Mark Griswold Wilson, Horticulturist 723 SE Thirty-third Avenue Portland, Oregon 97214 (503) 234-2233

memorandum

July 2, 1993

TO: Pete Hillman
SUBJECT: St. Johns Landfill-Subareas 1, and 2

Dear Pete,

At this time, in my judgement, it appears that the seedings of native grasses and wildflowers in the 7.5 total acres of experimental plots in Subarea 1 have largely failed. I have inspected all the areas that have been mowed to date and small patches of native Fescue grass and the two wildflowers Lupine and Yarrow are evident only in the eastern section of Subarea 1 in areas that were not overtaken by Vetch and that were able to be mowed in March of this year. Most of the seeded areas are now dominated by various combinations of Regreen (covercrop), and Ryegrass, Timothy, Clover and other aggressive exotic weeds.

It is very difficult to identify one exact reason for the seeding failure as there are many probabilities. In summary, the causes of seeding failure were due to a combination of: over-enrichment of topsoil with nutrients; incorrect seeding rates; contamination of seedbed; and problems with the coordination of landfill closure design, implementation work, and the initiation of landscape maintenance for the cover vegetation. Specific problems contributing to failure were: 1. Over-fertilization of all covercrop types with ammonium sulfate (21-0-0) and additional nutrient surplus from compost breakdown. 2. Too high a seeding rate of Regreen on all covertype areas. 3. Poor separation and/or preparation of existing stripped soil, imported soil and compost. 4. Contamination of imported soil (and perhaps compost) with Vetch and other weed seed. 5. Lack of time between soil placement and seeding with native seed (e.g. prolonged fallowing). 6. Prohibition of the use of herbicides for obtaining a clean seedbed. 7. Failure to perform spring 1993 maintenance mowing in a timely fashion. 8. Inability to carry out first year maintenance mowing due to combination of steep slopes and surface gas line placement.

As specifications for this years closure call for the surface placement of the stripped temporary closure topsoil contaminated with ryegrass, clover and other aggressive weed seed there is an

the highly contaminated topsoil seedbank. I have collected soil seedbank samples and am currently having them analyzed by the Oregon State University Seed Testing Lab in Corvallis in order to gain a better understanding of the extent of contamination; results are due next week. Wes Jarrell, Jim Morgan and I met last friday to discuss strategies for vegetation establishment; we all came to the conclusion that taking time to achieve control of the pest plant seed in the topsoil is necessary before seeding the landfill with the permanent native grass cover. Therefore, I recommend that:

1. <u>The request I submitted for a change order regarding seeding rates be withdrawn.</u>

2. <u>That all native grass wildflower seeding on Subarea 2 (Covertypes 1 & 2) be postponed until the fall of 1994. In their place I recommend that all areas closed this year be seeded with only Regreen covercrop seeded at a rate of 20#/Acre.</u>

If you concur with my recommendations please contact me before informing Tri-State Construction.

Jim Morgan will be contacting you this week regarding your availability to attend a meeting to discuss vegetation site preparation, seeding, and maintenance.

Mark G. Wilson

cc: Dennis O'Neil
Jim Morgan
Sam Chandler
Wes Jarrell-OGI

Jim Morgan

REGIONAL SERVICES

600 NORTHEAST GRAND AVENUE | PORTLAND, OREGON 97232 2736
TEL 503 797 1700 | FAX 503 797 1797

METRO

July 13, 1993

To: Tri-State Construction, Inc.
Attention: Jim Solberg
Subject: Proposed Change, Cover Crops

Dear Jim,

The results of the test plots for native plants in Sub Area 1 have been disappointing. The topsoil included a tremendous seed bank of non-native, fast-growing weeds that choked out the native species. Tests of the topsoil stockpiles planned for Sub Area 2 and 3 indicate a similar condition. It appears that Metro will need to fallow the topsoil in place, a process which will outlive your contract and exhaust the seed bank prior to planting.

We propose to eliminate Cover Crop Types 1 and 2 on this contract and to plant Temporary Erosion Control Cover Crop on Sub Area 2 this year and on Sub Area 3 next year.

The seed vendor may require payment for the native seed that you have reserved. If so, we propose to pay for the seed and obtain a letter of credit in lieu of taking possession of seed that we cannot use at this time.

In addition, we would like to have you disk the on-site topsoil stockpiles this month and again in August to knock down the volunteer plant growth and start the fallowing process.

Please review this letter and let me know as soon as you are ready to discuss the details of this change.

Sincerely,

Pete Hillmann

cc: Sean Fitzgerald
Dennis O'Neil
Jim Watkins
Sam Chandler
Janell Davis
Jim Morgan
Mark Wilson

coverop.doc

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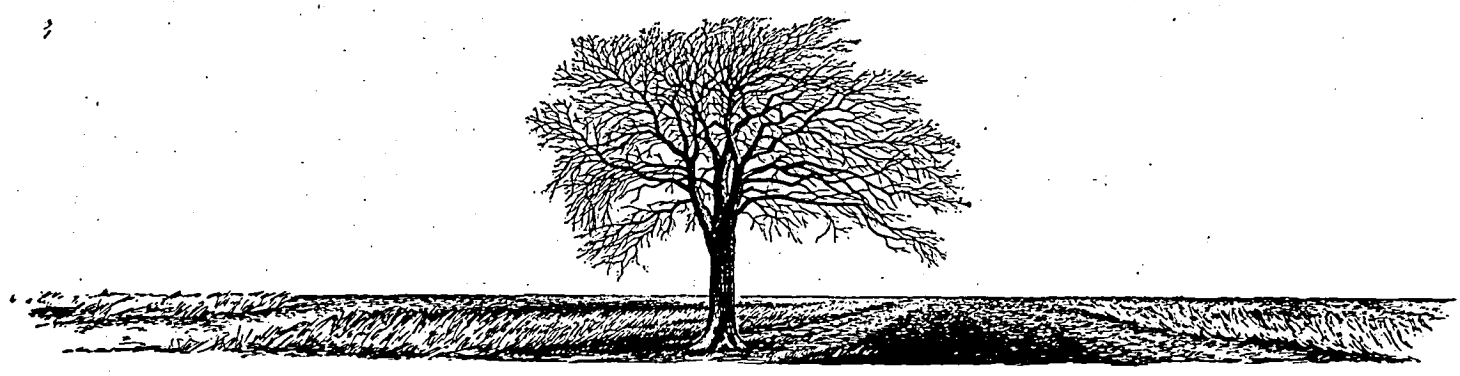


Mark Griswold Wilson, Horticulturist 723 SE Thirty-third Avenue Portland, Oregon 97214 (503) 234-2233

memorandum

August 24, 1993

TO: Pete Hillman
SUBJECT: Re-analysis of proposed change order affecting seeding of Subarea 2 & 3

Pete,

I have reviewed the following information:

1. Copy of handwritten note from Scot Spackeen [Granite Seed] to Gary Washburn [A & G Landscaping]; dated August 12, 1993; 3 pages
   SUBJECT: Details of request for payment for 1993 seed order

2. FAX copy of letter from Mike Kasberger [Tri-State Construction] to Sean Fitzgerald [PMX]; dated August 16, 1993; 1 page
   SUBJECT: Response to proposed cover crops

3. FAX copy of letter from Mike Kasberger [Tri-State Construction] to Sean Fitzgerald [PMX]; dated August 16, 1993; 1 page
   SUBJECT: Change to Regreen application

4. FAX copy of memorandum to file from Pete Hillman; 3 pages
   SUBJECT: Costs of proposed change order affecting seed species

COMMENTS/QUESTIONS/RECOMMENDATIONS

Number 1. (above): COMMENTS: I spoke with Scot Spackeen on August 23, he stated that Granite would be willing to forgo profit upon the cancellation (proposed) of the 1993 native grass and wildflower seed order. Therefore, Granite was only requesting payment of the sum of $24,587.20 (the figure of $30,734.00 includes 20% profit). He further stated that he would issue a letter of credit in the amount of $24,587.20 upon receipt of payment and that he understood that

all future transactions regarding use of this credit would be with METRO representatives only.

QUESTION: Does either Tri-State or A & G Landscaping intend to charge METRO for the 20% profit ($6,146.80) that Granite is not asking to be reimbursed?

RECOMMENDATION: Pay only Granite Seed, Inc. $24,587.20 and obtain letter of credit. Use letter of credit next year and thereafter to purchase native seed as required to re-seed Subareas 1, 2 & 3.

Number 2. COMMENTS:

Payment to Granite Seed, Inc. See Question and Recommendation in Number 1 above. Payment to either Tri-State or A & G as profit for a seed order proposed for cancellation is not warranted.

Proposed credit of $50.00/acre. See Number 4 Questions and Comments below.

Concern regarding proposed seeding rate for Regreen. Regreen contains approximately 10-12 thousand Pure Live Seeds (PLS) per pound of seed. [PLS equals 100% germination]. Using 11 thousand seeds per pound as an average, a 20 pound (PLS) per acre seeding rate would equal approximately 220,000 seeds per acre or approximately 5 seeds per square foot of surface area.

RECOMMENDATION: Seed Regreen on all Subarea 2 areas except any identified test plots at a twenty pound/acre application rate. This seeding rate, if applied according to specifications, will provide adequate slope stabilization and erosion control. [See attached Regreen information.]

Number 3. COMMENTS:

Proposed change in application procedure for Regreen. On August 23 I spoke with Gary Washburn [A & G Landscaping] seeking additional information about their proposal for "blowing on the [Regreen] seed and then harrowing it in". Gary stated that their intent was to use a truck mounted blower to distribute the seed over the entire area and follow by harrowing. Upon further questioning, he stated that they would like to apply the seed in 50 foot passes but that they had not used this technique before to apply Regreen.

Proposed credit of $87.50/Acre. See Number 4 below.

RECOMMENDATION: The proposed "blowing" technique has the potential to both damage the seed and apply it unevenly. As Regreen is a large heavy seed applying it accurately in one 50 foot pass may not be possible or desirable. I suggest that it be broadcast from a tractor mounted hopper in accordance with the specifications [See Section 02930 - Paragraph 3.3 Broadcast / Track Seeding Method].

Number 4. **QUESTION**: The contractor originally bid the seeding of the erosion control cover Regreen at $800.00/Acre. Why is a price per acre price increase to $1000.00/Acre necessary?

COMMENTS:
Action item Number 2..."Compensation will be made at a combination of revised unit cost and lump sum payment..." The prices below reflect the credit adjustments in costs discussed in Numbers 1 & 3 above.

Description	Unit Price	Est. Quantity	Total Cost
Erosion control cover crop Regreen	$862.50/Ac.	126 Acres	$108675.00
Lump sum payment to Granite Seed	$24587.00		$24587.00
TOTAL			$133262.00

Action item Number 5...The total decrease in this contract is therefore $12738.00.

RECOMMENDATION: Apply the monies saved in Action item 5 above to hiring a local farmer as either a METRO part time employee or long term contractor responsible for native vegetation establishment and maintenance.

NOTE: It is my professional opinion that a unit cost of $862.50 per acre for materials, labor and profit for the seeding of Regreen only on Subarea 2 & 3 (using the simplified broadcast method proposed in Number 3 above) is excessive. I offer the following information in support of this statement:

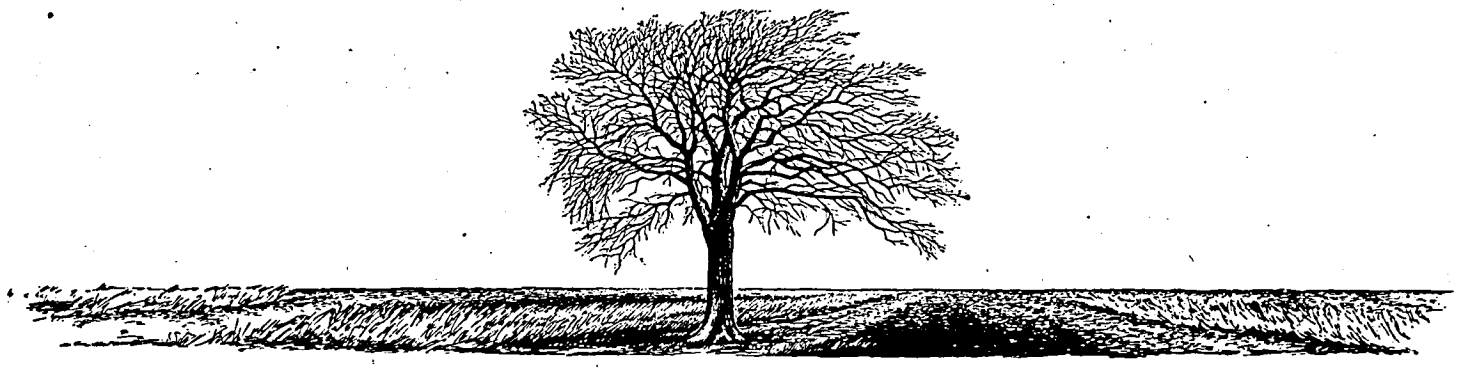
a. The wholesale cost of the Regreen seed is $2.00/pound; at a 20 pound/acre application rate the total cost is $40.00/acre for materials.

b. The cost of labor (at a Davis/Bacon wage scale) and equipment operation is approximately $200.00/acre. This price includes minimum site preparation, broadcast seeding, harrowing tasks and compensation for work on steep slopes.

c. Profit figured at a 100% markup rate on materials, labor and equipment would bring the total costs to approximately $500.00/acre.

SUMMARY The cover crop site preparation and establishment costs to the project contractor Tri-State and their subcontractor, A & G Landscaping would be drastically reduced if the proposed change order deleting native grass seeding and approving of a broadcast seeding method for Regreen are formalized. Although I think that these proposed cost savings should be passed on to METRO in the form of an increased credit, I understand the constraints of the binding contracts already negotiated. I do think, however, that METRO should be aware that a cost figure of $862.50/Acre should not be interpreted as the real cost of vegetation site preparation and establishment. Further significant savings will be possible if the compost element of the topsoil is eliminated; this savings could also be utilized for native vegetation establishment and maintenance.

cc: Jim Watkins, Dennis O'Neil, Jim Morgan, Wes Jarrell



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ST.JOHNS LANDFILL
MANAGEMENT GOALS AND EQUIPMENT NEEDS FOR NATIVE GRASSLAND SITE PREPARATION, ESTABLISHMENT AND MAINTENANCE

If the scope of work for subarea closure includes topsoil preparation and seeding of Regreen only, subsequent native grassland establishment and maintenance tasks could be performed by either a part time METRO employee or subcontractor hired specifically to manage the landfill landscape. I strongly recommend that this work be carried out by a farmer who is technically proficient in both agricultural equipment operation and techniques rather than a landscape contractor.

SITE PREPARATION GOAL:

Design a field management program that will, through the use of the agricultural techniques of mechanical, cultural, and/or chemical controls, exhaust the soil of noxious weed plants/seeds and nutrients.

EQUIPMENT NEEDS:

-Agricultural tractor with: 4WD, 3 point hitch, PTO, and front loader

-Agricultural implements:
  -sickle bar and side delivery rake
   or pull behind (3 point) swather
  -hay baler*
   or propane burner*

GRASSLAND ESTABLISHMENT GOAL:

When the fields have been sanitized and the nutrients reduced, seed a combination of native grasses, native legumes and non persistent covercrop using whenever possible no-till farming practices.

EQUIPMENT NEEDS:

-Tractor with 3 point hitch (above)

-Brillion seeder* or range drill* or land imprinter*

-Wildflower drill (optional)

GRASSLAND MAINTENANCE GOAL:

After seeding use managed sheep grazing and/or the agricultural practices of mowing and haying to favor the growth of the native grass and wildflower plant community.

EQUIPMENT/SUPPLIES NEEDED:

-Temporary solar powered fencing/cross fencing [cost share with livestock owner]

-Flail or rotary type mower

-Site preparation tractor and implements (above)

* lease, rent or hire a farmer who has this equipment

A COMPARATIVE ESTIMATE OF FIRST 2 YEAR PER ACRE VEGETATION ESTABLISHMENT COSTS:
NATIVE PLANT COMMUNITY VERSUS NON-NATIVE GRASSLAND

GRASSLANDS		
	NATIVE	NON-NATIVE
Seed materials only	$ 400.00/acre (mesic) $ 500.00/acre (xeric)	$ 20.00/acre (grass and legume)
Liming materials only	$ 0.00/acre (not necessary)	$ 500.00/acre (year 1 only)
Fertilization materials only	$ 10.00/acre (ammonium sulphate at 50lbs/acre)	$ 180.00/acre (ammonium sulphate at 900lbs/acre)
Lime/Fertilizer application labor	$ 150.00/acre (fertilizer only)	$ 200.00/acre
Mowing equipment and operator	$ 300.00-$500.00/acre (3-5 times per year)	$ 200.00/acre (2 times per year)
SUBTOTAL - GRASSLAND **Average costs/acre**	**$1410.00/acre plus seeding labor**	**$1100.00/acre plus seeding labor**

NATIVE UPLAND/LOWLAND SHRUBS	
Plant Materials mix of containers/collected propagules	$1000.00/acre
Fertilizers **and/or** Mychorrizal Enrichment (Shrubs*) materials only	$ 110.00/acre **and/or** $ 200.00/acre (plant cost plus 20%)
Irrigation gravity/drip system	$?/acre (METRO Staff and Water Truck?)
Labor Supervision volunteer planting and fertilizing/enrichment	$?/acre (METRO Staff or Contractor?)
SUBTOTAL - SHRUBS **Average costs/acre**	**$1310.00/ACRE**[1]

TOTAL ESTIMATED ESTABLISHMENT COSTS/ACRE

Native Plant Community (Grass & Shrubs)	**$2720.00/ACRE (AVERAGE COSTS/ACRE)**[1]
Non-Native (Grass Only)	**$1100.00/ACRE (AVERAGE COSTS/ACRE)**

* optional but desirable

[1] Plus irrigation and labor supervision

A COMPARATIVE ESTIMATE OF PER ACRE MAINTENANCE COSTS FOR NATIVE PLANT PRAIRIE COMMUNITIES AND NON-NATIVE GRASS MIXES

(YEAR 3 THROUGH 30)

COST FACTORS	NATIVE	NON-NATIVE
LIMING		
labor & materials	$ 0 (not necessary)	$ 850.00/Acre (1 application/2 years)
FERTILIZATION		
materials	$ 0 (not necessary)	$ 360.00 -/Acre (1-2 X Year)
application labor	$ 0 (not necessary)	$ 200.00 -/Acre
MOWING		
equipment & operator	$100.00/Acre (1 mow/year)	$100 - $200/Acre (1 - 2 Mows/Year)
TOTAL COSTS	**$100.00/Acre/Year**	**$1510.00 - $1610.00/Acre/Year**