DEQ Response to Public Comments on the Draft St. Johns Landfill Closure Permit and Consent Order

Summary:

During the Chance to Comment period and public hearing the Department received written comments from two organized groups and one individual citizen. Although several citizens attended and commented at the informal information meeting on May 15, 2003, none submitted oral testimony for the formal public hearing portion of that meeting. This document presents the public comments in bold, italic type and DEQ responses in non-bold, standard type.

Public Comments and the Department's Responses:

Comments from Smith & Bybee Lakes Wildlife Area Management Committee (letters dated February 27, 2003/ May 13, 2003).

February 27, 2003 letter:

1. Risks associated with recreational use. What are the risks to people using a public trail that may be located on the dome or perimeter dike of the landfill? We are also interested in risks to paddlers boating in the slough and/or lakes, and anglers that catch and eat fish from the slough and lakes. Non-recreational human activities include the landfill workers performing their duties.

We cannot now predict the risks to people using a public trail on the landfill in the future, boaters or anglers using Columbia Slough or on-site workers performing their duties. The proposed permit and consent order will require Metro to conduct a risk assessment for St. Johns landfill. The consent order scope of work (SOW) delineates the required elements of the risk assessment. As prescribed in the SOW the human health portion of the risk assessment must evaluate risk in the context of current and reasonably likely future land and water uses. The first step in the risk assessment process will be for Metro to prepare a risk assessment work plan and submit the plan to DEQ for review. DEQ will carefully consider the Smith & Bybee Lakes Management Committee's comments in our review of the risk assessment work plan.

DEQ has clear authority under the cleanup law and administrative rules to regulate risks associated with the release of hazardous substances to the environment. DEQ lacks regulatory authority regarding physical risks that are unrelated to exposure to hazardous substances (e.g. someone's risk of physical injury while walking a trail across the landfill). Lacking such authority, DEQ cannot formally address this issue in the closure permit and consent order. However, DEQ is recommending that Metro address your concerns about physical safety in their planning for the site's future use.

2. ***Fish and wildlife species to consider studying in the risk assessment include:***

a. Benthic macroinvertebrates
b. Mussels
c. Crayfish
d. Juvenile salmonids
e. Amphibians
f. Western painted turtle
g. Great blue heron
h. Osprey
i. Savannah sparrow
j. River otter

DEQ revised the consent order scope of work, section **V., B. pg. 7**, to incorporate the above list of fish and wildlife species as a minimum requirement of the ecological risk assessment. The risk assessment must include but not be limited to this list.

3. ***Impacts to the lakes associated with water level management. Metro will be replacing the dam at the east end of North Slough with a water control structure in 2003. This will result in seasonal draw downs of the lakes/wetlands occurring every year. Will there be changes to groundwater movement, particularly in the Bybee Lake area, and are there any associated risks?***

The PSU groundwater modeling project (December, 1995) evaluated the influence of lake levels on groundwater flow and concluded that the lake levels have virtually no influence on groundwater movement in the gravel aquifer beneath the landfill. PSU performed a sensitivity analysis to compare contaminant plume migration for two lake/slough scenarios: 1) Lakes closed to North Slough; 2) Lakes open to North Slough. These simulations showed no discernable difference in predicted contaminant plume size or position.

Based on our review, the model prediction appears reasonable, but DEQ believes further verification is warranted considering the lake's importance. Accordingly, DEQ modified the Consent Order Scope of Work (Section III) to include requirements for assessing the affect of lake levels on surface water quality, groundwater water quality and ground water flow (i.e., monitoring and analysis of surface water quality, groundwater quality, and water levels in the sand and gravel aquifer after replacement of the water control structure).

4. ***Landfill stability – perimeter dike and cover/dome. We would like to see DEQ and Metro investigate the risks associated with breaches of the cover and perimeter dike, as well as the overall stability of the site.***

In their 1991 closure engineering study, Metro 's consultants, Parametrix Inc. and Cornforth Consultants, evaluated slope stability, settlement, and closure design

alternatives. The final cover system and other closure elements were specifically designed to withstand the landfill site's physical and environmental conditions and they are required to be inspected in accordance with the closure permit and the DEQ-approved operations and maintenance manual. The closure design, however, did not fully anticipate the localized slope failures resulting from flooding (e.g. 1996/1997 floods) and tidal action on the slough banks and natural silt dikes that surround the landfill. Inspection and maintenance of the perimeter dikes is an ongoing effort that must continue for the foreseeable future. The closure permit was revised to include specific conditions requiring Metro to inspect, maintain, and repair the perimeter dikes and the cover system. See permit Sections 7.5 and 7.6.

5. Development issues. We anticipate construction of a public trail on the surface or perimeter of the landfill in future years. What risks might be associated with trail construction activities such as grading and installation of additional material (e.g., rock base, asphalt top)?

During trail construction activities risk could manifest as 1) risk to construction worker's health and safety and 2) risk of damaging critical landfill features. Construction worker risk related to exposure to hazardous substances should and will be addressed in the risk assessment. Potential risk to landfill facilities may include:

- Landfill-cover disturbance or damage from trail-related soil grading or excavating.
- Disruption of the landfill's storm water drainage patterns due to trail-related earthwork.
- Damage to landfill gas wells or associated piping and equipment.

DEQ believes risks to construction worker physical safety and to landfill facilities can be minimized with good advance planning and design. A well-planned, well-designed trail is unlikely to have significant, long-lasting impacts.

6. Other substances that may be released/piped out with the methane gas.

Typical landfill gas is mostly methane and carbon dioxide. Many trace constituents including volatile organic compounds are usually present as well. The gas produced by St. Johns landfill fits this typical pattern. Some VOCs are hazardous substances and known carcinogens. Hydogen sulfide, a highly odorous, toxic compound also is present. The risk assessment must consider such air emissions and potential exposure pathways.

7. Air quality emissions.

Although air emissions from landfill gas are a potential health risk of significant proportions at St. Johns Landfill, most of the gas is collected and removed from the site. As part of the landfill closure Metro installed a highly efficient landfill gas collection system to minimize emissions. The landfill cap plays an integral role in preventing the gas from escaping to the atmosphere. Collected gas is compressed and piped to Ashgrove

Cement Company where it is burned as fuel. In addition, Metro conducts comprehensive air quality monitoring near the landfill surface to satisfy the compliance requirements of their Title V air quality permit issued by DEQ.

As currently drafted, the remedial investigation scope of work and risk assessment will address this issue based on reasonably likely future land use.

8. ***Phytotoxic effects of releases on plants.***

Historically, many native plant species located along the landfill perimeter dikes survived the physical effects of the landfill operations but died because of the toxic effects of landfill gas and leachate seeps. Methane, one of the main components of landfill gas, displaces oxygen in the root zone of trees and other deep rooted plants and may suffocate them. Landfill leachate contains very high concentrations of salts and other constituents that may be toxic to plants. The landfill closure improvements, particularly the landfill cap and gas collection systems, have significantly reduced the landfill's phyto toxic effects. Under DEQ cleanup rules and guidance the ecological part of the risk assessment that Metro will conduct must consider the landfill's toxic effects on both plants and animals.

9. ***Will the closure permit specify allowed uses and management practices? We are very interested in any language that relates to wildlife habitat restoration and trail construction and use, as well as management requirements that may specify activities such as seeding, planting, mowing, irrigation, fertilizer use, etc. because of their relationship to habitat restoration.***

Because of the limits of DEQ's regulatory authority the closure permit does not specify the landfill's allowed uses and management practices except to the extent that such uses and practices may threaten the integrity of the site's environmental control and monitoring features. DEQ regulations do not give us authority to mandate specific requirements for wildlife management, trail construction and habitat restoration. DEQ anticipates that Metro , the Smith & Bybee Lakes Management Committee, and other involved organizations will continue the habitat planning and management activities currently in progress. DEQ's role will be to review Metro's plans to make sure the landfill closure and its post-closure care are not compromised in any way by proposed future uses.

10. ***We would like to see DEQ include the following substances in its investigation of leachate movement into groundwater with Metro:***

- ***a. Those that are close to or exceed drinking water standards in samples collected.***
- ***b. Others of interest – all that have been detected, and substances such as ammonia.***
- ***c. Substances for which there are TMDLs established for the Columbia Slough.***
- ***d. Pesticides.***

DEQ agrees that the St. Johns Landfill remedial investigation must evaluate the substances listed above. DEQ did not change the draft closure permit or consent order in response to this comment because we believe these documents contain existing language that adequately addresses the issues of concern.

May 13, 2003 letter:

Closure Permit

11. Public trails (including fencing to regulate access) and wildlife habitat restoration activities should be added as approved operations in the closure permit. Trails are a very likely future use, and habitat restoration is already occurring as part of the cover and vegetation work. Trails could conceivably be located on the perimeter dike and/or on the landfill cover. It is unclear where these would best fit in the permit, although we discussed locating them in section 5, 7, or 8. By including both items at this time, DEQ and Metro can avoid re-opening the permit later.

DEQ regulations address post closure care of the landfill cap, leachate and gas control systems, and other environmental protection features. As explained in our response to comment No. 9, however, DEQ lacks direct statutory authority to regulate future land use of St. Johns and other landfills.

DEQ regulations do require landfill owners to describe and report intended land uses in the site closure plan which must receive DEQ's review and approval. Our expectation is that Metro would submit to DEQ an amendment to the St. Johns Landfill Closure Plan as needed to incorporate any intended changes in the site's land use. The permit would not need to be "re-opened" later because any approved changes to the Closure Plan become part of the permit by reference.

12. We would like to clarify whether item 6.3, prohibition against open burning, precludes the use of vegetation management techniques such as prescribed burns. There may be occasions when burning could be the optimum activity for establishing native plant communities and controlling weeds. Certain techniques for conducting prescribed burns (e.g., low-intensity burns using drip torches) may have reasonably low risk associated with them.

The permit's prohibition against open burning is a standard requirement of DEQ's solid waste closure permits. The prohibition's intent is to prevent burning of solid waste materials such as construction debris or land clearing debris. This permit does not preclude the use of fire for controlling invasive weeds. Burning of any kind may require an air quality permit from DEQ in advance of such activities. In addition, any plans to use this technique must consider the flammability and explosiveness of landfill gas and potential for such fires to damage landfill facilities and equipment.

13. How are catastrophic events, such as earthquakes, handled? Are they included under the closure permit? The management committee does not have a

recommendation in this area, but did note that response to natural disasters did not appear to be included in the permit.

Catastrophic events, such as earthquakes, are addressed implicitly under the general post-closure care and maintenance provisions of the draft closure permit (permit sections 7.0. and 8.0) and in the inspection and maintenance provisions of Metro's (DEQ approved) Operation and Maintenance Manual, dated June 1998. For better clarity on this issue, though, DEQ has added explicit new requirements to the final permit regarding catastrophic events such as earthquakes. Please refer to the final permit section 7.10. Included is a requirement for Metro to amend their approved Operations and Maintenance Manual to establish specific contingencies for catastrophic events.

14. ***In section 8.8, DEQ requires submission of engineering design plans at least six months prior to anticipated construction. Does this paragraph include trail construction activities?***

DEQ will consider a shorter review period if a proposed trail project involves superficial grading and construction that does not result in modification or disturbance of the landfill cap or other site environmental protection features.

15. ***Clarification of Previous Letter***

Item (3) in our February 27, 2003, letter may require clarification. Our intent was to inquire whether changes with the new water management in the lakes (and consequently North Slough) could exacerbate movement of contaminants between the lakes/wetlands and groundwater. Similarly, we are interested in any impacts to contaminant movement in surface water that would be associated with changes in surface water movement.

Please refer to DEQ's response to comment No. 3.

Comments from William Michael Jones (summarized below)–

DEQ Steps to a Safe Landfill Closure

16. ***The first step DEQ must take in formulating a responsible closure plan is to require a working double lined cap over the landfill.***

The landfill cover built by Metro has failed. If Metro is not going to move the landfill to Arlington, the mound of leachate rising high above the primary aquifer must be controlled. I personally participated in forming the Closure Plan formulated in 1989. That plan required a multi-layer cap over the entire landfill. That plan included a two-foot thick impermeable clay cap over a synthetic membrane and the maintenance for the steep slopes.

In 1993 I became aware of Metro 's plan to pre-load the landfill with dredged spoils and change the cap design to a single membrane, with the very permeable dredged

spoils placed on top. At that time it was very obvious that the pre-loading had changed the shape of the landfill and that the steep slopes would not be maintained. I was also very disturbed by the slip-shod installation of this single cap. The membrane was at times laid on top of exposed garbage and over leachate running from multiple seeps. Metro must be required to prevent rainfall from entering the landfill.

With the closure project's completion in 1997 the entire landfill is covered with a duel cap system consisting of the following moisture barrier features: 1) a compacted low-permeability soil layer; 2) an overlying 40-mil thick, high density polyethylene geomembrane layer. The cap specifications required extensive construction quality assurance inspections and testing to verify the cap's proper installation and integrity.

DEQ does not believe the St. Johns landfill cover system has failed. The dramatic reductions in visible leachate seeps and landfill gas related emissions and odors suggest that the cover system is functioning very well. The cover system's design and construction met or exceeded DEQ and federal regulations and standard of practice in the solid waste industry. All construction phases included comprehensive quality control and quality assurance procedures and testing. In addition, the firms involved in the cover design and construction had extensive experience in landfill closures. Most modern landfill caps are single-barrier-layer systems i.e., a geomembrane (synthetic plastic membrane) or a compacted low-permeability soil layer. The St. Johns Landfill cap has both barrier layer types: a geomembrane layer and a low-permeability soil layer.

The original final cover system proposed in Metro's 1989 Closure Plan for St. Johns Landfill did not include a low-permeability soil layer component. The low permeability layer was added later at DEQ's request as a closure plan modification. The original cover system included the following layers from top to bottom:

- 12- inches of topsoil to promote vegetative growth
- A geotextile filter fabric to separate the drainage material from overlying top soil
- 12-18 inches of drainage material (sand and gravel) to transmit storm water infiltration
- A 40-60 mil plastic membrane (geomembrane) cap (hydraulic barrier layer)
- 12-inches of sand to serve as a gas collection medium
- 6-inches of daily cover soil

The cover system actually constructed at St. Johns Landfill, including the low-permeability soil and geomembrane layers consists of the following layers from top to bottom:

- 12- inches of top soil

- 12-inches of drainage material (sand)
- Synthetic drainage layer (to enhance drainage on steep side slopes)
- A 40-mil polyethelyne geomembrane
- A 12-inch-thick, compacted, low-permeability soil layer on landfill's top slopes.
- A 6-inch-thick, low-permeability soil layer on side slopes

Once construction of the cover system and other closure improvements began, Metro experienced significant cost over runs and proposed a number of design changes to reduce construction materials costs. DEQ approved some of these changes contingent on specific conditions. A DEQ letter, dated December 30, 1992, authorized Metro to make the following changes:

- Eliminate a synthetic drainage layer (known as a geonet composite) from gently sloping top slopes.
- Reduce the minimum top slopes from the original goal of 5% after settlement to the greater of the following two choices: 1) 5% before settlement or 2) 2% plus compensation for total predicted differential settlement.

Conditions of DEQ's approval included requirements for Metro to conduct additional testing and analysis of landfill settlement and to demonstrate that overall cover system performance would not be compromised by the changes. A subsequent DEQ letter dated June 22, 1993 authorized Metro to further reduce final cover slopes provided the completed slopes would maintain positive drainage of the cover. Metro retained expert geotechnical engineers, Cornforth Consultants, to complete the settlement analysis. This and related engineering studies were completed in March of 1994.

Although the main purpose of these design changes was to reduce construction costs, the changes did not, in any way, compromise the integrity of the geomembrane and low-permeability soil layers. These barrier layers are the landfill cover system's most critical components for minimizing leachate generation and protecting the surrounding environment. Potential negative impacts of the DEQ-approved flatter slopes and reduced drainage efficiencies, however, include increased storm-water ponding above the landfill cap and increased costs for the cover's long-term maintenance and repair.

In some instances, cover-system construction did proceed on localized, leachate saturated areas. Metro's construction specifications anticipated this problem and provided special instructions for constructing the cover system on areas with flowing leachate seeps. Geosysthetic clay liner (GCL), material was used in place of the compacted low permeabilty soil at such locations. GCLs consist of bentonite clay granules sandwiched between two layers of geotextile fabric (filter fabric). GCLs have a very low permeability

and can easily be placed directly over wet or otherwise difficult construction surfaces. GCLs are widely used at solid waste landfills for low-permeability cover and bottom liner systems.

In summary, DEQ believes the landfill's existing cover system is intact and performing its job to contain landfill gas and minimize leachate generation. The upcoming remedial investigation results will provide additional verification of the cover system's condition and performance. Please refer to Section III, item No.7 of the Scope of Work. The Scope of Work was modified to include requirements for Metro to assess the condition and performance of the cover system as part of the remedial investigation. In addition, the existing and proposed new closure permit as well as Metro's current, DEQ-approved Operations and Maintenance Manual require Metro to monitor and maintain the cap.

17. The second step DEQ must take in formulating a responsible closure plan is to require a comprehensive perimeter leachate collection system.

The only landfill closure plan that the public participated in was the 1989 closure plan. Although the 1989 closure plan did not specifically include a perimeter leachate collection system, it clearly envisioned one. Metro has done some work on this issue. Whenever garbage could be seen washing into the sloughs around the landfill Metro has covered that area with riprap, and in some few areas has installed short squat leachate cut off walls. The riprap placed directly on exposed garbage only covers the exchange of leachate and water from the slough from sight. It is hard to see how short leachate cut off walls could do any more than delay the obvious leachate stream reaching the sloughs for the length of time it takes to flow around these cut-off walls.

The new closure permit and consent order require Metro to conduct a remedial investigation and feasibility study. The purpose of the feasibility study will be to evaluate alternative remedies or corrective measures for reducing site risks. Under DEQ's cleanup rules, DEQ evaluates alternative remedies for their effectiveness, implementability, long-term reliability, implementation risk, and reasonableness of cost. Depending on the remedial investigation and risk assessment's outcome, a comprehensive perimeter leachate collection system may be evaluated as one of the alternative remedies.

Metro's 1989 engineering study evaluated a number leachate management options including cover system enhancement and installation of partial and complete perimeter leachate collection systems. A perimeter leachate collection system would have the following advantages: 1) greater reduction of most visible (surface) leachate seeps; 2) reduction of shallow subsurface seeps). Its main disadvantages include:

1. High cost (the estimated cost of such a system in 1989 dollars was approximately $ 4,168,000).
2. Potential for short-term releases of leachate during in-waste excavation/construction.
3. Removal of most perimeter trees required to accommodate construction.

4. Uncertain leachate collection efficiency and zone of influence given landfill configuration (i.e., no bottom liner) and site's hydrogeologic conditions (i.e., some leachate may flow downward beneath the capture zone of a perimeter collection system).

Because, of these disadvantages, perimeter leachate collection was not implemented as part of the original closure plan improvements but was retained as a possible contingency in case the cover system failed to eliminate significant leachate seeps or other detrimental water quality impacts.

18. ***Step 3. DEQ should be the lead agency in developing a safe water management plans for the dynamic system of sloughs and lakes that surround the landfill.***

We agree that DEQ should be directly involved in developing a safe water management plan for the system of sloughs and lakes that surround the landfill. DEQ is the lead agency in coordinating development of water quality improvement plans for the Columbia Slough and Smith & Bybee Lakes with Metro, the City of Portland, the Smith & Bybee lakes Management Committee and other key stakeholders (e.g., Columbia Slough Watershed Council).

19. ***Step 4: DEQ must characterize the sediments in the close vicinity of the landfill. That characterization must represent contaminated sediments no matter how deep they are. Construction in those sediments should be suspended until the danger of those sediments is known and relevant transport methods have been identified.***

We agree that sediments must be characterized near the landfill as part of the remedial investigation. Metro, with DEQ's oversight, will be responsible for the sediment characterization work prescribed in the closure permit and consent order. DEQ also agrees that sediment sampling activities should be designed to characterize landfill-impacted surface and subsurface sediments that could pose an unacceptable risk to human or ecological receptors.

DEQ believes construction projects, such as replacement of the water control structure, can be safely implemented without spreading contamination. Although, this issue is beyond the scope of the landfill's Closure Permit and Consent Order, DEQ offers the following comments in response. Metro's construction plan for replacement of the existing water control structure includes installation of coffer dams and preconstruction dewatering to isolate the construction zone, core sampling, testing, and evaluation, and a determination regarding on-site reuse of sediments or off-site disposal. These measures provide substantial protection of surrounding surface waters. In addition, Metro has applied for all required regulatory permits and certifications from The Corps of Engineers and DEQ's Water Quality program.

The draft Consent Order scope of work addressed contaminated sediments in general, but not sediment depth in particular. Accordingly, we have added new language to the

consent order scope of work to address concerns regarding deep landfill-impacted sediments. Please refer to the Scope of Work, Section III, last paragraph.

20. ***Step 5: DEQ must find the limits of the leachate plume. The leachate plume is clearly offsite and probably extends into the Troutdale Aquifer. Samples, not conjecture, should define the limit of off-site contamination***

One of the Remedial Investigation's main objectives will be to define the limits of the landfill leachate plume. We agree that sampling, not conjecture, should define the limits of off-site contamination. The consent order scope of work (Section III) requires the installation of additional monitoring wells to assess the landfill's impacts, if any, on the Pleistocene sand and gravel aquifer (the uppermost region-wide aquifer). Near St. Johns Landfill, the Troutdale Aquifer is very deep and lies beneath the Pleistocene sand and gravel aquifer.

Because of its depth and the presence of an intervening aquifer, the Troutdale Aquifer is unlikely to be effected by the landfill. Nevertheless, the remedial investigation will objectively determine the nature, extent and distribution of hazardous substances in all affected media. Starting with the most vulnerable aquifers, those nearest the contaminant source, logical scientific methods and principles will be used to define the limits of the landfill's impacts (i.e., contaminant plume depth and area of extent).

21. ***Step 6. The Columbia River tides control the landfill environment. Metro must stop tidal averaging its data by accounting for the tide in all monitoring.***

We agree that Metro's surface water monitoring programs must accurately account for any tidal effects on water chemistry. DEQ added new language to the consent order scope of work that requires Metro to evaluate tidal/water quality relationships. Please refer to the Scope of Work Section III, last paragraph.

22. ***The Final Step: When all of the above issues are addressed, then DEQ should require the studies and investigations found in the draft closure permit. DEQ should only issue a consent order when such an order has a recognizable legal need.***

To some it might seem that DEQ's intention in issuing the new closure permit and the consent order is to remove any remnant of an actual landfill closure plan by replacing conditions that already exist with studies that have no timeline or described end. There is no need for the consent order at this time.

In DEQ's view the proposed Consent Order is necessary. At high-priority contaminated sites, consent orders are DEQ's standard mechanism for compelling responsible parties to investigate and clean up releases of hazardous substances.

23. ***The consent order gives complete discretion of the enforcement of DEQ regulations and policies to the DEQ and Metro project managers. There is no need to exclude***

citizen participation in any form while the discussion is still at the "planning-to-study" stage.

DEQ has no intention of excluding citizen participation at any stage of the Remedial Investigation/ Feasibility Study (RI/FS) process. To accommodate public involvement, DEQ has revised the RI/FS schedule to provide greater flexibility in the process. In addition, DEQ has drafted a public involvement plan to establish a formal road map for citizen involvement. The draft plan will be sent to the North Portland neighborhood groups and other key stakeholders for their review. The final plan will reflect the citizen input we receive.

24. Please do not consider this comment to say that all of the studies and monitoring DEQ now proposes are not necessary. This comment simply says that the physical requirements of DEQ for any landfill (such as an effective landfill cap) should not be sacrificed in order to conduct a risk assessment a generation after it was needed. In fact I ask DEQ to include dioxin testing in any sediment sampling, risk assessments or leachate profiles.

Historical information (see Consent Order Finding of Fact) suggests the likely source of any dioxins, present in the landfill, would be Rhone-Poulenc pesticide manufacturing wastes deposited in the landfill from 1958 to 1962. Dioxins and furans were common byproducts of Rhone-Poulenc's herbicides. Dioxins and furans are also byproducts of incineration. Airborne dioxins from the old, Chimney-Park, waste incinerator may have dispersed broadly in the vicinity of the landfill. Consequently, the source of any dioxins found in sediment sampling may be extremely difficult to identify.

With regard to landfill releases of hazardous substances, the Remedial Investigation (RI) objectives are broad and inclusive (refer to the RI Scope of Work, Section II, "Objectives"). As stated in the RI Scope of Work, one of the overall objectives is to identify the hazardous substances which have been released (by the landfill) to the environment. If detections include herbicides typically associated with dioxin or other dioxin precursors at levels of concern in groundwater, surface water or sediments, DEQ will likely require specific dioxin testing.

Comments from the St. Johns Neighborhood Association (summarized below)

25. ***Despite the lack of detail and actual deadlines, the draft remedial investigation scope of work and consent order would have been an effective plan if it had been presented in 1988. In 1988, Fred Hansen and Steve Greenwood made the argument that if a closure plan assumed the worst case in each relevant parameter, the safest closure plan could be developed without all the expensive studies. Now it seems that DEQ proposes the very studies that Metro avoided at the time, in lieu of a valid closure plan, fifteen years after landfill closure.***

The proposed Remedial Investigation reflects current, post-closure conditions at the landfill and long-term environmental monitoring results. Since 1988, we have benefited from 15

additional years of environmental monitoring information and further site characterization gained from Metro's groundwater modeling studies and other investigations. As previously mentioned, the Remedial Investigation will address identified data gaps that currently exist. It will not be a re-hash of previous investigations. The statements attributed to Fred Hansen and Steve Greenwood of DEQ reflected a different time and dramatically different circumstances. The landfill was still open and landfill-related pollution was much worse than it is today. The most critical priority then was to reduce the pollution as quickly as possible rather than studying its effects and risks.

As discussed at length in response No. 16 the closure improvements that were implemented exceeded federal and state closure regulations and included a double cap. Although the cap is performing as designed, low levels of several hazardous substances and other landfill leachate contaminants are present in shallow ground water. This is not surprising since the landfill lacks a bottom liner to prevent such releases.

The proposed Remedial Investigation is not optional it is required under Oregon's solid waste and cleanup laws in response to the confirmed release of hazardous substances.

26. DEQ has dropped most of the requirements of the 1989 closure plan, beginning with an alternative plan adopted covertly and without comment in 1990 and then subsequent, un-reviewed letters only to Metro relieving Metro of the requirements of the very permissive 1990 plan.

Please refer to previous response to comment No. 16 for a detailed discussion of the closure plan and the cover system.

27. The 1989 closure plan was the result of considerable public planning. Central to this plan was a double cap, a two-foot clay cap, and a membrane barrier maintained with steep slopes. DEQ has removed this central feature and other requirements without public input.

Please refer to previous response No. 16 for a detailed discussion of the closure plan and the landfill cover system. We understand the St. John's Neighborhood's frustrations regarding DEQ-approved changes to the cover system in the early 1990s. DEQ intends to keep the St. Johns neighborhood and other stakeholders better apprised of landfill-related DEQ actions, than we did in the early 1990s. Working with communities and supporting community-based problem solving is one of DEQ's most important agency-wide priorities. DEQ frequently teams with other state agencies to participate with local communities in collaborative problem solving.

In keeping with these priorities, we will provide opportunities for public input at all important decision making points in the Remedial Investigation process, as provided for in the public involvement plan, and will maintain open lines of communication concerning all aspects of DEQ's ongoing regulation of St. Johns Landfill.

28. The abandonment of the 1989 plan is not justified by modeling, which was primarily conducted by graduate students without the experience, the liability or the

responsibility that accrue to a normal engineering firm. Those studies do not justify the use of the pervasive "best-case" scenarios adopted by DEQ. The new closure requirements only propose and require un-reviewed new studies without suggesting remedial measures. In fact, the new proposals vitiate all of the previous 1989 closure plan requirements.

As explained in response No. 16, DEQ did not abandon the 1989 closure plan. Although some of the cap's original details were modified, the double cap concept was retained and constructed. Metro's groundwater model was not developed as a justification for any particular closure philosophy. In fact the model was developed after Metro completed the final closure design. The main purpose of the groundwater model was to improve the overall understanding of groundwater flow patterns beneath the landfill, fate and transport of contaminants, and to evaluate the long-term influence of landfill closure and other environmental variables on groundwater quality.

29. ***Metro has taken, and continues to take actions that close out other remedial actions while DEQ proposes more studies. One obvious example of these actions is the disastrous pre-loading of the landfill with dredge spoils. This action proceeded without comment or any review. The preloading simply drove the landfill into the primary aquifer. Because of the compressible soils under the landfill, the effect of this action itself requires a separate scientific consideration.***

DEQ has forwarded comments concerning Metro's management of the site directly to Metro staff for their review. DEQ is requiring a remedial investigation specifically to address data gaps that we identified from detailed review of previous site investigations and groundwater modeling. From our perspective, the landfill's pre-loading was not disastrous. Groundwater quality monitoring results do not indicate that water quality degradation followed the preload program. Preloading was necessary to prevent severe localized, settlement that eventually would have damaged the landfill cap. Metro's geotechnical consultants used sound engineering principles to evaluate the landfill's long-term settlement potential and to design the preloading program. Preloading is a common engineering technique that has been used successfully for reducing long-term settlement at many landfills.

30. ***A second example is Metro 's present attempt to change the circulation of water in the North Slough and Smith & Bybee Lakes, while DEQ proposes new studies. Metro should refrain from major construction activities in the close vicinity of the landfill unless they are part of the comprehensive closure plan. So far, the DEQ approach does not allow the community any recourse if the plan is not followed through.***

The proposed changes in circulation of water in the North Slough and Smith & Bybee Lakes reflect many years of study and planning by the Smith& Bybee Lakes Management Committee, Metro, the City of Portland, and others. Replacement of the existing dam and water control structure is intended to restore a more natural balance of flora and fauna and eliminate stagnant conditions in the lakes by reestablishing hydraulic connection between the lakes, Columbia Slough, and the Willamette River. With the

dam in place the lakes have functioned as reservoirs, disconnected from daily tidal forces and seasonal floods. Under these chronic high water conditions, shoreline willow trees and other native vegetation have died.

31. ***The following three steps should be part of the Closure Plan renewal.***

Step 1: Return to the 1989 Closure Plan in its entirety.

Step 2: Develop a perimeter leachate plan for the entire perimeter of the landfill.

Step 3: Develop a surface water management plan for all of the waters surrounding the landfill.

In the vicinity of the landfill, the primary aquifer and the surface waters are the same. To this point Metro 's proposals for surface water management have ignored the landfill and the hazardous sediments in the sloughs surrounding the landfill.

Step 1: Please refer to response No. 18 for a detailed discussion of the 1989 Closure Plan. The 1989 plan did not specify a double cap as part of the landfill's final cover system. The clay soil component of the cap was added later. DEQ believes that the landfill was properly closed and that reverting back to the1989 Closure Plan will not change the status quo with regard to current contaminant levels in groundwater, surface water, sediments and air. One main objective of the Remedial Investigation is to determine what, beyond the closure improvements, needs to be done to manage residual risks to human and ecological receptors.

Step 2: The Remedial investigation and Feasibility Study will evaluate alternative remedial measures based on standard criteria including effectiveness, implementability, cost reasonableness, long-term reliability, and implementation risk. Depending on the results of the Remedial Investigation, perimeter leachate collection may be evaluated as one of the alternative remedial measures. Please refer to response No. 18 for additional discussion of perimeter leachate collection.

Step 3: We will notify Metro of this concern regarding management of surface waters. The scope of the Remedial Investigation will be designed to evaluate the landfill's impacts to the surrounding environment in all media (including sediments) and wherever significant landfill impacts have occurred. A comprehensive management plan already has been developed for Smith& Bybee lakes and the City of Portland's Columbia Slough Revitalization Plan is well under way.

32. ***St. Johns asks the DEQ to fund a DEQ ombudsman for St. Johns residents to provide balance to the process.***

DEQ does not have a funding source for an ombudsman, but DEQ's job under state law is to protect the public's health and safety. With the public's help and participation we

intend to do our job as effectively as we can. What we propose, and intended from the outset, is to encourage citizen participation and collaborative decision making as we implement the new Closure Permit and Cleanup Consent Order. As previously mentioned, we have drafted a public involvement plan. Before its adoption, we will provide the draft plan to the St. Johns Neighborhood and other stakeholders for their review and comment.

33. ***The Consent Order makes intervention by the public impossible. If DEQ is going to internalize all consideration of landfill issues, DEQ should give a meaningful voice to St. Johns, beyond that stipulated in Section 6 of the proposed Consent Order. If DEQ feels it cannot fund an ombudsman, it must provide for independent peer review and public comment on each step delineated in the Consent Order in the work plan.***

As we indicate in response No. 29, DEQ does not have a funding source for an ombudsman, nor is DEQ able to fund an independent peer review process. In addition, providing for an independent peer review is not consistent with how DEQ implements cleanup at closed landfills or other contaminated sites in Oregon. However, DEQ has every intention of considering public input throughout the upcoming investigation. During each step outlined in the Consent Order, DEQ will consult closely with the St. Johns Neighborhood Association and other stakeholders to make sure we fully consider public concerns and interests. We have expanded Section 6 of the draft Consent Order to include specific public involvement objectives that DEQ will meet.

Other matters DEQ should Consider

34. ***Perimeter leachate collection***

DEQ should have dropped the pretense long ago that the silts on the banks of the slough form an impermeable natural barrier surrounding the landfill. The DEQ's rose-colored glasses should have been discarded with the sight of garbage washing away from the interior of the landfill. This fictional leachate barrier was obviously bogus to anyone who had enjoyed recreation by canoeing, swimming, fishing, hiking in or around the sloughs near the landfill. The flow of leachate from the banks of the sloughs was obvious.

DEQ has never held the view that the silts on the banks of the sloughs surrounding the landfill form an impermeable barrier. Field evidence, including the historic leachate seeps along the slough banks, and actual hydraulic tests, suggest that these silts are far from impermeable. Permeability testing conducted during Metro 's past site investigations indicates that the silts exhibit variability in permeability, from moderate to low depending on localized variations in sand and clay content. More sand content in the soils equates to higher permeability and more clay to lower permeability.

The landfill cap, however, does represent a nearly impermeable barrier that minimizes storm water infiltration into the waste and leachate generation. As previously discussed,

the cap has dramatically reduced the number and size of perimeter leachate seeps. The two perimeter leachate cutoff walls that Metro constructed to mitigate seeps also have an extremely low permeability relative to the natural silts.

The perimeter leachate collection concept was previously discussed in response No. 32 and elsewhere.

35. ***The Closure Plan must include an effective precipitation barrier***

Once DEQ removes its rose-colored glasses, it will become obvious that the membrane covering the landfill has failed. An effective closure plan must include an effective cover.

As previously discussed DEQ believes the existing cover system is very effective. Based on this comment, however, we have modified the Consent Order Scope of Work to include a requirement for evaluating the condition and performance of the cover. Please refer to the Scope of work, Section III item No. 7 (RI Proposal).

36. ***Hazardous Sediments***

Hazardous sediments are a great concern to the citizens of St. Johns. Anyone who has ever stepped out of a boat or waded in the sloughs around the landfill has been exposed to hazardous sediments that go several feet deep. To this point, Metro and the city of Portland have only measured sediments two centimeters deep, and the calculations depended on water samples, which had been filtered through four- micron filters. These actions render the sediment studies irrelevant.

Metro 's spurious study has, despite its flaws, deemed sediments in the North Slough hazardous. Metro should not be allowed to dredge and deposit those sediments without DEQ review of those actions and a monitoring plan.

Please refer to response No. 20 for a discussion of sediments. As noted in response No. 20, the Consent Order Scope of Work was modified to include a requirement for assessing sediment-depth related changes in sediment quality.

37. ***Dioxin***

The St. Johns Landfill was placed on the National Dioxin List because of a confirmed release from Rhodia. No sampling for Dioxin has occurred as part of any closure plan despite that confirmed released. DEQ should require Metro to sample both sediments and bio-accumulators in the vicinity for Dioxin. Metro should include that data in its risk assessment.

The St. Johns landfill was placed on the National Dioxin Strategy List because historic records indicated that the landfill received approximately 5,000 drums of herbicide manufacturing waste from Rhone-Poulenc. This listing stemmed not from a confirmed

release of Dioxins to the environment but from the perceived potential for a release. This waste included chemical residues that may have contained the herbicides 2, 4-D, MCPA, and 2, 4, 5-T. Dioxins and furans are common byproducts of these compounds and of incineration. To determine whether dioxin was in the landfill, the EPA study team sampled solid waste and leachate where geophysical tests and historical information indicated that the drums of herbicide manufacturing waste might have been buried. EPA analyzed the samples for the various herbicides associated with dioxin. If the herbicides were found in significant levels, as determined by EPA criteria, sampling for dioxin analysis would follow. Based on laboratory results, EPA concluded that follow-up analysis for dioxin was unnecessary. EPA also concluded that even if dioxin were present in the landfill, it did not appear to pose a significant environmental or public health threat due to the lack of an exposure mechanism. Please refer to response No. 25 for further discussion of Dioxins.

38. Monitoring the leachate plume

Metro should find out how far offsite the leachate plume has traveled. In the past Metro has found volatile organics off site, but claimed they could be from other unidentified sources. DEQ should require more than a "best-case" scenario and require Metro to prove the volatile organics are not from the landfill. The fact that the Blind Slough exceeds State water quality standards due to the landfill was well reported by Metro and its consultants. An independent expert should undertake a scientific measurement of leachate coming from the landfill.

Please refer to response No. 21 for additional discussion of leachate plume monitoring. One of the main objectives of the Remedial Investigation will be to provide better definition of the leachate plume extent and the landfill's contribution, if any, to the volatile organic contaminants detected in the Pleistocene sand and gravel aquifer. DEQ does not have the resources to hire an independent expert to study the landfill's leachate releases. However, Metro will hire qualified environmental consultants (environmental cleanup experts) to conduct the remedial investigation and DEQ engineers, hydrogeologists and toxicologists will review their results.

39. Summary

DEQ must address the lack of integrity of the St. Johns Landfill Closure process. DEQ also needs to restore the trust between the St. Johns Community and DEQ. The Community is finding it hard to trust an agency that developed a closure plan in a public process, then out of the public's eye replaced that plan with hypothetical scientific studies and stop-gap cosmetic repairs, only proposing studies in the future.

DEQ will address concerns about the integrity of the St. Johns Closure process as follows:

1. DEQ held an informal informational meeting with the St. Johns Neighborhood Association and Metro to discuss the history of the landfill closure process and

public perceptions about that process. Working collaboratively, with the St. Johns Neighborhood and other stakeholders, and applying lessons learned from the 1980s and early 1990s, we will maintain open lines of communication, build trust, and create effective working relationships that last well into the future.

2. As previously discussed, DEQ will prepare a draft public involvement plan to serves as a blueprint for neighborhood/DEQ collaboration during the Remedial Investigation and any subsequent cleanup activities. The public will have the opportunity to review and comment on the plan and the final plan will reflect that input.

3. As the Remedial Investigation proceeds DEQ will provide the opportunity for future informational meetings at important junctures, or whenever requested by the St. Johns Neighborhood Association, or other concerned public organizations.

As discussed at length in response No.16, DEQ did not replace the original closure plan with hypothetical scientific studies and stop-gap cosmetic repairs. The final engineered closure reflected the principles agreed to by all parties in the original closure plan. The changes DEQ allowed, involved engineering design details, not wholesale compromises of the cover system or its environmental protectiveness.