

ACRL Report



September 9, 2015; Topeka, KS

Basis for the Preparation of a ACRL Type Report

As it has been from the beginning, the BWM has sought to provide a relatively simple, scientific basis for the RTP activities. Financial assurance (FA) cost savings provide the incentive for Subtitle D O/O to investigate this option to the current rolling 30 statutory requirement (recall the **distinction between PCP and RTP**, i.e., a rolling 30 versus RTP of less than 30 years).

Strategy for the Preparation of an ACRL Type Report

The preparation of this ACRL Report is another attempt to encourage O/O to consider the RTP option. It uses the ACRL as a prototype landfill to demonstrate, with the data that are available, how the RTP can occur. It assumes that the ACRL Closure and PCP can be modified to allow the demonstration to occur. Obviously, other landfills can follow this pattern if they choose.

Strategy (Continued)

The preparation of the ACRL Report consisted of the following steps:

- 1. Collection of available data related to RTP.**
- 2. Analysis of available data and assumptions concerning other needed data.**
- 3. Statistical analysis of data.**
- 4. Cost estimates of demonstrated RTP activities with financial assurance savings.**

Step 1: Collection of available data related to PCC.

Existing monitoring activities were identified and resultant data collected for the following monitoring efforts:

- 1. Groundwater**
- 2. Leachate**
- 3. Landfill Gas in GCCS, structures & facility boundaries, flare and surface emissions.**

The results are illustrated in the following tables.

Step 2: Analysis of available data and assumptions concerning other needed data.

The current ACRL data collection effort was not designed to provide the information needed to justify RTP activities; however, these data would be needed to provide the basis for the submission of an actual report that could result in RTP activities with accompanying FA cost savings.

Table 1 – ACRL Monitoring Activities

Monitoring Activity/Bureau monitoring results	Location(s)	Frequency	Parameters
Groundwater/BWM	Multiple monitoring wells	Semi-Annual	KAR Appendix I (Geochemicals & volatile organics for detection monitoring)
Leachate/BWM	Pre-Subtitle D toe drain sump, Phases I & II wet well, Cells 1A & 1B SEB inlet & SEB No.1 future cells' SEB inlets	Biannually and Quarterly	Flow, KAR Appendix I* (see above), BOD ₅ , TSS, total iron & pH
Landfill gas at wells and flare inlet header/BOA	Multiple wells	Monthly at wells and weekly at flare	CH ₄ , CO ₂ , O ₂ , balance gases, pressure & temperature
Flare emissions/BOA	Flare	Recorded continuously every 10 seconds at flare	System inlet pressure, flow rate, temperature, bypass flow rate, actual exit velocity & average

Table 1 – ACRL Monitoring Activities (Continued)

Monitoring Activity/Bureau monitoring results	Location(s)	Frequency	Parameters
Two to four inches above the landfill surface/BOA	installed LFG extraction wells		background
Boundary emissions/BWM	North & east edge of landfill	Quarterly	CH ₄
Structure emissions/BWM	Maintenance building, office & storage shed	Weekly & Continuous	CH ₄

Sample Monitoring Results

The ACRL Report contains available results. The following extracts from the report illustrate the results.

Table 3 Extract – Key Toe Drain Data

	BOD₅ (mg/L)	COD (mg/L)	TSS (mg/L)	NH₃-N (mg/L)	pH
Average	16	214	90	48	7.5
Average w/o outlier	No outliers	No outliers	16	No outliers	No outliers
Range	5.2 to 48	147 to 290	2.1 to 1120	0.55 to 150	6.7 to 8.4
Range w/o outlier	No outliers	No outliers	2.1 to 66	No outliers	No outliers

Figure 2 - Toe Drain Concentrations (mg/L)

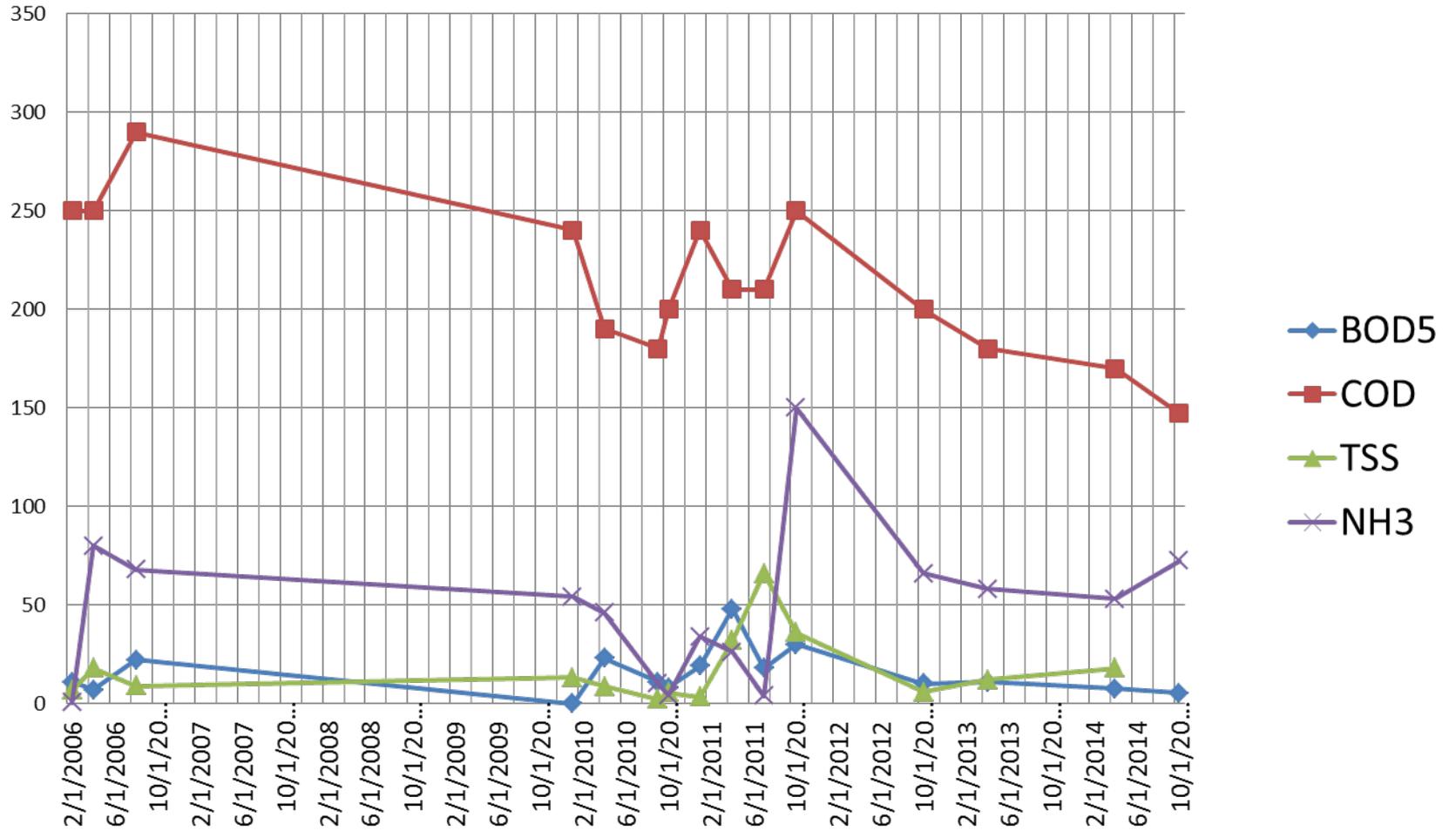


Table 4 – Key Leachate Data for Other Leachate Sources

	BOD ₅ (mg/L)	COD (mg/L)	TSS (mg/L)	NH ₃ -N (mg/L)	pH
Average	89	258	117	41	7.4
Ave. w/o outliers	43	191	52	35	No outliers
Range	5 to 1400	1.6 to 2200	10 to 1100	1.3 to 180	6.1 to 8.5
Range w/o outliers	5 to 260	1.6 to 500	10 to 250	1.3 to 86.8	No outliers

Other Leachate Sources: Concentrations (mg/L)

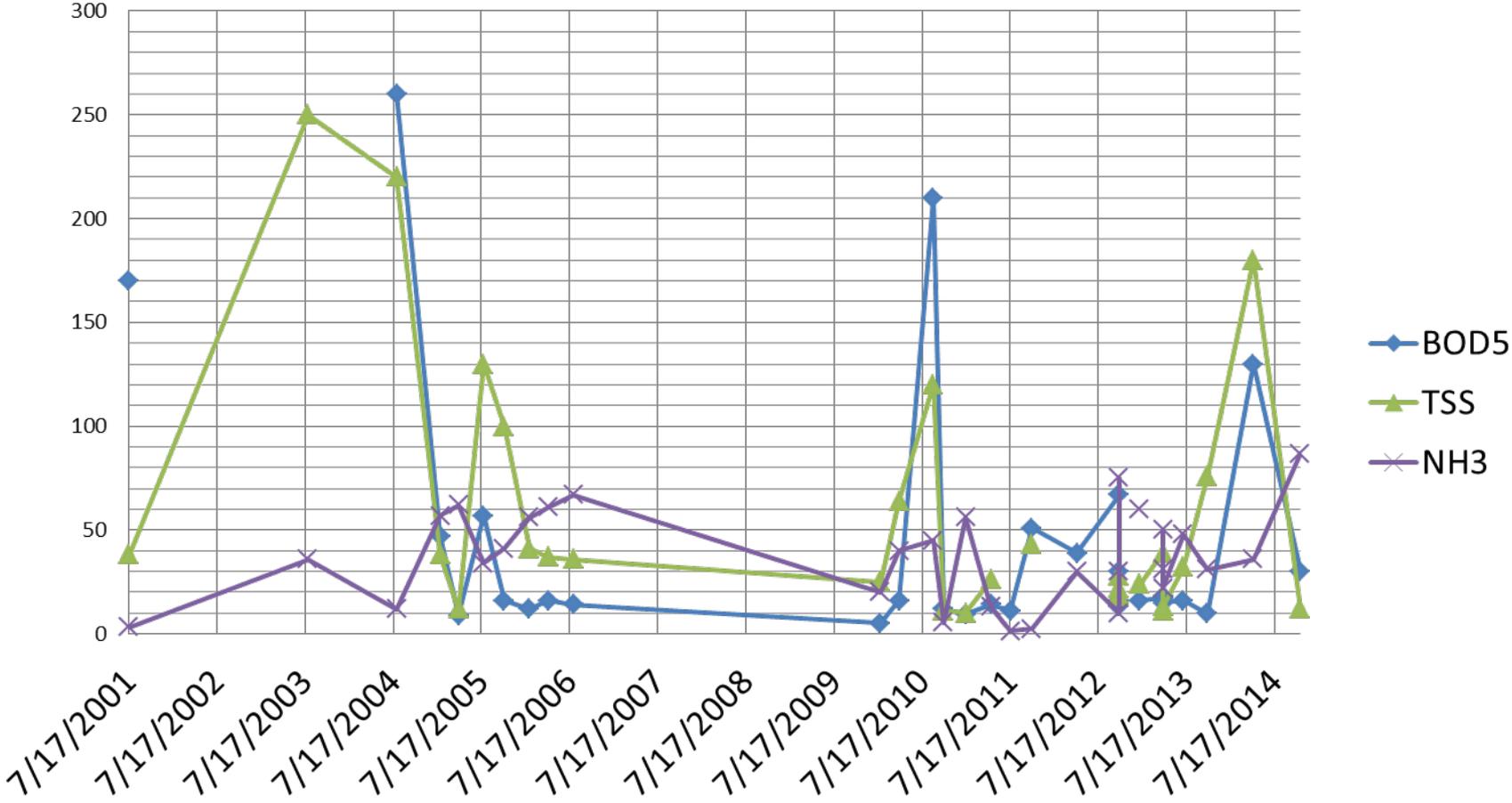


Table 5 – ACRL Pre-Subtitle D Area Blower and LFG Well No. 10 Data

Date: 1-27-10	Blower Velocity = 915 fpm	Blower Rate = 60 cfm	Well Temperature = 46.8 ° F	Well Vacuum = 0 inches H₂O
LFG Well No. 10 Composition (% by volume)				
CH₄ =	CO₂ =	O₂ =	Balance =	Sum of LFGs =
62.4	35.4	0.3	0.8	98.9

Figure 5 - Well No. 10 Gas Constituents (Volume %)

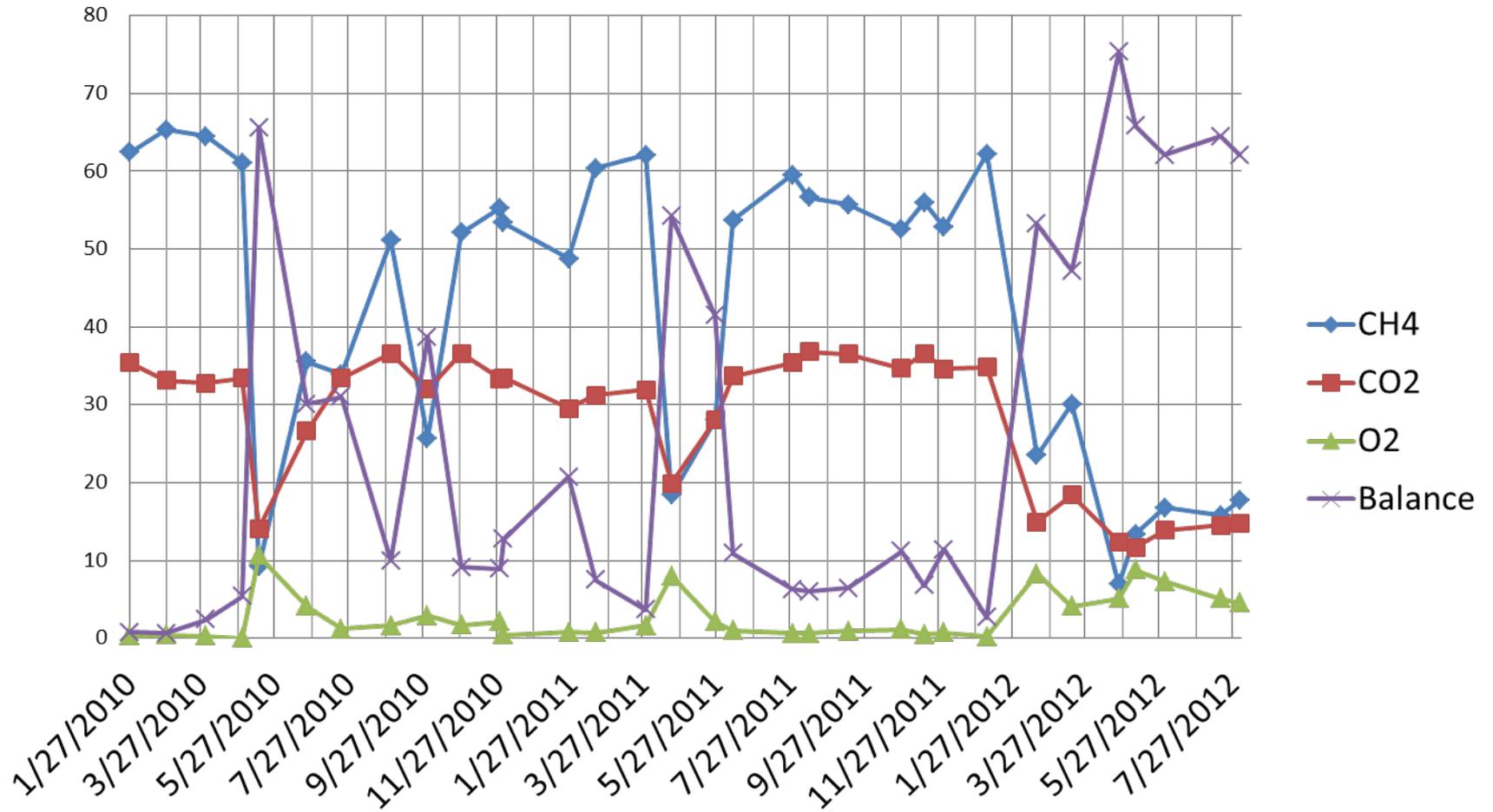


Figure 1 – Extract from Reference 8

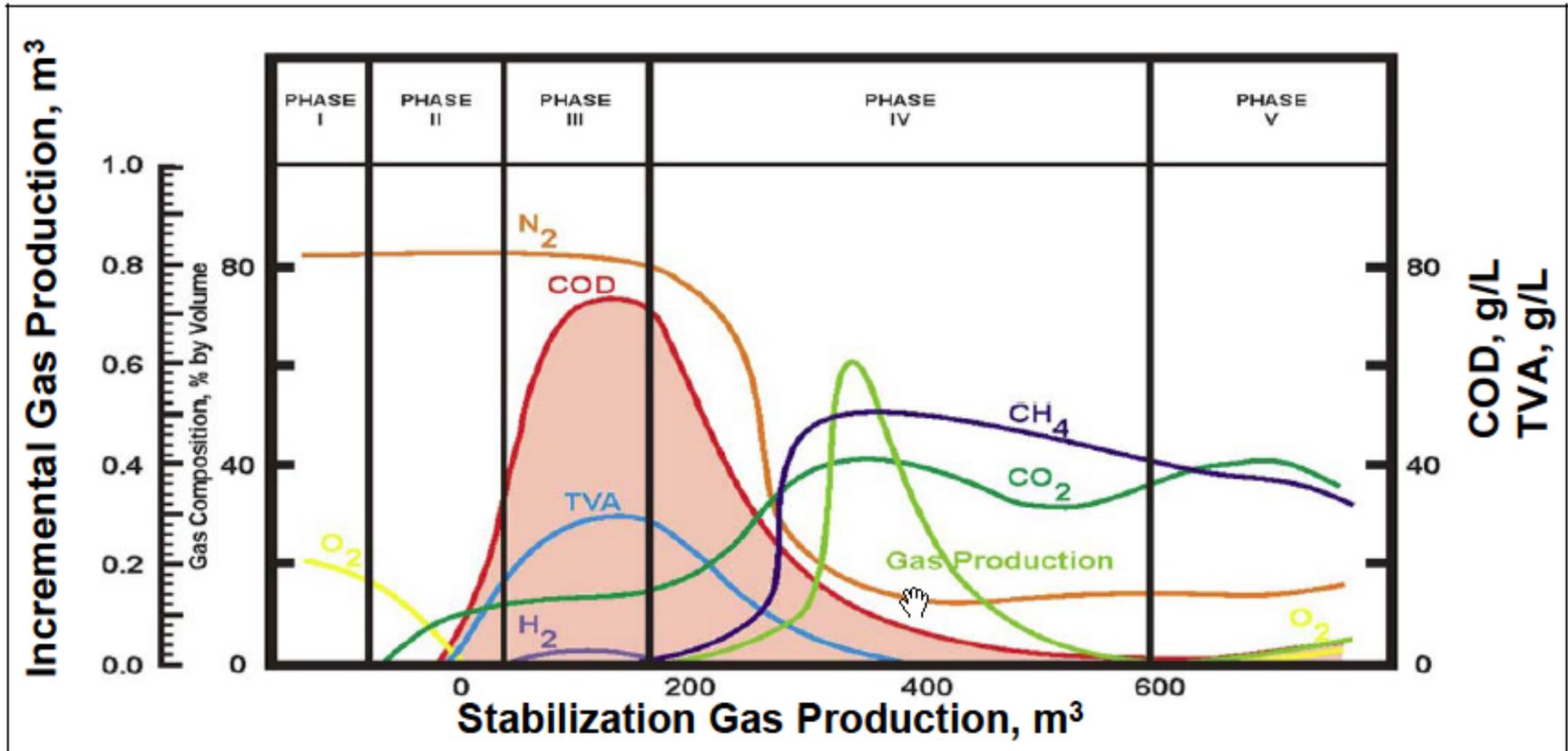


Figure 1-4. Waste decomposition phases taken from draft
(Modified from Pohland and Harper, 1986)

Table 2 - Projected Dates for Unit Activity Reduction or Termination

Unit:	Pre-Subtitle D	Phases I & II	Cells 1A & 1B
Date Closed	October 2001	Anticipated 2028 (Currently Inactive)	Estimated 2050 (Cell 1A inactive, Cell 1B active)
5 Year Period (Reduction)	October 2006	Anticipated 2033	Estimated 2055
15 Year Period (Termination)	October 2016	Anticipated 2043	Estimated 2065

Step 3: Statistical analysis of data.

Step 4: Cost estimates of demonstrated RTP activities with financial assurance savings.

Step 3 was not done because of the lack of available software to do the Kendall tau test.

Step 4 was completed using the results of **Table 2**. **Table 6** (next slide) results were obtained based on given assumptions for making cost estimates.

Table 6 – Projected PCC Annual Costs for FA Purposes

Closure Year	2014	2016	2025	Subsequent Cells
Affected Units	All units	Except pre-Subtitle D unit	Except pre-Subtitle D & Phases I & II units	Except pre-Subtitle D, Phases I & II & Units 1A & 1B
Annual Costs	\$146,754	\$116,337	Not estimated	Not estimated
Savings	-	\$30,417	Ditto	Ditto
30 Year Costs	\$4,402,622	\$3,490,110	Ditto	Ditto

Summary: Much of what was presented is based on data that were not collected for the designated purpose of this document, i.e., preparing an ACRL Report (4). This was pointed out with regard to leachate and LFG sampling results. Guidance is available to produce the best results for both emissions (12, 13). Also, companion data, e.g., flow data with date coordinated sampling values, must be collected if emission analysis results are to have their greatest value (4).

Questions





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