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January 4, 2013

Mr. Paul Gildersleeve, P.E.
NHDES Waste Management Division
Permitting & Design Review Section
P.O. Box 95, 29 Hazen Drive
Concord, New Hampshire 03302-0095

*Diethyl Ether
1,1 - Dichloro ethane*

**RE: North Country Environmental Services, Inc.
Stage I Phase III Secondary Leachate Flows
CMA #665**

Dear Paul:

On behalf of North Country Environmental Services, Inc (NCES), CMA Engineers, Inc. has prepared this letter in response to your e-mail dated December 19, 2012. You have requested an explanation of the cause of the increase in leachate flows in Stage I, Phase III beginning in August 2011. Since August 2011, Stage I, Phase III secondary flows have ranged from monthly averages of 20 gallons per acre per day (gpad) to 93 gpad, with an average of 39 gpad over that period. Table 1 provides monthly average secondary leachate flows for each phase of Stage I from 1995 to the present. Figures 1 through 3 provide plots of Stage I, Phase I-III leachate flows on a 6-month rolling average basis, along with explanations and the remedy for any flows above the Action Leakage Rate (ALR) value of 25 gpad established for the landfill.

As shown on Figure 3 and in Table 1, flows above the ALR are currently being measured in Stage I, Phase III. Not unexpectedly, increased secondary flows began in March 2011 when the lining systems were exposed and opened for Stage IV, Phase II-A construction in the adjacent cell. Stage IV, Phase II-A construction was temporarily stopped at the end of the 2011 construction season. At that time, the lining system had been completed up to the tie-in with the southern portion of Stage I, Phase III. The exposed and open lining systems for each phase were temporarily patched to prevent clean water from entering the secondary collection systems. This area of the landfill is not exposed to the flow of leachate.

The patches are located in a low area that is saturated with clean surface water runoff from capped areas of the landfill. The timing of the increased flows and the other factors discussed in this letter have led us to conclude that the patch for the Stage I, Phase III liner is not water tight, and in the presence of ponded water, clean water is entering the secondary system and being recorded as elevated secondary flows. We understand that on April 19, 2012 you were able to observe the condition of the patched liners and associated clean water drainage situation yourself, and concurred with the NCES approach to interim 2012 repairs. The results of repairs to the patch in 2012 are evident in the reduction in secondary flows since the summer, as shown

of Figure 3. As you know the planned permanent repair involves completion of liner construction, currently scheduled to begin as soon as practical in the Spring of 2013.

Table 2 is a summary of leachate quality data obtained in July 2012. The complete July laboratory reports are also attached. The parameters listed in the table, including certain VOCs, leachate indicator parameters, and metals, were those that were consistently and substantially elevated in the Stage I primary leachate of Phases I-III. As shown in Table 2, these markers of primary leachate are diluted by about 90 percent in the Phase III secondary system. This indicates the fluid in the secondary system has a ratio of about one part leachate to 9 parts clean water. This analytical data confirms that the volume of Phase III secondary flows is not indicative of elevated levels of leachate leaking through the primary liner, but rather the typical levels of leakage with clean water intrusion directly into the secondary collection system. In the absence of the clean water intrusions, secondary flows would be in the 2 to 9 gpad range, and average 4 gpad, values that are well below the 25 gpad ALR.

Our recommendation to NCES is therefore to proceed with the completion of the liner construction this Spring, after which we expect the clean water component of the Phase III secondary flows to taper off rapidly. If for any reason you disagree with this recommendation, please do not hesitate to contact me so we can discuss any alternatives you have in mind.

Best regards,

CMA ENGINEERS, INC.



Robert J. Grillo, P.E.
Principal in Charge

Attachments: Tables 1 and 2
Figures 1 through 3
Eastern Analytical Laboratory Report

cc: Wayne Wheeler, NHDES
Michael Guilfoyle, NHDES
John Gay, NCES
Kevin Roy, NCES

North Country Environmental Services
Table 1 - Stage I Secondary Leachate Flows



Monthly Average	Phase I	Phase II	Phase III
	Gal/Ac/Day	Gal/Ac/Day	Gal/Ac/Day
January-95	0.00	0.00	2.17
February-95	0.00	0.07	0.90
March-95	0.00	0.02	5.22
April-95	0.00	0.00	1.36
May-95	0.00	0.00	0.62
June-95	0.00	0.00	0.33
July-95	0.00	0.00	0.30
August-95	0.00	0.02	0.25
September-95	0.00	0.00	6.69
October-95	15.11	16.97	14.85
November-95	12.68	1.77	0.00
December-95	7.32	0.53	4.95
January-96	60.16	0.00	4.60
February-96	6.64	1.82	8.46
March-96	3.82	1.22	3.99
April-96	2.99	17.73	15.78
May-96	1.88	12.80	9.40
June-96	0.89	1.93	1.61
July-96	8.04	0.94	5.54
August-96	4.92	1.04	14.25
September-96	3.64	0.00	3.48
October-96	5.16	0.00	4.33
November-96	4.51	0.00	4.39
December-96	8.50	7.66	34.25
January-97	1.05	0.66	8.57
February-97	0.00	0.75	14.43
March-97	0.00	0.00	0.00
April-97	0.00	0.00	4.28
May-97	0.49	0.00	5.14
June-97	0.00	0.00	0.00
July-97	0.00	0.00	0.87
August-97	0.00	18.85	39.01
September-97	8.73	9.42	55.11
October-97	98.44	18.14	20.56
November-97	7.23	23.97	149.31
December-97	0.00	1.20	60.97
January-98	0.00	64.92	249.87
February-98	0.00	0.00	20.34
March-98	0.00	43.47	39.54
April-98	0.00	10.81	78.11
May-98	0.00	0.00	33.85
June-98	0.00	9.91	49.53
July-98	0.00	26.56	73.51
August-98	0.00	10.81	16.12
September-98	4.71	12.16	23.06
October-98	0.20	3.20	7.10
November-98	0.00	6.20	4.90

North Country Environmental Services
Table 1 - Stage I Secondary Leachate Flows

Monthly Average	Phase I	Phase II	Phase III
	Gal/Ac/Day	Gal/Ac/Day	Gal/Ac/Day
December-98	0.00	20.40	7.00
January-99	0.00	40.90	7.29
February-99	0.00	4.46	25.44
March-99	0.00	3.59	24.23
April-99	0.00	9.09	41.07
May-99	0.00	0.00	11.79
June-99	0.00	0.00	11.53
July-99	0.00	14.78	6.24
August-99	0.00	0.00	11.66
September-99	0.00	11.46	11.41
October-99	0.00	1.82	18.38
November-99	0.00	15.30	9.63
December-99	0.00	36.60	17.36
January-00	0.00	4.89	6.96
February-00	0.00	2.86	13.38
March-00	0.00	18.71	8.74
April-00	2.83	162.61	100.76
May-00	0.00	170.80	58.29
June-00	0.00	33.82	14.57
July-00	0.00	0.61	12.77
August-00	0.00	0.00	17.16
September-00	0.00	0.21	0.00
October-00	0.10	5.59	18.60
November-00	3.30	0.00	6.60
December-00	0.00	39.68	18.89
January-01	0.00	0.45	0.79
February-01	0.00	0.00	17.77
March-01	0.00	0.98	18.22
April-01	0.00	223.41	149.28
May-01	4.28	64.00	45.78
June-01	0.00	15.59	12.66
July-01	0.00	0.00	10.17
August-01	0.00	0.80	8.74
September-01	0.00	0.51	7.06
October-01	0.00	0.00	5.18
November-01	0.00	0.00	12.54
December-01	0.00	0.10	12.81
January-02	0.00	28.09	16.03
February-02	0.00	42.16	39.25
March-02	0.00	197.72	39.07
April-02	0.00	63.86	49.40
May-02	0.00	119.35	61.39
June-02	0.00	76.32	33.41
July-02	0.47	19.89	28.30
August-02	0.00	12.32	14.58
September-02	0.00	3.38	2.59
October-02	0.00	0.32	1.04

North Country Environmental Services
Table 1 - Stage I Secondary Leachate Flows

Monthly Average	Phase I	Phase II	Phase III
	Gal/Ac/Day	Gal/Ac/Day	Gal/Ac/Day
November-02	0.00	0.00	21.32
December-02	0.00	0.00	18.36
January-03	0.00	0.04	9.30
February-03	0.00	0.00	8.46
March-03	0.11	13.11	10.95
April-03	0.00	0.94	7.55
May-03	0.00	9.04	7.47
June-03	0.00	0.00	3.31
July-03	0.00	0.37	1.91
August-03	0.00	0.00	0.56
September-03	0.00	0.00	0.00
October-03	0.00	0.00	0.00
November-03	0.00	0.00	0.00
December-03	0.00	0.00	0.00
January-04	0.00	17.44	0.00
February-04	0.00	0.00	0.00
March-04	0.00	5.22	2.17
April-04	0.00	0.58	6.03
May-04	0.00	14.57	6.21
June-04	0.00	0.00	10.13
July-04	0.00	0.00	22.08
August-04	0.00	0.00	14.83
September-04	0.00	0.02	4.67
October-04	0.00	4.58	5.40
November-04	0.00	0.54	0.00
December-04	0.00	14.73	1.97
January-05	0.00	8.69	0.00
February-05	0.00	1.16	1.83
March-05	0.00	0.96	21.57
April-05	0.00	13.47	1.46
May-05	0.00	0.42	0.00
June-05	0.00	0.06	0.00
July-05	0.00	0.00	0.00
August-05	0.00	0.00	0.02
September-05	0.00	10.48	8.46
October-05	0.00	4.05	3.88
November-05	0.00	0.54	0.00
December-05	0.00	0.00	0.00
January-06	0.00	43.50	29.18
February-06	0.00	25.71	31.77
March-06	0.00	2.61	16.84
April-06	0.00	1.82	13.23
May-06	14.40	7.14	18.43
June-06	11.43	12.04	7.42
July-06	17.00	2.65	17.01
August-06	14.78	4.22	4.91
September-06	3.09	0.89	24.62

North Country Environmental Services
Table 1 - Stage I Secondary Leachate Flows

Monthly Average	Phase I	Phase II	Phase III
	Gal/Ac/Day	Gal/Ac/Day	Gal/Ac/Day
October-06	6.25	11.70	20.17
November-06	17.38	12.57	19.11
December-06	18.13	4.47	22.03
January-07	91.02	6.25	20.24
February-07	23.62	0.98	15.81
March-07	90.67	34.15	30.28
April-07	108.88	32.01	36.13
May-07	17.73	3.00	20.67
June-07	15.01	1.61	19.98
July-07	7.64	1.59	21.12
August-07	8.32	5.79	17.08
September-07	6.09	0.89	15.71
October-07	8.46	3.45	16.90
November-07	4.61	4.54	28.47
December-07	3.63	11.66	23.38
January-08	4.43	11.63	25.34
February-08	4.03	18.69	21.78
March-08	2.61	2.17	38.91
April-08	7.92	16.57	31.96
May-08	12.02	7.69	18.79
June-08	14.44	2.73	19.11
July-08	11.17	11.64	24.08
August-08	33.00	24.13	28.93
September-08	17.60	6.18	16.66
October-08	7.11	0.87	19.75
November-08	13.13	0.47	45.86
December-08	24.62	0.48	24.92
January-09	23.57	0.02	70.31
February-09	12.70	0.00	23.62
March-09	57.31	0.00	50.90
April-09	33.84	0.00	30.11
May-09	13.74	0.00	13.23
June-09	11.32	13.87	15.46
July-09	11.11	22.53	10.10
August-09	16.02	4.67	18.43
September-09	6.86	3.63	14.01
October-09	7.16	1.86	13.33
November-09	6.95	6.04	9.44
December-09	20.69	14.87	20.73
January-10	17.33	0.00	0.00
February-10	19.25	0.00	4.19
March-10	13.77	0.03	0.68
April-10	22.39	0.00	0.00
May-10	65.82	0.00	0.00
June-10	6.65	0.00	16.52
July-10	5.41	0.00	0.00
August-10	16.08	0.00	14.32

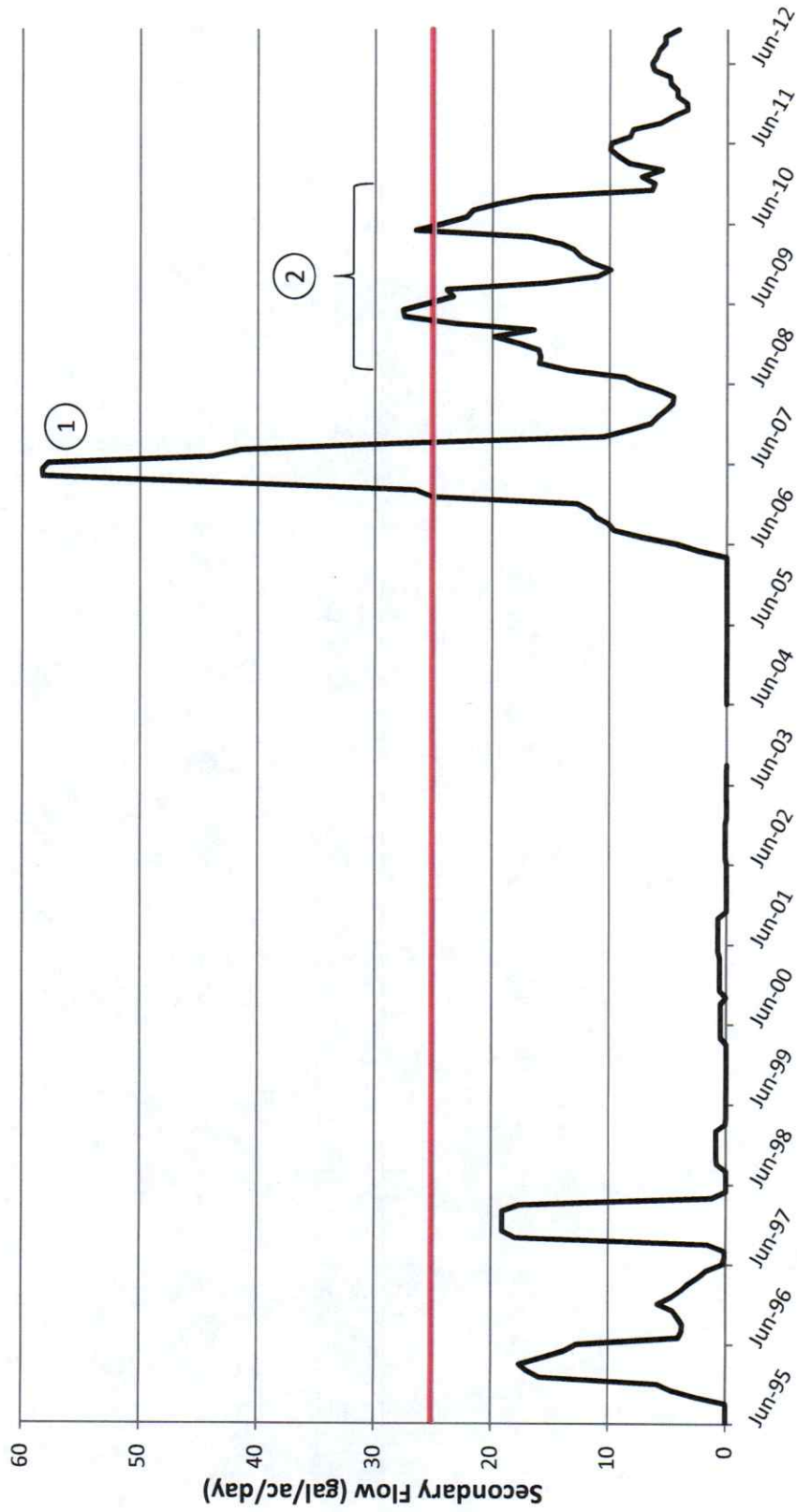
**North Country Environmental Services
Table 1 - Stage I Secondary Leachate Flows**

Monthly Average	Phase I	Phase II	Phase III
	Gal/Ac/Day	Gal/Ac/Day	Gal/Ac/Day
September-10	0.00	0.00	14.45
October-10	5.21	0.00	14.56
November-10	5.14	19.25	42.19
December-10	5.20	13.74	18.95
January-11	12.08	0.00	18.79
February-11	5.64	0.00	19.73
March-11	16.88	0.00	29.11
April-11	10.52	6.27	28.47
May-11	9.49	0.01	27.21
June-11	4.74	0.00	19.18
July-11	2.34	0.00	15.29
August-11	4.26	0.00	43.96
September-11	2.57	12.84	92.68
October-11	4.57	12.17	42.46
November-11	1.94	0.00	31.68
December-11	4.91	12.78	62.28
January-12	7.29	0.00	35.32
February-12	4.18	0.00	20.33
March-12	6.11	11.96	40.17
April-12	4.96	0.00	36.66
May-12	10.00	13.00	49.00
June-12	6.00	0.00	38.00
July-12	5.00	12.00	31.00
August-12	2.71	10.08	36.65
September-12	3.00	0.00	24.00
October-12	5.00	12.00	27.00
November-12	3.00	24.00	26.00
December-12	N/A	N/A	33.11
Average	6.79	11.54	20.45

North Country Environmental Services
Table 2 - Leachate Quality Summary

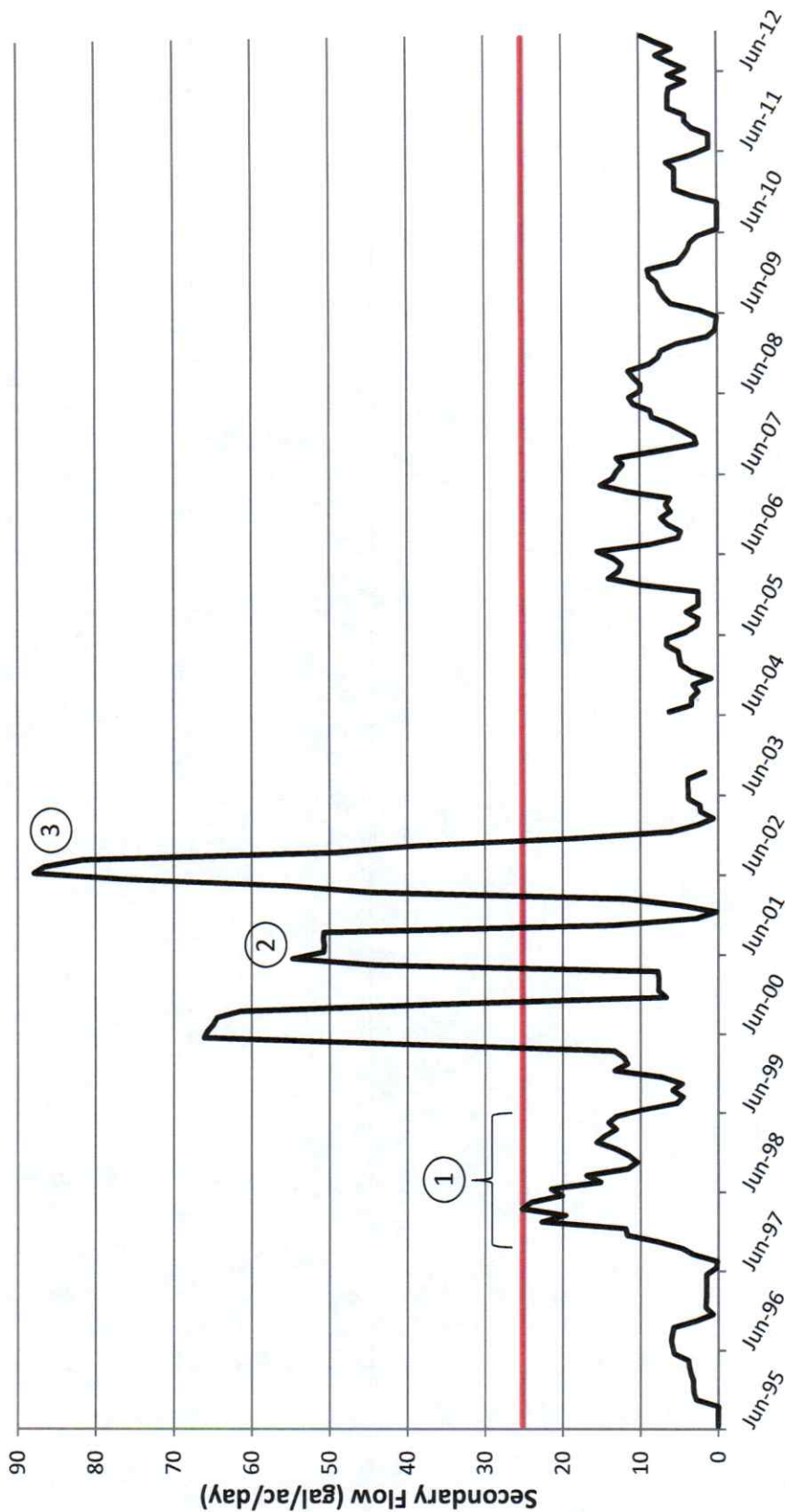
Compound		Phase I	Phase II	Phase III		% Reduction
		Primary	Primary	Primary	Secondary	
		7/18/2012	7/18/2012	7/18/2012	7/24/2012	
tert-Butyl Alcohol (TBA)	µg/L	1400	1300	1200	180	85%
Tetrahydrofuran (THF)	µg/L	1500	2300	2200	70	97%
o-Xylene	µg/L	50	70	30	4	87%
p-Isopropyltoluene	µg/L	20	30	10	1	90%
Chloride	mg/L	2200	1800	2900	330	89%
COD	mg/L	1600	1000	1400	220	84%
Chromium	mg/L	0.086	0.040	0.100	0.007	93%

Figure 1
Stage I Phase I Secondary Leachate Flow
6 Month Rolling Average
 (Refer to Table 1 for monthly secondary leachate flow data)



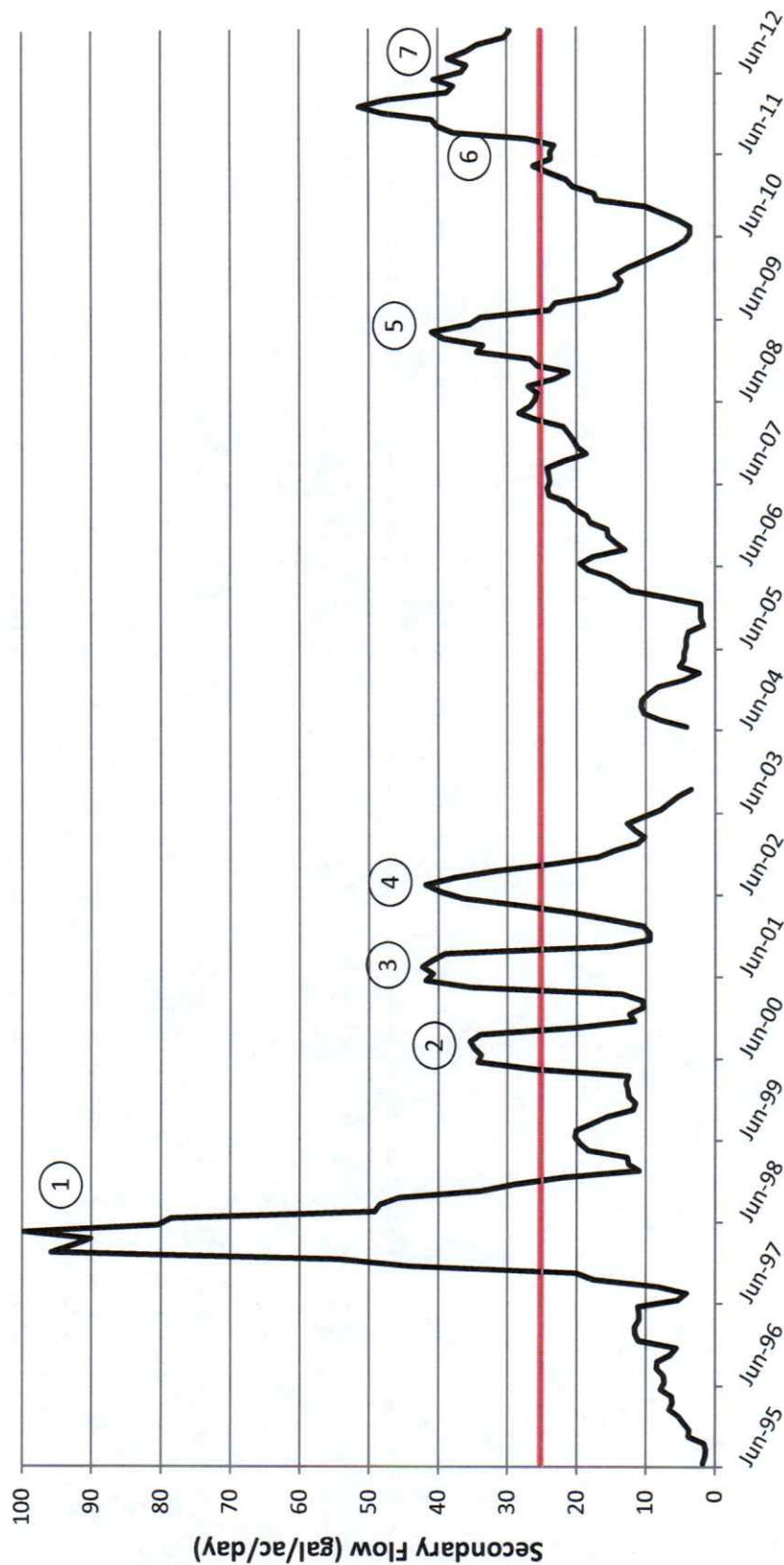
1 - Stage IV Phase I construction
 2 - Cap down chute damage/repair

Figure 2
Stage I Phase II Secondary Leachate Flow
6 Month Rolling Average
 (Refer to Table 1 for monthly secondary leachate flow data)



- 1 - Stage 1 closure construction
- 2 - Drainage improvements - Installed drain pipe at low spot in anchor trench
- 3 - Welded entire length of Stage 1 primary liner to secondary liner in the anchor trench

Figure 3
Stage I Phase III Secondary Leachate Flow
6 Month Rolling Average
 (Refer to Table 1 for monthly secondary leachate flow data)



- 1 - Stage 1 closure construction
- 2 - First Spring post closure
- 3 - Drainage improvements - Installed drain pipe at low spot in anchor trench
- 4 - Welded entire length of Stage 1 primary liner to secondary liner in the anchor trench
- 5 - Partial repairs to north side anchor trench
- 6 - Stage IV Phase IIA construction
- 7 - Repairs of Stage IV Phase IIA temporary liner termination