Capital Regional District

Review of Management Practices for Catchbasin and Oil-Water Separator Wastes

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LIST OF ABBREVIATIONS

AWQG	Approved Water Quality Guidelines
BC	British Columbia
BETX	Benzene, Ethylbenzene, Toluene and Xylenes; types of VOC's
BOD	Biological oxygen demand
C/I	Commercial / industrial
CB	Catchbasin
CCME	Canadian Council of Ministers of the Environment
COP	Codes of practice
CPPI	Canadian Petroleum Producers Institute
CRD	Capital Regional District. Capital Regional District
CSR	Contaminated Sites Regulation
DIPA	Diisopropanolamine
EMSSB	Enhanced Model Storm Sewer Bylaw
LWMP	Liquid Waste Management Plan. Liquid Waste Management Plan
M/R	Municipal / residential
MOG	Mineral oil and grease
MSR	Municipal Sewer Regulation
MTBE	Methyltertiarybutylether
OWS	Oil-water separator
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyls
PERC	Perchloroethylene
pH	Negative log of hydrogen ion concentration used as a measurement of acidity/alkalinity
SUB	Sewer Use Bylaw
SWR	Special Waste Regulation
TCE	Tetrachloroethylene
TLW	Trucked Liquid Waste. Trucked Liquid Waste
TSS	Total suspended solids
ULC	Underwriters' Laboratories of Canada
UST	Underground storage tank
VOC	Volatile organic compound
WTF	Waste Treatment Facility

EXECUTIVE SUMMARY

ES.1 BACKGROUND

Earth Tech Canada Inc. (Earth Tech) was retained by the Capital Regional District (CRD) to conduct a review of management practices for catchbasin and oil-water separator wastes generated in the core area of the CRD. This project was initiated as part of the CRD's commitment to develop a Trucked Liquid Waste (TLW) program as specified in Stage 3 of the Liquid Waste Management Plan (LWMP). Trucked liquid waste is the term used to describe wastes that do not meet the CRD's requirements for disposal to storm or sanitary sewers. These wastes must be collected, contained and transported to appropriate treatment or disposal sites.

The primary goal of this project was to provide clear definitions and guidelines to generators, and handlers of catchbasin (CB) and oil-water separator (OWS) wastes as well as regulators regarding liabilities and appropriate management of such wastes. This was done through a review of existing legislation, and current management practices for these waste and an assessment of CB and OWS wastes based on analytical data provided by the CRD.

ES.2 LEGISLATION

In Canada, responsibility for waste discharge permitting is primarily a matter of provincial jurisdiction. The provinces develop the necessary legislation and provincial agencies put in place regulations and administer the waste discharge processes. The power to issue permits is created by provincial legislation.

The management of wastes in British Columbia are regulated under the Waste Management Act (WMA). The Municipal Sewer Regulation gives authority to local governments to manage and regulate their sewer systems. However, the management and disposal of contaminated soils and liquids remains under provincial jurisdiction.

The only federal legislation that could potentially affect waste discharges from CBs and OWSs is the Fisheries Act, which regulates discharges to freshwater, marine and estuarine environments. The Act gives authority to the federal government to take action against any organization that discharges substances into the aquatic environment that are considered to be deleterious to aquatic life.

The CRD Sewer Use Bylaw specifies maximum concentrations of certain contaminants permitted for discharge to the sanitary sewer and the Hartland Landfill bylaw specifies certain sump wastes that are accepted as controlled waste. However, there is no legislation that specifically addresses wastes from CBs and OWSs, some of which would not meet the above mentioned bylaw criteria. The onus is placed on the generators to characterize the waste and ensure that the waste is disposed of appropriately.

In general, regulations regarding the disposal of wastes from CBs and OWSs are complex because there is no prescriptive set of regulations. The disposal method for these wastes types depends largely on the physical nature of the waste and the types of contaminants.

ES.3 WASTE CHARACTERISTICS

Analytical data from commercial and municipal catchbasin wastes were provided by the CRD to compare against existing standards, guidelines and criteria. The major findings were that OWS and CB waste:

- may qualify as special waste as defined by the SWR
- may contain solids that exceed the CSR
- may contain liquids that exceed SUB, CSR or ambient water quality criteria.

ES.4 CURRENT DISPOSAL PRACTICES

Current disposal practices for CB and OWS waste was determined through a survey conducted by Earth Tech for a related project (10). The results of the survey showed that CB waste is disposed of in various ways including:

- Collection by contractor for disposal at Hartland Landfill
- Collection by special waste disposal company
- Placed in trash bin
- Spread on property

In addition several people surveyed did not know how the waste was disposed.

Ten businesses surveyed owned oil-water separators and the method of disposal of the wastes varied also.

- Four had the waste collected by waste oil recyclers,
- One had the waste taken to Peninsula Wastewater Services Ltd.,
- Two had the waste collected by special waste handlers, and
- Three did not know how the waste was being collected.

ES.5 PROBLEMS AND GAPS

There was confusion over responsibility for catchbasin maintenance between business operators, property owners and property managers. Haulers were uncertain as to waste quality and regulations that may apply. For non-special wastes there are no prescriptive regulations or requirements. Both generators and haulers were uncertain of liability.

It is important to note that generators of contaminated or toxic waste are ultimately responsible for the management of that waste and do not transfer that responsibility to the contractor or disposal facility upon disposal of the material. Generators of waste that may be

harmful to the environment or human health must ensure that the material is disposed of appropriately.

ES.6 RECOMMENDATIONS

Generators of CB and OWS waste such as business owners have the potential of exposing themselves to liability from improper disposal of wastes collected from these devices. This is in part due to lack of due diligence on their part and, to some extent, to a lack of clear regulations regarding such wastes. Generators can reduce this liability by adopting basic principles of due diligence including the following:

- Initial cleanup with the help of professionals.
- Maintain CBs and OWSs regularly and frequently to reduce or avoid accumulating toxic and hazardous compounds in the devices thereby avoiding special waste disposal requirements and reducing costs.
- Keep updated maintenance and disposal records readily available for inspection.
- Ensure that waste disposal companies comply with all regulations pertaining to disposal or treatment of CB and OWS waste.

Likewise, municipalities and regional districts can assist in ensuring proper management of CB and OWS wastes by:

- Continuing to adopt codes of practice and best management practices for CBs and OWSs connected to the sanitary sewer system. The COP should include as a minimum acceptable standards for the design of such devices as well as requirements for installation, maintenance and record keeping. The BMP should include instructions for owners to develop pollution prevention plans to reduce the amount of contaminants that make their way to the devices and reduce the risk of spills and leaks that may find their way to the catchbasins. The COP should include provisions for regular inspections and sampling by the jurisdiction having authority.
- Adopting COPs and BMPs into the model storm sewer bylaw For CBs and OWSs connected to the storm sewer system.
- Continuing to develop a set of BMPs designed to reduce the amount of contamination that accumulates in CBs and OWSs and ensure proper operation and maintenance.
- Approving only OWSs designed to meet the more stringent CSR water standards. The installation of an OWS should be inspected and maintained on a regular basis and the CCME guidelines for USTS should be adopted to regulate these devices.
- Educating generators about the environmental concerns of improper disposal of these types of wastes and on the appropriate methods of maintaining these devices and disposing of the waste.
- Liasing with service providers and hauling companies to inform them of existing regulations and keeping them updated about new and changing regulations.

SECTION 1.0
INTRODUCTION

1.1 INTRODUCTION

Earth Tech Canada Inc. (Earth Tech) was retained by the Capital Regional District (CRD) to conduct a review of management practices for catchbasin and oil-water separator wastes generated in the core area of the CRD. This project was initiated as part of the CRD's commitment to develop a Trucked Liquid Waste (TLW) program as specified in Stage 3 of the core area Liquid Waste Management Plan (LWMP).

Trucked liquid waste is the term used to describe wastes that do not meet the CRD's requirements for disposal to storm or sanitary sewers. These wastes must be collected, contained and transported to appropriate treatment or disposal sites. Although, they represent a small portion of the flow, some TLW can be expensive to treat and dispose of properly, thus the potential for illegal dumping is high. The goal of the program is to ensure that TLW generated in the core area of the CRD is handled and disposed of in an appropriate and responsible manner to protect public health and the environment.

1.2 OBJECTIVES AND GOALS

The objective of this exercise was to outline the regulatory requirements for handling and disposing of catchbasin (CB) and oil-water separator (OWS) wastes, assess existing collection and disposal practices and make recommendations for the appropriate handling of these wastes.

The primary goal of this project is to provide clear definitions and guidelines to generators, and handlers of CB and OWS wastes as well as regulators regarding liabilities and appropriate management of such wastes.

1.3 PROJECT SCOPE

The scope and tasks of this project are as follows:

1. Review existing regulations at different levels of government that would apply to catchbasin and OWS wastes. This includes municipal and regional by-laws as well as provincial and federal regulations, standards and guidelines.

2. Review and assessment of sample data collected by the CRD from private catchbasins and OWSs against applicable standards and disposal criteria.
3. Review existing practices carried out by private contractors that service and maintain catchbasins and OWSs. Recommendations for appropriate management practices were developed based on the quality of the waste in question, applicable regulations and criteria and general health and safety concerns for the public and the environment.

SECTION 2.0
BACKGROUND

2.1 HISTORY

The Capital Regional District (CRD) initiated the development of the Core Area Liquid Waste Management Plan (LWMP) in 1989 in order to provide a strategy for handling liquid wastes for the next 25 years.

Currently, wastewater collected from the Core Area of the CRD receives preliminary treatment through screening before being discharged to the ocean into the Strait of Juan de Fuca through two outfalls at Clover Point and Macaulay Point. No advanced treatment such as chemical or biological treatment of the wastewater occurs at this time prior to discharge to the ocean.

The position of the Ministry of Water, Land and Air Protection is that secondary treatment will eventually be required for all municipal wastewater discharges in the province. Due to the favourable conditions at the discharge locations, the province, in 1993, indicated that the CRD may take 15-20 years to comply with the policy.

The position of Environment Canada is that the CRD's current sewage disposal practices are in non-compliance with the Federal Fisheries Act, that primary treatment is required as soon as possible and that secondary treatment is required within a reasonable time frame.(5)

The CRD supports a wastewater management program based on "sound scientific evidence of a need for increased treatment and cost benefit analyses of treatment and other programs to determine where money is most effectively spent"(5). Essentially, the CRD examined all options, including end-of-pipe treatment, for managing liquid wastes generated in the region to minimize harmful effects to the environment and human health. As a result, the CRD has adopted a pollution prevention approach to wastewater management that aims to eliminate or reduce pollution at the source, believing it to be a more cost effective method for controlling pollution rather than treating the pollution after it has been generated.

The Core Area LWMP provides a strategy for the handling, treatment, disposal and beneficial use of the area's liquid wastes. In addition to planning for treatment and disposal of wastewater, the plan includes a number of on-going programs. Five of these programs are currently underway in the CRD:

- Source Control
- Stormwater Quality Management
- Harbours Environmental Action
- Management of Inflow and Infiltration
- Wastewater and Marine Assessment

In addition, two new programs have been initiated to address other sources of wastewater generated in the CRD:

- Management of On-site Wastewater Treatment and Disposal Systems
- Management of Trucked Liquid Waste.

Trucked liquid wastes are specific liquid wastes[1] that are generated outside sewered areas, or are unsuitable for direct discharge to sewers and are therefore trucked to treatment or disposal facilities. The goal of the Trucked Liquid Waste Management Program is to ensure that trucked liquid waste generated in the core area of the CRD is handled and disposed of in an appropriate and responsible manner to protect public health and the environment. This report examines the regulatory requirements and management practices for two types of TLW; catchbasin waste and oil-water separator waste.

Part of the impetus for targeting CB and OWS waste stems from suspicion of a problem with poorly maintained devices and improper disposal of the waste resulting in soil, groundwater and surface water contamination. An example of this was discovered during the Cecelia Creek Rehabilitation project that subsequently led to a study, undertaken by the City of Victoria, to examine the condition and maintenance of sumps and catchbasins at certain business within the Cecelia Creek catchment area located within the City of Victoria (1). The November 2000 study reported the following: "during the reconstruction of the Cecelia Ravine storm drain system, oil was observed entering Cecelia Creek after a significant rainfall event in contravention of environmental regulations." The study confirmed earlier suspicion and found that over one quarter of businesses were not adequately maintaining their sumps or catchbasins as evidenced by the presence of oil in the devices and there being no maintenance program in place. Another 38% of businesses owned sumps or CBs evaluated to be in fair condition because they had a maintenance program with no oil in the devices but were filled with debris over the invert indicating inadequate inspection and maintenance. Only one quarter of the businesses inspected had maintained their CBs in good condition and had an adequate maintenance program in place.

Another, more significant, reason for targeting these wastes is the confusion amongst generators of CB and OWS waste, disposal contractors and regulators, in dealing with these wastes. Questions such as whether solids from catchbasins and the residual liquids collected with the solids are considered waste by the various jurisdictions has not been adequately answered to date. This has lead to ambiguities in defining the proper handling and disposal of these materials to ensure not only compliance with existing regulation but also to protect the environment.

[1] The Sewer Use Bylaw defines Trucked Liquid Waste as follows: "any waste that is collected and transported from the site where the waste originated by means other than discharge to a sewer, but does not include septage waste, recreational vehicle waste, carpet cleaner waste or ship and boat waste."(7)

2.2 DEFINITIONS

2.2.1 Catchbasins

Catchbasins or sumps are designed to remove heavy particles that can accumulate and obstruct the sewer systems. Solids are washed into the catchbasin during storm events, snow and ice melt and street or surface flushing or cleaning activities and settle at the bottom of the catchbasin while the water flows into the sewer system. Some catchbasins may also be designed with baffles and inverted pipes allowing clean water to flow out while retaining floatable oils and greases. CBs may be designed with either a straight, horizontal pipe allowing water to enter when it reaches invert level or a baffle connection or bent pipe that allows water to enter from the bottom and floating oil and grease to accumulate at the surface, acting as an oil-water separator. **Figure 1** is a diagram of a typical catchbasin with a baffle-type invert.

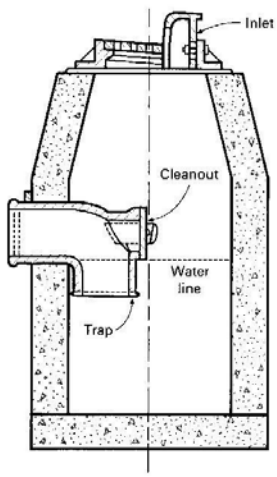

Figure 1 Typical catchbasin configuration (Metcalf and Eddie (14)).

Catchbasins are used to collect storm water run-off from large, impermeable areas such as streets or parking areas. They may also be used to treat runoff from commercial, industrial or institutional operations such as yard storage areas or vehicle wash areas. In the CRD, catchbasins that collect stormwater runoff are normally connected to the storm sewer system. In some cases, stormwater runoff may be collected for discharge to the sanitary sewer system if there is a potential for contamination of the water due to the activities on the site.

Waste collected in catchbasins consists of accumulated solids and liquids. Catchbasin are cleaned using an eductor truck, commonly called a “vactor” truck or vac-truck. Solids and liquids are siphoned into the truck for transport and disposal. If the solids have compacted or hardened in the catchbasin, a water jet may be used to loosen the material prior to siphoning. Standing water may also be present in catchbasins and collected at the same time as the solids (8). The water collected from CBs is often decanted from the solids in order to make room in the vac trucks for more waste or to process the waste for disposal resulting in two separate

waste streams. The decant water or residual water, having been in contact with the solids, may contain the same contaminants through leaching or entrained solids resulting in possible contaminated water unsuitable for discharge to the sewer systems.

2.2.2 Oil-Water Separators

An oil-water separator is a shop-fabricated assembly used to remove free oil and grease from non-domestic or process wastewater prior to discharge to the sewer.

The separation process in an OWS makes use of the immiscible nature of water and hydrocarbons and gravity. Wastewater contaminated with hydrocarbons is piped into a settling chamber or tank containing a series of baffles or plates. The tank serves to slow the flow so that the oil and water have a chance to separate and form two layers. The baffles or plates provide a barrier to further slow the flow, a surface on which the oil globules can form and rise to the surface and physically retain the floating oil layer while the denser water layer passes below the baffles and out of the settling chamber. In a three-stage separator there are at least three compartments where separation can take place prior to the water being discharged to the sewer. The oil and grease collected in the settling chamber can be either contained within the floating layer or decanted automatically into a holding tank. The floating layer or oily sludge is then siphoned off using a vac truck or other methods such as skimming or soaking up with oil absorbent pads. **Figure 2** shows a typical installation of an OWS in a parking lot. In this figure, storage of the separated oil layer and debris is integral to the OWS; there is no separate storage tank for the waste.

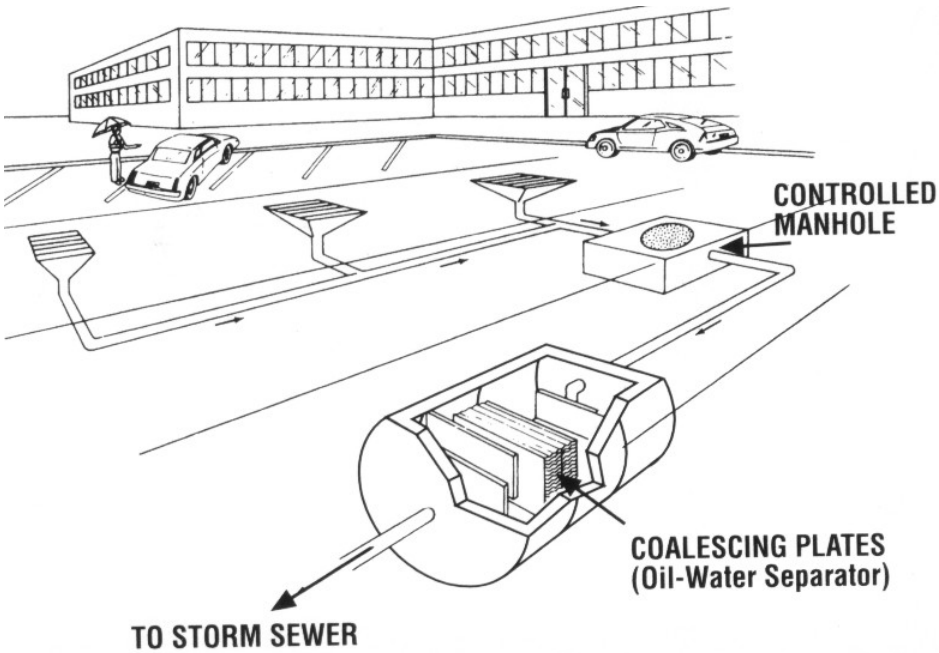

Figure 2 Example of an application for an oil-water separator where the hydrocarbons and solids are contained within the separator (ZCL Composites Inc.)

OWSs are typically installed at gasoline service stations to collect and treat run-off from the dispensing and service areas, to collect run-off from storage tank containment areas, at vehicle wash and maintenance operations and in any business or shop whose wastewater discharge to the sewer contains oil and grease in excess of the allowable limit. Some municipalities and disposal companies use OWSs to treat decant water from the collection of waste material from catchbasins.

OWS are also used to treat effluents from the following industrial applications; compressed air condensate, grinding coolants, machine coolants, paint booth wastewater, die cast solutions, rinse water, mop water, parts washer water, boiler water, car wash wastewater, and other water-based wastes.

Wastes from OWSs may consist of a mixture of oil, grease, solids and some amount of wastewater. Depending on the application, type of separator, the collection method and maintenance frequency the hydrocarbon content of the waste material may be concentrated or dilute.

In the CRD, all non-domestic wastewater sent to the sanitary sewer must meet the sewer use bylaw criteria of 15 mg/L (50 mg/L if regulated under a code of practice) hydrocarbon or mineral oil and grease and 100 mg/L total oil and grease. The CRD has recently put in place codes of practice specific to certain industry sectors requiring the installation of OWSs to capture oil and grease from wastewater. The sectors that are currently required to have OWSs in place are food services (grease interceptor), automotive repair shops and vehicle wash operations.

2.3 WASTE CHARACTERIZATION

Wastes from catchbasins consist of solids and residual liquids while wastes from oil-water separators typically consist of an oily liquid waste component and some amount of solids or sludge that has accumulated in the device.

The 1998 report by Carley Environmental Inc. (8) characterized both the solid and liquid portions of municipal catchbasin wastes. The contaminants of concern found in CB waste include heavy metals resulting from vehicle operation, corrosion of metal components and industrial and commercial activity. CB wastes were also found to contain organic compounds originating from refined products including oils and lubricants, fuels and solvents as well as poisons such as pesticides and herbicides. Some of the substances of concern include benzene, ethylbenzene, toluene and xylene (BETX) and polycyclic aromatic hydrocarbons (PAHs) that are either toxic or carcinogenic.

The oily component collected by an OWS may vary greatly in the concentration of hydrocarbons depending on the type of system used (e.g. single, two or three stage separators, coalescing plate, etc.), operating conditions, maintenance, and especially whether the system

has been designed properly for the specific application. Oily wastes collected from OWSs generally have a high enough concentration of petroleum hydrocarbons to qualify as special waste.

The liquid component may also contain other substances depending on the source of the wastewater. For example, OWSs at automotive repair shops may contain elevated concentrations of metals.

The solid or sludge waste collected in OWSs may originate from the waste stream itself or may be entrained from other sources through open channels. The amount of solids is generally small but have to be removed on a regular basis as part of the maintenance of the systems. These accumulated solids may contain some amount of hydrocarbons from contact with the waste stream and may contain other harmful substances such as heavy metals in concentrations that are toxic or hazardous.

2.4 CONCERNS FOR GENERATORS AND DISPOSAL COMPANIES

Chemical analyses undertaken by the CRD and other organizations (8) have shown that wastes from CBs and OWSs are expected to contain elevated concentrations of metals and hydrocarbons that are harmful to human health and the environment. These substances, if introduced into the environment, can damage the local ecosystems as well as be a potential health hazard to humans through contamination of public areas, groundwater, etc.

The main concern with CB and OWS wastes is that they are not being handled and disposed of appropriately. Federal, provincial and municipal regulations regulate the discharge of pollutants to the environment and set standards for the disposal of certain substances. The implication of this is that generators and disposal companies may be liable for contamination and damage caused by the improper management of these wastes.

SECTION 3.0
LEGISLATION

In Canada, responsibility for waste discharge permitting is primarily a matter of provincial jurisdiction. The provinces develop the necessary legislation and provincial agencies put in place regulations and administer the waste discharge processes. The power to issue permits is created by provincial legislation.

Generators and disposal contractors should be aware of the potential environmental liability associated with the management of CB and OWS wastes. Private companies and public entities such as municipal public works departments that contract the collection and disposal of these wastes to private companies may retain liability if the contractor fails to handle or dispose of the wastes in an appropriate manner.

The following section describes existing regulations that apply to waste material (solid or liquid) discharged to the environment and to the management and disposal of catchbasin and oil-water separator wastes generated in the CRD. Regulations from the three levels of government are presented and discussed; federal, provincial and municipal or regional. Both the solid and liquid wastes (including leachate from solids) generated from CBs and OWSs are examined with respect to the regulations.

3.1 FEDERAL GOVERNMENT

The federal act that is primarily concerned with discharges of wastewaters to the environment is the Fisheries Act. However, it does not outline specific regulatory requirements for the management of CB and OWS wastes but sets standards for discharges to the environment.

3.1.1 Fisheries Act

The Fisheries Act governs commercial and recreational fishing and their habitats in all waters (fresh, marine and estuarine) in Canada. The parts of the act most applicable to CB and OWS waste are the discharge or deposit of deleterious substances into water frequented by fish.

The Act partly defines deleterious substances as “any substance that, if added to any water, would degrade or alter or form part of a process of degradation or alteration of the quality of that water so that it is rendered or is likely to be rendered deleterious to fish or fish habitat or to the use by man of fish that frequent that water”. This definition includes hazardous or non-hazardous substances that, when introduced into fish bearing waters, would render them deleterious to fish. This Act is the one most commonly enforced in the event of a spill. Contravention of the Act is punishable by fines up to one million dollars and jail terms of up to three years.

Relevance to CB/OWS waste:

CB and OWS wastes contain substances that are known toxics to bio-organisms and if not handled properly can damage fish habitat. This regulation would apply to continuous discharges directly to aquatic environments as well as to spills, leaks and contaminated runoff from a disposal site.

Discharges to fish bearing waters should meet the CCME criteria or guidelines for aquatic life which are deemed to be the minimum standards set by the federal government.

3.1.2 Registration of Storage Tank Systems for Petroleum Products and Allied Petroleum Products of Federal Lands Regulation of CEPA

This regulation applies to owners of outdoor aboveground storage tank systems for petroleum products having a single or total capacity of more than 4,000 L, and to owners of all underground storage tank systems for petroleum products or allied petroleum products, where the storage tank systems are located on federal property. It sets requirements for storage tank registration, installation, operation, maintenance, record keeping and reporting.

Relevance to CB/OWS wastes:

This regulation impacts owners of OWS systems where the hydrocarbon phase that is extracted from the wastewater stream is stored in an underground tank on federal property.

3.1.3 Other National Guidelines and Criteria

The following standards and guidelines provide instructions for the installation and maintenance of OWS that will result in the quantity and quality of the waste generated and provide guidelines for appropriate monitoring of wastes generated as well as standards for effluent quality and standards for receiving environments.

3.1.3.1 Underwriters' Laboratories of Canada (ULC)

The ULC has recently developed design standards for oil-water separators (ULC-S656). These standards describe the approved construction and installation requirements for OWSs, performance criteria to be met, various test procedures for evaluating the installations, appropriate marking and operating and maintenance instructions.

The standard specifies effluent hydrocarbon content limits of 15 mg/L of free oil at the manufacturer's recommended maximum flow capacity and a maximum loading of 150 mm of hydrocarbon depth or the maximum allowable by an automatic oil removal device. Free oil is defined as non-water soluble and non-emulsified hydrocarbons.

The standard also calls for the immediate removal of any accumulation of free oil greater than the manufacturer's recommended level, a minimum monthly inspection for accumulation of

free oil or solids and an annual examination of the OWS for damage to the interior surface and internal components and reparation as required.

The standards also refer to other guidelines and standards that the OWSs are designed to meet. These include;

1. The CCME Environmental Code of Practice for Underground Storage Tank Systems Containing Petroleum Products and Allied Petroleum products;
2. The Canadian Petroleum Producers Institute (CPPI) Code of Practice for Management of Water Effluent Quality at Petroleum Storage and Distribution Facilities.

Relevance to CB/OWS wastes:

This standard applies solely to OWS systems. In the case where the standard has been adopted into legislation, it is enforceable by the relevant jurisdiction. For example, the CRD has adopted this standard as part of the CRD Sewer Use Bylaw specifically for the codes of practice for automotive repair and vehicle wash operations.

3.1.3.2 CCME Environmental Code of Practice for Underground Storage Tank Systems Containing Petroleum Products and Allied Petroleum Products

The Canadian Council of Ministers of the Environment (CCME) is the major intergovernmental forum in Canada for discussion and joint action on environmental issues of national and international concern. It comprises environment ministers from the federal, provincial and territorial governments. CCME members propose nationally consistent environmental guidelines, criteria and objectives. However, the CCME has no jurisdiction to impose its suggestions on its members. Each jurisdiction determines the degree to which it will adopt CCME recommendations.

Under the CCME code of practice for underground storage tanks (UST's), all underground OWSs must be registered with the appropriate authorities. The code also specifies requirements for secondary containment and leak detection for UST's, over-fill protection devices, spill-containment around product removal or transfer connections and secondary containment with leak detection for remote fill piping. The code also sets standards for maintenance of OWSs and record keeping requirements.

Relevance to CB/OWS wastes:

These guidelines, although recognized by the BC government have not been incorporated into legislation and are not enforceable. However, they have been adopted by the federal government and are enforced at federal facilities and properties.

3.1.3.3 CCME Water Quality Guidelines for the Protection of Aquatic Life

Canadian water quality guidelines are intended to provide protection of freshwater and marine life from anthropogenic stressors such as chemical inputs or changes to physical components. The guidelines provide a list of substances and their maximum ambient concentrations in freshwater and marine environments that will support and maintain a designated water use.

The water quality guidelines are normally used in conjunction with dispersion models for a particular water body to determine allowable discharge rates into that water body. As a general approximation for allowable discharge concentrations, the ambient concentrations are multiplied by a factor of 10 to account for dilution.

Relevance to CB/OWS wastes:

The CCME guidelines are treated as standards by the federal government although they are not written into legislation and are not enforceable. However, all federal facilities are expected to follow the guidelines and the government can instruct other jurisdictions to comply with those guidelines by acting under the Fisheries Act. Municipal sewer systems as well as treatment and storage facilities and any effluent emanating from those facilities are expected to conform to those standards.

If a substance released to the environment is not within the allowable concentration, the federal government may require the generators of the substance as well as the handlers of wastes containing the substance to modify their operations to be in compliance.

3.2 PROVINCIAL GOVERNMENT

3.2.1 Waste Management Act

The British Columbia Ministry of Water, Land and Air Protection regulates the management of waste through the Waste Management Act (Act). The Act establishes the authority of provincial regulators, enables the passing of regulations and gives legal definition of certain activities related to waste management.

The Act specifies that no waste is to be discharged into the environment unless it complies with the regulations. Penalties for failure to comply with the Act include fines up to 1 million dollars.

The Act also provides for the ability to grant authority to a regional district to make bylaws and regulate the management and disposal of municipal solid and liquid waste into the environment with the condition that the bylaws and regulations must conform to the Act.

The Act defines waste as,

"air contaminants, litter, effluent, refuse, biomedical waste or special waste and any other substance designated by the Lieutenant Governor in Council, whether or not the type of waste has any commercial value or is capable of being used for a useful purpose." (12)

As such, materials and substances collected in CBs and OWSs are considered waste whether or not they were directly generated as a consequence of a manufacturing or commercial activity or had a commercial value and are subject to regulation under the Act.

The Waste Management Act sets specific regulations for certain activities and industries. Those regulations that pertain to the management of CB and OWS waste include the following:

- Municipal Sewer Regulation
- Contaminated Sites Regulation
- Special Waste Regulation

3.2.1.1 Municipal Sewer Regulation

The MSR governs the operation of a sewage treatment facility. It sets standards for the design and construction of sewage treatment facilities as well as for effluent reuse and discharge to the environment. The regulation specifies maximum concentrations of BOD, TSS, pH, coliforms, total phosphorous, orthophosphate and ammonia for different effluent discharge rates.

The regulation also specifies what substances can be accepted at treatment plants. Non-domestic waste, defined as liquid waste other than domestic sewage, is prohibited from discharge to a treatment facility unless the quality of the waste meets or exceeds the standards set by B.C. Reg. 63/88, the Special Waste Regulation or it can be ensured that the final discharge meets the requirements of this regulation and the quality of any biosolids meets the requirements of an authorization issued under the Act (B.C. Reg. 129/99, MSR Section 20).

A municipality is also restricted in accepting the discharge of non-domestic waste to a municipal sewage collection system unless a source control bylaw or equivalent is in place to regulate the discharge of non-domestic waste into the sewer system or there is no demonstrable need to protect the sewage facility or receiving environment from that waste.

Relevance to CB/OWS waste:

Wastes from CBs and OWSs would have to meet the requirements under this regulation prior to discharge to a sewage treatment facility or municipal sewage collection system. In the CRD, discharges to the sanitary sewer system must comply with the Sewer Use Bylaw. The key parameters of concern are oil and grease, total solids content and metals concentrations.

3.2.1.2 Contaminated Sites Regulation

The Contaminated Sites Regulation (CSR) (9) of the WMA defines contaminated sites, land uses and remediation standards for contaminated soil and water. It sets the requirements for site investigations, the relocation of contaminated soil and water, and remediation processes. It also contains specifications for attributing liability for contamination and sets conditions for relocating contaminated soils.

Most importantly, the CSR sets investigation, remediation and relocation standards for contaminated media such as soil, surface water and groundwater. These standards vary according to intended use of the site and use of contaminated media, and whether present or future use of the site is residential, urban park, commercial or industrial (C/I). They also define powers of regulators and responsibilities of the site owner in each of these areas.

Relevance to CB/OWS waste:

Under the CSR, soil is defined as unconsolidated mineral or organic material, rock, fill, and sediment deposited on land, but does not include sewage sludge or composted organic material, which are applied to land for a beneficial purpose. As such, CB solids would be subject to the sections dealing with soil relocation, sampling and classification according to the standards set in the regulation.

Contaminated soil relocation agreements are required if the soils exceed the standards set out in Schedule 7 – Standards Triggering contaminated Soil Relocation Agreements. However, such an agreement is not required under several conditions specified in Section 41.3 of the CSR and include, among others:

- Relocation of soil to an authorized special waste facility or treatment facility,
- Relocation of contaminated soil not exceeding 5 cubic metres from a specific site, and
- Relocation of soil to a landfill under specific conditions set out in CSR Section 42.

In the case of CBs, it can be assumed that solid wastes collected from a single site will not exceed 5 m^3 and will in most cases not require soil relocation agreements. Also, since Hartland is authorized to accept soil contaminated above industrial standards but below special waste criteria, relocation of CB solid wastes to the landfill would also not require relocation agreements.

The CSR also specifies criteria for surface water and groundwater located on or discharging from contaminated sites. The regulations state that surface water or groundwater which has a probability of being used for aquatic life, irrigation, livestock or drinking water use must meet the specified standards for those uses. Residual water, or water drained from CB wastes must be discharged in such a manner as the local land and water uses will allow. There is no requirement under the CSR for relocation of contaminated water to a disposal site such as keeping records of analytical results, etc.

CB waste (consisting of solids and residual liquid) or solids collected from OWSs could be disposed of on land provided the specific land use standards and surrounding water use standards are met. For example, silts from CBs may be used as roadbed fill if the silt meets the CSR standards for commercial land use. In the event that the waste exceeds the land or water use standards, the waste would have to be disposed of at a waste treatment facility (WTF) unless it is a special waste in which case it would have to be disposed of at a special waste facility.

3.2.1.3 Special Waste Regulation

This provincial regulation governs the storage, handling, treatment, containment and discharge of most types of hazardous waste and hazardous materials. The definition of special wastes is outlined in the regulations and includes treated residuals and contaminated media (e.g. soil, sediment, groundwater, surface water, etc.) if they exceed specified concentrations and quantities (11). Any waste that produces a leachate that does not meet the requirements of SWR Schedule 4, Part 3, is also considered special waste.

The SWR defines special wastes as follows;

(a) Dangerous goods that are no longer used for their intended purpose,

(b) PCB wastes,

(c) wastes containing dioxin,

(d) waste oil,

(e) waste asbestos,

(f) waste pest control product containers and wastes containing pest control products, including wastes produced in the production of treated wood products using pest control products,

(g) leachable toxic waste,

(h) waste containing tetrachloroethylene (TCE or PERC), and

(i) waste containing polycyclic aromatic hydrocarbon.

The SWR also define the requirements for treatment and recycling facilities and defines wastes prohibited from disposal at secure landfills and long-term storage facilities (i.e. municipal landfills). Effluent from a special waste facility must meet requirements of SWR Schedule 1.2.

The SWR does not apply to material, which exceeds certain quantity, and concentration triggers provided it is retained (i.e. collected, packaged, handled, bulked or held) on site for less than 14 days.

The SWR permits the recycling of SW where the waste or residual from a special waste facility is wholly utilized for the purposes specified in the regulation but explicitly excludes the application of SW or residue into or onto land or the disposal by burning or as a fuel (Reg. 63/88). Notwithstanding the letter definition, waste oil, as defined by the Special Waste Regulation, may be recycled in the manufacture of asphalt, on any land for the purpose of construction, repair or dust control or by combustion as a fuel if it meets the requirements of the regulation (Sec. 41 Reg. 63/88). Likewise, hydrocarbon contaminated soil may be used in the manufacture of asphalt provided it meets the requirements of the regulation (Sec. 41.1, Reg. 63/88).

Relevance to CB/OWS waste:

Silt and sediment in the case of CBs and oil and grease in the case of OWSs may, in some cases qualify as special waste depending on the composition and concentration. For example, sediment with a high concentration of heavy metals may qualify as leachable toxic waste; likewise, if the oily residue from an oil-water separator contains at least 3% oil (hydrocarbon product).

Highly contaminated wastes from CBs or OWSs may be deemed special wastes in which case they would have to be collected, transported and disposed at an authorized special waste facility.

Wastes from CBs and OWSs that exceed the SW standards, may be used in the manufacture of asphalt or as fuel oil if they meet the SW criteria for waste oil and hydrocarbon contaminated soil for those purposes.

3.2.2 British Columbia Approved and Working Water Quality Guidelines

The BC Approved Water Quality Guidelines were developed in order that water quality data could be assessed and site-specific water quality objectives could be prepared. They provide benchmarks for the assessment of water quality and setting water quality objectives. Approved guidelines are given to protect six major water uses: Drinking Water, Aquatic Life (freshwater and marine), Wildlife, Recreation and Aesthetics, Agriculture (irrigation and livestock watering), and Industrial (e.g. food processing industry).

In the CRD, Stormwater runoff, which passes through CBs, may collect in “live” streams prior to being discharged into the coastal waters of the Pacific Ocean. Therefore, both freshwater and marine environments must be monitored to ensure they can support aquatic life. Water quality guidelines have been approved for the following substances.

Algae Aluminium Benthic sedimentation Chlorine Chlorophenols Coliforms Colour Copper Cyanide (weak –acid dissociable) Ethylbenzene Fluoride Lead	Manganese Mercury Microbiological indicators Molybdenum Nitrate Nitrite Nitrogen (nitrate, nitrite and ammonium) Nutrients (phosphorus) and algae Organic Carbon Oxygen (dissolved) Particulate matter (suspended solids and turbidity)	Sulphate pH Phosphorus PCBs PAHs Silver Suspended solids Toluene Total gas pressure Turbidity Zinc

Guidelines for the following substances are being reviewed:

Aluminium (update) Barium Beryllium Boron Cadmium Chlorate	Chromium Diisopropanolamine (DIPA) Dioxins and furans Iron Methyltertiarybutylether (MTBE)	Phenol Selenium Sulfolane Temperature Xylene

Relevance to CB/OWS Waste:

The BC Approved Water Quality guidelines are treated as standards for discharges to the environment by the provincial government and effluent to freshwater and marine environments are expected to meet these guidelines at the point of discharge.

3.2.3 Other provincial regulations

Another provincial regulation that impacts oil-water separators is the British Columbia Fire Code. Since oil-water separators are considered underground storage tanks containing petroleum products, a dangerous good, their design, installation and maintenance must conform to the fire code.

3.3 REGIONAL GOVERNMENT

The CRD is empowered under the provincial Waste Management Act to regulate the disposal of waste into its sewers and landfill. This includes the discharge of waste into its own sewers and into sewers owned and operated by member municipalities and at the Hartland landfill. The CRD has two enforceable bylaws and one model bylaw that pertain to CB and OWS waste:

- Sewer Use Bylaw
- Hartland Landfill Tipping Fee and Regulation Bylaw
- Enhanced Model Storm Sewer Bylaw

3.3.1 Sewer Use Bylaw No. 2922

The bylaw defines allowable discharges to the sanitary sewer system. Under the bylaw, the CRD sewage control manager may issue waste discharge permits for the discharge of certain restricted wastes, high volume discharge or to allow the discharge of waste other than domestic sewage (TLW) to the sewer. The bylaw also allows for the development of Codes of Practice that outline minimum acceptable practices for specific industry groups and similar commercial operations to assist in meeting the sewer use bylaw criteria and reduce the types and quantities of contaminants entering the sewer.

Relevance to CB and OWS waste:

CB and OWS wastes have typically been found to qualify as restricted waste and as such, may not be discharged directly to the sewer without prior approval. Without approval, these wastes must be disposed of in accordance with all municipal, provincial and federal regulations or at a WTF or disposal facility such as Hartland Landfill provided they meet the requirements of those facilities.

The bylaw currently requires certain commercial and industrial operations to install OWSs according the ULC standards through the codes of practice (COP). The COPs set requirements for the installation of OWSs as well as maintenance and record keeping but not on the disposal of waste materials collected in those devices.

3.3.2 Hartland Landfill Tipping Fee and Regulation Bylaw No. 2338

The Hartland Landfill bylaw (4) specifies materials that are accepted at the Hartland Road landfill facility and sets rates for disposal of waste, restricted waste and controlled waste. The bylaw does not have set standards or criteria for wastes being brought to the landfill but uses a system of categories or types of waste based on the sources of the wastes. Permission to dispose of the waste at the landfill to some extent depends on the assessment by the CRD. A number of liquid wastes are accepted at the landfill as controlled wastes" This includes water containing soil, sand, gravel, other non-hazardous solids, sewage solids, and trace levels of petroleum products or grease. Although the bylaw does not specifically mention catchbasin waste it describes the waste that would be normally found in catchbasins as the following:

- Pumpings from parking lot drainage sumps, and
- Pumpings from sumps which collect runoff from vehicle washing facilities excluding facilities used for maintenance or lubrication of automobile components or where solvents or sandblasting are employed for removal of paint, grease or oil.

Liquid waste, other than what is specifically permitted in the bylaw, is prohibited from disposal at the landfill, as is Special Waste as defined by the BC Special Waste Regulation.

Relevance to CB/OWS Waste:

Pumpings from CBs, consisting of mostly water with some solids, are generally accepted at the landfill as controlled waste unless they contain more than trace levels of petroleum products; a disposal permit is required.

The bylaw does not allow the disposal of "sump" waste from facilities used for maintenance of automobile components or where solvent or sandblasting is used for removal of paint, grease or oil. This includes waste from oil water separators used in automotive repair shops, which would normally qualify as special waste.

3.3.3 Enhanced Model Storm Sewer Bylaw

The Enhanced Model Storm Sewer Bylaw was drafted to provide a basis that can be used by member municipalities to manage discharges to the storm sewer systems in their communities. The model bylaw is not enforceable by the CRD but member municipalities may adopt a similar bylaw that would be enforceable.

The objectives of the enhanced bylaw are to provide regulations with respect to protecting infrastructure, management of stormwater discharge quality, management of stormwater flow, watercourse protection and restoration and flood control.

The enhanced model bylaw includes a prohibition of the discharge of wastes other than "stormwater" into a storm sewer or watercourse. Stormwater is defined as water resulting from natural precipitation from the atmosphere and which is intended to be transported into a storm sewer or watercourse with the following inclusions: water resulting from domestic activities customarily incidental to a residential use of the land, including gardening and lawn maintenance, and non-commercial car, building and driveway washing. Other sources of water also permitted into the storm sewer are street, hydrant and water main flushing and water used for firefighting.

The enhanced model bylaw also deals with one of the shortcomings of the current model bylaw by implementing preventative measures and powers instead of having a reactive approach that deals with problems only once they have occurred. The enhanced bylaw therefore includes allowances for such regulations or codes of practice (COP) as:

- requiring regular maintenance of storm water works,
- restricting the amount of impermeable area of a property, etc.

The aim of the COPs would be to educate the operators to adopt working practices and site layout options that would reduce the amount of contaminants entering the storm sewer system. A tentative list of those operations targeted for COPs include automotive operations, industrial/commercial yard storage, construction site operations and parking lot maintenance operations.

Relevance to CB/OWS waste:

Decant water that has been extracted from CB solids from private and municipal/residential catchbasins are not specifically covered under the model bylaw. Although, decant water may have originated from stormwater runoff, chemical analyses have shown these liquids to be contaminated to levels that are not suitable for disposal into the storm sewer system or directly into receiving waters. In addition, decant water results from the dewatering of vactor truck wastes collected from several sources by a disposal contractor, which could be interpreted as a commercial activity. Therefore decant water should not be treated as stormwater.

As OWSs are generally used to treat wastewaters incidental to the operations at commercial, industrial and institutional facilities they would not fall under the definition of stormwater.

The model bylaw, if adopted, would not only set regulations on the water quality discharged to the storm sewer system but could also specify regulatory codes of practice for certain industrial, commercial and institutional operations. The types of operations targeted for COPs include those that currently operate CBs or OWSs and would be harmonized with those included in the Sewer Use Bylaw.

3.3.4 Summary

In Canada responsibility for solid waste and wastewater discharge permitting is a matter of provincial jurisdiction. The provinces develop the necessary legislation and provincial agencies put in place regulations and administer the wastewater discharge permitting processes. The provinces also have the power to delegate authority to regional governments. The power to issue permits is created by provincial legislation.

The federal government has the power to regulate substances deemed deleterious to fish and fish habitat under the Fisheries Act. The CRD regulates discharges to the sanitary sewer system and to the regional landfill in compliance with the provincial and federal criteria while storm water remains the responsibility of individual municipalities in the region.

It is important to note that generators of contaminated or toxic waste are ultimately responsible for the management of that waste and do not transfer that responsibility to the contractor or disposal facility upon disposal of the material. Generators of waste that may be harmful to the environment or human health must ensure that the material is disposed of appropriately.

Wastes from CBs and OWSs may be in solid or liquid form and in many cases a mixture of the two, as slurry, that may be dilute or concentrated. It is therefore difficult to determine where the wastes fall in terms of existing legislation. However, since wastes from these sources are generally separated into two phases, solid and liquid, during handling and prior to disposal it is best to treat them separately.

The disposal of solid waste is regulated by the waste management act in the province of BC which sets standards for the handling, treatment or disposal of contaminated soil and special wastes as well as the design and operation of municipal landfills. Solids collected from CBs and OWSs are classified as soil and should be handled as such. Solid waste from CBs and OWSs must be characterized for the parameters specified in the CSR and SWR. Solids contaminated up to the commercial/industrial (C/I) standards can be disposed of as fill material on corresponding land-use properties. Solids contaminated beyond the C/I standards can be disposed of at a WTF, disposal facility or an authorized municipal landfill while solids classified as special wastes must be disposed of or treated at a special waste facility.

The disposal and discharge of waste liquids is more complicated due to the numerous options and regulations regarding this waste. In order to assist generators, disposal companies and regulators determine the proper course of action to take when disposing of liquid waste, the CRD has put together a document entitled, "Liquid Waste Decision Tree"(6). The document goes through the various steps for deciding how to handle the specific type of waste and includes a flow diagram. The decision tree deals with all possible scenarios from clean water that may be discharged to the storm sewer to special waste liquids.

Regulations focus on waste characteristics rather than being prescriptive for a particular waste type and are therefore not easily interpreted. Except for sump wastes accepted as controlled waste at the Hartland Landfill, there are no explicit "instructions" for dealing with wastes from CBs and OWSs. This is in part due to the wide variety or composition of wastes collected from such devices making it difficult to classify the wastes collected. The diversity of the waste is due to several factors including the type business, the age of the facilities on the property, its location, etc. Moreover, in order to evaluate wastes against the CSR standards or use the Liquid Waste Decision Tree to decide on appropriate disposal of waste, expensive chemical analyses of the wastes are required. In many cases, the volume of waste collected from these devices is very small and the waste is not necessarily created by the business operation but by customers and clients, making the disposal more onerous on the part of the businesses.

Although waste from OWSs may exceed the criteria for the SUB or Hartland, it will not necessarily exceed the SW standards and as such, its disposal is not regulated by any legislation and may be transported off site without mandatory record keeping through manifests. This is perceived as a potential source of problems since although the waste may be contaminated it is not regulated and there is less control as to what is done with it compared to contaminated soils and SW.

SECTION 4.0
WASTE CHARACTERISTICS AND CURRENT DISPOSAL PRACTICES

4.1 CATCHBASIN AND OIL-WATER SEPARATOR WASTE QUALITY

The CRD has been collecting and analysing samples from CBs and OWSs for the purpose of issuing disposal permits for restricted and controlled wastes. In this section, sample data from analytical results of CB waste provided by the CRD is presented along with other reported data. These data are examined and discussed with respect to existing criteria, guidelines, objectives and standards described in the previous section. Although no data of wastes collected in OWSs was available, a brief discussion of waste originating from these devices is also presented.

Some of the samples referred to in this report were obtained from existing businesses and municipalities. However, the names of the businesses and municipalities are not identified and a two-letter code is used to identify the samples. It must also be emphasized that the samples presented in this report are not representative of all catchbasins and oil-water separators in the CRD. They are only a very small sample of the many devices in operation throughout the CRD and are meant only to demonstrate the applicability of the existing legislation and the potential liability to generators, disposal companies and the CRD.

4.1.1 Catchbasin Waste

4.1.1.1 Commercial/Industrial Catchbasins

The CRD provided results of analytical tests performed on solids collected from four catchbasins from commercial operations. The CBs were located on the properties of light industrial and commercial operations. Analytical tests were performed on both the solids and the decant water, the results of which are presented in **Appendix A**, **Tables A.1** and **A.2,** respectively.

4.1.1.1.1 Solids

Table A.1 presents the data from the four catchbasins as well as the standards from the special waste and contaminated sites regulations. The first column on the left lists the parameters for which the waste was analysed followed to the right by the SWR and CSR standards and the unit of measurement in the following column. The samples were compared against the special waste standard for leachability, PAH concentration and petroleum hydrocarbon content and the CSR standards for residential and commercial/industrial land use and the standards triggering contaminated soil relocation agreements.

To the right of the “Units” column are the results from the analytical tests along with an indication of which criteria have been exceeded (the word “over” in the cell indicate that the

concentration of the corresponding parameter in that row exceeds the corresponding standard in the column).

Three of the four CB waste samples were collected from operations with a high potential for contaminant release, i.e. facilities used for maintenance, storage or lubrication of automobile components. The remaining sample was obtained from a sign manufacturer, which also has a high potential for contamination.

The CB waste solids were analyzed for metals, polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOC's) and leachability. Of the four samples analyzed, all of them exceeded the CSR Standards for commercial/industrial land use (C/I standards) in at least one parameter and one sample exceeded the special waste criterion for oil content of 3% by weight. All four samples exceeded the CSR C/I standards for cadmium, chromium, copper, lead and zinc. The sample that exceeded the SW criterion for oil also exceeded the C/I standards for xylenes.

Based on these results, the solid waste from all four catchbasins would have to be disposed of at a permitted contaminated soil landfill site as they are too contaminated to be used as fill elsewhere (i.e. they do not meet the least stringent standards for commercial or industrial land use). One of the samples would have to be disposed of at a special waste facility due to the petroleum hydrocarbon content of the waste. In all cases, the standards triggering contaminated soil relocation agreements were also exceeded but since the amounts of solids that can accumulate in a single CB is generally less than $5m^3$ it is exempt under section 41.3 of the CSR.

4.1.1.1.2 Liquids

Samples of decant water collected from the CBs of automotive repair and maintenance operations were analysed and the results are presented in **Table A.2**, **Appendix A**. The data is presented in a similar fashion to **Table A.1** except that the sample results are compared to different criteria.

The decant liquids were compared to the CCME Water Quality Guidelines, the BC Approved Water Quality Guidelines (AWQG), the BC Contaminated Sites Regulation, the BC Special Waste Regulation, and the CRD Sewer Use Bylaw. **Table A.2** indicates the decant liquids exceeded many of the CCME and BC AWQ Guidelines. In addition, all three samples also exceeded at least one of the CSR aquatic life standards and the CRD Sewer Use Bylaw criteria.

Following the Liquid Decision Tree adopted by the CRD, the waste liquids from all three sources would not qualify for a controlled waste permit for disposal at the municipal landfill and would have to be disposed of at a waste treatment or disposal facility.

4.1.1.2 Municipal Catchbasin Waste

Municipal and residential (M/R) catchbasin waste quality has been well documented in the 1998 study by Carley Environmental (8). Results from that study are presented below along with an analysis of wastes from municipal storage and handling yards. Data on the former was provided by the CRD to compare with existing regulations and standards.

4.1.1.2.1 Solids

The study by Carley Environmental examined the characteristics of municipal catchbasin wastes from three different land-use areas in the CRD; residential, commercial and industrial. The analytical results showed exceedences of the corresponding CSR standards for metals in all three areas. PAH concentrations from samples from residential CBs exceeded both residential and C/I standards while solids samples collected from both commercial and industrial areas exceeded the residential standards only. This may be attributable to the greater use of pesticides and herbicides in residential areas. Leachate extraction tests performed on solids samples from CBs from residential and commercial areas did not exceed the Special Waste standards and none of the samples collected from the three land use areas exceeded the SW standards for PAHs.

4.1.1.2.2 Liquids

Decant water collected from municipal CB wastes was also characterized in the Carley study and evaluated against the CRD SUB limits. Samples collected from the three land-use areas exceed the CRD limits for several metals concentrations as well as COD, TSS and PAHs. In addition, samples from residential and commercial areas exceeded the limits for MOG and TOG. None of the samples exceeded the SW standards for PAHs.

The CRD provided analytical data of vactor truck water collected from public works yards at different municipalities in the region. The data consists of metals concentrations (total) as well as suspended solids and mineral oil and grease (MOG) concentrations. The data was obtained either directly from the truck or downstream from oil-water separators that remove floatable oil and grease prior to discharge to the sanitary sewer.

The data, presented in **Table A.3, Appendix A**, indicates that in all cases samples taken directly from the truck did not meet the SUB criteria and in one case exceeded the special waste standard for lead[2]. However, the samples taken downstream of the OWSs had reduced contaminant levels and in one case (Sample 2001009) met all of the requirements of the SUB for metals, TSS and MOG. One other downstream sample (Sample 2001045) exceeded TSS levels, another sample (Sample 2001110) exceeded both TSS and MOG while a fourth sample (Sample 2001115) exceeded several SUB criteria in addition to TSS and MOG.

[2] The solids concentration of the water sample was 68,200 mg/L, in excess of the 0.5% solids limit specified in the SWR for LEP. In this case the solids would have to be filtered and an LEP performed on the solids.

The data also indicates that the contaminants from M/R catchbasins are closely associated with the solids in the waste and to some extend with the oil since the concentrations of contaminants decreases significantly after partial removal of suspended solids and floatable oil by an oil-water separator. This is in agreement with the findings of Carley et al., 1998 (8).

4.1.2 Oil-Water Separator Waste

The reason no characteristic data of OWS waste was available is that CRD inspectors found that the waste rarely met the criteria for disposal at the Hartland Landfill from a visual inspection of the OWS wastes and have been recommending generators to dispose of the waste through a waste treatment or disposal company without performing analytical tests (13). This was in part due to the stricter criteria for mineral oil and grease that have been adopted for O&G-containing controlled waste at the landfill. This is to be expected if the OWSs are functioning correctly and are effectively separating the oil from the wastewater stream resulting in a concentrated layer of oil in the separator or discharging to a storage tank.

In addition to mineral oil and grease, OWS wastes may also contain elevated concentrations of metals and other organic and inorganic substances, which may be toxic.

4.2 CURRENT DISPOSAL PRACTICES

4.2.1 Catchbasin Wastes

Solid waste or slurry from private catchbasins is currently accepted as controlled waste at the Hartland Landfill. Permission from the CRD is required prior to disposal to the landfill. In some cases, an analysis of the waste may be requested for petroleum hydrocarbon content, metals and leachable toxic waste (only trace amounts (< 150 ppm) of petroleum hydrocarbons are accepted at the landfill). An analysis may not be necessary if the source of the waste is known to staff, an inspection finds the waste acceptable or prior testing revealed it to be acceptable for disposal.

Once a permit to send the waste to the landfill has been obtained, a contractor is normally hired by the business owner to collect the waste (via vactor truck) and transport it to the landfill. The waste must be accompanied by a declaration by the waste carrier, including the permit number issued by the CRD. If the waste is not suitable for disposal at the landfill, a waste disposal company is hired to collect the waste. It is then shipped to a landfill site or waste treatment facility.

Earth Tech conducted a survey of businesses located in the CRD for a related project to inventory trucked liquid waste generated in the region (10). The survey included asking businesses whether or not catchbasins were present on their property, how and how often they were maintained and by whom. Of the fifty-seven businesses that were interviewed, only ten confirmed the presence of CBs on their properties. Two had their catchbasins cleaned by a

disposal contractor for disposal to Hartland Landfill, two had their CB waste collected by a special waste disposal contractor, three did not know how the catchbasins were being maintained while two disposed of the waste by putting it in the trash bin and one shovelled it out and let it dry after which it was spread on the property. As reported by Allen et al. (1) "the method of choice for [disposing of catchbasin and sump wastes] is to shovel out the waste and dispose of the debris in the garbage". **Table 4.1** summarizes the results of the survey.

Table 4.1 Summary of Survey Results for Catchbasin Maintenance and Disposal Practices

Maintenance and Disposal Method	Number of Answers
Collected by disposal contractor for disposal to Hartland Landfill	2
Collected by Special Waste Disposal Company	2
Don't know	3
Other:	
Placed in trash bin	2
Spread on property	1

4.2.2 Oil-Water Separator Waste

Wastes collected from oil-water separators typically consist of a mixture of oil and water and other suspended and dissolved substances such as particulates and metals. Oil concentrations normally reach beyond 3% by mass and fall under the special waste category. All wastes from OWSs must be transported and treated separately from other types of liquid waste. In the CRD, there are typically four methods of handling OWS waste. In the past, OWS waste that had low concentrations of O&G and passed either a visual inspection by CRD staff or whose analytical results were approved could be disposed of at the Hartland Landfill as controlled waste. However, this practice has been discontinued in large extent due to the lowering of O&G concentrations in waste streams accepted at the landfill. Another method is to have the OWS pumped out and transported by vac truck to a permitted treatment facility such as Peninsula Wastewater Services Ltd. if it meets their process operating requirements as specified in their permit. The third option is to dispose of the waste through a special waste contractor such as Safety Kleen that will transport the waste to a special waste treatment facility or disposal site. Lastly, if the oily waste is of adequate quality, it may be collected for recycling or reused as heating oil or in the production of asphalt in accordance with the SWR.

In the survey conducted for the CRD project "TLW Inventory" (10), 10 of the 57 businesses contacted for information on TLW owned and operated an oil-water separator. **Table 4.2** summarizes the distribution of disposal methods used.

Table 4.2 Summary of Disposal Methods for Oil-Water Separator Waste

Maintenance and Disposal Method	Number of Answers
Taken with waste oil by waste oil recycler (Mohawk Oil, Chevron)	4
Taken to Peninsula Wastewater Services Ltd.	1
Collected by Special Waste handlers (Safety Kleen, New Alta)	2
Unknown	3

Although waste from OWSs may exceed the criteria for the SUB or Hartland, it will not necessarily exceed the SW standards and as such, its disposal is not regulated by any legislation and may be transported off site without mandatory record keeping through manifests. This is perceived as a potential source of problems since although the waste may be contaminated it is not regulated and there is less control as to what is done with it compared to contaminated soils and SW.

In summary, there was confusion over responsibility for catchbasin maintenance between business operators, property owners and property managers. Haulers were uncertain as to waste quality and regulations that may apply. For non-special wastes there are no prescriptive regulations or requirements. Both generators and haulers were uncertain of liability.

SECTION 5.0
RECOMMENDED PRACTICES

5.1 BACKGROUND

The chief concern with catchbasins and oil-water separators in the CRD is the discharge of toxic substances to the environment through inappropriate disposal of the wastes collected in the devices. The substances of concern found in CBs and OWSs include heavy metals such as cadmium, chromium and lead, PAHs and hydrocarbon oil and grease as well as elevated levels of suspended solids, BOD and COD. The presence of these substances may be a result of several factors; direct discharge of toxic or hazardous liquids into the devices, transport of toxic substances from impermeable surfaces during rainfall events and leaching of toxic substances from the sediments that accumulate in devices.

Although the Hartland Landfill Bylaw specifically identifies sump (CB) wastes from parking lots and vehicle wash facilities as controlled waste acceptable for disposal at the landfill, there are no specific regulations for waste material from CBs that contain more than trace levels of petroleum hydrocarbons and are not accepted at the landfill. A survey of local businesses showed that most owners of CBs either had the waste material collected by a contractor or disposed of it themselves either in the trash or on their property indicating no knowledge of the potential liability to themselves.

Wastes from OWSs consist of concentrated mixtures of water and oil or grease and may contain other contaminants such as metals and other chemicals and would normally qualify as special waste. In interviews conducted with owners of OWSs, the waste, in most cases, is disposed of through special waste haulers such as New Alta or Safety Kleen or transported to Peninsula Wastewater Services Ltd. for treatment and disposal. However, in three cases, the generators did not know how the OWS wastes were disposed of and unless the waste is a special waste, there are no requirements under existing legislation for manifesting the transport and disposal of contaminated wastewater and record keeping. This has the potential for exposing generators and transporters to investigation and liability for inappropriate waste management.

5.2 RECOMMENDED PRACTICES FOR GENERATORS

The primary objective in recommending appropriate practices for managing the wastes from CBs and OWSs is to reduce the liability to generators. The simplest step that generators can take to reduce their liability is to show due diligence in the management of their waste and ensure that they and the waste haulers comply with existing legislation regarding waste management (e.g. BC Waste Management Act, Special Waste Regulation, Contaminated Sites Regulation, CRD Bylaws and federal Fisheries Act). This includes keeping maintenance records of these devices and ensuring that the waste is disposed of at a waste treatment facility

in compliance with all regulations or, if a contractor is hired to dispose of the waste, that they are assured that the contractor follows all required regulations.

Another option for reducing the liability to owners of these devices is to ensure that the waste is not hazardous or harmful to the environment. Through regular and frequent maintenance of the devices, contaminants are less likely to accumulate in concentrations that would classify the material as hazardous, requiring special handling and disposal. This may also result in significant cost savings to the owners from less expensive disposal options.

Generators can also reduce their liability by showing due diligence in the maintenance of CBs and OWSs. This may involve keeping records of maintenance (e.g. dates, volumes extracted, repairs, etc.), waste characteristics (i.e. chemical analyses), information about the transporter and final destination. This would enable proper management of these wastes and assist generators, disposal companies and controllers keep track of wastes that are being collected in the devices and what is being done with them. Accurate and detailed records of these wastes streams can also assist in the development of COPs or BMPs to help reduce contaminated discharges.

The generators could obtain services of a professional environmental consultant to assist with initial cleanup of accumulated wastes, followed by strategies for frequent maintenance and contaminant reduction to reduce future liability.

Although the Waste Management Act and CSR do not require relocation agreements for the quantities of contaminated soil and residual wastewater collected from catchbasins, generators should maintain records of analytical results and relocation records in order to protect themselves should an investigation into their waste management practices take place.

5.3 RECOMMENDED APPROACH

One solution to the problem of inappropriate disposal could include a program of testing and inspections. This could require registering every private catchbasin in the CRD and would provide better control over the operation and maintenance of CBs and their wastes. However, the costs of such a program would be very high and there is currently no legislation giving the CRD the authority to do this.

Alternatively, a risk management-based program could be developed that would assess the potential for contamination of a particular catchbasin based on such factors as local land use, location relative to high-risk activities, seasonal parameters, etc. The attention each catchbasin would require would be based on the assessed risk for contamination. The risk management approach would likely be less expensive than an inspection and testing approach.

Another approach is to eliminate or reduce the problem in the first place by dealing with the source of the problem through prescriptive regulations and educational programs. A potential

cause of the concerns with CBs is that the devices may be located in areas of high risk potential for spills of toxic or hazardous material or where storm water run-off can collect high concentrations of contaminants. In such cases, possible pollution prevention options would be to increase the distance between the CB and the spill hazard or position them so that if a spill does occur it will never reach the catchbasin. Another possible solution would be to investigate ways to reduce the amount of material that can be washed away during a rainfall event and carried to the CB through the use of covered storage areas or other means. The CRD has already begun such an approach through a series of Code of Practice that include pollution prevention options and best management practices for several industrial and commercial sectors.

There is also some question as to the appropriateness of the design, installation and maintenance of the devices. Installations of CBs and especially OWSs should be inspected to ensure they are of the appropriate design for the specific application and are sized correctly to handle the flows involved. In the cases where catchbasin wastes routinely qualify as special waste they should be disconnected from the storm sewer system and replaced with a self-contained system and disposed of appropriately. Alternatively, where CBs tend to collect significant amounts of oil they should be replaced with oil-water separators or have an OWS installed in series with the CB. A program of inspection and monitoring could also be applied to oil-water separators; however, a more effective method is to reduce the amount of oil and grease being sent to the sewer through a source reduction program or best management practices similar to those used for catchbasins.

Municipalities should also encourage open communication with waste haulers and other service providers to ensure proper understanding of existing regulations and keep them informed of any changes and new regulations. This would also provide an opportunity to properly communicate the reasoning behind the regulations, which should assist in achieving better compliance.

SECTION 6.0
CONCLUSIONS

6.1 CHARACTERIZATION OF CB AND OWS WASTE

Catchbasins and oil-water separators are rudimentary wastewater treatment devices that generate two waste streams; a “treated “ wastewater stream that is either discharged into the storm sewer or sanitary sewer systems and a potentially toxic and hazardous waste that must be disposed of in an appropriate manner.

Catchbasins generate a solid waste stream consisting of sediments collected from surface run-off after a rainfall event and may contain high concentrations of metals, oils and grease and other chemical substances as well as organic and mineral matter that can be transported by the rain. Oil-water separators are designed to remove floatable oil and grease from wastewater and generate a more concentrated mixture of oil, grease and water.

Liquid and sediment samples collected from CBs at commercial operations were analyzed by the CRD and compared to existing discharge standards and criteria. The results showed that all sediment samples exceeded the CSR standards for commercial/industrial land use for more than one parameter (e.g. metals, PAH, VOC, BTEX). One of the samples qualified as special waste because of a hydrocarbon oil and grease content of 7.3%, more than twice the 3% standard.

Liquid residuals obtained from the commercial CB waste samples exceeded both the sewer use bylaw criteria and the controlled waste criteria for disposal at the municipal landfill. Liquid residuals from CB samples from municipal catchbasins did not meet the SUB criteria and only one out of four met the criteria after treatment through an OWS.

In the case of oil-water separators, the only data that was available was that from municipal street waste treatment facilities that treat catchbasin waste through an OWS prior to disposal of the soil and discharge of the water to the sewer. However, these samples not only exceeded the CSR standards but in more than one case exceeded the sewer use bylaw criteria, which are less stringent.

6.2 EXISTING LEGISLATION

Regulations regarding the disposal of wastes from CBs and OWSs are complex because there is no prescriptive set of regulations. The disposal method for these wastes types depends largely on the physical nature of the waste and the types of contaminants.

In British Columbia, contaminated soil and water quality is regulated under the Contaminated Sites Regulation of the Waste Management Act. The regulations specify the allowable

concentrations of a number of substances for discharge into various receiving environments including surface water based on land and water use.

Federal and provincial water quality guidelines also exist for ambient conditions for marine and freshwater environments. Both levels of government, under CEPA and the Environment Management Act, respectively have the authority to monitor and issue orders and fines, if harmful substances are discharged into the environment.

The BC Waste Management Act also regulates the management of solid waste and special waste while the municipalities regulate discharges to the sewer systems.

The CRD Sewer Use Bylaw specifies maximum concentrations of certain contaminants permitted for discharge to the sanitary sewer and the Hartland Landfill bylaw specifies certain sump wastes that are accepted as controlled waste. However, there is no legislation that prescriptively addresses wastes from CBs and OWSs, some of which would not meet the above mentioned bylaw criteria. The onus is placed on the generators to characterize the waste and ensure that the waste is disposed of appropriately.

Generators and disposal contractors are wholly and severally liable for mismanagement of waste and the liability cannot be transferred on to another party. Each must ensure that all regulations are adhered to.

6.3 EXISTING PRACTICES

Currently, sump (including CBs and OWSs) waste from certain sources is classified as a controlled waste by the CRD and can be disposed of at the Hartland landfill if it meets certain criteria and approval has been granted for disposal. However, in a survey of ten businesses conducted by Earth Tech, four disposed of the waste appropriately at the landfill or through special waste haulers, three either placed the waste in the dumpster with the other domestic trash or spread it on the property and another three did not know when the catchbasins were maintained and what happened to the waste.

It is clear from the laboratory results that CB (and likely OWS) wastes can contain toxic and hazardous substances and that generators need to better manage waste from these devices.

In general, there is a lack of understanding by generators as to how to manage wastes from CBs and OWSs and there is a lack of clarity between business operators and property owners/managers regarding responsibilities for waste disposal.

6.4 RECOMMENDATIONS

Based on the information collected and presented in this report the following recommendations are suggested:

For generators:

- Inspect CBs and OWSs and address current issues utilizing qualified professional assistance.
- Adopt best management practices and/or pollution prevention plans to prevent contamination from entering the devices in the first place.
- Maintain CBs and OWSs regularly and frequently to reduce or avoid accumulating toxic and hazardous compounds in the devices thereby avoiding special waste disposal requirements and reducing costs.
- Keep updated maintenance and disposal records readily available for inspection.
- Ensure that waste disposal companies comply with all regulations pertaining to disposal or treatment of CB and OWS waste (i.e. SWR, CSR, CRD Bylaws, Provincial Waste Management Act and Federal Fisheries act

For municipalities:

- The CRD should continue to adopt codes of practice and best management practices for CBs and OWSs connected to the sanitary sewer system. The COP should include as a minimum acceptable standards for the design of such devices as well as requirements for installation, maintenance and record keeping. The BMP should include instructions for owners to develop pollution prevention plans to reduce the amount of contaminants that make their way to the devices and reduce the risk of spills and leaks that may find their way to the catchbasins. The COP should include provisions for regular inspections and sampling by the jurisdiction having authority.
- For CBs and OWSs connected to the storm sewer system, COPs and BMPs should be adopted into the model storm sewer bylaw.
- Continue to educate generators about the environmental effects of improper disposal of these types of waste and through the development and promotion of BMPs designed to reduce the amount of contamination that accumulates in CBs and OWSs and ensure proper operation and maintenance.
- Only OWSs designed to meet the more stringent CSR water standards should be approved for installation. The installation of an OWS should be inspected and maintained on a regular basis and the CCME guidelines for USTS should be adopted to regulate these devices.
- Liaise with haulers and service providers to ensure wastes are handled and disposed of appropriately and inform them of new and changing regulations.

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