




*Sunderland Recycling Facility
Master Plan 2005*



**City of Portland
Sunderland Recycling Facility
Master Plan
October, 2005**

**Office of Transportation
Bureau of Maintenance
Samuel M. Irving, Jr.
Liane Welch
Jill Jacobsen
Doug Hight**

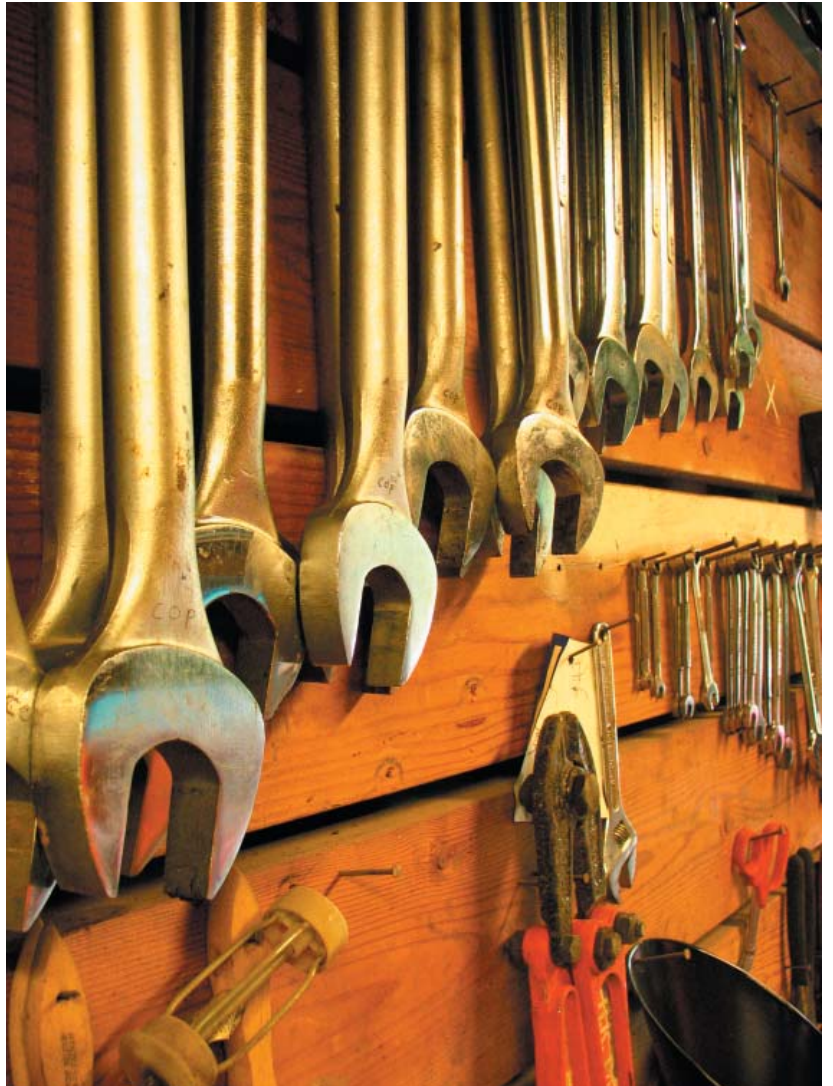
**Walker Macy, Landscape Architecture and Planning
Mike Zilis
Eric Bode
Wayne Stewart
Tanya Gilula**

TABLE OF CONTENTS

	<u>Page</u>
I. INTRODUCTION	1
II. EXECUTIVE SUMMARY	3
III. EXISTING CONDITIONS	9
• Existing Conditions	
• Current Uses	
• Surrounding land uses	
• Access and Circulation	
• Trip Generation	
• Soils	
• Utilities	
• Regulatory Organizations	
IV. MASTER PLANNING PROCESS	19
• Goals	
• Material Processing	
• Alternative Site Plans	
• Permitting and Pilot Testing of Street Sweeping Debris	
• Preferred Concept	
V. MASTER PLAN DESCRIPTION	28
• Preferred Site Plan	
• Common Elements	28
– Entrances and Circulation	
– Road Link Along Base of Dike	
– Truck Weighing	
– Office and Training Center	
– Retail Sales Area	
– Pedestrian Route to Dike	
– Buildings	
– Leaf Composting	
– Wood Material Grinding	
– Street Sanding Material	
– Water Quality Facilities	
– Campground	
• Elements Specific to the Preferred Site Plan	37
– Relocation of the Rock Crusher and Associated Elements	
– Street Sweepings Processing	
– Utilities Plan	
– Soils Preloading	

• Cost Estimates	40
• Phasing	43
– Phase One Improvements	
– Phase Two Improvements	
– Phase Three Improvements	
• Regulatory Issues	45
– Federal Aviation Authority	
– Federal Environmental Protection Agency	
– Oregon Department of Environmental Quality	
– Port of Portland	
– Multnomah County Drainage District Number 1	
– City of Portland	
VI. APPENDICES	48
A. Council Ordinance No. 178828	
B. Proposed Sunderland Yard Expansion, JD White Company, 2004	
C. A Report on the Condition of Existing Storage Buildings at the City of Portland’s Sunderland Yard, PDOT, 2005	

INTRODUCTION



INTRODUCTION

The City of Portland is a leader in the sustainability and green building movement in the United States. The Portland Office of Transportation (PDOT)/Bureau of Maintenance (BOM) has embraced the challenge of developing cost effective ways to recycle materials generated when performing street maintenance operations. Since 1997, BOM employees have been experimenting with various techniques to economically recycle materials such as leaves, concrete, asphalt, and street sanding material at the Sunderland Recycling Facility. At present, some 50,000 cubic yards of material are processed annually. Some of this processed material, such as leaf compost, is sold to the public as part of BOM's outreach program while the rest is used by BOM crews or other City Bureaus. See Figure 1 for location.

To accommodate expansion of this successful facility, a 14.2 acre parcel of land was acquired in October 2004. With this expansion, BOM will be potentially able to add the following activities: processing of street sweepings, processing of moisture conditioned vector waste, grinding of woody debris, and improved retail sales of recycled products to homeowners and contractors. By expanding the range and amount of recycled materials available, the amount of virgin materials purchased by the City can be reduced.

In summary, the goals of the Sunderland Recycling Facility are:

- To expand reuse/recycling of City generated "road waste" materials
- To reduce the amount of City generated material destined for a landfill
- To reduce the purchase of virgin materials
- To showcase what can be accomplished toward achieving a sustainable transportation system.

The remainder of this document includes an executive summary; and then describes existing conditions at the Sunderland site, the master plan process, and illustrates and describes the preferred site master plan.

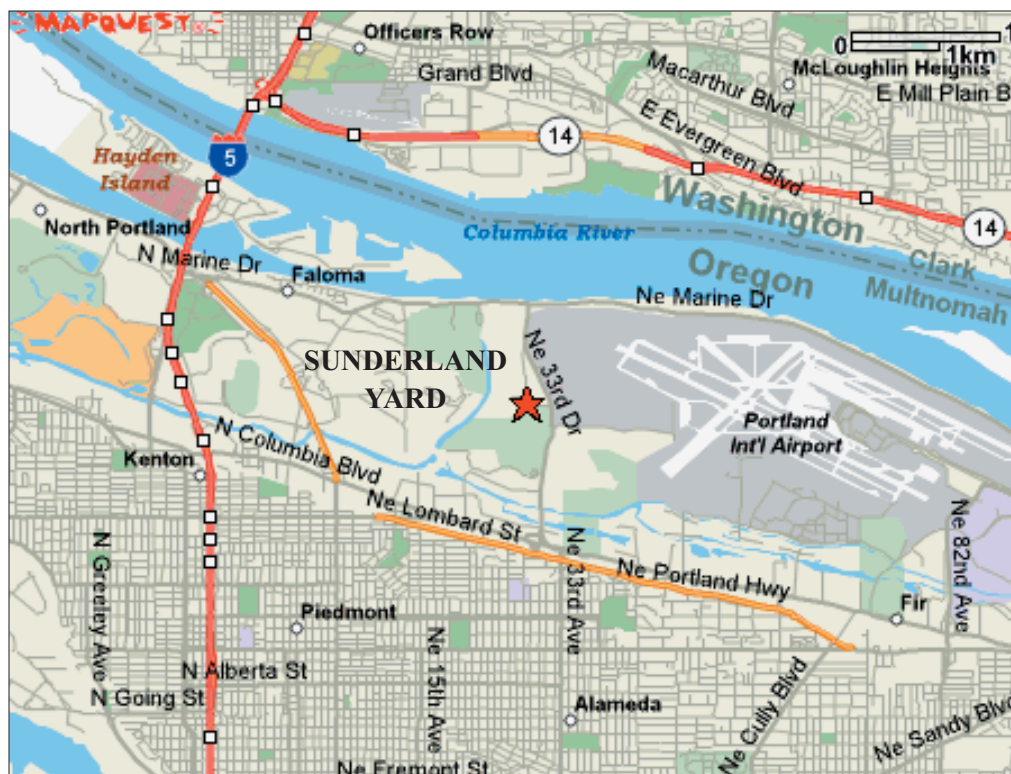
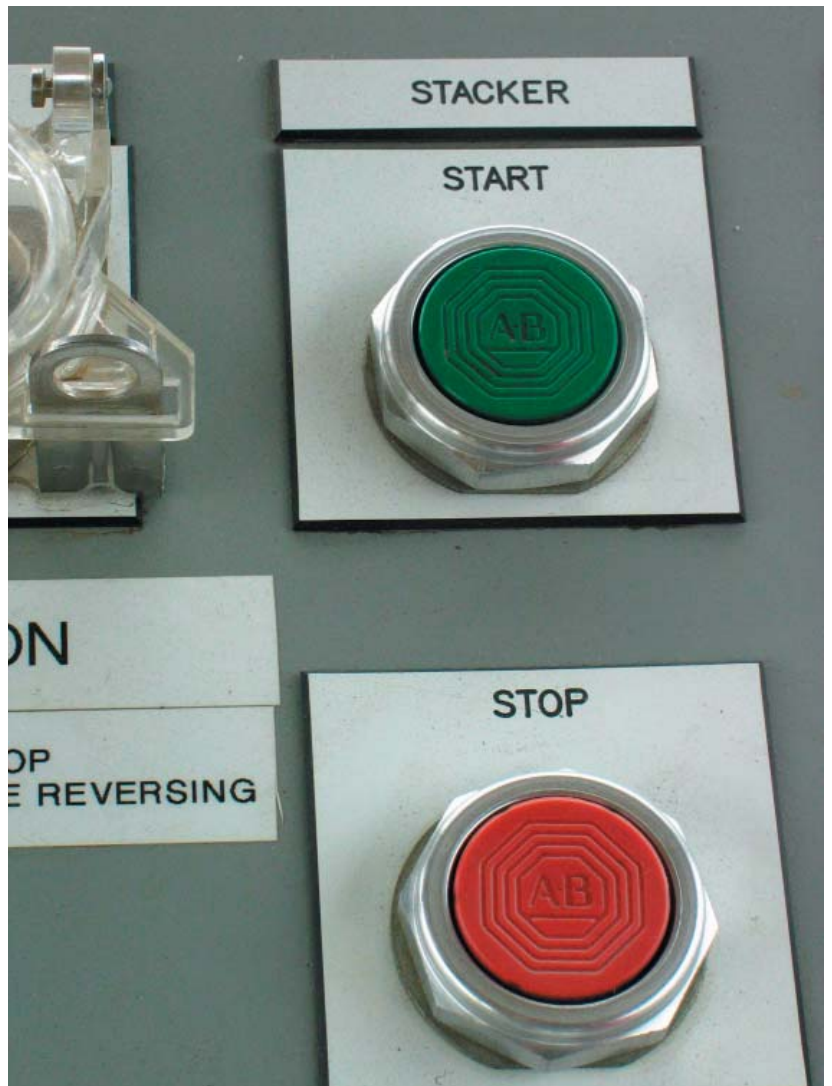


Figure 1: Location Map

EXECUTIVE SUMMARY



Materials Processing

In addition to the 50,000 cubic yards of materials already being processed annually, the BOM staff is seeking ways to process additional related “road waste” materials. This master plan illustrates how the expanded site can be developed to accommodate additional recycling operations. When fully implemented, the Sunderland Recycling Facility will achieve the goals identified in the introduction and will process for reuse the following transportation system generated materials:

- Leaves
- Concrete
- Asphalt
- Soil
- Street Sanding Material
- Street Sweepings
- Wood Materials
- Landslide Debris
- Ditch Cleaning Material (Future)
- Vector Waste (Future)

Preferred Site Plan

Figure 2 illustrates the preferred site plan for the expanded Sunderland site. The key elements of this plan are as follows:

1. All composting operations are to be concentrated on the southern portion of the property. This will provide the greatest operational efficiency as staff and specialized composting equipment (eg., scat, trommel) can be moved quickly between leaf composting and street sweepings treatment areas.
2. All asphalt and concrete crushing and aggregate screening operations are to be developed on the northern portion of the property. Again, this will allow for the greatest operational efficiency as the movement of equipment needed for these operations can be minimized.
3. One primary truck entrance is provided to ensure that all trucks entering and leaving the facility are routed via the scale station where loads can be weighed and inspected. A secondary truck entrance is also provided to ensure flexibility in the event of an emergency (eg., landslide material removal, ice storm sanding) when trucks must be operated on a fast turnaround basis.
4. A retail sales area is proposed at the south edge of the property, with an entrance separate from the truck entrance. The purposes of this sales area are threefold. First, to encourage the sale of recycled products. Second, to generate additional revenue to help offset processing costs. Third, to develop an educational outreach program to showcase the City’s progress in developing a sustainable transportation system.
5. The existing farmhouse is to be remodeled into an office and training center. The remodeled building will accommodate the needs of the Sunderland staff (eg., office space, mud room, lockers, restrooms, and lunch room). In addition, it will provide a training facility for PDOT employees.
6. When the temporary campground is relocated off-site, the master plan calls for recapturing the one acre site to accommodate proposed expansion of the composting operations.

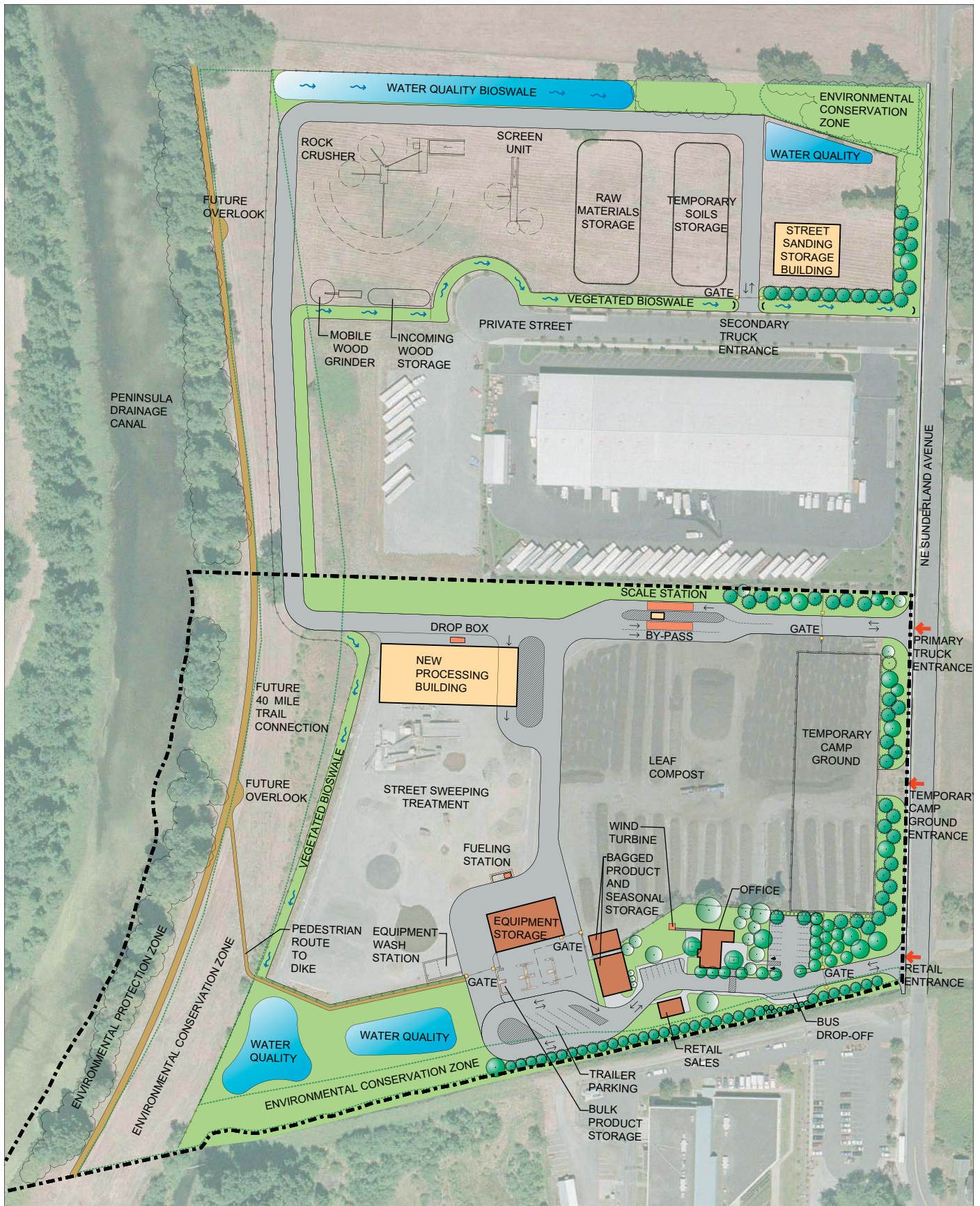


Figure 2: Master Plan

Cost Estimates

The estimated cost to fully develop the Sunderland Recycling Facility is approximately \$5,250,000. This cost estimate assumes that the City's standard bid process will be followed and the low bid private contractor will be selected to accomplish the work. The estimate also assumes construction in 2006 and includes construction, design services, permitting, and a 25 percent contingency. Additional detail on how these estimates were developed is included later in this report. Please note that this cost estimate was prepared at a planning level, and is not based on engineered construction documents. While this estimate is adequate for planning level decision making, more refined cost estimates will need to be prepared before making final construction decisions.

Training Opportunity for all Divisions within PDOT

The expansion of the site will offer training opportunities to BOM employees. The proposed training room can accommodate up to 30 people for safety discussions, classroom training, and staff meetings.

Phasing

The proposed master plan assumes that Oregon Department of Environmental Quality (DEQ) will agree to reclassify processed street sweepings in a manner that will allow for reuse of the processed material. However, until DEQ makes a final determination, it behooves the City to maintain flexibility in the layout of the Sunderland Recycling Facility. The improvements identified below as Phase One are those that can, and should, be accomplished in the near future. Phase Two improvements have a lower priority and can be accomplished when personnel and/or funding are/is available. Phase Three improvements should be deferred until an agreement is reached with DEQ. Figure 3 illustrates the proposed phasing of improvements.

Phase One Improvements (orange)

1. Construct the haul road linking the north and south segments of the site.
2. Relocate the primary truck entry approximately 80 feet to the north to maximize site utilization and allow a straight route to the weigh station.
3. Make appropriate changes at the temporary campground including: develop a new entrance, reconfigure the campground site slightly to accommodate emergency vehicles, and install fencing and a vegetated visual screen where appropriate.
4. Construct the truck scale station.
5. Reopen the south entrance to provide access to the office and retail sales area.
6. Renovate the office and training building.

Phase Two Improvements (purple)

1. Construct the office/retail sales area road, parking, and vehicle maneuvering areas. Landscape as appropriate.
2. Expand the retail sales operation including developing office, display, bagged product and seasonal storage areas.
3. Construct the pedestrian trail to the top of the dike.
4. Construct and vegetate the berm around the winter storm sanding material area (from the proposed secondary truck entrance to the environmental zone near the northeast corner of the property).
5. Install security fencing as necessary.
6. Construct an equipment wash station.

Phase Three Improvements (green)

1. Prepare the north annex site and consolidate the underlying soils using a “rolling preload” technique.
2. Install necessary utility services to serve the north annex site.
3. Pave the north annex area.
4. Relocate the rock crusher to the north site.
5. Erect the street sweepings/vactor waste processing building.
6. Erect the winter storm sand storage building.
7. Construct appropriate water quality enhancement facilities as needed. (eg., holding pond expansion, sedimentation pond construction, bioswale development).
8. Construct half street improvements on Sunderland Drive.
9. Install an above grade fueling station near the equipment maintenance building.

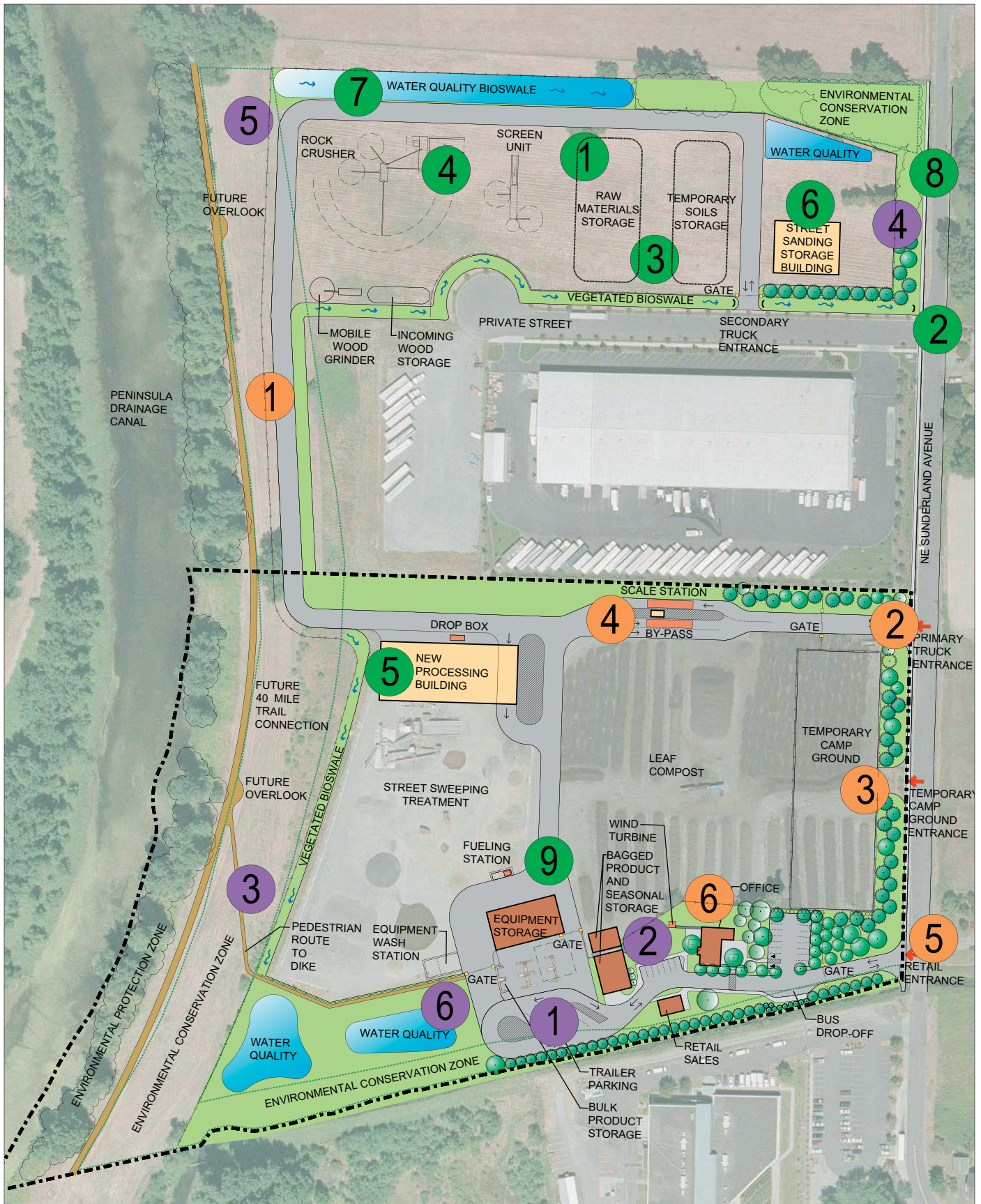


Figure 3: Phasing Plan



EXISTING CONDITIONS



EXISTING CONDITIONS

The Sunderland site is a 'C'-shaped land parcel fronting on NE Sunderland Avenue that contains approximately 35 acres. The southern 20.8 acres were purchased in 1997 and have been developed to accommodate current recycling operations. The northern 14.2 acres, including a narrow strip of land that connects to the southern property, were purchased in 2004 and have not been improved. The center of the 'C' is a privately owned parcel of land that has been developed to support Swartz Moving and Storage Company. Figure 4 illustrates the Sunderland site configuration.



Figure 4: Site Configuration

CURRENT USES

The southern portion of the site has been fully developed to accommodate leaf composting, concrete and asphalt crushing and street sanding recycling operations. The newly acquired northern portion of the site expansion area is grass covered and vacant.

The City's leaf composting operation is located on the east half of the developed property and occupies 3.5 acres of the site. Approximately 25,000 cubic yards of leaves are collected during the fall and early winter from city streets and brought to this site for processing. The leaves are stored in rows and turned periodically as the composting operation proceeds. During the composting operation, the volume decreases by a factor of five (from 25,000 cubic yards to 5,000 cubic yards). By the following summer, the leaf compost is ready for use. The composted and screened product is sold as either a straight leaf compost or as a constituent in a blended soil mixture containing soil, sand and compost.

Four storage buildings and a farm house existed on site when the property was acquired in 1997. A PDOT Structural Engineer conducted an inspection of the storage buildings in April 2005 and determined that two of them (Buildings 1 and 5) are in excellent condition and, with adequate maintenance, should remain useful for an additional twenty to thirty years. The other two buildings (Buildings 2 and 3) are nearing the end of their useful life and will probably need to be removed or replaced within the next five to ten years. See Figure 5.



Figure 5: Buildings

The farmhouse (Building 4) on the property when acquired is in reasonable condition and is being used as the Sunderland Recycling Facility office and employee building. Plans have been prepared to revamp this house to better serve employees and to provide a training facility for use by PDOT employees.

The lower level of the house is below the 100-year flood elevation as mapped by Federal Emergency Management Agency (FEMA). If remodeled, the lower level cannot be used as an "occupied floor" without extensive flood proofing. BOM is working with the Port of Portland and the Multnomah County Drainage District Number 1 to document to FEMA that the flood plain elevation can be lowered by approximately four feet. If FEMA agrees to modify the floodplain elevation, the lower level of the building can be remodeled without extensive flood proofing.

A rock crusher was installed near the west side of the developed portion of the site in 2002. This unit, together with its associated screening operation, allows concrete and asphalt to be crushed, graded for size, and stockpiled for reuse. Nearby bins hold incoming asphalt, concrete, soil, and large rock awaiting processing.

Truck driver training for snow and ice response and leaf collection are held at the facility annually. In addition to the annual training, periodic training events are held at the site. Examples of these training events are regional erosion control for public agencies and trench rescue for the Portland Fire Bureau. The facility is also used for skill testing for recruitment of new employees. The enlarged site with its road patterns, materials stockpiles, protective barriers, and open areas will provide flexibility to set up exercises, train truck drivers, loader operators, trackhoe operators and others in a safe, off street environment.

In 2001, the City Council directed that a portion of the leaf composting area be set aside for an experiment in community living by homeless adults. An area of approximately one acre has been set aside and now accommodates 60 people in transitional housing. On February 26, 2004, the Council passed a resolution zoning this area as a campground. The infrastructure for the campground will be constructed as part of the first phase of development under this master plan.

SURROUNDING LAND USES

Nearby land uses include the Columbia River Correctional Institute located to the South, vacant Port owned land to the north and east, a single family residence to the east, Oregon Army National Guard to the far northeast, and the Peninsula Canal, a golf course, and single family residences to the west. Swartz Moving and Storage is located in the center of the 'C'-shaped Sunderland site. Figure 6 illustrates the location of these nearby land uses.

The Port of Portland has been purchasing land in the vicinity of Sunderland Recycling Facility primarily to control the types of land uses developed in proximity to airport runways. At present, the Port owns or controls the land to the north of the Sunderland site and most of the land on the east side of Sunderland Avenue. Port officials have indicated that while the land owned by the Port is not for sale, it may be possible to lease land for uses deemed to be compatible with airport operations.

A single family residence is located on the east side of Sunderland Avenue. In the long term, it is likely that the Port will acquire this property on a willing seller-willing buyer basis. In a conversation with the owner, it appears that the current Sunderland operations are compatible with living in this residence. So long as a visual buffer is included as part of the development of the expansion area, it appears that the owner of this residence will accept expansion of the Sunderland facility.

The dike and Peninsula Canal to the west of the site provide both vertical separation (the dike top is some 22 feet above the Sunderland site) and some 900 feet of horizontal separation between Sunderland activities and the nearest residence to the west. Given the vertical and horizontal separation, it is highly unlikely that Sunderland activities will have any impact on land uses west of the canal.

Of all the adjacent land uses, Swartz Moving and Storage is likely to be most impacted by expansion of the Sunderland facility. Swartz officials indicated that they are pleased with the cleanliness of the Sunderland facility and do not have a problem with expansion to the newly acquired 14.2 acres. They also accept the campground for what it is, attempting to aid homeless individuals. However, these officials indicated in strong terms that Swartz will not accept relocation of the campground to the expansion area. They also noted that the existing shared private road represents an integral part of their operation and must not be compromised. Long haul truck drivers arrive at all hours (24/7) and need a place to temporarily park while awaiting a time slot for loading and unloading.

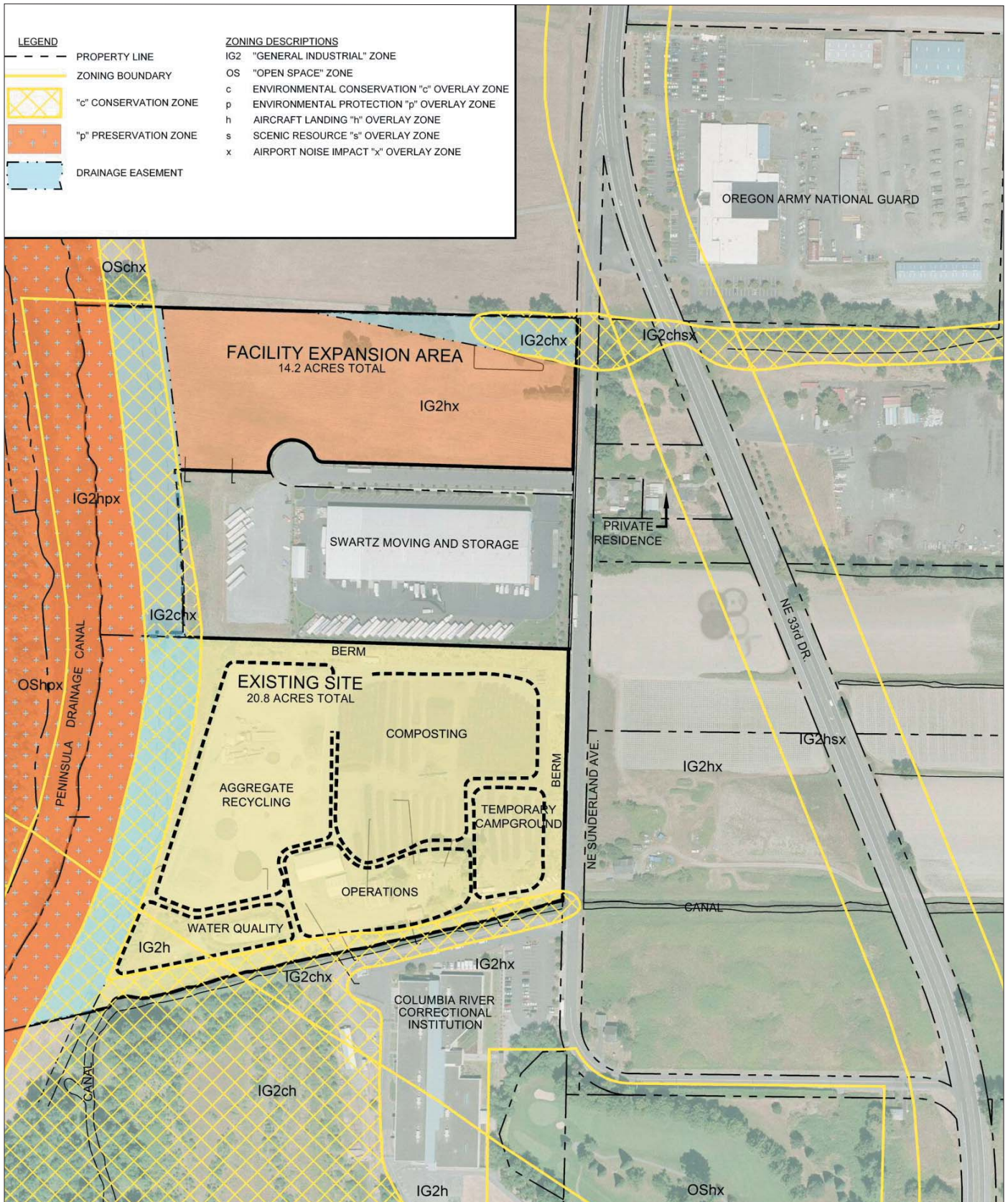


Figure 6: Land Uses

ACCESS AND CIRCULATION

The site is accessible from NE 33rd Drive, which is classified as a neighborhood collector/minor transit street. NE 33rd connects to Marine Drive at the north and to Columbia Boulevard at the south. NE Sunderland Avenue is an ‘L’-shaped street that connects to NE 33rd both north and south of the Facility. Sunderland Avenue is classified as a minor transit street. Due to an understrength culvert under Sunderland Avenue at the south edge of the Facility, weight is limited to 50,000 pounds. Heavier trucks are routed via the north connection to 33rd Drive.¹

The intersection of Marine Drive (which is a through route) and 33rd Drive (which is stop sign controlled) appears to function adequately at present, but is reported to be nearing capacity during peak hours. As general traffic volumes increase, it is likely that at some point in the next 10 years intersection improvements will be needed. Figure 7 illustrates access considerations.

There are two points of access to the southern portion of the site. At present, the south driveway is used for access to the campground and is not available to serve the Facility. The north driveway is the main site access and serves both inbound and outbound traffic. This creates a safety issue in that visitors destined for the office must drive through an operational area before arriving at the office. The newly acquired expansion site abuts both Sunderland Avenue and a private street that forms the southern edge of the newly acquired site. Access to this portion of the site is available either directly from Sunderland Avenue, or preferably, from the private street.

The “flag strip” that is part of the 14.2 acre purchase provides a connection between the north and south parcels of the Facility. A haul road will need to be constructed across the flag strip to link the two portions of the site and to allow for the movement of off-road equipment and trucks.

TRIP GENERATION

Each year some 50,000 cubic yards (CY) of material are brought to Sunderland Recycling Facility for processing and recycling. Of this total, fully 50 percent of the incoming material is leaves. Composting reduces leaf volume to roughly 20 percent of its original size (25,000 CY of leaves becomes 5,000 CY of compost). After processing, approximately 30,000 CY of material is available annually for reuse. Assuming that a typical truckload contains roughly 10 CY of material, approximately 5,000 truckloads of raw material are brought to the Facility annually, and 3,000 truckloads of processed material leave the yard annually.

In some situations, trucks bringing in raw material are reloaded with finished product to take back to a job site. This is clearly an efficient way to operate as the truck is fully loaded in both directions. However, due to the needs of the individual job sites, for the most part, trucks operate loaded one way and empty the other way. While no records are available, the Sunderland Recycling Facility staff estimates that none of the leaf hauling trucks back haul finished products and approximately 20 percent of the other trucks are loaded both ways. Based on this loading assumption, the following chart shows the estimated number of trucks entering and leaving the Facility monthly, daily (assuming 22 working days per month), and hourly (assuming an eight-hour work day).

¹ As there are two ways to reach properties along Sunderland Avenue, PDOT has assigned a low priority to replacing the weight limited culvert.

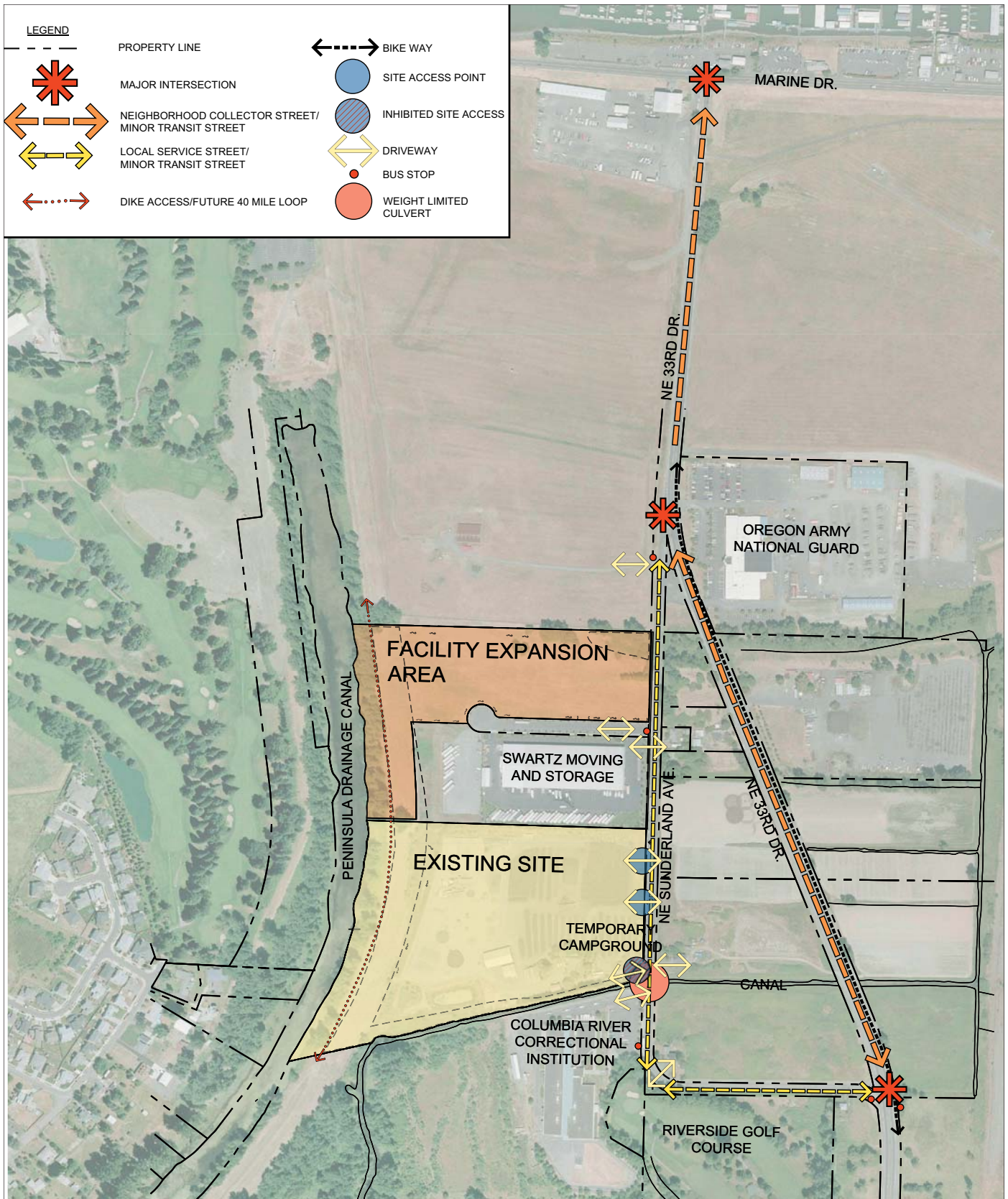


Figure 7: Access and Circulation

Month	No. of Trucks Incoming				Outgoing				Raw Monthly Total	Reduction for loaded backhaul *	Net Monthly Total	Average Daily Traffic **	Avg. Hourly Traffic ***
	Leaves	Asphalt	Concrete	Grindings	1 1/2 ' Rock	Compost	Blended Soil	Sand					
JAN	450	115	43	319	39	17	26	25	1034	(117)	917	42	5
FEB	0	109	52	27	48	22	12	79	349	(70)	279	13	2
MAR	0	120	58	27	51	30	25	79	390	(78)	312	14	2
APR	0	110	49	27	51	33	31	79	380	(76)	304	14	2
MAY	0	44	52	19	53	29	35	85	317	(63)	254	12	1
JUN	0	66	61	122	55	21	42	113	480	(96)	384	17	2
JUL		66	77	122	58	17	45	113	498	(100)	398	18	2
AUG	0	29	65	53	44	40	51	113	395	(79)	316	14	2
SEP	0	14	59	10	52	22	53	11	221	(44)	177	8	1
OCT	100	42	47	12	48	3	33	12	297	(39)	258	12	1
NOV	1250	113	42	1	52	8	21	14	1501	(50)	1451	66	8
DEC	700	125	39	63	49	13	23	20	1032	(66)	966	44	5
Annual Total	2500	953	644	802	600	255	397	743					

* Best Judgment from Sunderland Staff
** Assumes 22 working days/month
*** Assumes 8 hours/day

Trip Generation

SOILS

The site is in a lowland area adjacent to the Columbia River. Its soils are fine grained river deposited materials. Most of the site is underlain with Sauvie Series soils which are saturated in the winter and dry somewhat in the summer. These soils have low strength and moderate shrink-swell characteristics. A small portion of the newly acquired 14.2 acres is underlain with Rafton Silt Loam which is saturated year round. These soils also have low strength.

Pavement and structural design needs to take into account the low strength of site soils, as imposition of heavy loads (i.e. materials stockpiles) leads to settlement and subsequent surface ponding. BOM has a complete geotechnical report on this site and will comply with its recommendations to ensure a level and well-constructed paved surface.

UTILITIES

City water mains, sanitary sewers, and storm drainage pipes are located in Sunderland Avenue adjacent to the Facility (see Figure 8).

A 12-inch City water main is available which is more than adequate for the Facility's needs. At the elevation of the site, this main operates with a static pressure of 86 to 107 PSI, and nearby fire hydrants have been flow tested at 1565 gallons per minute (GPM). There are four fire hydrants on Sunderland Avenue, located as shown on Figure 8. A four-inch fire main loop has been installed around the developed portion of the site with hose connections installed at locations determined by the Portland Fire Bureau.

A 12-inch sanitary sewer is available in the street which has adequate capacity to accommodate the needs of the Columbia River Correctional Institute as well as the Facility. The existing office and employee facility is connected to this sanitary sewer.

Runoff from the leaf composting operation is held in an aeration pond before being pumped to the sanitary sewer in Sunderland Avenue. This holding pond has a surface area of approximately 8,500 square feet and contains four aerators and a pump. To avoid overloading the sanitary sewer, the pump output is limited to a flow rate of 341 GPM.

A 42-inch storm sewer has been installed in Sunderland Avenue which has capacity to serve Swartz Moving and Storage and the newly acquired expansion site. This storm line discharges to the drainage ditch located along the south side of the developed recycling facility.

The west portion of the developed site contains the rock crushing equipment plus raw and finished materials stockpiles. This portion of the site drains to a vegetated constructed wetland which treats the runoff before it is discharged into the adjacent drainage ditch.

The drainage ditch flows southwesterly across Riverside Golf and Country Club to Pump Station Number 2, which is maintained by Multnomah Drainage District Number 1. This pump station was recently upgraded and now can hold a 100 year, 24-hour design storm to a maximum surface elevation of 10 feet NGVD (11.4 feet COP datum).

Electric power is available from PP & L from aerial service along Sunderland Avenue. Aerial service is brought into the developed portion of the Facility in the vicinity of the office. The existing PP & L service is adequate to accommodate both existing and proposed development at Sunderland Recycling Facility.

Telecommunications service is available from Qwest via aerial service from Sunderland Avenue. The existing service capacity is adequate for both the existing and proposed development on site.

Natural gas service, while not currently used on site, is available from Northwest Natural via a 4-inch main located in Sunderland Avenue. Available capacity should be adequate for both existing and proposed development.

REGULATORY ORGANIZATIONS

There are a number of regulatory and other organizations that have some degree of oversight of activities and development that takes place at the Sunderland Recycling Facility. These organizations include the Federal Aviation Administration, Oregon Department of Environmental Quality, Bureau of Development Services, Bureau of Environmental Services, Water Bureau, Fire Bureau, Bureau of Parks and Recreation, METRO, Port of Portland, and Multnomah Drainage District Number 1. The current facility was developed in compliance with requirements in place at the time approvals were attained.

Expansion of the Facility to include the newly acquired 14-acre site will have to meet current regulatory standards. Regulatory requirements associated with site expansion will be discussed in a later portion of this master plan report.

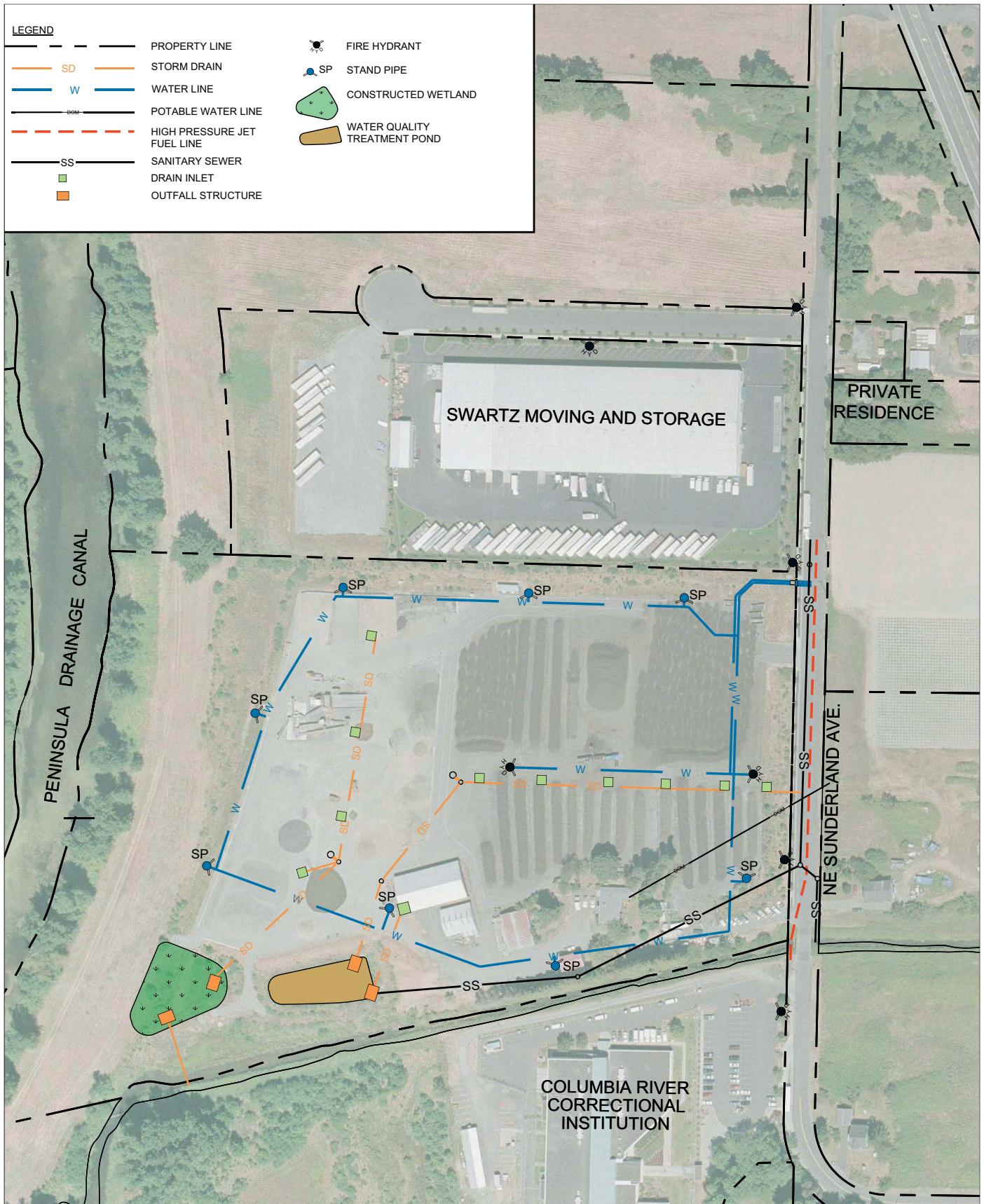


Figure 8: Utilities



MASTER PLANNING PROCESS



GOALS

The master planning process began with a series of meetings with BOM staff to discuss project goals, review current activities performed on the site, and to discuss possible additional reuse/recycling activities that might be accommodated on the expansion area. As described earlier, the project goals are to:

- To expand reuse/recycling of City generated “road waste” materials
- To reduce the amount of City generated material destined for a landfill
- To reduce the purchase of virgin materials
- To showcase what can be accomplished toward achieving a sustainable transportation system

A list of possible additional reuse/recycling activities was developed by the BOM staff. While not all of these activities can be located on the site, it seemed appropriate to evaluate the entire list at a conceptual level. With further evaluation and review by the BOM staff, the following uses were identified as appropriate for the site and compatible with project goals:

- Street sweeping material processing for reuse
- Woody material grinding and reuse
- Training opportunity for City employees during site development
- Hiring process testing site for City field personnel and training as currently being done on site
- Enhanced materials screening flexibility (wider range of products)
- Expand recycled materials marketing and sales (to government entities, contractors, and private individuals)

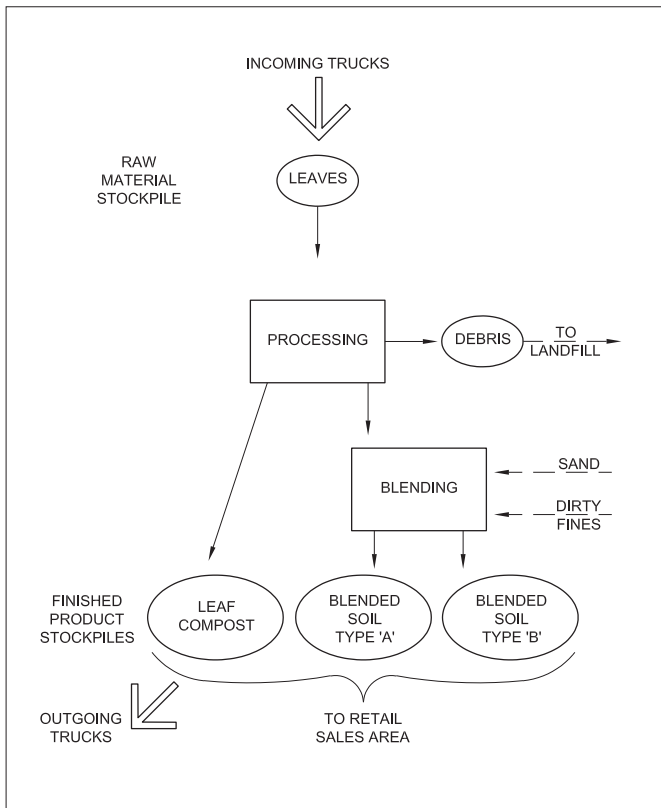
- Potential future use operations include dewatered vector debris processing for reuse
- Potential future use operations include ditch cleaning material processing and reuse

MATERIALS PROCESSING

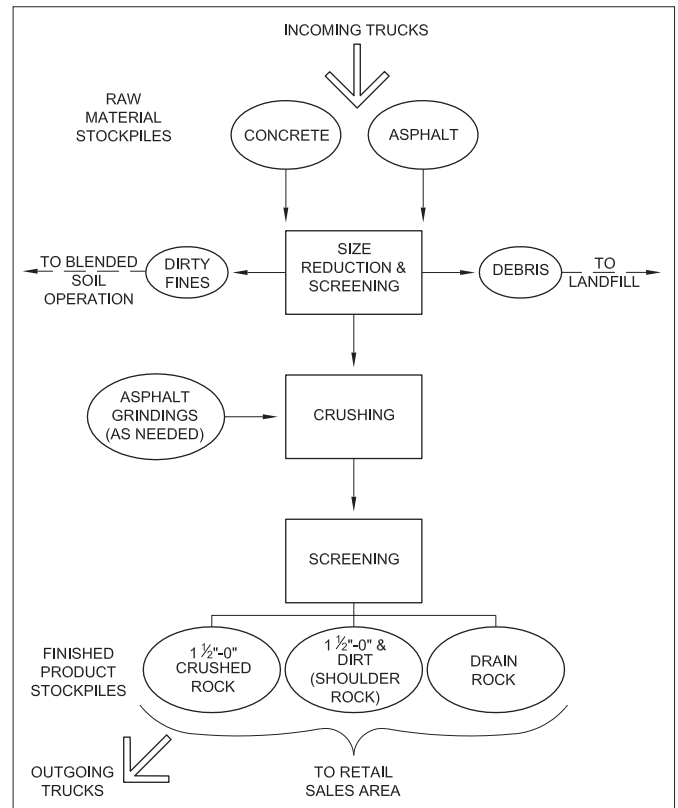
Process Flow diagrams have been developed for current, proposed, and potential future operations (i.e.: street sweepings, vector waste, woody debris, and ditch cleaning materials). The accompanying diagrams illustrate the steps involved in processing materials from arrival at Sunderland Recycling Facility through completion of processing and hauling of recycled products from Sunderland Recycling Facility. Miscellaneous inputs (such as compost or sand) and outputs (such as debris to a landfill) are also noted.

These diagrams also suggest that, for operational efficiency, certain activities should be located in close proximity to each other. When practical, these adjacencies should be accommodated to minimize unproductive time as personnel and equipment move between operations.

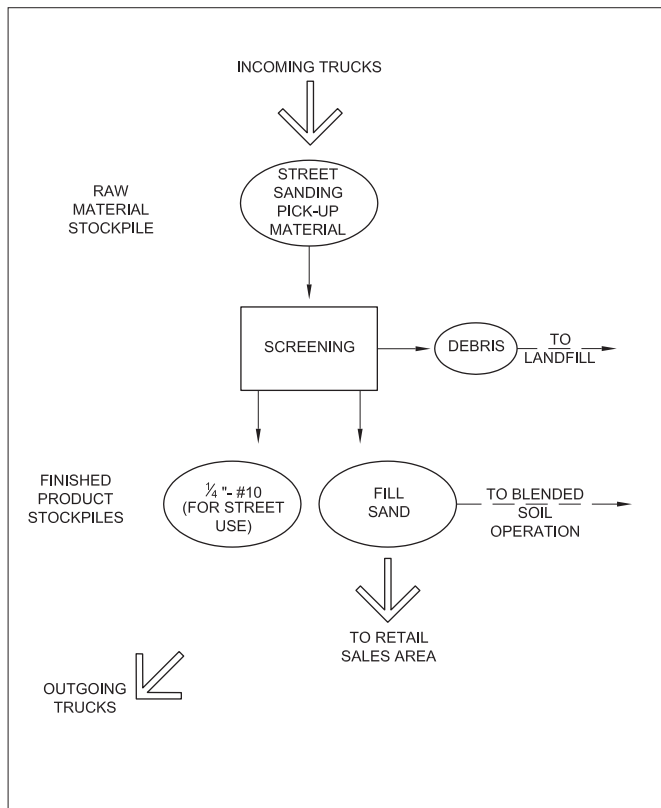
PROCESS FLOW DIAGRAMS



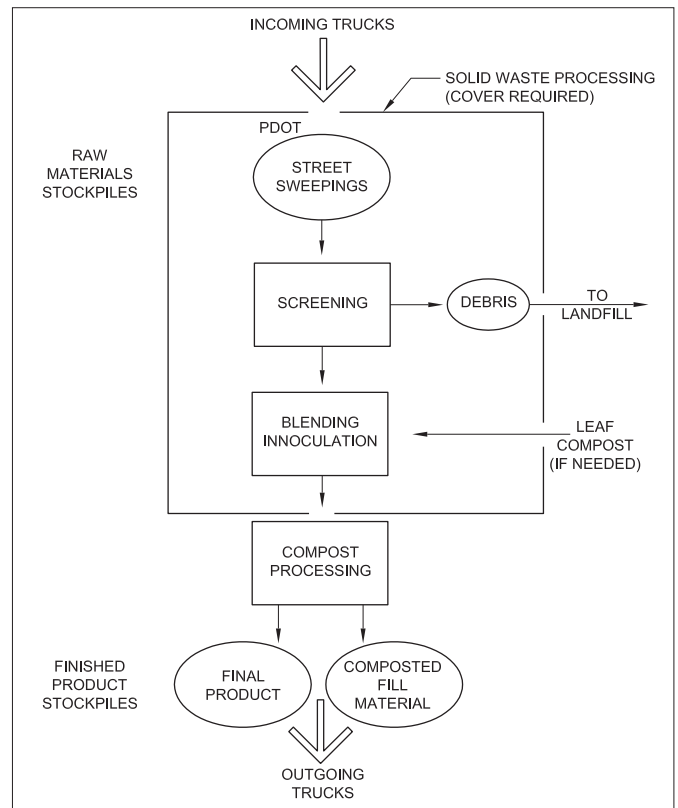
Leaf Compost



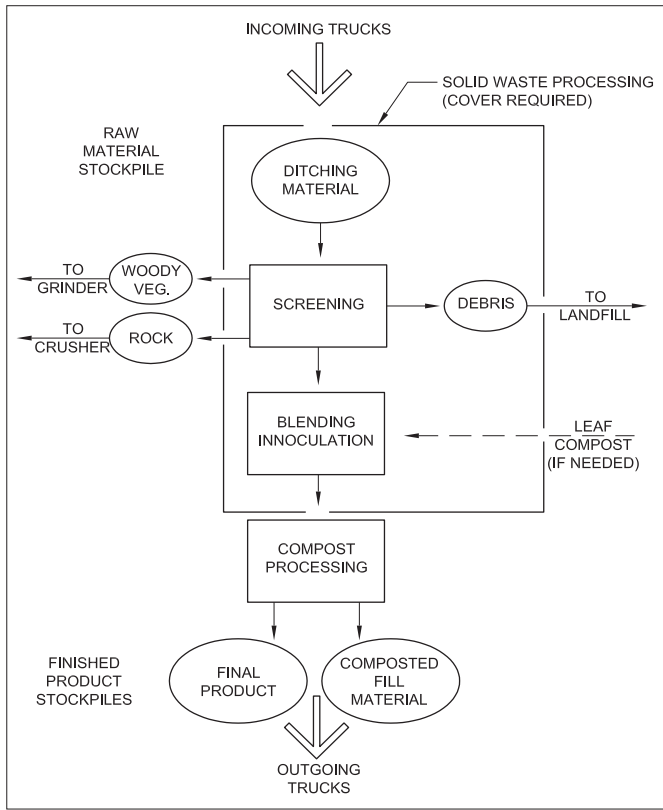
Crushed Rock



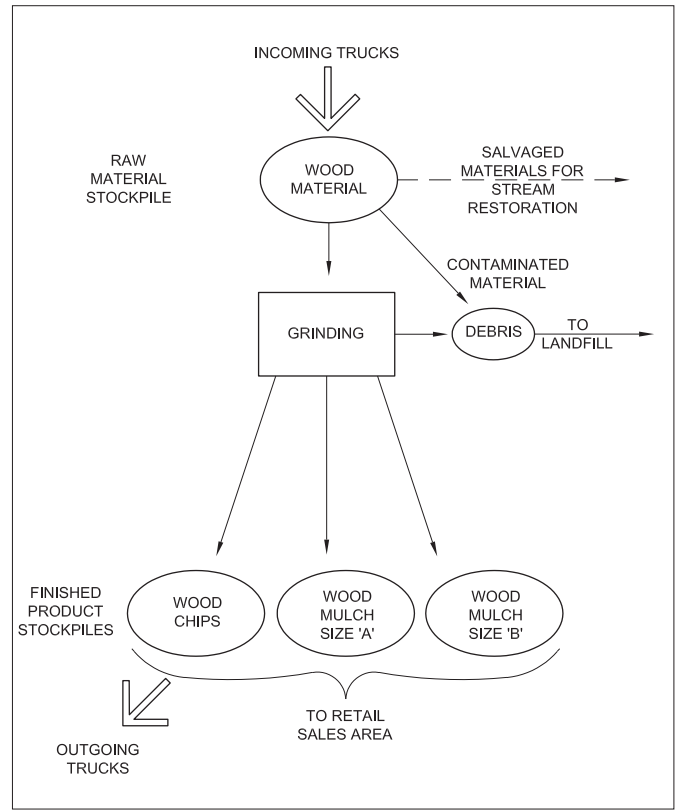
Street Sanding



Proposed Street Sweepings



Ditch Cleaning



Wood Materials

ALTERNATIVE SITE PLANS

In developing alternative site plan concepts for the expanded site, it became clear that there are two basic approaches that work, given the ‘C’ shape of the property and the location of existing improvements. Operations Concept 1 (See Figure 9) leaves the southern portion of the property more or less as is. The northern portion is developed to accommodate street sweeping and seasonal woody debris grinding. Operations Concept 2 (See Figure 10) relocates the concrete and asphalt crushing operation to the northern portion of the site. Seasonal woody debris grinding would be located on the northern portion of the site. The area vacated by the crushing operation is then developed to accommodate street sweeping.

Both concepts have merit and drawbacks. The following discusses positive and negative attributes of each.

Concept 1 leaves existing operations in place, minimizing expansion costs and allowing existing operations to proceed unencumbered. The proposed street sweeping operation can be developed as a “clean slate,” allowing flexibility to develop an efficient layout and tailor improvements to exact needs. On the negative side, staff and equipment would need to move periodically between the north and south portions of the site leading to operational inefficiency. In addition, the collection, retention and treatment of stormwater would be required. This would be a substantial financial investment and would take up valuable space. Also the City’s 100-foot setback requirement for “solid waste” operations limits the net acreage available for street sweeping activities. See Figure 9.

Concept 2 requires a greater capital investment, in that the rock crusher and associated equipment and services would be relocated to the north annex. On the positive side, all of the composting operations will be located side-by-side, reducing the time required to move people and equipment back and forth between leaf composting and street sweeping composting. Other positives are that screening and setback requirement are already in place, and the existing stormwater holding pond can be easily enlarged (or duplicated) to accommodate increased runoff. As the stormwater collection facility is already connected to the sanitary sewer, only minor changes to the pump are likely to be required. A final benefit is that the net area available for “composting and treatment” activities is somewhat larger than for concept 1 resulting in an ability to process a greater volume of material for reuse. See Figure 10.

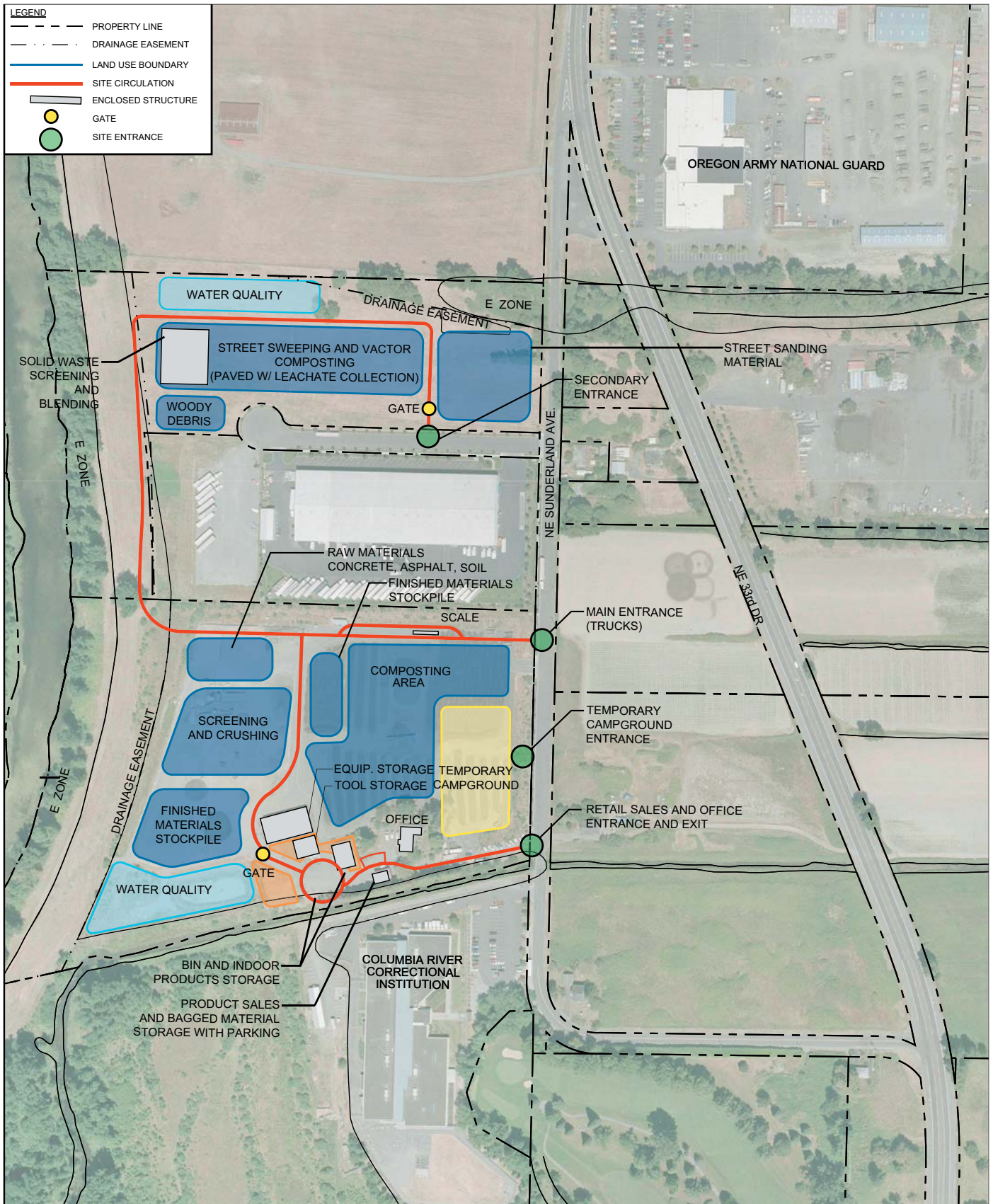


Figure 9: Operations Concept 1

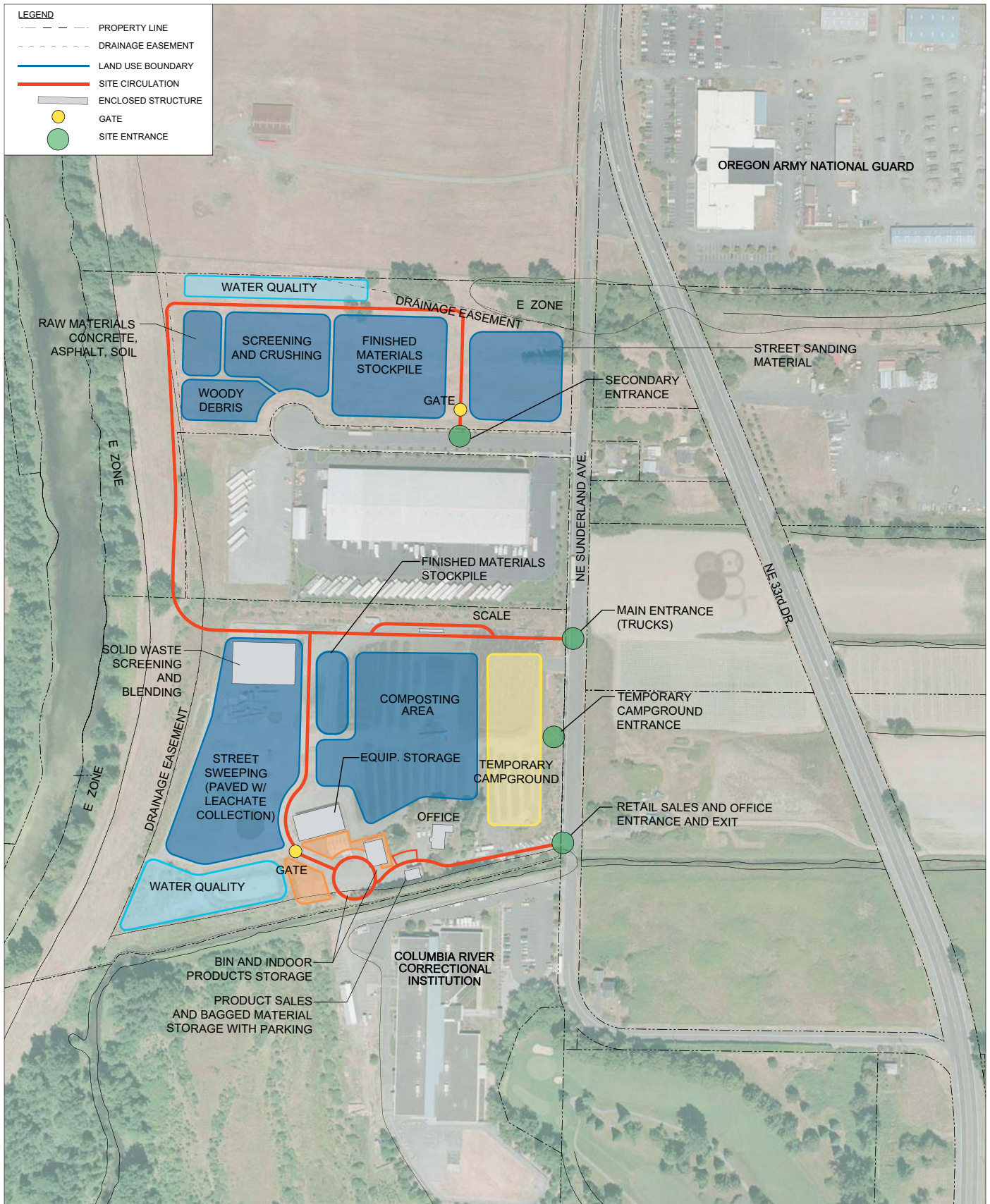


Figure 10: Operations Concept 2

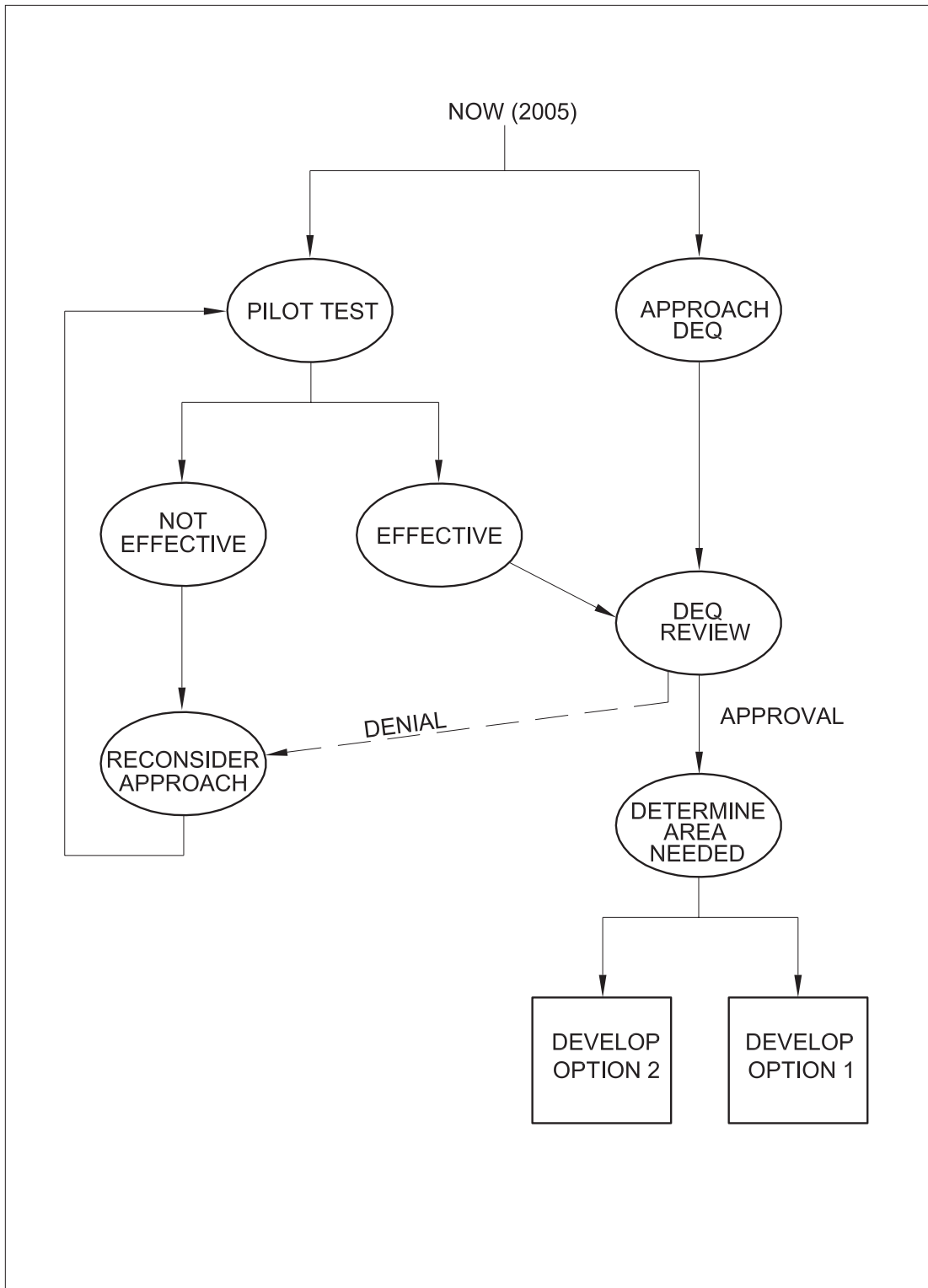
PERMITTING AND PILOT TESTING OF STREET SWEEPING DEBRIS

Transportation agencies generate street sweeping debris through routine sweeping and cleaning of their street systems. PDOT generates approximately 25,000 cubic yards of street sweeping debris each year. Street sweepings are defined as “solid waste” by Oregon Administrative Rules and disposal at an Oregon Department of Environmental Quality (DEQ) permitted solid waste management facility is required. For most transportation agencies this means disposal at a local landfill. Annual disposal of 25,000 yards of PDOT street sweepings at a landfill will impact landfill capacity and cost PDOT 1.1 million dollars annually. PDOT has a need for developing sweeping debris management alternatives that are affordable, meet DEQ disposal requirements, and keep excess street sweepings from filling local landfills.

PDOT has put considerable effort into researching and developing new ways to dispose or manage street sweepings. One promising alternative is to use treated street sweepings as a daily cover at solid waste landfills instead of the required 6 inch layer of soil. In the summer of 2005 BOM, in cooperation with ODOT and with the support of METRO and DEQ, conducted a pilot project that will be the foundation of a PDOT application for designation of treated street sweepings as an approved Alternative Daily Cover Material (ADCM). To be approved, the treated sweepings must perform all functions of daily cover as specified by 40 CFR 258.21 (ie., control disease, vectors, fires, odors, blowing litter, and scavenging). The result of this project is setting the stage for additional reuse options for street sweeping debris.

PREFERRED CONCEPT

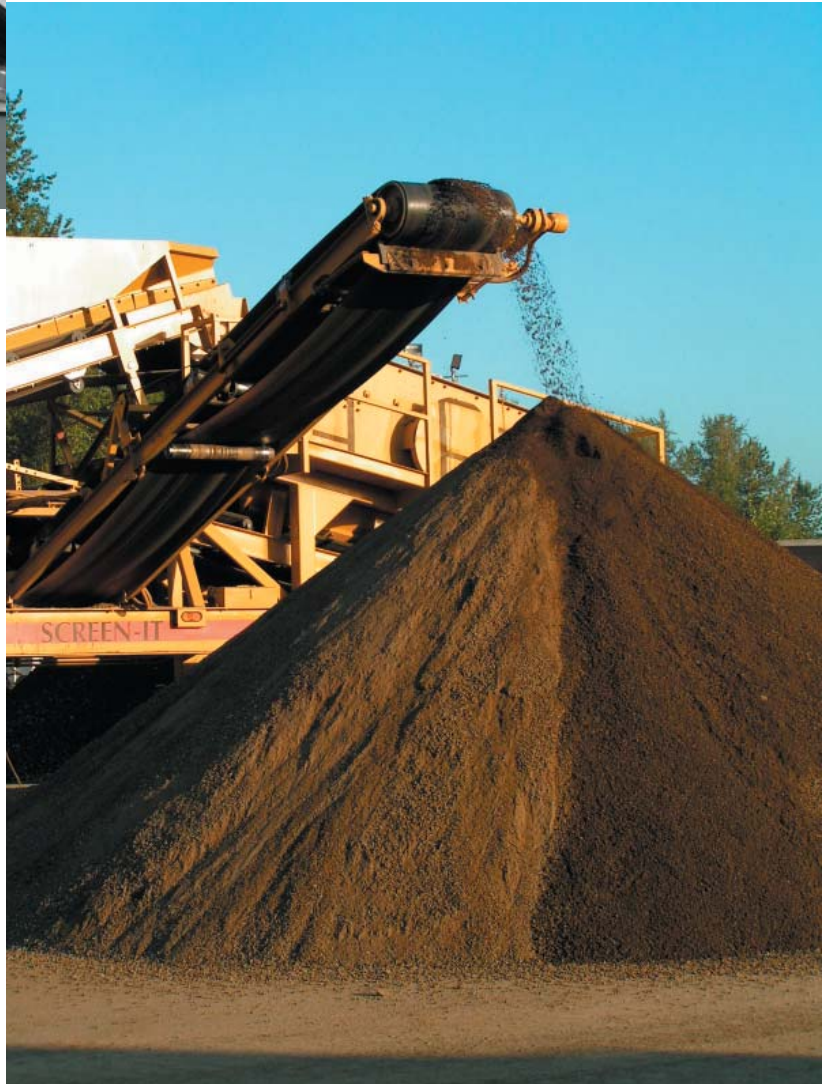
After lengthy discussion of the merits and drawbacks of the alternate concepts, and the uncertainties associated with pilot testing and DEQ approval, the BOM staff concluded that Concept 2 will better accommodate the City’s reuse/recycling goals. Therefore, the consultants were directed to proceed with further development of Concept 2, but with the understanding that early improvement actions are not to foreclose the ability to switch to Concept 1, should that become necessary. The following “decision tree” illustrates in a simple graphic manner the process that will need to be followed in order to reach a conclusion as to which alternate will be most appropriate for the site. The next section of this document covers refinement of Concept 2, identifies elements common to both concepts (ie., potential early implementation actions), develops preliminary construction cost estimates, and recommends implementation phasing.



Street Sweepings Decision Tree



MASTER PLAN DESCRIPTION



PREFERRED SITE PLAN

Figure 11 illustrates a refined version of Concept 2 which was described in the previous chapter. As noted previously, there is a great deal of commonality between the two concepts. The differences revolve around whether the street sweeping operation is located on the existing site or is developed on the expansion site.

The next portion of this chapter describes and illustrates the elements common to both concepts.

COMMON ELEMENTS

Entrances and Circulation

Four entrances are proposed to serve the expanded facility. The entrance to the existing site is proposed as the main truck entry and exit. This driveway is proposed to be relocated approximately 80 feet to the north to better align with the internal circulation road. The scale station is proposed to be located along the internal road, set back from Sunderland Avenue at least 200 feet to provide stacking space for trucks awaiting weighing.

The south entrance, which now provides access to the campground, is proposed to be recaptured to provide access to the office/training center and proposed retail sales area. This entrance will also provide a second means of egress should the main entrance be blocked.

The campground entrance is proposed to be relocated to a point midway between the main truck entry and the south entry. This will provide a separate, easily identifiable entrance to the campground while freeing up the south entry to accommodate Sunderland Recycling Facility operations.

The street access to the north site from the private road is proposed as a secondary truck entrance and exit. This entry is proposed to be normally closed to ensure that trucks enter and exit via the weigh station. When appropriate, this entry can be opened to expedite truck movement, and provide an additional means of exiting the north site.

The on site circulation system is essentially the same between the two concepts and includes a route between the scale station and the retail sales areas, a route along the base of the dike which links the existing site and the expansion site, and a link that serves the expansion site and connects to the private road.

Road Link Along Base of Dike

A connection is needed to join the existing and newly acquired sites to allow off-road equipment, trucks, and Facility personnel to move between the two areas without the necessity of using Sunderland Avenue. Because of the location of property lines, it will be necessary to construct this road at the toe or base of the dike. Multnomah County Drainage District staff have indicated that such a road is acceptable, provided that the road section is developed through the use of imported fill rather than cutting into the existing dike. Actual design and construction details will need to be worked out between the BOM and Multnomah County Drainage District No. 1 staffs. The following cross-section (see Figure 12) illustrates a conceptual design that is likely to be acceptable to the drainage district staff.

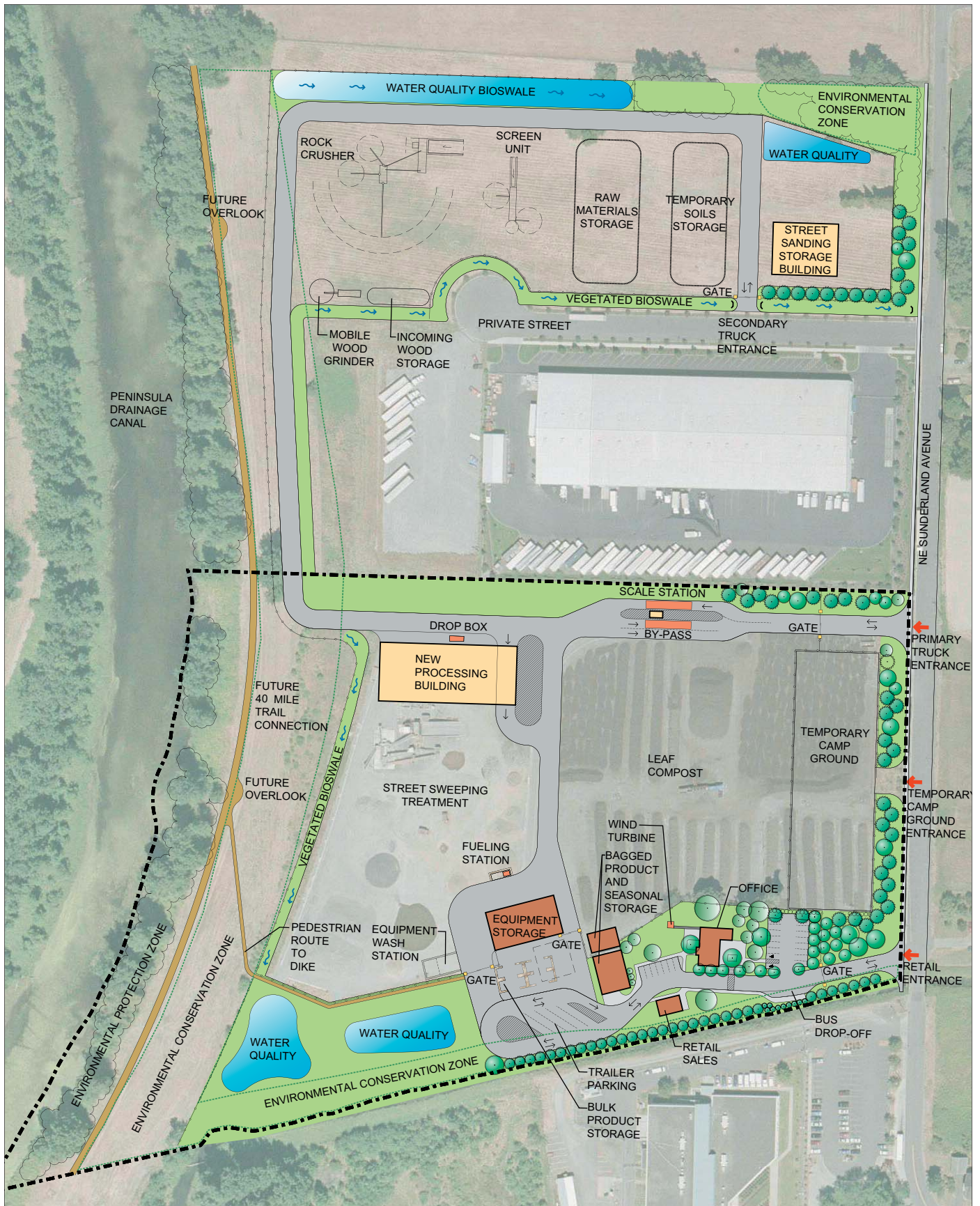


Figure 11: Master Plan

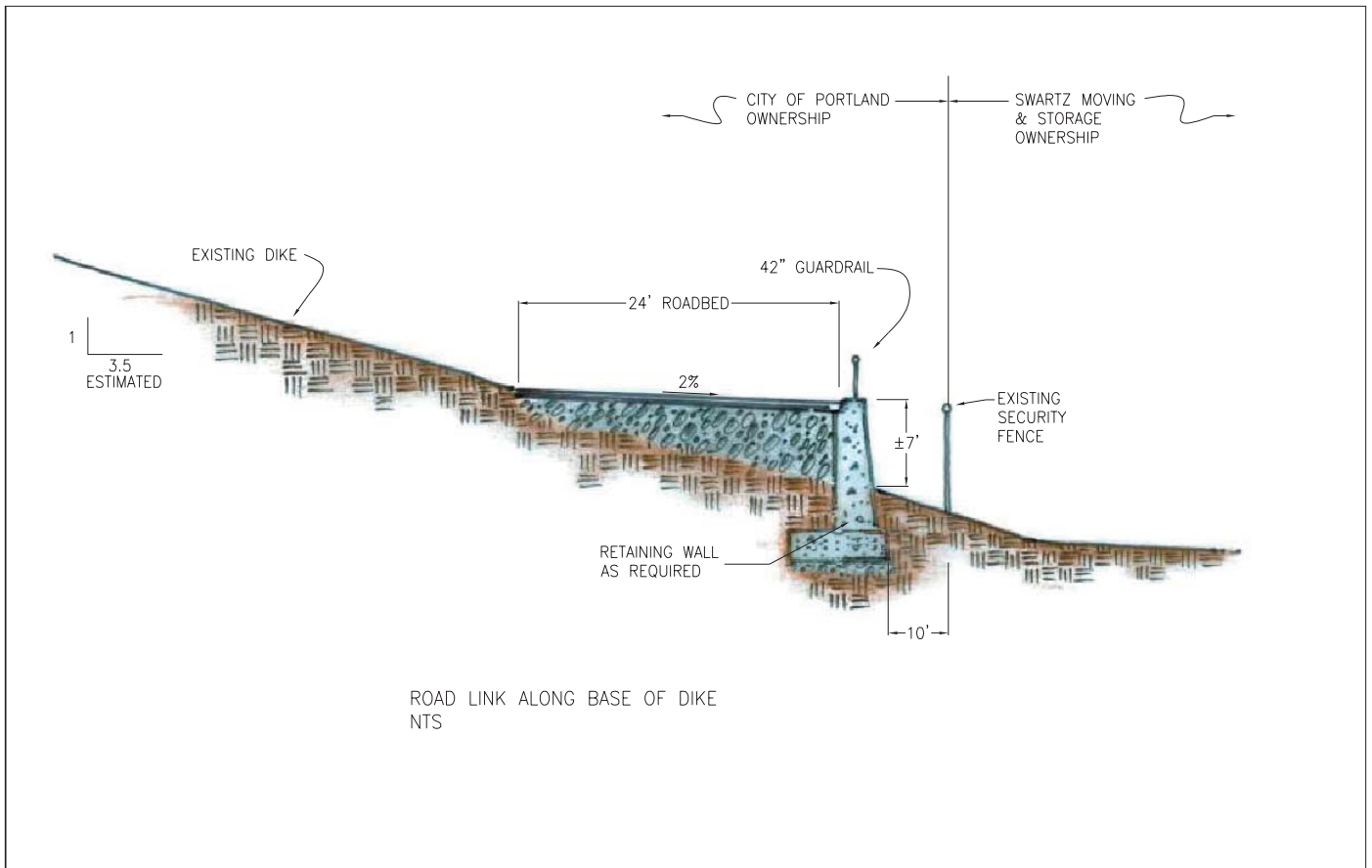


Figure 12: Road Cross Section

Truck Weighing

At present, the BOM staff estimates the amount of material brought to the Sunderland Recycling Facility and the amount of processed material that leaves the Facility. In order to more accurately track material, and therefore productivity, costs, and charges, it is necessary to be able to weigh inbound and outbound trucks. A raised platform truck scale station is proposed to be located approximately 200 feet inside of the main entrance. An existing trailer already on site can be used as a scale house.

Office and Training Center

The existing farmhouse (Building Number 4 on Figure 5) is proposed to be remodeled to accommodate the needs of the Facility staff (mud room, lockers, restrooms, office and lunchroom) as well as provide an additional training facility for the use of PDOT employees. In 2003, Browning Shono Architects, LLP were retained to design the house remodel. The architect's preliminary revisions call for developing a training room which is sufficient to accommodate up to 30 people for training sessions. Figures 14 and 15 illustrate the proposed exterior elevations of the remodeled farmhouse.

Proposed site improvements associated with the office and training center include 23 parking spaces, an outdoor terrace for staff lunch breaks and as a breakout space between training sessions, an ADA accessible route to the training center, and appropriate landscape enhancement. The parking spaces are intended to accommodate multiple users, including Facility employees, training center attendees, and retail sales visitors. Figure 13 illustrates the proposed office and training center site plan.

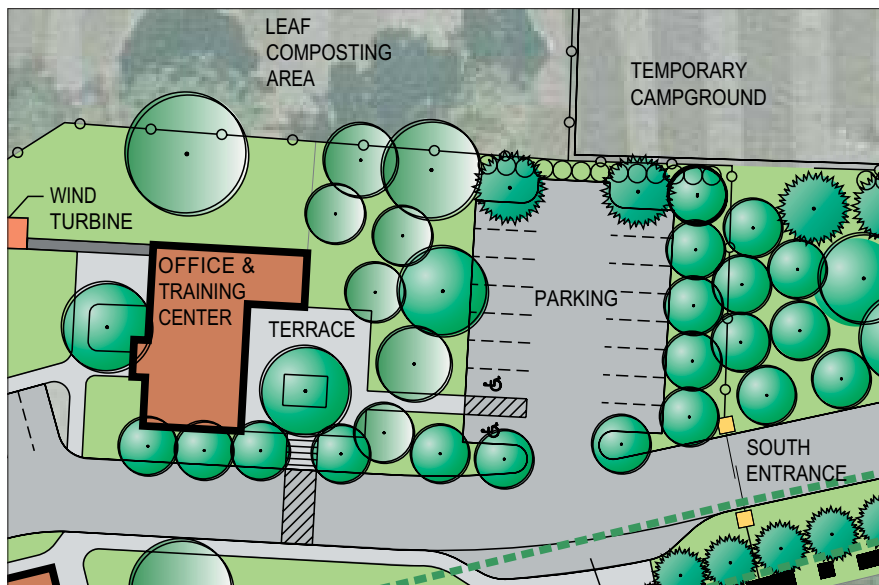
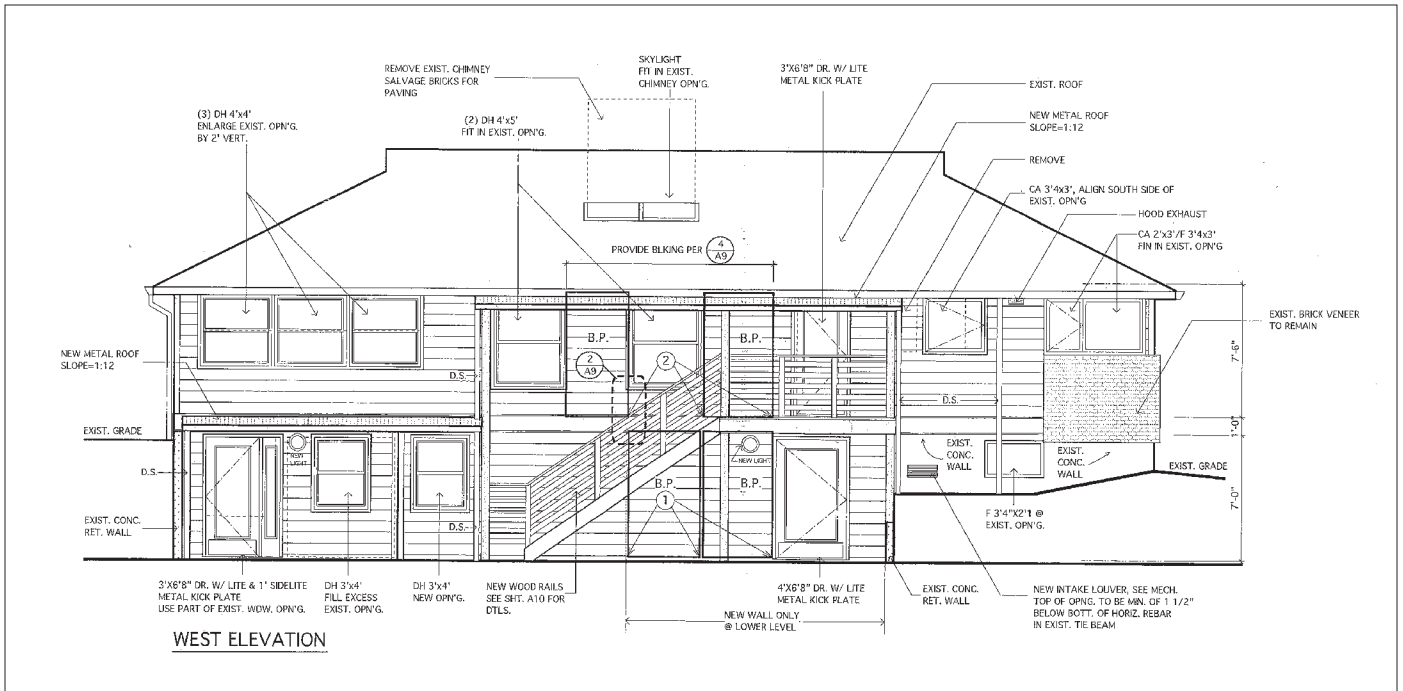
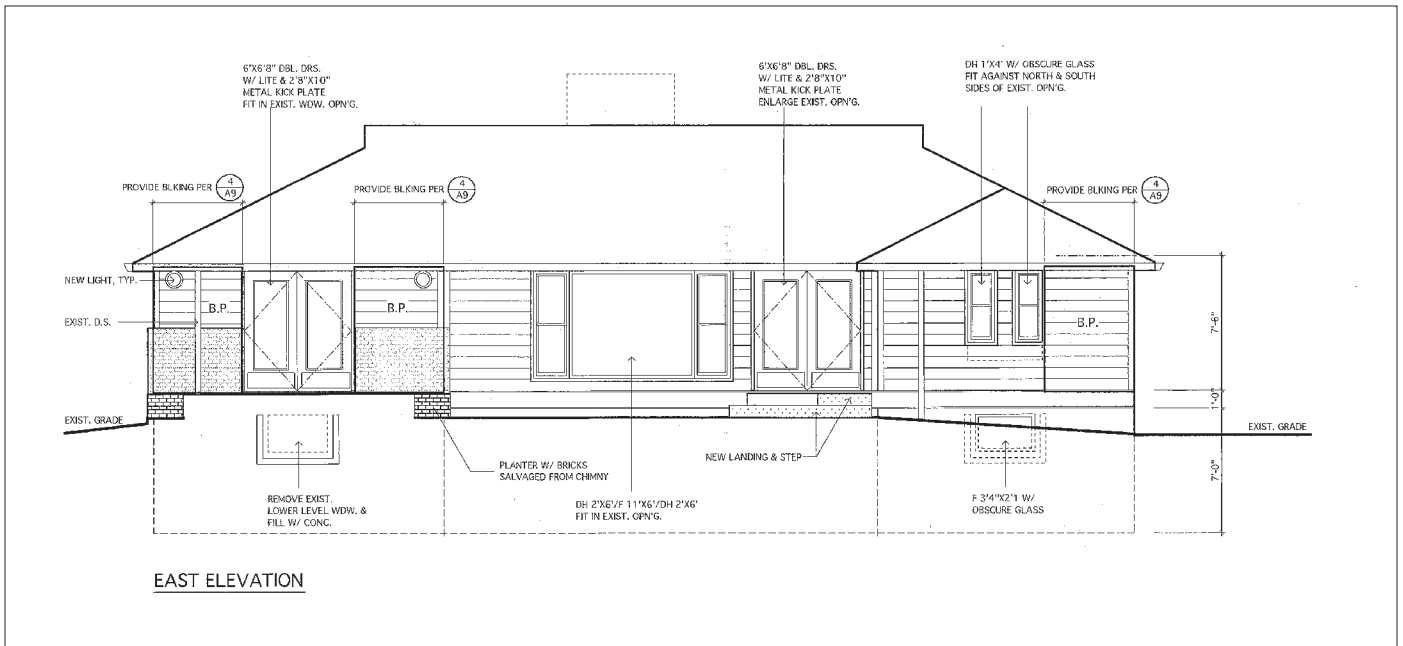


Figure 13: Office and Training Center



Browning Shono Architects, LLP

Figure 14: West Elevation



Browning Shono Architects, LLP

Figure 15: East Elevation

Retail Sales Area

As BOM increases the volume of material brought to the site for recycling, the volume of material available for reuse and sales will increase. To keep pace with this increase in incoming volume, outgoing volumes to internal BOM customers, contractors and the general public must also increase. Increased sales will of course provide more revenue to help offset processing costs. Equally important, the sales area will allow for the showcasing of recycled products and will bring more Portland area residents, students, and others to Sunderland Recycling Facility where they can learn more about recycling and sustainability.

Building 5, a newer metal sided pole barn near the office, is proposed as the sales office and product display area. Product displays should include all the processed materials available for sale, plus illustrations/ instructions describing how these materials might be used. It might also be appropriate to include interpretive elements illustrating how and why raw materials are processed at Sunderland Recycling Facility.

Building 3 is an older pole barn located near the proposed sales office. It is proposed that some of the recycled products (e.g.: recycled sand, leaf compost, blended soil) be bagged for retail sale to those citizens that do not have trucks or trailers. Bagging equipment and bagged products could be stored in this building. A new seasonal equipment storage building is proposed to be constructed immediately north of Building 3. This building should be designed to be expanded in the future to replace Building 3 when it reaches the end of its useful life.

Building 2, an older pole barn, is proposed to be removed and replaced with outdoor bins to hold bulk recycled materials. A small front end loader would be used to load these bulk materials into purchasers' trucks and trailers.

Figure 16 illustrates how the retail sales area might be organized. An 80-90 foot diameter turnaround is proposed at the westerly end so that most purchaser's vehicles can enter and leave the site without having to pass through the active recycling area. A gated road connection to the main yard area is included to allow bulk purchasers to be routed via the truck scale when deemed appropriate by the BOM staff.

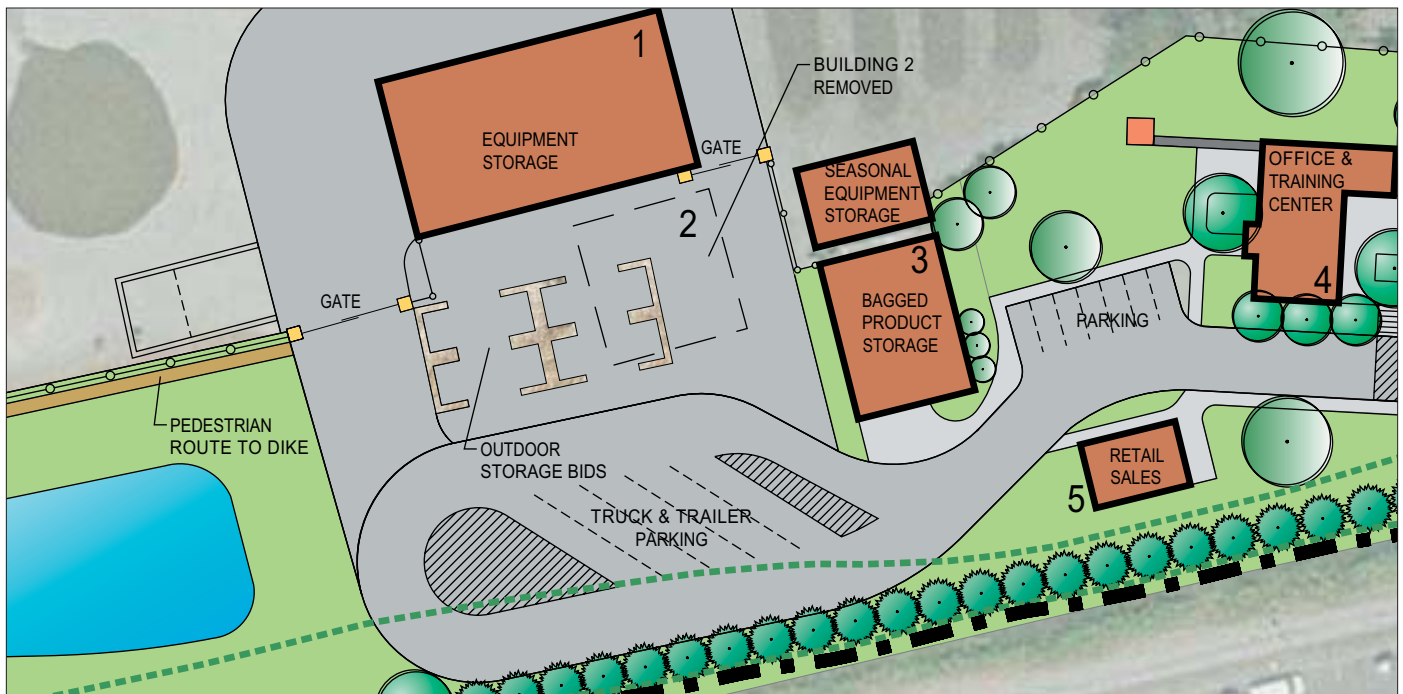


Figure 16: Retail Sales Area

Pedestrian Route to the Dike

A pedestrian route is proposed to lead from the office/retail sales area to the top of the dike. This route will allow BOM staff members to take school children and others interested in recycling to the top of the dike where an overview of yard operation can be safely provided.

A fenced route located immediately north of the holding pond and water quality wetland is proposed. This location has minimal impact on operational areas and will allow for close up viewing of the water quality facilities and yard operations on the way to overview locations. Figure 17 illustrates the proposed location of this pedestrian route.

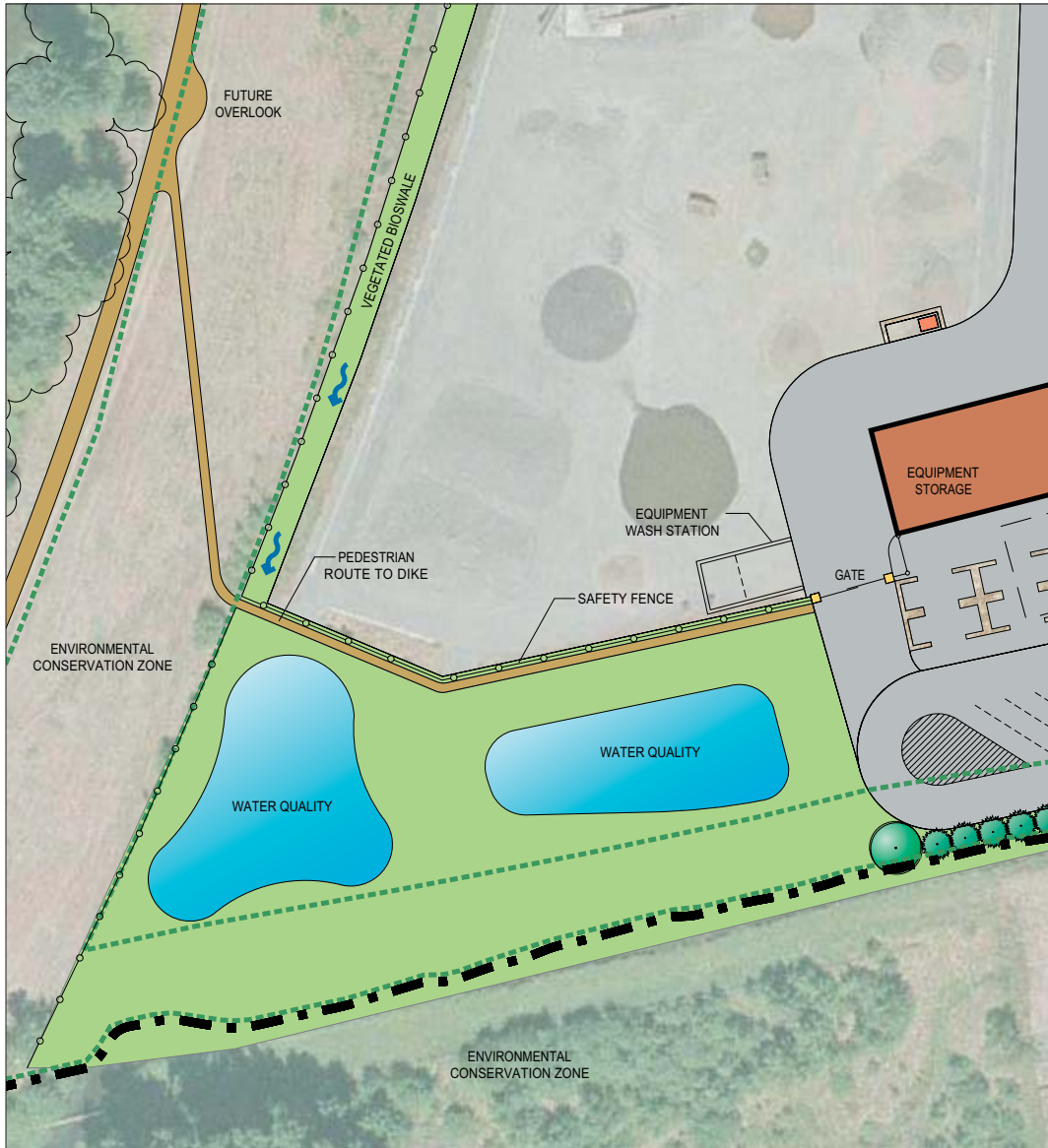


Figure 17: Trail Connection

Buildings

There are five buildings on the existing site, four of which are proposed to be retained (see Figure 5). As discussed previously, the farmhouse is to be remodeled into an office/training center, and buildings 3 and 5 are proposed to become part of the retail sales area (note: building 3 is older and is expected to need to be replaced within the next five to ten years). As stated previously, Building 2 is proposed to be removed.

Building 1, the largest of the existing buildings, is proposed to continue to be used for equipment maintenance and storage. This building is in good structural condition and is expected to have twenty to thirty years of additional useful life.

A major new building is proposed to accommodate street sweeping. While the structure is located differently in Concepts 1 and 2, the building dimensions and floor plan layout are the same. City land use regulations require that solid waste operations be conducted within a structure. Once street sweepings are processed (i.e.: dumped, dried as necessary, screened to remove trash, and treatment initiated), they can be moved outdoors and placed in windrows while the processing continues. An open sided but roofed structure approximately 90 feet wide by 210 feet long will accommodate processing operations. A clear height of 24 feet is needed to provide clearance for dump trucks when the bed is in the raised position. A clear span building is preferred to maximize operational flexibility. Figure 18 illustrates the proposed floor plan of the solid waste processing building.

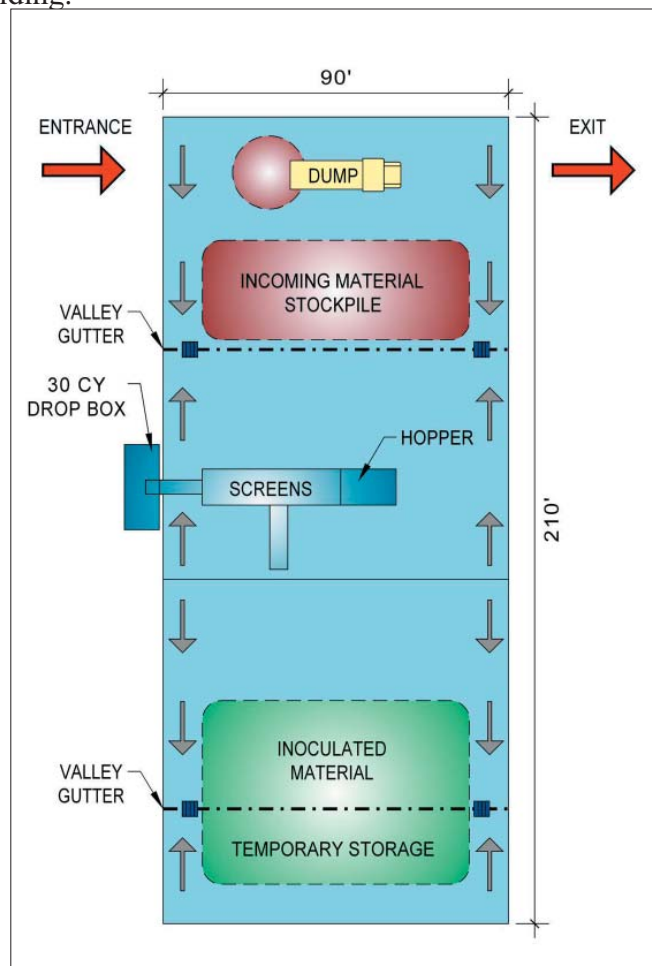


Figure 18: Solid Waste Processing Floor Plan

A second structure is proposed to protect street sanding material from freezing. The proposed location for this structure differs between Concept 1 and 2, but the building dimensions are the same. A roofed, clear span structure approximately 80x100 feet with a clear height of 24 feet will be sufficient for providing freeze protection.

Leaf Composting

The leaf composting area is of adequate size to accommodate the current level of use and this master plan does not propose any changes to its general layout. The composting area is paved, with drainage collected and routed to the holding pond before being pumped to the sanitary sewer.

Wood Material Grinding

Portland Parks has a large trailer mounted wood grinder that is moved periodically between about six collection sites around the city. The Parks' staff would like to add a collection and grinding location at Sunderland Recycling Facility. This process would be accommodated on an as needed basis and when space in the yard is available. As the operation is self contained and mobile, all that is needed is a paved area of sufficient size. Figure 19 illustrates a possible layout for the mobile wood grinder operation.

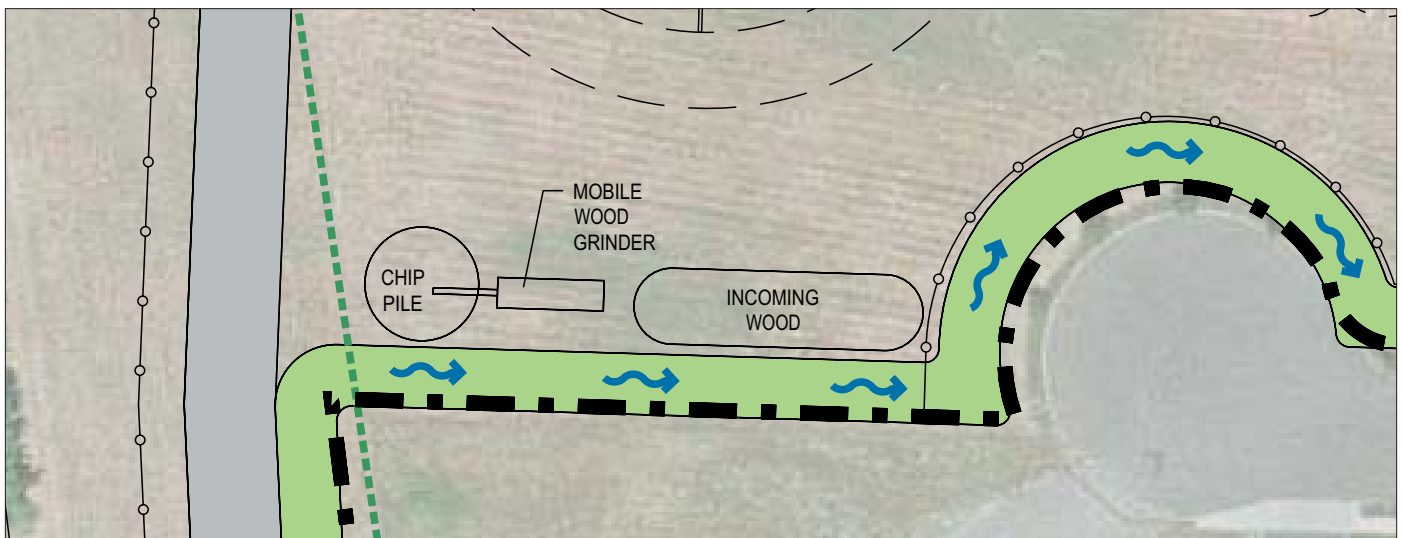


Figure 19: Wood Grinding

Street Sanding Material

A storage area is needed for winter storm sand. A location on the north site adjacent to Sunderland Avenue is proposed for this use. Trucks can be routed via the main entrance and truck scale to allow for determining incoming and outgoing quantities. In an emergency or to speed up truck movement, the gated secondary entrance on the private road can be used for ingress and egress.

A landscaped berm is proposed to be developed along Sunderland Avenue and along the private road as far west as the secondary entrance to screen this sand storage area from nearby private properties.

Water Quality Facilities

The existing water quality features (holding pond and constructed treatment wetland) are proposed to be retained, or modified as needed to meet state requirements. In addition, an area adjacent to the north property line of the expansion site is proposed to be reserved for a water quality facility, of a type to be determined based on which concept is ultimately selected. An area approximately 40 feet wide by 550 feet long is proposed to ensure adequate area to develop a swale, pond, or treatment wetland as required. The existing environmental zone at the northeast corner of the north annex property will be improved during the development of the site and the construction of the half-street improvement. Only runoff water that has passed through a stormwater treatment process will be allowed to drain into this protected area.

Campground

PDOT is working with all City Bureaus with an interest, Commissioner's Offices, and Dignity Village on the impact of implementation of the master plan on the relocation of the campground. The aforementioned parties are supporting Dignity Village on the development of a design for the campground.

This master plan assumes that the campground is a temporary facility that will ultimately be relocated. When that occurs, this portion of the Sunderland Recycling Facility is proposed to revert to the leaf composting operation that formerly occupied the site. This will allow for an increase in the amount of leaves, and possibly street sweeping/vactor waste, composted annually at Sunderland Recycling Facility.

ELEMENTS SPECIFIC TO THE PREFERRED SITE PLAN

The preferred site plan requires relocation of existing equipment and operations. By relocating these operations a site for street sweepings processing can be developed.

Relocation of the Rock Crusher and Associated Elements

The rock crusher and screening unit are proposed to be relocated to the western portion of the north site. Figure 20 illustrates the layout proposed for this operation. Incoming materials (concrete, asphalt, gravel, dirt) are proposed to be stockpiled toward the east, near the secondary truck entrance gate. Finished products from the crusher are proposed to be placed towards the west, adjacent to the access road. By placing the crusher and screen unit as illustrated, loader operations can be conducted in an efficient manner.

The entire area is proposed to be paved, with rain runoff routed to a bioswale located along the north property line for treatment prior to discharge. Treated stormwater will be discharged through the drainageway in the environmental zone located at the NE corner of the north site.

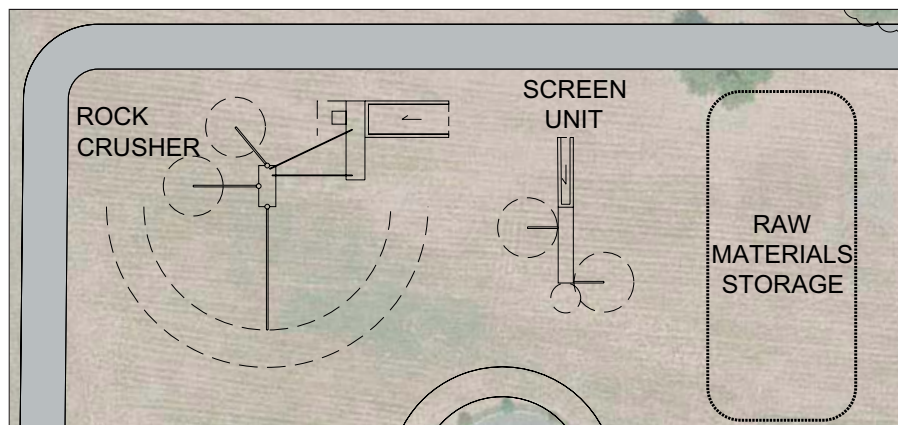


Figure 20: Crushing and Screening

Street Sweepings Processing

This operation is proposed to be located in the area that now supports the crushing operation. After the crushing operation is relocated, this site will be modified to accommodate street sweepings processing.

The solid waste processing building is located as far north as practical, given setback and circulation requirements. Incoming material would be received at the east side of the building with truck entry from the north. Screened material beginning treatment, and awaiting additional treatment will be located toward the west side of the building. Drainage from the roof of the processing building will be relatively clean and should be piped to the existing swale at the base of the dike for treatment and possible infiltration.

Windrows of composting materials will be laid out on the existing paved surface and turned periodically as required. Drainage from this paved area is will be discharged to the sanitary sewer system via the existing holding pond. The size of the pond may have to be enlarged or the pumping rate may have to be increased to manage the increased volume of runoff.

After treatment is complete, the treated material can be stockpiled until it is trucked off site for reuse. If the temporary soil storage area is empty, treated material can be stockpiled there for short periods of time. If it is necessary to stockpile this material for longer periods of time, it is recommended that the Port be approached about leasing five to 10 acres of land immediately north of the north property.

Utilities Plan

Water, electric power, and storm water bioswales will be needed on the expansion property (see Figure 21). Sanitary sewer service will not be needed on the expansion site, but the current system may need to be modified on the existing site.

A separate water meter is proposed near the intersection of Sunderland Avenue and the private street. From here, a 4-inch water loop is proposed to encircle the concrete and asphalt crushing area. Stand pipes are proposed at locations along this line, at locations acceptable to the Fire Bureau. This loop will provide water for operational purposes as well as provide water for use in emergencies. Two fire hydrants exist along the private road; one at the corner of Sunderland Avenue and one prior to the cul-de-sac. Initial contact with the Fire Bureau suggests that the water loop plus the existing fire hydrants may be sufficient to meet requirements. Additional fire hydrants will be placed per Fire Bureau recommendations. However, once plans are finalized for this area, the Fire Bureau should again be contacted.

Electric power can be brought in either overhead or preferably underground to service the rock crushing operation. On a preliminary basis, PP & L has indicated that adequate capacity is available from aerial service along Sunderland Avenue to accommodate Sunderland Recycling Facility needs.

All rainfall runoff from the rock crushing and wood materials areas will be collected and routed to a bioswale for treatment. These bioswales can discharge to either the existing drainageway at the northeast corner of the north property or the storm system inlet at the southeast corner.

Roof runoff from the street sweeping processing building and from the street sanding material storage building will be reasonably clean and can be routed to a nearby bioswale for treatment. These bioswales can discharge to existing drainageways.

Runoff from the temporary soil storage area will, at times, contain a substantial amount of suspended solids. Runoff should first be passed through a settling pond to remove most of the suspended solids. After settlement, the runoff should be passed through a vegetated bioswale and can then be discharged to the drainageway located at the northeast corner of the north site.

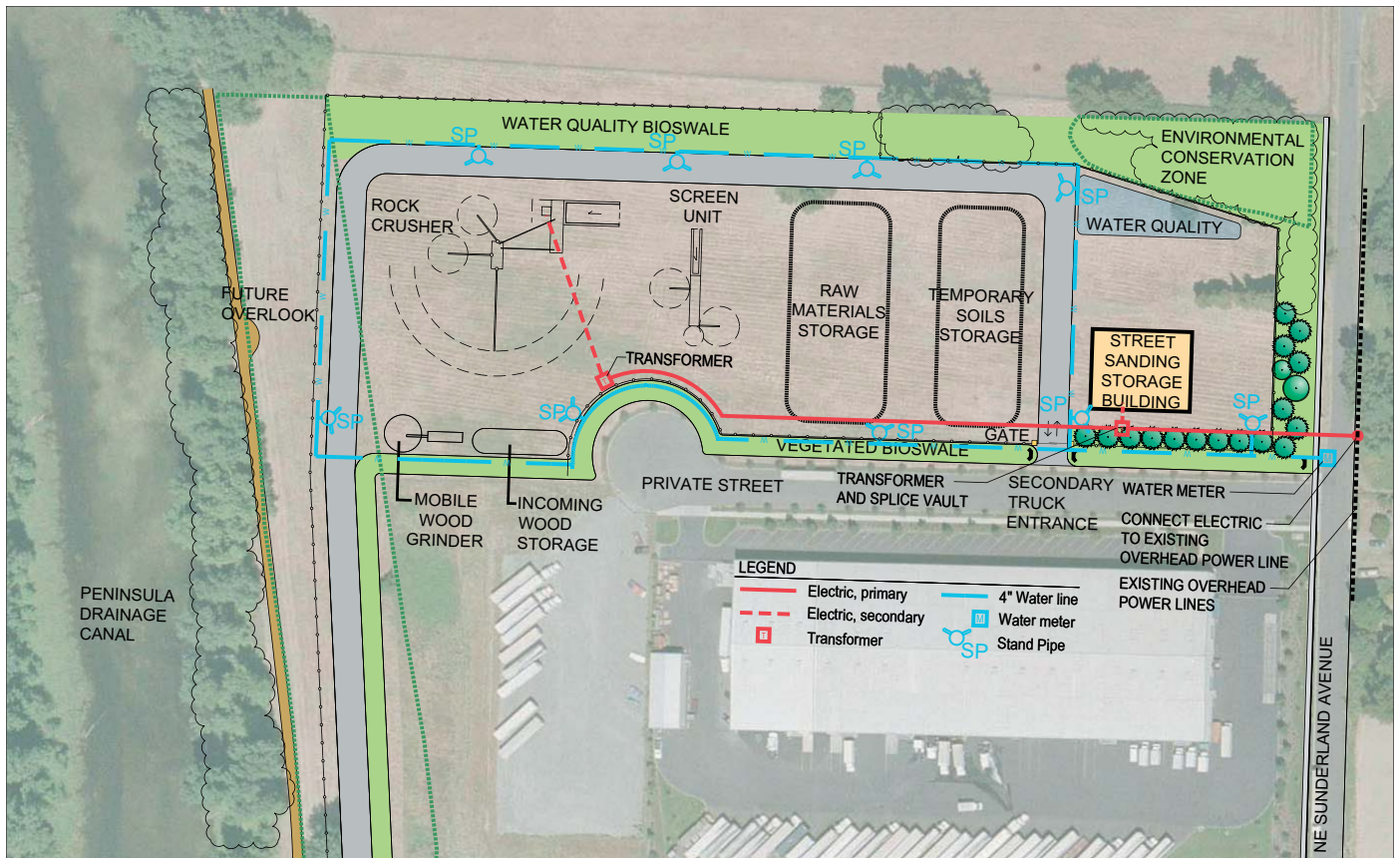


Figure 21: Infrastructure Plan

Soils Preloading

The fine grained river deposited materials underlying the site have relatively low strength and consolidate under load. According to GRI, the geotechnical engineer retained by BOM to evaluate the north site, settlement of some seven inches can be expected under the influence of a twenty foot stockpile. Preloading of the site is the preferred way to consolidate underlying soils.

BOM maintains a 10,000 CY stockpile of street sanding material on site for use during winter storms. This granular material can be used for preloading the site on a “rolling basis”, where the preload material is moved periodically after sufficient consolidation has taken place. A preliminary discussion with the geotechnical engineer suggests that the preload material thickness should be around 20 feet and that consolidation will likely take 60 to 90 days.

The 10,000 CY sanding material stockpile will cover approximately 12,000 square feet to the required 20 foot depth. Assuming relocation of the preload every 90 days, approximately 1.1 acres of the north site can be consolidated each year. Since the net area that might be used to stockpile materials is approximately 4.5 acres, this suggests that rolling consolidation, using only 10,000 CY of sanding material, will take approximately four years to complete.

COST ESTIMATES

The following construction cost estimate prepared for the preferred concept is based upon the following assumptions:

- The work will be accomplished during the summer and fall of 2006. (Note: An inflation factor will need to be added to these prices to cover work that will be accomplished in years later than 2006.)
- The work will be accomplished by a private contractor selected through a public bid process.
- A “rolling preload” process will be undertaken, using the 10,000 CY of road sand available on site.
- The crushed rock working pad will be installed using concrete and asphalt crushed on site, with an assumed in place value of \$25 per cubic yard.
- The rock crushing operation can be relocated to the north annex at an assumed cost of \$100,000.

Please note that these construction cost estimates were prepared at a planning level, and are not based on engineered construction documents. A 25% contingency has been included in an attempt to cover unknowns. While these cost estimates are adequate for planning level decision making, more refined estimates will need to be prepared before making final construction decisions.

SUNDERLAND YARD

Phase I Improvements

ITEM	CONST. UNIT	UNIT COST	QUANTITY	SUBTOTAL
Road Retaining Wall	LF	\$200.00	460	\$92,000
Haul Road	SF	\$4.50	56,400	\$253,800
Main Entry / Scale Paving	SF	\$3.50	23,400	\$81,900
Scale Station - Installation Only	Allow	\$110,000.00	1	\$110,000
Reopen South Entrance	Allow	\$10,000.00	1	\$10,000
Office Remodel	Allow	\$200,000.00	1	\$200,000
Office Terrace	SF	\$12.00	1,600	\$19,200
Office Area Landscape	SF	\$2.00	15,000	\$30,000
Subtotal (Raw Construction)				\$796,900
Design Fees, Survey at 15%				\$119,535
Contingency at 25%				\$199,225
Estimated Project Cost (2006 Construction)				\$1,115,660

SUNDERLAND YARD

Phase II Improvements

ITEM	CONST UNIT	UNIT COST	QUANTITY	SUBTOTAL
Office / Sales Yard Parking	SF	\$3.50	58,100	\$203,400
Sidewalk	SF	\$4.50	3,000	\$13,500
Curbs	LF	\$15.00	750	\$11,300
Seasoned Equipment Storage Building	SF	\$25.00	4000	\$100,000
Retail Sales Building Remodel	Allow	\$4000.00	1	\$4,000
Bulk Storage Bins	Allow	\$10,000.00	1	\$10,000
Gates	EA	\$3000.00	4	\$12,000
Pedestrian Trail	SF	\$2.00	3,000	\$6,000
Screening Berm	CY	\$2.00	2,000	\$4,000
8' Chain Link Fence	LF	\$21.00	620	\$13,000
Equipment Wash Basin	Allow	\$20,000.00	1	\$20,000
Subtotal (Raw Construction)				\$397,200
Design Fees, Survey at 15%				\$59,580
Contingency at 25%				\$99,300
Estimated Project Cost (2006 Construction)				\$556,080

SUNDERLAND YARD
Phase III Improvements

ITEM	CONST UNIT	UNIT COST	QUANTITY	SUBTOTAL
Strip Vegetation (3")	CY	\$4.00	2,600	\$10,400
12" Thick Working Pad	SF	\$1.00	217,000	\$217,000
Rolling Preload (20' Depth)	SF	\$2.00	217,000	\$434,000
Yard Paving	SF	\$3.50	217,000	\$759,500
Water Loop	LF	\$25.00	2,450	\$61,300
Electric Power	LF	\$25.00	1,000	\$25,000
Relocate Crusher	Allow	\$100,000.00	1	\$100,000
Road Sanding Building	SF	\$25.00	8,000	\$200,000
Street Sweeping Building	SF	\$25.00	18,900	\$472,500
Water Quality Features	CY	\$4.00	1,200	\$4,800
Holding Pond Revisions	Allow	\$15,000.00	1	\$15,000
Sunderland Half Street Improvements	LF	\$170.00	355	\$60,400
Fueling Station	Allow	\$6,000.00	1	\$6,000
8' Chain Link Fence	LF	\$21.00	3,000	\$63,000
Revegetation	SF	\$2.00	35,000	\$70,000
Gate	EA	\$3,000.00	1	\$3,000
Subtotal (Raw Construction)				\$2,501,900
Design Fees, Survey at 15%				\$375,300
Contingency at 25%				\$625,800
Estimated Project Cost				\$3,503,000
				(2006 Construction)

SUNDERLAND YARD
Other Expenses

ITEM	CONST UNIT	UNIT COST	QUANTITY	SUBTOTAL
Campground Site Development	LS	\$55,000.00	1	\$55,000
Subtotal (Raw Construction)				\$55,000
Design Fees, Survey at 15%				\$8,250
Contingency at 25%				\$13,750
Estimated Project Cost				\$77,000
				(2006 Construction)

PHASING

A number of the proposed improvements are common to both Concepts 1 and 2 and can be implemented at any time. The improvements identified below as Phase One improvements are those that can, and should, be accomplished in the near future. These improvements are common to both concepts and will allow BOM to move forward with those site improvements needed to “set the stage” for treating street sweepings debris. Those improvements identified as Phase Two have a lower priority and can be accomplished when personnel and/or funding are/is available. Phase Three are improvements that should not be implemented until a complete management plan for street sweeping debris has been developed and approved by regulating agencies. See Figure 22.

Phase One Improvements (orange)

1. Construct the haul road linking the north and south segments of the site.
2. Relocate the primary truck entry approximately 80 feet to the north to maximize site utilization and allow a straight route to the weigh station.
3. Make appropriate changes at the temporary campground including: develop a new entrance, reconfigure the campground site slightly to accommodate emergency vehicles, and install fencing and a vegetated visual screen where appropriate.
4. Construct the truck scale station.
5. Reopen the south entrance to provide access to the office and retail sales area.
6. Renovate the office and training building.

Phase Two Improvements (purple)

1. Construct the office/retail sales area road, parking, and vehicle maneuvering areas. Landscape as appropriate.
2. Expand the retail sales operation including developing office, display, bagged product, and seasonal storage areas.
3. Construct the pedestrian trail to the top of the dike.
4. Construct and vegetate the berm around the winter storm sanding material areas (from the proposed secondary truck entrance to the environmental zone near the northeast corner of the property).
5. Install security fencing as necessary.
6. Construct an equipment wash station.

Phase Three Improvements (green)

1. Prepare the north annex site and consolidate the underlying soils using a “rolling preload” technique.
2. Install necessary utility services to serve the north annex site.
3. Pave the north annex area.
4. Relocate the rock crusher to the north site.
5. Erect the street sweepings/vactor waste processing building.
6. Erect the winter storm sand storage building.
7. Construct appropriate water quality enhancement facilities as needed. (eg., holding pond expansion, sedimentation pond construction, bioswale development).
8. Construct half street improvements on Sunderland Drive.
9. Install an above grade fueling station near the equipment maintenance building.

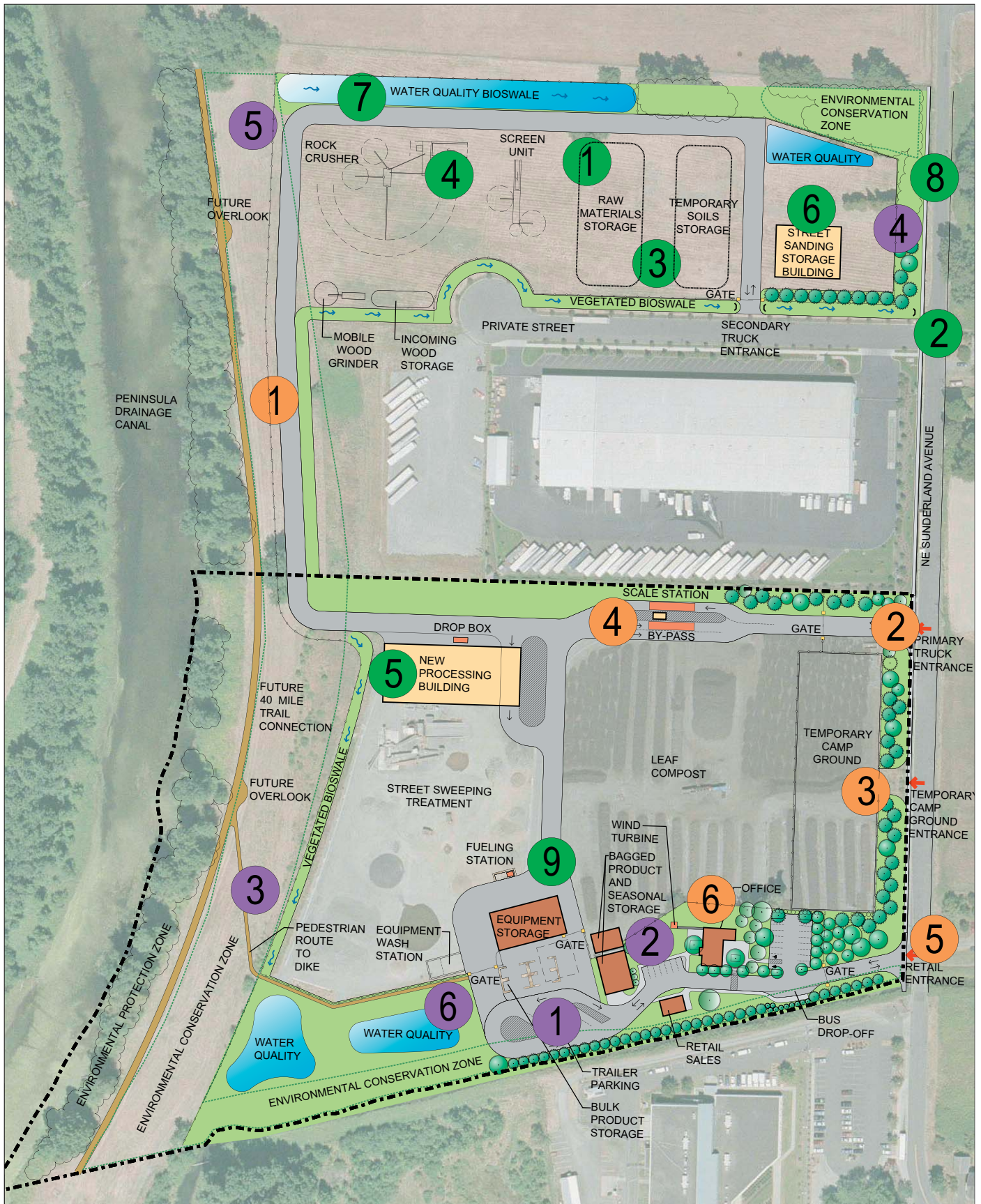


Figure 22: Phasing Plan

REGULATORY ISSUES

Activities at Sunderland Recycling Facility are regulated at Federal, State, Regional and City Levels. Each level has its own set of regulations, which are not always compatible with the rules and guidelines of other agencies. The following is a listing of regulatory issues by organization, which may have an impact on development and operations at the recycling center. As Sunderland Recycling Facility expansion proceeds, BOM will ensure that proposed activities meet agency requirements, and needed permits are obtained.

Federal Aviation Authority

The FAA has an interest in airport operations including intrusion into airspace protected zones, avoidance of dust and smoke, and discouragement of bird activity to limit conflicts with landings and takeoffs. So long as proposed improvements are no taller than the approved wind turbine, it is unlikely that airspace intrusion will be a problem. The FAA seeks to discourage waterfowl (avoid large open bodies of water), and to discourage flocks of smaller birds (avoid certain plant materials to discourage bird flocks). According to Port of Portland officials, a “7460” permit process may need to be followed to address FAA concerns.

Federal Environmental Protection Agency

The EPA has an interest in ensuring that water quality regulations are met. Because the runoff from street sweepings treatment will be routed to the City’s sewage treatment plant, this interest is satisfied as described here.

The City’s sanitary service in Sunderland Avenue conveys wastewater from the Facility to the City’s Columbia Boulevard Wastewater Treatment Plant, and that treatment plant is considered part of the Publicly Owned Treatment Works (POTW). Therefore, the area proposed for treating street sweepings and dewatered vector waste will not be considered “categorical waste water” under 40CFR Part 437. Although not subject to federal categorical limits, runoff from the Facility must meet City discharge quality limits prior to entering the POTW.

Oregon Department of Environmental Quality

The DEQ has an interest in air and water quality, solid waste management, and contamination clean up. All construction activities that exceed one acre in disturbance area will require DEQ oversight and issuance of an erosion control permit. BOM will contact DEQ to determine if PDOT’s 1200-CA permit will cover proposed construction activities at this site.

As discussed earlier, DEQ currently classifies street sweepings as “solid waste”, a classification that requires handling and disposal in a specified manner. The BOM staff is working with other agencies to document that preliminary processing plus treatment can produce a material that can be reclassified for reuse. Until and unless DEQ agrees to a reclassification, street sweepings debris will need to continue to be managed as “solid waste”. The Sunderland Recycling Facility is currently permitted to manage “solid waste” in the form of composting leaves. METRO issues and administers these DEQ licenses within its jurisdiction.

Port of Portland

Like the FAA, The Port has an interest in airport operations and assuring that FAA requirements are met. Port officials expressed a willingness to assist BOM staff in identifying and complying with FAA requirements. The Port also has extensive land holdings in the vicinity of Sunderland Recycling Facility and has an interest in insuring that land use activities are compatible with airport operations.

Multnomah County Drainage District Number 1

MCDD controls water levels in the drainage ditches and slough that drain the area, and controls activities on and immediately adjacent to the levee along the Peninsula Canal. MCDD officials are working with BOM and Port officials to obtain FEMA concurrence to lower the 100 year flood elevation in the drainage basin in which the Sunderland Recycling Facility resides. All activities that might potentially effect either the levee or drainageways will need to be approved by the MCDD staff (eg., haul road construction, fencing, gate locations, tree planting).

City of Portland

A pre-application conference was held with the Bureau of Development Services in April 2005 to discuss expansion of the Sunderland Recycling Facility to include the newly purchased 14.2 acre site. The following is a brief summary of key regulatory issues identified in the Conference Summary Report (PC 05-114230). The identified issues have been slightly modified after additional communication with responsible parties.

- A Site Development permit will be required for preloading the site
- Waste-Related activities need to be set back 100 feet from all property lines
- Half street improvements and right-of-way widening will be required on NE Sunderland Avenue
- An adjustment of the existing Conditional Use Approval will be needed in order to accept an additional “solid waste” source (street sweeping debris).
- A Type II Environmental Review will likely be required for environmental resource areas disturbed by construction
- A traffic study may be required by PDOT. (This task has already been completed)
- Stormwater management will need to meet BES requirements
- The Fire Bureau’s access and fire hydrant requirements will need to be met
- BDS erosion control requirements will need to be met for site preparation and development
- Street tree plantings will need to meet Land Use and Urban Forestry requirements
- Building permits will be required for all structures and site improvements
- Chapter 33 Development Standards will need to be met including: Base Zone; Waste-Related; Environmental Protection; Landscaping; Parking and Loading; Access and Driveways; Airport Noise Impact; and Height Restriction
- For development in a flood plain, applicable requirements of Chapter 24, Flood Hazards must be met
- A Construction Management Plan must be submitted if an environmental review is required



APPENDICES

ORDINANCE No. 178828 AS AMENDED

*Authorize acquisition of property at 9827 NE Sunderland Road for the Bureau of Maintenance.
(Ordinance)

The City of Portland ordains:

Section 1. The Council finds:

1. The Portland metropolitan area, long a leader in environmental issues, needs an expanded recycling facility for municipal construction spoils. While fulfilling the responsibility to provide essential recycling services, such a facility is needed to save taxpayer money by reducing tipping fees, lessening the need to purchase virgin aggregate, and offsetting operating costs.
2. With the proposed expansion of the Office of Transportation/Bureau of Maintenance Sunderland Yard Recycling Center, one of the Bureau's most successful and visible programs could serve multiple jurisdictions.
3. The property located immediately north of, and adjacent to the existing Sunderland Yard will serve the needs of the bureau, the City and the metropolitan area. The property at 9827 NE Sunderland Road is ideally located for expansion purposes.
4. The Bureau of Maintenance has approved an environmental survey of the property.
5. A fee appraisal of the property was obtained, and the Bureau of Maintenance approves a purchase price of \$2,370,000.00, as shown in the appraisal.
6. Site development costs including design, permits, and construction is estimated at \$1,000,000.
7. The Bureau of General Services, on behalf of the Office of Transportation/Bureau of Maintenance, has negotiated a Real Estate Sale Agreement for acquisition of the property.
8. The closing documents will be approved as to form by the City Attorney.

NOW, THEREFORE, the Council directs:

- a. The Director of the Bureau of General Services, on behalf of the Bureau of Maintenance, is authorized to sign closing documents between the City of Portland and Weston Holding Co. LLC, owner of the property at 9827 NE Sunderland Road. The City Attorney's approval shall be obtained on closing documents to be prepared by the escrow company.
- b. The Director is hereby authorized to draw and deliver checks chargeable to the Transportation Fund.

- c. The Office of Management and Finance is authorized to sell bonds in the amount of \$3,370,000 to be paid by the Transportation Fund through the net savings from Phase II Sunderland Recycling Facility grinding and recycling revenue now received and not currently allocated to other program activities.

Section 2. The Council declares an emergency exists since a delay in acceptance of the sale agreements and execution of the deeds in a timely manner may cause additional costs to both the Bureau of Maintenance and the private property owner; therefore, this ordinance shall be in force and effect from and after its passage by Council.

Passed by the Council, October 20, 2004
 Mayor Vera Katz
 Diana Lee Holuka: Janene Edgerton
 October 12, 2004

Gary Blackmer
 Auditor of the City of Portland
 By /S/ Susan Parsons
 Deputy

BACKING SHEET INFORMATION

AGENDA NO. 1213-2004

ORDINANCE/RESOLUTION/COUNCIL DOCUMENT NO. 178828 AS AMENDED

COMMISSIONERS VOTED AS FOLLOWS:		
	YEAS	NAYS
FRANCESCONI	X	
LEONARD	X	
SALTZMAN	X	
STEN	X	
KATZ	X	

Proposed Sunderland Yard Expansion

June 14, 2004

City of Portland
Office of Transportation/
Bureau of Maintenance

Prepared by The JD White Company, Inc.



Executive Summary

The **Portland Metropolitan Area**, long a leader in environmental issues, needs an expanded recycling facility for municipal construction spoils. While fulfilling our responsibility to provide essential recycling services, such a facility will help to save taxpayer money by reducing tipping fees, lessening the need to purchase virgin aggregate, and offsetting operating costs.

The City of Portland Office of Transportation (PDOT)/Bureau of Maintenance (BOM) seeks ways to develop additional processes and programs to meet City goals and to leverage resources for environmental health and sustainability, cost-effectiveness, and efficiency. With the proposed expansion of the Sunderland Yard Recycling Center, one of the Bureau's most successful and visible programs could serve multiple jurisdictions.

This report examines three alternatives for future Sunderland Yard operations and identifies a Preferred Alternative.

- ◆ **Alternative 1:** Sunderland Yard operations remain in current location with no change in programming. Represents no additional expenditure, but also means lost opportunities for additional savings, revenue, and recycling/reuse.
- ◆ **Alternative 2:** Sunderland Yard operations relocate to new site. No potential site yet identified, so financial implications are unknown. New location could be more accessible, but suitable acres could be expensive and hard to find. Infrastructure costs, neighborhood buyoff, and relocating Dignity Village are additional considerations.
- ◆ **Alternative 3:** Current Sunderland Yard site expands by 13.12 total acres. Adds capacity for additional programs and provides new opportunities for additional savings and revenue.

This report examines three alternatives for future Sunderland Yard operations.



Executive Summary

The Preferred Alternative (**Alternative 3**) provides additional space for the Bureau's successful composting program, and provides an opportunity to develop methods for recycling/reusing other waste products, potentially including sweeper debris, ditching debris, and vactor waste. The expansion proposes to reuse and recycle additional materials now in the waste stream, reduce material that now goes to the landfill, provide landfill cover, consolidate efforts in a single location, and save significant amounts in tipping and disposal fees. Financial analysis indicates payback in 9 years for this investment.

If the Sunderland Recycling Center is expanded, the City of Portland will:

- ◆ Gain the opportunity to develop new disposal technology with space to nurture and grow new programs.
- ◆ Reduce the nearly \$1 million per year spent on street sweeping disposal fees.
- ◆ Benefit the environment by recycling materials that are now disposed of.
- ◆ Reduce the amount of material delivered to the landfill.
- ◆ Take advantage of additional opportunities to meet sustainability goals.
- ◆ Take advantage of an opportunity to purchase and utilize property adjacent to City's existing recycling facility.

Sunderland Yard

Fast Facts

- ◆ Purchased 1997 - \$3,000,000
- ◆ Over \$1.5 million in improvements
- ◆ 12 usable acres
- ◆ 9.5 paved acres for compost, crushing, washing, and stockpiling
- ◆ 2.5 acres for water quality facilities, building, parking and miscellaneous
- ◆ Uses
 - Compost leaves
 - Crush and recycle asphalt and concrete
 - Wash and recycle winter sand
 - Separate and recycle landslide debris
 - Equipment training
 - Environmental training
- ◆ Process 30-50K cubic yards of material each year
- ◆ Site is a model for materials recycling and other environmentally friendly activities and processes

Project Background

PDOT is a leader in municipal recycling programs. BOM has led the development of new, innovative processes and programs to meet the goals, objectives, and mission of PDOT.

Program Goals

- ∴ Reduce tipping fees
- ∴ Reduce need to purchase virgin aggregates
- ∴ Offset operating costs

Planning and constructing solutions to meet the challenges of growth faced by the Portland region while maintaining our economic viability and neighborhood character require PDOT to leverage its limited resources to meet the demands of a growing and evolving city. Stewardship of Portland's mobility and livability is PDOT's primary responsibility. Protecting our way of life creatively while balancing competing uses is part of its mission. PDOT and BOM have led the development of municipal recycling programs that maximize public resources by effectively and cost efficiently collecting, treating, and reusing construction, road, and

The City of Portland is a leader in municipal recycling and innovative solutions.

organic debris. The programs at the Sunderland Yard Recycling Center exemplify BOM's innovative approach.

When the City's municipal landfill closed in the 1990s, BOM researched available options for disposal. In FY 2004, if the City did not recycle what is being currently processed at Sunderland, it would cost \$638,000 each year, as shown below.

If No Recycling Program (2004 Dollars)	
Disposal costs to truck the material to the landfill or other private recycling facility (materials include leaves, asphalt, concrete, dirt, dirty sanding rock, and woody debris)	\$533,000/year
Cost to purchase virgin aggregates instead of reusing recycled materials	\$105,000/year
Disposal Total	\$638,000/year

The Sunderland Yard programs grew out of employee experiments to determine what was most feasible and cost effective. Today, Sunderland Yard recycles leaves, asphalt, concrete, landslide debris, dirty sanding material, and woody debris. The yard accepts 30,000 to 50,000 cubic yards of these materials annually. The operating costs and revenues from the current program at Sunderland Yard are presented below. As shown, the difference between disposal and recycling currently saves the City \$278,000 annually.

Sunderland Yard Recycling Program (2004 dollars)	
Operating costs	<\$400,000>
Cost to purchase virgin aggregates	\$0
Revenues (compost)	\$40,000
Total	<\$360,000>
DISPOSAL TOTAL if no recycling program	<\$638,000>
NET SAVINGS between disposal and recycling at Sunderland Yard	\$278,000

The City is dedicated to the reuse and recycling of materials wherever possible. BOM's recycling program at Sunderland Yard is designed to meet the City's sustainability goals by 1) reducing tipping fees for disposal, 2) lessening the need to purchase virgin aggregates, and 3) offsetting operating costs through the sales of compost and aggregates.



Aerial view of Sunderland Yard

Opportunities & Challenges

The current Sunderland Yard recycling program is innovative and cost-saving. Additional space is needed to expand the current recycling efforts as well as to take advantage of opportunities to recycle additional materials.

Other City bureaus and other jurisdictions have expressed an interest in bringing similar materials to Sunderland Yard for recycling. The yard is currently operating at capacity. With additional space, the City could take advantage of opportunities to expand current programs.

Street sweeping debris, road and ditch debris, and vector waste are other roadwaste materials that are not currently being recycled. Although all of these materials have regulatory issues, we believe that these issues are not insurmountable. If the City does not expand the recycling facility, it will continue to spend \$1.46 million to dispose of this material at the local landfills, as shown below.

Tipping Fees—No Expanded Recycling (2004 dollars)	
Street sweeper debris disposal costs	\$950,000
Ditch spoils disposal costs	\$325,000
Vector waste disposal costs	\$190,000
Total Landfill Tipping Fees	\$1,465,000

The following describes these materials and the potential to recycle them.

Street Sweepings

Approximately 25,000 tons of debris are swept from City streets each year. The BOM has been creative over the last several years in developing alternate disposal options that are no longer available because of increasing regulatory controls. For example, BOM used to take screened sweeper debris to a local private composter for composting at a reduced rate. However, the composter no longer accepts this material at its facility. In addition, DEQ now enforces the solid waste regulations associated with street sweeping debris more stringently.

Project Problem Statement

The Portland Metropolitan Area, long a leader in environmental issues, needs an expanded recycling facility. While fulfilling our responsibility to provide essential recycling services, such a facility will help to save additional taxpayer money and could potentially serve other jurisdictions.

Potential Recycling Solutions

- ADCM — BOM has had initial positive discussions with both local landfills and DEQ regarding the use of screened sweeper debris as Alternative Daily Cover Material (ADCM) at local landfills. BOM would need to screen the material, dispose of the screened trash, and transport the material to one of the local landfills. Other states, including Minnesota and Massachusetts, have been successful in finding options to allow municipalities to reuse street sweeping material as ADCM. Continued negotiations with DEQ, Metro, and local landfills are needed.
- Compost/Use as Fill — Street sweepings could be composted and screened and used as fill or cover in the right-of-way, specifically areas where there is little contact with the public or children. The material would not be placed in residential areas. Candidate areas include landscaped areas, median strips, and under the road surface. PDOT would need to work with regulatory agencies to determine the viability of this option.



Recyclable materials diverted by Sunderland Yard recycling operations currently save disposal tipping fees.

Road and Ditch Debris

This material is removed from the shoulders and ditches along non-curbed city streets and can contain any combination of concrete, rocks, dirt, vegetation, debris, and road waste. Appropriate disposal of this debris depends on the specific contents and moisture level. If the material is mostly dirt and grit, it is taken to a City-owned dewatering facility (Inverness) and mixed with vector waste for dewatering. If the material is dry with lots of vegetation, it is taken to the Columbia Wastewater Treatment Plant (CBWTP).

Bureau of Environmental Services (BES) has been looking for ways to reuse or recycle ditch spoils, and considering construction of a ditch spoils processing pad at CBWTP. While the space is available, the proximity of CBWTP to residential neighborhoods severely limits the use of loud equipment and dusty operations. Hauling ditch spoils to Sunderland Yard would increase efficiency and reduce costs by combining ditch spoils with other materials that BOM removes from the right-of-way. It would also improve the likelihood of recycling and reuse. Rather than having to build a new facility and add staff at CBWTP, BES could simply have BOM haul the materials to Sunderland Yard.

Potential Recycling Solution

- Compost/Use as Fill — The concrete and rock could be screened out for crushing, and the remaining material could be remediated and used as clean fill. Like the street sweeping debris, this material could be composted and screened and used as fill or cover in the right-of-way, specifically where there is little contact with the public or children. The material would not be placed in residential areas. Candidate areas include landscaped areas, median strips, and under the road surface. PDOT would need to work closely with BES and with regulatory agencies to determine the viability of this option.

Factor Waste

This material is removed from stormwater street sumps (dry wells, sumps, and sedimentation manholes) and consists largely of contaminated silts with variable amounts of organic debris. The material is brought to the Inverness dewatering facility for decant treatment. The material must have a specific moisture content before it will be accepted at the landfill.

The dewatering pads at Inverness are almost at capacity. It can take as long as 3-4 weeks to completely dewater the waste before it can be disposed of at the landfill. The lack of adequate space at Inverness can cause, at times, a slowdown in the work schedule.

Potential Recycling Solution

- ADCM- This factor waste also could be used as Alternative Daily Cover Material at a local landfill. The issue of treating the decant water still remains. PDOT would need to work closely with BES as discussions with local landfills, DEQ, and Metro are held.

If the City were to take this opportunity to expand the recycling facility and develop recycling options for street sweeping debris, road and ditch debris, and factor waste, the City potentially could save the difference between the \$1.46 million in landfill tipping fees and the \$900,000 cost to operate these activities for an overall savings of \$565,000 annually.

When the savings from the existing operation of \$278,000 are added to the expansion savings of \$565,000, the City could save approximately \$843,000 annually.

Expanded Sunderland Yard (2004 dollars)	
Operating Costs	\$435,000
Disposal costs (ADCM option)	\$465,000
Total	\$900,000
NET SAVINGS between expanding and not expanding Sunderland Yard	\$565,000
NET SAVINGS from both the existing activities at Sunderland Yard and the expansion of the recycling program	\$843,000

Discussion of Project Alternatives

Alternative 1

- No change – continue to operate current program

- ◆ **Advantages:**
 - ◆ Least disruption to current activities.
 - ◆ No additional expenditure.
- ◆ **Disadvantages:**
 - ◆ Current site is at maximum capacity.
 - ◆ Programs cannot be expanded/added.
 - ◆ Space is not available to experiment with new recycling opportunities, such as street sweeping debris.
 - ◆ Lost opportunities for additional financial savings.
 - ◆ Lost opportunities for additional revenue.

Alternative 2

- Purchase land elsewhere in city for expanded services

- ◆ Financial estimates for an alternative site are unknown, since the financial implications would vary with location. (A search for available property identified only one potentially suitable site. The asking price was over \$7 million, not including needed improvements.)
 - ◆ Significant factors that would influence financial feasibility would include: a) cost of land; b) net usable acreage; c) transportation costs associated with hauling material to a particular site; and d) ability of a site to attract more recyclable material from other City bureaus or outside agencies.
- ◆ **Advantages:**
 - ◆ New location could be more accessible to partners and haulers.
 - ◆ Expanded capacity would allow expanded programs and yield added savings.
 - ◆ **Disadvantages:**
 - ◆ Difficulty of locating and purchasing suitable and sufficient acreage elsewhere within city.
 - ◆ A suitable site could cost over \$7 million plus needed improvements.
 - ◆ Potential additional costs for infrastructure development, and construction.
 - ◆ Need for community/neighborhood acceptance of recycling operation in new location.
 - ◆ Current site would need new use and/or owner.

Alternative 3

- ✦ Expand site
- ✦ Purchase adjacent land
- ✦ Expand recycling opportunities

- ◆ The financial analysis of expanding the current site by an added 13.12 total acres (or 9.45 acres of added usable area) shows a payback period of 9 years with the expansion area. The asking price for this property is \$2.4 million.

◆ Advantages:

- ◆ Added capacity for current Sunderland Yard programs (composting, debris recycling, and sales) would yield additional revenue.
- ◆ Added capacity for additional programs (street sweeping, ditch debris, and vector waste recycling) also would offset costs and yield additional savings.
- ◆ Now served by water, sewer, and power; significant additional infrastructure most likely not needed.
- ◆ Overall cost savings.
- ◆ Consolidation of programs would save staff hours; economy of scale.

◆ Disadvantages:

- ◆ Start-up costs for new programs.
- ◆ Potential capital costs for equipment for new/expanded programs.
- ◆ Higher operational costs for larger site.

Alternative 3: Recommend Preferred Alternative

PDOT through BOM leads the nation's municipalities in devising programs that maximize public resources and demonstrate commitment to respect for the environment.

The **Preferred Alternative 3** will help Portland continue in that leadership position. Expanding Sunderland Yard will 1) further reduce fees for disposal, 2) provide revenue through sales of materials that are now discarded, and 3) reduce liability of disposed material to offset operational costs. Further benefits include:

- ◆ Environmentally responsible.
- ◆ Financially self-sustainable.
- ◆ In keeping with City Council policy on sustainability and waste reduction.
- ◆ Consolidates programs and staff for efficiency and cost savings.
- ◆ Spends tax money wisely.
- ◆ Uses today's cheaper dollars to pay for future, more costly needs.

Benefits

Further reduces fees for disposal

Provides revenue through sales of materials that are now discarded

Reduces liability of disposed material to offset operational costs

Environmentally friendly

Meets City Council goals

Consolidates services and maximizes investment

Options	Uses Resources Efficiently	Environmentally Responsible	Uses Taxes Wisely	Carries Out City Council Policy	Provides for Future
Alternative 1	●	●	●	●	○
Alternative 2	○	●	●	●	●
Alternative 3	●	●	●	●	●

● = yes ● = somewhat ○ = not at all

Capital & Operating Costs with Phase II Expansion:

Phase I Recycling – These are costs already incurred for existing operations. Capital costs for the existing facility are estimated at \$4.56 million. The net savings associated with recycling are now estimated at \$278,000, indicating that capital costs are recouped over approximately 16.4 years.

Phase II Expansion – This indicates what is forecast with expansion of the Sunderland facility. Capital costs, including acquisition and improvements, are estimated at \$3.49 million. The net savings associated with recycling (of disposal costs without recycling, less net operating expense of recycling) are estimated at \$565,000. Consequently, this expansion yields a payback of only 6.2 years—an even better investment than the existing recycling operation.

Phases I+II Combined – This illustrates the sum total of existing and expanded operations. When combined, capital costs for Phases I+II total \$7.55 million. Operating savings associated with existing plus proposed recycling amount to \$843,000 annually—for an overall payback on Phases I and II combined of 9.0 years.

Portland Sunderland Recycling Financing Options			
(Capital & Operating Costs with Phase II Expansion)			
	Phase I	Phase II	Phases I+II
	Recycling	Expansion	Combined
Capital Cost			
Acquisition	\$3,000,000	\$2,493,360	\$5,493,360
Improvements	\$1,558,266	\$1,000,000	\$2,058,266
Total Site Cost	\$4,558,266	\$3,493,360	\$7,551,626
Operating Expense			
<i>No Recycling Program</i>			
Materials Purchases	\$105,000	--	\$105,000
Disposal Costs*	\$533,000	\$1,465,000	\$1,998,000
Net Operating Expense	\$638,000	\$1,465,000	\$2,103,000
<i>Sunderland Yard Recycling</i>			
Operating Costs	\$400,000	\$435,000	\$835,000
Disposal Costs	--	\$465,000	\$465,000
Revenues	(\$40,000)	--	(\$40,000)
Net Operating Expense	\$360,000	\$900,000	\$1,260,000
Net Savings with Recycling	\$278,000	\$565,000	\$843,000
Payback Period (Years)	16.4	6.2	9.0
	* Note: Disposal costs without expanded Sunderland recycling are for sweeper debris @ \$950,000, ditch spoils @ \$325,000, and vector waste @ \$190,000.		

Prepared by: E. D. Hovee & Company, from information provided by PDOT Bureau of Maintenance.

Expansion Financing Options: The worksheet on the following page is consistent with information provided by Bryant Enge and illustrates how the capital costs associated with Phase II expansion could be repaid under two different financing options:

Option A/10-Year Financing – This is calculated using PDOT-provided financing terms assumed at a 5.75% interest rate. Debt service is calculated at \$469,030 per year to recoup \$3.49 million in capital cost over a 10-year equal payment amortization period.

Option B/5-Year Financing – This is run over a shorter time period with PDOT-provided financing assumption of a 3.5% interest rate. Debt service is calculated at \$773,714 per year.

Both financing options could make funds from two sources available as a source of debt repayment: a) net savings from Phase II Sunderland recycling; and b) grindings revenue now received and not currently allocated to other program activity. Projections reflect inflation over time, including anticipated increases in Metro tipping fees. With either 5-or 10-year financing, there appears to be more than adequate funding to cover the cost of financing the capital expense for Sunderland expansion.

Portland Sunderland Recycling Financial Analysis
(Phase II Expansion Financing Options)

Option A -- 10 Year Financing	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Cumulative
Net New Revenues Available:											
Net Savings with Recycling	\$565,000	\$577,863	\$592,168	\$606,233	\$608,757	\$599,621	\$606,868	\$614,203	\$621,626	\$629,139	
Grindings Revenue	\$340,000	\$350,200	\$360,706	\$371,527	\$382,673	\$394,153	\$405,978	\$418,157	\$430,702	\$443,623	
Total Revenue Available (\$3,493,360)	\$905,000	\$928,063	\$952,874	\$977,760	\$991,430	\$993,774	\$1,012,846	\$1,032,360	\$1,052,328	\$1,072,762	\$9,919,197
Annual Debt Service	(\$469,030)	(\$469,030)	(\$469,030)	(\$469,030)	(\$469,030)	(\$469,030)	(\$469,030)	(\$469,030)	(\$469,030)	(\$469,030)	(\$4,690,299)
Net Revenue (Cash Flow)	\$435,970	\$459,033	\$483,844	\$508,730	\$522,401	\$524,745	\$543,816	\$563,330	\$583,298	\$603,732	\$5,228,898
Option A Financing Assumptions:											
Term of Repayment (Years)	10										
Interest Rate	5.75%										
Amount to be Financed	\$3,493,360										
Net Present Value of Revenues	\$8,208,146	Based on total revenues before debt service is deducted									
Net Present Value of Cash Flow	\$4,307,409	Based on total revenues less debt service									
Internal Rate of Return (IRR)	24.5%	Calculated on capital investment offset by total revenues (and deducting capital cost in year 0)									
Option B -- 5 Year Financing	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Cumulative
Net New Revenues Available:											
Net Savings with Recycling	\$565,000	\$577,863	\$592,168	\$606,233	\$608,757	\$599,621	\$606,868	\$614,203	\$621,626	\$629,139	
Grindings Revenue	\$340,000	\$350,200	\$360,706	\$371,527	\$382,673	\$394,153	\$405,978	\$418,157	\$430,702	\$443,623	
Total Revenue Available (\$3,493,360)	\$905,000	\$928,063	\$952,874	\$977,760	\$991,430	\$993,774	\$1,012,846	\$1,032,360	\$1,052,328	\$1,072,762	\$9,919,197
Annual Debt Service	(\$773,714)	(\$773,714)	(\$773,714)	(\$773,714)	(\$773,714)	--	--	--	--	--	(\$3,868,571)
Net Revenue (Cash Flow)	\$131,286	\$154,349	\$179,160	\$204,046	\$217,716	\$993,774	\$1,012,846	\$1,032,360	\$1,052,328	\$1,072,762	\$6,050,626
Option B Financing Assumptions:											
Term of Repayment (Years)	5										
Interest Rate	3.50%										
Amount to be Financed	\$3,493,360										
Net Present Value of Revenues	\$8,208,146	Based on total revenues before debt service is deducted									
Net Present Value of Cash Flow	\$4,714,786	Based on total revenues less debt service									
Internal Rate of Return (IRR)	24.5%	Calculated on capital investment offset by total revenues (and deducting capital cost in year 0)									
Projection Assumptions											
Metro Tipping Fee/Ton	\$47.00	\$48.07	\$49.26	\$50.43	\$50.64	\$49.88	\$50.48	\$51.09	\$51.71	\$52.34	
% Change from Prior Year		2.3%	2.5%	2.4%	0.4%	-1.5%	1.2%	1.2%	1.2%	1.2%	
Rate of Inflation											
Assumed Discount Rate											

Prepared by: E. D. Hovee & Company. Estimates are preliminary and subject to revision.

Stakeholder Interviewees	
Name	Affiliation
Susan Anderson	COP Office of Sustainable Development
Linda Dartsch	Collection System Manager COP Bureau of Environmental Services Columbia Wastewater Treatment Facility
Paul Gribbon	West Side Willamette River CSO Program (West Side Big Pipe)
Steve Hazzard	COP Bureau of Environmental Services
Mary Huff	Manager of Operations COP Parks Maintenance
Todd Humphrey	COP Water Bureau
Stan Jones	Recycling Program Manager Port of Portland Aviation Environmental
Jeff Moore	Environmental Program Coordinator Oregon Department of Transportation
Don Newell	Multnomah County Land Use/Transportation Road Maintenance
Randy Tomsik	Facility Manager Columbia Wastewater Treatment Facility
Bruce Walker	COP Office of Sustainable Development

**Sunderland Yard Project Stakeholder Interview Questionnaire
City of Portland Office of Transportation/Bureau of Maintenance**

Prepared by
The JD White Company, Inc.
1111 Main Street • Vancouver WA 98660 • 360.696.1338

Date:

Stakeholder Name:

Title:

Phone:

The Mayor and City Council of the City of Portland are looking to the City's operating bureaus to identify and implement internal efficiencies to reduce costs and/or expand city services cost effectively.

The Portland Office of Transportation (PDOT)/Bureau of Maintenance (BOM) operates a highly successful program for processing and recycling construction spoils, slide debris, winter sand, and fall leaves. This program provides considerable savings to PDOT because it reduces 1) tipping fees for disposal, 2) the need to purchase virgin aggregates, and provides added revenue through sales of compost and aggregates. The processing and recycling program is centered on approximately 15 acres of land in NE Portland—the Sunderland Yard.

The BOM believes that expanding the yard offers opportunities for saving the City money and in some cases, generating revenue.

Your answers to the following questions will help us identify and quantify recycling opportunities within the City and region that are either not now addressed or how they are addressed could be improved.

Questions

- 1) Are you currently recycling debris?
- 2) If yes, what are you recycling? How much do you recycle annually? Cost?
- 3) If no, what are you doing with the road waste? Cost?
- 4) How do you dispose of the debris?
- 5) If the Sunderland Yard was expanded, and included street sweeping debris, would you utilize Sunderland for processing and recycling?
- 6) If resources were available, are there other types of debris you would like to see processed?
- 7) PDOT/BOM is always interested in partnerships. Would you be willing to participate financially to consolidate operations and ultimately, save money?

Other comments:

City of Portland Park Bureau Questions

- 1) You currently compost greenway waste. Please describe your recycling program. Could you be interested in working with BOM to consolidate efforts?
- 2) If yes, what are the possibilities?
- 3) How much do you recycle annually? Cost?
- 4) What, if anything, is your plan for vector waste?
- 5) If Sunderland were expanded, do you think there are possibilities for incorporating disposal of vector waste?

Other comments:

Some questions about expanding Sunderland Yard and its activities

Street sweeping debris consists of everything picked up when the streets are swept, comprising organic material, rocks, leaves, and similar material, but also including soda cans, cigarette butts, and the odd Frisbee. Ditch debris and vector waste present additional potential savings opportunities. BOM estimates it could save an additional \$163,000 — \$350,000 annually by recycling additional materials.

- ◆ **Could additional materials be recycled?**
 - ◆ BOM is experimenting with recycling methods and markets for this material.
 - ◆ DEQ thinks composted street sweeping material could be acceptable as ADCM.
 - ◆ Local landfill is willing to work with BOM on accepting the material as ADCM.
 - ◆ Cooperative efforts with regulatory agencies and other bureaus could develop new programs and strategies.
- ◆ **Could other bureaus or jurisdictions gain by becoming partners in this effort?**
 - ◆ Cost of expanding the Sunderland Yard Recycling Facility is limited to real estate and added infrastructure.
 - ◆ Expanding the site would cost approximately \$2.5 million for real estate, much less than relocating to another site.
 - ◆ Savings on tipping fees will be amplified by an expanded site, even without additional partners.
 - ◆ More detailed estimates could be developed if partnership interest emerges.
 - ◆ Even without partners, payback for expansion is estimated at 9 years.
- ◆ **Could the Sunderland Yard operation be relocated to a location more convenient to a freeway and potential partners?**
 - ◆ A suitable site could be difficult to find and acquire.
 - ◆ A suitable site acceptable to neighbors also could be difficult to find.

**Brant
Williams**
Director

**Eileen
Argentina**
System
Management

**Bryant
Enge**
Finance

**Don
Gardner**
Engineering &
Development

**Sam M.
Irving, Jr.**
Maintenance

**Laurel
Wentworth**
Planning



**A report on the condition of the
Existing Storage Buildings at the
City of Portland's Sunderland Yard,
9325 NE Sunderland Ave, Portland.**

May 6, 2005

Existing Buildings:

The existing storage buildings located at Sunderland Yard are indicated below:

Designation Number	Local Name	Type
Building One	The Arena	Modern
Building Two	Building #2	Vintage
Building Three	Drainage & Street Cleaning	Vintage
Building Five	Red Barn	Modern

Building Four, known as the House, was not included in the study.

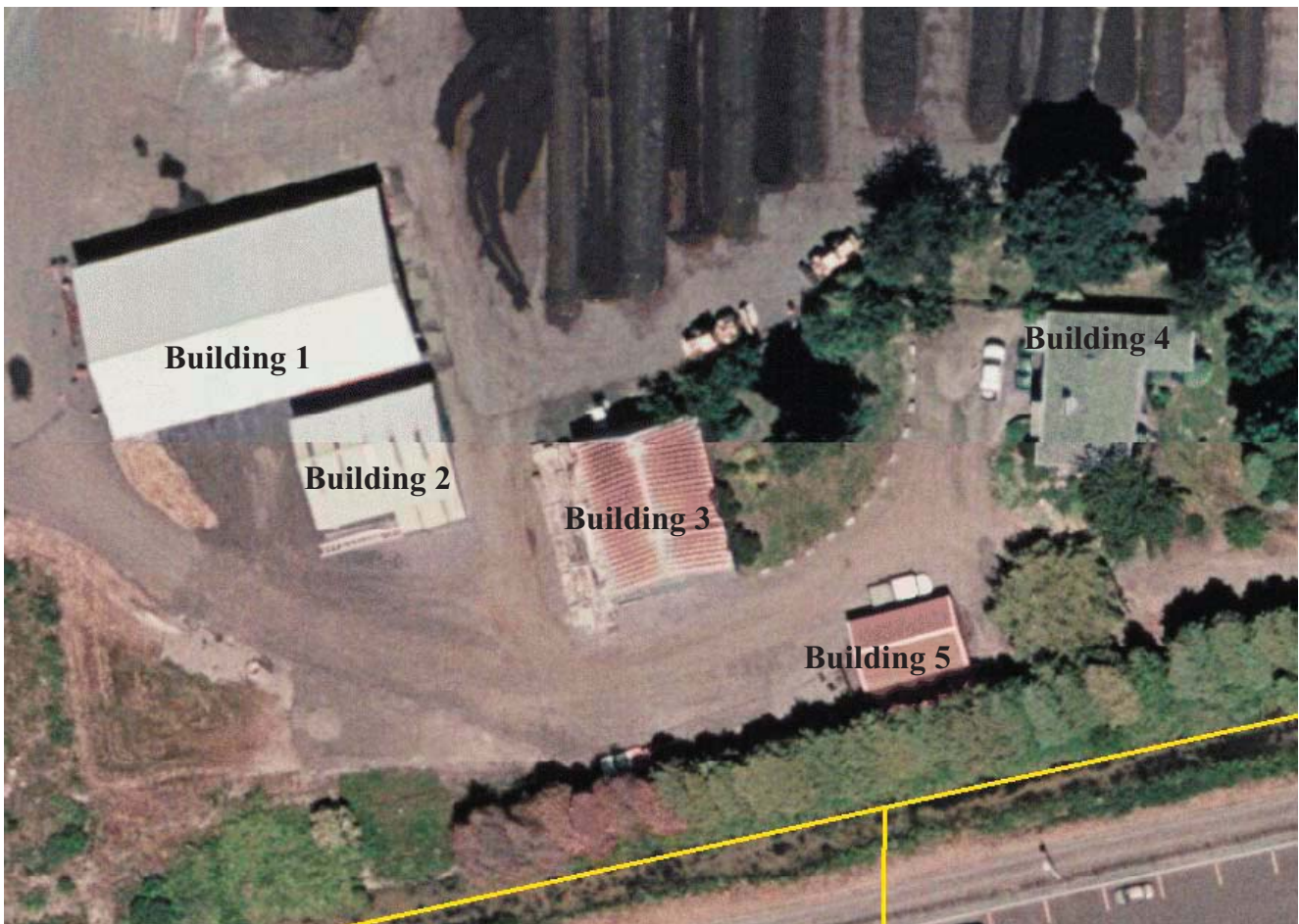


Figure 1 - Aerial view of Sunderland Yard showing the existing buildings.

Scope of work:

The scope of this study comprises carrying out a limited visual reconnaissance of the existing storage buildings at the City of Portland's Sunderland Yard Facility and to report on their existing condition and potential for future performance.

General:

The existing storage buildings located at the City of Portland's Sunderland Yard Facility appear to be typical agricultural type Pole Barn Buildings.

Pole Barn Buildings typically comprise of wood truss frames, which have wood post supports that are embedded in the ground to resist both vertical gravity loads and lateral wind/seismic loads. They are inexpensive to build and easy to erect and are common for agricultural use. Given that the Sunderland Yard Facility was previously used as a farm before the City purchased it, these buildings appear to be remnants of that period.

Existing Building types:

Typically the existing storage buildings at Sunderland Yard can be divided into two types, modern and vintage.

Modern Building Characteristics (Bldgs 1 & 5):

- Modern trusses incorporating steel connection plates.
- Pressure treated wood posts
- No interior posts
- Modern cladding system

Vintage Building Characteristics (Bldgs 2 & 3):

- Non-pressure treated posts
- Unfinished Earth Floors
- Corrugated metal cladding system
- Interior post supports
- Evidence of previous structural repair work
- Worn and jaded appearance

Foundation Investigation:

Limited excavation was carried out at Sunderland Yard on April 19, 2005, to determine the foundation types for the different buildings. Pits were excavated alongside one of the exterior posts for buildings 1, 2 and 5. For building 3 the pit was excavated alongside an existing concrete wall.

The investigation revealed that the posts for each of the buildings investigated appear to be embedded at least 3 feet into the ground. The excavation did not reach the bottom of the footing.

Conclusions:

(i) Buildings 1 and 5 (Modern)

The two modern type buildings, Buildings 1 and 5, appear to be in excellent condition and do not appear to show any obvious signs of distress. With normal maintenance, these buildings could remain in service for an additional 20 – 30 years.

(ii) Buildings 2 and 3 (Vintage)

Whereas the two vintage building types, Buildings 2 and 3, do not appear to show any obvious signs of distress, they do appear to have outlasted their design life. Given their present condition it may be possible to prolong their service life for an additional five to ten years without any repairs being made, but there after, replacement or extensive repairs would probably be necessary.

The extent of repairs necessary to substantially prolong the life of these buildings include

- Providing a new cladding system
- Providing plywood clad shearwalls located at the exterior of the building to resist lateral wind/ seismic loads
- Installing a concrete slab on grade within the building
- Providing adequate drainage around the building to keep the ground reasonably dry around the buried posts.

Report prepared by
David O'Longaigh,
Bridges and Structures, PDOT.