UNITED STATES DEPARTMENT OF THE INTERIOR

OFFICE OF SURFACE MINING RECLAMATION AND ENFORCEMENT

Environmental Assessment for the Freedom Mine West Mine Area

February 2016

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Contents

Figures

Tables

Appendices

1. Introduction

The Coteau Properties Company (Coteau), a subsidiary of the North American Coal Corporation, owns and operates the Freedom Mine (Mine) surface coal mine in Mercer County, North Dakota. The mine is located approximately 10 miles north of Beulah, North Dakota. Coal mined at the Freedom Mine is sold to Dakota Coal Company, a subsidiary of Basin Electric Power Cooperative (BEPC), and used by the adjacent Dakota Gasification Company's Great Plains Synfuels Plant (DGC), which gasifies coal, the adjacent Antelope Valley Station (AVS) coal-fired power plant and is hauled by rail approximately 30 miles to the Leland-Olds Station (LOS) coal-fired power plant, near Stanton, North Dakota. Please refer to ***Figure 1 Project Location Map.***

This environmental assessment (EA) has been conducted in accordance with the National Environmental Policy Act (NEPA) and the Council on Environmental Quality (CEQ) regulations for implementing NEPA (40 C.F.R 1500-1508); the Department of the Interior's (DOI's) regulations for implementation of NEPA (43 C.F.R Part 46); the DOI's Departmental Manual Part 516; and the Office of Surface Mining Reclamation and Enforcement (OSMRE) Directive REG-1, Handbook on Procedures for Implementing the National Environmental Policy Act of 1969 (OSMRE 1989). Information gathered from Federal, state, and local agencies, Coteau, and publicly available literature, as well as in-house OSMRE sources, such as Freedom Mine's Permit Application Package (PAP), were used in the preparation of this EA.

The EA describes the environmental impacts that are anticipated to result from the future mining operations at the Freedom Mine from mining Federal coal located beneath the N1/2 Section 10 and Section 14, T145N, R88W that lie within the approved Surface Mining Control and Reclamation Act of 1977 (SMCRA) Permit Area (the Project). Please refer to ***Figure 2 Mining Plan Permit Map.***

NEPA requires Federal agencies to disclose to the public the potential environmental impacts of projects they authorize and to make a determination as to whether the analyzed actions would "significantly" impact the environment. "Significantly" is defined in C.F.R 1508.27. If OSMRE determines that this Project would have significant impacts following the analysis in the EA, then an Environmental Impact Statement (EIS) would be prepared for the Project. If OSMRE determines that the potential impacts would not be "significant," OSMRE will prepare a "Finding of No Significant Impact" (FONSI) statement to document this finding, and accordingly would not prepare an EIS.

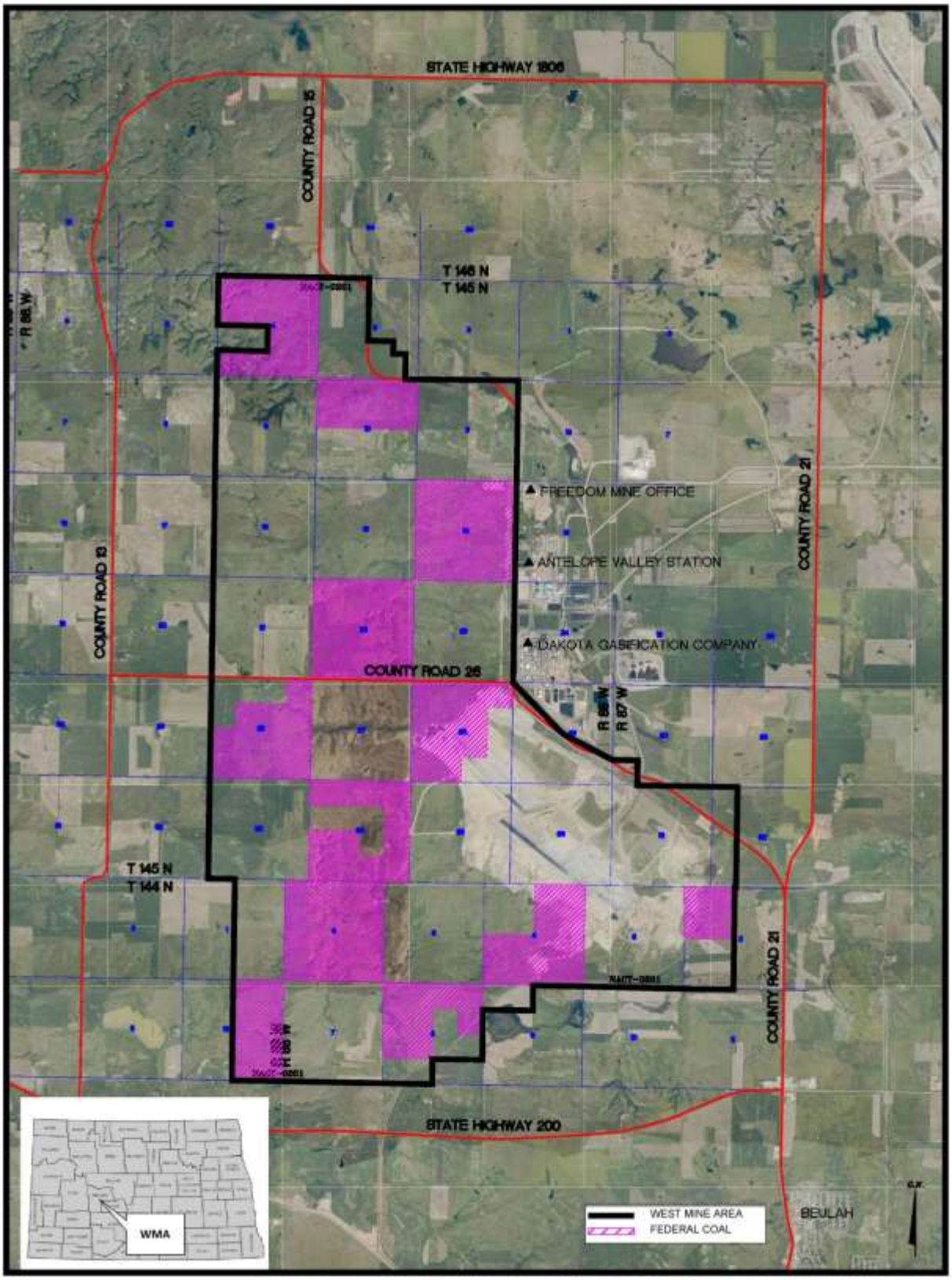

Figure 1 Project Location Map

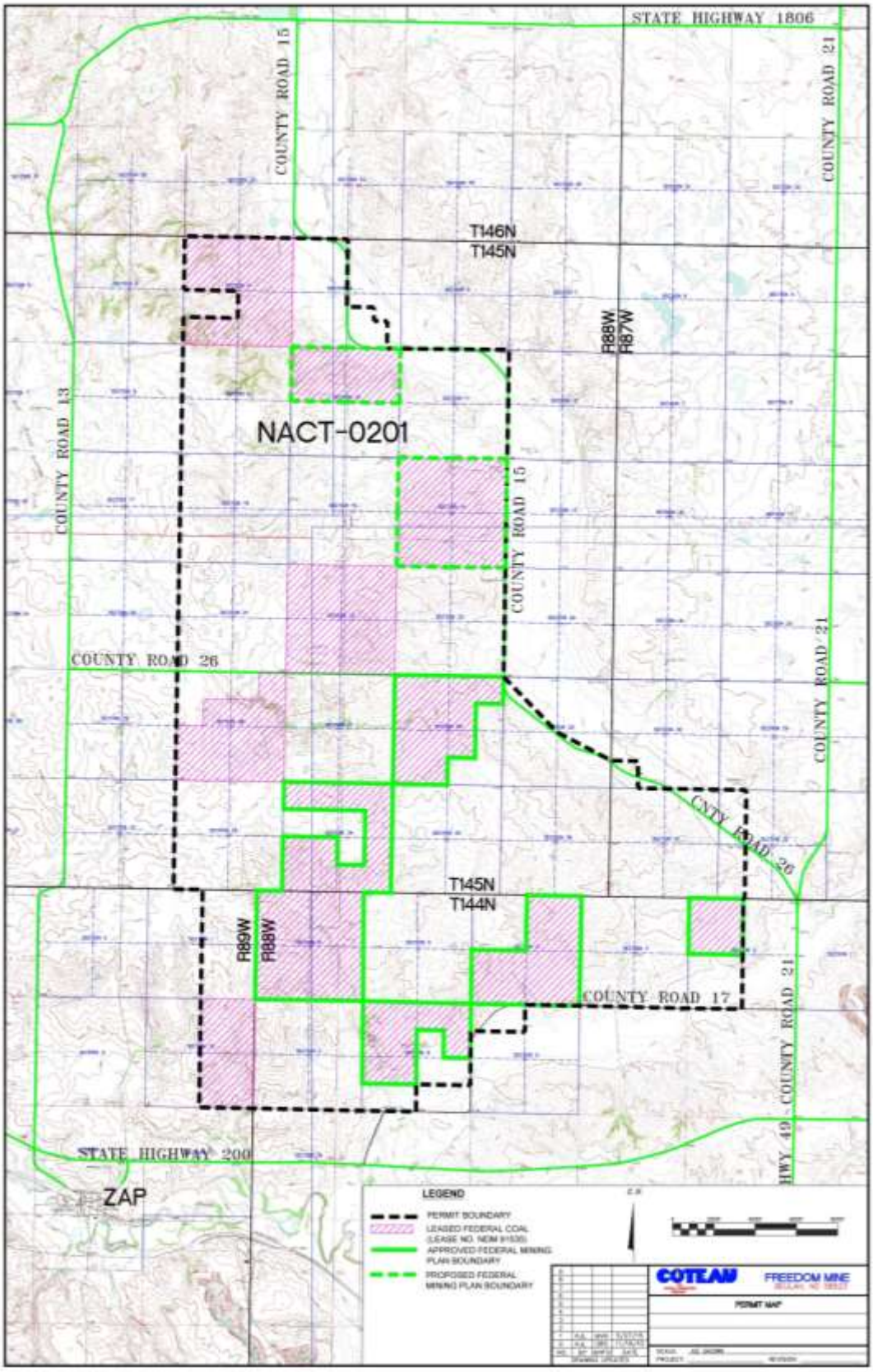

Figure 2 Mining Plan Permit Map

1.1. Background

1.1.1. Site History

Coteau began mining and selling coal from the Freedom Mine in 1983. Since that time, over 425 million tons of coal has been mined. The first Federal mining plan for the Freedom Mine was approved on October 2, 1985. Since that time, nine Federal mining plan modifications have been approved, with the latest approved on April 2, 2011.

1.1.2. Project Background

The BLM administers a competitive leasing process of Federal coal with a Lease by Application (LBA) process. The program is designed to provide Federal coal for development and to ensure fair market value for the Federal coal is received. When an application for coal lease sale is submitted to the BLM by industry, the BLM holds either a competitive lease sale or does not offer the coal for sale. If the BLM decides to hold a competitive lease sale, it must evaluate the quantity, quality, maximum economic recovery, fair market value of the coal, as well as the potential environmental impacts of leasing the coal.

On January 16, 2002, Coteau filed an application with the BLM to lease Federal coal deposits beneath private surface at the following locations:

- T144N, R88W, 5th PM
    - Sec. 2: Lots 3, 4, and S½NW¼
    - Sec. 4: Lots 1, 2, S½NE¼, and S½
    - Sec. 6: Lots 1-7, S½NE¼, SE¼NW¼, E½SW¼, and SE¼
    - Sec. 8: N½NE¼, SE¼NE¼, NW¼, and N½SW¼
- T144N, R89W, 5th PM
    - Sec. 12: E½
- T145N, R88W, 5th PM
    - Sec. 4: Lots 1-4, S½N½, SE¼, and S½SW¼
    - Sec. 10: N½
    - Sec. 14
    - Sec. 22
    - Sec. 26: N½NE¼, SW¼NE¼, NW¼SE¼, and W½
    - Sec. 28: E½NE¼, SW¼NE¼, SE¼NW¼, and S½
    - Sec. 34: N½N½, SE¼NE¼, E½SE¼, SW¼SE¼, and SW¼

The BLM determined that this LBA would be processed as a competitive lease sale. The potential impacts of leasing this Federal coal were analyzed in an EIS (BLM, 2005a). Three alternatives were studied in the EIS, including two action and one no-action alternative. On November 1, 2005, following review of the *Final Environmental Impact Statement (EIS) FES 05-03, The Coteau Properties Company Federal Coal Lease by Application NDM 91535 for West Mine Area, Freedom Mine, Mercer County, North Dakota*, the Bureau of Land

Management (BLM) issued a Record of Decision (ROD) for leasing approximately 5,344 acres of Federal coal within a proposed 17,051 acre expansion, called the West Mine Area (WMA) (BLM, 2005a; BLM, 2005b). The preferred alternative (Alternative C) identified in the ROD recommended leasing of the above listed tracts with specific provisions set in place to minimize impacts to cultural resources. ***Figure 2 Mining Plan Permit Map*** depicts these tracts with diagonally hatched lines.

On April 1, 2011, Coteau received Federal mine plan approval from OSMRE to mine the Federal coal located at:

- T144N, R88W, 5th PM
    - Sec. 2: Lots 3, 4, and S½NW¼
    - Sec. 4: Lots 1, 2, S½NE¼, and S½
    - Sec. 6: Lots 1-7, S½NE¼, SE¼NW¼, E½SW¼, and SE¼
    - Sec. 8: N½NE1/4, SE¼NE¼, NW¼, and N½SW¼
- T145N, R88W, 5th PM
    - Sec. 26: N½NE¼, SW¼NE¼, NW¼SE¼, and W½
    - Sec. 34: N½N½, SE¼NE¼, E½SE¼, SW¼SE¼, and SW¼

The North Dakota Public Service Commission (PSC) has granted Coteau approval to mine coal adjacent to the above-listed Federal coal tracts through Permit NACT-0201. This permit has had one major renewal, one mid-term update, and 8 additional revisions since the 2011 Federal mining plan approval, with the last revision being submitted June 18, 2014. The last public notice soliciting comments or objections to the permit revision was published on November 13, 2014, in the Beulah Beacon, Bismarck Tribune, and the Hazen Star. The permit revision was reviewed by the PSC and received final approval on October 21, 2015. In addition to Federal surface lands contained in PSC Permit NACT-0201, Coteau has surface ownership rights to the land above the Federal coal and will utilize that surface to construct haul and access roads, sedimentation ponds, and other necessary features to access private coal resources.

1.2. Statutory and Regulatory Background

SMCRA gives OSMRE primary responsibility to administer programs that regulate surface coal mining, in addition to surface effects from underground coal mining. Pursuant to Section 503 of SMCRA, which grants states the right to assume jurisdiction over the regulation of surface coal mining of non-Federal coal, the PSC developed a permanent regulatory program. In August 1983, pursuant to § 523(c) of SMCRA, the PSC entered into a cooperative agreement with the Secretary of the Interior to assume that jurisdiction. The PSC maintains primacy to enforce performance standards and permit requirements and has authority during environmental emergencies while OSMRE retains oversight of this enforcement.

Federal coal lease holders in North Dakota must submit a PAP to OSMRE and the PSC for proposed mining and reclamation on Federal lands as well as on non-Federal private or state owned surface with federally controlled coal. The PSC reviews the PAP to ensure it complies

with permitting requirements and performance standards. The PSC coordinates with North Dakota regulatory and resource management programs with respect to other applicable statutes. If the PAP complies with regulatory requirements, the PSC issues a permit to conduct coal mining operations. OSMRE, BLM, and other interested Federal agencies also review the PAP to ensure it is in compliance with Federal regulations.

For new mining plans, OSMRE prepares a mining plan decision document (MPDD) in support of its recommendation to the Assistant Secretary of Land and Mineral Management (ASLM) (30 C.F.R Chapter VII, Subchapter D). For existing approved mining plans that are proposed to be modified, as is the case with the Freedom Mine, OSMRE prepares a MPDD for a mining plan modification. The ASLM reviews the MPDD and decides whether or not to approve the mining plan modification, and if approved, what, if any, conditions may be needed. Pursuant to 30 C.F.R 746.13, OSMRE's recommendation is based, at a minimum, upon:

- The PAP;
- Information prepared in compliance with NEPA, including this EA;
- Documentation assuring compliance with the applicable requirements of Federal laws, regulations and executive orders other than NEPA;
- Comments and recommendations or concurrence of other Federal agencies and the public;
- Findings and recommendations of the BLM with respect to the Resource Recovery and Protection Plan (R2P2), Federal lease requirements, and the MLA;
- Findings and recommendations of the PSC with respect to the mine permit NACT-0201 and the North Dakota State program; and,
- The findings and recommendations of the OSMRE with respect to the additional requirements of 30 C.F.R Chapter VII, Subchapter D.

In order to ensure compliance with other Federal laws, regulations and executive orders, OSMRE also conducts consultation with other agencies to make its recommendation to the ASLM. This consultation includes the U.S. Fish and Wildlife Service (USFWS) Section 7 consultation for threatened and endangered (T&E) species potentially affected by the proposed mining plan under the Endangered Species Act of 1973 (ESA) (USFWS 2016), and the National Historic Preservation Act of 1966 (NHPA) "Section 106" consultations for the affected area (CSHPO 2016).

1.2.1. Reports and Assessments

In addition to Permit NACT-0201, Coteau and the PSC have conducted additional assessments and prepared reports for the WMA. These reports address various aspects of the mining process. One report that is created by the PSC whenever a permit is submitted or additional land is added to a permit; or there are significant changes to the mining and reclamation plan, is the cumulative hydrologic impact assessment (CHIA). CHIAs look at the potential cumulative effects to surface

and groundwater resulting from the proposed mining and other mining operations in the area. They use a set of hydrologic standards to determine if cumulative impacts will occur:

1. The baseline state as documented in all permit applications and in the appropriate county ground water studies
2. The probable hydrologic consequences and hydrologic reclamation plan in all relevant permits
3. NDAC 69-05.2-16 Performance standards - Hydrologic balance
4. NDAC 33-16-02 Standards of Water Quality for State of North Dakota

One CHIA was completed by the PSC for the WMA in 2004. No new or unforeseen hydrologic impacts were identified during this assessment. Temporary, known impacts were noted in the CHIA. These temporary impacts are loss of hydraulic head and lower water levels in wells. These levels are expected to recover within three to seven years after mining moves away from the affected area. In addition, operable, private water wells will be destroyed by mining, but replaced during the reclamation process. The PSC updated the CHIA for Permit NACT-0201, including the WMA, in October 2015 with the approval of Revision No. 18 to Permit NACT-0201.

Annually, a Groundwater Monitoring Report is submitted to the PSC for Permit NACT-0201. The purpose behind the design and implementation of the ground water monitoring plan is threefold; investigate and quantify the pre-mining hydrologic conditions of permitted and adjacent areas, monitor impacts on the ground water hydrology of the area due to surface mining operations and climatic conditions, and monitor and quantify post-mining ground water conditions.

Additionally, submitted to the PSC annually is the Surface Water Monitoring Report for Permit NACT-0201. This report identifies the extent to which mining affects water quality and quantity in areas within and adjacent to the Mine. Precipitation and surface runoff data from established monitoring sites is reported to the PSC every quarter. Surface water is monitored for conformance with effluent limitations in accordance with Coteau's North Dakota Pollutant Discharge Elimination System (NDPDES) permit, which is issued by the North Dakota Department of Health (NDDOH).

Every two years, a Wildlife and Habitat Monitoring Report is submitted to the PSC for Permit NACT-0201. This plan details results from wildlife surveys and establishes the methods for future wildlife and habitat surveys. The plan discusses all permitted areas within the Mine and was last approved by the PSC on December 15, 2014. Information relevant to the WMA is discussed in ***Section 3.3, Wildlife.***

Other reports and assessments completed for the Mine include:

- Consolidated Bonding Plan, which details the financial means necessary to complete reclamation on the Mine. This plan was most recently updated to reflect the worst-case

reclamation estimate during approval of Revision No. 18 to Permit NACT-0201 by PSC.

- Consolidated Blasting Plan, which details blasting procedures and was last approved by the PSC on September 23, 2013.
- Annual Emission Inventory Report last submitted to the NDDOH on March 3, 2015. For more information on air emissions and quality, please refer to Section 3.1, Air Quality.

1.3. Purpose and Need

The purpose of the action is established by the MLA and the SMCRA, which requires the evaluation of Coteau's proposed mining plan modification for the Freedom Mine, WMA before Coteau may conduct surface mining and reclamation operations to develop Federal coal lands included in Lease NDM 91535. OSMRE is the agency responsible for making a recommendation to the ASLM to approve, disapprove, or approve with conditions the proposed mining plan modification. The ASLM will decide whether the mining plan modification is approved, disapproved, or approved with conditions.

The need for the action is to provide Coteau the opportunity to exercise its valid existing rights granted by BLM under federal coal Lease NDM 91535 to access and mine undeveloped federal coal resources located in the Freedom Mine, WMA. The Freedom Mine is presently operating under a mining plan approved by the ASLM in 2011 that allows it to mine coal from Federal Coal Lease NDM 91535 in accordance with the surface mining permit issued by PSC. Approval of the mining plan modification submitted to PSC and OSMRE in Revision No. 18 to Permit NACT-0201 will allow mining of the Federal coal as required under the terms and conditions of Federal Coal Lease NDM 91535. In addition, it would allow for a more contiguous mining pattern at the Freedom Mine and maximize coal resources by not bypassing Federal coal. Approval to mine this Federal coal would not increase production at the Mine, but would allow for a more efficient and economical resource recovery of all coal in the permit area than if the Federal coal were bypassed.

The lignite coal mined at the Freedom Mine plays an important role in meeting regional and national energy demands. Freedom Mine is the exclusive provider of fuel to DGC and AVS and the exclusive provider to LOS unless the coal mix is not adequate for their facility, under contractual obligations. Coal from the Mine is converted into natural gas and other products and is used to generate electricity at two nearby power plants. This electricity is sold to Basin Electric Cooperative's member-owner electric cooperatives located throughout Colorado, Iowa, Minnesota, Montana, Nebraska, New Mexico, North Dakota, South Dakota, and Wyoming. Natural gas created at DGC is piped to Ventura, Iowa, for distribution to the eastern United States. Other products of the gasification process created at DGC are sold to agricultural and industrial users regionally and nationally. Carbon dioxide (CO_2) produced at DGC is recovered and transported by pipeline to Saskatchewan, Canada, and used for enhanced oil recovery. The

mining and related industries create jobs for local residents, which in turn contributes to the local economy.

1.4. Outreach and Issues

Public comments were solicited through multiple methods. OSMRE published legal notices in the Beulah Beacon on September 10 and 24, 2015 (***Appendix A, Consultation***). The notice described the Project in summary form and announced that public comments would be accepted until October 10, 2015. An outreach letter describing the Project and soliciting comments was also mailed on September 18, 2015, to a total of 36 recipients, including federal agencies, Indian tribes, state agencies, city and county governments, adjacent landowners, and other interested parties.

On May 21, 2015, OSMRE published the following Project website, which provided additional Project notice, Project information, and comment opportunities and can be found on the OSMRE website for the Freedom Mine initiative.

Table 1 Public Outreach Comments Categorized by Resource Category

Comment Category	Number of Comments	% of Total Comments
Air Quality/ Climate Change	3608	24.9%
Water	3623	25%
Reclamation	3553	24.5%
Climate Change	84	0.01%
Vegetation	56	0.001%
Wildlife	3585	24.7%
Topic Not Clear But Supportive of the Mine	5	0.0003%
Total	14,514	100%

Table 1 Public Outreach Comments Categorized by Resource Category summarizes the comment topics by resource category. The comments received during the public outreach comment period varied widely but the overall majority was a form letter initiated by Wild Earth Guardians and forwarded by e-mail. Commenters also raised several concerns over the potential adverse impacts of the Project on a number of resources. Almost 25 percent of the comments addressed air quality, including climate change. Others expressed concern about the adverse effects of coal combustion on air quality and the need to carefully evaluate and consider its impacts. In particular, some commenters identified concerns over the potential impacts on air quality from mining operations, coal transportation, and burning coal, including impacts to climate change from greenhouse gases (GHGs) and the social costs of carbon emissions. Other air quality impact concerns raised by one commenter include: impacts of mining to national ambient air quality standards (NAAQS), particularly for ozone; particulate matter and nitrogen; and impacts on threatened and endangered fish species in the Missouri River, and their habitats.

Comments also identified alternatives to the Project that could be analyzed. These alternatives included: reduced mining levels, underground mining, reduced air quality impacts including reduced GHGs, and an alternative that would require offsite mitigation or compensation for impacts. These alternatives and reasons for dismissing or carrying them forward for analysis are addressed in ***Section 2.5***. All outreach comments received have been considered and included as appropriate in the preparation of this document.

1.5. Crosswalk of Resource Areas

The Proposed Action adds Federal coal from the Federal coal Lease NDM 91535 issued by the BLM in 2005 to the WMA mining plan and SMCRA Permit NACT-0201. The potential impacts of leasing the Federal coal included in the Proposed Action were analyzed by the BLM in an EIS (BLM, 2005a). Potential impacts from the action evaluated in the 2005 BLM EIS and ROD (BLM, 2005b) that may have changed since the BLM leasing approval are discussed in this EA. Resource categories and potential impacts that have not changed since the 2005 BLM EIS and ROD will not be reevaluated. Because the 2005 BLM EIS and ROD thoroughly described the environmental setting and mining operations, it is incorporated by reference into this document.

Table 2 Crosswalk of Resource Areas identifies the location of resource areas analyzed in the original 2005 EIS, if they were brought forward for this analysis, and their location in this document. Resource areas that were sufficiently addressed in the 2005 EIS and have not had new information that would affect the decision-making process have not been brought forward for analysis. These resource areas have been fully incorporated from the 2005 EIS (BLM, 2005a).

Table 2 Crosswalk of Resource Areas

Resource Area	2005 EIS Location		Current Analysis		
	Affected Environment	Environmental Consequences	No new issues or impacts, not further analyzed	Brought forward for analysis	Affected Environment/ Environmental Consequences Location
Air Quality & Climate	Page 17	Page 33		X	Section 3.1; Section 3.2
Topography	n/a	n/a		X	Section 3.3
Geology, Minerals, and Paleontology	n/a	n/a		X	Section 3.4
Water Resources	n/a	n/a		X	Section 3.5
Wetlands and Alluvial Valley Floors	n/a	n/a		X	Section 3.6
Visual Resources	n/a	n/a		X	Section 3.7
Hazardous and Solid Waste	n/a	n/a		X	Section 3.8
Soils (Prime Farmland)	Page 23	Page 35		X	Section 3.9
Wildlife	Page 24	Page 36		X	Section 3.10
Cultural Resources	Page 24	Page 36		X	Section 3.11
Noise	n/a	n/a		X	Section 3.12
Transportation	n/a	n/a		X	Section 3.13
Land Use/Vegetation	Page 23	Page 35	X		
Environmental Justice	Page 29	Page 45	X		
Socioeconomics	Page 29	Page 45	X		
Regulatory Compliance, Mitigation and Monitoring	n/a	Page 46	X		
Irreversible and Irretrievable Commitments of Resources	n/a	Page 47	X		

2. Alternatives

This chapter describes the Proposed Action and Alternatives being evaluated in this EA. ***Section 2.1*** describes Freedom Mine's existing mining and reclamation operations. The history of alternative development is described in ***Section 2.2***, the Proposed Action Alternative is described in ***Section 2.3*** and the No Action Alternative is presented in ***Section 2.4***. Information on alternatives considered but eliminated from further analysis is presented in ***Section 2.5***.

2.1. Description of Existing Mining and Reclamation Process

Surface coal mining has been conducted at the Freedom Mine and within the WMA since the approval of the Federal coal lease in 2005 and Federal mining plan approval in 2011. The current mining plan predicts mining in the WMA through 2045. Please refer to ***Figure 3 WMA Proposed Mining Schedule.*** Existing mining and reclamation process are excerpted from the Freedom Mine PAP and are described below.

The surface mining process begins with obtaining mining rights, either by lease or ownership. Once these rights have been established, baseline data about the coal and environmental conditions are collected. This baseline data includes biological and cultural resources information, soil types, coal quality, and hydrologic data. This information is compiled into a mining permit application that is submitted to the PSC. In addition to the mining permit required from the PSC, over 20 other permits must be obtained from various Federal and State agencies. Examples of additional permits that must be obtained before mining begins include an Air Permit to Construct, Air Permit to Operate, Section 404 permits, County Road Closure Permits, and County, State, and Federal Coal exploration permits. Once all permits have been approved, surface water management is established. Sedimentation ponds are built downstream from mining activities. These ponds collect all water coming off of the disturbed mining areas. Water is left in the ponds until it meets NDPDES standards (e.g., total suspended solids, pH, and iron) before being discharged into existing surface water features.

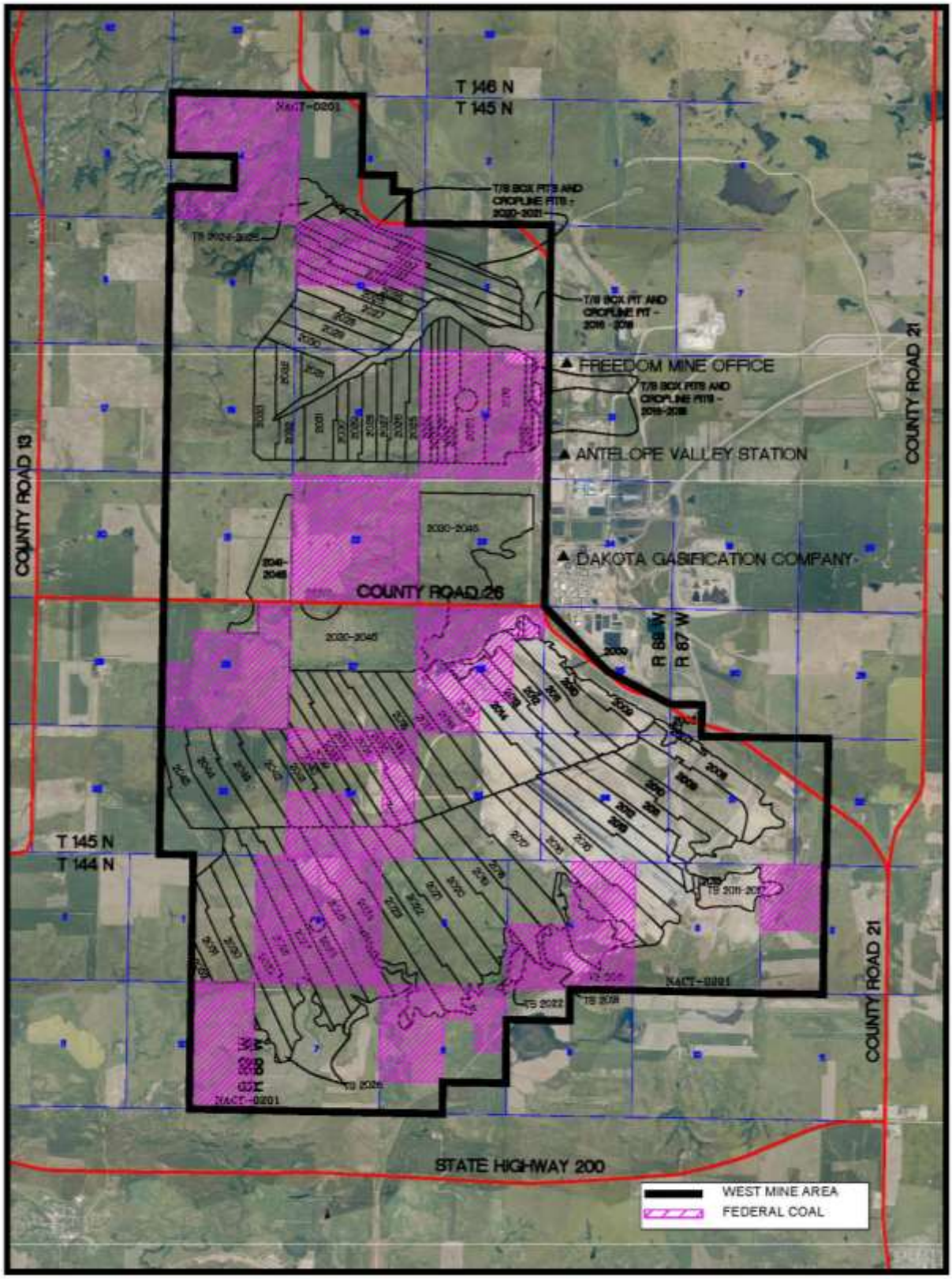

Figure 3 WMA Proposed Mining Schedule

Once surface water management has been established, topsoil and subsoil (referred to together as suitable plant growth material [SPGM]) are removed. The soils are either directly respread onto reclaimed areas or stockpiled for later respreading. From there, the material directly above the coal, called overburden, is removed and placed adjacent to the pit in a spoil pile. At Coteau, overburden is mainly removed by draglines, which have bucket capacities of up to 124 cubic yards. Other machinery, such as loading shovels, excavators and large trucks also help with overburden removal.

After coal is exposed, it is either ripped or blasted to prepare for loading into coal hauling trucks. For additional information about blasting, please refer to ***Section 3.5, Noise.*** Once coal is loaded into haul trucks, it is taken to the truck dump and crushers. From there, coal is delivered to the customers, by trucks and conveyors to DGC and AVS and rail to LOS.

Once coal has been removed from an area, the spoil piles are graded to the approximate original contour of the land prior to mining. Once the regraded spoil contours are approved by the PSC, SPGM is respread over the area. When the SPGM and topsoil is in place, grasses or crops are seeded using standard farming techniques and equipment. This reclamation process occurs contemporaneously with the advancing mining process.

Reclamation farming activities generally involve chisel plowing or disking, rock picking, harrowing, seeding, mulching, and crimping. Croplands are planted with a temporary pre-crop grass/legume seed mixture or planted directly with a small grain crop, depending on season and potential erosion problems. Cover crops of oats or rye are used in place of or in conjunction with mulching and crimping to establish quick erosion control on reclaimed areas. Locally grown straw is generally used as the primary mulch for reclaimed lands. Slough or native grassland hay may be used depending on price, origin, and quality of the hay. Wood chips may be used as a mulch and weed barrier in reclaimed tree plantings. Wetland edges are planted with a seed mix beneficial to wildlife and valuable as a hay crop, provided the wetland lies within a cropland tract. Introduced species are not used when a wetland lies within a rangeland tract.

Reclamation of ephemeral streams is conducted utilizing the reclaimed native grasslands seed mix, since most reclaimed stream areas are found in native rangeland land use areas. Site specific field determinations are made to assess riparian vegetation establishment potential and establishment, and species such as big bluestem *(Andropogon gerardii),* Canada wildrye *(Elymus canadensis),* prairie cordgrass *(Spartina pectinate),* or streambank wheatgrass *(Elymus lanceolatus)* is added to initial seed mixes, or interseeded to established grass stands as determined on a site specific basis as deemed necessary by reclamation personnel. Where the potential for erosion is high due to large watersheds draining through reclaimed channels, these areas are seeded, and either mulched with hay/straw mulch, lined with erosion control fabric, or hard armored with material such as rip-rap or concrete erosion control pads. Rock check dams, coir logs, or dirt berms may also be used to recreate or enhance natural stream flow characteristics, and help with the natural re-establishment of riparian vegetation. All seed mixes are approved by the PSC.

Vegetation assessments on reclaimed lands will be conducted to achieve the requirements for successful vegetation specified in the latest version of the PSC Standards for Evaluation of Revegetation Success and Recommended Procedures for Pre- and Post-mining Vegetation Assessments. Coteau conducts assessments following methods specified in these standards. For example:

Cropland productivity is evaluated using Natural Resource Conservation Service (NRCS) productivity indices to calculate an unadjusted yield standard. The standard is adjusted for annual climatic variations using annual county yield data. Prime farmland is evaluated separately from non-prime farmland only in those instances where a great productivity disparity exists between the farmland types. Standards are established for each permitted section of land when owned by Coteau, or by landowner tract when privately owned. Crops are sampled using standard combining procedures with normal field rotation practices.

Native grassland productivity is evaluated using NRCS production values in conjunction with reference area data to correct for climatic variations. Cover is evaluated using basal cover (10 point frame) measurements. Diversity is evaluated using relative cover or yield measurements to attain the standard in place at the time of bond release. Seasonality is evaluated using relative cover or yield measurements to attain the standard in place at the time of bond release. Reference areas are established to represent at least the three most dominant range types.

Tame pastureland production will be evaluated using NRCS yield estimates as explained in the PSC Standards for Evaluation of Revegetation Success and Recommended Procedures for Pre- and Post-mining Vegetation Assessments. Unadjusted yield standards are corrected for climatic variations using annual county yield data.

Replacement shelterbelts are evaluated as described in the PSC Standards for Evaluation of Revegetation Success and Recommended Procedures for Pre- and Post-mining Vegetation Assessments. Non-replacement or voluntarily planted tree/shrub plantings will be considered as enhancement practices to other land uses, and will be evaluated subjectively as to their enhancement value.

Temporary wetlands, which will include Class I and II wetlands, are evaluated with associated land uses. All other wetlands are evaluated following the PSC Standards for Evaluation of Revegetation Success and Recommended Procedures for Pre- and Post-mining Vegetation Assessments.

Replacement native tree and shrub woodlands and replacement grassland tall shrub communities are evaluated as woodlands as described in the PSC Standards for Evaluation of Revegetation Success and Recommended Procedures for Pre- and Post-mining Vegetation Assessments.

On average, 600-700 acres of land are disturbed and an equal amount is reclaimed each year across the entire Mine. In the WMA in 2015, more than 245 acres were backfilled and graded; and approximately 140 acres were respread with SPGM (Coteau, 2015b).

The reclamation process begins the process of bond release. As described in Chapter 69-05.2-12, of Title 69 of the North Dakota Administrative Code, a reclamation performance bond is required for all surface mined and reclaimed areas. The PSC can partially release the performance bond for a mined area if the area satisfies any combination of the reclamation standards established for each individual bond release stages. The first stage is backfilling and grading. Post-mining topography is first approved by the PSC during the permitting process. During reclamation, the PSC conducts a physical inspection of the re-graded area following coal removal. Once the re-graded area meets PSC standards for stage one bond release, the area can be considered for the second stage of bond release requiring SPGM respread. To determine the amount of SPGM that must be respread, overburden material is sampled. Several factors, including sodium absorption rates and texture, are then taken into consideration to determine the thickness of SPGM needed.

After SPGM is respread, the third stage of bond release can be considered—vegetation establishment. Vegetation must meet certain success standards as described in North Dakota Administrative Code (NDAC) 69-05.2-22-07(3)(b) before the performance bond for the area can be released. These success standards are different for cropland, native grassland, woodlands, fish and wildlife habitat, and other land uses, which include recreation, residential, and industrial. Data on all vegetation must be collected and reported to the PSC. Some of the data that is collected includes fertilizer, herbicide, and pesticide use on cropland, grazing history on rangeland, seeding dates, production rates, and soil samples.

The fourth stage of bond release is the final bond release. Revegetation success standards are more detailed and specific to types of land use. In addition, the land must have been seeded for vegetation establishment for at least 10 years before final bond release is applied for. Once standards have been met, information is submitted and the final bond release is requested from the PSC. The Commission meets to discuss the bond release and the public may request a formal hearing before the final bond release is approved. Approximately 3,973 acres have been approved for final bond release from Permit NACT-0201 at the Freedom Mine (James Deutsch, personal communication, January 29, 2016).

In addition to active mining areas, the Mine contains a network of haul roads and support buildings. Adjacent to County Road 15 are the office building, maintenance shop, and several additional shop buildings. The coal handling facility, where coal is sorted and processed before being shipped to customers, the truck dump facility, and coal stockpile are located adjacent to County Road 15 between Coteau's office building and AVS. Gravel haul roads connect active mining areas to the coal handling facility and other areas of the Mine. The haul roads are relocated as active mining and reclamation occur (Coteau, 2015).

2.2. History of Alternative Development

In the 2005 EIS, three alternatives were analyzed including two action and one no-action alternative. The ROD identified Alternative C (Modified Leasing) as the selected alternative.

This alternative included that, after a competitive lease sale, Federal Coal Lease NDM 91535 and its associated approximate 5,344 acres be issued to the successful, qualified high bidder, provided the highest bid meets or exceeds the fair market value of the tract as determined by BLM and that all other leasing requirements are met. Coteau was the successful high bidder during the lease sale.

The Proposed Action analyzed in this EA considers adding Federal coal to the mining plan approved by the ASLM in 2011; however, the environmental analysis presented in the 2005 BLM EIS and ROD considered the potential environmental effects of leasing all of Federal Coal Lease NDM 91535 within the WMA, including the 960 acres of Federal coal proposed in the Proposed Action considered by this EA.

2.3. Alternative A (Proposed Action)

Alternative A includes the mining of approximately 960 acres of Federal coal located in the following sections of Federal Lease NDM 91535:

- T145N, R88W, 5th PM
    - Sec. 10: N½
    - Sec. 14

Please refer to ***Figure 2 Mining Plan Permit Map*** depicting these sections (Project Area).

Due to a variety of factors including setbacks from cultural sites, transmission lines, and roads, approximately 795.1 of the 960 acres are actually mineable for coal. Within the 795.1 acres, approximately 25.6 million tons (mt) of mineable in-place Federal coal exist. However, with Coteau's historic average coal recovery rate of 90 percent, approximately 23.0 mt would likely be mined. It is reasonably foreseeable that Coteau would mine at the current rate of 14.3 mtpy. At this rate of production, the additional Federal coal approved in the Proposed Action would be mined in approximately 10-15 years (Coteau, 2015).

This area considered in the proposed action represents approximately 21 percent of the total Federal coal leased in the WMA; approximately 45 percent of the WMA is Federal coal. Coteau would likely only be able to mine approximately 3,750 acres of Federal coal leased in the WMA, due to setbacks, terrain, and deep overburden. Total coal reserves in the WMA are approximately 268.0 mt. Total Federal mineable coal within the WMA is approximately 121.5 mt. The Federal coal proposed to be mined with this alternative equals approximately 9.5 percent of total coal reserves in the WMA.

2.4. Alternative B (No Action)

Alternative B is the No Action Alternative. Under this alternative, the MPDD developed by OSMRE would not recommend approval and the ASLM would not approve the Proposed Action. Mining could occur in other areas within the SMCRA Permit boundary but no further mining would occur in the Project Area.

The 960 acres of Federal coal proposed to be mined in Alternative A would be left in place. Non-Federal coal within the WMA would still be mined. By not including this Federal coal, Coteau would not be able to mine coal long enough to meet current customer contract demands for the planned life of the facilities Coteau sells coal to without mine plan revisions. This would require the customer to either locate additional coal resources or scale back electricity generation, which in turn would affect many of BEPC's member systems.

2.5. Alternatives Considered But Eliminated From Further Analysis

If an alternative is considered during the NEPA process, but the agency decides not to analyze the alternative in detail, the agency must identify those alternatives and briefly explain why those alternatives were eliminated from detailed study (40 C.F.R 1502.14). An action alternative may be eliminated from detailed study for a number of reasons, including:

- it is ineffective (does not respond to the purpose and need);
- it is technically or economically infeasible (consider whether implementation of the alternative is likely given past and current practice and technology);
- it is inconsistent with the basic policy objectives for the management of the area (such as, not in conformance with the land use plan (LUP);
- its implementation is remote or speculative;
- it is substantially similar in design to an alternative that is analyzed; or,
- it would have substantially similar effects to an alternative that is analyzed.

2.5.1. Underground Mining Alternative

An alternative to require Freedom Mine to use underground mining methods to extract the coal was identified in public comments received during the outreach period, considered by OSMRE, and eliminated from detailed study for the following reasons: PSC has approved a surface mining permit for this project using surface mining techniques; and underground mining is inconsistent with the approved permit. The Purpose and Need for this EA is predicated upon review of a surface mining plan included as part of the approved surface mining permit. An Underground Mining Alternative would, thus, be inconsistent with the Purpose and Need for this action.

Also, Federal Coal Lease NDM 91535 is a surface reserve lease only. The lease was sold by the federal government, purchased by the mining company, and held by the mining company, with the clear understanding by all parties concerned that the lease would be mined by surface mining methods only.

This alternative is also economically infeasible at current permitted production rates, and the economics of initiating an underground longwall mining operation in the Freedom Mine are not cost effective. The facilities and equipment needed for underground mining are different from surface mining. Because the infrastructure for underground mining is not in place at the Freedom Mine, new infrastructure for underground mining would need to be constructed. The capital expenditure to develop an underground mine would be prohibitive. In addition, all new surface

facilities would need to be constructed, including, but not limited to, conveyors, coal stock piles, a wash plant, and maintenance and support facilities. In addition, all new underground mining equipment would need to be purchased such as, but not limited to, a long wall mining system, conveyor systems/drives/power stations, vehicles for transporting men and supplies, several continuous miners, shuttle cars, large and small ventilation fans, and roof bolters.

In addition, approval by NDSPD of an application for a Permit Revision would be required to authorize underground mining. The process for Freedom Mine to design and engineer a new underground mine and for NDSPD to process a new permit application would take a number of years. These factors would also result in this being an economically unreasonable alternative to consider.

In summary, this alternative was not brought forward for analysis because underground mining does not respond to the Purpose and Need for this action and in addition, the economic burden to shift to underground mining would be prohibitive.

2.5.2. Air Quality Mitigation Alternatives

Some public comments suggested that OSMRE consider alternatives that mitigate air quality impacts, specifically by imposing more stringent emission limits at power plants fueled by the Freedom Mine and by requiring oil and gas operators in the region to reduce their emissions. These proposals are not alternatives to the mining plan being considered. The effects of coal combustion are analyzed in Alternatives A as well as in the No Action Alternative because they are considered to be indirect effects. CEQ regulations at 40 C.F.R 1508 (b) define "indirect effects" as those which are caused by the proposed action and are later in time or farther removed in distance, but are still reasonably foreseeable. These indirect effects would occur as a result of burning the coal that is mined. The analysis concluded there would not be significant impacts to air resources under the Proposed Action and no mitigation was recommended. Any mitigation measure proposed by OSMRE imposing more stringent emission limits at generating stations and upon oil and gas operators is beyond OSMRE's authority and its implementation would be highly remote and speculative.

Public comments also suggested considering an alternative that required reduced air emissions at the mine by changing or modifying mining related equipment to equipment which would produce lower air emissions. The Freedom Mine is a relatively small contributor of the emissions related to engine combustion (primarily carbon dioxide [CO2] and oxides of nitrogen [NOX]) in the region. The DGC and AVS and LOS stations, and oil and gas operations contribute the large majority of these pollutants to the regional air quality.

The cost to make the switch to equipment powered by a different fuel (such as natural gas or solar powered equipment) for 960 acres of federal coal would be cost prohibitive for the minimal benefit to the regional air quality. In addition, the use of natural gas powered engines in mining equipment is relatively new and some types of equipment would not be available for replacement with natural gas powered engines. The use of solar power to run large equipment has not been

tested and is not considered technologically feasible at this time. Similarly, retrofitting existing equipment with additional emissions control devices would be expensive with limited effect on regional air emissions.

OSMRE has not brought forward this alternative for full analysis because requiring natural gas and solar powered engine technology and retrofitting existing equipment is not economically or technically feasible for all equipment at the Freedom Mine; and would likely have substantially similar effects to an alternative that is analyzed.

2.5.3. Mining Plan with Reduced Disturbance Alternatives

Alternatives that would reduce the disturbance area were considered; however, we did not carry these forward for analysis because as described in the Background section of the EA, in 2005 the BLM granted federal coal Lease NDM 91535 to Coteau. Coteau subsequently gained approval to mine portions of federal coal Lease NDM 91535 in the WMA from the ASLM in 2011. As a result of these approvals mine operations were initiated in 2011 and mining has continued over the past five years, subject to PSC approved revisions. Alternatives that would consider a mining plan that is substantively different from the mining plan that has been implemented between 2011 and the present would not be consistent with the Purpose and Need and were not carried forward for analysis. Alternative mine plans including a reduced disturbance area that were substantially similar in design to the Proposed Action would have substantially similar effects and therefore were not carried forward for analysis.

3. Affected Environment and Environmental Consequences

This chapter discusses the existing conditions of the physical, biological, cultural, and human environment that could be affected by the alternatives described in ***Chapter 2.*** Following the description of the existing condition, potential direct, indirect, and cumulative impacts from each alternative are analyzed. The resources discussed in this chapter are ones that may have changed since the original analysis was completed in the 2005 EIS (BLM, 2005a). If the existing condition or potential impacts have not changed, please refer to the original EIS (BLM, 2005a) for discussion of additional resources.

3.1. Air Quality

3.1.1. Criteria Pollutants

The Clean Air Act (CAA) requires the EPA to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. EPA has set NAAQS for six principle pollutants, called criteria pollutants. The criteria pollutants include carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), particulate pollution ($PM_{2.5}$ and PM_{10}), and sulfur dioxide (SO_2). When a designated air quality area or airshed, in a state exceeds a NAAQS that area may be designated as a "nonattainment" area. Areas with levels of pollutants below the health-based standard are designated as "attainment" areas. To determine whether an area meets the NAAQS, air monitoring networks have been established and are used to measure ambient air quality and determine attainment status. In addition, the visibility in Class I areas (mainly national parks and wilderness areas) must be monitored based on the Regional Haze Rule (Clean Air Act 169A and 169B, 40 C.F.R 51, subpart P).

In North Dakota, the responsibility of monitoring the levels of criteria pollutants is held by the NDDOH. A network of 16 ambient air quality monitors across the state are used to monitor these pollutants; only 8 of the monitors are directly maintained by the NDDOH. Four monitors are industry-supported and the final monitor is a National Park Service site, located in the Theodore Roosevelt National Park-North Unit (TRNP), which qualifies as a Class I area. TRNP is located approximately 95 miles west of the Mine. The EPA also maintains a database of air pollutant levels at various sites across the country on their AirData website (EPA, 2015a). The Beulah monitor site and the EPA's Mercer County site are both located at 6024 Highway 200, which is north of the City of Beulah, southeast of the Mine, AVS, and DGC. Please refer to the NDDOH's map showing the monitoring sites ***Figure 4 North Dakota Air Quality Monitoring Network.*** Circles with Xs depict NDDOH ambient monitoring sites, plain circles are industry sites, with the exception of TRNP, which is operated by the National Park Service.

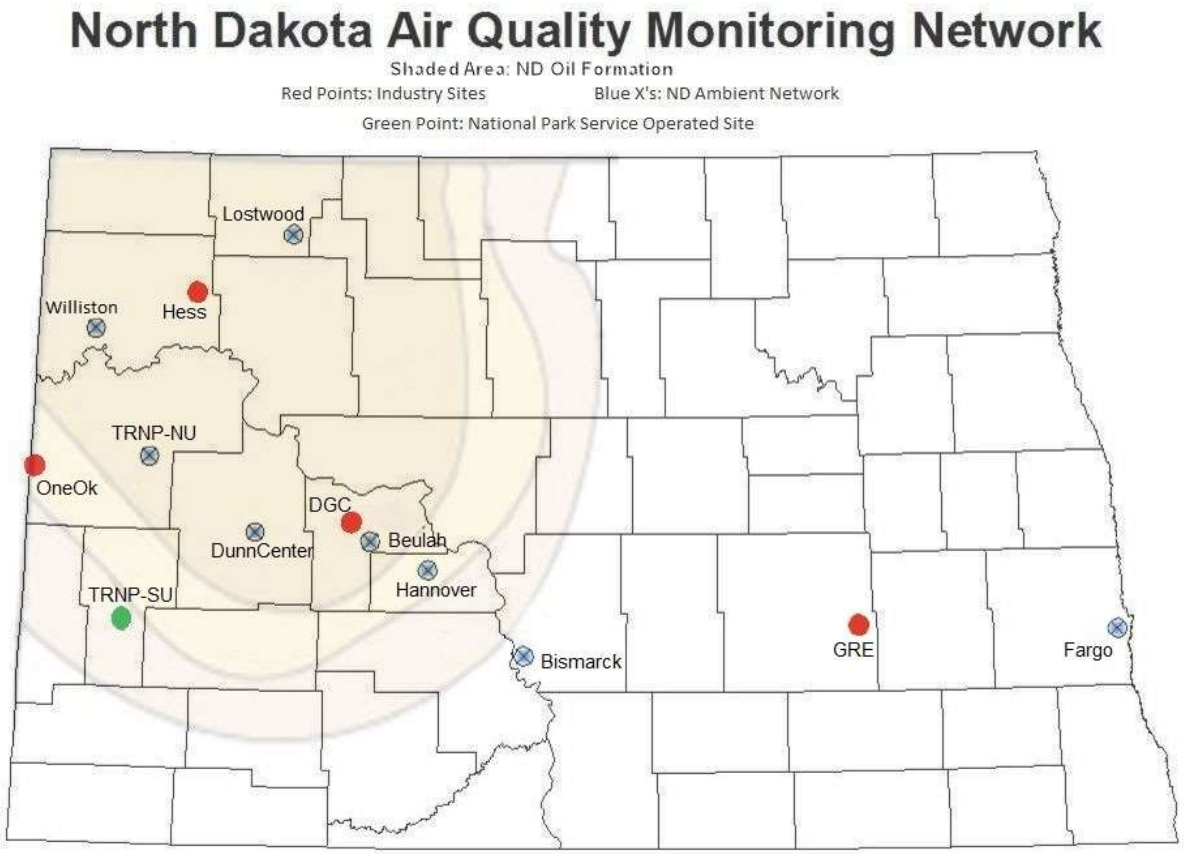

Figure 4 North Dakota Air Quality Monitoring Network

Table 3 NAAQS Levels lists the NAAQS and recorded levels at the Beulah and TRNP monitoring sites based on the NDDOH's 2013 *Annual Report, North Dakota Ambient Monitoring Network Plan* as well as reported levels from EPA's Mercer County site (NDDOH, 2013). Even though the EPA levels are more current, levels from both sources are listed. Federal standards for any NAAQS were not exceeded at any NDDOH reporting location. North Dakota was one of 13 states in 2015 in attainment for all criteria pollutants (EPA, 2015e).

Table 3 NAAQS Levels

Pollutant	Primary/ Secondary[1]	Averaging Time	Compliance Limit[2]	Form	2012 Beulah Site Levels	2012 TRNP Site Levels	2014 Mercer County Levels [3]
Carbon monoxide (CO)	Primary	8-hour	9 ppm	Not to be exceeded more than once per year	not reported	not reported	not reported
		1-hour	35 ppm				
Lead (Pb)	Primary and secondary	Rolling 3 month average	0.15µ/m^3	Not to be exceeded	not reported	not reported	not reported
Nitrogen dioxide (NO_2)	Primary	1-hour	100 ppb	98th percentile of 1-hour daily max. concentrations averaged over 3 years	24 ppb	10 ppb	24 ppb
	Primary and secondary	annual	53 ppb	Annual mean	2.7 ppb	1.2 ppb	not reported
Ozone (O_3)	Primary and secondary	8-hour	75 ppb	Annual 4th-highest daily max. 8-hour concentration, averaged over 3 years	60 ppb	60 ppb	58 ppb
$PM_{2.5}$	primary	annual	12 µ/m^3	Annual mean, averaged over 3 years	6.2 µ/m^3	8.1 µ/m^3	6 µ/m^3
	secondary	annual	15 µ/m^3	Annual mean, averaged over 3 years	6.2 µ/m^3	8.1 µ/m^3	6 µ/m^3
	Primary and secondary	24-hour	35 µ/m^3	98th percentile, averaged over 3 years	16.9 µ/m^3	17.4 µ/m^3	17.3 µ/m^3
PM_{10}	Primary and secondary	24-hour	150 µ/m^3	Not to be exceeded more than once per year on average over 3 years	12.1 µ/m^3	9.4 µ/m^3	37.5 µ/m^3
Sulfur dioxide (SO_2)	primary	1-hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years	28 ppb	10.1 ppb	23 ppb
	secondary	3-hour	50 ppb	Not to be exceeded more than once per year	30 ppb	10 ppb	not reported

[1] Primary standards provide public health protection (asthmatics, children, elderly, etc.), while secondary standards provide public welfare protection (visibility, damage to crops, danger to animals, etc.).
[2] Ppm=parts per million; ppb=parts per billion; µ/m^3=micrograms per cubic meter of air
[3] Preliminary statistics; annual statistics are not final until May 1, 2015

In addition to criteria pollutants, the EPA regulates a list of hazardous air pollutants (HAPs). HAPs are pollutants that cause or may cause cancer, serious health effects, or adverse environmental and ecological effects. The CAA Amendments of 1990 lists 187 HAPs, including pollutants such as asbestos, chlorine, and mercury compounds. Most air toxics are generated from mobile or stationary, human-made sources. Major stationary sources are sources that emit 10 tons per year of any listed HAP. Area sources are defined as smaller facilities that release less than 10 tons per year of any listed HAP. Stationary source facilities must report their releases to the EPA through the Toxics Release Inventory (TRI) Program (EPA, 2015f).

3.1.2. Greenhouse Gases/Climate Change

The term "global warming" refers to the observed increase in the average global temperature of the atmosphere near the Earth's surface and in the troposphere (CCSP, 2009). Through complex interactions on a global scale, the emissions of greenhouse gases (GHGs), along with other climate-influencing environmental factors, cause a net warming of the atmosphere. GHGs include CO_2, methane (CH_4), N_2O, water vapor, ozone and several other gases. These are called GHGs because when released into the atmosphere they impede the escape of reflected solar radiation and heat from the Earth's surface back into space. In this way, the accumulation of GHGs in the atmosphere exerts a "greenhouse effect" on the earth's temperature. GHG emissions can be anthropogenic (human-made) or naturally occurring (e.g., volcanic activity). Other than GHG emissions, factors that contribute to global warming include aerosols, changes in land use, and variations in cloud cover and solar radiation which affect the absorption, scattering, and emissions of radiation within the atmosphere and at the Earth's surface. The average global temperature increased 0.85°C from 1880-2012; during the period from 1901 to 2012, almost the entire plant experienced higher surface temperatures. Because temperature is a part of climate, the phenomenon of global warming is both an element of and a driving force behind climate change (IPCC, 2014).

Climate is defined as the average course or condition of the weather at a place usually over a period of years as exhibited by temperature, wind velocity, and precipitation (Merriam-Webster, 2014). The term "climate change" refers to a substantial and persistent change in the mean state of global or regional climate or its variability, usually occurring over decades or longer (CCSP, 2009). Climate change occurs in response to changes in various aspects of Earth's environment, including, but not limited to, global warming, regular changes in earth's orbit around the sun, and volcanic eruptions (IPCC, 2014). These climatic changes, while impacts in and of themselves, can affect other aspects of the environment including desert distribution, sea level, species distribution, species survivability, ocean salinity, availability of fresh water, and disease vectors. These effects can vary from region to region over time; some agricultural regions may become more arid while others become wetter; some mountainous areas may experience greater summer precipitation, yet have their snowpack disappear in the future (IPCC, 2014). Thus, the causes and effects of climate change can be depicted as a four step chain of events: GHG emissions/climate drivers→ global warming → climate change → environmental effects. First, GHGs are emitted and other events occur which contribute to climate change in the form of

global warming. Second, climate change contributes to environmental effects around the globe. Greenhouse gases directly emitted from the mining of coal are from diesel and gasoline-powered vehicles. Indirectly, GHGs are also produced from the generation of electricity used on the mine site and from transporting the coal to the end user once it is mined. The U.S. Energy Information Administration estimates that in 2013 approximately 1.52 billion metric tons of CO_2 were emitted from diesel and gasoline combustion in the U.S. (EIA, 2014).

On December 18, 2014, the Council on Environmental Quality (CEQ) issued revised draft guidance "to provide Federal agencies direction on when and how to consider the effects of GHG emissions and climate change in their evaluation of all proposed federal actions in accordance with NEPA and CEQ Regulations implementing NEPA" (CEQ, 2014). This revised draft guidance is intended to describe controlling requirements under NEPA and the CEQ regulations, and indicates that NEPA requires the documentation of the proposed Project's impacts on GHG emissions and climate change. CEQ's revised draft guidance indicates that NEPA requires not only the documentation of the proposed Project's potential impacts on GHG emissions, but also the need to assess how climate change would affect the proposed Project. Climate-related impacts are occurring across regions of the country and across many sectors of our economy. Many state and local governments are already preparing for the impacts of climate change through "adaptation," which is planning for the changes that are expected to occur (EPA, 2015c).

An approach to evaluate the possible monetary impacts of climate change is the "social cost of carbon" (SCC) protocol. The SCC protocol was developed for use in cost-benefit analyses for proposed regulations that could impact cumulative global GHG emissions (USEPA 2013). The SCC estimates economic damages associated with increases in carbon emissions and includes, but is not limited to changes in net agricultural productivity, human health, and property damages associated with increased flood risks.

The SCC is typically expressed as the cost in dollars per MT of emissions and there is a wide range of costs, with the greatest influence on costs caused by the discount rate. The discount rate is a measure to estimate the present value for costs/damages that may occur far out into the future. For 2020 emissions, the range in SCC presented by the USEPA is $13/MT to $137/MT, represented as 2011 dollars (USEPA 2013).

OSMRE has elected not to specifically quantify the SCC. First, the GHG emissions associated with the project are mostly from the indirect effects of coal combustion, and there is no consensus on the appropriate fraction of SCC tied to electricity generation that should be assigned to the coal producer. In addition, there is no certainty that GHG emissions at DGC, LOS or AVS would actually be reduced if Freedom Mine coal from the Project Area was not mined, given that the Freedom Mine has substantial non-federal coal reserves that could be mined (see Section 2.3). Also, in order to provide any meaningful insight, the projected SCC would need to be viewed in context with other Project costs and benefits associated with the Proposed Action. Given the uncertainties associated with assigning a specific and accurate SCC

to the Project, and the uncertainties that indirect GHG emissions would actually be reduced under any reasonable Project alternatives, OSMRE has elected to quantify direct and indirect GHG emissions and evaluated these emissions in the context of state and national GHG emission inventories (***Section 3.1.3.1***).

On a Federal level, EPA and other agencies have implemented various programs to encourage the reduction of GHG emissions to address climate change. EPA has promulgated rules under the CAA to regulate greenhouse gas emissions, most recently finalizing rules under Section 111(d) of the CAA to cut carbon emissions from existing fossil fuel-fired power plants. The rule is commonly referred to as "the Clean Power Plan". The Clean Power Plan would establish goals for carbon reduction from power plants, but the states would determine the means of achieving the standards: "EPA's guidelines provide flexibility and encourage states to look across their whole electric system to identify strategies to include in their plans that reduce carbon pollution from fossil fuel- fired power plants" (EPA, 2015d). Under the final Clean Power Plan, North Dakota will be required to reduce CO_2 emissions from existing power plants on the order of 45 percent. The clean power plan will not directly regulate emissions from the Mine, but will regulate emissions from downstream users of the coal produced by the Mine.

3.1.3. Emission Sources

Direct Emissions

Particulate and gaseous air pollutants are emitted during the coal mining process. The Mine currently operates under North Dakota Air Pollution Control Minor Source Permit to Operate #085004. The NDDOH sets standards to ensure operations under the Minor Source Permit are within state and Federal air quality regulations. Coteau submits an annual air emission report for sources generating reportable emissions. At the Mine the only reportable sources are two, 54-inch conveyors in the coal-handling fines building and a dust collector in the baghouse. In 2014, these sources emitted approximately 2.65 tons of total particulates (Coteau, 2014a). Please refer to ***Appendix B, Air Emissions Information,*** for a copy of the annual air emission report and calculations.

Other sources of direct emissions from mining are fugitive emissions from coal excavation and reclamation activities and tailpipe emissions from equipment. Fugitive particulate emissions result from dust being generated during dragline operations, coal haulage, bulldozers, scrapers, loaders, and other equipment operating on the Mine, coal stockpiles, and reclamation activities.

One air pollutant of note that is created during the surface coal mining process is black carbon. Black carbon is a light-absorbing, fine particulate ($PM_{2.5}$) that is formed by the incomplete combustion of fossil fuels, biofuels, and biomass. The Clean Air Task Force estimates that each gallon of diesel fuel burned emits 1.2 grams of black carbon (2009). Based on the amount of diesel fuel used at the Mine, approximately 10.4 tons of black carbon was generated per year from 2005 to 2014.

Another group of pollutants are nitrogen oxides (NO_x). NO_x is formed when fuel is combusted, such as from vehicles, off-road equipment, fires, and power plants. These emissions can create particulate matter and ground-level ozone, as well as contribute to respiratory issues. NO_x levels are tracked by the criteria pollutant NO_2. North Dakota is in attainment for NO_2 levels, as previously shown by ***Table 3 NAAQS Levels.*** NO_x is created at the Mine by the burning of diesel and gasoline and, in very small amounts, by coal blasting. On average from 2012 to 2014, approximately 0.002 pounds of NO_x was created from blasting for each ton of coal that was mined. (EPA, 1995).[4] Please refer to ***Appendix B, Air Emissions Information,*** for calculations relating to blasting NOx emissions. The PSC has regulations in place limiting the distance of a blast from residences and other buildings. These setback distances are in place to ensure ground vibration does not damage structures or injure people, but also limits the amount of gases released from the blast that may reach buildings in the vicinity (NDCC, 2004). In addition, residences within a half mile of blasting are notified on a daily basis during blasting. Within a half-mile of the Federal coal included in the proposed action two residences exist. Please refer to the blasting map located in ***Appendix C, Maps***, which shows residences within a one-mile radius of the entire mine. An electric substation, Coteau's office building, and AVS are also located within a half-mile radius of the Federal coal included in the proposed action. To date, neither the PSC nor Mine has received a public complaint regarding gases or emissions from blasting.

Indirect Emissions

As previously discussed, the Freedom Mine sells coal to three facilities: DGC, AVS, and LOS. DGC is the only facility in the United States that gasifies coal into natural gas and other byproducts. AVS and LOS are both coal-fired power plants. AVS is a 900 megawatt facility with two generating units; one that began commercial operation in 1984 and the second that began operating in 1986. LOS also has two generating units with a combined output of 669 megawatts; the first unit began operations in 1966 and the second came online in 1975. These plants work by combusting coal to heat water, which generates steam. This steam turns a turbine connected to a generator. The generator produces electricity using magnets spinning against wire coils. The electricity is then delivered to customers through transmission lines.

On a yearly basis, approximately 44 percent of the coal from the Freedom Mine goes to DGC, 37 percent goes to AVS, and the remaining 19 percent is delivered to LOS. DGC, AVS, and LOS each maintain Title V Permits to Operate, issued by the NDDOH. These permits are required for any operations that emit 100 tons per year or more of a criteria pollutant or 10 tons per year of a HAP or 25 tons per year or more of any combination of HAPs. Each facility has technology in place that reduces the amount of pollutants from coal combustion to levels acceptable under NDDOH and EPA regulations. DGC captures much of their CO_2 emissions and transports them by pipeline to the oil fields in Saskatchewan, Canada. There, the CO_2 is used for enhanced oil recovery and is sequestered in the ground. In 2013 through the EPA's greenhouse gas reporting

[4] NO_x amount calculated by using the EPA's AP-42 emission factor of 17 lbs. of NO_x generated per ton of ANFO used for blasting.

requirements, DGC reported approximately 2.3 million metric tons of CO_2 were released. Even though more coal was delivered to DGC than AVS, DGC's emissions into the atmosphere were lower than AVS' because of their unique sequestration process.

Mercury is a naturally occurring element. It is released when coal is combusted, chlorine is produced, hazardous chemicals are burned, or when mercury-containing products are broken down. Once released into the atmosphere, mercury settles back onto land or into water. Once settled, microorganisms can transform it into methylmercury, which is highly toxic. Mercury can cause health effects such as harm to the brain, heart, kidneys, lungs, and immune system if exposure levels are high enough. It can also have ecological impacts, particularly to fish, birds, and mammals that eat fish. Mercury exposure to ecological communities can cause reduced reproduction, slow growth and development, and death. When coal from the Mine is combusted, mercury is released.

3.1.4. Direct and Indirect Impacts to Air Quality from Alternative A

Direct Impacts

The mine plan proposed under Alternative A would not increase production above that planned in the original EIS. Operations at the Mine are not anticipated to substantially change. The amount of particulate and gaseous air pollution is also not anticipated to increase from current levels. Dust suppression techniques are utilized throughout Mine operations to manage fugitive particulate emissions. One common dust suppression technique is to apply water from sedimentation ponds to gravel roads throughout the Mine.

Based on the average amount of NO_x generated from blasting per ton of coal, an estimated 5,500 pounds per year for the seven years of mining would be generated from mining of the Federal coal. This would represent approximately 28 percent of the total Mine NO_x emissions from blasting during the years the Federal coal was mined.

Assuming the amount of diesel fuel combusted stays consistent, the amount of black carbon generated from mining the Federal coal in the preferred alternative would be approximately 2.9 tons per year.[5]

Specifically, it is estimated that the mining of the Federal coal proposed in Alternative A would equate to approximately 230,000 gallons of diesel fuel and less than 4,000 gallons of gasoline on average per year. This equals approximately 2,535 short tons of CO_2 emissions per year from the mining of the Federal coal in the WMA.[6]

[5] Black carbon generated from mining the Federal coal in the preferred alternative was calculated using the ratio of the amount of Federal coal projected to be mined from the preferred alternative per year (3.7 million tons) to the average coal mined per year in the history of the mine (13.3 million tons).
[6] 1 gallon gasoline=19.64 pounds CO_2. 1 gallon diesel=22.38 pounds CO_2

Direct emissions from equipment used on the Mine to mine the Federal coal proposed with this alternative were estimated using the average total hours per year from 2004 to 2014 that each fleet-type was operated and the emission factors for that engine. Emission factors for hydrocarbons HC/NO_x, CO, and PM were received directly from the engine manufacturer. [7] The emission factor for CO_2 was derived from the amount of diesel fuel used. Emission factors for SO_X and TOC were taken from EPA's *AP-42, Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources* (1995).[8] These amounts are reported in ***Table 4 Direct Fleet Emissions.***

Table 4 Direct Fleet Emissions

	Average Annual Tons of Emissions for Federal Coal				
Fleet	**NO_x[9,10]**	**CO[8]**	**PM[8]**	**SO_X[11]**	**CO_2[12]**
Motor Graders	24	9	1	1	102
Track Dozers	76	25	1	3	200
Overburden Trucks	259	66	7	10	531
Overburden Shovels	15	9	0	1	121
Rubber Tire Dozers	29	5	0	1	375
Scrapers	12	12	1	1	194
Coal Trucks	110	28	3	4	302
Front End Loaders	43	6	1	1	710
Total	566	159	13	23	2,535

Table 5 Total Direct Emissions shows the emissions from both the proposed mining of Federal coal and non-Federal coal. As a result of the proposed action, direct and indirect air quality impacts would not differ from impacts in the past, as the same amount of coal will be mined and delivered to customers.

[7] Calculations were completed using the formula: tons of emissions=(x g/kw-hr*y kw*z average total hours)/907,185 g
[8] Calculations were completed using the formula: tons of emissions=(x lb/hp-hr*y hp*z average total hours)/2,000 lb
[9] Emission factors from engine manufacturer data. Calculations were completed using the formula: tons of emissions=(x g/kw-hr*y kw*z average total hours)/907,185 g
[10] Assumed value based on combined NO_x and HC certifications, with the exception of the front end loaders which had a direct NO_x emission factor
[11] Emission factors from EPA's *AP-42*. Calculations were completed using the formula: tons of emissions=(x lb/hp-hr*y hp*z average total hours)/2,000 lb
[12] Emission total calculated directly from diesel fuel usage. Individual fleet amounts based on percentage of total usage.

Table 5 Total Direct Emissions

	From Federal coal, tons (A)	From non-Federal Coal, tons (B)	Total Freedom mine coal (A+B)	Average historical Freedom mine, tons	Change in total Freedom Mine emissions, tons
NO_x[13]	8,018	20,616	28,634	28,634	0
CO	159	391	550	550	0
PM	14	36	50	49	0
SO_X	23	60	83	83	0
CO_2	2,535	6,577	9,112	9,112	0
Black carbon	3	8	11	10	0

In the early 1990s, Coteau established an ambient air quality monitoring system to monitor PM_{10} emissions. This system was established under the direction of the NDDOH as a condition of the Minor Source Permit to Operate. Four monitoring sites were setup across the Mine:

- Site #5, located on a hilltop in native grassland
- Site #6, located in an abandoned farmstead on the edge of cropland
- Site #7, located next to a gravel road (County Road 9) on the edge of cropland
- Site #8, located next to a gravel county road on the edge of cropland

Wedding PM_{10} monitors were used at each location. Data analysis and collection was completed by Huntingdon Engineering and Environmental, Inc. Nine consecutive, quarterly reports from 1993 to 1995 were submitted to the NDDOH. These reports detailed the methods for monitoring and analysis and reported the highest 24-hour concentrations and quarterly averages at each site. Results from monitoring are summarized in a table located in ***Appendix B, Air Emissions Information.*** During the monitoring period, no exceedances of the NAAQS standard (150 μ/m^3) were recorded. In a letter dated May 15, 1995, the NDDOH approved the discontinuance of PM10 monitoring effective the end of July 1995. This letter can also be found in ***Appendix B, Air Emissions Information.***

When PM_{10} monitoring was completed at the Mine, no NAAQS existed for $PM_{2.5}$. Although $PM_{2.5}$ levels do not necessarily track with PM_{10} levels, a conservative estimate of primary $PM_{2.5}$ was calculated based on emission factors from EPA's AP-42. Those emission factors were used to calculate the fraction of PM_{10} that is $PM_{2.5}$. This calculation suggested approximately 55 percent of primary PM_{10} emissions to be comprised of $PM_{2.5}$. Highest 24-hour $PM_{2.5}$ concentrations at each site were then estimated from PM_{10} emissions based on the 55 percent factor. The calculated 95th percentile of estimated $PM_{2.5}$ concentrations for each year, using available data (2 quarters for 1993, 4 quarters for 1995 and 3 quarters for 1995) were averaged to

[13] Includes NOx from vehicle emissions and blasting.

represent a three-year average used by NAAQS. Again, no site experienced average PM 2.5 levels greater than the NAAQS standard of 35 μ/m^3. Results from these estimates are shown in tables located in ***Appendix B, Air Emissions Information.***

The NDDOH conducts bi-annual inspections of the Mine to ensure compliance with conditions in the Minor Source Permit to Operate and dust control plan.

Indirect Impacts

Indirect emissions resulting from the combustion of Federal coal proposed in this alternative were calculated based on emissions from each facility. A representative year, or years, of data was chosen to provide a reasonably conservative estimate of indirect emissions from the Federal coal from Freedom Mine. Emissions from 2014 were utilized for both DGC and LOS, while emissions from 2012 to 2014 were averaged for AVS. Different years of analysis were used for the facilities due to different source units being reported for each year. In order to remain consistent, the year or years with the most source units were used. Emission data was derived from the NDDOH and Annual Emissions Inventory Reports (2014-2012). Federal coal combusted at each facility was then estimated based on average coal deliveries and the amount of coal the Federal coal would make up during the seven years it would be mined. These emission estimates are located in ***Table 6 Average Yearly Indirect Emissions for the Proposed Action.***

Table 6 Average Yearly Indirect Emissions for the Proposed Action

	Average Yearly Tons of Emissions for Proposed Action		
	DGC	**AVS**	**LOS**
PM_{10}	260	156	107
$PM_{2.5}$	219	110	57
SO_2	1,062	3,713	308
NO_x	900	3,023	1,409
VOC	107	31	31
CO	621	359	163
CO_2e	649,292	2,103,326	940,545

For comparison, the total indirect emissions from the combustion of all coal mined at the Freedom Mine are shown in ***Table 7 Average Yearly Indirect Emissions for All Freedom Mine Coal.*** These emissions would remain the same regardless of the Federal coal combusted as the coal quantities combusted at DGC, AVS, and LOS would remain the same.

The hourly SO_2 and NO_x emission rates are determined from available CEM data provided by the NDDOH (NDDOH, 2015). CEM data is available for 2010-2014 and the emissions are presented here as the 99^{th} percentile for SO_2 and 98^{th} percentile for NO_x for each year of data in ***Table 8 Hourly emissions by year for 2010-2014.*** The hourly emissions from federal coal and all coal combusted are the same.

Table 7 Average Yearly Indirect Emissions for All Freedom Mine Coal

	Average Yearly Tons of Emissions for all Freedom Mine Coal		
	DGC	AVS	LOS
PM10	934	563	386
PM2.5	786	396	204
SO2	3,818	13,347	1,108
NOx	3,236	10,868	5,065
VOC	386	110	112
CO	2,231	1,291	587
CO2e	2,334,177	7,561,365	3,381,219

Table 8 Hourly emissions by year for 2010-2014

	Hourly 98th and 99th Percentile Indirect Emissions for 2010 through 2014 - lb/hr		
	DGC	AVS	LOS
2010 SO2 99th percentile	1,843	3,673	15,452
2011 SO2 99th percentile	2,394	3,798	15,386
2012 SO2 99th percentile	1,860	3,522	15,898
2013 SO2 99th percentile	932	3,521	5,221
2014 SO2 99th percentile	1,122	3,561	656
2010 NOx 98th percentile	875	4,102	2,082
2011 NOx 98th percentile	874	3,771	1,952
2012 NOx 98th percentile	856	3,817	1,898
2013 NOx 98th percentile	843	3,789	2,050
2014 NOx 98th percentile	850	3,576	2,151

NDDOH relies on regional monitors in the state monitoring system as shown in ***Figure 4 North Dakota Air Quality Monitoring Network*** to demonstrate attainment of the NAAQS. North Dakota policy is that applicable facilities report emissions as required by their permit and that air quality attainment is maintained as demonstrated by the regional monitoring network. As such, facility specific ambient air quality modeling data is not available for demonstration of NAAQS attainment. North Dakota is in attainment of all criteria pollutants. Historical annual and hourly emissions may be compared to the monitored results to relate a level of ambient air quality associated with the reported or estimated emissions. Because the proposed action does not propose a change in either direct or indirect emissions, the monitored ambient air is expected to continue to have consistent concentrations of monitored pollutants as related to the proposed action.

In 2015 the EPA notified the NDDOH that in the implementation of the 2010 1-hour NAAQS local SO_2 concentrations would need to be characterized near certain isolated emission sources. LOS was one of these sources (AECOM 2015). Thus, 1-hour SO_2 modeling estimates are available for LOS. This characterization covered a three year modeling period (2012-2014), however, mid-way through 2013 LOS installed SO_2 wet scrubbers on both combustion units. Because three years of actual emissions using the scrubbers were not available, at the direction of

the NDDOH, the Best Available Retrofit Technology (BART) Permit Allowable emission rate was modeled as a conservative estimate of hourly emissions (equivalent to 1,162.8 lb/hr at maximum load). The modeled 99th percentile daily 1-hour maximum concentration from LOS is 11 ppb (AECOM 2015). Additionally, LOS showed no culpability in the immediate area and minimal culpability in downwind areas to overall SO_2 concentrations (AECOM 2015). The low modeled concentrations and minimal culpability demonstrated in this characterization further confirm SO_2 NAAQS attainment by LOS.

Please refer to ***Figure 5 AVS CO2e emissions*** and ***Figure 6 LOS CO2e emissions*** (NDDOH, 2015). In addition to practices such as sequestration in the gasifying of coal at DGC, advances in technology and efficiency have allowed coal-fired power plants across North Dakota to greatly reduce their CO_2 and other emissions. Electrostatic precipitators and filters remove a majority of fly ash from the combusted coal. Low NOx burners have helped reduce nitrogen oxide emissions. Recent regulations such as the Clean Power Plan may require additional reductions in CO_2 emissions at AVS and LOS. The Clean Power Plan set CO_2 emissions limits from power generation on each state. In North Dakota, the Clean Power Plan will require emission reductions of up to 45 percent. Research and development continues to occur regarding additional avenues for utilization of CO_2 generated from power plants. Some technologies currently being researched include geological sequestration, the allam cycle, and enhanced oil recovery. Please refer to ***Figure 7 CO2e emissions from North Dakota coal-fired power plants*** (NDDOH, 2015).[14]

[14] CO_2e reported in Figure 5, Figure 6, and Figure 7 is CO_2 only prior to 2010. From 2010 to present, emissions are CO_2e. All the information that was available from the NDDOH is presented in these graphs.

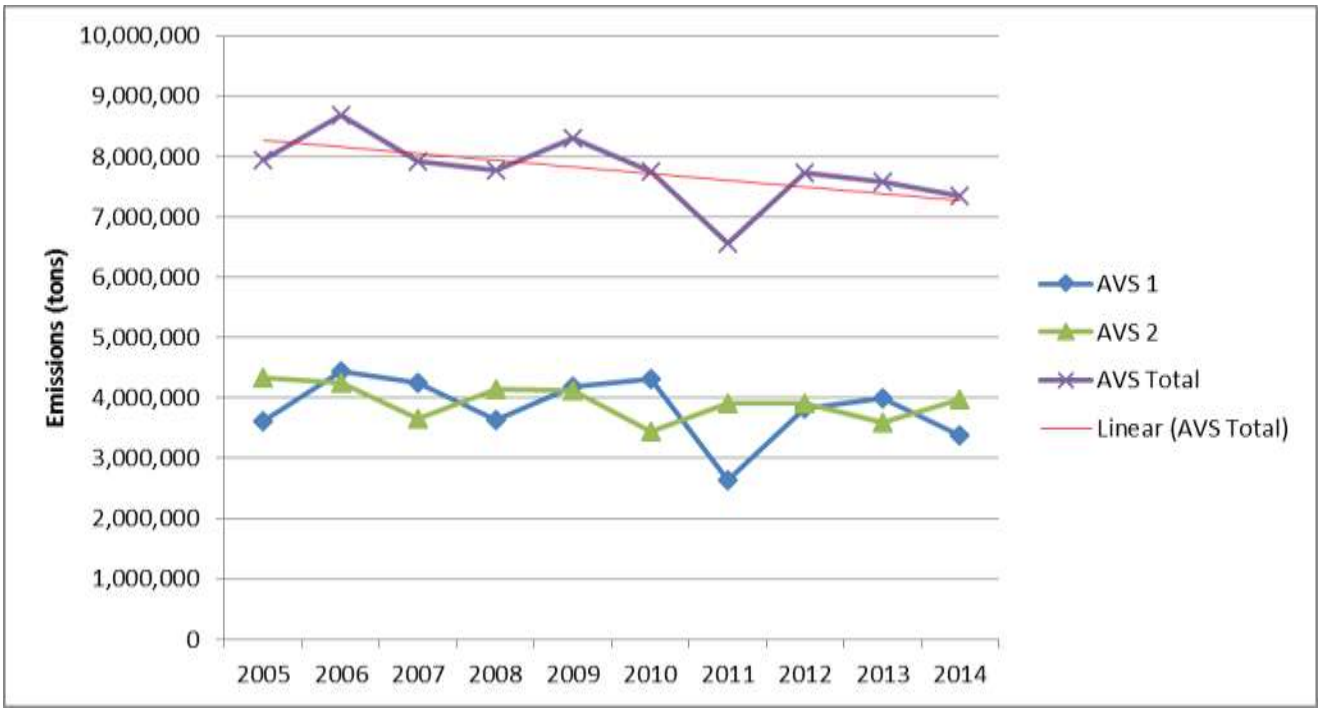

Figure 5 AVS CO2e emissions

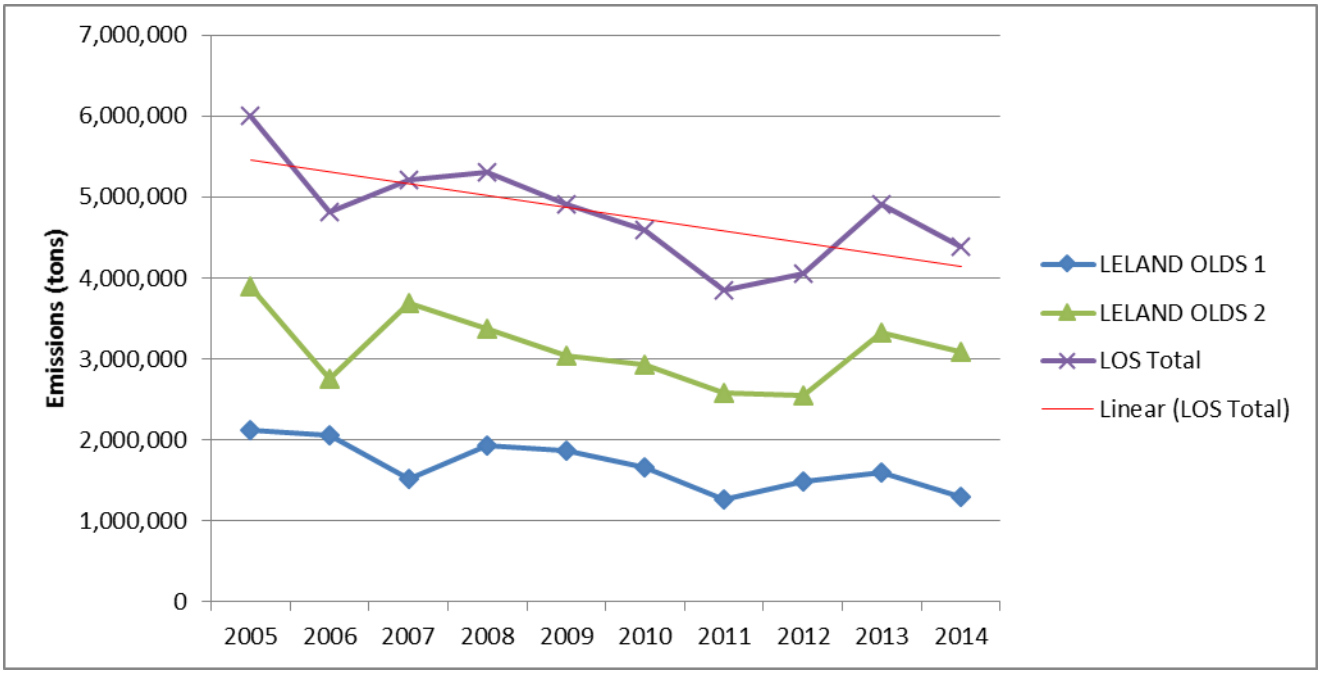

Figure 6 LOS CO2e emissions

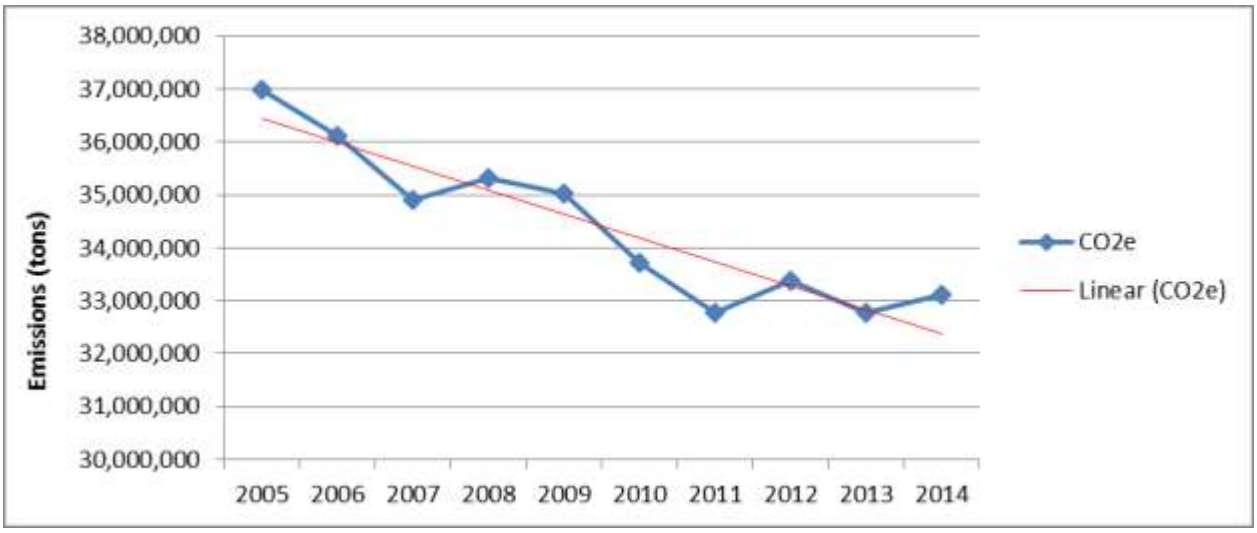

Figure 7 CO2e emissions from North Dakota coal-fired power plants

No expected changes in greenhouse gas emission rates as compared to current emission rates are anticipated from mining under Alternative A as operations at the mine will not change significantly from historic mining.

In addition to CO_2, other airborne pollutants are produced during the combustion and gasification of coal. These emissions are reported to the NDDOH on a yearly basis. The levels of NO_x, SO_2, and PM within the state of North Dakota have been steadily decreasing due to implementation of Best Available Retrofit Technology (BART) controls on BART eligible facilities. As part of the Supplement No. 2 to Regional Haze State Implementation Plan (2013), the NDDOH did a BART analysis on LOS. The NDDOH analyzed five BART eligible units at LOS:

1. Unit 1 boiler
2. Unit 2 boiler
3. Auxiliary boiler
4. Fire pump
5. Materials handling equipment

Each unit was evaluated using an iterative process that involved first identifying all available technologies, eliminating technically infeasible options, evaluating effectiveness of technologies, impacts, and visibility results, and finally, selecting the BART. The NDDOH determined the BARTs for the unit 1 boiler include a wet scrubber for SO_2, no additional controls for filterable PM, wet scrubber for condensable PM, and selective non-catalytic oxidation plus separated overfire air for NO_x. The unit 2 boiler BARTs included a wet scrubber for SO_2, no additional controls for filterable PM, a wet scrubber for condensable PM, and selective non-catalytic reduction plus advanced separated overfire air for NO_x. For the auxiliary boiler, NDDOH determined the BART were no additional controls as the unit is only used when both unit 1 and 2 boilers are down and the annual average emissions are low. In a similar determination, the NDDOH found no additional controls were the BART for the fire pump as it is used for

emergency purposes only. The materials handling equipment are controlled by rotoclones and the NDDOH determined no additional controls were the BART.

Additional NO_x reductions have also been made, as discussed in the North Dakota State Implementation Plan. Low NO_x burners and advanced over-fire air for NO_x control were installed in one unit at AVS in 2014; the upgrades resulted in reductions in NO_x emissions. The same upgrades will be installed in the spring of 2016 at AVS' second unit, further reducing NO_x emissions. Please refer to ***Figure 8 North Dakota point source NOx emissions*** and ***Figure 9 North Dakota point source SO2 emissions*** (NDDOH, 2015).

Power plants within North Dakota report mercury emissions to the NDDOH. Much like NO_x and SO_2, improvements in technology have resulted in decreasing emissions of mercury. The EPA's Mercury and Air Toxics Standards (MATS) set emissions standards on all HAPs. Recently enacted Maximum Achievable Control Technology (MACT) Standards require the installation of mercury controls to achieve over 50 percent reduction from historical levels starting in June 2015. More specifically, these controls have been operational at AVS since June 1, 2015. This effectively provides greater reduction of mercury emissions from North Dakota emission sources. Please refer to ***Figure 10 Mercury emissions from North Dakota coal-fired power plants.***

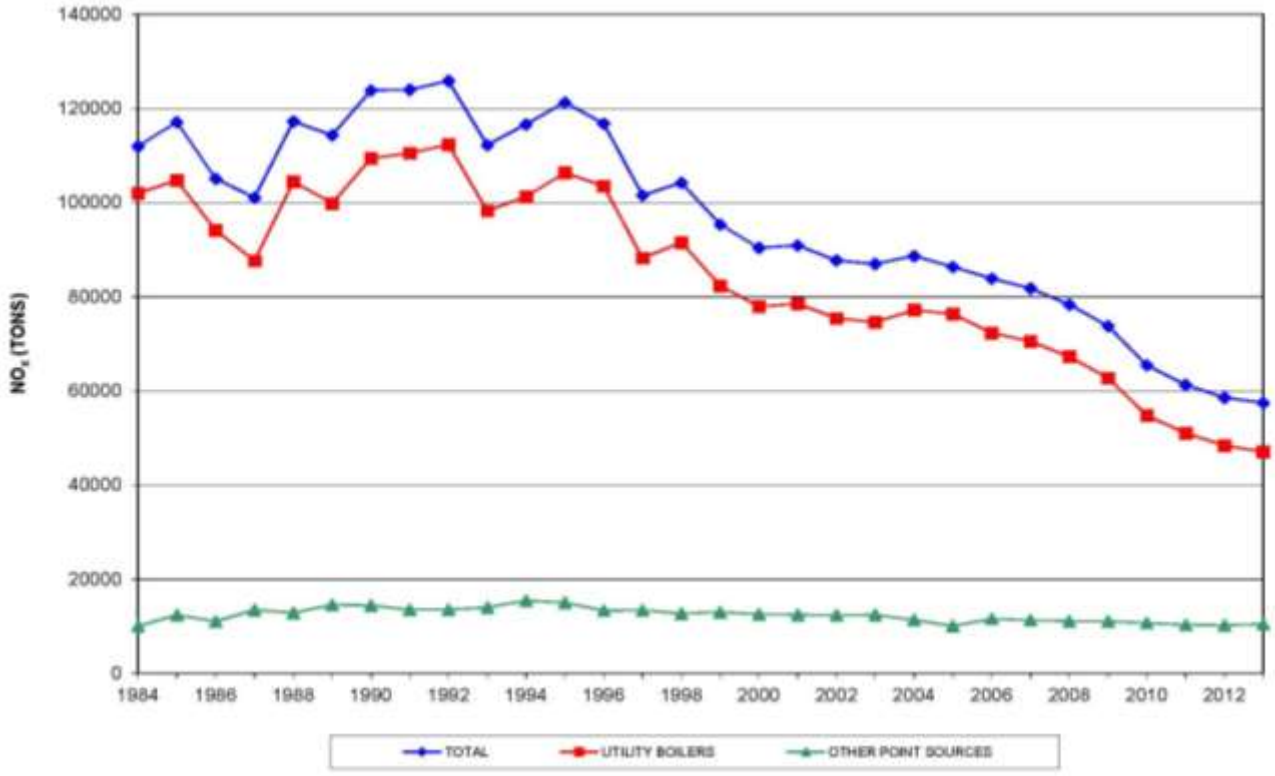

Figure 8 North Dakota point source NOx emissions

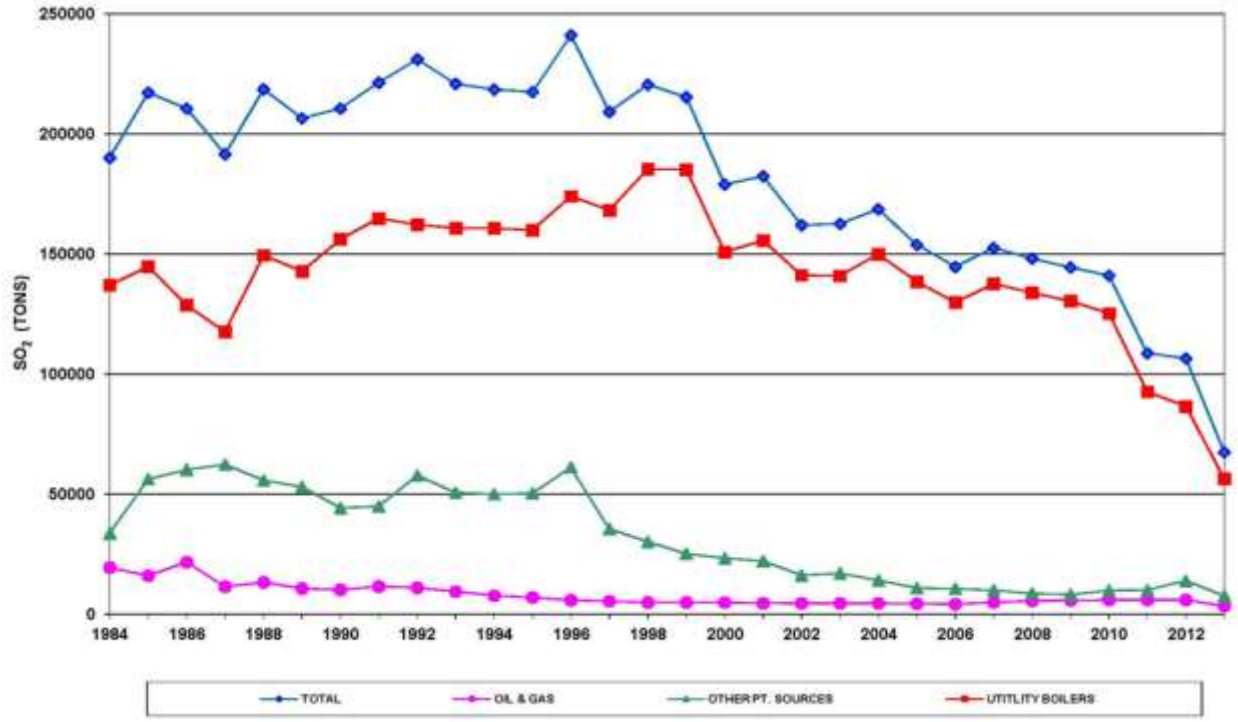

Figure 9 North Dakota point source SO2 emissions

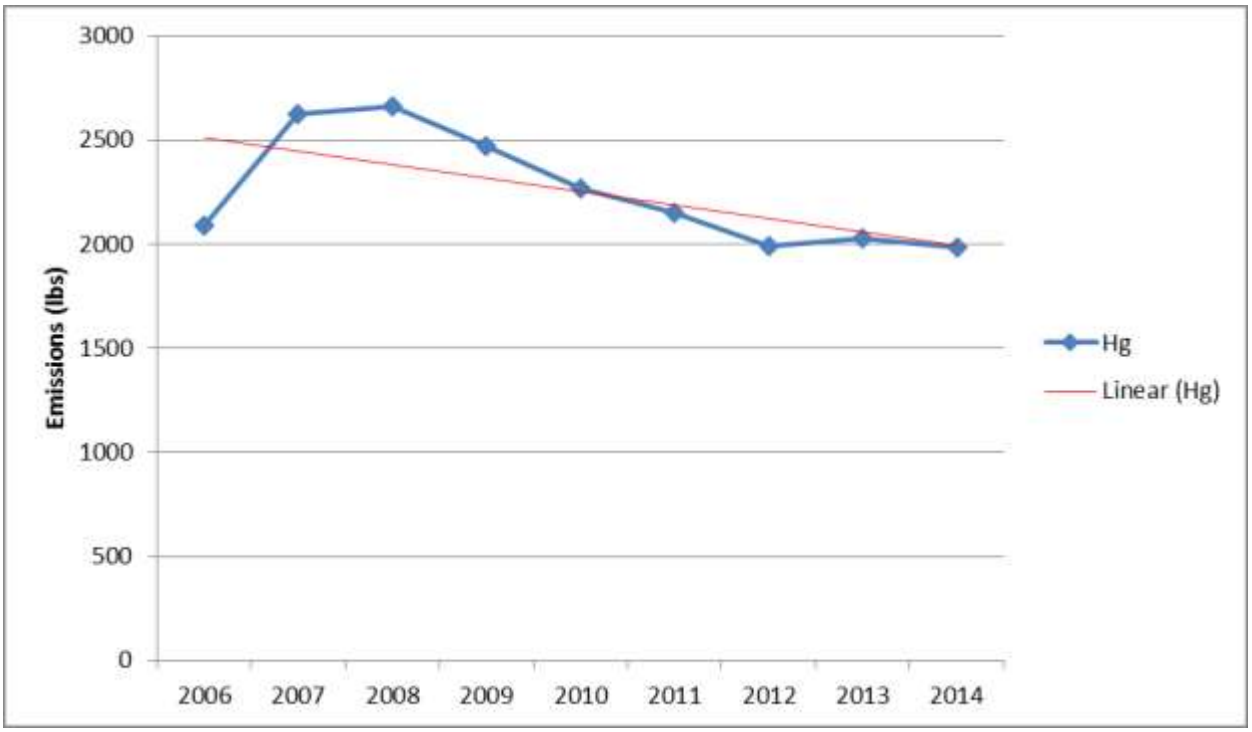

Figure 10 Mercury emissions from North Dakota coal-fired power plants

DGC, AVS, and LOS operate under Title V Permits to Operate. The permits are legally-enforceable documents that detail what the facilities must do to control air pollutants. These

permits are issued and enforced by the NDDOH as required by the Clean Air Act. Each permit specifically documents limits of air pollutants for each emitting source unit. Reporting requirements are also described in the Title V permits. These permits can be found on the NDDOH website for air quality permits.

Dispersion modeling for criteria pollutants has been completed for the facilities in accordance with requirements outlined by the NDDOH in their *Policy for the Control of Hazardous Air Pollutant Emissions in North Dakota (Air Toxics Policy).* In addition, the *Air Quality Dispersion Modeling Analysis Guide* helps facilities develop modeling protocols. This guide is consistent with EPA's *Guideline on Air Quality Models*, but provides additional clarification and specification to regulatory requirements in North Dakota. The models analyzed potential impacts to the airsheds surrounding the facilities as well as to the Class I area of Theodore Roosevelt National Park. A detailed, three-tiered modeling procedure is used to calculate the maximum off-property, ground level ambient concentration of HAPs. Each tier involves a more refined modeling process. If a tier of modeling results in compliance with pollutant standards, the successive tiers of modeling are not required.

The modeling conducted for Title V Permits to Operate demonstrated NAAQS compliance based on the permit limits and conditions. Therefore, it is expected that if each facility is in compliance with its permit limits and conditions the NAAQS would not be exceeded.

Lignite coal from the Freedom Mine would continue to be combusted at receiving facilities DGC, AVS, and LOS; even if the mining of the federal coal proposed by this document did not change. Because the amount of coal scheduled to be combusted by the facilities (or used as a chemical feedstock for gasification or for other products by DGC) is not anticipated to increase as a result of either alternative discussed here, emission amounts of CO_2, as well as criteria pollutants and HAPs, would remain consistent with historical levels which have been approved by the NDDOH. Technological advances have recently been developed as the result of regulations. One such regulation is the New Source Performance Standards (NSPS). This regulation required new or modified facilities to meet emissions ratings and demonstrate compliance with the state implementation plan. The Acid Rain Program created under Title IV of the 1990 CAA Amendments required emission reductions of SO_2 and NO_x. The MATS rule previously discussed required similar reductions in HAPs. In order to continue operating, DGC, AVS, and LOS had to meet the requirements outlined in those regulations. Future regulations, such as the Clean Power Plan, are anticipated to drive technological advancements in order for facilities to remain in compliance with the regulation. As technologies continue to advance, it is reasonable to assume that further reductions in emissions could be achieved. Since future advancements and responses to regulation are facility-specific and have not yet been determined, it is reasonable to assume the technological advances would continue the past trend of reducing emissions; the following set of figures shows the amount of emissions has been trending downward. Please refer to ***Figure 11 AVS NOx emissions***, ***Figure 12 AVS SO2 emissions***, ***Figure 13 LOS NOx emissions***, ***Figure 14 LOS SO2 emissions***, ***Figure 15 DGC NOx***

emissions, ***Figure 16 DGC SO2 emissions***, ***Figure 17 AVS mercury emissions***, and ***Figure 18 LOS mercury emissions*** for depictions of NO_x, SO_2, and mercury levels at AVS, DGC, and LOS (NDDOH, 2015). In addition, ***Table 9 AVS and LOS Yearly Mercury Emissions*** shows mercury emissions from AVS and LOS. Similar historical information regarding mercury emissions for DGC is not available at the time of publication of this document, however an estimate for 2015 mercury emissions based on 170 days of CEMS data estimates mercury emissions at DGC in 2015 to be approximately 85 pounds.

Table 9 AVS and LOS Yearly Mercury Emissions

	Yearly Pounds of Mercury Emissions								
	2006	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
AVS	544	500.6	520	472	445	371	440	422	400
LOS	299	340.1	318	262	248	207	216	266	231

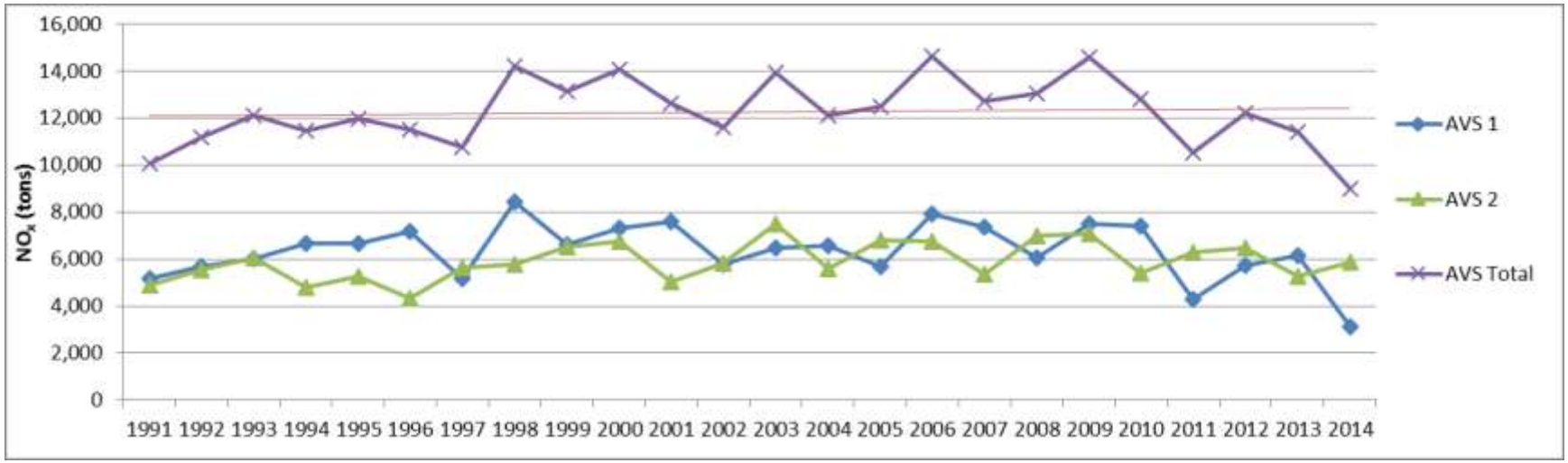

Figure 11 AVS NOx emissions

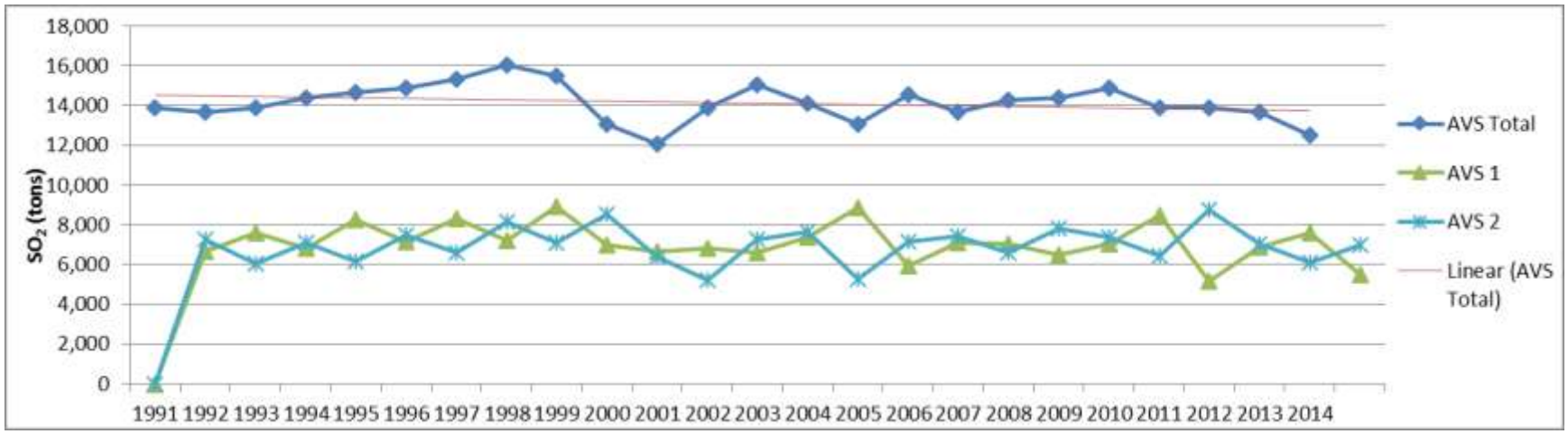

Figure 12 AVS SO2 emissions

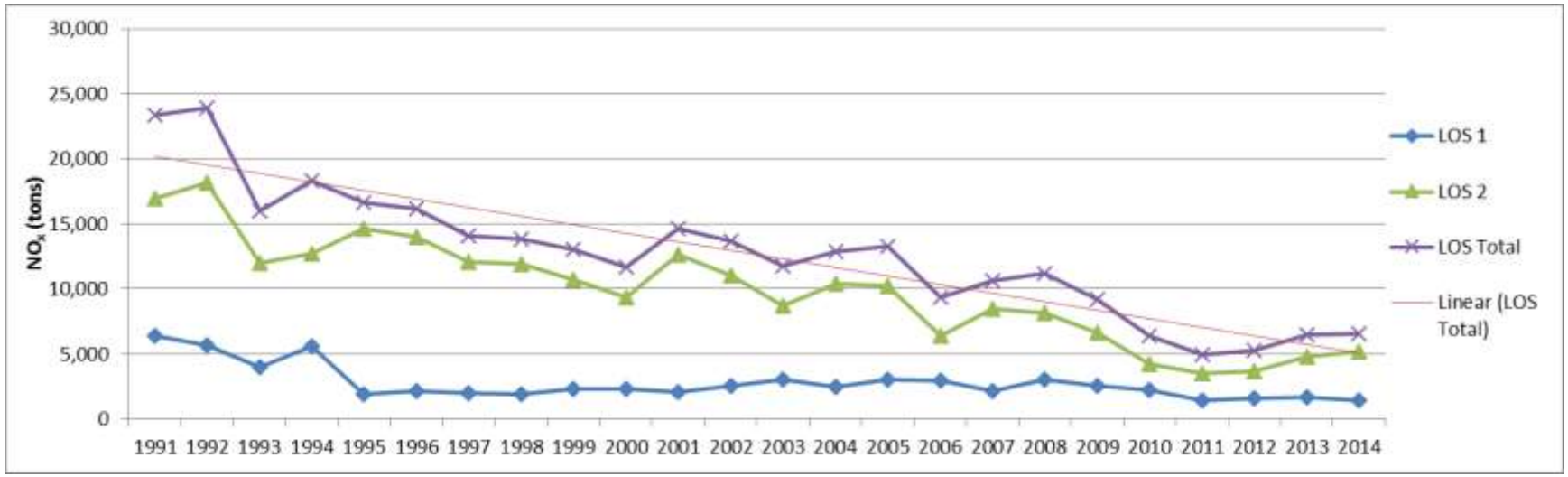

Figure 13 LOS NOx emissions

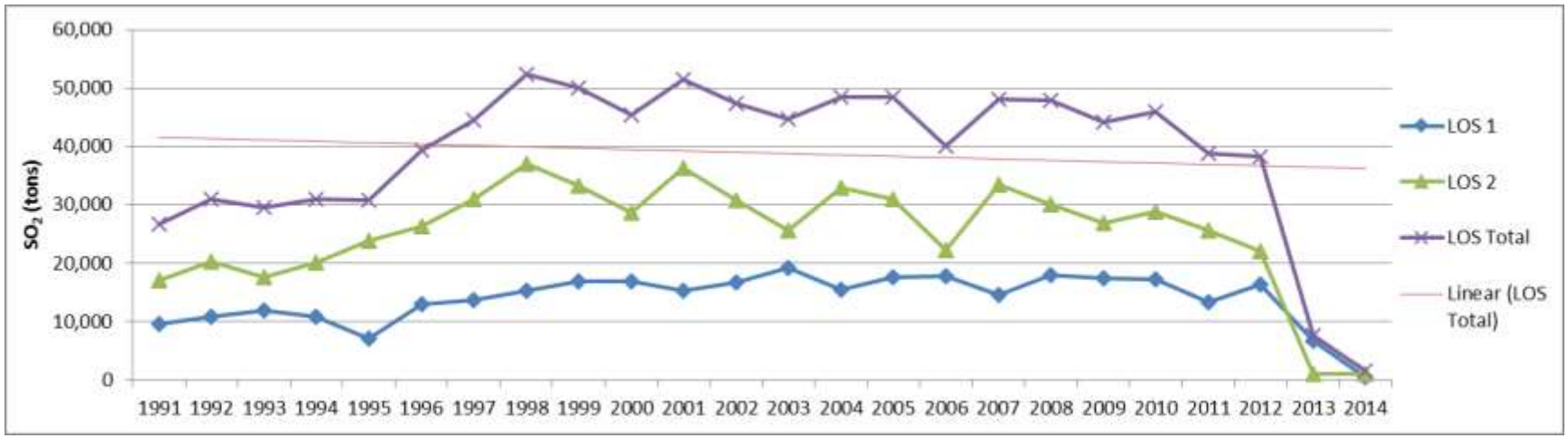

Figure 14 LOS SO2 emissions

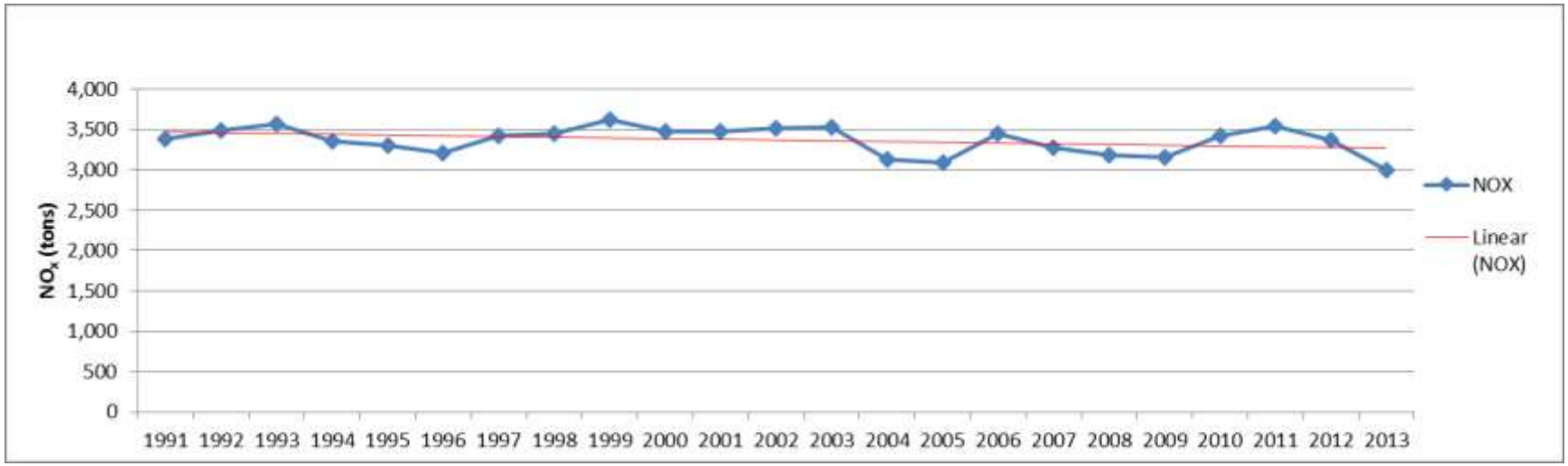

Figure 15 DGC NOx emissions

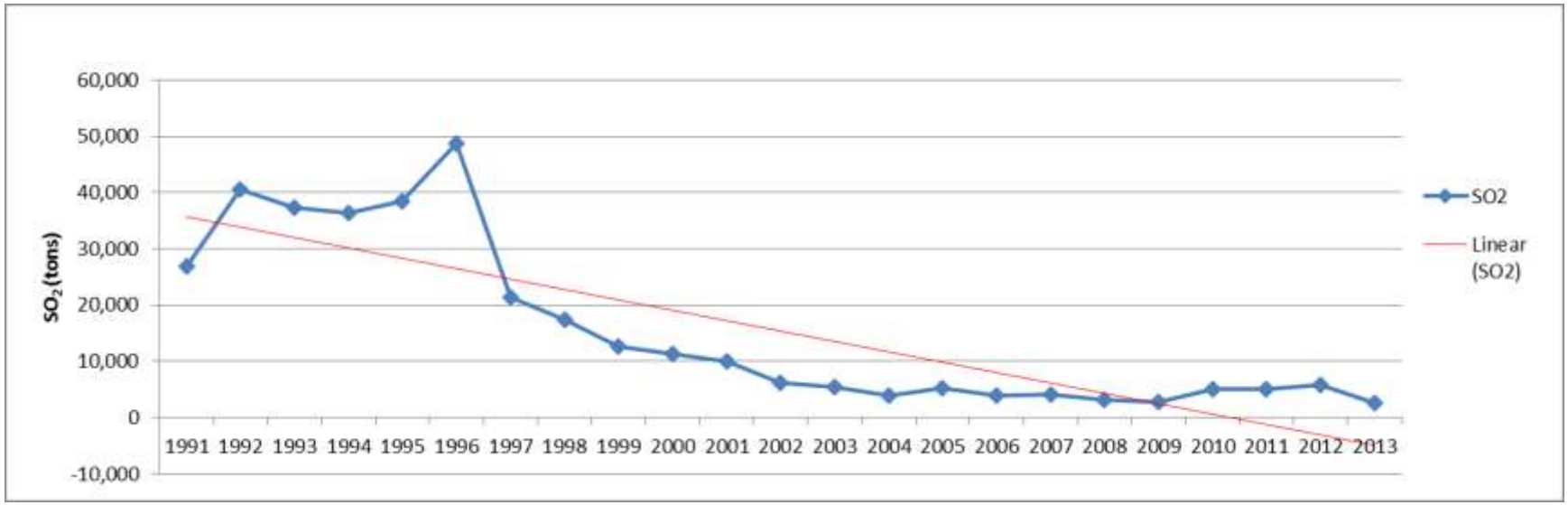

Figure 16 DGC SO2 emissions

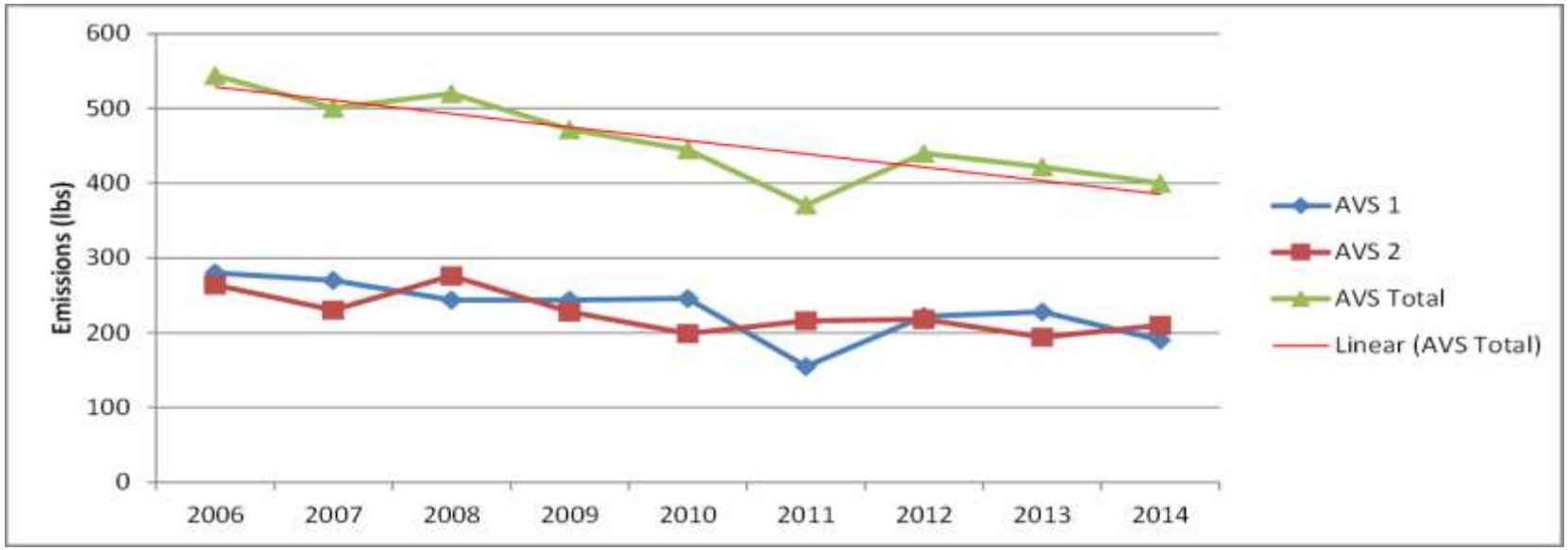

Figure 17 AVS mercury emissions

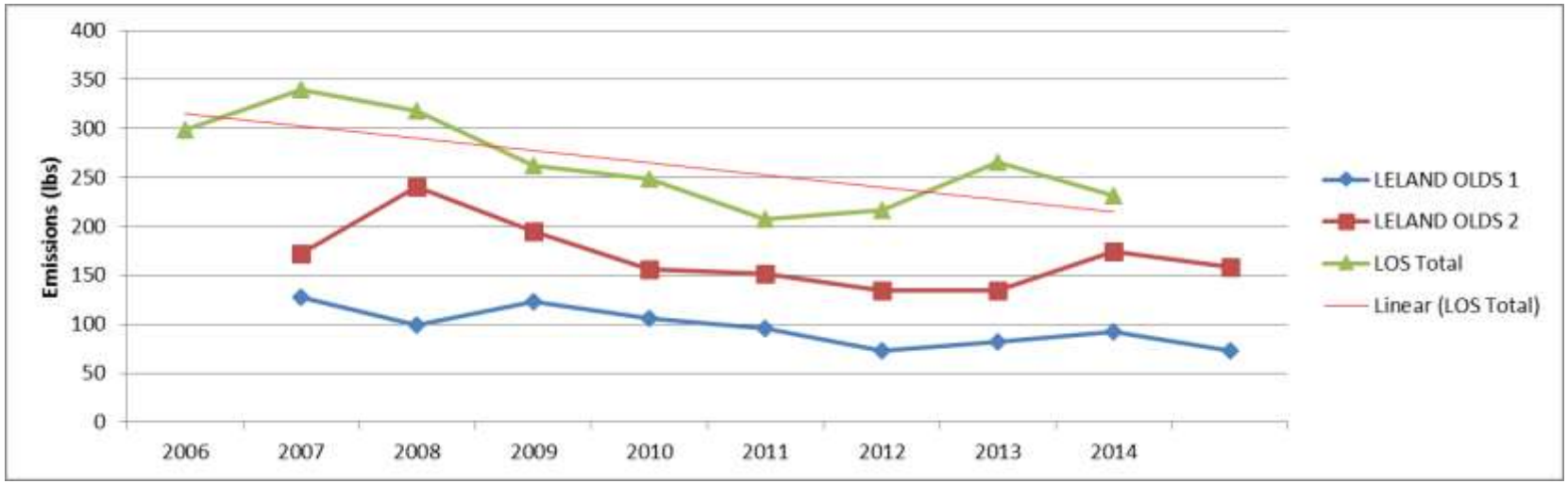

Figure 18 LOS mercury emissions

Direct and Indirect Impacts to Air Quality from Alternative B

Alternative B would not approve the mining of Federal coal in Section 10 and 14, T145N, R88W. However, failure to mine Federal coal in a timely manner to meet customer demands would necessitate some pit realignments to temporarily mine around the Federal coal, subjecting coal removal to various separate blocks in the landscape. This would decrease efficiency in digging and coal removal, and could increase haulage distances. As the specific location of these additional coal resources has not been included in Mine plans, exact emissions amounts are unknown. However because mining operations would not be as efficient since coal in active mining areas would be left in place, direct and indirect air quality impacts from Alternative B would be equal to or slightly greater than those discussed in Alternative A.

3.2. Cumulative Impacts to Air Quality

The cumulative impact assessment area (CIAA) analyzed for air quality was a 50 km radius around the proposed project. Within the CIAA, four coal-fired power plants and DGC are the major contributors to air pollutants. The power plants include AVS, LOS, Coyote Station, and Stanton Station. Coyote Station is a 427MW power plant that has been in operation since 1981. Stanton Station is a 188MW power plant that has been in operation since 1966. Since all of the previously mentioned facilities were constructed, additional advances in technology have reduced the amount of air pollutants released during the coal combustion process, as shown by figures in Section 3.1.1.1. Technological advancements are largely driven by regulation as evidenced by past improvements at facilities due to regulations such as NSPS, MATS, and the Acid Rain Program. As additional regulations are implemented, these technological advancements are expected to continue and require facility-specific improvements.

The background levels of criteria pollutants are monitored within the CIAA at the NDDOH's Beulah ambient air monitoring site. The 2012 reported levels did not exceed any NAAQS. Please refer to ***Table 3 NAAQS Levels.*** The proposed project (Alternative A) would not increase production at the Mine or combustion at any facility receiving coal from the Freedom Mine. Contributions to the measured criteria pollutant levels at the Beulah monitoring site would remain the same in the future as they were when the 2012 results were measured. As a result, it would be expected that the previous background levels as measured at the Beulah monitoring site would not increase with the proposed action. As emissions rates would not increase as a result of either Alternative A or Alternative B, no significant cumulative impact to air quality would occur.

The EPA reports on the trends of air pollution across the country. From 1980 to 2012, total emissions from the six criteria air pollutants decreased by 62 percent. CO_2 emissions over the same time period increased by 14 percent (EPA, 2015). Production levels at the Mine have been generally consistent for the past 30 years and emissions have stayed at the minor source permit level. Even though they are small, the current emissions do contribute to total pollutants in the air.

The EPA completes an annual inventory of greenhouse gases across the U.S. The most recent inventory shows a trend of decreasing greenhouse gas emissions, with a 3.4 percent decrease from 2011 to 2012. In addition, 2012 emission levels were 10 percent below 2005 levels. The 2012 total U.S. greenhouse gas emissions equaled 6.526 billion metric tons of carbon dioxide equivalents. Electricity generation was the largest source of these emissions, making up 32 percent of the total. Transportation was a close second source with 28 percent of total emissions, followed by industry (20 percent), commercial/residential (10 percent) and agriculture (10 percent).

As previously mentioned, coal from the Mine is sold to Dakota Coal Company, and used by three facilities: DGC, AVS, and LOS. Occasionally, small amounts of coal have been sold to other power plants or to companies for research purposes. From 1983 to 2014, an average of 13.3 million tons of coal has been mined per year. It is estimated that approximately 3.7 million tons of Federal coal would be mined from the proposed alternative per year. In comparison, approximately 30 million tons of coal is mined each year in North Dakota (Lignite Energy Council, 2015). In 2013, 984.8 million tons of coal was mined throughout the U.S. (U.S. Energy Information Administration, 2015). The Federal coal from the preferred alternative would represent approximately 0.3 percent of the total coal mined in the U.S. in 2013. Globally, total coal production in 2012 was approximately 7,830 million tons (World Coal Association, 2015).[15] The amount of Federal coal that would be mined in the proposed action would equate to approximately 0.0004 percent of total global coal production.

DGC is adding a urea manufacturing facility to the existing plant site, which is located near the Mine. This project may add to particulate and gaseous air pollutants in the area, at least temporarily during construction. In addition, North American Coal is opening a new mine south of Beulah, called Coyote Creek Mine. Coyote Creek Mine will be replacing an existing mining operation, so its operations will not lead to an increase in coal production or, in turn, an increase in air pollutants in the area. Direct impacts from both the urea facility and Coyote Creek Mine would be addressed in applicable air quality permits issued by the NDDOH. These air quality permits are not yet available to the public. As the NAAQS levels have not been exceeded during the time of the Mine's operation, continued mining operations on a similar scale are unlikely to cause a cumulative impact large enough to exceed the NAAQS standards even when combined with future projects, as those projects must also be permitted through the NDDOH and be in compliance with the state implementation plan.

The 2005 total black carbon emissions in the U.S. was approximately 5.5 million tons; black carbon emissions from the mining of the Federal coal proposed in this EA would comprise less than 0.0000005 percent of the total U.S. yearly black carbon emissions (EPA, 2012).

[15] 1 tonne=2,204.6 pounds

Total direct emissions of CO_2 from the proposed action, when compared to CO_2 emissions from coal combustion in the entire state of North Dakota in 2013, would account for approximately 0.00007 percent of emissions. When compared to 2013's total CO_2 emissions in North Dakota from all fossil fuels, the direct emissions from the proposed action would account for 0.00004 percent of all emissions (EIA, 2015b).

Total indirect CO_2 emissions from the combustion of coal in the proposed action would account for approximately 0.1 percent of all emissions when compared to the 2013 coal combustion emissions in North Dakota. When compared to 2013's total CO_2 emission in North Dakota from all fossil fuels, the indirect emissions from the proposed action would account for approximately 0.07 of all emissions (EIA, 2015b).

Though total emission levels for mining operations and emissions from DCG, AVS, and LOS have been estimated, climate change science is not at a place where levels of emissions can be correlated to the effect on climate change. The rate of contribution to cumulative climate change would not increase as neither alternative would increase production.

3.3. Topography

From the Cambrian Period (488 to 542 million years ago) through the early Paleocene Epoch (55.8 to 65.5 million years ago), numerous shallow, inland seas advanced and retreated across the area now known as west-central North Dakota, depositing a wide range of marine and lagoonal sediments, mainly shales, limestones, and evaporites. Since the early Paleocene Epoch, only stream and lake sediments have been deposited in western North Dakota. Deposition of these sediments was interrupted during the late Tertiary Period (13 to 36 million years ago) by episodes of regional uplift, faulting, warping, and erosion (Coteau, 2015).

During the Pleistocene Epoch (10,000 to 2.6 million years ago), continental glaciers advanced and retreated, modifying the existing topography by depositing varying thicknesses of glacial materials in the uplands area, and eroding and filling the diversion trenches. Following this period of aggradation, there was a gradual dissection of the present topography, which consists of rolling prairie, isolated buttes, mesas, and badlands (Coteau, 2015).

Southwest of the Missouri River, glacial deposits are thin or absent, and the boundary of the Glaciated Missouri Plateau is poorly defined with the maximum extent of glaciation marked by glacial erratics (Coteau, 2015).

The topography of the WMA may be described as glacially modified bedrock topography. The mantle of drift generally follows the preexisting topography, although in some areas there is glacial constructional relief. The general effect of the drift has been to lessen the local relief. The major drainages and their main tributaries are preglacial bedrock valleys. The Knife River is adjusting its profile to the Missouri River base level, so it is currently an aggrading stream. Relief in the area is due largely to erosion in contrast to the depositional landscape of the

Missouri Coteau. Relatively softer siltstone and claystone layers locally have been dissected to produce badland topography, but more commonly, smooth rounded slopes are formed between benches (Coteau, 2015).

3.3.1. Direct and Indirect Impacts to Topography from Alternative A

The topography of the area would be altered due to the surface mining proposed with Alternative A. Post-mining topography would be returned to pre-mining conditions as closely as possible, with slight elevation changes where coal was removed. Reclaimed land is capable of supporting alternative land uses. Slopes of reclaimed areas have typically been flattened compared to pre-mining conditions. Reclaimed areas are also respread to more uniform soil depths than what existed pre-mining. Soil texture is the third limiting factor regarding restoration capabilities. Pre-mining texture is limiting where soils have an extreme characteristic, whether it's extremely sandy or claypan. The mining and reclamation process mixes different soil types, generally resulting in a silty texture that is more suitable for plant growth.

Most reclaimed areas would be capable of supporting a number of post-mining land uses, including cropland, rangeland, tame pasture, woodlands, or shelterbelts. Some reclaimed rangeland will have slopes that cause them to be better suited to this land use than to cropland, although many rangeland areas will be suitable for tillage also. Some permitted areas will only have surface disturbance. In these areas, post-mining gravel and scoria recovery would still be possible in most cases. In areas where coal removal or pond construction has occurred, most or all of these reserves would be either used during mining, or lost, which would prevent the areas from supporting the industrial use of post-mining gravel or scoria pits.

3.3.2. Direct and Indirect Impacts to Topography from Alternative B

Topography impacts related to Alternative B may be the same in nature as those resulting from Alternative A or could result in greater topographic impacts due to a greater number of final highwalls and endwalls where the lowered topography of the adjacent mined areas would have to tie into the higher topography of the bypassed federal coal (James Deutsch, personal communication, January 29, 2016). The footprint of the impacts may also be larger as additional areas would be disturbed in order to mine enough coal to meet customer contracts. Post-mining topography would be restored to pre-mining conditions as closely as possible.

3.3.3. Cumulative Impacts to Topography

Mining of the Federal coal in the WMA would have short-term effects on the topography of the area until reclamation has been completed. When added to past, present, and reasonably foreseeable future actions, cumulative effects to topography would be minimal with both alternatives as the landscape would be returned to approximately the same topography as it was pre-mining.

3.4. Geology, Minerals, and Paleontology

3.4.1. Geology

The WMA is located within the glaciated subsection of the Missouri Plateau, part of the Great Plains Province. The formations of sedimentary origin were deposited in the Williston Basin, the dominant structural feature of western North Dakota. The center of this essentially symmetrical basin is located near the town of Williston, North Dakota, approximately 100 miles northwest of the Mine. The basin consists of approximately 15,000 feet of sedimentary rock overlying a basement complex of gneisses, schists, and granites. This sequence records a geologic time interval spanning late Precambrian (1 to 2 billion years ago) to Holocene (last 10,000 years) (Coteau, 2015).

The structural influence of the Williston Basin is reflected in the dip of the formations underlying the study area. Drill hole data indicates that the Sentinel Butte Formation, the uppermost bedrock unit of the sedimentary series within the study area, dips westward toward the center of the Williston Basin at 50 to 75 feet per mile (about ½ to 1 degree). The dip of the bedrock strata increases with depth due to the physical characteristics of the Williston Basin (Coteau, 2015).

The subsidence of the Williston Basin began early in the Paleozoic Era (425 to 542 million years ago). Subsidence has not been continuous, nor has sedimentation occurred at a constant rate. These irregularities are evidenced by the presence of several unconformities in the stratigraphic column (Coteau, 2015).

The Knife, the Cannonball, and the Heart Rivers flow eastward to preglacial courses to join the southward flowing Missouri River. Preglacial ancestors of these tributaries flowed northeastward from the present Missouri River Trench location toward Hudson Bay. These waterways are incised 500 to 700 feet below the upland surface. The most striking features are the large valleys or trenches that cross the area from the northwest to the southeast. Although these valleys are impressive, they contain only small streams. The Knife River channel, which occupies a preglacial valley, also was enlarged and deepened by melt water. Undrained depressions, called sloughs or prairie potholes, are common. Most of the depressions contain water for only a few months during the spring and early summer. The Knife River flows mostly through the glaciated portion of the Missouri Plateau, but erosion has removed much of the glacial sediment so the drainage is, for the most part, well integrated (Coteau, 2015).

The stratigraphy of the WMA has been influenced by the deposition from epicontinental seas and by basinal subsidence. The Paleozoic rocks in the area may be divided into four sequences; a sequence being the preserved sedimentary record bounded by major regional unconformities. Sequences recognized are, in ascending order: the Sauk, Tippecanoe, Kaskaskia, and Absaraka, with the Absaraka extending to include Triassic rocks of the Mesozoic era (Coteau, 2015).

Mesozoic rocks in the WMA are all part of the Zuni Sequence, with the exception of the Spearfish Formation. The majority of the Mesozoic rocks are shales and sandstones (Coteau, 2015).

The Cenozoic rocks include, in ascending order: the Ludlow, Cannonball, Tongue River (also known as Bullion Creek), Sentinel Butte, and Golden Valley Formations of the Fort Union Group. Thickness variations are due mainly to a continuation of regional dip to the north and west, regional slope to the east, and processes of erosion that have carved the present topography largely from these rocks. Overlying the aforementioned Cenozoic rocks are the Pleistocene and Holocene deposits. The Coleharbor Formation includes all of the unconsolidated Pleistocene age sediments resulting from deposition during glacial or interglacial periods. The types of sediments include gravel, sand, silt, clay, and till. Recent sediments include alluvium, slopewash, and clays, silts, and sands deposited as alluvial fans (Coteau, 2015).

3.4.2. Paleontology

The WMA is within the Sentinel Butte Formation. A large paleontological investigation that provides information on the Sentinel Butte Formation was completed within Theodore Roosevelt National Park, located west of the Mine. The most common fossil found in this formation is petrified wood, due to the forested conditions during time of deposition. Petrified wood specimens are commonly found in lignite as the trees were growing in an aqueous environment. The petrified wood often has bird and insect damage, lending more information to the environment at that time. In addition, freshwater mollusks are also common within the Sentinel Butte Formation. Vertebrate fossils have been found in this formation elsewhere in the state, but have not been found in the WMA. These vertebrate fossils include *Champosaurus*, crocodiles, alligators, turtles and fish (Hoganson and Campbell, 2007).

Direct and Indirect Impacts to Geology, Minerals, and Paleontology from Alternative A

The mineable coal seam is known as the Beulah-Zap or Beulah/Lower Beulah bed, and is contained within the Sentinel Butte Formation of the Fort Union Group. The Beulah/Lower Beulah bed ranges generally from 17 to 22 feet in thickness, with a weighted average thickness of approximately 18 feet throughout the permit area. The overburden directly above the Beulah/Lower Beulah bed ranges in thickness from 30 feet along the cropline, to more than 200 feet along the western edge of the permit. Along the southwest and west edge of the permit area, a parting is encountered in the Beulah/Lower Beulah. This interburden ranges in thickness from 0.1 to 25 feet, and is typically located near the middle of the seam. In various locations throughout the western portion of the permit area, smaller partings are also encountered in the Beulah/Lower Beulah bed, splitting the upper and lower portions of the seam. The mineable coal seam from Federal coal in the north half of Section 10 and all of Section 14 would be removed with Alternative A. This would have a permanent effect on the geologic resources of the area. Once coal has been removed, the pit would be filled back in with materials similar to what were removed before the coal was mined.

Some paleontological resources may be lost due to the mining of the Federal coal. Many smaller fossils are not detectable or recoverable during the mining process. However, these specimens would likely not be of significant paleontological value, but rather common to the area and would not provide additional paleontological information. Larger specimens would be removed by appropriately trained personnel and handled appropriately.

Direct and Indirect Impacts to Geology, Minerals, and Paleontology from Alternative B

The Federal coal beneath the north half of Section 10 and all of Section 14 would not be removed, leaving the geology, minerals, and paleontological resources in place. Because this coal would be left in place, additional non-Federal coal resources would likely be mined in another area of the Freedom Mine not requiring ASLM mining plan approval in order to fulfill coal supply obligations, causing similar impacts to those discussed in Alternative A.

Cumulative Impacts to Geology, Minerals, and Paleontology

Cumulative impacts to geological, mineral, and paleontological resources would be the removal of coal. Since 1983, Coteau has mined approximately 13.3 million tons of coal on average per year and would continue to do so with both Alternatives A and B. Reasonably foreseeable future actions that could cumulatively impact these resources include additional coal mining (such as continued mining at Coteau) and mining of other minerals such as gravel or scoria. Cumulative impacts would be minor to the geologic, mineral, and paleontological resources in the area.

3.5. Water Resources

3.5.1. Ground Water

The aquifers of significance in the WMA include shallow lignite beds of the Sentinel Butte Formation and a glacial channel of the Coleharbor formation. The lignite beds serve as the primary supply of ground water for domestic and livestock purposes due to their areal extent. The Antelope Creek aquifer, found within the Beulah Trench glaciofluvial deposits, is the most productive aquifer associated with the WMA. However, due to its limited surface area, the aquifer is not utilized to the same degree as the shallow lignite beds. *North Dakota Geological Survey Bulletin 56 (Part III) – Ground Water Resources, Mercer and Oliver Counties, North Dakota* reports that wells completed in the Antelope Creek aquifer should be capable of yielding 100 to 500 gallons per minute (Croft, 1973). The Survey Bulletin (1973) also reports that the Antelope Creek aquifer contains about 260,000 acre-feet of ground water and states that most wells completed in the lignite bed aquifers of the Sentinel Butte Formation yield less than 10 gallons per minute, which is sufficient for their intended use.

The lignite bed aquifers of concern in the WMA are, in descending order, the Twin Buttes lignite, the Schoolhouse lignite, the Beulah/Lower Beulah lignite, the Insert lignite, and the Spaer lignite. The Beulah/Lower Beulah lignite bed is the thickest of the shallow lignites, averaging about 20 feet in the permit area, and is the only lignite bed to be mined. A split in the

Beulah lignite that forms the Beulah/Lower Beulah lignite occurs on the west side of the permit area. The Insert lignite is only present in the south half of the WMA. The stratigraphy of the Beulah Trench consists of 250 to 350 feet of lenticular beds of clay, silt, sand, and gravel. Overlying the glaciofluvial deposits of the trench is about 20 feet of alluvium composed of brown sandy silt and clay. The surface of the trench measures from one-half mile to one mile in width. The sand and gravel beds found within the formation, especially near the bottom of the trench, are referred to as the Antelope Creek aquifer. A network of approximately 70 monitoring wells is utilized to collect water level information and water quality data associated with the WMA (Coteau, 2015). Please refer to the potentiometric maps located in ***Appendix C, Maps,*** for locations of the monitoring wells.

A total of 96 certified wells and springs are located within the WMA or within a one-mile radius of the WMA. The availability of several shallow ground water aquifers in the WMA is exemplified by the diverse domestic and livestock well installations and the development of several springs. Fifteen developed springs are located in the WMA, fourteen of which have been certified. All of these developed springs are utilized as a water source for livestock. The Twin Buttes lignite supplies four springs. The Schoolhouse lignite supplies three springs. Flow rates range from perceptible to 3.6 to 4.0 gallons per minute (gpm). The final seven developed springs flow from the Beulah lignite and Insert lignites, and a local sand. The Beulah lignite supplies six developed springs. Flow rates vary from 0.8 gpm to 3.8 gpm. One developed spring is located in the Insert lignite and one is located in the local sand.

Diverse sources of ground water are utilized in the WMA. The Twin Buttes lignite supplies fourteen wells and four developed springs; the Schoolhouse lignite supplies seven wells and three developed springs; the Beulah lignite supplies eleven wells and four developed springs; the Lower Beulah lignite is the source for two wells and one developed spring; the Insert lignite supplies three wells and one developed spring; the Spaer lignite supplies six wells; and the Stanton lignite, found below the Spaer lignite, is thought to be the source for seven wells. Localized sand units supply eight wells and one developed spring. The Antelope Creek Aquifer supplies 16 wells around the east and south perimeter of the WMA. The source of the remaining eight wells is unknown, as the wells were inaccessible to measurement.

Recharge of the lignite beds found in the upper portion of the Sentinel Butte Formation is highly dependent upon annual precipitation. Precipitation is the only source of recharge for the uplands region encompassing the WMA. On average, north-central Mercer County receives 16.8 inches of precipitation annually according to data published by the National Oceanic and Atmospheric Administration. Typically, 80 percent of the average annual precipitation is received as rainfall and the remaining 20 percent as snowfall. In western North Dakota, annual evapotranspiration greatly exceeds total annual precipitation. The amount of precipitation infiltrating into the ground is small compared to the percentage of precipitation lost to runoff and evapotranspiration. The rate of ground water recharge is also small due to the low annual precipitation and the low hydraulic conductivity of the surface materials. Under natural conditions, ground water

infiltration that occurs within the layered sequences of till, silt, clay, and lignite is very slow and produces very small vertical recharge rates. However, given the areal extent of the lignite reserves and the long period of time that precipitation has occurred, annual precipitation can provide a sufficient amount of recharge to the local aquifers (Coteau, 2015).

3.5.2. Surface Water

The WMA is well drained by a network of intermittent and ephemeral streams, encompassing portions of three major watersheds. The three major watersheds are those of Lake Sakakawea, West Antelope Creek, and Spring Creek; all lie within the drainage basin of the Missouri River. The northern portion of the WMA drains into Lake Sakakawea, which was formed as a result of impounding the Missouri River by construction of the Garrison Dam. The central portion of the WMA drains into the upper reaches of West Antelope Creek. West Antelope Creek combines with East Antelope Creek northwest of Hazen, North Dakota, to form Antelope Creek. Antelope Creek then flows into the Knife River approximately one mile northeast of Hazen. The southern portion of the WMA drains into Spring Creek. Spring Creek flows into the Knife River approximately one mile southwest of Beulah, and the Knife River in turn flows into the Missouri River near Stanton. Please refer to the surface water maps located in ***Appendix C, Maps.***

North Dakota surface water quality standards are regulated in NDCC 33-16-02.1-09. These standards are specified for six classes of surface waters:

1. Class I streams
2. Class IA streams
3. Class II streams
4. Class III streams
5. Wetlands
6. Lakes and reservoirs

Surface waters in the state are specifically listed by classification in Appendix I and Appendix II of NDCC 33-16. There are a number of minor or intermittently flowing watercourses, unnamed creeks, or draws, etc., which are not listed in Appendix I and Appendix II. All tributaries not specifically mentioned in Appendix I and Appendix II are classified as Class III streams. Detailed numeric standards for physical and chemical criteria are listed in NDCC 33-16-02.1-09.3. General quality standards for the classes of surface waters include:

- Class I streams. The quality of the waters in this class shall be suitable for the propagation or protection, or both, of resident fish species and other aquatic biota and for swimming, boating, and other water recreation. The quality of the waters shall be suitable for irrigation, stock watering, and wildlife without injurious effects. After treatment consisting of coagulation, settling, filtration, and chlorination, or equivalent treatment processes, the water quality shall meet the bacteriological, physical, and chemical requirements of the department for municipal or domestic use.

- Class IA streams. The quality of the waters in this class shall be the same as the quality of class I streams, except that where natural conditions exceed class I criteria for municipal and domestic use, the availability of softening or other treatment methods may be considered in determining whether ambient water quality meets the drinking water requirements of the department.
- Class II streams. The quality of the waters in this class shall be suitable for agricultural and industrial uses. Streams in this class generally have low average flows with prolonged periods of no flow. During periods of no flow, they are of limited value for recreation and fish and aquatic biota. The quality of these waters must be maintained to protect secondary contact recreation uses (e.g., wading), fish and aquatic biota, and wildlife uses.
- Class III streams. The quality of the waters in this class shall be suitable for agricultural and industrial uses. Streams in this class generally have low average flows with prolonged periods of no flow. During periods of no flow, they are of limited value for recreation and fish and aquatic biota. The quality of these waters must be maintained to protect secondary contact recreation uses (e.g., wading), fish and aquatic biota, and wildlife uses.
- Wetlands. These water bodies, including isolated ponds, sloughs, and marshes, are to be considered waters of the state.
- Lakes and reservoirs. The type of fishery a lake or reservoir may be capable of supporting is based on the lake's or reservoir's geophysical characteristics. The capability of a lake or reservoir to support a fishery may be affected by seasonal or climatic variability or other natural occurrences, which may alter the physical and chemical characteristics of the lake or reservoir.

The WMA does not contain any perennial streams, permanent wetlands, or natural or manmade lakes. All streams within the WMA would be classified Class III Stream according to NDCC 33-16. The only surface water features present in the WMA consist of small stockponds, temporary, seasonal, and semi-permanent wetlands, fens or fen-like wetlands, and developed and undeveloped springs. Forty-six pre-mining stockponds are located within the permit area and are used for livestock watering. Please refer to surface water maps located in ***Appendix C, Maps,*** for locations of these stockponds. Stockpond configurations consist of dugouts and/or embankments and are fed by surface water runoff or by a combination of runoff and spring flow. The number of stockponds within the WMA is consistent with native grassland being the primary land use (Coteau, 2015).

Coteau established two surface water monitoring sites in 2000 and one in 2012 to analyze the surface runoff water quality within the permit area. The U.S. Geological Survey also had two surface water monitoring sites located in close proximity to Coteau's monitoring sites and along West Antelope Creek that were established in 1977 and 1978. These two sites are no longer

active. The locations of these surface water monitoring sites and their contributing watersheds are shown on the surface water maps located in ***Appendix C, Maps***.

Monitoring site 27 is located in the SE¼ Section 20, T145N, R88W. This site monitors surface water quality from a watershed located in the upper reaches of West Antelope Creek with an area of 2,915 acres. Water quality data from this site has been collected since February of 2000.

Monitoring site 28 is located in the SE¼ Section 23, T145N, R88W approximately four miles downstream from monitoring site 27 and immediately upstream from the confluence of West Antelope Creek with the DGC's peripheral ditch. The contributing watershed for this site is 6,473 acres. Water quality data from this site has been collected since February of 2000.

Monitoring site 31 is located in the SW¼ Section 8, T144N, R88W at the southern end of the WMA. The contributing watershed for this site is 2,104 acres. Water quality data has been collected at this site since March 2012.

Monitoring site 2 is USGS monitoring site 06340524 located in the SE¼ Section 20, T145N, R88W, and in close proximity to Coteau's monitoring site 27. This site was established by the USGS in 1978 and abandoned in 1982. The contributing watershed for this site is 2,848 acres. Water quality data for this site was collected by the USGS from June 1978 to April 1982.

Monitoring site 3 is USGS monitoring site 06340528 located in the NE¼ Section 26, T145N, R88W, and approximately one-half mile upstream from monitoring site 28. This site was established by the USGS in 1977 and abandoned in 1986. The contributing watershed for this site is 5414 acres. Water quality data for this site was collected by the USGS from June 1977 to July 1986.

Surface runoff water quality data collected from these four sites is presented in the Pre-Mining Surface Water Quality table located in ***Appendix D, Water Data.*** The data presented in this table for Coteau's monitoring sites was collected according to Coteau's Consolidated Surface Water Monitoring Plan, which is on file at the Mine and with the PSC. Data presented for the USGS monitoring sites was gathered from USGS Water Resource Data Reports. Water quality parameters with no data are recorded in Table 2 of Appendix D as a hyphen. Flow data is given for each sampling occurrence in the last column of the table. Data from snowmelt events was collected from February through May, while data for rainfall events was collected from May through November. No exceedances or violations of the NDPDES permit have been recorded within the WMA.

Conductivity values for surface runoff water range between 95 µmhos/cm and 1420 µmhos/cm with the average being 557 µmhos/cm. Conductivity values from runoff contributed from a rainfall event are consistently higher than runoff from a snowmelt event because this runoff water has more contact with the natural ground. Values for total dissolved solids range between 48 mg/l and 1040 mg/l with the average being 377 mg/l. Water with total dissolved solids

concentrations less than 1000 mg/l is excellent for livestock consumption and only one sample showed a total dissolved solids (TDS) value greater than 1000 mg/l.

Hardness values for surface runoff water range between 27 mg/l and 697 mg/l, with the average being 253 mg/l. The majority of surface runoff water is hard to very hard water. The pH values range between 6.8 units and 8.1 units, which are very common for streams. The concentrations of the cations found in each sample are commonly found in surface water runoff. Bicarbonate and sulfate concentrations in samples obtained during periods of low flow are consistently higher than samples taken during higher flow conditions. During low flow conditions the sample is representative of local groundwater quality due to the large number of springs located along West Antelope Creek. Groundwater contributing to the flow in West Antelope Creek comes from spring flow out of the Twin Buttes aquifer. The Twin Buttes aquifer produces a predominantly calcium and bicarbonate type water. Pre-mining surface water quality data indicates that calcium is the dominant cation, with bicarbonate as the dominant ion, especially during low flow or temperate season flow conditions. The concentrations of chloride found in each sample are within acceptable limits for this constituent. In the WMA where native grassland is the primary land use, the pre-mining surface water runoff is a good water source for livestock and should have no adverse effects on stockponds, wetlands, or other receiving waters in the area.

A total of forty-four pre-mining stockponds are located within the WMA and are used for livestock watering. The location of each stockpond is shown on the surface water features maps located in ***Appendix C, Maps***, along with the principal watersheds within the permit area. The stockpond configurations consist of dugouts, embankments, or a combination of both, and are either fed by surface water runoff or a combination of surface water runoff and springs.

During the summer of 2000 and 2001, water samples were collected from forty-one of the forty-four pre-mining stockponds within the permit area to analyze pre-mining stockpond water quality. The two stockponds not sampled were dry at the time of sampling and one is incapable of impounding water. Resulting water quality data is presented in Table 2, Pre-Mining Stockpond Water Quality, of ***Appendix D, Water Data***. As the table shows, the stockponds have a variation in water quality throughout the WMA. Some of the variation is attributed to the number of springs located within the WMA feeding the stockponds. The conductivity values range between 123 µmhos/cm and 5280 µmhos/cm, the TDS range between 99 mg/l and 4570 mg/l, and the sulfate values range between less than 1.0 mg/l and 2590 mg/l. The North Dakota State University Extension Service published water quality guidelines for livestock in bulletin AS-954, Livestock and Water. The guidelines state a good water source for livestock contain a concentration of TDS less than 2000 mg/l and sulfate concentrations less than 1000 mg/l. Seven stockponds within the permit area exceed a total dissolved solids concentration of 2000 mg/l and seven exceed a sulfate concentration of 1000 mg/l.

To compare the water quality of pre-mining and post-mining stockponds, water quality data for three post-mining stockponds constructed at the Freedom Mine is presented in Table 3, Post-

Mining Stockpond Water Quality, of ***Appendix D, Water Data***. The data indicates an improvement of water quality over time. Conductivity values range between 136 µmhos/cm and 565 µmhos/cm, TDS values range between 71 mg/l and 228 mg/l, and sulfate values range between less than 1.0 mg/l and 43 mg/l. These values are within the guidelines set forth by the North Dakota State University Extension Service for water quality of a good livestock water source. Because post-mining livestock water sources will be surface-fed, water quality should be generally improved over the pre-mining quality of livestock water in drainageway wetlands, intermittent streams, and stockponds that have groundwater or spring and seep flow as a component source.

Another surface water feature located with the WMA is wetlands. During the summers of 2000 and 2001, water samples were collected from 37 wetlands throughout the WMA to analyze pre-mining water quality. The results of the samples are presented in Table 4, Pre-Mining Wetland Water Quality, of ***Appendix D, Water Data***. The results of samples collected from fen wetlands are presented in Table 5, Fen Wetland Water Quality, also in ***Appendix D, Water Data***. As the table shows, the wetlands show a variation in water quality. This is consistent with the water quality of stockponds throughout the permit area. The conductivity values range between 66 µmhos/cm and 4750 µmhos/cm, and TDS values range between 49 mg/l and 4360 mg/l. The pH values range between 5.8 units and 9.9 units. The higher pH values are a result of aquatic plant growth within the wetland during the summer months. The selenium levels showed little variation and were at a low concentration of less than 0.003 mg/l, lessening the potential for toxic bioaccumulation

To compare the water quality of pre-mining and post-mining wetlands, water quality data of four post-mining wetlands reclaimed at the Freedom Mine is presented in Table 6, Post-Mining Wetland Water Quality, in ***Appendix D, Water Data***. Water samples were collected during the spring and fall to monitor the seasonal water quality of these reclaimed wetlands. All the wetlands exhibit an increased concentration of each constituent during the first two years after reclamation, but then tend to decrease and stabilize. This trend is a result of vegetation being established in the contributing watershed reducing the amount of sediment and runoff collecting in the wetland.

3.5.3. Direct and Indirect Impacts to Water Resources from Alternative A

Ground Water

The mining operations that will occur will remove the Beulah/Lower Beulah lignite seam from an area that encompasses the majority of the WMA. Surface mining operations will remove this lignite bed from the east outcrop to within ¾ mile of the west permit boundary. In the process of mining the Beulah/Lower Beulah lignite, the areas of Twin Buttes lignite and Schoolhouse lignite overlying the Beulah lignite will also be disturbed.

Mining operations in the WMA will begin in Section 31, T145N, R87W, and Section 25, T145N, R88W, and progress to the west and southwest. A review of the Beulah/Lower Beulah Lignite Potentiometric Map indicates that the initial mining area is a discharge zone for the Beulah/Lower Beulah lignite bed. Please refer to the Beulah/Lower Beulah Lignite Potentiometric Map located in ***Appendix C, Maps.*** The direction of ground water flow in this lignite bed is from the west-northwest to the east-southeast. Therefore, as mining progresses to the west and southwest, the direction of mining will be progressing into, or against, the direction of ground water flow (Coteau, 2015).

A review of the Twin Buttes Lignite Potentiometric Map, and the Schoolhouse Lignite Potentiometric Map, yields similar results concerning the direction of ground water flow in these two lignite beds. Please refer to ***Appendix C, Maps,*** for copies of the potentiometric maps. Ground water is flowing from the west-northwest to the east-southeast, and is discharging as springs and seeps on the west valley slopes of the Beulah Trench and the north valley slopes of the Zap Branch of the Beulah Trench. The direction of mining will also progress against the direction of ground water flow (Coteau, 2015).

Given these conditions associated with the lignite beds to be disturbed by mining, ground water drawdown will occur in advance of the active mine pits. Variables associated with the various lignite beds will dictate the radius of influence. Those variables include the height of the hydraulic head ahead of the active pits, the specific yield, and specific retention of the aquifer material, the permeability of the aquifer, the degree of fracturing induced by blasting of the exposed lignite, and the availability of water to replace the ground water that is being intercepted or withdrawn. Recharge of the mined area may be supplied by precipitation at the ground surface or by vertical or lateral inflows from other aquifers. The following information has been excerpted from the approved permit NACT-0201. All referenced monitoring wells can be located on the surface water features maps located in ***Appendix C, Maps.***

Mining in the WMA began in 2006, with just a small area of coal removal for a sump, and expanded in 2007. A monitoring well located in the SE¼SE¼ Section 25, T145N, R88W was abandoned and destroyed in 2006 due to mining activities. No dewatering or drawdown effect was observed in this well, since it was removed before the first coal was removed.

A drawdown effect was observed in monitoring well MP84-6P2 located in the NW¼ Section 31, T145N, R87W. The water level in the well averaged around the 1,919.5 feet below land surface (BLS). At the level reading in August of 2006, the water level had dropped three and a half feet to an elevation of 1,916 feet BLS. At the water level reading in November of 2006, the water level had dropped another six and one half feet to an elevation of 1,909.6 feet BSL. The level stayed around the 1908 to 1909 elevation until October of 2007, when the level dropped to the 1905.5 elevation. The well was then destroyed in the first quarter of 2008 before the first quarter reading could be taken. Mining in the WMA greatly expanded in 2008. The drop in water level observed from August of 2006 to October of 2007 was due to a sump constructed in the coal

about 3,000 feet away from the monitoring station for dewatering purposes, followed by expanded coal removal operations in 2007 (Coteau, 2015).

Monitoring well MP82-P17, located in the SW¼ Section 25, T145N, R88W, produced no drawdown due to mining. The average water elevation in the well was 1949.5. The last reading was taken in June of 2010, and was at the 1950 elevation even though it was located only 840 feet away from coal removal in June of 2010. There was very little ground water in the coal at this site, and the ground water flow direction in this area was from northwest of the well to southeast of the well to the structural low where the first sump was constructed and coal removal took place. There may have been too little ground water in the coal at this site to notice any kind of mining influence, or the well may have continued to encounter incoming ground water from the structural high to the northwest, passing through to get to the structural low, therefore not producing drawdown due to the replenishment of ground water. The well was destroyed in August of 2010 (Coteau, 2015).

Monitoring well MP84-7P2, located in the NW¼ Section 36, T145N, R88W, also produced no drawdown due to mining. The average water elevation for this well was 1928.5. The last reading was taken in November of 2010, and was at 1928 elevation. The well was located about 960 feet away from the closest coal removal, which was in October of 2010. This well was also screened in an area where there was a structural high to the northwest, and a structural low to the east-southeast. This well may have intercepted incoming ground water from the structural high, traveling to the structural low, and therefore not undergoing a drawdown due to mining because of ground water replenishment (Coteau, 2015).

Monitoring well MP83-P15, located in the NW¼ Section 3, T144N, R88W, may have produced a small drawdown due to mining. The water level in the well averaged 1938. The last reading was in April of 2012, right before abandonment. In June of 2011, the water level was at its historical high at 1940.62. Each subsequent quarterly reading indicated a slight decrease in water level. In September of 2011, the water level was 1939.15, in November of 2011 it was 1938.54, in February of 2012 it was 1937.51, and 1937.36 at the last reading in April of 2012. The water level was decreasing consistently from the historic high, even though there were consecutive years of above average precipitation, illustrating a drawdown from mining. The well was located about 1,760 feet away from the coal removal in April of 2012. This well was screened in an area of the coal with a structural high to the south, and a structural low to the north. This was an intermediate point in the dip of the coal bed, where the coal may have been dewatered more quickly than infiltration of surface water from the south could recharge the aquifer (Coteau, 2015).

Monitoring well MP82-P26, located in the NW¼NW¼ Section 4, T144N, R88W, is about 3,000 feet southwest of active mining pits. Mining has not affected the water level at this point. The water level has remained fairly consistent over time, but has slightly risen from June of 1995 to the latest reading in October of 2014. Some of this rise may be attributed to the recent years of

above average precipitation. This well is located on somewhat of a structural plateau, with structural highs to the north and south, and structural lows to the west and east (Coteau, 2015).

Monitoring well MP84-8P2, located in the NW¼NW¼ Section 35, T145N, R88W, is about 2,800 feet southwest of the active mining pits. Mining has not affected the water level at this point. The water level has remained consistent around the 1970 elevation since June of 1996 through the latest reading in October of 2014. There is a tight structural gradient in the location where this well is screened. There is a structural high to the east and a structural low to the west. As mining progresses west and meets the structural high crest that spans from northwest to southeast, this well may begin to experience drawdown effects due to mining. Once the top of the ridge is mined through, the aquifer recharge zone for that well will be removed, causing little recharge water to pass through the well to the structural low on the west (Coteau, 2015).

Monitoring well MP83-P04 is located next to the stream channel of West Antelope Creek in the SE¼NE¼ Section 27, T145N, R88W, and is a shallow installation. The top of the Beulah lignite lies only 31 feet below ground surface. Data collected shows that water level cycles are associated with greater spring and early summer flows in the creek, and low flow conditions in the late fall and winter. The potentiometric map for the Beulah/Lower Beulah lignite aquifer also indicates that this area is a region of recharge for the aquifer. Please refer to ***Appendix C, Maps*** for a copy of the potentiometric map. The water levels shown on the hydrograph continue to support this observation. Please refer to ***Appendix D, Water Data*** for copies of the hydrographs. The nearest active mining pit to this well is about 900 feet southeast of the well. The coal here was removed in June of 2014, and the latest water level reading was within its expected range at approximately 1988 and was taken in October of 2015 (Coteau, 2015).

A few conclusions can be surmised from studying the drawdown data associated with the monitoring wells in the areas of the WMA that have already been mined. Drawdown effects were observed in a well 3,000 feet away from coal removal. However, coal removal has progressed to within 800 feet of a monitoring well with no observed drawdown. In some cases, the structure of the coal where a well is screened has a greater impact than the proximity of mining on the water level in the well. Some wells produce no drawdown from mining due to lateral ground water flow from higher elevations to structural lows, or even due to a structural divide that behaves like an underground watershed divide that intercepts the groundwater flow path. Another conclusion could be that the coal near the croplines is generally more fractured than the coal in the middle of the coal field. Glacial activity at the croplines generally disturbed the coal at the cropline zone, fracturing it more, whereas the coal in the middle of the coal field only exhibits natural fractures and bedding planes. Numerous factors can influence the degree and effective distance of drawdown associated with a lignite aquifer.

These conclusions can be applied to groundwater resources located in the N1/2 of Section 10 and Section 14, T145N, R88W. After mining, the Beulah/Lower Beulah lignite bed and the stratigraphic units that constitute the overburden will be replaced with an agglomeration of

unconsolidated overburden sediments, or spoil. Recharge of ground water in the spoil comes from three sources; lateral ground water from adjacent undisturbed strata, lateral flow from adjacent reclaimed spoil, and vertical recharge through the layers of regraded spoil and SPGM. Lateral recharge will occur primarily from the undisturbed Sentinel Butte strata to the west of the mined area. Vertical infiltration from the ground surface will also contribute to the resaturation and continuous recharge of the reclaimed spoils.

The process of recharge in the reclaimed spoil can benefit from the mining process, which breaks down the consolidation and cementation of the Sentinel Butte sediments, resulting in a material with an average porosity higher than that of the undisturbed overburden sediments. Due to the nature of large scale surface coal mining operations, the porosity of the spoil material is expected to be variable in both vertical and lateral aspects. Spoil placed near the bottom of mined out pits by large draglines will be more consolidated underneath spoil peaks and less consolidated toward the outer edges of the spoil piles, or in the valleys formed by parallel spoil ridges. When the tops of the spoil ridges are struck off and leveled by large bulldozers, and further contoured by large motor graders, the upper levels of overburden are more likely to be more compacted and more uniform in permeability. Observations made during drilling operations for monitoring well installations in reclaimed areas indicate that the frequent loss of drilling fluid is indicative of a more porous material than the consolidated sediments of the Sentinel Butte formation.

The removal and respread of SPGM as described below may favor infiltration conditions in spoil materials. As a result, the vertical recharge rate in spoil materials will generally be greater than that exhibited in pre-mining conditions. The less compacted spoil material should allow more rapid percolation of rainfall and snowmelt than the consolidated and compacted pre-mining sediments.

The two layers of SPGM, topsoil and subsoil, will be removed in two lifts and either stockpiled or directly respread. After mining, SPGM is respread over the recontoured overburden materials. Some compaction of the upper layer of overburden and subsoil occurs due to heavy equipment traversing the area. After revegetation, however, these soil materials should eventually exhibit structural characteristics similar to those before mining. Annual freeze-thaw cycles and penetration of the topsoil and subsoil zones by plant roots should, over time, alleviate SPGM compaction by heavy equipment. Also, reduced surface slopes in the post-mining landscape may further increase the potential for recharge through the upper soil layers.

The post-mining land use in the WMA will essentially be the same as pre-mining land use. Therefore, the consumptive use of water by post-mining vegetation should be equivalent to the pre-mining consumptive use. The temporary and seasonal wetlands that will be disturbed by mining operations will also be reclaimed acre for acre in the same areas that they occupied in the pre-mining landscape, and thus will conserve the same areal extent of surface bodies inducing infiltration.

Therefore, taking into account the conditions described in the preceding paragraphs concerning ground water recharge, the disturbed mine area, upon reclamation, should approximate the pre-mining ground water recharge environment. The potentiometric levels in the spoil should tend to reach equivalent pre-mining conditions since the driving forces of flow, discharge, and recharge should not be drastically affected by mining operations.

As a result of mining, the lateral flow in the Beulah/Lower Beulah bed will be replaced by lateral flow at the base of the spoil. During mining, the dragline deposits overburden material in a series of ridges that parallel the direction of the mine pits. This process of deposition tends to result in the coarser material moving to the base and outward slopes of the spoil ridges. This coarser material facilitates ground water movement at the base of the spoil (Coteau, 2015).

Spoil materials are generally more porous than the consolidated Sentinel Butte sediments and can exhibit a higher hydraulic conductivity and a higher transmissivity (Coteau, 2015). A study conducted at the former Indian Head Mine, which is located approximately two miles south of the south boundary of the WMA, included slug tests on monitoring wells screened in the base of spoils (Groenewold, et.al., 1979). These tests yielded values of conductivity for reclaimed Sentinel Butte spoil materials. The base of spoil monitoring wells at the Indian Head Mine were located within the pre-contouring spoil ridges as well as within the pre-contouring valleys located between the spoil ridges. The lignite that was mined at the Indian Head Mine was also the Beulah lignite seam; therefore, the overburden was comprised of Sentinel Butte sediments similar to those found at the Freedom Mine.

The study states that pre-mining hydraulic conductivities of the Sentinel Butte sediments, which consist primarily of silty and clayey flood basin deposits, range from 10^{-4} to 10^{-7} centimeters per second (cm/s). The study also presents hydraulic conductivity values for eleven monitoring wells on which slug tests were performed. Six values from monitoring wells located in the pre-contouring spoil ridges ranged from 3.0×10^{-5} cm/s to 7.3×10^{-7} cm/s. Five values from monitoring wells located in the pre-contouring spoil valleys ranged from 4.6×10^{-3} cm/s to 5.9×10^{-7} cm/s. These test results indicate the variable nature of recharge within the reclaimed spoils; however, there is evidence of recharge rates in the reclaimed setting that are greater than the reported pre-mining recharge rates. Therefore, the recharge rates that existed prior to mining should be reestablished in the post-mining landscape (Coteau, 2015).

Mining in the WMA is not expected to substantially affect the quality of ground water within the Antelope Creek aquifer of the Beulah Trench. Lake Sakakawea is the main source of recharge to the aquifer in the trench. (Coteau, 2015). The Lake Sakakawea recharge to the alluvium will continue to contribute to the overall quantity and quality of ground water.

Since the Beulah/Lower Beulah lignite bed is the focus of mining operations in the WMA, this lignite aquifer, and any upper lignite aquifers that overlay that portion of the Beulah lignite bed proposed for mining, will be disturbed by mining operations. Therefore, any domestic well or

developed spring that is located in this area, or wells completed in either the Beulah/Lower Beulah, Schoolhouse, or Twin Buttes lignite beds adjacent to these areas, could potentially be impacted by mining operations. If impacts from mining occur, Coteau would follow the procedures established in NDAC 69-05.2-01-02(90). This includes providing an equivalent water delivery system and payment of operation and maintenance costs in excess of customary and reasonable delivery costs for the premining water supplies.

Deeper lignite aquifers and any adjacent glacial trench aquifers in the WMA have not been mined (Coteau, 2015). In the WMA, these aquifers include the Insert and Spaer lignite beds, and the Antelope Creek aquifer of the bordering Beulah Trench and Zap Branch of the Beulah Trench. These strata would continue to be a viable source of ground water during and after mining of the Beulah lignite. In addition, the quality and quantity of any replacement water supply provided by Coteau would be at least equivalent to the pre-mining water supply.

Surface Water

At this time, five intermittent streams will be either directly or indirectly affected by mining operations throughout the WMA. Some portions of these streams lie above Federal coal. These streams would be impacted regardless of the Proposed Action, as the surface is not federally controlled and would be disturbed due to mining disturbances necessary for removal of non-federal coal.

Existing intermittent streams are found in the NE¼ Section 10, and the S½ Section 14, all T145N, R88W. Please refer to the surface waters maps located in ***Appendix C, Maps.*** These isolated segments of intermittent streams are supplied by ground water from either springs and/or drainage wetlands that reflect discharge zones for various lignite aquifers. These aquifers are typically the Twin Buttes, Schoolhouse, and Beulah/Lower Beulah lignite beds. As the Beulah/Lower Beulah lignite bed is the focus of coal removal operations, the disturbance of the Twin Buttes and Schoolhouse lignite beds, which are located stratigraphically above the Beulah/Lower Beulah lignite bed, is assured. As post-mining drainages will be returned to the approximate location of the pre-mining drainages, the creation of post-mining ephemeral streams is also assured. However, the intermittent flow characteristics of the stream will be lost (Coteau, 2015).

It should be noted that the majority of the intermittent streams impacted by surface mining operations are isolated stretches of intermittent stream. These streams physically begin as swales and shallow channels that are classified as ephemeral, and only develop into a reach of intermittent stream as ground water is discharged into the channel from springs and/or seeps associated with drainage type wetlands. As the streams flow from the elevated, incised valleys and enter mild slope areas located along the fringes of floodplains associated with glaciofluvial trenches, the intermittent stream flow slows in velocity, and over variable distances, infiltrates again into the local ground water regime. The lower reaches of the affected streams once again

become ephemeral in nature with only larger flows reaching downstream collector streams of higher order (Coteau, 2015).

A request for jurisdictional determination of delineated wetlands was submitted to the USACE on October 30, 2015. Once a jurisdictional determination has been made, Coteau will submit a Section 404 Individual Permit for impacts to jurisdictional waters. Coteau will then work with the USACE and other resource agencies to best determine a mitigation plan for impacts to jurisdictional waters, if mitigation above the current practice of acre-for-acre replacement is required.

The loss or reduction of flows from the intermittent stream segments impacted by mining, therefore, is expected to have minor to no effect on receiving streams of higher order, such as West Antelope Creek. The reclaimed stream channels will be classified as ephemeral in the post-mining landscape. As an approach to mitigating the loss or reduction of intermittent flows produced by ground water discharge from lignite aquifers, Coteau would construct additional stockponds or dugouts within the ephemeral drainages to provide water sources for livestock that utilize adjacent tracts of reclaimed rangeland, along with an acre for acre replacement of the seasonal, drainage type wetlands associated with these streams. Please refer to Section 3.6 for additional discussion and information on wetlands.

3.5.4. Direct and Indirect Impacts to Water Resources from Alternative B

Direct and indirect impacts to water resources resulting from Alternative B would be the same as those resulting from Alternative A. Leaving small portions of coal undisturbed and in the ground while mining the surrounding coal would not leave those groundwater resources unaffected, due to drawdown effects. As mentioned in the previous section, the surface above Federal coal tracts will be disturbed by mining regardless of the Proposed Action, as the surface is privately owned. Coteau would mitigate any impacts associated with Alternative B as was described in Alternative A and would reestablish groundwater and surface water hydrology during reclamation.

3.5.5. Cumulative Impacts to Water Resources

The CIAA for water resources includes the watersheds of Lake Sakakawea, West Antelope Creek, and Spring Creek. Please refer to the surface waters maps located in ***Appendix C, Maps***. Within these watersheds, existing and future land uses include surface coal mining, farming, grazing, power generation, and coal gasification. Existing industrial land uses, such as those at AVS and DGC, impacts to water resources have been studied and must acquire and maintain permits to continue operations. Appropriate state and Federal agencies, such as the NDDOH and EPA, execute these permits. Regulations such as the North Dakota Pollutant Discharge Elimination System require permits for the discharge of stormwaters. The PSC completed a CHIA on the WMA on March 30, 2004. The assessment area was selected to include all existing and foreseeable operations of the Freedom Mine and all groundwater and surface water systems

which logically may be affected by the cumulative effects of Freedom Mine, or other mining operations.

This CHIA assessed the area described as:

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that portion of Mercer County, North Dakota within the drainage basin of the Knife River from Coyote Creek to downstream of the mouth of Coal Creek about 5 miles east of Hazen, and unnamed drainages flowing into Lake Sakakawea in T146N, R87W and T146N, R88W.

No new or unforeseen potential hydrologic impacts were identified during the PSC's review. The PSC found that operations proposed in the application for Permit NACT-0201 had been designed to maintain the quantity, quality, and hydrologic regime of surface and ground water systems in the area. The cumulative effects of all existing and proposed mining operations should not materially damage the hydrologic balance and water availability within or near the proposed permit area.

More recently, on October 20, 2015, the PSC completed a CHIA revision for approval of Revision No. 18 to Permit NACT-0201 and concluded:

The relative scarcity of water in North Dakota, the reclamation rules taken collectively, and the very limited degradation of water quality by surface coal mining in the coal-bearing strata of North Dakota imparts special emphasis on water quantity, more properly the conservation of flow systems and hydrostatic heads, in adjacent areas of permits. Lowering of potentiometric surfaces near mine pits by ground water flow into pits is generally recognized in mining permits as a probable hydrologic consequence of mining. Where hydrostatic head loss is due only to mine pit inflows, nearly full recovery of shallow aquifers after pit closure and reclamation has been documented at several North Dakota mines and can be logically expected in the normal North Dakota surface mine setting. Recovery to approximate premining conditions is a reasonable standard for water quantity in undisturbed strata near reclaimed mine pits and is expected at Freedom Mine.

Freedom Mine is fully committed to restoration and replacement of any in-use water supply that may be adversely affected by its operations and has committed to the water supply replacement requirements of the North Dakota reclamation law and rules. The mine plan incorporates modern best management practices to control and minimize water pollution. In addition to

the Reclamation Division's permit review, all aspects of the operator's ground water and surface water management plans and systems were allowed to be reviewed by the State Water Commission and State Health Department as members of the Reclamation Division's advisory review committee and no issues or concerns were brought forward regarding water management operations from either of those reviewing agencies. Utilizing the best technology currently available and as required by NDAC 69-05.2-16-01(a), the Freedom Mine has been designed to minimize disturbance to the hydrologic balance within the permit and adjacent areas and prevent material damage outside the permit area.

Grazing and agricultural use of the land within the CIAA would continue during and following mining operations. These operations have the potential to cause erosion and sedimentation to surface water. However, these land uses have existed in the CIAA for many decades and are anticipated to be negligible.

Minor cumulative impacts to water resources are anticipated from Alternatives A and B.

3.6. Wetlands and Alluvial Valley Floors

3.6.1. Wetlands

WMA wetlands exist as wet pockets located along the major drainage ways and as pothole type wetlands. The primary uses of area wetlands are the same as adjacent areas. Wetlands located within croplands are generally cropped or hayed, depending on how wet they are at the time of seasonal farming activities. Wetlands located in native grasslands are grazed with the adjacent tract, and may also serve as a source of water for livestock. Incidental to agricultural uses, wetlands are important habitat for a variety of wildlife. Habitat value, nature, and variability of wetland vegetation are dependent on precipitation and farming histories of a wetland, and are well described by Stewart and Kantrud (1971).

Two semi-permanent wetlands exist within the WMA. Both wetlands' permanence is partially due to anthropogenic causes. One wetland serves as a water source for a small pasture near an active farmstead. The area is typically used as season-long grazing for several horses, but is also sometimes grazed with adjacent pastures, especially late in the year. This provides season-long disturbance by livestock to the wetland. Located in a drainage, part of the permanence of this wetland is a result of a raised creek crossing that dams flows in the drainage to form the deep water portion of the wetland. Because of annual livestock disturbance, the vegetation surrounding the wetland is dominated by species that can withstand this use, including *Hordeum jubatum*, *Spartina,* and *Carex* species. The other semi-permanent wetland can attribute a portion of its permanence to a section line road that runs roughly parallel to the wetland, and then crosses the drainage just downstream of it. This road slightly dams the water flow in this drainage,

creating a pool in the creek. Two springs are located adjacent to this wetland. They discharge ground water directly into the wetland, which also contributes to its permanence. This wetland receives heavy livestock use that affects its vegetative community. Neither of these wetlands are located above Federal coal tracts (Coteau, 2015).

Many seasonal wetlands exist within the WMA. The condition of these wetlands is quite varied, and a result of the surrounding land use. Many of the wetlands are located in native grassland or tame pasture. Some wetlands are heavily disturbed by livestock as a water source in the spring, and by mid-summer are sometimes even used as a mud wallow. However, some wetlands located in rangeland are not heavily disturbed by livestock, and some rangeland managers think that proper livestock use may even be helpful to the wetland plant community and the wildlife that use it (Coteau, 2015). Wetlands located in or near woodlands are similar to wetlands in rangeland. In areas that do not receive much livestock disturbance, the wetlands are very diverse and unique areas. However, cattle often congregate in these areas to seek shade and water, so in areas that receive livestock use, the disturbance is often severe. Some of the seasonal wetlands are located in cropland. Wetlands that are located along cropland margins appear to be farmed around more years than those that are located in the middle of cropland, and so often have more permanent types of wetland vegetation, while wetlands in the middle of croplands often are made up of more weedy species. Regardless of location, seasonal wetlands located in cropland are farmed through any years that tillage is possible. Therefore, these wetlands typically have less species diversity and are dominated by quick establishing, early seral species (Coteau, 2015).

Many temporary wetlands are also located within the WMA. Much of the discussion on seasonal wetlands also applies to temporary wetlands. However, because temporary wetlands hold water for a shorter period of time, the severity and frequency of disturbance is slightly different. Wetlands located in cropland are dry enough to be farmed through more often than seasonal wetlands, so they are disturbed more regularly. Annuals or species that are able to establish quickly often dominate vegetation in these wetlands. Temporary wetlands in areas that are grazed are often disturbed less than seasonal wetlands. When cattle begin grazing in the spring, these wetlands usually hold less water and are shallower than seasonal wetlands, so are often passed over as a water source. Because they hold water for a shorter period of time, even if they are an area of focused livestock use, it is for less time. This often means that livestock disturbance is not as severe, and the wetland vegetation has a better chance to recover from the stress of livestock use. Water quality and surface disturbance from hoof action are also typically impacted less (Coteau, 2015).

Two types of wetlands are located in the WMA: pothole and drainage wetlands. Pothole wetlands are usually low areas on a relatively flat landscape where water pools and eventually evaporates or infiltrates into the soil. Their water source is primarily precipitation and runoff. These wetlands act as sinks for the nutrient load of the runoff, and can aid in flood prevention as runoff is collected in these areas. Sampling of pothole wetlands indicates that water quality is fairly consistent. Due to the shallow configuration of most pothole wetlands, water samples were

collected in the late spring or early summer. As an indicator of general water quality, TDS varied from 49 mg/l to 392 mg/l. The median TDS was 108 mg/l. Concentrations of major ions are low. The majority of samples retrieved and analyzed from pothole wetlands had potassium-bicarbonate type waters, while the remainder had calcium-bicarbonate waters. Field pH values varied from 5.8 to 9.1 standard units, or slightly acidic to mildly alkaline. As a general observation, pothole wetlands in the WMA exhibit good water quality as related to agricultural or wildlife use (Coteau, 2015).

Topographic variation within the WMA is high. Several large drainages are located throughout the WMA, many of which are fed by springs or groundwater seeps. Hydric soils and wetlands form in the bottoms of these drainages. Both of the semi-permanent wetlands and many of the seasonal and temporary wetlands are drainage type wetlands. Although drainage wetlands also receive runoff, they are very different in form and function than pothole wetlands because groundwater is frequently the primary water source. Like pothole wetlands, during the late summer and fall they can be recharge features. However, drainage wetlands that have a groundwater source act primarily as discharge features. Drainage wetlands are long and linear, and quite varied. Their deepest zone is often a creek channel that may only be several feet or sometimes even a few inches wide. These often swell in width in areas where pools within the drainage have developed. Their shallower zones may also be very narrow, or because of a wide flat floodplain or a large groundwater seep, they may be very wide. Frequently, drainage wetlands decrease in permanence at some point downstream as they cross coarse textured soils. At this point, they often lose their groundwater source, and their flows infiltrate and disappear underground (Coteau, 2015).

Unlike pothole wetlands, sampling of water from drainage wetlands yields water quality data that exhibits greater variability and higher concentrations of ions. When compared with groundwater quality data from shallow aquifers found in the WMA, major ion concentrations are very similar. This is indicative of the fact that the drainage wetlands serve as discharge features for groundwater. Again, as an indicator of general water quality, TDS values range from 334 mg/l to 4360 mg/l, while the median TDS concentration was 995 mg/l. Values of pH range from 7.1 to 9.9 standard units, which indicate that all drainage wetlands had slightly alkaline to alkaline waters. The dominant cations are calcium and sodium, while the dominant anions are bicarbonate and sulfate. The dominant water types are calcium-bicarbonate and sodium-sulfate waters. Overall, drainage wetlands typically contain more mineralized waters than do the pothole wetlands. However, most waters are still acceptable for livestock watering and wildlife use (Coteau, 2015).

Drainage wetlands are usually located in native grassland between relatively steep slopes that inhibit tillage. Vegetation surrounding the wetlands helps to stabilize the soil, which prevents water erosion. Furthermore, vegetation and plant litter slow runoff speed, which causes some of the sediment and nutrient load to be dropped out. Even though these wetlands typically have acceptable water quality and are fairly permanent, they are of varying use to wildlife and

livestock because they have very limited open water. They may be very narrow, shallow, or both (Coteau, 2015).

Five fen wetlands have been identified in the WMA. These are formed where shallow groundwater flows immediately below the soil surface form very deep organic soils. The fen zones within these wetlands can be identified by walking through the area and noting locations that have a deep mat of organic material that appears to float as you walk across it. The fen zones within the wetlands are typically only a small part of the overall wetland, usually toward the middle. The fen wetlands are found above the toe of slopes, and can be linear or circular. In every case, groundwater seeps out below them, sometimes at a barely perceptible rate, and sometimes immediately flows back below ground on its path downhill.

Unlike active springs, pothole, and drainage wetlands, open water is rarely visible within fen wetlands. Light surface flows, much like a seep, may occur below fens in the spring and fall. When wetland vegetation is actively growing in the hot summer months, and evapotranspiration rates are high, fen wetland vegetation may pull so much water from below the surface that flows coming out of these wetlands are minimal. This makes water sampling difficult.

Fen wetlands share water quality characteristics more similar to drainageway wetlands than pothole wetlands, because their water source is primarily groundwater. The median TDS concentration of sampled fen wetlands was 897 mg/l, and ranged from 644 to 2210 mg/l. The pH values of sampled fens ranged from 6.6 to 8.3 standard units (Coteau, 2015).

Fen wetlands contain species indicative of a wider range of microhabitats than is found in pothole or drainageway wetlands. Some species, such as bulrushes (*Scirpus sp*.) are indicative of a typical deep marsh zone, more common in semi-permanent and permanent wetlands. Water starwort (*Callitriche hermaphroditica*) is an indicator of flowing water (Coteau, 2015).

Fen wetlands are sometimes associated with rare or unique vegetation, especially calcareous fens in the eastern Dakotas, Minnesota, Wisconsin, and Iowa. Species found at fens in the WMA, however, are not particularly unique. This may be because of their extremely small size and active grazing or other disturbance around them. The smaller fen zones within these wetlands, however, are largely undisturbed by livestock, because of the mucky and unstable conditions that prevent grazing (Coteau, 2015).

Several intermittent streams are located within the permit area. Drainage wetlands are often located within the drainages that contain these streams. Field inspections were conducted to determine whether surface water features were drainage wetlands or intermittent streams. If flowing water was evident, and found to flow for more than 30 days, they were considered intermittent streams. Drainage wetlands are delineated as discrete wetland areas that may have standing water that does not appear to be flowing. These are generally wider than intermittent streams. Intermittent streams are generally narrow stretches of channel, often with an incised pilot channel less than a foot to a few feet wide. Riparian or wetland vegetation follows these

channels from a few feet to several feet on each side, depending on the steepness of the topography adjacent to the channel. The National Wetland Inventory identifies palustrine emergent wetlands throughout most of the intermittent stream corridors, mostly as dashed lines on the maps. These areas will still be classified as an intermittent stream, but the areas that exhibit riparian vegetation throughout the reach were identified and classified separately as temporary wetlands. Although an administrative distinction was made, intermittent drainages, associated wetlands, and drainage wetlands share many ecological characteristics. Much of the hydric vegetation is the same. Water quality is similar, although intermittent streams may more closely reflect groundwater conditions, while drainage wetlands have a greater influence from surface water. The narrow and incised nature of intermittent streams may result in differences in wildlife use and grazing impacts from drainage wetlands (Coteau, 2015).

Pothole wetlands, drainage wetlands, and intermittent streams provide a valuable source of water for livestock. Seasonal and temporary pothole wetlands hold water in the spring, but later in the season they dry up and are no longer a dependable source of water. Drainage wetlands are quite variable in nature. Some are wholly precipitation driven and are merely depressions in the drainage that collect runoff. These wetlands are no more permanent than pothole wetlands, and are frequently less so. Those that are supplemented by a groundwater source, as well as intermittent streams, are more permanent in nature than pothole wetlands. Some drainage wetlands and areas of intermittent streams are mostly seep areas, where water does not pool to become available for livestock to drink from. However, during wet years when precipitation recharges the shallow aquifers that support these wetlands and streams, many provide a dependable season-long source of water for livestock. During years with less precipitation, the aquifers become less productive, and some of the drainage wetlands and streams also dry up. Many pastures within the WMA partially or totally rely on pothole wetlands, drainage wetlands, and/or intermittent streams as a livestock water source. Most pastures have an additional water source, such as a stockpond, well, or spring that may provide water later in the season when pothole wetlands have dried up, or during dry years when even the ground water fed drainage wetlands and intermittent streams may dry up. However, several pastures do rely completely on wetlands as a water source. Throughout the WMA, water availability frequently determines pasture size and grazing distribution and timing. Particularly in the southern part of the WMA, fewer water sources are available for livestock. Multiple tracts of land are consolidated into one large management unit so that livestock have access to a dependable, season-long water source. This often results in poorly utilized areas that are far from water and over grazed areas surrounding the water source. Because of their effect on grazing distribution, timing, and pasture size, wetlands and intermittent streams greatly affect native grasslands in the WMA (Coteau, 2015).

3.6.2. Alluvial Valley Floors

In accordance with NDAC 69-05.2-08-13, a determination on the existence of Alluvial Valley Floors (AVF) has been made by the PSC prior to permit application submittal. They have determined that no AVF exist within the proposed permit area or adjacent areas.

Several AVF studies have been conducted in the vicinity of the Freedom Mine. These overlap to encompass the proposed WMA and adjacent areas. The bulk of the proposed permit area is covered by the report Alluvial Valley Floor Study – Freedom Mine Southwest Study Area (Z Environmental & Geological Engineering, February 10, 1997). Following revisions requested by the PSC, Coteau submitted the final report on August 7, 1997.

Coteau conducted additional studies to address adjacent areas to the west and south in 2001. These were compiled in the report Alluvial Valley Floor Study for The Coteau Properties Company Freedom Mine, 2001 Study Area (October 2001). This was submitted to the PSC on October 10, 2001, along with a request for AVF determination for the entire WMA and adjacent areas. In a November 5, 2001, letter to Coteau, the PSC asked that the study boundary be expanded to include a larger adjacent area. The report was revised and submitted again to the PSC on December 4, 2001. The PSC made their final determination in a January 11, 2002, letter to Coteau.

Additional information on file at the PSC and used to make their determination include a 1981 determination for The North American Coal Corporation's Indian Head Mine Northeast Area Permit (September 22, 1981). This covers the area immediately south and east of Coteau's proposed WMA. Also, Coteau's Permit NACT-9001 includes an AVF study for the Beulah Trench, and extends several miles downstream toward Hazen along West Antelope Creek.

All AVF studies encompass analyses of geology, soils, vegetation, land use, surface water and groundwater hydrology, and irrigation practices. Previous studies have concluded that:

- The majority of the WMA is composed of uplands with little to no indication of geohydrologic or soils development indicative of AVF.
- Some downstream areas exhibit geomorphic features (stream channel and floodplain development) and soils (alluvial stream-laid deposits) that are characteristic of AVF. However, the quality of soils, potential flood hazard, small field size, and limited irrigation potential negatively affect agricultural use for crop production, a prerequisite characteristic of AVF.

3.6.3. Direct and Indirect Impacts to Wetlands and Alluvial Valley Floors from Alternative A

Coteau has developed plans to reconstruct those wetlands that are impacted by mining. These plans are designed specifically to:

- Ensure no net loss of wetland acreage
- Minimize the farming hindrance wetlands create
- Maximize the wetlands wildlife value

Many ephemeral, temporary, seasonal, and semi-permanent wetlands, and all fen/fen-like wetlands will be disturbed by proposed mining activities within the WMA. Above the Federal coal proposed to be mined with Alternative A, approximately 1.8 acres of temporary and 1.3 acres of seasonal wetlands would be disturbed. For the purposes of this narrative, ephemeral, temporary, and wetlands associated with intermittent streams are described simply as temporary wetlands. Post-mining seasonal and semi-permanent wetland acreage, including constructed wetlands, will be at least the acreage of what existed before mining. Each landowner will have the same pre- and post-mining seasonal and semi-permanent wetland acreage, except some movement of post-mining wetlands may occur to another landowner with landowner permission.

During the pre-mining wetland assessments, the pothole and drainage type wetlands were evaluated using the Stewart and Kantrud wetland classification system. Drainage type wetlands exist as mesic pockets along drainage bottoms. These mesic pockets can be recreated by using small earthen embankments and/or rock check dams placed across the drainage bottom. In most instances, however, pothole type wetlands will be constructed within the drainageways to reestablish seasonal and semi-permanent wetlands. Coteau has established mesic pockets using the rock check dam method, and proposes to use them or small earthen dams in the WMA to reestablish some reclaimed drainage type wetlands and wetlands associated with intermittent streams. In general, rocks being picked from adjacent reclaimed areas are piled across the drainage bottom to form small two foot dams. These dams will slow and retain runoff and form mesic pockets. The check dams also help protect the drainage bottom from erosion by slowing waterflows. Check dams or small earthen embankments can be placed at randomly selected locations during respread or rock removal operations.

Temporary wetlands will be replaced as a result of the mechanical recontouring process, and by differential settling of spoil material. While every effort is made to recontour the reclaimed land to drain, there are always small shallow depressional areas that do not drain perfectly. In addition, depressional areas are also formed as a result of differential settling of spoil material. Both of these conditions will result in the formation of small, shallow, depressional areas. Should the formation of these not occur in sufficient number to replace temporary wetland acres lost through mining, others will be formed by mechanical means to make up the difference. Temporary wetlands formed through settling and recontouring processes have already been identified on reclaimed tracts in other permit areas.

Spring and seep-fed intermittent streams will not be restored in the disturbed portion of the permit area, as the localized aquifers that supported these streams in the pre-mining environment will be removed by mining activities. Drainages will be recreated in the reclaimed landscape in the approximate locations of pre-mining drainages, and the lower reaches of the drainages will

develop with mesic to hydric vegetation over time, in association with post-mining wetlands constructed in the drainages that replace wetlands present along the intermittent streams.

Wetland Construction and Revegetation

Following soil removal, appropriate regulatory approvals, and mining, the wetland basin(s) will be reconstructed in overburden. Wetland basins will be lightly compacted and sealed as a result of normal heavy equipment traffic within the wetland basin. Following grade approval, subsoil and topsoil will be respread throughout the basin following standard methods and approval processes. Respread depths will be based on overburden quality and the amount of topsoil available for respread. While not required, wetland topsoil will be saved when operationally feasible and used to respread constructed wetland basins. When wetland topsoil is not available, regular topsoil will be used. After SPGM respread, the wetland backslopes will be seeded with the native grassland seed mix if the surrounding land use is reclaimed native grassland, or with the wildlife seed mix otherwise. No seeding will be done within the wetland basins. Experience with other reclaimed wetlands indicates that revegetation of basins does occur by natural invasion or by seed remaining in salvaged wetland topsoils (Coteau, 2015).

Depending on the wetland and associated upstream watershed, it may be necessary to delay SPGM respread until upstream watersheds are completely reclaimed, or divert dirty water around a respread wetland to an appropriate sediment pond. In either case, only clean water will be allowed to enter naturally or by being pumped into respread wetlands. All upstream waterways will be stabilized with the appropriate seed mix for the associated land use. Grassed waterways will be left in cropland drainages upstream of wetlands (Coteau, 2015).

During construction, the following enhancement practices will be evaluated and built into wetlands as appropriate: SPGM may be used to build small islands and shoreline fingers in and around the wetland basin, rocks picked from nearby areas may be used to build small rock islands in wetland basins, and fences may be built around certain wetlands to limit grazing or watering of livestock (Coteau, 2015).

Wetland Success Standards

Temporary wetlands are included under other land use categories and will be evaluated using those performance standards. The acreage of temporary wetlands will be at least equal to pre-mining acreage. Seasonal and larger constructed wetland success will be evaluated using wetland performance criteria in the latest version of the North Dakota Public Service Commission Standards for Evaluation of Revegetation Success and Recommended Procedures for Pre- and Post-Mining Vegetation Assessments (Coteau, 2015).

As no AVF are located with the WMA, Alternative A would not result in any AVF impacts.

3.6.4. Direct and Indirect Impacts to Wetlands and Alluvial Valley Floors from Alternative B

Impacts to wetlands resulting from Alternative B would be similar but likely less adverse when compared to impacts from Alternative A. Portions of the surface land above Federal coal would still be disturbed and those wetlands would be impacted from mining support operations such as sedimentation pond and haul road construction needed to mine the adjacent private coal. Wetland impacts could be greater for Alternative B if the location of the additional coal that is necessary to mine to meet customer demands has wetlands on its surface. Wetland impacts resulting from Alternative B would be mitigated and reclaimed in the same fashion as described in Alternative A. Again, no impacts to AVF would be expected, as none exist in the WMA.

3.6.5. Cumulative Impacts to Wetlands and Alluvial Valley Floors

Cumulative impacts to wetlands disturbed from either Alternatives A or B would be temporary, as all wetlands impacted by mining operations at Coteau are replaced. During the time period when these wetlands are removed from the landscape until the time they are mitigated and reclaimed, some of the functions they provided in the landscape prior to mining are provided by sedimentation ponds during mining. Many types of construction and agricultural activities in the larger watersheds of the proposed Alternatives also have the probability of impacting wetlands. If those impacted wetlands are jurisdictional waters of the U.S., mitigation of impacts is required under Section 404 of the Clean Water Act. As any wetlands that are impacted from mining-related disturbances are replaced, permanent, cumulative impacts from the either proposed Alternative are not anticipated. As discussed in ***Section 3.6*** there are no AVF within the WMA or adjacent areas.

3.7. Visual Resources

The BLM has developed a system to quantify visual resource value and minimize visual impacts to a landscape, called Visual Resource Management (VRM). Using the VRM system involves two steps—inventory and analysis. The visual resource inventory identifies visual resources in an area and classifies them according to BLM ratings. Each classification has a management objective, ranging from preservation of the existing landscape to allowing major modification to the visual landscape. The analysis determines if surface disturbance would meet management objectives for the area.

This VRM process is typically used by the BLM on public lands they manage. Results from their VRM analyses are an important part of creating Resource Management Plans for each area. However, the VRM process can also be useful for private lands to determine if surface disturbance activities would affect the overall visual quality of the area. A Visual Resource Inventory was conducted for the WMA by Coteau, based on methods described in the *BLM Handbook H-8410-1, Visual Resource Inventory.*

The WMA consists of rolling hills, cropland, and grazed rangeland. Some wooded drainages and wetlands are located throughout the area. Lake Sakakawea is visible from the northern portion of the permit area or from higher hillsides. Active surface mining operations, AVS, and DGC are also visible from many areas. Upon completion of the visual resource inventory, the WMA was classified with a Class IV Objective. This rating is due to the fact that the WMA is not unique in its visual landscape, but is similar to the adjacent landscapes and greater vicinity. In addition, mining operations can already be seen from the WMA. The Class IV Objective states, "To provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high."

3.7.1. Direct and Indirect Impacts to Visual Resources from Alternative A

The visual landscape in the entire WMA would change from mainly cropland and rangeland to an active mining area during operations. The topography, color, and texture of the land would appear differently to outside viewers within the area. Some of the active mining would be visible along County Road 15; however, a large stretch of the road north of the Coteau office building to County Road 37 will be closed and access to the area would be limited. Users traveling on County Roads 15 and 37 would see the active mining operations. However, this would not be unusual on the landscape. Active mining has been visible from other area roads, including Highway 1806 and County Roads 21 and 26, dating back to 1983 when the Mine began operations. After mining operations in the WMA have been completed, the area would be reclaimed to closely match pre-mining landscape conditions and topography, essentially restoring the visual resources that were previously there. Visual resources impacts are therefore, anticipated to be temporary in nature.

3.7.2. Direct and Indirect Impacts to Visual Resources from Alternative B

Visual impacts from Alternative B would be the same as Alternative A, as the surface above Federal coal would be disturbed regardless of mining of the Federal coal.

3.7.3. Cumulative Impacts to Visual Resources

Other surface disturbance activities within the viewshed of the proposed Alternatives include a scoria surface mine along County Road 21 (east of the WMA) and DGC's planned urea plant expansion. The surface disturbance from the scoria mine is similar to that from the Freedom Mine, though reclamation requirements for the scoria mine are not as regulated. The urea plant is being constructed on the grounds of DGC, where surface disturbance and industrial facilities currently exist. Residual effects of mining would be visible for several years after active mining has concluded, as reclamation efforts are established. During that time, the visual landscape could be impacted by additional development in the area, though no additional plans are known. Cumulative impacts to visual resources would be minimal, as the entire area would be reclaimed following mining.

3.8. Hazardous and Solid Waste

No designated or illegal sites for hazardous or solid waste are located within the WMA. Several items used for mining operations are recycled, including fluorescent light bulbs, used oil, wire rope, batteries, and tires. All other waste is taken to an approved solid-materials landfill.

As part of Section 313 of the Emergency Planning and Community Right-to-Know Act, Coteau is required to report any release of toxic chemicals that reach a certain threshold amount through the Toxics Release Inventory. The only reportable chemical Coteau releases is anhydrous ammonia, which is a commonly-used agricultural fertilizer. Anhydrous ammonia is used on reclamation cropland across the Mine. No storage of this chemical occurs on the Mine. All mining activities are also in compliance with the Resource Conservation and Recovery Act, Federal Water Pollution Control Act, Safe Drinking Water Act, Toxic Substances Control Act, Mine Safety and Health Act, and all state regulations related to hazardous and solid waste management.

3.8.1. Direct and Indirect Impacts to Hazardous and Solid Waste from Alternative A

Impacts resulting from hazardous or solid waste are not anticipated with Alternative A. Any waste generated would be disposed of at an appropriate facility or recycled. A Spill, Prevention, Control, and Countermeasure (SPCC) Plan is in place at the Mine. The SPCC Plan is designed to meet the requirements of EPA regulations contained in 40C.F.R, Part 112 – Oil Pollution Prevention ("the SPCC Rule"); U.S. Department of Labor, Mine Safety and Health Administration regulations contained in 30C.F.R, Part 77 – Surface Mines and Surface Areas of Underground Mines; and North Dakota Administrative Code Article 33-24, Hazardous Waste Management Rules. The SPCC Plan outlines the procedures to follow in the event of a spill of fuel, oil, lubricants, solvents, and hazardous materials. This plan is available for review by request at the Mine, as required by regulation. Diesel fuel presents the greatest potential for spills or leaks at the Mine, as it is used on a daily basis.

3.8.2. Direct and Indirect Impacts to Hazardous and Solid Waste from Alternative B

Impacts resulting from hazardous or solid waste are not anticipated with Alternative B. Procedures for wastes and spills as outlined in Alternative A would be adhered to with Alternative B.

3.8.3. Cumulative Impacts to Hazardous and Solid Waste

No cumulative impacts resulting from hazardous or solid waste are anticipated to result from either Alternative A or B. No additional waste would be generated from the current amounts, so landfill and recycling facilities would not have additional burden from the proposed alternatives.

3.9. Prime Farmland

A wide range of soils exists in the WMA. A registered Professional Soil Classifier of North Dakota conducted a detailed soil survey of the WMA. Also, the State Office of the NRCS was consulted to determine the extent of prime farmland. Prime farmlands are located on the Mercer County Soil Survey maps. Soil mapping units are delineated and identified along with the depth of topsoil and subsoil of each unit that is suitable for saving and replacing during reclamation. Only prime farmland that is historically used as cropland is considered as prime farmland and subject to the special prime farmland provisions of SMCRA and the PSC.

Soil series such as Amor, Cabba, Zahl, or complexes of these soils, commonly occupy steeper areas (25 percent or greater slopes). The Amor and Cabba series are moderately deep and shallow soils, respectively, derived from underlying soft shale and sandstone bedrock. Zahl series is a shallow soil developed in a thin mantle of glacial till that overlies soft bedrock. These loamy soils possess low natural fertility and are used primarily as grazing lands.

Soil series such as Arnegard, Bowbells, Grail, Parshall, Shambo, Straw, Williams, or complexes of these soils, are found over much of the landscape of the WMA where gentle to moderate slopes exist. These soils have formed in wind or water deposited alluvial sediments and in glacial till. They possess high natural fertility and are used extensively for cropland. Steeper portions of these soils are commonly used for hay and pastureland.

The largest amount of prime farmland within the permit area is located in the Beulah Trench. Because of the large size of the WMA, two areas were selected to represent the typical soil series composition in the Beulah Trench. Section 3, T145N, R88W, and the SW¼ Section 2, T144, R88W, were chosen because they contain the largest area of Beulah Trench prime farmland within the permit. The boundary of the Beulah Trench for these calculations was based on the approximate Beulah Trench delineation found on the ***Geomorphic Reference Map*** located in ***Appendix C, Maps***. Because the Beulah Trench is delineated at such a large scale, its boundaries were refined and checked against a topographic map of the area. The composition of each Order 1 soil map unit within NRCS delineated prime and nonprime soils was then calculated within the Beulah Trench boundary. The dominant Order 1 soils of the Beulah Trench NRCS prime and nonprime soils are listed in ***Table 10 Dominant first order map units within Beulah Trench NRCS prime and adjacent nonprime.***

Table 10 Dominant first order map units within Beulah Trench NRCS prime and adjacent nonprime

Map Unit	Soil	Dominant Soil within Prime or Nonprime	% Composition within Prime Soils	% Composition within Nonprime Soils
6	Straw-Prime	Both	51%	34%
15	Shambo-Nonprime	Both	13%	7%
16	Grail-Prime	Both	12%	8%
80	Savage-Nonprime	Both	14%	22%

Within the NRCS designated prime farmland, the dominant soil map units from the Order 1 soil survey were Straw (prime), Savage, Shambo, and Grail (prime). Within the adjacent NRCS designated nonprime farmland, the dominant Order 1 soil map units were Straw (prime), Savage, Grail (prime), and Shambo. Because the dominant Order 1 soil map units in the Beulah Trench are the same within NRCS prime and nonprime soils, no detailed comparison of these map units is necessary.

Table 11 Subsoil characteristics of prime and nonprime soils compares the chemical and physical properties of the dominant prime and nonprime soils of the Beulah Trench as delineated by the NRCS soil survey.

Table 11 Subsoil characteristics of prime and nonprime soils

Soil Type	Depth (in)	Texture* (USDA)	Permeability (in/hr)	Available Water (in/hr)	pH	Salinity (mmho/cm)	Shrink/Swell Potential
Straw-Prime	20-46 46-60	l, sicl, cl ls, fsl	0.6 – 2.0 2.0-6.0	0.16-0.19 0.06-0.09	7.4-8.4 7.4-8.4	<2 <2	Moderate Low
Williams-Nonprime	7-26 26-60	cl, l cl, l	0.6 – 2.0 0.2 – 0.6	0.16-0.20 0.15-0.18	6.6-7.8 7.9-8.4	<2 <2	Moderate Moderate
Arnegard-Prime	10-39 39-60	l, sil, cl fsl, l, cl	0.6 – 2.0 0.6 – 2.0	0.16-0.22 0.14-0.18	6.6-7.3 6.6-8.4	<2 <2	Low Low
Zahl-Nonprime	5-60	cl, l	0.6 – 2.0	0.15-0.19	7.4-8.4	<2	Moderate
Parshall-Nonprime	17-60	fsl, sl, ls	2.0-6.0	0.12-0.17	6.6-8.4	<2	Low
Grail-Prime	12-26 26-60	sic l, sil, sicl	0.06-0.6 0.06-0.6	0.14-0.17 0.13-0.22	6.6-7.3 7.9-8.4	<2 <2	High Moderate

**From Mercer County Soil Survey*

fsl = fine sandy loam *sl = sandy loam* *sil = silt loam* *cl = clay loam*

sicl = silty clay loam *ls = loamy sand* *l = loam* *sic = silty clay*

The remainder of the prime farmland within the permit area is located in upland areas. As with the prime farmland located in the Beulah Trench, because of the large permit size, select areas were chosen to represent the typical soil series composition of the upland prime and adjacent nonprime soils. Five quarter sections of upland prime soils were selected throughout the WMA to adequately represent the variability of those areas. They include the SE¼ Section 9, SW¼ Section 10, SE¼ Section 21, NW¼ and NE¼ Section 35, T145N R88W. The dominant Order 1 survey map units within upland prime farmland are Arnegard (prime), Williams, and Bowbells (prime). The dominant Order 1 map units within the adjacent upland nonprime farmland are Williams, Zahl (sandstone substratum)-Williams (sandstone substratum), Williams-Zahl complex, and Parshall-Vebar/Vebar-Parshall complexes. The dominant Order 1 prime and nonprime soils in upland areas are listed in ***Table 12 Dominant first order map units of upland NRCS prime and adjacent nonprime soils.***

Table 12 Dominant first order map units of upland NRCS prime and adjacent nonprime soils

Map Unit	Soil	Dominant Soil within Prime or Nonprime	% Composition within Prime Soils	% Composition within Nonprime Soils
7B	Arnegard-Prime	Prime	34%	7%
10	Bowbells-Prime	Prime	12%	4%
13B	Williams-Nonprime	Both	15%	14%
13C	Williams/Zahl-Nonprime	Nonprime	6%	9%
19C	Parshall/Vebar-Nonprime	Nonprime	4%	8%
27D	Vebar/Parshall-Nonprime	Nonprime	0%	8%
85C	Zahl/Williams*-Nonprime	Nonprime	3%	10%

**Zahl (sandstone substratum)/Williams (sandstone substratum)*

NRCS delineations found Bowbells and Arnegard to be the dominant prime and Williams and Zahl to be the dominant nonprime upland map units. ***Table 13 Subsoil characteristics of prime and nonprime soils*** is a comparison of the chemical and physical properties of these soil series, as listed in the SCS (now the NRCS) Soil Survey of Mercer County. The pedon analysis results of soil series sampled within this permit were compiled for each of the Order 1 surveyed dominant soil series of concern, to further compare subsoil characteristics of prime (***Table 14 Dominant first order map units within NRCS prime)*** and nonprime (***Table 15 Dominant first order map units within NRCS nonprime)*** farmland. As illustrated in the following tables, no significant difference between the prime and nonprime subsoil characteristics exists.

Table 13 Subsoil characteristics of prime and nonprime soils

Soil Type	Depth (in)	Texture* (USDA)	Permeability (in/hr)	Available Water (in/hr)	pH	Salinity (mmho/cm)	Shrink/Swel Potential
Bowbells-Prime	11-34 34-60	l, cl l, cl	0.6 – 2.0 0.2 – 0.6	0.16-0.22 0.14-0.18	6.1-7.3 7.9-8.4	<2 <2	Moderate Moderate
Williams-Nonprime	7-26 26-60	cl, l cl, l	0.6 – 2.0 0.2 – 0.6	0.16-0.20 0.15-0.18	6.6-7.8 7.9-8.4	<2 <2	Moderate Moderate
Arnegard – Prime	10-39 39-60	l, sil, cl fsl, l, cl	0.6 – 2.0 0.6 – 2.0	0.16-0.22 0.14-0.18	6.6-7.3 6.6-8.4	<2 <2	Low Low
Zahl-Nonprime	5-60	cl, l	0.6 – 2.0	0.15-0.19	7.4-8.4	<2	Moderate
Parshall-Nonprime	17-60	fsl, sl, ls	2.0-6.0	0.12-0.17	6.6-8.4	<2	Low
Vebar-Nonprime	26-60	wb	---	---	---	---	---

**From Mercer County Soil Survey*

fsl = fine sandy loam sl = sandy loam sil = silt loam cl = clay loam wb = weathered bedrock l = loam ls = loamy sand

Table 14 Dominant first order map units within NRCS prime

Soil Type	EC	SAR	CCE	pH
Arnegard	0.68	1.69	3.82	11.75
Williams	1.19	2.91	13.94	7.64
Bowbells	0.55	2.14	7.35	7.27
Average	0.81	2.25	8.37	8.89

Table 15 Dominant first order map units within NRCS nonprime

Soil Type	EC	SAR	CCE	pH
Williams	1.19	2.91	13.94	7.64
Zahl*-Williams*-Parshall	0.58	1.49	10.67	7.42
Williams-Zahl	1.05	3.09	15.02	7.73
Parshall-Vebar	0.46	1.19	3.02	7.02
Average	0.82	2.17	10.66	7.45

**sandstone substratum*

NRCS-designated prime farm lands are present on approximately 1,022 acres throughout the proposed WMA. Of this total, approximately 33.5 acres of prime farmland overly the Federal coal proposed to be mined. Please refer to ***Figure 19 Prime farmland,*** which shows the prime farmland above Federal coal within the WMA.

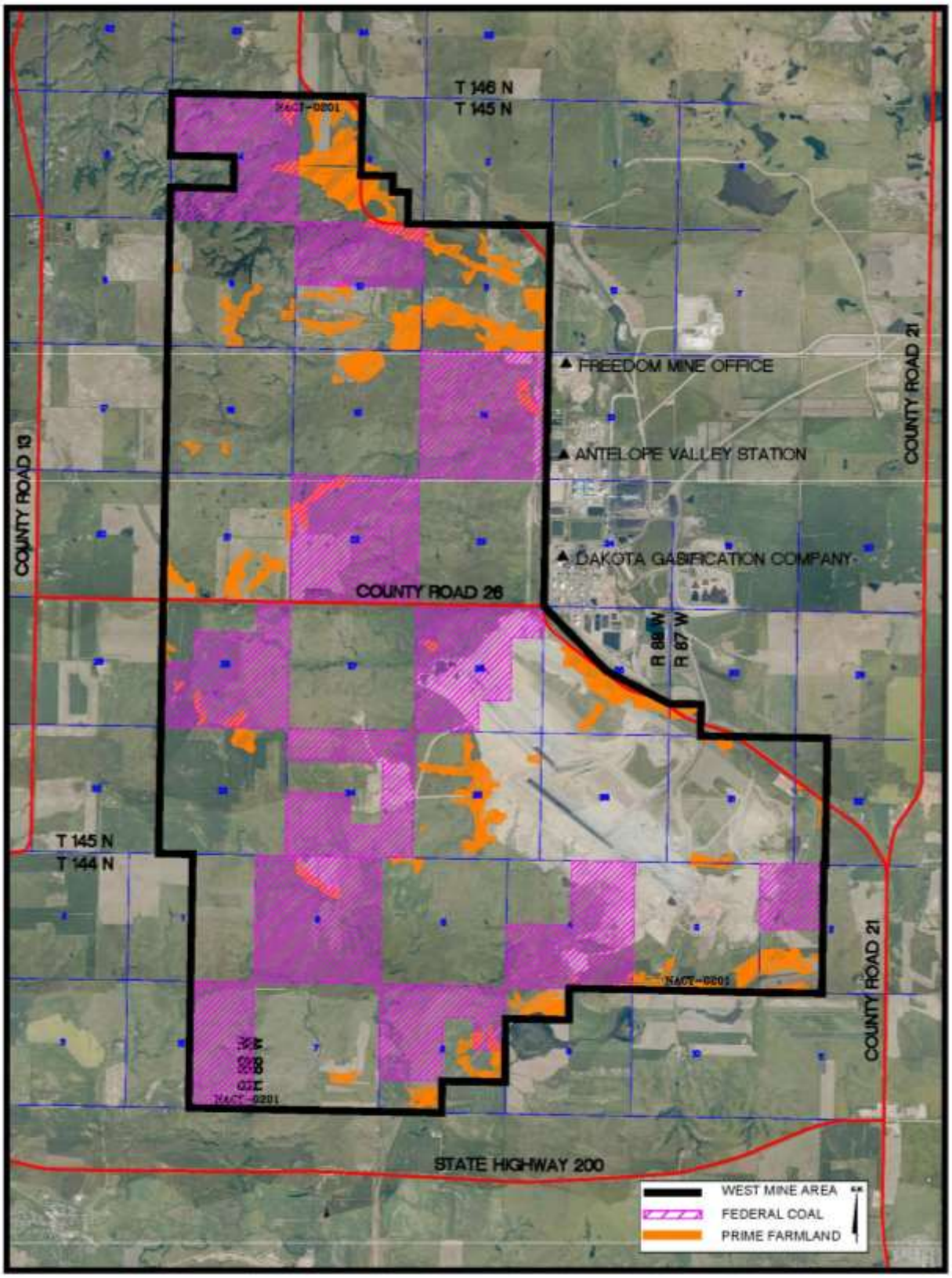

Figure 19 Prime farmland

3.9.1. Direct and Indirect Impacts to Prime Farmland from Alternative A

Direct impacts to prime farmlands would be the same as originally disclosed in the 2005 EIS. A short-term loss of soil productivity would occur during mining. In addition to satisfying the standard reclamation requirements (as outlined in subdivisions a and b of subsection 6 of ND Century Code Section 38-14-24), the PSC requires that a minimum thickness of soil and soil material be removed from prime farmlands to meet the prime farmland performance standards, as defined in North Dakota Century Code Chapter 69-05.2-26.

Soil instability and erosional problems associated with reclamation are kept to a minimum with proper handling techniques and adherence to regulatory guidelines as described in PSC rules. All runoff from disturbed areas is required to pass through sedimentation ponds on the mine permit areas, thus trapping water-eroded soil materials before they move offsite. Vegetative cover is restored on re-spread soils as quickly as possible to stabilize sites and reduce erosion. Reclaimed lands remain under bond with the PSC until such time that successful reclamation is demonstrated under its standards.

Topsoil and subsoil is removed and stockpiled separately from overburden, which is material that is not suitable for plant growth. Once reclamation begins, SPGM is reconstructed to a depth of 48 inches or equal to the original soil horizons. Topsoil is replaced as the final soil layer at a thickness equal to the approximate average of the materials saved. The reclaimed lands are vegetated and managed according to surface coal mining laws and regulations. Restoration of prime farmlands is achieved when the average yield of the crop on reclaimed lands equals or exceeds that of crop on non-mined prime farmland in the surrounding area.

No indirect impacts to prime farmlands are anticipated, as the lands would be restored and erosion control would be implemented during mining to protect non-mined prime farmland in the area.

3.9.2. Direct and Indirect Impacts to Prime Farmland from Alternative B

Approval has been obtained and subsequent plans approved to disturb the surface of the Federal coal tracts for the purposes of activities related to mining, including the construction of haul roads, surface water management, and stockpiles. Under Alternative B, direct impacts to prime farmlands would be similar to those described in Alternative A since very little prime farmlands exists within the area included in the Proposed Action. Please refer to ***Figure 2 Mining Plan Permit Map.***

3.9.3. Cumulative Impacts to Prime Farmland

Cumulative impacts to prime farmland are not anticipated. During the mining when the approximately 143 acres of prime farmland above Federal coal is not in crop production, sufficient farmland would remain in Mercer County to support farming operations and livestock feed supply. Prime farmlands would be restored following mining.

3.10. Wildlife

Since the 2005 EIS, the Mine has continued conducting wildlife surveys. Seventeen reclaimed wetlands at the Freedom Mine are monitored annually for waterfowl use. In addition, biennial aerial wildlife surveys are conducted across the mine. Upland game birds, songbirds, mule *(Odocoileus hemionus)* and whitetail deer *(Odocoileus virginianus),* pronghorn *(Antilocapra americana),* coyotes *(Canis latrans),* and raptors, including bald eagles *(Haliaeetus leucocephalus),* are routinely observed using reclaimed habitat.

Native grassland is the dominant land use within the WMA; steep slopes and shallow soils prevent tillage for farmland. This provides habitat for a variety of species including upland game birds, white-tailed deer, coyotes, fox *(Vulpes vulpes),* rabbits *(Lepus curpaeums)* hares *(Lepus europaeus),* and songbirds. It also surrounds islands of other high value habitats, including wetlands and woodlands.

Nearly all of the native grassland is used for grazing. Rangeland with relatively flat slopes, low areas, and sites adjacent to a water source receive the most grazing pressure, while steep slopes and upland sites receive less grazing pressure and are typically in better condition. Heavy grazing has had adverse effects on populations of wildlife species that require prairie of climax plant composition during certain life history stages, such as the sharp-tailed grouse *(Tympanuchus phasianellus).* Grazing also reduces cover and may increase competition for space and food sources for some species. However, species that inhabit short-grass prairie, such as the chestnut-collared longspur *(Calcarius ornatus),* may benefit from grazing.

Western snowberry *(Symphoricarpos occidentalis)* is a component of native grasslands and is found in many patches throughout the WMA, from several square feet to a few acres in size. Cattle do not actively select this plant for forage when other grasses and forbs are green and palatable, but cattle often eat it late in the summer when grasses and forbs become mature and western snowberry leaves are still green. Heavy livestock grazing of surrounding grasslands may benefit the expansion of western snowberry. The fruit ripen in the fall and frequently remain available on the brush for half a year or more. These fruits are valuable food for sharp-tailed grouse and various non-game birds. The foliage and twigs of this plant are eaten extensively by deer and pronghorn. Snowberry is also useful as nesting cover and protective cover for upland nesting waterfowl and game birds, rabbits, and other small animals. Some grassland locations are devoid of snowberry, while others may have several dense thickets. Snowberry is also closely associated with woodlands. Some 200 acres of snowberry directly associated with woodlands were mapped in the WMA.

Two dominant types of wetlands are located in the WMA; pothole and drainage wetlands. The pothole wetlands are usually low areas on relatively flat landscapes where water pools and eventually evaporates or infiltrates into the soil. Pothole wetlands provide especially valuable habitat for waterfowl. Their water source is primarily precipitation and runoff. These wetlands

act as sinks for the nutrient load of the runoff and can aid in flood prevention as runoff is collected in these areas. Surface water quality varies depending on use. Water quality can be quite good in wetlands located in an area that is not heavily disturbed. However, in many areas water quality is heavily impacted by high nutrient concentrations, sedimentation, and vegetation removal from livestock use or tillage.

Topographic variation is prominent within the WMA. Several large drainages are located throughout the WMA, many of which are fed by springs or groundwater seeps. Hydric soils and wetlands form in the bottoms of these drainages. Both of the semi-permanent wetlands and many of the seasonal and temporary wetlands are drainage type wetlands. Although drainage wetlands also receive runoff, they are very different in form and function than pothole wetlands; groundwater is frequently the primary water source. Like pothole wetlands, during the spring they can be recharge features. However, drainage wetlands that have a groundwater source act primarily as discharge features. Drainage wetlands are long and linear and quite varied. Their deepest zone is often a creek channel that may be several feet to several inches wide. These often swell in width in areas where pools within the drainage have developed. Their shallower zones may also be very narrow, or because of a wide flat floodplain or a large groundwater seep, they may be very wide.

Drainage wetlands are usually located in native grassland between relatively steep slopes that inhibit tillage. Vegetation surrounding the wetlands helps to stabilize the soil, which prevents water erosion. Furthermore, vegetation and plant litter slow runoff speed, which causes some of the sediment and nutrient load to be dropped out. Even though these wetlands typically have good water quality and are fairly permanent, they are of varying use to wildlife and livestock because they have very limited open water. They may be very narrow and/or shallow.

Intermittent streams have been identified upstream and downstream from some drainage wetlands. These are areas where water may flow for more than 30 days, often as a small trickle from a spring or seep. The primary difference between intermittent streams and drainage wetlands lies in the periodic visible flow of water along the intermittent streams. These streams are generally quite narrow, often less than a foot wide. Adjacent saturated ground represents a riparian corridor that may be dominated by hydric species. Trees and shrubs may also be found along the intermittent stream corridor. These streams are generally so narrow that they provide limited wildlife habitat by themselves. They are used as an occasional water source for wildlife and nearby tall vegetation is used for cover.

Wetlands are important habitat for a variety of wildlife. However, many wetlands in the permit area are heavily impacted by agriculture. Some wetlands located in native grassland and tame pasture receive heavy livestock use as a water source in the spring, and by mid-summer are sometimes even used as a mud wallow. Wetlands that are located along cropland margins appear to be farmed around more than those that are located in the middle of cropland, and so often have more permanent types of wetland vegetation. Wetlands in the middle of cropland often are made

up of more weedy species. Regardless of location, wetlands located in cropland are farmed through during years that tillage is possible. These wetlands typically have less species diversity and are dominated by quick establishing, early seral species. Habitat with low diversity can support a less diverse wildlife population. Additionally, these wetlands have less cover for wildlife use and typically poorer water quality.

Some wetlands located in rangeland are not heavily disturbed by livestock, and some managers think that proper livestock use may even be helpful to wetland plant communities and wildlife that use the wetlands. Wetlands located in or near woodlands are similar to wetlands in rangeland. In areas that do not receive much livestock disturbance, the wetlands are very diverse and unique areas. However, cattle often congregate in these areas to seek shade and water, so in areas that receive livestock use, the disturbance is often especially severe. Please refer to ***Appendix C, Maps,*** for maps depicting wetlands, streams and other surface water features within the WMA.

Eighteen mixed deciduous woody draws are located within different drainages throughout the WMA, making up two percent of the entire WMA. The trees in these woody draws consist primarily of cottonwood (*Populus deltoides*), green ash (*Fraxinus pennsylvanica*), boxelder (*Acer negundo*), American elm (*Ulmus americana*), and big-toothed aspen (*Populus tremuloides*). The tall shrub components are composed of silver buffaloberry (*Shepherdia argentea*), chokecherry (*Prunus virginiana*), nannyberry (*Viburnum lentago*), and juneberry (*Amelanchier alnifolia*). Intermittent patches of western snowberry occur within the margins and drainage fingers of these woody draws. The tree and tall shrub communities consist of both homogenous and mixed stands of these species.

Most woodland areas are grazed. Cattle can be very destructive to this habitat type. Herbivory and trampling reduces and often removes the understory, especially where livestock crowd for shade, winter shelter, and to avoid insects. As a result, these areas decrease in value for winter and nesting cover with cattle use.

Shelterbelts provide food and shelter for songbirds, upland game birds, potential nesting sites for raptors, and cover and food for various mammals. Most shelterbelts within the WMA were associated with a farmstead, either occupied or abandoned. Shelterbelts associated with occupied farmsteads were typically in good condition with grassed understories. Most shelterbelts located at abandoned farmsteads were in poor condition with many large gaps and were often grazed. When grazed, shelterbelts were areas of high cattle use, and so had little understory left for wildlife cover.

3.10.1. Threatened and Endangered Species

Special consideration was given to species listed as threatened, endangered, proposed, or candidate by the USFWS during field surveys conducted by Coteau in 2013 and 2014 (Coteau, 2014b). Potential habitat capable of supporting listed, proposed, and candidate species were

searched during these surveys. Any sightings of species and their locations were identified. All tracts containing Federal coal were included in this ground reconnaissance. Species listed in Mercer County at the time of field surveys included the least tern, whooping crane, black-footed ferret, pallid sturgeon, piping plover, and gray wolf. Since 2014, several additional species have been listed or proposed within Mercer County. These include the rufa red knot and northern long-eared bat (USFWS, 2015j). The Poweshiek Skipperling, Western Prairie Fringed Orchid and Greater Sage Grouse threatened, endangered, proposed or candidate species listed by the North Dakota Game and Fish Department that are not known to potentially occur in Mercer County. Brief discussions of listed, proposed, and candidate species are included below. Assessments for each species listed in subsequent paragraphs were inclusive of all tracts in the study area.

Black-footed ferret, endangered

The black-footed ferret *(Mustela nigripes),* is a small mammal that depends on prairie dogs for its survival. Prairie dogs make up more than 90 percent of the ferret's diet, and prairie dog burrows provide dens for the ferrets to nest in. The largest threat to black-footed ferrets has been the destruction of prairie dogs and their colonies, as well as the loss of native prairie acreages (USFWS, 2015a). Because no known prairie dog colonies exist within the Mine, it is anticipated that the black-footed ferret would not be located within the WMA.

Gray wolf, endangered

The gray wolf *(Canis lupus)* is a large, predatory mammal listed as endangered west of U.S. Highway 83 in North Dakota. Though no resident populations of gray wolf exist in North Dakota, they may travel through the area to reach hunting grounds (USFWS, 2015b). While it is unlikely that gray wolf would be located within the WMA due to lack of the forested areas the wolves prefer, it is possible they could travel through the area. Any sighting of a gray wolf would be reported to the PSC and the USFWS. Work in the vicinity of the sighting would be stopped and would not resume until it is determined appropriate by the PSC and USFWS.

Interior least tern, endangered

The interior least tern *(Sterna antillarum)* is a small shorebird that dives into the water to retrieve fish. They prefer sandy areas along lakes or rivers for nesting and breeding, and have been found along the Missouri River and its tributaries in North Dakota. Preferred habitat is located north of the WMA at Lake Sakakawea. However, it is unlikely that a least tern would be located on the mine, as additional food and nesting sources are not abundant within the permit boundaries (USFWS, 2015c). Any sighting of an interior least tern would be reported to the PSC and the USFWS. Work in the vicinity of the sighting would be stopped and would not resume until it is determined appropriate by the PSC and USFWS.

Pallid sturgeon, endangered

The pallid sturgeon *(Staphirhynchus albus)* is a freshwater fish species found in the Missouri River and its associated lakes, tributaries, and refuges (USFWS, 2015d). No habitat for the pallid sturgeon exists within the WMA, and mining activities are not anticipated to impact any pallid sturgeon within Lake Sakakawea, the nearest known habitat to the Mine.

Whooping crane, endangered

The whooping crane *(Grus americana)* is North America's tallest bird that migrates through North Dakota in the spring and the fall. The WMA is located within the central migration corridor where 75 percent of whooping crane sightings occur (USFWS, 2007). Migration roosting stopover habitat includes shallow, seasonally and semi-permanently flooded palustrine wetlands of varying sizes. These roost sites are generally located within 0.62 miles of food sources, which include cropped fields and temporary wetlands (USFWS, 2015e). Whooping cranes find stopover habitat during migration opportunistically, and often do not return to the same wetlands year after year (USFWS, Regions 2 and 6, 2009). A desktop analysis of potential migration stopover and feeding habitat was conducted for the WMA. Seasonal and semi-permanent pre-mining wetlands of all sizes within 0.62 miles of pre-mining cropland are shown as potential roost habitat on the Potential Whooping Crane Roosting and Feeding Wetlands Map located in ***Appendix C, Maps***. Wetland size was not restricted, as the USFWS has found that 40 percent of whooping crane stopover roost sites occurred in wetlands less than 1.24 acres in size (USFWS, Regions 2 and 6, 2009). In addition, temporary wetlands are shown as potential feeding habitat. In total, approximately 3 acres of pre-mining wetlands above Federal coal may provide suitable migration roosting habitat for whooping cranes within the permit area. One of the biggest threats to whooping cranes during migration is collision with power lines or other low-lying obstructions, due to the low visibility during the morning and evening hours when the cranes come in to roost. Several overhead power lines do exist within the permit area. In addition, whooping cranes would likely avoid active mining areas due to noise levels and mining activity.

All wetlands that may provide roosting habitat are reclaimed after mining has occurred in an area. In addition, equal acreages of cropland are reclaimed post-mining. As whooping cranes are opportunistic in locating a roosting wetland, it is likely that they would avoid active mining areas and utilize already reclaimed wetlands on the mine or undisturbed wetlands in the area during migration. If a whooping crane was sighted on the mine, work within the immediate vicinity would be stopped, and the PSC and USFWS would be notified and consulted on how to proceed with work in the area.

Dakota skipper, threatened

The Dakota skipper *(Hesperia dacotae)* is a small butterfly found in bluestem prairies with wildflower growth, or in relatively dry upland prairie (USFWS, 2015f). Although not listed in

Mercer County, ground surveys have been conducted to determine if the Dakota skipper is present based on suitable available habitat. Coteau will continue to inventory areas as part of the annual wildlife surveys to determine if suitable habitats for Dakota skipper are present within the permit area.

Northern long-eared bat, threatened

The northern long-eared bat *(Myotis septentrionalis)* is a medium sized bat that spends winters hibernating in caves or abandoned mines, called hibernacula. No hibernacula were found within the permit area during annual wildlife field surveys; abandoned underground mines located within the permit area do not have any surface access to underground mine shafts. In addition, no hibernacula are known to exist in the state of North Dakota (USFWS, 2015g).

The northern long-eared bat spends the summer roosting underneath bark, in cavities and crevices of both live and dead trees, or in cracks in structures such as bridges. According to Paul Barnhart, assistant professor at Dickinson State University and formerly with the Gillam Bat Lab (the foremost northern long-eared bat researchers in North Dakota), contemporary International Union for Conservation of Nature distribution maps show this species occupying areas east of the Missouri River in North Dakota. However, the Gillam Bat Lab has only documented the northern long-eared bat in mixed deciduous stands dominated by cottonwoods along the Missouri River, its western tributaries, and the Little Missouri River. Mature elm, green ash, and boxelder trees within the permit area may be of sufficient size for summer roosting habitat. However, Mr. Barnhart concluded it would be unlikely to find the bat within the permit area. The ND Game and Fish Department said that at this time they could offer no additional guidance regarding habitat or monitoring protocol, because Paul Barnhart was currently their best source of information (P. Isakson, personal communication).

The Federal Register listing of the northern long-eared bat provides additional information on potential summer maternity habitat. Potential habitat within the permit area would include live or dead trees with a diameter at breast height of three or more inches, abandoned buildings, or concrete structures such as bridges. Coteau conducted surveys on wooded areas that are planned to be stripped in 2015 to determine if they contained potential summer maternity habitat due to the listing of the species in April, 2015. No potential summer maternity habitats in the form of trees, buildings, or concrete structures were found within the 2015 stripping limits. Analysis was conducted on the entire WMA to determine the amount of potential northern long-eared bat habitat. Please refer to the Potential Northern Long-Eared Bat Habitat Map located in ***Appendix C, Maps***, which depicts the potential habitat for the bat within the permit area. The map also shows existing disturbance areas. Because the bat was listed in the spring of 2015, some potential tree and tall shrub habitat was disturbed prior to any surveys or timing restrictions. Approximately 17.7 acres of potential tree and tall shrub habitat exists on private surface above federal coal tracts.

The removal of future mixed deciduous woodlands and/or abandoned buildings within stripping limits that could provide maternity habitat will be conducted outside of the June 1to July 31 maternity timeframe, unless approved by the USFWS. Coordination with the USFWS is ongoing regarding the northern long-eared bat. If it is determined field surveys are necessary to determine bat presence/absence, mist-netting would be conducted by qualified biologists in coordination with the USFWS.

The biggest threat to this species has been the White-Nose Syndrome (WNS), which is a fungus that causes the bats to come out of hibernation early. By coming out of hibernation early, the bats lack a food source and often starve. The USFWS has released a map showing areas that have reported WNS infections and counties within a 150 mile buffer zone. Mercer County is not within the WNS buffer zone (USFWS, 2015h). Please refer to ***Appendix C, Maps*** for a copy of this map.

Piping plover, threatened

The piping plover *(Charadrius melodus)* is a small shorebird that nests along sandy or gravely shores. The USFWS has designated areas of critical habitat for the piping plover, including prairie alkali wetlands and surrounding shoreline; river channels and associated sandbars and islands; and reservoirs and inland lakes and their sparsely vegetated shorelines, peninsulas, and islands. Except for the south shoreline of Lake Sakakawea, Mercer County has no areas designated as critical habitat for this species (USFWS, 2015i). Although Lake Sakakawea is nearly adjacent to the northwest permit boundary, there are likely no piping plover habitats in the permit area. Piping plovers have been observed on the mine in isolated cases. Specifically, during times of flooding or high water on Lake Sakakawea, piping plovers have been observed nesting along gravel roads on the mine. Piping plovers feed on aquatic invertebrates found in riverine systems or alkali wetlands. When conditions along Lake Sakakawea are not ideal, piping plovers may move into the permit area and nest along constructed mine roads in proximity to wetlands. However, because most wetlands are disturbed during mining activity, the probability of ideal habitat conditions existing for piping plovers within the permit area is low. Therefore, monitoring for these birds during the breeding and nesting season, which begins in mid-April and ends in mid-July, will be conducted. Any sighting of a piping plover would be reported to the PSC and the USFWS. Work in the vicinity of the sighting would be stopped and would not resume until it is determined appropriate by the PSC and USFWS.

Rufa red knot, threatened

The rufa red knot (*Calidris canutus rufa*) is a shorebird occurring and migrating primarily along the coasts, but will sometimes use interior flyways during migration. They feed primarily on clams and mussels and need safe beach habitat for feeding and resting. They are commonly found along sand, gravel, or cobble beaches. Based on habitat requirements during its migration periods, it is unlikely this species would be present within the WMA. The shores of Lake

Sakakawea, located approximately five miles north of the WMA, are the nearest potential habitat for this proposed species. Please refer to ***Figure 20 Potential rufa red knot habitat.***

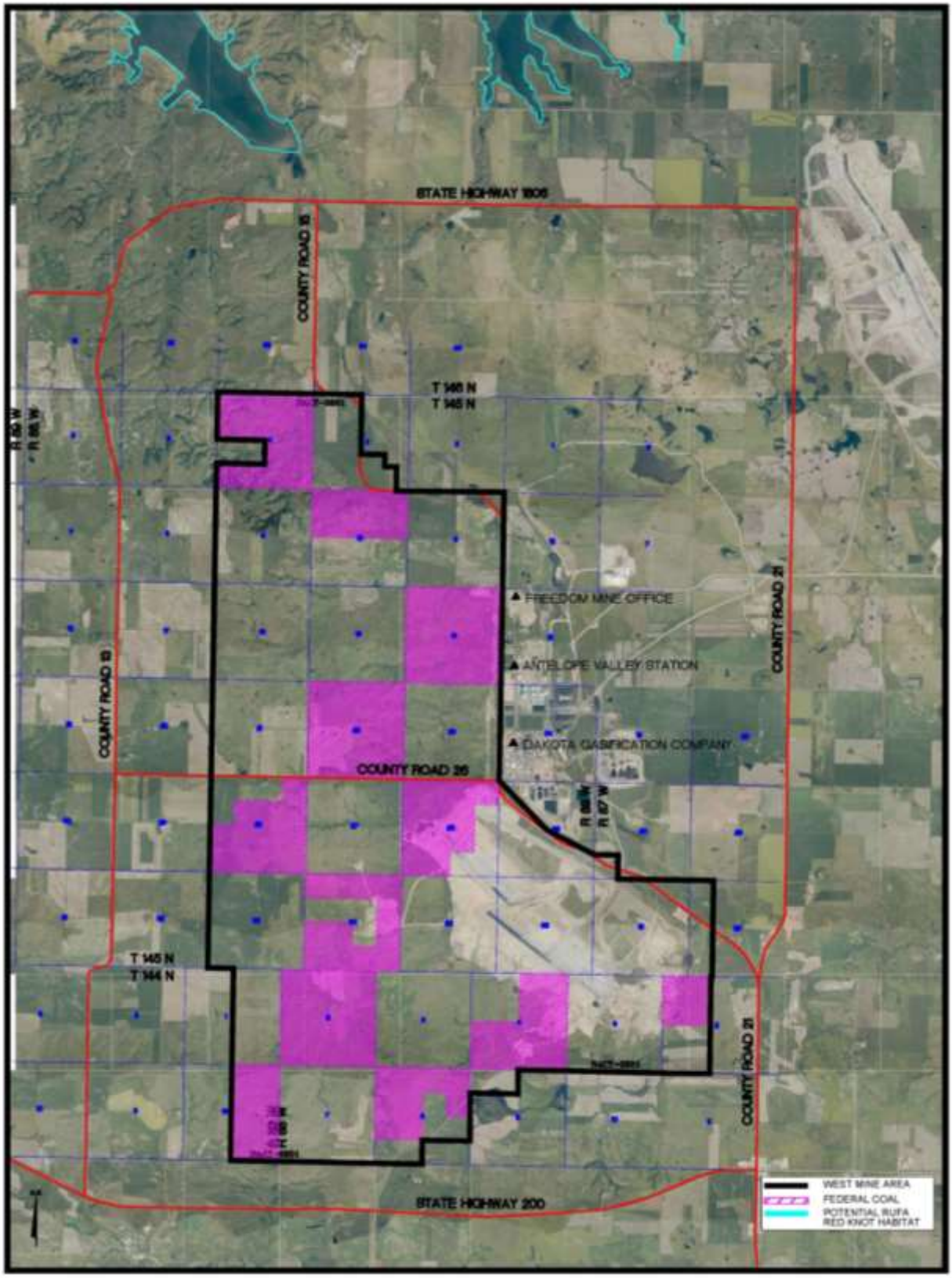

Figure 20 Potential rufa red knot habitat

Sprague's pipit, candidate

On September 10, 2010, the USFWS determined that the Sprague's pipit, a small grassland bird, warrants protection under the Endangered Species Act (ESA), but that listing the species under the ESA is precluded by the need to address other listing actions of a higher priority. The Sprague's pipit will be classified as a candidate species until a listing proposal can be prepared. Candidate species do not receive statutory protection under the ESA, but are protected under the Migratory Bird Treaty Act.

Sprague's pipits require relatively large patches of prairie for nesting (estimated at between 170-776 acres). Within grazed mixed grass areas in North Dakota, an abundance of Sprague's pipits was positively associated with percent club moss cover and plant communities dominated by native grass (Schneider 1998). Abundance was negatively associated with percent grass cover, litter depth, density of low-growing shrubs, vegetation density, and with plant communities dominated by Kentucky bluegrass and native grass. In areas not occupied by Sprague's pipits, percent grass cover, litter depth, and vegetation density were greater than in areas where Sprague's pipits were present. Strongest vegetation predictors of the presence of Sprague's pipit were decreasing bare ground and decreasing litter depth. Sprague's pipits avoided idle areas with deep litter in North Dakota (Madden 1996). Despite short-term negative impacts due to grazing, burning, and mowing, these techniques ultimately benefit Sprague's pipits by preventing encroachment of woody vegetation and excessive litter accumulation.

Sprague's pipits are rarely observed visually. Instead, monitoring efforts must focus on listening. Sprague's pipits exhibit singing flight behavior during their mating season, which is when survey efforts should be focused. Early mating season typically lasts from mid-May to either late May or early June, depending on the year. After this period, first nesting efforts of the season occur and Sprague's pipit males quit displaying, so are typically quiet. Monitoring efforts are started again in July, when a second mating effort begins. Surveyors focus their efforts during these two time periods, but additionally, while conducting all other wildlife monitoring and vegetation sampling efforts, surveyors also listen for Sprague's pipit calls. Results from the initial year of Sprague's pipit monitoring, combined with results of vegetation sampling, provided information so that long-term monitoring transects could be located in prime habitat. Transect locations at the Mineare selected for future monitoring using a 100 meter radius belt transect method. Each transect is approximately variable in length, and are walked. Transects are arranged so they can be completed in a somewhat out and back approach, so each of the locations are either circular, or split into two or more segments that can be walked out from a vehicle one direction and return back to the vehicle in the opposite direction. This method allows observation results to be converted to an observations/acre result that can be used for comparisons. While other grassland sites within the study area may appear to contain suitable habitat for Sprague's pipits, no additional birds were observed during the sampling period. This may be in part due to current grazing management and vegetation structure. Future grazing management dynamics may change, along with variable growing season conditions, and all areas in the study area will be

continually evaluated to ensure the best locations for transects are evaluated on a yearly basis. Surveys utilizing these transects began in 2015, and were conducted once per month from May through July, which is based on methods used by the USFWS.

Coteau conducted surveys in 2014, focusing their efforts between May to July, but also listened for pipits while conducting all other wildlife monitoring and vegetation sampling efforts (Krabbenhoft, 2014). During that time a total of 40 Sprague's pipit sightings were recorded throughout the Mine; many of these sightings were recorded on reclaimed land. Of the 40 sightings, 7 were recorded on the lands above the Federal coal included in the proposed alternative. Any sighting of a Sprague's pipit would be reported to the PSC and the USFWS.

3.10.2. Migratory Birds

The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c) prohibits the taking of bald or golden eagles, including their parts, nests, or eggs. Takes include pursuing, disturbing, and killing of these eagles. Take permits are issued for the eagles, as well as for their transportation, possession, or for removal of a nest. Nesting bald eagles have been located on the Mine, though not in the WMA.

Migratory birds are protected by the Migratory Bird Treaty Act of 1918 (MBTA). Activities resulting in the take of a migratory bird are prohibited, unless otherwise permitted by the USFWS. No provisions exist within the MBTA to allow for the unintentional take of a migratory bird. Over 1,000 bird species are protected under the MBTA, including eagles and raptors.

Twenty-two migratory bird species protected under the MBTA exist within the WMA, according to the USFWS's Trust Resources List. These species are listed in ***Table 16 Migratory bird species within the WMA.*** However, additional migratory birds may be located within the WMA or may travel through the WMA.

Table 16 Migratory bird species within the WMA

Species Name	Seasonal Occurrence in Project Area
American bitternv (*Botaurus lentiginosus*)	Breeding
Baird's sparrow (*Ammodramus bairdii*)	Breeding
Bald eagle (*Haliaeetus leucocephalus*)	Wintering
Black tern (*Chlidonias niger*)	Breeding
Black-billed Cuckoo (*Coccyzus erythropthalmus*)	Breeding
Burrowing Owl (*Athene cunicularia*)	Breeding
Common tern (*Sterna hirundo*)	Breeding
Dickcissel (*Spiza americana*)	Breeding
Ferruginous hawk (*Buteo regalis*)	Breeding
Golden eagle (*Aquila chrysaetos*)	Wintering
Grasshopper Sparrow (*Ammodramus savannarum*)	Breeding
Hudsonian Godwit (*Limosa haemastica*)	Migrating
Loggerhead Shrike (*Lanius ludovicianus*)	Breeding
Marbled Godwit (*Limosa fedoa*)	Breeding
Nelson's Sparrow (*Ammodramus nelsoni*)	Breeding
Prairie Falcon (*Falco mexicanus*)	Wintering, Year-round
Red-headed Woodpecker (*Melanerpes erythrocephalus*)	Breeding
Short-eared Owl (*Asio flammeus*)	Year-round
Sprague's Pipit (*Anthus spragueii*)	Breeding
Swainson's hawk (*Buteo swainsoni*)	Breeding
Upland Sandpiper (*Bartramia longicauda*)	Breeding
Yellow Rail (*Coturnicops noveboracensis*)	Breeding

3.10.3. Direct and Indirect Impacts to Wildlife from Alternative A

Mine development and coal removal operations would have short-term adverse impacts on most pre-mining aspects of the WMA. Most habitats would be destroyed or altered, and new habitats created as areas are developed, mined, and reconstructed. Mine related facilities such as sediment ponds, diversion ditches, haul and access roads, and SPGM stockpile areas would create new habitats. Wildlife would be forced into new or adjacent habitats or would move into newly reclaimed habitats as they are reconstructed. Based on past observations, populations of species such as deer, pheasants, and ducks would likely increase with the development of mining (Coteau, 2014b). These species appear to thrive in the temporary habitats created by SPGM stockpiles and sedimentation ponds.

Coteau strives to reclaim habitats that replicate pre-mining habitats as closely as possible. The reclaimed habitats may be different than the pre-mining habitats, but would still be of high value to wildlife. Several drainages in the WMA contain wetlands that are an expression of groundwater. These long, narrow wetlands are dominated by areas that have saturated soils, but little pooled, standing water. The springs and seeps that cause these wetlands would not be possible to recreate post-mining. As such, these wetlands would be replaced by pothole-type

wetlands. These wetlands are different, but present value as wildlife habitat. They would be especially beneficial to waterfowl and shorebirds, as the open water areas and wetland vegetation zones may be larger than before mining. Although the drainage channel itself would be recreated, the stretches of spring or seep-fed intermittent streams near drainage wetlands would no longer have a subsurface water source. Construction of surface-fed water developments and wetlands would replace these narrow streams, in many ways improving the wildlife value of riparian habitat along these drainages.

Wetlands, woodlands, and native prairie are the most important habitats that would be impacted from mine development and operations. Woodlands and shelterbelts that would be impacted due to mining operations would be removed outside of the breeding and nesting timeframe of February 1 to July 15 as much as possible. If the woodlands and shelterbelts were to be removed during that timeframe, pre-construction surveys would take place to identify any nesting birds. If nesting birds were identified, removal of that tree would be halted until the bird(s) had left the nest. In addition, trees in woodlands or shelterbelts that meet the requirements for summer maternity habitat for northern long-eared bats would not be removed during the June 1 to July 31 maternity timeframe.

These habitats are considered important because of their past and continuing decline, both locally and nationally. Wildlife species that use these habitats are still considered abundant, but have also declined in relation to loss of these habitats. Coteau's reclamation and post-mining land use plans would ensure that approximately the same acreage of wetlands, woodlands, and native prairie would be reclaimed as those destroyed. Other important features such as stockponds and shelterbelts would also be reconstructed.

The removal of future mixed deciduous woodlands and/or abandoned buildings within stripping limits that could provide maternity habitat for northern long-eared bats would be conducted outside of the June 1 to July 31 maternity timeframe, unless approved by the USFWS. Coordination with the USFWS is ongoing regarding the northern long-eared bat; if it is determined field surveys are necessary to determine bat presence/absence, mist-netting would be conducted by qualified biologists in coordination with the USFWS.

Except for the Sprague’s pipit, mining is unlikely to affect any known Federally-listed threatened, endangered, proposed, or candidate species; or areas designated as critical habitat for threatened and endangered species. Permanent transects have been established within the Mine’s permitted areas to monitor trends of the Sprague’s pipit during mining and on the reclaimed landscape. Using proper seed mixes, weed control, and grazing management, it is expected the trend of observing Sprague’s pipits within the Mine would continue.

3.10.4. Direct and Indirect Impacts to Wildlife from Alternative B

Impacts to wildlife from Alternative B may be greater to wildlife than those resulting from Alternative A. These additional impacts may be due to the fact that additional surface disturbance would occur to reach enough coal to meet customer demands. Additional impacts

would be similar in nature to those discussed in Alternative A; any disturbed land would be reclaimed in the manner described in Alternative A.

3.10.5. Cumulative Impacts to Wildlife

Wildlife in the area around the Mine has become accustomed to the permanent facilities such as the office building, shop, and yard, as well as DGC and AVS. All areas of surface disturbance from mining are eventually reclaimed. However, during the time of mining animals previously living in that area must relocate or adapt to changing conditions. Coteau reclaims approximately the same amount of land each year as they disturb, which provides new habitat for animals to relocate to. Some animals would return to the area once it is reclaimed; some would not. If enough development were to happen in the area, these animals would not have areas to relocate to when mining was occurring. If Alternative B was chosen as the preferred alternative, the resulting additional surface disturbance would cause a larger cumulative impact to wildlife than Alternative A. Currently, no developments within the area are known that would contribute to such an event. Loss of individual members of a species may have larger impacts to the species community, including less genetic diversity and populations being reduced to an unsustainable number of individuals.

3.11. Cultural Resources

A cultural resource survey and inventory of the entire permit area has been completed (Ethnoscience 1999). All sites that were identified have been properly tested and evaluated. A total of 40 prehistoric sites and one historic farmstead were identified as being significant and eligible for listing on the National Register of Historic Places. The Cultural Resource Management Plan for the WMA was accepted by the State Historical Society on July 28, 2003. This plan was amended to address changes in excavation strategy, and a revised plan was approved by SHPO on April 22, 2005. *Coteau, a Cultural Resource Management Plan for the West Mine Area, Mercer County, North Dakota, Revision 1* (April 12, 2005) outlines how to manage the loss of cultural resources. The management plan also outlines the procedure to address inadvertent discoveries during the mining process. Strategies developed to lessen and mitigate the impacts to cultural resources include:

- Designing the mine plan to avoid cultural resources
- Donating monies and land to an Indian Cultural Education Trust
- Providing Native Americans access to Traditional Cultural Properties (TCP) within the mine site
- Moving designated stone features for Native Americans to use in their traditional cultural practices prior to mining
- Avoiding 16 sites throughout the WMA

One site, 32ME1486, was determined to be significant as a Traditional Cultural Property. This site will be protected by fencing and no disturbance will be allowed within a two hundred foot

radius of feature as approved in the management plan. Likewise, site 32ME238 was cleared by mechanical grading in accordance with the WMA plan in the summer of 2014 and SHPO accepted the mitigation report and approved the site for disturbance in January of 2015. Sites 32ME189 and 32ME206 were mitigated and approved in 2006 and 2013, respectively. The federal coal lease includes a special stipulation that prohibits mine related disturbance of two cultural resource areas located over federal coal. One site is located in Section 14 where a 200 foot disturbance set-back will result in approximately 21.3 acres of coal not being mined and the other is approximately 81 acres in size located in Section 22, both in T145N, R88W. The remaining sites will be either mitigated through data recovery, avoided, or preserved.

SMCRA requires that no mining occur within three hundred feet of any publicly owned park or places in the State Historic Sites Registry or the National Register of Historic Places. Therefore, the applicant will not conduct any mining activities within one hundred feet of the cemeteries in accordance with NDCC 38-14.1-07. Cultural Resource Site 32ME108, an unmarked Native American burial site located in Section 14, T145N, and R88W was mitigated with disinterment and re-interment as approved in the Cultural Resource Management Plan in the summer of 2014 and SHPO approved this mitigation in January of 2015.

The approved management plan also includes the establishment of an Indian Cultural Education Trust. The purpose of the trust will be to hold certain lands containing cultural resource sites for their protection and preservation and generate income for educational activities for Native Americans that advance knowledge about previous inhabitants of the area and their traditions. In addition, a programmatic agreement was developed and signed by government agencies for the consultation process that was used to receive comments from several Indian Tribes on cultural resource matters involving the proposed permit area. In accordance with the National Historic Preservation Act (NHPA) Section 106 rules, the Bureau of Land Management, Office of Surface Mining Reclamation and Enforcement, State Historical Society, and the Commission, in coordination with the applicant, consulted with the appropriate Indian Tribes on cultural resource matters.

The applicant has committed to reporting, testing, and mitigating, if necessary, any previously unrecorded archeological, cultural, or historical materials that may be discovered as a result of mining related activities.

3.11.1. Direct and Indirect Impacts to Cultural Resources from Alternative A

Any culturally significant or historic properties affected would be mitigated in accordance with the North Dakota Century Code and SMCRA. The WMA management plan has been in place since 2005 and has actively been implemented; monetary donations to the Indian Cultural Education Trust have been made, site mitigation and moving of stone features has occurred. Please refer to ***Appendix A, Consultation***, for an approval letter from SHPO, as well as other consultation with SHPO that has occurred since the 2005 EIS. The WMA management plan

would continue to be adhered to throughout mining and reclamation of the WMA and impacts are anticipated to be minor.

3.11.2. Direct and Indirect Impacts to Cultural Resources from Alternative B

Impacts to cultural resource under Alternative B could be less in magnitude than Alternative A because less surface area would be disturbed. It is also reasonably foreseeable that in order to supply its customers, Coteau would develop alternate coal resources within or adjacent to the WMA not requiring ASLM approval, and a comparable numbers of cultural resources could be encountered. Since all cultural resource within the permitted area would be protected in accordance with the Cultural Resource Management Plan discussed previously, impacts to cultural resources are expected to be minor in both cases.

3.11.3. Cumulative Impacts to Cultural Resources

As land is developed for a variety of reasons, cultural resources are either destroyed or moved from their original location. When a project has a Federal connection and is required to comply with Section 106 of the National Historic Properties Act, cultural resources are recorded and mitigation plans are created, if necessary, before these cultural resources are destroyed or moved from their original location. This recordation of cultural resources helps to preserve the historical information of the area. However, additional cultural resources may be destroyed during private development before they are recorded. In addition, the destruction or removal of cultural resources from the landscape severs the bond Native American Tribes have with past ancestors and ways of life.

Cumulative impacts to cultural resources were fully discussed and quantified in the 2005 EIS. Since that time, additional developments have been proposed, permitted, and constructed in the area that have increased the cumulative impacts on cultural resources. The Proposed Action (Alternative A) is expected to have minor impacts and considering the regulatory requirements that exist to protect cultural resources; negligible adverse cumulative impacts on cultural resources are expected.

3.12. Noise

Noise is unwanted or disturbing sound that can interfere with day-to-day activities, such as sleeping. Sound generated from the Mine consists of vehicular traffic, heavy machinery, and explosive blasts. No regulations on noise levels exist in the Mine area, but the PSC regulates the airblast generated from blasting procedures. Airblast is generally of a non-audible sound frequency that occurs concurrent with the audible sounds from the blast. However, for discussion purposes all excessive unwanted or disturbing sound, whether audible or from inaudible airblast, is considered “noise”. The values listed in ***Table 17 Blasting Sound Limits*** must not be exceeded at any dwelling, public building, school, church, or commercial or institutional structure that is not owned by the mine operator.

Table 17 Blasting Sound Limits

Lower frequency limit of measuring system, hertz (Hz) (±3 dB)	Maximum level (dB)
0.1 Hz or lower-flat response	134 peak
2 Hz or lower-flat response	133 peak
6 Hz or lower-flat response	129 peak
C-weighted, slow response	105 peak dBC

Explosive blasts are used at the Mine primarily for coal. Occasionally, overburden rock may be blasted. A typical coal blast fractures approximately 100,000 tons of coal, using 20,000 lbs. of explosive. The primary explosive used is ammonium nitrate/fuel oil (ANFO). Residents and owners of manmade dwellings within one mile of the permit area are notified of an opportunity to receive a preblast survey according to North Dakota Administrative Code (NDAC) Article 69-05.2-17-02. To date, the Mine has sent pre-blast notices to over 120 individuals; 33 have requested pre-blast surveys. Additionally, an annual blasting schedule is sent to all residents within a half-mile of blasting sites, as well as others that regularly work within the area. The PSC has the authority to conduct inspections and sound level measurements during blasting; the Mine has never had a violation of airblast limits.

3.12.1. Direct and Indirect Impacts to Noise from Alternative A

Mining operations would generate sound in the vicinity of the mine. Production at the Mine would continue with current practices; no increase to the noise level from machinery or airblasts would occur. Due to the distance from developments or towns and the buffer distances from buildings and dwellings required by the PSC, no violations to airblast limits are anticipated.

3.12.2. Direct and Indirect Impacts to Noise from Alternative B

Alternative B would generate the same sounds from machinery and blasting that Alternative A would. Mining operating procedures would not change for this alternative, although there may be a slight increase in equipment noise from longer haul distances caused by inefficient mining of smaller, more distant blocks of coal. As such, a minimal increase in impacts to sound levels are anticipated with Alternative B.

3.12.3. Cumulative Noise Impacts

Continued mining operations are not anticipated to contribute to a cumulative noise impact in the area. The Mine is located near other noise-generating operations, including DGC and the AVS electric generation plant. These facilities are located approximately 10 miles north of the nearest town of Beulah. The surrounding landscape lessens the potential noise impact, as the rolling topography does not allow sound to travel as far. There would be no additional developments in the area that would likely add to the overall sound level under either Alternative A or B.

3.13. Transportation

Access to the Freedom Mine is north of Beulah along County Roads 21, 26, and 15. The city of Beulah is situated south of the intersection of State Highways 200 and 49. Highway 200 is a main transportation corridor between communities along the Missouri River in central North Dakota. In addition, the Mine can be accessed from the north along State Highway 1806. Average daily traffic counts at the intersection of Highways 49 and 200 as reported by the North Dakota Department of Transportation were 2,575, with 365 (14 percent) of those as commercial truck traffic in 2014. Much of the traffic traveling on these roads are employees of the Mine, AVS, and DGC, as well as recreationalists traveling to Lake Sakakawea.

Visitors to the Mine must come into the visitor parking lot and enter the main office or can enter the Mine site through a guarded entrance. As most of the coal mined at the Freedom Mine is used by facilities that are directly adjacent to the Mine, coal is delivered directly to AVS and DGC by gravel roads. Coal that is delivered to LOS is transported from the Mine by rail a distance of approximately 30 miles to the east. One or two trains, or 63 or 126 railcars, deliver on average approximately 6,000 tons of coal to LOS per day.

3.13.1. Direct and Indirect Impacts to Transportation from Alternative A

Alternative A would result in the closure of a portion of County Road 15 directly north of the Coteau office building. Traffic would be rerouted along County Road 37. This planned road closure was included in Permit NACT-0201 and has been approved by the PSC, as well as by the Mercer County Commission. The road closure will occur regardless of the outcome of this NEPA decision. Mine truck and employee traffic would not increase as the proposed action does not include an increase in production. Haul roads and access roads would be constructed within the active mining areas, but would be reclaimed once mining is completed.

3.13.2. Direct and Indirect Impacts to Transportation from Alternative B

Alternative B would also result in the planned closure of a portion of County Road 15, as described in Alternative A. Similarly to Alternative A, mine truck and employee traffic would not increase and any roads constructed for the purposes of mining would be reclaimed once mining is complete.

3.13.3. Cumulative Impacts to Transportation

Traffic volumes within the project area would not increase with either Alternative. When combined with future known plans, the burden on transportation infrastructure is not anticipated to be more than the county or state road departments can maintain. In addition, revenue from the continued mining within the WMA contributes to state and local taxes which are used to maintain public roads.

4. Consultation and Coordination

Consultation and coordination with governmental agencies, Tribes, and the public regarding the WMA has occurred since the 2005 ROD. Record of this consultation can be found in ***Appendix A, Consultation.*** Details on consultation held prior to 2005 can be found in the *Final Environmental Impact Statement FES 05-03* (BLM, 2005a).

4.1. Preparers and Contributors

OSMRE personnel that contributed to this EA include:

OSMRE Contributors are:

Name	**Responsibility**
Marcelo Calle	Manager, Field Operations Branch
Eugene Hay	Mining Engineer
Lauren Mitchell	Environmental Protection Specialist
Roberta Martinez Hernandez	Environmental Engineer
Erica Trent	Natural Resource Specialist

Coteau staff and consultants that contributed to this EA include:

Coteau and Consultant Contributors are:

Name	**Responsibility**	**Education/Experience**
Joseph Friedlander	QA review	B.S. Landscape Architecture and Environmental Design; M.S. Range Science; 35 years experience
Mark Haugen	QA review	B.S. Mining Engineering; Professional Engineer; 36 years experience
Troy Leingang	QA/QC review	B.S. Zoology; 26 years experience
Kayla Torgerson	Principal author, impact analysis	B.S. Mathematics; M.S. Natural Resources Science and Management; 5 years experience
Louise Segroves Barr Engineering Co.	Review of air quality analysis and impacts	B.A. Geology and Economics; M.S. Geosciences; 8 years experience
Nadine Czoschke Barr Engineering Co.	Review of air quality analysis and impacts	B.A. Chemistry; PhD Environmental Science; 9 years experience

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Appendix A

Consultation

1. *United States Fish and Wildlife Service Consultation Decision, 7-13-10*
2. *State Historical Society of North Dakota, 4-22-05*
3. *The Coteau Properties Company, 8-2-05*
4. *State Historical Society of North Dakota, 8-12-05*
5. *The Coteau Properties Company, 8-26-05*
6. *State Historical Society of North Dakota, 3-26-06*
7. *State Historical Society of North Dakota, 1-8-07*
8. *The Coteau Properties Company, 1-18-13*
9. *State Historical Society of North Dakota, 1-23-13*
10. *The Coteau Properties Company, 1-6-15*
11. *State Historical Society of North Dakota, 1-7-15 (a)*
12. *State Historical Society of North Dakota, 1-7-15 (b)*
13. *Letter to Interested Parties, 9-18-15*
14. *Interested Parties Mailing List*
15. *Public Comment Legal Ad, 9-10-15 and 9-24-15*
16. *United States Department of the Interior, Office of Surface Mining 12-7-15 (a)*
17. *United States Department of the Interior, Office of Surface Mining 12-7-15 (b)*
18. *United States Department of the Interior, Office of Surface Mining 12-7-15 (c)*
19. *United States Department of the Interior, Office of Surface Mining 12-7-15 (d)*
20. *United States Department of the Interior, Office of Surface Mining 12-7-15 (e)*

STATE OF NORTH DAKOTA

PUBLIC SERVICE COMMISSION

The Coteau Properties Company
Revision No. 8, Permit NACT-0201
Application

Case No. RC-10-71

NOTICE OF RECEIPT OF REVISION APPLICATION

June 2, 2010

The Coteau Properties Company has filed an application for Revision No. 8 to Surface Coal Mining Permit NACT-0201. This revision proposes to mine federal coal tracts within the existing permit area and updates other mining plans south of County Road 26. The revision also modifies the post-mining topography, surface water hydrology, post-mining land use, post-mining wetlands and post-mining stockponds for most lands south of County Road 26. No additional lands are being added to the permit with this revision and permitted acreage will remain at 17,050.96 acres. The federal coal tracts located south of County Road 26 that are proposed to be mined are located in all or portions of:

Sections 26 and 34, T145N, R88W, and Sections 2, 4, 6, and 8, T144N, R88W, Mercer County, ND.

The revision applications and surface coal mining and reclamation permit may be inspected at:

Public Service Commission
State Capitol
Bismarck, North Dakota 58505-0480

Mercer County Auditor
County Courthouse
Stanton, North Dakota 58571

You may submit written comments or objections on the proposed permit renewal and revision applications and their effects on the environment and on surface owners of the land in the permit area. You may request an informal conference with the Commission and the applicant on the renewal and revision applications. The reasons for requesting an informal conference must be stated in the request. Written comments, objections, or requests for informal conference must be made by July 12, 2010.

If there is an informal conference, you may request a formal administrative hearing on the Commission ruling on the applications. Your request for a formal hearing must be made within thirty days of the Commission ruling on the applications.

Written comments, objections, or requests for informal conferences should be addressed to the Public Service Commission, State Capitol, Bismarck, North Dakota 58505-0480.

For more information you may contact the Public Service Commission at 701-328-2400.

PUBLIC SERVICE COMMISSION

Tony Clark	Kevin Cramer	Brian P. Kalk
Commissioner	Chairman	Commissioner

RECEIVED
JUL 15 2010
32090
NORTH DAKOTA
PUBLIC SERVICE COMMISSION

FROM DIRECTOR - RECLAMATION DIV.

Date:_____

Action:_____

Info. Only:_____

Info & File:_____

U.S. FISH AND WILDLIFE SERVICE

ECOLOGICAL SERVICES
ND FIELD OFFICE

Project as described will have no significant impact on fish and wildlife resources. No endangered or threatened species are known to occupy the project area. IF PROJECT DESIGN CHANGES ARE MADE, PLEASE SUBMIT PLANS FOR REVIEW.

7-13-10
Date

Jeffrey K. Towner
Field Supervisor

STATE HISTORICAL SOCIETY OF NORTH DAKOTA

April 22, 2005

Mr. Joseph D. Friedlander
Environmental Manager
The Coteau Properties Company
Freedom Mine
204 County Road 15
Beulah, ND 58523-9475

NDSHPO Ref: 93-0209 BLM/OSM/PSC Coteau, Coteau West Mine Area Cultural Resource Management Plan (WMA CRMP), April 12, 2005, **WMA CRMP acceptance**

Dear Joe:

We have reviewed: ***"Coteau: A Cultural Resource Management Plan for the West Mine Area, Mercer County, North Dakota, Revision 1"*** (Revised, April 12, 2005) regarding the identification, evaluation, and treatment of Historic Properties affected by surface coal mining operations in the West Mine Area.

We find the WMA CRMP document acceptable, and we look forward to reviewing the products specified in it.

Thank you for the opportunity to review the project. If you have any questions please contact either Fern Swenson at (701) 328-3575 or Paul Picha at (701) 328-3574.

Sincerely,

for

Merlan E. Paaverud, Jr.
Director, State Historical Society of North Dakota
and
State Historic Preservation Officer (North Dakota)

c: Barry Williams, BLM

COTEAU
THE COTEAU PROPERTIES COMPANY

A SUBSIDIARY OF THE NORTH AMERICAN COAL CORPORATION

FREEDOM MINE
204 County Road 15
Beulah, ND 58523-9475
(701) 873-2281 • Fax (701) 873-7226

August 2, 2005

Mr. Merlan E. Paaverud, Jr.
Director
State Historical Society of North Dakota
North Dakota Heritage Center
612 East Boulevard Avenue
Bismarck, ND 58505-0830

Dear Mr. Paaverud:

This letter is to request approval from your office for mining disturbance of certain National Register of Historic Places eligible sites in Coteau's West Mine Area, recently mitigated through field excavation and data recovery. As part of the Phase II investigations, Ethnoscience, Inc. completely excavated Features 1 and 2 at Site 32ME169. Seventeen cairns and 65 stone rings were each examined with a single 1 x 1 m unit. No evidence of burials were found at any excavated cairns. Grading was conducted at six sites targeted for impact within the next five years. These include Sites 32ME108 (outside the 200 foot grave setback area), 32ME167, 32ME169, 32ME171, 32ME232, and 32ME233 (see enclosed maps). No features were identified during grading. Finally, the artifacts associated with cairn features 1 and 26 at Site 32ME1513 were reburied under the direction and ceremony of Perry Brady (No Tears), the cultural resource monitor from the Three Affiliated Tribes.

Specifically, we are requesting concurrence that all field work has been completed and surface disturbance can occur at the following sites: 32ME108 (outside the 200 foot grave setback), 32ME167, 32ME169, 32ME171, 32ME232, and 32ME233.

If you have questions, please contact me.

Sincerely,

THE COTEAU PROPERTIES COMPANY

Joseph D. Friedlander
Environmental Manager

JDF:lr
Enc.

cc: w/enc.
James R. Deutsch, North Dakota Public Service Commission
Foster Kirby, Office of Surface Mining
Lynelle Peterson, Ethnoscience
Alan Stanfill, Advisory Council on Historic Preservation
Barry Williams, Bureau of Land Management

REVISION 5
FEBRUARY 2007

STATE HISTORICAL SOCIETY OF NORTH DAKOTA

August 12, 2005

Mr. Joseph D. Friedlander
Environmental Manager
The Coteau Properties Company
Freedom Mine
204 County Road 15
Beulah, ND 58523-9475

NDSHPO Ref: 93-0209 BLM/OSM/PSC Coteau, Coteau West Mine Area Request for mining disturbance at sites in West Mine Area [32ME108 (outside 200 foot setback), 32ME167, 32ME169, 32ME171, 32ME232, and 32ME233]

Dear Joe:

We have reviewed: "Request for mining disturbance at sites in West Mine Area [32ME108 (outside 200 foot setback), 32ME167, 32ME169, 32ME171, 32ME232, and 32ME233]" outlined in your correspondence of August 2.

The request is granted and is in accord with the ***"Coteau: A Cultural Resource Management Plan for the West Mine Area, Mercer County, North Dakota, Revision 1"*** (Revised, April 12, 2005) regarding the identification, evaluation, and treatment of Historic Properties affected by surface coal mining operations in the West Mine Area.

Finally, we look forward to reviewing the products specified in the CRMP.

Thank you for the opportunity to review the project. If you have any questions please contact either Paul Picha at (701) 328-3574 or Susan Quinnell at (701) 328-3576.

Sincerely,

for Merlan E. Paaverud, Jr.
Director, State Historical Society of North Dakota
and
State Historic Preservation Officer (North Dakota)

c: Barry Williams, BLM

REVISION 5
FEBRUARY 2007

COTEAU
THE COTEAU PROPERTIES COMPANY

A SUBSIDIARY OF THE NORTH AMERICAN COAL CORPORATION

FREEDOM MINE
204 County Road 15
Beulah, ND 58523-9475
(701) 873-2281 • Fax (701) 873-7226

August 26, 2005

Mr. Merlan E. Paaverud, Jr.
Director
State Historical Society of North Dakota
North Dakota Heritage Center
612 East Boulevard Avenue
Bismarck, ND 58505-0830

Dear Mr. Paaverud:

During a recent review of our copy of *Coteau: A Cultural Resource Management Plan for the West Mine Area, Mercer County North Dakota, Revision 1 (April 12, 2005)*, we noted three errors that were not substantive on Table 3.1. Under the column "Avoidance", Site 32ME108 was shown as partial avoidance, with no avoidance shown for Site 32ME1513. Also, Site 32ME1513 was described as containing only stone rings, but two burials were found there. These errors have been corrected and a new Table 3.1 is enclosed to replace the existing table. These changes are consistent with the approved language in the text portion of the document. Apparently the table was not changed when all the text changes were made.

I'm also sending a new Table 3.1 to the original recipients of the approved management plan. We apologize for any inconvenience this may have caused.

Sincerely,

THE COTEAU PROPERTIES COMPANY

Joseph D. Friedlander
Environmental Manager

JDF:lr
Enc.

cc: (w/enc.)
James R. Deutsch, North Dakota Public Service Commission
Foster Kirby, Office of Surface Mining
Lynelle Peterson, Ethnoscience, Inc.
Alan Stanfill, Advisory Council on Historic Preservation
Barry Williams, Bureau of Land Management

STATE HISTORICAL SOCIETY OF NORTH DAKOTA

March 23, 2006

Mr. Joseph D Friedlander
Environmental Manager
Coteau Properties Company
Freedom Mine
204 County Road 15
Beulah, ND 58523-9475

ND SHPO Ref.:93-209P Site 32ME189, the Ricker Farmstead [NE1/4 S 10, T145N R88W Coteau's West Mine Area Permit NACT-0201

Dear Mr. Friedlander,

We reviewed ND SHPO Ref.:93-209P Blain Fandrich, "Historic American Buildings Survey - Brakofiu Zrakovi Homestead/Christian Ost Farm/Walter Ricker Farm," and find the revised report acceptable. We concur that this HABS documentation concludes mitigation of Site 32ME189, and that surface mining disturbance can commence.

Thank you for the opportunity to review this project. If you have any questions please contact Susan Quinnell, at (701) 328-3576, e-mail squinnell@state.nd.us

Sincerely,

Merlan E. Paaverud, Jr.
State Historic Preservation Officer (North Dakota)

REVISION 5
FEBRUARY 2007

STATE HISTORICAL SOCIETY OF NORTH DAKOTA

January 8, 2007

Mr. Joseph D. Friedlander
Environmental Manager
The Coteau Properties Company
Freedom Mine
204 County Road 15
Beulah, ND 58523-9475

ND SHPO REF: 93-0209 Coteau Properties/BLM/OSM/PSC
Final: West Mine Area Data Recovery Reports-Management Plan:
Archaeological Investigations
Appendix A: Geospatial and Morphological Analyses

Dear Mr. Friedlander:

We have reviewed final: "Coteau: Data Recovery in the West Mine Area," by Shane Hope, John Boughton, Lynelle A. Peterson, Lynn M. Peterson, and Jennifer Bales (Ethnoscience, May 2006-revised), find it acceptable, and in accord with the management plan.

Thank you for the opportunity to review the project. If you have any questions please contact either Paul Picha at (701) 328-3574 or Susan Quinnell at (701) 328-3576.

Sincerely,

for

Merlan E. Paaverud, Jr.
State Historic Preservation Officer (North Dakota)
and
Director, State Historical Society of North Dakota
c: James R. Deutsch, Director, Reclamation Division, PSC
c: Barry Williams, BLM
c: Foster Kirby, OSM
c: Daniel E. Cimarosti, State Program Manager, Bismarck Regulatory, COE
c: Lynelle Peterson, Ethnoscience

REVISION 5
FEBRUARY 2007

THE COTEAU PROPERTIES COMPANY

A SUBSIDIARY OF THE NORTH AMERICAN COAL CORPORATION

FREEDOM MINE

204 County Road 15
Beulah, North Dakota 58523-9475

(701) 873-2281 • Fax (701) 873-7226

January 18, 2013

Mr. Merlan E. Paaverud, Jr.
Director
State Historical Society of North Dakota
North Dakota Heritage Center
612 East Boulevard Avenue
Bismarck, ND 58505-0830

RE: NDSHPO Ref: 93-0209 BLM/OSM/PSC Coteau

Dear Mr. Paaverud:

This letter is to request approval from your office for mining disturbance of two National Register of Historic Places eligible sites in Coteau's West Mine Area, 32ME206 and 32ME757, which were recently mitigated through field excavation (grading). Additional data recovery efforts were conducted at these two sites in accordance with the management plan implemented in *"Coteau: A Cultural Resource Management Plan For The West Mine, Mercer County, North Dakota, Revision 1."* Grading was conducted on September 4, 2012 at these two sites targeted for impact within the next five years. No features were identified during grading.

Also enclosed is an addendum dated October 22, 2012 to "*Coteau: Data Recovery in the West Mine Area*" prepared by Ethnoscience, Inc., who conducted the data recovery work. Also enclosed are a Manuscript Data Record Form and the $50 fee.

Specifically, we are requesting concurrence that all field work has been completed and surface disturbance can occur at 32ME206 and 32ME757.

If you have questions, please contact me.

Sincerely,

THE COTEAU PROPERTIES COMPANY

Donn R. Steffen
Environmental Manager

DRS:lr
Enc.

cc: w/enc.
James R. Deutsch, North Dakota Public Service Commission
Foster Kirby, Office of Surface Mining
Justin Peters, North Dakota Field Office - Bureau of Land Management

STATE HISTORICAL SOCIETY OF NORTH DAKOTA

January 23, 2013

Mr. Donn R. Steffen
Environmental Manager
Coteau Properties Company
Freedom Mine
204 County Road 15
Beulah , North Dakota 58523-9475

NDSHPO Ref.: 93-0209DE PSC/OSM/BLM Coteau West Mine Area CRMP Revision 1 Provisions and Reporting

Dear Mr. Steffen:

We have received and reviewed correspondence and documentation for: **93-0209DE PSC/OSM/BLM Coteau West Mine Area CRMP Revision 1 Provisions and Reporting**, "Coteau Mining Properties: Addendum to Data Recovery in the West Mine Area," by Patrick Kuntz (Ethnoscience, October 2012), and find it acceptable and in accord with the executed Coteau West Mine Area CRMP.

Thank you for the opportunity to review the project. If you have questions please contact Paul Picha at ppicha@nd.gov or (701) 328-3574.

Sincerely,

Merlan E. Paaverud, Jr.
State Historic Preservation Officer (North Dakota)
and
Director, State Historical Society of North Dakota
c: James R. Deutsch, PSC
c: Foster Kirby, OSM
c: Justin Peters, BLM
c: Lynelle Peterson, Ethnoscience

THE COTEAU PROPERTIES COMPANY

A SUBSIDIARY OF THE NORTH AMERICAN COAL CORPORATION

FREEDOM MINE
204 County Road 15
Beulah, North Dakota 58523-9475
(701) 873-2281 • Fax (701) 873-7226

January 6, 2015

Ms. Claudia J. Berg
Director
State Historical Society of North Dakota
North Dakota Heritage Center
612 East Boulevard Avenue
Bismarck, ND 58505-0830

RE: NDSHPO Ref: 93-0209 BLM/OSM/PSC Coteau West Mine Area CRMP

Dear Ms. Berg:

This letter is to request approval from your office for mining disturbance of three National Register of Historic Places eligible sites in Coteau's West Mine Area. The sites are identified as 32ME0108, 32ME0328, and 32ME1571, and were recently mitigated through reinterment and excavation (grading).

Additional data recovery efforts were conducted at these three sites in accordance with the management plan implemented in "Coteau A Cultural Resource Management Plan for the West Mine, Mercer County, North Dakota, Revision 1".

Grading was conducted on July 23, 2014 at sites 32ME0328 and 32ME1571 according to the strategy outlined in the management plan. No features were identified during the grading. Enclosed is an addendum dated August 12, 2014 to "Coteau Mining Properties Addendum to Data Recovery in West Mine Area 2014" prepared by Ethnoscience, Inc., who conducted the data recovery work. Also enclosed is a Manuscript Data Record Form.

Site 32ME108 was a burial located within Coteau's West Mine Area. Excavation of the burial identified a secondary burial of a woman, and recovered Knife River flint chipped stone flaking debris and a Tongue River silcrete scraper. The human remains and artifacts were interred in an area designated by the Three Affiliated Tribes in concurrence with Coteau's management plan. The work was conducted by Ethnoscience July 8 through July 10, 2014. A cultural monitor from Three Affiliated Tribes was on site during the excavation and reinterment, along with a representative from the North Dakota Public Service Commission for one day during excavation. Enclosed is a report entitled "Cultural Resource Investigation of a Prehistoric Burial (32ME0108) in Mercer County, North Dakota" and a Manuscript Data Record Form.

Early next week, Coteau will send the $100 manuscript filing fee for the reports. We are requesting concurrence that all field work has been completed in accordance with the management plan, and that surface disturbance can occur at 32ME0108, 32ME0328, and 32ME1571.

If you have questions, please contact me.

Sincerely,

THE COTEAU PROPERTIES COMPANY

Troy J. Leingang
Environmental Manager

TJL:lr
Enc.

cc: w/enc.
James R. Deutsch, North Dakota Public Service Commission
Bob Postle, Office of Surface Mining
Paul Picha, State Historical Society of North Dakota
Loren Wickstrom, Bureau of Land Management – ND Field Office

STATE HISTORICAL SOCIETY OF NORTH DAKOTA

January 7, 2015

Troy J. Leingang
Environmental Manager
The Coteau Properties Company
Freedom Mine
204 County Road 15
Beulah, North Dakota 58523-9475

ND SHPO Ref: 93-0209 and 94-0108 PSC/BLM Coteau West Mine Area Permit NACT-0201
Coteau: A Cultural Resource Management Plan (CRMP) for the West Mine Area, Mercer County, North Dakota, Revision 1. Grading Report for 32ME238 and 32ME1571

Dear Troy:

We have received and reviewed correspondence and documentation: "Coteau Mining Properties: Addendum to Data Recovery in the West Mine Area 2014" by Patrick Kuntz (Ethnoscience, August 2014). If consulted by a federal agency we concur that the report is acceptable and is in accordance with the executed CRMP.

Thank you for the opportunity to review the project. Please include the ND SHPO reference number listed above in any further correspondence for this specific project. If you have any questions, please contact either Paul Picha at (701) 328-3574 or ppicha@nd.gov or Susan Quinnell at (701) 328-3576 or squinnell@nd.gov.

Sincerely,

Claudia J. Berg
State Historic Preservation Officer (North Dakota)
and
Director, State Historical Society of North Dakota
c: Lynelle Peterson, Ethnoscience

REVISION 18
JUNE 2014

STATE HISTORICAL SOCIETY OF NORTH DAKOTA

January 7, 2015

Troy J. Leingang
Environmental Manager
The Coteau Properties Company
Freedom Mine
204 County Road 15
Beulah, North Dakota 58523-9475

ND SHPO Ref: 93-0209 and 94-0108 PSC/BLM Coteau West Mine Area
Permit NACT-0201
Coteau: A Cultural Resource Management Plan (CRMP) for the West Mine Area, Mercer County, North Dakota, Revision 1. Investigations at 32ME108

Dear Troy:

We have received and reviewed correspondence and documentation: "Cultural Resource Investigations of a Prehistoric Burial (32ME108) in Mercer County, North Dakota" by Lynelle Peterson (Ethnoscience, November 2014). If consulted by a federal agency we concur that the report is acceptable and is in accordance with the executed CRMP.

Thank you for the opportunity to review the project. Please include the ND SHPO reference number listed above in any further correspondence for this specific project. If you have any questions, please contact either Paul Picha at (701) 328-3574 or ppicha@nd.gov or Susan Quinnell at (701) 328-3576 or squinnell@nd.gov.

Sincerely,

Claudia J. Berg
State Historic Preservation Officer (North Dakota)
and
Director, State Historical Society of North Dakota
c: Lynelle Peterson, Ethnoscience

REVISION 18
JUNE 2014

United States Department of the Interior

OFFICE OF SURFACE MINING
RECLAMATION AND ENFORCEMENT
Western Region Office
1999 Broadway, Suite 3320
Denver, CO 80202-3050

September 18, 2015

Dear Interested Public Land User,

The U.S. Department of the Interior (DOI), Office of Surface Mining Reclamation and Enforcement (OSMRE), Western Region Office, will prepare an environmental assessment (EA) for a Federal mining plan modification for the Freedom Mine's West Mine Area (the Project). The application to lease Federal Coal Tract NDM-91535 was filed with the Bureau of Land Management (BLM) by Coteau Properties Company (Coteau) on January 16, 2002 and subsequently approved by the BLM for competitive lease sale on November 1, 2005. Coteau was the successful high bidder during the lease sale. On April 1, 2011, in accordance with the Mineral Leasing Act of 1920 (MLA), Coteau received Federal mining plan approval from the Assistant Secretary of Lands and Mineral Management (ASLM) to mine portions of Federal Coal Tract NDM-91535 at the Freedom Mine, Surface Coal Mining Permit NACT-0201. On October 28, 2014, the North Dakota Public Service Commission notified OSMRE that they had received Permit Revision (PR) No. 18 for Coteau's Surface Coal Mining Permit NACT-0201 for the Project (including mining of portions of Federal Coal Tract NDM-91535) in accordance with its responsibilities under the Federal Surface Mining and Reclamation Control Act (SMCRA) of 1977.

OSMRE is preparing this EA to evaluate the environmental impacts resulting from the Project, pursuant to the requirements of the National Environmental Policy Act of 1969 (NEPA). The Freedom Mine is located approximately 10 miles north of Beulah, North Dakota, north of Highway 200 in Mercer County, North Dakota. The total amount of Federal coal authorized for removal within the currently approved Federal mining plan is approximately 45.1 million tons (mmt) and an estimated 39.1 mmt of coal remains to be mined. PR No.18 proposes to add zero Federal surface acres to the approved permit area and add approximately 960 Federal coal acres and 25.6 mmt of Federal coal to the approved Federal mining plan. The Freedom Mine uses a combination of dragline and truck shovel mining methods. The average production rate at the Freedom Mine is approximately 13.5 million tons per year (mmtpy) and the maximum production rate is 16 mmtpy. PR No. 18 would not change the average production rate or the maximum production rate for the life of the mining operation. Freedom Mine started operation in 1983 and the life of mine would continue operation until 2045. This mining plan modification would not extend the life of the mine.

The EA will disclose the potential for direct, indirect and cumulative impacts to the environment from the Project. Further, this EA will update, clarify, and provide new and additional environmental information for the Project. Through the EA process, OSMRE will determine whether or not there are

significant environmental impacts. If a finding of no significant impact is reached the OSMRE Director will make a recommendation to the DOI's ASLM on the Federal mining plan modification, and the ASLM will approve, approve with conditions, or disapprove the Federal mining plan modification as required under the MLA. If the EA identifies significant impacts, an environmental impact statement will be prepared.

OSMRE is soliciting public comments on the Project. Your comments will help to determine the issues and alternatives that will be evaluated in the environmental analysis. You are invited to direct these comments to:

ATTN: Freedom Mine West Mine Area EA
C/O: Lauren Mitchell
Western Region Office, Office of Surface Mining Reclamation and Enforcement
1999 Broadway, Suite 3320
Denver, CO 80202-3050

Comments may also be emailed to: OSM-NEPA-ND@OSMRE.gov. Comments should be received or postmarked no later than October 10, 2015 in order to be considered during the preparation of the EA. Comments received, including names and addresses of those who comment, will be considered part of the public record for this project and will be available for public inspection. Additional information regarding the Project may be obtained from Lauren Mitchell, telephone number (303) 293-5028. When available, the EA and other supporting documentation will be posted at:
http://www.wrcc.osmre.gov/initiatives/freedomMine.shtm

Sincerely,

Marcelo Calle, Manager
Field Operations Branch

COTEAU PROPERTIES

Freedom Mine - Mercer County
Standard First Class Mail

LEWIS & CLARK REGIONAL
DEVELOPMENT COUNCIL
200 1st AVE NW, STE B
MANDAN ND 585554-3109

COUNTY COMMISSION
COUNTY AUDITOR
PO BOX 39
STANTON ND 58571-0039

PLANNING AND ZONING COMMISSION
COUNTY AUDITOR
PO BOX 39
STANTON ND 58571-0039

SOIL CONSERVATION DISTRICT
DISTRICT CONSERVATIONIST
1400 HWY 49 N #103
BEULAH ND 58523-6066

WATER RESOURCE DISTRICT
JOHN KLEIN
PO BOX 488
HAZEN ND 58545-0488

HONORABLE MAYOR
TERRY BARDEN
PO BOX 97
ZAP ND 58580-0097

HONORABLE MAYOR
DARRELL BJERKE
PO BOX 910
BEULAH ND 58523-0910

SEND TO THE FOLLOWING IF ACREAGE IS ADDED TO ANY PERMIT
Certified Mail

Mr. Marcus Wells Jr., Chairman
Three Affiliated Tribes Bus Council
404 Frontage Rd
New Town, ND 58763

Myra Pearson, Chairperson
Spirit Lake Tribal Council
PO Box 359
Fort Totten, ND 58335-0359

Mr. Ron His Horse is Thunder, Chairman
Standing Rock Tribal Bus Office
Admin Service Ctr Bldg #1
Fort Yates, ND 58538

Mr. Richard Marchellais, Chairman
Turtle Mountain Band of Chippewa
PO Box 900
Belcourt, ND 58316-0900

Mr. Ray K. Eder, Chairman
Fort Peck Tribes
PO Box 1027
Poplar, MT 59255

Company	LastName	FirstName	Address1	City	State	PostalCode
North Dakota Game & Fish Department	Dyke	Steve	100 North Bismarck Expressway	Bismarck	ND	58501
North Dakota State Historical Society	Quinnell	Susan	612 East Boulevard Ave.	Bismarck	ND	58505
U.S. Army Corps of Engineers	Cimarosti	Daniel	1513 South 12th	Bismarck	ND	58504
U.S. Fish and Wildlife Service	Shelley	Kevin	3425 Miriam Avenue	Bismarck	ND	58501
US Congress	Cramer	Kevin	328 Federal Building	Bismarck	ND	58501
US Senate	Heitkamp	Heidi	US Federal Building, Rm 228	Bismarck	ND	58501
US Senate	Hoeven	John	US Federal Building, Rm 312	Bismarck	ND	58501
USDA-Natural Resources Conservation Service-	Podoll	Mary	220 East Rosser Avenue, Room 270	Bismarck	ND	58501
Office of Governor	Dalrymple	Jack	600 East Boulevard Avenue	Bismarck	ND	58505-0100
North Dakota Lignite Council	Bohrer	Jason	1016 E Owens Ave.	Bismarck	ND	58501
Dakota Resource Advisory Council	Bowman	Bruce	15707 83rd St. S.W.	Rhame	ND	58651
Dakota Resource Advisory Council	Combs	Drew	436 Brunswick Dr.	Bismarck	ND	58503
Dakota Resource Advisory Council	Gilbert	Ray	12097 Gilbert-Hett Road	Buffalo	SD	57720
Dakota Resource Advisory Council	Timmerman	Vern	25272 455th Ave.	Salem	SD	57058
Dakota Resource Advisory Council	Rettinger	Brenda	5908 137th Ave. SW	New England	ND	58647
Dakota Resource Advisory Council	Forrester	Kevin	2002 Paha Sapa Drive	Sturgis	SD	57785
Dakota Resource Advisory Council	Colbath	Gary	840 North Spruce St. #219	Rapid City	SD	57701
Dakota Resource Advisory Council	Waterland	Ronald	801 Glover Street	Sturgis	SD	57785
Dakota Resource Advisory Council	Bestgen	Branden	P.O. Box 216	Sturgis	SD	57785
Dakota Resource Advisory Council	Kain	Mike	P.O. Box 932	Spearfish	SD	57783
Dakota Resource Advisory Council	Bleich	Vernon	5546 Flaconer Drive	Bismarck	ND	58504
Dakota Resource Advisory Council	Brown	Debra	P.O. Box 655	Buffalo	SD	57720
Dakota Resource Advisory Council	Brunner	Ryan	708 Bridgeview Ave.	Pierre	SD	57501
Dakota Resource Advisory Council	Johnson	Robert	12478 Bob's Place	Buffalo	SD	57720

PUBLIC NOTICES

NOTICE OF HEARING

Notice is hereby given that the housing authority of Mercer County will conduct a public hearing at crescent manor, 20 7th St NE, Hazen, ND on October 13, 2015, 11:30 a.m., To discuss the annual plan. A copy of the proposed amendment is available for review and inspection in the management office at 1600 3rd Ave NW, Mandan, ND, or by phoning 701-663-7494 for a copy. Any person interested may inspect the amendment during the next 45 day period and/or appear at the hearing and be heard.

RICK HORN, MANAGEMENT AGENT

(9-3-15) (9-10-15)

NOTICE OF PETITION FOR NAME CHANGE

NOTICE IS HEREBY GIVEN THAT Bobbi Jean Just (current full name) has filed a Petition with the District Court in Stanton (city), Mercer (county), North Dakota where he/she has requested an order from the court changing his/her name from Just (current last name to) Berg (new last name) to be known as Bobbi Jean Berg, (first, middle, last new name). This Petition will be presented to the Court for consideration not less than thirty days following publication of this Notice.

Dated this 23 day of July, 2015.

(9-3-15) (9-10-15) (9-17-15)

NOTICE OF LEASING SCHOOL TRUST LANDS

The Board of University and School Lands will offer the following lands for lease in Mercer Co.

		Ac	Term	Rent	
UNORGANIZED (143-89)					
36	SE4	160	5	1888	
UNORGANIZED (143-88)					
4	N2NE4	80	5	1088	
4	NW4	159	5	1718	
4	SW4	160	5	2456	
32	NW4	160	5	2096	
32	SW4	160	5	2130	
UNORGANIZED (143-89)					
20	NE4	160	5	2212	
20	NW4	160	5	1373	
22	NE4	160	5	2349	
22	NW4	160	5	2456	
22	SE4	160	5	1966	
28	NE4	157	5	1852	
28	NW4	160	5	1966	
28	SW4	160	5	2048	
UNORGANIZED (143-90)					
28	NE4	160	5	1636	*
36	NE4	160	5	2081	N
36	NW4	160	5	2252	N
36	SE4	160	5	1968	
36	SW4	160	5	1926	N
UNORGANIZED (144-88)					
36	NE4 less deeded acres	127	5	1759	N
36	SE4	160	5	1885	N
UNORGANIZED (144-90)					
20	SW4NW4	40	5	614	
20	E2SE4	80 (73 Hay)	5	1206	
20	W2SW4	80	5	1065	
UNORGANIZED (145-88)					
16	NW4	160	5	1626	
UNORGANIZED (148-90)					
36	NE4	151	5	1936	
36	NW4	155	5	1960	

* = Successful bidder must pay previous lessee for undepreciated investment in a permanent improvement.

N = Known noxious weed infestation. Control requirements apply to all leases.

Auctioneer will read specific requirements at the auction.

The public lease auction will be held in the Courthouse, Courtroom at Stanton, ND, on Thursday, October 08, 2015 at 1:00 PM CT.

Bidding will begin at minimum rent. 1st year's rent must be paid in full immediately after the sale. The Board reserves the right to reject any and all bids.

For more information, visit www.land.nd.gov or call (701) 328-2800. For auxiliary aids and services, please call by 10/01/2015.

8/25/2015 /s/ Lance D. Gaebe
Land Commissioner

(9-10-15)

PUBLIC NOTICE

North Dakota livestock brands will expire on Jan. 1, 2016, in accordance with North Dakota Century Code 4.1-73-10. Present brand owners have the right to rerecord their brands. If a brand is allowed to expire, ownership interest in the brand will be lost and the brand may no longer be used.

In August, a renewal notice for each recording was mailed to the address on file in the brand recording office. If you have not received your notice or have questions about renewing a brand, contact the North Dakota Stockmen's Association at (701) 223-2522 or visit www.ndstockmen.org.

(9-10-15)

NOTICE OF INTENT TO ADOPT, AMEND, OR REPEAL ADMINISTRATIVE RULES

relating to Educator Licensure

Education Standards and Practices Board

will hold a public hearing to address proposed new, amendments to, or repeal of N.D. Admin. Code 67.1

Education Standards and Practices Board 2718 Gateway Ave.Suite 204 Bismarck, ND October 15, 2015 2:00 p.m.

The proposed rules may be reviewed at the office of the Education Standards and Practices Board, 2718 Gateway Avenue, Suite 204, Bismarck, ND 58503. A copy of the proposed rules and/or a regulatory analysis may be requested by writing the above address or calling (701) 328-9641. Written or oral comments on the proposed rules sent to the above address or telephone number and received by October 30, 2015 will be fully considered. If you plan to attend the public hearing and will need special facilities or assistance relating to a disability, please contact the Education Standards and Practices Board at the above telephone number or address at least one week prior to the public hearing.

Dated this 31th day of August, 2015.
Janet Placek Welk, Ph.D.
Executive Director
Education Standards and Practices Board

PUBLIC NOTICE FREEDOM MINE MINING PLAN MODIFICATION ENVIRONMENTAL ASSESSMENT

The U.S. Department of the Interior (DOI), Office of Surface Mining Reclamation and Enforcement (OSMRE), Western Region Office, will prepare an environmental assessment (EA) for a Federal mining plan modification for the Freedom Mine's West Mine Area (the Project). The application to lease Federal Coal Tract NDM-91535 was filed with the Bureau of Land Management (BLM) by Coteau Properties Company (Coteau) on January 16, 2002 and subsequently approved by the BLM for competitive lease sale on November 1, 2005. Coteau was the successful high bidder during the lease sale. On April 1, 2011, in accordance with the Mineral Leasing Act of 1920 (MLA), Coteau received Federal mining plan approval from the Assistant Secretary of Lands and Mineral Management (ASLM) to mine portions of Federal Coal Tract NDM-91535 at the Freedom Mine, Surface Coal Mining Permit NACT-0201. On October 28, 2014, the North Dakota Public Service Commission notified OSMRE that they had received Permit Revision (PR) No. 16 for Coteau's Surface Coal Mining Permit NACT-0201 for the Project (including mining of portions of Federal Coal Tract NDM-91535) in accordance with its responsibilities under the Federal Surface Mining and Reclamation Control Act (SMCRA) of 1977.

OSMRE is preparing this EA to evaluate the environmental impacts resulting from the Project, pursuant to the requirements of the National Environmental Policy Act of 1969 (NEPA). The Freedom Mine is located approximately 10 miles north of Beulah, North Dakota, north of Highway 200 in Mercer County, North Dakota. The total amount of Federal coal authorized for removal within the currently approved Federal mining plan is approximately 45.1 million tons (mmt) and an estimated 39.1 mmt of coal remains to be mined. PR No.16 proposes to add zero Federal surface acres to the approved permit area and add approximately 960 Federal coal acres and 25.6 mmt of Federal coal to the approved Federal mining plan. The Freedom Mine uses a combination of dragline and truck shovel mining methods. The average production rate at the Freedom Mine is approximately 13.5 million tons per year (mmtpy) and the maximum production rate is 16 mmtpy. PR No. 16 would not change the average production rate or the maximum production rate for the life of the mining operation. Freedom Mine started operation in 1963 and the life of mine would continue operation until 2045. This mining plan modification would not extend the life of the mine.

The EA will disclose the potential for direct, indirect and cumulative impacts to the environment from the Project. Further, this EA will update, clarify, and provide new and additional environmental information for the Project. Through the EA process, OSMRE will determine whether or not there are significant environmental impacts. If a finding of no significant impact is reached the OSMRE Director will make a recommendation to the DOI's ASLM on the Federal mining plan modification, and the ASLM will approve, approve with conditions, or disapprove the Federal mining plan modification as required under the MLA. If the EA identifies significant impacts, an environmental impact statement will be prepared.

OSMRE is soliciting public comments on the Project. Your comments will help to determine the issues and alternatives that will be evaluated in the environmental analysis. You are invited to direct these comments to: ATTN: Freedom Mine West Mine Area EA, C/O: Lauren Mitchell, Western Region Office, Office of Surface Mining Reclamation and Enforcement, 1999 Broadway, Suite 3320, Denver, CO 80202. Email: OSM-NEPA-ND@OSMRE.gov. Comments should be received or postmarked no later than October 10, 2015 in order to be considered during the preparation of the EA. Comments received, including names and addresses of those who comment, will be considered part of the public record for this project and will be available for public inspection. Additional information regarding the Project may be obtained from Lauren Mitchell, telephone number (303) 293-5028. When available, the EA and other supporting documentation will be posted at: http://www.wrcc.osmre.gov/initiatives/freedomMine.shtm

(9-10-15)

MERCER COUNTY COMMISSION MINUTES AUGUST 19, 2015

The meeting was called to order at 9:00 AM CT by Chairman Murray, also present was Commissioner Scheurer, Commissioner Entze, Commissioner Tveit, Commissioner Gunsch, State's Attorney Binder, Auditor Brost, and Sarah Bauer.

Motion made by Commissioner Gunsch, second by Commissioner Scheurer to approve the agenda with additions. All members voted "Aye", motion carried.

Motion made by Commissioner Scheurer, second by Commissioner Entze to approve the minutes of the August 5th regular meeting. All members voted "Aye", motion carried.

The board reviewed the bills. Commissioner Entze stated even if the money is in the budget, departments should have the courtesy to let the commission know they are spending $94,000. Once it is on the spreadsheet, it is too late to discuss it and the bill needs to be paid. Motion made by Commissioner Tveit, second by Commissioner Gunsch to approve the payment of bills as follows: City of Stanton, $4,874.74; Corner Express of Center LLC, $40.00; D & E Supply, $824.68; Electronic Communications Inc., $1,770.00; Wayne Entze, $142.68; Farmers Union, $85.71; Fastenal, $72.85; Weslie Gunsch, $193.14; Implementation Specialists, $14,773.35; Interstate Batteries, $150.80; NDACo 911 Payment, $1,439.60; ND Secretary of State, $116.00; Office of Attorney General, $2,175.00; Roughrider Electric, $937.89; Southwest Business Machines Inc., $161.47; Duane Scheurer, $272.40; Bill Tveit, $85.84; Twin City Roofing LLC, $84,946.00; Acme Tools, $199.00; American Welding & Gas, $93.51; BHG Inc., $828.56; Brad Seifert, $203.51; Butler, $5,244.35; Candice Strand, $63.53; City of Golden Valley, $22.00; Contech Engineered Solutions, $1,041.40; Farmers Union Oil Co., $40,093.40; Hadahls Auto Plus, $25.03; Hiway Express, $572.09; J & M Hardware, $176.93; Legend-Air LLC, $4,970.00; Neuberger Oil, $3,061.80; Northern Plains Equipment, $172.50; RDO Equipment, $736.66; Ryan Flemmer, $3.42; Sailer Septic Service, $120.00; Team Electronics, $863.39; Warne Chemical & Equipment Co., $527.33; WRT, $7,134.25; Advanced Business Methods, $274.42; Craig Askim, $276.66; Beulah Drug, $50.84; Bronson's Marketplace, $4,954.22; Cardmember Services, $153.57; Chem-Tex, $40.88; Comfort Inn, $111.60; Dennise Drewes-Interstate Engineering, $95,009.13; Downtown Gas & Auto Repair, $345.00; Eide Ford Lincoln, $8,510.00; Hazen Drug, $437.69; Industrial Builders/ Hjc-Interstate Engineering, $400.00; International Association of Arson Investigators, $40.00; J & L Automotive, $925.41; Joy Dental Design/Hazen, $93.00; Dana Kammet, $992.80; Krauss Super Valu, $425.80; Lyle Signs Inc, $361.21; Martin Construction-Interstate Engineering, $250,656.44; Mathew Bender & Co. Inc, $88.60; Mercer County Shop, $3,594.57; Midcontinent Communication, $205.38; Kurt Milbradt, $140.00; NAPA, $472.62; Nasco, $93.30; OK Tire Store, $716.44; Pharmchem, $3,099.00; Pitney Bowes, $305.97; Redwing Shoe Store, $216.74; Redwood Toxicology Lab, $145.50; Reliance Telephone, $1,300.00; Sakakawea Medical Center, $139.94; Scott's Bait & Tackle, $29.40; Sirchie, $98.55; Staples Credit Plan, $616.97; Stroup Insurance, $60.00; Subway, $167.00; Team Electronics, $522.90; Ultramax, $1,364.00; Uniform Center, $234.43; Wex Bank, $2,341.90. All members voted "Aye", motion carried.

The board reviewed the NDSU Extension Highlights. No further action was taken.

The board reviewed the Monthly Financial Statement. No further action was taken.

The board reviewed the Monthly Landfill Tonnage Report. No further action was taken.

Motion made by Commissioner Scheurer, second by Commissioner Tveit to approve the July Sheriff's Fees in the amount of $14,523.00. All members voted "Aye", motion carried.

Motion made by Commissioner Entze, second by Commissioner Gunsch to approve the July Recorder's Fees in the amount of $7,611.60. All members voted "Aye", motion carried.

Motion made by Commissioner Gunsch, second by Commissioner Scheurer to approve the Additional Services Contract from Contegrity Group in the amount of $29,326.00. Roll call vote; Gunsch, "Aye", Scheurer, "Aye", Entze, "Aye", Tveit, "Aye", Murray, "Aye", motion carried.

Motion made by Commissioner Tveit, second by Commissioner Scheurer to approve the request of $13,406 for border and fill for the new play systems to Hazen Parks and Recreation, to be paid out of the Parks In-Lieu Of account. Roll call vote; Tveit, "Aye", Scheurer, "Aye", Entze, "Aye", Gunsch, "Aye", Murray, "Aye", motion carried.

Gary Emter, Land Use Administrator, presented the board with three zoning cases. Motion made by Commissioner Tveit, second by Commissioner Scheurer to stand behind the Planning & Zoning board's decision to deny Zoning Case #5067 to change the distance of a residence to a wind tower from 1,000 feet to one mile. Commissioner Gunsch stated he agrees one mile is too far, but thinks a different distance should be looked at for future windfarms. Gunsch added he thinks 1,000 feet is too close to a residence, but the property owner should be able to obtain a variance if they wanted it closer. Gunsch noted changing the distance is to protect property owners who live by the wind towers, but do not have the towers on their property. Roll call vote; Tveit, "Aye", Scheurer, "Aye", Entze, "Aye", Gunsch, "Nay", Murray, "Aye", motion carried.

Motion made by Commissioner Gunsch, second by Commissioner Entze to approve Zoning Case #15-08-04, an application for zoning exemption, issued to David Hauser to erect a farm shop in the E ½ NW ¼ Section 28 T144N R89W. This approval is for agriculture building only. Roll call vote; Gunsch, "Aye", Entze, "Aye", Scheurer, "Aye", Tveit, "Aye", Murray, "Aye", motion carried.

Motion made by Commissioner Gunsch, second by Commissioner Tveit to approve Zoning Case #15-08-05, a statement of approval of a variance, issued to NCS Schwarz LLP a six foot variance on the west lot line of Lot 17 in Lake Sakakawea Estates Subdivision within the SE ¼ of Section 26 T147N R86W. Adjacent property owner has been notified of the variance and has no problem with the commission granting the variance. Roll call vote; Gunsch, "Aye", Tveit, "Aye", Entze, "Aye", Scheurer, "Aye", Murray, "Aye", motion carried.

The board discussed portfolio updates. Commissioner Gunsch stated he would be attending the annual meeting for ND Oil & Gas Counties in Killdeer on September 10th and distributed the Water Board and Policy Committee meeting minutes. Commissioner Tveit stated he has researched the county's engineering contract and the county is not tied to using one firm. Tveit stated it may be in the county's best interest to use other firms for smaller projects. Commissioner Scheurer stated there will be an Ambulance Board meeting next Monday night. Scheurer also stated the Landfill has covered a portion of the cell and has the engineering services out on bids. Commissioner Entze stated the Airport Authority has finished their budget and will be installing a camera system to have visual activity due to security issues. Entze also stated the Dakota Central Social Services budget is complete and there will be a meeting tomorrow in McClusky.

The board recessed at 9:46 AM.

The board reconvened at 10:00 AM.

Ken Miller, Road Superintendent, presented to the board three Utility Occupancy Application and Permits. Motion made by Commissioner Entze, second by Commissioner Tveit to approve Permits #1570 and 1571 to the North Dakota State Water Commission for directional drilling for a 2" and 3" PVC Potable Waterline. Roll call vote; Entze, "Aye", Tveit, "Aye", Scheurer, "Aye", Gunsch, "Aye", Murray, "Aye", motion carried.

Motion made by Commissioner Gunsch, second by Commissioner Scheurer to approve Permit #1572 to Kurt Winkler for underground boring of the Southwest Waterline in the NE ¼ Section 19 T144N R87W. Roll call vote; Gunsch, "Aye", Scheurer, "Aye", Entze, "Aye", Tveit, "Aye", Murray, "Aye", motion carried.

Commissioner Tveit discussed Sakakawea Estates with the board. Tveit stated that Dennis Rohrs submitted a proposal for Mercer County to create a Special Assessments District for the project, Sakakawea Estates would pay 100% of the asphalt installation through the Special Assessment District, and since Mercer County approved in 1991 to correct the drainage issues they would ask that be done now. Bill Trotter stated he could make some minor improvements to the drainage issues and not disrupt the entire road system for $20,000. The engineering fees would be additional in the amount of $35,000. The cost of prep on the road base and a 3 inch overlay of asphalt 28 feet wide would cost $125,000. Commissioner Gunsch stated he would be in favor of the project. Commissioner Tveit wondered if the county could get away from using an engineer to save monies. Commissioner Entze stated the county needs to use the engineering firm for road projects so it doesn't come back to bite them in the future. State's Attorney Binder stated the road would have to be done at county specs. Commissioner Scheurer noted the county should look into the liability of not using an engineer. Commissioner Tveit added the cost of $20,000 does fix the migration issues of the road. State's Attorney Binder stated under the NDCC landowners can petition to improve a section line, but this is a county road and she would need to look into the legalities of it. Eric Umess, Interstate Engineering, stated the county needs to be aware of the drainage issues, and building up a county road could cause flooding to the residents. Commissioner Tveit stated with the blessings of the board he would like to invite Trotter into a commission meeting to discuss the road project on September 16th at 10:30 AM. No further action was taken.

Umess discussed options of how to spend HB1176. Umess stated the county could leave County 37 and wait until they have enough federal funds to pay for it and put more monies towards County 25 so it is done right or they could roll over the left over monies until additional funds are available. Commissioner Scheurer stated he has heard resistance from taxpayers for allocating $2M to County 25. Commissioner Gunsch stated the last mile of County 25, the county should not be paying anything for that because Coyote Station paid for their own road. Commissioner Tveit stated the county will pave County 25 from ND Highway 49 and leave the last mile gravel. Commissioner Gunsch suggested carrying over any leftover monies. Commissioner Gunsch added the weeds on County 25 need to be taken care of because they are over three feet high and the corner posts are pulling on the fence and warranty work needs to be done on the fencing project.

The board discussed the Ron Isaak Creek Crossing. Miller stated it is an old Texas crossing and Isaak's would like to have it concreted. It was done 50 years ago and it needs to be done again. The board asked Miller to bring a quote to the next meeting. No further action was taken.

The board reviewed the Outstanding Road Accounts. No further action was taken.

Motion made by Commissioner Tveit, second by Commissioner Scheurer to approve Interstate Engineering's revised bills in the amount of $96,458.40, and Interstate Engineering will issue a credit using 2014 rates versus 2015 rates. Roll call vote; Tveit, "Aye", Scheurer, "Aye", Entze, "Aye", Gunsch, "Aye", Murray, "Aye", motion carried.

Rhonda Pfenning, President of Zap City Council, asked the county to help fund the patching, leveling, fabric, overlay, and seal cost on County 13 that runs through the City of Zap in the amount of $265,300. Pfenning stated the road has not been repaired since 1977 and the total cost of the project is over $2M; therefore, the special assessments will be high. Commissioner Tveit stated the county's responsibility ends at the city limits and any monies that would be given would be above and beyond. Com-

AFFIDAVIT OF PUBLICATION

STATE OF NORTH DAKOTA)
SS
COUNTY OF Mercer)

I SHELLEY CHASE, being first duly sworn, on my own oath, say, that I am the bookkeeper of the Beulah Beacon , a weekly newspaper of general circulation, published in the city of Beulah, that the advertisement headed:

COTEAU PROPERTIES/LISA RYAN BH-14.25" MINING PLAN MODIFICATION/LEGAL

a printed copy of which is here annexed, was published in the regular and entire issue of said newspaper during the period and time of publication, and that the notice was published in the newspaper proper , and not in a supplement,

for 1 consecutive week 09/10/2015 to wit:

Column Inches 14.25 $6.38 $90.92 09/10/2015

Notary Fee $1.00 Total Cost of Legal $91.92

Shelley Chase

Subscribed and sworn to before me this 14th day of September A.D. 2015

(Seal) Dana J Mauty

PUBLIC NOTICES

NOTICE OF LEASING
SCHOOL TRUST LANDS

The Board of University and School Lands will offer the following lands for lease in Mercer Co.

		Ac	Term	Rent
UNORGANIZED (142-89)				
36	SE4	160	5	1880
UNORGANIZED (143-88)				
4	NGNE4	80	5	1088
4	NW4	159	5	1718
4	SW4	160	5	2456
32	NW4	160	5	2096
32	SW4	160	5	2130
UNORGANIZED (143-89)				
20	NE4	160	5	2212
20	NW4	160	5	1373
22	NE4	160	5	2349
22	NW4	160	5	2456
22	SE4	160	5	1966
28	NE4	157	5	1952
28	NW4	160	5	1996
28	SW4	160	5	2048
UNORGANIZED (143-90)				
28	NE4	160	5	1838 *
30	NE4	160	5	2081 N
30	NW4	160	5	2352 N
30	SE4	160	5	1968
30	SW4	160	5	1928 N
UNORGANIZED (144-88)				
36	NE4 less deeded acres	127	5	1759 N
36	SE4	160	5	1685 N
UNORGANIZED (144-90)				
20	SW4NW4	40	5	814
20	E2SE4	80 (73 Hay)	5	1295
20	W2SW4	80	5	1265
UNORGANIZED (145-88)				
16	NW4	160	5	1920
UNORGANIZED (146-90)				
36	NE4	151	5	1936
36	NW4	159	5	1960

* = Successful bidder must pay previous lessee for undepreciated investment in a permanent improvement.
N = Known noxious weed infestation. Control requirements apply to all lessees.
Auctioneer will read specific requirements at the auction.
The public lease auction will be held in the Courthouse, Courtroom at Stanton, ND, on Thursday, October 08, 2015 at 1:00 PM CT.
Bidding will begin at minimum rent. 1st year's rent must be paid in full immediately after the sale. The Board reserves the right to reject any and all bids.
For more information, visit www.land.nd.gov or call (701) 328-2800. For auxiliary aids and services, please call by 10/01/2015.
8/25/2015 /s/ Lance D. Gaebe
Land Commissioner
(9-10-15) (9-17-15) (9-24-15)

ABBREVIATED NOTICE OF INTENT TO ADOPT AND AMEND ADMINISTRATIVE RULES AND STATE IMPLEMENTATION PLAN
relating to Air Pollution Control

North Dakota Department of Health and Air Pollution Control Advisory Council

will hold a public comment period and public hearing to address proposed changes to the N.D. Admin. Code Articles 33-15 and the State Implementation Plan (SIP) for the control of air pollution. Some of the rule revisions and other documents that are the subject of this public notice will be submitted to the United States Environmental Protection Agency to be included in or to revise the SIP required by the Federal Clean Air Act.

4th Floor Conference Rm,
Gold Seal Center
918 E Divide Ave.
Bismarck, ND
Tuesday, Nov. 10, 2015
9:00 a.m. CST

A copy of the proposed rules and full public notice may be viewed at the Department's website at: www.ndhealth.gov/AQ/Public-Com.aspx. A copy of the proposed rules and full public notice may be obtained by writing to the North Dakota Department of Health, Division of Air Quality, 918 E Divide Avenue, 2nd Floor, Bismarck, ND 58501-1947 or calling (701)328-5188. Written comments may be submitted to the above-address from October 10, 2015 through November 20, 2015. If you plan to attend the public hearing and will need special facilities or assistance relating to a disability, please contact the Department of Health at the above-address at least seven days prior to the public hearing.

Dated this 31st day of Aug. 2015.
Terry L. O'Clair, P.E.
Director
Division of Air Quality

IN DISTRICT COURT, MERCER COUNTY, STATE OF NORTH DAKOTA
Case No. 29-2014-CV-00334
AMENDED PETITION FOR NAME CHANGE OF DRSH (Initials of child), A MINOR CHILD

Pursuant to N.D.C.C. 32-28-02 JoLean Saborg (name), Petitioner, respectfully petitions the Court for a change of name of his/her minor child, DRSH (Initials of child), and respectfully states to the Court as follows:

1. The minor child DRSH (initials of child), currently resides with petitioner at the petitioner's home in Mercer County, North Dakota. The minor child has been a resident of Mercer County, North Dakota, for more than six months immediately preceding this petition.

2. Petitioner makes this Verified Petition for Name Change pursuant to Section 32-28-02 of the North Dakota Century Code and hereby requests the Court change his/her minor child's name from DRSH (initials of minor child) to DRS (new initials of minor child after name change).

3. Petitioner's minor child was born on November 28, 2000, in Casper (city), Wyoming (state).

4. Petitioner wishes to change the minor child's name to DRS (initials of the child's new name) for the following reason(s):

The minor child's father has had no contact with the minor child and the minor child does not identify himself with his present last name. When he is asked what his name is, he identifies himself as DRS rather than DRSH. The minor child does not understand why his last name is different. Further the minor child is known as DRS at the social security administration but other entities recognize him as DRSH and this action would clarify his legal name.

5. The Petitioner states that the appointment of a guardian ad litem, as allowed under

N.D.C.C. Ch. 32-28-02 is unnecessary given the facts of this petition.

6. Petitioner does not wish to change the name of his/her minor child (initials of child) for any fraudulent, illegal, or immoral purpose, such as to avoid any type of debt or other obligation, or to avoid criminal prosecution.

7. Accordingly, the name change requested by petitioner for her/his minor child is from, DRSH (current initials of child) to DRS (new initials after name change).

8. There is no just cause to deny the Petition for Change of Name.

9. Petitioner believes it to be in the best interest of the child for his/her name to be changed to DRS (new initials of child after name change).

WHEREFORE, Petitioner prays that the Court enter an order changing the name of DRSH (initials of child) to DRS (initials of child after name change).

Dated this 15th day of September, 2015.

/s/ JoLean Saborg
(Signature of Petitioner)
(9-17-15) (9-24-15) (10-1-15)

PUBLIC NOTICE
FREEDOM MINE MINING PLAN MODIFICATION
ENVIRONMENTAL ASSESSMENT

The U.S. Department of the Interior (DOI), Office of Surface Mining Reclamation and Enforcement (OSMRE), Western Region Office, will prepare an environmental assessment (EA) for a Federal mining plan modification for the Freedom Mine's West Mine Area (the Project). The application to lease Federal Coal Tract NDM-91536 was filed with the Bureau of Land Management (BLM) by Coteau Properties Company (Coteau) on January 16, 2002 and subsequently approved by the BLM for competitive lease sale on November 1, 2005. Coteau was the successful high bidder during the lease sale. On April 1, 2011, in accordance with the Mineral Leasing Act of 1920 (MLA), Coteau received Federal mining plan approval from the Assistant Secretary of Lands and Mineral Management (ASLM) to mine portions of Federal Coal Tract NDM-91536 at the Freedom Mine, Surface Coal Mining Permit NACT-0201. On October 28, 2014, the North Dakota Public Service Commission notified OSMRE that they had received Permit Revision (PR) No. 18 for Coteau's Surface Coal Mining Permit NACT-0201 for the Project (including mining of portions of Federal Coal Tract NDM-91536) in accordance with its responsibilities under the Federal Surface Mining and Reclamation Control Act (SMCRA) of 1977.

OSMRE is preparing this EA to evaluate the environmental impacts resulting from the Project, pursuant to the requirements of the National Environmental Policy Act of 1969 (NEPA). The Freedom Mine is located approximately 10 miles north of Beulah, North Dakota, north of Highway 200 in Mercer County, North Dakota. The total amount of Federal coal authorized for removal within the currently approved Federal mining plan is approximately 45.1 million tons (mmt) and an estimated 39.1 mmt of coal remains to be mined. PR No.18 proposes to add zero Federal surface acres to the approved permit area and add approximately 960 Federal coal acres and 25.6 mmt of Federal coal to the approved Federal mining plan. The Freedom Mine uses a combination of dragline and truck shovel mining methods. The average production rate at the Freedom Mine is approximately 13.5 million tons per year (mmtpy) and the maximum production rate is 16 mmtpy. PR No. 18 would not change the average production rate or the maximum production rate for the life of the mining operation. Freedom Mine started operation in 1983 and the life of mine would continue operation until 2045. This mining plan modification would not extend the life of the mine.

The EA will disclose the potential for direct, indirect and cumulative impacts to the environment from the Project. Further, this EA will update, clarify, and provide new and additional environmental information for the Project. Through the EA process, OSMRE will determine whether or not there are significant environmental impacts. If a finding of no significant impact is reached the OSMRE Director will make a recommendation to the DOI's ASLM on the Federal mining plan modification, and the ASLM will approve, approve with conditions, or disapprove the Federal mining plan modification as required under the MLA. If the EA identifies significant impacts, an environmental impact statement will be prepared.

OSMRE is soliciting public comments on the Project. Your comments will help to determine the issues and alternatives that will be evaluated in the environmental analysis. You are invited to direct these comments to: ATTN: Freedom Mine West Mine Area EA, C/O: Lauren Mitchell, Western Region Office, Office of Surface Mining Reclamation and Enforcement, 1999 Broadway, Suite 3320, Denver, CO 80202, Email: OSM-NEPA-ND@OSMRE.gov. Comments should be received or postmarked no later than October 10, 2015 in order to be considered during the preparation of the EA. Comments received, including names and addresses of those who comment, will be considered part of the public record for this project and will be available for public inspection. Additional information regarding the Project may be obtained from Lauren Mitchell, telephone number (303) 293-5028. When available, the EA and other supporting documentation will be posted at: http://www.wrcc.osmre.gov/initiatives/freedomMine.shtm

(9-10-15) (9-24-15)

MERCER COUNTY COMMISSION MINUTES
SEPTEMBER 2, 2015

The meeting was called to order at 9:00 AM CT by Chairman Murray, also present was Commissioner Scheurer, Commissioner Entze, Commissioner Tveit, Commissioner Gunsch, State's Attorney Binder, Auditor Brost, Sarah Bauer, Wanda Knutson, Steve Bortaug, Mel Roth, and Dwight Bergar.

Motion made by Commissioner Entze, second by Commissioner Tveit to approve the agenda with additions. All members voted "Aye", motion carried.

Motion made by Commissioner Gunsch, second by Commissioner Scheurer to approve the minutes of the August 19th regular meeting. All members voted "Aye", motion carried.

Motion made by Commissioner Tveit, second by Commissioner Gunsch to approve the payment of bills as follows: Mercer County Treasurer- SCBS, $7,012.49; Guardian Life Insurance, $245.56; AFLAC, $2,581.34; Mercer County Treasurer- Misc. Deductions, $1,858.83; Mercer County Treasurer- Federal Tax, $40,383.69; Mercer County Treasurer- State Tax, $3,820.10; Cuna Mutual Plan 1, $1,240.06; Mercer County Treasurer- Fica, $22,117.28; Mercer County Treasurer- Medicare Tax, $5,172.53; Annuity Program Plan 2, $1,316.19; Nationwide Retirement Solutions Plan 3, $13,142.41; NDPERS, $15,800.94; Payroll, $250,706.04; Recovery Resources, $90.72; NDPERS, $29,858.50; Nationwide Retirement Solutions Plan 3, $1,661.29; Montana CSED, $84.00; Mercer County Treasurer- Fica/ Medicare, $3,187.54; Mercer County Auditor-SCBS, $86,365.47; Guardian Life Insurance, $82.08; Cuna Mutual Plan 1, $298.21; Collection Center Inc., $824.10; Annuity Program Plan 2, $628.84; NDAPCO, $775.00; Ameripride, $98.49; Craig Aaklm, $30.00; Brock White, $259.44; Comfort Inn, $516.00; Corner Express of Center LLC, $30.00; Custer Health, $4,084.70; O & E Supply, $427.53; Dakota Central Social Service District, $52,821.32; Gary Emter, $302.60; Farmers Union Oil of Hazen, $121.96; Fireside, $122.94; Hazen Hardware Hank & Rental, $175.03; Hiway Express, $118.94; Implementation Specialists Inc., $11,868.10; Dana Kemmet, $50.00; Language Line Services, $90.00; Mel Roth Oil Company Inc., $177.80; ND Association of Oil & Gas Producing Counties, $75.00; Neuberger Oil, $1,472.00; Perreault Construction Inc., $28,500.00; Pitney Bowes, $5,000.00; Carmen Reed, $209.97; Colette Schilling, $372.00; Southwest Business Machines, $262.02; Thomson Reuters, $125.35; Verizon Wireless, $47.57; Staples, $1,081.37; BCBS, $49,813.76; Eggers Electric Motor Company, $76.84; NAPA, $353.45; Severin, Ringsak, & Morrow, $4,250.00; Mobile Binders, $1,803.97; Advanced Business Methods, $496.88; Titan Machinery, $1,893.86; SD IZAP, $170.00; LyCox Enterprises, $10,950.00; Hobbs, $2,859.30; Butler Machinery, $198.66; Filter Care, $101.29; J & M Hardware, $57.92; Montana Dakota, $45.80; OK Automotive, $97.69; Klein McCarthy Architects, $7,436.26; WDALA, $50.00; Pretty Petals, $45.00; Dennis Drewes Inc., $261,878.03; Hewlett-Packard Company, $14,202.00; Charles Johnson, $25.00; Gontran Langowski, $302.48; L-Tron Corp., $3,636.30; Martin Construction, $134,716.41; Bridget McElroy, $38.92; Postmaster, $88.00; Rockmount Research & Alloys, $1,118.06; Ken Foss Construction, $39.14; Hazen Star, $31.19; Jensen Jewelry, $84.00. All members voted "Aye", motion carried.

Motion made by Commissioner Gunsch, second by Commissioner Tveit to approve Amendment #1 from Klein McCarthy for the additional services to add a sewage grinder to the scope of work to be a lump sum of Seven Thousand Five Hundred and Fifty-Five Dollars ($7,555.00). Roll call vote: Gunsch, "Aye", Tveit, "Aye", Entze, "Aye", Scheurer, "Aye", Murray, "Aye", motion carried.

Carmen Reed, 911 Coordinator/ Emergency Manager, presented her quarterly report to the board. No further action was taken.

The board updated one another on their portfolios. Commissioner Gunsch stated the Missouri Stakeholders Group is now renamed as the ND Missouri River Advisory Council and will have a board of 13 members. Commissioner Tveit stated after discussion at the Social Services meeting the county is only responsible for a burial and not a funeral. Tveit stated he rode along in the ambulance with Stacy and Walt; they are fine EMT's and the ambulance board has a great crew. Commissioner Scheurer stated they are in the midst of addressing issues at the Ambulance Board and there will be a special meeting tonight to resolve some issues. Commissioner Entze reported the Mercer County Regional Airport has received grant funds to concrete the hangar floor and crack seal the runway. Entze also touched on the Social Services discussion stating the burials will be under the Social Services budget, not the county budget. Chairman Murray stated there will be a Cost Conversion Counties meeting tomorrow night, and although his term is up he has agreed to serve an additional three years.

Gary Emter, Land Use Administrator, gave the board an update on the SunEdison Antelope Hills Wind Project. Emter stated in a letter from Paul Burdick, Director of Project Development, the soil is not compatible in areas and archeological issues have come up. Since environmental issues are prohibiting the roads being built, they will need to re-examine the overall layout. No further action was taken.

Emter presented to the board five zoning cases. Motion made by Commissioner Scheurer, second by Commissioner Gunsch to approve zoning case #15-08-01, a certificate of approval of a conditional use issued to Blake Dschaak for a non-farm residence containing a 2.50 acre parcel located within Tract B Government Lot 4 of Section 1 T144N R88W. Present and future owners are responsible for snow removal and maintenance of private roads and approaches. The septic system must meet Custer Health District standards. The owners must provide a school bus turnaround if needed. All structures must be built above base flood elevation. Roll call vote; Tveit, "Aye", Entze, "Aye", Scheurer, "Aye", Gunsch, "Aye", Murray, "Aye", motion carried.

Motion made by Commissioner Gunsch, second by Commissioner Entze to approve zoning case #15-08-02, a preliminary plat issued to Shawn and Heather Stimmre for Northview Subdivision located in the E ½ SE ¼ Section 8 T144N R87W that was approved by the zoning commission on August 20, 2015. The subdivision consists of three 10 acre lots where the easements are already in place and SWW is going along the road. The owners will be responsible for the maintenance of the road in the future. No further action was taken.

Motion made by Commissioner Tveit, second by Commissioner Entze to approve zoning case #15-08-03, a certificate of approval of a conditional use issued to Michael and Maria Grimm for a non-farm residence containing a 2.0 acre parcel located within Lot 4 of Tract E of Section 27 T145N R84W. Present and future owners are responsible for snow removal and maintenance of private roads and approaches. The septic system must meet Custer Health District standards. The owners must provide a school bus turnaround if needed. All structures must be built above base flood elevation. Roll call vote; Tveit, "Aye", Entze, "Aye", Scheurer, "Aye", Gunsch, "Aye", Murray, "Aye", motion carried.

Motion made by Commissioner Gunsch, second by Commissioner Scheurer to approve zoning case #15-08-01, a statement of approval of a variance issued to Melvin Roth for the approval of two camper pads with hook-ups located on a two acre parcel in Lot A-4 within the SE ¼ of Section 31 T 147N R88W. Roll call vote; Gunsch, "Aye", Scheurer, "Aye", Entze, "Aye", Tveit, "Aye", Murray, "Aye", motion carried.

Motion made by Commissioner Scheurer, second by Commissioner Entze to approve Temporary Use permit #480 issued to Badlands Aggregate for the temporary use of a gravel pit located in the S ½ Section 36 T143N R86W. Work is limited to daylight hours. The area disturbed under this temporary use permit must be reclaimed by the applicant and must be approved and released by the County Road Superintendent. The haul road must be approved and released by the County Road Superintendent if it is a county maintained road. The permit holder shall control weeds, in an acceptable manner, during the time the permit is in effect. Roll call vote; Scheurer, "Aye", Entze, "Aye", Gunsch, "Aye", Tveit, "Aye", Murray, "Aye", motion carried.

The board recessed at 9:48 AM.

The board reconvened at 10:03 AM.

In road issues, the board reviewed cost estimates to repair the Ron Isaak Creek Crossing in the amount of $4,496.00 plus the cost of rebar. Commissioner Tveit stated he is concerned about repairing a single user road, even though it is a section line, how does the board continue to fix private crossings. Commissioner Tveit questioned what the county will do in the future with similar crossings that are private. Commissioner Entze stated there are several throughout the county and the previous commissioners approved them. Although the crossings have lasted a long time, in the future the landowners may have to cost share in these crossings. Entze added a temporary fix could haunt the county, it needs to be fixed to last. Commissioner Tveit stated the county's regular roads need attention and the road budget for 2016 may raise the mill levies the way it is. Tveit added a 50/50 cost share may be in line. Commissioner Gunsch stated his concern is whatever decision the board makes, they need to make sure it is consistent in the future. Commissioner Entze noted this may be case by case management. Commissioner Scheurer stated the county has some responsibility for emergency response, but since this particular road does not go anywhere it may have to be a cost share if the landowner is willing to do so. Ron Isaak stated the county owns the

2016 CITY OF BEULAH BUDGET NOTICE

Notice is given that the 2016 preliminary budget for the City of Beulah is on file in the office of the City Auditor and may be examined upon request during regular office hours. The final budget approval will be held on Monday, October 5, 2015 at 7:00 pm at Beulah City Hall.

Expenditures in the preliminary budget are as follows:

General Government	$3,031,960.00
Highway Fund	720,035.00
Special Revenue Funds	2,049,585.00
Sales Tax Fund	556,000.00
Debt Service Funds	1,297,305.00
Enterprise Funds	1,449,013.00

(9-24-15)

AFFIDAVIT OF PUBLICATION

STATE OF NORTH DAKOTA)
SS
COUNTY OF Mercer)

I SHELLEY CHASE, being first duly sworn, on my own oath, say, that I am the bookkeeper of the Beulah Beacon , a weekly newspaper of general circulation, published in the city of Beulah, that the advertisement headed:

COTEAU PROPERTIES/AMANDA HOFFER BH-FREEDOM MINE MINING PLAN MODIFICATION/LEGAL

a printed copy of which is here annexed, was published in the regular and entire issue of said newspaper during the period and time of publication, and that the notice was published in the newspaper proper , and not in a supplement,

for 1 consecutive week 09/24/2015 to wit:

Column Inches 14.25 $6.38 $90.92 09/24/2015

Notary Fee $1.00 Total Cost of Legal $91.92

Shelley Chase

Subscribed and sworn to before me this 28th day of September A.D. 2015.

(Seal) Carla J. Meier

United States Department of the Interior

OFFICE OF SURFACE MINING
RECLAMATION AND ENFORCEMENT

Western Region Office
1999 Broadway, Suite 3320
Denver, CO 80202-3050

15-12-23-04

December 7, 2015

Myra Pearson, Chairperson
Spirit Lake Tribal Council
PO Box 359
Fort Totten, ND 58335-0359

Dear Miss Pearson,

The U.S. Department of the Interior (DOI), Office of Surface Mining Reclamation and Enforcement (OSMRE), Western Region, will prepare an environmental assessment (EA) to analyze environmental impacts of a Federal mining plan approval for current and future mining within Federal Coal Lease NDM91535 held by the Coteau Properties Company as part of the Freedom Mine. The EA will cover the time period beginning October 2, 1985, and continuing through the planned life of mine for the portion of the Federal coal lease area lying within the approved Surface Mining Control and Reclamation Act of 1977 (SMCRA) Permit Area (the Project). As required by the National Environmental Policy Act of 1969 (NEPA), the EA will disclose the potential for direct, indirect, and cumulative impacts to the environment from the Project. In accordance with the 2011 Department of Interior Policy on Consultation with Indian Tribes and 36 CFR Part 800.2(c)(2)(ii), the regulations implementing Section 106 of the National Historic Preservation Act of 1966 (as amended [NHPA]), OSMRE requests continued consultation with your tribe for the stages of the proposal development and implementation of the final federal action.

The Freedom Mine is located approximately 10 miles north of the town of Beulah in Mercer County, North Dakota. The proposed Project is occurring on a federal coal lease administered by the Bureau of Land Management (BLM) and located within the western portion of the Freedom Mine's approved SMCRA Permit Area. Federal Coal Lease NDM91535 was issued by the BLM in December 2005. The leases within the SMCRA Permit Area cover a total of approximately 17,050.96 acres of Federal mineral estate. As of October 1, 2015, approximately 39.1 million tons of recoverable Federal coal remains within the Project area. The Freedom Mine uses a combination of dragline and truck shovel mining methods to remove the overburden and mine the coal.

The EA will update, clarify, and provide new and additional environmental information for the Project.

As a result of the EA process, OSMRE will determine whether or not there are significant environmental impacts. An environmental impact statement will be prepared if the EA identifies significant impacts. If a finding of no significant impact is reached, and pursuant to 30 CFR 746.13, OSMRE will prepare and submit to the Assistant Secretary for Lands and Minerals Management (ASLM) a mining plan decision document recommending approval, disapproval, or conditional approval of the mining plan. The ASLM will approve, disapprove, or conditionally approve the mining plan approval document within the mining plan decision document, as required under the Mineral Leasing Act of 1920.

If you are interested, we would be willing to meet with you at your convenience to discuss the proposed mining plan modification and its impacts, including any concerns you may have regarding the NHPA. If you wish to provide comments please send those to:

OSMRE WR
C/O: Lauren Mitchell
Freedom Mine West Expansion EA
1999 Broadway, Suite 3320
Denver, CO 80202

You also have the option to submit comments and/or questions to: OSM-NEPA-ND@OSMRE.gov, please ensure the subject line reads: ATTN: OSMRE, Freedom Mine West Expansion MPDD EA. Additional information regarding the Project may be obtained from Lauren Mitchell, telephone number (303) 293-5028. We would appreciate receiving those comments with the next 60 days. For your convenience, information about the Project can be accessed on the OSMRE Western Region website at: http://www.wrcc.osmre.gov/initiatives/freedommine.shtm.

Thank you for taking the time to consider this project. If this letter has not been sent to the correct representative, please help us update our records. OSMRE will be in contact with your office in the coming weeks to inquire if you have had time to consider this project further. In the meantime, if you have any questions, please contact me directly at (303) 293-5035.

Sincerely,

Marcelo Calle, Manager
Field Operations Branch

United States Department of the Interior

OFFICE OF SURFACE MINING
RECLAMATION AND ENFORCEMENT

Western Region Office
1999 Broadway, Suite 3320
Denver, CO 80202-3050

December 7, 2015

Mr. Ray K. Eder, Chairman
Fort Peck Tribes
PO Box 1027
Poplar, MT 59255

Dear Mr. Eder,

The U.S. Department of the Interior (DOI), Office of Surface Mining Reclamation and Enforcement (OSMRE), Western Region, will prepare an environmental assessment (EA) to analyze environmental impacts of a Federal mining plan approval for current and future mining within Federal Coal Lease NDM91535 held by the Coteau Properties Company as part of the Freedom Mine. The EA will cover the time period beginning October 2, 1985, and continuing through the planned life of mine for the portion of the Federal coal lease area lying within the approved Surface Mining Control and Reclamation Act of 1977 (SMCRA) Permit Area (the Project). As required by the National Environmental Policy Act of 1969 (NEPA), the EA will disclose the potential for direct, indirect, and cumulative impacts to the environment from the Project. In accordance with the 2011 Department of Interior Policy on Consultation with Indian Tribes and 36 CFR Part 800.2(c)(2)(ii), the regulations implementing Section 106 of the National Historic Preservation Act of 1966 (as amended [NHPA]), OSMRE requests continued consultation with your tribe for the stages of the proposal development and implementation of the final federal action.

The Freedom Mine is located approximately 10 miles north of the town of Beulah in Mercer County, North Dakota. The proposed Project is occurring on a federal coal lease administered by the Bureau of Land Management (BLM) and located within the western portion of the Freedom Mine's approved SMCRA Permit Area. Federal Coal Lease NDM91535 was issued by the BLM in December 2005. The leases within the SMCRA Permit Area cover a total of approximately 17,050.96 acres of Federal mineral estate. As of October 1, 2015, approximately 39.1 million tons of recoverable Federal coal remains within the Project area. The Freedom Mine uses a combination of dragline and truck shovel mining methods to remove the overburden and mine the coal.

The EA will update, clarify, and provide new and additional environmental information for the Project.

As a result of the EA process, OSMRE will determine whether or not there are significant environmental impacts. An environmental impact statement will be prepared if the EA identifies significant impacts. If a finding of no significant impact is reached, and pursuant to 30 CFR 746.13, OSMRE will prepare and submit to the Assistant Secretary for Lands and Minerals Management (ASLM) a mining plan decision document recommending approval, disapproval, or conditional approval of the mining plan. The ASLM will approve, disapprove, or conditionally approve the mining plan approval document within the mining plan decision document, as required under the Mineral Leasing Act of 1920.

If you are interested, we would be willing to meet with you at your convenience to discuss the proposed mining plan modification and its impacts, including any concerns you may have regarding the NHPA. If you wish to provide comments please send those to:

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Denver, CO 80202

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Thank you for taking the time to consider this project. If this letter has not been sent to the correct representative, please help us update our records. OSMRE will be in contact with your office in the coming weeks to inquire if you have had time to consider this project further. In the meantime, if you have any questions, please contact me directly at (303) 293-5035.

Sincerely,

Marcelo Calle, Manager
Field Operations Branch

United States Department of the Interior

OFFICE OF SURFACE MINING
RECLAMATION AND ENFORCEMENT

Western Region Office
1999 Broadway, Suite 3320
Denver, CO 80202-3050

December 7, 2015

Mr. Richard Marchellais, Chairman
Turtle Mountain Band of Chippewa
PO Box 900
Belcourt, ND 58316-0900

Dear Mr. Marchellais,

The U.S. Department of the Interior (DOI), Office of Surface Mining Reclamation and Enforcement (OSMRE), Western Region, will prepare an environmental assessment (EA) to analyze environmental impacts of a Federal mining plan approval for current and future mining within Federal Coal Lease NDM91535 held by the Coteau Properties Company as part of the Freedom Mine. The EA will cover the time period beginning October 2, 1985, and continuing through the planned life of mine for the portion of the Federal coal lease area lying within the approved Surface Mining Control and Reclamation Act of 1977 (SMCRA) Permit Area (the Project). As required by the National Environmental Policy Act of 1969 (NEPA), the EA will disclose the potential for direct, indirect, and cumulative impacts to the environment from the Project. In accordance with the 2011 Department of Interior Policy on Consultation with Indian Tribes and 36 CFR Part 800.2(c)(2)(ii), the regulations implementing Section 106 of the National Historic Preservation Act of 1966 (as amended [NHPA]), OSMRE requests continued consultation with your tribe for the stages of the proposal development and implementation of the final federal action.

The Freedom Mine is located approximately 10 miles north of the town of Beulah in Mercer County, North Dakota. The proposed Project is occurring on a federal coal lease administered by the Bureau of Land Management (BLM) and located within the western portion of the Freedom Mine's approved SMCRA Permit Area. Federal Coal Lease NDM91535 was issued by the BLM in December 2005. The leases within the SMCRA Permit Area cover a total of approximately 17,050.96 acres of Federal mineral estate. As of October 1, 2015, approximately 39.1 million tons of recoverable Federal coal remains within the Project area. The Freedom Mine uses a combination of dragline and truck shovel mining methods to remove the overburden and mine the coal.

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Marcelo Calle, Manager
Field Operations Branch

United States Department of the Interior

OFFICE OF SURFACE MINING
RECLAMATION AND ENFORCEMENT

Western Region Office
1999 Broadway, Suite 3320
Denver, CO 80202-3050

December 7, 2015

Mr. Ron His Horse is Thunder, Chairman
Standing Rock Tribal Bus Office
Admin Service Ctr Bldg #1
Fort Yates, ND 58538

Dear Mr. Ron His Horse is Thunder,

The U.S. Department of the Interior (DOI), Office of Surface Mining Reclamation and Enforcement (OSMRE), Western Region, will prepare an environmental assessment (EA) to analyze environmental impacts of a Federal mining plan approval for current and future mining within Federal Coal Lease NDM91535 held by the Coteau Properties Company as part of the Freedom Mine. The EA will cover the time period beginning October 2, 1985, and continuing through the planned life of mine for the portion of the Federal coal lease area lying within the approved Surface Mining Control and Reclamation Act of 1977 (SMCRA) Permit Area (the Project). As required by the National Environmental Policy Act of 1969 (NEPA), the EA will disclose the potential for direct, indirect, and cumulative impacts to the environment from the Project. In accordance with the 2011 Department of Interior Policy on Consultation with Indian Tribes and 36 CFR Part 800.2(c)(2)(ii), the regulations implementing Section 106 of the National Historic Preservation Act of 1966 (as amended [NHPA]), OSMRE requests continued consultation with your tribe for the stages of the proposal development and implementation of the final federal action.

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Marcelo Calle, Manager
Field Operations Branch

United States Department of the Interior

OFFICE OF SURFACE MINING
RECLAMATION AND ENFORCEMENT

Western Region Office
1999 Broadway, Suite 3320
Denver, CO 80202-3050

December 7, 2015

Mr. Marcus Wells Jr., Chairman
Three Affiliated Tribes Bus Council
404 Frontage Rd
New Town, ND 58763

Dear Mr. Wells,

The U.S. Department of the Interior (DOI), Office of Surface Mining Reclamation and Enforcement (OSMRE), Western Region, will prepare an environmental assessment (EA) to analyze environmental impacts of a Federal mining plan approval for current and future mining within Federal Coal Lease NDM91535 held by the Coteau Properties Company as part of the Freedom Mine. The EA will cover the time period beginning October 2, 1985, and continuing through the planned life of mine for the portion of the Federal coal lease area lying within the approved Surface Mining Control and Reclamation Act of 1977 (SMCRA) Permit Area (the Project). As required by the National Environmental Policy Act of 1969 (NEPA), the EA will disclose the potential for direct, indirect, and cumulative impacts to the environment from the Project. In accordance with the 2011 Department of Interior Policy on Consultation with Indian Tribes and 36 CFR Part 800.2(c)(2)(ii), the regulations implementing Section 106 of the National Historic Preservation Act of 1966 (as amended [NHPA]), OSMRE requests continued consultation with your tribe for the stages of the proposal development and implementation of the final federal action.

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Sincerely,

Marcelo Calle, Manager
Field Operations Branch

Appendix B

Air Emissions Information

1. *2014 Annual Air Emissions Report (2 pages)*
2. *NOx generated from blasting*
3. *Coteau diesel fuel vehicle fleet hours*
4. *Engine emission ratings*
5. *Measured PM10 at Freedom Mine (3 pages)*
6. *Percentage of PM2.5 from PM10 calculations (2 pages)*
7. *Calculated PM2.5 at Freedom Mine (2 pages)*
8. *North Dakota State Department of Health and Consolidated Laboratories, 5-15-1995*
9. *Indirect emissions quantities and calculations*

MANUFACTURING OR PROCESSING EQUIPMENT
ANNUAL EMISSION INVENTORY REPORT

NORTH DAKOTA DEPARTMENT OF HEALTH
DIVISION OF AIR QUALITY
SFN 8537 (11-10)

GENERAL

Name of Firm or Organization	Permit to Operate Number	Year of Emissions	
The Coteau Properties Company	**085004**	**2014**	
Mailing Address	City	State	Zip Code
204 County Road 15	**Beulah**	**ND**	**58523**
Facility Name	Facility Location	Actual Hours of Operation	
Freedom Mine	**Mine Site**	**3,150 hours**	
Source Unit Description		Emission Unit Number	
Two 54″ conveyors in fines building, dust collector – baghouse		**16 and 17**	

RAW MATERIAL INFORMATION

Raw Materials Introduced into Process	Quantity (Specify Units)
Lignite Coal	**14,283,743 tons**
	Delivered through truck dumps and crushing facilities

FUELS USED

		Primary Fuel	Auxiliary Fuel
Type (ex. lignite, natural gas, LPG No. 2 fuel oil, No. 6 fuel oil. etc.)			
Quantity of Fuel per Year (Specify Units: ex. ton, gal, cu.ft., etc.)			
Percent Sulfur	Maximum		
	Minimum		
	Average		
Btu per Unit (Specify lb, ton, gal, etc.)	Maximum		
	Minimum		
	Average		

STACK EMISSIONS

Air Contaminant *	Emission Factor (Include Units)	Emission Factor Source (Include Test Date if Applicable)	Tons
Particulate - Total	**See Attached**	**See Attached**	**2.65**
PM_{10} (Particulate < 10 microns)			
$PM_{2.5}$ (Particulate < 2.5 microns)			
Sulfur Dioxide			
Nitrogen Oxides			
Carbon Monoxide			
Total Organic Compounds: Nonmethane			

* Submit SFN 19839 for Hazardous Air Pollutants if applicable.

I declare under the penalties of perjury that this report has been examined by me and to the best of my knowledge is a true, correct and complete report.

Print Name of Person Submitting Report	Title	Email
Troy J. Leingang	**Environmental Manager**	**troy.leingang@nacoal.com**
Signature	Telephone Number	Date
	701-873-7217	**03/05/14**

Return completed form to:
North Dakota Department of Health
Division of Air Quality
918 E Divide, 2nd Floor
Bismarck, ND 58501-1947
Telephone: (701)328-5188

Basis for quantities listed above; provide calculations (use additional sheets as necessary):

In 2013, Source 16 and 17 (two 54" conveyors in fines building, dust collector – baghouse) ran 3,150 hours

Calculation:

0.02[a] grains x 1 pound/7000 grains x 9,800[b] ACFM x 60 minutes/hour = 1.68 pounds/hour emissions

1.68 pounds/hour x 3,150 hours/year x 1 ton/2000 lbs. = 2.65 tons/year

[a]Pollutant concentration (Grains/ACFM); Manufacturer's guarantee. Assume ACFM = SCFM
[b]Outlet gas volume (SCFM)

NOx Generated from Blasting

		Formulas
Avg tons mined from EA per year (7 years)	3,659,571.43	
tons of coal 2012	13,122,259.00	-
tons 2013	13,815,245.00	-
tons 2014	14,283,743.00	-
Avg tons severed, 2012-2014	13,740,415.67	(13,122,259+13,815,245+14,283,743)/3
Avg lbs ANFO per year, 2012-2014	2,424,916.00	-
Avg tons ANFO per year, 2012-2014	1,212.46	2,424,916/2,000
Avg lbs NOx per year from blasting, 2012-2014	20,611.79	1,212.46*17
Avg lbs NOX per year per ton coal, 2012-2014	0.0015	20,611.79/13,740,415.67
Avg lbs Nox per year from EA coal blasting	5,489.67	0.0015*3,659,571.43

Fleet Hours											
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
OB Shovels:	8801	9518.00	11533	15497	13269.00	12972	16153	13837	13688	14684	14257
RT Doz:	28332	26110.00	26314	30275	27654.00	30053	27640	21752	19261	21439	24,350.00
Track Doz.:	66404	55899.00	56879	70849	65505.00	75390	86786	73395	63627	69056	66,413.00
F.E. Loader:	13132	15050.00	15878	16585.35	12696.00	17954	17509	15661	15823	14569	16,045.00
M. Graders:	52595	47549.00	48196	56213	46813.00	49454	51361	47041	43726	43146	44,172.00
Scrapers:	28627	25551.00	24646	31360	23670.00	25209	24887	23098	22028	23509	20,882.00
Coal Trucks:	41805	36202.00	38358	48228	41730.00	42857	40631	34745	31783	34200	35,932.00
OB Trk Fleet	75452	81080	87589	98637	84823	90016	112030	94263	87468	93394	97,791.00

	Average hours per year, 2004-2014	% total hours
OB Shovels	13,109.91	0.04
RT Dozer	25,743.64	0.08
Track Dozer	68,200.27	0.21
Front End Loader	15,536.58	0.05
Motor Graders	48,206.00	0.15
Scrapers	24,860.64	0.08
Coal Trucks	38,770.09	0.12
OB Truck Fleet	91,140.27	0.28
Total	325,567.40	

Engine Emission Ratings

				Exhaust (g/kw-hr)[a]					lb/hp-hr[b]			Opacity (%)		
Coteau Fleet	**Engine Name**	**Emission Standard Category**		**HC**	**NOx**	**NMHC+Nox**	**CO**	**PM**	**Sox[c]**	**CO2**	**TOC**	**ACCEL**	**LUG**	**PEAK**
M. grader	24M- S/N B9K00375 C18 ACPXL18.1ESK	Tier 3	std	n/a	n/a	4	3.5	0.2				20	15	50
			cert	n/a	n/a	4	2.4	0.15	0.000405	1.08	12.555	9	4	13
track dozer	D10T- S/N RJG02804 C27 ACPXL27.0ESK	Tier 3	std	n/a	n/a	4	3.5	0.2				20	15	50
			cert	n/a	n/a	3.7	2.8	0.16	0.000405	1.08	12.555	14	3	22
track dozer	D11T- S/N GEB00896 C32 ACPXL32.0ESX	Tier 2	std	n/a	n/a	6.4	3.5	0.2				20	15	50
			fel	n/a	n/a	n/a	n/a	0.14				n/a	n/a	n/a
			cert	n/a	n/a	5.7	0.9	0.06	0.000405	1.16	7.05	8	2	14
OB truck	789D- S/NSPD00615 3516B ACPXL58.6T2E	Tier 2	std	n/a	n/a	6.4	3.5	0.2				20	15	50
			fel	n/a	n/a	n/a	n/a	0.14				n/a	n/a	n/a
			cert	n/a	n/a	6.3	1.6	0.16	0.000405	1.16	7.05	19	6	31
OB truck	793D- S/N FDB00881 3516B 8CPXL78.1E2W	Tier 2	std	n/a	n/a	6.4	3.5	0.2				20	15	50
			fel	n/a	n/a	9	n/a	0.4				n/a	n/a	n/a
			cert	n/a	n/a	7.9	1.1	0.18	0.000405	1.16	7.05	14	7	30
M. grader	16M- S/N R9H00401 C13 ACPXL12.5ESK	Tier 3	std	n/a	n/a	4	3.5	0.2				20	15	50
			cert	n/a	n/a	3.7	2.7	0.16	0.000405	1.08	12.555	15	4	25
scraper	657G- S/N W1C00276 Tractor, W1E00312 w1c00276= C18 8CPXL18.1ESK	Tier 3	std	n/a	n/a	4	3.5	0.2				20	15	50
			cert	n/a	n/a	3.4	3.4	0.15	0.000405	1.16	7.05	11	6	15
f.e. loader	994F- S/N 44200235 3516B ENGINE PASSED	Tier 1	std	1.3	9.2	n/a	11.4	0.54				20	15	50
			cert	0.4	8.3	n/a	1.2	0.13	0.000405	1.16	7.05	9	2	20
rt dozer & OB shovels	854K- S/N 22100299 C32 ENGINE PASSED	Tier 2	std	n/a	n/a	6.4	3.5	0.2				20	15	50
			cert	n/a	n/a	5.4	0.9	0.06	0.000405	1.16	7.05	7	2	11

[a] *from engine manufacturer data*

[b] *from AP-42 Table 3.3-1 and Table 3.4-1*

[c] *only the factor from AP-42 Table 3.4-1 is used, as the factor from Table 3.3-1 was last updated in 1996 and does not consider sulfur content in fuel. Coteau uses USLD.*

PM10 Measured at Coteau Properties Freedom Mine

	2nd Quarter 1995, Huntingdon 8-10-95		1st Quarter 1995, Huntingdon 5-1-95		4th Quarter 1994, Huntingdon 1-27-95	
Site No.	Highest Concentration 24-hr µg/m^3	Quarterly Average µg/m3	Highest Concentration 24-hr µg/m^3	Quarterly Average µg/m3	Highest Concentration 24-hr µg/m^3	Quarterly Average µg/m3
5	27.7	14.7	31.8	12.1	35.5	11.5
6	25	13.9	18.7	9.2	41.7	11.9
7	39.7	16.8	29.1	10.1	40.2	14.2
8	15.6	10.7	20.3	9.3	44.5	10.4

PM10 Measured at Coteau Properties Freedom Mine

	3rd Quarter 1994, Huntingdon 10-26-94		2nd Quarter 1994, Huntingdon 7-13-94		1st Quarter 1994, Huntingdon 4-6-94	
Site No.	Highest Concentration 24-hr µg/m^3	Quarterly Average µg/m3	Highest Concentration 24-hr µg/m^3	Quarterly Average µg/m3	Highest Concentration 24-hr µg/m^3	Quarterly Average µg/m3
5	36	14.6	28	12.8	26.9	11.1
6	41.9	13	23.5	11.2	17.1	9.9
7	66.8	19.6	30.1	14.9	16.1	9.7
8	33.8	16.9	39.8	15.9	17.9	10.1

PM10 Measured at Coteau Properties Freedom Mine

	4th Quarter 1993, Huntingdon 1-6-93		3rd Quarter 1993, Huntingdon 10-18-93		2nd Quarter 1993	
Site No.	Highest Concentration 24-hr µg/m^3	Quarterly Average µg/m3	Highest Concentration 24-hr µg/m^3	Quarterly Average µg/m3	Highest Concentration 24-hr µg/m^3	Quarterly Average µg/m3
5	45.8	11	24.4	12	19.3	not reported
6	20.9	10.5	28.3	11.5	18	not reported
7	67.5	15.7	84.3	22.4	47.8	not reported
8	41	14.4	56.2	21.6	33	not reported

PM2.5 calculations	0.549681187					
	2nd Quarter 1995	1st Quarter 1995	4th Quarter 1994	3rd Quarter 1994	2nd Quarter 1994	1st Quarter 1994
Site No.	Highest Concentration 24-hr µg/m^3	Highest Concentration 24-hr µg/m	Highest Concentration 24-hr µg/m^3	Highest Concentration 24-hr µg/m^3	Highest Concentration 24-hr µg/m^3	Highest Concentration 24-hr µg/m^3
5	15.22616888	17.47986174	19.51368213	19.78852273	15.39107323	14.78642393
6	13.74202967	10.27903819	22.92170549	23.03164173	12.91750789	9.399548295
7	21.82234312	15.99572254	22.09718371	36.71870328	16.54540372	8.849867109
8	8.575026515	11.15852809	24.46081282	18.57922412	21.87731124	9.839293245

PM2.5 95th Percentiles			
Site No.	1995 95th Percentile 24-hr	1994 95th percentile 24-hr	1993 95th percentile 24-hr
5	17.3671771	19.74729664	23.99908062
6	13.5688801	23.01515129	15.14921351
7	21.53101209	34.52547535	45.41465966
8	11.02935301	24.07328758	30.0565673

Site No.	PM2.5 95th Percentile Average
5	20.37118479
6	17.24441497
7	33.8237157
8	21.71973596

4th Quarter 1993	**3rd Quarter 1993**	**2nd Quarter 1993**
Highest Concentration 24-hr µg/m^3	**Highest Concentration 24-hr µg/m^3**	**Highest Concentration 24-hr µg/m^3**
25.17539836	13.41222096	10.60884691
11.48833681	15.55597759	9.894261364
37.10348011	46.33812405	26.27476073
22.53692866	30.8920827	18.13947917

Calculated PM2.5 at Coteau Properties Freedom Mine

Site No.	2nd Quarter 1995 Highest Concentration 24-hr µg/m3	1st Quarter 1995 Highest Concentration 24-hr µg/m3	4th Quarter 1994 Highest Concentration 24-hr µg/m3	3rd Quarter 1994 Highest Concentration 24-hr µg/m3	2nd Quarter 1994 Highest Concentration 24-hr µg/m3	1st Quarter 1994 Highest Concentration 24-hr µg/m3
5	15.2	17.5	19.5	19.8	15.4	14.8
6	13.7	10.3	22.9	23.0	12.9	9.4
7	21.8	16.0	22.1	36.7	16.5	8.8
8	8.6	11.2	24.5	18.6	21.9	9.8

Site No.	PM2.5 Average*
5	16.82024432
6	14.35889411
7	25.74950982
8	18.45096517

**average based on nine quarters of data from 2nd quarter 1993 through 2nd quarter 1995*

Calculated PM2.5 at Coteau Properties Freedom Mine

Site No.	4th Quarter 1993 Highest Concentration 24-hr µg/m3	3rd Quarter 1993 Highest Concentration 24-hr µg/m3	2nd Quarter 1993 Highest Concentration 24-hr µg/m3
5	25.2	13.4	10.6
6	11.5	15.6	9.9
7	37.1	46.3	26.3
8	22.5	30.9	18.1

NORTH DAKOTA
STATE DEPARTMENT OF HEALTH
AND CONSOLIDATED LABORATORIES

ENVIRONMENTAL HEALTH SECTION

1200 Missouri Avenue
P.O. Box 5520
Bismarck, North Dakota 58506-5520
Fax #701-328-5200
TDD #701-328-2068

May 15, 1995

Mr. George Hawkey
The Coteau Properties Company
P.O. Box 1089
Beulah, ND 58523

Dear Mr. Hawkey:

Your request to discontinue PM_{10} monitoring has been reviewed and approved with one exception: monitoring must continue through the end of June 1995. Operating through the end of June will provide eight consecutive, complete quarters of monitoring data.

The Coteau Properties Company monitoring requirements will be deemed complete after the Department receives and accepts the second quarter 1995 data report. After the second quarter data report is accepted, Coteau Properties' Permit to Operate will be updated to remove the monitoring requirement.

If you have any questions concerning this decision and the requirements, please contact Dan Harman of my staff.

Sincerely,

Dana K. Mount, P.E.
Director, Division of
Environmental Engineering

DKM/DEH:saj
xc: Gordon MacRea, EPA Region VIII

Indirect Air Emissions

	DGC (tons)					AVS (tons)					LOS (tons)				
	2014	**2013**	**2012**	**2011**	**2010**	**2014**	**2013**	**2012**	**2011**	**2010**	**2014**	**2013**	**2012**	**2011**	**2010**
PM10	934	199.5	459.1	156.96	142	644	519.4	524.33	208.1	165.6	501	154	363.9	343.3	407.5
PM2.5	786	272.7	39.5	30.66	766.3	345	427.7	416.5	132.2	55	265	165.4	151.9	43.7	13.5
SO2	3818	2628.6	5777	5056.9	5066.6	12484	13653.1	13905	5176	14891.9	1437	6731.9	16300	38790	23615.1
Nox	3236	2997.6	3370.1	3526.4	3406.4	8993	11416.5	12195	10547	12819.1	6570	1669.1	5163.2	4970.7	6426.62
VOC	386	393	331	422	362	98	104.4	128.7	38.8	60.4	145	33.7	30.4	126.6	82.9
CO	2231	2025.6	2175	1927.1	2025	1230	1294.9	1348.8	476.3	754.6	762	279.15	254	676	900.8
CO2e		2334177.4	2800000	3000000	2900000	7354196	7592034	7737865	6556711	7755860	4385922	4917141	4049313	3844708	4594366

**data from NDDOH and Annual Emissions Inventory Reports http://www.ndhealth.gov/AQ/Reporting.aspx*

Tons Emissions			
	DGC (2014)	**AVS (2012-2014)**	**LOS (2014)**
PM10	934	562.5766667	501
PM2.5	786	396.4	265
SO2	3818	13347.36667	1437
Nox	3236	10868.16667	6570
VOC	386	110.3666667	145
CO	2231	1291.233333	762
CO2e	2334177.4	7561365	4385922

Avg Tons Emissions from Federal Coal			
	DGC	**AVS**	**LOS**
PM10	260	156	107
PM2.5	219	110	57
SO2	1,062	3,713	308
Nox	900	3,023	1,409
VOC	107	31	31
CO	621	359	163
CO2e	649,292	2,103,326	940,545

tons of Federal coal to be mined per year this EA (7 years)	3,700,000.00
avg tons mined per year, total (1983-2014)	13,301,341.09
% of Fed coal this EA of total mined per year	0.27816744

	DGC	**AVS**	**LOS**
avg tons coal combusted per year[1]	5,865,022.90	4,953,781.38	3,263,718.50
avg tons coal delivered per year	5,865,022.90	4,953,781.38	2,516,084.07
% of coal from Freedom Mine	100	100	0.770925577
% of total Freedom Mine coal deliveries	0.440934704	0.372427212	0.18916018
% of coal from Fed coal[2]	0.28	0.28	0.21

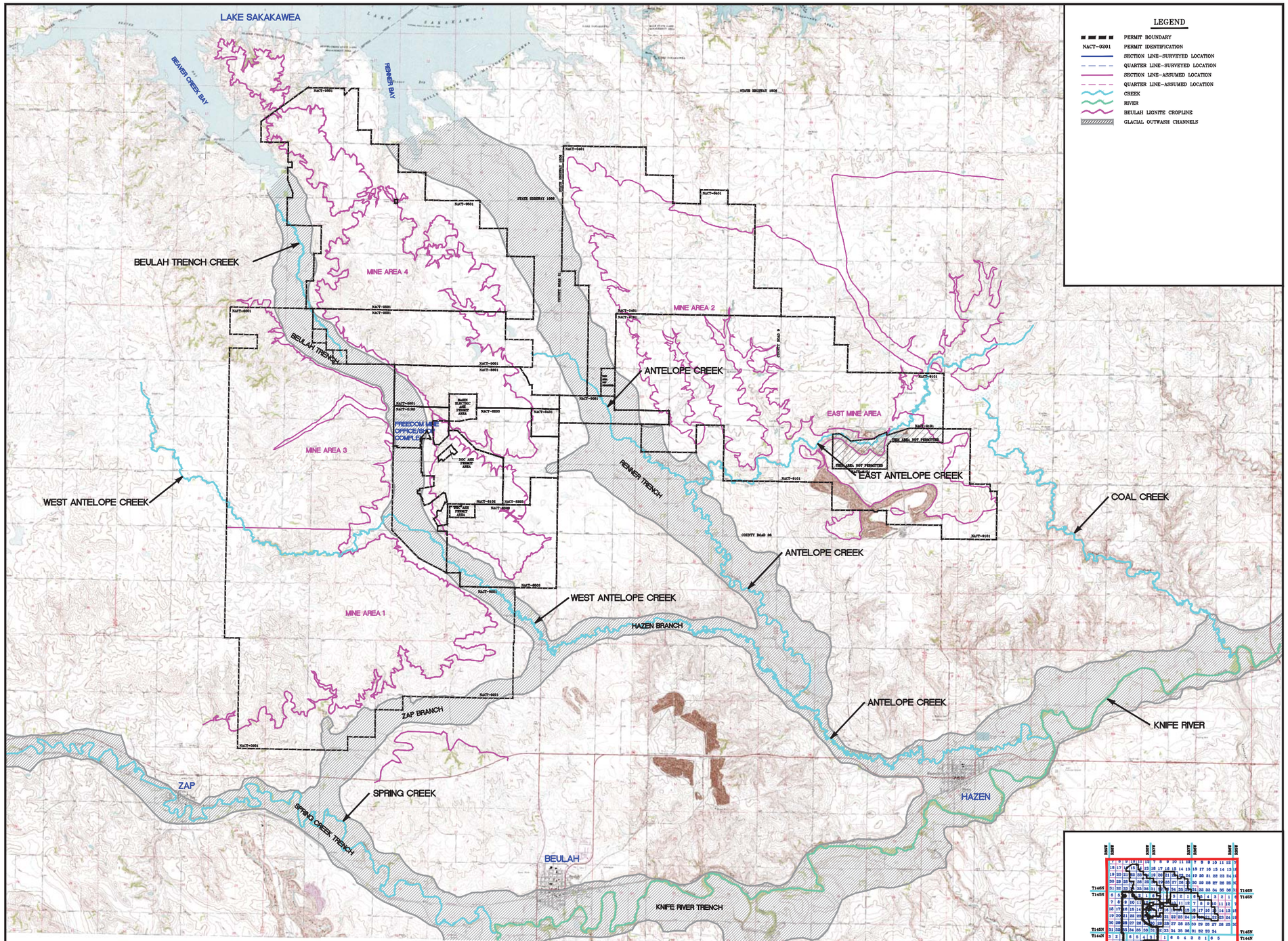
[1] averages for DGC and AVS were calculated from 1983-2014. LOS is the average of 2013-2014 tons only.

[2] ((% of total coal deliveries) x (tons of Federal coal to be mined per year this EA)) / (Avg tons coal combusted per year)

Appendix C

Maps

1. *Geomorphic Reference Map*
2. *Surface Water Features Map, Sheet 1*
3. *Surface Water Features Map, Sheet 2*
4. *Surface Water Features Map, Sheet 3*
5. *Potential Whooping Crane Roosting and Feeding Wetlands, Sheet 1*
6. *Potential Whooping Crane Roosting and Feeding Wetlands, Sheet 2*
7. *Potential Whooping Crane Roosting and Feeding Wetlands, Sheet 3*
8. *Potential Northern Long-eared Bat Habitat, Sheet 1*
9. *Potential Northern Long-eared Bat Habitat, Sheet 2*
10. *Potential Northern Long-eared Bat Habitat, Sheet 3*
11. *White-Nose Syndrome Buffer Zone Around WNA/Pd Positive Counties/Districts*
12. *Twin Buttes Lignite Potentiometric Map*
13. *Schoolhouse Lignite Potentiometric Map*
14. *Beulah/Lower Beulah Lignite Potentiometric Map*
15. *Spaer/Insert Lignite Potentiometric Map*
16. *Blasting Map Consolidated Blasting Plan*


LAKE SAKAKAWEA
BEAVER CREEK BAY
RENNER BAY
STATE HIGHWAY 1806
COUNTY ROAD 6
COUNTY ROAD 26
BEULAH TRENCH CREEK
MINE AREA 4
MINE AREA 2
MINE AREA 3
MINE AREA 1
EAST MINE AREA
FREEDOM MINE OFFICE/SHOP COMPLEX
RENNER TRENCH
BEULAH TRENCH
ANTELOPE CREEK
WEST ANTELOPE CREEK
EAST ANTELOPE CREEK
COAL CREEK
HAZEN BRANCH
ZAP BRANCH
SPRING CREEK
SPRING CREEK TRENCH
KNIFE RIVER
KNIFE RIVER TRENCH
ZAP
BEULAH
HAZEN
LEGEND
PERMIT BOUNDARY
NACT-0201 PERMIT IDENTIFICATION
SECTION LINE-SURVEYED LOCATION
QUARTER LINE-SURVEYED LOCATION
SECTION LINE-ASSUMED LOCATION
QUARTER LINE-ASSUMED LOCATION
CREEK
RIVER
BEULAH LIGNITE CROPLINE
GLACIAL OUTWASH CHANNELS
G.N.
0 3000' 6000' 9000' 12000'
Scale 1" = 3000'
O:\E-Permits\Permit Drawings\NACT-0201 (W)\03-Pending Approval\2-3-1-1 Geomorphic Ref.dwg
Jan15, 2015 - 1:45pm
NO. BY (APP'D) DATE
0 DAS DAS 01/19/15
DRAWING UPDATES
COTEAU
FREEDOM MINE
BEULAH, ND 58523
GEOMORPHIC REFERENCE MAP
SECTION 2,3,11
SCALE: 1"=3000' (paper size 36" x 42")
PROJECT: NACT-0201
REVISION: 18

WEST ANTELOPE CREEK

COUNTY ROAD 26

COUNTY ROAD 115

NACT-0201

R 88 W

R 87 W

WAC-10-01 4 ACRES

WAC-10-02 69 ACRES

WAC-10-03 64 ACRES

WAC-10-04 1 ACRES

WAC-10-05 68 ACRES

WAC-09 207 ACRES

WAC-08 99 ACRES

WAC-07 167 ACRES

WAC-06 93 ACRES

WAC-05 97 ACRES

WAC-04 52 ACRES

WAC-03 82 ACRES

WAC-02 51 ACRES

WAC-01 952 ACRES

SC-08-01 568 ACRES

SC-04 747 ACRES

SC-02 226 ACRES

SC-01 436 ACRES

SC-01-01 199 ACRES

SC-01-02 66 ACRES

SC-01-03 16 ACRES

SC-01-04 65 ACRES

SC-01-05 58 ACRES

SC-02-01 68 ACRES

SC-02-02 12 ACRES

SC-03 96 ACRES

SC-03-01 47 ACRES

SC-03-02 69 ACRES

SC-03-03 9 ACRES

SC-04-01 788 ACRES

SC-04-02 9 ACRES

SC-05 49 ACRES

SC-05-01 46 ACRES

SC-05-02 5 ACRES

SC-06 396 ACRES

SC-07 128 ACRES

NACT-0201

COUNTY ROAD 26A

COUNTY ROAD 17

COUNTY ROAD 21

STATE HIGHWAY 200

T 145 N

T 144 N

LEGEND

- PERMIT BOUNDARY
- NACT-0201 PERMIT IDENTIFICATION
- SECTION LINE-SURVEYED LOCATION
- QUARTER LINE-SURVEYED LOCATION
- SECTION LINE-ASSUMED LOCATION
- QUARTER LINE-ASSUMED LOCATION
- PAVED ROADS
- IMPROVED GRAVEL ROADS
- UNIMPROVED TRAILS
- SURFACE WATER DRAINAGE
- PRINCIPAL WATERSHED BOUNDARY
- SUBWATERSHED BOUNDARY

- SC-01 SPRING CREEK PRINCIPAL WATERSHED
- WAC-01 WEST ANTELOPE CREEK PRINCIPAL WATERSHED
- LS-01 LAKE SAKAKAWEA PRINCIPAL WATERSHED
- CLASS VII PEN/PEN-LIKE WETLANDS (FW5-2-144-88)
- SPRINGS (S31-1-145-87)
- CLASS I AND II WETLANDS
- CLASS III AND IV WETLANDS
- STOCKPOND (SP3-1-144-88)
- INTERMITTENT STREAM
- ACTIVE SURFACE WATER MONITORING SITE

NOTE: ALL STREAMS ARE EPHEMERAL STREAMS UNLESS OTHERWISE INDICATED ON MAP.

C.N.

0 600' 1200' 2400'

Scale 1" = 600'

COTEAU FREEDOM MINE BEULAH, ND 58523

WEST MINE AREA ENVIRONMENTAL ASSESSMENT

SURFACE WATER FEATURES MAP

NO.	BY	APP'D	DATE
0	DAS	KBT	11/19/15

REVISIONS

SCALE: 1"=600' (paper size 36" x 55")

PROJECT: 2015 EA REVISION: 0

NACT-020

WEST ANTELOPE CREEK

COUNTY ROAD 26

WEST ANTELOPE CREEK

WAC-10

6482 ACRES

WAC-10-10

WAC-10-09

WAC-10-08

WAC-10-07

WAC-10-06

SC-08-03

SC-08-02

T 145 N

T 144 N

SC-10

279 ACRES

SC-10-01

SC-10-02

SC-09-01

SC-08

2131 ACRES

SC-08-04

SC-09

1,988 ACRES

SC-09-02

SC-08-05

NACT-0201

R 89 W

R 88 W

COUNTY ROAD 17

STATE HIGHWAY 200

N: 620,000

N: 615,000

N: 610,000

N: 605,000

N: 600,000

N: 595,000

E: 1,645,000

E: 1,650,000

E: 1,655,000

E: 1,660,000

LEGEND

- PERMIT BOUNDARY
- NACT-0201 PERMIT IDENTIFICATION
- SECTION LINE-SURVEYED LOCATION
- QUARTER LINE-SURVEYED LOCATION
- SECTION LINE-ASSUMED LOCATION
- QUARTER LINE-ASSUMED LOCATION
- PAVED ROADS
- IMPROVED GRAVEL ROADS
- UNIMPROVED TRAILS
- SURFACE WATER DRAINAGE
- PRINCIPAL WATERSHED BOUNDARY
- SUBWATERSHED BOUNDARY

- SC-01 SPRING CREEK PRINCIPAL WATERSHED
- WAC-01 WEST ANTELOPE CREEK PRINCIPAL WATERSHED
- LS-01 LAKE SAKAKAWEA PRINCIPAL WATERSHED
- CLASS VII PEN/PEN-LIKE WETLANDS (PW5-2-144-88)
- SPRINGS (S31-1-145-87)
- CLASS I AND II WETLANDS
- CLASS III AND IV WETLANDS
- STOCKPOND (SP3-1-144-88)
- INTERMITTENT STREAM
- ACTIVE SURFACE WATER MONITORING SITE

NOTE: ALL STREAMS ARE EPHEMERAL STREAMS UNLESS OTHERWISE INDICATED ON MAP.

G.N.

0 600' 1200' 2400'

Scale 1" = 600'

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Nov19, 2015 - 8:57am

COTEAU NATURAL RESOURCES GROUP

FREEDOM MINE
BEULAH, ND 58523

WEST MINE AREA ENVIRONMENTAL ASSESSMENT

SURFACE WATER FEATURES MAP

NO.	BY	APP'D	DATE
0	DAS	KBT	11/19/15

REVISIONS

SCALE: 1"=600' (paper size 36" x 55")

PROJECT: 2015 EA REVISION: 0

LEGEND

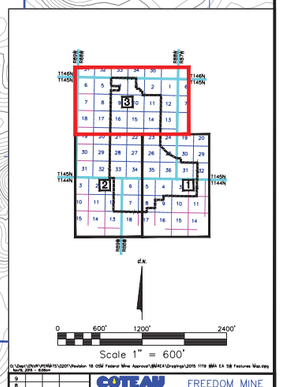
- PERMIT BOUNDARY
- NACT-0201 PERMIT IDENTIFICATION
- SECTION LINE-SURVEYED LOCATION
- QUARTER LINE-SURVEYED LOCATION
- SECTION LINE-ASSUMED LOCATION
- QUARTER LINE-ASSUMED LOCATION
- PAVED ROADS
- IMPROVED GRAVEL ROADS
- UNIMPROVED TRAILS
- SURFACE WATER DRAINAGE
- PRINCIPAL WATERSHED BOUNDARY
- SUBWATERSHED BOUNDARY
- SC-01 SPRING CREEK PRINCIPAL WATERSHED
- WAC-01 WEST ANTELOPE CREEK PRINCIPAL WATERSHED
- LS-01 LAKE SAKAKAWEA PRINCIPAL WATERSHED
- CLASS VII PEN/PEN-LIKE WETLANDS (PW6-2-144-88)
- SPRINGS (SP31-1-146-87)
- CLASS I AND II WETLANDS
- CLASS III AND IV WETLANDS
- STOCKPOND (SP3-1-144-88)
- INTERMITTENT STREAM
- ACTIVE SURFACE WATER MONITORING SITE

NOTE: ALL STREAMS ARE EPHEMERAL STREAMS UNLESS OTHERWISE INDICATED ON MAP.

T 146 N
T 145 N
R 89 W
R 88 W
R 88 W
R 87 W
NACT-0201
COUNTY ROAD 15
COUNTY ROAD 13
COUNTY ROAD 5
E: 1645,000
E: 1650,000
E: 1655,000
E: 1660,000
E: 1665,000
E: 1670,000
N: 640,000
N: 635,000
N: 630,000
N: 625,000

LS-07 77 ACRES
LS-06 25 ACRES
LS-05 55 ACRES
LS-04 552 ACRES
LS-03 512 ACRES
LS-02 165 ACRES
LS-01 483 ACRES
LS-01-02 89 ACRES
LS-01-01 89 ACRES
WAC-17-03 109 ACRES
WAC-17-04 106 ACRES
WAC-17 2672 ACRES
WAC-17-02 109 ACRES
WAC-17-01 106 ACRES
WAC-15 160 ACRES
WAC-16-01 109 ACRES
WAC-16 235 ACRES
WAC-16-02 48 ACRES
WAC-16-04 102 ACRES
WAC-16-03 66 ACRES
WAC-14 31 ACRES
WAC-13 105 ACRES
WAC-12 733 ACRES
WAC-11 18 ACRES

WATERSHED BOUNDARY EXTENDS 300' OFF OF SHEET



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Scale 1" = 600'

NO.	BY	APP'D	DATE	REVISIONS
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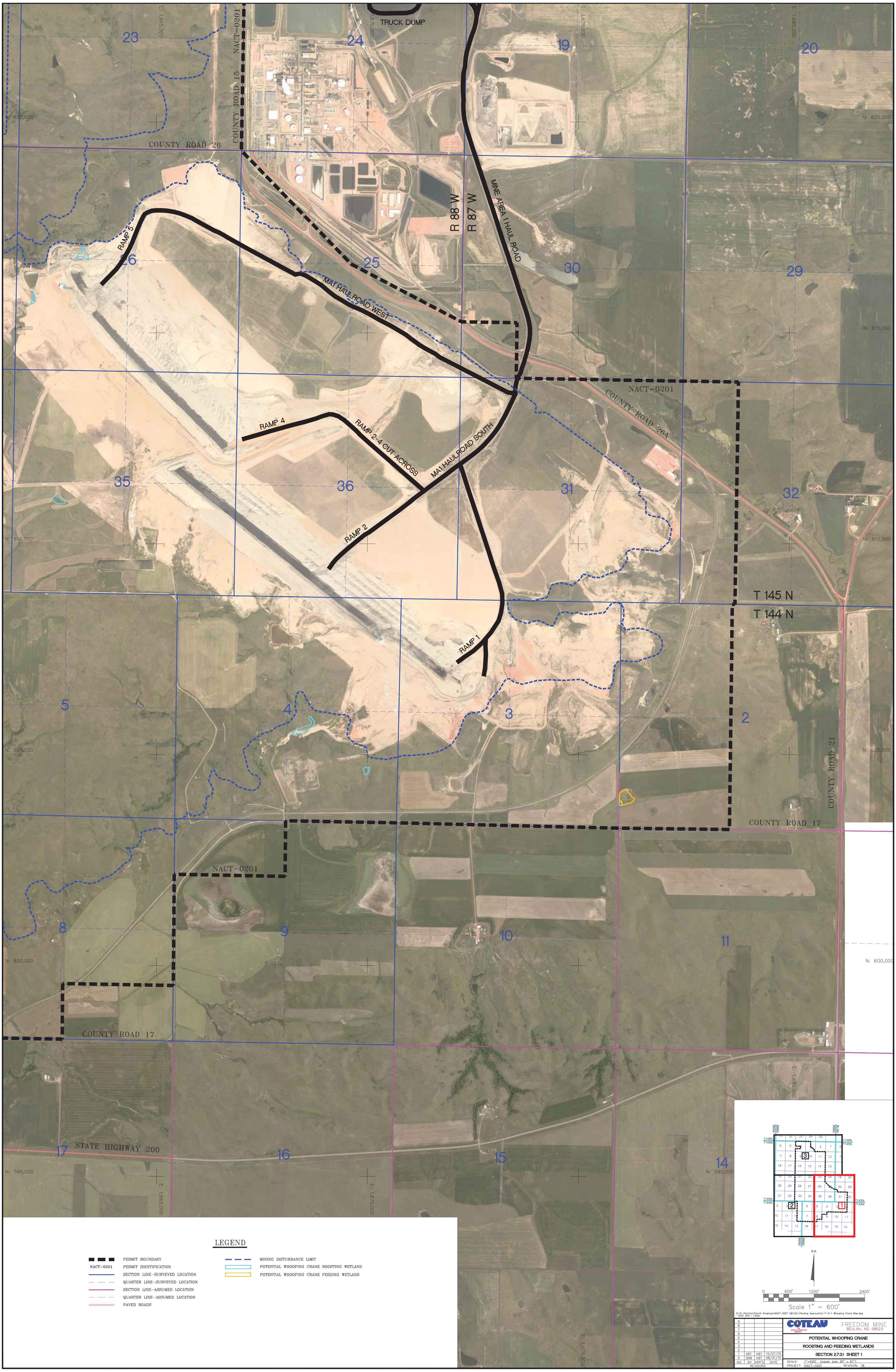
COTEAU — FREEDOM MINE, BEULAH, ND 58523

WEST MINE AREA ENVIRONMENTAL ASSESSMENT

SURFACE WATER FEATURES MAP

SCALE: 1"=600' (paper size 36" x 52")
PROJECT: 2015 EA REVISION: 0



TRUCK DUMP
23
24
19
20
NACT-0201
COUNTY ROAD 15
COUNTY ROAD 26
E: 1,665,000
E: 1,670,000
E: 1,675,000
E: 1,680,000
N: 620,000
N: 615,000
N: 610,000
N: 605,000
N: 600,000
N: 595,000
R 88 W
R 87 W
MINE AREA 1 HAUL ROAD
RAMP 5
26
25
30
29
MA1 HAULROAD WEST
NACT-0201
COUNTY ROAD 26A
RAMP 4
RAMP 2-4 CUT ACROSS
MA1 HAULROAD SOUTH
35
36
31
32
RAMP 2
T 145 N
T 144 N
RAMP 1
5
4
3
2
COUNTY ROAD 21
COUNTY ROAD 17
NACT-0201
8
9
10
11
COUNTY ROAD 17
17
STATE HIGHWAY 200
16
15
14
LEGEND
PERMIT BOUNDARY
NACT-0201 PERMIT IDENTIFICATION
SECTION LINE-SURVEYED LOCATION
QUARTER LINE-SURVEYED LOCATION
SECTION LINE-ASSUMED LOCATION
QUARTER LINE-ASSUMED LOCATION
PAVED ROADS
MINING DISTURBANCE LIMIT
POTENTIAL WHOOPING CRANE ROOSTING WETLAND
POTENTIAL WHOOPING CRANE FEEDING WETLAND
T146N T145N
T145N T144N
R89W R88W
R88W R87W
G.N.
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Scale 1" = 600'
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Oct07, 2015 - 1:01pm
COTEAU
FREEDOM MINE
BEULAH, ND 58523
POTENTIAL WHOOPING CRANE
ROOSTING AND FEEDING WETLANDS
SECTION 2.7.3.1 SHEET 1
1 KBT KBT 10/07/15
0 SDM KBT 08/31/15
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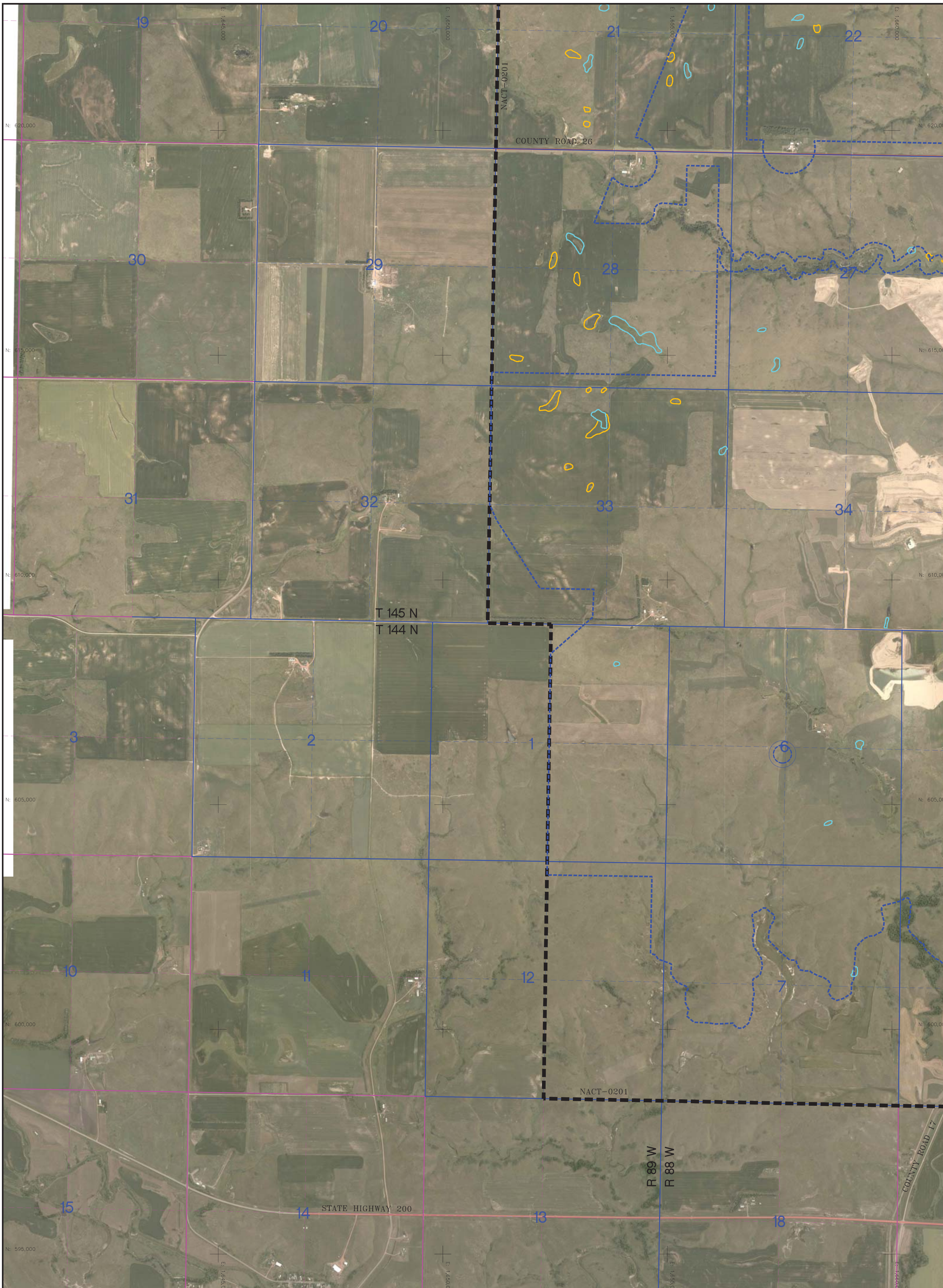
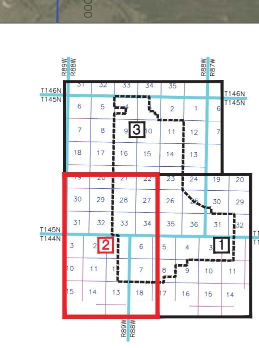
REVISIONS
SCALE: 1"=600' (paper size 36" x 61")
PROJECT: NACT-0201 REVISION: 18



LEGEND

▬ ▬ ▬	PERMIT BOUNDARY
NACT–0201	PERMIT IDENTIFICATION
——	SECTION LINE–SURVEYED LOCATION
— — —	QUARTER LINE–SURVEYED LOCATION
——	SECTION LINE–ASSUMED LOCATION
— — —	QUARTER LINE–ASSUMED LOCATION
═══	PAVED ROADS
— — —	MINING DISTURBANCE LIMIT
▭	POTENTIAL WHOOPING CRANE ROOSTING WETLAND
▭	POTENTIAL WHOOPING CRANE FEEDING WETLAND



G.N.

0 600' 1200' 2400'

Scale 1" = 600'

O:\E-Permits\Permit Drawings\NACT-0201 (W)\03-Pending Approval\2-7-3-1 Whooping Crane Map.dwg
Oct07, 2015 - 1:03pm

NO.	BY	APP'D	DATE
9			
8			
7			
6			
5			
4			
3			
2			
1	KBT	KBT	10/07/15
0	SDM	KBT	08/31/15

REVISIONS

COTEAU — THE COTEAU PROPERTIES COMPANY

FREEDOM MINE
BEULAH, ND 58523

POTENTIAL WHOOPING CRANE
ROOSTING AND FEEDING WETLANDS

SECTION 2.7.3.1 SHEET 2

SCALE: 1"=600' (paper size 36" x 61")
PROJECT: NACT-0201 REVISION: 18

LEGEND

- PERMIT BOUNDARY
- NACT-0201 PERMIT IDENTIFICATION
- SECTION LINE-SURVEYED LOCATION
- QUARTER LINE-SURVEYED LOCATION
- SECTION LINE-ASSUMED LOCATION
- QUARTER LINE-ASSUMED LOCATION
- PAVED ROADS
- MINING DISTURBANCE LIMIT
- POTENTIAL WHOOPING CRANE ROOSTING WETLAND
- POTENTIAL WHOOPING CRANE FEEDING WETLAND

T 146 N
T 145 N

R 89 W
R 88 W
R 88 W
R 87 W

COUNTY ROAD 15
COUNTY ROAD 13
NACT-0201
NACT-0201
NACT-0201
COUNTY ROAD 16

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Scale 1" = 600'

COTEAU
FREEDOM MINE
BEULAH, ND 58523

POTENTIAL WHOOPING CRANE
ROOSTING AND FEEDING WETLANDS
SECTION 27,33 SHEET 3

SCALE: 1"=600' (paper size 36" x 61")
PROJECT: NACT-0201 REVISION: 18

NO.	BY	APP'D	DATE	REVISIONS
1	KBT	KBT	10/07/15	
0	SCW	KBT	08/27/15	

SECTION 23
T145N, R88W

SECTION 24
T145N, R88W

SECTION 19
T145N, R87W

SECTION 20
T145N, R87W

SECTION 26
T145N, R88W

SECTION 25
T145N, R88W

SECTION 30
T145N, R87W

SECTION 29
T145N, R87W

SECTION 35
T145N, R88W

SECTION 36
T145N, R88W

SECTION 31
T145N, R87W

SECTION 32
T145N, R87W

SECTION 5
T144N, R88W

SECTION 4
T144N, R88W

SECTION 3
T144N, R88W

SECTION 2
T144N, R88W

SECTION 8
T144N, R88W

SECTION 9
T144N, R88W

SECTION 10
T144N, R88W

SECTION 11
T144N, R88W

SECTION 17
T144N, R88W

SECTION 16
T144N, R88W

SECTION 15
T144N, R88W

SECTION 14
T144N, R88W

SECTION 20

SECTION 21

SECTION 22

SECTION 23

TRUCK DUMP

NACT-0201

COUNTY ROAD 1

COUNTY ROAD 26

R 88 W

R 87 W

MINE AREA 1 HAUL ROAD

RAMP 5

MAT HAULROAD WEST

RAMP 4

RAMP 2-4 CUT ACROSS

MAT HAULROAD SOUTH

RAMP 2

RAMP 1

NACT-0201

COUNTY ROAD 26A

T 145 N

T 144 N

COUNTY ROAD 21

COUNTY ROAD 17

NACT-0201

COUNTY ROAD 17

STATE HIGHWAY 200

E: 1,665,000

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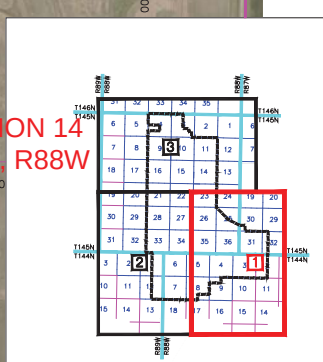
- PERMIT BOUNDARY
- NACT-0201 PERMIT IDENTIFICATION
- SECTION LINE-SURVEYED LOCATION
- QUARTER LINE-SURVEYED LOCATION
- SECTION LINE-ASSUMED LOCATION
- QUARTER LINE-ASSUMED LOCATION
- PAVED ROADS
- MINING DISTURBANCE LIMIT
- POTENTIAL ABANDONED UNDERGROUND MINE HABITAT
- POTENTIAL TREE/SHRUB HABITAT DISTURBED AS OF 2015
- POTENTIAL TREE/SHRUB HABITAT UNDISTURBED AS OF 2015
- POTENTIAL BRIDGE/CONCRETE CULVERT HABITAT
- POTENTIAL STRUCTURAL HABITAT-BUILDINGS



G.N.

0 600' 1200' 2400'

Scale 1" = 600'

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Aug 04, 2016 - 9:20am

NO.	BY	APP'D	DATE
0	DAS	KBT	08/31/16

REVISIONS

COTEAU NATURAL RESOURCES GROUP

FREEDOM MINE
BEULAH, ND 58523

POTENTIAL NORTHERN LONG-EARED BAT HABITAT

SECTION 27,32 SHEET 1

SCALE: 1"=600' (paper size 36" x 61")

PROJECT: NACT-0201 REVISION: 18

19
SECTION 19
T145N, R88W

20
SECTION 20
T145N, R88W

21
SECTION 21
T145N, R88W

22
SECTION 22
T145N, R88W

30
SECTION 30
T145N, R88W

29
SECTION 29
T145N, R88W

28
SECTION 28
T145N, R88W

27
SECTION 27
T145N, R88W

31
SECTION 31
T145N, R88W

32
SECTION 32
T145N, R88W

33
SECTION 33
T145N, R88W

34
SECTION 34
T145N, R88W

3
SECTION 3
T144N, R89W

2
SECTION 2
T144N, R89W

1
SECTION 1
T144N, R89W

6
SECTION 6
T144N, R88W

10
SECTION 10
T144N, R89W

11
SECTION 11
T144N, R89W

12
SECTION 12
T144N, R89W

7
SECTION 7
T144N, R88W

15
SECTION 15
T144N, R89W

14
SECTION 14
T144N, R89W

13
SECTION 13
T144N, R89W

18
SECTION 18
T144N, R88W

22
SECTION 22

23
SECTION 23

24
SECTION 24

19
SECTION 19

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NACT-0201

COUNTY ROAD 26

T 145 N
T 144 N

NACT-0201

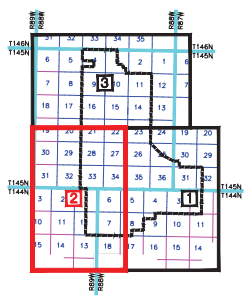
R 89 W
R 88 W

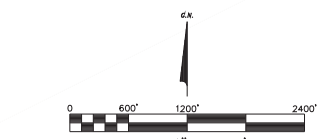
COUNTY ROAD 17

STATE HIGHWAY 200

LEGEND

- PERMIT BOUNDARY
- NACT-0201 PERMIT IDENTIFICATION
- SECTION LINE-SURVEYED LOCATION
- QUARTER LINE-SURVEYED LOCATION
- SECTION LINE-ASSUMED LOCATION
- QUARTER LINE-ASSUMED LOCATION
- PAVED ROADS
- MINING DISTURBANCE LIMIT
- POTENTIAL ABANDONED UNDERGROUND MINE HABITAT
- POTENTIAL TREE/SHRUB HABITAT DISTURBED AS OF 2015
- POTENTIAL TREE/SHRUB HABITAT UNDISTURBED AS OF 2015
- POTENTIAL BRIDGE/CONCRETE CULVERT HABITAT
- POTENTIAL STRUCTURAL HABITAT-BUILDINGS





COTEAU
FREEDOM MINE
BEULAH, ND 58523

POTENTIAL NORTHERN LONG-EARED BAT HABITAT

SECTION 2.7.3.2 SHEET 2

NO.	BY	APP'D	DATE
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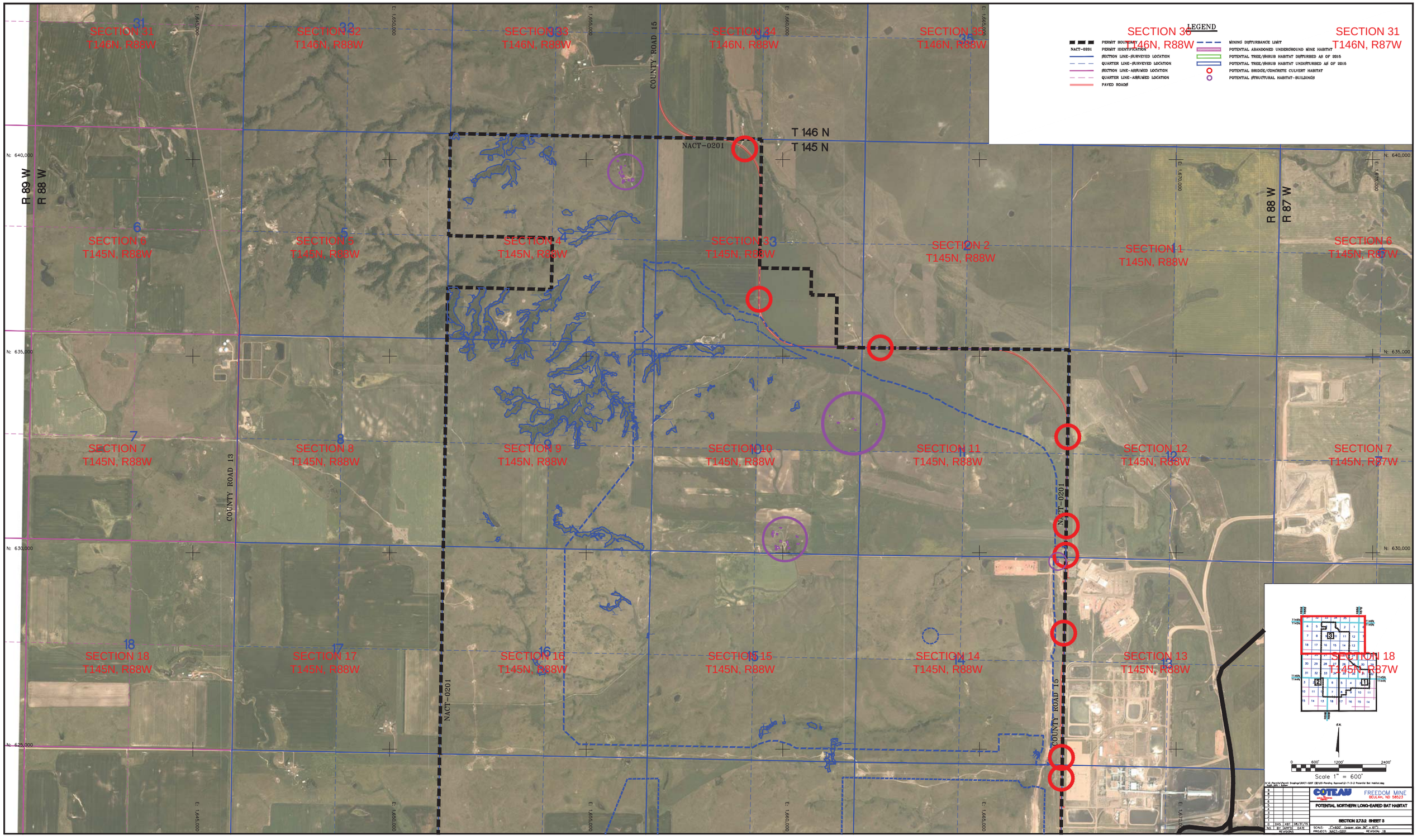
REVISIONS

SCALE: 1"=600' (paper size 36" x 61")
PROJECT: NACT-0201 REVISION: 18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NACT-0201 PERMIT IDENTIFICATION
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QUARTER LINE-SURVEYED LOCATION
SECTION LINE-ASSUMED LOCATION
QUARTER LINE-ASSUMED LOCATION
PAVED ROADS
MINING DISTURBANCE LIMIT
POTENTIAL ABANDONED UNDERGROUND MINE HABITAT
POTENTIAL TREE/SHRUB HABITAT DISTURBED AS OF 2015
POTENTIAL TREE/SHRUB HABITAT UNDISTURBED AS OF 2015
POTENTIAL BRIDGE/CONCRETE CULVERT HABITAT
POTENTIAL STRUCTURAL HABITAT-BUILDINGS
SECTION 31 T146N, R88W
SECTION 32 T146N, R88W
SECTION 33 T146N, R88W
SECTION 34 T146N, R88W
SECTION 35 T146N, R88W
SECTION 36 T146N, R88W
SECTION 31 T146N, R87W
COUNTY ROAD 15
NACT-0201
T 146 N
T 145 N
R 89 W
R 88 W
R 88 W
R 87 W
SECTION 6 T145N, R88W
SECTION 5 T145N, R88W
SECTION 4 T145N, R88W
SECTION 3 T145N, R88W
SECTION 2 T145N, R88W
SECTION 1 T145N, R88W
SECTION 6 T145N, R87W
SECTION 7 T145N, R88W
SECTION 8 T145N, R88W
SECTION 9 T145N, R88W
SECTION 10 T145N, R88W
SECTION 11 T145N, R88W
SECTION 12 T145N, R88W
SECTION 7 T145N, R87W
COUNTY ROAD 13
NACT-0201
NACT-0201
COUNTY ROAD 15
SECTION 18 T145N, R88W
SECTION 17 T145N, R88W
SECTION 16 T145N, R88W
SECTION 15 T145N, R88W
SECTION 14 T145N, R88W
SECTION 13 T145N, R88W
SECTION 18 T145N, R87W
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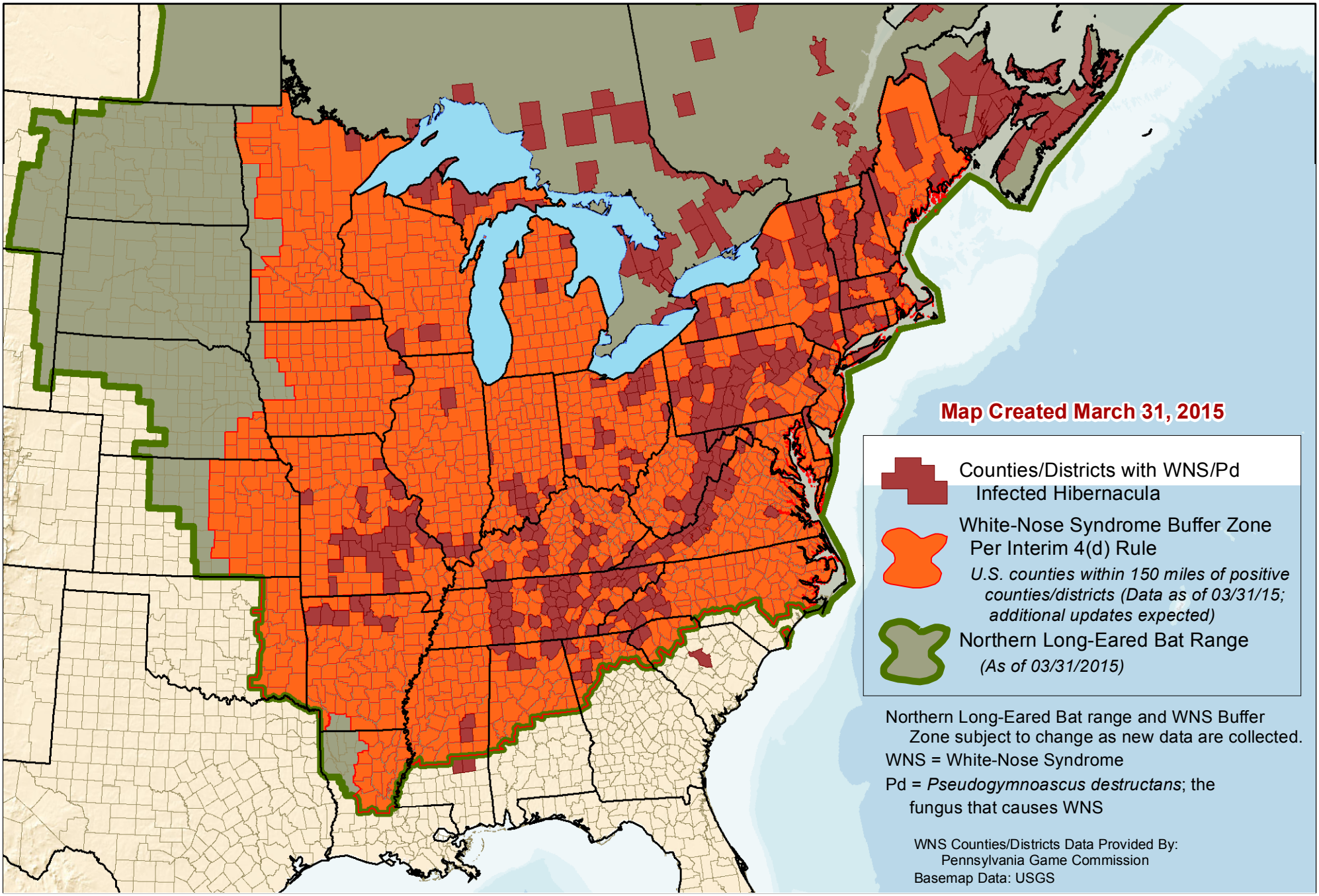
E: 1670,000
0 600' 1200' 2400'
Scale 1" = 600'
COTEAU
FREEDOM MINE
BEULAH, ND 58523
POTENTIAL NORTHERN LONG-EARED BAT HABITAT
SECTION 27,32 SHEET 3
SCALE: 1"=600' (paper size 36" x 61")
PROJECT: NACT-0201
REVISION: 18

U.S. Fish & Wildlife Service

Northern Long-Eared Bat Interim 4(d) Rule

White-Nose Syndrome Buffer Zone Around WNS/Pd Positive Counties/Districts



LEGEND

PERMIT BOUNDARY
NACT-0201 PERMIT IDENTIFICATION
SECTION LINE-SURVEYED LOCATION
QUARTER LINE-SURVEYED LOCATION
SECTION LINE-ASSUMED LOCATION
QUARTER LINE-ASSUMED LOCATION
TWIN BUTTES COAL CROPLINE (MINIMUM THICKNESS 1 FOOT)
PAVED ROADS
IMPROVED GRAVEL ROADS
UNIMPROVED TRAILS
SURFACE WATER DRAINAGE
POTENTIOMETRIC CONTOURS OF TWIN BUTTES LIGNITE
MP80-P07 EXISTING TWIN BUTTES LIGNITE MONITORING WELL
S9-1-145-88 EXISTING TWIN BUTTES SPRINGS

NOTE: POTENTIOMETRIC CONTOURS ARE BASED ON 2ND QUARTER 2001 WATER LEVELS OF MONITORING WELLS AND SURFACE ELEVATIONS OF SPRINGS.

Scale 1" = 1000'

0 1000' 2000' 4000'

REVISIONS				
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9				

PROJECT: NACT-0201 REVISION: 18

SCALE: 1"=1000' (paper size 36" x 49")

SECTION 28&1

FOTENTIOMETRIC MAP

TWIN BUTTES LIGNITE

COTTAM GROUP

FREEDOM MINE
BEULAH, ND 58523

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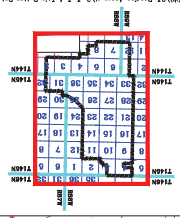

LEGEND

- PERMIT BOUNDARY
- PERMIT IDENTIFICATION — NACT-0201
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- QUARTER LINE–SURVEYED LOCATION
- SECTION LINE–ASSUMED LOCATION
- QUARTER LINE–ASSUMED LOCATION
- SCHOOLHOUSE COAL OUTCROPLINE (MINIMUM THICKNESS 1 FOOT)
- PAVED ROADS
- IMPROVED GRAVEL ROADS
- UNIMPROVED TRAILS
- SURFACE WATER DRAINAGE
- POTENTIOMETRIC CONTOURS OF SCHOOLHOUSE LIGNITE
- EXISTING SCHOOLHOUSE LIGNITE MONITORING WELL — MP84-6P2
- EXISTING SCHOOLHOUSE SPRINGS — S2-1-144-88

NOTE: POTENTIOMETRIC CONTOURS ARE BASED ON 2ND QUARTER 2001 WATER LEVELS OF MONITORING WELLS AND SURFACE ELEVATIONS OF SPRINGS.

Scale 1" = 1000'

0 1000' 2000' 4000'

REVISIONS					
NO.	BY	APP'D	DAS	01/19/15	DATE
0			DAS		
1					
2					
3					
4					
5					
6					
7					
8					
9					

SCALE: 1"=1000' (border size 36" x 49")
PROJECT: NACT-0201 REVISION: 18

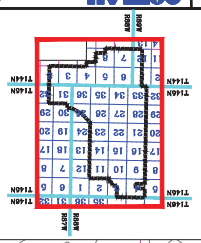
SCHOOLHOUSE LIGNITE

POTENTIOMETRIC MAP

SECTION 24&2

COTTAM — CRAIG & PENROSE GROUP

FREEDOM MINE
BEULAH, ND 58523



LEGEND

PERMIT BOUNDARY
NACT-0201
PERMIT IDENTIFICATION
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QUARTER LINE-SURVEYED LOCATION
SECTION LINE-ASSUMED LOCATION
QUARTER LINE-ASSUMED LOCATION
BEULAH/ZAP COAL CROPLINE
PAVED ROADS
IMPROVED GRAVEL ROADS
UNIMPROVED TRAILS
SURFACE WATER DRAINAGE
POTENTIOMETRIC CONTOURS OF BEULAH/LOWER BEULAH LIGNITE
MP84-6P2
EXISTING BEULAH LIGNITE MONITORING WELL

NOTE: POTENTIOMETRIC CONTOURS ARE BASED ON 2ND QUARTER 2001 WATER LEVELS.

Scale 1" = 1000'

0 1000' 2000' 4000'

REVISIONS				
NO.	BY	APP'D	DATE	
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2				
3				
4				
5				
6				
7				
8				
9				

SCALE: 1"=1000' (paper size 36" x 42")
PROJECT: NACT-0201 REVISION: 18

BEULAH/LOWER BEULAH LIGNITE
POTENTIOMETRIC MAP
SECTION 23&3

COTTAM
FREEDOM MINE
BEULAH, ND 58523

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Jan 05, 2015 - 7:50am

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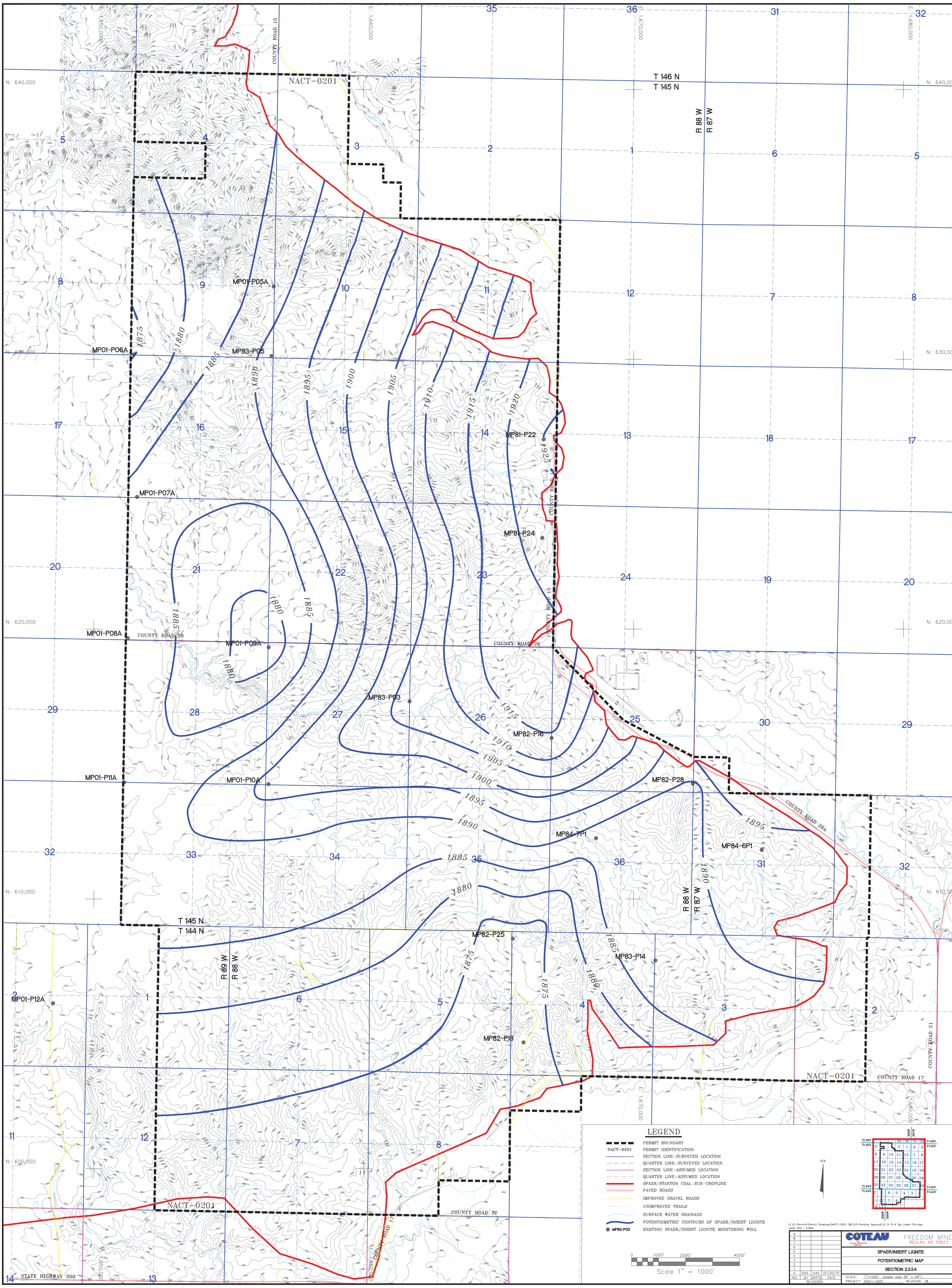
NACT-0201
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T 145 N
R 88 W
R 87 W
T 145 N
T 144 N
R 89 W
R 88 W
COUNTY ROAD 15
COUNTY ROAD 26
COUNTY ROAD 26A
COUNTY ROAD 17
COUNTY ROAD 21
STATE HIGHWAY 200
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E: 1,680,000
MP01-P05A
MP01-P06A
MP83-P05
MP81-P22
MP01-P07A
MP81-P24
MP01-P08A
MP01-P09A
MP83-P03
MP82-P16
MP01-P11A
MP01-P10A
MP82-P28
MP84-7P1
MP84-6P1
MP82-P25
MP83-P14
MP01-P12A
MP82-P18
1875
1880
1885
1890
1895
1900
1905
1910
1915
1920
1925
LEGEND
PERMIT BOUNDARY
NACT-0201 PERMIT IDENTIFICATION
SECTION LINE-SURVEYED LOCATION
QUARTER LINE-SURVEYED LOCATION
SECTION LINE-ASSUMED LOCATION
QUARTER LINE-ASSUMED LOCATION
SPAER/STANTON COAL SUB-CROPLINE
PAVED ROADS
IMPROVED GRAVEL ROADS
UNIMPROVED TRAILS
SURFACE WATER DRAINAGE
POTENTIOMETRIC CONTOURS OF SPAER/INSERT LIGNITE
MP83-P03 EXISTING SPAER/INSERT LIGNITE MONITORING WELL
0 1000' 2000' 4000'
Scale 1" = 1000'
G.N.
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COTEAU
THE COTEAU PROPERTIES COMPANY
FREEDOM MINE
BEULAH, ND 58523
SPAER/INSERT LIGNITE
POTENTIOMETRIC MAP
SECTION 2.3.3.4
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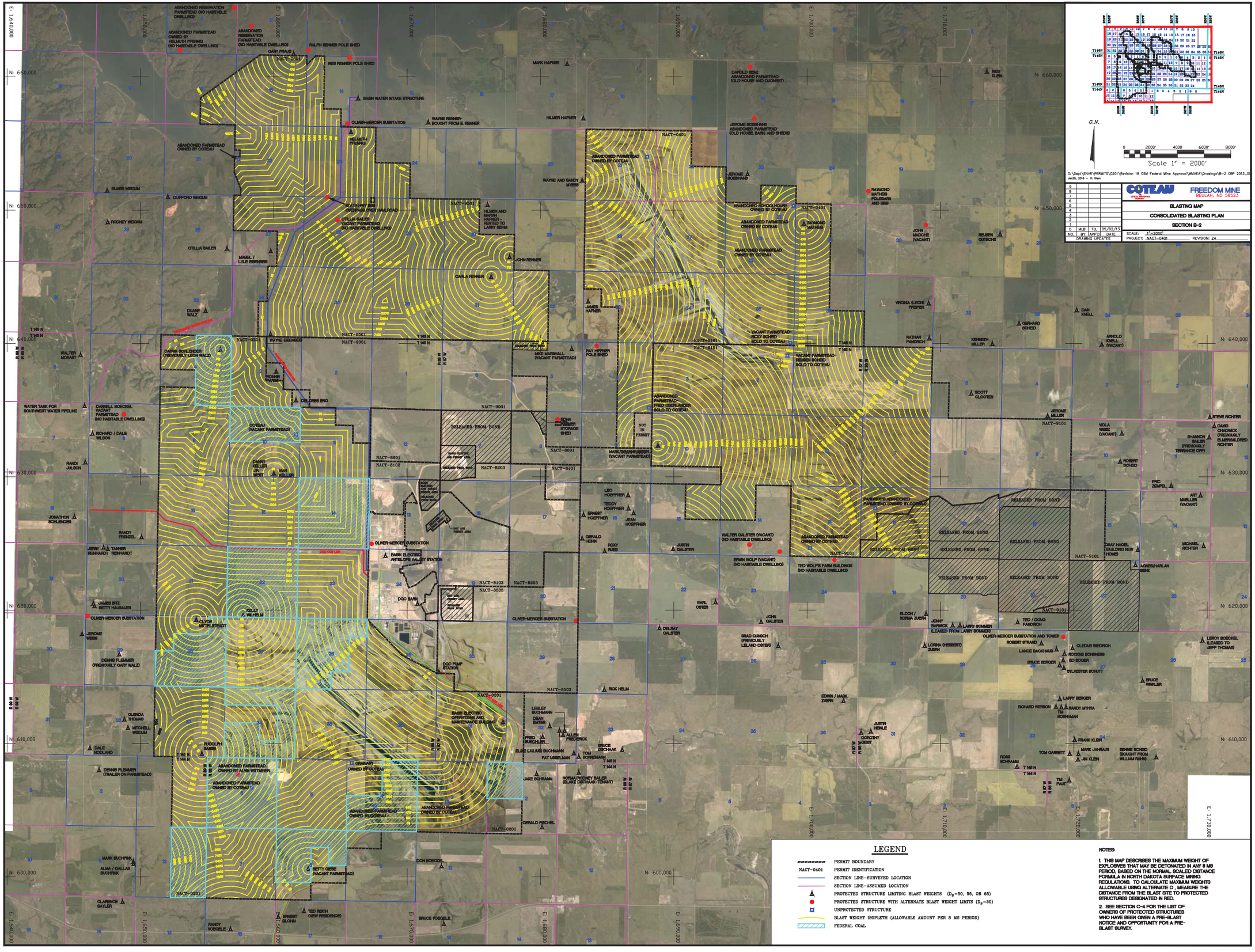
NO. BY APP'D DATE
REVISIONS
SCALE: 1"=1000' (paper size 36" x 49")
PROJECT: NACT-0201 REVISION: 18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COTEAU
FREEDOM MINE
BEULAH, ND 58523
BLASTING MAP
CONSOLIDATED BLASTING PLAN
SECTION B-2
SCALE: 1"=2000'
PROJECT: NACT-0401
REVISION: 24
NO. BY APP'D DATE
0 MLB T.A. 05/02/13
DRAWING UPDATES
LEGEND
PERMIT BOUNDARY
NACT-0401 PERMIT IDENTIFICATION
SECTION LINE-SURVEYED LOCATION
SECTION LINE-ASSUMED LOCATION
PROTECTED STRUCTURE LIMITING BLAST WEIGHTS (D_s=50, 55, OR 65)
PROTECTED STRUCTURE WITH ALTERNATE BLAST WEIGHT LIMITS (D_s=20)
UNPROTECTED STRUCTURE
BLAST WEIGHT ISOPLETH (ALLOWABLE AMOUNT PER 8 MS PERIOD)
FEDERAL COAL
NOTES:
1. THIS MAP DESCRIBES THE MAXIMUM WEIGHT OF EXPLOSIVES THAT MAY BE DETONATED IN ANY 8 MS PERIOD, BASED ON THE NORMAL SCALED DISTANCE FORMULA IN NORTH DAKOTA SURFACE MINING REGULATIONS. TO CALCULATE MAXIMUM WEIGHTS ALLOWABLE USING ALTERNATE D, MEASURE THE DISTANCE FROM THE BLAST SITE TO PROTECTED STRUCTURES DESIGNATED IN RED.
2. SEE SECTION C-4 FOR THE LIST OF OWNERS OF PROTECTED STRUCTURES WHO HAVE BEEN GIVEN A PRE-BLAST NOTICE AND OPPORTUNITY FOR A PRE-BLAST SURVEY.

Appendix D

Water Data

1. *Pre-mining surface water quality table (2 pages)*
2. *Pre-mining stockpond water quality table (5 pages)*
3. *Post-mining stockpond water quality table (2 pages)*
4. *Pre-mining wetland water quality table (3 pages)*
5. *Fen wetland water quality table*
6. *Post-mining wetland water quality table (2 pages)*
7. *Twin Buttes Lignite hydrographs (2 pages)*
8. *Schoolhouse Lignite hydrographs (7 pages)*
9. *Beulah/Lower Beulah Lignite hydrographs (21 pages)*
10. *Spaer Lignite hydrographs (12 pages)*

TABLE 2
PRE-MINING SURFACE WATER QUALITY
SURFACE WATER FEATURES AND WATER QUALITY DATA
PERMIT NACT-0201

								Cations					Anions			
Surface Water Monitoring Site	**Date**	**Field pH SU**	**EC umhos/cm**	**TDS mg/l**	**TSS mg/l**	**Hardness mg/l**	**SAR**	**Ca mg/l**	**Mg mg/l**	**Na mg/l**	**K mg/l**	**Total Fe mg/l**	**HCO_3 mg/l**	**SO_4 mg/l**	**Cl mg/l**	**Q cfs**
27	02/29/00	7.3	361	251	12	155.0	0.24	30.0	19.5	6.8	19.0	0.42	74	124.0	7.4	20.9
27	05/11/00	7.9	950	681	1	545.0	0.38	102.0	70.5	20.4	4.6	0.30	403	242.0	*0.5*	2.5
27	11/01/00	7.9	1220	756	3	611.0	0.36	106.0	84.0	20.4	12.2	0.25	463	253.0	3.1	1.0
27	03/12/01	6.8	182	106	15	72.3	0.14	13.8	9.2	2.7	9	1.66	54	38	1.3	Light
27	06/13/01	7.8	1130	816	1	697	0.42	130	90.5	25.6	4.7	0.32	469	278	5.3	0.9
27	06/18/01	7.9	981	655	8	540	0.49	91.9	75.4	26.4	6	0.2	283	280	5.3	3.8
27	03/27/02	7.2	165	82	18	73.3	0.10	15.5	8.4	2	11.2	0.61	57	10.8	*0.5*	6.2
28	02/29/00	7.4	385	273	11	169.0	0.36	36.0	19.3	10.8	15.9	0.45	106	122.0	5.2	1.8
28	05/11/00	7.9	1250	906	3	585.0	1.57	124.0	66.9	87.4	6.0	0.26	364	400.0	3.4	1.1
28	03/12/01	7.3	363	218	18	156	0.47	32.9	17.9	13.4	9.7	1.62	96	85.4	1.6	Light
28	06/13/01	8.1	1420	1040	4	617	1.77	131	70.3	101	7.4	0.13	365	509	5.6	1.7
28	06/18/01	7.3	1030	782	1	519	0.97	104	62.9	51	6.9	0.24	273	388	5.3	6.2
28	03/27/02	7.2	409	262	68	149	0.76	31.7	16.9	21.4	12.9	1.29	88	124	2.8	110.5
2	06/15/77	6.8	205	104	273	66	0.20	15.0	6.9	3.1	11.0	0.22	72	17.0	2.0	2.3
2	03/23/78	7.2	98	55	74	27	0.10	5.9	2.9	0.6	9.5	0.14	42	7.5	1.9	18
2	04/20/79	7.3	285	160	36	120	0.20	24.0	15.0	5.1	8.4	0.11	-	50.0	4.7	1.5
2	03/18/80	7.0	150	103	36	52	0.20	12.0	5.3	3.1	15.0	0.13	-	21.0	17.0	6.6
2	02/18/81	7.9	150	100	76	67	0.20	17.0	5.9	3.1	13.0	0.40	-	5.1	16.0	5.5
3	06/15/77	7.5	890	595	230	330	1.60	66.0	40.0	66.0	6.1	0.05	150	330.0	3.0	1.7
3	03/22/78	7.1	240	146	26	84	0.50	19.0	8.9	11.0	8.7	0.11	74	53.0	2.3	6.5
3	04/20/79	7.4	565	354	28	210	0.90	46.0	24.0	29.0	7.4	0.07	-	160.0	4.2	5
3	03/19/80	7.7	170	114	42	64	0.30	14.0	7.0	5.5	13.0	0.28	-	35.0	5.0	8.6
3	02/19/81	8.1	190	129	39	77	0.30	18.0	7.7	5.8	11.0	0.38	-	31.0	4.2	2.9
3	03/30/82	7.9	95	48	-	32	0.20	7.9	2.9	2.6	5.2	0.09	-	6.0	1.0	63
3	03/02/83	7.6	710	451	-	268	0.80	58.0	30.0	31.0	-	0.40	-	160.0	-	0.74
3	06/06/84	7.4	1200	861	-	470	2.00	100.0	53.0	97.0	-	-	-	400.0	-	0.13
3	03/19/85	7.8	610	398	-	260	0.90	59.0	27.0	34.0	-	-	199	170.0	-	0.22
3	03/01/86	7.2	185	110	-	66	0.40	15.0	7.0	7.0	9.1	0.18	-	28.0	1.1	52

TABLE 2
PRE-MINING SURFACE WATER QUALITY
SURFACE WATER FEATURES AND WATER QUALITY DATA
PERMIT NACT-0201

Surface Water Monitoring Site	Date	Field pH SU	EC umhos/cm	TDS mg/l	TSS mg/l	Hardness mg/l	SAR	Cations					Anions			Q cfs
								Ca mg/l	Mg mg/l	Na mg/l	K mg/l	Total Fe mg/l	HCO_3 mg/l	SO_4 mg/l	Cl mg/l	
	Average		557	377	44	253	0.60	50.9	30.5	24.8	9.7	0.4	202	154.6	4.4	
	Median	7.4	374	257	18	156	0.39	32.3	18.6	12.2	9.1	0.3	128	123.0	3.4	
	Std. Dev.		430	313	70	221	0.54	42.3	28.5	29.4	3.7	0.4	153	148.0	4.1	
	Min.	6.8	95	48	1	27	0.10	5.9	2.9	0.6	4.6	0.1	42	5.1	0.5	
	Max.	8.1	1420	1040	273	697	2.00	131.0	90.5	101.0	19.0	1.7	469	509.0	17.0	

Note: Italicized data are assumed values for data reported at a less than detectable limit. Example: Data reported at < 1.0 mg/l is listed as 0.5 mg/l.
Monitoring Site 2 is USGS monitoring site 06340524 abandoned in 1982.
Monitoring Site 3 is USGS monitoring site 06340528 abandoned in 1986.

TABLE 3
PRE-MINING STOCKPOND WATER QUALITY
SURFACE WATER FEATURES AND WATER QUALITY DATA
PERMIT NACT-0201

								Cations					Anions		
Stockpond	Date	Field pH SU	EC umhos/cm	TDS mg/l	TSS mg/l	Hardness mg/l	SAR	Ca mg/l	Mg mg/l	Na mg/l	K mg/l	Total Fe mg/l	HCO_3 mg/l	SO_4 mg/l	Cl mg/l
SP3-1-145-88	07/07/00	8.9	2310	1570	65	249	11.90	30.6	42.0	432.0	10.8	3.30	423	740.0	5.0
SP3-1-145-88	06/04/01	8.8	3590	3030	48	409	18.60	43.3	73.0	864.0	11.8	2.02	930	1400.0	5.5
SP3-1-145-88	08/27/01	8.8	3590	3010	169	413	20.60	36.3	78.2	964.0	75.4	7.60	1066	1040.0	16.2
SP4-1-145-88	07/07/00	8.3	1830	1280	8	553	4.26	86.1	82.1	230.0	14.1	0.26	554	534.0	2.0
SP4-1-145-88	06/04/01	8.3	1690	1360	5	563	4.44	93.4	80.1	242.0	10.7	0.24	631	551.0	5.3
SP4-1-145-88	08/27/01	7.5	1820	1370	5	599	4.55	96.6	86.8	256.0	14.5	0.19	606	556.0	*0.5*
SP4-2-145-88	07/14/00	9.7	1720	1190	4	185	11.40	21.5	32.0	358.0	5.7	0.23	382	390.0	3.0
SP4-2-145-88	06/04/01	9.5	2830	2350	5	254	19.70	19.6	49.8	723.0	7.6	0.24	798	880.0	5.6
SP4-2-145-88	08/27/01	8.5	2290	1650	6	199	17.00	19.2	36.6	552.0	7.1	0.27	635	535.0	4.3
SP9-1-145-88	07/07/00	9.5	272	152	6	136	0.08	31.4	14.0	2.1	10.2	0.38	70	7.6	*0.5*
SP9-1-145-88	06/25/01	7.6	360	218	4	203	0.07	52.4	17.6	2.4	7.9	0.38	200	13.3	4.9
SP9-2-145-88	07/07/00	8.8	343	178	4	177	0.09	31.7	23.7	2.8	7.7	0.22	183	1.1	1.0
SP9-2-145-88	06/25/01	9.3	219	133	*0.5*	132	0.09	22.9	18.2	2.4	1.0	*0.05*	45	17.8	5.0
SP9-2-145-88	08/27/01	N/A	240	149	2	148	0.09	22.0	22.6	2.4	1.2	0.16	103	23.0	*0.5*
SP9-3-145-88	07/07/00	10.4	242	131	7	104	0.24	20.9	12.7	5.6	9.4	0.12	*0.5*	36.4	*0.5*
SP9-3-145-88	06/25/01	8.1	235	166	16	115	0.19	29.0	10.4	4.6	7.0	1.35	84	59.7	4.7
SP9-3-145-88	08/27/01	9.0	207	137	18	105	0.25	23.9	11.0	6.0	10.4	0.71	67	32.8	*0.5*
SP9-4-145-88	08/24/00	8.1	440	328	208	218	0.07	59.3	17.1	2.3	28.6	6.30	226	77.7	7.6
SP9-4-145-88	06/25/01	7.8	165	142	34	93.1	0.03	28.7	5.2	0.6	9.4	1.64	97	35.5	4.7
SP10-1-145-88	07/07/00	7.6	514	369	176	191	0.19	55.9	12.6	6.2	51.5	19.40	220	102.0	9.0
SP14-1-145-88	07/10/00	8.9	3240	2580	32	335	18.00	50.5	50.7	758.0	16.9	1.65	553	1350.0	9.0
SP14-1-145-88	06/25/01	8.8	2610	2170	16	433	11.20	59.7	69.0	538.0	14.3	0.59	331	1210.0	5.1
SP14-1-145-88	08/28/01	9.5	5280	4570	24	390	31.50	24.9	79.7	1430.0	22.2	0.46	331	2590.0	13.2

TABLE 3
PRE-MINING STOCKPOND WATER QUALITY
SURFACE WATER FEATURES AND WATER QUALITY DATA
PERMIT NACT-0201

								Cations					Anions		
Stockpond	Date	Field pH SU	EC umhos/cm	TDS mg/l	TSS mg/l	Hardness mg/l	SAR	Ca mg/l	Mg mg/l	Na mg/l	K mg/l	Total Fe mg/l	HCO_3 mg/l	SO_4 mg/l	Cl mg/l
SP14-2-145-88	07/10/00	8.0	230	198	90	113	0.29	32.7	7.6	7.2	26.8	6.10	143	28.4	10.0
SP14-2-145-88	06/25/01	8.9	187	139	25	88.3	0.10	27.6	4.7	2.2	16.6	2.28	108	18.5	4.7
SP14-2-145-88	08/28/01	8.0	369	227	277	125	0.45	36.4	8.4	11.5	51.8	9.40	155	*0.5*	25.5
SP14-3-145-88	07/20/00	10.3	662	482	*0.5*	194	2.52	39.3	23.2	80.7	12.5	0.24	31	256.0	3.5
SP14-3-145-88	06/25/01	10.1	486	354	14	125	2.36	25.3	15.0	60.5	7.2	0.39	9	178.0	4.7
SP14-3-145-88	08/28/01	8.5	599	411	21	162	2.81	34.3	18.6	82.4	14.7	0.65	193	143.0	2.4
SP14-4-145-88	08/02/00	9.2	996	616	7	--	--	39.6	69.2	90.9	11.5	0.12	288	215.0	4.2
SP14-4-145-88	06/26/01	8.1	1240	928	9	--	--	101.0	77.9	110.0	6.3	0.46	386	397.0	4.7
SP16-1-145-88	07/10/00	9.1	356	196	62	158	0.14	36.2	16.4	4.0	13.8	1.18	122	50.1	2.0
SP16-1-145-88	06/25/01	7.6	250	152	9	130	0.14	31.9	12.2	3.6	8.7	0.42	115	21.7	4.8
SP16-1-145-88	08/27/01	7.8	324	209	41	186	0.18	43.0	19.0	5.5	13.7	1.95	174	22.0	1.5
SP21-1-145-88	07/20/00	9.1	260	171	38	141	0.11	37.5	11.5	3.0	17.9	1.62	147	8.4	4.6
SP21-1-145-88	06/27/01	8.6	196	130	4	94.3	0.08	25.4	7.5	1.7	11.8	0.33	100	16.6	6.8
SP21-1-145-88	08/27/01	7.7	340	203	44	167	0.11	46.1	12.7	3.3	24.7	1.81	159	18.3	2.6
SP22-1-145-88	07/10/00	10.1	1750	1320	10	561	3.43	85.9	84.2	187.0	4.9	0.17	35	860.0	3.0
SP22-1-145-88	06/27/01	9.7	1400	1060	6	481	3.23	78.0	69.5	163.0	2.1	0.15	35	675.0	6.3
SP22-1-145-88	08/28/01	8.8	650	474	3	243	1.84	48.7	29.5	65.9	9.8	0.27	150	215.0	1.3
SP22-2-145-88	07/26/00	9.5	302	216	130	103	0.18	27.9	8.0	4.3	33.8	6.90	152	40.5	9.9
SP22-2-145-88	06/26/01	8.8	188	141	97	71.9	0.13	20.4	5.1	2.5	19.5	5.00	92	32.1	6.1
SP22-2-145-88	08/28/01	7.6	235	177	89	113	0.12	32.2	7.9	2.9	26.3	4.62	124	29.9	3.1
SP23-1-145-88	07/11/00	10.3	1210	873	3	382	3.12	61.2	55.6	140.0	13.0	0.19	*0.5*	562.0	3.0
SP23-1-145-88	06/26/01	9.1	872	630	16	276	2.41	49.7	37.0	92.0	8.0	0.71	59	379.0	4.7
SP23-1-145-88	08/28/01	8.0	840	619	72	297	2.33	59.4	36.2	92.2	12.8	2.76	165	318.0	1.4
SP23-2-145-88	07/11/00	9.0	2020	1480	17	683	4.36	95.3	108.0	262.0	8.5	0.68	218	850.0	6.0
SP23-2-145-88	06/26/01	8.5	1490	1220	*0.5*	543	3.32	94.7	74.5	178.0	6.0	0.20	243	685.0	4.8
SP23-2-145-88	08/28/01	7.7	932	679	51	334	2.48	59.5	45.0	104.0	14.6	2.09	312	266.0	2.8

TABLE 3
PRE-MINING STOCKPOND WATER QUALITY
SURFACE WATER FEATURES AND WATER QUALITY DATA
PERMIT NACT-0201

								Cations					Anions		
Stockpond	Date	Field pH SU	EC umhos/cm	TDS mg/l	TSS mg/l	Hardness mg/l	SAR	Ca mg/l	Mg mg/l	Na mg/l	K mg/l	Total Fe mg/l	HCO_3 mg/l	SO_4 mg/l	Cl mg/l
SP23-3-145-88	07/11/00	8.3	2490	1940	5	799	5.49	109.0	128.0	357.0	8.5	0.22	478	1040.0	12.0
SP23-3-145-88	06/27/01	7.7	3050	2450	11	974	6.25	108.0	171.0	448.0	3.2	0.71	508	1410.0	6.1
SP26-1-145-88	07/11/00	8.6	1000	731	9	352	2.64	73.3	41.1	114.0	5.1	0.57	172	392.0	2.0
SP26-1-145-88	06/28/01	7.6	1010	693	6	328	2.48	77.0	32.9	103.0	3.4	0.36	221	338.0	6.5
SP26-1-145-88	08/28/01	7.6	1100	828	12	415	2.99	91.0	45.5	140.0	3.6	9.20	271	385.0	*0.5*
SP26-2-145-88	06/28/01	7.6	412	444	455	208	0.30	53.5	18.0	10.0	37.3	32.30	184	205.0	9.8
SP26-2-145-88	08/28/01	8.1	436	322	221	217	0.41	56.2	18.5	13.9	34.9	10.50	306	*0.5*	15.1
SP27-1-145-88	07/11/00	9.9	1040	767	2	471	1.71	41.4	89.2	85.4	4.1	0.11	67	412.0	3.0
SP27-1-145-88	07/06/01	8.5	1330	972	4	577	1.87	69.8	97.8	103.0	3.7	0.19	259	516.0	6.1
SP27-1-145-88	08/28/01	8.3	1220	1000	4	617	2.07	69.1	108.0	118.0	10.4	0.23	421	441.0	3.1
SP27-2-145-88	07/13/00	8.2	1180	904	16	629	1.21	132.0	72.6	69.8	7.3	0.24	458	344.0	4.0
SP27-2-145-88	06/27/01	8.3	978	679	7	501	0.78	94.8	64.1	40.1	6.9	0.82	303	285.0	6.2
SP27-2-145-88	08/27/01	8.1	1010	703	5	472	1.47	88.3	61.1	73.5	6.2	0.32	365	253.0	2.3
SP33-1-145-88	08/07/00	8.9	602	324	30	245	0.53	61.0	22.5	19.1	32.8	1.51	228	39.2	12.2
SP33-1-145-88	07/05/01	7.4	426	261	59	183	0.29	48.3	15.1	8.9	30.6	7.70	187	40.0	6.1
SP33-2-145-88	08/07/00	8.9	294	167	68	89	0.30	22.6	7.8	6.4	31.5	2.83	83	37.4	11.5
SP33-2-145-88	07/05/01	7.3	437	264	76	193	0.45	46.6	18.5	14.4	20.5	2.79	257	3.0	6.4
SP33-2-145-88	08/29/01	7.6	417	282	155	194	0.23	48.1	17.9	7.5	29.3	8.80	218	46.1	2.5
SP34-1-145-88	07/12/00	7.4	237	561	865	234	0.22	41.5	31.6	7.6	38.5	149.00	72	330.0	69.0
SP34-1-145-88	07/05/01	7.4	147	151	25	66.3	0.07	16.5	6.1	1.3	15.0	14.20	74	61.5	6.1
SP34-1-145-88	08/29/01	8.1	135	108	55	62.6	0.06	14.7	6.3	1.1	12.9	5.10	68	30.4	1.8
SP34-2-145-88	07/11/00	10.7	785	543	6	295	1.81	38.7	48.2	71.5	3.1	0.25	*0.5*	298.0	6.0
SP34-2-145-88	07/06/01	9.1	701	459	13	254	1.53	36.3	39.7	56.1	4.9	0.59	83	227.0	6.1
SP34-2-145-88	08/28/01	8.2	455	288	57	233	0.55	50.6	25.9	19.3	9.7	0.68	241	36.7	1.6
SP34-3-145-88	07/12/00	10.2	194	122	10	103	0.36	26.5	9.0	8.5	1.0	0.62	27	24.0	*0.5*
SP34-3-145-88	07/05/01	9.0	197	139	2	108	0.29	31.0	7.4	7.0	0.7	0.87	86	34.3	7.1
SP34-3-145-88	08/29/01	7.6	254	150	22	127	0.27	37.8	8.0	7.1	3.5	1.98	113	25.7	*0.5*

TABLE 3
PRE-MINING STOCKPOND WATER QUALITY
SURFACE WATER FEATURES AND WATER QUALITY DATA
PERMIT NACT-0201

								Cations					Anions		
Stockpond	Date	Field pH SU	EC umhos/cm	TDS mg/l	TSS mg/l	Hardness mg/l	SAR	Ca mg/l	Mg mg/l	Na mg/l	K mg/l	Total Fe mg/l	HCO_3 mg/l	SO_4 mg/l	Cl mg/l
SP35-1-145-88	08/02/00	9.9	833	562	3	255	2.67	19.8	49.8	97.9	8.5	0.20	145	215.0	1.5
SP35-1-145-88	07/06/01	9.6	818	563	10	262	2.60	21.7	50.5	96.6	2.7	0.21	60	252.0	6.6
SP35-1-145-88	08/28/01	10.1	849	590	14	268	3.00	20.7	52.5	113.0	4.5	0.48	68	245.0	*0.5*
SP36-1-145-88	07/11/00	10.3	329	208	5	116	1.54	23.2	14.1	38.1	5.8	0.39	11	32.0	1.0
SP36-1-145-88	06/28/01	9.1	207	142	8	76.5	0.72	18.1	7.6	14.4	5.9	1.38	85	33.5	6.8
SP36-1-145-88	08/28/01	9.0	310	209	103	135	0.80	28.7	15.4	21.5	18.2	4.56	151	21.7	2.6
SP36-2-145-88	07/11/00	8.5	725	418	190	165	2.34	38.1	17.0	69.2	16.9	10.60	265	100.0	18.0
SP36-2-145-88	06/28/01	7.4	385	220	124	123	1.18	29.0	12.3	30.1	17.2	11.90	150	35.0	6.6
SP36-2-145-88	08/28/01	7.8	846	550	44	271	2.35	64.1	27.0	89.0	30.9	3.29	387	85.9	20.6
SP36-3-145-88	07/11/00	8.4	502	313	5	238	0.98	46.9	29.3	34.9	5.3	1.46	311	8.9	1.0
SP36-3-145-88	06/28/01	7.2	432	263	91	181	0.74	39.4	20.1	22.8	9.3	5.10	238	22.0	6.5
SP36-3-145-88	08/28/01	7.7	619	442	295	253	1.62	47.4	32.6	59.0	32.1	18.00	367	43.1	7.1
SP30-1-145-87	08/02/00	10.3	1520	1010	7	305	6.03	22.3	60.6	242.0	6.7	*0.05*	81	550.0	1.6
SP30-1-145-87	06/28/01	9.2	1240	854	*0.5*	271	4.62	30.3	47.5	175.0	3.5	*0.05*	122	463.0	7.1
SP30-1-145-87	08/29/01	9.0	1720	1250	13	322	7.22	28.3	61.1	298.0	9.8	0.46	138	710.0	2.1
SP31-1-145-87	08/02/00	9.7	1990	1290	174	233	10.50	26.4	40.6	369.0	13.9	4.74	270	615.0	4.0
SP31-1-145-87	06/28/01	9.9	1600	1100	7	227	8.06	24.9	40.0	279.0	6.0	0.35	77	600.0	6.8
SP31-1-145-87	08/29/01	8.8	2120	1550	35	315	9.63	37.7	53.7	393.0	11.6	0.39	282	855.0	2.2
SP32-1-145-87	08/02/00	9.1	1250	852	49	362	3.54	79.8	39.6	155.0	9.0	1.25	296	365.0	12.3
SP32-1-145-87	06/28/01	7.8	1030	715	*0.5*	334	2.88	72.4	37.3	121.0	4.3	0.22	311	287.0	6.4
SP32-1-145-87	08/29/01	8.2	1090	743	1	176	6.14	34.2	21.9	187.0	7.4	0.10	149	403.0	*0.5*
SP2-1-144-88	07/12/00	9.4	307	202	34	151	0.30	36.8	14.3	8.6	19.3	2.14	152	27.0	5.0
SP2-1-144-88	06/28/01	7.0	123	99	3	48.7	0.22	12.4	4.3	3.6	12.6	1.09	63	21.6	6.7
SP2-1-144-88	08/29/01	7.6	444	293	313	220	0.24	52.5	21.6	8.2	28.8	17.50	213	45.0	9.2
SP3-1-144-88	07/12/00	8.0	360	301	162	140	0.58	35.6	12.4	15.9	25.0	15.90	153	110.0	10.0
SP3-1-144-88	06/28/01	7.5	169	117	*0.5*	54.9	0.48	14.4	4.6	8.1	12.0	1.28	63	34.0	6.4
SP3-1-144-88	08/29/01	7.8	292	202	91	113	0.65	29.4	9.5	15.8	20.2	5.10	113	56.3	2.8

TABLE 3
PRE-MINING STOCKPOND WATER QUALITY
SURFACE WATER FEATURES AND WATER QUALITY DATA
PERMIT NACT-0201

								Cations					Anions		
Stockpond	Date	Field pH SU	EC umhos/cm	TDS mg/l	TSS mg/l	Hardness mg/l	SAR	Ca mg/l	Mg mg/l	Na mg/l	K mg/l	Total Fe mg/l	HCO_3 mg/l	SO_4 mg/l	Cl mg/l
SP4-1-144-88	07/12/00	8.4	2840	2500	6	907	6.11	162.0	122.0	423.0	11.5	0.22	486	1480.0	13.0
SP4-1-144-88	07/05/01	8.0	2830	2420	14	983	5.94	181.0	129.0	428.0	8.5	0.17	452	1400.0	7.2
SP4-1-144-88	08/29/01	8.1	2920	2310	26	933	6.06	174.0	121.0	425.0	10.4	0.38	420	1320.0	9.3
SP5-1-144-88	07/12/00	8.5	1980	1970	11	1100	2.12	162.0	169.0	162.0	3.1	0.46	*0.5*	1410.0	5.0
SP5-1-144-88	07/05/01	8.8	1810	1520	7	917	2.14	133.0	142.0	149.0	2.0	0.14	75	1030.0	6.1
SP5-1-144-88	08/29/01	8.8	1920	1500	6	887	2.19	126.0	139.0	150.0	3.5	0.17	90	1010.0	3.4
SP5-2-144-88	07/12/00	8.2	1940	1650	18	1120	1.59	224.0	136.0	122.0	6.3	1.36	427	910.0	*0.5*
SP5-2-144-88	07/05/01	7.4	2000	1680	13	1080	1.63	209.0	135.0	123.0	0.6	0.21	392	970.0	7.2
SP6-1-144-88	08/02/00	8.6	2480	2010	25	1080	3.56	142.0	177.0	269.0	10.9	0.80	202	1280.0	8.8
SP6-1-144-88	07/05/01	8.7	2560	2260	6	1260	2.90	185.0	194.0	237.0	3.1	0.11	160	1520.0	6.1
SP6-1-144-88	08/29/01	7.8	2430	2010	28	1100	2.99	157.0	172.0	228.0	11.5	0.97	253	1280.0	6.8
SP1-2-144-89	07/12/00	10.2	2420	2120	8	1420	2.03	133.0	265.0	176.0	1.7	0.35	8	1480.0	6.0
SP1-2-144-89	07/05/01	8.8	1940	1660	4	1080	1.55	131.0	184.0	117.0	1.6	0.11	113	1110.0	6.1
SP1-2-144-89	08/29/01	7.9	2460	2080	20	1400	1.77	179.0	231.0	152.0	5.0	0.56	293	1330.0	5.7
	Average		1116	859	*53*	364	3.23	60.2	52.3	146.9	13.2	*3.98*	*223*	*423.0*	*6.1*
	Median	8.5	833	562	*14*	243	1.71	41.5	32.9	80.7	9.8	*0.65*	*165*	*252.0*	*5.0*
	Std. Dev.		978	827	*106*	323	5.03	46.4	53.1	220.2	11.9	*14.38*	*189*	*495.3*	*7.2*
	Min.	7.0	123	99	*< 1.0*	49	0.03	12.4	4.3	0.6	0.6	*< 0.1*	*< 1.0*	*< 1.0*	*< 1.0*
	Max.	10.7	5280	4570	*865*	1420	31.50	224.0	265.0	1430.0	75.4	*149.00*	*1066*	*2590.0*	*69.0*

NOTE: Italicized data are assumed values for data reported at a less than detectable limit. Example: Data reported at < 1.0 mg/l is listed as *0.5* mg/l.

TABLE 4
POST-MINING STOCKPOND WATER QUALITY
SURFACE WATER FEATURES AND WATER QUALITY DATA
PERMIT NACT-0201

								Cations					Anions		
Stockpond	Date	Field pH SU	EC umhos/cm	TDS mg/l	TSS mg/l	Hardness mg/l	SAR	Ca mg/l	Mg mg/l	Na mg/l	K mg/l	Total Fe mg/l	HCO_3 mg/l	SO_4 mg/l	Cl mg/l
SP-B18-01	05/31/94	8.6	368	191	5	158	0.42	35.1	17.1	12.2	8.1	0.38	132	27.0	5.9
SP-B18-01	04/11/95	8.0	342	196	3	146	0.35	38.6	12.1	9.8	7.8	0.34	132	43.0	5.4
SP-B18-01	09/08/95	8.7	407	228	9	184	0.45	39.4	20.9	14.1	9.9	0.20	167	36.0	4.7
SP-B18-01	06/10/96	8.5	426	208	12	166	0.42	37.3	17.6	12.5	8.4	0.21	136	37.9	3.2
SP-B18-01	09/18/96	8.4	307	215	8	160	0.61	31.6	19.7	17.8	9.1	0.15	144	42.6	4.8
SP-B18-01	06/19/97	7.9	297	173	6	128	0.36	28.8	13.5	9.4	6.1	0.22	119	35.9	1.9
SP-B18-01	09/22/97	8.8	232	131	22	95	0.19	24.0	8.4	4.2	5.5	1.21	97	17.7	2.8
SP-B18-01	04/29/98	9.1	250	148	17	119	0.29	28.6	11.6	7.4	7.4	0.96	66	17.4	2.8
SP-B18-01	10/21/98	8.1	304	185	14	144	0.46	31.4	16.0	12.6	7.9	0.34	149	22.5	3.0
SP-B18-01	06/21/99	8.8	190	136	13	112	0.33	29.1	9.6	8.1	6.9	1.17	88	13.9	3.5
SP-B18-01	08/10/99	8.8	197	117	16	82	0.37	17.8	9.1	7.8	7.2	0.63	100	12.0	2.7
SP-B18-01	06/05/00	8.9	257	172	10	122	0.44	26.8	13.3	11.1	9.0	0.44	132	30.1	2.0
SP-B18-01	08/22/00	9.2	227	141	7	92	0.52	16.5	12.4	11.4	8.8	0.54	33	24.5	1.6
SP-B18-01	08/30/01	7.9	270	150	29	116	0.42	25.7	12.7	10.4	10.3	1.15	126	13.7	1.5
SP-B18-01	06/21/01	9.4	200	120	17	94	0.37	21.3	9.9	8.2	8.4	0.42	64	6.2	4.7
SP-G12-01	10/29/93	8.4	398	174	7	133	0.18	38.8	8.8	4.9	9.7	0.30	152	*0.5*	20.2
SP-G12-01	05/27/94	7.6	295	156	2	129	0.23	36.9	8.9	6.0	9.8	0.34	139	11.0	*0.5*
SP-G12-01	04/11/95	7.9	254	142	5	108	0.23	34.4	5.3	5.6	9.8	0.51	115	16.0	2.0
SP-G12-01	09/08/95	8.4	303	168	*0.5*	126	0.33	30.1	12.3	8.6	13.5	0.14	155	10.0	*0.5*
SP-G12-01	06/10/96	8.8	565	129	*0.5*	101	0.41	22.8	10.7	9.5	10.7	0.10	100	*0.5*	*0.5*
SP-G12-01	09/18/96	7.9	307	167	22	109	0.66	23.5	12.3	15.8	14.1	0.78	136	16.9	2.6
SP-G12-01	06/19/97	8.2	237	138	6	99	0.32	24.8	8.9	7.2	8.5	0.39	99	15.9	1.1
SP-G12-01	09/22/97	8.2	238	140	*0.5*	96	0.18	26.9	7.0	4.1	8.0	0.75	123	16.4	3.4
SP-G12-01	04/29/98	8.3	281	167	1	118	0.34	33.4	8.4	8.6	9.4	0.37	141	20.5	2.5
SP-G12-01	10/21/98	9.0	247	170	14	93	0.73	17.9	11.6	16.2	10.9	0.42	16	37.3	3.8
SP-G12-01	06/21/99	8.2	191	146	2	108	0.21	29.5	8.4	5.0	8.4	1.01	113	9.3	15.2
SP-G12-01	08/10/99	9.6	137	83	12	58	0.18	13.7	5.8	3.2	6.5	0.45	34	12.0	1.2
SP-G12-01	06/05/00	8.4	322	193	3	139	0.48	35.1	12.4	13.0	11.9	1.31	170	17.3	1.0
SP-G12-01	08/22/00	8.2	259	156	7	96	0.51	21.0	10.6	11.4	12.3	0.46	136	17.0	2.4
SP-G12-01	06/21/01	8.5	226	146	2	105	0.32	27.3	8.9	7.5	12.1	0.75	125	10.7	4.7
SP-G12-01	08/30/01	7.8	283	150	13	103	0.46	24.5	10.2	10.7	13.8	0.67	132	10.0	1.5

TABLE 4
POST-MINING STOCKPOND WATER QUALITY
SURFACE WATER FEATURES AND WATER QUALITY DATA
PERMIT NACT-0201

								Cations					Anions		
Stockpond	**Date**	**Field pH SU**	**EC umhos/cm**	**TDS mg/l**	**TSS mg/l**	**Hardness mg/l**	**SAR**	**Ca mg/l**	**Mg mg/l**	**Na mg/l**	**K mg/l**	**Total Fe mg/l**	**HCO_3 mg/l**	**SO_4 mg/l**	**Cl mg/l**
SP-G12-02	05/27/94	8.3	352	198	17	170	0.15	54.0	8.5	4.4	10.4	0.98	169	17.0	2.4
SP-G12-02	04/11/95	7.8	241	143	22	114	0.16	38.4	4.3	4.0	5.7	0.69	113	21.0	1.9
SP-G12-02	09/08/95	8.5	282	158	1	129	0.18	35.8	9.6	4.7	8.5	0.31	149	10.0	*0.5*
SP-G12-02	06/10/96	8.5	422	136	11	120	0.24	33.2	9.1	6.0	8.2	0.40	123	*0.5*	*0.5*
SP-G12-02	09/18/96	8.3	301	156	5	116	0.38	30.6	9.6	9.4	10.1	0.38	132	14.5	2.3
SP-G12-02	06/19/97	10.0	137	71	10	54	0.13	15.9	3.4	2.2	4.3	0.36	1	10.5	*0.5*
SP-G12-02	09/22/97	9.0	234	133	*0.5*	102	0.09	30.1	6.4	2.0	6.0	0.27	93	12.4	1.8
SP-G12-02	04/29/98	8.9	214	111	13	105	0.13	31.2	6.5	3.0	6.6	0.44	106	*0.5*	*0.5*
SP-G12-02	10/21/98	8.1	200	130	4	95	0.32	24.2	8.5	7.1	8.2	0.54	83	17.8	1.4
SP-G12-02	06/21/99	8.8	136	90	27	73	0.10	20.2	5.4	1.9	5.3	0.16	50	5.8	6.7
SP-G12-02	08/10/99	8.5	196	122	3	90	0.83	21.6	8.7	18.0	9.3	0.55	107	*0.5*	*0.5*
SP-G12-02	06/05/00	9.1	220	136	11	103	0.26	25.8	9.3	6.1	8.5	0.66	105	19.0	*0.5*
SP-G12-02	08/22/00	8.8	199	127	17	91	0.20	23.7	7.6	4.4	10.9	1.74	105	16.1	1.4
SP-G12-02	06/21/01	9.5	142	95.9	12	69.9	0.16	18.6	5.7	3.0	7.4	0.44	45	10.8	4.8
SP-G12-02	08/30/01	8.1	266	145	12	114	0.24	31.0	8.9	5.8	12.6	1.66	122	12.2	1.3
	Average		269	150	*10*	113	0.33	28.4	10.1	8.2	9.0	0.58	110	*16.7*	*3.1*
	Median	8.5	256	146	*10*	109	0.33	28.7	9.2	7.7	8.5	0.44	121	*16.0*	*2.2*
	Std. Dev.		85	34	*7*	28	0.17	7.8	3.8	4.2	2.3	0.39	40	*10.9*	*3.6*
	Min.	7.6	136	71	*< 1*	54	0.09	13.7	3.4	1.9	4.3	0.10	1	*< 1*	*< 1*
	Max.	10.0	565	228	*29*	184	0.83	54.0	20.9	18.0	14.1	1.74	170	*43.0*	*20.2*

NOTE: Italicized data are assumed values for data reported at a less than detectable limit. Example: Data reported at < 1.0 mg/l is listed as *0.5* mg/l.

TABLE 5
PRE-MINING WETLAND WATER QUALITY
SURFACE WATER FEATURES AND WATER QUALITY DATA
PERMIT NACT-0201

							Cations					Anions			
Wetland	Date	Field pH SU	EC umhos/cm	TDS mg/l	TSS mg/l	Se mg/l	Ca mg/l	Mg mg/l	Na mg/l	K mg/l	Total Fe mg/l	HCO_3 mg/l	CO_3 mg/l	SO_4 mg/l	Cl mg/l
POTHOLE WETLANDS															
W9-1-145-88	06/25/01	6.7	123	98.5	13	< 0.002	14.1	3.9	0.7	13.6	1.91	66	< 1	21.7	4.9
W9-3-145-88	06/25/01	6.3	166	160	81	< 0.002	20.0	6.3	1.1	23.7	2.48	84	< 1	53.9	4.8
W14-1-145-88	07/11/00	7.6	220	161	12	< 0.002	20.6	10.3	2.6	26.0	8.00	112	< 1	27.0	7.0
W14-1-145-88	06/26/01	6.9	567	392	37	< 0.002	48.1	21.3	19.7	26.0	9.20	118	< 1	200.0	6.1
W15-2-145-88	07/10/00	6.9	132	82	35	< 0.002	13.8	5.3	2.0	9.0	6.70	65	< 1	12.7	*0.5*
W15-2-145-88	06/26/01	6.2	66	77.3	26	< 0.002	5.7	3.1	1.0	7.9	3.24	29	< 1	35.6	6.6
W15-3-145-88	07/10/00	7.5	213	139	126	< 0.002	14.7	12.0	6.4	24.3	2.62	103	< 1	16.5	3.0
W15-3-145-88	06/26/01	6.4	84	81.8	119	< 0.002	6.9	3.8	1.4	10.2	2.14	43	< 1	26.8	6.9
W15-5-145-88	06/26/01	5.8	83	49.1	105	< 0.002	5.5	3.0	0.7	14.5	0.71	32	< 1	*0.5*	6.2
W21-1-145-88	06/27/01	6.6	114	112	19	< 0.002	9.3	3.8	1.3	17.4	1.24	67	< 1	33.6	6.2
W21-2-145-88	06/27/01	8.7	93	89.9	1	< 0.002	9.8	3.0	0.8	14.7	0.44	42	< 1	30.1	6.3
W21-3-145-88	06/27/01	6.4	127	108	26	< 0.002	12.3	4.7	0.9	15.2	0.58	61	< 1	32.2	6.2
W21-4-145-88	06/27/01	6.1	109	104	151	< 0.002	9.2	3.7	0.7	17.8	0.57	57	< 1	32.0	6.3
W21-5-145-88	06/27/01	6.2	102	92.8	58	< 0.002	7.6	3.4	0.8	15.4	2.49	43	< 1	33.7	6.1
W22-1-145-88	06/26/01	7.4	122	129	32	< 0.002	8.3	5.8	1.3	18.4	4.90	61	< 1	52.3	6.5
W33-2-145-88	07/05/01	6.2	84	60	85	< 0.0026	5.6	2.6	0.7	15.8	4.80	38	< 1	6.0	6.7
W1-1-144-89	07/05/01	7.6	423	365	273	< 0.0026	46.7	17.6	4.8	59.6	10.70	310	< 1	44.4	6.1
	Average		166	135	71		15.2	6.7	2.8	19.4	3.69	78		38.8	*5.7*
	Median	6.6	122	104	37		9.8	3.9	1.1	15.8	2.49	61		32.0	*6.2*
	Std. Dev.		133	97	69		13.0	5.5	4.6	11.7	3.21	65		44.0	*1.6*
	Min.	5.8	66	49	1		5.5	2.6	0.7	7.9	0.44	29		0.5	*0.5*
	Max.	8.7	567	392	273		48.1	21.3	19.7	59.6	10.70	310		200.0	*7.0*

TABLE 5
PRE-MINING WETLAND WATER QUALITY
SURFACE WATER FEATURES AND WATER QUALITY DATA
PERMIT NACT-0201

							Cations					Anions			
Wetland	Date	Field pH SU	EC umhos/cm	TDS mg/l	TSS mg/l	Se mg/l	Ca mg/l	Mg mg/l	Na mg/l	K mg/l	Total Fe mg/l	HCO_3 mg/l	CO_3 mg/l	SO_4 mg/l	Cl mg/l
DRAINAGE WETLANDS															
W4-1-145-88	07/13/00	8.6	2160	1590	276	< 0.002	67.0	78.6	394.0	14.6	10.90	655	28.0	625.0	5.0
W9-2-145-88	07/07/00	7.8	794	460	*0.5*	< 0.002	100.0	48.5	7.5	2.9	0.13	450	< 1	30.0	1.0
W9-2-145-88	06/25/01	7.6	686	410	2	< 0.002	94.1	43.0	6.9	2.1	0.15	390	< 1	25.2	4.9
W14-3-145-88	08/02/00	8.6	1050	673	41	< 0.002	48.3	69.7	92.7	12.3	2.07	351	< 1	235.0	4.2
W14-3-145-88	06/26/01	7.8	1230	947	17	< 0.002	111.0	74.8	104.0	4.5	1.73	449	< 1	379.0	4.7
W14-4-145-88	08/02/00	8.6	1320	860	7	< 0.002	106.0	78.7	96.7	6.4	0.20	585	< 1	218.0	2.9
W14-4-145-88	06/26/01	8.1	1290	966	3	< 0.002	127.0	75.1	98.6	2.4	0.34	464	< 1	380.0	4.8
W14-5-145-88	08/02/00	8.1	1900	1500	7	< 0.002	166.0	114.0	148.0	7.7	0.52	464	< 1	780.0	3.6
W14-5-145-88	06/26/01	8.3	1200	923	3	< 0.002	125.0	73.3	89.9	2.1	0.59	468	< 1	347.0	4.8
W22-3-145-88	07/10/00	8.5	2440	1850	8	< 0.002	196.0	114.0	233.0	6.0	0.33	431	< 1	1040.0	6.0
W22-3-145-88	06/27/01	8.0	1780	1310	2	< 0.002	162.0	75.6	150.0	1.1	0.12	361	< 1	695.0	6.5
W23-2-145-88	07/26/00	8.2	1910	1600	2	< 0.002	89.2	122.0	251.0	7.7	0.35	335	< 1	925.0	6.4
W23-2-145-88	06/27/01	8.2	2220	1840	5	0.003	177.0	141.0	258.0	2.8	0.11	381	< 1	1030.0	6.1
W23-3-145-88	07/24/00	8.4	1190	895	1	< 0.002	93.4	57.7	111.0	8.1	0.16	315	< 1	432.0	3.9
W23-3-145-88	06/26/01	8.1	2590	2250	4	0.002	201.0	146.0	319.0	4.1	0.21	522	< 1	1260.0	5.1
W23-4-145-88	07/24/00	8.6	1830	1560	12	< 0.002	121.0	104.0	240.0	10.1	0.38	465	< 1	800.0	8.8
W23-4-145-88	06/26/01	8.4	2120	1490	25	< 0.0026	40.2	108.0	259.0	4.8	0.56	537	41.0	725.0	6.1
W26-1-145-88	07/06/01	8.4	1360	995	8	< 0.0026	87.3	80.6	139.0	2.7	0.16	437	< 1	417.0	6.2
W26-2-145-88	08/02/00	8.2	1330	987	5	< 0.002	131.0	69.6	83.1	7.4	0.28	405	< 1	450.0	3.0
W26-2-145-88	06/28/01	7.4	1030	709	15	< 0.002	98.2	54.8	54.4	6.0	0.53	318	< 1	298.0	6.4
W26-3-145-88	08/02/00	8.0	1120	697	101	< 0.002	111.0	51.0	71.7	34.0	4.59	657	< 1	26.9	8.1
W26-3-145-88	06/28/01	7.6	787	510	6	< 0.002	69.2	37.2	50.2	14.9	0.22	372	< 1	109.0	6.3
W27-3-145-88	06/27/01	7.8	1340	1010	8	< 0.002	120.0	56.8	144.0	0.8	0.49	532	< 1	364.0	6.2

TABLE 5
PRE-MINING WETLAND WATER QUALITY
SURFACE WATER FEATURES AND WATER QUALITY DATA
PERMIT NACT-0201

							Cations					Anions			
Wetland	Date	Field pH SU	EC umhos/cm	TDS mg/l	TSS mg/l	Se mg/l	Ca mg/l	Mg mg/l	Na mg/l	K mg/l	Total Fe mg/l	HCO_3 mg/l	CO_3 mg/l	SO_4 mg/l	Cl mg/l
W28-1-145-88	07/10/00	9.9	970	685	7	< 0.002	45.5	91.8	36.9	13.8	0.28	84	155.0	347.0	7.0
W28-1-145-88	06/27/01	8.5	878	637	3	< 0.002	92.7	72.4	25.5	6.5	0.17	275	32.0	249.0	6.5
W28-1-145-88	08/30/01	9.4	827	636	89	< 0.0026	52.3	83.7	40.7	17.9	1.75	143	75.0	305.0	5.9
W28-4-145-88	06/27/01	7.8	1250	917	1	< 0.002	150.0	78.4	32.3	8.5	0.33	375	< 1	417.0	6.1
W31-1-145-87	07/12/00	8.2	1800	1450	7	< 0.002	158.0	138.0	146.0	2.2	0.22	457	< 1	730.0	3.0
W31-2-145-87	07/12/00	8.0	4750	4360	25	< 0.002	354.0	286.0	695.0	8.2	2.44	575	< 1	2650.0	18.0
W36-1-145-88	07/11/00	9.1	397	245	10	< 0.002	31.1	14.8	37.0	12.7	4.02	172	30.0	23.0	5.0
W36-1-145-88	06/28/01	7.1	297	188	10	< 0.002	24.2	11.4	20.4	8.1	6.70	150	< 1	27.2	6.5
W5-1-144-88	07/12/00	7.8	1710	1450	5	< 0.002	199.0	144.0	87.8	8.2	0.84	527	< 1	685.0	6.0
W5-1-144-88	07/05/01	7.1	1840	1430	17	< 0.0026	173.0	158.0	93.2	0.7	0.16	421	< 1	745.0	6.6
W6-2-144-88	07/05/01	8.3	2400	1990	11	< 0.0026	181.0	218.0	137.0	33.7	0.22	215	< 1	1280.0	6.6
W6-3-144-88	07/05/01	7.4	534	334	9	< 0.0026	56.8	29.4	19.8	21.6	0.53	282	< 1	31.0	6.1
W8-1-144-88	08/02/00	8.6	1770	1230	20	< 0.002	134.0	104.0	159.0	19.8	0.62	578	< 1	455.0	9.3
W8-1-144-88	07/05/01	8.3	1530	1190	5	< 0.0026	115.0	94.1	149.0	6.0	*0.05*	345	< 1	610.0	6.1
	Average		1504	1156	*21*		119.1	91.8	137.3	9.0	1.17	404		544.5	5.9
	Median	8.2	1330	987	*7*		111.0	78.6	98.6	7.4	0.34	421		417.0	6.1
	Std. Dev.		800	743	*48*		63.1	53.5	131.5	8.0	2.17	139		495.1	2.6
	Min.	7.1	297	188	*1*		24.2	11.4	6.9	0.7	0.05	84		23.0	1.0
	Max.	9.9	4750	4360	*276*		354.0	286.0	695.0	34.0	10.90	657		2650.0	18.0

NOTE: Italicized data are assumed values for data reported at a less than detectable limit. Example: Data reported at < 1.0 mg/l is listed as *0.5* mg/l.

TABLE 3
FEN WETLAND WATER QUALITY
GROUND WATER QUALITY INFORMATION
PERMIT NACT-0201

							Cations					Anions			
Fen Wetland	Date	Field pH SU	EC umhos/cm	TDS mg/l	Hardness mg/l	SAR	Ca mg/l	Mg mg/l	Na mg/l	K mg/l	Dissolved Fe mg/l	HCO_3 mg/l	SO_4 mg/l	Cl mg/l	NO_3 as N mg/l
FW4-2-145-88	07/07/00	8.2	1830	1330	564	4.41	88.4	83.4	241.0	11.0	<0.1	590	550	1.0	<0.1
FW4-2-145-88	06/04/01	8.1	2180	1770	675	6.18	75.6	118.0	369.0	13.8	0.18	854	680	5.3	<0.1
FW4-2-145-88	08/27/01	7.8	2220	1840	733	5.82	97.2	119.0	362.0	13.2	< 0.1	754	795	< 1	<0.1
FW15-6-145-88	07/10/00	8.2	1090	719	544	0.92	113.0	63.7	49.5	10.6	<0.1	490	182	6.0	<0.1
FW15-6-145-88	06/25/01	7.6	903	644	473	0.73	106.0	50.7	36.7	1.2	< 0.1	328	248	4.7	<0.1
FW15-6-145-88	08/27/01	7.1	1050	784	601	0.89	130.0	67.2	50.4	3.9	< 0.1	335	329	2.8	<0.1
FW5-2-144-88[1]	11/22/99	6.6	1680	1440	828	1.98	200.0	79.7	131.0	13.5	N/A	323	817	7.2	N/A
FW5-2-144-88	07/14/00	7.7	1130	860	589	1.13	140.0	58.2	62.9	5.6	0.15	360	375	2.0	<0.1
FW5-2-144-88	07/06/01	7.4	1160	818	525	1.15	123.0	53.0	60.4	4.1	< 0.1	318	380	6.5	<0.1
FW5-2-144-88	08/29/01	7.5	1260	897	667	1.08	164.0	62.6	64.0	5.2	< 0.1	377	374	1.4	<0.1
FW5-3-144-88[2]	11/22/99	7.8	2340	2210	1530	1.34	220.0	239.0	121.0	5.6	N/A	494	1320	8.9	N/A
FW5-3-144-88	07/12/00	7.4	1770	1420	854	1.95	210.0	80.0	131.0	10.6	0.18	284	810	4.0	0.10
FW5-3-144-88	07/05/01	6.9	1850	1570	933	2.17	228.0	88.2	152.0	31.1	0.39	393	830	6.5	0.42
FW6-1-144-88	07/12/00	8.3	958	714	459	1.26	114.0	42.3	62.2	3.5	<0.1	286	317	3.0	<0.1
FW6-1-144-88	07/06/01	7.8	1060	799	480	1.38	119.0	44.4	69.3	3.8	< 0.1	300	376	6.4	<0.1
	Average		1499	1188	697	2.2	141.9	83.3	130.8	9.1		432	559	4.7	
	Median	7.7	1260	897	601	1.3	123.0	67.2	69.3	5.6		360	380	5.0	
	Std. Dev.		503	498	272	1.8	50.1	49.0	109.3	7.4		175	309	2.4	
	Min.	6.6	903	644	459	0.7	75.6	42.3	36.7	1.2	<0.1	284	182	1.0	<0.1
	Max.	8.3	2340	2210	1530	6.2	228.0	239.0	369.0	31.1	0.39	854	1320	8.9	0.42

[1]This sample originally designated as spring sample SPG5-1-144-88

[2]This sample originally designated as spring sample SPG5-2-144-88

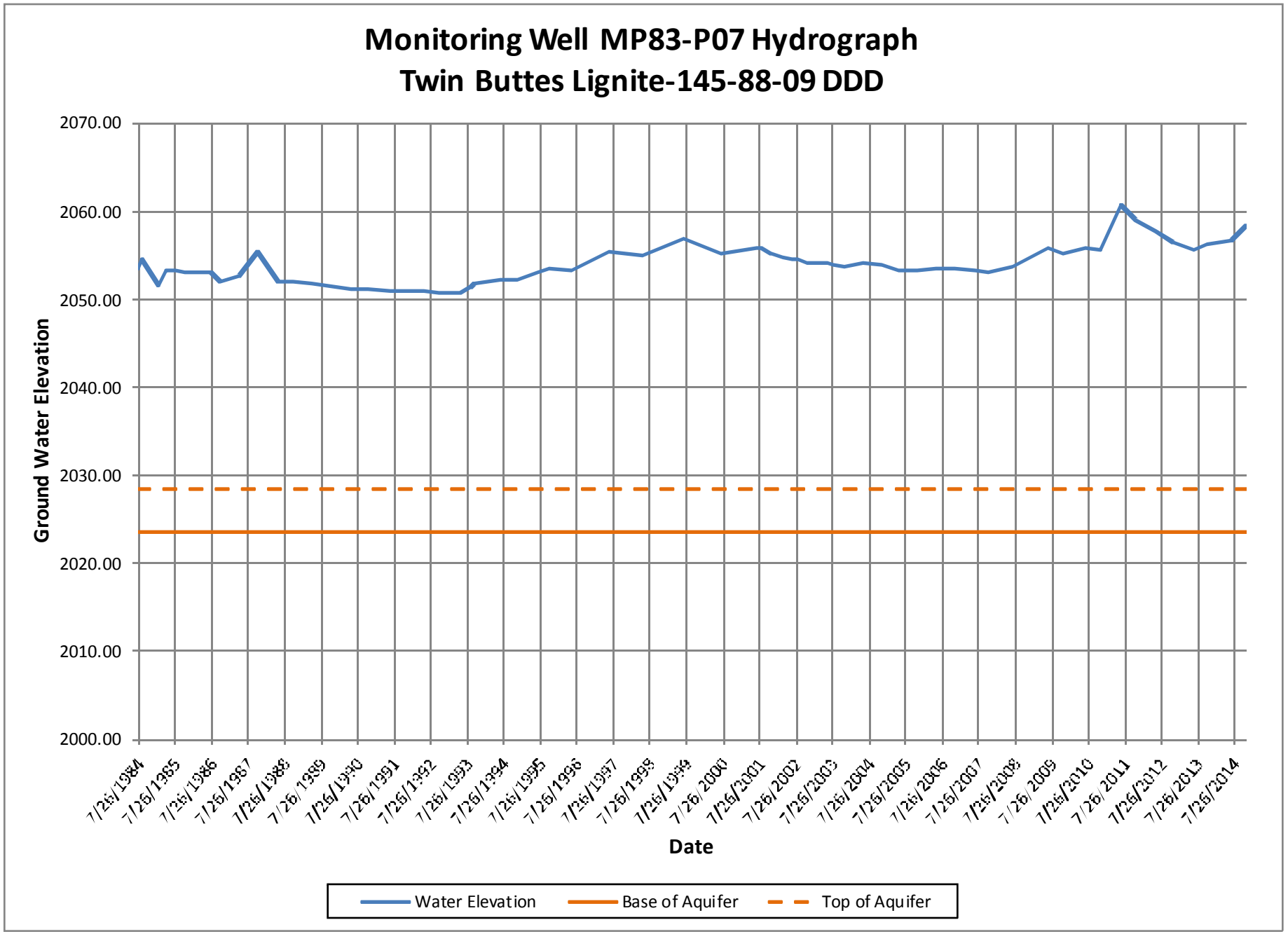
TABLE 6
POST-MINING WETLAND WATER QUALITY
SURFACE WATER FEATURES AND WATER QUALITY DATA
PERMIT NACT-0201

							Cations					Anions			
Wetland	Date	Field pH SU	EC umhos/cm	TDS mg/l	TSS mg/l	Se mg/l	Ca mg/l	Mg mg/l	Na mg/l	K mg/l	Total Fe mg/l	HCO_3 mg/l	CO_3 mg/l	SO_4 mg/l	Cl mg/l
CW-A18-01	06/19/90	N/A	690	518	110	<.002	48.6	17.3	77.0	13.3	6.30	126	0	275	11
CW-A18-01	03/30/92	8.8	750	468	4	<.002	55.0	21.7	71.0	17.1	2.28	142	16.0	191.0	17.2
CW-A18-01	05/05/93	8.4	527	282	14	<.002	51.0	19.4	23.7	19.2	0.95	274	0.0	*0.5*	4.6
CW-A18-01	08/16/93	8.2	338	224	3	<.002	41.5	16.2	10.8	11.3	0.35	204	4.0	18.0	1.9
CW-A18-01	06/10/94	7.4	359	207	8	0.0020	32.0	13.1	15.0	10.4	0.25	126	0.0	57.0	3.6
CW-A18-01	10/24/94	7.5	157	126	2	<.002	24.4	8.3	3.1	10.8	0.12	103	*0.5*	16.0	1.2
CW-A18-01	04/11/95	8.7	315	176	9	<.002	42.2	10.1	6.3	11.7	0.08	146	2.0	14.0	2.5
CW-A18-01	06/07/96	8.2	416	229	7	<.002	41.0	18.1	9.5	18.9	0.58	207	2.0	13.4	2.3
CW-A18-01	06/02/00	6.9	380	236	*0.5*	< 0.002	40.9	16.8	13.2	14.4	1.26	228	*0.5*	12.0	1.5
CW-A18-01	08/22/00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CW-A18-01	05/18/01	7.4	589	354	33	0.0035	70.1	25.6	22.7	19.7	3.18	327	*0.5*	16.9	2.3
CW-G08-01	05/07/91	8.9	1136	784	15	<.002	76.0	46.0	110.0	11.2	*0.05*	116	12.0	459.0	5.4
CW-G08-01	10/14/91	8.5	1746	1330	15	<.002	111.0	76.0	184.0	23.0	0.34	376	0.0	706.0	9.1
CW-G08-01	03/30/92	8.6	907	548	7	<.002	63.0	37.0	76.0	14.3	0.37	184	0.0	241.0	6.2
CW-G08-01	10/14/92	8.4	1600	1080	5	<.002	66.0	62.0	206.0	20.3	0.23	208	0.0	583.0	14.6
CW-G08-01	05/05/93	8.0	699	432	6	<.002	58.0	25.3	40.9	12.1	0.12	172	0.0	176.0	16.5
CW-G08-01	10/29/93	7.9	867	544	12	<.002	61.0	32.4	82.0	13.8	0.19	272	0.0	160.0	31.3
CW-G08-01	05/31/94	7.4	515	269	5	<.002	35.0	21.4	33.9	13.1	0.21	220	0.0	21.0	12.9
INFLOW	10/18/94	7.5	123	73	20	N/A	11.5	4.7	0.5	9.2	0.21	57	*0.5*	13.0	*0.5*
CW-G08-01	10/18/94	8.1	439	260	*0.5*	<.002	21.5	21.0	37.8	11.8	0.10	172	*0.5*	54.0	10.3
CW-G08-01	04/11/95	7.6	283	160	13	<.002	34.4	8.6	7.2	10.5	0.20	133	*0.5*	15.0	4.1
CW-G08-01	09/08/95	8.2	393	222	3	<.002	36.4	20.0	12.3	13.2	0.18	208	*0.5*	13.0	2.0
CW-G08-01	06/07/96	8.0	354	165	*0.5*	<.002	35.1	13.6	9.3	10.1	0.45	162	*0.5*	*0.5*	*0.5*
CW-G08-01	09/18/96	9.2	305	163	17	<.002	20.4	16.3	16.4	10.3	0.25	94	47.0	13.2	1.6
CW-G08-01	06/19/97	7.7	328	189	2	<.002	35.1	16.6	9.4	5.3	0.61	182	*0.5*	13.0	*0.5*
CW-G08-01	09/22/97	10.0	197	122	10	<.002	12.2	7.6	10.2	8.2	0.32	26	87.0	15.4	1.1
CW-G08-01	04/29/98	8.5	302	174	1	<.002	32.1	11.1	10.9	12.7	0.25	139	9.0	16.3	1.9
CW-G08-01	10/21/98	8.8	320	210	11	0.0023	22.6	13.3	22.7	13.2	0.50	64	77.0	51.9	2.2
CW-G08-01	06/17/99	10.1	215	134	31	<.002	27.5	8.2	6.5	6.9	1.39	10	92.0	22.3	1.1
CW-G08-01	08/10/99	9.4	192	144	53	<.002	18.8	8.4	29.4	6.2	1.02	31	78.0	15.3	*0.5*
CW-G08-01	06/05/00	8.6	349	214	8	< 0.002	35.2	18.7	11.8	13.5	2.47	196	*0.5*	16.1	1.1
CW-G08-01	08/22/00	8.8	362	226	13	< 0.002	27.8	19.7	19.1	16.6	0.67	211	*0.5*	16.4	*0.5*
CW-G08-01	06/21/01	8.6	233	156	58	< 0.0026	30.8	10.7	6.4	9.4	1.62	124	*0.5*	19.5	4.8
CW-G08-01	08/30/01	9.0	267	173	3	< 0.0026	24.3	16.1	11.6	17.9	0.37	121	34.0	9.0	1.5
CW-G12-01	10/29/93	8.5	530	294	22	<.002	53.0	23.6	17.8	17.7	0.68	256	8.0	22.0	1.6
CW-G12-01	05/27/94	8.4	336	185	14	<.002	31.8	13.4	13.8	15.0	0.52	163	0.0	12.0	1.5
CW-G12-01	10/24/94	8.0	113	96	3	<.002	14.7	5.7	2.7	11.1	0.23	73	*0.5*	17.0	1.1

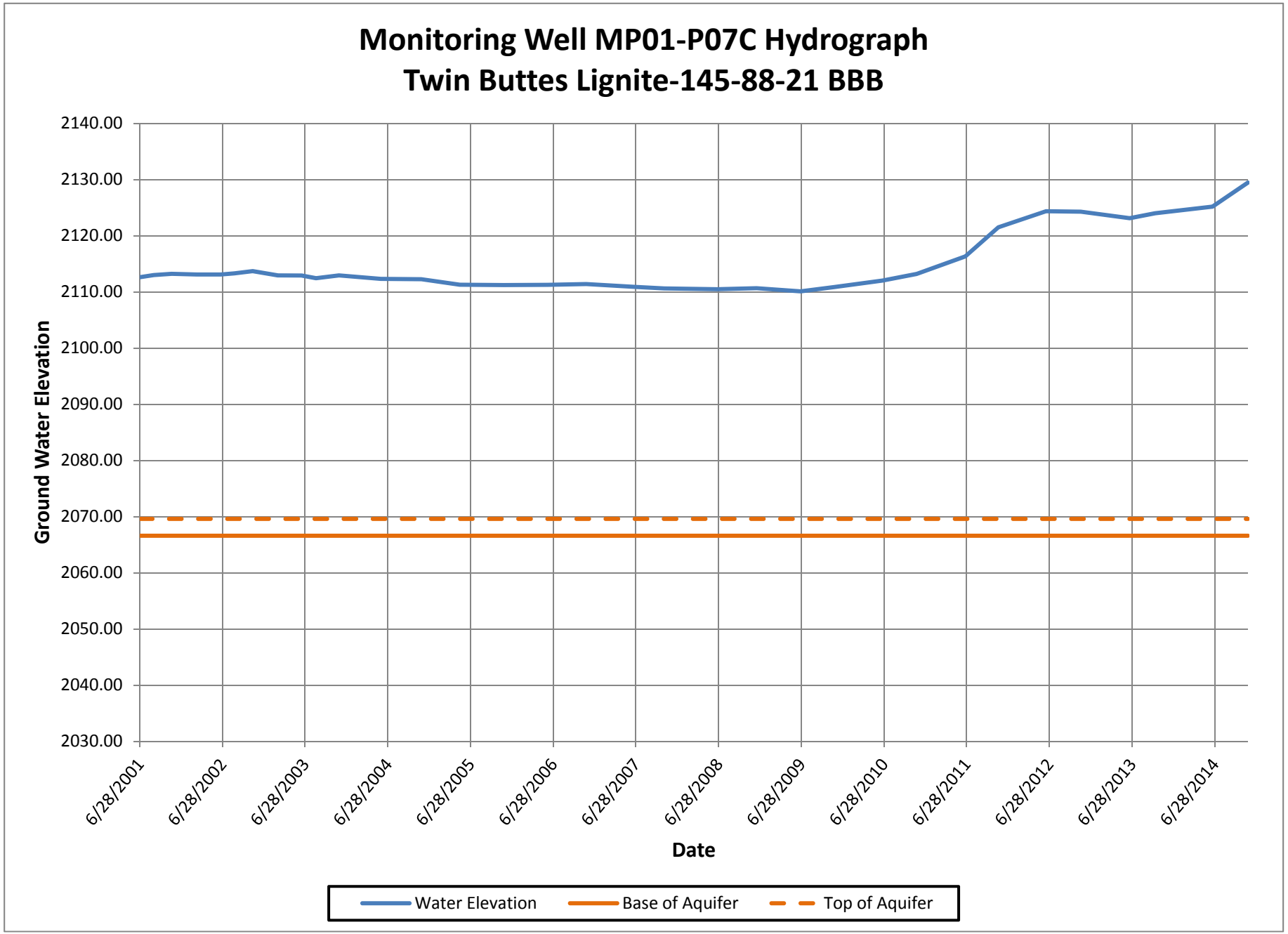
TABLE 6
POST-MINING WETLAND WATER QUALITY
SURFACE WATER FEATURES AND WATER QUALITY DATA
PERMIT NACT-0201

							Cations					Anions			
Wetland	Date	Field pH SU	EC umhos/cm	TDS mg/l	TSS mg/l	Se mg/l	Ca mg/l	Mg mg/l	Na mg/l	K mg/l	Total Fe mg/l	HCO_3 mg/l	CO_3 mg/l	SO_4 mg/l	Cl mg/l
CW-G12-01	04/11/95	8.3	227	131	16	<.002	29.7	6.3	5.2	12.0	0.18	105	*0.5*	13.0	1.8
CW-G12-01	09/08/95	8.0	412	236	1	<.002	31.9	20.3	18.8	18.6	0.51	216	*0.5*	14.0	2.8
CW-G12-01	06/07/96	8.8	316	155	5	<.002	30.4	12.6	5.7	11.4	0.39	119	22.0	10.6	*0.5*
CW-G12-01	09/18/96	7.8	515	286	23	<.002	36.8	23.7	21.4	25.2	1.55	252	*0.5*	20.8	6.9
CW-G12-01	06/19/97	6.7	284	167	13	<.002	32.6	12.7	5.6	7.2	0.72	159	*0.5*	13.1	*0.5*
CW-G12-01	09/22/97	7.5	336	181	1	<.002	32.1	9.8	2.9	10.5	0.59	185	*0.5*	13.2	1.8
CW-G12-01	04/29/98	7.7	307	179	10	<.002	35.2	10.5	4.6	16.4	0.45	156	*0.5*	16.3	2.8
CW-G12-01	10/21/98	7.8	400	248	2	<.002	41.1	17.3	13.0	17.9	0.16	169	*0.5*	51.7	5.5
CW-G12-01	06/17/99	7.7	339	195	119	<.002	52.7	11.6	4.0	8.7	3.27	189	*0.5*	4.2	*0.5*
CW-G12-01	08/10/99	7.3	300	172	82	<.002	35.4	13.4	5.8	10.4	2.27	179	*0.5*	*0.5*	*0.5*
CW-G12-01	06/05/00	6.9	380	221	4	< 0.002	48.1	14.8	6.8	19.3	0.81	218	*0.5*	*0.5*	1.0
CW-G12-01	08/22/00	7.2	379	230	8	< 0.002	45.2	17.3	8.0	22.0	2.86	206	*0.5*	14.1	*0.5*
CW-G12-01	06/21/01	7.9	239	173	8	< 0.0026	31.0	11.8	6.3	16.5	0.90	150	*0.5*	12.9	4.7
CW-G12-01	08/30/01	9.1	284	195	10	< 0.0026	26.0	17.5	12.1	26.2	2.37	115	49.0	12.3	2.1
CW-I06-01	04/11/95	7.9	244	138	91	<.002	30.7	9.1	5.1	6.4	2.98	95	*0.5*	26.0	3.3
CW-I06-01	09/08/95	8.6	1166	884	*0.5*	<.002	113.0	82.0	28.1	15.0	*0.05*	173	5.0	534.0	4.6
CW-I06-01	06/07/96	8.5	807	592	30	<.002	79.8	57.5	20.2	11.7	0.26	133	11.0	333.0	3.7
CW-I06-01	09/18/96	8.5	1120	749	22	<.002	72.8	82.0	33.9	16.5	0.18	133	13.0	450.0	6.5
CW-I06-01	06/19/97	7.8	375	220	3	<.002	43.6	15.6	5.9	10.5	0.31	169	5.0	38.5	1.4
CW-I06-01	09/22/97	8.7	373	194	5	<.002	31.4	14.8	5.6	7.7	0.16	180	18.0	13.8	1.6
CW-I06-01	04/29/98	8.9	383	234	25	<.002	40.6	20.4	8.4	11.5	0.68	147	37.0	41.0	2.2
CW-I06-01	10/21/98	8.1	726	503	5	0.0025	47.0	36.2	61.7	11.8	0.14	139	*0.5*	259.0	4.3
CW-I06-01	06/17/99	8.7	350	221	62	<.002	32.0	18.0	16.1	8.2	1.23	146	25.0	41.9	2.3
CW-I06-01	08/10/99	7.9	365	208	9	<.002	23.3	19.2	20.5	10.5	0.53	171	*0.5*	29.5	2.9
CW-I06-01	06/05/00	8.9	422	359	4	< 0.002	29.3	30.7	26.4	12.7	1.23	314	45.0	42.9	1.5
CW-I06-01	08/22/00	10.0	363	226	10	< 0.002	18.9	24.6	27.4	11.1	0.26	59	133.0	26.9	1.5
CW-I06-01	08/30/01	9.0	322	201	18	< 0.0026	22.1	21.7	24.0	12.2	0.16	130	45.0	14.0	1.8
CW-I06-01	07/05/01	9.7	310	175	7	< 0.0026	19.1	15.8	17.0	8.8	0.18	35	115.0	18.3	6.4
	Average		464	294	*18*		39.9	21.4	26.0	13.3	*0.85*	161	*15.7*	*84.1*	*4.0*
	Median	8.3	361	217	*9*		35.1	17.1	13.1	12.1	*0.42*	161	*0.5*	*16.7*	*2.2*
	Std. Dev.		319	235	*25*		20.1	16.9	37.6	4.6	*1.09*	71	*30.0*	*155.2*	*5.2*
	Min.	6.7	113	73	*< 1.0*		11.5	4.7	0.5	5.3	*< 0.10*	10	*0.0*	*< 1.0*	*< 1.0*
	Max.	10.1	1746	1330	*119*		113.0	82.0	206.0	26.2	*6.30*	376	*133.0*	*706.0*	*31.3*

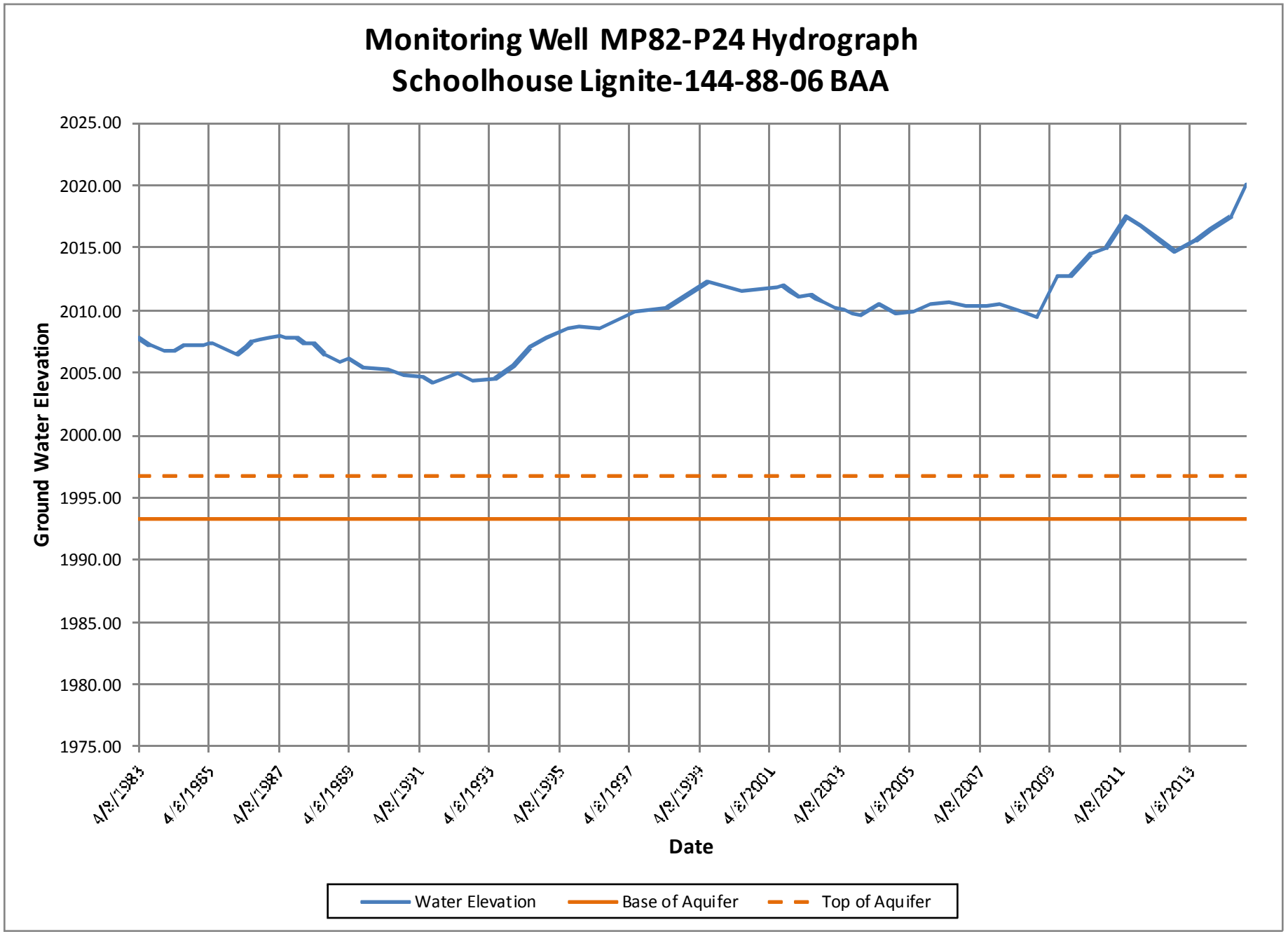
NOTE: Italicized data are assumed values for data reported at a less than detectable limit. Example: Data reported at < 1.0 mg/l is listed as *0.5* mg/l.



REVISION 18
JUNE 2014



REVISION 18
JUNE 2014



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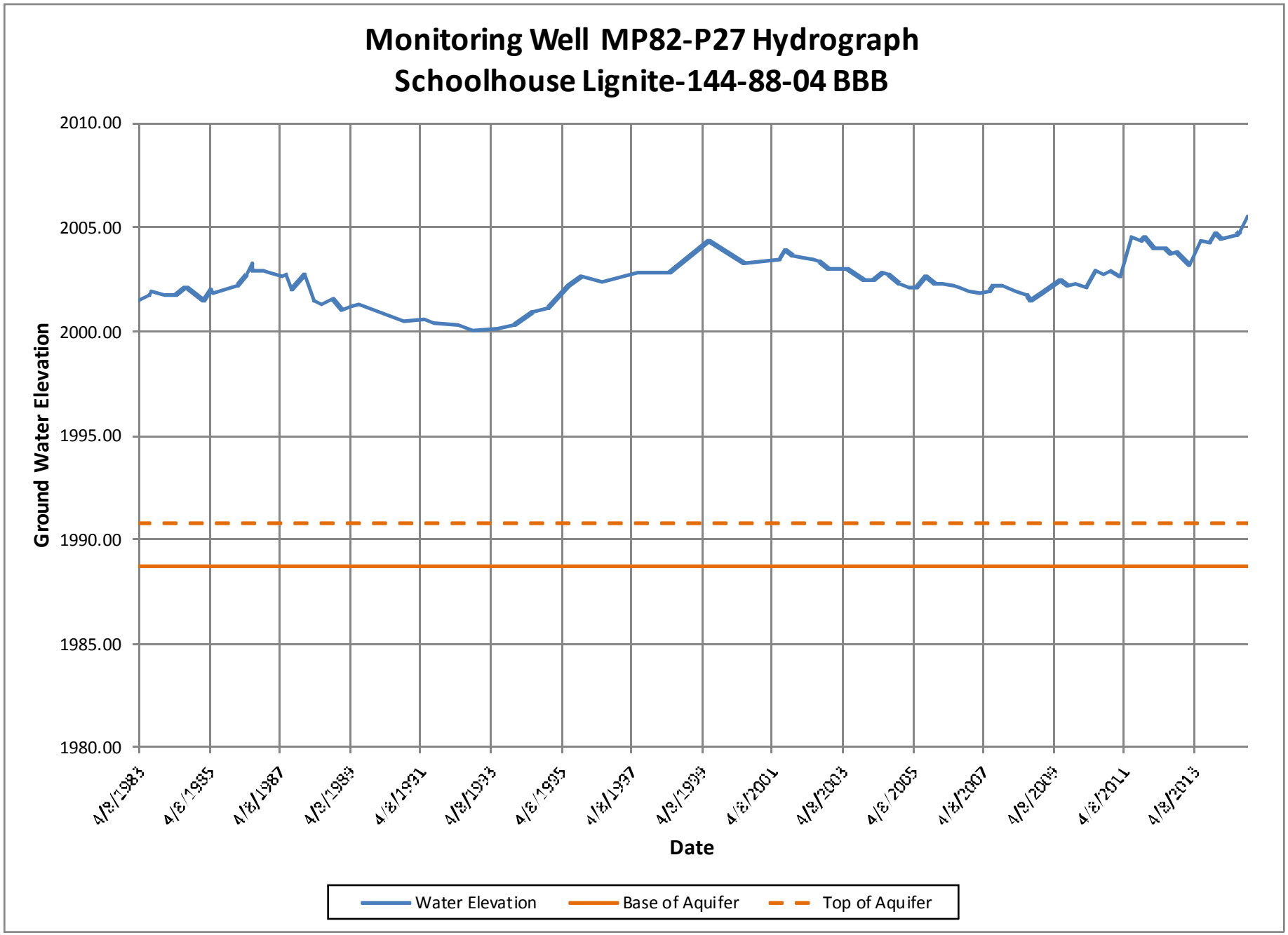

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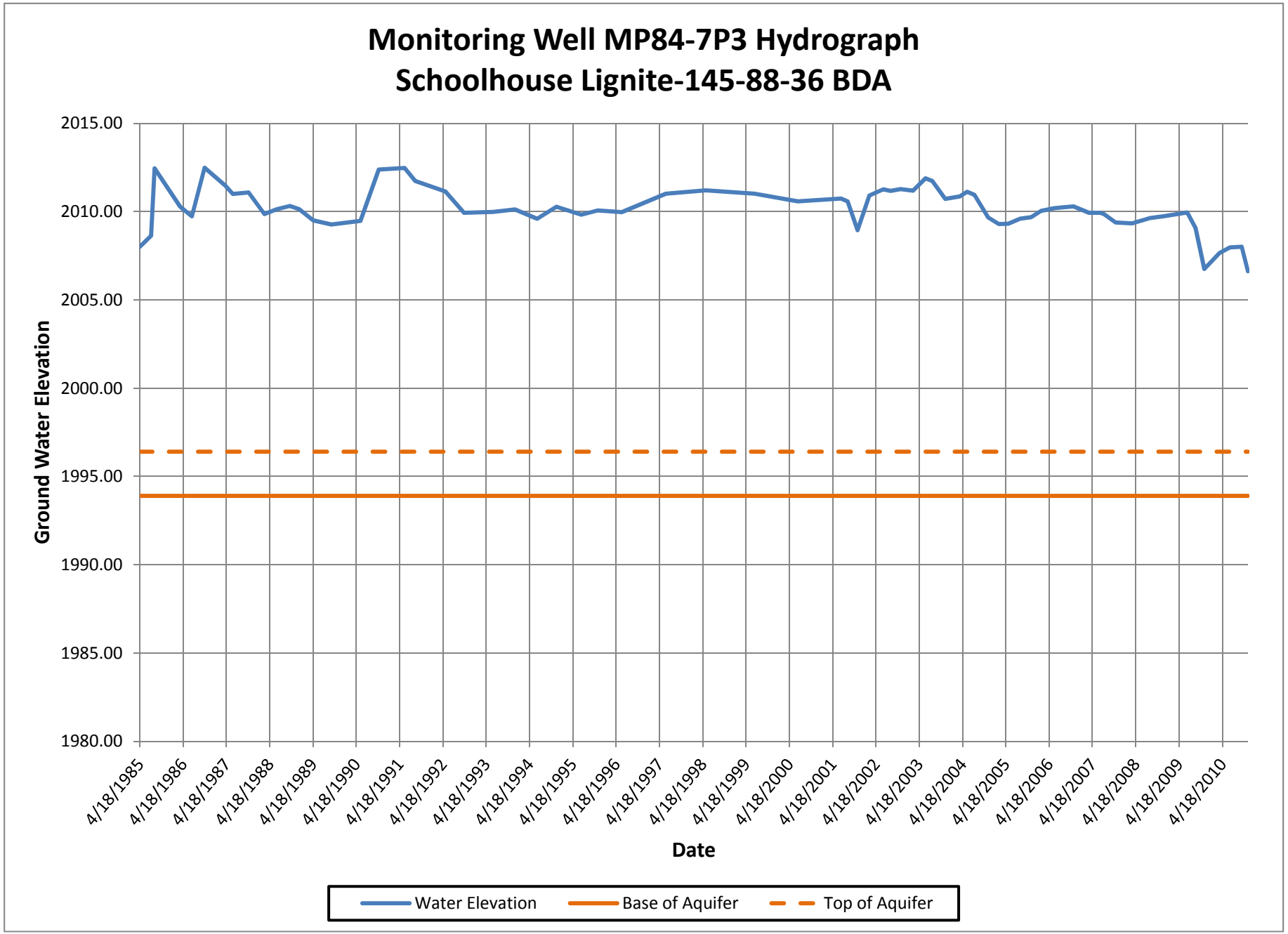

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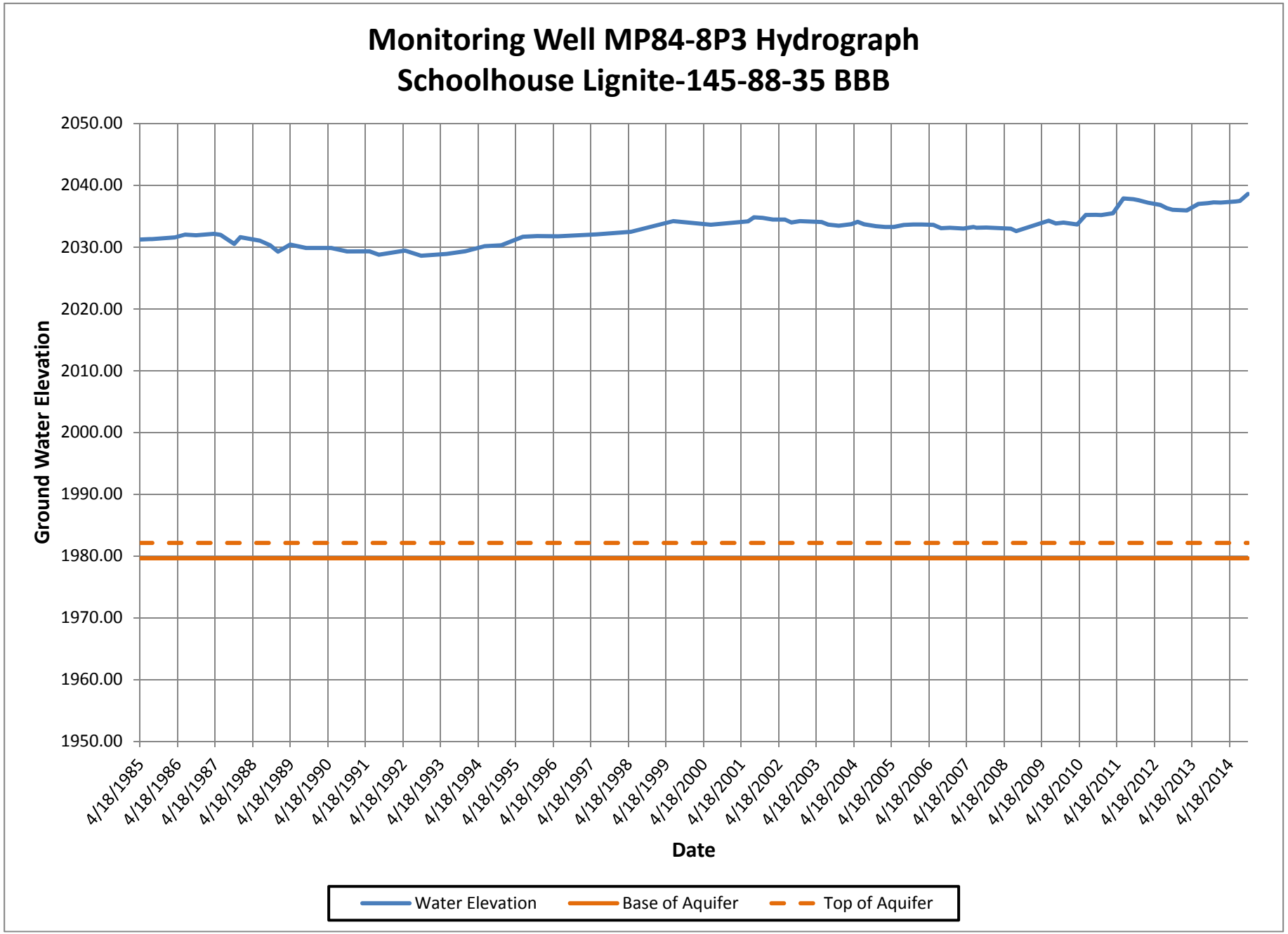

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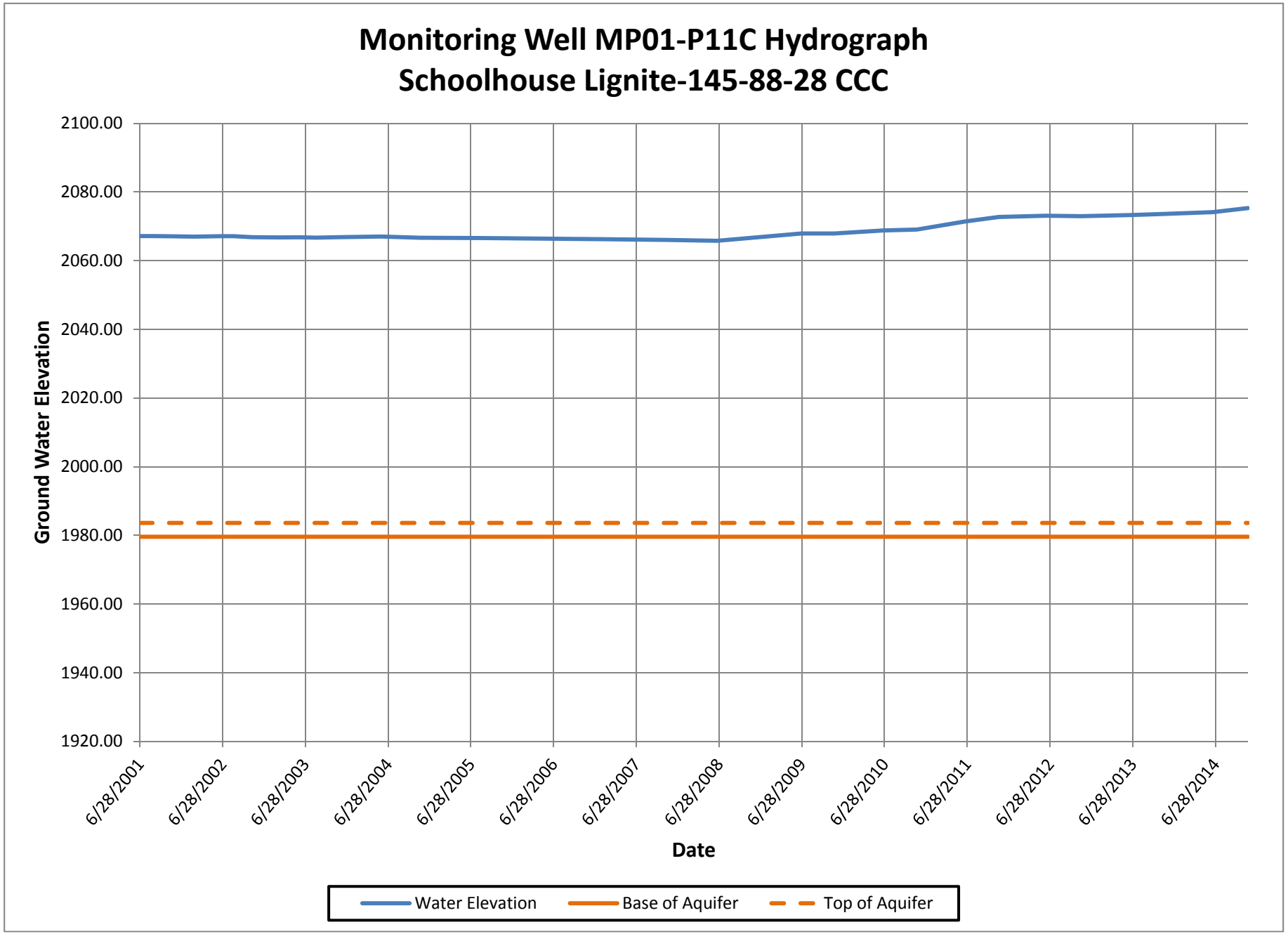

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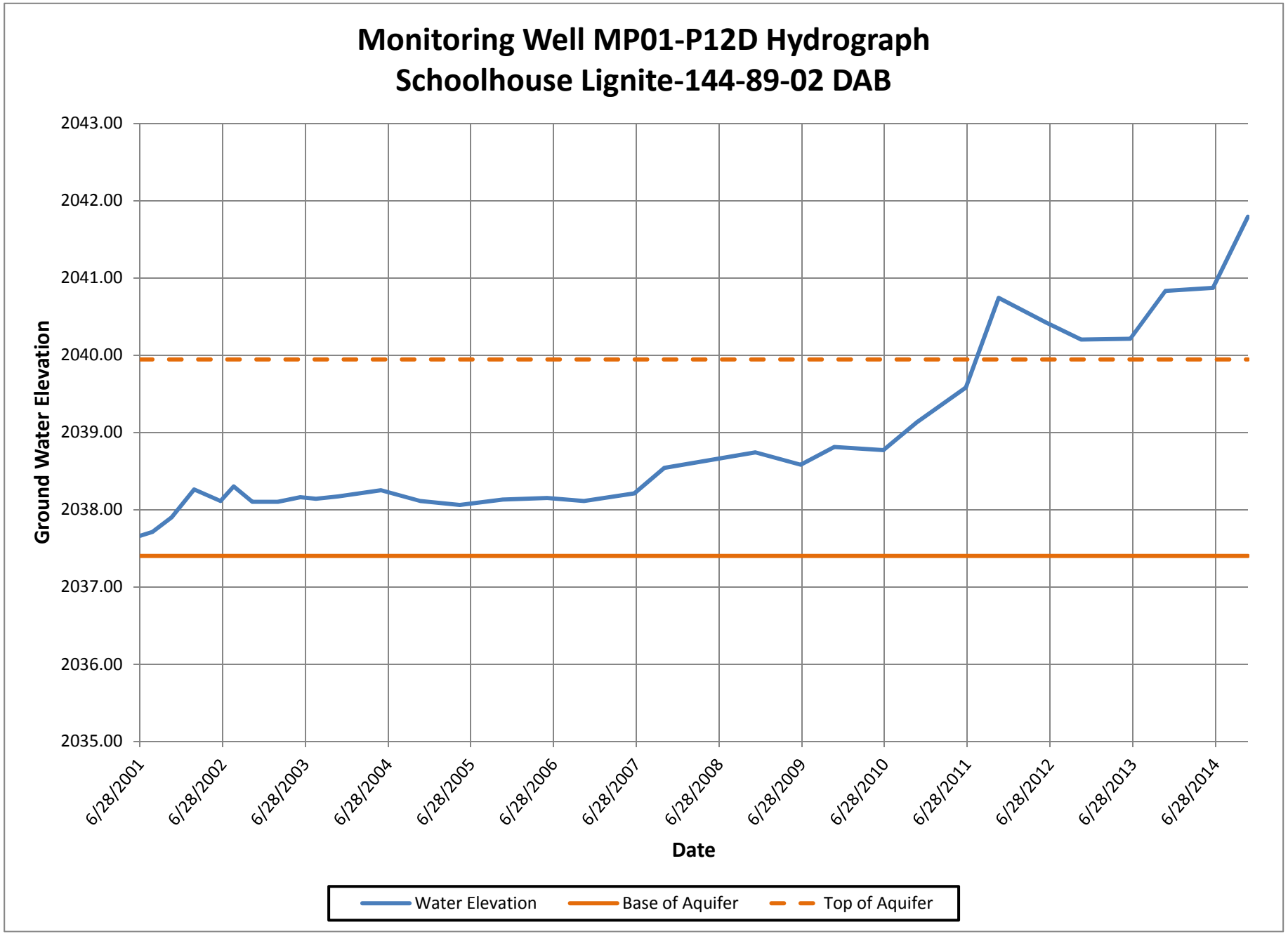

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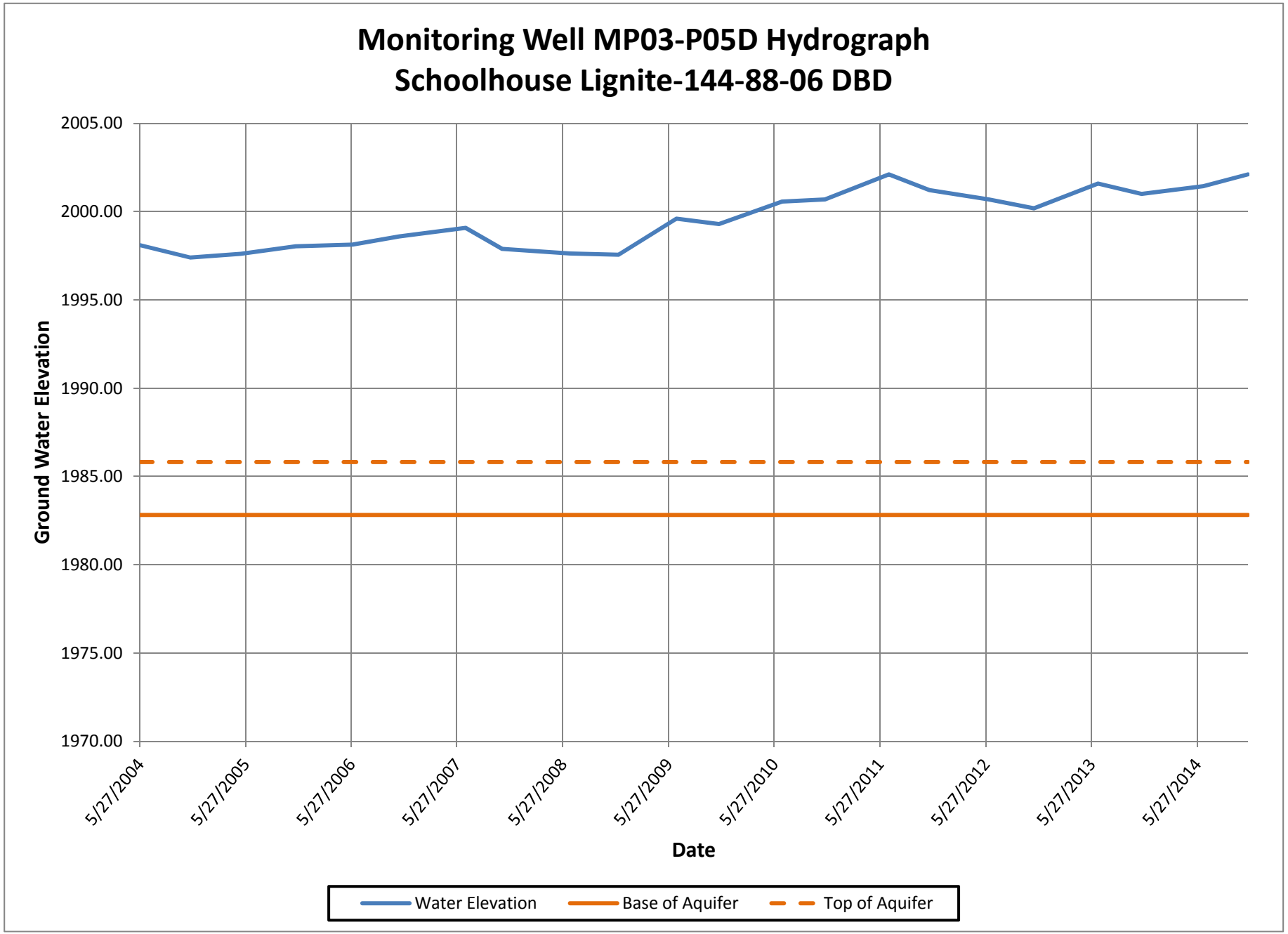

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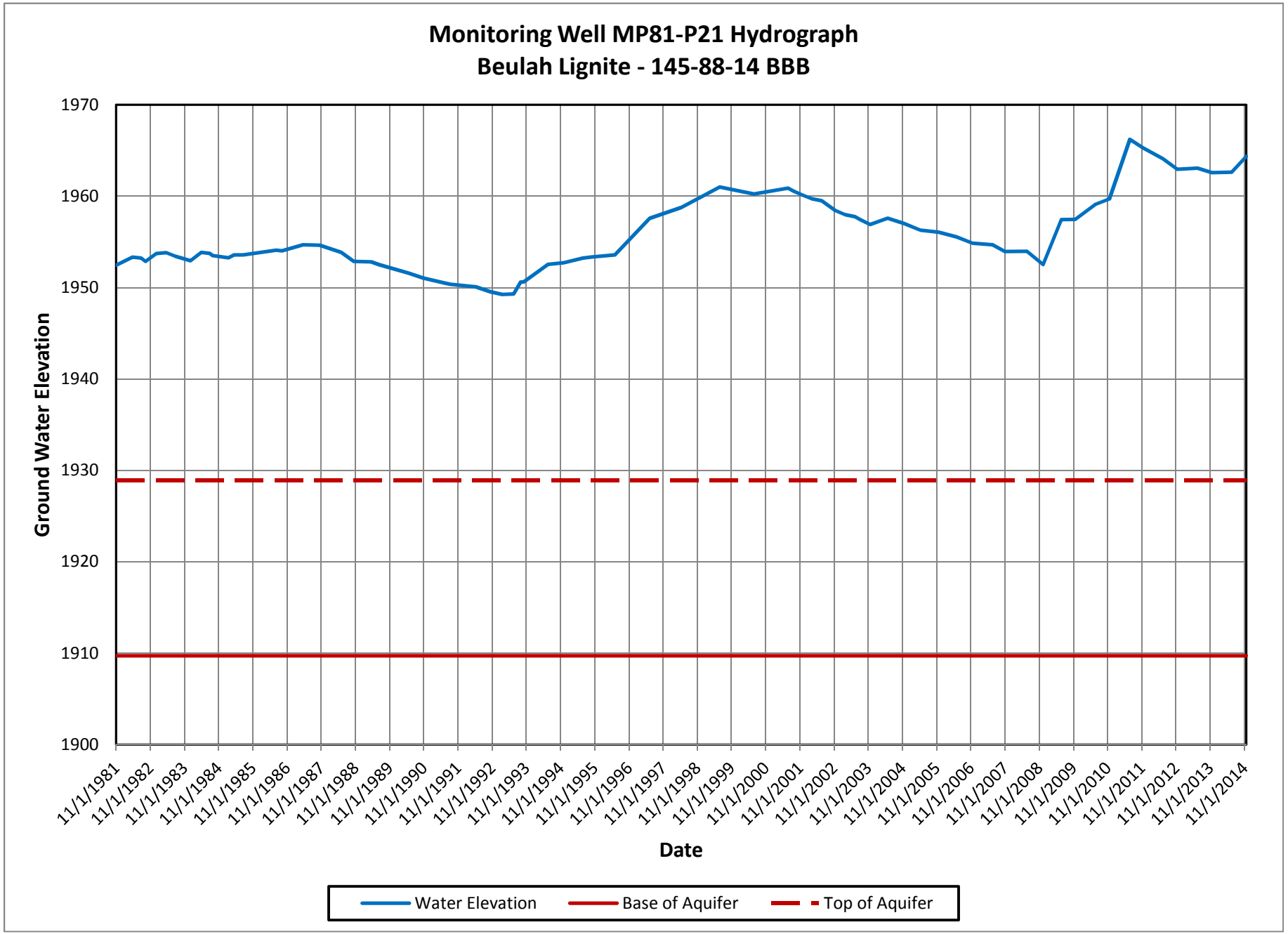

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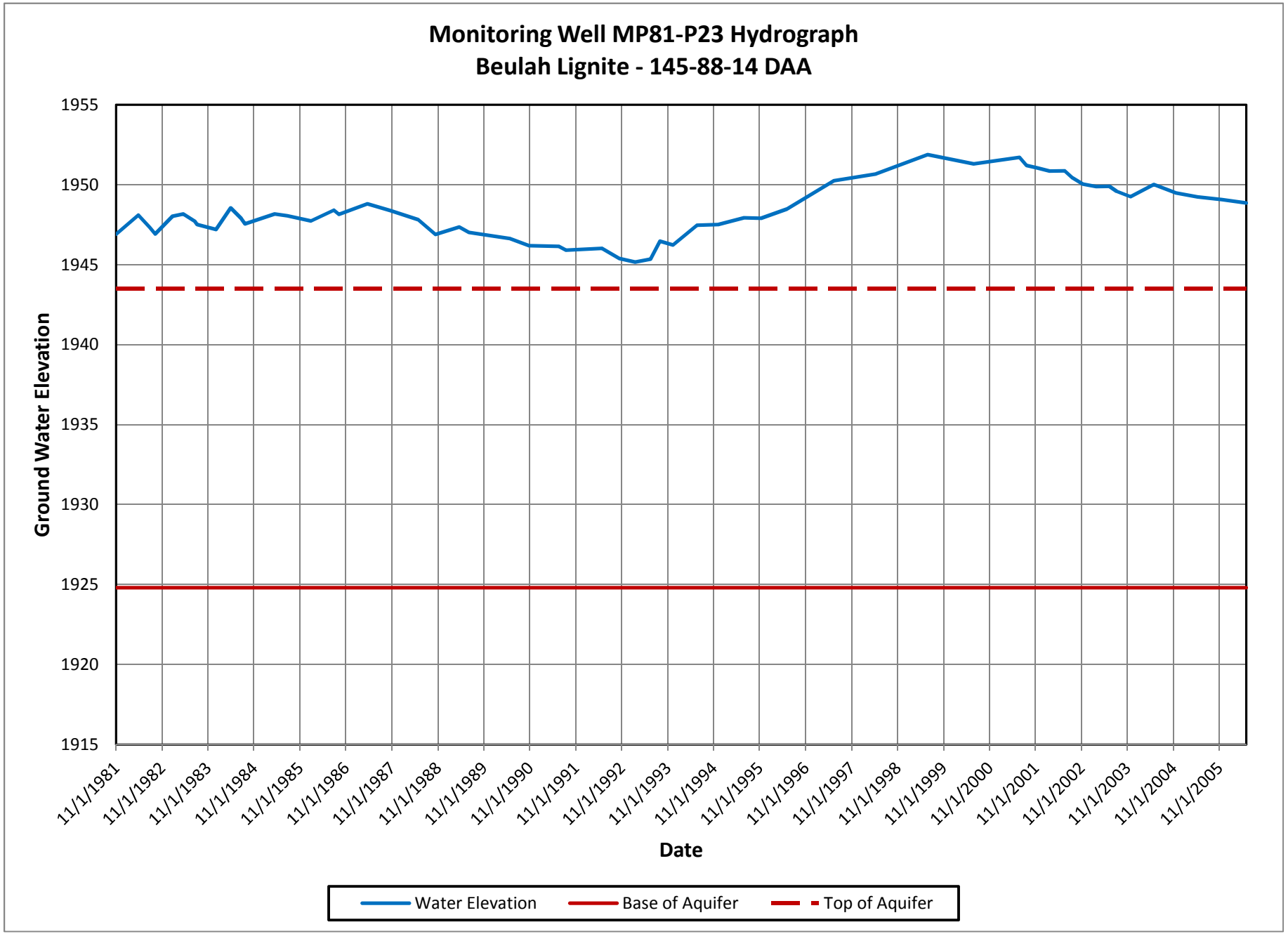

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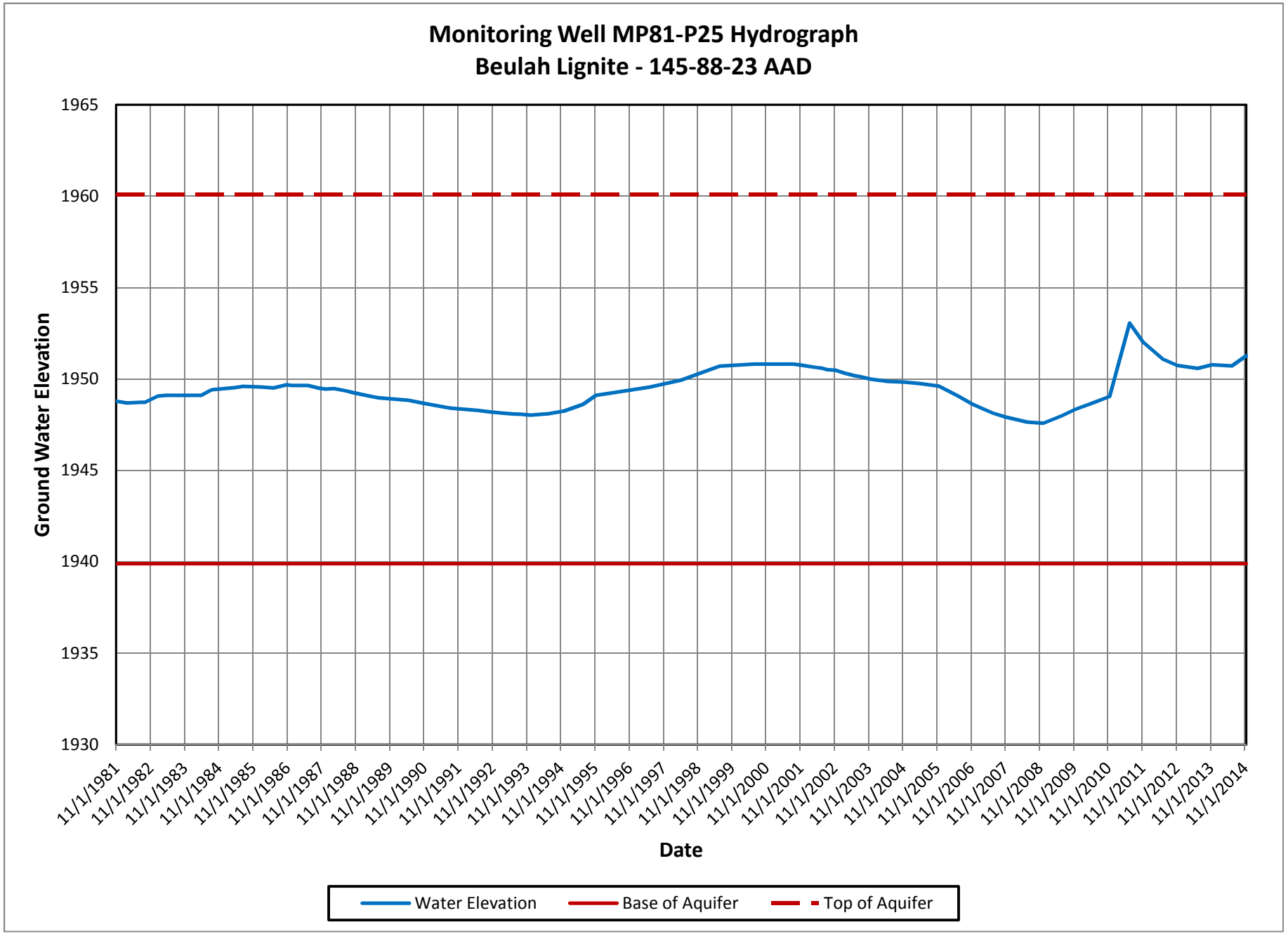

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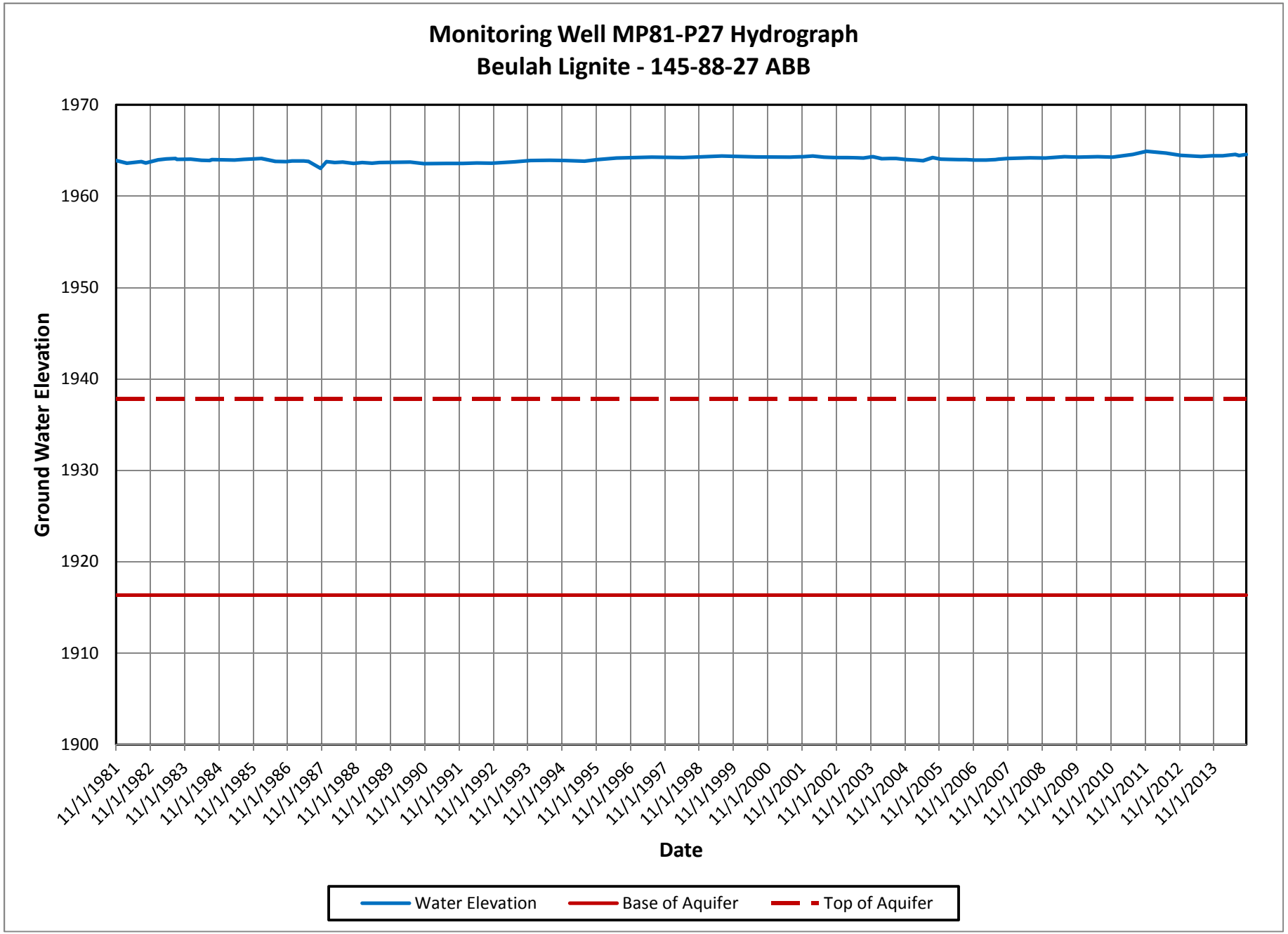

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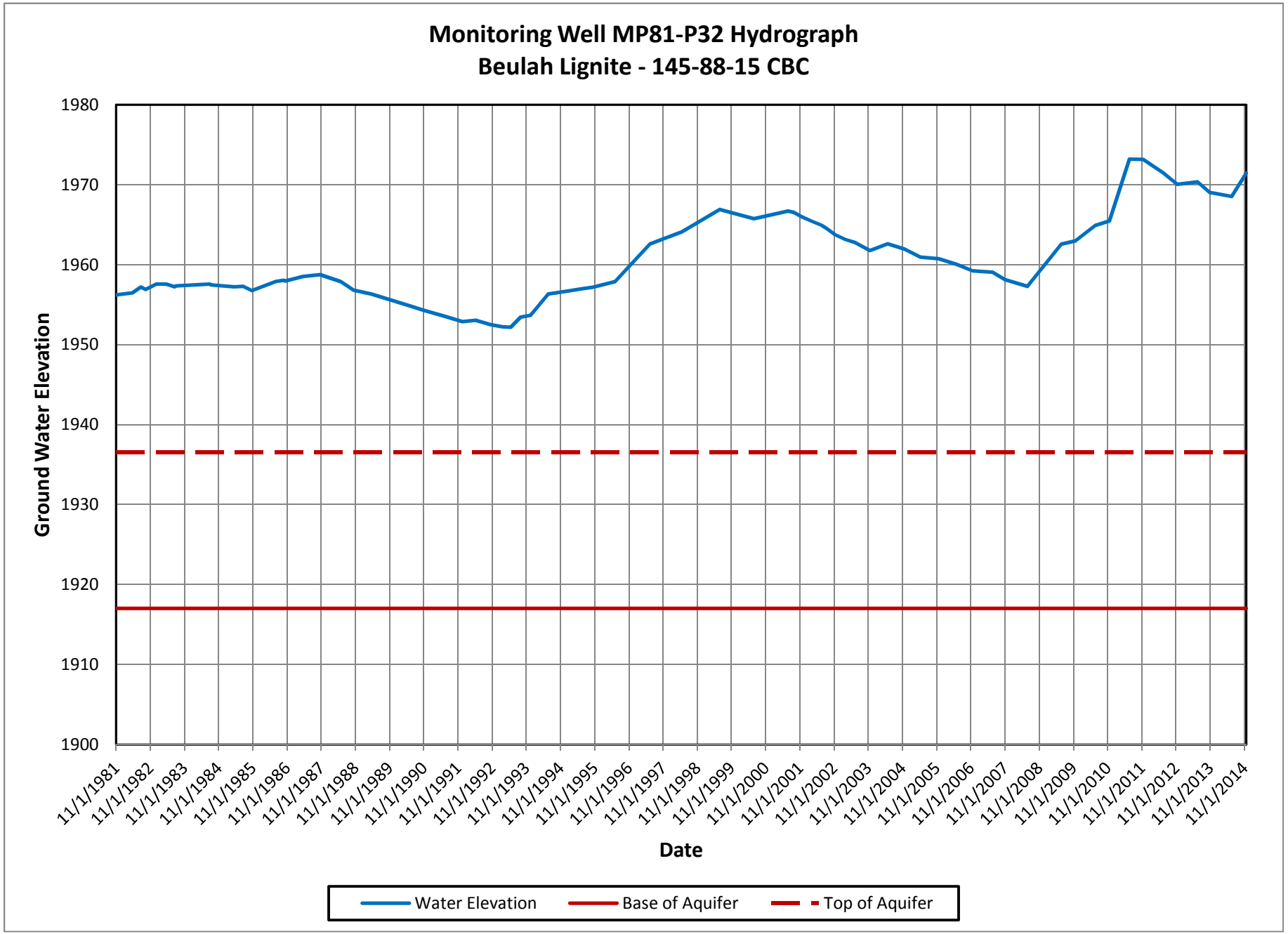

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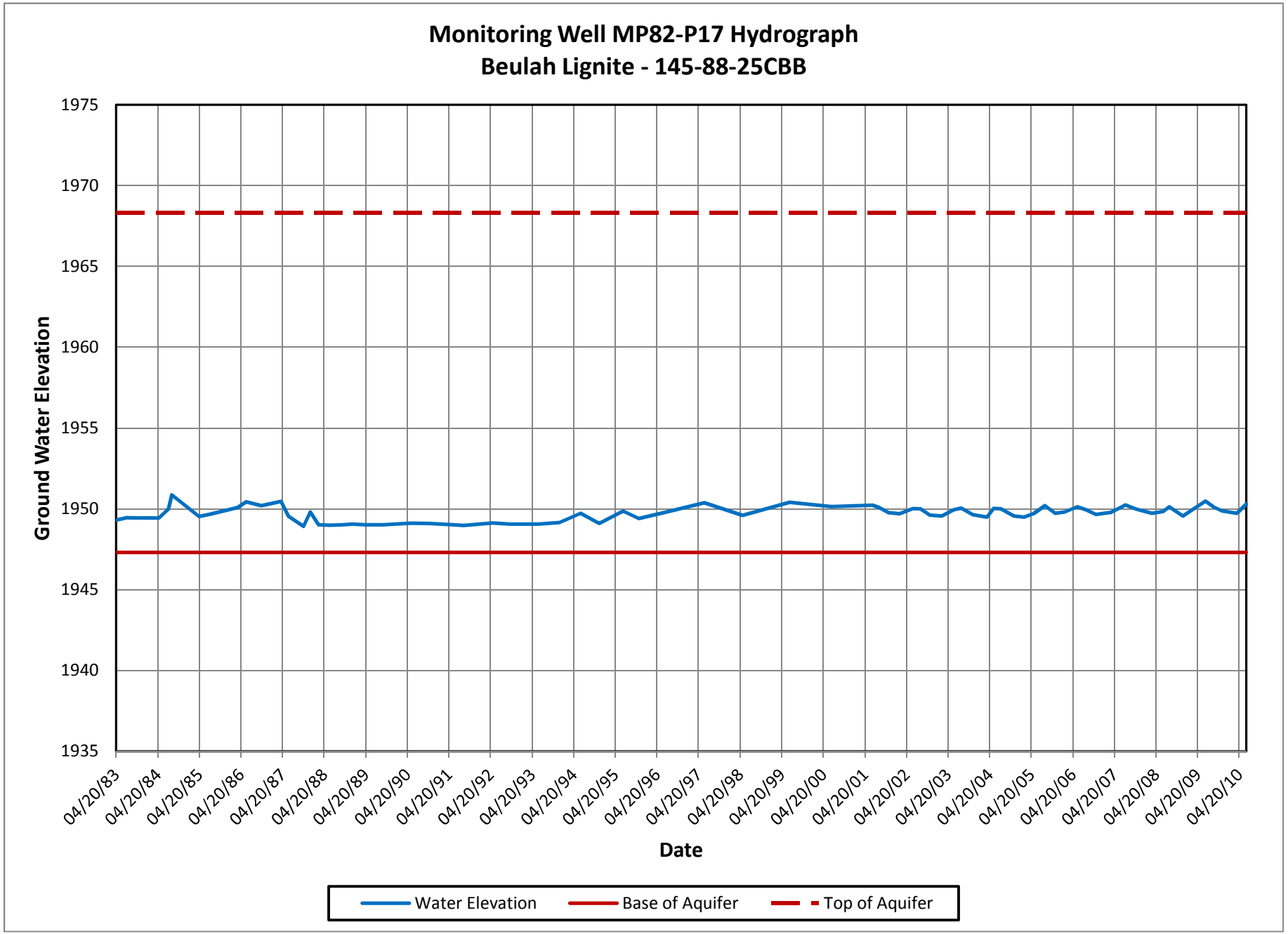

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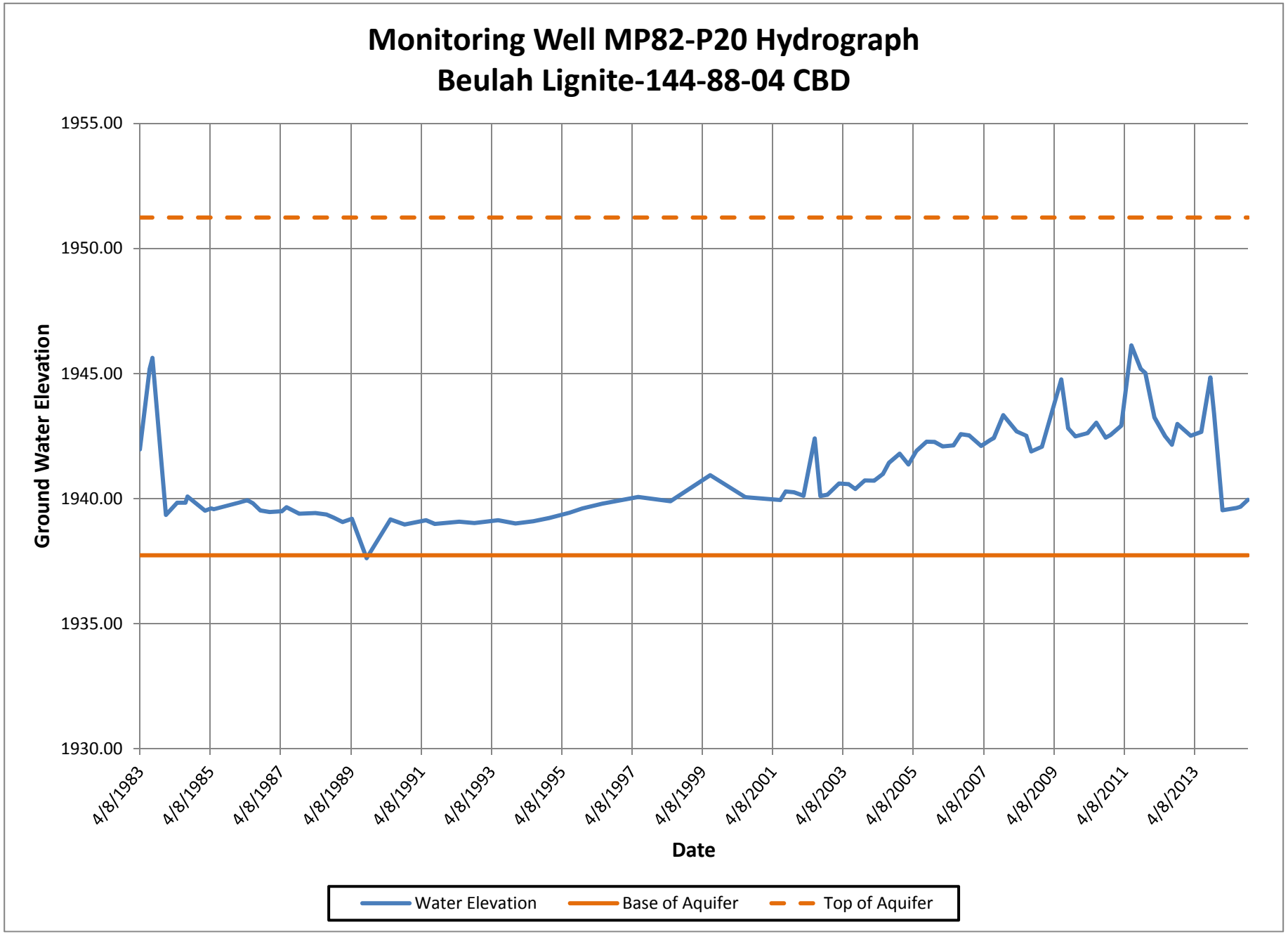

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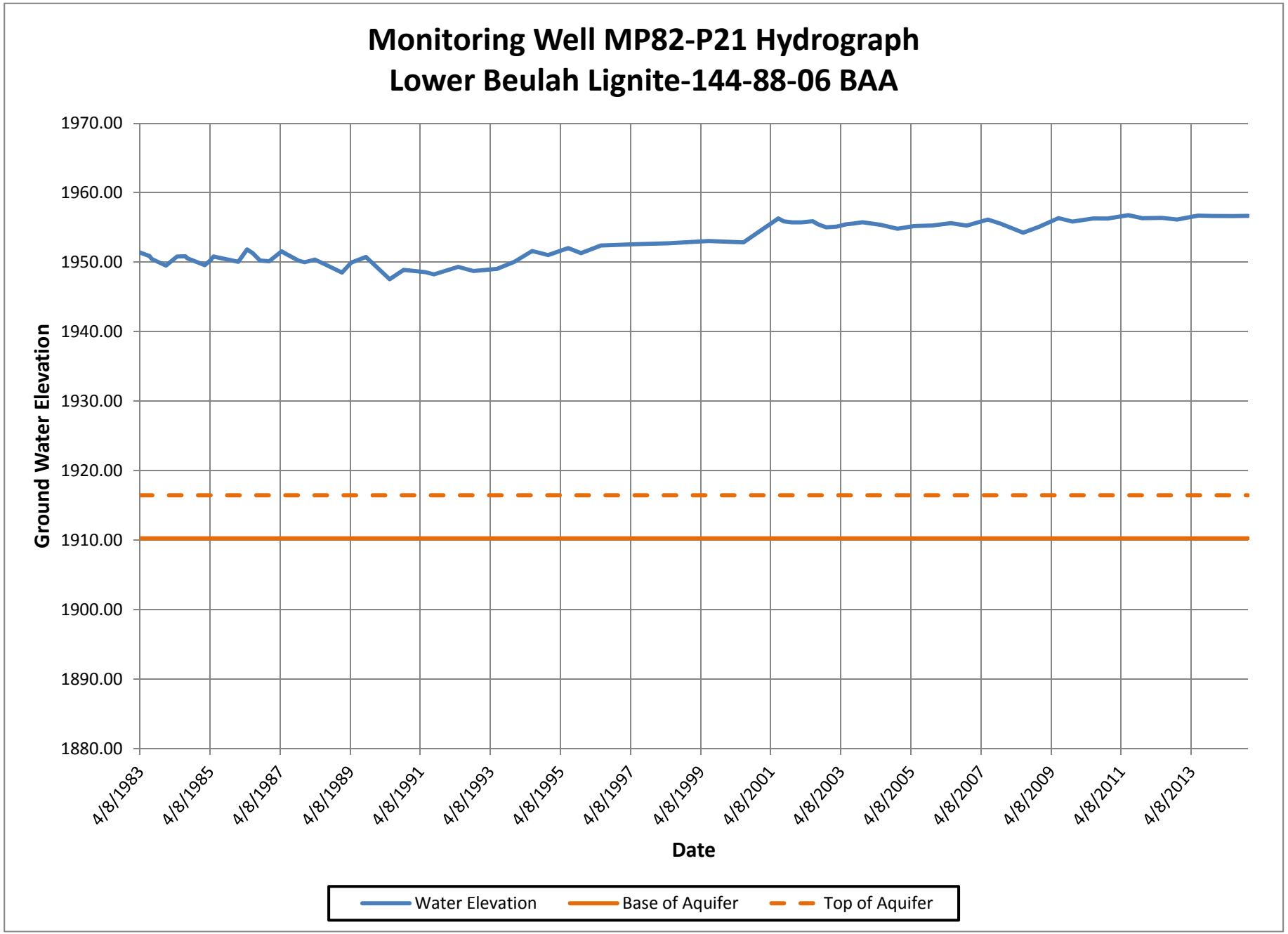

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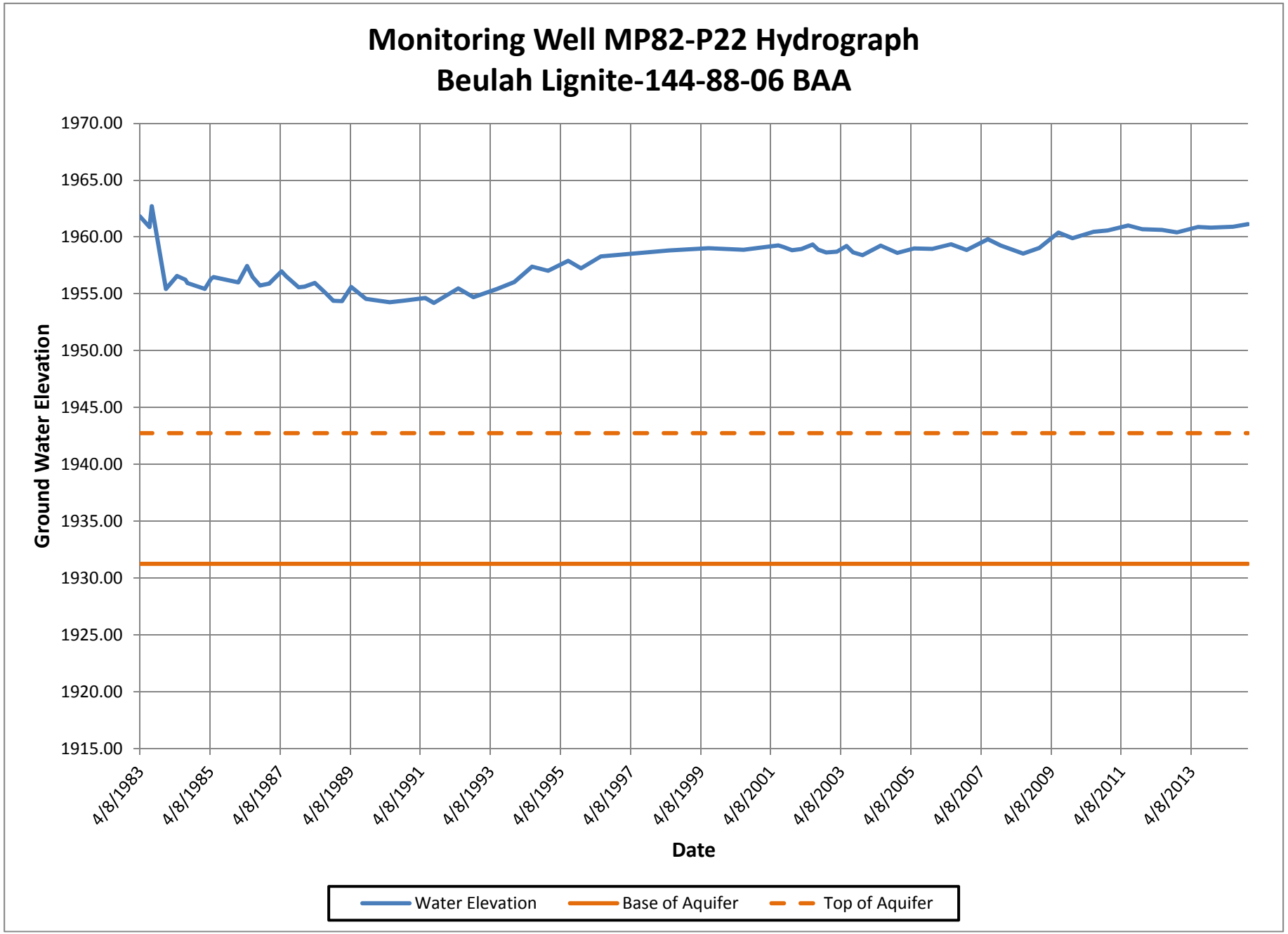

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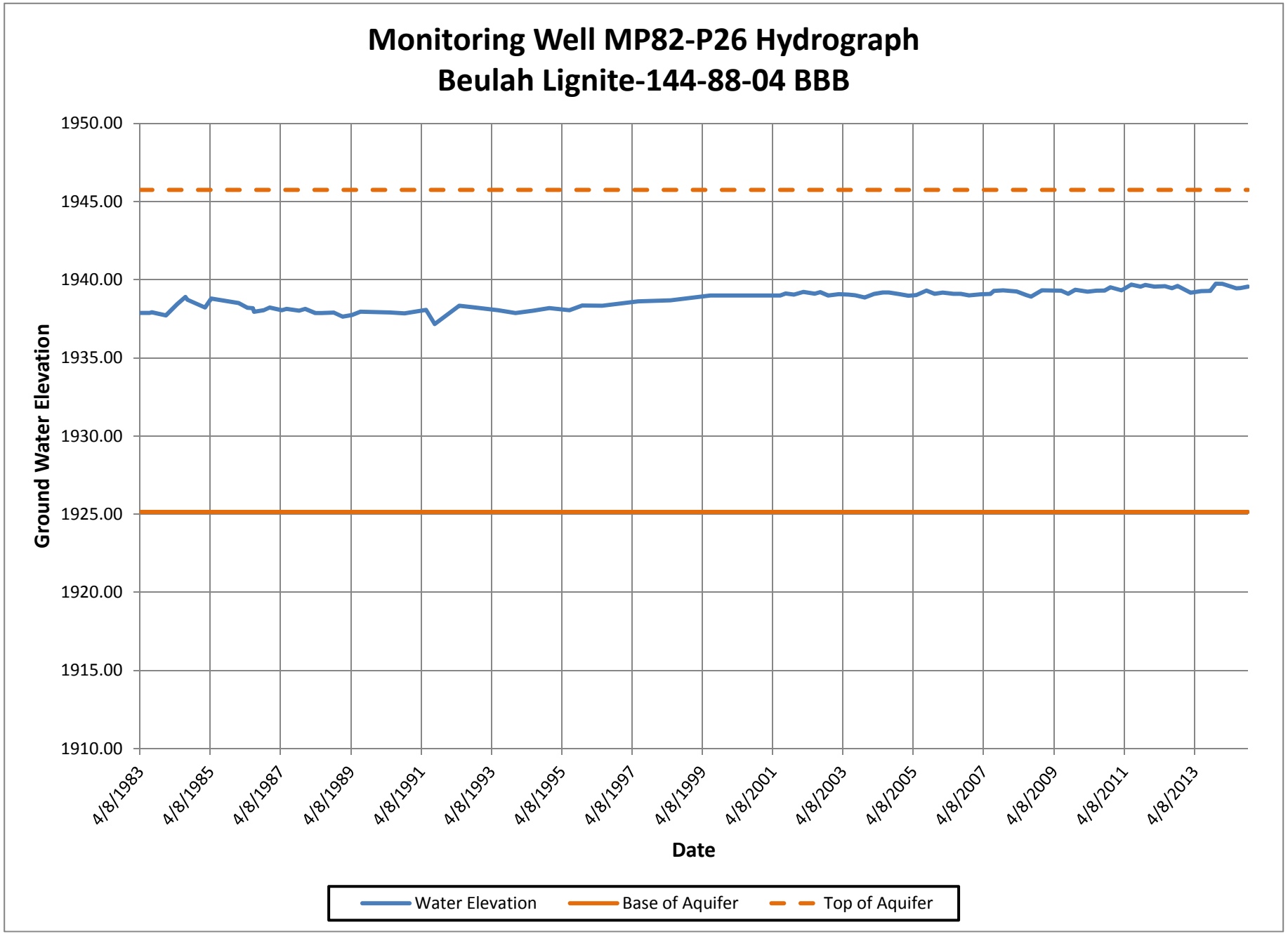

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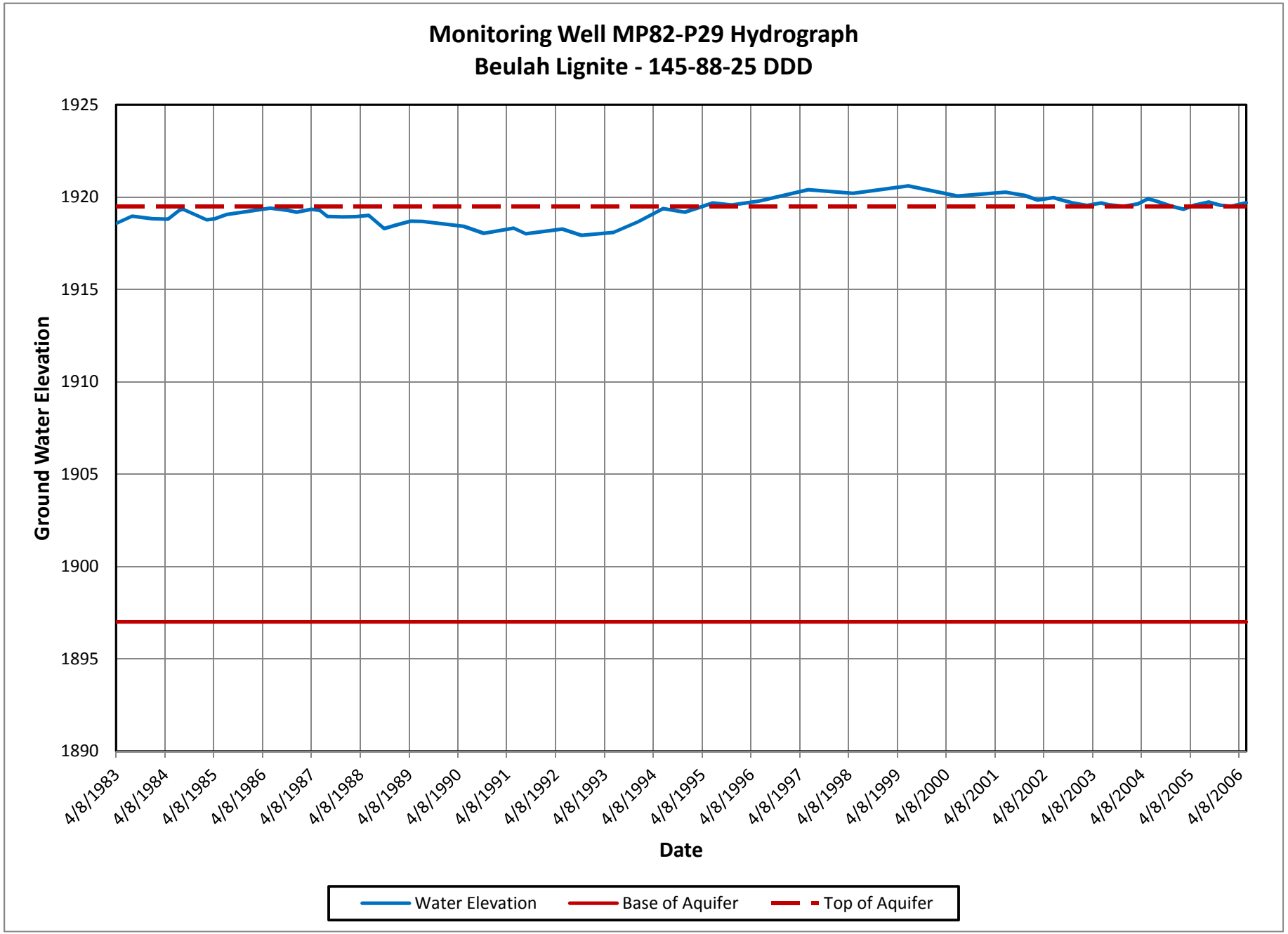

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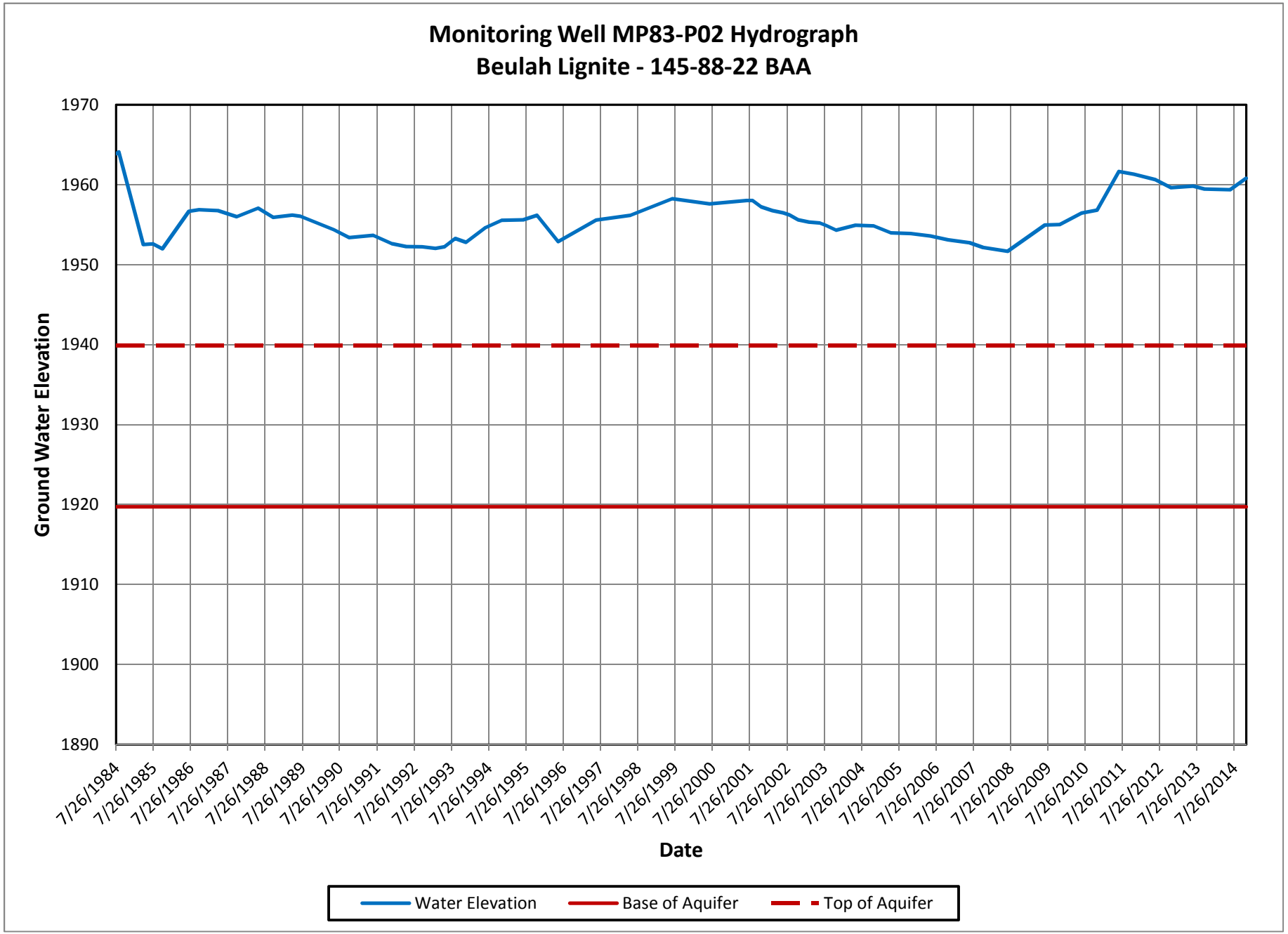

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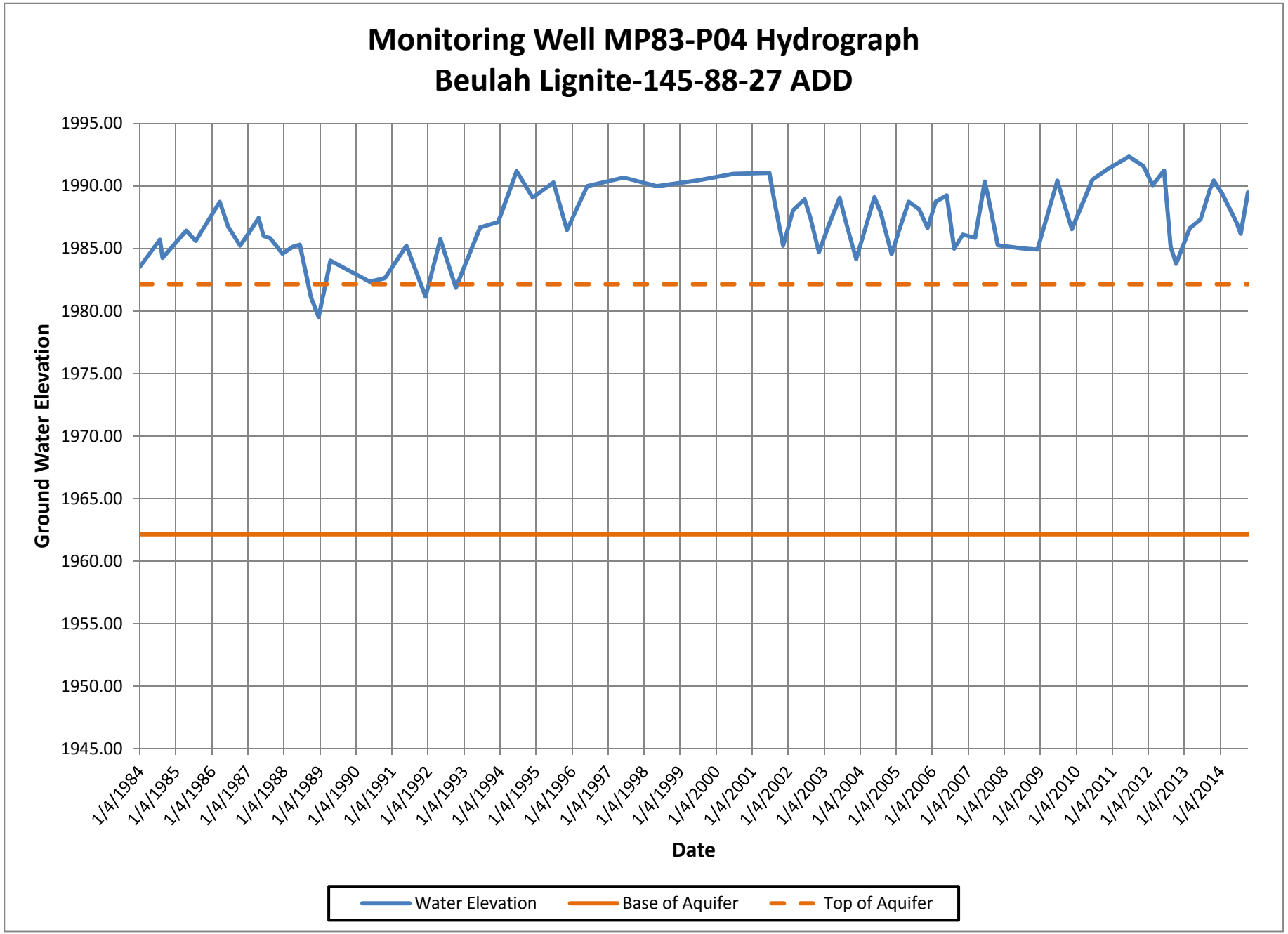

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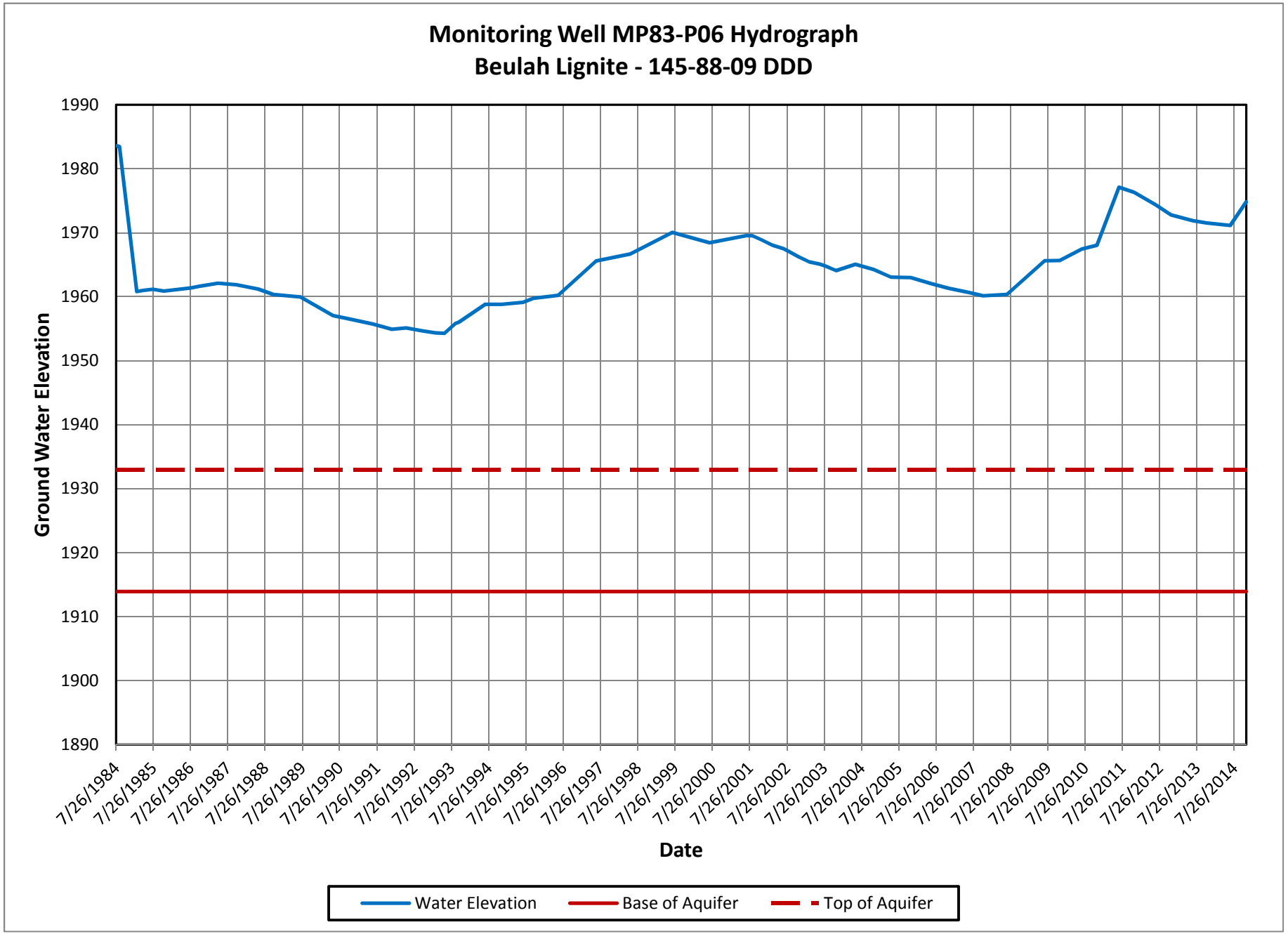

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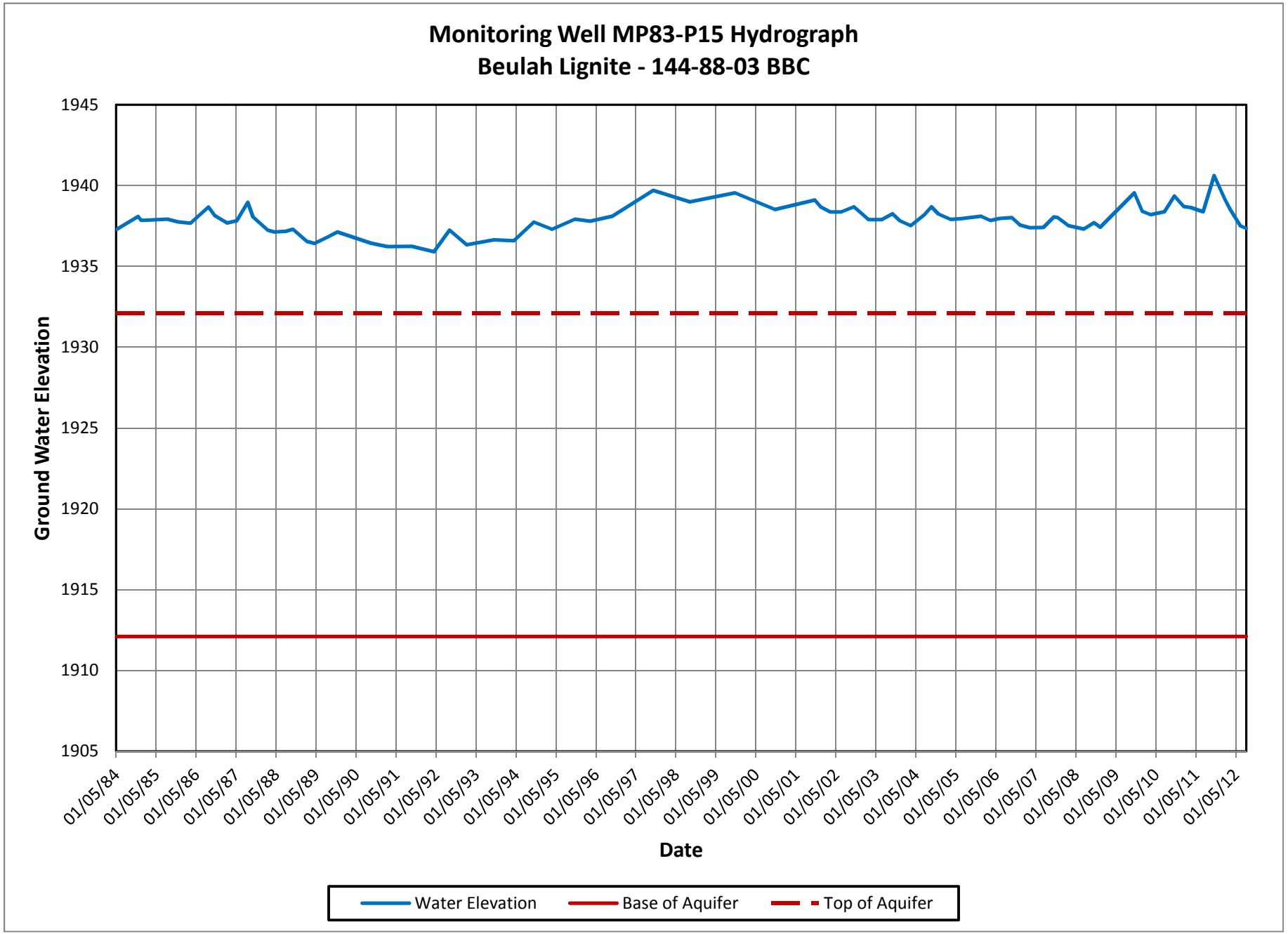

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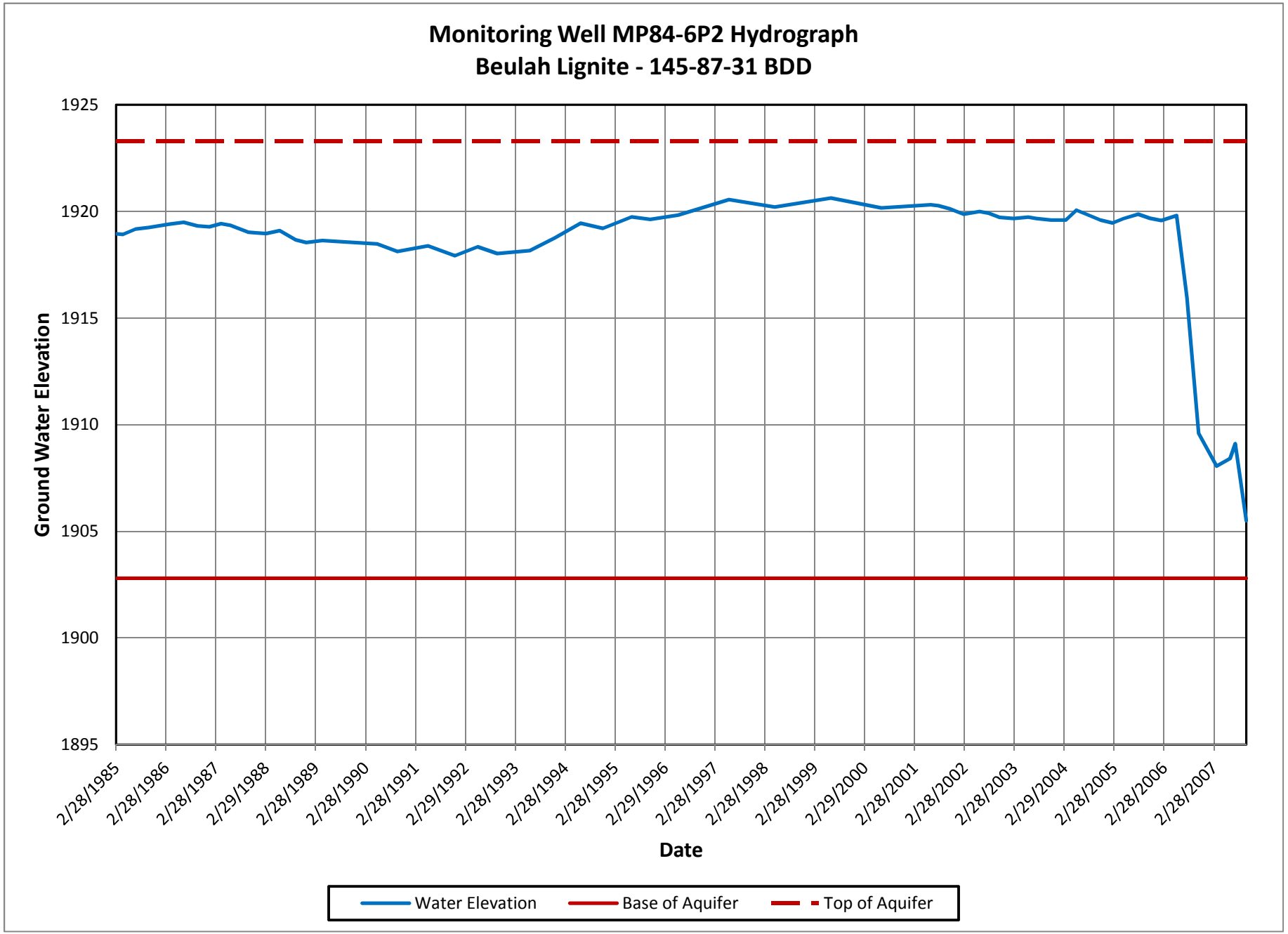

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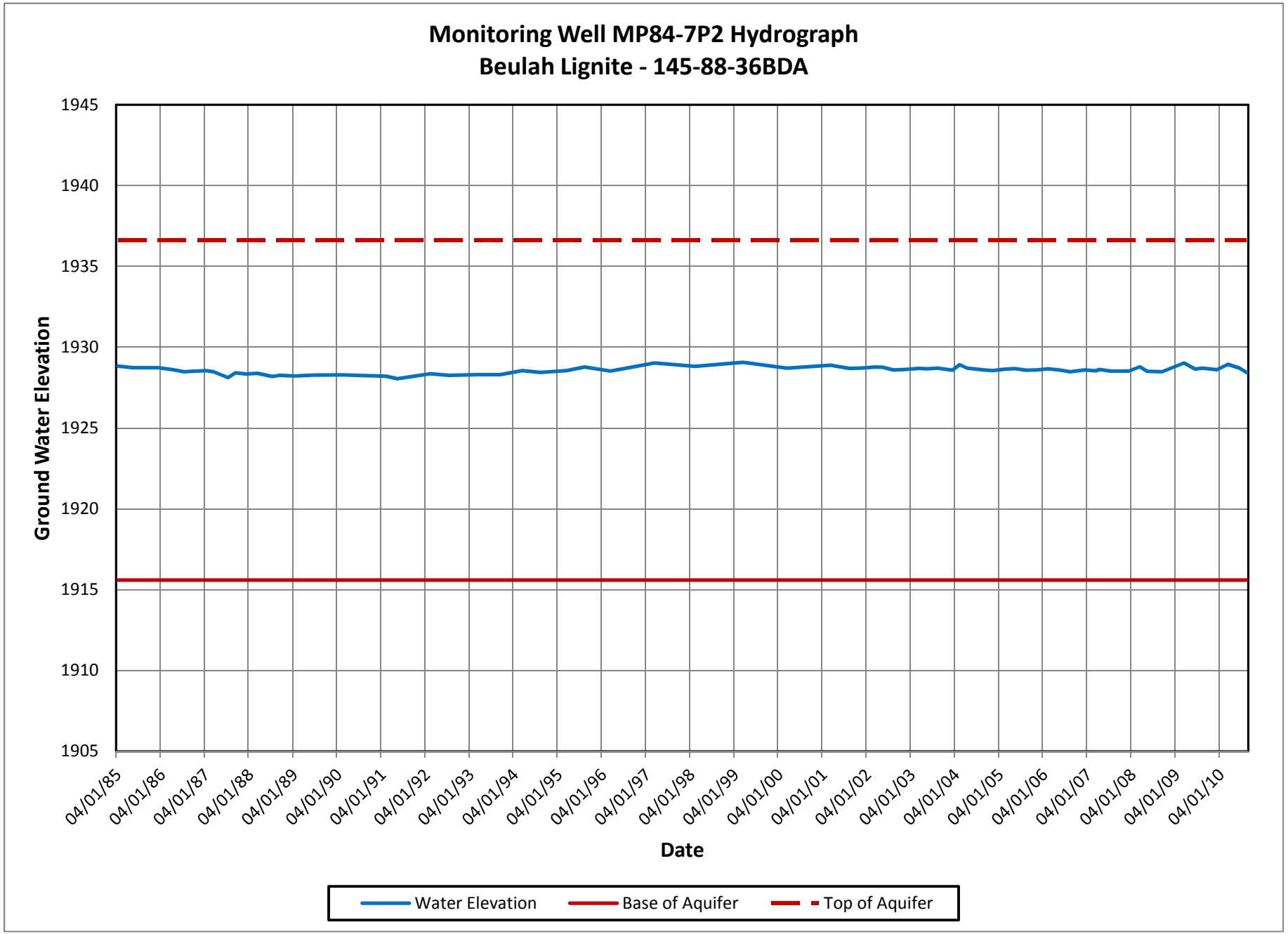

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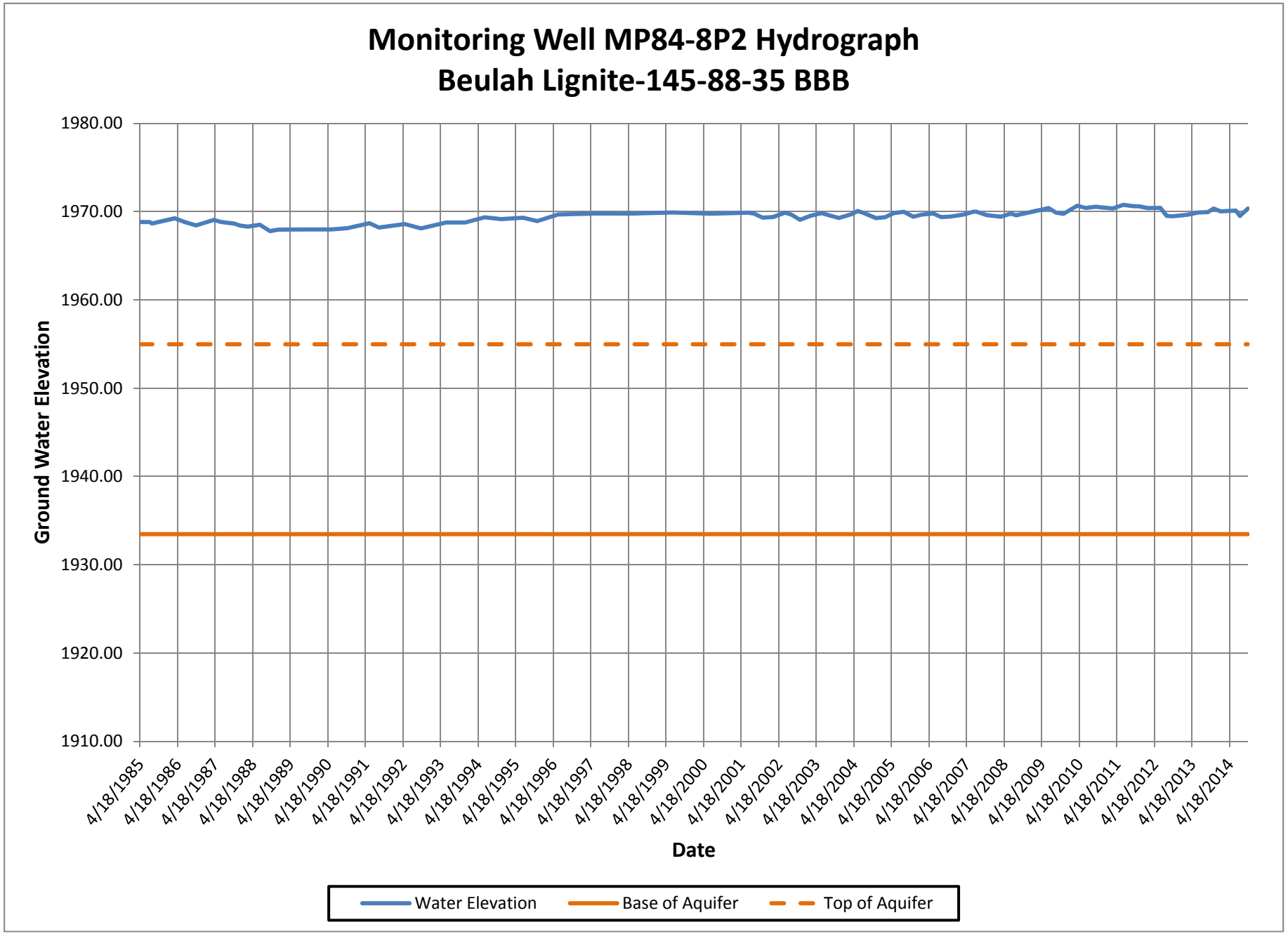

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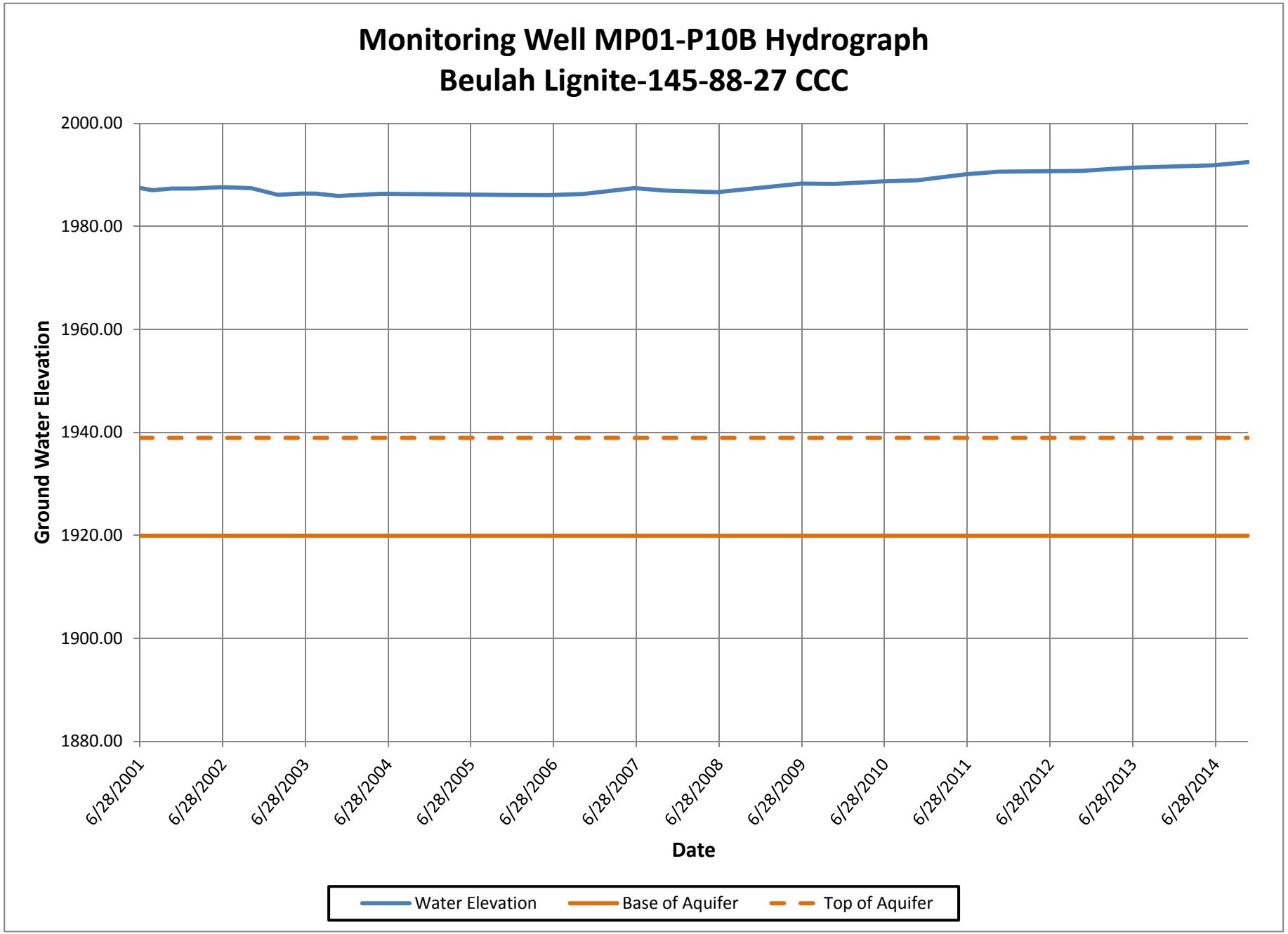

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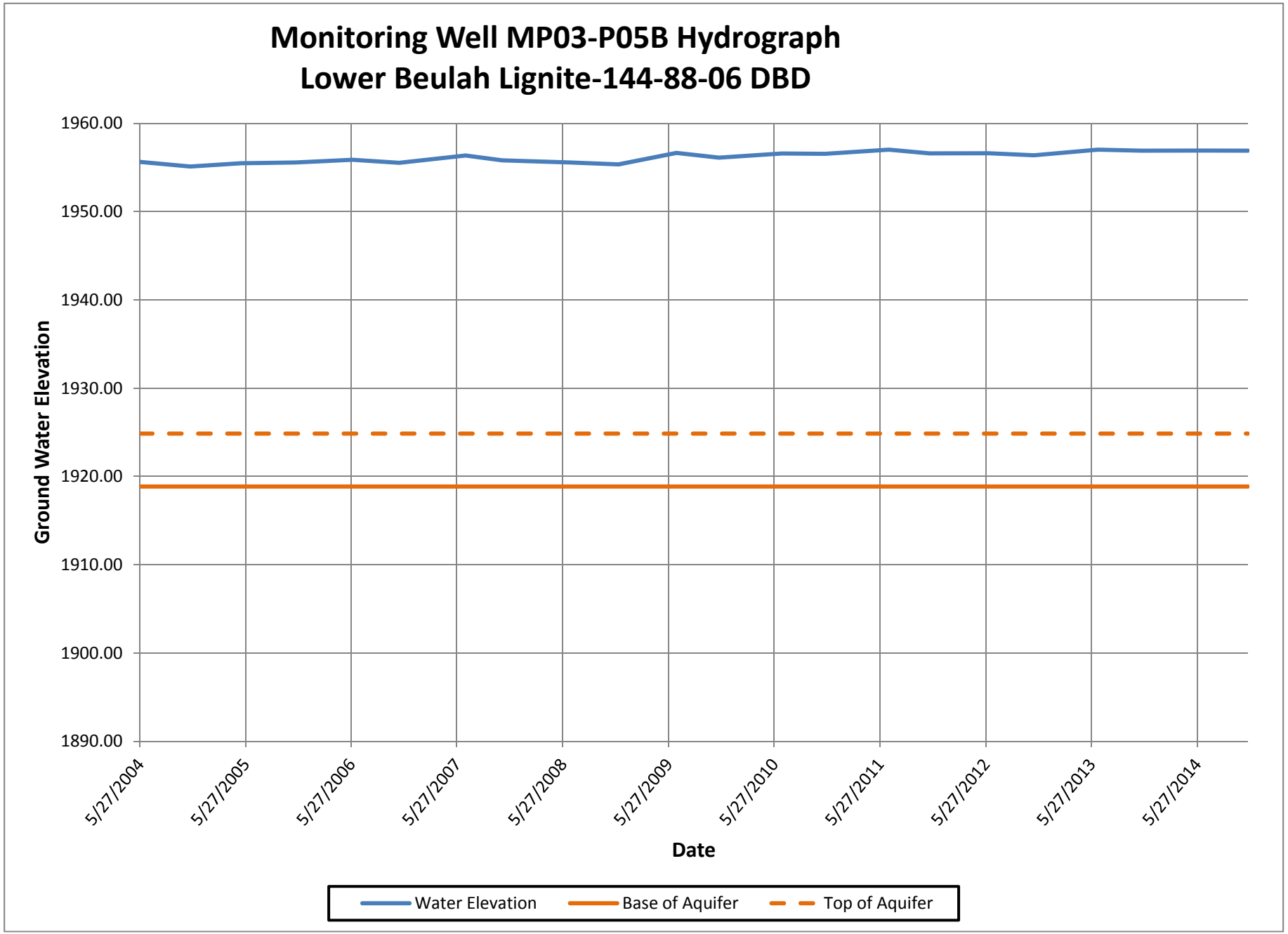

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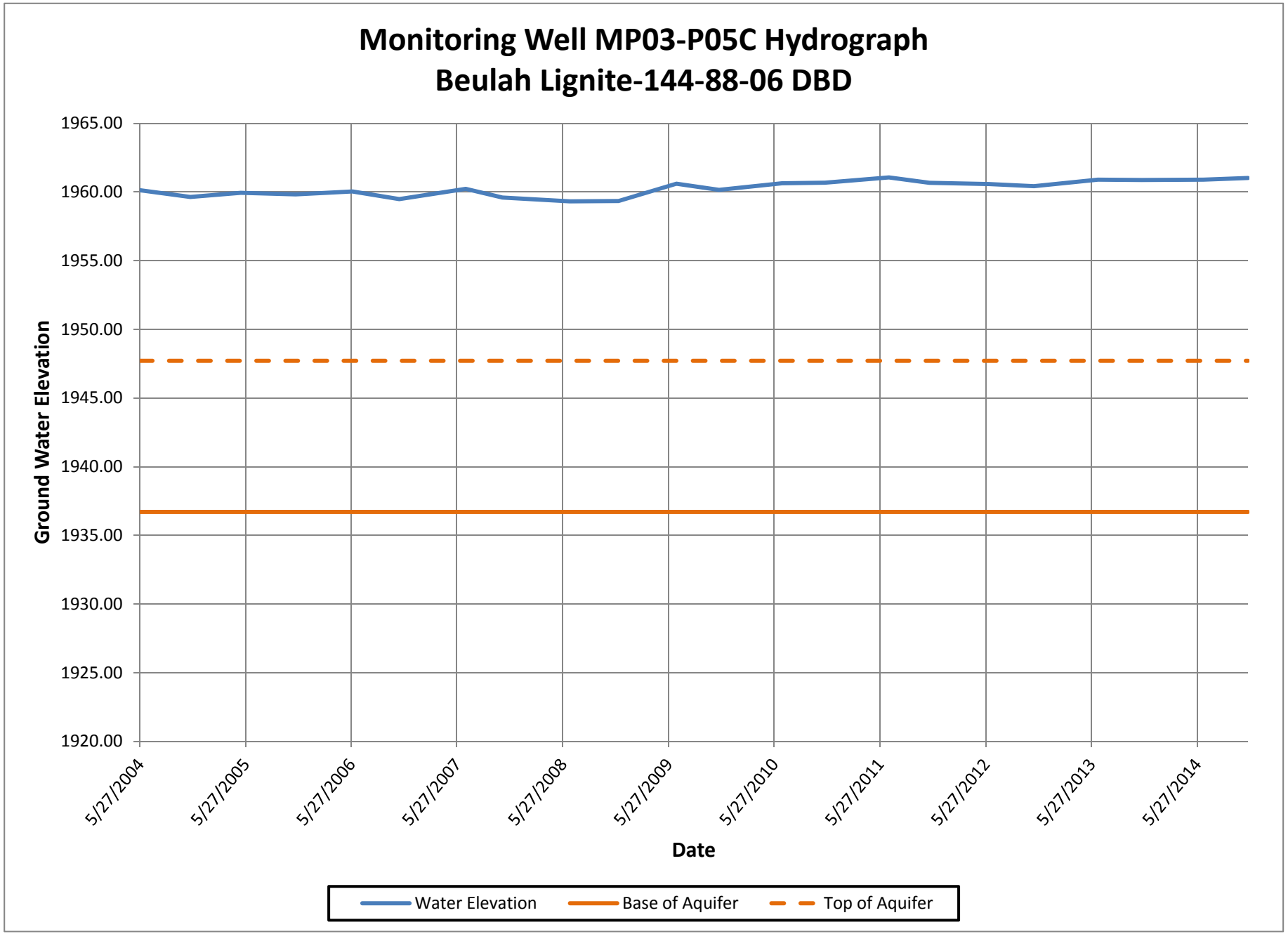

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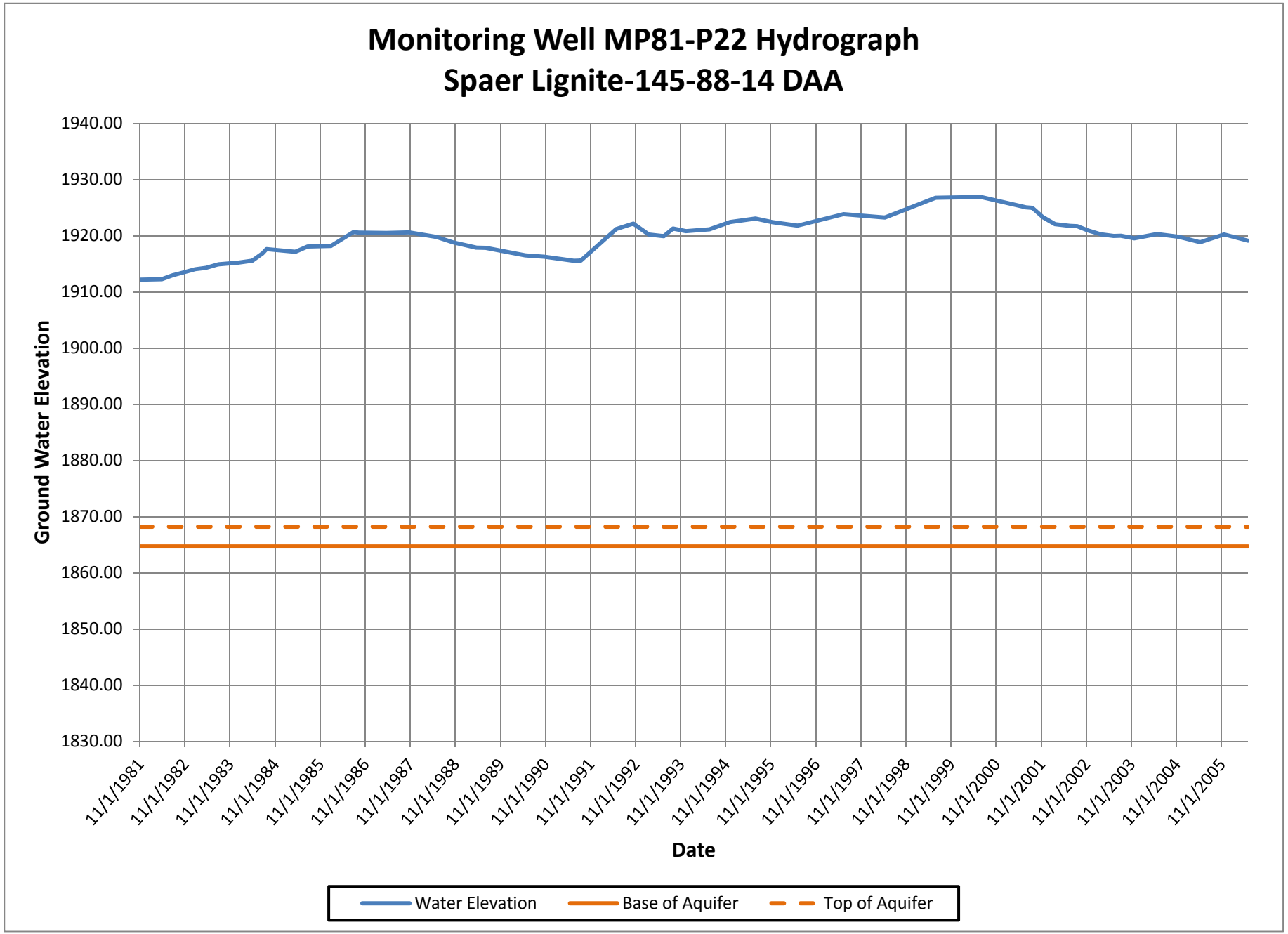

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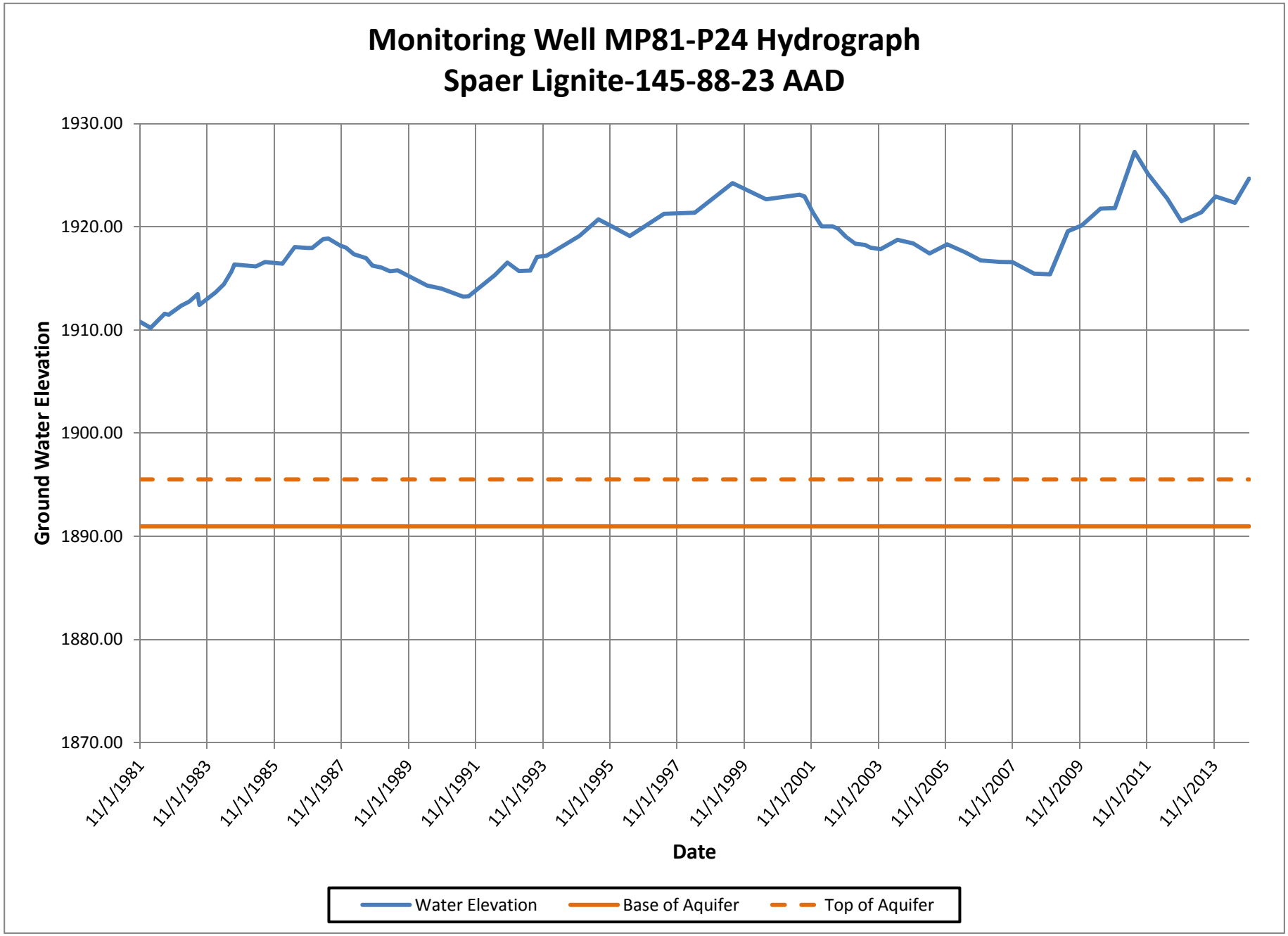
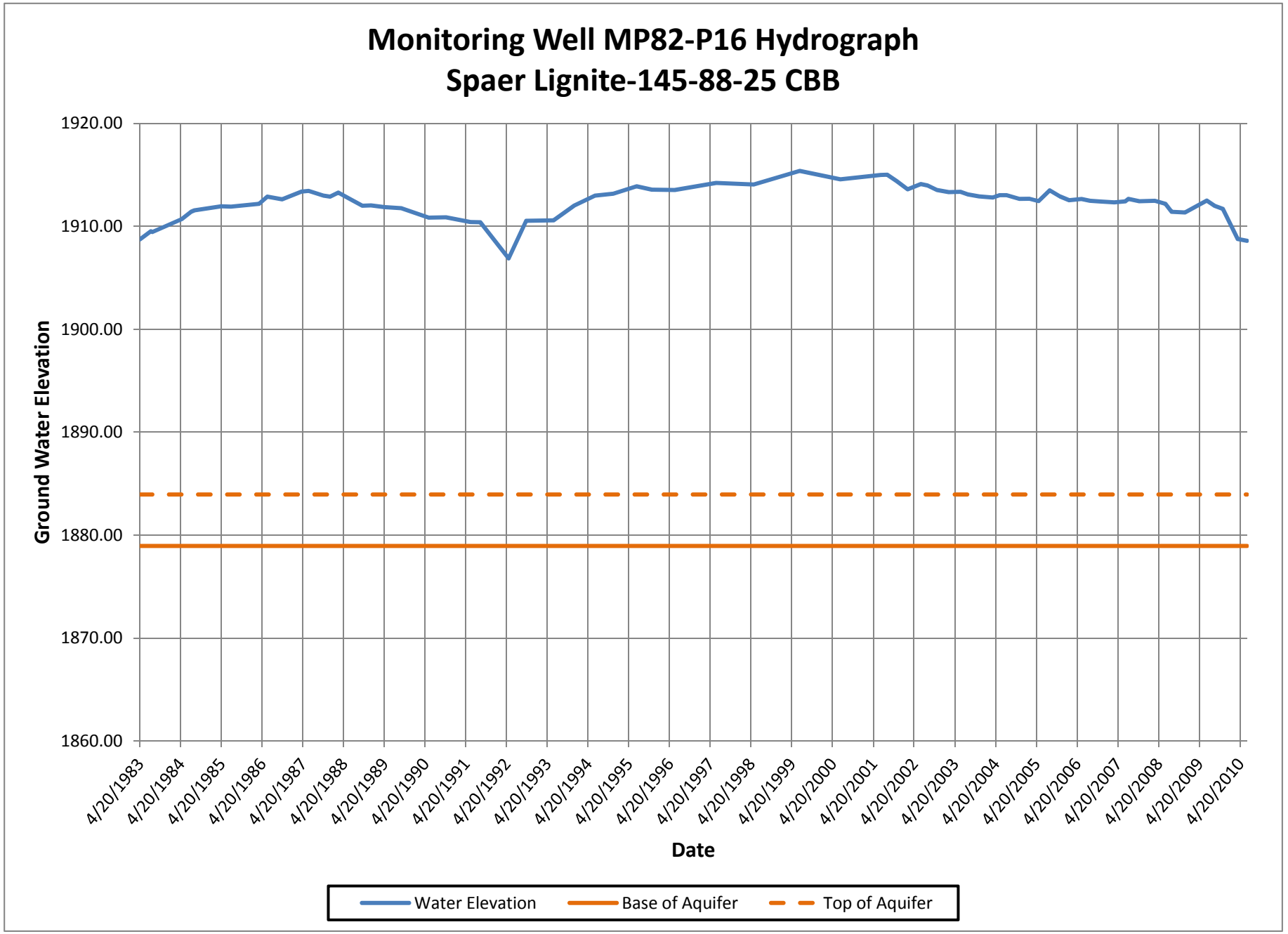

Monitoring Well MP81-P24 Hydrograph
Spaer Lignite-145-88-23 AAD
Ground Water Elevation
1930.00
1920.00
1910.00
1900.00
1890.00
1880.00
1870.00
11/1/1981
11/1/1983
11/1/1985
11/1/1987
11/1/1989
11/1/1991
11/1/1993
11/1/1995
11/1/1997
11/1/1999
11/1/2001
11/1/2003
11/1/2005
11/1/2007
11/1/2009
11/1/2011
11/1/2013
Date
Water Elevation
Base of Aquifer
Top of Aquifer



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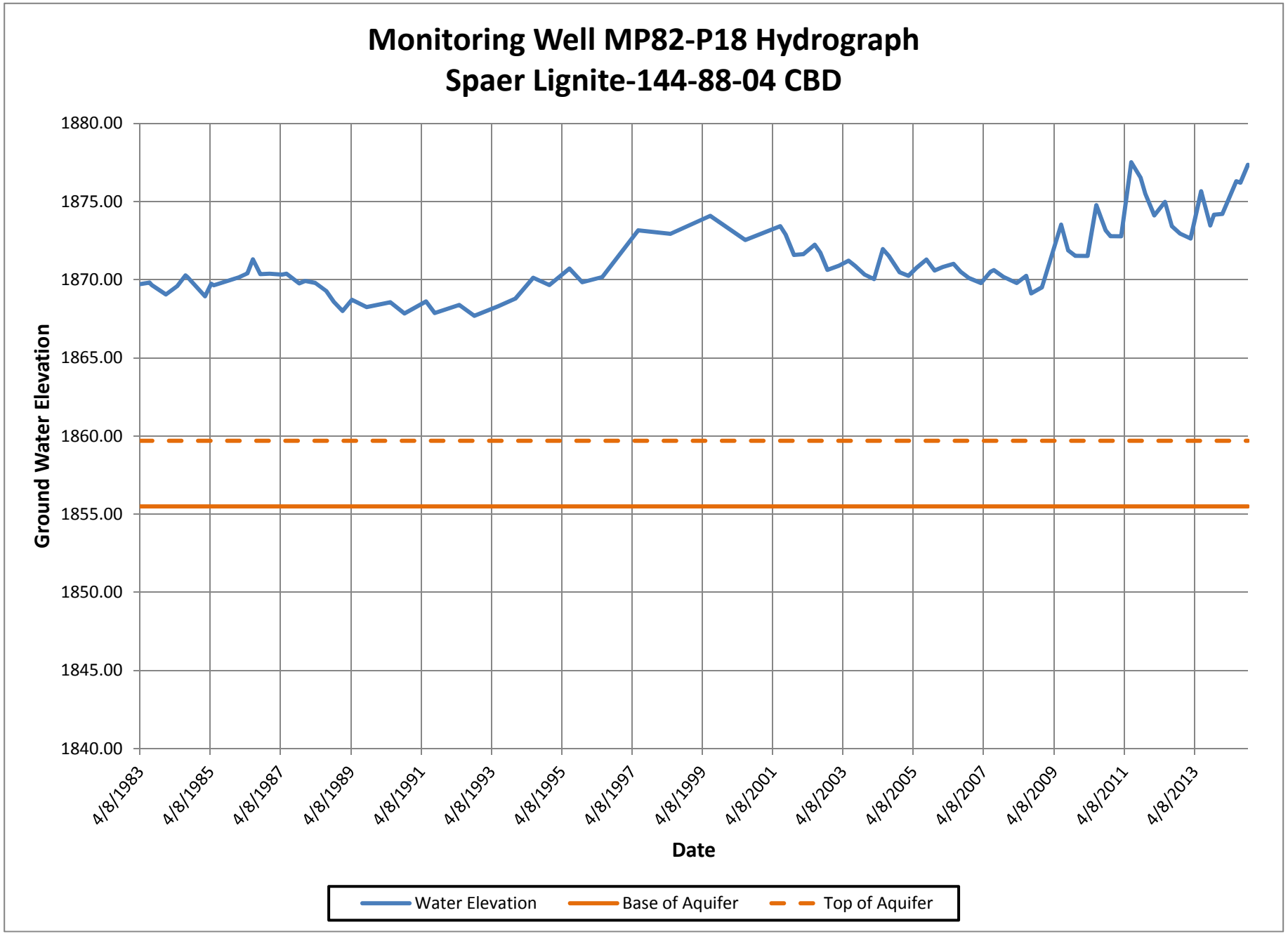

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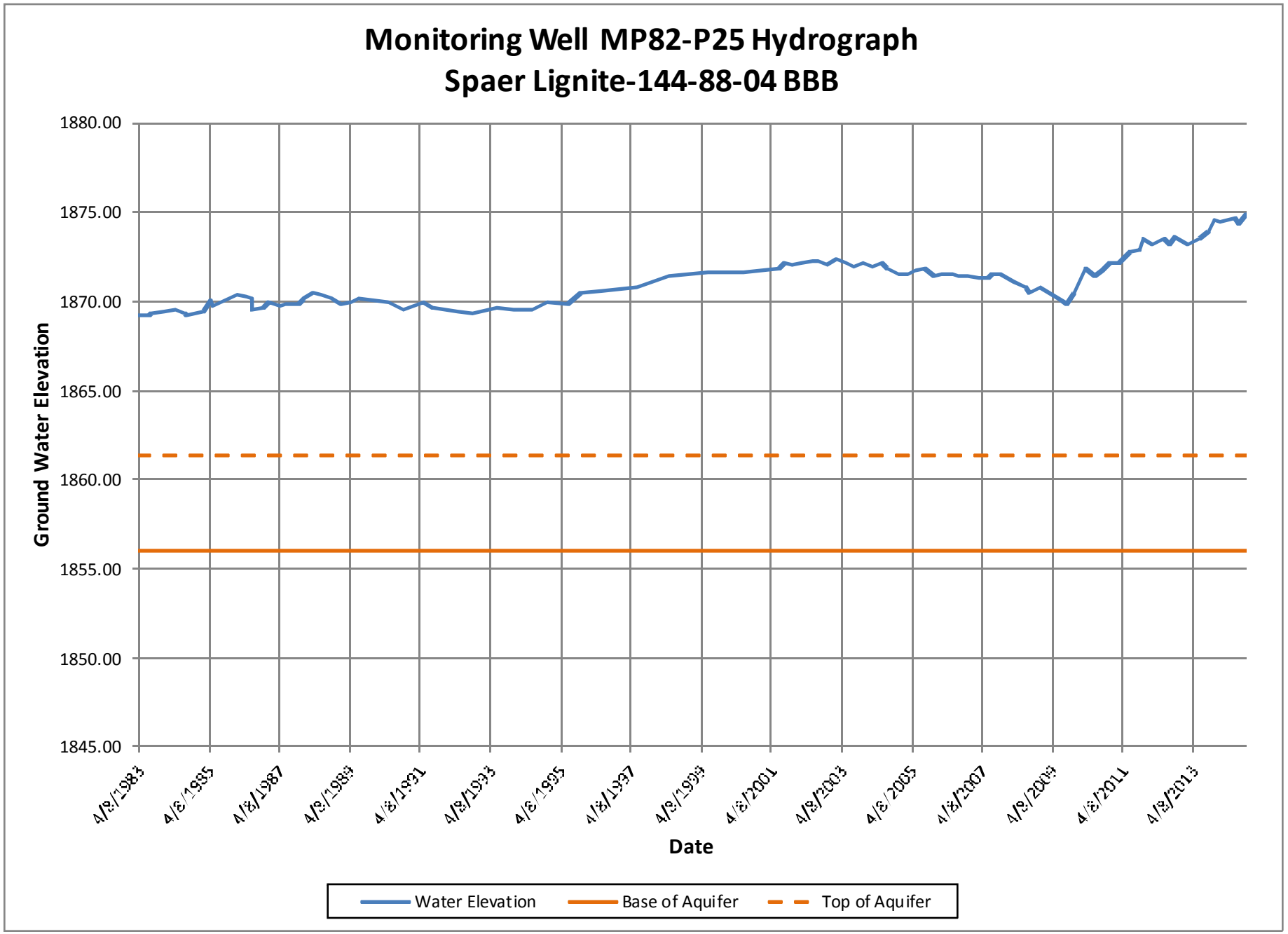

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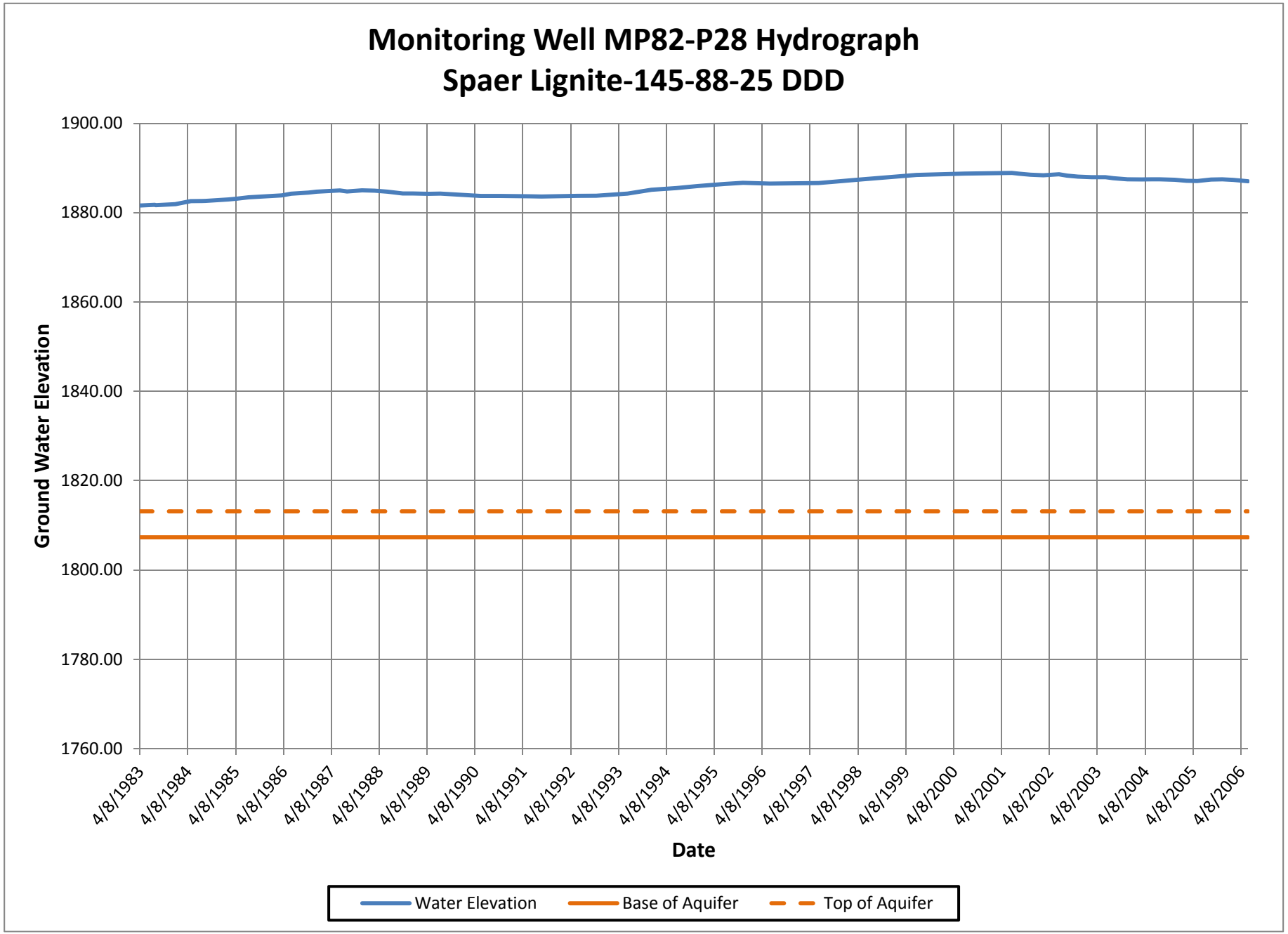

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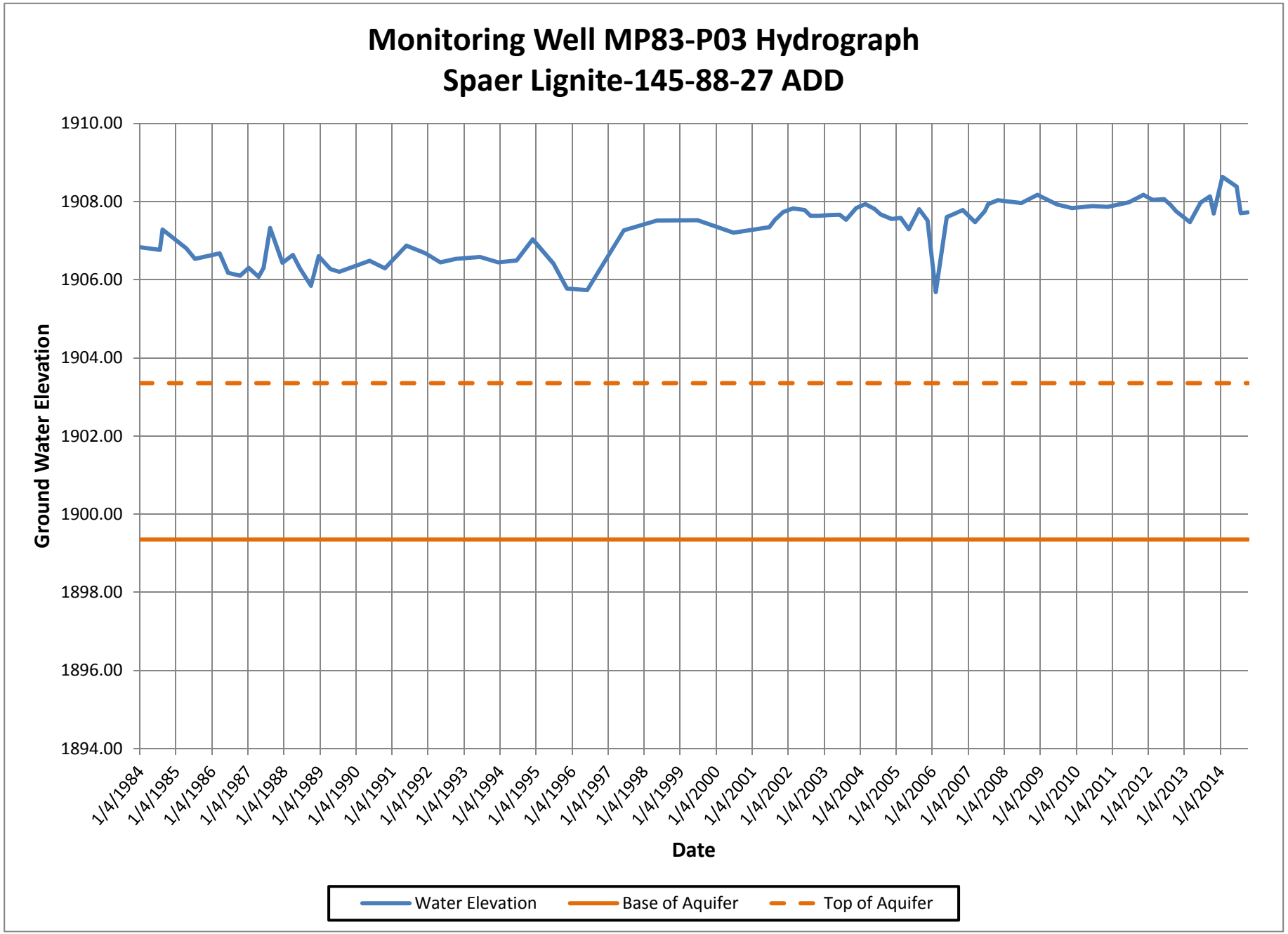

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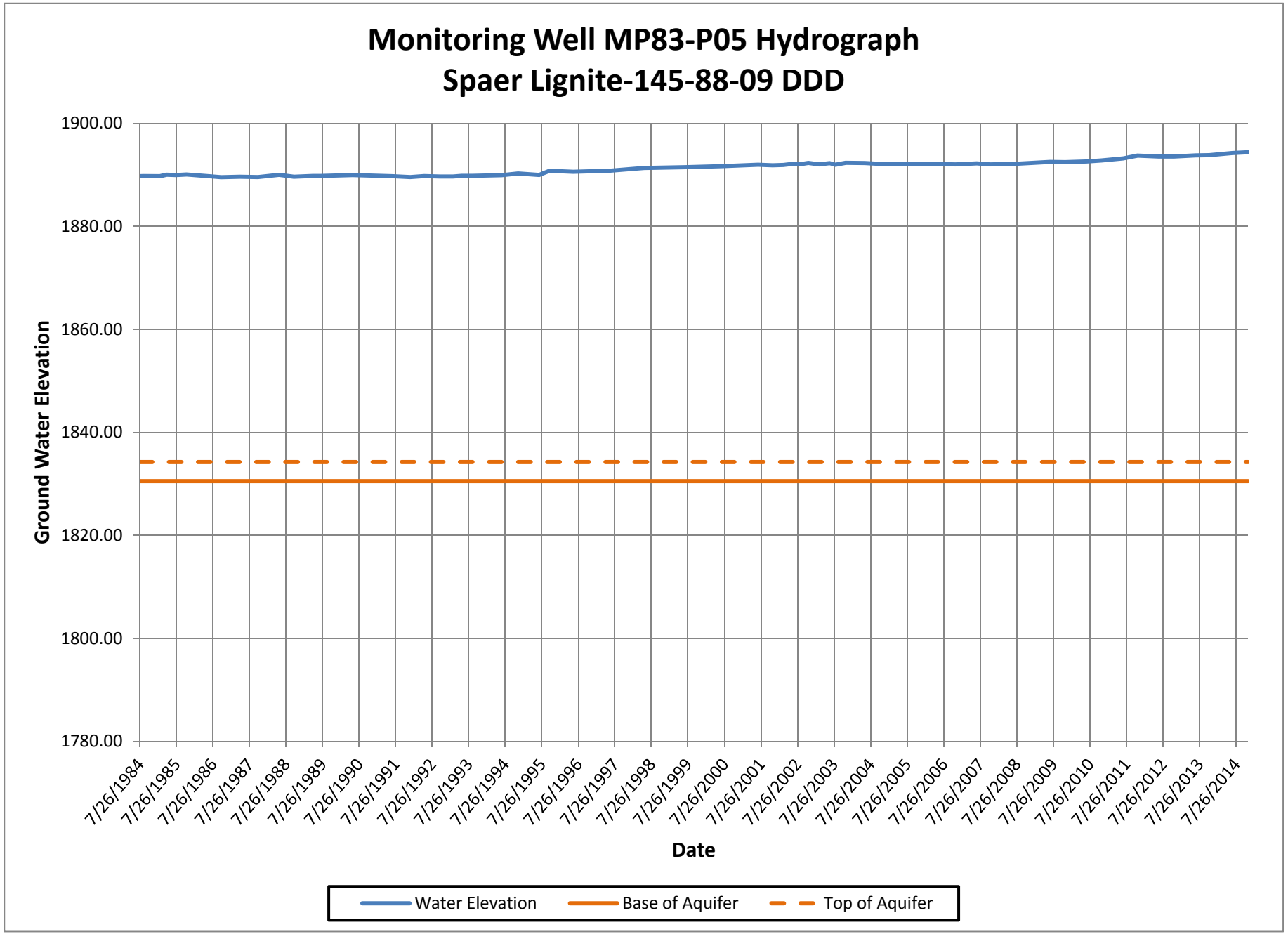
Monitoring Well MP83-P05 Hydrograph
Spaer Lignite-145-88-09 DDD
Ground Water Elevation
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1880.00
1860.00
1840.00
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1800.00
1780.00
7/26/1984
7/26/1985
7/26/1986
7/26/1987
7/26/1988
7/26/1989
7/26/1990
7/26/1991
7/26/1992
7/26/1993
7/26/1994
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7/26/1996
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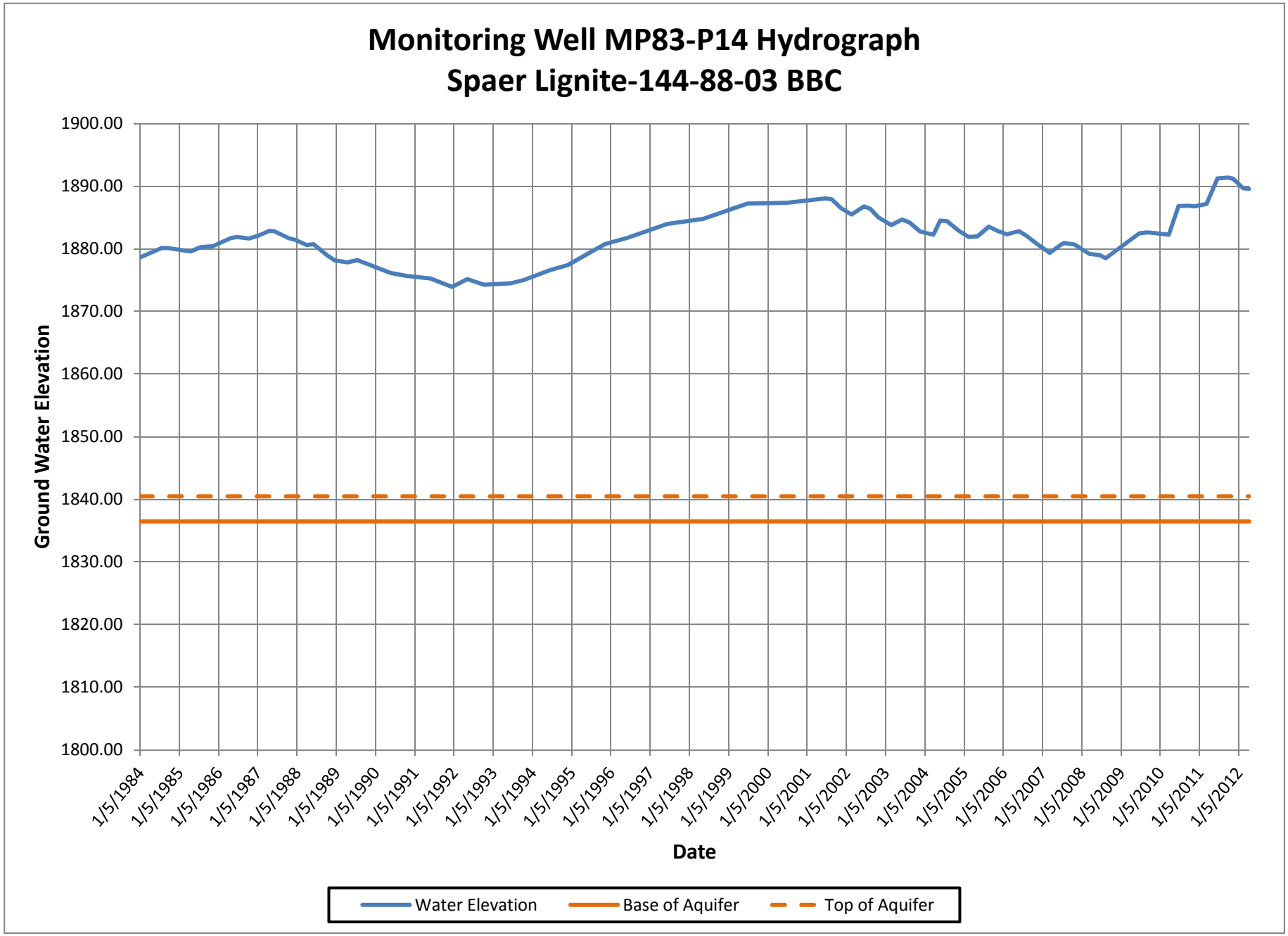
7/26/2004
7/26/2005
7/26/2006
7/26/2007
7/26/2008
7/26/2009
7/26/2010
7/26/2011
7/26/2012
7/26/2013
7/26/2014
Date
Water Elevation
Base of Aquifer
Top of Aquifer



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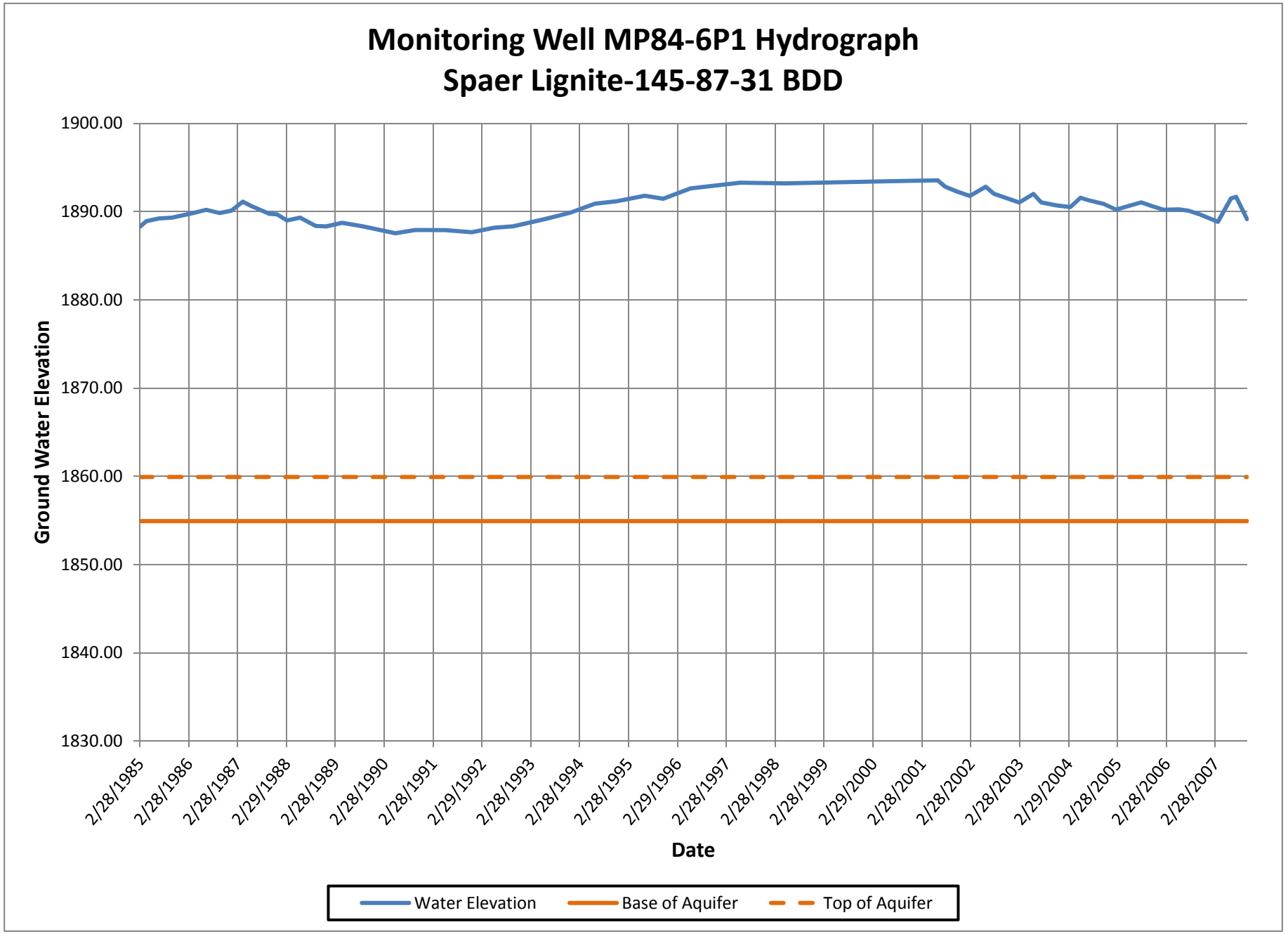

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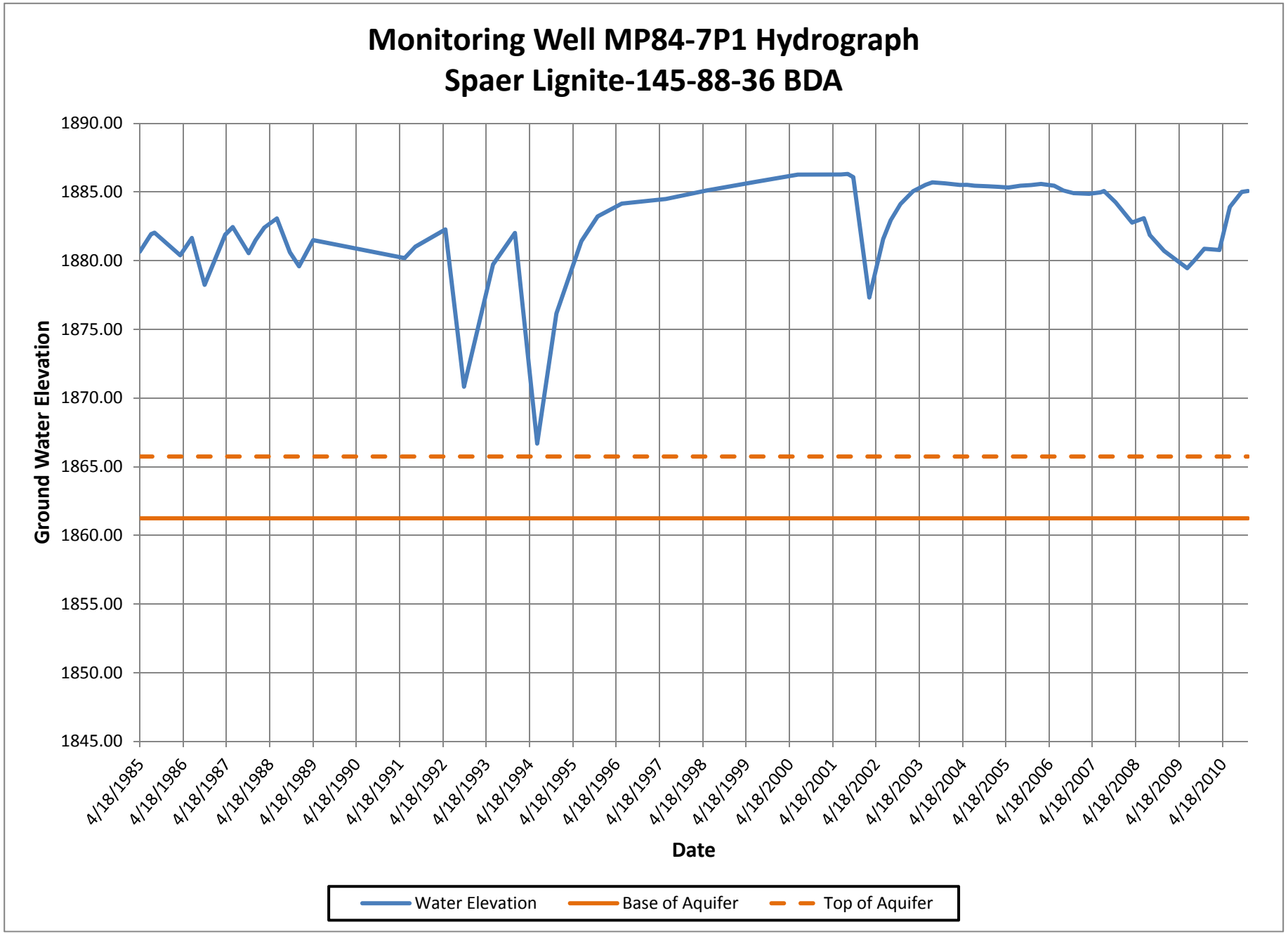

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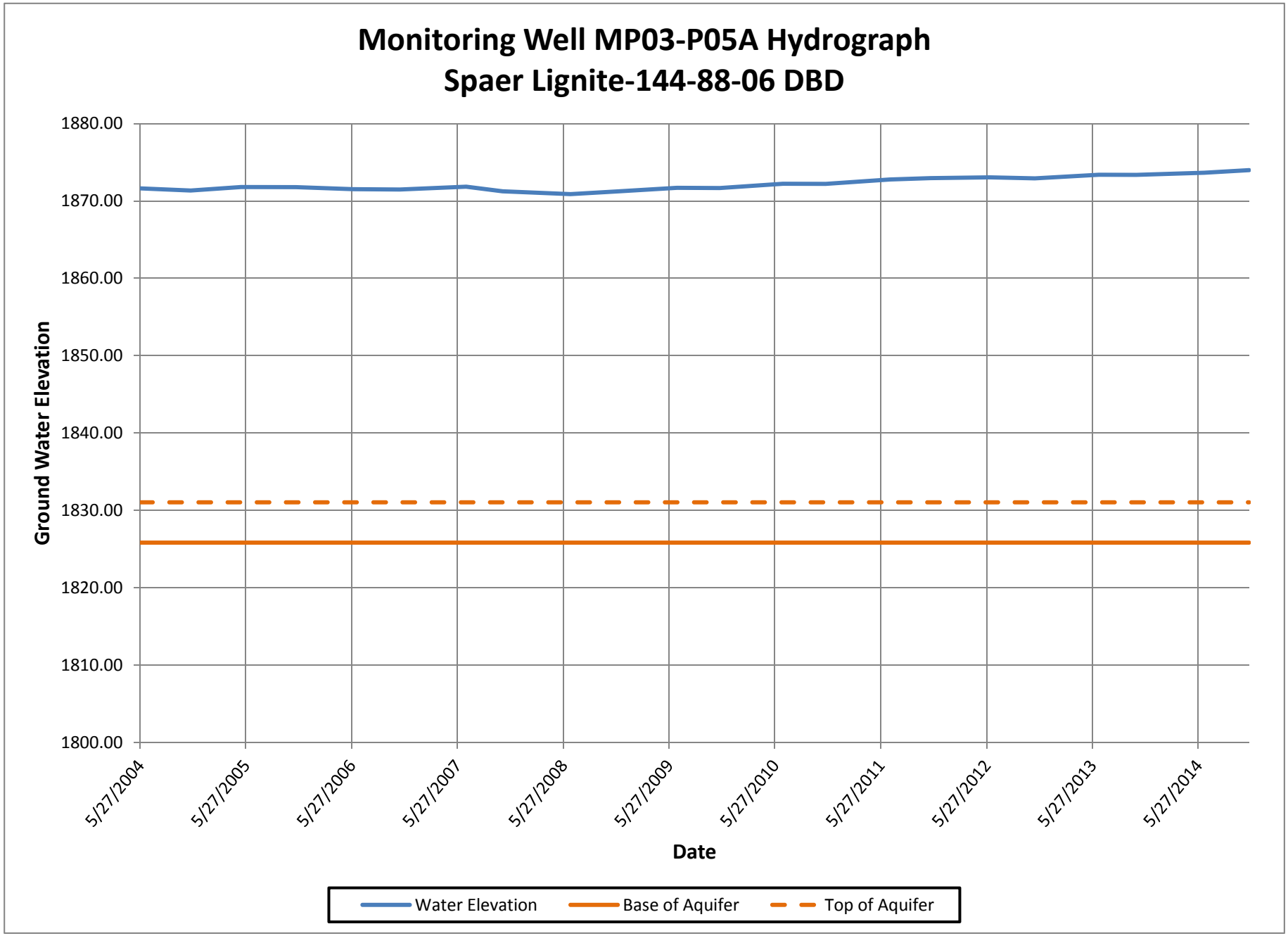
Monitoring Well MP03-P05A Hydrograph
Spaer Lignite-144-88-06 DBD
Ground Water Elevation
1880.00
1870.00
1860.00
1850.00
1840.00
1830.00
1820.00
1810.00
1800.00
5/27/2004
5/27/2005
5/27/2006
5/27/2007
5/27/2008
5/27/2009
5/27/2010
5/27/2011
5/27/2012
5/27/2013
5/27/2014
Date
Water Elevation
Base of Aquifer
Top of Aquifer