Policy Memorandum No. 17 To Mine Operators

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TO: All Mine Operators and Lignite Energy Council

FROM: Commissioners Wefald, Hagen and Reinbold

SUBJECT: Suitable Plant Growth Material (SPGM) Removal and Redistribution under NDAC Chapter 69-05.2-15, as revised January 1, 1987

This policy memorandum provides guidance to mine operators for SPGM removal and redistribution under the revised requirements of North Dakota Administrative Code (NDAC) 69-05.2-15, as amended effective January 1, 1987. Under the amended chapter, mine operators have the opportunity to select one of two options in their handling of SPGM which must be specified in the permit:

1. The first option is to save and respread all available SPGM. The availability of suitable plant growth materials is determined by a pre-mining soil survey to a depth of five feet conducted by a professional Soil Classifier. Using topsoil and subsoil quality criteria defined in NDAC Section 69-05.2-08-l0, the Soil Classifier identifies the vertical and lateral (areal) extent of SPGM. Specifications for the removal and redistribution of all SPGM under this practice are in NDAC Chapter 69-05.2-15 and Policy Memorandum No. 5 to Mine Operators. However, the Commission may require the saving of other suitable strata under procedures in Policy Memorandum No. 3 to Mine Operators.

   The replaced SPGM thicknesses will be checked by Reclamation Division staff no later than at the time bond release is requested for replacement of SPGM. The required SPGM thickness at this time will be based on the premine soil survey inventory thickness with an adjustment for any net compaction plus any difference between the premine inventory and what was actually removed. Any significant variation in the amount of SPGM removed from that indicated in the soil survey must be accounted for and documented by the mining company at the time of soil removal. This variation must also be noted in grade approval requests and bond release applications for SPGM respread.

2. The second option as first allowed by the January 1, 1987, amended rules, requires the saving of all topsoil and a sufficient amount of subsoil to respread a specific thickness over the graded spoil based on the spoil properties. The properties which must be

considered are sodium adsorption ratio (SAR), saturation percentage (SP) and texture. The specific parameters of graded spoil and redistribution thicknesses of SPGM are in NDAC Section 69-05.2-15-04(4)(a)(2) of the amended rules.

Since the total SPGM respread thicknesses are tied to the graded spoil properties, the amount of SPGM to be removed prior to mining will be based on the premine overburden sample analyses. However, at the present time, there is no model for accurately predicting postmining graded spoil properties from the premine overburden data. Until a suitable model is developed, the proposed SPGM replacement thicknesses for the permit area will be determined by the Commission prior to permit approval according to the following procedures using available overburden sample results:

a) If one coal seam will be mined and the overburden will be removed with a dragline, the respread thickness for the area represented by each drill hole will be specified based on the most undesirable material (i.e. that requiring the greatest thickness of replaced SPGM) occurring in twenty percent or more of the overburden above the coal seam to be mined. Example - if the overburden thickness down to the coal seam is eighty feet and four of the sixteen five-foot overburden segments have SAR's greater than twenty, the respread thickness will be 48 inches. However, depending on the distribution of the least desirable material and site specific SAR values, variations from this procedure may be considered on a case by case basis.

b) If more than one coal seam will be mined and the interburden will be removed with a dragline, the respread thickness for the area represented by each drill hole will generally be specified based on the most material occurring in twenty percent or more of the interburden between the two lowest coal seams to be mined. Example - if two coal seams will be mined with an interburden thickness of thirty feet and two of the six five-foot interburden segments have SAR's greater than twenty, the respread thickness will be 48 inches. However, depending on the site specific interburden thickness and stripping methods, this procedure may be modified on a case by case basis.

c) If scrapers or truck/shovel operations are to be used to remove some or all of the overburden, the respread thickness will be specified based on the site specific stripping procedures as well as the overburden characteristics.

More specific example determinations using the procedures specified by a) and b) are attached.

The amount of SPGM removed must take into account any net compaction that may occur during the soil handling process. Example - if the required replacement thickness is 36 inches and the net compaction of the replaced soils is ten percent, 40 inches must be initially removed in order to achieve the 36 inch replacement thickness. The mine operator must assure that sufficient SPGM is salvaged to meet the specified replacement thicknesses.

The amount of SPGM to be removed from all areas to be disturbed must be specified in the mining and reclamation plans contained in the approved permit or in the annual soil handling plan. The annual soil handling plan must include a map depicting the areas

(and soil mapping units) to be stripped of soil, the removal depths and volumes, the current and projected topsoil and subsoil balances, and any required comparative analyses of the soil material in the removal areas.

Sufficient soil material must normally be saved as operations proceed so that at any given time sufficient SPGM is available for respreading the required thicknesses over all disturbed areas. For example, if 300 acres are disturbed at a mine and the premine overburden data shows that 36 inches of SPGM must be respread, sufficient topsoil and subsoil must be available in stockpiles to achieve this thickness over the 300 acres (provided a sufficient amount is available based on the soil survey for the 300 acres). However, if the quality of inventoried subsoil varies significantly within a permit area, exceptions to this practice may be approved on a case by case basis to allow for the saving and respreading of better quality subsoil and/or substitute material.

If the soil survey shows that there is not a sufficient amount of SPGM available to meet the required replacement thickness, other suitable strata to the extent available must be saved to achieve the required thickness.

Graded spoil sampling will be required until an acceptable model to accurately predict postmine graded spoil properties from premine overburden data is developed. Exceptions will be made if the SPGM replacement thickness is 48 inches. Once final grading has been completed in an area, final graded spoil samples must be taken to determine the physical and chemical properties of the spoil. These samples must be taken to a 12 inch depth on a grid with approximately 400 foot intervals. If grade approval areas tend to be narrow strips (i.e., less than 400 feet wide), an alternate sampling scheme may be approved by the Reclamation Division to ensure that each grade approval area is adequately sampled.

It is recommended that at least 3 or 4 samples be randomly collected around each grid point and then combined into a composite sample for analyses. The composite samples must be analyzed for SAR, SP and texture (including percent sand, silt and clay) and the results submitted to the Commission with grade approval requests. The grade approval requests must include a map showing the location of grid points where the composite sample was taken. From these data the Commission will determine and specify the SPGM replacement thickness (or thicknesses if the spoil properties vary within a grade approval area). However. this sampling requirement may be modified or dropped by the Commission if premine data show that overburden properties are generally uniform throughout an area.

There may be situations where the graded spoil sampling demonstrates that excess subsoil has been removed and stockpiled (based on predictions from the premine overburden data). In these situations, the excess subsoil may be respread on other areas (assuming the landowner is the same or mixing agreements exist) and the amount of subsoil to be removed from other areas to be disturbed may be correspondingly reduced. If the graded spoil sampling shows that insufficient subsoil has been removed and stockpiled, additional subsoil or other material must be saved and respread to the extent available within the same land ownership (or others if mixing agreements exist) to achieve the necessary thickness.

The option for respreading SPGM based on graded spoil characteristics also applies to areas that were disturbed as of January 1, 1987 that had not been respread with SPGM. However, if this option was selected, the appropriate permits must have been revised to incorporate plans to respread SPGM based on the graded spoil properties.

In general, the replaced SPGM thicknesses will not be checked until both the subsoil and topsoil have been respread. However, if requested, the Commission will check the replaced subsoil thickness prior to topsoil replacement. If such a request is made, the operator must recognize that some delays in topsoil respreading are likely to occur.

Finally, it must be noted that, as specified by NDAC 69-05.2-15-04(4)(a)(2)(a), the minimum thickness of SPGM at any one location must be within 6 inches of the total average thickness required for that particular area. The average respread thickness for a particular tract must not be less than the required thickness.

Please note that the option for respreading SPGM based on the graded spoil properties does not apply to prime farmlands. Sufficient topsoil and subsoil must be saved for redistribution on reconstructed prime farmlands to achieve the 48 inch minimum thickness (or lesser thickness if the original prime farmland soil profile contains a horizon which inhibits root penetration) required by NDAC Section 69-05.2-26-04(2).

Bruce Hagen Commissioner	Susan E. Wefald President	Leo M. Reinbold Commissioner

Attachments

Examples of SPGM replacement thicknesses determined according to procedure (a)

Sample Segment	Example 1 SAR	Example 2 SAR	Example 3 SAR
0-5'	1	1	1
5-10'	2	1	1
10-15'	4	2	1
15-20'	4	5	3
20-25'	5	3	4
25-30'	9	7	5
30-35'	10	5	2
35-40'	13 (SP<95)	11	6
40-45'	11	8	10
45-50'	17 (SP>95)	10	9
50-55'	15 (SP>95)	9	15 (SP<95)
55-60'	18 (SP>95)	16 (SP>95)	11
60-65'	27	14 (SP>95)	14 (SP<95)
65-70'	32	22	21
70-75'	25	19 (SP>95)	16 (SP>95)
75-80'	34	30	25
80'	Coal	Coal	Coal

In each of these examples 20% of the overburden thickness is 16 feet; therefore, the 4 least desirable five-foot overburden segments will be used to specify the respread thickness.

Example 1 - The 4 least desirable segments have SAR's greater than 20; therefore, the required SPGM respread thickness will be 48 inches.

Example 2 - The 4 least desirable segments are two with SAR's greater than 20 and two with SAR's between 12 and 20 with an SP greater than 95: the required SPGM respread thickness will be 42 inches.

Example 3 - The 4 least desirable segments are two with SAR's greater than 20, one with an SAR between 12 and 20 with a SP greater than 95, and the other a SAR between 12 and 20 with a SP less than 95; the required SPGM respread thickness will be 36 inches.

Examples of SPGM replacement thicknesses determined according to procedure (b)

	Example 1	Example 2	Example 3
Sample Segment	SAR	SAR	*SAR*
0-51’	1	2	1
5-10’	1	1	1
10-15'	3	4	2
15-20'	2	7	1
20-25’	7	12 (SP<95)	4
25-30'	6	16 (SP<95)	13 (SP<95)
30-35’	15 (SP>95)	22	20 (SP>95)
35-40’	Coal	Coal	Coal
40-45'	18 (SP>95)	19 (SP<95)	6
45-50'	13 (SP>95)	15 (SP<95)	8
50-55’	17 (SP>95)	16 (SP>95)	11
55-60’	29	18 (SP>95)	9
60-65'	19 (SP>95)	15 (SP>95)	11
65-70'	35	24	22
70’	Coal	Coal	Coal

In each of these examples the interburden thickness is 30 feet with 20% of that equaling 6 feet; therefore, the 2 least desirable five-foot interburden segments will be used to specify the respread thickness. Also, these examples assume all samples have either a medium or fine texture.

Example 1 - The 2 least desirable interburden segments have SAR's greater than 20; therefore the required SPGM respread thickness will be 48 inches.

Example 2 - The 2 least desirable interburden segments are one with a SAR greater than 20 and the other a SAR between 12 and 20 with SP greater than 95; the required SPGM respread thickness will be 42 inches.

Example 3 - The 2 least desirable interburden segments are one with a SAR greater than 20 and the with other a SAR less than 12; the required SPGM respread thickness will be 24 inches.

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