Appendix IV-C – Recommendations for Management of Street Wastes

Introduction

This appendix addresses waste generated from stormwater maintenance activities such as street sweeping and the cleaning of catch basins and, to a limited extent, other stormwater conveyance and treatment facilities. Limited information is available on the characteristics of wastes from detention/retention ponds, bioswales, and similar stormwater treatment facilities. The recommendations provided here may be generally applicable to these facilities, with extra diligence given to waste characterization.

These recommendations do not constitute rules or regulations, but are suggestions for street waste handling, reuse, and disposal using current regulations and the present state of knowledge of street waste constituents. The recommendations address the liquid and solid wastes collected during routine maintenance of stormwater catch basins, detention/retention ponds, ditches and similar stormwater treatment and conveyance structures, and street and parking lot sweeping. In addition to these recommendations, end users and other authorities may have their own requirements for street waste reuse and handling.

"Street Wastes" include liquid and solid wastes collected during maintenance of stormwater catch basins and detention/retention ponds, ditches and similar stormwater treatment and conveyance structures, and solid wastes collected during street and parking lot sweeping.

"Street Wastes," as defined here, does not include solids and liquids from street washing using detergents, cleaning of electrical vaults, vehicle wash sediment traps, restaurant grease traps, industrial process waste, sanitary sewage, mixed process, or combined sewage/stormwater wastes. Wastes from oil/water separators at sites that load fuel are not included as street waste. Street waste also does not include flood debris, landslide debris, and chip seal gravel.

Street waste does not ordinarily classify as dangerous waste. The owner of the stormwater facility and/or collector of street waste is considered the waste generator and is responsible for determining whether the waste designates as dangerous waste. Sampling to date has shown that material from routine maintenance of streets and stormwater facilities does not classify as dangerous waste (see Table C.6 at the end of this appendix). However, it is possible that street waste from spill sites could classify as dangerous waste. Street waste from areas with exceptionally high average daily traffic counts may contain contaminants – such as heavy metals, total petroleum hydrocarbons (TPH), and carcinogenic polycyclic aromatic hydrocarbons (c-PAH) – at levels that limit reuse options.

Contamination in Street Waste Solids

Street waste is solid waste. While street waste from normal street and highway maintenance is not dangerous waste, it is solid waste, as defined under The Solid Waste Management Act (Chapter 70.95 RCW) and under Solid Waste Handling Standards (Chapter 173-350 WAC). The Solid Waste Management Act gives local health departments primary jurisdiction over solid waste management. Street waste solids may contain contaminants at levels too high to allow unrestricted reuse. There are no specific references in the Solid Waste Handling Standards to facilities managing street waste solids, although these facilities will typically fit under the section dealing with Piles Used for Storage and Treatment (Section 320). There are no specific references for reuse and disposal options for street wastes in the Solid Waste Handling Standards because they do not apply to clean soils. Clean soils are defined as 'soils and dredged material which are not dangerous wastes, contaminated soils, or contaminated dredged material…' (WAC 173-350-100). Whether or not a soil is a clean soil depends primarily upon the level of contaminants and, to a lesser degree, on the background level of contaminants at a particular location and the exposure potential to humans or other living organisms. Therefore, evaluate both the soil and potential land application sites to determine if a soil is a clean soil.

There is no simple regulatory mechanism available to classify street waste solids for uncontrolled reuse or disposal. Street wastes are not defined simply as solid waste. Local health districts have historically used the Model Toxics Control Act (MTCA) Cleanup Regulation Method A residential soil cleanup levels to approximate "clean" and to make decisions on land application proposals. The MTCA regulation is not intended to be directly applied to setting contaminant concentration levels for land application proposals. However, they may provide human health and environmental threat information and a useful framework for such decisions, when used in conjunction with other health and environmental considerations. In addition to MTCA, Ecological Soil Screening Levels from EPA, ODEQ Risk-based concentrations, Toxicological benchmarks from Oak Ridge National Labs, and natural background levels can be considered. Contact the Tacoma-Pierce County Health Department to determine local requirements for making this determination.

Using the old MTCA regulations, many local health departments have set a criterion of 200 mg/kg Total Petroleum Hydrocarbons (TPH) for diesel and heavy fuel oils as a threshold level for clean soil. Using the new MTCA terrestrial ecological evaluation procedures, allowable TPH levels for land application could range from 200 to 460, depending on site characteristics and intended land use. Street waste sampling has historically yielded TPH values higher than 200 mg/kg for hydrocarbons in the diesel and heavy oil range. These values typically reflect interference from natural organic material and, to a lesser extent, relatively immobile petroleum hydrocarbons. The mobile hydrocarbons that are of concern for groundwater protection are generally not retained with street waste solids. Ecology's Manchester Lab has developed an analytical method to reduce the problem of natural organic material being included in the TPH analysis for diesel and heavier range hydrocarbons. This method, called NWTPH-Dx, reduces the background interference associated with vegetative matter by as much as 85 percent to

95 percent. However, even with the new methodology, TPH test results for street waste may still be biased by the presence of natural vegetative material and may still exceed 200 mg/kg. Where the laboratory results report no 'fingerprint' or chromatographic match to known petroleum hydrocarbons, the soils should not be considered to be petroleum contaminated soils. Table C.1 at the end of this appendix lists typical TPH levels in street sweeping and catch basin solids.

Street waste solids frequently contain levels of carcinogenic PAHs (c-PAH) that make unrestricted use inappropriate. This is complicated further by analytical interference caused by organic matter that raises practical quantitation or reporting limits. To greatly reduce the level of interference, the use of U.S. EPA Test Method 8270, incorporating the silica gel cleanup step, is recommended. The calculated c-PAH value can vary greatly depending upon how non-detect values are handled. The new MTCA Method A criterion for c-PAH is 0.1 mg/kg (the sum of all seven c-PAH parameters multiplied by the appropriate toxicity equivalency factor) for unrestricted land uses. The MTCA criteria for soil cleanup levels for industrial properties is 2.0 mg/kg. Following this guidance, most sites where street wastes could be reused as soil will be commercial or industrial sites, or sites where public exposure will be limited or prevented. See Table C.2 at the end of this appendix for typical c-PAH values in Street Waste Solids and Related Materials. See Table C.3 for typical metals concentrations in Catch Basin Sediments.

Permitting of street waste treatment and storage facilities as solid waste handling facilities by the City of Gig Harbor Public Works Department or Tacoma-Pierce County Health Department is required. Under the Solid Waste Management Act, local health departments have primary jurisdiction over solid waste management.

Street waste handling facilities are subject to the requirements of the Solid Waste Handling Standards. Specific requirements depend upon the manner in which the waste is managed. Most facilities are permitted under the section dealing with Piles Used for Storage and Treatment (Section 320).

For most facilities, permit requirements include a plan of operation, sampling, record keeping and reporting, inspections, and compliance with other state and local requirements. The plan of operation should include a procedure for characterization of the waste and appropriate reuse and disposal options, consistent with the recommendations in this document and applicable federal, State, and local requirements.

Ecology suggests a street waste site evaluation (see sample at end of this appendix) for all street waste as a method to identify spill sites or locations that are more polluted than normal. Ecology based the disposal and reuse options listed below on characteristics of routine street waste and are not appropriate for more polluted wastes. The collector of street waste should evaluate it for its potential to be classified as dangerous waste. The collector should also be aware that this waste may not meet end user requirements.

Street waste suspected to be dangerous waste should not be collected with other street waste. Material in catch basins with obvious contamination (unusual color,

staining, corrosion, unusual odors, fumes, or oily sheen) should be left in place or segregated until tested. Base testing activities on probable contaminants. Street waste that is suspected to be dangerous waste should be collected and handled by someone experienced in handling dangerous waste. If collecting potential dangerous waste because of emergency conditions, or if the waste becomes suspect after it is collected, it should be handled and stored separately until a determination as to proper disposal is made. Street waste treatment and storage facilities should have separate "hot load" storage areas for such waste. **Dangerous Waste** includes street waste known and suspected to be dangerous waste. This waste must be handled following the Dangerous Waste Regulations (Chapter 173-303 WAC) unless testing determines it is not dangerous waste.

Spills should be handled by trained specialists. Public works maintenance crews and private operators conducting street sweeping or cleaning catch basins should have written policies and procedures for dealing with spills or suspected spill materials. Emergency Spill Response telephone numbers should be immediately available as part of these operating policies and procedures.

The end recipient of street waste must be informed of its source and may have additional requirements for its use or testing that are not listed here. This document is based primarily on average street waste's chemical constituents and their potential effect on human health and the environment. There are physical constituents (for example, broken glass or hypodermic needles) or characteristics (for example, fine grain size) that could also limit reuse options. Additional treatment such as drying, sorting, or screening may also be required, depending on the needs and requirements of the end user.

Street waste treatment and storage facilities owned or operated by governmental agencies should be made available to private waste collectors and other governmental agencies on a cost recovery basis. Proper street waste collection and disposal reduces the amount of waste released to the environment. The operators of street waste facilities should restrict the use of their facilities to certified and/or licensed waste collectors who meet their training and liability requirements.

The use of street waste solids under this guidance should not lead to designation as a dangerous waste site, requiring cleanup under MTCA. Exceeding MTCA Method A unrestricted land use cleanup levels in street waste and products made from street waste does not automatically make the site where street waste is reused a cleanup site. A site is reportable only if "a release poses a threat to human health or the environment" (Model Toxic Control Act). The reuse options proposed below are designed to meet the condition of not posing a threat to human health or the environment.

Testing of street waste solids will generally be required as part of a plan of operation that includes procedures for characterization of the waste. Testing frequency, numbers of samples, parameters to be analyzed, and contaminant limit criteria should all be provided as part of an approved plan of operation. However, street sweepings that consist primarily of leaves, pine needles, branches, and grass clippings do not require testing. Tables C.4 and C.5 at the end of this appendix provide some recommended parameters and sampling frequencies for street waste solids from routine street maintenance. These

are provided as guidance only, and are intended to assist the city and the Tacoma-Pierce County Health Department in determining appropriate requirements. Sampling requirements may be modified over time, based on accumulated data. When the material is from a street waste facility or an area that has never been characterized by testing, the test should be conducted on a representative sample before co-mingling with other material. Testing in these instances would be to demonstrate that the waste does not designate as dangerous waste and to characterize the waste for reuse. At a minimum, the parameters in Table C.4 are recommended for these cases. Note that it will generally not be necessary to conduct TCLP analyses when the observed values do not exceed the recommended values in Table C.4. Table C.6 illustrates some observed relationships between total metals and TCLP metals values.

For further information on testing methods and sampling plans, refer to:

- SW 846 (U.S. EPA, Office of Solid Waste, Test Methods for Evaluating Solid Wastes, 3rd Edition); and
- Standard Methods for the Examination of Water and Wastewater (American Public Health Association, et al., 18th Edition, 1992).

For street waste not exceeding the suggested maximum values in Table C.4, the following street waste solids reuse and disposal options are recommended:

- Compost street sweepings that consist primarily of leaves, pine needles and branches, and grass cuttings from mowing grassy swales. Remove litter and other foreign material prior to composting or the composting facility must provide for such removal as part of the process. Dispose of the screened trash as solid waste at an appropriate solid waste handling facility.
- It is possible to reuse coarse sand screened from street sweeping after recent road sanding, providing there is no obvious contamination from spills. The screened trash is solid waste and must be disposed of at an appropriate solid waste handling facility.
- Screen roadside ditch cleanings, not contaminated by a spill or other release and not associated with a stormwater treatment system such as a bioswale, to remove litter and separate into soil and vegetative matter (leaves, grass, needles, branches, etc.). The soils from these activities are typically unregulated as solid waste. Ditching material that may be contaminated must be stored, tested, and handled in the same manner as other street waste solids. It is the generator's responsibility to visually inspect and otherwise determine whether the materials may be contaminated.
- Construction street waste – solids collected from sweeping or in stormwater treatment systems at active construction sites – may be

placed back onto the site that generated it, or managed by one of the methods listed below, provided that it has not been contaminated as a result of a spill. For concrete handling at construction sites, refer to BMPs C151 and C154 in Volume II.

- Use screened street waste soils as feedstock materials for topsoil operations. Reserve this option for street waste soils with very low levels of contaminants. Evaluate the allowable level of contaminants based on the proposed use of the soil. At a minimum, the contaminate level in the soil should be below established action levels for in situ soils. Do not dilute street waste soils with clean soils or composted material as a substitute for treatment or disposal. There may be unscreened physical contaminants (for example, glass, metal, nails, etc.) in street waste. Where present, these contaminants in street waste could preclude its use as feedstock material for topsoil operations.

- Fill in parks, play fields, golf courses, and other recreational settings, where direct exposure by the public is limited or prevented. One way to accomplish is to cover the fill with sod, grass, or other capping material to reduce the risk of soil being ingested. The level of contaminants in the street waste must be evaluated to ensure that the soils meet the definition of clean soils when used in this manner.

- Fill in commercial and industrial areas, including soil or top dressing for use at industrial sites, roadway medians, airport infields, and similar sites where there is limited direct human contact with the soil, and stabilize the soils with vegetation or other means. Evaluate the level of contaminants in the street waste to ensure that the soils meet the definition of clean soils when used in this manner.

- Top dressing on roadway slopes, road or parking lot construction material, road or parking lot subgrade, or other road fill. Evaluate the level of contaminants in the street waste to ensure that the soils meet the definition of clean soils when used in this manner.

- Daily cover or fill in a permitted municipal solid waste landfill, provided the street waste solids have been dewatered. Street waste solids may be acceptable as final cover during a landfill closure. Consult the Tacoma-Pierce County Health Department and landfill operator to determine conditions of acceptance.

- Treatment at a permitted contaminated soil treatment facility.

- Recycling through incorporation into a manufactured product, such as Portland cement, prefabricated concrete, or asphalt. Consult the facility operator to determine conditions of acceptance.

- Other end-use as approved by the Tacoma-Pierce County Health Department.

- Disposal at an appropriate solid waste handling facility.

For street waste that exceeds the suggested maximum values in Table C.4, the following street waste solids reuse and disposal options are recommended:

- Treatment at a permitted contaminated soil treatment facility.

- Recycling through incorporation into a manufactured product, such as Portland cement, prefabricated concrete, or asphalt. Consult the facility operator to determine conditions of acceptance.

- Other end-use as approved by the Tacoma-Pierce County Health Department.

- Disposal at an appropriate solid waste handling facility.

Street Waste Liquids

General Procedures:

Street waste collection should emphasize retention of solids in preference to liquids. Street waste solids are the principal objective in street waste collection and are substantially easier to store and treat than liquids.

Street waste liquids require treatment before their discharge. Street waste liquids usually contain high amounts of suspended and total solids and adsorbed metals. Treatment requirements depend on the discharge location.

The Industrial Pretreatment Program responsible for O&M of the system must approve discharges to sanitary sewer and storm drain systems. Ecology will not generally require waste discharge permits for discharge of stormwater decant to sanitary sewers or to stormwater treatment BMPs constructed and maintained in accordance with Ecology's *Stormwater Management Manual for Western Washington* (see Volume V for further detail).

Follow the following required order of preference for disposal of catch basin decant liquid and water removed from stormwater treatment facilities.

1. **Discharge of catch basin decant liquids to the municipal sanitary sewer is the <u>preferred disposal option</u>.** Discharge to a municipal sanitary sewer requires the approval of the City of Gig Harbor Public Works

Department at (253) 851-6170. Approvals for discharge to a municipal sanitary sewer will likely contain pretreatment quantity, and location conditions to protect the municipal system. Following the Gig Harbor Public Works Department's conditions is a permit requirement.

2. **Discharge of catch basin decant liquids may be allowed into a basic or enhanced stormwater treatment BMP, if option 1 is not available.** Only discharge liquid collected from cleaning catch basins and stormwater treatment wet vaults back into the storm drain system under the following conditions:

   - The preferred disposal option of discharge to sanitary sewer is not reasonably available.
   - The discharge is to a basic or enhanced stormwater treatment facility (see Volume V). If pretreatment does not remove visible sheen from oils, the treatment facility must be able to prevent the discharge of oils causing a visible sheen.
   - The discharge is as near to the treatment facility as is practical, to minimize contamination or recontamination of the collection system.
   - The storm drain system owner/operator has granted approval and has determined that the treatment facility will accommodate the increased loading. Part of the approval process may include pretreatment conditions to protect the treatment BMP. Following local pretreatment conditions is a permit requirement.
   - Ecology must approve in advance flocculants for the pretreatment of catch basin decant liquids. The liquids must be non-toxic under the circumstances of use.

   The discharger shall determine if reasonable availability of sanitary sewer discharge exists, by evaluating such factors as distance, time of travel, load restrictions, and capacity of the stormwater treatment facility.

3. **Operators may return water removed from stormwater ponds, vaults, and oversized catch basins to the storm drain system.** Stormwater ponds, vaults, and oversized catch basins contain substantial amounts of liquid, which hampers the collection of solids and poses problems in hauling the removed waste away from the site. Water removed from these facilities may be discharged back into the pond, vault, or catch basin provided:

   - Operators may discharge clear water removed from a stormwater treatment structure directly to a down gradient cell of a treatment pond or into the storm drain system.

- Turbid water may be discharged back into the structure it was removed from if:
    - The removed water has been stored in a clean container (eductor truck, Baker tank, or other appropriate container used specifically for handling stormwater or clean water); and
    - There will be no discharge from the treatment structure for at least 24 hours.
- The storm drain system owner/operator must approve the discharge.

Site Evaluation

Ecology suggests use of a site evaluation as a method to identify spill sites or locations that potentially contain dangerous wastes.

The site evaluation will aid in determining if waste is a dangerous waste and in determining what to test for if dangerous waste is suspected. The site evaluation will also help to determine if the waste does not meet the requirements of the end users.

There are three steps to a site evaluation:

1. A **historical review** of the site for spills, previous contamination, and nearby toxic cleanup sites and dangerous waste and materials.

   The historical review will be easier if done on an area wide basis prior to scheduling any waste collection. The historical review should be more thorough for operators who never collected waste at a site before. At a minimum, the historical review should include operator knowledge of the area's collection history or records kept from previous waste collections.

   Private operators should ask the owner of the site for records of previous contamination and the timing of the most recent cleaning. Ecology's Hazardous Substance Information Office maintains a Toxic Release Inventory and a "Facility Site" Web page, tracking more than 15,000 sites. This information is available from Ecology through the Internet at: < https://ecology.wa.gov/Research-Data/Data-resources/Toxics-Release-Inventory> or by calling a toll-free telephone number (800-633-7585). The Web page allows anyone with Internet access to search for facility information by address, facility name, town, zip code, and SIC code, etc. It lists why Ecology is tracking each one (NPDES, TSCA, RCRA, Clean Air Act, etc.), as well as who to call within Ecology to find out more about the given facility. EPA's toxic release Web site is <https://www.epa.gov/toxics-release-inventory-tri-program>.

2. An **area visual inspection** for potential contaminant sources such as a past fire, leaking tanks and electrical transformers, and surface stains.

   Evaluate the area around the site for contaminant sources prior to collection of the waste. The area visual inspection may be done either as part of multiple or as single site inspections. If the inspection finds a potential contaminant source, delay the waste collection until the potential contaminant is assessed.

   A second portion of the area visual inspection is a subjective good housekeeping evaluation of the area. Locations with poor housekeeping commonly cut corners in less obvious places. Inspect these sites in greater detail for illegal dumping and other contamination spreading practices.

3. **A waste and container inspection** before and during collection.

   The inspection of the waste and catch basin or vault is the last and perhaps most critical step in the site evaluation.

   For example, if the stormwater facility has an unusual color in or around it, then there is a strong possibility that someone dumped something into it. Some colors to be particularly wary of are yellow-green from antifreeze dumping and black and/or rainbow sheen from oil and/or grease dumping. In addition, if the inspector observes any staining or corrosion, then a solvent may have been dumped.

   Fumes are also good indicators of potential dangerous waste. Avoid deliberate smelling of catch basins for worker safety, but suspicious odors may be encountered from catch basins thought to be safe. Some suspicious odors are rotten eggs (hydrogen sulfide is present), gasoline or diesel fumes, or solvent odors. If unusual odors are noted, contact a dangerous waste inspector before cleaning the basin.

   Finally, operator experience is the best guide to avoid collection of contaminated waste.

Table C.1. Typical TPH Levels in Street Sweeping and Catch Basin Solids.

Reference	Street Sweeping (mg/kg)	Catch Basin Solid (mg/kg)
Snohomish County (1) (Landau 1995)	390 – 4,300	
King County (1) (Herrera 1995)		123 – 11,049 (Median 1,036)
Snohomish County and Selected Cities (1) (W & H Pacific, 1993)	163 – 1,500 (Median 760)	163 – 1,562 (Median 760)
City of Portland (2) (Bresch)		MDL – 1,830 (Median 208)
City of Seattle – Diesel Range(2) (Herrera 2009)	330-520	780-1700
City of Seattle – Motor Oil(2) (Herrera 2009)	2000-2800	3500-7000
Oregon (1) (Collins; ODOT 1998) Oregon (3) (Collins; ODOT 1998)	1,600 – 2,380 98 – 125	

(1) Method WTPH 418.1; does not incorporate new methods to reduce background interference due to vegetative material
(2) Method NWTPH-Dx.
(3) Method WTPH – HCID.

Table C.2. Typical c-PAH Values in Street Waste Solids and Related Materials.

Sample Source	City of Everett					WSDOT	
Analyte	Street Sweepings	Soil	3-Way Topsoil	Vactor Solids	Leaf & Sand	Sweepings Fresh	Sweepings Weathered
Benzo(a)anthracene	0.1U	0.076U	0.074U	0.21	0.45	0.56	0.40
Chrysene	0.14	0.09	0.074U	0.32	0.53	0.35	0.35
Benzo(b)fluoranthene	0.11	0.076U	0.074U	0.27	0.52	0.43	0.51
Benzo(k)fluoranthene	0.13	0.076U	0.074U	0.25	0.38	0.39	0.40
Benzo(a)pyrene	0.13	0.076U	0.074U	0.26	0.5	0.41	0.33U
Indeno(1,2,3-cd)pyrene	0.1U	0.076U	0.074U	0.19	0.39	NR	NR
Dibenzo(a,h)anthracene	0.1U	0.076U	0.074U	0.081	0.12	0.39	0.33U
Revised MTCA Benzo(a)pyrene [ND=PQL]	0.215	0.134	0.134	0.388	0.727	0.708	0.597
Benzo(a)pyrene [ND=½ PQL]	0.185	0.069	0.067	0.388	0.727	0.708	0.366
Benzo(a)pyrene [See * below]	0.185	0.069	0	0.388	0.727	0.708	0.366
Benzo(a)pyrene [ND=0]	0.155	0.001	0	0.388	0.727	0.708	0.135

*If the analyte was not detected for any PAH, then ND=0; If analyte was detected in at least 1 PAH, then ND=½PQL; If the average concentration (using ND=½ PQL) is greater than the maximum detected value, then ND=Maximum value.
The new Method A soil cleanup level for unrestricted land use is 0.1 mg/kg for BAP. (WAC 173-340-900, Table 740-1).
The new Method A soil cleanup level for industrial properties is 2 mg/kg for BAP. (WAC 173-340-900, Table 745-1).

Table C.3. Typical Metals Concentrations in Catch Basin Sediments.

Parameter	Ecology 1993	Thurston 1993	King County 1995	King County 1995	City of Seattle 2003 through 2011
Metals; Total (mg/kg)	(Min – Max)	(Min – Max)	(Min – Max)	Mean	Min- Max (Mean)
Arsenic (As)	< 3 – 24	0.39 – 5.4	4 – 56	0.250	< 5 – 50 (9.3)
Cadmium (Cd)	0.5 – 2.0	<0.22 – 4.9	0.2 – 5.0	0.5	
Chromium (Cr)	19 – 241	5.9 – 71	13 – 100	25.8	
Copper (Cu)	18 – 560	25 – 110	12 – 730	29	9.1 – 3,280 (166)
Lead (Pb)	24 – 194	42 – 640	4 – 850	80	3 – 3,690 (154)
Nickel (Ni)	33 – 86	23 – 51	14 – 41	23	
Zinc (Zn)	90 – 558	97 – 580	50 – 2,000	130	44 – 4,170 (479)
Mercury (Hg)	0.04 – 0.16	0.024 – 0.193			< 0.03 – 3.8 (0.16)

Table C.4. Recommended Parameters and Suggested Values for Determining Reuse and Disposal Options.

Parameter	Suggested Maximum Value
Arsenic (As), Total	20.0 mg/kg (a)
Cadmium (Cd), Total	2.0 mg/kg (b)
Chromium (Cr), Total	42 mg/kg (c)
Copper (Cu), Total	100 mg/kg (d)
Lead (Pb), total	250 mg/kg (e)
Nickel (Ni)	100 mg/kg (d)
Zinc (Zn)	270 mg/kg (d)
Mercury (Hg), Inorganic	2.0 mg/kg (f)
PAHs (Carcinogenic)	0.1 – 2.0 mg/kg (see Note at (g) below)
TPH (Heavy Fuel Oil)	2,000 mg/kg (see Note at (h) below)
TPH (Diesel)	200 mg/kg (see Note at (j) below)
TPH (Gasoline)	100 mg/kg (j)
Benzene	0.03 mg/kg (j)
Ethylbenzene	6 mg/kg (j)
Toluene	7 mg/kg (j)
Xylenes (Total)	9 mg/kg (j)

(a) Arsenic: from MTCA Method A – Table 740-1: Soil cleanup levels for unrestricted land uses
(b) Cadmium: from MTCA Method A – Table 740-1: Soil cleanup levels for unrestricted land uses.
(c) Chromium; from MTCA Method A – Table 740-1: Soil cleanup levels for unrestricted land uses
(d) Copper, Nickel, and Zinc; from MTCA Table 749-2: Protection of Terrestrial Plants and Animals
(e) Lead; from MTCA Method A – Table 740-1: Soil cleanup levels for unrestricted land uses
(f) Mercury; from MTCA Method A – Table 740-1: Soil cleanup levels for unrestricted land uses
(g) PAH-Carcinogenic; from MTCA Method A – Table 740-1: Soil cleanup levels for unrestricted land uses and Table 745-1, industrial properties, based on cancer risk via direct contact with contaminated soil (ingestion of soil) in residential land use situations and commercial/industrial land uses. Note: The Tacoma-Pierce County Health Department may permit higher levels as part of a Plan of Operation, where they determine that the proposed end use poses little risk of direct human contact or ingestion of soil.

(h) TPH (Heavy Fuel Oil); from MTCA Method A – Table 740-1: Soil cleanup levels for unrestricted land uses
(i) TPH (Diesel): from MTCA Table 749-3**:** Protection of Terrestrial Plants and Animals..
(j) BETX; from MTCA Method A – Table 740-1: Soil cleanup levels for unrestricted land uses.

Table C.5. Recommended Sampling Frequency for Street Waste Solids.

Cubic Yards of Solids	Minimum Number of Samples
0 – 100	3
101 – 500	5
501 – 1,000	7
1,001 – 2,000	10
>2,000	10 + 1 for each additional 500 cubic yards

Modified from Ecology's Interim Compost Guidelines (no longer in effect)

Table C.6. Pollutants in Catch Basin Solids – Comparison to Dangerous Waste Criteria.

Parameter	Range of Values in Catch Basin Waste	Range of Values in Catch Basin Waste	Dangerous Waste Criteria
Metals	**Total Metals (mg/kg)**	**TCLP Metals (mg/kg)**	**TCLP values (mg/l)**
Arsenic	< 3 – 56	< 0.02 – 0 .5	5.0
Cadmium	< 0.22 – 5	0.0002 – 0.03	1.0
Chromium	5.9 – 241	0.0025 – 0.1	5.0
Copper	12 – 730	0.002 – 0.88	none
Lead	4 – 850	0.015 – 3.8	5.0
Nickel	23 – 86	< 0.01 – 0.36	none
Zinc	50 – 2,000	0.04 – 6.7	none
Mercury	0.02 – 0.19	0.0001 – 0.0002	0.2

Data from Thurston County (Thurston County 1993), King County (Herrera 1995) and Ecology (Serdar; Ecology 1993).

Table C.7. Typical Catch Basin Decant Values Compared to Surface Water Quality Criteria.

Parameter	State Surface Water Quality Criteria		Range of Values Reported	Range of Values Reported
Metals	Freshwater Acute (ug/l – dissolved metals)	Freshwater Chronic (ug/l – dissolved metals)	Total Metals (ug/l)	Dissolved Metals (ug/l)
Arsenic	360	190	100 – 43,000	60 – 100
Cadmium*	2.73	0.84	64 – 2,400	2 – 5
Chromium (total)			13 – 90,000	3 – 6
Chromium (III)*	435	141		
Chromium (VI)	0.5	10		
Copper*	13.04	8.92	81 – 200,000	3 – 66
Lead*	47.3	1.85	255 – 230,000	1 – 50
Nickel*	1114	124	40 – 330	20 – 80
Zinc*	90.1	82.3	401 – 440,000	1,900 – 61,000
Mercury	2.10	0.012	0.5 – 21.9	

*Hardness dependent; hardness assumed to be 75 mg/l

Table C.8. Typical Values for Conventional Pollutants in Catch Basin Decant.

Parameter (values as mg/l; except where stated)	Ecology 1993 Mean	(Min – Max)	King County 1995 Mean	(Min – Max)
PH	6.94	6.18 – 7.98	8	6.18 – 11.25
Conductivity (umhos/cm)	364	184 – 1110	480	129 – 10,100
Hardness (mg/l CaCO3)	234	73 – 762		
Fecal Coliform (MPN/100 ml)	3,000			
BOD	151	28 – 1,250		
COD	900	120 – 26,900		
Oil and Grease	11	7.0 – 40	471	15 – 6,242
TOC	136	49 – 7,880	3,670	203 – 30,185
Total Solids	1,930	586 – 70,400		
Total Dissolved Solids	212	95 – 550		
Total Suspended Solids	2,960	265 – 111,000		
Settleable Solids (ml/l/hr)	27	2 – 234	57	1 – 740
Turbidity (ntu)	1,000	55 – 52,000	4,673	43 – 78,000

Table C.9. Catch Basin Decant Values Following Settling.[1]

Parameter: Total Metals in mg/l	Portland – Inverness Site Min – Max	King County – Renton Min – Max	METRO Pretreatment Discharge Limits
Arsenic	0.0027 – 0.015	< MDL – 0.12	4
Cadmium	0.0009 – 0.0150	< MDL – 0.11	0.6
Chromium	0.0046 – 0.0980	0.017 – 0.189	5
Copper	0.015 – 0.8600	0.0501 – 0.408	8
Lead	0.050 – 6.60	0.152 – 2.83	4
Nickel	0.0052 – 0.10	0.056 – 0.187	5
Silver	0.0003 – 0.010	< MDL	3
Zinc	0.130 – 1.90	0.152 – 3.10	10
Settleable Solids; ml/L	No Data	0.02 – 2	7
Nonpolar fat, oil and grease	5.7 – 25	5 – 22	100
Ph (std)	6.1 – 7.2	6.74 – 8.26	5.0 – 12.0
Total Suspended Solids	2.8 – 1,310		
Recorded Total Monthly Flow; Gallons	Data not available	31,850 – 111,050	
Recorded Max. Daily Flow; Gallons	Data not available	4,500 – 18,600	25,000 GPD
Calculated Average Daily Flow; GPD	Data not available	1,517 – 5,428	

[1] Data from King County's Renton Facility (data from 1998 – 199) and the City of Portland's Inverness Site (data from 1999 – 2001); detention times not provide