Section 4.3.1 - Narrative

Vegetation assessments on reclaimed lands will be conducted to achieve the requirements for successful vegetation specified in the latest version of the North Dakota Public Service Commission Standards for Evaluation of Revegetation Success and Recommended Procedures for Pre- and Postmining Vegetation Assessments. The mine will conduct assessments following methods also specified in these standards.

Cropland productivity will be evaluated using Natural Resource Conservation Service (NRCS) productivity indices to calculate an unadjusted yield standard. Standards will be established for each permitted section of land by owner. Regional standards will be calculated using these individual standards where appropriate. If there is not a great disparity between prime and non-prime farmland production, a combined standard will be developed. In areas where regional standards are used, a combined standard will be generated by using the regional unadjusted prime and non-prime cropland standards, and weighting them by the acreage of prime and non-prime farmland in the reclamation tract. The standard will be adjusted for annual climatic variations using annual county yield data, or cropland control areas, whose locations will be determined after reclaimed fields have been established. Crops will be sampled using standard combining procedures with normal field rotation practices.

Native grassland productivity will be evaluated using NRCS production values in conjunction with reference area data to correct for climatic variations. Cover will be evaluated using basal cover (10 point frame) measurements. Diversity will be evaluated using relative cover or yield measurements to attain the standard in place at the time of bond-release. Seasonality will be evaluated using relative cover or yield measurements to attain the standard in place at the time of bond release. Proposed reference area locations are shown on the map in Section 2.4.7.1. These are sites that were sampled for baseline permit data that have been identified as being both outside of the anticipated disturbance boundary and representative of the dominant native grassland ecosites that are projected for disturbance. Sampling results to determine a similarity index for the sites can be found in Section 2.4.7.4. A different set of potential reference area sites had been identified and sampled for cover in 2013, but after additional cropline drilling was completed, it was determined they would be disturbed by mining, so new sites were ~~selected~~ proposed after the 2013 field season was over. However, at this time they haven't yet been ~~Because of this change, cover data is not available for the sites being proposed here, but it will be collected in 2014 and added to the permit. Reference areas will be inspected~~approved by the PSC ~~for approval~~. Additionally, as part of the 2015 orders issued in response to the formal hearing on NACC-1302, Casey Voigt will be consulted on the selection and management of reference areas to be used to demonstrate reclamation success of reclaimed native grasslands that he owns. After Casey Voigt and the PSC review reference area sites and they have been approved, they will be added to the permit.

To identify which ecosites needed to be represented by reference areas, the two dominant sites within the anticipated disturbance boundary were identified for each landowner. This was done by utilizing Section 2.4.7.2 Ecological Site Acres by Owner Table, Section 2.4.7.1 Ecological Site Map, and the anticipated disturbance boundary. It appears this method resulted in a complete

list of the dominant sites found within the permit area since this list also happens to include all sites that make up more than 10% of the native grassland as calculated using Section 2.4.7.2. Results follow:

Ecological Site	Ownership Where Identified as a Co-dominant Site	Reference Area Location
Cp	ND State, Unruh, P Winkler, Winkler et al, Young Paine Trust	Sec 19
Sa	CCMC, Gunsch, Schwalbe	Sec 31
Sy	CCMC, Voigt, Young Paine Trust, Gunsch, Ottertail et al, Schwalbe	Sec 23
Ly	Voigt, ND State, Ottertail et al	Sec 12
SwLy	Swenson, Unruh, Winkler et al	Sec 27
TCp	Swenson, Unruh, P Winkler	Sec 3*

* The TCp sites that were sampled for baseline permit data are all projected for disturbance. Therefore, a new site will be sampled to establish a reference area in Section 3.

Other reclaimed surface mines have historically struggled with the invasion of introduced species into reclaimed native grasslands. This happens for multiple reasons, including, but not limited to: introduced species seed bank from respread soils, inability to manage reclaimed native grassland tracts of small size and limited water sources. In an effort to reduce the long-term effects of these two short-term challenges regarding invasive species on reclaimed native grasslands at CCMC and provide the best possible end result for the surface owner, CCMC plans to adjust the typical early stages of the native grassland reclamation process, delaying the first normal period after topsoil has been respread to reflect the longevity of the stand and allow for the elimination of introduced species overtaking native areas. The initial seeding to native grassland on a reclaimed tract will require and CCMC requests a seeding delay until at least two years before the tract can be managed utilizing cattle grazing, the most effective management tool for a native grassland tract. Since the limiting factors for grazing are typically size of the tract and water resources, approximately two years before the appropriate size (approximately 80 acres) and water resource will be available for a manageable unit, the tract will be seeded into native species to allow for a stand to be established prior to grazing. In the time leading up to final seeding, the respread land will be managed to both stabilize the landscape and eliminate any remaining seed bank, utilizing herbicide application and reducing erosion by seeding cover crops, including annual crops and possibly longer-term temporary stands utilizing the pre-cropland hayland mix in Section 4.2.2 to allow surface owners to harvest the stand for hay and to stabilize drains and areas exceeding 9% slopes. These seedings, along with delayed areas, will be tracked on an annual basis.

Tame pastureland production will be evaluated using NRCS yield estimates as explained in the North Dakota Public Service Commission Standards for Evaluation of Revegetation Success and Recommended Procedures for Pre- and Postmining Vegetation Assessments. Unadjusted yield standards will be corrected for climatic variations using annual county yield data (Correction Method 1).

Replacement shelterbelts will be evaluated as described in the North Dakota Public Service Commission Standards for Evaluation of Revegetation Success and Recommended Procedures for Pre- and Postmining 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, will be evaluated with associated land uses. All other wetlands will be evaluated following the North Dakota Public Service Commission Standards for Evaluation of Revegetation Success and Recommended Procedures for Pre- and Postmining Vegetation Assessments.

Replacement woodlands will be evaluated as described in the North Dakota Public Service Commission Standards for Evaluation of Revegetation Success and Recommended Procedures for Pre- and Postmining Vegetation Assessments.

Standards will be calculated once disturbance boundaries (mining and associated disturbance) are known, therefore minimizing the need to recalculate standards as they are finalized.