0050

PLATEAU MINING COMPANY

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Please file original in ACT/007/006 Revision folder also copy to #3, 4

June 27, 1984

RECEIVED

DIVISION OF OIL
GAS & MINING

Mr. James W. Smith, Jr.
Coordinator of Mined Land Development
Division of Oil, Gas, and Mining
4241 State Office Building
Salt Lake City, Utah 84114

RE: Special Stipulation No. 10, December 9, 1984
Division Letter ACT/007/006

Dear Mr. Smith:

Enclosed is the Plateau Mining Company partial response to your December 9, 1984 letter expressing concerns relative to deficiencies in our comments to your August 16, 1983 letter. We have attempted in this letter to review the events and subsequent correspondence relating to Special Stipulation No. 10, and to answer your December 9, 1983 letter pertaining to this stipulation.

We hope that this will clarify our reclamation program and our commitment to effectively reclaim our mined property to its productive post mine land use.

Please contact me if you have any further questions.

Sincerely,

Ben Grimes/S.C.

Ben Grimes
Environmental Coordinator
Plateau Mining Company

CP/fc

cc: Kent Crofts, Getty Mining Company
Clem Parkin, Getty Mining Company

STIPULATION NO. 10

Plateau Mining Company (PMC) submitted an application for a mining and reclamation permit (MRP) on February 20, 1981. The Division of Oil, Gas and Mining (the Division) conditionally approved the MRP on January 21, 1982. Attached to the approval were stipulations for which PMC would provide additional information. Stipulation Number 10 required that (A), a specific seed mixture be proposed and the (B), additional information be presented concerning woody plant density, composition, and location of tree groupings which were to be established on the reclaimed lands. The following is an overview of what has transpired and the responses to the questions raised about previous responses to these stipulations in the Division's December 9, 1983 letter.

STIPULATION NO. 10(A), SEED MIXTURE

Introduction

In the Star Point Mines Mining and Reclamation, Permit ACT/007/006, several possible seed mixtures were originally proposed which would meet a variety of situations. There was, however, no commitment to use a particular seed mixture. Stipulation No. 10 (A) required, in a June 9, 1982 letter, that PMC designate a specific seed mixture. This was done and presented in PMC's August 18, 1982 response. A topsoil stockpile seed mixture was previously approved in conjunction with a minor modification to the refuse pile expansion plan on May 28, 1982. The seed mixture for the Corner Canyon site (Douglas Fir Seed Mixture) was identified in the Divisions August 16, 1983 letter as not being adequate to supply sufficient cover to stabilize the site and control erosion while trees and shrubs become established. The Division recommended the PMC consider a seed mixture with several grass and forb species. PMC responded to this request on September 23, 1983 with a revised seed mixture for the Corner Canyon site which contained four grasses, eight forbs, three shrubs, and one tree douglas fir.

Of the species contained in the revised seed mixture, three are not native to the North American Continent. These species are alsike clover, small burnet,

and meadow brome. In a letter dated December 9, 1983, the Division requested that PMC provide justification for the use of these introduced species under the requirements of UMC 817.112.

The following narrative contains PMC's response to Stipulation No. 10(A) and 10(B) as contained in the Division's December 9, 1983 letter.

RESPONSE TO STIPULATION NO. 10(A)

Division Concern:

The revised seed list for the douglas fir type includes several introduced species. Please provide justification for their use per the requirements for UMC 817.112. Also, the operator should consider hand planting (container or bare root) to reestablish douglas fir, due to the low success rate of seeding this species.

PMC RESPONSE:

The UMC 817.112 allows for the planting of introduced plant species on reclaimed land if approved by the Division. In order for the Division to approve the use of introduced plant species, it must be established that the introduced species is (1) capable of achieving a diverse, effective, and permanent cover consistent with the postmining land use, (2) the species are necessary to achieve a quick, temporary, and stabilizing cover to control erosion and measures to establish a permanent vegetation are part of the approved plan, (3) the species are compatible with the plant and animal species in the area, (4) the species meets the State and Federal introduced species statutes.

Conceptually, the acceptance of native species and the exclusion of introduced plant species in a reclamation seed mixture has been a source of great concern by both the regulatory agencies and by industry. Monsen, in a paper titled "Selecting Plans To Rehabilitate Disturbed Areas", Improved Range Plants Symposium, Society For Range Management, 1975, Denver, Colorado, made reference to the issue of introduced species versus native species. He states that "in contradiction to the premise of native plant superiority, several

introduced shrubs are showing promise on Idaho ranges," with "some plantings approaching 20 years of age." He makes reference to erosion control with this statement:

> "Exotics like smooth brome (Bromus inermis) and intermediate wheatgrass (Agropyron intermedium) greatly improve the groundcover and reduce erosion when planted on disturbed ponderosa pine-bunchgrass habitat types. although native grasses - bluebunch wheatgrass (Agropyron spicatum), Idaho fescue (Festuca idahoensis), and the grasslike elk sedge (Carex geyeri) are capable of reestablishing, they do not provide the desired soil protection that exotics supply."

Also that "the range of adaptation of a plant is difficult to predict, particularly for sites that have been dramatically disturbed, exotics can significantly aid revegetation". Numerous field trials have demonstrated that the introduced species can establish a diverse, effective, and permanent cover, and to control erosion.

In general, introduced species have been documented as being superior for forage and erosion control. This is reflected in the fact that they have been introduced, tested, propagated, and used extensively in pasture and range improvements. Various researchers have demonstrated the desirability of introduced species under wildland conditions. Some of these studies are as follows:

Colorado State University (1974) recommends desert wheatgrass, hard fescue, intermediate and pubescent wheatgrasses, russian wildrye, and smooth brome for seeding the mountain browse type in Colorado. The species recommended by Hull, et. al. (1952) for reseeding the mountain brush type include desert, pubescent, and intermediate wheatgrasses, hard fescue, smooth brome, russian wildrye, alfalfa, and orchardgrass.

McGinnies, et. al. (1963) working on rangeland two miles south of Hayden, Colorado, reported that 15 species were planted in a test plot in 1945 and

evaluated until 1958. The most outstanding species on the plot was pubescent wheatgrass followed by intermediate wheatgrass. The species produced the greatest amount of soil protection and forage. Desert wheatgrass was the next best species.

Breadless wheatgrass was inferior in initial establishment but appeared to be improving. Species performing fair to poor included green needlegrass, big bluegrass, and western wheatgrass. Species considered failures were tall wheatgrass, stiffleaf wheatgrass, blue wildrye, and short-awned barley.

Working on disturbed soils at Axial Basin, Colorado, Draves and Berg (1978) reported the results of 24 grass and 16 forb species. Of the 24 species planted, second highest plant cover was prdouced by intermediate wheatgrass, pubescent wheatgrass ranked fourth, smooth brome ranked fifth, and desert wheatgrass ranked fourteenth. Of the forbs, alfalfa produced the highest plant cover. Cicer milkvetch also produced an abundance of cover. These two forbs are included in the proposed seed mixture because native legumes cannot be expected to provide adequate erosion control and forage production.

After four growing seasons, Sim (1977) reported the results of 25 grass and 19 forb species seeded on test plots in the Piceance Basin. The best producing grass was pubescent wheatgrass, the third best was meadow brome, fourth best intermediate, seventh best desert wheatgrass, ninth best was smooth brome. Timothy ranked 21st. Among the legumes, alfalfa ranked second, while cicer milkvetch ranked fifth.

Merkel, et.al. (1974) reported that of ten species planted at Meeker SCS Plant Material Center, the best performing species were intermediate and pubescent wheatgrasses. The western wheatgrass of the native species planted could be considered successful.

Upon evaluation the establishment of various plants seeded on unleveled spoils at the Seneca Mine, Berg (1975) found that of the species planted, orchardgrass produced the highest frequency based upon the amount of seed

planted. Following orchardgrass, in descending order, were desert wheatgrass, smooth brome, and alfalfa.

Additional field trials by the SCS and Energy Fuels on Energy Mine No. 1 at an elevation of 7,500 feet and 16 inches of annual precipitation, found the species most suitable for erosion control on reclaimed lands were meadow brome, smooth brome, and intermediate wheatgrass. Cicer milkvetch also performed exceptionally well.

As concluded in the above cited reports, the best soil stabilization from reseeded plants is produced by introduced species. These species control erosion better because they are better able to establish themselves under adverse conditions, provide more rapid growth and also provide a more dependable early plant cover than the slower developing native species. These same reports also document that, unlike some of the recommended native species, introduced species have a longer life span, are able to reproduce more efficiently, and are better able to provide permanent vegetation. Once the introduced species have established themselves, the native species will have a more stable environment in which to grow and where plant succession can occur.

Almost all introduced species are deemed desireable from a range seeding and wildlife management standpoint in as much as the introduction, development and subsequent use of these species was based on their superiority. Nutritional value of introduced species for livestock and wildlife are well docmented. Mule deer preferences for intermediate wheatgrass, desert wheatgrass, orchardgrass, timothy, brome grass, alfalfa, and milkvetch are documented by Kufeld, et. al. (1973). Elk preferences are reported by Kufeld (1973) to include desert wheatgrass, timothy brome, alfalfa, milkvetch, and small burnet. Plummer, et.al. (1968) report that studies in Utah have shown big game prefer alfalfa, small burnet, desert wheatgrass, intermediate wheatgrass, pubescent wheatgrass, smooth brome, and orchardgrass.

Livestock forage preference for the proposed introduced species has been documented by Marquiss, et.al. (1974). Palatability ratings in order of

descending preferences were: smooth brome, intermediate wheatgrass, pubescent wheatgrass, desert wheatgrass, western wheatgrass, and beardless wheatgrass.

In a study spanning almost 30 years in which some 127 species of grasses were planted, Gomm (1969) documents the livestock preferences for introduced species. He concluded his studies with the following statement: "Generally, the introduced species have been more palatable than the native in areas where range seeding is a common practice."

The nutritional value of introduced species is predictable and is largely independent of geochemical changes resulting from disruption of the topsoil and overburden. Cook and Harris (1950) state that: "environmental factors and soil moisture are more important in determining the nutrient content of range forage plants under various site conditions than the chemical content of the soil...". Reclaimed vegetation quality, as reported by DePuit, et.al. (1977) was found not to differ significantly from that occurring on undisturbed sites.

After reviewing the revised douglas fir seed mixture presented in PMC's September 23, 1983 response, PMC proposes to eliminate two of the introduced species, alsike clover and small burnet. The new proposed seed mixture for the douglas fir site at Corner Canyon is given in Table 1, Revised Douglas Fir Seed Mixture. It is the opinion of PMC that the third introduced plant species, Regar meadow brome, is important to the integrity of the reclamation plant community in terms of effective erosion control. PMC requests that the Division approve the use of this introduced species based on the preceeding discussion and on the information presented below.

Meadow brome was introduced to the United States from southwestern Asia. The variety "Regar" was released cooperatively by Idaho and Washington Agricultural Experiment Stations and the SCS in 1966. It has been reported by the University of Wyoming (U of W Agricultural Experiment Station, publication B-621, May 1975, Guidelines For Seeding Range Pasture and Disturbed Lands) that Regar meadow brome would "do well at any location in Wyoming where precipitation exceeds 15 inches". Regar is further described in the University of Wyoming,

TABLE 1

REVISED DOUGLAS FIR SEED MIXTURE

GRASSES	
Mountain Brome (*Bromus marginatus*)	2.00
Slender Wheatgrass (*Agropyron trachycaulum*)	2.00
Sherman Big Bluegrass (*Poa ampla*)	2.00
Regar Meadow Brome (*Bromus biebersteinii*)	2.00
	8.00
FORBS	
Utah Sweetvetch	1.00
Pea Vine	2.00
Blue Flax (*Linum lewisii*)	0.25
Rocky Mtn. Penstemon (*Penstemon strictus*)	0.25
Western Yarrow (*Achillea millefolium*)	0.25
Sweet Anise *Osmorhiza occidentalis*)	0.25
	4.00
SHRUBS	
Douglas Fir (*Pseudotsuga menziesii*)	2.00
Golden Currant (*Ribes aureum*)	1.00
Woods Rose (*Rosa woodsii*)	1.00
Blue Elderberry *Sambucus cerulea*)	1.00
	5.00
TOTAL	17.00

Agricultural Experiment Station publication B-608, 1974, Dryland Grass Variety Trials in Wyoming, as a rapidly germinating seed with good seedling establishment. Favorable characteristic is given as its ability to recover quickly from grazing. It is predominently basal with weak rhizomes which causes it to be slow to become sod-bound.

Regar meadow brome is described by SCS (SCS-TP-157, 1982, Plant Materials For Use On Surface-Mined Lands In Arid and Semi-Arid Regions) as becoming rapidly established, dominantly basal leaves and an excellent forage plant. SCS recommends it for use in the Northern Great Plains, Northern and Central Rocky Mountains, and the Intermountain Regions. In the Colorado State University Agricultural Experiment Station Bulletin 73, 1963, A Summary of Range Grass Seeding Trials in Colorado, meadow brome was rated as "excellent" thirteen years after seedling at the Manitou Experimental Forest. Elevation at the station is 7,000 feet and the annual precipitation is 16 inches. It was also given a rating of "excellent" after nine years at a site in southern Colorado where it was planted at an elevation of 8,000 feet with 20 inches of annual precipitation. At two other sites in Colorado, both at an elevation of 7,500 feet and 12 inches of annual precipitation was rated "fair" and "excellent" nine years after seeding. It appears that it is well suited for medium and higher elevation sites with good soil moisture, such as the douglas fir or aspen type. Based on intensive trials conducted in Ephraim Canyon for the Utah State Division of Fish and Game and the USDA, Intermountain Forest and Range Experiment Station by A. Perry Plummer and others (Restoring Big-Game Range in Utah, Pub. No. 68-3, Utah Division of Fish and Game) meadow brome is recommended for the aspen and associated conifer vegetation types.

The objective of the Douglas Fir Seed Mixture is to supply sufficient cover to stabilize the site and to control erosion as expressed in the Divisions August 16, 1983 letter. Meadow brome is included in the seed mixture because of its quick initial cover and regrowth following grazing which along with its spreading growth form, which makes it necessary for erosion control while the trees and shrubs become established. It meets the requirements of UMC 817.112 as described above. PMC requests approval for its use in the douglas fir seed mixture.

In addition to seeding, PMC proposed to hand plant douglas fir seedlings at a rate of 500 stems per acre.

STIPULATION NO. 10(B)

Introduction and Review

In the Divisions June 9, 1982 letter, additional information was requested concerning the comprehensive plan addressing the density, composition, and location of woody plants and tree groupings to be reestablished the disturbed areas. PMC's response was inadequate and the Division again requested in the August 16, 1983 letter, the target density for woody plants and the spatial arrangements (clumping) to be discussed in detail. PMC's response was made on September 23, 1983. PMC presented a revegetation success standard for woody plant densities based on the densities of the reference areas, composition and distribution of trees and shrubs. After reviewing PMC response the Division issued a letter on December 9, 1983 requesting clarification of the shrub seeding plan, density of shrub clumps, and the interspaces between clumps. The following is additional information on Stipulation No. 10(B) as required in the Division's December 9, 1983 letter.

RESPONSE TO STIPULATION NO. 10(B)

Division Concern:

UMC 817.117 indicates the minimum standard for tree and shrub densities. The operator has failed to demonstrate that the proposed seeding plan will meet these minimum requirements. Also, what is the anticipated density of shrub clumps? Of the interspaces between clumps?

PMC RESPONSE:

All reclaimed sites, other than the Corner Canyon - Douglas Fir site, will be seeded with the seed mixture presented in PMC's August 18, 1982 submission. This is the mixture used to estimate the number of shrubs expected from planting. The seed mixture contains 9.9 pounds PLS of shrub seed per acre. Based on information presented at the Wildland Shrub Symposium, Brigham Young University, May 1983, it is expected that on an average, one shrub will become established for every 1000 pure live seed planted. According to this rule of

thumb, approximately 1,291 shrubs per acre should become established from seeding. On north and east facing slopes where the woody plant density standard is 2,200 stems per acre, the balance of woody plants not established by seeding will be made up by hand planting seedlings composed of serviceberry, curlleaf and true mountain mahogany, Utah juniper, currant, and mountain big sagebrush.

Based on woody plant densities on undisturbed sites which will be a source of shrub clumps, shrub clumps will average 2,200 stems per acre. They will occupy approximately 225 square feet with a spatial distance of 150 feet separating clumps. In the interspaces, hand planted shrubs and shrubs from the seeded source will have a target density of about 2,200 stems per acre. The value of the clumps is that they are transplanted pads of mature trees and shrubs which will provide instant wildlife cover and provide a native seed source of the associated trees, shrubs, grasses and forbs. This will create escape cover for wildlife in an otherwise open expance and accelerate natural plant succession.

If for any reason these procedures fail to achieve the anticipated results, PMC will confer with the Division in implementing corrective action. From the annual reclamation monitoring reports, success or failure to establish an adequate woody plant density should become evident within three to five years after revegetation. PMC and the Division will be able to evaluate success on a yearly basis from these data presented in the reports.

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