



-----Original Message-----

From: Whiting, Kelly
Sent: Thursday, August 10, 2000 7:55 AM
To: Kulzer, Louise; Rhoads, Kate
Cc: Masters, David
Subject: RE: Landscape Management Plans

with attachment.

---Kelly.

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Cc: Masters, David
Subject: RE: Landscape Management Plans

Kate (& Louise, if interested)-

Attached you will find the POS-SMP proposed approach for dealing with metal roofs. It lacks much of the detail I expected to see. I will be mostly deferring this issue to Ecology as this is a retrofit issue for roofs that are not being "redeveloped" at this time. Please look over the write-up and let me know if you have any comments with the issues I raise (underline text).

Thanks much,

---Kelly.

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From: Whiting, Kelly
Sent: Thursday, August 10, 2000 6:36 AM
To: Kulzer, Louise; Rhoads, Kate
Cc: Masters, David
Subject: Landscape Management Plans


Louise/Kate -

There is an issue with these plans that I have never fully understood. The POS-SMP has indicated that all grass infield areas surrounding runways and taxiways would be managed as water quality treatment BMPs (filter strips), and therefore will be managed per the BMP maintenance plan to be developed once improvements are complete. However, because these areas exceed the 1 acre threshold of managed landscape they appear to also be subject to treatment requirements or a landscape management plan requirements. Since the treatment BMP that would be required for the landscaped areas would be more of the same grass filter strips, I am unsure how to deal with the issue.

Attached is the proposed SMP section to address the issue of the managed landscape. My initial comments are in underline format. Please advise.

---Kelly.

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AR 017911

Most existing rooftops at STIA are constructed of non-metallic materials without exhaust structures that would result in pollutant emissions. Therefore, these rooftops are considered non-PGIS, and would not require treatment. However, some rooftops may be constructed of metallic materials. The assessment and treatment of these existing rooftops will be administrated under the Port's NPDES Permit, according to the following process:

1. Perform ongoing stormwater monitoring and whole effluent toxicity (WET) testing in subbasins SDE-4, SDS-3, SDN-1, and SDN-4. These subbasins contain nearly all of the existing rooftops at STIA, particularly metal rooftops.
2. If monitoring reveals toxicity or elevated levels of pollutants, perform source tracing.
3. If source tracing reveals that rooftops are pollution-generating, submit to Ecology a schedule for applying BMPs to eliminate or reduce the source. These BMPs may include: (1) coatings or membranes¹, (3) removal of exhaust sources, or (4) application of treatment BMPs.
4. After BMPs are applied, perform follow-up monitoring to demonstrate BMP effectiveness.

The above process has been demonstrated to be effective at identifying rooftops that act as PGIS. WET testing in subbasin SDN-1 identified two rooftops that act as PGIS (Port of Seattle 1999a). BMPs are being determined to control pollutants generated by these rooftops. When these BMPs are implemented, follow-up monitoring and action will take place until effective pollutant control is demonstrated.

¹ Research and discussion with several vendors identified several options for covering roofs. Paint systems and synthetic coverings were the most common options recommended by nearly every company contacted. Paint systems typically involve a surface preparation step (pressure washing or rust treatment), followed by application of a primer, and one or two coats of an acrylic, urethane, or epoxy topcoat. Synthetic coverings include options such as spray-on primer/elastomer coatings with sealants for joints, seams and fasteners; pre-made sheets of a reinforced single-ply membrane that would be applied over a layer of insulation; and a spray-on polyurethane foam to be covered with an elastomer topcoat.

Based on the research performed, it is expected that painting is less expensive than roof coverings, but would require more frequent maintenance. Synthetic coverings may have longer lifetimes, but involve a higher initial cost and more intensive pre-treatment (e.g., insulation to fill roof corrugation spacing). Evaluation of the proposed materials will be necessary to ensure that alternatives do not release significant concentrations of metals or other pollutants into stormwater runoff.

The costs for different coatings options vary considerably depending on the products used and labor estimations. Most contractors were reluctant to provide product pricing without first conducting a site visit. However, an attempt was made to obtain conservative gross estimates for different options. Prices ranged from \$0.22 - \$2.50 per square foot for paint systems to \$1.45 - \$3.50 per square foot for synthetic coverings, not including labor or installation.

Taken from July 18th Email, Keith Smith-POS.

ROOFTOPS AS PGIS

The Port will need to provide for King County and Ecology's review: (1) a description of a process and schedule for inventory of existing Port rooftops to determine which rooftops would be considered PGIS, and (2) proposed options for retrofitting existing rooftops determined to be PGIS.

The schedule and implementation for rooftop retrofitting would be addressed under the NPDES Permit.

Per this summary of your July 12 meeting with Ecology, you need to provide me a schedule for inventory of existing Port rooftops to determine which rooftops would be considered PGIS. Please coordinate with POS staff and include this schedule in SMP.

Write-up indicates that some rooftops have been identified as known, or likely, PGIS. Is there an inventory list of roofs and whether they are known, likely, unknown, or non-PGIS? Such a list would be useful in developing the inventory schedule and would help demonstrate the feasibility of the proposed approach.

Item #3 indicates that if some roofs are found to be PGIS then a schedule for retrofitting will be submitted to Ecology. The last paragraph of the write-up indicates that 2 rooftops in SDN-1 have been determined to be PGIS. Therefore, per item #3 a retrofit schedule should be provided to Ecology now. I suggest this retrofit schedule be included in SMP for Ecology's consideration. However, depending on the aggressiveness of the proposed inventory schedule, it may be supportable to defer retrofit schedule until inventory is complete. —

Item number 3 appears to be missing the second of the 4 alternative retrofit approaches. Is number 2 diversion to IWS, or is there a numbering problem?

Is removal of exhaust sources a feasible alternative? It seems this would require discontinuing whatever activities are being performed in the building. Do you mean instead that the exhaust system would be retrofitted to eliminate/reduce the deposition of exhaust emissions on the untreated roof areas.

The extent of metal roofs (and exhaust emissions) is largely unknown. Reviewer cannot advise Ecology as to the feasibility of the various alternative approaches. The siting of treatment BMPs would likely be a challenge in some areas.

WET Testing and Cu Concentration Comments (these comments can be expected in final review comments for DOE consideration. Although site-specific issues, such as these, would typically be addressed under Large Site Drainage review process, this project did not go through that process and therefore issues will only be discussed and deferred for Ecology's consideration):

Comments on the Copper levels from SEATAC runways (K. Rhoads, KC Senior WQ Specialist)

- Copper levels seem high (based on Table 4-8) - I think that they would exceed the numeric surface water standard, but it is impossible to tell with the data presented. The data presented is total recoverable (TR) Cu and the standard is based on the dissolved fraction. Based on the TSS levels for the runways, I expect that most of the Cu is in the dissolved form. Hardness levels are not presented and are needed to determine toxicity. Assuming a hardness of 100, the acute toxicity standard for Cu is 15ug/l. The runway data presented has a median TR Cu concentration of 37 ug/l. I should also note that an exceedance of the acute toxicity standard does not necessarily result in a fish kill, but there could be long term chronic effects. Also, the toxicity standard is an in-stream standard and (I think) the STIA data is stormwater runoff from the runways, prior to discharge to the creek.

The comparisons in Table 4-8 show TR Cu concentrations within the same range of the runways. The TSS concentrations from these comparisons (NUPR, freeway, etc) are much higher than from the runways. Because of this, I would assume that the dissolved Cu fractions from the comparison data would be much less than the runway. Therefore, the dissolve fraction of Cu is probably higher for the runways and more of a toxicity issue than the comparison stormwater.

- Per the STIA NPDES permit, WET (Whole Effluent Toxicity) tests were performed at various outfalls. I have not seen the specific wording in the NPDES permit, but based on the requirements of 173-205 WAC Whole Effluent Toxicity Testing and Limits, the test species is not specified. The WET testing was done using daphnia, which is a common invertebrate in this area, and Flathead minnows. The NPDES permit may have specified these test species, or the port may have chosen them. Standard methods for toxicity tests lists prime considerations for the selection of species - including their recreational, economic, and ecological importance and relevance to the purpose of the study. I think that a more appropriate test fish species would have been a salmonid. Since the metal of concern is copper and copper is more toxic to salmonids than other fish species, and the receiving water is habitat for salmon, that would have been a more appropriate test specimen.

Two WET tests were performed for the runway areas using flathead minnows - these tests had 95 and 98% survival rates. The dissolved Cu concentrations in the stormwater used for the WET test were 13ug/l, which is below the surface water toxicity standard of 15ug/l (as discussed above), and therefore low mortality would be expected. This is also lower than the reported median total recoverable concentration of 37ug/l in table 4-8. This makes me wonder two things: 1) were the WET tests performed with stormwater of typical Cu concentrations? and if the WET test was performed using a more appropriate species with stormwater more in line with Cu concentrations identified in Table 4-8, would there be a toxicity problem?

- In conclusion, it is difficult to tell if additional stormwater treatment would be recommended for additional metals removal.