing replacement will occur on regraded areas within two years of final regrading and root-zone mitigation, if needed. Areas of minimal surface disturbance (e.g., ancillary roads, power line disturbances, drill sites) will not receive additional topdressing material. Heavily compacted regraded surfaces are ripped to alleviate compaction. Topdressing may be replaced year-round with equipment (i.e., scrapers or haul trucks) best suited for the conditions of the reclamation area. Topdressing material will be hauled from either topdressing stockpiles or hauled directly from a topdressing salvage site and replaced on the reclamation plot at an average prescribed depth.

2.1.1.12 Revegetation

Revegetation activities are initiated on those areas that have been regraded and topdressed during the first normal growing season following completion of regrade and topdressing replacement. Revegetation activities run from March through October and include seedbed preparation, seeding, mulching, and irrigation. The seedbed is mechanically prepared using traditional agricultural practices to reduce soil compaction, promote water infiltration, control wind and water erosion, and improve seed to soil contact for early seed development. The prepared seed bed is seeded with approved mixes consisting of native forbs, grasses, and shrubs appropriate for the region. Mulch is applied and crimped into all reseeded areas to control erosion, slow evaporation at the surface, promote infiltration, decrease wind velocity at the soil surface, and provide an organic base to promote nutrient cycling.

BNCC utilizes irrigation to help promote the establishment of a sustainable revegetation cover. Irrigation is applied over two growing seasons, as needed, from May to mid-October. The first growing season is intended to help promote the successful germination and establishment of the seed mixes. The second growing season irrigation is generally a one-time application scheduled for April or May and is intended to support root development. During years of high winter or spring precipitation, the second year irrigation may be reduced or eliminated.

2.1.1.13 Monitoring and Bond Release

Once the area has been regraded, topdressed, and revegetated, BNCC is still responsible to ensure the area is successfully reclaimed. BNCC conducts both formal (e.g., vegetation studies) and informal (e.g., field inspections) monitoring of reclaimed areas to track reclamation progress until bond release. SMCRA regulations outline three phases of bond, or reclamation responsibility, release. The first phase of bond release (Phase I) is achievable when an area has been backfilled and graded to the approved FSC topography, and hydrologic structures are in place and functioning as designed. The second phase of bond release (Phase II) demonstrates that the area has been successfully revegetated and erosionally stable. The third phase of bond release (Phase III) demonstrates that the surface coal mine operator has completed all mining and reclamation activities within the area. The operator must also demonstrate that the reclaimed area has successfully satisfied all of the reclamation success criteria described in the SMCRA permit and the reclaimed areas are capable of supporting the PMLU. Reclaimed lands are not eligible for Phase III bond release until a minimum of 10 years has passed from the date of revegetation. Any re-disturbance of

the reclaimed area resets the bonding time schedule, and the operator must reapply for the bond release of those lands.

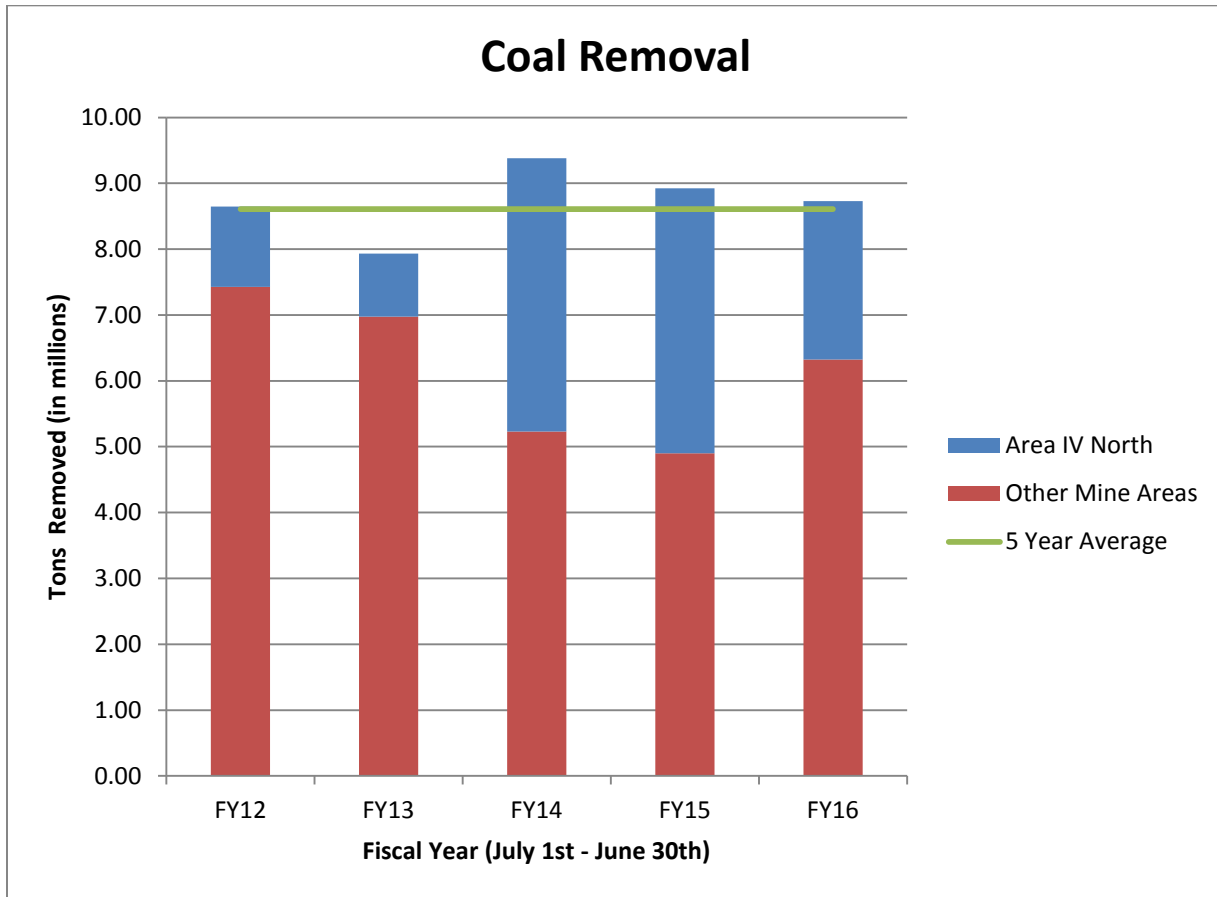
BNCC typically applies for phased bond release in reclaimed areas, or reclaimed management blocks, that are not expected to be affected by future mining and reclamation disturbance. These reclaimed management blocks are of sufficient size to allow for an adequate representation of the reclaimed area. BNCC has found pursuing phase bond release in these reclaimed management blocks, rather than a small-area segregated approach, to be practical from an operational perspective.

2.1.1.14 Operational Infrastructure

This section characterizes the type of equipment and vehicle used and the frequency of use for each phase of mining for current mining at Navajo Mine and includes how current levels would be affected by the addition of mining in Area IV North. This information is important for assessing impacts associated with vehicle/equipment emissions, dust, noise, and other activities that have the potential to impact resources in the Project Area. It is important to note that overall operations at Navajo Mine resulting from the Proposed Action would be a continuation of current mining levels and would not represent overall increases in operational activities. This is due to the fact that as mining decreases in particular areas of the mine (i.e., Hosten/Yazzie and Lowe pits)—they would be replaced by the same activities in Area IV North under the proposed action.

Table 1- Operational Equipment and Frequency of Use in Appendix B provides a description of the types of equipment and the frequency of use on Navajo Mine supporting ongoing mining operations and for the proposed Area IV North mining area. Figure 2.1-3 shows coal removal under current, historic, and Proposed Action conditions. Average annual coal removal/production at Navajo Mine over the years has been approximately 8.6 months per year (Mt/yr). Under the Proposed Action, coal production at the mine would continue at approximately average annual levels. Several charts in Appendix B show frequency and duration of use of various types of equipment used at Navajo Mine during the phases of mine development and reclamation. Specifically the charts show vegetation and topsoil removal, blasting, rail hauling, overburden/interburden removal, and rail hauling. These charts show that for some phases of operations under the Proposed Action the frequency and duration of equipment use will be slightly less than historic levels (e.g., blasting), while for other operational phases the intensity will be slightly greater (e.g., overburden/interburden removal). When considering all phases of mining operations under the Proposed Action, the frequency and use is essentially the same as the historic operational baselines. The difference is that over time the spatial area where a given phase of development is occurring, changes to other areas of the mine. For example, mining in Hosten/Yazzie pits is declining and will be completed by the time mining commences in Area IV North. Additionally, mining in Lowe Pit will be completed prior to 2016.

Figure 2.1-3. Coal Removal under Existing, Historic, and Proposed Action Conditions



2.1.1.15 Burnham Road Realignment

The potential environmental consequences of the realignment of approximately 5.2 miles of Burnham Road (N-5082) were previously addressed in environmental assessments in 2001, 2005, and 2008 (OSM 2005), in a 2007 EA/FONSI issued by BIA in 2007 for the off-lease portion of the realignment (BIA 2007), and in a 2008 OSM EA that evaluated the entire Burnham Road realignment as a standalone project (OSM 2008a). These impacts are again considered as part of the Proposed Action. Approximately 4.6 miles of the proposed realigned road would be within Areas III and IV North, and approximately 0.7 mile would connect with other roads just outside the BNCC lease and SMCRA permit area (BIA 2007). See Figure 2.1-1 for the location of Burnham Road. The total area of disturbance estimated for the realignment of the Burnham Road is approximately 75 acres. This acreage includes an additional potential disturbance buffer beyond what was analyzed in the past EAs.

Burnham Road is a public access road is in proximity to existing mining in Area III and proposed mining activities in Area IV North. OSM regulations prohibit or limit surface mining operations within 100 feet of a public road. Further, during blasting operations, the road must be closed to traffic during set-up, blasting, and clearing due to the proximity of mining operations to the road. Currently, there are Burnham Road closures approximately two to three times per month for 10 to 30 minutes in duration.

The proposed realignment would re-locate the road generally to the eastern side of the lease and SMCRA mine permit area through Areas III and IV North, and would straighten the road alignment. The proposed road design would comply with BIA standards and would include safety features for curves and slopes. Culverts, guardrails, and drop structures are incorporated into the design to provide for public safety and environmental benefits. The road would be a 24-foot wide, graveled, two-lane road with six-foot wide shoulders, for a total width of 36 feet. The fill slopes would be 4:1 (horizontal:vertical) except in areas with guardrails where the fill slopes would be 2:1. The cut slopes would be 3:1. All cut and fill slopes 2:1 or steeper would receive erosion control matting. In cut sections, drainage ditches would be constructed to divert storm runoff water away from the road. The road would be surfaced with an 8-inch layer of compacted gravel.

The width of surface disturbance along the realignment would vary from approximately 80-250 feet in width, with a maximum estimated disturbance of 75 acres. Wider disturbance areas would be associated with the installation of drainage features or other design features. Of this disturbance, approximately 23 acres associated with the new driving surface would remain permanently altered and the remainder would be reseeded after construction. The remaining impact acres are associated with buffer zones along each side of the proposed alignment. Safety berms would be installed along reaches where the roadway is elevated more than four feet high. Culverts would be installed where drainages cross the road. To control erosion, riprap (a permanent cover of rock) would be placed on steeper slopes and side ditches.

Routine road maintenance would consist of (1) surface repairs, (2) blading of side ditches and roadway surfaces, (3) application of water or chemical road stabilizers to control dust, (4) maintaining drainage control structures to standards of engineered design, (5) and maintaining safety berms. Periodic inspections will be conducted to insure proper maintenance and safe operating conditions.

2.1.1.16 Fill in Waters of the United States

BNCC has applied for an IP from the USACE to authorize fill in WUS associated with proposed mining activities in a portion of Area IV North, existing/permitted mining activities in Area III, and the relocation of the Burnham Road. These activities constitute all current Navajo Mine activities that warrant CWA permit coverage. With the exception of the Burnham Road, these areas are all currently permitted by the USACE under the prior NWP's listed in Table 1.2-1. The USACE previously permitted the realignment of the Burnham Road under a NWP #14; however, that permit expired in 2009. It is BNCC's intention to consolidate all NWP's for pre-2016 mining into a single IP.

Figure 2.1-2 shows areas proposed for coverage in the IP.

The proposed fill in the WUS in Area IV North for pre-2016 mining is estimated to be about 0.5 acre. These impacts are currently permitted under a NWP #21. Proposed fill in the WUS for the Burnham Road relocation is estimated to be about 0.1 acre. Proposed fill in the WUS for mining to July 2016 in Area III is estimated to be 1.3 acres.

While mining and reclamation activities in Area III (Lowe and Dixon mine pits) have previously been approved under SMCRA permit NM-0003F, the impacts of these mining activities are analyzed again in this EA for consideration by the USACE as it relates to an IP. Approximately 701 acres of SMCRA permitted land in Area III have been previously permitted but are not yet mined. The impacts of mining

the remaining portions of Area III are considered by the USACE as a part of the NEPA process associated with the decision to issue or deny an IP. A copy of the IP application is provided in Appendix A.

2.1.1.17 Resource Recovery and Protection Plan and Maximum Economic Recovery

The BLM previously approved the R2P2 prepared for the 2005 Area IV North mine plan revision. BNCC has re-applied for approval of its R2P2 because the currently proposed mine plan for a portion of Area IV North has a smaller mining footprint than was previously authorized by the OSM and BLM. BLM’s regulations require that mining operations be conducted in a manner that achieves maximum economic recovery (MER) of the available coal resource (43 CFR § 3480.0-5(34)). Maximum economic recovery “means that based on standard industry operating practices, all profitable portions of a leased Federal coal deposit must be mined. At the times of MER determinations, consideration will be given to: existing proven technology; commercially available and economically feasible equipment; coal quality, quantity, and marketability; safety, exploration, operating, processing, and transportation costs; and compliance with applicable laws and regulations. The requirement of MER does not restrict the authority of the authorized officer to ensure the conservation of the recoverable coal reserves and other resources and to prevent the wasting of coal.” (43 CFR 3480.0-5(21)). BNCC’s proposed mine plan is designed to achieve these requirements.

2.1.1.18 Proposed Action Resource Protections Measures

Table 2.1-3 lists BNCC committed resource protection measures and select regulatory requirements that serve to eliminate and/or minimize impacts to area resources as associated with proposed mining and surface disturbance. While these measures and requirements should be considered as part of the Proposed Action, they are also brought forward in Chapter 4 – Environmental Consequences to describe how the measure/requirement reduces project impacts.

Table 2.1-3. Navajo Mine SMCRA Permit Protection Measures

Protection Measure for Each Resource	Link to Other Resources
R1. GEOLOGICAL	
Soil surveys and mapping; resource identification	R6
Annual topdressing balance reporting	
Root zone (plant growth medium) sampling	R6
Overburden characterization	
Treatment of unsuitable Root zone (regolith)	R6
Topdressing stockpile mulching/seeding, protection	
Annual Root Zone/Topdressing Monitoring (Soils) Reporting	R6
Root zone (plant growth medium) sampling	R6
R2. WATER	
ISO 140001 certification - Water Management Plan	R13
Comprehensive Hydrology Report (Twice per permit term)	

Protection Measure for Each Resource	Link to Other Resources
Annual Rill and Gully Survey	R1
Probable Hydrologic Consequences (PHC) analysis	
Ground/surface water sampling	
Sediment Pond Inspections following substantial precipitation event	
Sediment control measures (ponds, diversions, culvert, best management practices (BMPs))	R1
Storm Water Pollution Protection Plan (SWPPP) Monitoring	
Pond inspections	
Spill Prevention Control and Countermeasures (SPCC) Plan	R1
Clean Water Act Section 401 Permit conditions (i.e., not placing debris in washes, use of BMPs, training)	
New Mexico State Office of Engineer Water Report	
Pre and post reclamation sediment yield modeling	
Provide potable water to local residents and livestock watering tanks, buying hay for local residents	R10
San Juan Recovery Implementation Plan (SJRIP) involvement	R7, R8
R3. NOISE and VIBRATION	
Blasting vibration surveys	
Pre-blast surveys	
Limited night time blasting	
Annual public blast notice	
R4. VISUAL	
SMCRA Reclamation Plan (post-mine land topography)	R1, R2, R6, R7, R8
R5. AIR QUALITY	
ISO 140001 certification – Air Emissions Monitoring Plan	R13
ISO 140001 certification – Energy Conservation and Greenhouse Gas Management	
SMCRA fugitive dust control plan	R1, R3, R4
PM ₁₀ monitoring stations/reporting (6 day sampling interval)	
Corporate GHG monthly reporting	
Corporate Health, Safety, Environmental, Community, and Legal (HSECL) capital purchase requirements	R1, R2, R3, R4, R6, R7, R8, R9, R10, R11, R12, R13, R14
Individual dust sampling	R14
R6. VEGETATION	
ISO 140001 certification - Biodiversity Plan	R7, R8, R13

Protection Measure for Each Resource	Link to Other Resources
Native seed revegetation plans including site adapted native vegetation	R4
Salvaging all suitable topdressing to a depth of 60 inches	R1
Seedbed preparation	
Seeding all reclamation plots with native grasses, forbs and shrubs	
Mulching and crimping all plots	
Vegetation community mapping	
SMCRA Reclamation Plan	R1
Irrigated revegetation plots	
Revegetation success standards/monitoring	R7, R8
Reclamation vegetation surveys	
Noxious Weed Control Plan	R7, R8
R7. WILDLIFE	
Annual Raptor and Wildlife Survey	
Wildlife protection and mitigation plan (i.e., protection and replacement of habitat features)	R6
Raptor Protection – Powerline (APLIC)	R8
R8. THREATENED AND ENDANGERED SPECIES, SENSITIVE SPECIES	
Special Status vegetation and wildlife surveys	R6, R7
R9. SOCIOECONOMICS (including Environmental Justice)	
ISO 140001 certification - Sustainable Development Plan	R13
ISO 140001 certification - Community Development Management Plan	R13
ISO 140001 certification - Stakeholder Engagement and Communication Plan	R11
Scholarship program	R11
Employment of student interns	R11
Community investment fund	R11
District 13 stakeholder engagement	R10, R11
Community Relations Council	R11
Community sustainable development fund	R11
Native American traditional ceremonial assistance	
BNCC constructed ceremonial hogan for employee/family use	
Employee coal permits	R11
Annual sustainability report	R11
Desert Miner newsletter	

Protection Measure for Each Resource	Link to Other Resources
Employee Assistance Fund	
Native American hiring preference	R11
Employee matched giving programs	
United Way and other community service programs	
Community Open Houses	R11
R10. LAND USE (includes Traffic and Transportation)	
ISO 140001 certification – Land Management Plan	R1, R2, R6, R7, R8, R9
Chapter requested assistance with public/access roads maintenance	R9
Customary Use Area agreements	R9, R11
R11. CULTURAL	
SMCRA cultural regulations	
Navajo Nation Cultural Regulations and Polices	
Federal Cultural Regulations and Polices	
BNCC internal Cultural polices	
Cultural sensitivity training	
Post-mining land use planning	R6, R7, R10
R13. HEALTH AND SAFETY	
Environment Management System (EMS)	R1, R2, R3, R5, R6, R7, R8, R9, R10, R12
ISO 140001 certification	R1, R2, R3, R5, R6, R7, R8, R9, R10, R12
Ground Control Plan	
Emergency Response Plan	
Waste Management Plan	
Contractor management plan	
Energy conservation and GHG	
Drug and alcohol testing plan	
Security management plan	
Industrial health and hygiene plans	
Pandemic event management plan	
Respiratory protection plan	
Corporate Health, Safety, Environment, and Community (HSEC) audits	R1, R2, R3, R5, R6, R7, R8, R9, R10, R12
Stop Look Assess and Manage (SLAM) Safety Awareness Training	
Annual Employee audiograms and hearing conservation programs	

Protection Measure for Each Resource	Link to Other Resources
Task/Process-based risk register and assessments	
Environment and Community SLAM Safety Awareness Training	
Mine Safety and Health Administration (MSHA) Safety Programs	
USEPA Toxic Release Inventory (TRI) reporting	
Corporate Fatal Risk Protocols	
Behavioral-based safety training	
R14. Environmental Protection and Training	
Task/position-based Environmental Training	
Environmental Responsibilities for individual positions	
Specialized position training	R9
Health, Safety, Environment, and Community Event Reporting	R1, R2, R3, R6, R7, R8, R9, R10, R11, R12, R13

2.1.2 Proposed Action with Additional Conditions

The imposition of additional special conditions as part of the permit revision approval process must be in response to a failure of the permit revision application to satisfy a statutory or regulatory requirement or must be otherwise appropriate to ensure compliance with the Act and regulatory program.

If an application for permit revision affirmatively demonstrates that it complies with all requirements of SMCRA and the regulatory program, and OSM is able to make the other findings mandated by statute and regulation, the inclusion of additional permit conditions is unnecessary. Given the comprehensive nature of the findings required for approval of permit revision applications under 30 CFR 773.15 and 774.13(c), it would be difficult to justify imposition of additional permit conditions when those findings have been made. In general, imposing additional conditions on a SMCRA permit, which are unrelated to the subject of the proposed revision or which address concerns outside the regulatory jurisdiction of OSM is inappropriate. Under the Proposed Action with Additional Conditions Alternative the permit revision application, USACE permit, and the R2P2 would be approved with special conditions and the Burnham Road realignment would occur as discussed in Section 2.1.1. In light of the foregoing discussion, OSM has identified two potential permit conditions that could be imposed as part of the permit revision approval process.

The first potential special condition would be that BNCC would be required to conduct supplementary hydrologic monitoring. The additional monitoring would serve to supplement existing baseline information, ensure that any potential adverse effects to the hydrologic balance are discovered before they affect areas outside the permit boundary, and provide additional data for reconstruction of disturbed stream channels. This additional monitoring would include both surface water stations and groundwater wells.

The additional surface water monitoring would consist of the following:

- On Cottonwood Arroyo, reinstate upstream and downstream quality and continuous quantity monitoring (i.e., continuous gage). Upstream stations should be located in the north, middle, and south forks of Cottonwood Arroyo. Data was collected on Cottonwood from 1990 to 1999, monitoring prior to 1998 was baseline (pre-mining). Monitoring during mining in Area IV North will allow observation of mining influences compared to the baseline data. Historic upstream data was collected exclusively on the north fork, which is the only fork receiving NAPI discharge; therefore, stations on each fork will help differentiate NAPI impacts from baseline conditions. Additionally, while the north fork of Cottonwood in Area III has been mined through, eventually the channel will be reconstructed. Accurate characterization of stream flow variability in this area will be used for permanent channel design.

The additional groundwater monitoring would consist of the following:

- Alluvial wells – several alluvial wells used for stock water supply are located within the vicinity of area IV North along the Chaco River and Cottonwood Arroyo and (PAP Appendix 6.E). Alluvial monitoring in Area IV North will be protective of these alluvial water uses. Cottonwood Arroyo alluvial quality and water level monitoring is already being conducted downstream of the proposed mining activity at monitoring well QACW-2. However, this well is often dry. Monitoring well QACW-2B was historically monitored from 1986 to 1999 and was rarely dry. Therefore, downstream monitoring should be reinstated at QACW-2B. Historic Cottonwood Arroyo alluvial quality and water level monitoring was conducted upstream of the proposed mining activity at QACW-1 (1985-1998) and GM-17 (1975-1982). Alluvial quality and water level monitoring should be reinstated upstream of both the diversion and the proposed mining activity. Upstream wells should be located in the north (as close to the historic GM-17 location as possible), middle, and south forks, as close to the permit boundary as possible. Again having each branch monitored will help to characterize and differentiate NAPI influences, and support permanent channel design.
- At least one nested Fruitland well screened in at a minimum—the No. 3 and No. 8 coal seams that will not be mined through, but which are adjacent to the mine pit—will help to confirm groundwater model predictions of drawdown and recharge. The groundwater model also predicted transport of TDS from the reclaimed pit toward the Cottonwood alluvium. Therefore, the well should be located on the northwest side of the Area IV North pit between the pit and the Cottonwood Arroyo, since placement of the well in this location will assist in analyzing these predictions. Monitoring of the No. 3 and No. 8 coal seams should provide information about potential impacts prior to influences on the alluvial water system, which will be protective of downstream alluvial users on the Cottonwood and Chaco.

All surface water monitoring stations and groundwater monitoring wells should be located such that they will not be mined through, considering both current and reasonably foreseeable mining in the area.

The second potential special condition would be to require implementation and application of the updated Cultural Resources Programmatic Agreement (PA) for Area III, Area IV, and the Burnham Road (see Appendix C). Significant portions of the areas to be permitted have been the subject of prior Section 106 compliance efforts, including communications and consultations with interested parties including Tribes and Pueblos. OSM, the Navajo Nation, and the other federal agencies have utilized that compliance work

to provide a basis for ongoing Section 106 efforts ensuring thoughtful identification of any additional prehistoric and historic period properties, as well as traditional cultural properties, and related eligibility evaluations, adverse effect determinations, and possible resolutions of adverse effects through avoidance, data recovery, or other forms of mitigation. These efforts also consider the handling of unanticipated cultural finds. Additionally, the consideration of burials and associate grave-goods are of utmost importance. At present, compliance efforts have already been completed with respect to any known sites or objects that are subject to NAGPRA or the Nation's Jishchaa' Policy. However, with cultural resources, there is the possibility of being informed of or discovering human remains. Therefore, to provide for encompassing consideration and protection for all cultural resources, including burials, and to provide for future cultural resource compliance activities, an updated PA has been developed. A requirement to implement and apply the updated PA for Area III, Area IV, and the Burnham Road could be considered as a special condition for the permit revision approval.

2.1.3 USACE Considered Mining Alternatives

Any activity requiring an IP from the USACE under Section 404 of the CWA must undergo an analysis of alternatives and impacts to aquatic resources in order to identify the LEDPA pursuant to the requirements of the guidelines established by the EPA, known as the 404(b)(1) Guidelines (Guidelines).

The Guidelines prohibit discharges of dredge or fill material into WUS if there is a "practicable alternative to the proposed discharge that would have less impact on the aquatic ecosystem, provided that the alternative does not have other significant environmental consequences." (40 CFR § 230.10(a)). An alternative is practicable "if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of the overall project purposes." (40 CFR §§ 230.10(a) and 230.3(q)).

The guidelines for the 404 (b)(1) alternatives analyses suggest that applicants consider the consequences of alternatives that would involve both smaller and larger areas, as well as alternatives that would be sited in different locations.

Alternatives are evaluated to determine whether they meet the project purpose. In addition, alternatives area analyzed to determine if they are "practicable" in terms of cost, logistics, and technical feasibility criteria. If an alternative would not fulfill the project purpose or does not meet the practicability criteria, it cannot be determined as the LEDPA"; and the USACE cannot issue a permit for that alternative.

In the USACE Alternatives Analysis (Appendix A), the Proposed Action, No Action, three on-site and one off-site alternatives, and sub-alternatives, were considered. The primary difference between the Proposed Action and the alternatives is that each alternative includes a different source for obtaining the coal that would be mined from Area IV North in the Proposed Action. A summary of the alternatives is listed below.

- Alternative 1: Proposed Action – Mine Plan Revision that includes mining a total of about 12.5 million tons of coal from Area IV North, continued mining in Area III, and realignment of Burnham Road.

- Alternative 2: No Action Alternative – Use existing approved Mine Plan to mine coal from remaining reserves located in Area II (Hosteen, Yazzie pits) and Area III (Lowe and Dixon pits), but do not mine in Area IV North and do not realign the Burnham Road.
- Alternative 3: Expedite Production in Dixon Pit – Implement a sequencing change to the Mine Plan that includes pre-stripping and expedites production in Dixon Pit. Realign the Burnham Road.
- Alternative 4: Extend Mining in Dixon and/or Lowe Pits – Navajo Coal Mine Plan revision or lease extension that extends mining in Dixon Pit and east of Lowe Pit. Realign the Burnham Road.
- Alternative 5: Navajo Coal Mine Plan revision that includes implementation of highwall or longwall mining methods. Realign the Burnham Road.
- Alternative 6: Obtain Coal from Off-site Source – Obtain coal from San Juan Mine located five miles north and across the San Juan River from FCPP in Fruitland, NM or Black Mesa Mine located 50 miles west of FCPP. Realign the Burnham Road.

Detailed descriptions of the alternatives are provided in the Alternatives Analysis in Appendix A. Based on the analysis; the USACE has determined that the Proposed Action represents the LEDPA.

2.1.4 No Action Alternative

The No Action Alternative, in accordance with CEQ requirements, is carried forward in this analysis to serve as a benchmark against which the impacts of the Proposed Action can be assessed.

Under the No Action Alternative, the mine permit revision, USACE permit, and R2P2 would not be approved and ground disturbance or mining activities would not take place in Area IV North. Existing disturbance on about 268 acres in Area IV North from mine preparation activities initiated in 2005, following the OSM's issuance of Permit NM-0003-F-R-01 would be reclaimed in accordance with the previous mine plan. This disturbance is the result of preliminary land clearing in preparation for mining and construction of infrastructure including approximately eight miles of access roads and six miles of power lines. These activities ceased in 2010 at the direction of OSM (refer to Section 1.1). Under this alternative, mining authorized in Area III would continue as permitted.

Under the No Action Alternative, impacts to WUS would be reduced from about 1.9 acres to a maximum of 1.3 acres and limited to currently authorized (USACE permit SPA-2011-00122-ABQ) activities in Area III. Thereafter, mining activities that would affect WUS in Area III would cease unless the USACE verifies authorization of continued fill in WUS from mining under a NWP or a different IP.

The Burnham Road realignment would not occur under the No Action Alternative. While the OSM, BIA, and USACE previously approved the realignment, the USACE's and BIA's approvals have expired. Therefore, without further agency action, 75 acres would not be impacted by realignment of Burnham Road.

2.1.5 Comparison of Alternatives

After considering the project’s purpose and need, regulatory and environmental factors as well as cost, logistical and technological feasibility of mining in Area IV North, three alternatives are carried forward for environmental analysis in this EA—the Proposed Action, the Proposed Action with additional conditions, and the No Action Alternative. As described above, four other action alternatives were considered as part of this EA by the USACE (refer to Appendix A) but were eliminated from detailed consideration in the EA and for IP consideration because the alternatives did not meet the purpose and need and/or were not technically or economically practicable. Proposed activities and disturbance associated with each alternative carried forward for analysis are shown in Table 2.1-4.

The No Action Alternative includes mining activities currently taking place in Area III of the Navajo Mine; existing surface disturbance in Area IV North; and existing infrastructure (including power lines and roads) in Areas III and IV North. The total disturbance associated with these existing and permitted activities is approximately 972 acres.

In addition to existing mining activities and infrastructure, the Proposed Action would include mining an additional approximately 704 acres of Area IV North to meet coal delivery contract requirements to the FCPP and construction of the Burnham Road realignment (75.0 acres) for a total of 779.2 acres of proposed new disturbance.

Table 2.1-4. Comparison of Activities for No Action and Proposed Action

Project Component	No Action Alternative		Proposed Action	
	Disturbance (acres)	Impacts to WUS (acres)	Disturbance (acres)	Impacts to WUS (acres)
Approved Area III New Mining Surface Disturbance	701	2.1	701	1.3
Approved Area III Existing Mining Surface Disturbance	358		358	
Existing Mine Ancillary Roads (8.1 miles)	20	0	20	0
Existing Power Lines (6.0 miles)	32	0	32	0
Burnham Road Realignment (5.2 miles)	0	0	75	0.1
Area IV North Mining Surface Disturbance	216	0	704	0.5
Total of Permitted and Proposed Mining Disturbance	1,327	2.1	1,890 ¹	1.9
TOTAL Proposed Newly Permitted Disturbance	0		779 ²	

¹This permitted and proposed mining disturbance acreage represents impact acreages evaluated by the USACE for consideration of issuance of an IP.

²OSM considered permit acreage under the Proposed Mine Plan Revision

2.2 Alternatives Considered but Eliminated from Detailed Analysis

Alternatives considered in the 404(b)(1) alternatives analysis but not carried forward for detailed analysis in this EA include the following: Expedite Production in Dixon Pit; Extend Mining in Dixon and/or Lowe Pits; implementation of highwall or longwall mining methods at Navajo Mine; and Obtain Coal from Off-site Source. These alternatives would not fulfill the project purpose, after taking into consideration cost, existing technology, availability, and logistics. Therefore the alternatives are not practicable under Section 404 of the CWA, and, for the same reasons, not reasonable under NEPA, and were therefore eliminated from further consideration. Table 2.2-1 provides a summary of the practicability analysis. Details are available in Appendix A.

Table 2.2-1. Alternatives considered but eliminated from detailed analysis

Alternative	Availability	Cost	Existing Technology	Logistics	Meets Project Purpose
Expedite Production in Dixon Pit	Yes	No	No	No	Yes, but in an unreasonable manner and at excessive cost.
Extend Mining in Dixon and/or Lowe Pits	No	No	Yes	No	No
Implement Highwall or Longwall Mining Techniques	No	No	No	No	No
Offsite Coal Supply	Uncertain	No	Yes	No	No