

PUBLIC SERVICE COMMISSION

Reclamation Division

Memorandum

TO: Commissioners Clark, Kalk and Cramer
Darrel Nitschke
Illona Jeffcoat-Sacco

FROM: *JJ* Jim Deutsch, *DKM* Dean Moos and *AW* Guy Welch

DATE: March 14, 2012

SUBJECT: Bond Release No. 7 for Surface Coal Mining Permit BCGH-8204, Basin Cooperative Services, Case No. RC-11-30

SUMMARY

On January 12, 2011, Basin Cooperative Services (BCS) filed Bond Release Application No. 7 to Surface Coal Mining Permit BCGH-8204. This application requests final bond release on 2,378.8 acres of land at the former Glenharold Mine near Stanton, of which 1,439.6 acres were disturbed and reclaimed. This acreage is comprised of approximately 1,047.4 acres of reclaimed native grassland, 268.6 acres of hayland (of which 172 acres were seeded to warm season native grasses), 5.4 acres of cropland, 82.4 acres of woodlands, 25.9 acres of developed water resources, and 9.9 acres of conservation field windbreaks. This bond release application contains 5 tracts of land that are further subdivided by land use and reclamation law period. While most of the acreage is subject to the current reclamation law that was enacted in 1979, this bond release application contains areas of pre-law spoils, some of which were re-affected to support present law mining activities, and some areas that were mined under North Dakota's pre-1979 reclamation laws. Except as otherwise noted in the discussion below, the productivity of the reclaimed land must be restored to pre-mine levels. The Reclamation Division has conducted a detailed review of the bond release application and inspected the reclamation tracts. The Reclamation Division recommends final bond release approval on all of the acreage involved.

DISCUSSION

This bond release includes areas in Sections 13 and 14, T144N, R85W, and Sections 21, 27, 31, 32 and 33, T144N, R84W, Mercer County and Sections 4 and 5, T143N, R84W, Oliver County. Basin Cooperative Services and Basin Electric Power Cooperative own most of the acreage included in this bond release application. Attached Figure 1 is an aerial photo showing the location of each tract and Figures 2, 3 and 4 provide additional details for subareas within the tracts. Table 1 lists the post-mine land use acreage, applicable reclamation law periods, and surface ownership information by tract and subtract.

Some of the acreage included in this bond release application was initially permitted and disturbed by Consolidation Coal Company (Consol) under North Dakota's early reclamation laws. BCS bought the Glenharold Mine from Consol and re-permitted this acreage and other lands as part of Permit BCGH-8204 that was approved December of 1983. It should be noted that areas mined under the early laws and

then used in support of later mining had to be re-permitted and are subject to the applicable requirements of the current North Dakota reclamation law that was enacted in 1979.

Mining in the bond release tracts occurred from 1969 through 1991. Active coal mining ceased at the Glenharold Mine in 1993. Grading, soil respreading and seeding of the bond release tracts occurred from the early 1970's through the spring of 2000. Limited or no soil was available for respreading on the areas disturbed under the 1969 and 1971 reclamation laws; however, a few inches of topsoil and/or subsoil were respread on some of these areas that were used in support of mining after the 1979 law was enacted. Topsoil had to be saved from area mined under the 1973 reclamation law and all available topsoil and subsoil had to be saved and respread on areas mined after July 1, 1975.

Generally, 9 to 13 inches of topsoil was respread on areas reclaimed to native grassland in the northwest portion of the mine (Sections 13 & 14) with 28 inches of subsoil while the cropland (hayland) and native grassland that had a pre-mine potential to be cropped was respread with approximately 13 inches of topsoil and 28 or 29 inches of subsoil. The reclaimed native grassland and hayland in Sections 4 and 5 were respread with similar amounts. The reclaimed native grassland in Section 31 was respread with 3 to 8 inches of topsoil and 2 to 7 inches of subsoil. The topsoil and subsoil thicknesses varied based on the amount of suitable soil material that could be salvaged from these tracts. The actual soil respread thicknesses on each tract were verified by Bill Gunnerson of the Reclamation Division in the fall of 2010 and 2011 and no concerns were noted.

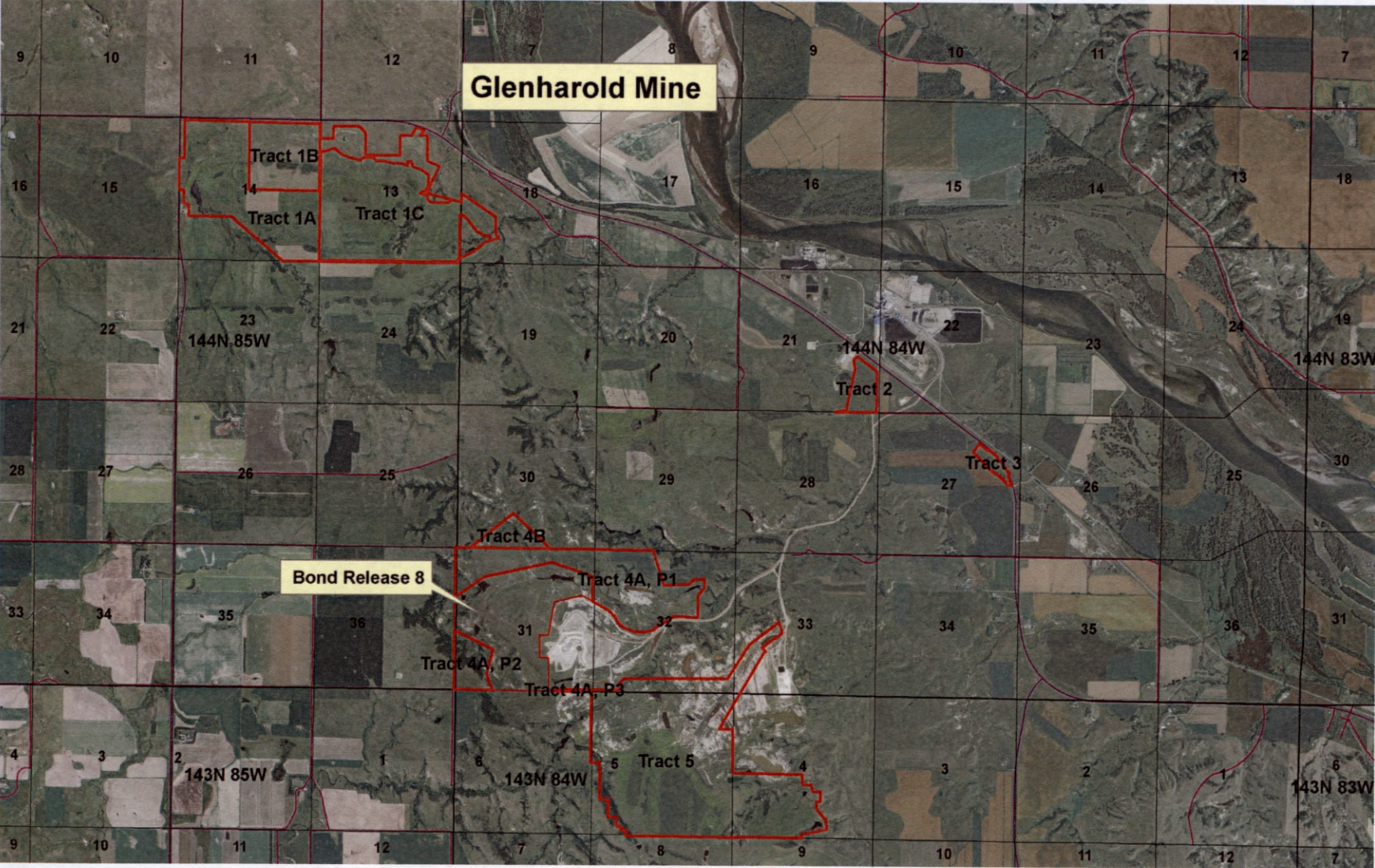
The bond release areas are divided into five tracts and further divided into subtracts based on surface ownership and postmine land use. Partial bond releases 1 and 2 were previously approved for this permit for the completion of backfilling and grading on 449.17 acres and soil respreading on 367.69 acres. Therefore, vegetation establishment and final release is being requested for these areas and all four stages of bond release (backfilling and grading, topsoil and subsoil respreading, vegetation establishment and final release) are being requested for the remainder of the reclaimed land. Revegetation success for all land uses except woodlands must be demonstrated for any two years after year six of the responsibility period. Data from only the last year of the responsibility period is required for woodlands. Revegetation success summary information for the various land uses is discussed below and summarized in the accompanying tables. The land uses by ownership area shown in Table 1 and Figures 1 shows the bond release tracts.

Tract No.	Ownership	Total Acres	Native Grass land	Wood land	Crop land	Hay land	Ponds	Field Wind Break	Not Disturbed
Tract 1A & 1C	BCS	896.30	487.8*	41.6	0	130.5	11.4	6.9	218.1
Tract 1B	Boeckel	151.25	103.9	15.5	0	0	0	0	31.9
Tract 2	BCS	40.75	17.7	0	0	0	0	0	23.1
Tract 3	BCS	16.99	0	0	0	13.8	0	0	3.2
Tract 4A	BCS	365.18	123.5**	2.6	5.4	0	0	0	233.7
Tract 4B	Slinde	44.15	5.8	0	0	0	0	0	38.4
Tract 5	BCS & GRE	864.13	308.8**	22.6	0	124.4	14.5	3.0	390.8
Total Acres		2378.75	1047.4	82.4	5.4	268.6	25.9	9.9	939.2

*Includes 65 acres of native grassland reclaimed as potential cropland

**Includes re-disturbed orphan spoil

Figures 1:



NATIVE GRASSLAND

The reclaimed native grasslands are well established with the seeded native species. These reclaimed grasslands yielded exceptionally well in 2011 and the vegetation is providing excellent ground cover. The warm season species, particularly big bluestem, switchgrass, Indiangrass, little bluestem and sideoats grama, are the dominant species established on the areas with sandy textured soils in Sections 13, 14, 18, and portions of Section 5. Prairie sandreed and sand bluestem are generally present in variable quantities. Western wheatgrass and green needlegrass are more prevalent on areas with finer textured soils, such as Section 31, but the warm season species are also present in good quantities on these areas. Kentucky bluegrass is present throughout the reclaimed native grassland and smooth brome grass is present in variable quantities throughout the native grassland tracts. During the final bond release inspection, smooth brome grass appeared to be more prominent on the reclaimed native grassland in Sections 13 and 18 where prescribed grazing was not applied during the responsibility period; however, these areas are subject to the 1975 reclamation law that did not include diversity and seasonality requirements. Intermediate wheatgrass was present on the reclaimed native grassland in areas surrounding the reclaimed hayland fields in Section 5 and in a portion of Section 31.

Approximately 65 acres of reclaimed native grassland in the SW $\frac{1}{4}$ of Section 13 and SE $\frac{1}{4}$ of Section 14 were reclaimed with the potential for converting to cropland. Thicker depths of soil were respread on these areas and the topography was shaped to accommodate cropping practices should that be the desire of a future landowner.

Redisturbed pre-law (orphan) spoil and areas subject to North Dakota's early reclamation laws, where a limited amount of soil was respread, are also generally well established with a mixture of introduced and native grasses. BCS respread some soil on many of these areas even though it was not required under the applicable law.

No specific revegetation standards apply to lands that are subject to the 1969, 1971 and 1973 reclamation law periods; however, areas that were used in support of mining under the present law must have sufficient ground cover to protect them from erosion. The 1975 reclamation law requires that the pre-mine productivity levels be restored, but no specific species diversity and seasonality standards apply. The 1978 interim rules are very similar to our present reclamation requirements and production, ground cover, diversity, and seasonality standards apply.

Mining companies must demonstrate that reclaimed native grasslands yield as good as or better than the pre-mine native grasslands during any two years after year six of the ten-year revegetation responsibility period. The calculated productivity standard is based on the pre-mine soils and is climatically adjusted annually with the use of native grassland reference areas on nearby undisturbed lands. The ground cover standard is developed using native grassland reference areas and a value that the Agriculture Research Service (ARS) determined to be sufficient for erosion control. The diversity standard requires that at least five native grass species be present on the reclaimed tract and native species must comprise at least 65% of the total vegetative composition. The seasonality standard requires that warm season grasses comprise be at least 15% of the composition. In addition, four native grass species must each contribute at least 3% relative live basal cover or 5% relative composition by weight. Of these four species, at least two must be warm season species and at least one must be a cool season species. Table 2 is a summary of the revegetation bond release parameters for each tract.

The bond release application includes vegetation sampling data demonstrating that the required revegetation standards have been achieved on each tract of reclaimed native grassland. The permanence standard is achieved by the continued persistence of the seeded grass species.

TABLE 2: Reclaimed Native Grassland Summary										
Tract	Years Sampled	Production (lbs/ac)		Ground Cover (%)		Total No. Native Species (5)	No. Native >3 Live Basal Cover		% Warm Season Species 15%	Percent Native 65%
		Standard	Reclaimed	Standard	Reclaimed		Cool (1)	Warm (2)		
1A, Part 1	2006	1155	1895	95.8	96.5	12	1	5	57.1	73.1
	2009	2502	2703	95.9	95.9	11	1	5	57.0	72.9
1A, Part 3	2008	1468	1784	95.9	100	5	1	4	64.9	73.0
	2009	2502	2759	95.9	100	6	2	4	54.5	72.7
1B	2006	1333	2027	99.5	97.4	10	2	4	70.2	87.1
	2009	2415	3244	99.5	98.4	9	1	6	61.1	80.2
1C 75/79law Sect 13	2008	1555	2175	99.6	99.5	7	2	4	40.2	75.2*
	2009	2685	3080	99.6	99.3	11	1	3	37.0	79.6*
1C75/79 law Sect 18	2008	1555	1948	99.6	99.5	4	1	2	46.9	81.6*
	2009	2685	2821	99.6	99.5	6	2	2	51.2	87.8*
2 (1969) Facilities	2008	N/A: 1969 Law		73	99.8	N/A	N/A	N/A	N/A	N/A
	2009			73	99.4	N/A	N/A	N/A	N/A	N/A
4A, P1 Sect 31	2008	1186	2437	93.6	98.4	7	1	3	31.7	78.0
	2009	1800	2193	93.4	98.5	8	2	5	41.6	84.4
4A, P1 Diversion	2008	1186	1792	93.6	98.0	5	1	3	30.9	69.1
	2009	1800	2194	93.4	97.1	6	1	4	45.9	83.8
4A 73 law P3, Sect 31	2009	N/A: 1973 law Redisturbed Orphan Spoil		73	89.0	N/A	N/A	N/A	N/A	N/A
	2010			73	88.6	N/A	N/A	N/A	N/A	N/A

TABLE 2 (continued)										
Tract	Years Sampled	Production (lbs/ac)		Ground Cover (%)		Total No. Native Species (5)	No. Native >3 Live Basal Cover		% Warm Season Species 15%	Percent Native 65%
		Standard	Reclaimed	Standard	Reclaimed		Cool (1)	Warm (2)		
4A 73 law P1, Sect 32	2007	N/A: Orphan Spoil		73	97.4	N/A	N/A	N/A	N/A	N/A
	2008			73	97.5	N/A	N/A	N/A	N/A	N/A
4B	2008	1372	2050	87.6	99.0	7	3	3	15.5	86.8*
	2009	2113	2993	87.5	98.8	9	2	3	21.3	72.4*
5 (1979) Sect 4	2007	1197	2159	91.1	100	7	3	4	46.4	75.5
	2009	2255	2831	92.2	100	5	2	3	44.6	94.1*
5 (Prelaw) Sect 4	2009	N/A: Redisturbed Orphan Spoil		73	96.4	N/A	N/A	N/A	N/A	N/A
	2010			73	96.4	N/A	N/A	N/A	N/A	N/A
5 (1979) Sect 5	2002	1232	2186	92.3	100	7	2	3	67.7	79.7
	2006	1179	1870	92.1	99.9	6	2	3	67.2	72.0
5 (Prelaw) 5 & 33	2006	N/A : Redisturbed Orphan Spoil		73	95.3	N/A	N/A	N/A	N/A	N/A
	2010			73	92.6	N/A	N/A	N/A	N/A	N/A

*Kentucky bluegrass included, to the extent present on the native grassland reference area, to meet 65% native requirements

CROPLAND

This bond release application has only one tract of cropland, 5.4 acres in Tract 4A, Part 1, in Section 32. This cropland is part of a larger field but only a portion was disturbed to construct a dragline trail. The cropland was respread with 15 inches of topsoil and 21 inches of subsoil. This cropland was reclaimed in 1994 and was cropped and managed with the adjacent undisturbed cropland where a cropland control area was established. The reclaimed and undisturbed cropland was managed the same during the revegetation responsibility period. The unadjusted yield standard for the reclaimed area and the control area is 29.6 bushels of wheat per acre. The pre-mine soil survey documents that reclaimed cropland and control areas are comprised of a single soil mapping unit. Therefore, a direct comparison of the yields can be made between the reclaimed cropland and the control area.

The cropland revegetation success standards require that reclaimed cropland yields be equal or greater than that of the approved control area with ninety percent statistical confidence during any two years after year six of the ten-year responsibility period. Hand harvesting data included in the bond release application shows that the reclaimed field yielded 30.2 bushes of spring wheat in 2007 while the control area yielded 27.3 bushels per acre. In 2009 the control area yielded 35.4 bushels of wheat per acre while the reclaimed tract yielded 37.7 bushels of wheat per acre. Therefore, the reclaimed cropland had higher production than the cropland control area.

Hayland

There are eight hayland fields in this bond release application. The hayland was respread with 9 to 14 inches of topsoil and 17.5 to 37 inches of subsoil. Five of these fields are established with a conventional hayland mixture of grasses and legumes, i.e. intermediate and tall wheatgrass and alfalfa, while three are established with native warm season grasses that include big bluestem, Indiangrass, switchgrass and sand bluestem. These hayland fields have been managed as hayland during the revegetation responsibility period, and seed was periodically harvested from the warm season native grass fields. The seeded species are well established on these hayland fields along with other invasive species, principally Kentucky bluegrass and smooth brome grass. The reclaimed hayland in Tract 1C (Section 13) was mined in the 70's and is subject to the 1975 reclamation requirements which are essentially the same as our present reclamation requirements. The reclaimed hayland in Tract 3 is associated disturbance where gravel was removed in the mid 1970's and then the area was redisturbed under our present reclamation law. BCS used two different methods to demonstrate revegetation success on this area. While the Reclamation Division normally does not allow this, an exception is being made in this instance because Tract 3 was initially disturbed in 1976 and limited soil materials were available for respraying over it. Hayland is a subcategory of cropland so the only performance standard is productivity. BCS demonstrated that the reclaimed hayland has achieved revegetation success as shown in the table below.

Tract	Year	Production (lbs/acre)	
		Standard	Reclaimed
1A, Part 1 (Section 14)	2006	1518	2709
	2009	2935	4794
1C (Section 13 - WS)	2005	2742	2940
	2009	2602	3531
Tract 3 (Former Gravel Pit)	2009	2676	2928
	2011	3279	4241

Table 3 (continued)			
Tract	Year	Production (lbs/acre)	
		Standard	Reclaimed
Tract 5 (Grass/Legume Sect. 5)	2006	1723	2233
	2009	2640	3709
Tract 5 (Section 4 – WS)	2006	1867	2106
	2009	2640	3901
Tract 5 (Section 4)	2007	1197	2159
	2009	2255	2831

WS= Warm Season native grasses

Woodlands

This bond release application contains 32 woodland plantings that comprise approximately 82.4 acres of land. These woodland plantings are located within tracts of reclaimed native grassland. Two types of woodland plantings, mixed deciduous and tall shrubs, were used to replace the pre-mine woodlands. A total of 16 tree and shrub species were planted at a rate of 2,700 plants per acre. Topsoil and subsoil were respread at the same depths as the surrounding reclaimed native grasslands. The sites were fertilized and weed competition was controlled with herbicides during the initial establishment period. The reclaimed woodlands were mostly planted in topographic sites that have concave north and east facing slopes which are better suited to woodland development. Most of the woodlands in this bond release application were planted in the 1990's.

Woodland revegetation success must be measured during the last year of the responsibility period. The revegetation success standards are based on the stocking rates and types of trees and shrubs planted. The woodland density standard is calculated using the stocking rate used for the plantings. At least 70% of the trees planted must be present at the time of final bond release and the shrub species must triple in number by suckering during the responsibility period. All planted species must be present in the reclaimed woodland and at least 60% of the number of tree species planted should be present at 50% of the initial planting rate. At least 60% of the number of shrub species planted should each comprise 10% of the density standard. The time in place requirement is satisfied if there has not been any replanting during the last six years of the responsibility period. Ground cover, including canopy cover of woody vegetation, must be adequate to protect from erosion. BCS has included woodland sampling data showing that the final bond release standards have been achieved. The density information is summarized in Table 4 below. The woodland aerial and herbaceous ground cover exceeded 97% which is greater than the 83% standard.

Overall, the reclaimed woodlands have established very well at the Glenharold Mine. The reclaimed woodlands are generally not fenced to exclude livestock and they are functioning to provide landscape diversity and wildlife habitat. The chokecherry trees in some of these woodlands are affected by western X disease, which is a disease that kills chokecherry trees. There is no treatment available to eradicate this disease. Three small woodland plantings were noted as being marginally successful during the final bond release inspection. One is located in Section 31 where very little topsoil or subsoil was available from the premine soils, one is located in Section 5 and one is located in the SE1/4 of Section 15. Buffaloberry is essentially the only species surviving in these woodland plantings. BCS was required to replace a total of 225.8 acres of woodlands at the Glenharold Mine; however, an additional 36.4 acres of woodlands were planted on reclaimed lands in the event some plantings failed to establish adequately. Even though a few woodland plantings were considered failures, there are more than enough successful woodland plantings to meet the required postmining woodland acreage at the Glenharold Mine.

Table 4 is a summary showing that on average the seasonality and density standards have been achieved. The permanence standard has been achieved given the age of the woodlands and their continued persistence.

Tracts	Woodl Comm Type	Total Density Stems per acre	TALL SHRUB COMPONENT						TREE LAYER in the MDW Plant Community					
			Shrub Density Stand	Recl Shrub Density	No of Spp. Planted	No of Recl. Spp.	Recl. TS Spp. => 18% Den	Standard Spp. => 18% Den	Recl. Tree Stems per Ac.	Stock Rate	70% Surv. Stand	No of Spp. Plant	Diversity Standard 60% x 4	Recl. Diversity No. Spp. =>50%
1,5	MDW	13,482	6,480	12,757	10	10	5	4	725	540	370	4	2	3
1,4,5	TS	15,316	8,100	15,254	10	10	6	4	n/a	n/a	n/a	n/a	n/a	n/a

MDW = Mixed Deciduous Woodland TS = Tall Shrub

Data Year Includes Years 2010 for Section 5 and 31, 2009 for Sections 13, 14, and 18, and 2007 for Section 4

Tree Species present and standards applicable to the reclaimed mixed deciduous woodland community only

Generally, the reclaimed woodlands appear natural with silverberry expanding around the perimeters of the plantings. Chokecherry, American plum, buffaloberry, woods rose, silverberry and green ash are the principal species established. Cottonwood trees have volunteered in some of the plantings.

Developed Water Resources

There were no pre-mine stockponds or dugouts located on the lands that were mined within this bond release application. However, this bond release application contains five former sediment ponds that are being retained as developed water resources. These ponds are known as 14-4A, 18-7B, 05-E2, 4-6E and 4-7F. These developed water resources are functioning as stock ponds and providing habitat for wildlife. These ponds are all located in tracts of native grassland. There are no specific revegetation standards for stock ponds, but the surface owners must agree to maintain the ponds and the water must be suitable for livestock use. Landowner maintenance agreements have been provided as well as water quality data showing that it is suitable for cattle. These ponds were all holding water at adequate levels throughout the grazing season.

A series of four impoundments were retained along a former pit ramp that passes through pre-law spoils. These ponds function as sediment traps and providing habitat for wildlife. There are other pond-like features in the orphan spoil but these features are not considered developed water resources and they were not water management features during active mining operations. Some of these features in the redisturbed spoil function as wetlands. There are two old pits in Section 32 that are holding water. These pit areas are subject to the 1971 and 1973 reclamation requirements that did not require the complete backfilling of final pits. The highwalls on these pit areas were eliminated by reducing the slope and subsoil quality overburden was respread on these areas. These areas are well vegetated and are stable.

Shelterbelts

Approximately 3 miles of two-row conservation field windbreaks were planted within or adjacent to the hayland fields included in this bond release. These windbreaks were planted to catch snow to improve hayland yield and to enhance wildlife habitat. These windbreaks were planted in the 1990's and consist of rows of green ash, Russian olive, buffalo berry and chokecherry species. A few trees are missing in some of these rows but few gaps exist where trees are missing from both rows so the windbreaks are functioning as intended. There are no specific performance standards for these conservation plantings.

General Information

Formal final bond release inspections were held on September 14 and 15, 2011. Attending the inspections were Dave Nilson and Shad Erdmann, representing Basin Cooperative Services, and Reclamation Division staff members Dean Moos, Mike Berg, Bill Gunnerson, Bruce Beechie, Randy Kowalski and Guy Welch. Frank Bitterman, Mercer County Commissioner, also participated in this inspection. The surface owners, Oliver County Commissioners, State Soil Conservation Committee, ND Department of Health and OSM were also invited to participate in this inspection. The bond release inspection was conducted over a two day period due to the amount of acreage involved.

Several of the reclaimed tracts contained leased federal coal that was mined and these were inspected by John Ahlbrandt, OSM Casper Field Office on June 9, 2011. OSM must concur on bond release for tracts that contained federal coal that was mined. We have received a letter from OSM concurring with our recommendation to approve this bond release.

Some minor concerns identified during the inspection have been addressed and follow-up inspections have been conducted to verify that measures were taken to address the concerns to the Reclamation Division's satisfaction. These concerns included erosion features, a beaver dam blocking the riser of pond 18-7B and

leafy spurge and Canada thistle control. BCS also repaired an underground mine subsidence feature that had formed due to the old Tueber Mine. The repair of this feature near BCS's mining disturbance boundary was not required by the Reclamation Division.

There are scattered patches of leafy spurge throughout the reclaimed and undisturbed lands at this mine, but BCS's leafy spurge flea beetle control plan has generally effectively controlled infestations throughout the mine. Herbicides were used to control scattered patches of thistle during the responsibility period.

Information in the permit, Revision 29 to Permit BCGH-8204, Final Bond Release Hydrology Assessment states that none of the pre-mine springs in or adjacent to lands included in the final bond release application have been affected by mining activities and no stockponds were destroyed by mining activities. Likewise, no domestic or stock water wells were destroyed by mining. The hydrologic assessment concluded that BCS did not affect any pre-mine water supply wells and no adverse effects were observed outside of the permit area in terms of groundwater quality or flow and recharge rates. The post-mining hydrologic and wildlife assessments that were added to the permit demonstrate the impacts to these resources have been minimal.

A final bond release public notice was published in the Hazen Star and Center Republican once a week from September 1st to September 22, 2011. No objections to this bond release were received.

The acreage remaining in this permit is currently bonded with collateral bond CB-8204-01 for \$541,874.91 and self-bond SF-8204-01 for \$4,876,874.24. If this bond release is approved, Basin Cooperative Services will be released from all reclamation liabilities on the 2,378.8 acres included in this bond release application. BCS will be allowed to reduce collateral and self-bonds by a total of \$4,617,060.92 if approved at the March 21, 2012 meeting and the bond release will become effective on April 20, 2012. With the approval of this bond release application and the concurrent approval of Bond Release No. 8 for Permit BCGH-8204, all the remaining permitted acreage at the Glenharold Mine will be released and the Commission's jurisdiction over this mine will end.

Attached are a motion and award form for consideration at the March 21st Commission meeting.

Attachments

Figure 2: Postmine Land Use: Tracts 1A, 1B and 1C:

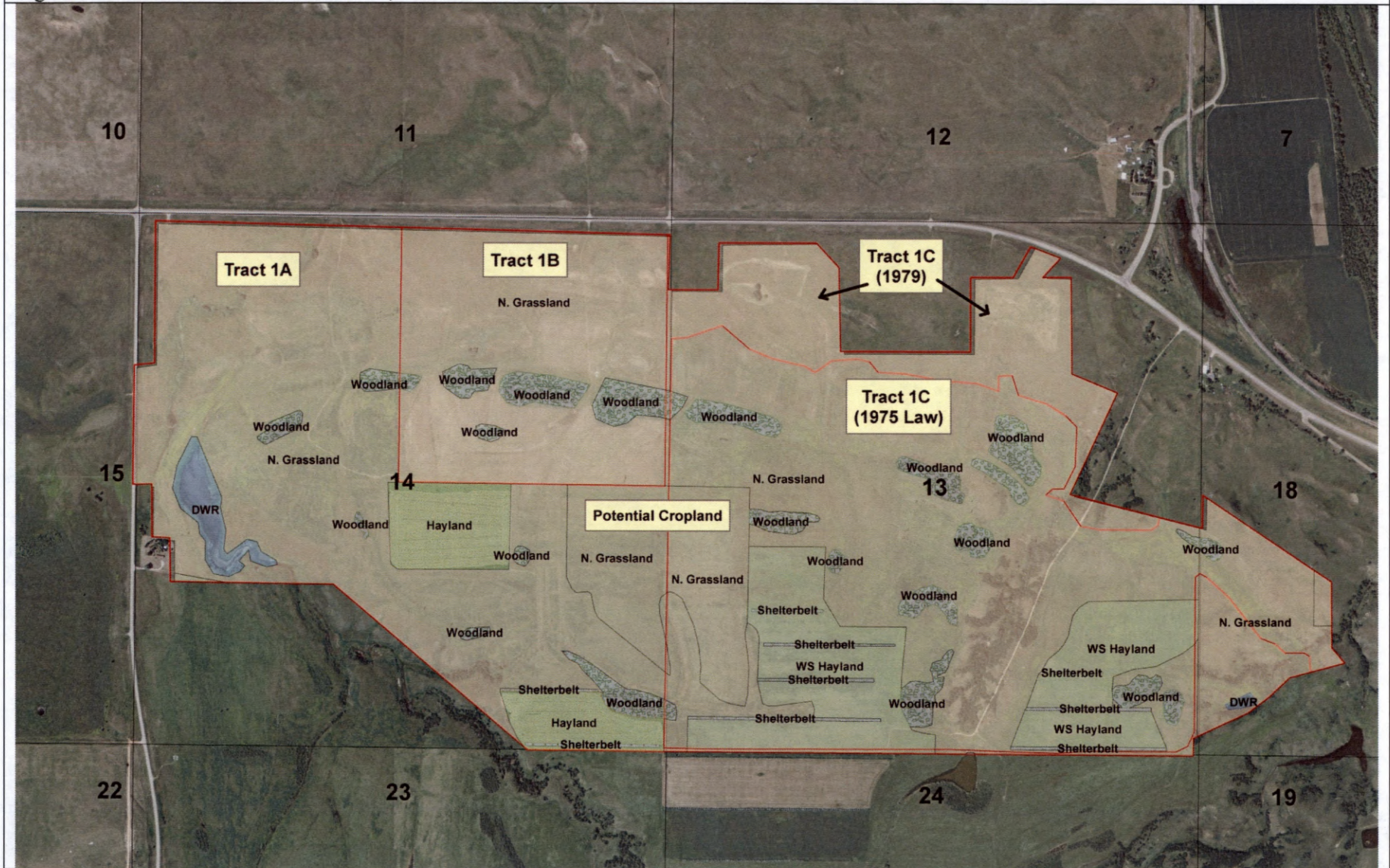


Figure 5: Postmine Land Use: Tracts 2 and 3



Figure 4: Postmine Land Use: Tracts 4 and 5

