Attachment E

**Financial Assurance Documentation** 

## Post Closure Maintenance Cost Estimate for Cedar Hills Regional Landfill

#### Background

WAC 173-351 requires owners and operators of Municipal Solid Waste Landfills (MSWLF) have a detailed written estimate, in current dollars, of the cost of hiring a third party to conduct postclosure care for the MSWLF unit or all MSWLF units in compliance with the post-closure plan developed under WAC 173-351-500(2). The post closure period is defined to last thirty years or as long as necessary for the landfill to become functionally stable. For this cost estimate, thirty years is assumed.

The Post Closure Maintenance (PCM) estimates have been prepared for Cedar Hills Regional Landfill (CHRLF) previously. These estimates are prepared based on historical levels of effort required for tasks that will continue through the post closure period and levels of effort required for similar tasks conducted at closed landfills maintained by the King County Solid Waste Division (SWD). The last major revision was completed in 2012; annual reviews include reviewing the proposed activities and adjusting activities that have changed based on changes to operation and maintenance practices utilized by SWD.

## Purpose

This document provides the basis for the PCM estimate. This includes the underlying assumptions and the documented changes from previous years. The estimate is to be reviewed annually and updated as necessary.

#### 2014 Update

The cost items were reviewed for completeness for 2014. No additional items were identified. The cost estimates remained the same and the total annual PCM cost was inflated to 2014 dollars.

#### 2015-2017 Updates

The cost items were reviewed for completeness annually by SWD Facility Engineering and Science Unit. No additional items were identified. The line-item detail cost estimates in Table 1 remained the same and the total annual PCM cost was inflated to current year dollars using the Seattle area CPI-U index computed by the King County Office of Economic Forecasting and Analysis.

#### 2018 Update.

The cost items were reviewed and adjusted to reflect the addition of Area 8. Area 8 increases the volume of the landfill by 12% and the footprint by 14%. The following PCM elements were increased by 14% to reflect the addition of Area 8: Cover maintenance, leachate system maintenance, stormwater system maintenance, landfill gas system maintenance, electrical utility charges, and wastewater utility charges.

## 2019 Updates

The cost items were reviewed for completeness annually by SWD Facility Engineering and Science Section. No additional items were identified. The line-item detail cost estimates in Table 1 remained the same and the total annual PCM cost was inflated to current year dollars.

## Major PCM Elements

The cost estimate includes maintenance costs for the environmental control systems at the site. The main systems are the landfill gas collection system, the leachate collection system, the North Flare Station, the leachate aeration lagoons, the cover system and the groundwater monitoring network. All tasks from previous PCM estimates were reviewed to determine that all tasks are still necessary and that all necessary tasks are included. The itemized tasks were reviewed with SWD operations leads and or supervisors.

All tasks were reviewed to determine whether current estimates of levels of effort to complete the task are still current and to determine level of effort for any new tasks.

The estimate is based on tasks being performed by SWD staff or contractors in the same manner as currently performed. To compensate for the potential that all tasks may be performed by contractors, a project management cost was added to the overall estimate. The underlying assumption is that the cost of performing the work remains constant whether performed by SWD forces or contractors, but SWD would incur increased costs for managing contracts with the contractors.

The cost items in the PCM estimate include:

- Cover Maintenance & General Site Maintenance
  - Vegetation control
  - o Geomembrane repair
  - Road maintenance
  - o Fence Repair
  - Litter Control
  - o Grading
  - Well Boot repair
- Leachate System Maintenance
  - Aerator repair and maintenance
  - Pump repair and maintenance
  - Leachate extraction well replacement
  - Periodic line cleaning
  - o Air compressor repair and maintenance
- Stormwater System Maintenance
  - Stormwater conveyance system cleaning and maintenance
  - Catch basin cleaning and maintenance
  - Pond cleaning and maintenance
- Landfill Gas System Maintenance
  - Blower repair and maintenance
  - Flare repair and maintenance
  - Stack emissions testing

- Routine testing and maintenance
- Environmental Monitoring
  - Groundwater and leachate samples
  - Laboratory analysis
  - Sample collection
  - o Data analysis
  - Reporting
  - o Data Management
- Electrical Utilities
- Permits
  - Operating Permit for Closed Landfill
  - Air Operating Permit
- Wastewater Utility Fees
- Project Management and Reporting
  - Sample collection
  - Data management
  - Reporting
  - Project Management
- Investigation and Remediation
- Project management costs for third party contractor
- Contingency

# Key Assumptions for Cost Estimates

Several key assumptions were made regarding the cost estimates. These assumptions are outlined below.

- The post closure period will be thirty years in length, beginning when the closure is approved by Public Health Seattle and King County (PHSKC).
- At the time of closure, BEW or equivalent facility will be operating to utilize the landfill gas generated at the site. The facility will have scheduled downtime for maintenance, requiring use of the flares. The source testing requirement for this minimized use of the flares will be to test all flares once every five years.
- The closure project at the final closure will leave all systems in full working condition, with no anticipated major repairs.
- Support facilities and equipment currently located at CHRLF will either be relocated or will be supported through another funding source.
- Leachate recirculation is not included in the estimate. It is expected that if leachate recirculation is implemented, this will represent a cost savings.
- Operating and maintenance costs are included in the hourly rates for equipment.
- Overhead costs for employees include all costs associated with providing resources for employees to perform their tasks, including supervision.
- Equipment required to perform tasks is included in task budgets, including pickups for supervisors and leads. Equipment costs are based on federal approved rates, as available and California State approved rates otherwise.
- As is true with SWD's existing closed landfills, the Industrial General Stormwater Permit (IGSWP) will no longer be in effect after closure; no surface water sampling will be required.

- The estimate is based on tasks being performed by SWD staff or contractors in the same manner as currently performed. To compensate for the potential that all tasks may be performed by contractors, a project management cost was added to the overall estimate. The underlying assumption is that the cost of performing the work remains constant whether performed by SWD forces or contractors, but SWD would incur increased costs for managing contracts with the contractors.
- Contingency The contingency in this estimate includes known unknowns such as responses to changes in groundwater quality or need to address landfill gas in native soil. This contingency assumes there will be one major investigation and remediation project during the thirty-year closure period. This activity is projected from years 5 through 10. Additional contingency is included to address the management of the risk that the landfill gas and leachate systems may have a failure requiring extensive repair or replacement and is assumed at 25% of the maintenance cost of the leachate and landfill gas systems.
- Major cost items with more uncertainty include a 5-10% estimating contingency. These items are maintenance activities currently performed and therefore have reliable cost projections to perform the work, but the frequency required is less certain. Higher contingency is applied to systems that have had more variable maintenance costs.
- Unknown unknowns are not included in the contingency and are assumed to be covered by management reserves. Examples of potential unknown unknowns include remediation due to Queen City Farms, changes to regulations and natural disasters.

Assumptions specific to the tasks are included in the detail tables that provide the supporting documentation for the estimate.

## Summary of Costs

The summary of costs is provided in the table below.

	<u>2017</u> Annual	
Task Group	Amount	<u>Basis</u>
		Based on 2012 estimated hours for
		PCM; updated wage and benefit rates
Cover		and includes a 5% contingency, and
Maintenance	\$605,000	was increased by 14%
		Based on 2012 estimated hours for
		PCM; updated wage and benefit
		rates; reduced aerator repair and
		replacement to reflect historical;
		adjusted for reduced leachate
Leachate		production in PCM and includes 10%
System		contingency and was increased by
Maintenance	\$234,000	14%.
		Based on 2012 estimated hours for
Stormwater		PCM; updated wage and benefit rates
System		and includes a 5% contingency and
Maintenance	\$500,000	was increased by 14%.

Table 1: Cedar Hills Regional Landfill Post Closure Maintenance Cost Estimate
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Landfill Gas System Maintenance Environmental Monitoring Electrical Utilities	\$300,000 \$166,000 \$328,000	Based on 2012 estimated hours for PCM; updated wage and benefit rates; assumes BEW or alternative utilizing all LFG; flares operating intermittently requiring source testing every 5 yrs. This estimate includes a 10% contingency. 2012 analytical lab, weather station maintenance inflated Based on 2012 costs increased by 14% and inflated.
Permits	\$6,000	Based on 2012 permit costs inflated
Project Management and Reporting <sup>1</sup>	\$754,000	Includes project management, field staff for monitoring; database mgmt. contract mgmt.; field equipment
Project management costs for third party contractor	\$238,000	Assumes contractor can complete labor at same cost as KCSWD; KC assumes 9% cost to manage - contingency is inherent to labor tasks
Wastewater utility	\$328,000	Assume reduced to average of 100 MG per year over the 30 years and increased by 14% from prior estimate
Base Estimate	\$3,459,000	
Contingency	\$308,000	Contingency based on 25% of leachate & LFG system maintenance plus one \$5M project occurring between years 5 and 10
2019 Total	\$3,767,000	2018 dollars
2020 Total	\$3,984,000	2019 dollars

## **Exclusions**

This estimate does not include costs of unknown risks. The risks addressed are identifiable and have some probability of occurring based on experiences at other closed sites. The estimate does not address the potential for the PCM period to extend beyond the minimum thirty years prescribed in the WAC 173-351.

# Attachments

Project Management and Reporting Costs Landfill Reserve Fund Cash Flow

Calculatio	on of Landfill Reserve	e Fund	2019 (2016\$) = 17.4814 Area 9, max height 800						Calculation of Landfill Reserve Fund 2019 (2016\$) = 17.48													
	A789 Cashflow 4/12/18 Mar 2018	8	Closure per ton \9 (2016\$) =		C91003 CH Post-Closure Maintenance \$6.232 per ton 19 (2016\$) =		C91004 CH New Area De \$1.043		Development C91001 per ton l9 (2016\$) = \$6.921						C91002 <b>\$3.285</b>	Total LRF						
	Apr 2018		Rea		7	7		8	8	8			4	4	4		6	6	6			o
Year Status	CH Disposal Projected Tonnage	EOY Capacity	Intere Tonnage Rate		Interest Earned	Expenditures	Year-end Balance	Revenue / Transfers	Interest Earned	Expenditures	Year-end Balance	Year	Revenue / Transfers	Interest Earned	Expenditures	Year-end Balance	Revenue / Transfers	Interest Earned	Expenditures	Year-end Balance	Year-end Balance	Contribution Summary
1994 history 1995 history	814,384 822,520		3.0%			513,220 544,191	(2,615,707) 1,132,816	1,058,717 484,771	449,184 668,324		11,332,732 12,485,826	1994 1995	2,598,299 2,390,990	457,169 740,541	283,222 830,699	11,534,186 13,835,018	513,071 780,564	131,548 227,132	988,751 83,237	3,318,894 4,243,353	23,570,104 31,697,013	]
1996 history	809,836		3.0%	3,341,69	3 238,061	234,264	4,478,306	727,166	741,819		13,954,811	1996	2,091,622	841,907	933,571	15,834,977	1,070,322	296,392	34,452	5,575,616	39,843,710	
1997 history 1998 history	864,397 875,496		3.0% 3.0%			6,163,038 6,446,861	1,412,875 (2,403,361)	738,474 733,524		0	15,609,094 17,427,418	1997 1998	11,715,021 2,838,832	1,615,420 1,520,115	1,632,096 7,496,872	27,533,323 24,395,398	208,510 473,833	358,797 367,074	27,567 1,059,187	6,115,356 5,897,075	50,670,647 45,316,529	
1999 history 2000 history	925,357 947,174		3.0% 3.0%				(1,737,670) (3,986,054)	548,289 719,851	1,205,846 1,766,389	0	19,181,553 21,667,793	1999 2000	1,133,937 1,903,818	926,778 1,295,365	11,713,734 2,051,685	14,742,379 15,889,876	325,256 350,454	226,057 (10,155)	2,845,891 ) 4,067,363	3,602,496 (124,568)	35,788,758 33,447,047	
2001 history	936,506		3.0%	5,637,76	) (91,988)	3,312,977	(1,753,259)	739,839	1,245,568	0	23,653,200	2001	2,041,581 832,703	907,435	1,600,992	17,237,900	852,220	(17,177) 76,085	) 1,038,342	(327,868)	38,809,974	
2003 history	939,488 978,836		3.0%	3,181,16	7 138,833	2,486,402 2,320,514	1,452,636 2,452,121	699,420 636,244	893,380 676,286	0	25,246,000 26,558,530	2002 2003	6,509,525	447,676 269,166	5,867,404 3,759,093	12,650,876 15,670,474	2,426,479 630,955	122,498	24,613 192,901	2,150,084 2,710,636	41,499,597 47,391,763	
2004 history 2005 history	1,006,163 988,855		3.0% 3.0%			4,199,095 1,726,896	4,490,598 9,757,413	523,205 207,659	664,548 794,030	0 0	27,746,284 28,747,973	2004 2005	3,999,677 1,077,851	111,826 118,398	15,113,014 2,788,412	5,878,768 4,286,604	0 0	49,159 52,606	707,299 200,482	2,052,497 1,904,622	40,168,146 44,696,611	
2006 history 2007 history	998,207 1,010,429		3.0% 3.0%			5,656,525 3,168,565	9,315,800 11,185,747	0	1,367,521 1,554,363	0 0	30,115,493 31,669,856	2006 2007	618,888 579,848	184,967 112,798	1,019,096 2,468,476	4,071,363 2,295,533	339,390 317,981	96,390 53,596	218,133 1,396,695	2,122,268 1,097,150	45,624,925 46,248,287	
2008 history 2009 history	930,617 867,481		3.09	4,234,30	7 291,016	4,913,371 3,516,106	10,797,699 10,823,372	0	856,085 816,886	762,193 0	31,763,748 32,580,635	2008 2009	1,061,917 1,397,225	(78,342) (257,449)	6,185,877 8,501,066	(2,906,769) (10,268,059)	241,960 216,871	11,659 (19,332)	918,189	432,581 (771,039)	40,087,259 32,364,909	
2010 history	830,932		3.09	2,592,43	5 146,490	1,831,806	11,730,492	0	412,011	0	32,992,646	2010	1,213,586	(137,615)	1,827,700	(11,019,787)	224,345	(9,465)	) 201,785	(757,944)	32,945,406	
2011 history 2012 history	812,784 806,914		-2.00 1.93			4,860,709 3,785,264	9,267,042 9,590,061	0	291,003 486,547	35,407 0	33,248,242 33,734,789	2011 2012	1,820,412 2,815,552	(83,237) (97,967)	227,524 0	(9,510,137) (6,792,551)	674,528 644,980	(2,050) 577	) 148,701 371,370	(234,166) 40,021	32,770,981 36,572,319	
2013 history 2014 history	809,165 843,321		-0.70 -1.31			4,165,174 2,593,043	10,319,359 12,894,929	1,777,738 1,867,110		0 0	35,854,927 37,890,259	2013 2014	2,631,725 2,838,572	(42,258) (21,270)	222,039 3,183,038	(4,425,124) (4,790,860)	679,699 600,444	4,302 4,537	273,484 33,535	450,539 1,021,986	42,199,703 47,016,313	10,417,489
2015 history 2016 history	869,802 922,000		-0.75	6 5,821,87	78,551	6,276,818 1,329,322	12,518,531 19,980,634	3,443,063 2,132,496	260,996 416,066	0	41,594,317 44,142,879	2015 2016	2,647,862 3,913,805	(85,384) (214,887)	11,379,097 12,890,033	(13,607,479) (22,798,593)	545,999 806,843	4,151 (27,149)	910,574	661,561 (2,880,360)	41,166,932 38,444,561	12,458,793 15,456,243
2017 history	931,177	20,873,863	931,177 -1.87	6,067,64	2 233,111	5,594,309	20,687,079	10,239,844	619,794	0	55,002,517	2017	5,521,338	(415,344)	19,166,353	(36,858,951)	1,935,824	(32,059)	) 1,868,463	(2,845,058)	35,985,587	23,764,649
2018 forecast 2019 forecast	953,421 963,089	19,920,442 18,957,353	953,421 -1.72 963,089 -1.12			\$7,738,015 \$11,235,171	18,819,841 13,405,030	3,317,221 1,004,780	(972,145) (648,554)	0 0	57,347,593 57,703,818	2018 2019	5,648,208 6,665,365	780,520 614,601	\$22,914,948 \$9,617,920	(53,345,171) (55,683,125)	1,982,020 3,163,950	72,084 68,007	\$4,694,650 \$4,325,015	(5,485,604) (6,578,662)	17,336,659 8,847,061	17,160,072 16,836,108
2020 forecast 2021 forecast	1,007,056 1,030,711	17,950,297 16,919,586	1,007,056 -0.29 1,030,711 0.11			\$4,567,291 \$602,526	15,072,816 20,913,620	1,050,650 1,075,329	(167,184) 65,404	0 0	58,587,285 59,728,018	2020 2021	16,969,653 7,133,364	142,178 (45,933)	\$4,643,051 \$3,752,169	(43,214,346) (39,879,083)	3,308,391 3,386,102	42,081 (32,922)		(22,692,564) (36,864,269)	7,753,191 3,898,285	27,604,711 18,018,233
2022 forecast 2023 forecast	1,070,056 1,088,907	15,849,530 14,760,623	1,070,056 0.40 <sup>o</sup> 1,088,907 0.66 <sup>o</sup>	6,668,63	5 87,442	\$4,781,705 \$578,816	22,887,993 29,267,250	1,116,378 1,136,045	241,182 407,890	0	61,085,577 62,629,512	2022 2023	7,405,664 7,536,128	(149,887) (251,797)	\$2,579,616	(35,202,922) (41,168,436)	3,515,359 3,577,288	(144,121) (221,900)	\$1,836,392	(35,329,424) (31,974,036)	13,441,224 18,754,289	18,706,037 19,035,578
2024 forecast	1,129,620	13,631,003	1,129,620 0.81	7,039,84	2 247,894	\$4,702,513	31,852,472	1,178,520	514,903	0	64,322,934	2024	7,817,896	(433,591)	\$31,952,060	(65,736,192)	3,711,039	(253,140)	) \$1,923,078	(30,439,215)	0	19,747,297
2025 forecast 2026 forecast	1,161,198 1,201,570	12,469,805 11,268,235	1,161,198 0.93 1,201,570 0.99	7,488,23		\$3,660,282 \$14,595,799	35,740,288 28,952,258	1,211,465 1,253,585	601,139 662,783	0 0	66,135,538 68,051,906	2025 2026	8,036,441 8,315,849	(607,509) (614,977)	\$7,797,475 \$0	(66,104,735) (58,403,864)	3,814,779 3,947,410	(264,160) (247,343)	) \$0	(26,888,595) (23,188,528)	8,882,495 15,411,772	20,299,323 21,005,081
2027 forecast 2028 forecast	1,231,316 1,273,235	10,036,919 8,763,684	1,231,316 1.02 1,273,235 1.02			\$2,967,981 \$6,618,363	33,976,427 35,645,334	1,284,618 1,328,352	698,976 702,983	0 0	70,035,500 68,843,647	2027 2028	8,521,715 8,811,829	(550,914) (468,334)	\$0 \$0	(50,433,063) (42,089,568)	4,045,132 4,182,845	(215,367) (175,698)		(19,358,764) (15,351,617)	34,220,100 47,047,796	21,525,081
2029 forecast 2030 forecast	1,295,246 1,317,638	7,468,438 6,150,800	1,295,246 1.02 1,317,638 1.02			\$4,412,242 \$6,618,363	39,686,441 41,691,577	1,351,316 1,374,677	707,371 728,437	0 0	70,902,334 73,005,448	2029 2030	8,964,165 9,119,134	(383,320) (296,972)	\$129,157 \$215,261	(33,637,879) (25,030,979)	4,255,156 4,328,717	(134,557) (92,255)		(11,231,018) (6,994,556)	65,719,877 82,671,490	251,617,206
2031 forecast	1,340,417	4,810,383	1,340,417 1.02	8,353,53	5 444,271	\$4,412,242	46,077,142	1,398,442	749,958	0	75,153,847	2031	9,276,782	(207,936)	\$86,104	(16,048,238)	4,403,550	(55,394)	\$1,302,589	(3,948,988)	101,233,762	
2032 forecast 2033 forecast	1,363,589 1,387,162	3,446,794 2,059,631	1,363,589 1.02 1,387,162 1.02	8,644,85	3 514,370	\$6,618,363 \$4,412,242	48,435,132 53,182,118	1,422,618 1,447,211	771,941 794,396	0	77,348,406 79,590,013	2032 2033	9,437,155 9,600,301	(115,281) (19,600)	\$0 \$0	(6,726,365) 2,854,336	4,479,677 4,557,120	(37,272) (44,692)	\$6,512,944	(3,414,349) (5,414,865)	115,642,825 130,211,603	
2034 forecast 2035 closing	1,411,143 1,435,538	648,488 -	1,411,143 1.02 648,488 1.02			\$26,190,800 \$34,732,631	36,238,256 5,759,618	1,472,230 676,560	817,332 836,581	0 0	81,879,576 83,392,717	2034 2035	9,766,267 4,488,069	78,730 152,051	\$0 \$0	12,699,333 17,339,453	4,635,902 2,130,420	(38,139) (10,730)		(2,119,690) 0	128,697,475 106,491,788	
2036 closed 2037	1,460,355 1,485,602	-	- 1.02° - 1.02°		) 29,154 ) (0)	\$5,788,772 \$0	(0) (0)	0 0	832,137 807,808	3,223,188 3,223,188	81,001,666 78,586,286	2036 2037	0	176,432 178,227	\$0 \$0	17,515,885 17,694,112	0	0	\$0 \$0	0 0	98,517,551 96,280,398	
2038 2039	1,511,284 1,537,410	-	- 1.02 <sup>o</sup> - 1.02 <sup>o</sup>		) (0) ) (0)	\$0 \$0	(0)	0	783,231 758,404	3,223,188 3,223,188	76,146,328 73,681,544	2038 2039	0	178,921 178,503	\$220,000 \$220,000	17,653,034 17,611,537	0	0	\$0 \$0	0	93,799,362 91,293,082	
2040 2041	1,563,989	-	- 1.029	b	) (0)	\$0	(0)	0	733,324	3,223,188	71,191,681	2040	0	178,641	\$110,000	17,680,178	0	0	\$0 \$0	0	88,871,859	
2042			1.02	þ	- (-)		(0) (0)	0	707,989 682,397	3,223,188 3,223,188	68,676,482 66,135,691	2041 2042	0	179,899 181,729	\$0 \$0	17,860,077 18,041,806	0	0	\$0 \$0	0	86,536,559 84,177,497	
2043 2044			1.029		) (0) ) (0)		(0) (0)	0 0	656,544 630,428	3,223,188 3,223,188	63,569,047 60,976,286	2043 2044	0	183,579 185,446		18,225,385 18,410,831	0 0	0 0		0 0	81,794,431 79,387,118	
2045 2046			1.02 <sup>0</sup> 1.02 <sup>0</sup>		) (0) ) (0)		(0) (0)	0	604,046 577,396	3,223,188 3,223,188	58,357,144 55,711,352	2045 2046	0	187,333 189,240		18,598,165 18,787,404	0	0		0	76,955,309 74,498,756	
2047 2048			1.02 <sup>0</sup> 1.02 <sup>0</sup>	b	) (0)		(0)	0	550,474 523,279	3,223,188 3,223,188	53,038,639	2047 2048	0	191,165 193,110		18,978,569	0	0		0	72,017,208 69,510,409	
2049			1.02	b	) (0) ) (0)		(0)	0	495,807	3,223,188	50,338,730 47,611,349	2049	0	195,075		19,171,680 19,366,755	0	0		0	66,978,103	
2050 2051			1.029		) (0) ) (0)		(0) (0)	0	468,055 440,022	3,223,188 3,223,188	44,856,216 42,073,050	2050 2051	0	197,060 199,065		19,563,815 19,762,880	0 0	0 0		0	64,420,031 61,835,930	
2052 2053			1.02 <sup>0</sup> 1.02 <sup>0</sup>		) (0) ) (0)		(0) (0)	0	411,702 383,095	3,223,188 3,223,188	39,261,564 36,421,471	2052 2053	0	201,091 203,137		19,963,971 20,167,108	0	0		0	59,225,535 56,588,579	
2054 2055			1.02	b	) (0) ) (0)		(0)	0	354,197 325,004	3,223,188 3,223,188	33,552,479 30,654,296	2054 2055	0	205,204 207,292		20,372,311 20,579,603	0	0		0	53,924,791 51,233,899	
2056			1.02	b	) (0)		(0)	0	295,515	3,223,188	27,726,622	2056	0	209,401		20,789,004	0	0		0	48,515,626	
2057 2058			1.02 <sup>0</sup> 1.02 <sup>0</sup>		) (0) ) (0)		(0) (0)	0	265,725 235,632	3,223,188 3,223,188	24,769,159 21,781,603	2057 2058	0	211,532 213,684		21,000,536 21,214,220	0 0	0 0		0	45,769,695 42,995,823	
2059 2060			1.02 <sup>0</sup> 1.02 <sup>0</sup>		) (0) ) (0)		(0) (0)	0	205,233 174,525	3,223,188 3,223,188	18,763,649 15,714,986	2059 2060	0	215,858 218,055		21,430,078 21,648,133	0	0		0	40,193,727 37,363,119	
2061 2062			1.02	b	) (0) ) (0)		(0)	0	143,504 112,168	3,223,188 3,223,188	12,635,302	2061 2062	0	220,273 222,515		21,868,407 22,090,921	0	0		0	34,503,709 31,615,204	
2063			1.02	b	) (0)		(0)	0	80,513	3,223,188	9,524,282 6,381,607	2063	0	224,779		22,315,700	0	0		0	28,697,308	
2064 2065			1.02 <sup>0</sup> 1.02 <sup>0</sup>	b	) (0) ) (0)		(0) (0)	0 0	48,536 16,233	3,223,188 3,223,188	3,206,955 0	2064 2065	0	227,066 229,377		22,542,766 22,772,143	0 0	0 0		0	25,749,721 22,772,143	
2066 2067			1.02 <sup>0</sup> 1.02 <sup>0</sup>		) (0) ) (0)		(0) (0)	0	0	0	0	2066 2067	0	231,710 234,068		23,003,853 23,237,922	0	0 0		0	23,003,853 23,237,922	
2068 2069			1.02	b	) (0)		(0)	0	0	0	0	2068 2069	0	236,450 238,856		23,474,372	0	0		0	23,474,372 23,713,227	
2069			1.02		) (0) ) (0)		(0)	0	0	0	0	2069 2070	0	238,856 241,286		23,713,227 23,954,514	0	0		0	23,713,227 23,954,514	
Assumes 52%	recycling and current	t CHRL capacit	2036 • <b>v</b>																			

Assumes 52% recycling and current CHRL capacity