424113371M #M&b051

026-00707-0000
Parcel ID #(s)

Permit #

NONMETALLIC MINING RECLAMATION PLAN

Buffalo County
County

1. Superior Sand Systems Inc
(Name of Applicant)
7998 Cougar Ridge Ave
(Address)
Calgary Alberta Canada
(City, State, Zip)

2. Steve Segerstrom
(Name of Owner)
S561 State Rd. 37
(Address)
Mondovi Wisconsin 54755
(City, State, Zip)

3. **Mine Location** S561 State Rd. 37
(Address)
Mondovi (Buffalo County) Wisconsin 54755
(City, County, State, Zip)

4. **Legal Description of Mine:** **Superior Sand Mine**

5. **General Location Map** (Show the location of the mine on the section map below. Include roads, surface water and any other pertinent information) (See also Map #1).

40 ¼ of NE ¼ Section 33, Township 24 N, Range 11 W

N

6. Operator Information

List all mine operators if different from applicant.

(Operator Name)	(Operator Name)
(Address)	(Address)
(City, State, Zip)	(City, State, Zip)
(Telephone)	(Telephone)

7. Executive Summary

The Superior Sand Mine (Name of mine) is located at 5561 State Rd 37 Mondovi (Street Address, City, County, State, Zip) (Buffalo County) Wisconsin 54755

and currently encompasses 367 acres. Land use to the north is Gravel Pit, to the south is agricultural crops, farmland, to the east is agricultural crops, farmland, and to the west is Forest. The life expectancy of the mine is 20 years.

The material to be mined consists of Silica (Sand)

(Limestone, sand, sand and gravel, topsoil, clay, other)

The proposed final land use is "Return to agricultural crops and farmland"

Interim reclamation Will be implemented.
(will or will not)

The proposed interim reclamation will generally consist of replacement of clay and top soil in depths that allow for the planting of farm crops. (Original pre mining depths will apply to top soil and clay)

8. **Site Information**

Type of Material Mined Sand and Limestone
(Limestone, sandstone, sand & gravel, sand, clay, topsoil, other)

Method(s) of extraction and processing industrial front end loaders, drying and screening

Mine Size 367
(Acres)

Annual Operating Cycle (Continuous, Intermittent, Seasonal) Continuous

End Use of Material hydraulic fracturing sand, concrete, asphalt

Expected Life of Mine 20 years

Mining Stages (Maps #3 and #7) Mining stages will be repeated on 3 separate sections of the property

1. Removal of top soil and clay (stored in berms around each section)
2. Removal of sand for processing. (Leaving a depth of 7' to ground water)
3. Replacement of clay to original depth
4. Replacement of top soil to a depth of 12" with a 3 to 1 slope
5. Planting of crops

These stages are repeated for all 3 sections. Areas 1, 2, and 3 are on indicated on Map # 3

9. **Existing Site Conditions**

Topography – Pre-mining (USGS Topo Map #4) Agricultural crops and fields with a range of varied slopes from elevations of 1255ft to as low as 882ft

Topography – Current (Map #5) Agricultural crops, forest and fields, elevations running form 1255 ft to 882 ft

Soils – List primary soils and thickness/depth (County soil survey) (Map #6) _____

Soils found within or adjacent to the mining area are primarily Dubuque, Norden silt loams Urne-Norden loams series and Steep Stony Rocky Land soil series.

Geologic composition of deposit being mined (Map #7) ____Silica Sand, Construction grade sand___

Ground Water Table ___estimated_____ depth ___6___ feet below grade.
(Estimated or measured)

The nearest water supply well is completed in the _____ formation approximately _____ feet below grade. Wells completed in this formation typically produce_____to _____gallon per minute. Mining operations ___will not_____be performed below the ground-water elevations.
(will/or will not)

Regional ground-water flows ____South_____ toward ____Buffalo River_____.
(Direction)

Surface Water – Describe any surface water near the site (i.e., streams, rivers, lakes ponds, etc.) (Maps #4 and #5). Man made pond with no other surface water present.

Drainage Pattern – Summarize drainage patterns at the site (Map #5). Slopes converge to a dry creek bed that does not sustain surface water however, during storms the drainage flows in a south direction to the Buffalo River.

10. Physical and Biological Information

Surrounding land use consists of:

_____ Urban
_X_ Agricultural
_____ Marsh
_X_ Forest
_X_ Field

Other (explain any/all of the above)

Describe animal and plant life observed near the site. Birds in both the cultivated cropland and the adjacent forest include ducks, geese, grouse, cardinal, chickadee, crow, blue jay, woodpecker, wren, robin, warbler, oriole and hawk. Prominent mammals include field mice, gray and fox squirrels, chipmunk, cottontail rabbit, woodchuck, raccoon, opossum, skunk, red fox and white tail deer. Plant life consists of red and white oaks, sugar maples, elms and bass wood in the forested areas. Shrubs include maple leaf viburnum, fox grape, alternate-leaf dogwood, hairy honeysuckle and bearberry.

11. Post-Mining Land Use

Describe the final use of the land affected by nonmetallic mining (Maps 8 and 9)

The final use of the land will revert back to its original usage of agricultural farm crops mainly consisting of corn.

12. Reclamation Measures

Summarize for each mining stage

1. Removal of top soil and clay (stored in berms around each section)
2. Removal of sand for processing. (Leaving a depth of 7' to ground water)
3. Replacement of clay to original depth
4. Replacement of top soil to a depth of 12" with a 3 to 1 slope
5. Planting of crops

Describe the methods of salvaging and storing topsoil and other overburden to be used for reclamation. If topsoil substitute or imported material is to be used, list source and time table for acquiring it.

Topsoil will removed and placed in berms and stockpiled as to not affect drainage of the mine areas and erosion control devices will be used as needed to minimize soil loss during berm and other soil disturbance activities.

Describe earthwork necessary for site reclamation including final slope angles, high wall reduction, benching, terracing, and other slope stabilization measures.

Soil and clay fill will come from the temporary berms and stockpiles that were constructed during the mining process. Erosion control devices will be used as needed to minimize soil loss during berm and other soil disturbance activities. Topsoil and clay will be place back in the same thickness as pre mining levels. The mine areas will be graded to properly drain and the slopes will be blended into the surrounding topography.

Describe anticipated topography, water impoundments, created wetlands and/or other surface features (Maps #8 and #9).

Elevation levels will drop in each of the 3 mine areas.

Mining Area 1. Will have a pre mining elevation of 900 ft and a final elevation of 810 ft.

Mining Area 2. Will have a pre mining elevation of 925 ft and a final elevation of 825 ft

Mining Area 3. Will have a pre mining elevation of 880 ft and a final elevation of 779 ft.

All areas will be sloped and blended back into the topography and revert back to Agricultural crops.

Describe, or attach a copy of a seeding plan, which includes methods of seed bed preparation, seed mix, seeding rates, mulching, netting, and/or other techniques of stabilization (if applicable).

Standard farming methods of seeding for corn will apply as the current mine areas are corn fields. The mining area will revert back to original agriculture crops.

Describe all methods of erosion control to be used during reclamation.

Erosion control mats, fences, screens, blankets, bail checks, dikes and other erosion control devices will be used as needed to minimize soil loss during berm and other soil disturbance activities. We will meet all minimum requirements for methods and procedures governed by Wisconsin DOT Standard Specifications.

Describe interim/final reclamation phases.

Topsoil and clay will be place back in the same thickness as pre mining levels. The mine areas will be graded to properly drain and the slopes will be blended into the surrounding topography. Standard farming methods of seeding will be applied to the mining areas to revert back to agricultural crops.

Describe a quantifiable standard that will be used to determine the success of revegetation on reclaimed areas.

Meeting standards of crop yield per acre based on industry standards for local agricultural crops.

13. Criteria for Successful Reclamation

Describe a quantifiable standard to determine the success of site reclamation. As the mining areas are currently agricultural crops the current crop yield can be used as a bench mark. If crop yields are comparable to pre mining state it will be successful

14. The following maps must be attached to this document.

Map 1 Mine Location (from county plat book). Outline property boundaries and indicate location of mine.

Map 2 Mine Location (from orthographic photographs [scale 1" = 300']). Clearly indicate the following on photograph.

- Property boundaries
- Mine location
- All buildings and structures
- Location of water supply wells
- Surface Water

Map 3 Mine Layout (Scale 1" = 100') Clearly indicate the following on the orthographic photograph.

- Area mined before 8/1/01
- All buildings and structures
- Stockpile and equipment locations
- Area currently being mined
- Approximate final outline of mine
- Surface water at mine
- Mine stages

Map 4 Mine Topography USGS topographic maps

Map 5 Mine Topography (Scale 1" = 100') (from orthographic photograph) Existing mine topography

- Clearly draw the existing 10-foot contour lines on the orthographic photograph
- Indicate drainage patterns

Map 6 Soil From county soil survey, indicate the following:

- Mine location
- Property boundaries

Map 7 Geologic Map Existing Cross Section Present mine configuration, include the following:

- Subsurface
- Ground water
- Floor
- Surface water
- Highwall
- Stripped areas
- Topsoil
- Area to be mined
- Mine stages

Map 8 Post-Mining Land Use – Plan View (Scale 1" = 100') Clearly indicate the following on the orthographic photograph:

- Reclaimed land
- Planned development (i.e., roads, buildings, etc.)
- Surface water
- Vegetation
- Mine stages
- Reclaimed topography

Map 9 Post-Mining Land Use – Cross Section Include the following.

- Floor
- Planned development (i.e., roads, buildings, etc.)
- Surface water
- Reclaimed slope
- Topsoil
- Berms, fences, etc.

Pictures of mines are optional and can be very helpful. Label all maps clearly.

15. Financial Assurance Worksheet

16 Certification

Fee Enclosed $_____

See the County Nonmetallic Mining Reclamation Ordinance for the current fee schedule or contact the Zoning Department

To the best of my knowledge, I certify that the information provided on this application and accompanying documents are true and accurate. I certify that the areas identified within the permit that are impacted by mining activities will be reclaimed as specified in the approval permit for the site. I also understand that submitting this application authorizes the County Zoning Administration or his/her designee to enter onto the property for the purposes outlined in the Nonmetallic Mining Reclamation Ordinance.

Steve Sequeira
Applicant's Signature

9-2-11
Date

Landowner Certification (if landowner is different than applicant)

I certify that I concur with the reclamation plan authorized by this permit and will allow it to be implemented.

_____
Landowner's Signature

_____
Date

TO:

Buffalo County Zoning Department

IN REFERENCE TO:

Superior Sand Systems' Mondovi Quarry
Nonmetallic Reclamation Permit Application

SUBMITTED BY:

Superior Sand Systems Inc.
7998 Cougar Ridge Ave S.W.
Calgary Alberta Canada
T3H 5S1
DATE: June 1st 2011

TABLE OF CONTENTS

LIST OF DRAWINGS

LIST OF APPENDICES

SECTION 1.0
INTRODUCTION

1.1 Purpose

This application to Buffalo County Zoning Department is a request for approval for a Nonmetallic Mining Reclamation Permit for Superior Sand Systems Inc. This application describes the plans for reclamation of a limestone quarry located on property currently owned by Steve & Beth Segerstrom; Marvin & Donna Moy; Chad & Paula Thompson and referred to as the SMT Quarry. Superior Sand Systems Inc. entered into a lease for the quarry property in 2011. This lease encompasses the processing and removal of frac sand and aggregate for construction use. The mailing address of the operator and owner are:

Owner
Segerstrom, Moy, Thompson (SMT)
S561 State Road 37
Mondovi, WI 54755

Operator
Superior Sand Systems Inc.
7996 Cougar Ridge Ave SW
Calgary, AB T3H 5S1

Legal description of the land within this request is:

Steven and Beth Segerstrom

SW OF SE EXC PART	28-24N-11W
THAT PT OF THE SW OF SE	28-24N-11W
SW PT OF SE OF SE	28-24N-11W
NE OF NE	33=24N-11W
NW OF NE	33-24N-11W
SW OF NE	33-24N-11W
SE OF NE	33-24N-11W
NE OF NW	33-24N-11W
N 2A OF NE OF SE	33-24N-11W

Segerstrom & Sons LLC

SE OF SW	28-24N-11W
SW OF SW	28-24N-11W *
NW OF NW	33-24N-11W *

*Pending under Contract

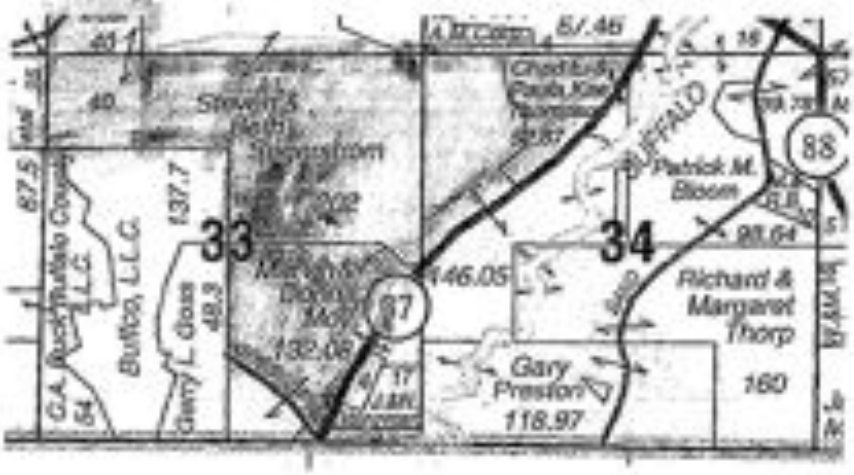
Marvin and Donna Moy

Pt OF SW NW	34-24N-11W
PT OF NE SE	33-24N-11W
PT OF NW SE	33-24N-11W
PT OF NW NW	34=24=11W

Chad and Paula Kae Thompson

PT OF SW NW	34-24N-11W
PT OF SE NW	34-24N-11W
PT OF NW NE	34-24N-11W
PT OF NE NW	34-24N-11W
PT OF NW NW	34-24N-11W

Figure #1 Plat Map



Superior Sand Systems Inc. proposes a plan for the final reclamation of these properties. An existing mine on the Segerstrom property was previously owned and operated by Clarence Linse from approximately 1958 – 1968.

1.2 Location & Background

The SMT Quarry is located West of Highway 37, one mile south of Highway 88. (see Figure 2, Site location Map).

Figure 2 Site Location Map

1.3 Site Characteristics & Land Use

The existing quarry has four high walls that extend about fifty (50) feet above the quarry floor. The quarry floor is at approximately 1235 feet elevation (above msl). The current area of quarry operation is about 19.91 acres.

Figure 3 Quarry Pit Face

No major streams, rivers or surface water bodies traverse or on the mining site. However there is a two acre private pond located near the homestead. The Buffalo River is located approximately ¾ miles south of the property. Surface drainage (i.e., runoff) is primarily contained on-site with minor drainage from the entrance road exiting the site.

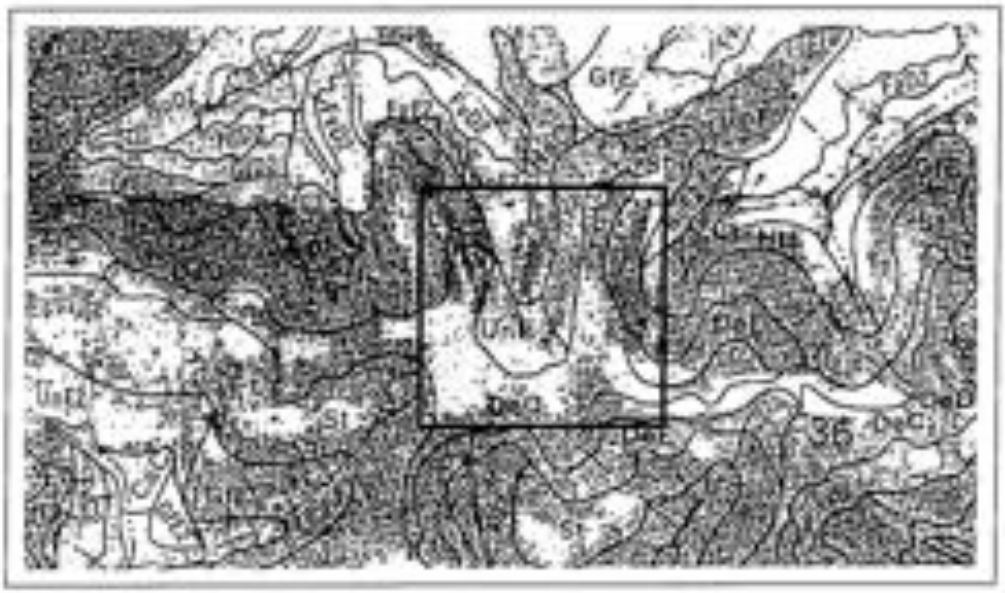
1.4 Land Ownership

Land ownership of properties adjacent to the Mondovi quarry property is shown on the Plat and Existing Conditions Maps (Figure 1 and Drawing 1, respectively). Surrounding properties are either forested or in agricultural use.

1.5 Soil and Geology

Soils found within or adjacent to the mining area are primarily the Dubuque, Norden silt roams, Urne-Norden roams series and Steep Stony Rocky Land soil series[1], see figure #3, Soil Survey Map. The various roams on the site are considered to be fair-to-good farmland soils; whereas, the Stony Land series is considered poor and only suitable as pasture or forest land. The roams are wind-blown (loess) deposits derived from the Mississippi River valley bottom during the ice age. The Stony Land series includes rock cliffs and outcrops and a shallow mantle of soil covering near-surface rock comprising the bulk of the material that is quarried.

Figure 3 Soil Survey Map



Beneath the soil of the Mondovi Quarry property is bedrock[2]. The bedrock is composed of dolomite of the Oneota Formation of the Prairie du Chien Group. The dolomite was deposited some four hundred eighty (480) million years ago during the Ordovician Period of the Paleozoic Era. The Oneota Dolomite is between one hundred-fifty (150) and two hundred fifty (250) feet thick in Western Wisconsin. The dolomite, when crushed and sized, is of high quality and is suitable for use in concrete, asphalt and other construction products, as well as agricultural lime. Below that is approximately 40 – 70 feet of fine sand suitable for glass making and hydraulic fracturing.

1.6 Biology

Most of the slope of the hill within the request is forested. The very top of the hill is an area partially utilized for overburden storage. Historically, the site was likely sugar maple, basswood and oak forest.

Red and white oaks, sugar maples, elms and basswood are the dominant species in this type of forest community. Shrubs include mapleleaf viburnum, fox grape, alternate-leaf dogwood, hairy honeysuckle and bearberry. Common herbaceous species in this forest community are bittersweet, large-flowered bellwort, bloodroot, sweet cicely, wild ginger, hepatica and ginseng.

Birds in both the cultivated cropland and adjacent forest include ducks, geese, grouse, cardinal, chickadee, crow, bluejay, woodpecker, wren, robin, warbler, oriole and hawk. Prominent mammals include field mice, gray and fox squirrels, chipmunk, cottontail rabbit, woodchuck, raccoon, opossum, skunk, red fox and white-tailed deer.

There are two barns, a house, shed, cabin and manmade pond located on the properties. There will be no mining located within 200 feet of these manmade objects.

SECTION 2.0
Erosion Control Practices

2.1 Erosion Control

Erosion control practices are addressed in the storm water pollution prevention plan prepared by Superior Sands and implemented as part of Wisconsin Department of Natural Resources (WDNR) NR 216 Storm Water Group Permit. A copy of the WDNR NR 216 Storm Water Group Permit is provided in Appendix A.

Section 628 of the Wisconsin DOT Standard Specifications (see Appendix B) will serve as the standard for erosion control [illegible] mats, fences, screens, blankets, bale checks, dikes and other erosion control devices will be used as needed to minimize soil loss during berm and other soil disturbance activities. These erosion control devices will meet the minimum requirements described in Section 628.2 Materials and be installed according to the methods and procedures described in Section 628.3 Construction Methods of the Wisconsin DOT Standard Specifications.

2.2 Vegetation and Berms

Existing stands of trees will be left in place, to provide an established vegetative cover to prevent erosion when not in the path of immediate extraction area. Trees will only be taken in the excavation area if stripping operations occur for extraction of any of the remaining reserve. Temporary berms may be constructed to control stormwater runoff. Berm height may vary somewhat in different areas of the property depending on the need to effectively contain and divert stormwater, but are planned to be approximately four to eight (4-8) feet in height.

The temporary berms will be constructed of topsoil and subsoil removed from future areas to be mined and will be stabilized and seeded. Reclamation of depleted areas will be completed when all mining excavation is complete.

2.3 Stormwater

Rain that falls onto the excavation area is largely contained within the excavation area and allowed to seep naturally into the underlying rock. When and where necessary to prevent surface runoff from entering the quarry proper, temporary small, earthen berms will be constructed to direct surface water flow from the site. As well a retention pond will be added to hold runoff water from buildings and only clean water will be pumped off onto farmland.

SECTION 3.0
RECLAMATION PLAN

3.1 Post-Mining Land Use

A man-made rock outcrop (high wall) will remain, similar to the natural rock outcrops on others properties in the area. Basal portion of the high wall will be covered with soil and sloped as described below.

Areas disturbed by the mining operation will be reclaimed to passive recreational uses (i.e., grassland, pasture and woodland), a permitted use under current zoning. Drawing 2,

Reclamation Plan Map shows the proposed final site reclamation plan and post-mining land use. A Reclamation Cross- Section (to be added), also show the proposed final site reclamation plan and post-mining land use.

Figure 6 to be inserted

The reclamation activity will include the back filling and sloping of all non-reclaimed areas against bottom 3-10 feet of the final quarry walls and sloping of soils/overburden above the final quarry highwalls. Any unreclaimed quarry floor will be backfilled and graded to a very gentle slope to facilitate drainage. The quarry floor will be seeded so as to blend into the surrounding topography. All remaining overburden and topsoil stockpiles will either be utilized in the reclamation process or re-graded to accent site drainage and blend with surrounding topography.

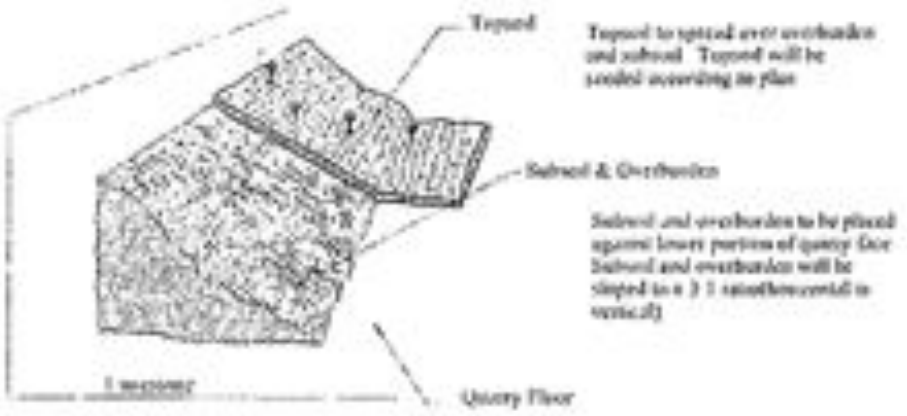
3.2 Reclamation Area

Reclamation will be completed as the limestone reserves are removed. The area to be reclaimed is shown in Drawing 2. Initial efforts will be directed toward (a) stabilizing internal slopes (through grading and landscaping) and (b) creating more formalized appearance (through additional grading and landscaping).

The bulk of the stripped overburden was removed prior to NR 135. Current conditions should provide enough of the soils to complete reclamation. If required to meet reclamation standards, deficiency of soil will be brought in from off-site. All of the A, B and C Horizon soils stockpiled on the site will be used in the reclamation of the site. B and C Horizon soils will be spread across the quarry floor as an approximately 3 to 6" layer. A Horizon soils will be spread evenly, as an approximately 1" layer, over the B/C Horizon soils.

3.3 Reclamation Sequence

Reclamation will begin after limestone reserves and sand reserves are depleted and formerly excavated areas are no longer necessary for stockpiling and equipment setup. Reclamation will be done as one project (from start-to-finish). The reclamation process will involve the back filling of the pit floor with subsoil and back filling against the exposed limestone face with overburden and subsoil materials with a minimum slope of 3:1, horizontal to vertical, see figure #7.



Part of the soil fill will come from the temporary berms and stockpiles that were constructed during mining process. Topsoil will be placed on all back-filled areas, graded to properly drain and seeded according to the seeding plan prescribed in Section 3.4, See photo 1, Typical Reclaimed Quarry Face. The slopes will be blended into the surrounding topography and all areas will be graded to properly drain.

3.4 Seeding Plan

Disturbed and reclaimed areas will be seeded with Seed Mixture No. 20 as specified in Section 630 of the Wisconsin DOT Standard Specifications (see Appendix B). Oats, rye or other equivalent early/late season grass seed mixture may be used as a cover crop if seeding occurs in the spring or early summer.

Mulching will be applied according to the standards in Section 627 of the DOT Standard Specifications (see Appendix B). Areas will be checked for nutrients and the "Standard" fertilizer will be applied to seeded areas according to the methods and rates prescribed in Section 629 of the DOT Standard Specifications (see Appendix B).

3.5 Reclamation Costs and Financial Assurance

An estimate of reclamation costs is provided in Table 2, Reclamation Cost Estimates. Financial assurance for reclamation will be in the form of a performance bond issued by an independent surety in an amount to cover acres disturbed annually.

Table 2 RECLAMATION COST ESTIMATES

Material on Site	Acres	Quantity (CY)	Reclamation Breakdown Item	Quantity (CY)	Acres	Unit Cost	Total Cost ($)
Topsoil on site Average Thickness 6"	10.52	38,115	Subsoil and Topsoil Replacement Against Lower Portion of Face	3,759	1.165	$0.86	$3,232
Subsoil on Site Average Thickness 60"	2.26	18,230	Subsoil & Topsoil Replacement Quarry Floor	27,753	13.189	$0.86	$23,868
Material from	0.92	7,421	Sloping Soil above Quarry	7,421	0.92	$1.27	$9,425

Sloping Above Quarry Face			Face 3:1 Slope (Removed above face and placed on quarry floor and side slopes)	(removal)			
Material Stockpiled On Site		11,099	Erosion Control Lump Sum Seedbed Prep., Seed, Fertilizer & Mulch		18.611	$575/ac	$10,000 $10,701
Totals		38,753		38,753			
			Total Reclamation Cost				$57,226
			Avg. Cost/Acre		18.611		$3,074.65

3.6 Criteria for Successful Reclamation

Percent cover of vegetation will determine successful reclamation. Randomly selected sample sites (square meter quadrants, two per acre) will be employed. Sampling will be conducted during peak growing periods and will compare sample site to vegetation cover of undisturbed soils in neighboring areas. A minimum of 70 percent vegetation (determined by visual count) or equal to percent cover of similarly vegetated areas in undisturbed locations will qualify as successful reclaimed. Annual site inspection will be performed to ensure standards for revegetion and reclamation are followed. If Buffalo County during these inspections recommends grading and/or seeding remedial/repair measures or additional erosion control, they will be implemented and later re-evaluated to accomplish successful revegetation and reclamation of the site.

3.7 Reclamation Certifications

Signed operator and owner certifications pertaining to reclamation are provided in Appendix C.

TABLE OF NATIVE SEED MIXTURES

SPECIES	SPECIES BOTANICAL NAME	PURITY & GERMINATION minimum %	MIXTURE PROPORTIONS in percent	
			NO 70	NO 70A
Canada Anemone	*Anemone Canadensis*	PLS	2	
Butterflyweed	*Asclepias tuberose*	PLS		2
New England Aster	*Aster novae-angliae*	PLS	2	2
Patridge-pea	*Chamaecrista (Cassia) fasciculate*	PLS		2
Purple Prairie Clover	*Dalea (Petalostemum) purpurea*	PLS	2	2
Canada Tick-trefoil	*Demodium canadense*	PLS	2	
Flowering Spurge	*Euphorbia corollata*	PLS		2
Wild Geranium	*Geranium maculatum*	PLS	2	
Western Sunflower	*Helianthus occidentaalis*	PLS	3	2
Rough Blazingstar	*Liatris aspera*	PLS		2
Praine Blazingstar	*Liatris pycnostachya*	PLS	2	
Lupine	*Lupinus perennis*	PLS		3
Wild Bergamot	*Monarda fistulosa*	PLS	2	
Horse Mint	*Monarda punctata*	PLS		2
Yellow Coneflower	*Ratibida pinnata*	PLS	2	2

Showy Goldenrod	*Solidago speciosa*	PLS	2	2
Spiderwort	*Tradescantia ohiensis*	PLS	2	2
Golden Alexanders	*Zizia aurea*	PLS	2	
Big Bluestem	*Andropogon gerardi*	PLS	15	15
Sideoats Grama	*Bouteloua curtipendula*	PLS	15	20
Canada Wildrye	*Elymus Canadensis*	PLS	15	15
Junegrass	*Koeleria macratha*	PLS		5
Little Bluestem	*Schizachyrium (Adropogon) scoparium*	PLS	15	20
Indiangrass	*Sorgatrum nutans*	PLS	15	

630.2.1.5.1.1.2 Mixture

(1) The contractor shall select a seed mixture or mixtures that meet with the engineer's approval, and unless specified otherwise in the contract, shall conform to the following:
   1. Use seed mixture No. 10 where average loam, heavy clay, or moist soils predominate.
   2. Use seed mixture No. 20 where light, dry, well-drained, sandy, or gravelly soils predominate and for all highcut and fill slopes generally exceeding 6 to 8 feet (1.8 to 2.4 m), except where using No. 70.
   3. Use seed mixture No. 10 or No. 20 on all ditches, inslopes, median areas, and low fills, except where using No. 30 or No. 70.
   4. Use seed mixture No. 30 for medians and on slopes or ditches generally within 15 feet (4.5 m) of the shoulder where a salt-tolerant turf is preferred.
   5. Use seed mixture No. 40 in urban or other areas where a lawn type turf is preferred.
   6. Use seed mixture No. 60 only on areas, the contract designates or the engineer specifies. Use it as a cover seeding for newly graded wet areas or as a nurse crop for specified wetland seed mixtures. The contractor shall not apply it to flooded areas.
   7. Use seed mixture Nos. 70 and 70A on slopes and upland areas the contract designates or the engineer specifies. Use seed mixture No. 70 on loamy soils and seed mixture No. 70A on sandy soils.

630.2.1.5.1.2 Temporary

(1) Under the Seeding Temporary bid item, use a temporary seed mixture conforming to 630.2.1.5.1.4. Use oats in spring and summer plantings. Use winter wheat or rye for fall plantings started after September 1.

630.2.1.5.1.3 Nurse Crop

(1) If seeding bare soil with either mixture 70 or 70A, include the work under the Seeding Nurse Crop bid item.

630.2.1.5.1.4 Borrow Pits and Material Disposal Sites

(1) For seeding borrow pits and material disposal sites beyond the right-of-way, use seed mixtures conforming to seed mixture No. 10, No. 20, No. 70 or No. 70A of 630.2.1.5.1.1or a borrow pit mixture composed of seeds of the species, purity, germination and proportions, by weight as given below:

SPECIES	**PERMANENT** %MINIMUM PURITY	%MINIMUM GERMINATION
Alfalfa	98	90
Bromegrass	85	88
Orchardgrass	80	85
Timothy	98	90
Red Clover	98	90
Alsike Clover	97	90
Ladino Clover	95	90
Kentucky Bluegrass	98	85
Birdsfoot Trefoil	95	80
SPECIES	**TEMPORARY** %MINIMUM PURITY	%MINIMUM GERMINATION
Annual Oats	98	90
Agricultural Rye	97	85
Winter Wheat	95	90
SPECIES	**NURSE CROP** %MINIMUM PURITY	%MINIMUM GERMINATION
Annual Oats	98	90
Annual Ryegrass	97	90
Winter Wheat	95	90

(2) For the borrow pit mixture use, by weight, 60 percent temporary species seeds and 40 percent permanent species seeds.
(3) For the temporary component, use any combination of temporary seeds listed in the table above.
(4) For the permanent component, use seeds from not more than 4 of the permanent species listed in the table above in any combination.
(5) When nurse crop is required for spring seeding before June 15, use annual oats. For fall seeding after October 15, use winter wheat, or annual ryegrass.

630.3 Construction

630.3.1 General

(1) If not protecting with a mulch cover, perform seeding, except Nos. 60, 70 and 70A mixtures at times of the year when temperature and moisture conditions are suitable for seeding, except during midsummer.
(2) Perform seeding, except Nos. 60, 70 and 70A mixtures, in conjunction with mulching as specified in section 627 at any time the engineer allows.
(3) The contractor may perform seeding of Nos. 60, 70 and 70A mixtures at any time soil conditions are suitable, except between June15 and October 15, unless the engineer allows otherwise.
(4) Perform seeding with the selected seed mixture, sown at the specified rate.

630.3.2 Preparation of Seed Bed

(1) Complete grading, shouldering, topsoiling, and fertilizing, if part of the work under contract, before permanent seeding, except the contractor may place the fertilizer and seed mixture in one operation if using equipment designed for the purpose.

(2) Just before seeding, work the area being seeded with discs, harrows, or other appropriate equipment to obtain a reasonably even and loose seedbed. Place topsoil as specified in 625.3.3.

630.3.3 Sowing

(1) Select the method of sowing from either method A, method B, or method C as described below. Obtain the engineer's approval for the selected method.

630.3.3.1 Method A

(1) Sow the selected seed mixture using equipment adapted to the purpose, or by scattering it uniformly over the areas to be seeded. Lightly rake or drag to cover the seed with approximately ¼ inch (6 mm) of soil. After seeding, lightly roll or compact the areas using suitable equipment, preferably the cultipacker type, when the engineer judges the seedbed too loose, or if the seedbed contains clods that might reduce seed germination. The contractor shall not roll slopes steeper than 1:3.
(2) If scattering seed by hand, perform this work with satisfactory hand seeders and only when the air is calm enough to prevent seeds from blowing away.

630.3.3.2 Method B

(1) Sow or spread the seed upon the prepared bed using a stream or spray of water under pressure and operated from an engineer-approved machine designed for that purpose. Place the selected seed mixture and water into a tank, provided within the machine, in sufficient quantities that when spraying the seed on a given area it is uniformly spread at the required application rate. During this process, keep the tank contents stirred or agitated to provide uniform distribution. Spread the tank contents within one hour after adding the seed to the tank. The engineer will reject seed that remains mixed with the water for longer than one hour. The engineer will not require dragging or rolling.

630.3.3.3 Method C

(1) For spring seeding of seed mixtures 70 and 70A into existing ground cover, mow existing vegetation to 4 inches or less in height 2 to 4 weeks before seeding. Ten to 14 days after mowing, spray with vegetation control herbicide conforming to 632.2.12.
(2) For fall seeding of seed mixtures 70 and 70A into existing ground cover, mow existing vegetation to 4 inches or less in height 4 to 6 weeks before seeding. Ten to 14 days after mowing, spray with vegetation control herbicide conforming to 632.2.12. Retreat with vegetation control herbicide 10 to 14 days after initial application if live vegetation persists.
(3) Seed with a no-till rangeland type drill. If the configuration of the area to be seeded allows, apply seed at ½ the specified seed rate and apply the second ½ in a perpendicular direction.

630.3.3.4 Borrow Pits and Material Disposal Sites

(1) Seed borrow pits, and material disposal sites off the right-of-way, with the selected seed mixture specified in 630.2.1.5.1.4. Consult with the landowner or the landowner's agent when selecting the seed mixture.

630.3.3.5 Seeding Rates

630.3.3.5.1 Right-of-Way

(1) Use the following sowing rate for seeds in pounds (kg) per 1000 square feet (100 m2) of area:
- Seed mixture No. 10 at 1 ½ pounds (1.0 kg)
- Seed mixture No. 20 at 3 pounds (1.5 kg)
- Seed mixture No. 30 at 2 pounds (1.0 kg)
- Seed mixture No. 40 at 2 pounds (1.0 kg)
- Seed mixture No. 60 at 1 ½ pounds (0.5 kg) (equivalent)/1/
- Seed mixture No. 70 or 70A at 0.4 pounds (0.18 kg) (equivalent)/1/
- Temporary seeding at 3 pounds (1.5 kg)
- Nurse crop seeding at 0.8 pounds (0.36 kg)

/1/ Determine the actual seeding rate for seed mixture No. 60 by multiplying the equivalent seeding rate for each of these mixtures by the sum of the unadjusted and adjusted percentages of the various species in the seed mixtures as sown.

(2) The unadjusted percentage equals the minimum percent of purity and germination specified in the table of seed mixtures contained in 630.2.1.5.1.1.1 for the applicable species.

(3) Obtain the adjusted percentage for each of the PLS species by dividing the specified percentage of the species by the product of the percent of purity and the percent of germination for each of the PLS species as delivered.

630.3.3.5.2 Borrow Pits and Material Disposal Areas

(1) For seeding borrow pits and material disposal off the right-of-way, sow the seed mixtures specified in 630.2.1.5.1.4 at the following rates per pound (kilogram) per 1000 square feet (100 m2) of area:
- Seed mixture No. 10 at ¾ pound (1.0 kg)
- Seed mixture No. 20 at 1 pound (1.0 kg)
- Seed mixture No. 30 at 1 ½ pounds (1.0 kg)
- Seed mixture No. 70 or 70A at 0.4 pounds (0.18 kg)
- Borrow pit mixture at 1 ½ pounds (0.8 kg)

630.3.3.6 Establishment Period for Native Seeding

(1) During the growing season after planting of seed mixture 70 or 70A, mow all seeded areas twice as directed by the engineer. Mow vegetation back to 6 inches high when it has reached a height of at least 12 inches.

(2) During the growing season after planting seed mixture 70 or 70A, eradicate the following species from the seeded areas as soon as they become evident:

SPECIES COMMON NAME	SPECIES BOTANICAL NAME
Musk thistle	Carduus nutans
Spotted knapweed	Centaurea maculaosa
Canada thistle	Cirsium arvense
Bull thistle	Cirsium ereal
Field bindweed	Con volulus arvensis
Leafy spurge	Euphorbia esula
Sweetclover	Melilotus spp.
Wild parsnip	Pastinaca sativa

(3) Eradicate by hand pulling or by applying a vegetation control herbicide conforming to 632.2.12 to individual plants.

630.4 Measurement

(1) The department will measure the Seeding bid items by the pound acceptably completed.
(2) The department will measure quantities based on net weights of seed shipments, or on quantities weighed on department-approved scales the contractor furnishes.
(3) The department will make deductions for all quantities wasted or not actually incorporated in the work according to the contract.
(4) The department will determine the equivalent pounds of seed furnished and applied by dividing the actual pounds of seed applied by the sum of the unadjusted and adjusted percentages of the various species in the seed mixture sown.
(5) The department will use the unadjusted and adjusted percentages determined in 630.3.3.5.1.

630.5 Payment

(1) The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
630.0100-0199	Seeding (mixture)	LB
630.0200	Seeding Temporary	LB
630.0300	Seeding Borrow Pit	LB
630.0400	Seeding Nurse Crop	LB

(2) Payment for the Seeding bid items is full compensation for providing, handling, and storing all seed; for providing the required culture and inoculating seed as specified; and for preparing the seed bed, sowing, covering and firming the seed. If the landowner does not want the pit or material disposal site seeded, or seeded with any of the mixtures allowed, the department will not make payment for fertilization or seeding of those areas.

Superior Sand Systems Inc.

STORMWATER POLLUTION PREVENTION PLAN FOR SMT QUARRY IN MONDOVI, WI

Summary

Nine Best Management Practices were incorporated into the plan that encompass the operation of rock and gravel crushing and sand processing plant, areas adjacent to the plants, and externally and internally drained sites that may be impacted by the operations. A summary of the Best Management Practices is:

1. Education- operator and employee training
2. Inspection and Supervision
3. Communication and emergency response
4. Plant site selection
5. Significant material storage
6. Repair and maintenance schedule
7. Good housekeeping practices
8. Construction of containment as needed
9. Erosion control prevention

The practices listed have been expanded in the plan to address specific areas of concern. Plant operators or supervisors have the option to expand or adapt particular practices to best serve the intent of the plan at a specific site.

STORM WATER PERMIT

STORM WATER POLLUTION PREVENTION PLAN

FACILITY PLAN

I. Facility Potential Pollutants
   A. # 2 Fuel Oil
   B. Lubricating Oils
   C. Grease
   D. Aggregates
   E. Reprocessed Waste Oil (HMA plants only)
   F. Asphalt Cement (HMA plants only)

II. Storm Water Exposure Potential for Pollutants
   A. # 2 Fuel Oil
      1. Spills during equipment refueling
      2. Bulk shipment deliveries- overfill
      3. Broken or leaking fuel lines and hoses
   B. Lubricating Oils
      1. Overfilling gearboxes
      2. Leaking seals on mechanical equipment
      3. Engine breather pipes
      4. Spills during oil changes
      5. Improper storage of oil inventory
   C. Grease
      1. Over greasing bearings and wear surfaces
      2. Improper disposal of cleaning towels
   D. Antifreeze
      1. Leakage from damaged radiators
      2. Overfill/spill

III. Best Management Practices For Pollution Prevention
   A. Education – Eliminate human error as a factor in pollution prevention
   B. Inspection and supervision
   C. Communication and supervision
   D. Selection of plant sites based on environmental factors
   E. Proper storage-of petroleum products- eliminate exposure to storm water
   F. Perform routine and repair maintenance as needed to eliminate leakage from mechanical components
   G. Use available resources to contain common spills
   H. Construct bermed containment area when needed to fulfill intent and purpose of the plan
   I. Erosion control prevention

IV. Site Map

A. Refer to the plant diagram on the following page for equipment configuration and significant material locations.

B. Specific location information is not included as this unit is portable.

C. Whenever possible, plant location is chosen such that site runoff from the immediate plant area is contained onsite by natural impounding in the quarry or pit. In cases where natural impounding is not available, berms will be constructed to provide containment for immediate plant area.

D. Whenever possible, aggregate piles will be located such that storm water runoff from the pile area will flow into a settling impoundment to reduce turbidity before exiting the site.

Implementation of Best Management Practices (BMP)

STORM WATER POLLUTION PREVENTION PLAN

IMPLEMENTATION OF BEST MANAGEMENT PRACTICES (BMP)

I. Education

A. The storm water pollution prevention plan will be reviewed at the spring and fall operator's meeting. The intent of the plan is stressed, and changes or improvements are noted. Operators discuss the plan and exchange ideas for plan improvement. Any new ideas that contribute to the plan are included in the written storm water pollution prevention plan for each plant.

B. Each plant operator holds an informal meeting of employees before beginning seasonal operation to instruct all plant personnel in safe petroleum product handling, proper maintenance procedures, and routine inspection of the plant during operation. Personnel are encouraged to take a proactive role in prevention of spills. Good housekeeping practices are stressed for control of minor drips and leaks from daily maintenance and operation.

II. Inspection and Supervision

A. The plant operator will inspect the plant site each day of operation and will include a pre-startup inspection, continuous monitoring during operations, and post shutdown inspection to insure that all plant equipment is functioning properly, all valves are closed, and significant materials are properly stored and secure before leaving the plant site.

B. Only the plant operator will supervise all bulk fuel deliveries to the site. Fuel transfers, including hose connect and disconnect from the receiving tank will be monitored to insure that spills do not occur. Plant personnel will assist tanker drivers as needed to provide safe and effective transfer of fuels. Tank drivers will know that spills will not be allowed.

C. Refueling of plant equipment will be monitored at all times to eliminate overfilling.

III. Communication and Response

A. Emergency response plan for spills is posted in the control house of the plants. The primary order of contact is listed. Plant operators and employees are aware of the location of the listing and follow the outlined procedure in a spill response situation.

B. Plant personnel will respond immediately to spill situations to mitigate effects and isolate/control source of spill. Operations will be immediately shut down when necessary to redirect on-site resources and manpower in spill response.
C. Company contact personnel and emergency phone numbers are posted in the control house or repair trailer to provide operators with immediate access to company support. Company contact will be established as soon as possible after the spill.
D. Emergency suppliers are listed with phone numbers for spill support services, including contaminated water pumping and removal service.
E. Company representatives follow state and federal reporting requirements. Documentation of spills is included in the plant record.

C. Selection of Plant Sites
A. The plant will be located as far from potential receiving waters as possible.
B. In locations where there is increased environmental sensitivity because of proximity to receiving waters, lack of natural containment or other critical factors, berms or diking will be constructed that will contain runoff from the immediate plant area.

D. Petroleum Product Storage
A. All fuel tanks shall have drop pans or sorbent material available for nozzle storage between refueling. Tanks and hoses are inspected daily for integrity and any problems are corrected.
B. Lubricants and grease are stored in repair or service trailer until needed. Storage area is secured at end of operating cycle.
C. Drip pans and contaminated sorbent material are replaced at the end of each work shift and at the onset of precipitation to eliminate storm water exposure to petroleum products. Containers are located in the service trailer for storage of used sorbents and other cleanup materials.
D. Used oil and grease from equipment service and repair is stored inside the plant service trailer until collected for offsite disposal.

E. Repair and Maintenance
A. Engines and gearboxes will be inspected and serviced as needed during the offseason to eliminate leaking seals, fuel lines, and gaskets. Drip pans, sorbents or other acceptable means contain leaks that develop during operation, until company maintenance personnel repair the problem. In cases where continued operation may cause uncontainable fluid losses, plant operations will cease until the problem is corrected.
B. Plant employees are instructed in proper lubrication procedures for plant equipment. Manufacturers specifications are followed to eliminate overfills of gearboxes and crankcases. Greasing of bearings and wear surfaces is carefully monitored to eliminate unnecessary great contact with the ground. Overflow from bearings is collected and disposed of with contaminated sorbent material.
C. Routine engine oil changes will be done with adequate sorbent material to provide for drips and spills associated with maintenance operations. Waste oil will be stored in spill proof containers in the service trailer until picked up for offsite disposal.
D. Any leaks that develop during the course of operation may, at the operator's discretion, be contained with drop pans or petroleum sorbent material, as long as

plant operation ceases prior to a storm event and containment vessels are cleaned and free of petroleum to prevent contact with storm water.

E. Repair and maintenance procedures will be conducted in the service trailer or outside with adequate containment for degreasing and cleaning. Petroleum sorbent material will be available as needed to supplement containment.

F. Use of Available Resources

A. Housekeeping supplies, including drip pans and sorbent materials, are kept on inventory in the repair trailer at all times. All plant personnel have access to materials and are instructed in their use.

B. All plant personnel are available to respond to petroleum spills as needed. Additional response personnel may be obtained from field crews working adjacent to the plant if needed.

C. If necessary, plant loader may be used to construct temporary berms or place aggregates for absorbing free flowing liquids. Loader can be used for backfilling and to remove impacted soils or aggregates.

D. Plant foreman, job superintendant, or other responsible company officials may obtain, mobilize and utilize and additional resources deemed necessary to mitigate the effects of a petroleum release. This may involve subcontractors, additional equipment or additional personnel, as needed.

G. Construction of Containment

A. Our plant will be constructed on high ground with a surrounding berm to insure that any rainwater or runoff is captured and filtered through the berm and high ground. This will insure that all captured water has been naturally filtered before entering the watershed.

B. Water collected in the onsite basins will be inspected by plant personnel for evidence of petroleum sheen or odor. If no evidence of contamination is apparent, the water may be released by gravity flow or by pumping. Release of water must be done in a manner that will not induce erosion or release water with high sediment loading into receiving waters. Water collected in onsite basins that shows evidence of petroleum contamination will be pumped into disposal tanks for transport to approved disposal facilities. Company environmental supervisor will be notified before removal and disposition of contaminated water. Any water releases will be documented in the daily plant record.

C. Berms constructed for containment during plant operation will be removed, regarded, or opened after the plant is removed from the site to prevent unsupervised water collection. Collection areas may be recontoured and seeded during site reclamation or separately.

H. Erosion Control Prevention

A. Bales, silt fences, and settling ponds are utilized to mitigate and eliminate erosion from potential problem areas.

B. Temporary seeding will be used to control critical area erosion, as needed, on a site specific basis. Critical areas may include stockpiled top soil and non-traffic areas that will support vegetation.

C. Contours of temporary plant sites are graded to minimize runoff to critical areas including waterways and stockpile areas.

D. Waterways for external drainage will have added drainage rock to prevent water carrying particulate from leaving the site.

Spill Prevention, Inspections and Facility Contact

Including:

- Spill Response Procedure
- Inspection Checklist
- Facility Contact

STORM WATER POLLUTION PREVENTION PLAN

Spills and Contamination:

Any ground contact petroleum product from routine operation was removed and properly disposed of offsite.

Operation sites are inspected by the plant operator for contamination before leaving the site. Cleanup is implemented if necessary.

Description of Inspections:

Inspections are recorded on the Environmental Programs Daily Tracking form. (A copy of the Environmental Programs Tracking form is included.)

The Spill Prevention Control and Countermeasures (SPCC) plan summarized the petroleum products handling, management, repairs and maintenance to petroleum equipment. These same procedures and containment type structures apply to the storm water plan also. Potential areas of contaminated discharge are inspected daily by the plant operator as outlined in the SPCC Inspection Outline. (A copy of the SPCC Inspection Outline is included.) This inspection procedure and any maintenance performed on equipment affecting these areas are documented on the Environmental Programs Tracking form in the SPCC section.

Facility Contact:

The facility contact is responsible for development and implementation of the pollution prevention plan.

Facility Contact – Print Name

Title President

For more information on storm water pollution prevention refer to the following plans:

- Spill Prevention Control and Countermeasures Plan (SPCC)
- Malfunction and Abatement Plan
- Fugitive Dust Plan

APPENDIX A

SEEDING PLAN AND EROSION CONTROL GUIDELINES

SECTION 627 MULCHING

627.1 Description

(1) This section describes furnishing, placing and anchoring a mulch cover, usually in connection with seeding the surfaces of the roadway.

627.2 Materials

(1) Mulching material consists of straw or hay in an air-dry condition, wood excelsior fiber, wood chips or other suitable material of a similar nature that the engineer approves, and is substantially free of noxious weed seeds and objectionable foreign matter.
(2) If using tackifier, the department will prequalify it before use. Select tackifiers from the department's erosion control product acceptability list (PAL). The contractor may obtain a copy of the PAL and the prequalification procedure for products not on the PAL from the department.

627.3 Construction

627.3.1 General

(1) Unless directed otherwise, place the mulch on the specified area within 2 days after completing the seeding.
(2) The contractor shall not perform mulching during periods of excessively high winds that might preclude proper mulch placement.
(3) Place the mulch loosely or open enough to allow some sunlight to penetrate and air to slowly circulate, but thick enough to shade the ground, conserve soil moisture and prevent or reduce erosion.
(4) Maintain the mulched areas and repair all areas damaged by wind, erosion, traffic, fire or other causes before final or partial acceptance of the work.

627.3.2 Placing

(1) The contractor may perform the work as specified in one of the following ways: Method A, Method B, or Method C, or a combination of the 3, unless a specific method is specified in the contract.

627.3.2.1 Method A, Netting

(1) Uniformly spread the mulching material over the designated areas to a loose depth of ½ to 1 ½ inches (13 to 38mm). Use a specific rate of application; dependent on the character of the material, that results in a cover conforming to the requirements specified above in 627.3.1. Loosen or make fluffy the mulch material from compacted bales before spreading in place. Unless directed otherwise, begin mulching at the top of the slopes and proceed downward.
(2) Securely anchor straw or hay mulch by using engineer-approved netting anchored to the ground with pegs or staples to prevent it from floating as the vegetation grows. Instead of this anchorage, the contractor may secure mulch by heavy biodegradable twine fastened by pegs or staples to form a grid with 6 to 10 feet (1.8 to 3m) spacing.
(3) The contractor may use department –approved erosion control mats, listed in the PAL, instead of separately applying mulch and netting.

627.3.2.2 Method B, Tackifier

(1) Treat straw or hay with a tackifier, blow from a machine, and uniformly deposit over designated areas in one operation. Place straw or hay uniformly over the area ½ to 1 inch (13 to 25mm) deep, using ½ to 3 tons (3.4 to 6.7mg) of mulch per acre. Mix and place tackifier according to the PAL. Within the above limits, the engineer will determine, on the job, the application rate of the mulch and the tackifier, and the engineer may vary the rates during mulching to produce the desired results. Use an engineer-approved machine to place the mulch that blows or ejects by constant air stream a controlled amount of mulch and applies a spray of tackifier to partially coat the straw or hay, sufficient to hold together and keep in place the deposited straw or hay. The contractor may apply the tackifier as an overspray in a separate operation after placing the straw or hay.
(2) Apply wood fiber, wood chips or similar material with engineer approved blowing machines or other engineer approved methods, that place a controlled amount of mulch uniformly over the area ½ to 1 ½ inches (13 to 38mm) deep. Treat areas receiving wood chip mulch, with one pound (0.5kg) of available nitrogen per 1000 square feet (100m^2) before or after applying the chips.
(3) Throughout the process, feed the mulch material into the blowing machine to produce a constant and uniform ejection from the discharge spout and operate in a position to produce mulch of uniform depth and coverage.

627.3.2.3 Method C, Crimping

(1) Spread the straw or hay mulch uniformly over the designated areas to a loose dept h of ½ to 1 ½ inches (13 to 38mm), using 1 ½ to 3 tons (3.4 to 6.7mg) of mulch per acre, by blowing from a machine, as specified in Method B, or by other engineer approved methods.
(2) Immediately after spreading, anchor the mulch in the soil by using a mulch crimper consisting of a series of dull, flat discs with notched edges. Space the 20inch (500mm) diameter discs at about 8 inch (200mm) centers. Equip the crimper with a ballast compartment to permit adjusting the weight for depth control.
(3) Impress the mulch into the soil 1 ½ to 2 ½ inches (38 to 64mm) deep in one pass of the crimper. The department will not allow mulch crimpers to operate on slopes so steep that damage to the mulch, seedbed, or soil occurs. Anchor the mulch on these areas by one of the following methods: Method A or Method B. Equip and operate tractors to minimize disturbing or displacing the soil. This process may require more than one pass of the crimper to ensure adequate anchoring of the mulch.
(4) The contractor shall not use Method C if it cannot impress the mulch to a minimum of 1 ½inch (38mm).

627.4 Measurement

(1) The department will measure mulching acceptably completed by the square yard or by the ton, whichever the contract specifies.
(2) If measured by the square yard, the measured quantity equals the number of square yards of surface area that the contractor applied the mulch.
(3) If measured by the ton, the measured quantity equals the number of tons of mulch provided, placed and acceptably completed.
(4) Tackifiers or nitrogen used for treating mulch are incidental to the cost of the work.

627.5 Payment

(1) The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
627.0200	Mulching	SY
627.0205	Mulching	TON

(2) Payment for mulching is full compensation for providing all materials, including tackifiers or nitrogen; for all hauling, treating, placing, spreading and anchoring of the mulch material; and for maintain the work and repairing all damaged areas.

(3) If the contractor opts to use department approved erosion control mats instead of separately applying mulch and netting, the department will pay for it at the contract unit price for mulching only.

SECTION 628 EROSION CONTROL

628.1 Description

(1) This section describes furnishing and installing, or constructing erosion control mats, bale checks or dikes, fences, screens, blankets, and other erosion control devices.

(2) This section also describes cleaning sediment basins and mobilizations for erosion control.

628.2 Materials

628.2.1 General

628.2.1.1 Acronyms

(1) Interpret acronyms used throughout this section as follows:

PAL The department's erosion control product acceptability list. The contractor my obtain a copy of the PAL and the prequalification procedure for products not on the PAL from the department.

ECRM Class I, II, and IIIA erosion control revegetative mats.

TRM Class IIIB, C, and D turf reinforcement mats.

628.2.1.2 Product Acceptability

(1) The department prequalifies selected erosion control products in the PAL. If the contract specifies, furnish products of the class, type, and subject to the seasonal limitations the PAL designates. Before installing a PAL product, submit to the engineer a written copy of the manufacturer's specifications for installing that product on slopes, channels, shorelines, high wind locations, and next to live traffic lanes as applicable to the contract installation. Install PAL products conforming to those manufacturer's specifications. The department may specify modifications to the manufacturer's procedures for individual materials here within section 628.

(2) The department may sample and test products supplied in the field to verify that they conform to the PAL prequalification requirements. Provide samples as the engineer directs.

628.2.2 Erosion Mat

(1) The department must prequalify all erosion mat products before use. Furnish erosion mat products from the PAL

(2) The PAL identifies prequalified erosion mat products by class and type. Use the required class and type of erosion mat the plans show or the engineer specifies. The contractor may furnish any prequalified erosion mat product of the class and type the plans show or that the engineer specifies.

(3) If using jute fabric for an erosion mat, use a woven fabric of a uniform open weave of single jute yarn. Use a jute yarn of loosely twisted construction with an average twist of not less than 1 ½ turns per one inch (25 mm). Ensure the average size of the warp and weft yarns are approximately the same. Furnish the woven fabric in rolled strips. Submit a certificate of compliance certifying that the jute fabric erosion mat conforms to the following:

- Is a minimum 48 inches (1220 mm) wide with a tolerance of minus one inch (25 mm).
- Has 78 warp ends, +/- one for each 48 inches (1220 mm) of width. Has 45 weft yarns, +/- 2, per linear yard(m) of length.
- Weighs 92 pounds per 100 square yards (50 kg/100 m2) +/_ 10 percent, measured under average atmospheric conditions.
- Is non-toxic to vegetation.

628.2.3 Staples

(1) Furnish U-shaped staples, made of No. 11 (3.05 mm) or larger diameter steel wire, or other engineer-approved material, are one to 2 inches (25 to 50 mm) wide, and not less than 6 inches (150 mm) long for firm soils and not less than 12 inches (300 mm) for loose soils.

628.2.4 Bales

(1) For bales, use straw, hay, or other engineer-approved material, in good condition, of the dimensions the plans show.

628.2.5 Stakes

(1) Furnish wood or metal stakes of the dimensions the plans show.

628.2.6 Silt Fence

628.2.6.1 Geotextile Fabric

(1) Furnish one of the following geotextile fabrics: woven or non-woven polyester, polypropylene, stabilized nylon, polyethylene, or polyvinylidene chloride. For non-woven fabric the contractor may use needle punched, heat bonded, resin bonded or combinations of all 3. Submit a certificate of compliance certifying that the geotextile conforms to the following:

TEST REQUIREMENT	METHOD	VALUE [1]
Minimum grab tensile strength (machine direction)	ASTM D 4632	120 lb (550 N)
Minimum grab tensile strength (cross machine direction)	ASTM D 4632	100 LB (450 N)
Maximum apparent opening size (equivalent standard sieve)	ASTM D 4751	No. 30 (600 µm)
Minimum Permittivity	ASTM D 4491	$0.05s^{-1}$
Minimum ultraviolet stability (strength retained at 500hrs of exposure)	ASTM D 4355	70%

[1]All numerical values represent minimum or maximum average roll values. Average test results from all rolls in a lot must conform the tabulated values.

628.2.6.2 Fence Support System

(1) Conform to plan requirements.

628.2.7 Silt Screen

(1) Furnish fabric and submit a certificate of compliance certifying that the fabric conforms to the following:

Thickness:	15mils (0.38mm)
Minimum grab tensile strength:	120lb (530 N)
Minimum equivalent opening:	No 170 sieve (90 µm)

(2) Heat seal or sew all fabric seams.
(3) For flotation use an 8 inch (200mm) diameter solid expanded polystyrene log, or engineer approved equal, with a buoyance of approximately 20 pounds per foot (9kg/300mm). Do not use polystyrene beads or chips.
(4) For the main load line, use 5/16 inch (8mm) cable. For ballast, use a ¼ inch (6mm) chain.

628.2.8 Sand Bags

(1) Furnish bags made of canvas, burlap, nylon or other engineer approved material filled with concrete sand or other engineer approved granular material.

628.2.9 Polyethylene Sheeting

(1) Furnish 6mil (0.152mm) or thicker polyethylene sheeting conforming to ASTM D 4397.

628.2.10 Turbidity Barriers

(1) Furnish barrier made of coated impervious fabric capable of containing all sediment at the location placed. It shall have a cable, with a 5/16 inch (8mm) or larger diameter, capable of supporting the barrier at the required height above the water. It shall have a self-contained ballast that weighs at least 0.7 pound per foot (1kg/m). the ballast may be either chain or flexible cable. Barrier ends shall have grommets to lace together adjoining sections. For anchor posts use one of the following: steel fence posts, steel pipes or steel channels.
(2) Submit a certificate of compliance certifying that the turbidity barrier fabric conforms to the following:

TEST REQUIREMENT	METHOD	VALUE [1]
Minimum grab tensile strength	ASTM D 4632	200 lb (890 N)
Minimum puncture strength	ASTM D 4833	90 lb (400 N)
Maximum permeability	ASTM D 4491	$1X10^{-7}$ cm/s
Minimum ultraviolet stability (strength retained at 500hrs of exposure)	ASTM D 4355	70%

[1]All numerical values represent minimum or maximum average roll values. Average test results from all rolls in a lot must conform the tabulated values.

628.2.11 Soil Stabilizer

(1) Soil stabilizer type A is one of the following: a cementitious soil binder added to wood cellulose fiber mulch, or a bonded fiber matrix. Soil stabilizer type B is a polyacrylimide.
(2) Furnish soil stabilizer products from the PAL.

628.2.12 Inlet Protection

(1) Use a type FF geotextile fabric conforming to 645.2.1 except use a woven polypropylene fabric. Furnish type FF geotextile fabrics, or bags manufactured from type FF geotextile fabrics, from the PAL.

628.3 Construction

628.3.1 General

(1) Deliver 25 percent of the plan quantity of erosion mat, erosion bales, silt fence, or manufactured alternative materials for temporary ditch checks, to the project site before construction begins unless the engineer directs otherwise. Deliver the balance required, based on actual site conditions, and determined by consulting with the engineer, in time to install each material as the contract specifies.
(2) Ensure that erosion control products selected from the PAL are properly installed and maintained to remain in place and functioning as the contract specifies

628.3.2 Erosion Mat

(1) Furnish and install protective covering mats or soil retention mats for erosion control on prepared planting areas of slopes, ditches, channels, or shorelines, at locations the plans show or the engineer directs. Conform to the seasonal limitations designated in the PAL for photodegradable products.
(2) Install as the manufacturer specifies except as follows:
    1. Do not use single roll material less than 6 feet (1.8 m) wide in channels.
    2. Entrench mats approximately 3 inches (75 mm) deep along the edge facing traffic for installations within 5 feet (1.52 m) of active traffic lanes.
    3. Overlap mats by 3 inches (75 mm) or less and anchor with anchoring devices selected from the PAL for all mats the PAL designates as urban.
(3) Cover TRM's immediately after installation with materials from the PAL as follows:
    1. On slopes use either an ECRM or a type A soil stabilizer. If using a soil stabilizer, apply at the manufacturer's recommended rate unless the contract or engineer specifies otherwise.
    2. In channels use an ECRM of a class and type the PAL allows for channel applications.
(4) Remove all stones, clods, roots, sticks, or other foreign material that prevent the mat from bearing completely on the surface before placing the mat.
(5) Reseed any seeded areas damaged or destroyed during placement of the erosion mat as specified for the original seeding.
(6) Dispose of all surplus excavation or materials, and all stones, clods, or other foreign material removed in preparing for placing the mat.
(7) Apply water uniformly after placing the mat over a seeded area to sufficiently moisten the seedbed to a depth of 2 inches (50 mm) and in a manner that precludes washing or erosion.
(8) Maintain the erosion mat and repair any damaged areas until the work is accepted.

(9) The contractor shall not overlap type urban erosion mat with type urban or other type erosion mat.

628.3.3 Erosion Bales

(1) Furnish bales of straw, hay or other suitable baled material to form erosion control structures other than ditch checks. Install at locations the plans show or as the engineer directs.
(2) Maintain the bales as required including removing and disposing of sediment deposits. Remove erosion bales after slopes and ditches are stable and turf develops enough to make future erosion unlikely. The engineer will determine when the contractor meets these criteria satisfactorily. The contractor may use bales as mulch. Dispose of bales not used as mulch in a manner acceptable to the engineer. Reshape ditches; fill sumps and trenches; dispose of excess eroded material; and topsoil, fertilize and seed the affected area.

628.3.4 Silt Fence

628.3.4.1 Installation and Removal

(1) Erect the silt fence before starting a construction operation that might cause sedimentation or siltation at the site of the proposed silt fence.
(2) If possible, construct the silt fence in an arc or horseshoe shape with its ends pointing up slope. Construct the silt fence to the dimensions, and according to the details the plans show. Remove silt fences, as the engineer determines, after stabilizing the slopes and ditches and developing the turn to the extent that future erosion is unlikely. Clean up and restore the surface after removal. The contractor owns all materials remaining after removal and is responsible for their disposal off the right-of-way.

628.3.4.2 Inspection and Maintenance

(1) Inspect all silt fences immediately after each rainfall and at least daily during prolonged rainfall. Correct any deficiencies immediately. Additionally, review the locations for silt fences and filter barriers in areas that construction activity changed the earth contour and drainage runoff on a daily basis to ensure that the silt fences are properly and effectively located. If deficiencies exist, install additional silt fences as the engineer directs or approves.
(2) Remove the sediment deposits when the build-up exceeds approximately ½ the volume capacity of the silt fence. The engineer may order the contractor to remove deposits if the engineer determines that deposits exceed ½ the volume capacity of the silt fence. The contractor shall dress, to the existing grade, sediment deposits remaining in place after the silt fence is no longer required; this includes topsoiling, fertilizing and seeding the affected area.

628.3.5 Silt Screen

(1) Install the silt screen to prevent drift shoreward or downstream. Securely attach the flotation log to the fabric in both the horizontal and vertical direction.
(2) Attach the 5/16 inch (8mm) cable at the flotation members and extend along the entire length of each section of silt screen. Seal a ¼ inch (6mm) chain in the lower hem for ballast.
(3) Use connectors to join the main load line and ballast chain to carry all tensile pressure. Join the fabric for its entire height with grommets and lacing rope.

(4) Ensure the silt screen extends from the water surface to a maximum 10 foot (3m) depth.
(5) Install anchorages or stakes on both shore and stream side to maintain stability. Use a post with deadman or engineer approved equal for shore anchors. Ensure stream anchors are of sufficient size, type and strength to stabilize the barrier beyond the construction area.
(6) Buoy anchors to prevent pulling the barrier under water. Use Danforth-type anchors in sandy bottom and heavy kedge type or mushroom anchors on mud bottoms.
(7) Maintain the barrier throughout construction operations.
(8) After completing the work, remove the barrier in a manner that prevents siltation of the river.

628.3.6 Cleaning Sediment Basins

(1) Clean sediment basins when the engineer determines the sediment has accumulated to an extent that impairs the effectiveness of the sediment basin.
(2) Dispose of the surplus material according to 205.3.12 for disposal of surplus or unsuitable material.

628.3.7 Mobilizations for Erosion Control

(1) Move personnel, equipment, and materials to the project site for constructing erosion control items at the stages the contract indicates or the engineer directs.
(2) Submit for approval an ECIP required in 107.20 for accomplishing temporary and permanent erosion control work. Stage the ECIP erosion control work to conform to the number of Mobilizations Erosion Control bid items the contract plans show. The department will not allow any deviation from approved staging without the engineer's written approval. The engineer will direct each of the mobilizations. Mobilize with sufficient personnel, equipment, supplies, and incidentals, within 72 hours of the engineer's written order.

628.3.8 Mobilizations Emergency Erosion Control

(1) Move personnel, equipment, and materials to the project site to install temporary erosion control items on an emergency basis as the engineer directs.
(2) Mobilize with sufficient personnel, .equipment, materials, and incidentals on the job site within 8 hours the engineer's written order to install temporary erosion control items on an emergency basis.
(3) An emergency is a sudden occurrence of a serious and urgent nature, beyond normal maintenance of erosion control items and mobilizations the ECIP includes. Under this definition, an emergency mobilization requires immediate action to move necessary personnel, equipment, and materials to the emergency site followed by immediate installation of temporary erosion control measures.
(4) Unless the engineer directs otherwise, replenish stockpiled material delivered as specified for plan quantities in 628.3.1 and subsequently used for emergency erosion control to the pre-emergency totals of these stockpiles.

628.3.9 Polyethylene Sheeting

(1) Install polyethylene sheeting at locations the plans how or as the engineer directs.
(2) Secure the sheeting from wind and water dislocation. Before placing, remove stones, roots, sticks and other materials that interfere with the sheeting bearing completely on the soil. Overlap adjacent sheet a minimum of 3 feet (1m) in the direction of flow; and seal the edges with waterproof tape or other engineer-approved method. Patch damaged areas with sheeting overlapped a minimum of 3 feet (1m) and seal the joins with waterproof tape or

other engineer approved method. Maintain the sheeting and make satisfactory repairs of damaged areas.

(3) Upon completing the work, remove the polyethylene sheeting. The contractor shall assume ownership of all removed material.

628.3.10 Turbidity Barriers

(1) Install turbidity barriers at locations the plans show or as the engineer directs.

(2) Place all barriers, before beginning adjacent construction, in a manner that causes minimum disturbance of the streambed and banks. Extend the barrier into the stream banks far enough to preclude washing out or erosion around the ends. Drive posts securely into the streambed at 10 foot (3m) intervals along the line of the barrier installation. Fasten the barrier to the posts an securely anchor the barrier load lines at the barrier ends and at 10 foot (3m) intervals between the barrier ends, unless the engineer directs otherwise. Provide additional anchoring if necessary to maintain the barrier location during construction operations. Install sand bags as the plans show to anchor the barrier to the streambed. The engineer may require additional sand bags to ensure adequate performance. The contractor, as required by permit under 107.18, shall provide and anchor both danger buoys and navigational markers.

(3) Maintain the integrity of the barrier as necessary to contain erosion from adjacent construction operations. Promptly correct all deficiencies. Barrier maintenance includes removing and disposing of accumulations of soil and other detrimental material.

(4) Remove the barrier after completing the adjacent work. Delay removal until removing and disposing of accumulated soils and other suspended materials, and all suspended materials settle. Minimize disturbing the streambed and banks during removal operations.

(5) If the engineer approves, the contractor may substitute sheet pile installed as a part of their construction operation for all or part of the turbidity barrier the plans show.

628.3.11 (Vacant)

628.3.12 Soil Stabilizer

628.3.12.1 General

(1) Provide soil stabilizer as a soil bonding agent to prevent or minimize erosion. Install on exposed soil surfaces of temporary or permanent slopes as the plans show or as the engineer directs.

628.3.12.2 Soil Stabilizer Type A

(1) Apply soil stabilizer with conventional hydraulic seeding equipment. Ensure that surrounding surfaces, structures, signs, trees, and shrubs are not over-sprayed. The engineer will not accept the work until the contractor satisfactorily cleans over-sprayed surfaces. Provide a finished application 3/16 inch (4 mm) to ¼ inch (6 mm) thick.

(2) For permanent slope applications, sow seed separately, before applying the soil stabilizer, to ensure that the seed has direct contact with the soil.

628.3.12.3 Soil Stabilizer Type B

(1) Apply soil stabilizer with conventional hydraulic seeding equipment or by dry spreading. Apply the material at the manufacturer's recommended rate unless the engineer directs otherwise.

(2) For permanent slope applications, apply department-approved mulch when applying the soil stabilizer or after applying it to protect the seed.

628.3.13 Inlet Protection

(1) Furnish, install, maintain, and remove type FF geotextile fabric, and fabric hold down and support systems for inlet protection where the plans show or the engineer directs. The contractor may provide manufactured alternatives selected from the PAL.
(2) For type A inlet protection, install around field inlets until establishing permanent soil stabilization; and around pavement inlets before placing curb, gutter, or curb & gutter.
(3) For type B inlet protection, install on curb, gutter, curb & gutter, and pavement inlets after placing the surrounding pavement surfaces.
(4) For type C inlet protection use a wooden 2 x 4 (50 x 100 mm), wrapped and secured in type FF geotextile fabric, installed in front of the curb head as the plans show. The wood shall not block the entire opening of the curb box.
(5) For type D inlet protection, the contractor may make the bag from type FF geotextile fabric or choose a manufactured type FF bag from the PAL. Ensure that the device is designed to fit the size and shape of the inlet. At a minimum, inspect and maintain after every precipitation event.

628.3.14 Temporary Ditch Checks

(1) Provide suitable ditch check materials, installed and maintained at locations the plans show or as the engineer directs.
(2) Construct temporary ditch checks using a double row of erosion bales or a manufactured alternative from the PAL. Place temporary ditch checks across ditches at locations the plans show or as the engineer directs immediately after shaping the ditches or slopes. Excavate upstream sumps as the engineer directs.
(3) Remove sediment deposits when the build-up exceeds approximately ½ the erosion bale structures volume capacity. The engineer may order the contractor to remove deposits if the engineer determines that sediment deposits exceed ½ the erosion bale structures volume capacity. Dispose of excess sediment as the engineer directs.
(4) Remove ditch checks after the slopes and ditches are stable and the turf develops enough to make future erosion unlikely. The engineer will determine when the contractor meets these criteria. The contractor may use bales as mulch. Dispose of bales not used as mulch in a manner acceptable to the engineer. Reshape the ditch; fill sumps and trenches; dispose of excess eroded material; and topsoil, fertilize, and seed the affected area.

628.3.15 Culvert Pipe Ditch Checks

(1) Install sand bag ditch checks the plans show or as the engineer directs immediately after installing newculverts. Place sand bags on the inlet end of the culvert only. Maintain the sand bags in place until slopesand ditches are stable and turf develops enough to make future erosion unlikely. Remove and dispose of the used sand bags. Remove accumulated sediment or spread it to form a surface suitable for seeding.

628.4 Measurement

General

628.4.1.1 Borrow Sites and Material Disposal Sites

(1) The department will measure work acceptably completed under selected bid items placed on borrow sites and material disposal sites if the engineer requests that work and that work is consistent with the ECIP. The department will measure only the following bid items using the methods described in their respective measurement subsections:

Mulching	Silt Fence Maintenance
Erosion Mat Delivered	Erosion Mat Installed
Erosion Bales Delivered	Erosion Bales Installed
Temporary Ditch Checks Delivered	Temporary Ditch Checks Installed
Silt Fence Delivered	Silt Fence Installed
Fertilizer Type A	Fertilizer Type B
Seeding	Seeding Temporary

628.4.1.2 Sand Bags

(1) The department will not measure sand bags. Sand bags are incidental to the bid items that use sandbags.

628.4.2 Erosion Mat Delivered

(1) The department will measure the Erosion Mat Delivered bid items by the square yard acceptably completed, determined as the same quantity measured for the Erosion Mat Installed bid items under 628.4.3.

628.4.3 Erosion Mat Installed

(1) The department will measure the Erosion Mat Installed bid items by the square yard acceptably completed. The department will not make allowance for portions of the mat that must be entrenched in the soil for any end or junction slot, or for required overlaps.

628.4.4 Erosion Bales Delivered

(1) The department will measure Erosion Bales Delivered as each individual bale acceptably completed, determined as the same quantity measured for the Erosion Bales Installed bid item under 628.4.5.

628.4.5 Erosion Bales Installed

(1) The department will measure Erosion Bales Installed as each individual bale acceptably completed.

628.4.6 Silt Fence Delivered

(1) The department will measure Silt Fence Delivered by the linear foot acceptably completed, determined as the same quantity measured for the Silt Fence Installed bid item under 628.4.7.

628.4.7 Silt Fence Installed

(1) The department will measure Silt Fence Installed by the linear foot acceptably completed. The department will measure along the base of the fence, center-to-center of end post, for each section of fence.

628.4.8 Silt Fence Maintenance

(1) The department will measure Silt Fence Maintenance by the linear foot acceptably completed. The department will measure along the base of the fence, end to end of the section maintained, for each time a section of fence is cleaned and repaired.

628.4.9 Silt Screen

(1) The department will measure Silt Screen by the linear foot acceptably completed.

628.4.10 Cleaning Sediment Basins

(1) The department will measure Cleaning Sediment Basins by the cubic yard acceptably completed, measured in the vehicle.

628.4.11 Mobilizations Erosion Control

(1) The department will measure Mobilizations Erosion Control by each individual mobilization acceptably completed. The department will not include the following:

1. Delivering materials provided for in specific delivered bid items in the contract.
2. Work specified under the Mobilizations Emergency Erosion Control bid item, or the work and operations necessary for normal contractor maintenance of erosion control items.
3. The movement of personnel, equipment, and materials to the work site to accomplish installing additional erosion control items the engineer deems necessary to control erosion between the stages contained in the department approved plan of operations, unless the engineer directs otherwise in writing.

628.4.12 Mobilizations Emergency Erosion Control

(1) The department will measure Mobilizations Emergency Erosion Control by each individual mobilization acceptably completed. The department will not include delivering temporary erosion control materials provided for in specific delivered bid items in the contract.

628.4.13 Polyethylene Sheeting

(1) The department will measure Polyethylene Sheeting by the square yard acceptably completed.

628.4.14 Turbidity Barriers

(1) The department will measure Turbidity Barrier by the square yard acceptably completed. The department will make no allowance for portions of the turbidity barrier considered as part of the anchorages, required overlaps, or having a bottom flap greater than 48 inches (1200 mm).

(2) If the contractor substitutes sheet pile for turbidity barrier as allowed in 628.3.10, the department will measure that turbidity barrier as the plan quantity in square yards of material replaced.

628.4.15 Soil Stabilizer

(1) The department will measure the Soil Stabilizer bid items by the acre acceptably completed within the limits the contract designates or as the engineer directs.

628.4.16 Inlet Protection

(1) The department will measure the Inlet Protection bid items as each individual location and type acceptably completed.

628.4.17 Temporary Ditch Checks Delivered

(1) The department will measure Temporary Ditch Checks Delivered by the linear foot acceptably completed, determined as the same quantity measured for the Temporary Ditch Checks Installed bid item under 628.4.18.

628.4.18 Temporary Ditch Checks Installed

(1) The department will measure Temporary Ditch Checks Installed by the linear foot acceptably completed. If using erosion bales, the department will only measure the length across the ditch, not the length of each row of bales. The department will not measure ditch checks constructed with a single row of bales.

628.4.19 Culvert Pipe Ditch Checks

(1) The department will measure Culvert Pipe Ditch Checks as each individual location acceptably completed.

628.5 Payment

628.5.1 General

(1) The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
628.1 1 05	Erosion Bales Delivered	EACH
628.1110	Erosion Bales Installed	EACH
628.1505	Silt Fence Delivered	LF
628.1510	Silt Fence Installed	LF
628.1520	Silt Fence Maintenance	LF
628.1550	Silt Screen	LF
628.1 y05	Mobilizations Erosion Control	EACH
628.1910	Mobilizations Emergency Erosion Control	EACH
628.1920	Cleaning Sediment Basins	CY
628.2000 - 2099	Erosion Mat Delivered (class) (type)	SY

628.3000 - 3099	Erosion Mat Installed (class) (type)	SY
628.5505	Polyethylene Sheeting	SY
628.6005	Turbidity Barriers	SY
628.6500 - 6599	Soil Stabilizer (type)	ACRE
628.7000 - 7099	Inlet Protection (type)	EACH
628.7505	Temporary Ditch ChecksDelivered	LF
628.7510	Temporary Ditch Checks Installed	LF
628.7550	Culvert Pipe Ditch Checks	EACH

(2) The department will pay for measured quantities at the contract unit price under selected bid items placed on borrow sites and material disposal sites if the engineer requests that work and that work is consistent with the ECIP. The department will pay for only the following bid items using the methods described in their respective payment subsections:

Mulching	Silt Fence Maintenance
Erosion Mat Delivered	Erosion Mat Installed
Erosion Bales Delivered	Erosion Bales Installed
Temporary Ditch Checks Delivered	Temporary Ditch Checks Installed
Silt Fence Delivered	Silt Fence Installed
Fertilizer Type A	Fertilizer Type B
Seeding	Seeding Temporary

628.5.2 Erosion Mat Delivered

(1) Payment for the Erosion Mat Delivered bid items is full compensation for providing and delivering acceptable erosion mat materials for the work including staples; and for protecting and storing on the project.

628.5.3 Erosion Mat Installed

(1) Payment for the Erosion Mat Installed bid items is full compensation for placing and anchoring the mat, including staples; for preparing the seeded areas; for installing end and junction slots; for repairing and reseeding damaged areas; for providing and applying water; and for disposing of all surplus and waste materials.

(2) The department will pay separately for covering class III types B, C, and D mats with an ECRM under the applicable Erosion Mat bid item, or with type A soil stabilizer under the Soil Stabilizer Type A bid item.

628.5.4 Erosion Bales Delivered

(1) Payment for Erosion Bales Delivered is full compensation for providing and delivering erosion bales for the work, including stakes; and for protecting and storing on the project.

628.5.5 Erosion Bales Installed

(1) Payment for Erosion Bales Installed is full compensation for placing all materials, including stakes; for anchoring the bales; for all excavating, including trenches and sumps; for removing excess sediment during construction; for removing and disposing of the bales and all waste or surplus materials, including eroded materials; and for shaping and restoring ditches.

(2) The department will pay separately for any required topsoiling, fertilizing, or seeding under the applicable bid item.

628.5.6 Silt Fence Delivered

(1) Payment for Silt Fence Delivered is full compensation for furnishing and delivering silt fence for the work, including all miscellaneous materials; and for protecting and storing on the project.

628.5.7 Silt Fence Installed

(1) Payment for Silt Fence Installed is full compensation for erecting fence, including all excavating, placing posts, backfilling and attaching geotextile fabric; and for removing the fence at project completion.

628.5.8 Silt Fence Maintenance

(1) Payment for Silt Fence Maintenance is full compensation for all required cleaning and repairing; for removing and spreading the accumulated sediment to form a surface suitable for seeding; and for replacing silt fence and all damages caused by overloading sediment material or ponding water adjacent to the silt fence.

628.5.9 Silt Screen

(1) Payment for Silt Screen is full compensation for providing, assembling, erecting, maintaining, and removing the silt screen barrier.

628.5.10 Cleaning Sediment Basins

(1) Payment for Cleaning Sediment Basins is full compensation for all excavating; and for disposing of surplus material.

628.5.11 Mobilizations Erosion Control

(1) Payment for Mobilizations Erosion Control is full compensation for the staged moving of personnel, moving equipment, and moving materials. The department will pay separately for delivery and installation of erosion control devices under the other bid items in this section.
(2) Failure to mobilize within 72 hours of the engineer's written order will result in a $300 per calendar day deduction from money due under the contract, for each calendar day of delay. The engineer may extend the 72-hour period for delays that are not the contractor's fault.

628.5.12 Mobilizations Emergency Erosion Control

(1) Payment for Mobilizations Emergency Erosion Control is full compensation for the staged moving of personnel, moving equipment and moving materials. The department will pay separately for delivery and installation of temporary erosion control devices under the other bid items in this section.
(2) Failure to mobilize within 8 hours, will result in a $300 per calendar day deduction from money due under the contract, for each calendar day of delay. The engineer may extend the 8-hour period for delays that are not the contractor's fault.

628.5.13 Polyethylene Sheeting

(1) Payment for Polyethylene Sheeting is full compensation for furnishing and delivering the polyethylene sheeting to the project site; for storing on the project; for installing the sheeting; for all excavating and backfilling; for securing the sheeting and sealing the edges of the sheeting; and for removing and disposing of the sheeting and surplus materials.

628.5.14 Turbidity Barriers

(1) Payment for Turbidity Barriers is full compensation for furnishing, assembling, installing, maintaining and removing the turbidity barrier; and for sandbags, buoys, navigational markers, anchors, and anchor ropes.
(2) If the contractor substitutes sheet pile for turbidity barrier as allowed in 628.3.10, the department will pay for the plan quantity of turbidity barrier replaced.

628.5.15 Soil Stabilizer

(1) Payment for the Soil Stabilizer bid items is full compensation for furnishing, mixing, and applying soil stabilizer.

628.5.16 Inlet Protection

(1) Payment for the Inlet Protection bid items is full compensation for furnishing, transporting, and installing all materials; and for maintaining and removing the inlet protection devices.

628.5.17 Temporary Ditch Checks Delivered

(1) Payment for Temporary Ditch Checks Delivered is full compensation for furnishing and delivering the ditch check material, including stake, to the project site; and for protecting and storing on the project.

628.5.18 Temporary Ditch Checks Installed

(1) Payment for Temporary Ditch Checks Installed is full compensation for installing and removing ditch checks at project completion or as the engineer directs; for repairing and reseeding damaged areas; and for disposing of all surplus and waste material.
(2) The department will not pay for installing ditch checks if constructed of a single row of erosion bales.

628.5.19 Culvert Pipe Ditch Checks

(1) Payment for Culvert Pipe Ditch Checks is full compensation for furnishing and installing sand bags; for all excavating; for removing and disposing of sand bags and all waste, surplus, or eroded materials; and for shaping and restoring the area.

SECTION 629 FERTILIZER AND AGRICULTURAL LIMESTONE

629.1 Description

(1) This section describes furnishing and incorporating fertilizing material in the soil on areas of proposed seeding or proposed sodding.
(2) This section also describes furnishing and incorporating agricultural limestone in the soil.

629.2 Materials

629.2.1 Fertilizers

629.2.1.1 General

(1) Use fertilizers for seeding, sodding, or other planting that are standard, commercial, packaged or bulk products, in granular or liquid form conforming to Wisconsin Statutes and the Wisconsin Administrative Code Chapter ATCP 40. Ensure that each container of packaged fertilizer is plainly marked with the analysis of the contents showing minimum percentages of total nitrogen, available phosphoric acid, and soluble potash. If furnishing the fertilizer in bulk, include an invoice in each shipment indicating the minimum percentages of total nitrogen, available phosphoric acid and soluble potash in the contents.
(2) If using fertilizer with a total of nitrogen, phosphoric acid, and potash greater than 32 percent for type A or 50 percent for type B, apply them at a rate that provides equal nitrogen, phosphoric acid, and potash.

629.2.1.2 Type A

(1) Type A fertilizer shall conform to the following minimum requirements:

Nitrogen, not less than	16%
Phosphoric Acid, not less than	6%
Potash, not less than	6%

(2) The total of nitrogen, phosphoric acid, and potash shall equal at least 32 percent.
(3) Total nitrogen shall at least equal the sum of the phosphoric acid and soluble potash.

629.2.1.3 Type B

(1) Type B fertilizer shall conform to the following minimum requirements:

Nitrogen, not less than	16%
Phosphoric Acid, not less than	6%
Potash, not less than	24$

(2) The total of nitrogen, phosphoric acid, and potash shall equal at least 50 percent.

629.2.2 Agricultural Limestone

(1) Conform to chapter 94.66 of the Wisconsin Statutes and of the Wisconsin Administrative Code Chapter ATCP 44. Furnish limestone with a neutralizing index of not less than 40 or more than 109.
(2) Before using, furnish a statement to the engineer indicating the index zone or grade of the limestone for each deposit.

629.3 Construction

629.3.1 Fertilizer

629.3.1.1 General

(1) Uniformly apply the fertilizer selected for the seeding areas and incorporate into the soil by lightly discing or harrowing. If applying granular fertilizer, ensure it is well pulverized and free from lumps.
(2) If incorporating fertilizer into topsoiled areas, the contractor may apply it just before, and in conjunction with, final discing or harrowing, or if hand manipulating the topsoil, apply it just before final raking and levelling.
(3) If placing fertilizer on surfaces with no topsoil, prepare the soil by discing or harrowing to at least 6 inches (150mm) deep and then incorporate the fertilizer as specified above.
(4) If sowing seeding areas by pressure sprayer, then fertilize by placing the required amount of fertilizer in the tank, mixing with the water and the seed, agitating constantly, and apply during the seeding operation. If applying fertilizer this way then the department will not require discing and harrowing after placement.
(5) If fertilizing areas to receive sod, spread the fertilizer uniformly over the soil before sodding at the rate specified below, and then work the fertilizer into the soil while preparing as specified for preparing the earth bed in 631.3.1.
(6) If applying fertilizer for work specified under section 632, then apply the fertilizer as specified in that section.

629.3.1.2 Type A

(1) Apply fertilizer containing 32 percent total of nitrogen, phosphoric acid, and potash at 7 pounds per 1000 square feet (3.5kg/100m^2) of area, unless the contract specifies otherwise. For type A fertilizer that contains a greater percentage of components, determine the application rate by dividing 112 by the greater percentage.

629.3.1.3 Type B

(1) Apply fertilizer containing 50 percent total of nitrogen, phosphoric acid and potash at 7 pounds per 1000 square feet (3.5kg/100m^2) of area, unless the contract specifies otherwise. For type B fertilizer that contains a greater percentage of components determine the application rate by dividing 175 by the greater percentage.

629.3.2 Agricultural Limestone Treatment

(1) Unless the contract specifies otherwise, spread agricultural limestone over the contract designated areas at a uniform rate, measure in punds per 100 square feet (kg/100m^2), as follows:

INDEX ZONES	40-49	50-59	60-69	70-79	80-89	90-99	100-109
RATE	140(70)	120(60)	100(50)	90(45)	80(40)	70(35)	60(30)

(2) To conveniently check the required application rate, the contractor may measure materials used on a volumetric basis, providing the conversion from weight to volume is determined from representative samples of materials used.
(3) Incorporate the agricultural limestone with the required fertilizers into the soil in the designated areas. The pertinent construction requirements applicable to fertilizers shall apply to those materials also.

629.4 Measurement

(1) The department will measure the Fertilizer bid items by the hundred pounds (CWT) acceptably completed, measured based on an application rate of 7 pounds per 1000 square feet (3.5 kg/100 m). The department will not measure fertilizer used for the bid items under section 632. The measured quantity equals the number of hundred-weight (CWT) of material determined by multiplying the actual number of cwt. of material incorporated by the ratio of the actual percentage of fertilizer components used to 32 percent for type A and to 50 percent for Type B.
(2) The department will measure Agricultural Limestone Treatment by the ton acceptably completed, measured based on an application rate of 100 pounds per 1000 square feet (50 kg/100 m2) and an index of 60-69. The measured quantity equals the number of tons of material determined by multiplying the actual number of tons of material incorporated by 50 and dividing by the application rate required the index zone of the material used.

629.5 Payment

(1) The department will pay for measured quantities at the contract unit price under the following bid items:

ITEM NUMBER	DESCRIPTION	UNIT
629.0200-0299	Fertilizer (type)	CWT
629.1100	Agricultural Limestone Treatment	TON

(2) Payment for the Fertilizer bid items is full compensation for providing, hauling, placing and incorporating in the work.
(3) Payment for Agricultural Limestone Treatment is full compensation for providing, hauling, placing and incorporating the required materials in the soil.

SECTION 630 SEEDING

630.1 Description

(1) This section describes preparing seed beds and furnishing and sowing the required seed on slopes, appurtenances, and other areas, and on borrow pits and material disposal sites.
(2) This section also describes furnishing and sowing temporary seed mixture on the slopes and appurtenances of temporary embankments and roadways.

630.2 Materials

630.2.1 Seed

630.2.1.1 General Requirements

(1) Conform to the Wisconsin Statutes and Wisconsin Administrative Code Chapter ATOP 20 regarding noxious weed seed content and labeling.
(2) Use seed within one year of the test date appearing on the label.
(3) Seed mixtures 70 and 70A contain wild type forbs and grasses. Wild type is defined as seed that is derived directly from native, wild stock, including seed that was wild collected and placed into production or has been harvested directly from native stands.

630.2.1.2 Purity and Germination

(1) Test seed according to the methods and procedures used for sampling and analyzing seed for purity, germination, and noxious weed seed content specified in the current edition of Rules for Testing Seed, published by the Association of Official Seed Analysts.

630.2.1.3 Inoculation

(1) Inoculate legume seed (white clover, red clover, ladino clover, alsike clover, alfalfa, empire birdsfoot trefoil, partridge pea, purple prairie clover, Canada tick-trefoil, and lupine) unless it has been pre-inoculated by the vendor. Follow the inoculation instructions that come with the culture purchases. If applying the seed according to method B, 630.3.3.2, treat seeds requiring inoculation with 5 times the amount of inoculant recommended in the instructions.
(2) Avoid exposure of the culture or inoculated seed to the sunlight, and in no case shall any exposure exceed 1/2 hour.

630.2.1.4 Storing Seed

(1) Store any seed delivered before use in a manner that protects it from damage by heat, moisture, rodents, or other causes. Discard and replace any previously tested and accepted seed that becomes damaged.

630.2.1.5 Seed Mixtures

630.2.1.5.1 Right-of-Way

630.2.1.5.1.1 Permanent

630.2.1.5.1.1.1 Composition

(1) Seed mixtures for use on the right-of-way and easements shall, unless specified otherwise, be composed of seeds of the purity, germination and proportions, by weight, as given in the Table of Highway Seed Mixtures and the Table of Native Seed Mixtures.
(2) Use seed of the species and varieties listed below. If no variety is listed, there will be no restriction on the variety furnished, except as follows: Species composed of pure live seed (PLS) shall contain no named or improved varieties. PLS shall be grown in Wisconsin or northern Illinois, northeastern Iowa or eastern Minnesota. PLS for seed mixtures 70 and 70A shall be packaged separately by species and clearly labeled with the vendor's name, species common and botanical names, gross weight, percent PLS, year of harvest and any specialized treatments that have been applied to ensure or enhance germination. If PLS is not listed, determine PLS by multiplying the percent germination times the percent purity. Minimum percent purity for native for species is 90 percent. If a listed species is not available, substitutions may be made with engineer's approval and must be documented.
(3) Mix native species at the project site. Clean and debeard seeds having awns or excessive hairs before mixing.

SPECIES COMMON NAME	SPECIES BOTANICAL NAME	ACCEPTABLE VARIETIES
Kentucky Bluegrass	Poa pratensis	Low maintenance
Red Fescue	Festuca rubra	Creeping
Hard Fescue	Festuca ovina var duriuscula	Improved
Tall Fescue	Festuca arundinacea	Improved turf type

Salt Grass	Puccinelia distans	Fult's
	Puccinelia distans	Salty
Redtop	Agrostis alba	
Timothy	Phleum pretense	
Canada Wild Rye[1]	Elymus Canadensis	
Perennial Ryegrass	Lolium perenne	
Perennial Ryegrass	Lolium perenne	Improved Fine
Annual Ryegrass	Lolium multiflorum	
Alsike Clover	Trifolium hybridum	
Red Clover	Trifolium pratense	
White Clover	Trifolium repens	
Birdsfoot Trefoil	Lotus corniculatus	Empire
Japanese Millet	Echinochola crusgalli var. frumentacea	
Annual Oats	Avena sativa	
Alfalfa	Medicago sativa	
Bromegrass	Bromus inermis	
Orchardgrass	Dactylis glomerata	
Ladino Clover	Trifolium repens var. latum	Ladino
Agricultrual Rye	Secale cereale	
Winter Wheat	Triticum aestivum	

[1] Pure live seed.

TABLE OF HIGHWAY SEED MIXTURES

SPECIES	PURITY MINIMUM %	GERMINATION MINIMUM %	MIXTURE PROPORTIONS IN PERCENT				
			NO 10	NO 20	NO 30	NO 40	NO 60
Kentucky Bluegrass	98	85	40	6	10	35	
Red Fescue	97	85	25		30	20	
Hard Fescue	97	85		24	25	20	
Tall Fescue	98	85		40			
Salt Grass	98	85			10		
Redtop	92	85	5				
Timothy	98	90					12
Canada Wild Rye		PLS[1]					10
Perennial Ryegrass	97	90	20	30			
Improved Fine Perennial Ryegrass	96	85			15	25	
Annual Ryegrass	97	90					30
Alsike Clover	97	90					4
Red Clover	98	90					4
White Clover	95	90	10				
Birdsfoot Trefoil	95	80			10		
Japanese Millet	97	85					20
Annual Oats	98	90[1]					20

[1]Substitute winter wheat for annual oats in fall plantings started after September 1.

APPENDIX B

NON-METALLIC MINING
RECLAMATION PLAN
OPERATOR AND OWNER CERTIFICATES

Non-metallic Mining Reclamation Plan Operator and Owner Certification

Operator Certification

I hereby certify, as a duly authorized representative or agent, that this reclamation plan meets the requirements of ch. NR 135, Wis. Adm. Code and that Superior Sands will follow this plan as submitted unless a revision is submitted and approved in writing by the regulatory authority.

Chad DeLuge
Signature of Applicant or Duly Authorized Agent

9-2-11
Date

Owner Certification

I/We hereby certify, as the landowner or lessee of the referenced property, that we agree with the proposed reclamation plan being submitted by Superior Sands and that we will allow implementation of this plan.

Signature of Landowner(s)/Lessee

9-2-11
Date

Signature of Landowner(s)/Lessee

Date

APPENDIX C

SCALED MAPS

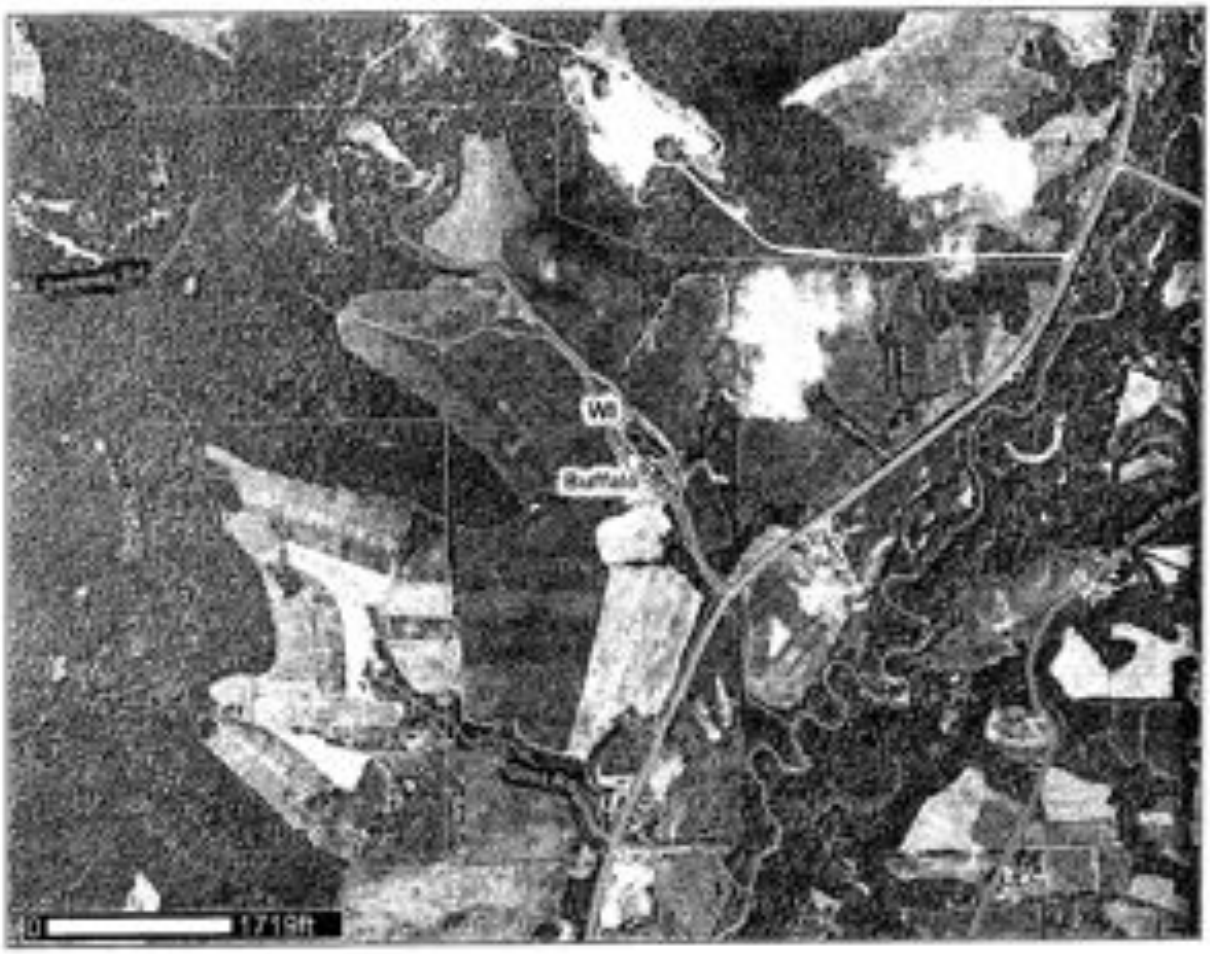
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

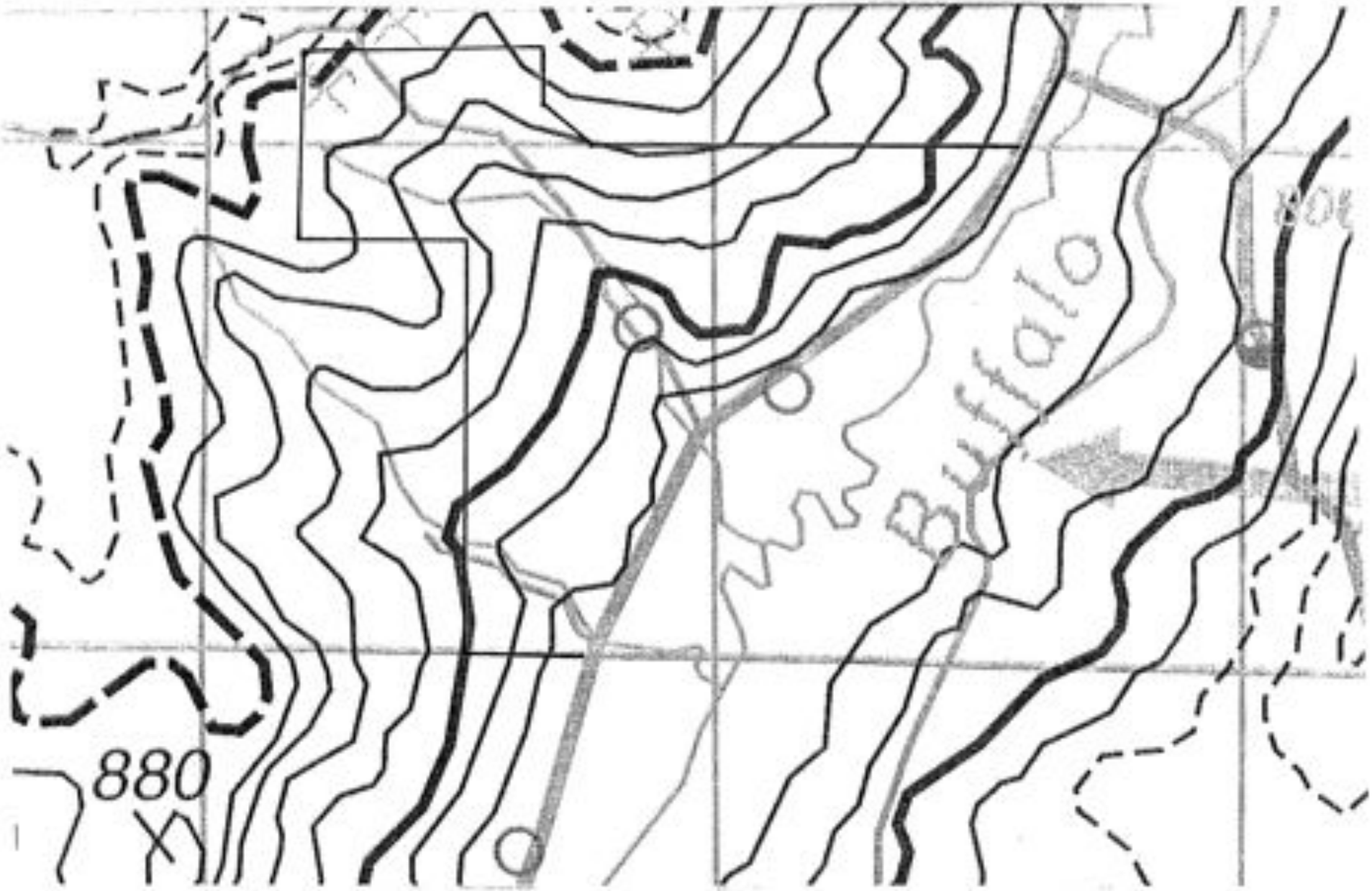
A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Buffalo County, Wisconsin

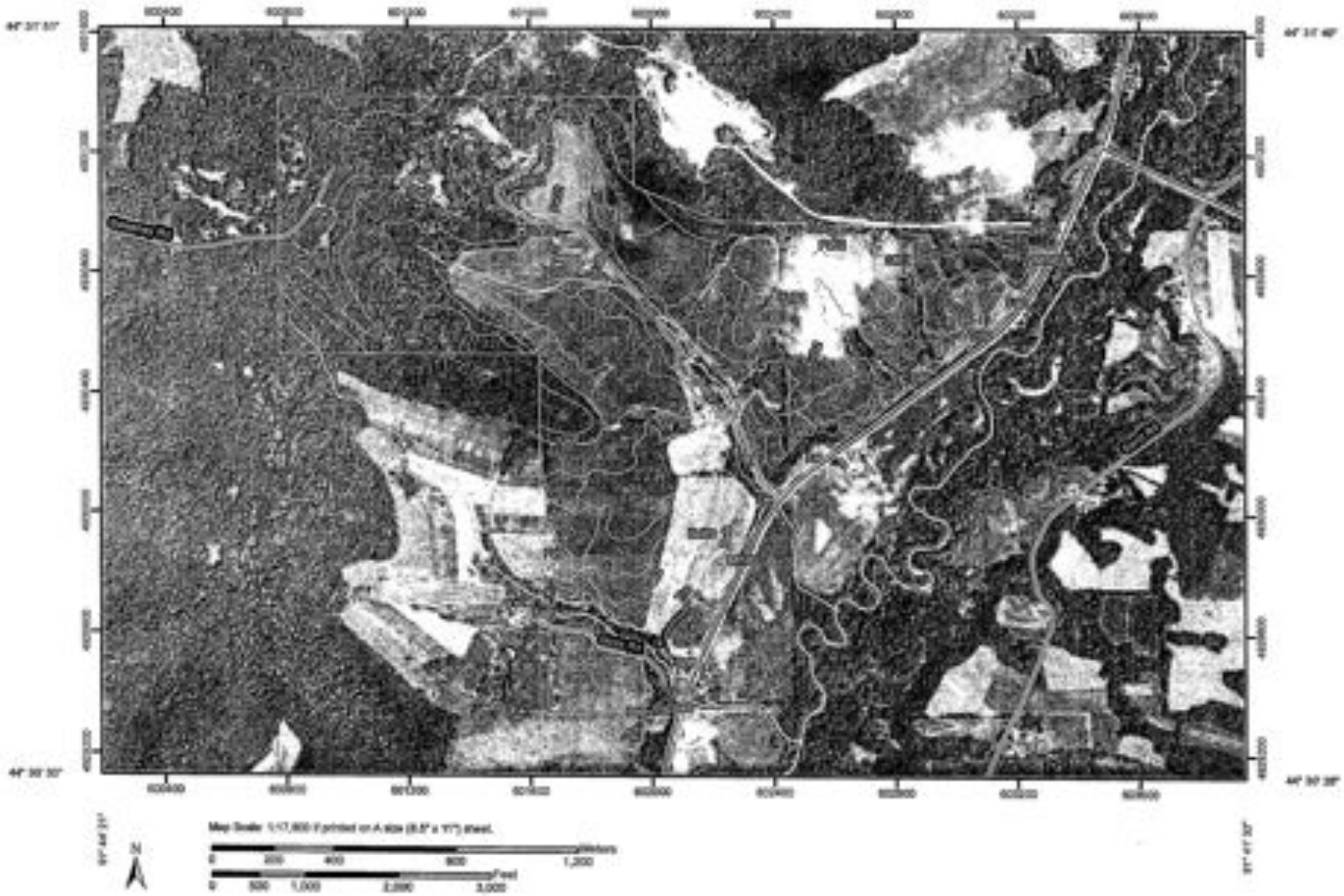


August 17, 2011

Groundwater Elevation Data- Segerstrom/Moy/Thompson



Custom Soil Resource Report
Soil Map (mondovi)



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Units

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other

Special Line Features

- Gully
- Short Steep Slope
- Other

Political Features

- Cities

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:17,800 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 15N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Buffalo County, Wisconsin
Survey Area Data: Version 5, Jun 25, 2009

Date(s) aerial images were photographed: 7/14/2005

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend (mondovi)

Buffalo County, Wisconsin (WI011)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Ar	Arenzville silt loam	3.3	0.5%
BeB	Bertrand silt loam, 2 to 6 percent slopes	26.8	4.2%
BeB2	Bertrand silt loam, 2 to 6 percent slopes, moderately eroded	18.3	3.0%
BeC2	Bertrand silt loam, 6 to 12 percent slopes, moderately eroded	1.8	0.3%
CaB	Chaseburg silt loam, 2 to 6 percent slopes	12.5	2.0%
CaC	Chaseburg silt loam, 6 to 12 percent slopes	1.2	0.2%
DeC	Dubuque silt loam, 6 to 12 percent slopes	33.4	5.4%
DeD	Dubuque silt loam, 12 to 20 percent slopes	29.5	4.8%
DeE	Dubuque silt loam, 20 to 30 percent slopes	5.4	0.9%
FaB	Fayette silt loam, uplands, 2 to 6 percent slopes	0.3	0.0%
FaB2	Fayette silt loam, uplands, 2 to 6 percent slopes, moderately eroded	17.9	2.9%
FaC2	Fayette silt loam, uplands, 6 to 12 percent slopes, moderately eroded	22.3	3.6%
FaD	Fayette silt loam, uplands, 12 to 20 percent slopes	1.0	0.2%
FaD2	Fayette silt loam, uplands, 12 to 20 percent slopes, moderately	22.2	3.6%
FvB	Fayette silt loam, valleys, 2 to 6 percent slopes	2.9	0.5%
FvC2	Fayette silt loam, valleys, 6 to 12 percent slopes, moderately eroded	25.2	4.1%
FvD2	Fayette silt loam, valleys, 12 to 20 percent slopes, moderately	102.5	16.6%
FvD3	Fayette silt loam, valleys, 12 to 20 percent slopes, severely eroded	2.4	0.4%
FvE2	Fayette silt loam, valleys, 20 to 30 percent slopes, moderately	39.9	6.5%
GfD2	Norden silt loam, 12 to 20 percent slopes, moderately eroded	19.8	3.2%
GfD3	Norden silt loam, 12 to 20 percent slopes, severely eroded	4.1	0.7%
GfE2	Norden silt loam, 20 to 30 percent slopes, moderately eroded	15.8	2.6%
GfE3	Norden silt loam, 20 to 30 percent slopes, severely eroded	14.5	2.4%
HsC2	Hixton loam, 6 to 12 percent slopes, moderately eroded	0.9	0.2%
HsE2	Hixton loam and Fine sandy loam, 20 to 30 percent slopes, moderately eroded	3.2	0.5%
Lv	Loamy alluvial land, poorly drained	1.3	0.2%

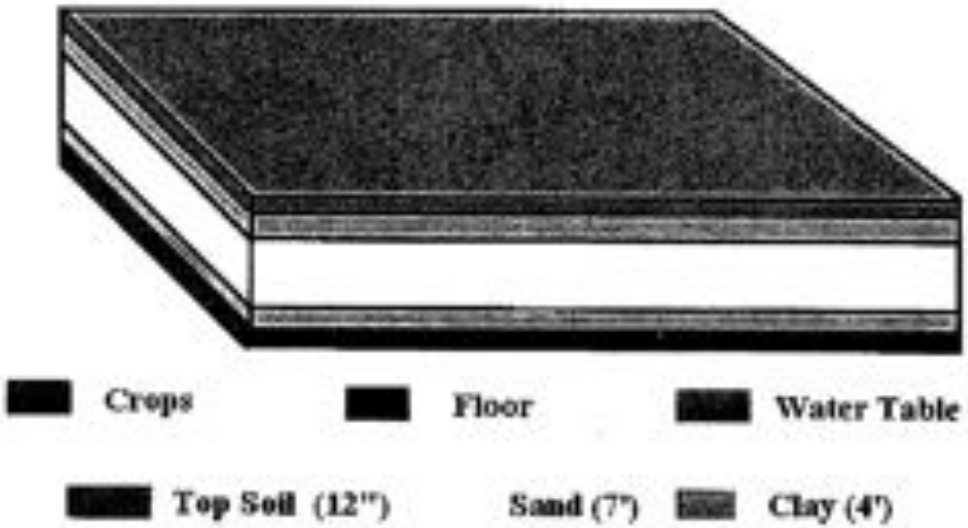
Buffalo County, Wisconsin (WI011)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Lw	Loamy alluvial land	5.7	0.9%
MmB	Meridian loam, 2 to 6 percent slopes	0.6	0.1%
MmB2	Meridian loam, 2 to 6 percent slopes, moderately eroded	1.0	0.2%
SpB	Sparta loamy fine sand, 2 to 6 percent slopes	1.7	0.3%
St	Steep stony and rocky land	77.0	12.5%
Tm	Terrace escarpments, loamy	44.9	7.3%
Tn	Terrace escarpments, sandy	2.4	0.4%
TrB	Trempe loamy fine sand, 2 to 6 percent slopes	0.1	0.0%
TrB2	Trempe loamy fine sand, 2 to 6 percent slopes, eroded	0.0	0.0%
UnE2	Urne-Norden loams, 20 to 30 percent slopes, moderately eroded	2.8	0.5%
UnF	Urne-Norden loams, 30 to 40 percent slopes	42.9	7.0%
UnF2	Urne-Norden loams, 30 to 40 percent slopes, moderately eroded	9.4	1.5%
Totals for Area of Interest		**616.0**	**100.0%**

Map Unit Descriptions (mondovi)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

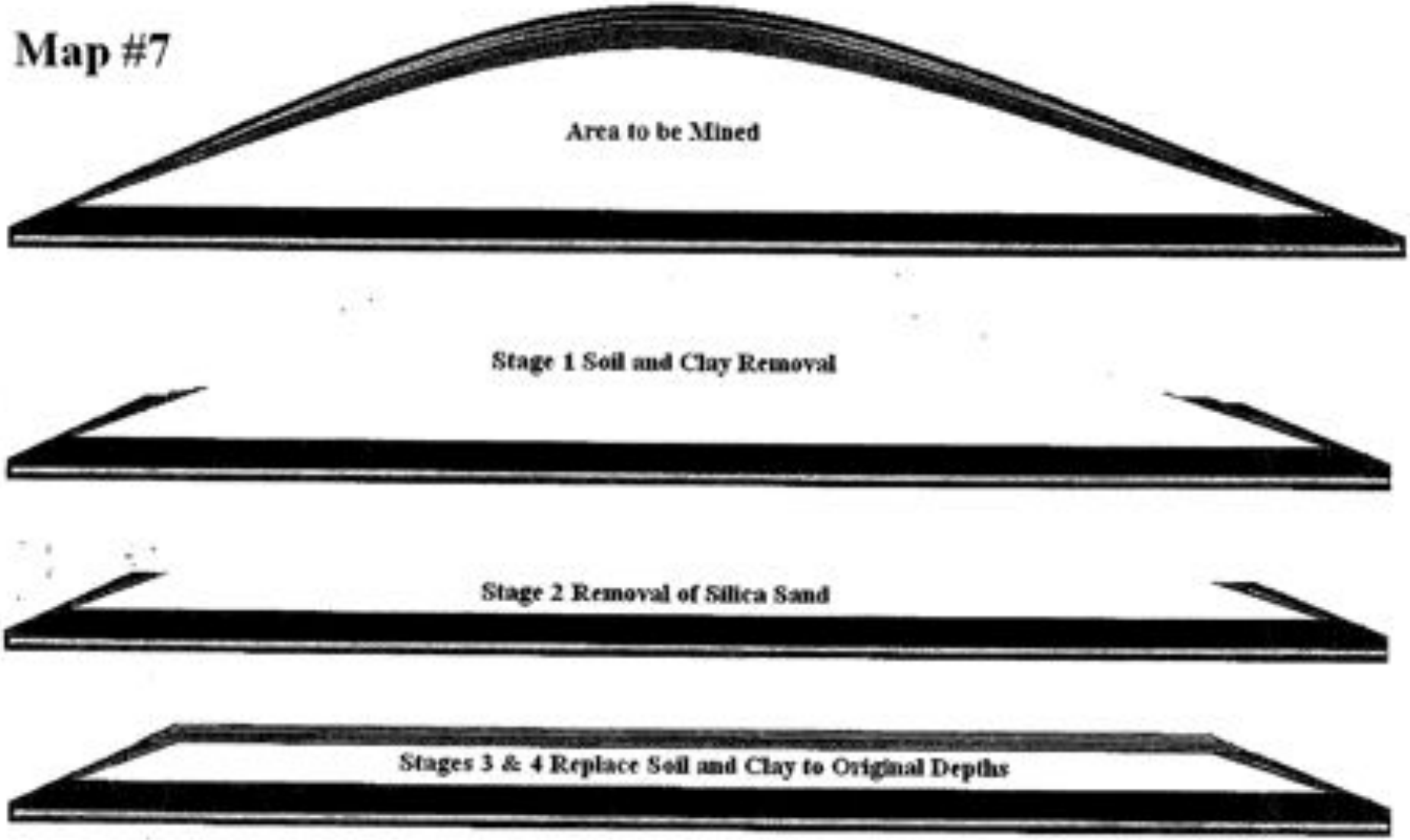
Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been



Map # 9

Floor Clay Sand Top Soil Water Table

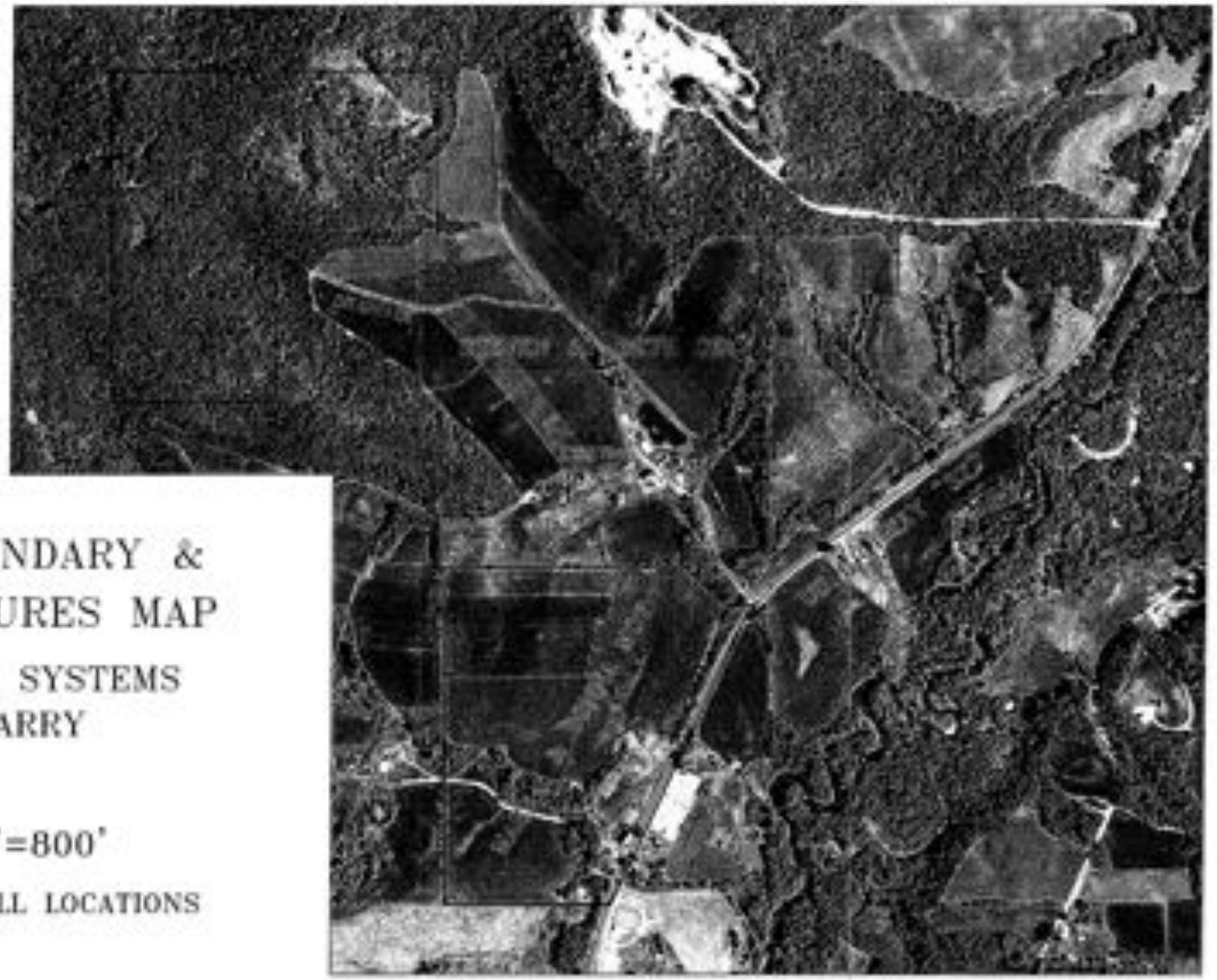
Map #7



MINE LAYOUT MAP

SUPERIOR SAND SYSTEMS
MONDOVI QUARRY

SCALE : 1"=800'



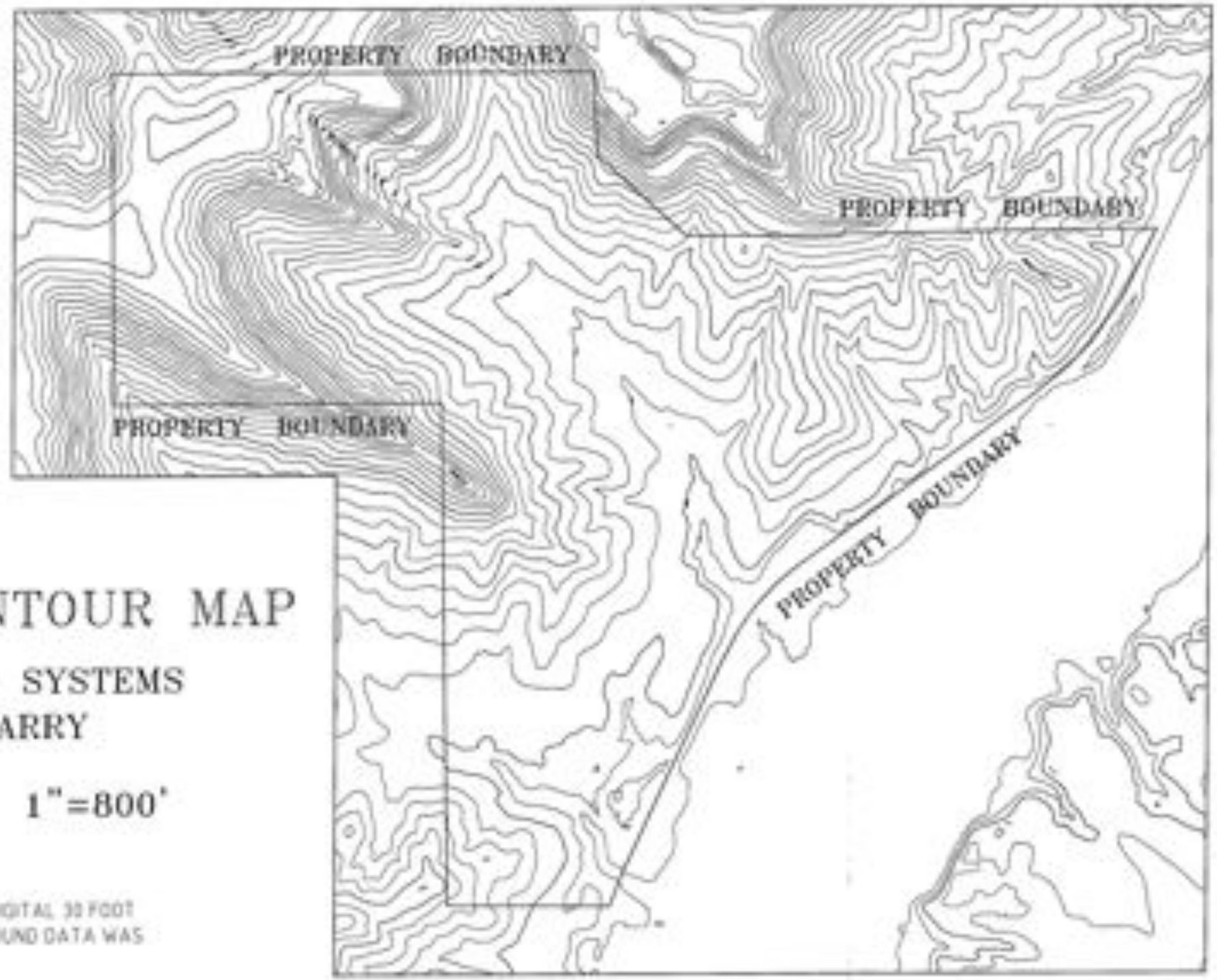
PROPERTY BOUNDARY & EXISTING FEATURES MAP

SUPERIOR SAND SYSTEMS
MONDOVI QUARRY

SCALE : 1"=800'

⊕ = WELL LOCATIONS

FIG. 1



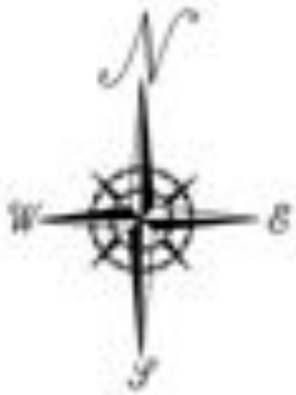
EXISTING CONTOUR MAP

SUPERIOR SAND SYSTEMS
MONDOVI QUARRY

SCALE : 1"=800'

NOTE:
CONTOUR DATA IS FROM DIGITAL 30 FOOT USGS QUAD MAPS. NO GROUND DATA WAS COLLECTED

FIG. 2



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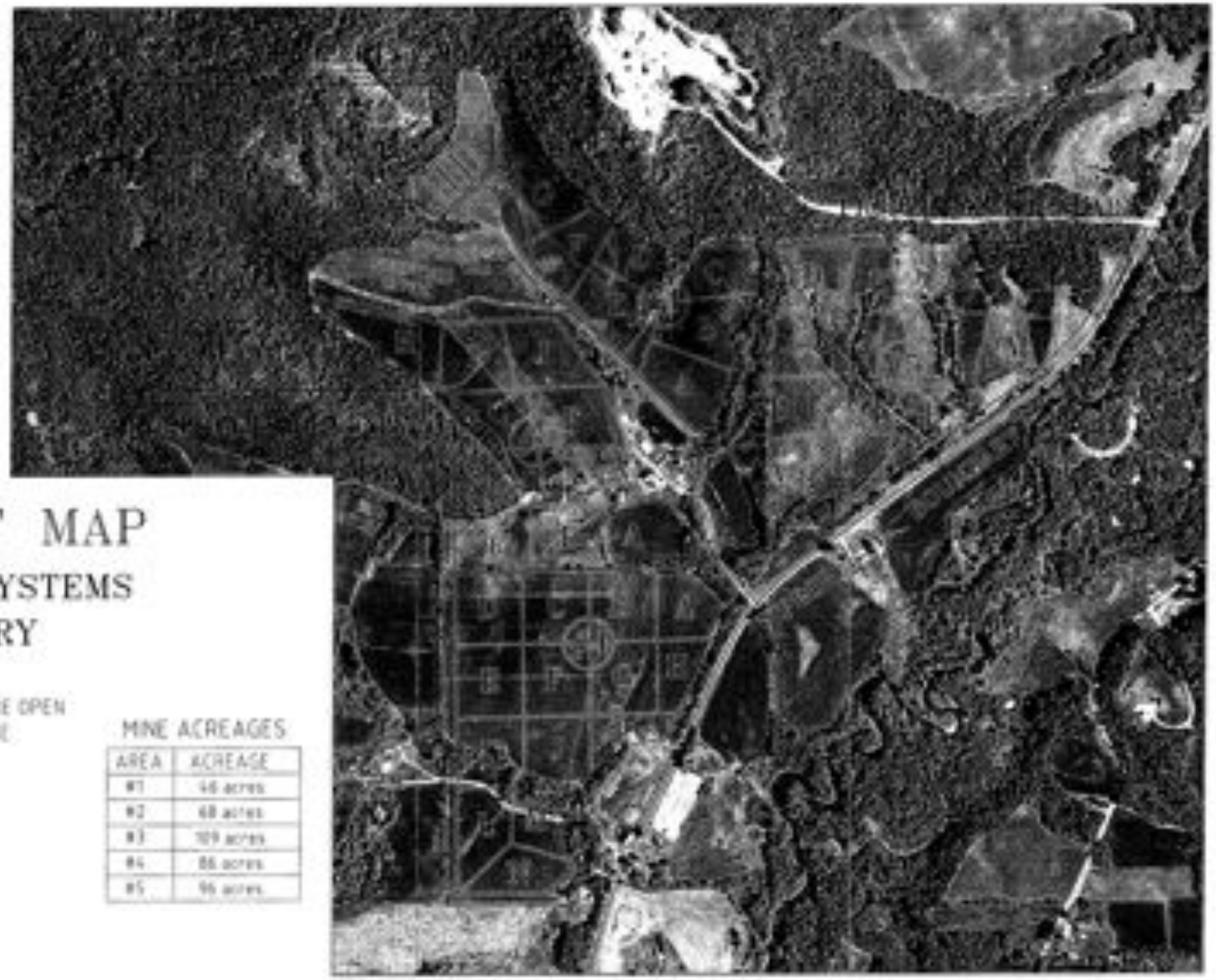


MINE LAYOUT MAP

SUPERIOR SAND SYSTEMS
MONDOVI QUARRY

NOTES:
NO MORE THAN 15 TOTAL ACRES WILL BE OPEN AT ANY TIME. SEPERATE AREAS MAY BE MINED AT THE SAME TIME.
EXAMPLE: AREA 1-A AND AREA 2-A

AREAS TOO STEEP TO RECLAIM TO 3:1 SLOPES.

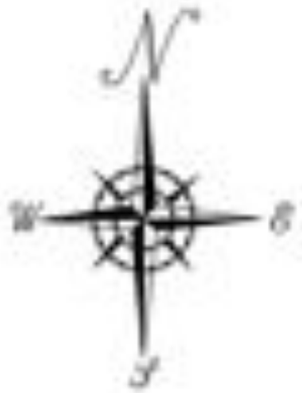
RETENTION POND

SETTLING BASIN

MINE ACREAGES

AREA	ACREAGE
#1	46 acres
#2	68 acres
#3	109 acres
#4	86 acres
#5	96 acres

FIG. 3



SCALE : 1"=800'

MINE LAYOUT MAP

SUPERIOR SAND SYSTEMS
MONDOVI QUARRY

NOTES:
NO MORE THAN 15 TOTAL ACRES WILL BE OPEN AT ANY TIME. SEPERATE AREAS MAY BE MINED AT THE SAME TIME.
EXAMPLE: AREA 1-A AND AREA 2-A

AREAS TOO STEEP TO RECLAIM TO 3:1 SLOPES

RETENTION POND

RETENTION POND

MINE ACREAGES

AREA	ACREAGE
#1	45 acres
#2	68 acres
#3	109 acres
#4	86 acres
#5	96 acres

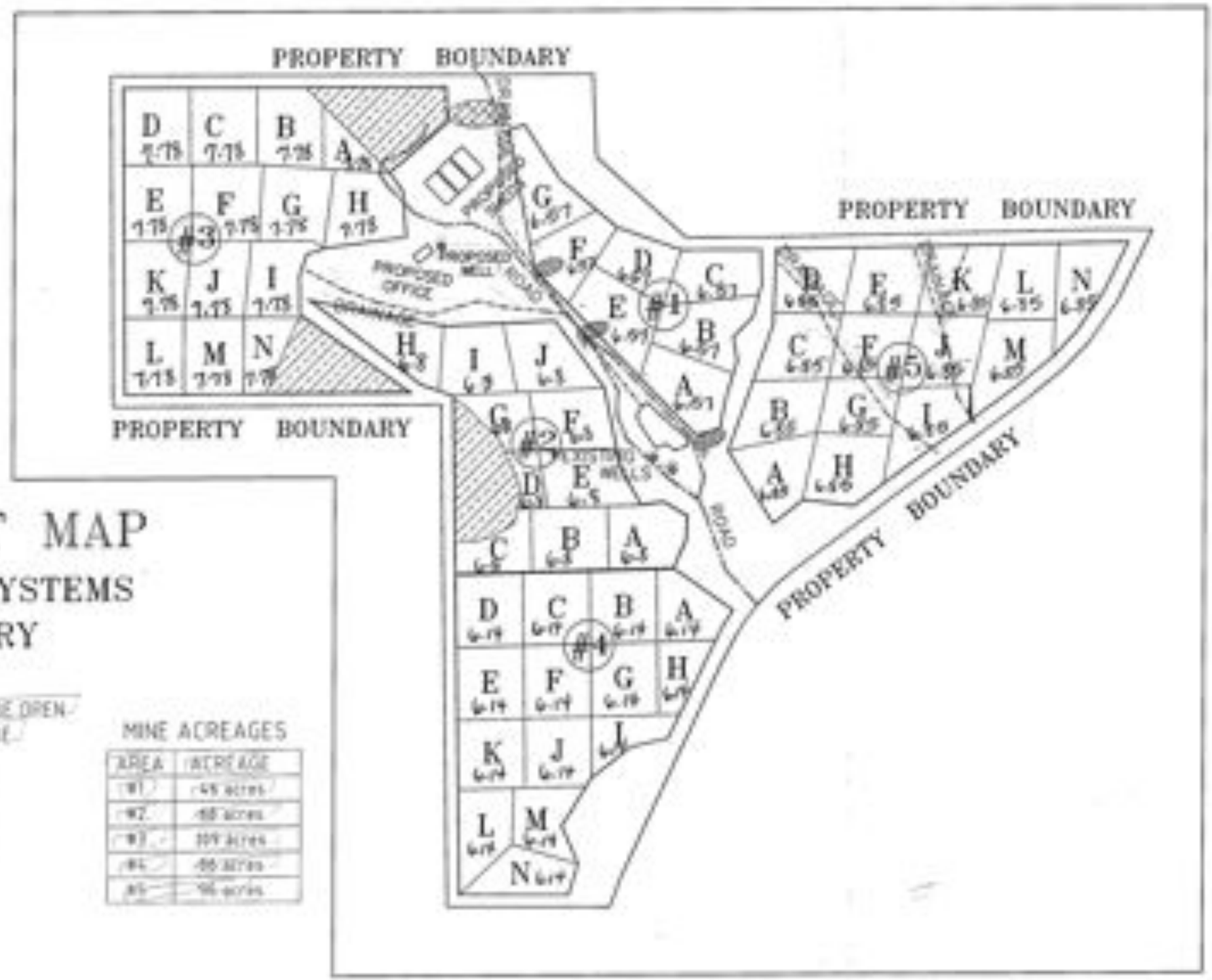


FIG. 3

NOTES:

OVERBURDEN STOCKPILES WILL BE CONSTRUCTED UP SLOPE OF EACH PHASE TO ROUTE STORMWATER AROUND THE ACTIVELY MINED AREA.

ALL STOCKPILES AND BERMS WILL BE REVEGETATED FOLLOWING SEEDING RATES AND METHODS OUTLINED IN THE RECLAMATION PLAN.

SILT FENCE WILL BE PLACED 15 FEET DOWN SLOPE OF ALL BERMS AND MAINTAINED UNTIL THE BERM HAS REACHED 70% VEGETATION.

BERM & SILT FENCE MAP

SUPERIOR SAND SYSTEMS
MONDOVI QUARRY

= BERM LOCATIONS

NOTE:

ALL BERMS WILL BE CONSTRUCTED WITH A MAXIMUM SLOPE OF 3:1

SCALE : 1"=800'

FIG. 4

NOTES:

NOTE: THE GROUNWATER CONTOURS ARE AN APPROXIMATE REPESENTATION OF THE GROUNDWATER ELELVATION. THE GROUNDWATER ELEVATIONS WERE INTENDED FOR REGIONAL USE, NOT FOR LOCAL. THE AVERAGE ELEVATION OF THE WATER TABLE IS CONSIDERED ACCURATE WITHIN +/-0.3 MILE ON THE LAND SURFACE (CONTOURS 990,920, AND 940 ARE +/-0.3 MILE). THE SOURCE OF THE DATA IS THE GENERALIZED WATER TABLE ELEVATION MAP OF BUFFALO COUNTY, WISCONSIN. WILLIAM B. BATTEN & ALEXANDER ZAPOROZEC, 2000.

GROUNDWATER CONTOUR LINE

AREAS TOO STEEP TO RECLAIM WITHOUT VERTICAL WALLS.

POST MINING CONTOUR MAP

SUPERIOR SAND SYSTEMS MONDOVI QUARRY

NOTES:

MINING MAY BE TERMINATED AT A SHALLOWER DEPTH IF POOR QUALITY MATERIAL IS ENCOUNTERED.

CONTOUR DATA IS FROM DIGITAL 30 FOOT USGS QUAD MAPS. NO GROUND DATA WAS COLLECTED.

THE CONTOUR DATA SHOWN ARE GENERAL REPRESENTATIONS. ALL SLOPES WILL BE RECLAIMED TO 3:1 OR LESS.

MINE ACREAGES

AREA	ACREAGE
#1	44 acres
#2	58 acres
#3	109 acres
#4	86 acres
#5	96 acres

SCALE : 1"=800'

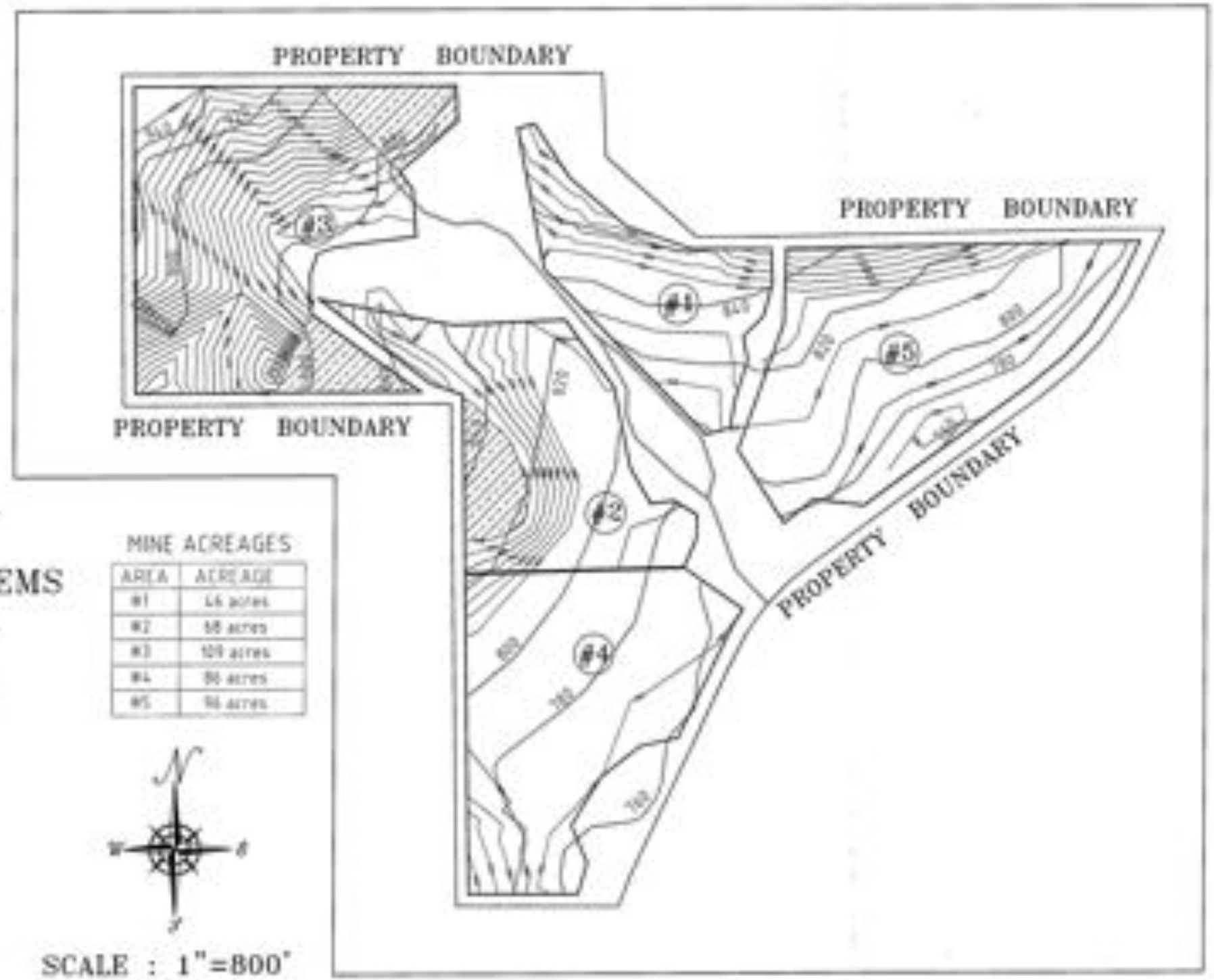


FIG. 5

SCALE : 1"=800'

POST MINING USE MAP

SUPERIOR SAND SYSTEMS
MONDOVI QUARRY

FOREST

FIELD

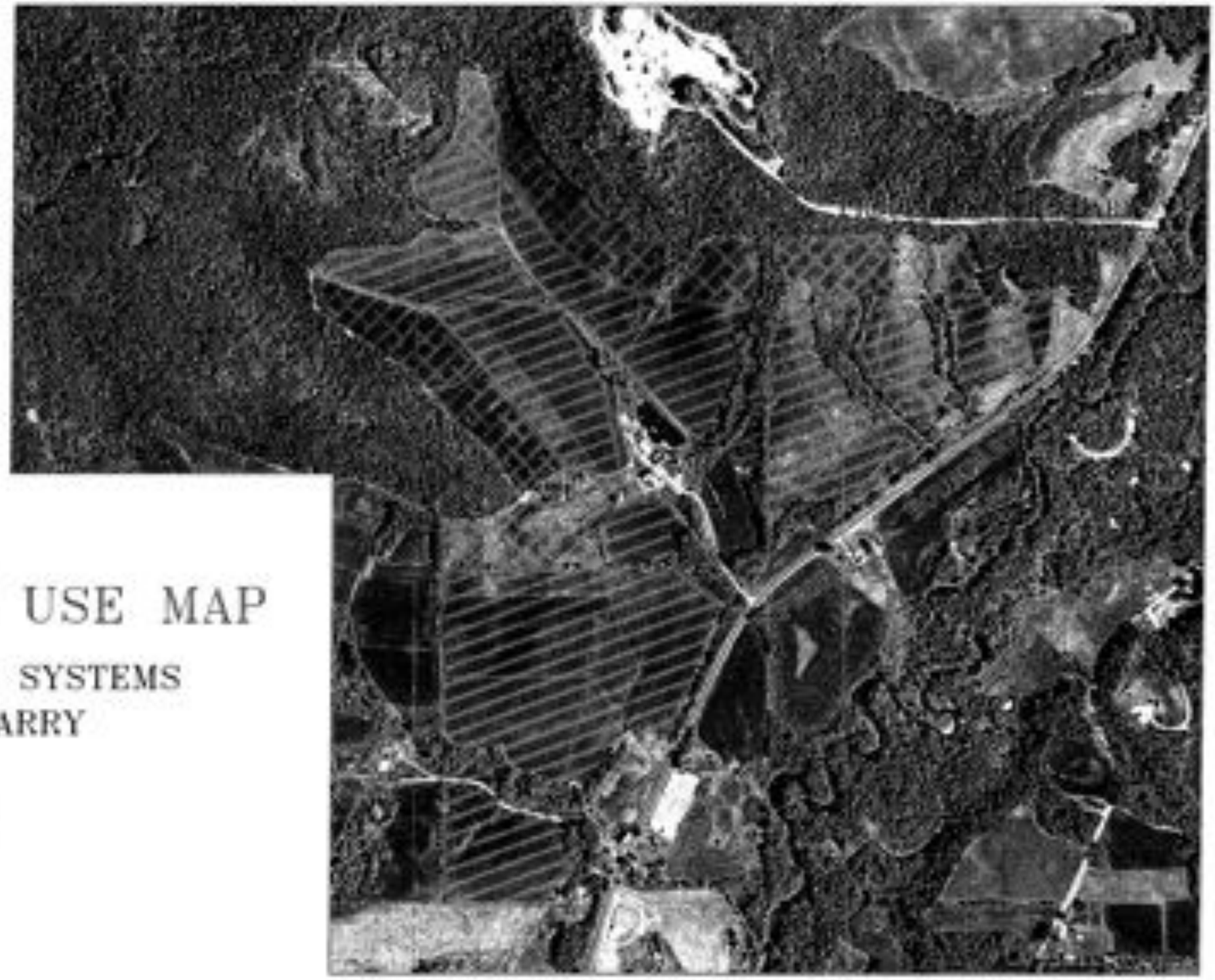


FIG. 6

Fin Assur Segerstrom Quarry

Reclamation Measure	Units	Cost per Unit	# of Units	Amount
A. Earthwork & Grading	Acre	$930	40	$37,200
Final Grading	Acre	$450	40	$18,000
Slope Stabilization	Linear Ft			$0
Subtotal				**$55,200**
B. Topsoil	Acre			$0
Redistribution of Topsoil	Acre	$810	40	$32,400
Chisel Plow/Soil Finishing	Acre	$25	40	$1,000
Purchase Topsoil & Apply	Existing Soil			$0
Subtotal				**$33,400**
C. Revegetation Plan	Acre			$0
Tree planting (680 trees/ac)	Acre	$200	27.5	$5,500
Crop Seed	Acre	$100	12.5	$1,250
Plant Installation	Acre	$20	12.5	$250
Lime	Acre	$50	40	$2,000
Fertilizer	Acre	$50	12.5	$625
Mulch or Other	Acre			$0
Irrigation	Acre			$0
Subtotal				**$9,625**
D. Erosion Control	Site Specific			$0
Erosion Control Materials	Linear Ft	$2.00	3100	$6,200
Berms	Linear Ft	$2.00	3100	$6,200
Subtotal				**$12,400**
E. Maintenance & Monitoring	Flat Fee			$0
Maintence	Flat Fee	$125	1	$125
Monitoring	Flat Fee	$125	1	$125
Subtotal				**$250**
F. Management of Refuse	N/A			$0
Building	N/A			$0
Road	N/A			$0
Refuse	N/A			$0
Concrete Removal	N/A			$0
Subtotal				**$0**
G. Other Reclamation	N/A			$0
Fill Material	N/A			$0
Well Abandonment	N/A			$0
Remove Electrical Supply	N/A			$0
Fence	N/A			$0
Subtotal				**$0**
Grand Total				**$110,875**
Updated 8/17/2012				
Total Cost Per Acre		**$2,772**	**40**	**$110,875**