Engineering Analytics, Inc. • 1600 Specht Point Rd. • Suite 209 • Fort Collins, CO 80525 • Ph 970.488.3111 • Fax 970.488.3112

Technical Memorandum

To:	Rob Zuber, P.E. Environmental Protection Specialist	**From:**	Jason Andrews, P.E.
Company:	Colorado Division of Reclamation Mining and Safety	**Date:**	February 13, 2025
EA No.:	P111502		
Re:	Revision 1.1 to Exhibit L, Reclamation Plan to Mine Permit M-2015-006		
Cc:			

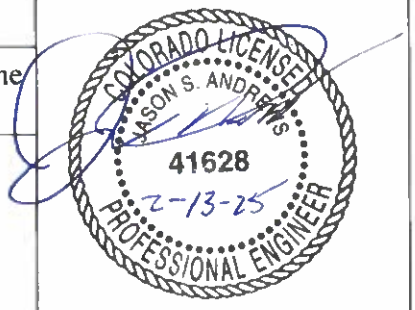


EXHIBIT L - RECLAMATION COST ESTIMATE

Final Reclamation Cost Estimate

Final reclamation to non-active mining areas will begin upon the completion of the quarried area. The reclamation costs are based on the reclamation plan provided in Exhibit E. Table 1 contains a summary of the estimate reclamation costs. The reclamation costs were developed using the information in this technical memorandum.

Table 1 - Summary of Reclamation Costs.

Grading Volume (16,667 Cubic Yards)	$12,714
Topsoil Placement (33,423 Cubic Yards)	$35,200
Fertilizer Cost (1,089 Pounds per Acre)	$15,684
Fertilizer Spreading Cost (62.0 Acres)	$10,428
Seed Cost (16 Pounds per Acre)	$40,511
Total Reclamation Cost	**$114,536**

Earthwork

Earthwork volume is determined based that active mining will be limited to 31.0 acres at any given time out of the total permitted 62.0 acres. The operator will backfill mining areas of the 31.0 acres with a minimum of 4-inches of overburden, and the area shall be roughly re-graded with on-site equipment. Topsoil placement will be completed at the time of final reclamation. Overburden placement at the time of closure is limited to approximately 16,671 cubic yards.

Topsoil placement will be completed at the time of final reclamation. Volumes for topsoil cover and fertilizer were determined based on a maximum disturbance area of 62.0 acres. All topsoil material will be stored on site. A cover depth of 4 inches is required, the approximate earthwork required is 33,342 cubic yards.

Earthwork labor cost was determined using current labor and equipment rates from construction estimating software RSMeans. The estimated cost to re-grade the site, spread topsoil and fertilizer assumes the following:

- Use of a rental bulldozer with the daily production of approximately 8,900 cubic yards per day.
- One operating crew hired at current labor rates for the region (northern Colorado).
- Re-grading and top-soil materials are located on site.
- No hauling of materials other than fertilizer is required.
- Fertilizer is distributed by tractor and implement with a daily production of approximately 800 thousand square feet per day (M.S.F.).

Itemized earthwork cost estimates are presented in Appendix A.

Fertilizers:

The goal of the fertilizer is not to change site potential but restore it by:

- Restoring soil attributes lost during stripping, stockpiling, spreading, and cultivating.
- Facilitating germination and establishment of native plants.

The specific types of fertilizers used will depend on the time of year they are applied, and the amount of moisture found in the soil. After soils inspection, a specific fertilizer can then be recommended.

Fertilizer quantity and cost estimates are based on the expertise of Granite Seed and Erosion Control based upon the seed mix selected for revegetation. Fertilizer is anticipated to be applied at a rate of 1,089 pounds per acre. Fertilizer costs and manufacture application rates are presented in Appendix B.

Seed Mix:

High Plains/Prairie Grass seed mix (Sporobolus Airoides) is designed for where no irrigation is present. It will grow on annual precipitation and will survive on a minimum of 10 inches of annual rainfall.

High Plains/Foothills Grass mix contains the following species:

15%	Western Wheatgrass	5%	Switchgrass
10%	Slender Wheatgrass	10%	Little Bluestem
4%	Big Bluestem	5%	Indian Grass
14%	Side Oats-Grama	1%	Sand Dropseed
10%	Blue Grama	3%	Prairie Dropseed
10%	Buffalograss	5%	Green Needle Grass
8%	Indian Rice grass		

Seed quantity and cost estimates were obtained from Granite Seed and Erosion Control and are presented in Appendix B. Seed pricing includes the cost to broadcast seed but excludes the cost of shipping and tax. Reference the Attached email correspondence for seed cost quotation.

APPENDIX A
ITEMIZED EARTHWORK COSTS

	Equipment	Fleet Size	Unit Cost Per Day Per Fleet ($)	Fleet production rate per day	Units	Volume	Task Time (days)	Equipment Cost ($)
Sprague Quarry Relcamation Earthwork	Fine Grading Dozer (700HP) (Grading)	1	$6,787.56	8,900.00	CY	16,671.00	1.87	$12,714.10
	Fine Grading Dozer (700HP) (Top Soil)	1	$6,787.56	8,900.00	CY	33,342.00	3.75	$35,200.19
	Fertilizing (Tractor Spread)	1	$1,434.37	800.00	MSF	2,701.00	3.38	$10,427.80
	Total Cost							$58,342.09

	Operation Type	Crew Code	Bare Cost ($/Hr)	Cost W/ O&P ($/Hr)
O$P Cost	2 Equipment Operator (Heavy)	B-10V	$65.00	$522.43
	1 Equipment Operator (Light)	B-66	$62.00	$123.93

	Material	Quantity (per acre)	Unit	Quantity Total	Cost (per acre)	Cost (Total)
Vegitation Cost	Seed Mix	1,089.00	lb	67,518.00	$653.40	$40,510.80
	Fertilizer	16	lb	992.00	$252.96	$15,683.52

Labor Classification	Bureau of Labor Statistics			
	Mandated	Benefits		Total Cost per Hour[5]
		Legally Required[3]	All Other[4]	
Laborer[1]	$21.78	$1.85	$5.59	$29.22
Power Equipment Operators				
Dozers[1]	$31.68	$2.33	$7.05	$41.06
Tractor [1]	$32.22	$2.33	$6.35	$40.90

	Phase	Cost $
Total Reclamation Cost	Overburden Earthwork	12,714.10
	Topsoil Earthwork	$35,200.19
	Seed and Fertlizer	$56,194.32
	Fertilizing	$10,427.80
	Total Base Cost	**$114,536.41**

Equipment Description	Rental Cost ($)		Mob/Demob (both ways)[2]	Fuel Use Averages		Total Cost With Labor ($/hr)
	Monthly	Hourly[1]		Use (gal/hr)	Cost ($/hr)	
Rent dozer, crawler, torque converter, diesel 700 HP, Incl. Hourly Oper. Cost.	38,953.80	$280.50	$9,772	20.0	45.52	848.45
Rent Agricultural Tractor With Implement, 4lb/M.S.F, 12' Spread	2286.14	21.23	$5,585	15	$34.14	179.30

APPENDIX B
SEED AND FERTILIZER COSTS

SUSTÅNE®
Naturally...

Known Worldwide
For Being Simply the Best...
Natural Fertilizers & Soil Builders

Recommended Use:
Landscapers' Choice all purpose slow release fertilizer for landscaped areas, overseeding and turf establishment. Fastest starter available. Golf course, home and sports turf grow in.

Description:
Suståne® 4-6-4 Landscapers' Choice is a natural organic starter and maintenance fertilizer. Suståne® 4-6-4 works by replenishing the soil with a rich supply of humus (stabilized organic matter) and the essential nutrients required for sound and long term fertility programs. Suståne® 4-6-4 provides a combination of slow release nutrients and organic substances. Derived from biologically stable compost plus natural potash and feathermeal.

4·6·4 SUSTÅNE

LANDSCAPERS' CHOICE ALL NATURAL FERTILIZER

OMRI™ Listed
Organic Materials Review Institute

Benefits of Suståne® 4•6•4 Natural Organic

- Adds approximately 10% humates by volume
- Increases the nutrient and water holding capacity of the soil
- Strengthens plants tolerance against hot dry conditions
- Greater root development
- Improves buffering against changes in soil pH
- Increases the soil's ability to suppress plant pathogens
- Increased soil porosity and stability for greater root development and water holding capacity

Turf Establishment

Turf establishment accelerates with 4-6-4 All Natural Organic Fertilizer from Sustane. A complete package containing Slow Release Nitrogen, chelated micronutrients, organic phosphorous and humic substances. Sustane 4-6-4 has been demonstrated time and again to surpass synthetic turf starter fertilizers and other sources of humates and plant biostimulants.

Landscapers' Choice

Professional landscapers have increasingly turned to Suståne 4-6-4 for use on high maintenance turf and landscaped environments. While synthetic fertilizers supply plant growth nutrients, they do not supply the organic matter required to maintain quality growth. Using fully composted natural fertilizers increases the levels of beneficial microbial activity, which in turn convert nutrients into plant available forms.

Suståne® 4 • 6 • 4

All Natural

Product Specifications

Application Rates

Warm Season Turf

Athletic Fields, Parks and Lawncare

Apply 4-7 times per season.

Spring and Fall - 25 lb. per 1000 ft^2

Summer - 19 lb. per 1000 ft^2

Cool Season Turf

Athletic Fields, Parks and Lawncare

Apply 2-3 times per season at a rate not exceeding 25 lbs. per 1000 ft^2

Soil Preparation For Flower & Shrub Beds

- Light, High Sandy Soil: 6 lb. per 100 square feet of bed
- Medium, Clay Loam Soil: 4 lb. per 100 square feet of bed
- Heavy, Silty, Clay Loam: 2 lb. per 100 square feet of bed

Suståne® All Natural Fertilizers are allowed for use in production of certified organic crops.

Turf Coverage

50 lb. covers 2000 ft^2 @ 1 lb. N per 1000 ft^2 (44 lb. N per acre)

22.67 kg covers 186 m @ 0.5 kg N per 100 m^2 (50 kg N per ha)

25 lb. per 1000 ft^2
12.5 g per 1 m^2

Available particle sizes:

Medium Grade, 200 SGN (2.8 mm - 1.4 mm)

Fine Grade, 100 SGN (1.4 mm - 0.6 mm)

*Suståne® Integrated Soil Management Program***

For Turf Establishment, Seeding, New Lawn Construction Laying Sod and Sprigging

Preplant - Broadcast and Incorporate into top 4 in. (5 cm) of soil
50 lb. per 1,000 ft^2 or 2,200 lb. per acre
25 kg per 100 m^2 or 1,250 kg per ha

Postplant - 45-60 days
Broadcast and water in 25 lb. per 1,000 ft^2 or 1,100 lb. per acre
12.5 kg per 100 m^2 or 1,250 kg per ha

Overseeding - Apply 25 lb. per 1,000 ft^2 at time of overseeding

Hydroseeding - Add 15 lb. per 1,000 ft^2 in tank with binder

Fertilizer Maintenance for Large Trees

Once trees have become well established, apply Suståne into holes punched into the ground within tree crown drip line. Once the tree has developed a 4-6 inch diameter, increase application rate to 1.5 lb. of Suståne per inch of tree trunk diameter.

**NOTE: Adjust fertilizer program for local conditions and requirements.

Guaranteed Analysis

Total Nitrogen (N)	4%
0.4% Ammoniacal Nitrogen	
0.4% Water Soluble Organic Nitrogen	
3.2% Water Insoluble Organic Nitrogen*	
Available Phosphate (P_2O_5)	6%
Soluble Potash (K_2O)	4%
Calcium (Ca)	4%

Derived from aerobically composted turkey litter, feather meal, and sulfate of potash.

*3.2% slowly available nitrogen from aerobically composted turkey litter and feather meal

Total Plant Nutrition

Magnesium	1.00%	Copper	0.05%
Sulfur	3.00%	Molybdenum	0.05%
Iron	0.50%	Boron	0.05%
Manganese	0.05%	Humic Acid	7%
Zinc	0.05%	Organic Matter	50%
pH	6.8	Carbon:Nitrogen(C:N)	4:1
Bulk Density	36 lb./ft^3	Salt Index (scale 1-100)	4
C.E.C. Cation Exchange Capacity	104 meq/100 g		
% of Total N as Slow Release	80%		

(507) 263- 3003
(800) 352-9245
(507) 263-3029 FAX
www.sustane.com

Suståne Natural Fertilizer Inc.
310 Holiday Avenue
Cannon Falls, Minnesota 55009
Made in the USA

SUSTÅNE Naturally...

Quality Growth Through Healthy Soil™

DB

Daniel Bradley<daniel@graniteseed.com>

To: Jay Blythe

Tue 10/1/2024 2:02 PM

4-6-4_spec.pdf
788 KB

I can offer Sustane 4-6-4 fertilizer. Organic slow release with a lot of organic content.

Application rates are various. See attached.

$0.60 / lb; $30.00 / 50 lbs bag

Daniel Bradley
Seed & Erosion Control Specialist
Granite Seed and Erosion Control
490 E 76th Ave, Unit A
Denver, CO 80229
720.496.0600 Office
720.496.0601 Fax
http://www.graniteseed.com/

granite SEED and erosion control

All quotes good for 60 days unless otherwise specified.

DB

Daniel Bradley<daniel@graniteseed.com>

To: Jay Blythe

Wed 9/25/2024 3:24 PM

You forwarded this message on Wed 9/25/2024 3:25 PM

Afternoon Jay,

Thanks for the info.

Prairie dropseed n/a; Alkali sacaton (Sporobolus airoides) used to price

$252.96 / acre @ 16.0 PLS lbs / acre
Broadcast rate, halve if drilling.
Pricing is pre-tax, pre-shipping.

Daniel Bradley
Seed & Erosion Control Specialist
Granite Seed and Erosion Control
490 E 76th Ave, Unit A
Denver, CO 80229
720.496.0600 Office
720.496.0601 Fax
http://www.graniteseed.com/

All quotes good for 60 days unless otherwise specified.

SUSTÅNE® Naturally...

4•6•4
ORGANIC PLANT ESTABLISHMENT FERTILIZER

KNOWN WORLDWIDE FOR *SIMPLY THE BEST*...
...NATURAL FERTILIZER & SOIL BUILDERS!

4-6-4 ORGANIC FERTILIZER DELIVERS A BALANCE OF NUTRIENTS, HUMATES, COMPOST-DERIVED MICROBIOLOGY AND SLOW RELEASE NITROGEN IN AN EASY-TO-SPREAD HOMOGENOUS GRANULE

SUSTÅNE® 4•6•4 GRANULAR

FASTEST STARTER AVAILABLE

Recommended Use

Suståne 4-6-4 fertilizer is a standard organic vegetation starter for low P soils. Suståne 4-6-4 is an organic slow release fertilizer and soil builder for plant establishment in environmentally sensitive areas and depleted soils. Suitable for revegetation projects, rapid vegetative establishment, erosion control, wetlands and watershed areas, native plant areas, dune and beach restoration, burn area reestablishment, mine site reclamation, oil/gas/coal right of ways and pipelines, highway roadside establishment, protected natural areas, forests, parks and landscapes.

Suståne 4-6-4 is specifically formulated to be gentle on plants, making it a go-to fertilizer for spreading with seed and applying to seedlings. It restores quality growth for native prairie grasses and forbs for quick ground cover, minimizing soil erosion and the need for repairs or re-seeding.

Suståne 4-6-4 works by replenishing the soil with a rich supply of humus (stabilized organic matter) and the essential nutrients required for sound and long term fertility programs. Suståne 4-6-4 provides a combination of slow release nutrients and organic substances that improve soil health. Derived from biologically stable compost plus natural potash and feathermeal.

Professional Grade

Suståne Natural Fertlizer is backed by over 30 years of independent applied research on diverse crops and ecosystems. The superior performance of Suståne products is recognized by growers from around the world.

Benefits of Natural Organic 4•6•4

- Adds approximately 5% humates by volume, increasing cation exchange and organic matter
- Increases nutrient and water holding capacity of the soil, strengthening plant tolerance to hot dry conditions
- Promotes healthy root development
- Improves buffering against changes in soil pH
- Increases soil's ability to suppress plant pathogens
- Increases soil aggregate stability, porosity, and quality for greater root development and water holding capacity
- Suitable for arid and saline soils, lowers transportation and application costs
- Provides primary and secondary (macro and micro) nutrients necessary for plant growth

Safe for Plants, People and the Environment

- Manufactured by Suståne in the USA at an EPA permitted facility
- Pathogen and weed free
- Contains no pharmaceutical waste
- Allowed for export to over 60 countries world wide.
- Derived from aerobically composted materials, so it won't attract insects or rodents to the application site
- Contains compost-based microorganisms to help replenish life in poor soils

OMRI LISTED For Organic Use

REGISTERED MATERIAL For Use In Organic Agriculture Washington State Dept. of Agriculture

REGISTERED cdfa ORGANIC INPUT MATERIAL

USDA CERTIFIED BIOBASED PRODUCT

LAND MANAGEMENT, NATIVE RESTORATION & EROSION CONTROL PROGRAMS**

Final fertilizer recommendations should be based on laboratory soil tests and specific site conditions including but not limited to aspect and slope. Use higher rates for soils low in organic matter, high in salts or pH, and on steep and southern facing slopes.

Coverage

50 lb. covers 2000 ft^2 @ 2 lb. N per 1000 ft^2 (44 lb. N per acre)
22.67 kg covers 186 m^2 @ 0.5 kg N per 100 m^2 (50 kg N per hectare)
25 lb. per 1000 ft^2 / 125 g per 1 m^2

Hydroseeding

Mix with water solution at a ratio of 4 lb. Suståne 4-6-4 to 1 gallon of water or 2 tons per 1,000 gallon tank
For 44 lb. of N per acre apply 1100 lb.
For 88 lb. of N per acre apply 2200 lb.

Soil Preparation

Light, High Sandy Soil: 6 lb. per 100 ft^2 of bed (30 kg per 100m^2)
Medium, Clay Loam Soil: 4 lb. per 100 ft^2 of bed (20 kg per 100m^2)
Heavy, Silty, Clay Loam: 2 lb. per 100 ft^2 of bed (10 kg per 100m^2)

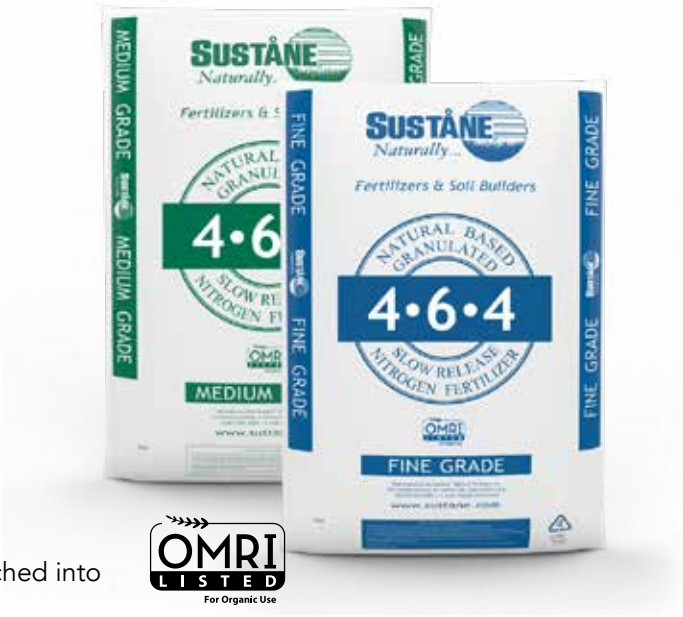
Fertilizer Maintenance for Large Trees

Once trees have become well established, apply Suståne into holes punched into the ground within tree crown drip line. Once the tree has developed a 4-6 inch diameter, increase application rate to 1.5 lb. of Suståne per inch of tree trunk diameter.

***NOTE: ADJUST FERTILIZER PROGRAM FOR LOCAL CONDITIONS & REQUIREMENTS.*

Storage

Store in a cool, dry place. Do not expose to moisture or extreme temperatures. For best results, use by expiration date printed on label.



4-6-4 BULK DENSITY

ROUNDED MEASURE	WEIGHT GRAMS
1 teaspoon	2.8
1 Tablespoon	8.5
1/4 cup	34
1/2 cup	68
1 cup	136

Item #	Package Size	Units / Pallet
Suståne 4-6-4		
FINE GRADE, 100 SGN (1.4 .mm - 0.6 mm)		
30-20-1311	50 lb. bags	40 bags / pallet
30-20-1351	1-ton tote	1 tote / pallet
30-20-1375	50 lb. bags	44 bags / ISPM pallet
MEDIUM GRADE, 200 SGN (2.8 mm - 1.4 mm)		
30-20-1175	50 lb. bags	40 bags / pallet
30-20-1151	1-ton tote	1 tote / pallet
30-20-1175	50 lb. bags	44 bags / ISPM pallet

DISTRIBUTED BY:

4-6-4 Guaranteed Analysis

Total Nitrogen (N)	4%
0.4% Ammoniacal Nitrogen	
0.4% Other Water Soluble Nitrogen	
3.2% Water Insoluble Nitrogen*	
Available Phosphate (P_2O_5)	6%
Soluble Potash (K_2O)	4%
Calcium (Ca)	4%
Magnesium (Mg)	0.75%
Sulfur (S)	1%
Iron (Fe)	0.25%

Derived from aerobically composted turkey litter, feather meal, bone meal, and sulfate of potash.

*3.2% slowly available nitrogen from aerobically composted turkey litter and feather meal

Total Plant Nutrition

Magnesium	1.00%	Copper	0.05%
Sulfur	3.00%	Molybdenum	0.05%
Iron	0.50%	Boron	0.05%
Manganese	0.05%	Organic Matter	50%
Zinc	0.05%	Carbon:Nitrogen(C:N)	4:1
pH	6.8		
Bulk Density	36 lb./ft^3		
C.E.C. Cation Exchange Capacity	104 meq/100 g		
% of Total N as Slow Release	80%		

V. 05292020