



Noxious Weed Management Plan for Sheep Mountain Unit Operations

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NOXIOUS WEED MANAGEMENT PLAN FOR OXY USA Inc.

Sheep Mountain Unit Operations

Huerfano County, Colorado

Introduction

OXY USA Inc. (“Oxy”) has developed this Noxious Weed Management Plan (Plan) to comply with the Colorado Noxious Weed Act (C.R.S. Title 35, Article 5.5) (“Act”), Colorado Oil and Gas Conservation Act, and local and federal noxious weed management requirements, such as Huerfano County Planning Department, the Bureau of Land Management (BLM), and U.S. Forest Service (FS).

The Act requires that “noxious weeds” be managed on private and public lands. The Act further declares that control of noxious weeds should use methods that are least damaging to the environment but also practicable and economically reasonable. The state requires management of noxious weeds included on one of three lists (see Appendix): List A – designated for statewide eradication; List B – managed to prevent further spread and, for selected species, designated for eradication in large areas; and List C – of more localized concern, but for which the state will provide education, research, and biological control assistance to jurisdictions that choose to manage the species.

This Plan is intended to manage Oxy's oil and gas operational areas in order to comply with all local, state and federal noxious weed management requirements including Huerfano County, Colorado Oil and Gas Conservation Commission (COGCC), BLM, and FS.

Compliance Statements

Oxy will manage all noxious weeds, as defined by the Act, Huerfano County Noxious Weed Management Plan, BLM Pesticide Use Plans (PUPs), any other approved noxious weed management conditions of approval issued by a land management agency in all existing surface disturbed areas managed by Oxy as well as newly disturbed project areas using recommendations identified in this plan or those provided by a biological consultant at the time of project specific inventories. The term, “disturbed area” includes all well pads, access roads, easements, pipelines, and associated support facilities such as compressor stations, water management facilities, and other areas disturbed by project activities. Disturbed areas also soil stockpiles, earthen berms and other erosion control best management practices (BMP's) that require ground disturbance for installation and maintenance. Oxy will comply with COGCC noxious weed management 1000 Series rules, which requires Oxy to keep all disturbed areas free of noxious weeds.

Oxy will report all State List A and List B noxious weed populations inventoried and treated and any other species identified by Huerfano County for eradication upon discovery to the appropriate County designee.

Local Contacts

The local contacts for Oxy's Plan include the Production Coordinator, who serves as Oxy's noxious weed management coordinator and Oxy's Reservoir Engineer, who manages the noxious weed coordinator and associated noxious weed contractors.

Engineer Advisor Sr Reservoir – Albert P. Giussani, (806) 894-0200
Production Coordinator – James (Eddie) Corley, (575) 374-3052

Huerfano County's Pest Management contact number is 719.738.2420. Additional contact information is listed in Section 8 of the Plan.

Operating Area

Oxy manages active and inactive leases associated with natural gas exploration in the following areas of Huerfano County:

Oxy operates on split estate, where surface lands are wholly federal (both BLM and Private) and minerals wholly fee owned and vice versa.

Land Use Objectives

Oxy conducts natural gas exploration and production activities on fee and federal lease holdings in Southwestern Colorado. Land uses and types of facilities to be developed include access roads, pipelines, well pads, compressor stations, staging/storage areas for equipment and supplies, and other associated natural gas development activities. Some of the developments are short-term temporary disturbances, such as staging areas and pipelines, while the access roads and well pads remain in active use for an estimated 20-30 years.

Weed Management Objectives & Implementation Strategies

The following are the overall objectives of the Plan.

Inventory and monitor existing or new noxious weed infestations using Global Positioning System (GPS) equipment or other mapping techniques. Inventories shall occur at least annually;

Prevent new infestations of noxious weeds:

- Utilize state certified contractors to implement an Integrated Weed Management (IWM) protocol as recommended by the state or Huerfano County Noxious Weed Management plan to control or manage noxious weed populations;
- Maintain a noxious weed inventory, herbicide application and mapping records;
- Restore disturbed areas to protect native plant ecosystems and watersheds from degradation by noxious weeds.
- Monitoring should be done in early summer and fall. Checking too early can make it easy to overlook some species, especially at that elevation.
- Fall examinations can help assess problems and assist with spring treatment plans. Some species are also susceptible to fall treatments.

Specific actions to be taken to meet these objectives include:

- Bare ground treatments will occur at existing facilities at the start of the Spring season, prior to reduce the emergence potential of noxious weeds.
- Annual monitoring will occur at existing and new facilities, specifically looking for noxious weeds, if noxious weeds are identified, they will be mapped, treated, and the treating event will be logged.
- All treating events will be logged by the noxious weed treating contractor using a Pesticide Application Record (PAR). See Appendix B for an example of what information should be collected; the contractor may choose their own format. The PAR will be use to report noxious weed management activities to federal land managing agencies. In addition to completing the PAR, the noxious weed contractor will complete Oxy's noxious weed tracking form, see Appendix C.
- Completion of the PAR and Oxy's tracking form will serve as documentation of noxious weed management activities.
- That disturbed areas and roads be treated for at least 100 feet from the edge.
- Diffuse knapweed has already been introduced into the area and is a problem, especially along roads.
- Gravel brought in for well pads or roads should be from sites without weed problems.

Inventory and Monitoring

Before a new site is developed and when practical, Oxy will inventory the site and adjacent areas for noxious weeds, including access roads and other probable weed ingress routes. If development activities are started in the winter months or when noxious weeds cannot be identified, the new disturbance area will be inventoried the next growing season. Noxious weed locations (List A and List B species) will be collected with a GPS unit or mapped in relation to the facility or landmark. Any noxious weed infestations found will be treated before site disturbance, if timing is appropriate. If the timing is not appropriate for noxious weed treatment, activities may proceed and the weeds will be monitored and treated during the appropriate season. Weeds on adjacent properties may be treated as appropriate with permission of the landowner. Populations of Colorado or County List A and List B species (see Appendix A) will be reported to the County Weed Manager. On federal lands or for federal projects, a Noxious Weed Inventory record will be completed each time a List A or B weed infestation is inventoried (with the exception of redstem filaree and quackgrass), and the populations will be reported.

Monitoring will be conducted at least annually, early in the growing season, by Oxy staff or contractors, and in coordination with BLM or FS staff on federal lands. For most of Oxy's operation areas, monitoring will occur between May and July. All previously treated noxious weed sites will be monitored for regrowth and scheduled for re-treatment as necessary. All disturbed areas under Oxy management will also be monitored to ensure there are no new weed infestations.

Prevention

The purpose of prevention measures is to preclude the introduction of new or existing noxious weeds from the project area to un-infested areas or from adjacent land into the project area.

Construction Prevention Measures

Construction equipment entering project areas (backhoes, trackhoes, dozers, blades, rollers, lowboys, equipment trailers, etc.) will be power washed or otherwise cleaned. "Equipment" is defined as any earth moving and any other machinery, trucks or vehicles, trailers and tools. On Federal property, equipment may be inspected by BLM or FS personnel. Pickup trucks, SUVs, vans, water trucks, and pipe trucks should also be clean but do not require inspection prior to entering federal lands. Where required, track pads, gravel beds or rumble strips will be installed at ingress/egress points to the site to limit weed seed from entering or leaving the site.

Soils from infested areas of the project site will not be moved off site, but will be stockpiled and treated for weeds as necessary. If infested soils are moved off site, they will be kept on Oxy-managed property, monitored, and treated as necessary. Stockpiled soils will be monitored and treated to control noxious weeds. All purchased products used in development and reclamation of a site will be inspected or certified as weed-free whenever possible, including soils, rock and gravel, seeds, mulch and erosion control products.

Operational Prevention Measures

Existing facilities such as well pads, valve/meter sites, and compressor stations that require work areas to be free of vegetation shall have bare ground treatments at the start of Spring. Existing facilities such as access roads, reclaimed pipeline right-of-ways, shall be monitored through the growing season for noxious weeds and noxious weeds identified will be treated.

Revegetation

The goal of reclamation and revegetation of a site after disturbance is timely establishment of a desirable native plant community and prevention of noxious weed infestation. Elements of successful revegetation include the use of topsoil that was set aside during construction and kept weed-free; reseeding with appropriate species to establish plant cover, and stabilization of the soil surface with the appropriate mulches, tackifiers, and erosion control products as needed. Plans for revegetation and reclamation of disturbed areas are site-specific, and will include a plant list, method of seeding, how seeding success will be determined and how the revegetated area will be monitored. Oxy will rely on existing surface use agreements, revegetation plan, or Stormwater Management Plan, which

has a recommended seed mix. BLM and FS seed mixes are compiled on a site-specific basis, according to elevation and existing vegetation community on the site. Non-native, non-persistent sterile grasses may be used to provide ground cover for soil stabilization and weed suppression during temporary reclamation on both private and federal land. See Appendix D for a sample Oxy Revegetation and Reclamation Plan.

Certified weed seed free straw, hay, mulch, seed or other materials will be used for soil stabilization and/or revegetation purposes (Colorado Department of Agriculture certified inspector to State standards). Seed tags will be available for inspection upon request of the Inspector.

Topsoil that is stock piled for more than one year will be seeded according to above standards at the earliest practical time to reduce the possibility of noxious weed establishment.

Revegetation efforts will be monitored annually until successful establishment of desirable or intentionally planted seed or plants is confirmed. Noxious weeds found in revegetation will be documented, and managed per guidelines in this Weed Management Plan.

Control and Management

The noxious weed contractor will follow the guidelines identified in the Noxious Weed Management Plan developed by the Colorado Department of Agriculture and the Noxious Weed Management Plan developed by the Division of Pest Management of Huerfano County identify, treat, and control noxious weeds. Treatments will include herbicide, cultural, mechanical, revegetation, and biological control alone or in combination as necessary for efficient weed control. On federal lands, control and management methods (including herbicide use) will be verified and approved with the appropriate land management agency representatives. Noxious weed management activities on federal lands will comply with the BLM/FS or other land management agencies Pesticide Use Plan (PUP). Annual reporting to the BLM/FS or other land management agency will be completed as prescribed in the PUP by the noxious weed contractor.

The accompanying treatment tables describe the management methods, rates, and timing of control measures for specific targeted weeds (see Table 1 and Table 2). Treatment application records will be retained by Oxy and available for inspection by agency personnel listed in contacts section.

Table 1. Weed Management Methods

Target Weed(s)	Management Method(s)	Herbicide Recommendation Product/Rate†	Adjuvant or Surfactant & Rate	Timing of Control
Chamomile, scentless (<i>Matricaria perforate</i>)	Herbicide, mechanical, cultural	picloram or clopyralid, as per label	Nonionic surfactant, as per label	Pre-flower, early season
Houndstongue (<i>Cynoglossum officinale</i>)	Herbicide, mechanical, cultural	Aminocyclopyrachlor + chlorsulfuron or Aminopyralid + metsulfuron as per label	Nonionic surfactant, as per label	Pre-bud or rosette stage (early spring)
Knapweed, Russian (<i>Acroptilon repens</i>)	Herbicide, cultural	Aminopyralid + 2, 4-D or Aminocyclopyrachlor + chlorsulfuron as per label	Nonionic surfactant, as per label	Fall
Knapweed, Diffuse (<i>Centaurea maculosa</i>)	Herbicide	1)clopyralid plus2,4-D, or 2)clopyralid plus triclopyr or 3)glyphosate, as per label	Nonionic surfactant, as per label	Rosettes in fall or early spring
Moth mullein (<i>Verbascum blattaria</i>)	Herbicide, mechanical, cultural	Dicamba or chlorsulfuron, as per label	Nonionic surfactant, as per label	Rosettes in fall or early spring
Oxeye daisy, (<i>Chrysanthemum leucanthemum</i>)	Herbicide, mechanical, cultural	Clopyralid or metsulfuron methyl, as per label	Nonionic surfactant, as per label	Early, young growth
*Sulfur cinquefoil (<i>Potentilla recta</i>)	Herbicide, mechanical, cultural	1)picloram or 2)metsulfuron methyl, as per label	Nonionic surfactant, as per label	Spring or fall
*Tamarisk, Salt cedar (<i>all Tamarix sp.</i>)	Herbicide	Triclopyr, as per label	Nonionic surfactant, as per label	Basal spray on young plants, cut and treat stump on older plant.
Thistle, bull (<i>Cirsium vulgare</i>)	Herbicide, mechanical, cultural	Clopyralid or picloram, as per label	Nonionic surfactant, as per label	Rosette stage, spring or fall
Thistle, Canada (<i>Breearvensense</i>)	Herbicide, cultural	Aminopyralid + 2, 4-D Aminocyclopyrachlor + chlorsulfuron as per label	Nonionic surfactant, as per label	Early bud stage or fall rosettes

Target Weed(s)	Management Method(s)	Herbicide Recommendation Product/Rate†	Adjuvant or Surfactant & Rate	Timing of Control
Thistle, musk (<i>Carduus nutans</i>)	Herbicide, biological, mechanical, cultural	Aminopyralid + 2, 4-D or Aminocyclopyrachlor + chlorsulfuron as per label	Nonionic surfactant, as per label	Rosette stage, spring or fall
Thistle, plumeless (<i>Carduus acanthoides</i>)	Herbicide, mechanical, cultural	Clopyralid or tricloram, as per label	Nonionic surfactant, as per label	Rosette stage, spring or fall
Thistle, Scotch (<i>Onopordum tauricum</i> , <i>Onopordum acanthium</i>)	Herbicide, mechanical, cultural	Aminopyralid + 2, 4-D or Aminocyclopyrachlor + chlorsulfuron as per label	Nonionic surfactant, as per label	Rosette stage, spring or fall

*These are small population or individuals that have been treated in the area, and will be monitored; all others are large and widespread populations

†Herbicides that are preferred for control are numbered as 1, if not numbered, there is no preference

Table 2. Biological, Cultural, or Mechanical Methods to be Used

Practice	Target Weed(s)
Those with biological listed as a control method in Table 1 have approved bio-controls.	All weeds above, but especially important for those that list cultural as a control method in Table 1.
Removal of small infestations by pulling or hand grubbing at any stage.	Houndstongue, bull thistle, musk thistle, plumeless thistle, scotch thistle
Repeated mowing during bolting pre-flowering stage; cutting, bagging and removal of flowering heads	All thistle species.
Introduce biological control approved for specific weeds in very large infestations, after agency approval.	Those with biological listed as a control method in Table 1 have approved bio-controls.

Local, State and Federal Contacts and Resources

Additional Noxious Weed Resource Management contacts include:

Royal Gorge Field Office BLM Weed Management Specialist John Lamman 3028 E. Main St., Callon City, CO, 81601-4180 719.269.8534	Huerfano County Weed Manager Darryl Crawford 1038 Russell Ave. Walsenburg, CO 81089 719-738-2420
Colorado Department of Agriculture State Weed Coordinator-Noxious Weed Program & Plant Industry Biological Control 970.244.3004 Division of Conservation Services 305 Interlocken Parkway Broomfield, CO 80021 (303) 869-9000 http://www.colorado.gov/cs/Satellite/agConservation/CBON/1251618780047	Colorado State University Cooperative Extension Service Huerfano County 928 Russell Ave Walsenburg CO 81089-2045 719.738.2170

Appendix A

Colorado Noxious Weed List

List A- Statewide Eradication

African rue (<i>Peganum harmala</i>)*	Myrtle spurge (<i>Euphorbia myrsinites</i>)* Orange
Camelthorn (<i>Alhagi pseudalhagi</i>)*	hawkweed (<i>Hieracium aurantiacum</i>)* Purple
Common crupina (<i>Crupina vulgaris</i>)*	loosestrife (<i>Lythrum salicaria</i>)* Rush
Cypress spurge (<i>Euphorbia cyparissias</i>)*	skeletonweed (<i>Chondrilla juncea</i>)* Sericea
Dyer's woad (<i>Isatis tinctoria</i>)* Giant	lespedeza (<i>Lespedeza cuneata</i>)* Squarrose
salvinia (<i>Salvinia molesta</i>)* Hydrilla	knawweed (<i>Centaurea virgata</i>)* Tansy ragwort
(<i>Hydrilla verticillata</i>)* Meadow knapweed	(<i>Senecio jacobaea</i>)* Yellow starthistle
(<i>Centaurea pratensis</i>)* Mediterranean	(<i>Centaurea solstitialis</i>)*
sage (<i>Salvia aethiopsis</i>)*	
Medusahead (<i>Taeniatherum caput-medusae</i>)	

List B-Prevent Further Spread

Absinth wormwood (<i>Artemisia absinthium</i>)*	Musk thistle (<i>Carduus nutans</i>)*
Black henbane (<i>Hyoscyamus niger</i>)*	Oxeye daisy (<i>Chrysanthemum leucanthemum</i>)*
Bouncingbet (<i>Saponaria officinalis</i>)* Bull	Perennial pepperweed or tall whitetop (<i>Lepidium latifolium</i>)
thistle (<i>Cirsium vulgare</i>)*	Plumeless thistle (<i>Carduus acanthoides</i>)*
Canada thistle (<i>Cirsium arvense</i>)* Chinese	Quackgrass (<i>Elytrigia repens</i>)
clematis (<i>Clematis orientalis</i>)* Common	Redstem filaree (<i>Erodium cicutarium</i>)
tansy (<i>Tanacetum vulgare</i>)* Common	Russian knapweed (<i>Acroptilon repens</i>)*
teasel (<i>Dipsacus fullonum</i>)* Corn	Russian-olive (<i>Elaeagnus angustifolia</i>)*
chamomile (<i>Anthemis arvensis</i>)* Cutleaf	Salt cedar (<i>Tamarix chinensis</i> , <i>T. parviflora</i> , and <i>T. ramosissima</i>)
teasel (<i>Dipsacus laciniatus</i>)*	Scentless chamomile (<i>Matricaria perforata</i>)*
Dalmatian toadflax, broad-leaved (<i>Linaria dalmatica</i>)*	

Dalmatian toadflax, narrow-leaved (*Linaria genistifolia*) *

Dame's rocket (*Hesperis matronalis*) * Diffuse

knapweed (*Centaurea diffusa*) * Eurasian

watermilfoil (*Myriophyllum spicatum*) * Hoary

cross or whitetop (*Cardaria draba*) *

Houndstongue (*Cynoglossum officinale*) *

Leafy spurge (*Euphorbia esula*) * Mayweed

chamomile (*Anthemis cotula*) * Moth mullein

(*Verbascum blattaria*) *

Scotch thistle (*Onopordum acanthium*) *

Scotch thistle (*Onopordum tauricum*) *

Spotted knapweed (*Centaurea maculosa*) *

Spurred anoda (*Anoda cristata*) * Sulfur

cinquefoil (*Potentilla recta*)^M * Venice

mallow (*Hibiscus trionum*) * Wild caraway

(*Carum carvi*) *

Yellow nutsedge (*Cyperus esculentus*)

Yellow toadflax (*Linaria vulgaris*)

List C-Localized Concern

Chicory (*Cichorium intybus*)

Common burdock (*Arctium minus*)

Common mullein (*Verbascum thapsus*) St.

Johnswort (*Hypericum perforatum*) Downy

brome or cheatgrass (*Bromus tectorum*)

Field bindweed (*Convolvulus arvensis*)

Halogeton (*Halogeton glomeratus*)

Johnsongrass (*Sorghum halepense*)

Jointed goatgrass (*Aegilops cylindrica*)

Perennial sowthistle (*Sonchus arvensis*)

Poison hemlock (*Conium maculatum*)

Puncturevine (*Tribulus terrestris*)

Velvetleaf (*Abutilon theophrasti*) Wild

proso millet (*Panicum miliaceum*)

-- These noxious weed species will be mapped and inventoried to meet BLM and FS requirements.

Appendix B

Example Excel Spreadsheet Components and Example Tables for Pesticide Reporting

Pesticide Reporting Example

The Excel spreadsheet table will contain the data fields listed below. This information should have been recorded on Noxious Weed Inventory and Pesticide Application records completed during the field season. The Excel spreadsheet will contain a new entry for each weed inventory and/or pesticide application.

Infestation Number (IN #): Needed when List A or List B species (with the exception of redstem filaree and quackgrass) are inventoried and treated. This is the unique number or code associated with each weed infestation.

Date: Date of the weed inventory and/or treatment

Observer/Applicator (Obs/Appl): Person conducting the inventory and/or applying the herbicide.

Weed Name or Bare Ground: Common name of the weed. If it was a bare ground treatment state as such.

UTM Easting (UTM E), Northing (UTM N) and Zone (Z) (should always be in NAD 83) or use Lat and Long if preferred. Be consistent with which one is used.

Infested Acres (Inf Acres): List how many acres are covered with the weed.

Density (Dens) i.e. Cover: L= Low (less than 5% total canopy cover)

M = Moderate (5% - 25% canopy

cover) **H** = High (more than 25% canopy cover)

Surface ownership (Own): **BLM, FS or private**

Herbicide Trade Name (Tr Name) or Treatment Method — if a manual or biological treatment state as such.

Chemical Names (Chem Name) — Only needed when using an herbicide with multiple active ingredients or when using a mixture of chemicals. For example, if using Sahara DG which has two active ingredients, imazapyr and diuron, enter the first two letters of each active ingredient. e.g. im + di. See Excel spreadsheet example.

Application Rate (Pounds Active Ingredient (A.I.)/Acre or Pounds Acid Equivalent (A.E.)/Acre): For those herbicides with multiple active ingredients, multiple columns for the application rates are provided. Application rates should be entered in the same order chemical names are entered. For example, for Sahara DG, the A.I./acre of imazapyr would be entered in the first Application Rate (AR #1) column. The A.I./acre of diuron would be entered in the second Application Rate (AR #2) column. If an additional chemical was used in the mix it would be entered in the third Application Rate (AR #3) column.

Total Pounds Active Ingredient (A.I.) or Acid Equivalent (A.E.) Applied: For those herbicides with multiple chemicals, multiple columns for the pounds of A.I./A.E. are provided. Pounds of A.I./A.E. should be entered in the same order chemical names are entered. For example, for Sahara DG, the pounds of A.I. of imazapyr would be entered in the first Total Pounds A.I./A.E. (AI AE #1) column. The pounds of A.I. of diuron would be entered in the second Total Pounds

A.I./A.E. (AI AE #2) column. If an additional chemical was used in the mix it would be entered in the third Total Pounds A.I./A.E. (AI AE #3) column.

Acres Treated: This should equal the Total Pounds A.I./A.E. divided by the Application Rate in Pounds A.I./A.E.

Example of a Table for Reporting Total Pounds Active Ingredient Applied and Total Acres Treated by Chemical Type

Chemical(s)	Application Rate (lbs. A.I./acre or lbs. A.E/acre)	Acres Treated	Total Pounds A.I. or A.E.
metsulfuron methyl	.056	20.7	1.16
metsulfuron methyl	.075	1.7	.13
Total acres and # a.i.		22.4	1.29
Metsulfuron methyl + 2,4-D	.125 + 1.87	.07	.009 + .0135
Total acres and # a.i.		.07	.009 + .0135
clopyrali d + 2,4-D	.285 + 1.5	5.0	1.43 +7.60
Clopyrali d + 2,4-D	.185 + 1.0	1.6	.3 + 1.6
Total acres and # a.e.		6.6	1.73 + 9.2

Example of a Table for Reporting Total Pounds of Active Ingredient Applied by Chemical Type

Chemical(s)	Total Pounds A.I. or A.E.
metsulfuron methyl	1.29
2,4-D	9.21
Clopyralid	2.78
Glyphosate	2.37

Appendix C

Sample Revegetation and Reclamation Plan

Sample Revegetation and Reclamation Plan

The proposed facility will be in operation for an anticipated period of approximately _____ during development and production of Oxy's natural gas production operations. Upon termination of the development and production activities, the facility will be reclaimed, as outlined below:

All equipment and structures will be removed.

OXY will remove all safety and storm water BMPs and other surface objects from the premises.

OXY will restore the site to pre-facility conditions by re-contouring and re-vegetating the site. Top soil will be redistributed across the site and will be reseeded with an approved seed mix (see attached seed mix recommendation).

OXY will monitor the site to ensure that 70 percent of the pre-existing vegetation is achieved, per the requirements of the area wide CDPHE Stormwater Permit for Sheep Mountain Unit Developments.

Seedbed Preparation and Slope Reconstruction:

Cut and fill slopes will be backfilled and re-contoured to a slope of 3:1 – 2.5:1 or less in instances where necessary to match the existing natural contours. Following final contouring, all backfilled or ripped surfaces will be covered evenly with topsoil. Re-contouring should form a complex slope with heavy pocking. In areas with slope greater than 3 percent, imprinting of the seed bed is recommended. Final seedbed prep will consist of scarifying/imprinting the topsoil prior to seeding. Imprinting can be in the form of dozer tracks or furrows perpendicular to the direction of slope. When hydro-seeding or mulching, imprinting should be done prior to seeding, unless the mulch is to be crimped into the soil surface. If broadcast seeding and harrowing, imprinting will be done as part of the harrowing. Furrowing can be done by several methods, the most simple of which is to drill seed perpendicular to the direction of slope in a prepared bed. Other simple imprinting methods include deep hand raking and harrowing, always perpendicular to the direction of slope. All compacted areas will be ripped to depth of 18" with max furrow spacing of 2'. Where practicable, ripping will be conducted in two passes at perpendicular direction.

Topsoil: Following final contouring, all backfilled or ripped surfaces will be covered evenly with topsoil. The topsoil in the cut slope on the back of the pad will be heavily pocked using the excavator bucket to form an uneven soil surface complex which will aid in revegetation and help with slope stabilization. The fill slope, and remaining disturbed, and reclaimed areas will be track walked to aid in revegetation and slope stabilization. In areas that may not have been disturbed during the reclamation process or areas of suspected compaction that will be reseeded, measures will be taken to loosen and spread the topsoil. These measures may include scarifying the soil by racking or harrowing the soil.

Seed Mix: Seed mix used for reclamation will be taken from the attached seed mixtures.

Seeding Procedures: For best results and success, the recommended grass mixture reseeding should be done in late autumn in order to take advantage of natural precipitation for the region. The reseeding rate should be doubled for broadcast application. Preferred seeding method is

multiple seed bin rangeland drill with no soil preparation other than simple grading to slope and imprinting and waterbars, where applicable.

Alternative seeding methods include, but are not limited to:

- ❖ No-till-drill (no soil preparation required);
- ❖ Harrow with just enough soil moisture to create an rough surface, broadcast seed and reharrow, preferably at a 90 degree angle to the first harrow;
- ❖ hydro-seeding (most economical in terms of seed cost); and
- ❖ hand raking at a 90 degree angle to the first raking.
- ❖ These are not the only means of replanting the site. However, these methods have been observed to be effective in similar landscapes.

The prepared soils will be seeded (weather permitting) no more than 24 hours following completion of final seedbed preparation. The seeding will be conducted by means of drilling the prescribed seed at prescribed seeding rate. The seed will be drilled with a common range drill at a depth of 0.25 – 0.5” beneath the soil surface. The seed will be drilled horizontally across the pad faces and perpendicular to the track walking when possible. When slope gradient less than 2.5:1 exists and drilling is not possible from a mechanical and safety standpoint the soils will be broadcast seeded at twice the prescribed amount. The reseeding will be monitored and reseeded as appropriate until the reclamation standards detailed above are met.