

**SOLID WASTE MANAGEMENT  
Annual Operations and Monitoring Report  
Revelstoke Refuse Disposal Site MR-15821  
2014**



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**Columbia Shuswap Regional District  
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## **1.0 INTRODUCTION**

The Revelstoke refuse disposal site (hereinafter referred to as “the site”) is located at 330 Westside Road Revelstoke, British Columbia, approximately 3 km northwest from the core of Revelstoke. The site area is contained on two individual sites bisected by Westside Road. The existing landfill is located west of Westside Road and is the area where the active landfill is being constructed. The other site is located approximately 400 meters south of the existing site on the east side of Westside Road and is the proposed future landfill area (new site). The new site contains a scale, scale house, transfer station and marshalling areas and is the source of soil cover for the existing landfill site. The properties are located along western portions of Legal Sub-division 13 of Section 4, Legal Subdivisions 4 and 5 of Section 9, and all of Legal Sub-division 1 of Section 8, all in Township 24, Range 2, West of the 6<sup>th</sup> Meridian. Kootenay Division Yale District. The two sites are leased from the Crown and contain 54 acres.

The site has been in operation since the early 1970’s as a natural attenuation landfill. The site came under the management of the Columbia Shuswap Regional District (CSRD) in the late 1970’s. The site is operated by Score Construction Ltd under contract with the CSRD. The site provides solid waste disposal and residual processing services to residents, businesses, and institutions located within the municipality of Revelstoke and surrounding area and to Electoral Area 'B'. CSRD operate a refuse transfer station in Trout Lake delivers solid waste to the Revelstoke refuse disposal site.

The site is operated under Operational Certificate MR-15821, issued by the Ministry of Environment, and most recently amended on March 1, 2011. The site is operated by CSRD contractors under an approved Design and Operations Plan (D&O Plan).

Environmental monitoring which includes groundwater sampling, analysis and reporting continued at the site in 2014. Data collected from the groundwater monitoring program has been compared to the historical records to determine whether the site has affected groundwater quality and, if so, to what extent. The qualified professionals report is currently in draft form and will be posted to the CSRD’s webpage upon completion.

In accordance with the user-pay principles of the Solid Waste Management Plan, fees are charged for the disposal of all waste materials. The disposal fee for co-mingled municipal solid waste across scaled sites is set at \$70 per tonne, as per changes in the 2009 in accordance with the new Solid Waste Management Plan. Furthermore, in 2010 a differential tipping fee was introduced to encourage recycling by creating disincentive fees for loads which are not separated.

## **2.0 BACKGROUND**

With the exception of statutory holidays, the site is open to the public on the following schedule:

Year Round                      Monday to Saturday from 10:00 am to 4:00 pm

The site contains a lockable gate, a single truck scale with electronic weighing and reporting software, a scale house, and an internal transfer station. The site operates on a user pay system where payment is collected on a load weight basis.

### 3.0 OBJECTIVES

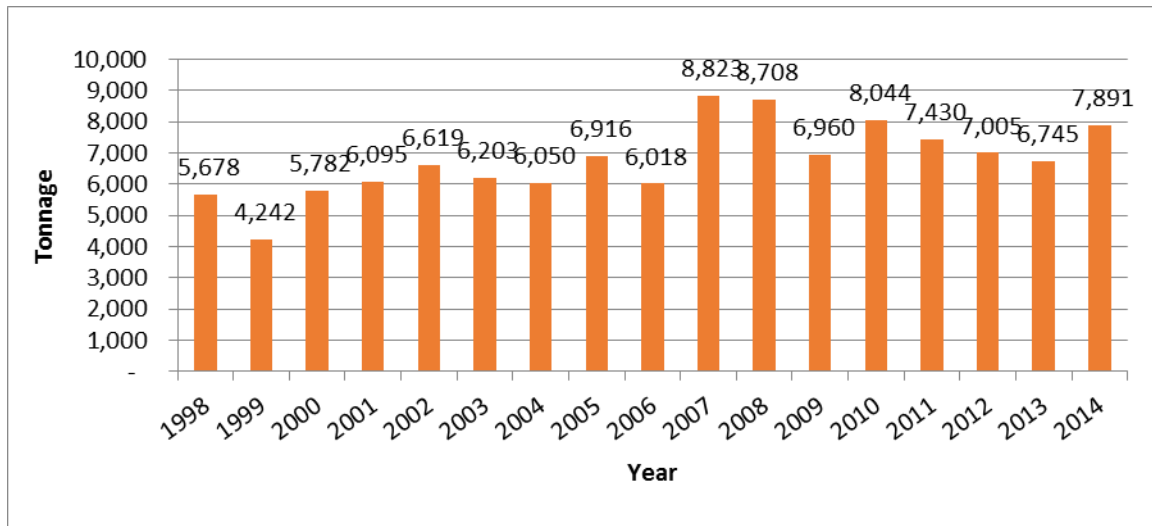
The objectives of this report is to provide information required to meet the annual reporting requirements in Section 5.1 of Operational Certificate MR- 15821 issued by the BC Ministry of Environment on March 1, 2011.

#### 3.1 Total Tonnage of Waste Discharged (Fig.1)

In 2014 approximately 13,474 tonnes of refuse and recoverable wastes were managed at the site. The quantity of municipal solid waste landfilled at the site in 2014 was 7,891 tonnes, which represents a 15% increase over 2013. Using the most recent census date (2011) the per capita disposal rate for 2014 was 0.95 tonnes/person/year, based on a population of 8,287 for the service area.

Nearly half of all incoming materials 5,584 tonnes, were diverted to marshalling areas for recovery. Existing diversion programs include; mattress, drywall, asphalt shingles, concrete, contaminated soil, wood waste, metal and reusable items. 2014 saw the introduction of a mattress recycling program whereby by a tipping fee of \$25/mattress is charged to marshal, collect and recycle. Recycling is a process of deconstructing and separating materials including, metal, wood and waste into categories to be returned to the Salmon Arm landfill for recycling or disposal. In 2014 423 mattresses were diverted for recycling.

Fig.1



#### 3.2 Design Volume/Life Expectancy

The D&O Plan was prepared by Sperling Hansen Associates in January of 2007. According to the plan, the existing site will be constructed and progressively closed in four phases which would consume an overall 582,319 m<sup>3</sup> of air space.

The first scheduled closure, according to the D&O Plan, was anticipated for 2015, however, planning exercises and survey work in 2014 showed that the current Phase of the landfill has additional space for landfilling. As a result, closure work has been delayed and more in-depth survey work will be performed in 2015 to enable the CSRD to update existing timelines. Final closure would occur in 2044.

It was determined by survey that 16,573 m<sup>3</sup> of air space was consumed at the site in 2014, representing a 36% increase over 2013. This increase was due in part to the cleanup project associated with the rejected wood waste from grinding activities being landfilled.

### **3.3 Review of Preceding Year**

The site was inspected on 4 separate occasions in 2014. The contractor was found to be in compliance with the contract and the design and operations plan during all inspections. Inspections reports are available upon request.

Landfill contracts expired on June 30, 2014 and new contractors were hired. The Cover and Compaction contract was won by SCV Contractors and the Scalehouse Operations contract was won by SCV Contractors.

Site improvement and repair projects were completed at the site in 2014. In 2012, an infiltration ditch was constructed along the east slope of phase 1 to catch any leachate outbreaks and allow for re-infiltration into the landfill. This ditch is connected to a larger infiltration area by a culvert under the east access road. These measures were installed and upgraded in an effort to ensure water coming into contact with refuse is managed on site. This ditch and infiltration area has worked well in 2014 to manage leachate on site.

A clean soil marshalling area was established to divert soil and gravel out of the waste stream, enabling the contractor to use these materials as clean fill or cover. The transfer bay safety railings were upgraded to comply with the CSRD's engineered safety railing design. A small infiltration ditch was dug by the scale to allow for better drainage and fewer freeze/thaw problems with the scale.

### **3.4 Wildlife Occurrences**

The perimeter of the Revelstoke landfill has an electric fence which is winterized from November to March. Voltage is checked during inspections and is in the 6-7 kV range (except winter). Occurrences of wildlife in 2014 included moose entering the site in winter months. There was one incident of a bear entering the site after hours during a short period when the electric fence was damaged due to BC Hydro operations. The electric fence will be fully repaired during spring start up.

### **3.5 Solid Waste Landfill Closure and Post-Closure Liability**

Each spring the CSRD's Finance Department assesses closure reserves, future closure projects and landfill capacity to ensure adequate reserve funds are available for planned closure work. A copy of this assessment work has been included as Appendix 'A'.

### **3.6 Plans for 2015**

The existing Phase development at the Revelstoke landfill will be reviewed in 2015 with the aid of Sperling Hansen and Associates to provide an update to landfilling plans. It is anticipated that the survey work will show considerable unused airspace in Phase 1.

### **3.7 Operator Training**

Although no formal training was completed by the contractor in 2014, CSRD staff developed a guide for best landfilling practices based on a consultant's report done in 2012 and training was provided by CSRD staff.

## **4.0 ENVIRONMENTAL MONITORING**

The CSRD hired a new environmental consultant, Western Water, in 2014 to conduct all monitoring and reporting for CSRD landfills, as per the requirements of the Operational Certificate. Western Water has provided conclusions and recommendations based on the 2014 data collected, which will be posted on the CSRD website for public review after April 1, 2015.

## **5.0 WASTE HIERARCHY**

The CSRD emphasizes and encourages the 6R Hierarchy of Rethink, Reuse, Reduce, Recycle, Recovery and Residual management and continually strives towards a higher 'R' in waste management practice. The programs offered within each category along with successes and challenges experienced in 2014 are indicated below.

### **5.1 Rethink**

#### ***5.1.1 Composter Incentive Program***

In the fall of 2009, the CSRD launched a Region wide composter incentive program. The CSRD purchased a number of Earth Machine outdoor compost units at a cost of \$45 per unit. These composters were then offered to residents in the spring of 2014 in Revelstoke and Electoral Area B for the same price. To ensure that all residents receiving a composter understood the benefits of home composting as well as how to properly use the Earth Machine composter, all individuals purchasing a composter were given the option to attend a 30 minute training seminar given by CSRD staff.

#### ***5.1.2 Reuse Website***

The CSRD, in partnership with the Recycling Council of BC, continued to promote our reuse website, called [www.csrd.reuses.com](http://www.csrd.reuses.com). The website allowed users to post items for sale, or post wanted items for free, up to a maximum of value of \$99.00. The site had seen a limited number of exchanges, therefore the site was discontinued in the spring.

## **5.2 Reduce**

### **5.2.1 Media Communications and Advertising**

The CSRD continues to utilize local radio advertisements aired on the EZ Rock Network (AM Stations – 1340 Revelstoke) and newspaper advertisements in the local paper (Revelstoke Times Review, The Current) to make residents aware of special events, and to promote various waste reduction themes. Social media (Facebook, Twitter, website) is also used to help promote waste reduction. The CSRD also published The Loop Newsletter in the Revelstoke Times Review, which included information regarding the upcoming transition to the Multi Materials BC program for packaging and printed paper.

## **5.3 REUSE**

### **5.3.1 Marshalling Areas at Refuse Disposal Sites**

The Revelstoke Refuse Disposal Facility contains reuse marshalling areas for wood waste and propane tanks. A large portion of wood waste material is chipped and reused as alternate daily cover (in a soil /wood blend) or placed on the unloading pads of the active face when the ground is saturated and un-drivable.

### **5.3.2 Woodwaste grinding**

In 2014, 4,008 m<sup>3</sup> of white wood waste was chipped at the landfill site, as well as 1,998 m<sup>3</sup> of organic material. 982 tonnes of wood waste and 1,397 tonnes of organic waste was received at the site in 2014.

In the spring of 2014, a windrow composting operation was started at the site, using the yard and garden waste as feedstock. At this time there is no finished compost for distribution.

### **5.3.3 Propane Tank Collection**

183 propane tanks were collected for recycling in 2014 from the Revelstoke Refuse Disposal Facility, compared to 151 in 2013.

### **5.3.4 Reuse Centre**

The CSRD installed a Reuse Centre at the Revelstoke Landfill in the fall of 2009. In 2014, approximately 100 items were salvaged from the Reuse Centre by residents. Items include household items, sports equipment, building material, and appliances. Residents are required to pay the regular disposal rate for items, but can chose to place items that

are in good working order in the Reuse Centre for someone to take home free of charge.

## 5.4 Recycling

### **5.4.1 *Marshalling Areas at Refuse Disposal Sites***

All CSRD landfills contain recycling marshalling areas for auto batteries (except Salmon Arm), metal wastes including white goods and scrap metal, gypsum, asphalt shingles, and household recyclables, including mixed paper, newspaper, tin cans, glass containers, plastics #1 to 7 and corrugated cardboard.

### **5.4.2 *Scrap Metal Recovery***

This site recycled approximately 77.4 tonnes of scrap metal in 2014 which includes source separated metal wastes deposited at the site from commercial and residential sources. 117.0 tonnes had been recycled from the site in 2013. 123.5 tonnes was received at the site in 2014.

### **5.4.3 *Ozone Depleting Substance Removal***

In Revelstoke, 214 refrigeration units were serviced to have the ozone depleting substances removed before recycling.

### **5.4.4 *Household and Automotive Battery Recycling***

In 2014, 158 automotive batteries were collected from the Revelstoke landfill for recycling.

### **5.4.5 *Gypsum/Asphalt Shingles/Concrete Recycling***

Marshalling areas for gypsum, asphalt shingles and concrete were established at the Revelstoke Landfill in 2010. 78.9 tonnes of gypsum were removed for recycling, as were 0.0 tonnes of shingles in 2014. Concrete stockpiles hadn't reached a large enough capacity to crush by the end of the year. 122.7 tonnes of drywall and 101.0 tonnes of shingles, as well as 345.7 tonnes of concrete were received at the site in 2014.

### **5.4.6 *Mattress Recycling***

In June of 2014, the CSRD started a mattress recycling program. Mattresses are deconstructed, with metal springs being added to scrap metal, and wood material added to wood waste. The remaining foam and textile portion of the mattress is landfilled. In 2014, 423 mattresses were collected at the site for recycling.

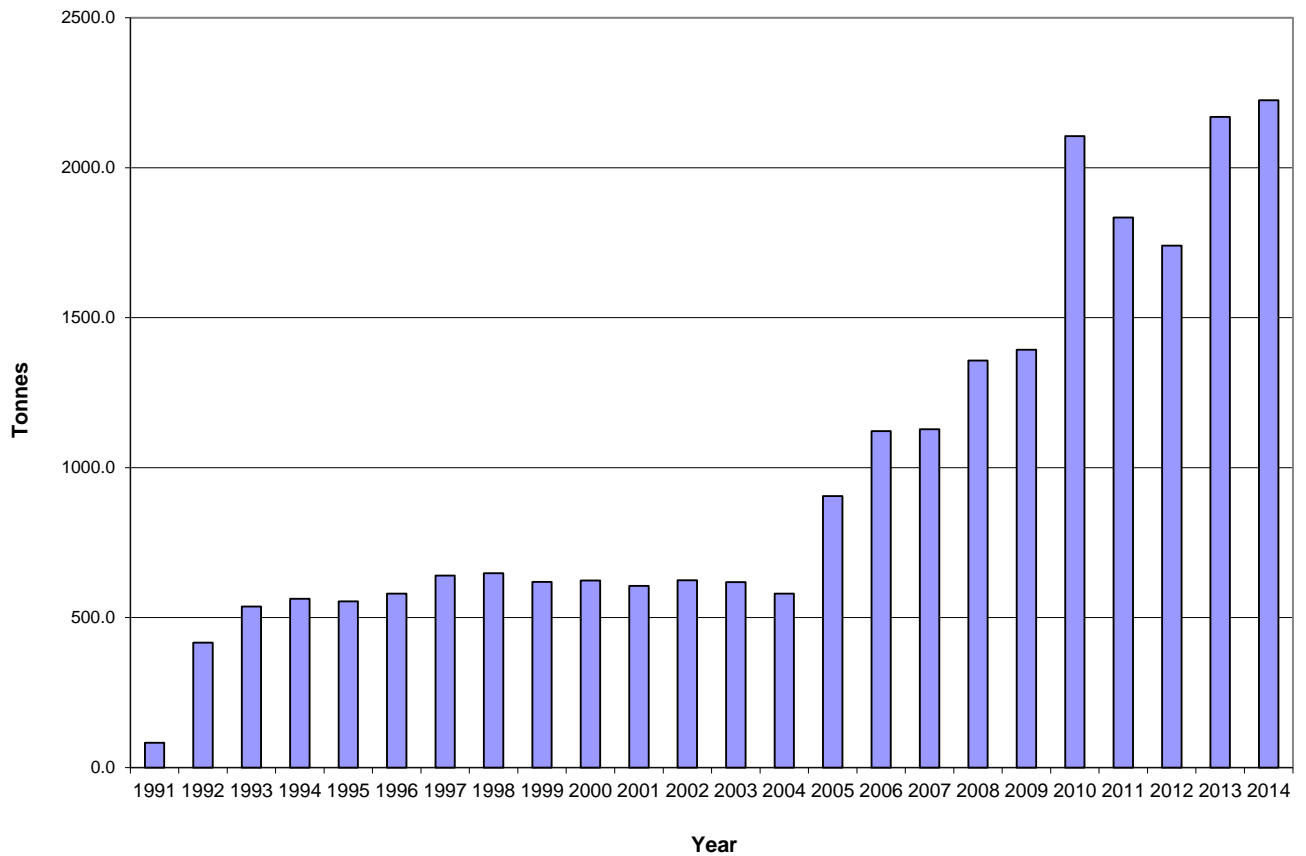
#### **5.4.6.1 *Depot Recycling***

Opportunities to deposit recyclable items such as: newspaper, mixed waste paper, food cans, glass containers, plastic containers #1 to 7, and corrugated cardboard exist at all Regional District Refuse Disposal sites and depots found in downtown

municipalities. In Revelstoke, the downtown recycle depot is located in the bottle depot parking lot. The recycle depot also has bins for the collection of cardboard only as well as glass only. The City of Revelstoke also provides a curbside collection program. In the fall of 2009, the recycling collection changed to a comingled collection system. A total of 288 tonnes of mixed waste paper, tin food cans, newspaper glass jars and bottles, corrugated cardboard and plastics #1 to 7 were collected in 2014 from the Revelstoke landfill and downtown depot. This is unchanged from the previous year depot collection program for Revelstoke only.

On a region wide basis, the depot collection program increased 2.6% from 2013 to 2225 tonnes. The following graph represents recycling collection quantities collected region wide (from all depots) since 1991.

Figure 1-Recycling Collected in Depots Region Wide



Recycling is collected through a curbside bag collection system from all single family dwellings within the City of Revelstoke. The material was delivered to a reload facility operated by Bresco Industries, baled, and sent to Cascades Recovery in Kelowna. On May 19, the City of Revelstoke partnered with Multi Materials

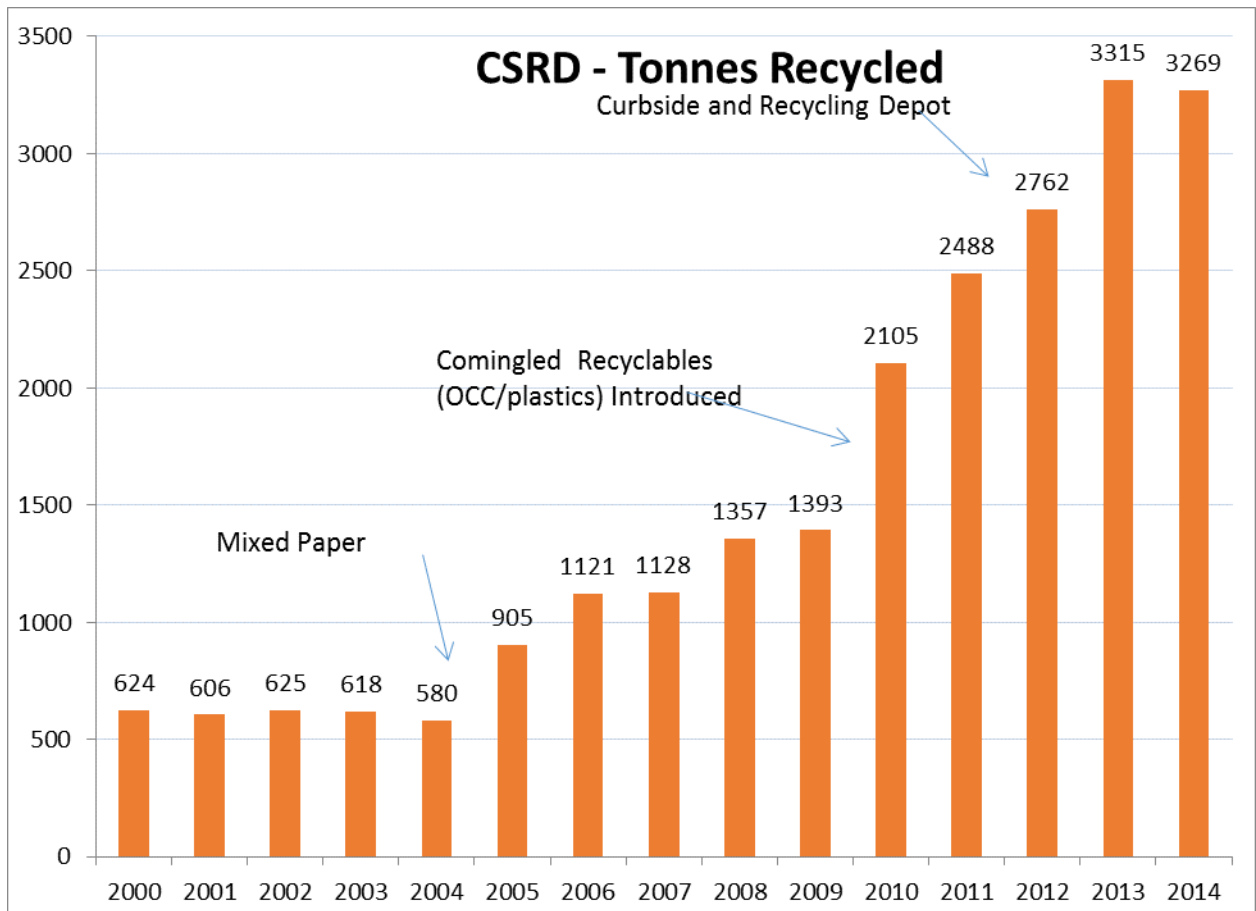


BC (MMBC) for the collection of Packaging and Printed Paper until December 31, at which time the City transferred responsibility for the collection solely to MMBC. MMBC material continues to be delivered to the reload facility operated by Bresco Industries. In 2014, 294 tonnes of material was collected through the curbside program (190 tonnes from January 1<sup>st</sup> to May 19<sup>th</sup>, and 104 tonnes from May 20<sup>th</sup> to December 31<sup>st</sup>). This is an 11% decrease over last year.

This, combined with the depot program, resulted in an overall tonnage of 582, or a 3.8% decrease overall for Revelstoke.

There is a -1.4% decrease in recycling from 2014 over the entire region for all depot and curbside collection tonnages combined in 2013, amounting to 3269 tonnes.

Figure 2 Decrease in Recycling Regional Wide Combining Depot and Curbside Amounts



5.4.6.3 Recycle Fair Events

A spring and hazardous waste round up event was held in Revelstoke in 2014. Hazardous waste, pesticides, and old gasoline were accepted as Revelstoke does not have permanent drop off facilities for most of these items.

#### **5.4.7 *Extended Producer Responsibility***

Provincial stewardship programs such as the beverage container deposit-refund system, paint, pesticides and other residuals, waste oil and oil containers, tire recovery programs, pharmaceuticals and electronics contribute to diverting materials from local landfills. Unfortunately, the Province of British Columbia does not require Stewardship agencies to report quantities recycled on a regional district basis; therefore quantities diverted from CSRD landfills through extended producer responsibility programs are largely unknown.

#### **5.4.8 *Private Sector Recycling***

At this time the Regional District does not have quantitative values of wastes collected through other programs and therefore cannot adequately determine the overall waste diversion rate from the City of Revelstoke.

**COLUMBIA SHUSWAP REGIONAL DISTRICT**

**Notes to Consolidated Financial Statements**

December 31, 2014

**5. Solid Waste Landfill Closure and Post-Closure Liability**

The Environmental Management Act of B.C. and the Ministry of Environment of B.C. set out the landfill criteria to properly close and maintain all active and inactive landfill sites. Under the guidelines, there is a requirement for closure and post-closure care of solid waste landfill sites. Provisions are therefore made over the estimated remaining life of the Regional District landfill sites based on scalehouse records and through tipping fees.

The main components of the landfill closure plans are: final capping using an engineered cap design and the implementation of a drainage and gas management plan. The post-closure care requirements may involve: cap maintenance; groundwater monitoring; gas management system operation and maintenance; inspections; leachate treatment and monitoring; and annual reports. Post-closure care activities begin once the entire landfill site no longer accepts waste and continues on for a period of 25 years. As the date of the site closure is unknown, management estimates the liability to begin after the closure of the current active phase, assuming another phase will not be opened. In the event another phase is opened, the start date for the liability will be adjusted to begin upon closure of the newly opened phase.

The table below sets out the liability based on the estimated capacities used in cubic metres, multiplied by the estimated total expenditures, expressed as discounted present values, assuming 1.00% (2013 - 0.00%) inflation and 3.00% (2013 - 3.85%) long-term borrowing rate (fall issue MFA 25 year rate). The amount remaining to be recognized in future years is \$983,900 (2013 - \$1,229,700). The annual provision is reported as an Operating Fund expense and the accumulated provision is reported as a liability on the Consolidated Statement of Financial Position. Reserve funds totalling \$899,720 (2013 - \$843,389) have been established to provide for this liability in the Landfill Closure Special Reserve Fund.

The table also indicates the remaining landfill life in years and remaining capacity (100 minus % used) on the open phases and the anticipated post-closure costs recognized on total site capacity used.

	Estimated Remaining Life (Years)	Estimated Total Expenditure for Closure	Cumulative Capacity Used (m <sup>3</sup> )	Total Estimated Capacity (m <sup>3</sup> )	Used (%)	Liability for Closure December 31, 2014
Salmon Arm (phase 2 of 5)	12	\$ 1,650,000	114,708	383,778	30	\$ 493,200
Golden (pre-phase)	14	268,600	613,416	613,416	100	268,600
Golden (phase 1 of 4)	14	307,000	56,591	157,000	36	110,700
Revelstoke (pre-phase)	1	292,000	70,000	70,000	100	292,000
Revelstoke (phase 1 of 4)	1	655,100	98,535	98,535	100	655,100
Revelstoke (phase 2 of 4)	13	541,900	13,067	156,212	8	45,300
Sicamous (phase 2 of 4)	11	220,000	73,706	166,000	44	97,700
Sicamous (phase 4 of 4)	29	257,600	110,000	125,000	88	226,700
<b>Closure liability subtotal</b>		<b>\$ 4,192,200</b>	<b>1,150,023</b>	<b>1,769,941</b>	<b>65</b>	<b>2,189,300</b>
<b>Post closure liability subtotal</b>						<b>1,019,000</b>
<b>2014 total liability</b>						<b>3,208,300</b>
Less: Expenses previously recognized						<b>(2,309,200)</b>
<b>2014 reduction in the liability for landfill closure</b>						<b>\$ 899,100</b>