JIM MORGAN

coordinated by:

Metro

600 NE Grand Ave.
Portland, OR 97232
(503) 797-1870

Smith & Bybee Lakes Natural Area Management Committee
Nancy Hendrickson, Chair

Smith & Bybee Lakes Management Committee Meeting

5:30 p.m. - 7:00 p.m., Tuesday, January 26, 1999
Metro Regional Center, Room 270
600 N E Grand Ave.
Portland, Oregon 97232

AGENDA

Review and approve minutes of November meeting (10 min.)	5:30 - 5:40 pm
Updates: (30 min.)	5:40- 6:10 pm

Turtle Monitoring Project
General Lake News
Facility Planning
Landfill Activities
North Marine Drive
Others

Discussion – Jail Siting (50 min.)	6:10 - 7:00 pm

Update
Buffer/Setback Design (see attached)

Discussion - Rivergate Letter (20 minutes)	6:40 - 7:00 pm
Adjourn	7:00 pm

Enclosures:
November 24, 1998 Meeting Notes
Update on the Multnomah County Jail Siting
Dec. 7, 1998 letter to Sheriff Noelle from Management Committee
Dec. 7, 1998 letter to Sheriff Noelle from Metro
Dec. 7, 1998 letter to PDOT from Emily Roth
Dec 10, 1998 Letter to Mult County from The Columbia Slough Watershed Council
Dec. 18, 1998 Oregonian article on Lakes
Mult Co Executive Summary of Preliminary Site Assessment

JIM - DO YOU WANT A COPY?

Smith & Bybee Lakes Natural Area Management Committee
Nancy Hendrickson, Chair

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Smith & Bybee Lakes Management Committee
Summary Meeting Notes

Metro Regional Center
Room 270
January 26, 1999
5:30 PM

In Attendance:

Dennis O'Neil	Metro Regional Environmental Mgmt
Gerry Wright *	Merit Oil
Frank Opila *	Friends of S & B Lakes
Holly Michael *	Oregon Dept of Fish & Wildlife
Pam Arden	40-Mile Loop
Susan Oman *	Port of Portland
Bob Akers	Reg'l Parks & Greensp Advisory Comm
Nancy Hendrickson *	Portland Bureau of Env Services
Jim Sjulin *	City of Portland Parks & Rec
Emily Roth	Metro Regional Parks & Greenspaces
Patricia Sullivan	Metro RPAG
Jim Morgan *	Metro Executive Office
Troy Clark *	Portland Audubon Society
Kevin O'Sullivan	North Portland citizen

* voting member

Meeting Minutes

The following changes were made to the November 24, 1998 meeting notes.

Page 3, first paragraph will read: "The weir will be closed down for the winter and its opening tried again next summer." In the third paragraph under Jail Siting on the same page, the order of events was different than reported. The sentence will now read: "The SAC's second choice was the Rivergate site, which had already been sold."

Susan Oman referred to the 2nd to the last paragraph on page 3 and the motion that passed stipulating a letter be sent from the Management Committee to the Multnomah County Commissioners and the Sheriff describing the Committee's concerns and recommendations should the Leadbetter Peninsula site be chosen for the jail. Susan, as representative for the Port of Portland, voted in opposition to the motion. She asked whether the letter she sent to the Committee explaining the Port's position on certain recommendations should be included in the November meeting notes. Because the letter was written subsequent to the meeting, it was not included in the minutes, but was added to the Smith & Bybee Lakes Management Committee file and, as such, is part of the record.

Troy Clark moved that the minutes be accepted as amended. Jerry Wright seconded the motion which passed unanimously.

Updates

Volunteer recruitment for the **turtle monitoring project** has begun. Response has been tremendous. The first orientation meeting for volunteers attracted 47 people, while registration for the second meeting is already full at 50. Another orientation is scheduled for Feb 22nd; those interested may obtain an information packet from Lupine Jones, Parks Volunteer Coordinator.

The **IGA with the Port of Portland** for the turtle monitoring project has been finalized. Over the next five years $30,000 will be received from the Port for that undertaking. A separate project in South Rivergate will also be carried out by the Port. Emily will be meeting with them once a month to exchange information and updates.

General lake news – The water level has risen considerably at the lakes with the Smith blind now about 1/3 under water. The students of **C.R.U.E.** are removing exotic vegetation and planting desired species. They will be doing erosion control in the area off the trail that's sandy and very eroded and terracing by the canoe launch.

A number of environmental education activities are being planned. **Smith & Bybee Lakes Days** will be held May 8th and 9th, the last weekend of Great Blue Heron Week. James Davis is coordinating the event and will be providing details at an upcoming Management Committee meeting. In addition to the walks, more hands-on, interactive events and activities are being organized to interest children, hoping to attract more families. Those with ideas or help to offer are asked to contact James Davis or Emily.

Troy Clark, rating **purple loosestrife** a major problem (particularly on the west side of the lakes, Ramsey Lake and along the Slough), proposed the Committee consider its eradication as a potential "full-blown" project this summer. He further suggested the Port, BES, and the Management Committee work together to pool resources and consolidate funding and volunteer processes. If every resource available is not employed in a consolidated effort, he stated, wind-deposition will allow it to re-establish itself.

Emily responded that funds for such an effort have been given priority in the budget. Susan Oman noted that the Port also has a budget for such a need. EnviroCorps crews will be scheduled by Metro to be utilized in pulling loosestrife in July and August. Emily, assuming the lead on this undertaking, will contact Scott Carter of the Port, and BES will provide the name of its contact person so that such an effort can be pulled together. It was further suggested that Steve Bricker from Portland Parks be conferred with, as the same problem is being dealt with at Oaks Bottom. The introduction of beetles was also discussed, however, it was noted it would be at least three years before a difference could be detected and only very thick stands of loosestrife would support the needed population.

Frank Opila reported the **Friends of Smith & Bybee Lakes** led a canoe trip on Martin Luther King Day. Although it was exceedingly cold, wet and windy, two boats with hardy souls ventured out (with Polly Knox in the lead). Troy will lead a Valentine's Day canoe trip on Sunday, February 14th.

Frank contacted Chris White of the Port several weeks ago requesting information about progress on the **N. Marine Drive project**. He suggested it would be beneficial to send letters to former members of the Technical Advisory Committee and Citizens Advisory Committee informing them of the status of the project. No response to that request has yet been received although Frank was advised that more than two months of engineering work would be necessary before information could be presented at a workshop. Susan will follow-up and report back to the Committee next month.

Troy expressed concern over how far the design process will have progressed before the Management Committee or the public is invited to look at what is transpiring. He added he was under the impression the advisory committees were going to have input throughout the process; that has not occurred. He

was also uncomfortable waiting until the next meeting for a response. Slowing down the process has been the hiring of a new project person replacing Jeanne Caswell at the City of Portland. Nancy Hendrickson will follow up on the current status the day after this meeting.

Facility Planning – A Request for Proposal (RFP) for the boat launch and the vault toilet and education shelter was recently issued. Six proposals were received and are being reviewed by a group consisting of Emily Roth, Polly Knox from the Friends group, Dan Kromer, Manager of Operations & Maintenance Division and Jane Hart, senior planner of the master planning program. Awarding of the contract should take place shortly. Committee members will be contacted by the consultants or Emily for their input as to how the stakeholders meetings and/or phone interviews should proceed.

Dennis O'Neil gave a **Landfill Update** and distributed the annual report to DEQ on the St. Johns Landfill Closure Project.

Highlights included:

1) Experiment developed for native vegetation to determine if it can be successfully established at the landfill and whether it can continue to dominate over a long period of time in the face of competition from non-native vegetation. Establishment = ability to go to seed approximately 9 months after planting. Dominant = more than 50% of all the plants in the test plot.

2) Benches installed, (sand terraces surrounded by rock) to buttress the bank against continued erosion. The City of Portland has planted them with immergent wetland-type vegetation to determine if they will survive and thrive.

3) Stormwater data presented.

4) A multi-disciplinary team of consultants has been hired to investigate the entire issue of erosion of the landfill bank. The preliminary report is due in February, input from Emily will be solicited and Dennis will again brief the Committee. The process will proceed to the preliminary design, the Committee will be updated and its input sought before the design is put out for regulatory review.

Dennis does expect tension will arise between two goals. One is to have a long term, stable structure which resists erosion. The other goal is to have a high quality riparian habitat. The challenge is to create a compromise or find creative ways to achieve as much of both goals as possible. Troy urged that some effort be made to save the mature trees (being undercut) along the South bank of the North Slough.

Jail Siting

Discussions with the Port, the Sheriff's Office and Multnomah County Commissioners have led to the possibility of a 150 ft setback from Bybee Lake. The Commission intends to meet with various interested parties in working groups to discuss their visions of this setback. *See attached for the list of objectives and characteristics the Management Committee "brainstormed" to include in such a vision.*

Smith & Bybee Lakes Management Committee's List of Objectives and Desired Characteristics of a 150 ft Setback from Bybee Lake for Potential Leadbetter Peninsula Jail Site

Brainstorming Session 1/26/99

OBJECTIVES:

1) Screening – visual and noise
2) Wildlife habitat
   - **a) Western painted turtles**
   - **b) Roosting sites – eagles, raptors**
   - c) Owls/ bats
   - **d) Wildlife corridor**
   - **e) Neotropical bird migrants**
   - f) Salmon habitat
3) Bank erosion
4) Visual aesthetics
   - a) natural vegetation
5) Native vegetation
6) Stormwater treatment part of facility (outside the 150 ft)

CHARACTERISTICS:

1) 40 ft. wide forest from building - out of conifers; from there out – mixed forest
2) shading
3) leaf litter
4) woody debris
5) foraging opportunities
6) more natural edge of peninsula
7) berms – artificial resting area, some clumped
8) on slope – terrace bench
9) shrubs/ cottonwoods
10) upright snags
11) upland meadows
12) mixed hardwoods
13) open meadows
14) sand

TIME FRAME:

Bottom up
Conifer
Quick Growers

Outliers

40-Mile Loop Trail

Update on the Multnomah County Jail Siting

Following the management committee's November meeting, I drafted a letter to Sheriff Dan Noelle, with copies to the County Commissioners expressing the concerns brought forward at the meeting. Nancy Hendrickson reviewed and signed the letter on the committee's behalf. I entered the letter into the record at the public hearing held by the Sheriff on Dec. 8, 1998. Nancy presented the letter to the County Commissioners on Dec. 10, 1998. At that meeting, the Sheriff also presented the technical findings on the site. The commissioners have directed the Sheriff to continue to pursue this site.

Everyone but the Sheriff and his staff took a break.

On January 7, 1999, Frank Opila, Jay Mower (Columbia Slough Watershed Council), Troy Clark, Nancy Hendrickson and myself met with the Sheriff and Lt. Bobbi Luna to talk about the process and the buffer. It seems that the 150-foot set back is seriously being considered. The Port of Portland has indicated that they may be willing to sell more land if necessary. At the meeting, we were asked to describe what we envisioned the buffer planting and design to look like. After everyone tried to articulate their vision, we decided it would be better to have a series of meeting between now and the beginning of March to come up with a design that incorporates wildlife needs and aesthetics. It was also decided to expand the group to possibly include a wildlife biologist, Chuck Harrison with the Columbia Corridor Association and Peter Teneau who was on the design committee for the Radio Towers site. Also, Lt. Luna would have one of the landscape architects and environmental consultants working with her group attend the meeting to illustrate ideas.

The meetings are scheduled for:
January 26 at 7:00 p.m., following the management meeting (are we crazy?)
February 10 at 6:30 p.m.
Feb 23 at 7:00, once again after the management committee
All meetings are at Metro in room 101.

As far as the other issues raised in the committee's letter, Lt. Luna said that they will be working to incorporate the suggestions in the design.

coordinated by:

Smith & Bybee Lakes Wildlife Area Management Committee
Nancy Hendrickson, Chair
Troy Clark, Vice Chair

Metro

600 NE Grand Ave.
Portland, OR 97232
(503) 797-1870

December 7, 1998

Sheriff Dan Noelle
Multnomah County Sheriff
12240 NE Glisan St.
Portland, OR 97230

RE: North Rivergate Site Location for the New County Jail Facility

Dear Sheriff Noelle,

Thank you for the opportunity to submit these comments regarding the North Rivergate site location for the new county jail facility. This testimony is provided on behalf of the Smith and Bybee Lakes Management Committee (except for the Port of Portland). We would like to thank you for your willingness to talk to the committee and for answering many of our questions. The committee's general and specific comments are detailed below.

Background
Smith and Bybee Lakes Wildlife Area is recognized throughout our region as a significant natural area, protected primarily for wildlife values. The wildlife area is the largest, protected, urban wetland in the United States. It is home to or visited by over a hundred bird species, river otter, beaver, western painted turtles, Columbia slough sedge and numerous other native species. The wildlife area is the remaining remnant of the wetland, slough, riparian complex that used to exist at the confluence of the Columbia and Willamette Rivers.

The Multnomah County Framework Plan, Policy 15 Willamette River Greenway, identifies Smith and Bybee Lakes Wildlife Area as an Area of Significant Environmental Concern. The factors of significant environmental concern include shoreline vegetation, rare ecosystems, unique wildlife habitat, views and vistas, recreational needs and water quality. The City of Portland also recognized the complexity and uniqueness of the area in their "Inventory and Analysis of Wetlands, Water Bodies and Wildlife Habitat Areas for the Columbia Corridor" (City Ordinance #161896, April 20 1989). In the report, the wildlife habitat inventory score for the lakes was the highest of all areas evaluated. The narrative for the report states, "Smith and Bybee Lakes is the most complex and unique natural area within Portland's Urban Growth Boundary. (T)he Smith and Bybee Lakes area is the largest, most significant wetland area in the City of Portland, and the largest natural resource inventory area in the Columbia Corridor. It has tremendous habitat value and diversity, and should be protected."

Recognizing the unique habitats and importance of Smith and Bybee Lakes to the region, The City of Portland, Metro and the Port of Portland developed and adopted the *Natural Resources Management Plan for Smith and Bybee Lakes* in 1990. The plan set forth the goal, objectives and policies for the wildlife area. The goal of the Management Plan "is to protect and manage the Smith and Bybee Lakes area as an environmental and recreational resource for the Portland region. (I)ts primary use will be as an environmental preserve." Included in the plan was the formation of the Smith and Bybee Lakes Management Committee (SBLMC)[1]. The management committee is responsible for overseeing the

[1] Committee Representatives include Metro Executive Office, Oregon Department of Fish and Wildlife, Audubon Society of Portland, Friends of Smith and Bybee Lakes, Port of Portland, City of Portland Bureau of Environmental Services, City of Portland Parks and Recreation and Private Landowners.

implementation of the plan and provides ongoing policy guidance. One of the ongoing responsibilities is to review and comment on any development activities adjacent to the wildlife area boundaries.

Concerns and Recommendations
At the SBLMC meeting held October 27,1998, Sheriff Dan Noelle and Lt. Bobbi Luna presented a concept for the proposed jail that may be built in the Rivergate Industrial Area, adjacent to Bybee Lake on the Leadbetter Peninsula. This area is surrounded on three sides by the wildlife area. The SBLMC met on November 24,1998, to discuss the potential siting and construction of the new jail facility. The committee voted 6 to 1 (the Port of Portland opposed and the representative for the private landowners was not in attendance) to submit the following concerns and recommendations about the jail siting. The concerns and recommendations are made under the assumption that Multnomah County allows for a thorough and complete public process for siting the new jail facility.

1. Wildlife and Habitat Protection – the lakes provide unique habitat for many species. The largest known western painted turtle population in the lower Columbia River ecosystem uses them. The turtles are listed as "critically sensitive" by the Oregon Department of Fish and Wildlife. They bask on the logs within Bybee Lake, next to the Leadbetter Peninsula. The turtles may use the sand area for nesting. The peninsula also provides a valuable upland wildlife corridor along the Columbia Slough, connecting the Willamette River to the wildlife area.

   To protect the lakes' ecosystems and preserve the wildlife corridor:
   - The facility should be placed a minimum of 150 feet back from the top of the bank to provide a buffer from the development. For wildlife habitat a 1992 Washington State Department of Wildlife report entitled "Buffer Needs of Wetland Wildlife" states that, "To retain wetland-dependent wildlife in important wildlife areas, buffers need to retain plant structure for a minimum of 200 to 300 feet beyond the wetland. This is especially the case where open water is a component of the wetland or where the wetland has heavy use by migratory birds or provided feeding for heron. The size needed would depend upon disturbance from adjacent land use and resources involved."
   - The buffer should be planted with native vegetation, including conifers (evergreen) and have ground, shrub and canopy layers. Some areas should be left unplanted to provide turtle habitat.
   - Construction should be limited to daylight hours to prevent additional interference with wildlife movement. Dusk and dawn are active wildlife periods.
   - Construction of the perimeter road and fence should be limited to enclose the first phase of the facility only. The road and fence can be moved in the future if the facility is expanded. This will limit disturbance and leave more area for wildlife use. The vegetative buffer should be planted to the edge of the fence.
   - Ensure that there is no direct light from the jail, perimeter road and the road to the facility into the wildlife area that would disturb wildlife. Lighting should be controlled by lighting type, direction, distance from the lakes and vegetative screening.

2. Recreation and Public Access - a variety of passive recreation users enjoy bird watching, paddling canoes or kayaks, walking and wildlife watching at the wildlife area. The area is also used by schools and other educational programs throughout the region as an outdoor classroom to learn about wetlands, wildlife and water quality. Numerous North Portland schools participate in restoration and monitoring projects there.

   To maintain or enhance the high quality of passive recreation opportunities:
   - The jail facility needs to be visually screened from the lakes.
   - Avoid eliminating opportunities for future public access. The SBLMC is developing a facility plan for the wildlife area including a possible option to site a small boat launch facility at Bybee Lake. The planning process will examine each potential site for habitat sensitivity and numerous other factors.
   - As a community amenity for siting a jail adjacent to the wildlife area, Multnomah County should fund the construction of a boat launch and parking area. For having the jail sited next to a regionally significant natural area, used by residents from the entire Metro region, the county should compensate users by providing this amenity.

3. Water Quality – the Oregon Department of Environmental Quality lists Smith and Bybee Lakes as water quality limited. The SBLMC is concerned that surrounding development would cause further degradation of the water quality in the lakes; it is looking for opportunities to improve water quality. As more area adjacent to the lakes is paved, the quality and quantity of stormwater entering the lakes and slough needs to be controlled and monitored.

   To prevent further degradation:
   - No stormwater should be directly discharged into Bybee Lake.
   - Treat all stormwater on site with controlled release into the slough or retain the water on site to use for summer watering.
   - Treat all stormwater runoff during construction.
   - Use best management practices to treat stormwater, above and beyond the City of Portland's requirements, because of the area's sensitivity.

4. Creative Alternatives – consider alternatives that would allow the jail to be sited on the Leadbetter Peninsula and be compatible with the wildlife area.

   The following are just a few design changes and suggestions:
   - Redesign the building to reflect the uniqueness of the site. Instead of trying to "fit" the building designed for the radio tower site at Leadbetter Peninsula, look at design changes that would allow the concerns and recommendations in this letter to be met.
   - Limit the scope of the project, keeping it a smaller facility.
   - Lay out a traffic pattern that has the least impact of lights on the wildlife area.
   - Have an eco-roof to treat and retain stormwater. Capture the rainwater in cistern to store and use for irrigation in the summer.
   - Reduce the amount of parking, build a two-story garage or place the parking under the building to allow for a larger buffer area.
   - Provide a lighting design that does not encroach into the wildlife area.

If this site is selected, the SBLMC would like to work with the Sheriff's Office and Multnomah County to ensure that site preparation and building design protects the wildlife area and is acceptable to the community. A member of the committee would be available to participate in any working group to address the concerns and recommendations in this letter. The full committee would appreciate a chance to review the site preparation and building design before any activity begins.

Thank you for your consideration.

Sincerely,

Nancy Hendrickson

Nancy Hendrickson, Chair
Smith and Bybee Lakes Management Committee

C: Charles Ciecko, Director, Metro Regional Parks and Greenspaces
Mike Burton, Metro Executive Officer
Lt. Bobbi Luna, Multnomah County Sheriff's Department
Multnomah County Commissioners

REGIONAL SERVICES

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METRO

December 7, 1998

Sheriff Dan Noelle
Multnomah County Sheriff
12240 NE Glisan St.
Portland, OR 97230

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As the managing agency of the wildlife area, Metro looks forward to working with Multnomah County to ensure that site preparation and building design protects the lakes and allows the county to build the facility in a cost and time efficient manner. I have reviewed the letter submitted by the Smith and Bybee Management Committee. The concerns raised by the management committee would be significant regardless of what uses may be proposed for that area.

Thank you for your consideration.

Sincerely,

Mike Burton
Executive Officer

Charles Ciecko, Director
Regional Parks and Greenspaces Department

C: Smith and Bybee Lakes Management Committee
Multnomah County Commissioners

The Columbia Slough Watershed Council

Portland, Oregon

December 10, 1998

Commissioner Bev Stein, Chair
Commissioner Diane Linn, District 1
Commissioner Gary Hansen, District 2
Commissioner Lisa Naito, District 3
Commissioner Sharron Kelley, District 4
Commissioner-elect Serena Cruz, District 2
Sheriff Dan Noelle
Lt. Bobbi Luna

Re: Proposed Rivergate Jail Site at Bybee Lake

Dear County Commissioners and Officials:

Thank you for the opportunity to comment. The Council appreciates Multnomah County's willingness to work with the community. Several Council members have participated on the Siting Advisory Committee and the Working Group. Recently Sheriff Noelle met with the Council at our October meeting where we discussed the proposed Rivergate site. In November a number of Council members toured the site on foot and by canoe. Recommendations from the site visit group were forward to and discussed by the entire Council on 30 November. The Council supports the following recommendations:

- **Vegetative and Wildlife Buffers**. Buffers are necessary to protect natural areas, provide wildlife habitat and corridors, contain stormwater and provide visual screening. The Council considers the proposed 40-foot buffer to be insufficient. The Council urges that buffers around this development be increased beyond the currently required amounts so they are more in line with the recommendations contained in two reports from the State of Washington, namely: *Wetland Buffers: Use and Effectiveness,* and *Management Recommendations for Washington's Priority Habitats* (copies attached). This could be accomplished by shifting the building back, away from the tip of the peninsula. The buffers should be comprised of native vegetation, consisting of several layers including shrubs and ground cover. Evergreens should be included so that the facility is not visible from the lakes or the trail system during all seasons of the year. Sufficient soil should be brought in to support root systems for large trees (sand fill on the peninsula is about 30 feet deep). New soil could be shaped into a perimeter berm which would create even more visual screening from the lake. The screening will be at least 6 feet high and 75% opaque within three years. Also, plantings near the jail building(s) should also contain evergreens to ensure year round screening. Buffers should be designed to provide wildlife habitat, including turtle habitat. The County should consider removing fill to reshape the banks and create a more natural edge.

- **Turtles**. Western Painted turtles have been seen in this area of Bybee Lake. The Western Painted turtle is listed "critically sensitive" by the Oregon Department of Fish

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and Wildlife. Turtle use of upland habitat in this area is not fully known. Turtle and other wildlife use in the area needs to be examined and protected or mitigated.

- **Canoe/kayak Access**. As a community amenity for siting a jail adjacent to the Wildlife Area, we request that Multnomah County fund a boat launch somewhere within the Wildlife Area – not necessarily on the Leadbetter peninsula. The location and design of the launch will be determined by a public process that is currently being developed by Metro and the Smith and Bybee Lakes Management Committee.

- **Lighting**. The CSWC agrees with the Sheriff that lighting at the facility should not cast any direct light into the Wildlife Area so that nocturnal wildlife is not disturbed. Lighting should be controlled by lighting type and direction, distance from the lakes and vegetative screening. The headlights of evening visitors using the access road to the facility should also be screened.

- **Water Quality**. Columbia Slough and Smith and Bybee Lakes are listed as 303(d) water quality limited by the Oregon Department of Environmental Quality. As much stormwater as possible should be retained on site. Any remaining stormwater should be treated using appropriate Best Management Practices prior to discharge. New outfalls into the Management Area should be designed to minimize impact on water quality consistent with the NPDES permit process. Particular care must be given to stormwater during the construction phase.

- **40-Mile Loop Trail**. There are plans to build a portion of the 40-Mile Loop Trail along the Columbia Slough in this area. Design for the site should allow for the trail, including vegetative buffers.

- **Reimburse County for Infrastructure Costs**. The Council supports Sheriff Noelle's point of view that the Port of Portland should reimburse the County for infrastructure costs as other nearby property is developed.

The Columbia Slough Watershed Council wants to work with the County to ensure a development that is environmentally sound and acceptable to the community. We would like to participate in any working or advisory group to help address these and any other issues that may arise.

On behalf of the entire Watershed Council, thank you for your consideration.

Sincerely,

Jay Mower

COLUMBIA SLOUGH WATERSHED COUNCIL
Jay Mower, Coordinator

cc: Emily Roth, Metro Wildlife Area Manager
Charles Ciecko, Metro Regional Parks and Greenspaces
Smith & Bybee Lakes Management Committee

Attachments

7040 NE 47th Avenue
Portland, OR 97218-1212
VOICE: (503) 281-1132 FAX: (503) 281-5187 INTERNET: jaymower@email.msn.com

WETLAND BUFFERS: Use and Effectiveness

Andrew J. Castelle[1], Catherine Conolly[1], Michael Emers[1], Eric D. Metz[2], Susan Meyer[2], Michael Witter[2], Susan Mauermann[3], Terrell Erickson[3], Sarah S. Cooke[4]

[1]Adolfson Associates, Inc., Edmonds, WA
[2]W&H Pacific, Inc., Bellevue, WA
[3]Washington State Department of Ecology, WA
[4]Pentec Environmental, Edmonds, WA

for

Washington State Department of Ecology
Shorelands and Coastal Zone Management Program
Olympia, Washington

February 1992

populations, WDW management guidelines recommend no harvest within 200 feet of riparian corridors.

McMahon (1983) found that vegetated buffers were important for survival of juvenile coho salmon, both for temperature moderation, cover and increased food supply. Brook trout are also extremely susceptible to elevated temperatures, and Raleigh (1982) recommended a 30-meter (98-foot) buffer width with 50 to 75% midday shade as optimal. Eighty percent of this buffer should be vegetated, for erosion control, for maintaining the undercut bank areas, and for providing essential cover for the trout along the bank. Raleigh et al. (1984) described similar habitat requirements for rainbow trout, and recommended the same size and make-up for buffer areas.

Some researchers have assessed the value of buffers for several species concurrently, and offer general buffer recommendations. Mudd (1975) studied the Touchet River, analyzing current conditions along the river, and the amount of riparian and wetland wildlife habitat that existed. Bird, mammal, and plant species were surveyed, although game species were studied most. Mudd found that a minimum of 75 feet of natural riparian, primarily mature, vegetated buffer promoted optimum wildlife populations for pheasant, quail, mourning dove, and deer.

The WDW (Appendix C, this report) summarizes that:

> "To retain wetland-dependent wildlife in important wildlife areas, buffers need to retain plant structure for a minimum of 200 to 300 feet beyond the wetland. This is especially the case where open water is a component of the wetland or where the wetland has heavy use by migratory birds or provided feeding for heron. The size needed would depend upon disturbance from adjacent land use and resources involved.
>
> Influence of the water table on the landscape and vegetation is often reduced on the eastside of the state with more abrupt wetland-upland edges. Wildlife use tends to be concentrated closer to water in drier climates. Hall (1970) showed more narrow beaver use on streams in eastern California than had been reported in the literature (100 feet vs. 328 feet). Mudd (1975) showed minimum riparian area for maximum pheasant and deer use to be 75 feet in one eastern Washington study.
>
> In western Washington, wetlands with important wildlife functions should have 300-foot. upland buffers for intense land uses and 200-foot upland buffers for low intensity land uses. In Eastern Washington, wetlands with important wildlife functions should have 200-foot upland buffers for intense land use and 100-foot buffers for low intensity land uses.
>
> Priority species or especially sensitive animals or wetland systems such as bogs/fens or heritage sites may need even larger buffers around wetlands to prevent their loss to disturbance or isolation of subpopulations or other loss of wetland function or value."

Note

Wetland Buffer Determination Models and Recommendations

Washington State agencies and local governments are not the first to consider the question of wetland buffer protection and buffer sizes. Others, most notably in the eastern United States,

Management Recommendations for Washington's Priority Habitats

Riparian

K. Lea Knutson
and Virginia L. Naef

December 1997

Washington Department of ***FISH*** *and* ***WILDLIFE***

Modifications to Recommended RHAs. Site-specific modifications to recommended RHAs can be made using *Habitat Characteristics Important to Fish and Wildlife* (p. 79) as a guide. Important characteristics should be retained or restored in all riparian areas in order to provide suitable habitat for fish and wildlife.

Rationale. The recommended RHA widths were developed by synthesizing studies that examined riparian habitat functions and the widths necessary to maintain these functions (Appendix B). This information was then grouped by riparian habitat function, and averages and ranges of reported distances were calculated (Appendix C and Table 4). Literature containing recommended riparian habitat buffer schemes was compared to the information in Appendix C. The WDFW recommended RHA widths are based in large part on this synthesis and evaluation, with a provision for variable RHA widths to accommodate the specific needs of priority species.

Table 4. Range and average widths to retain riparian function as reported in the literature (summarized in Appendix C).

Riparian habitat function	Range of reported widths in meters (feet)	Average of reported widths in meters (feet)
Temperature control	11-46 (35-151)	27 (90)
Large woody debris	30-61 (100-200)	45 (147)
Sediment filtration	8-91 (26-300)	42 (138)
Pollution filtration	4-183 (13-600)	24 (78)
Erosion control	30-38 (100-125)	34 (112)
Microclimate maintenance	61-160 (200-525)	126 (412)
Wildlife habitat	8-300 (25-984)	88 (287)

Recommended RHA widths will generally encompass the extent of riparian habitat and provide sufficient distances to retain riparian habitat functions. Recommended RHA widths are wider for larger rivers and streams to encompass the wider riparian habitat. It is recommended that RHAs be protected across the entire landscape because maintaining the connectivity of all parts of the aquatic and riparian ecosystem is necessary for healthy watersheds and fish and wildlife habitat (Naiman et al. 1992). In addition, within a watershed all flowing water is connected; impacts in a localized area can have far-reaching consequences.

Appendix C. Riparian habitat buffer widths needed to retain various riparian habitat functions as reported in the literature, organized by riparian habitat function.

Riparian habitat function	Perpendicular distance from stream in meters (feet)	Source
WATER TEMPERATURE CONTROL		
60-80% shading	11-38 (35-125)	Brazier et al. 1973
	11-37 (35-120)	Johnson and Ryba 1992
	12 (39)	Corbett and Lynch 1985
	15-30 (49-100)	Hewlett and Fortson 1982
	18 (59)	Moring 1975
50-100% shading	18-38 (60-125)	U.S. Forest Service et al. 1993
	30 (100)	Lynch et al. 1985
	30 (100)	Beschta et al. 1987
	30 (100)	Johnson and Ryba 1992
	30-43 (100-141)	Jones et al. 1988
80% shading	46 (151)	Steinblums et al. 1984
LARGE WOODY DEBRIS		
	30 (100)	Murphy and Koski 1989
	31 (103)	Bottom et al. 1983
	45 (148)	Harmon et al. 1986
	46 (150)	McDade et al. 1990
	46 (150)	Robison and Beschta 1990
	50 (165)	Van Sickle and Gregory 1990
	55 (180)	Thomas et al. 1993
FILTER SEDIMENTS		
75% sediment removal	30-38 (100-125)	Karr and Schlosser 1977
90% of sediment removal at 2% grade	30 (100)	Johnson and Ryba 1992
Sediment removal	30 (100)	Erman et al. 1977, Moring et al 1982, Lynch et al 1985
	61 (200)	Terrell and Perfetti 1989
50% deposition	88 (289)	Gilliam and Skaggs 1988
Effective control of non-channelized sediment flow	60-91 (200-300)	Belt et al. 1992
FILTER POLLUTANTS		
Nutrient reduction	4 (13)	Doyle et al. 1977
Minimum	10 (33)	Petersen et al. 1992
	15 (49)	Castelle et al. 1992
	16 (52)	Jacobs and Gilliam 1985

Riparian habitat function	Perpendicular distance from stream in meters (feet)	Source
Nutrient removal using the multi-species riparian buffer strip system described by the authors	20 (66)	Schultz et al. 1995
Remove fecal coliforms	30-43 (100-141)	Jones et al. 1988
	30 (100)	Grismer 1981
	30 (100)	Lynch et al. 1985
Nitrates removed to meet drinking water standards	30 (100)	Johnson and Ryba 1992
Nutrient pollution in forested riparian areas	30 (100)	Terrell and Perfetti 1989
Nutrient removal	36 (118)	Young et al. 1980
Pesticides and animal waste	61 (200)	Terrell and Perfetti 1989
Nutrient pollution in herbaceous or cropland riparian areas	183 (600)	Terrell and Perfetti 1989
EROSION CONTROL		
Bank erosion control	30 (100)	Raleigh et al. 1986
High mass wasting area	38 (125)	Cederholm 1994
MICROCLIMATE INFLUENCE		
In forested ecosystem	61-122 (200-399)	Chen et al. 1990
	160 (525)	Harris 1984, Franklin and Forman 1987
WILDLIFE HABITAT		
General wildlife habitat	23 (75)	Mudd 1975
	9-201 (30-660)	Johnson and Ryba 1992
	61 (200)	Zeigler 1992
Species sensitive to disturbance	25 (82)	Croonquist and Brooks 1993
Aquatic insects	30 (100)	Erman et al. 1977
Benthic invertebrates - food supply	30 (100)	Erman et al. 1977
Macroinvertebrate density	30 (100)	Newbold et al. 1980
Macroinvertebrate diversity	30 (100)	Gregory et al. 1987
Riparian invertebrates	30 (100)	Erman et al. 1977, Roby et al. 1977, Newbold et al. 1980
Brook trout	30 (100)	Raleigh 1982
Chinook salmon	30 (100)	Raleigh et al. 1986
Cutthroat trout	30 (100)	Hickman and Raleigh 1982
Rainbow trout	30 (100)	Raleigh et al. 1984
Reptiles and amphibians	30-95 (100-312)	Rudolph and Dickson 1990

Riparian habitat function	Perpendicular distance from stream in meters (feet)	Source
Reptiles and amphibians	30 (100)	Rudolph and Dickson 1990
Birds	75-200 (246-656)	Jones et al. 1988
Full complement of birds	127 (417)	Sedgewick and Knopf 1986
	125 (410)	Croonquist and Brooks 1993
Nest predation reduced	100 (328)	Temple 1986
Forest interior birds only occur in corridors wider than 50 m	50 (164)	Tassone 1981
Minimum riparian width to sustain forest dwelling birds	60 (200)	Darveau et al. 1995
Minimum distance needed to support area-sensitive neotropical migrant birds	100 (328)	Keller et al. 1993
Distance needed to maintain functional assemblages of common neotropical migratory birds	100 (328)	Hodges and Krementz 1996
Great blue heron feeding	100 (328)	Short and Cooper 1985
Great blue heron nesting	250 (820)	Short and Cooper 1985
	250-300 (820-984)	Parker 1980, Short and Cooper 1985, Vos et al. 1985
Wood duck nesting	80 (262)	Gilmer et al. 1978
	183 (600)	Grice and Rogers 1965, Sousa and Farmer 1983
	200 (656)	Lowney and Hill 1989
Harlequin nesting	50 (164)	Cassirer and Groves 1990
Bald eagle buffer from human disturbance	121 (396)	Grubb 1980
Bald eagle disturbance during feeding	200 (656)	Skagen 1980
Bald eagle feeding areas	75-100 (246-328)	Stalmaster 1980
Bald eagle nesting	100 (328)	Small 1982
Bald eagle perching	50 (164)	Stalmaster 1980
Osprey nesting - no cut zone	61 (200)	Zarn 1974, Westall 1986
Pheasant and quail, eastern Washington	23 (75)	Mudd 1975
Mourning dove	15 (50)	Mudd 1975
Belted kingfisher roosts	30-61 (100-200)	Prose 1985
Downy woodpecker	15 (50)	Cross 1985
Hairy woodpecker	40 (133)	Stauffer and Best 1980
Pileated woodpecker and some neotropical migrants	15-23 (50-75)	Triquet et al. 1990
Pileated woodpecker nesting	150-183 (492-600)	Conner et al. 1975, Schroeder 1983

Riparian habitat function	Perpendicular distance from stream in meters (feet)	Source
Pileated woodpecker nesting	100 (328)	Small 1982
Black-capped chickadee	15 (50)	Cross 1985
White-breasted nuthatch	17 (57)	Stauffer and Best 1980
Red-eyed vireo	40 (133)	Stauffer and Best 1980
Warbling vireo nesting	90 (295)	Gilmer et al. 1978
Spotted towhee breeding populations	200 (656)	Stauffer and Best 1980
Brown-headed cowbird penetration from edge	240 (787)	Gates and Giffin 1991
Large mammals	100 (328)	Jones et al. 1988
Small mammals	67-93 (220-305)	Jones et al. 1988
	12-70 (39-230)	Cross 1985
	67 (220)	Cross 1985
Dusky shrew food and cover	183 (600)	Clothier 1955
Beaver	30-100 (100-328)	Allen 1983
Beaver foraging	100 (328)	Allen 1983
Fisher travel corridor	183 (600)	Freel 1991
Marten food and cover	61 (200)	Spencer 1981
Marten travel corridor	92 (300)	Freel 1991
Mink	100 (328)	Melquist et al. 1981, Allen 1986
	200 (656)	Melquist et al. 1981
Red fox, fisher, marten	100 (328)	Small 1982
Deer, Eastern Washington	23 (75)	Mudd 1975
Deer and elk cover	61 (200)	Mudd 1975
INSTREAM HABITAT		
Minimal maintenance of most functions	15-30 (50-100)	Johnson and Ryba 1992

Mean buffers:*

Temperature Control	27 m (90 ft)	Windthrow Protection	15 m (50 ft)
Large Woody Debris	45 m (147 ft)	Microclimate Influence	126 m (412 ft)
Filter Sediments	42 m (138 ft)	Wildlife Habitat	88 m (287 ft)
Filter Pollutants	24 m (78 ft)	Instream Habitat	15-30 m (50-100 ft)
Erosion Control	34 m (112 ft)		

* If a range of values was reported in the literature, the median of that range was used to calculate the means.

REGIONAL SERVICES

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

METRO

December 7, 1998

Carol Durand
City of Portland
Office of Transportation
1220 S.W. 5th Ave, Room 802
Portland, OR 97204-1914

Subject: **N. Marine Drive Extension**
Smith and Bybee Lakes Wildlife Area Access

Dear Ms. Durand,

In reply to your letter date December 2,1998 concerning the parking lot for Smith and Bybee Lakes Wildlife Area, Metro is not considering relocating it. After the first of the year Metro and the Smith and Bybee Lakes Management Committee will be starting a process to locate a boat launch, vault toilet and small education shelter. We anticipate the siting and design process will take 4-5 months. One of the options will look at redesigning the present parking lot to allow for an extension road to a boat launch area.

The siting and design process will be completed before the final design date stated in your letter. However, the process will not be completed before March 1, 1999. We hope to be able to work with the City and their design team to coordinate any changes decided upon during the process for the new facilities at the wildlife area.

I would appreciate if you would send me and the others that worked on the N. Marine Drive alignment the revised engineering, design, permit and construction schedule. When the alignment was approved by City Council, they ensure us that public involvement would continue throughout the process and that there would be a public hearing on the final design, before the construction contract is issued.

The Smith and Bybee Lakes Management Committee discussed and approved (except the Port of Portland) design criteria for the extension at the August 1998 meeting. That list was sent to Ms. Caswell. Encase you have not received it, I have enclosed a copy.

Thank you in advance for sending a copy of the revised schedule. I look forward to working with you and the City's design team on the extension project.

Sincerely,

Emily Roth

Emily Roth, P.W.S.
Wildlife Area Manager

C: Smith and Bybee Lakes Management Co.

enclosure

 OREGONIAN A:E DEC. 18 '98

The winter solstice: A ripple effect

Paddlers can celebrate quietly at Smith and Bybee Lakes

By JOE FITZGIBBON
Special writer, The Oregonian

On the darkest day of the year, Troy Clark is in search of the unconquerable sun.

And he's inviting canoeists and kayakers to join him this weekend at Smith and Bybee Lakes.

It's the winter solstice — an ancient festival honoring the birthday of the sun. Pagans called it the start of the season of light, when day overcomes night. Scientists say that it's simply the beginning of the Northern Hemisphere's tilt toward the sun.

Originally celebrated on Dec. 25, winter solstice is observed by today's revelers on Dec. 22.

"We decided to take our trip on Sunday because that's the quietest time on the lakes," said Clark, a postal letter carrier and self-taught naturalist. "I expect to see a dozen species of ducks — many wintering in from the Arctic. Then it'll be anyone's guess as to the number of other animals we'll take in."

When he first saw the 2,100-acre site, "it looked like a swamp," he said. "But once I canoed it, I fell in love with the place."

On Sunday afternoon, Clark will lead a party of nonmotorized boats around the two shallow lakes. There's no charge for the event, but participants will need to bring their own lightweight watercraft. All-weather clothes, binoculars and camera also are recommended.

Many visitors are shocked to discover river otter, mink, hawks and an occasional eagle nestled comfortably in the wildlife sanctuary, only a few yards from the roar of trucks along North Marine Drive.

Clark calls it an oasis in the middle of an industrial corridor.

"The more people stop to see what's here, the more they will want to protect it," he added.

ROGER JENSEN/The Oregonian

Troy Clark and his dog, Murphy, check out a route for a winter solstice canoe trip Sunday to the Smith and Bybee Lakes area. The broad lakes in St. Johns are home to numerous flocks of birds and wildlife.

Clark is one of the founders of the Friends of Smith and Bybee Lakes, a group dedicated to preserving the area while involving local school groups in wildlife-appreciation activities.

For years, the lakes and surrounding wetlands suffered from neglect and infill, mostly by the Port of Portland.

But, in 1988, armed with a $3 million trust fund, supporters of preserving the lakes started working together. Residents, environmentalists, wildlife managers and government agencies developed a plan to improve water quality, reintroduce fish channels and create a greenway protection zone.

As a result, the marshy grasslands, shallow lakes and craggy-shaped trees today are home to more than 100 species of fish, birds, mammals and reptiles.

Clark and Metro officials plan additional boat outings, hiking and bird-watching trips this winter and spring.

day tripper

if you go

WHAT: Celebrating Winter Solstice on Smith and Bybee Lakes

WHEN: 11 a.m. to 3 p.m. Sunday

WHERE: Meet at Smith and Bybee Lakes parking lot. About two miles west of Interstate 5 on North Marine Drive.

EQUIPMENT: Furnish your own canoe, kayak or rubber raft. No motorized boats allowed. Rentals available from Alder Creek Kayak and Canoe at Jantzen Beach (285-0464) or REI (283-1300). Life jackets required. All-weather clothing, camera or binoculars are recommended.

COST: Free

CALL: For more information about the solstice outing or Friends of Smith and Bybee Lakes, call Troy Clark, 249-0482.

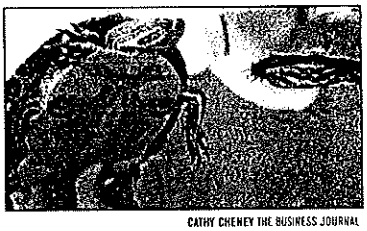
Port's development project downshifts to a turtle's pace

BY MICHAEL ROSE
Business Journal staff writer

When it comes to protecting rare turtles, it takes thousands of greenbacks to protect a few hundred green backs basking in the sun.

Over the next five years, regional government Metro and the Port of Portland expect to spend a total of about $200,000 on two "turtle monitoring" studies at the Smith and Bybee Lakes Wildlife Area and the port's nearby Rivergate Industrial District, agency officials said. The focus of the effort is the Western painted turtle—a scarce species in Oregon.

Meanwhile, a port project to improve the flow of truck traffic through its Rivergate industrial park in North Portland has been modified to be more turtle friendly—at triple the original cost. Redesigning the road improvement project has raised the



CATHY CHENEY THE BUSINESS JOURNAL

The lovable Western painted turtle

See TURTLES, *Page* 38

Turtles: *Their survival clashes with busy port's activities*

FROM PAGE 1

price tag from $9 million to $27 million, port officials said.

"I quite honestly think it's a miracle the turtle survives at all," said Teresa DeLorenzo, a local turtle expert hired by Metro, which has parks and greenspaces under its purview. The turtles contend with everything from sewage spills to harassment by people in a small wildlife area surrounded by industrial development.

Painted turtles, distinguished by red markings along the bottom of their shells, grow as large as dinner plates and were once common here. The turtles, listed as a "sensitive species" by state wildlife regulators, have hung on in respectable numbers at Smith and Bybee lakes. There are only rough estimates on the number of turtles in the area of perhaps 200 to 300. Little is known about the health of the population or its reproductive success rate.

Under the guidance of DeLorenzo's Northwest Ecological Research Institute, volunteers and wildlife professionals will collect information about the painted turtles primarily by observation and a catch-and-release program.

Nets and baited traps will be used to capture the turtles. All turtles larger than about 2 inches in diameter will have a computer ID chip implanted just below the skin. Smaller than a grain of rice, the computer chip can be read with a hand-held scanner so researchers can identify individual turtles, DeLorenzo said. Turtles also get some extra protection in the process because the computer ID discourages people from illegally taking the animals for pets, she said.

The painted turtles are making their last stand in the vicinity of the port's thriving Rivergate industrial park. In order to manage the industrial park's expansion, port officials said they need to know more about their reptilian neighbors and any wildlife conflicts that may arise. The area has 365 acres ready for development, including a site close to Smith and Bybee lakes that's a prime candidate for Multnomah County's proposed 225-bed jail.

For that reason, the port is kicking in $30,000 toward Metro's five-year $115,000 turtle study. In addition, the port is paying the entire bill for a second turtle study dealing with the southern portion of Rivergate. The port's turtle study is expected to cost about $100,000, although it will be carried out by professionals exclusively on an accelerated timeframe of about one year.

Nearly two years ago a group of citizens howled when the port proposed relocating train tracks next to turtle nesting sites. Port officials wanted to eliminate a railroad crossing on North Marine Drive that held up traffic. Moving the railroad tracks was the preferred solution.

"North Marine Drive was a very large issue for Metro and the Friends of Smith and Bybee Lakes and the environmental groups," said Emily Roth, the Metro employee who manages the wildlife area.

The outcry raised over the port's proposal resulted in talks between Metro executive director Mike Burton, city commissioner Charlie Hales and the port's executive director Mike Thorne. It was a key driving force behind the turtle studies, Roth said.

An alternate plan for North Marine Drive, developed after a series of public meetings, uses an overpass to carry trucks and cars over the railroad crossing. The change in plans hiked the cost of the project by $18 million for a grand total of $27 million.

"It was more than just turtles, but certainly turtles had a lot to do with it," said port spokesman Aaron Ellis of the revised plan. Other environmental concerns, such as noise and the consequences of a train car overturning in the wetland, also came into play, he said.

The port plans to soon move ahead with about $9 million worth of traffic improvement work on North Marine Drive, including widening it to five lanes. But federal funds will be needed for the $18 million overpass portion of the project—money that won't be available until 2004 at the earliest, Ellis said.

Metro's Roth said citizens don't seem to be concerned about shelling out public money for the turtles. In fact, Metro's call for people to assist in its turtle study brought 47 eager volunteers. ❑

Smith & Bybee Lakes Management Committee's List of Objectives and Desired Characteristics of a 150 ft Setback from Bybee Lake for Potential Leadbetter Peninsula Jail Site

Brainstorming Session 1/26/99

OBJECTIVES:

1) Screening – visual and noise
2) Wildlife habitat
   - **a) Western painted turtles**
   - **b) Roosting sites – eagles, raptors**
   - c) Owls/ bats
   - **d) Wildlife corridor**
   - **e) Neotropical bird migrants**
   - f) Salmon habitat
3) Bank erosion
4) Visual aesthetics
   - a) natural vegetation
5) Native vegetation
6) Stormwater treatment part of facility (outside the 150 ft)

CHARACTERISTICS:

1) 40 ft. wide forest from building - out of conifers; from there out – mixed forest
2) shading
3) leaf litter
4) woody debris
5) foraging opportunities
6) more natural edge of peninsula
7) berms – artificial resting area, some clumped
8) on slope – terrace bench
9) shrubs/ cottonwoods
10) upright snags
11) upland meadows
12) mixed hardwoods
13) open meadows
14) sand

TIME FRAME:

Bottom up
Conifer
Quick Growers

Outliers

40-Mile Loop Trail

Multnomah County Correction Facility Siting - Bybee Lake
Environmental Issues

- development in the immediate vicinity of Columbia Slough and Bybee Lake is problematic due to the ecological sensitivity of the area
- construction impacts to water quality and wildlife are of potential concerns
- impacts to wildlife from prison operation could be substantial due to increased traffic, noise, light, etc.
- stormwater runoff from prison site and adjacent parking area must be treated to TMDL standards before discharge to either the Columbia Slough or Bybee Lake. These standards are quite stringent; it may be more cost-effective to keep the stormwater on-site.
- preferably, stormwater is treated and infiltrated on-site; however, infiltration may not be feasible due to soils with low permeability, and proximity of the watertable to the surface in this area. To keep the stormwater on site might require roof gardens, storage cisterns for the winter months to discharge as irrigation water during the summer months, etc.
- sumps for stormwater disposal should not be permitted and would probably not work anyway, because of the reasons listed above
- proposed site might be underlain by older unpermitted fill that illegally filled existing wetlands. These issues need to be discussed with the Division of State Lands (DSL) and the U.S. Army Corps of Engineers (COE)

Questions:

- When was the fill placed at this site?
- Was the fill placed in a wetland? If yes and it happened within the last 15 years, are COE and/or DSL aware of the fill?
- What is the exact location of the proposed site? I haven't seen an intermediate scale map which shows some other landmarks. I'd like to find the exact location on the soil survey map.

Land Use?

Charlie Hales, Commissioner
Engineering & Development
Brant Williams, City Engineer
1120 S.W. 5th Avenue, Room 802
Portland, Oregon 97204-1914
(503) 823-7004
FAX (503) 823-7371
TDD 823-6868

CITY of PORTLAND
OFFICE of TRANSPORTATION

February 8, 1999

Emily Roth
Metro
600 NE Grand Ave
Portland OR 97232-2736

Dear Ms. Roth:

Attached is the most current schedule for the N. Marine Drive Widening Project as you requested. The project has been delayed for various reasons, and is now moving ahead in accordance with this schedule.

Thank you for sending a copy of the Smith and Bybee Lakes Management Committee's design criteria. It was very informative, although I need to emphasize that the design criteria we are required to follow is spelled out for us in the document approved by City Council; the "Final Draft for the North Marine Drive Widening and Rail Relocation Project," dated July 22, 1998. It is our responsibility to ensure that the preliminary design product covers bullet items 1 through 10 on pages 3 and 4 of this document. I have enclosed a copy of the Final Draft for your information.

We intend to conduct public workshops on the design as directed by the City Council resolution. The emphasis of the Design Review Workshops will be on the improvements within the public right-of-way listed below:

1. Noise wall design and location.
2. Landscape design – native and conventional.
3. 40-mile loop trail and location.
4. Bicycle and pedestrian safety.
5. Water quality and spill containment.

Greg Jones, Manager of the Arterial Improvements Division of Transportation Engineering & Development, and Bill Bach, Director of Development Services for the Port, will be attending the next meeting of the Smith and Bybee Lakes Management Committee to give an update of the N. Marine Drive Extension Project.

If you have any questions, please feel free to contact me at 823-5415.

Sincerely,

Carol A. Durand, P.E.
Assistant Project Manager

CAD:clm
Attachment
c: Greg Jones
Stacy Bluhm
Brett Kesterson
Marilyn Leitz, Port of Portland
Christ White, Port of Portland
Jim Bauman, CH2M Hill

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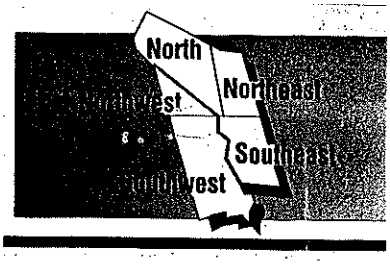

N. Portland challenges new jail site

■ Neighbors of the Bybee Lake spot voice concern about wildlife and say their area gets many undesirable services

By DAVID AUSTIN
of The Oregonian staff

To some North Portland residents, the 22-acre swath of land along Bybee Lake where Multnomah County officials want to put a new jail is a sensitive area that should be left alone so wildlife can prosper.

To others, it's the perfect spot for the proposed 225-bed, medium-security facility because it's far away from schools, day-care centers and houses.

On Monday night, the county Board of Commissioners heard public testimony from both sides as it moves closer to deciding where to put the jail.

"The wetlands are shrinking rapidly, and it should not even be considered for this place," said Ray Piltz, a North Portland resident. "This has all been a boondoggle since Day One."

Board Chairwoman Beverly Stein and Sheriff Dan Noelle have their sights set on the land, which is owned by the Port of Portland. But many of the North Portland residents testified that the county has made a habit of placing jails, group homes and other undesirable facilities in their neighborhoods.

Members of the Smith and Bybee Lake management committee told the board that they will support the site as long as the county commits to making improvements that will help wildlife stay in the area.

Jim Sjulin, a member of the committee, said the area is home to the Western painted turtle and other wildlife that are considered vulnerable. He urged the board to make sure there are plans built into the jail framework that protect water quality in the area and reduce lights that might affect wildlife at night.

But the most critical move by the county should be to place a 150-foot buffer of natural vegetation, including trees, between the jail and Bybee Lake, Sjulin said.

The county came up with the money to build the jail after voters passed a $55 million general obligation bond in 1996. A citizens advisory committee helped the sheriff whittle a list of 100 potential sites down to three.

Of the three sites, the committee chose a different swath of Port property as its top choice. But when Port officials threatened not to sell the county the property, the committee fell back on its second choice, a 25-acre parcel called Radio Tower on the edge of the Kenton neighborhood.

But the Radio Tower site sits atop a wetland, and the board dropped it after an outcry by environmental groups. Port officials then contacted the county, which had already spent $1.5 million to hire consultants and others to study the site, and offered to make a deal on the Bybee Lake property.

The board is leaning heavily toward putting the jail at the new site. Commissioners are expected to determine a fair-market price for the property in April.

You can reach David Austin at 221-5383 or by e-mail at davidaus...

6 REGonian
2-23-99

St. Johns Landfill

Closure Project

Annual Report to the Oregon Department of Environmental Quality

July 1, 1997 to June 30, 1998

METRO
Regional Services
Creating livable communities

600 NE Grand Avenue
Portland, OR 97232-2736

ST. JOHNS LANDFILL CLOSURE PROJECT

ANNUAL REPORT

TO THE

OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY

July 1, l997 to June 30,1998

METRO
Regional Environmental Management
Engineering Division
600 NE Grand Ave
Portland, OR 97231-2736

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FIGURES

APPENDIX

ST. JOHNS LANDFILL CLOSURE PROJECT ANNUAL REPORT TO THE OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY

INTRODUCTION

During this reporting period, useful energy began to be successfully recovered from the gas produced by St. Johns Landfill. Metro examined the protective perimeter dike between the buried solid waste and surface water, and constructed three experimental vegetated benches/terraces to test their usefulness for dike stabilization. Also, Metro reconstructed a section of the cover system and leachate force-main. Metro pursued its goal of positively integrating the landfill into the surrounding wetland by continuing to establish native trees and shrubs on the perimeter dike, and beginning a five-year test to determine if it is feasible to establish and maintain native-dominant vegetation on the cover cap.

ENERGY RECOVERY FROM LANDFILL GAS

Landfill gas, generated by the decomposing garbage in St. Johns Landfill, must be removed from the landfill and properly burned to minimize air pollution. Until 1998 all of the gas was burned in enclosed flares operating under an air contaminant discharge permit issued by DEQ.

During FY 1997-98, landfill gas began flowing from St. Johns Landfill through a 9,400 foot underground pipeline to Ash Grove Cement Co. There the gas is burned to provide heat for the lime manufacturing process. The energy recovered is equal to that needed for 3,500 homes.

This project has the potential of reducing carbon dioxide emissions in the Portland airshed by 23,300 metric tons a year, because two sources of emissions will be reduced to one. This has the same impact on greenhouse gas emissions as removing 3,300 cars from the road or planting 7,100 acres of trees.

For years, Metro looked for cost-effective ways to recover useful energy from this gas. Until 1997, the project was found to be economically unfeasible. In 1997 Metro entered into agreements with Portland LFG-Joint Venture, a partnership between affiliates of Palmer Capital Corp. and Ash Grove Cement Co., who were able to incorporate the use of energy tax credits to significantly improve the project economically.

Since the spring of 1998, this gas has been compressed at the landfill and transported through a 9,400-foot buried polyethylene high-pressure pipe. In the Smith & Bybee Lakes Natural Area, negative environmental impacts were avoided by burying the pipe in the existing landfill perimeter road and by boring at an angle 20 feet below Columbia Slough to prevent any disturbance by construction activity. More than 15 permits from 10 regulatory agencies were needed to clear the way for the pipeline route along a waterway, roadways, railroad tracks, and Port of Portland property.

At full production, Ash Grove's total consumption of energy is in excess of what the landfill can produce, so Ash Grove can mix the landfill gas with natural gas as necessary. When Ash Grove cannot take all of the landfill gas, it is automatically diverted to the flare station at the landfill, where it is combusted.

PERIMETER DIKE STABILIZATION

St. Johns Landfill (see Figure 1) is bordered on three sides by approximately two miles of the Columbia Slough and its North Slough and Blind Slough arms. The solid waste in St. Johns Landfill is enclosed within a dike, both natural and man made, which separates it from this surrounding surface water. The dike inhibits movement of contaminants from the solid waste toward surface water.

This protective perimeter dike is being eaten away by Columbia Slough, a natural process which causes slope failures leading to slumps of silt and vegetation into the slough. High water events in 1996 and 1997 have made this slope failure process more rapid and noticeable. This process resulted in a significant slide of the bank into the water near the confluence of the Columbia Slough with its North Slough arm. The slide was about 30 feet wide, with an adjacent 70-foot section showing a headscarp suggestive of upcoming failure.

Metro staff directed the geotechnical engineering firm, Cornforth Consultants, to inspect this area and provide technical advice concerning the design of a repair. After receiving authorization from the City of Portland Planning Bureau, Oregon Division of State Lands, and U.S. Army Corps of Engineers, the repair was constructed in October 1997. A drawing of the slide and its reconstruction is shown in Figure 2.

In October 1997, Metro also constructed three rock and sand benches/terraces in the slough at the base of the perimeter dike of St. Johns Landfill. These experimental, small scale structures were constructed to test the feasibility and cost of achieving the following objectives:

1. Inhibit the current erosional environment from eating away the protective dike.
2. Promote a depositional environment along the dike.
3. Repair and also buttress undercut areas.
4. Promote native vegetation along Columbia Slough to provide riparian habitat and increase shading.
5. Possibly reduce contaminant migration into the Slough by phytoremediation by plants growing in benches.

The benches/terraces are being planted with native vegetation including ash and willow. An erosion control bench design drawing is shown in Figure 3.

In 1991, a survey of the perimeter dike using bores encountered evidence of solid waste contamination in a section fronting North Slough. In a 1995 report concerning seepage control, Metro presented evidence (based on an historical topographic map and aerial photographs), that fill had been placed on top of a low elevation natural dike during the period between 1956 and 1964.

In l997 Metro directed its geotechnical consultant to oversee test pits in the perimeter service road fronting the North Slough to study the dike structure. Two test pits were dug with a backhoe. Below ground surface (about 27 ft. MSL), solid waste was encountered from about 2-3 ft. to about 12 feet deep (15 ft. MSL). This layer is underlain by native, soft, blue-gray, slightly clayey silt. In one test pit a saturated layer of waste with flowing liquid was encountered at 10.6 feet below road surface. At this time the water surface of the adjacent North Slough was about 15.5 feet below the road surface.

The above results suggest that this section of dike fronting North Slough is built of solid waste stacked above a low elevation natural dike and covered with a veneer of soil. To determine the vertical and lateral extent of the solid waste deposit, Metro commissioned nine more investigative bores. The results indicate that the waste is one-half to 18 feet thick and extends about 1,000 feet. It is overlain by 1.5 to 6 feet of brown, gray sandy, clayey silt. It is underlain by native alluvium, ranging from slightly clayey silt to silty fine sand with a trace of clay.

At the end of the reporting period, Metro was preparing to solicit proposals for engineering services, including the design of structures to combat the dike erosion process and to minimize any negative environmental impact of this waste deposit in the perimeter dike.

RECONSTRUCTING A SECTION OF THE FINAL COVER CAP

In 1993, Tri-State Construction, Inc. built the final cover system on a slope that overlooked the engineered dike adjacent to the southeast one-half of North Slough. Since that time, Metro has observed persistent gas leakage along the edge of this section of the final cover cap. To combat this problem Metro decided to extend the membrane into a cutoff trench built in the perimeter road. The 1997-98 annual report appendix contains a drawing of this design. This cutoff trench design had been approved by DEQ and was used in 1995 during construction of the cover cap bounded by the road fronting Smith Lake.

When construction of this improvement began in the summer of 1997, it was discovered that a 1,800 foot length of membrane had been folded over upon itself and had been covered with the sand and topsoil layer without being unfolded. Thus, the edge of the membrane was about 10 to 15 feet short of the design location. This damaged section was removed and new membrane was welded on to complete the reconstruction. No gas leakage problems were observed as of the end of the reporting period.

REROUTING A SECTION OF LEACHATE FORCE-MAIN

In 1980, a force-main (pressurized sewer pipe) was built to carry a leachate condensate mixture to the city force-main at Columbia Blvd. from a pump station draining part of the buried solid waste This force-main began carrying leachate or contaminated storm water in the late 1980s. In 1997, Metro experienced problems with repeated blockage of this force-main. It was difficult to clear these blockages because there were few clean-outs or isolating valves.

To combat these blockage problems, Metro constructed a rerouted section of force-main. This new section extended 2,500 feet from the lower pump station to connect with the existing force-main at the landfill bridge.

Metro took advantage of improvements in pipe materials which had taken place since 1980. It constructed this force-main of thick-walled, but flexible, high density polyethylene plastic instead of the older, rigid plastic. This kind of pipe is used in the gas collection system and the pressurized gas transmission line to Ash Grove Cement Co. The flexibility of this pipe allowed Metro to bury this force-main above the solid waste. It was buried in the cover system above the membrane beside road "B" between the pump station and the bridge. This section includes three clean-outs with isolation valves for effective maintenance.

During the 12 months ending September 1, 1998, about 600,000 gallons of leachate / condensate mixture was pumped to the City sewer.

INTEGRATING THE LANDFILL INTO THE NATURAL AREA

The goal of positively integrating St. Johns Landfill into the surrounding wetland is set forth in the Natural Resources Management Plan for Smith & Bybee Lakes. St. Johns Landfill is designated a special management area in the plan. The goal within the area is to reduce or eliminate unwanted impacts to adjoining higher quality resources. Objectives include "develop and manage as a complementary habitat such as a meadow habitat for ground nesting or raptor nesting areas"; "take active steps to reduce or eliminate, escape and establishment of invasive non-native vegetation"; and "employ management practices that have the least negative impact practicable on adjoining resource areas".

During 1997-1998 the City of Portland Bureau of Environmental Services, under contract to Metro, continued to establish native trees and shrubs on the perimeter bank of St. Johns landfill. The Bureau carries out vegetation establishment projects along the entire Columbia Slough. During this reporting period, it experimented with establishing plants in the unvegetated zone at the toe of the slope fronting Columbia Slough, in the above-mentioned repair of the dike, and in an area formerly part of the perimeter road. The Bureau has also established native vegetation on the slope of the engineered dike fronting Smith Lake, and has begun to establish vegetation on the experimental benches/terraces constructed by Metro, as well as on two sand fans southeast of the landfill bridge.

During the reporting period, Metro began a five-year experiment designed to determine if it is feasible to establish and maintain native vegetation on the multi-layered cover cap on St. Johns Landfill. Native vegetation issues and previous establishment efforts are summarized in the 1996-1997 annual report.

A team of native vegetation consultants recommended that three test plots be set up, each one-acre in size. Site preparation included the repeated use of the herbicide glyphosate, to destroy non-native competitors. After a thorough discussion, the Smith & Bybee Lakes Management Committee and its technical subcommittee authorized the use of this herbicide only for these test plots, rather than repeated tilling, which is another potential site preparation method.

After the above site preparation (designed to maximally favor natives), the consultants propose to plant the native grasses **Bromus carinatus** and **Elymus glaucus** in September 1998 with and without the addition of the native clover (nitrogen fixer), **Lotus parshianus.** This will test whether the presence of a nitrogen fixer will help establish and maintain the native grasses. Also, the consultants propose to test whether addition of fungi which associate with plant roots (mycorrhizae) will give the natives a competitive advantage over non-natives.

After the plants are established ("establishment" is defined as producing seed) in late spring 1999, the consultants and Metro staff will monitor and maintain the plots for three more years. The consultants propose to test maintenance methods such as high mowing, hand hoeing, or herbicide spot spraying to disfavor non-native competitors. Also, in late summer 1998, the consultants will propose methods to maintain past test plots of the above two grasses and to control invasive, non-native plants that are beginning to colonize some areas of the landfill.

It is hoped that these experiments will demonstrate whether or not it is feasible (cost effective and environmentally acceptable) to establish and maintain native-dominant (defined as greater than 50% native) vegetation on the cover without increasing soil erosion.

OPERATION AND MAINTENANCE

Metro maintained a staff of 4.6 FTE to perform the following operation, maintenance, and monitoring functions at St. Johns Landfill:

- Monitor and adjust the St. Johns Landfill gas well field which includes 92 vertical wells, 86 trench wells, and 16 miles of pipe on the 226-acre cover system.
- Monitor, adjust, and maintain mechanical aspects of the motor blower flare station including, blowers, valves, flares, and scrubbers.
- Maintain and repair components of the condensate system, such as remote station pumps, motors, compressors and underground piping.
- Inspect and repair components of the above-ground gas system, including header pipe, well completions, and condensate valve stations.
- Inspect and repair liner abnormalities to reduce the risk of subsurface fires.
- Inspect and maintain the final cover system components (including cutting vegetation) and repair areas of significant differential settlement and erosion.
- Monitor and maintain the leachate collection system, including pumps, underground piping, continuous sampler, and low flow meter.
- Analyze gas system data and interpret results in order to maximize methane content and minimize oxygen draw. This maximizes methane recovery efficiency and reduces the risk of subsurface fires.
- Collect pressure and head data from remote groundwater monitoring locations.
- Inspect and maintain continuous groundwater measurement equipment, such as data-loggers and piezometers.
- Sample and maintain the stormwater collection system.
- Sample surface water and sediment in the Smith & Bybee Lakes Natural Area surrounding St. Johns Landfill.
- Sample groundwater from 13 wells and submit samples to a laboratory for testing.
- Establish, monitor, and maintain native vegetation test plots and other experiments as needed.
- Inspect and repair service roads, including ditches and culverts.
- Inspect and maintain serviceability of sedimentation basins.

During the reporting period Metro submitted a draft operation and maintenance manual to DEQ for review. This manual presents an operation and maintenance plan, including detailed methods and time schedules. In June 1998, Metro submitted a final operation and maintenance manual to DEQ, containing modifications in response to comments from DEQ.

DEQ approved the manual (the long term operation and maintenance element of Metro's 1989 closure plan) in July 1998.

Since 1995, Landfill Operation and Maintenance Staff have had to deal with four subsurface fires. These fires have been located at vertical gas wells W9, W56, W62, and W68. Evidence for these fires includes decreased methane concentration, increased temperature, and carbon monoxide measured in the well casing. Usually a void space occurs in the waste under the membrane and around the well casing. Often the weight of the cover system causes subsidence of the cover, into the void space in a 5 to 10-foot radius circle around the well.

These subsurface hot spots appear to be caused by oxygen intrusion through an opening near the well head. This oxygen stimulates microbial decomposition of the waste, which increases the temperature to a level where spontaneous combustion occurs in the localized area near the oxygen source.

Various methods have been used to cool down these underground hot spots. These methods have been developed through consultation with the staff of EMCON, Inc., a landfill engineering consultant, and through experience. First , the well is isolated from the collection system so that no suction is being placed on the well. Suction promotes oxygen entry and combustion (just as sucking on a cigarette causes it to glow). Other nearby wells are also isolated, to prevent low pressure in the nearby waste from causing more oxygen to be sucked into the combusting area. Then, water is added around the well barrel to cool down the waste. The effectiveness of these measures is monitored by measuring carbon monoxide, methane, temperature, and other parameters. Staff carrying out these activities at the well head are protected by a supplied air mask and by a safety harness, by which other staff can pull them to safety, if necessary.

After conditions appear to be stabilized, the wells are inspected and repaired or abandoned by removing the cover, sealing any hole in the cover or well boot, filling any void space with earth, and reinstalling the cover system in accordance with Amendment No. 3 to Solid Waste Site Closure Permit No. 116. In one case, it was considered necessary to install another gas well near a gas well abandoned in this way.

To monitor the operation of the well field Metro staff routinely measures various gases and temperature in the wells. These tables of numerical measurements are currently being converted to computerized graphics for analysis to determine if an early warning system for hot spots can be developed.

Metro continued to allow a herd of sheep to graze on the cover from April to about July 1998. Operation and maintenance staff occasionally had to round up sheep which broke out of fenced areas.

The 1998 aerial photo indicates that differential settlement has produced several depressions in the cover surface on the side of the swale between Sub-areas 2 and 4. Metro plans to first survey the depressions to determine if they must be filled, and then use dirt or mixed waste excavated from the perimeter dike to fill these depressions and reestablish the cover system. This mixed waste fill is expected to become available during the construction season of 1999.

ENVIRONMENTAL MONITORING

Metro monitors for contaminants and chemical changes in groundwater, surface water, stormwater, sediment, leachate, landfill gas, and flare emissions in order to detect changes in risk to health, safety, and the environment at and around St. Johns Landfill. Metro also monitors groundwater movement and leachate levels in the landfill to evaluate the predictions of its contaminant flow model and the effectiveness of the final cover. Metro submits monitoring data to DEQ and the City of Portland as required by permits issued by these regulatory agencies.

In September 1997, Metro submitted to DEQ a draft environmental monitoring plan for the St. Johns Landfill and the Smith & Bybee Lakes Natural Area which surrounds it. This plan covers monitoring related to water quality and elevation. Landfill gas and flare emissions monitoring methods are presented in the operation and maintenance manual. Although Metro has received comments from DEQ concerning this draft plan, Metro expects to delay submission of a final plan document until after DEQ issues an updated regulatory framework governing future efforts (including monitoring) at St. Johns Landfill. This is because monitoring should be structured to reflect the concerns and objectives made evident by this regulatory framework.

This annual report highlights information gained through long-term monitoring of groundwater, leachate mound levels, and stormwater. It also discusses a project aimed at better understanding the complex interactions which influence water quality in Columbia Slough adjacent to St. Johns Landfill.

GROUNDWATER

It is important to determine the level of risk to public health, safety and the environment from St. Johns Landfill. One way that Metro and DEQ can assess risk is to monitor for contaminants in environmental media such as the groundwater surrounding the buried solid waste. Then, they can determine whether the presence of various contaminants constitutes a significant risk. Metro's monitoring program gathers most of the information needed to perform risk assessment.

Another way to generate information about contaminant movement at the landfill site is to construct computerized mathematical models. These models are tools to predict the rate and direction at which various contaminants will travel in the groundwater. Such predictions help determine where to monitor for contaminants and what contaminants to monitor for. They can be used to estimate the location of contaminants in the future. However, model predictions are verified by comparison to actual monitoring data. The actual monitoring data are the ultimate source of information to assess risk at any given time.

In September 1996, DEQ commented about a Metro report which presented the results of a 1995 groundwater modeling effort by a team led by Dr. Shu Guang Li of Portland State University (PSU). The DEQ staff noted that the hydrogeology around St. Johns Landfill is complex. This leads to uncertainty about inputs to the model such as silt thickness and hydraulic conductivity. The staff believed that there was a need to evaluate information generated in the last 10 years about characteristics such as these and their use in the model. There was a need to interpret the existing groundwater monitoring data to test the model predictions and estimate the current impact of the landfill on groundwater.

In response, Metro selected a hydrogeology consultant, EMCON, and gave it the following goals:

1. Evaluate critical groundwater model input parameters and assumptions and verify predictions from PSU's 1995 groundwater model (especially in regards to the silt aquifer).
2. Compare input parameters, assumptions, and predictions with existing information from Metro and elsewhere (chemical database and water elevation data).
3. Provide recommendations for additional information and analysis needed to adequately predict the transport of a variety of contaminants and to quantify leachate pathways in the site conceptual model suitable for use in a future risk assessment.

The EMCON team reviewed and interpreted observations and data about the composition of the subsurface strata based on logs from many borings made by Metro and others. The team also analyzed and evaluated a large amount of data about groundwater quality and elevation collected by Metro and others. The results of this work are presented in the report titled **Assessment of PSU Groundwater Flow Model of St. Johns Landfill, Portland, Oregon, September 29, I997**.

The hydrostratigraphic interpretation presented in the report generally supports the findings of previous investigations regarding the nature, distribution, and extent of the three unconsolidated units beneath the solid waste. These are named the Overbank Silt (OBS) unit (in which the solid waste is buried), and also the Columbia River Sands (CRS) and Pleistocene Gravel (PG) units, which are below the OBS.

This report differs from previous reports by interpreting boring records to indicate more heterogeneity in the OBS, and a somewhat thinner unit which could be defined as OBS rather than CRS. The team also interprets boring data and literature values to indicate that a higher overall vertical hydraulic conductivity should be assumed for the OBS than was assumed in the PSU model. The higher vertical hydraulic conductivity would tend to increase the predicted percentage of contaminants migrating downward, and therefore decrease the percentage of contaminants moving laterally toward surface water.

In its analysis of the groundwater monitoring data, the review team notes that the distribution of certain characteristic leachate indicators does not yet show a site-wide downward migration of contaminants through the OBS to the CRS and PG. An exception is well G7, which is screened in fine-grained CRS underlying a thin portion of the OBS.

Although the concentrations of leachate indicators appear to be increasing in the mid and lower portion of the OBS, their concentrations are still significantly lower than in wells screened in the upper portion of the OBS near the buried solid waste. An exception is D-3b (which monitors contaminants in the mid region of the OBS).

The figures presented in the report show off-site wells in the CRS and PG around the landfill with low concentrations of all seven leachate indicators (all of which could be naturally occurring). This suggests no leachate impacts in these wells. However, these wells monitor low but fairly constant concentrations of certain volatile organic carbon (VOC) contaminants. Some of these VOCs are above regulatory standards for drinking water; most are different from VOCs detected in wells in the OBS near the buried waste.

From its analysis of groundwater monitoring data the team concluded that:

1. Impacts to groundwater appear to be significantly less than might be expected given the age, size, location, length of operation, and minimal engineered environmental protection features at St. Johns Landfill.
2. Assessment of leachate indicators and VOCs in groundwater and leachate suggest that an off-site source may be contributing to VOCs detected in groundwater in wells monitoring contamination in the gravel aquifer under the east and south sides of the landfill.
3. Some wells monitoring groundwater in the upper portion of the low permeable OBS aquifer (located between the solid waste and lower aquifers), or in the OBS perimeter dike (between the solid waste and surface water) show elevated levels of leachate indicator contaminants and the same general collection of VOCs as those detected in leachate.

Finally, the team critiqued the 1995 PSU models and 1997 silt flow net model, their underlying assumptions, and their use to yield estimates of current and future flow and contaminant transport. This critique was detailed and thorough.

In response to the report, Metro directed the PSU modeling team to perform additional model runs in order to evaluate the issues raised by the EMCON team. Metro's objective was to determine the level of significance of these issues when evaluating the usefulness of the PSU model as a reasonable representation of contaminant movement.

The PSU team examined the issues by incorporating variations into the models based on the issues raised, and then running the models to determine whether these variations would cause the major predictions to change significantly. These model results are presented in the November 1997 report titled **St. Johns Landfill Modeling System: Sensitivity Simulations and Response to EMCON Review Comments**.

Certain general conclusions can be drawn from the 1997 study of St. Johns Landfill hydrogeology and our understanding of this.

1. The 1997 hydrogeology study is a thorough evaluation of existing information.
2. So far, impacts of landfill contaminants on groundwater appear to be significantly less than expected.
3. The PSU models provide a concept of the hydrogeology which agrees reasonably well with the monitoring well data.
4. Additional information in critical areas will improve the predictive power of the models.

The PSU model predictions of the rate of contaminant movement both horizontally and vertically in the OBS are significantly influenced by the vertical and horizontal hydraulic conductivity used as model inputs. Since there was some question about the conductivity values used in the PSU model, Metro took the opportunity to collect more conductivity data during an investigation of a portion of the perimeter dike (levee) fronting the North Slough arm of Columbia Slough (see perimeter dike stabilization, above).

Two bores were drilled into the native OBS. A hollow -stem auger was used to drill through solid waste, and a clean water rotary wash method to drill into the native silt. A relatively undisturbed, thin-walled Shelby tube sample of native silt was obtained in bore Q-4 for constant head (ASTM D5084) laboratory testing to determine vertical hydraulic conductivity. Horizontal conductivity measurements were conducted using rising head and falling head slug tests in temporary wells which were constructed to isolate the test zone from the overlying refuse layer.

The field test results generally support the hydraulic conductivity numbers used in the PSU model. The vertical hydraulic conductivity of the OBS sample was 4.0×10^{-7} cm./sec. This is comparable to the range (4×10^{-6} to 2×10^{-7} cm./sec.) of 21 previous tests. The PSU model predictions are based on an OBS vertical hydraulic conductivity of 1×10^{-6} cm./sec. The average horizontal hydraulic conductivities were 2×10^{-4} in one well and 3×10^{-5} cm./sec. in the other. These values are comparable to those (4×10^{-5} to 3×10^{-8} cm./sec.) of 26 previous tests. The PSU model predictions assumed OBS horizontal hydraulic conductivities as high as 1×10^{-4} cm./sec.

LEACHATE LEVELS IN THE LANDFILL

The driving force exerted by the contaminated liquid (leachate) in the buried waste also influences the rate of contaminant movement in the groundwater at St. Johns Landfill. It is desirable to measure the elevations of this leachate actually in the solid waste to verify or improve the predictions of the PSU groundwater model. Fortunately, the numerous gas wells in the waste can be used to measure if the elevations of this leachate change with the different seasonal groundwater pressure changes, and/or change with time because the cover cap prevents rain from entering the solid waste.

General Approach: Leachate levels in St. Johns Landfill tend to show localized variability. the gas wells provide up to 92 monitoring points from which to determine what is occurring throughout the landfill, both spatially and generally over time. In order to analyze this data, three basins were designated (see Figure 4) based on information about natural or constructed hydrogeologic boundaries, as well as the refuse fill conditions and age of fill. For example, Basins A and B are mostly divided by roads. Since the roads were constructed over time, they create a vertical wall (most likely made of compacted clay/silt) down toward the underlying silt. The road construction can be seen the 1956 photograph in *Water Quality Impact Investigation, Volume II* (Sweet-Edwards/Emcon, 1989).

The boundary between Basins A and C is the old Blind Slough. Fill conditions in Basin C were significantly different than in Basins A and B, in that the area was filled quickly (within a few years), quite recently (after 1985) and to a higher elevation, and the refuse was much better compacted during filling and later by pre-loading the area. Also, there is a natural silt dike between Basins A and C (see *Controlling Seepage from St. Johns Landfill to Surrounding Surface Water*, May 1995). In contrast, Basins A and B are much older, were filled over many years to a much lower elevation, and with minimal compaction.

Data Analysis: Depth-to-water readings in the gas wells have been recorded since 1994. This data generally has a great deal of variability because of the difficulty of accurate measurement. The following procedure was used to analyze this data: Only single completion and deeper, double-completion wells were included, because it was believed that these wells resembled each other (in that their well screens were near the underlying silt). The reference elevation

was based on a 1997 survey. It is assumed that there has been minimal settlement in the silt underlying the well casing (although significant settlement may have occurred in the refuse), and thus it is valid to use this survey data throughout the period of study, 1994 -1998.

A visual inspection of data plots was used to eliminate any obviously bad data from the study; for example, if at a given well the data is relatively flat with one spurious data point significantly different than the others, it was not included. Or if the data seemed to be erratic, the entire set of data for that well was not used. This method was applied because there were not enough data points per well to apply standard outlier tests.

The elevation data for each basin was averaged for each sampling period (Figure 5), resulting in a trend line. In Basin C, numerous wells were constructed at higher surface elevations; preload and cover soil weight was added during the construction seasons of 1995 and 1996. For these reasons, the average datapoints were left unconnected over this period. Also, box plots were determined within each basin for each sampling period (Figure 6), showing the median value and range of data (with the number of observations noted below the x-axis).

Initial Conclusions:

1. Leachate levels do not change significantly over time, not even seasonally. This is consistent with the hypothesis that little or no leachate is leaving the landfill, neither moving down vertically to the underlying aquifer, nor out laterally to the surrounding surface water. The lack of seepage may be partially caused by pockets of perched water in the waste, such that the effective pressure on the underlying silt is lower than the measured head data. The data suggests that the groundwater model developed by PSU (Li, 1995) is conservative. It over-predicts the rate at which leachate leaves the landfill, and the rate at which the leachate mound will dissipate.
2. Relative to the temporal variability, there is a great deal more spatial variability (Figure 7). Basin B has the least spatial variability; Basin C has the most, as well as the highest water level elevations (see Figure 5, showing leachate levels and their averages). Increased variability and water levels are typically a result of smaller effective permeability (refuse added to Basin C was more tightly compacted, the large quantity of pre-load added, and the well-compacted engineered dike surrounding it). The higher elevations seem to be a function of topography, as well as the fill conditions of Basin C. The water level elevations in Basin C remain high, despite the removal of all liquid draining from the underdrain system.
3. There may be a net movement from Basin C to Basin A. For example, Figure 5 shows the higher elevation wells in Basin A increasing over time, and Figure 4 shows that these wells are generally located near Basin C.

Metro continues to monitor the water level in selected gas collection wells to determine long-term trends. It is anticipated that further information will be available in future annual reports.

STORMWATER

Rain falling on the cover system of St. Johns Landfill follows two pathways: If it does not soak into the vegetated topsoil, it flows across the soil surface to drainage ditches. These vegetated ditches empty into five sedimentation basins which handle surface stormwater from about 80% of the landfill surface area. From each basin outfall it is carried to surface water by rock spillways or a metal flume. About 20% of this surface stormwater is carried directly to outfalls without passing through sedimentation ponds.

A second pathway is followed by any rain that penetrates the average one-foot of topsoil without being transpired by the vegetation. It percolates through a 13 to 18 inch layer of underlying sand until it is stopped by an impermeable plastic geomembrane. This geomembrane and a back-up layer of compacted low permeable soil form a roof over the solid waste.

This subsurface water then migrates downslope though the sand layer (and also through a mesh grid on steep slopes) to underdrain pipes below certain drainage ditches. These pipes empty into the sedimentation ponds or directly below the surface water outfalls.

The scatter plots in Figures 8 and 9 present water quality data from the surface stormwater and mixtures of surface and subsurface stormwater. Data is shown for the contaminants of concern in the slough, which are monitored as required by the storm water permit for St. Johns Landfill. These are: Ortho-phosphate, fecal coliform bacteria, and total recoverable lead. A scatter plot of total suspended solids is also shown as an indication of sediment contribution by erosion.

The figures present data for stormwater drainage from areas where the cover system had been completed and planted to vegetation at least six months before a sample was taken. This was considered the beginning of the post construction period, when stormwater effluent quality should improve with time.

Most ortho-phosphate concentrations are above a DEQ interim target of O.02 mg./liter. The mean orthophosphate concentration is 0.06 milligrams per liter. Total suspended solids concentrations in all but one sample are low, well below a DEQ stormwater benchmark of 130 mg./liter. Suspended solids are low in most recent stormwater samples from the vegetated cover system. This suggests that there is a low risk from chemicals of concern, if present in the solid, which sorb to solids. The one sample with a high suspended solids concentration was taken from an area that was experiencing significant localized erosion at the time.

Lead in stormwater samples is measured as total recoverable lead, which includes dissolved lead and lead sorbed to suspended solids in the sample. Lead cannot be detected in most samples. Where it was detected, it was less than the DEQ stormwater benchmark of 0.4 mg./liter. The highest lead concentration, in April 1995, was associated with the sample that had an abnormally high suspended solids concentration.

Most stormwater samples have fecal coliform bacteria counts below the DEQ stormwater benchmark of 406 organisms/liter. Two samples had counts suggesting fecal contamination; both samples had come from an area where sheep were grazing. Sheep are pastured on the landfill cover in the spring to eat non-native grasses, which tend to out compete native grasses. Alternatively, the bacteria could come from wildlife, such as flocks of geese, which use the landfill vegetation for food and shelter.

To develop current and future estimates of the quantity (loading) of contaminants from stormwater, it is necessary to estimate stormwater flow from the cover system. As noted above, the cover system of St. Johns Landfill is both similar to and different from a normal vegetated area or an impervious surface, such as a parking lot. Metro engineers have used the HELP model and other information to calculate factors for both surface and subsurface flow that can be multiplied by contaminant concentration in milligrams per liter to determine contaminant

quantity in pounds per year. These factors are representative of the unique characteristics of stormwater flow from the St. Johns Landfill cover.

For example, if the mean ortho-phosphate concentration of 0.06 milligrams per liter is multiplied by the total stormwater flow factor of 847.1 lb.-L/mg.-yr. calculated by Metro, the total ortho-phosphate load is 51 lbs. per year from the St. Johns Landfill cover. This is one percent of the proposed total annual stormwater ortho-phosphate load allocation of 4,953 lbs. per year for Columbia Slough.

The final cover topsoil is probably the source of this ortho-phosphate. In conformance with the cover system specifications approved by DEQ, most of the cover topsoil was amended with sewage sludge compost which contains phosphorus. Inorganic fertilizer containing phosphorus was added as necessary to achieve good vegetation growth needed to combat erosion. Also, native soils in the Portland area commonly contain phosphorus.

SURFACE WATER

Surface water quality in the lower Columbia Slough is influenced by a complex interaction of many variables. These include inputs such as:

- Stormwater
- Combined sewer overflows (CSO)
- Discharge from the upper slough
- Willamette River water
- Groundwater including landfill seepage
- Industrial process water

Which interact with:

- Daily tidal cycles of Willamette River flow into and out of the lower slough
- Seasonal water level variations
- Seasonal sunlight and water temperature variations which influence algae growth, photosynthesis, and respiration.

About five miles of the lower Columbia Slough, and its North and Blind Slough arms lie within the Smith & Bybee Lakes Natural Area. Also, St. Johns Landfill fronts on two miles of this five mile length. Metro has the responsibility to monitor water quality in the Natural Area.

Long-term monitoring can identify trends that help policy makers determine the effectiveness of best management practices such as reduction of combined sewer overflows in the lower slough and low water level management in the upper slough. If data is collected frequently enough, it can be used to improve the predictive power of the model for the Columbia Slough being developed at Portland State University. Also, frequent water quality data collection might detect occasional discharges of contaminants that have intense but temporary impacts on water quality. Finally, it may help measure the relative environmental impact of various sources of contamination discharging into the Smith & Bybee Lakes Natural Area.

To obtain these benefits, in October 1997 Metro began to monitor dissolved oxygen, temperature, pH, and salinity every 30 minutes in the water of the lower slough at three locations. It took advantage of the availability of instruments which can be suspended in the slough to automatically measure these parameters and store the information until the instruments are periodically serviced. Initially, Metro plans to collect this data for one full year, until October 1998. This data is available to DEQ, the City of Portland, Portland State University, and other interested parties.

FUTURE PLANS

1. Jointly with DEQ determine objectives and methods to control the long-term environmental impact of St. Johns Landfill.
2. Submit to DEQ a final plan for monitoring which effectively assesses the above objectives and methods.
3. Carry out a monitoring program that gathers information necessary to assess the environmental health of the Smith & Bybee Lakes Natural Area.
4. By June 1999 design cost effective improvements to stabilize the St. Johns Landfill perimeter dike against erosion by surrounding surface water. By June 1999 design cost-effective improvements to minimize contact between solid waste buried in a portion of the perimeter dike and adjacent surface water..
5. Construct the above improvements according to a schedule based on immediacy and severity of risk.
6. Operate, monitor, and maintain the gas collection system to minimize the risk of underground fires and to dependably supply adequate landfill gas to Ash Grove Cement Co. for energy recovery.
7. By June 1999, finish planting native vegetation on the perimeter dike of St. Johns Landfill and begin to maintain this vegetation as necessary.
8. By June 1999, establish native dominant vegetation in three, one-acre test plots on the St. Johns Landfill cover cap.
9. By 2002, determine if it is feasible to maintain native dominant vegetation in the test plots before attempting to establish it on the entire 226-acre landfill cover cap.

DO:gbc
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REFERENCES

Cornforth Consultants, Inc., July 24, 1997 letter report to Parametrix, Inc., titled **Geotechnical Evaluation, St. Johns Landfill Perimeter Levee, Portland, Oregon**.

Metro, **Controlling Seepage from the St. Johns Landfill to Surrounding Surface Water**, May 1995.

Cornforth Consultants, Inc., December 4, 1997 letter report to Parametrix, Inc., titled **North Levee Test Pit Investigation, St. Johns Landfill, Portland, Oregon**.

Metro, St. Johns Landfill, Operations and Maintenance Manual, 1998, June 1998.

Wilson, M., L. Brophy, and L. Wilson, **Establishment of Native Vegetation at St. Johns Landfill: Proposed Phase 1 Work Guidelines and Cost Estimates, Final Draft**, February 1998.

Cornforth Consultants, Inc., April 3, 1998 letter report to Parametrix, Inc., titled **Phase II Investigation of North Levee, St. Johns Landfill, Portland, Oregon**.

EMCON, Inc., **Assessment of PSU Groundwater Flow Model of St. Johns Landfill, Portland, Oregon**, September 1997.

Shu-Guang, et al, **St. Johns Landfill Modeling System, Sensitivity Simulations and Response to EMCON Review Comments**, November 1997.

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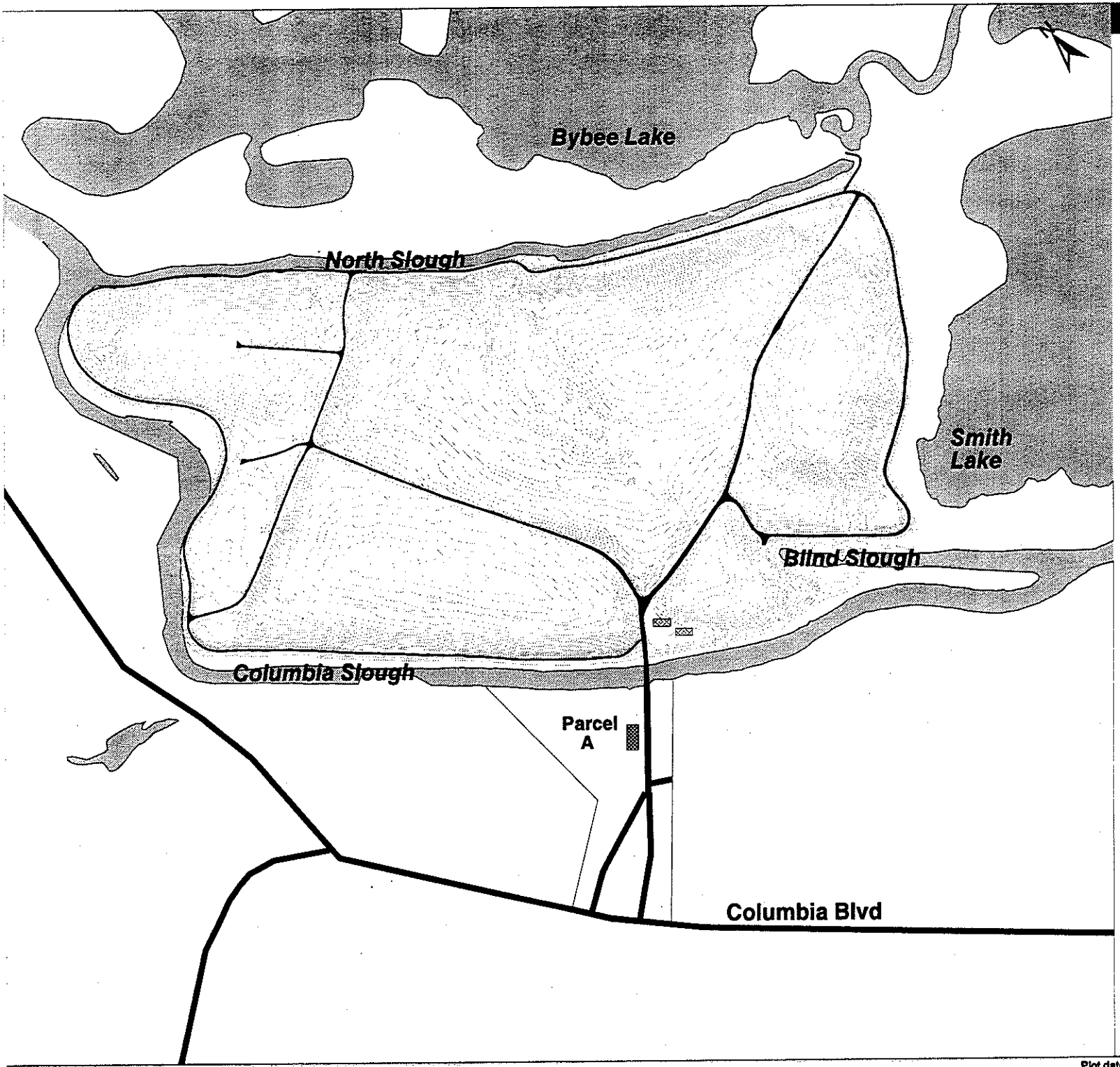


R L I S

REGIONAL LAND INFORMATION SYSTEM

St Johns Landfill

0 400 800 1200 Feet

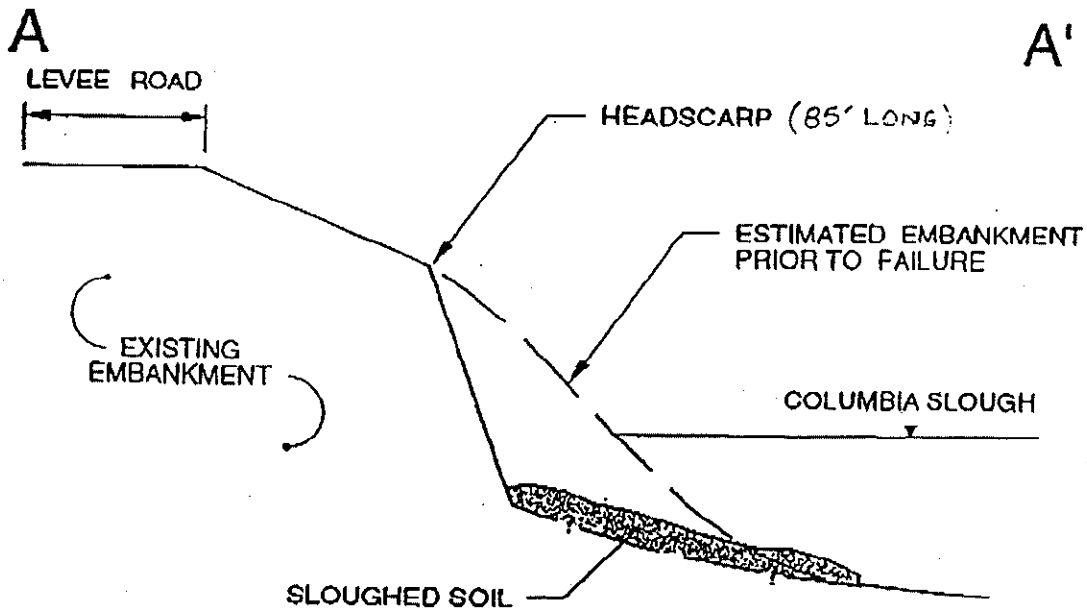
1"= 800 feet

METRO

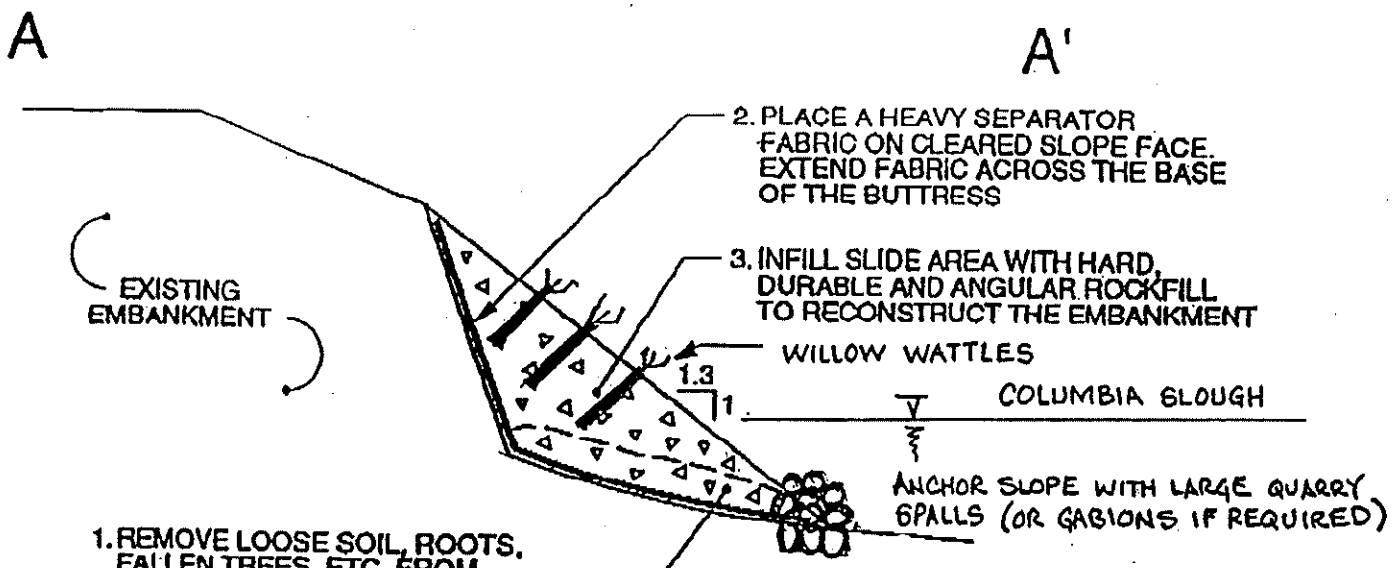
600 NE Grand Ave.
Portland, OR 97232-2736
503 797-1742 FAX 503 797-1909
Email: drc@metro.dst.or.us

Figure 1

Plot date: Apr 21, 1998; /disc/disc2/sw/proj/98038/dennis2.apr



(A) GENERAL CROSS SECTION THROUGH SLIDE

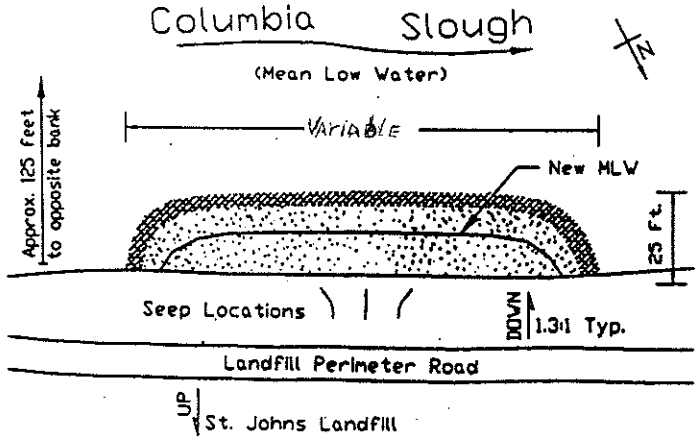


(B) CONCEPTUAL RECONSTRUCTION

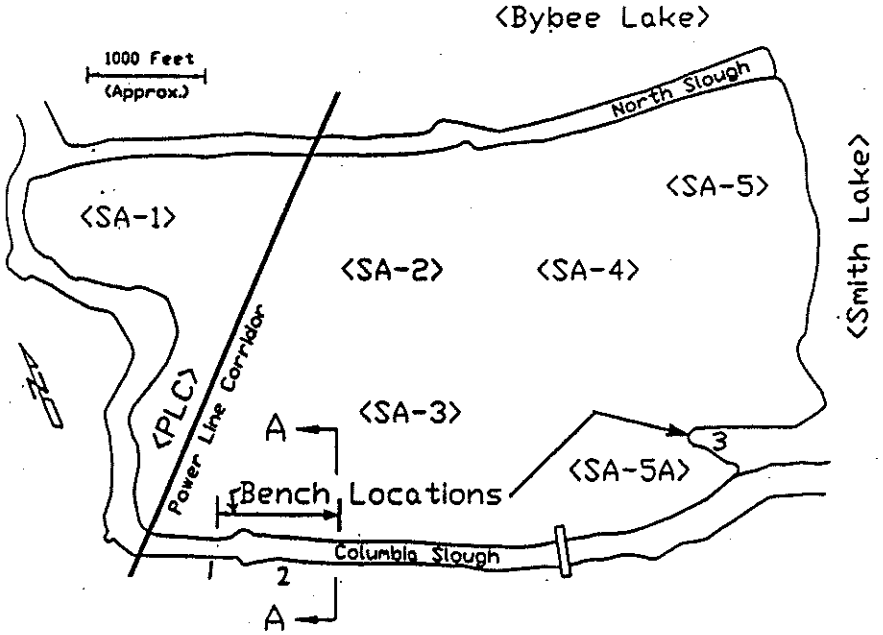
SCALE: 1" = 10' (APPROX.)

M1038\FIGURE02

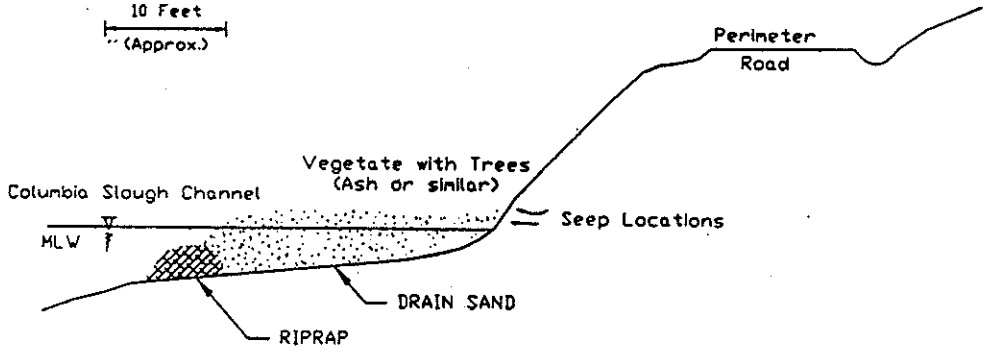
Cornforth Consultants, Inc. 10250 S.W. Greenburg Rd. Portland, OR 97223	TITLE: CROSS SECTION	DATE: JUL 1997
		JOB NO. 1038
	JOB: PERIMETER LEVEE EVALUATION ST JOHNS LANDFILL – PORTLAND, OREGON	FIG. 2



PLAN VIEW
EROSION PROTECTION BENCH



AERIAL VIEW
ST. JOHNS LANDFILL



SECTION A-A

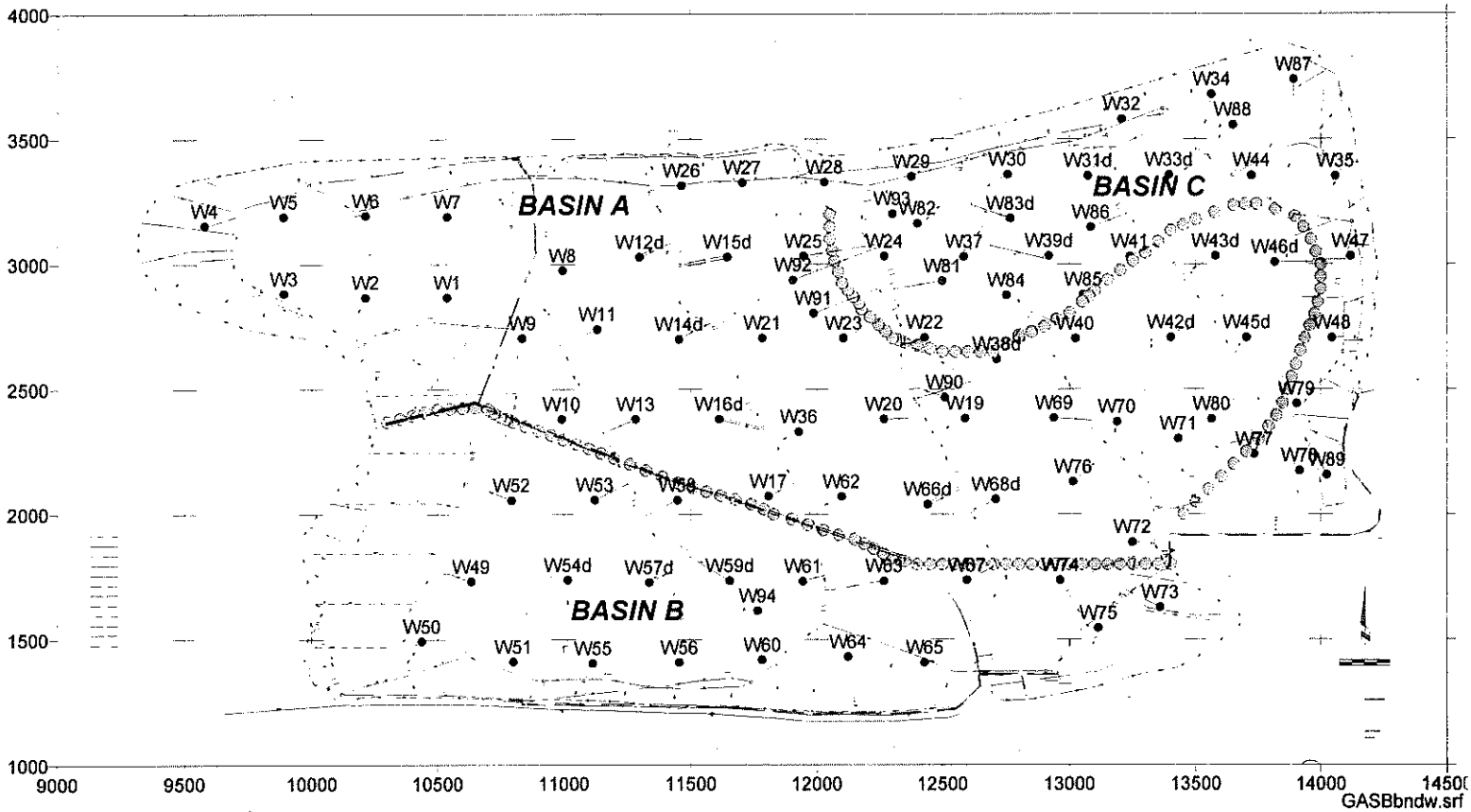
ST. JOHNS LANDFILL
EROSION CONTROL BENCH DESIGN

REV	DATE	DESCRIPTION	BY

July 31, 1997 — No Scale
George Kral — HcN

Figure 3

Figure 4


BASIN A
BASIN B
BASIN C
W1
W2
W3
W4
W5
W6
W7
W8
W9
W10
W11
W12d
W13
W14d
W15d
W16d
W17
W20
W21
W22
W23
W24
W25
W26
W27
W28
W29
W30
W31d
W32
W33d
W34
W35
W36
W37
W38d
W39d
W40
W41
W42d
W43d
W44
W45d
W46d
W47
W48
W49
W50
W51
W52
W53
W54d
W55
W56
W57d
W58
W59d
W60
W61
W62
W63
W64
W65
W66d
W67
W68d
W69
W70
W71
W72
W73
W74
W75
W76
W77
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W80
W81
W82
W83d
W84
W85
W86
W87
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W89
W90
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W93
W94
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3500
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GASBbndw.srf

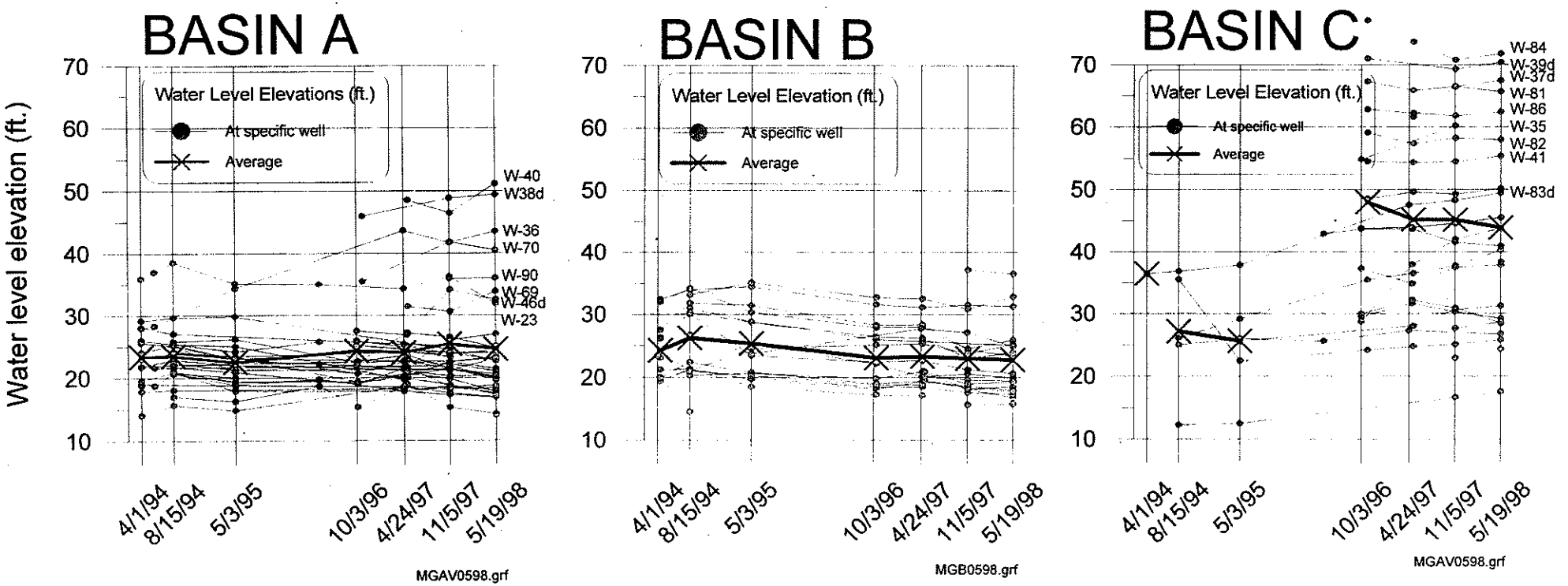
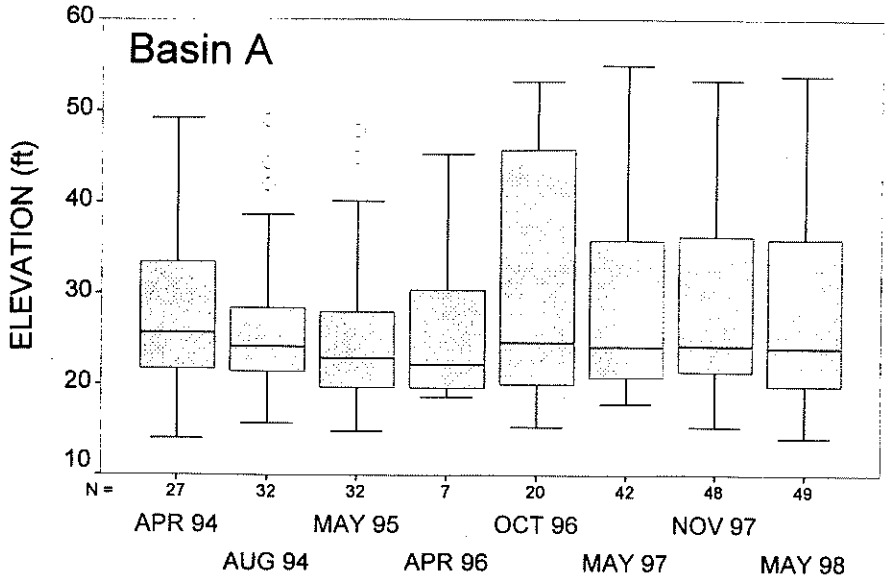
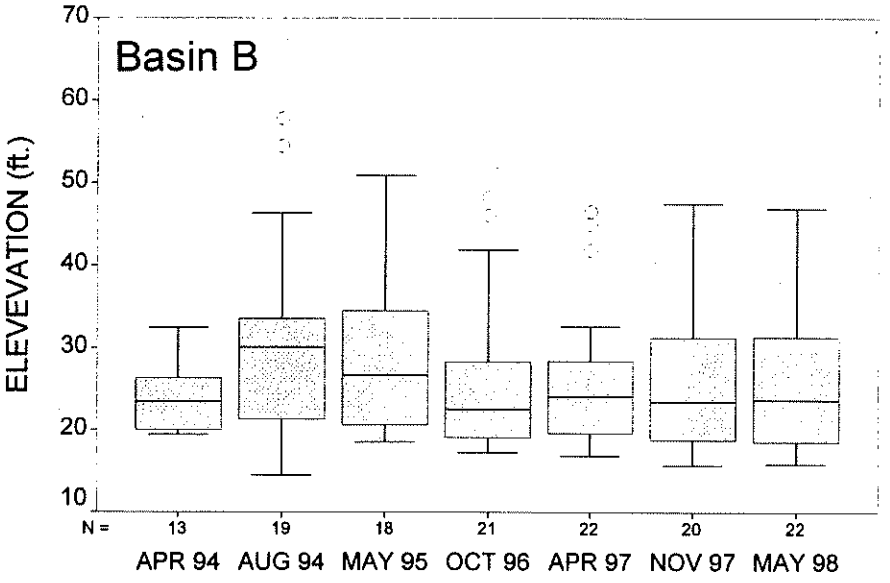
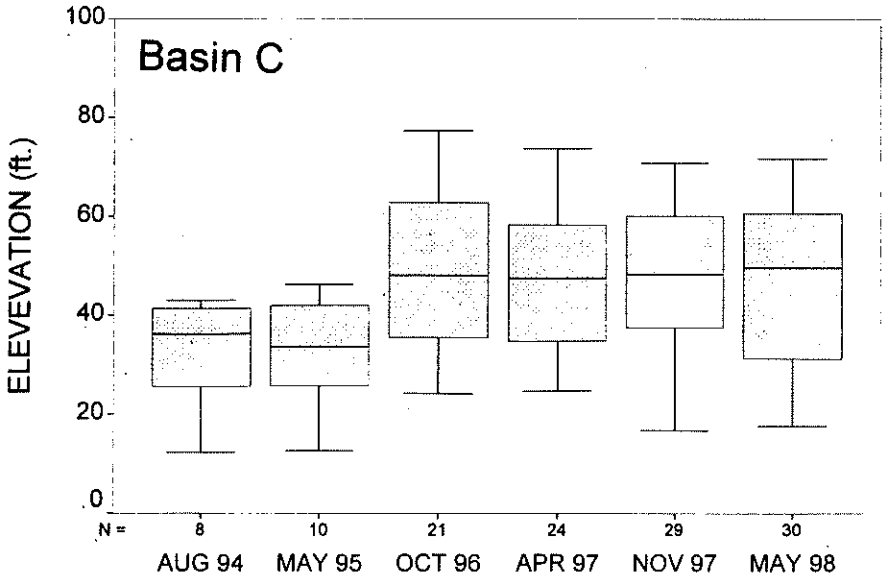

BASIN A
Water level elevation (ft.)
70
60
50
40
30
20
10
Water Level Elevations (ft.)
At specific well
Average
W-40
W38d
W-36
W-70
W-90
W-69
W-46d
W-23
4/1/94
8/15/94
5/3/95
10/3/96
4/24/97
11/5/97
5/19/98
MGAV0598.grf
BASIN B
Water Level Elevation (ft.)
At specific well
Average
MGB0598.grf
BASIN C
Water Level Elevation (ft.)
At specific well
Average
W-84
W-39d
W-37d
W-81
W-86
W-35
W-82
W-41
W-83d
MGAV0598.grf

Figure 5

Water Level Elevation in Gas Wells







Leachate Elevations in Gas Wells
St. Johns Landfill - 5/98

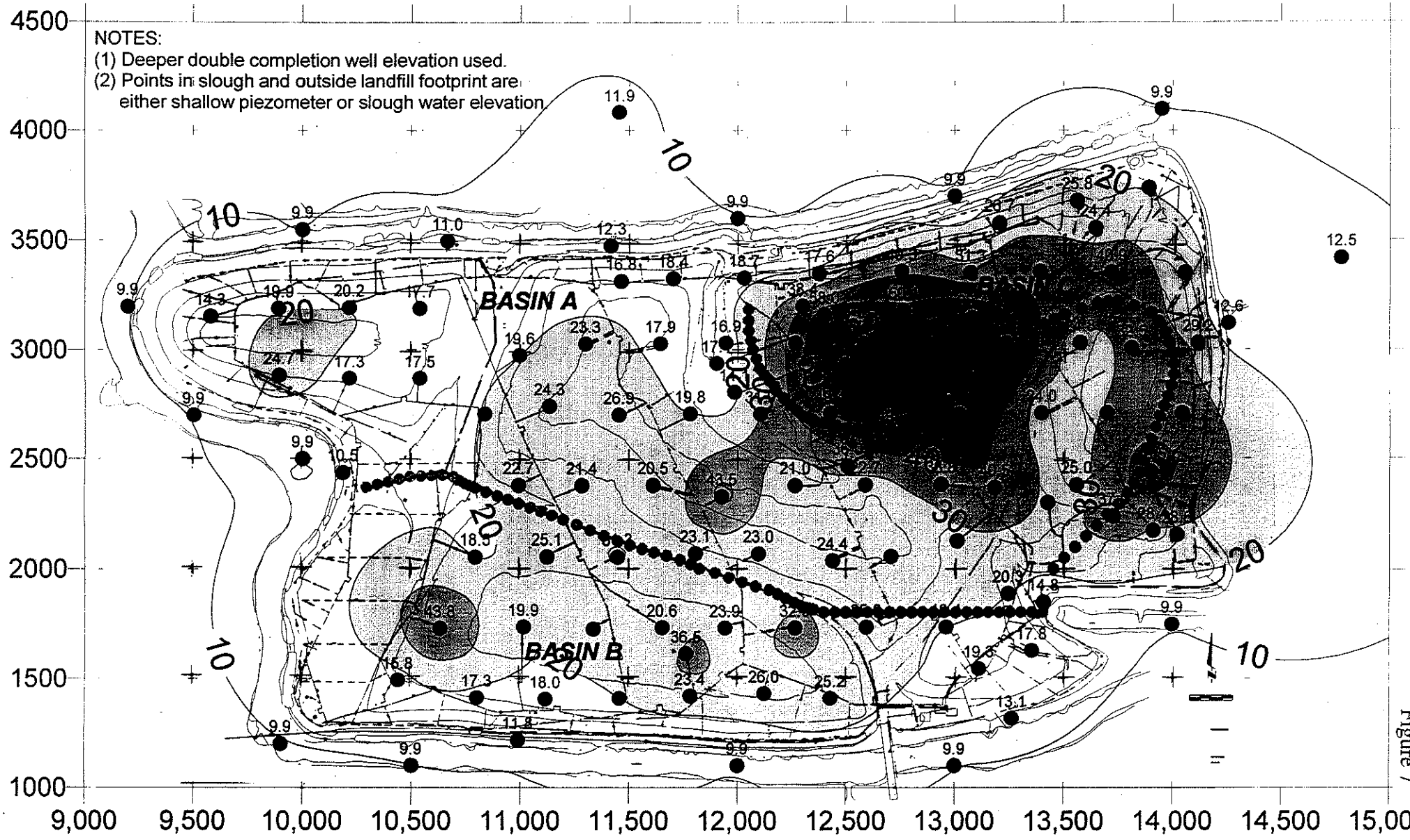
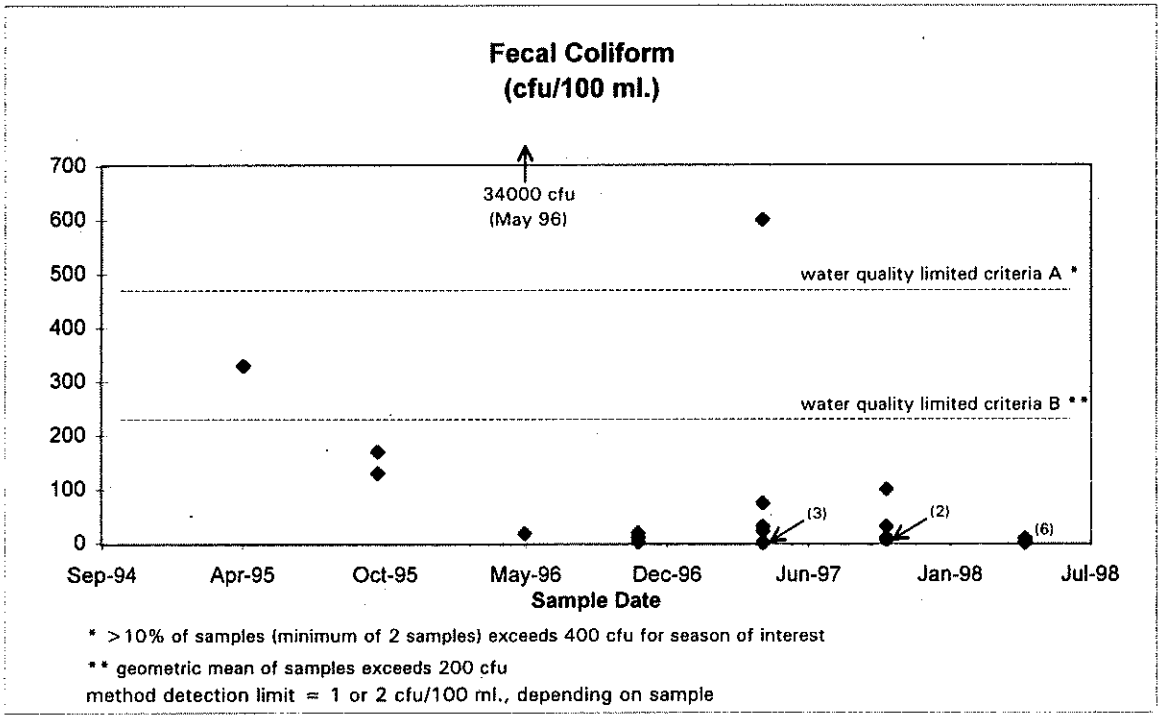
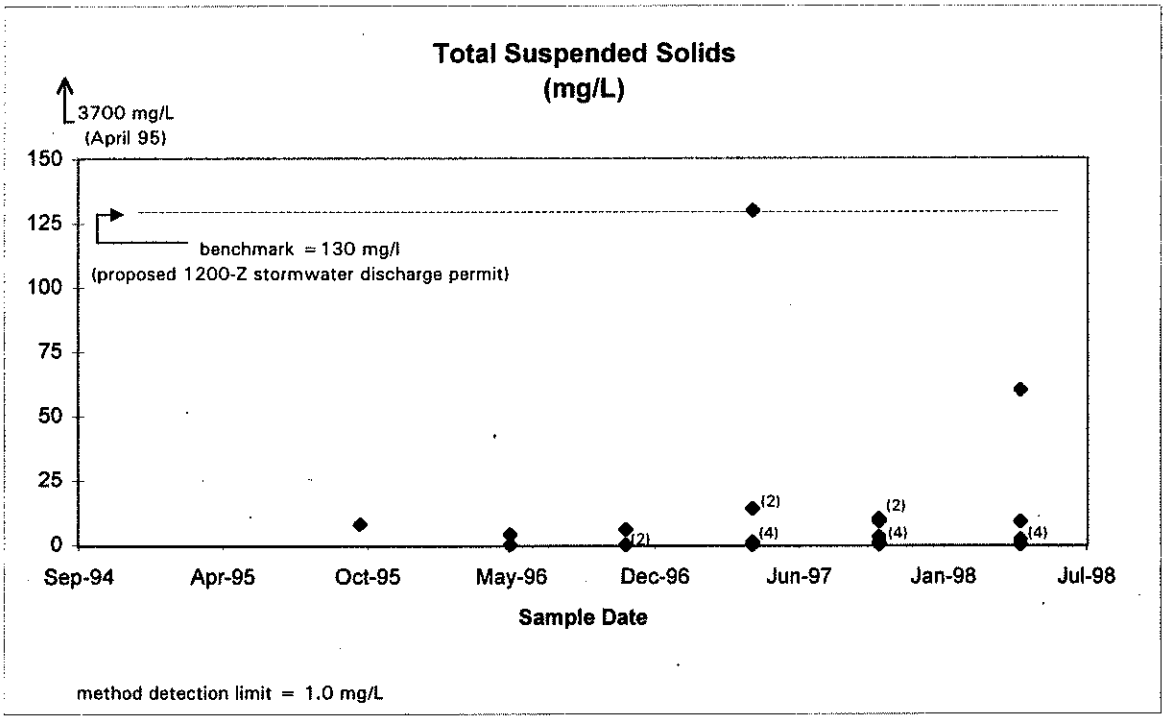


Figure 7

GAS05985.SRF (09/08/98)

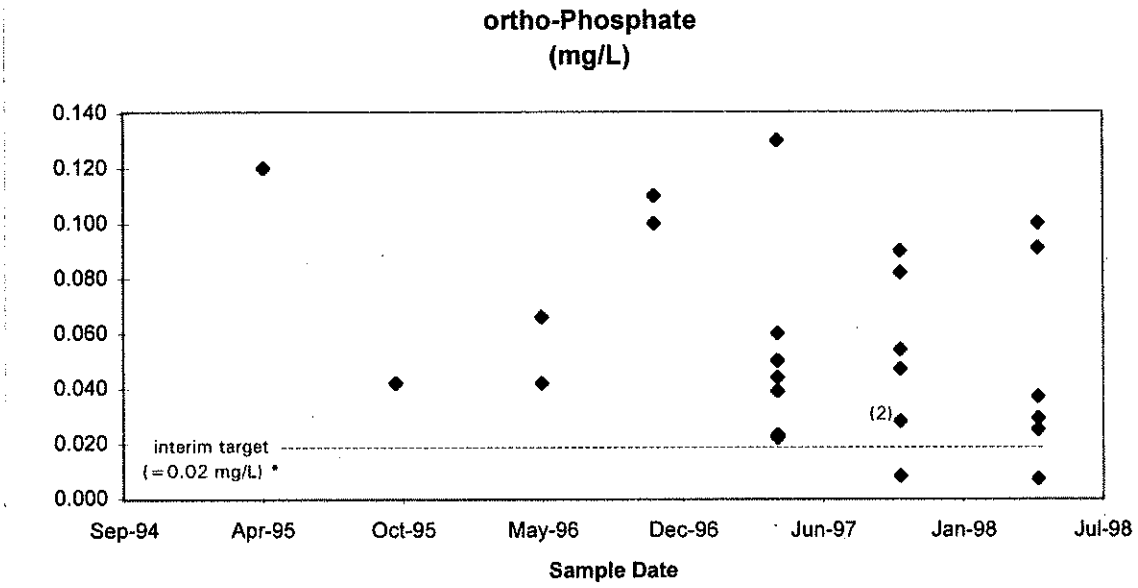
Stormwater Data
St. Johns Landfill
(from samples collected 6 mo. or more after all areas contributing stormwater were covered and planted to vegetation)



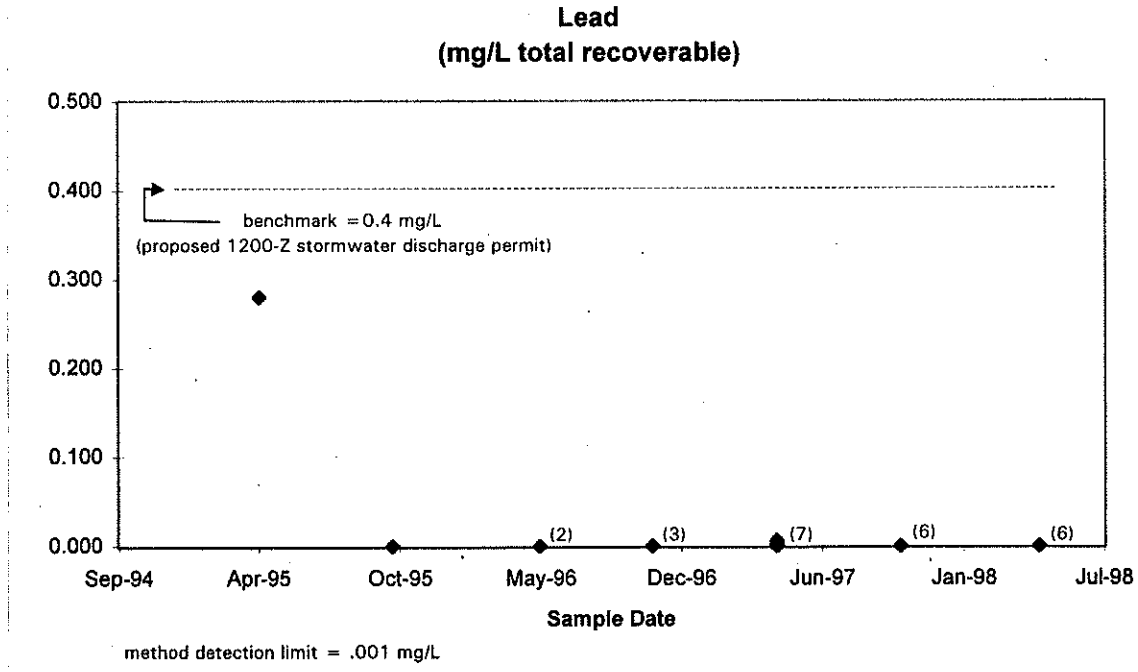


Notes:
Values plotted as zero were not detected and were below the method detection limit.
In parentheses are numbers of data points clustered at the same, or approximately same value.

Stormwater Data
St. Johns Landfill
(from samples collected 6 mo. or more after all areas contributing stormwater were covered and planted to vegetation)



* established by DEQ, based on EPA Quality Criteria for Water, 1986
method detection limit = .005 mg/L



method detection limit = .001 mg/L

Note: Values plotted as zero were not detected and were below the method detection limit.

APPENDIX

M E M O R A N D U M

METRO

DATE: July 21, 1998

TO: Dennis O'Neil, St. Johns Landfill Closure Project Manager

FROM: Maria Roberts, Budget & Finance Administrator MR

RE: Report to DEQ on the St. Johns Landfill Reserve Account

Financial activity in the St. Johns Landfill Reserve Account during FY 1997-98 was in compliance with established policies and other applicable requirements, including Metro ordinances, generally accepted accounting principles (GAAP), and Oregon budget law.

In accordance with the FY 1997-98 Approved Budget, no annual contribution was required to the St. Johns Landfill Closure Account. The fund/account structure established in FY 1989-90 (through adoption of Master Bond Ordinance #89-319) remained in place through FY 1997-98.

Following is a summary of unaudited revenues, expenditures, and the ending balance as of June 30, 1998, in the St. Johns Closure Account.

Beginning Balance (Actual)	$7,474,778
Interest Earnings (estimated)	412,918
Contribution from rates	0
Revenue: City of Portland Reimbursement	37,198
Settlement	34,053
Total Resources	$7,958,947
Expenditures	($525,931)
Unappropriated ending balance	$7,433,016

MR:AC:hs
cc: Jim Watkins, Engineering & Analysis Manager
Dennis Strachota, Business & Regulatory Affairs Acting Manager

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M E M O R A N D U M

METRO

DATE: May 20, 1998

TO: Charlie Ciecko, Director, Regional Parks and Greenspaces

FROM: Jim Watkins, Engineering & Analysis Manager,
Regional Environmental Management

THROUGH: Bruce Warner, Director, Regional Environmental Management

RE: Policy Concerning Public Access to St. Johns Landfill

I am responding to your request for our current policy concerning public access to the St. Johns Landfill. First, I present a detailed account of the factors upon which our policy is based. Then, I present our policy, which I anticipate will be in effect as long as the gas collection system is operating. I expect that operation will continue until AD 2008 to 2013.

BACKGROUND

The closure of St. Johns landfill required the installation of an active gas collection system consisting of gas wells (extending above ground surface) and underground gas collection trenches. Each of these gas wells and collection trenches are connected to a network of gas collection pipes of various sizes. This network is exposed on the ground surface because experience at other landfills has shown that this accessibility makes operation and maintenance most feasible, especially in the management of gas condensate (the liquid which condenses out of the wet landfill gas). The gas wells and condensate collection pipes are made of various types of plastic.

Landfill gas contains substances which are hazardous to both health and safety. For example, landfill gas contains nearly 50% methane (natural gas) which is a fire and explosion hazard. In addition the landfill gas contains substances such as hydrogen sulfide and methyl mercaptans which are known health hazards. Finally the landfill gas contains small amounts of various volatile chemicals from the solid waste that have potential, but poorly understood, risks.

Nearly all of this landfill gas collected in the wells is transported in the network of pipes to a motor blower flare (MBF) facility. Here it is burned in enclosed flares in compliance with a permit issued by the Oregon Department of Environmental Quality, or is compressed and piped to Ashgrove Cement Company for use as fuel. However, gas pressures currently in the landfill can cause a small amount of the gas to escape untreated. For example, localized gas pockets exist under the membrane that can escape through a small hole in the membrane or through the soil at its edge. Thus there are localized areas on and around the cover where this gas is present.

Efforts are ongoing to detect these emissions and eliminate as many as are feasible. Metro operation and maintenance staff are trained and equipped to minimize risk of gas exposure to themselves and those they escort. This is not true for the general public.

There are significant risks from vandalizing or tampering with the mechanical and electrical equipment at St. Johns Landfill. One risk is the release of landfill gas as discussed above. Another risk is the prolonged shutdown of the motor blower flare and compressor facility. A third risk comes from above-ground fires and from underground fires in the solid waste caused by oxygen intrusion.

The motor blowers and flares automatically shut down if various sensors indicate problems including intrusion of oxygen into the collection pipes. Because there is a large quantity of gas being generated and because the cover system is a barrier to escape, there is a high probability that the cover will bubble up in numerous areas and be damaged if the blowers stop sucking gas out of the collection system for more than about one half day. Thus, there is a significant risk if the MBF facility is damaged to the point of a prolonged shutdown.

Underground fires and above-ground fires have historically been a problem at landfills. At the Woodburn Landfill, gas seeped into a building and caused a fire which injured several workers. In the 1970s Rossman's Landfill in Oregon City had an underground fire which resulted in air quality degradation. In Deschuttes County a child was injured by falling into a smoldering cavity in an old landfill. St. Johns Landfill has experienced several underground fires within the past two years. Due to the vigilance and prompt action of the landfill staff they were minor and are being suppressed. Periodically there are similar incidents throughout the country.

Controlling gas flow, at each of the 84 exposed gas wells, reduces the risk of underground fires and helps suppress them when they occur. Flow control, accomplished by adjusting a valve on each well, also balances flow in the well network for maximum efficiency. Preventing uncontrolled public access to the landfill reduces the risk that these valves will be tampered with.

In summer there is a risk of damage to the gas collection system from a grass fire. The collection system would itself become a source of fire and possible explosion if it was damaged by fire or vandalism and gas was ignited deliberately or accidentally.

The above risks and others make it desirable to limit access to the landfill to trained and equipped people until the gas collection system is no longer needed. It is also desirable to limit public knowledge about equipment on the landfill to reduce the number of people who might tamper with this equipment. However, it is recognized that a section of the planned 40 mile loop trail runs along the dike road on the south-east side of St. John's landfill adjacent to Smith lake. Past planning has been to connect one end of this section with a trail on the north bank of the North Slough via the water control structure and the other end with: 1) North Portland Road via a trail between Smith Lake and the Columbia Slough, and 2) Incinerator Park via a trail across the landfill and its bridge to a crossing at Columbia Blvd. It is also recognized that a guided tour of the landfill is a useful educational opportunity.

The policy set forth below balances the above risks and benefits:

POLICY

Access to the public is limited to the dike road along the south-east edge of the landfill adjacent to Smith Lake (see figure attached). Access shall not be from the landfill but could be from the trail over the water control structure on the north-east end. Access from the south-east end could be from a trail leading to North Portland Blvd.

Until there is no longer a significant risk to health, safety, and the environment, access to the remainder of the landfill is limited to Metro staff who have been trained and equipped to minimize risk to themselves and others. Public tours of the landfill will be allowed if conducted by a trained Metro staff person. Access restrictions shall be enforced by a fence and gates which prevent unauthorized access by land, by warning signs, and by challenging (and reporting to proper authority) unauthorized persons on the landfill. At this time it is not considered feasible to fence the landfill from access by water.

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JW:DO:gbc
Attachment
cc: Emily Roth, Regional Parks and Greenspaces
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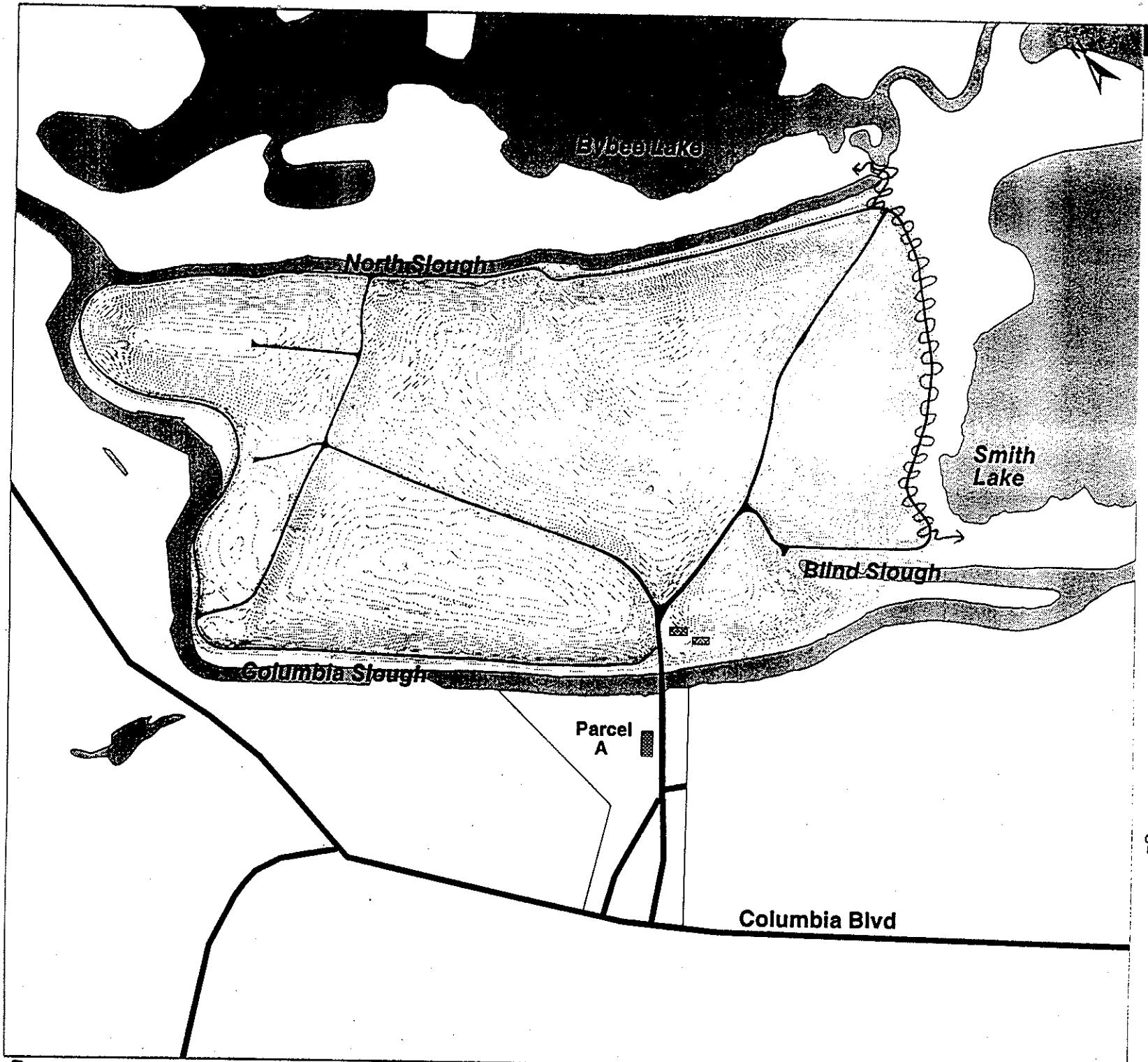

R L I S

REGIONAL LAND INFORMATION SYSTEM

St Johns Landfill

ACCESS

0 400 800 1200 Feet

1"= 800 feet

METRO

600 NE Grand Ave.
Portland, OR 97232-2736
503 797-1742 FAX 503 797-1909
Email: drc@metro.dst.or.us

Plot date: Apr 21, 1998: /disc/disc2/swforpl/98038/dgnpls2.apr