EXISTING LFG W/VALVES

KESTREL HAWK LANDFILL
RACINE, WISCONSIN

PHASE 1
PHASE 2
PHASE 3
PHASE 4
PHASE 5

MC1 MC2 MC3 MC4 MC5 MC6 MC7 MC8 MC9 MC10 MC11 MC12 MC13 MC14 MC15 MC16 MC21 MC22 MC23 MC24 MC25 MC27 (BURIED) MC28 MC29 MC30 MC32 MC33 MC34 MC34A MC34B MC37 MC38 MC39 MC40 MC41 MC42 GT1 GT2

2008425 679.99
2008424 691.56
2008423 715.19
2008402 720.39
2008400 672.34
2008426 683.24

E 8,000 E 8,500 E 9,000 E 9,500 E 10,000 E 10,500 E 11,000 E 11,500 E 12,000 E 12,500 E 13,000
N 2,500 N 2,000 N 1,500 N 1,000 N 500 N 0 N -500

LEGEND

- FACILITY BOUNDARY
- WASTE BOUNDARY
- PHASE/CELL BOUNDARY
- CLOSURE AREA BOUNDARY
- 800 EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- EXISTING ROAD
- x x EXISTING FENCE
- EL EL EXISTING ELECTRICAL CONDUIT
- LIMITS OF EXISTING FINAL COVER
- EXISTING LANDFILL GAS PIPING
- EXISTING PERF. LANDFILL GAS PIPING
- FM FM EXISTING LEACHATE FORCEMAIN
- AIR AIR EXISTING AIRLINE
- EL EL EXISTING ELECTRIC CONDUIT

- GW420 EXISTING LANDFILL GAS EXTRACTION WELL
- GW-415A EXISTING LANDFILL GAS EXTRACTION WELL
- EXISTING REMOTE WELLHEAD
- EXISTING FORCEMAIN CLEANOUT
- EXISTING CAP
- EXISTING FORCEMAIN REDUCER
- EXISTING FLANGE
- ROAD CROSSING
- BENTONITE SEAL
- ×7192 2022-2023 LFG AS-BUILT SURVEY POINT
- MC1 GAS WELL CONTROL POINTS
- LFG VALVES
- GAS TRENCH RISER

NOTES:

1. EXISTING TOPOGRAPHY SHOWN INSIDE OF THE CLOSURE AREA IS FROM AERIAL SURVEY CONDUCTED ON NOVEMBER 14, 2022.
2. EXISTING TOPOGRAPHY SHOWN OUTSIDE THE CLOSURE AREA IS FROM AERIAL SURVEY CONDUCTED ON MARCH 20, 2023.

N

SCALE: 1" = 200'

0 100' 200' 400'

PREPARED FOR:
KESTREL HAWK LANDFILL

☐ DRAFT
☐ RELEASED FOR BID
☐ APPROVED FOR CONSTRUCTION
☐ CLIENT APPROVAL BY: _____
☐ OTHER: _____

No.	DATE	REVISION DESCRIPTION	BY

Weaver Consultants Group

WEAVER CONSULTANTS GROUP
1316 BOND STREET, SUITE 108
NAPERVILLE, ILLINOIS 60563
(630) 717-4848
www.wcgrp.com

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DRAWN BY:	HSM
REVIEWED BY:	BPS
DATE:	07/27/2023
FILE:	0120-184-DWG
CAD:	KH000486.dwg
SHEET	1 OF 5

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F:\PROJECTS\0120\184 - Kestrel Hawk\dwg\KH000486.dwg,WCGrp19b5,Stutler,March 25, 2025

FIGURE D

Appendix A: Hazardous Wastes Accepted

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MANIFEST LOG

MANIFEST NUMBER	DATE ACCEPTED	COMPANY NAME	WASTE NAME	US DOT HAZARD CLASS	US DOT ID #	US EPA WASTE CODE	SHIP WT	PROFILE NUMBER
17801	01/16/01	Phillips Plating Corp	Hazardous waste sludge N.O.S.	ORM-E	NA9188	EW	24210	
						GW	57090	
						F006	32800	
17802	02/10/01	Phillips Plating Corp	Hazardous waste sludge N.O.S.	ORM-E	NA9188	EW	24420	
						GW	57690	
						F006	33270	
01497	01/09/00	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D008		
01493	12/29/00	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189			
39321	02/12/01	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D008	1500	
29635	10/07/01	Ladish Company	Hazardous Waste Solid NOS	ORM-E	NA9189	D008	6400	
49801	02/19/01	Ladish Company	Waste oil, forge Lubricant scale mixture	ORM-E	NA9189	D008	1500	1
39320	02/10/01	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D008	1500	
39319	02/09/01	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D008	1500	
39318	02/09/01	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D008	1500	
39317	02/06/01	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D008	1500	
39316	02/15/01	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D008	1500	
39314	02/05/01	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D008	1500	
93915	02/04/01	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D008	1500	
39313	02/04/01	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D008	1500	
39312	02/02/01	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D008	1500	

MANIFEST LOG

MANIFEST NUMBER	DATE ACCEPTED	COMPANY NAME	WASTE NAME	US DOT HAZARD CLASS	US DOT ID #	US EPA WASTE CODE	SHIP WT	PROFILE NUMBER
39311	01/29/81	Ladish Company	Waste Oil, Forge Lubricants Scale Mixture	ORM-E	NA9189	D000	1500	
39310	01/27/81	Ladish Company	Waste Oil, Forge Lubricants Scale Mixture	ORM-E	NA9189	D000	1500	
39309	01/27/81	Ladish Company	Waste Oil, Forge Lubricants Scale Mixture	ORM-E	NA9189	D000	1500	
39308	01/22/81	Ladish Company	Waste Oil, Forge Lubricants Scale Mixture	ORM-E	NA9189	D000	1500	
39307	01/20/81	Ladish Company	Waste Oil, Forge Lubricants Scale Mixture	ORM-E	NA9189	D000	1500	
39306	01/16/81	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D000		
39305	01/16/81	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D000		
39304	01/15/81	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D000	1500	
39303	01/14/81	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D000	1500	
39302	01/13/81	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D000	1500	
39301	01/12/81	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D000		
01498	01/12/81	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D000		
01496	01/07/81	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189			
01495	01/06/81	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189			
01494	01/05/81	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189			
39323	02/13/81	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D000	1500	
39324	02/16/81	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D000	1500	
39325	02/10/81	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D000	1500	
39322	01/12/81	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189	D000	1500	
50012	03/27/81	Ladish Company	Hazardous Waste, Liquid or Solid NOS	NON-E	NA9189	D000	4000	

MANIFEST LOG

MANIFEST NUMBER	DATE ACCEPTED	COMPANY NAME	WASTE NAME	US DOT HAZARD CLASS	US DOT ID #	US EPA WASTE CODE	SHIP WT	PROFILE NUMBER
49803	04/02/01	Ladish Company	Hazardous Waste, Liquid or Solid NOS	ORM-E	NA9189	D008	2500	
49804	04/29/01	Ladish Company	Hazardous Waste, Liquid or Solid NOS	ORM-E	NA9189	K063	22000	
20959	09/09/01	Ladish Co/Tri-Clover	Waste Flammable Liquid NOS	Flammable Liq	UN1993	D001,F001 F002,F005	3200	
20956		Ladish Co/Tri-Clover	Waste Flammable Liquid NOS	Flammable Liq	UN1993	D001,F001 F002,F005	12455	
20957	04/21/01	Ladish Co/Tri-Clover	Waste Flammable Liquid NOS	Flammable Liq	UN1993	D001,F001 F002,F005	5397	
01402	12/08/00	Ladish Company	Waste Oil, Forge Lubricant, Scale Mixture	ORM-E	NA9189		2500	
01407	12/16/00	Ladish Company	Waste Oil, Forge Lubricant Scale MIxture	ORM-E	NA9189			
01406	12/15/00	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189			
01404	12/11/00	Ladish Company	WAste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189			
01499	12/09/00	Ladish Company	Waste Oil, Forge Lubricant, Scale MIxture	ORM-E	NA9189			
01500	11/25/00	Ladish Company	Waste Oil, Forge Lubricant, Scale Mixture	ORM-E	NA9189		11000	
01403	12/9/00	Ladish Company	Waste Oil, Forge Lubricant Scale Mixture	ORM-E	NA9189		2500	
01405	12/15/00	Ladish Company	Waste Oil, Forge Lubricant Scale MIxture	ORM-E	NA9189			
49306	10/09/01	Getzen Company	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006,D-000		
49305	10/09/01	Getzen Company	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006,D-000		
04846	10/09/01	Getzen Company	WAstewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006,D-000		
04844	10/09/01	Genzen Company	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006,D-000		
04845	10/09/01	Getzen Company	Wastewater treatment sludge from electroplating operations	ORM-E	NA9190	F-006,D-000		
04840	10/09/01	Gentzen Company	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006,D-000		
04934	10/08/01	Gentzen Company	WAstewater treatment sludge from electroplating operations	ORM-E	NA9189			

MANIFEST LOG

MANIFEST NUMBER	DATE ACCEPTED	COMPANY NAME	WASTE NAME	US DOT HAZARD CLASS	US DOT ID #	US EPA WASTE CODE	SHIP WT	PROFILE NUMBER
04043	10/01/01	Getzen Company	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006,D-008		
04039	10/08/01	Getzen Company	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006,D-008		
04036	10-08/01	Getzen Company	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006,D-008		
04030	10/08/01	Getzen Company	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006,D-008		
04035	10/08/01	Getzen Company	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006,D-008		
04032	10/08/01	Getzen Company	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189			
04028	05/10/01	Getzen Company, Inc.	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006	6300	
04031	10/08/01	Getzen Company, Inc.	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006		
23035	10/08/01	Getzen Company, Inc.	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006,D-008		
23033	10-08-01	Getzen Company, Inc.	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006,D-008		
23034	10/08/01	Getzen Company, Inc.	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006,D-008	55540	
23031	10/08/01	Getzen Company, Inc.	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006,D-008		
23030	10/08/01	Getzen Company, Inc.	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006,D-008		
04033	10/08/01	Getzen Company, Inc.	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189			
49308	10/09/01	Getzen Company, Inc.	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189			
49307	10/91/01	Getzen Company, Inc.	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006,D-008		
23032	10/08/01	Getzen Company, Inc.	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006,D-008		
04041	10/09/01	Getzen Company, Inc.	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006,D-008		
04042	10/09/01	Getzen Company, Inc.	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189			
04047	10/09/01	Getzen Company, Inc.	Wastewater treatment sludge from electroplating operations	ORM-E	NA9189	F-006,D-008		

MANIFEST LOG

MANIFEST NUMBER	DATE ACCEPTED	COMPANY NAME	WASTE NAME	US DOT HAZARD CLASS	US DOT ID #	US EPA WASTE CODE	SHIP WT	PROFILE NUMBER
49315	12/20/02	Getzen Company, Inc.	WAstewater treatment electroplating operat	sludge from ions ORM-E	NA9189	F-006		
04049	04/14/02	Getzen Company, Inc.	Wastewater treatment electroplating operat	sludge from ions ORM-E	NA9189	F-006		
04040	01/15/02	Getzen Company, Inc.	WAstewater treatment electroplating operat	sludge from ions ORM-E	NA9189	F-006		
49314	09/21/02	Getzen Company, Inc.	Wastewater treatment electroplating operat	sludge from ions ORM-E	NA9189	F-006	4020	
20932	02/03/01	Eaton Corporation	Hazardous Waste	ORM-E	NA9189	F017	1670	
20940	09/24/02	Eaton Corporation	Hazardous Waste	ORM-E	NA9189	F017	5120	
127303	12/14/02	Eaton Corporation	Hazardous Waste	ORM-E	NA9189	F017	466	
20943	06/22/02	Eaton Corporation	Hazardous Waste	ORM-E	NA9189	F017	640	
20939	03/24/02	Eaton Corporation	Hazardous WAste	ORM-E	NA9189	F017	1665	
20946	06/29/02	Eaton Corporation	Hazardous Waste-S	ORM-E	NA9189	D008	237	
			Hazardous Waste-L	ORM-E	NA9189	F002	1540	
			Hazardous Waste-L	ORM-E	NA9189	D001	53	
20945	06/29/02	EAton Corporation	Hazardous Waste-S	ORM-E	NA9189	D007	200	
			Hazardous Waste-L	ORM-E	NA9189	D007	2068	
127301	12/12/02	Eaton Corporation	Hazardous Waste-L	ORM-E	NA9189	D007	370	
			Hazardous Waste-L	ORM-E	NA9189	F002	735	
			Non-Hazardous Special	N/A	N/A	N/A	1831	
36002	06/29/02	Frank Holton & Co	Wastewater treatment electroplating operat	sludge from ions ORM-E	NA9189	F-006	10000	
36003	07/08/02	FRank Holton & Co	Wastewater treatment electroplating operat	sludge from ions ORM-E	NA9189	F-006	10000	
36004	09/30/02	Frank Holton & Co	Wastewater treatment electroplating operat	sludge from ions ORM-E	NA9189	F-006	10000	

MANIFEST LOG

MANIFEST NUMBER	DATE ACCEPTED	COMPANY NAME	WASTE NAME	US DOT HAZARD CLASS	US DOT ID #	US EPA WASTE CODE	SHIP WT	PROFILE NUMBER
36005	10/15/02	Frank Holton & Co	Wastewater treatment sludge from electroplating operation	ORM-E	NA9189	F-006	10000	
36006	11/24/02	Frank Holton & Co	Wastewater treatment sludge from electroplating operation	ORM-E	NA9189	F-006	10000	
13955	02/26/01	Phillips Plastics Corp	Hazardous waste-S	ORM-E	NA9189	F-006	29370	
13961	07/31/01	Phillips Plastics Corp	Hazardous waste-S	ORM-E	NA9189	F-006	20210	
13962	09/15/01	Phillips Plastics Corp	Hazardous waste-S	ORM-E	NA9189	F-006	27000	
13969	07/27/02	Phillips Plastics Corp	Hazardous waste-S	ORM-E	NA9189	F-006	36780	
13965	12/17/01	Phillips Plastics Corp	Hazardous waste-S	ORM-E	NA9189	F-006	34040	
13957	04/15/01	Phillips Plastics Corp	Hazardous waste-S	ORM-E	NA9189	F-006	20000	
13953	02/03/01	Phillips Plastics Corp	Hazardous waste-S	ORM-E	NA9188	F-006	30480	
13952	01/14/01	Phillips Plastics Corp	Hazardous waste-S	ORM-E	NA9189	F-006	28430	
13954	02/05/01	Phillips Plastics Corp	Hazardous waste-S	ORM-E	NA9189	F-006	31690	
101005	11/08/02	Square D Company	Hazardous waste NOS	ORM-C	NA9189	NONE	1680	
			Scrap Magnet waste-NOS	ORM-E	NONE	U013	715	
101001	08/09/02	Square D Company	Hazardous waste-NOS	ORM-C	NA9189	NONE	1870	
			Scrap Magnet waste-NOS	ORM-E	NONE	U013	1170	
20597	04/28/02	Square D Company	Hazardous waste-NOS	ORM-C	NA9189	NONE	3020	
			Scrap Magnet Waste-NOS	ORM-E	NONE	U013	1860	
20593	02/03/02	Square D Company	Hazardous waste-NOS	ORM-C	NA9189	NONE	940	
			Scrap magnet waste-NOS	ORM-E	NONE	U013	2705	
20576	05/05/01	Square D Company	Hazardous Waste-S-NOS	ORM-E	NA9189	D000	5460	

MANIFEST NUMBER	DATE ACCEPTED	COMPANY NAME	WASTE NAME	US DOT HAZARD CLASS	US DOT ID #	US EPA WASTE CODE	SHIP WT	PROFILE NUMBER
20576(CONT)	05/05/01	Square D Company	Not Listed	Not Listed	N/L	N/L	13932	
			Combustible Liquid-NOS	Combustible	NA9189 liquid	N/A	910	
20583	07/29/01	Square D Company	Hazardous Waste-S NOS	ORM-E	NA9189	D000	370	
			Not Listed	Not Listed	N/L	N/L	5460	
			Scrap Magnet Waste	ORM-C	N/A	0011	830	
20580	05/20/01	Square D Company	Scrap Magnet Waste	ORM-C	N/A	U011	6000	
20592	10/20/01	Square D Company	Scrap Magnet Waste	ORM-C	N/A	U011	2025	
			Hazardous Waste-S NOS	ORM-E	NA9189	N/A	1010	
101000	12/29/02	Square D Company	Scrap Magnet Waste NOS	ORM-E	NONE	U011	600	
			Hazardous Waste NOS	ORM-C	NA9189	NONE	315	
22397	10/01/01	Professional Plating	Sludge from Chloride zinc Bath with Chromate	ORM-E	UN2331	F006,F000	6250	
			Profile No. K066-K008 Drum Control 2173	NONE	NONE	NONE	7916	
23604	01/02/01	Racine Steel Casting	Waste Furnace Dust	ORM-E	NA9189	D006,D000	20000	
23606	01/20/01	Racine Steel Casting	Waste Furnace Dust	ORM-E	NA9189	D006,D000	20000	
23600	12/01/01	Racine Steel Casting	Pep setI-1600 & Pep	set II-2600 ORM-E	NA9189	D001	2000	
136715	06/17/02	Huffy Corporation	Hazardous waste NOS	ORM-E	NA9189	D000		
21019	06/22/02	Huffy Corporation	Hazardous waste NOS	ORM-E	NA9189	0000	2000	
37725	08/19/01	Plastics Engineering	Waste phenol contaminated dirt	ORM-E	NA9189	U188	46300	
22444	08/06/01	Jacobsen-TEXTRON	Hazardous Waste NOS	ORM-E	NA9189	D000		
22443	07/23/01	Jacobsen-TEXTRON	Hazardous Waste NOS	ORM-E	NA9189	D000		

MANIFEST LOG

MANIFEST NUMBER	DATE ACCEPTED	COMPANY NAME	WASTE NAME	US DOT HAZARD CLASS	US DOT ID #	US EPA WASTE CODE	SHIP WT	PROFILE NUMBER
22442	07/14/01	Jacobsen-TEXTRON	Hazardous waste-NOS	ORM-E	NA9189	D000		
22438	07/09/01	Jacobsen-TEXTRON	Hazardous waste-NOS	ORM-E	NA9189	D000		
22439	07/07/01	Jacobsen-TEXTRON	Hazardous waste-NOS	ORM-E	NA9189	D000		
22436	06/09/01	Jacobsen-TEXTRON	Hazardous waste-NOS	ORM-E	NA9189	D000		
22437	06/09/01	Jacobsen-TEXTRON	Hazardous waste-NOS	ORM-E	NA9189	D000		
22435	06/09/01	Jacobsen-TEXTRON	Hazardous waste-NOS	ORM-E	NA9189	D000		
52001	04/12/02	Jacobsen-TEXTRON	Hazardous waste-NOS	ORM-E	NA9189	D000		
52002	10/05/02	Jacobsen-TEXTRON	Hazardous waste-NOS	ORM-E	NA9189	D000		
52012	10/20/02	Jacobsen-TEXTRON	Hazardous waste-NOS	ORM-E	NA9189	D000		
52000	09/03/02	Jacobsen-TEXTRON	Hazardous waste-NOS	ORM-E	NA9189	D000		
52004	05/13/02	Jacobsen-TEXTRON	Hazardous waste-NOS	ORM-E	NA9189	D000		
36620	03/31/02	Quality Carriers, Inc	, Haz waste NOS	ORM-E	NA9189	D001	15660	
36621	04/01/02	Quality Carriers, Inc	, Haz waste NOS	ORM-E	NA9189	D001	15000	
36623	05/01/02	Quality Carriers, Inc	, Haz waste NOS	ORM-E	NA9189	D001	10020	
11664	07/30/02	Quality Carriers, Inc	, Haz waste NOS	ORM-E	NA9189	D001	6540	
40201	04/16/02	Shurpac Inc.	Paint Sludge	11274	11274	F017	7126	
22401	09/20/02	Shurpac Inc.	Paint Sludge	11274	11274	F017	2545	
22402	12/27/02	Shurpac Inc.	Paint Sludge	11274	11274	F017	1527	
40200	06/30/02	Shurpac Inc.	Paint Sludge	11274	11274	F017	2545	

Appendix B: U.S. EPA and WDNR Letter Regarding HWU Landfill Gas, November 20, 1985, and November 13, 1986; Uncontained Gas Rule Determination

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

NOV 20 1985

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

Mr. Glenn Oakes
President
Land Reclamation, Ltd.
2250 S. Green Bay Road
Racine, Wisconsin 53406

Dear Mr. Oakes:

This is in reply to your letter dated October 1, 1985, regarding the need to regulate recovered landfill gas under the hazardous waste regulations. In your letter, you indicate that this gas (which is produced by the natural decomposition of organic matter) is passively venting to the atmosphere (if it is not collected) and should be considered an air emission and treated as such; applying any other logic to this situation would seriously stretch the original intention of the rules. You also believe that if the Agency considered recovered landfill gas to be subject to the hazardous waste rules, it could have serious implications on the extraction and utilization of landfill gas, and possibly could shut down all existing landfill gas recovery projects currently operational. You, therefore, request that we exempt such recovered landfill gas from any controls under the hazardous waste rules.

First, let me thank you and other members of the landfill gas industry for meeting with members of my staff to discuss this issue. We found the information and data provided to be quite helpful. Based on your input as well as our own analysis, we have decided that recovered landfill gas that is burned for energy recovery should not now be regulated under the hazardous waste regulations. Therefore, we have included a provision in the final rule dealing with the burning and blending of hazardous waste (which was signed by the Administrator on November 8) which specifically exempts gas recovered from landfills that is burned for energy recovery from the hazardous waste regulations. (See enclosed preamble discussion and regulatory provision regarding recovered landfill gas.)

Please feel free to give Mr. Straus a call if we can be of any further assistance; Mr. Straus can be reached at (202) 475-8551.

Sincerely,

Marcia Williams

Marcia E. Williams
Director
Office of Solid Waste

Enclosure

Subpart D--Hazardous Waste Burned for Energy Recovery

§266.30 Applicability.

(a) The regulations of this subpart apply to hazardous wastes that are burned for energy recovery in any boiler or industrial furnace that is not regulated under Subpart O of Part 264 or 265 of this chapter, except as provided by paragraph (b) of this section. Such hazardous wastes burned for energy recovery are termed "hazardous waste fuel". Fuel produced from hazardous waste by processing, blending, or other treatment is also hazardous waste fuel. (These regulations do not apply, however, to gas recovered from landfills when such gas is burned for energy recovery.)

(b) The following hazardous wastes are not subject to regulation under this subpart:

(1) Used oil burned for energy recovery that is also a hazardous waste solely because it exhibits a characteristic of hazardous waste identified in Subpart C of Part 261 of this chapter. Such used oil is subject to regulation under Subpart E of Part 266 rather than this subpart; and

(2) Hazardous wastes that are exempt from regulation under §§261.4 and 261.6(a)(3)(v)-(ix) of this chapter, and hazardous wastes that are subject to the special requirements for small quantity generators under §261.5 of this chapter.

§266.31 Prohibitions.

(a) A person may market hazardous waste fuel only:

(1) To persons who have notified EPA of their hazardous waste fuel activities under Section 3010 of RCRA and have a U.S. EPA

material. Further, the sludge is mixed with the coal tar in small volumes representing about 1% of the coal tar by-product. We, therefore, conclude that such recycling does not increase levels of phenol and napthalene in the coal tar by-product, and the coal tar should be exempt from today's rules when burned for energy recovery.

These exemptions apply only to the waste-derived products, and only when derived from tar decanter sludge. Thus, tar decanter sludge is subject to full RCRA regulation prior to recycling, and the exemption does not extend to coke or coal tar derived from hazardous waste (e.g., spent solvents) other than tar decanter sludge designated as EPA Hazardous Waste K087.

E. Status of Gas Recovered from Landfills

We are indicating that today's final rules on hazardous waste fuels do not apply to gas recovered from landfills that is burned for energy recovery in boilers or industrial furnaces. Although it is clear that EPA has authority to regulate gaseous emissions from hazardous wastes (see, e.g., RCRA Section 3004(n)), EPA has not yet addressed whether there are any limits on this authority, and, if there are limits, what the extent might be. Nor has the Agency received comment on these questions sufficient to make a considered decision. In light of the absence of a record and the potential difficulty of the question, we are not deciding the question in today's rule but instead are indicating that recovered landfill gas is not regulated under today's rules.

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Carroll D Besadny
Secretary

BOX 7921
MADISON, WISCONSIN 53707

November 13, 1986

IN REPLY REFER TO: 4430

Mr. Allen W. Williams, Jr.
Foley & Lardner
First Wisconsin Center
777 East Wisconsin Avenue
Milwaukee, WI 53202-5367

RE: S.C. Johnson Landfill Methane Purchase

Dear Mr. ~~Williams~~ Sandy:

In your letter to me on October 22, 1986, you requested a determination on the regulatory status of landfill gas utilized in an industrial boiler. The specific case you discussed involved the purchase of landfill gas by S.C. Johnson and Son, Inc. from Biogas Development Corporation. We are prepared to advise you of the Wisconsin regulatory authority in such cases, but will only cite the federal regulations we are aware of. The reauthorized Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), section 124, addresses the methane recovery question. It appears that unless EPA promulgates regulations specific to methane recovery under subtitle C of the Solid Waste Disposal Act (SWDA), such activities are exempt from subtitle C regulation with the following exception. Condensate generated in methane recovery systems which meets any of the characteristics identified under section 3001, subtitle C, SWDA, will be considered, and therefore must be handled as, a hazardous waste. I suggest you contact Mr. David Stringham, Chief - Solid Waste Branch, U.S. Environmental Protection Agency - Region V, directly if you need further interpretation of this law.

In Wisconsin, landfill gas is not a solid waste as defined in sec. 144.01(15), Wis. Stats. Since a waste must first meet this statutory definition of a solid waste in order to be considered a hazardous waste (s. NR 181.12, Wis. Adm. Code), the gas is not a hazardous waste and the equipment for the processing, transporting or storage of the gas would not be regulated under ch. NR 181, Wis. Adm. Code. However, the gas collection system at the landfill must be approved as part of, or as a modification to, the facility's Plan of Operation under ch. NR 180, Wis. Adm. Code. While Land Reclamation Ltd. recently submitted plans for the gas collection system, they have not yet received Department approval.

The condensate collected in the gas pipeline, however, is a solid waste. The condensate must be tested to determine if it is a characteristic hazardous waste as defined in NR 181.15, Wis. Adm. Code. If the condensate exhibits any

of the hazardous characteristics, it must be handled, stored and disposed accordingly. One of the options for final disposal of the condensate could be treatment in a publicly owned treatment works or possibly the S.C. Johnson industrial pretreatment system.

In summary, the landfill gas piped to the S.C. Johnson & Son, Inc. facility, and used in one of their industrial boilers, is not a solid waste and therefore not a hazardous waste. If I can be of further assistance, please do not hesitate to call me at (608) 266-1327.

Sincerely,

Paul

Paul P. Didier, P.E., Director
Bureau of Solid Waste Management

PPD:jmc/9860Q

cc: D. Stringham - U.S. EPA/Region V
A. Glor - SED
Hazardous Waste Management Section
P. Flaherty - LC/5
R. Schuff - SW/3

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MEMORANDUM

Republic Services of Wisconsin, Limited Partnership
Kestrel Hawk Landfill

RCRA Regulation of Uncontained Gas

In its notice of noncompliance dated December 9, 2019 (the "NON"), the Wisconsin Department of Natural Resources ("WDNR") requests in item 4 that the Kestrel Hawk Landfill ("KHL") make a waste determination pursuant to the Resource Conservation and Recovery Act ("RCRA") for the landfill gas chiller condensate (the "Condensate"), which forms when the collected landfill gas is fed to a chiller.

Background

A solid waste can be a hazardous waste if it displays a characteristic of hazardous waste or if it is specifically listed as a listed hazardous waste. Previous testing (which is being confirmed) indicated that the Condensate does not display a characteristic of hazardous waste. The hazardous waste rules also do not specifically list the Condensate as a hazardous waste.

The result of the Condensate being neither a listed nor a characteristic hazardous waste is that it can be a hazardous waste only if it is (1) a solid waste generated from the treatment, storage or disposal of a hazardous waste (the "derived from rule") or (2) a mixture of a solid waste and a listed hazardous waste (the "mixture rule"). See NR 661.03, Wisc. Adm. Code; 40 C.F.R. § 261.3. The key to the analysis of the Condensate under these rules is the understanding that landfill gas is not a solid waste.

In order to be a hazardous waste, a material must first be a solid waste. Wisc. Stat. § 289.01(12); 42 U.S.C. § 6903(5). The definition of "solid waste" requires that the material be in a solid, liquid or contained gaseous form. Wisc. Stat. § 289.01(33); 42 U.S.C. § 6903(27). Here, the landfill gas is not a contained gas at the point of generation when it exits the landfill. Since the landfill gas is not a solid waste and therefore cannot be a hazardous waste, the Condensate is not derived from the treatment of a hazardous waste. Similarly, the mixture rule does not apply because landfill gas is not a listed hazardous waste – indeed, the landfill gas cannot be a hazardous waste at all because it is an uncontained gas that is not a solid waste.

Regulatory Guidance

This analysis is consistent with WDNR's prior conclusion that KHL landfill gas is not a solid waste. See Letter from Paul P. Didier, P.E., Director, Bureau of Solid Waste Management to Allen W. Williams, Jr. dated November 13, 1986 (copy attached). Since the landfill gas is not a hazardous waste, WDNR determined that the Condensate could only be a hazardous waste if the Condensate displayed a characteristic of hazardous waste.

The NON requests that KHL review RCRA Online Document 12363. It was interpreted that the NON intended to reference RCRA Online Document 12362 dated January 11, 1985 (the "1985 Guidance"). In the 1985 Guidance, the United States Environmental Protection Agency ("EPA") speculates in this letter that condensate from a landfill containing listed waste is a hazardous waste unless it has been subject to a delisting petition. In addition, the December 1987 Revised Conditional Approval of the Closure and Long Term Care Plan for KHL indicated, without any analysis, that the Condensate is a hazardous waste. It is not clear how WDNR reached this position.

The 1985 Guidance and the 1987 Approval admittedly contradict the conclusion of the 1986 WDNR letter but they do not address its reasoning. Subsequent EPA guidance and related case law has clarified that the reasoning and conclusion of the 1986 WDNR letter are correct. In connection with the 1989 listing of certain chlorinated aliphatic hydrocarbon manufacturing waste, EPA stated that its jurisdiction to regulate gases under RCRA was limited to containerized or condensed gases. 54 Fed. Reg. 50968, 50973 (Dec. 11, 1989). EPA explicitly acknowledged that this conclusion was a reconsideration of its prior position. Id. Because the KHL landfill gas is neither containerized nor condensed, it is not a solid waste for purposes of RCRA.

This issue was addressed more recently in a United States District Court for the Northern District of Illinois opinion. Northern Illinois Gas Company v. City of Evanston, 14-cv-9227 (N.D. Ill. Feb. 10, 2016). In this matter, the City of Evanston brought claims under RCRA alleging that the release of methane gas from pipelines constituted improper disposal of solid waste. The court reviewed the relevant authorities and determined that it was EPA's clear policy that there was no RCRA jurisdiction over uncontained gases. Id. at pages 7-15. Based on this policy, the court dismissed the City of Evanston's RCRA claim with respect to methane leaks.

The Condensate is not a listed or, assuming the current testing confirms previous results, characteristic hazardous waste by itself. It is not derived from a hazardous waste or a mixture containing hazardous waste because the landfill gas is not a solid waste based on the uncontained gas exclusion at the point of generation. WDNR has previously concurred in writing with this conclusion, consistent with the rules and EPA's interpretation of them.

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March 12, 2020

Appendix C: Contaminant Ranges Found in Leachate Samples

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CONTAMINANT RANGES FOUND IN LEACHATE SAMPLES
KESTREL HAWK

Organic	**Range in ug/L**
Benzene	<4.0 – 17
Chlorobenzene	<3.8 – 73
Chloroethane	<2.7 – 410
Chloromethane	<1.5 – 41
1,1-Dichloroethane	<2.9 – 310
1,1-Dichloroethene	<3.6 – 51
Ethyl Benzene	55 – 1100
Methylene Chloride	<7.9 – 25
Tetrachloroethene	<2.8 – 34
Toluene	23 – 410
1,1,-Trichloroethane	3 – 18
Vinyl Chloride	<2.7 – 19

Inorganic	**Range**
Sodium	up to 632,000 ug/L
Potassium	2.5 – 730 mg/L
Iron	1.3 – 8,100 ug/L
Alkalinity	640 – 3,200 mg/L
Chloride	49 – 115 ug/L
Hardness (total)	559 – 3,300,000 ug/L
Chemical Oxygen Demand	34 – 5,700 mg/L

General Notes:

1. Data provided by Kestrel Hawk.
2. Contaminant ranges are typical monitoring values.
3. Actual analytical results are provided in Annual Report for the site.

Appendix D: Wisconsin Administrative Code – Chapter NR 664 (Hazardous Waste Treatment, Storage and Disposal Facility Standards)

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Published under s. 35.93, Wis. Stats., by the Legislative Reference Bureau.

Chapter NR 664

HAZARDOUS WASTE TREATMENT, STORAGE AND DISPOSAL FACILITY STANDARDS

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NR 664.0003 Relationship to interim license standards.
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NR 664.0011 Identification number.
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Subchapter F —Releases From Solid Waste Management Units
NR 664.0090 Applicability.
NR 664.0091 Required programs.
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NR 664.0112 Closure plan; amendment of plan.
NR 664.0113 Closure; time allowed for closure.
NR 664.0114 Disposal or decontamination of equipment, structures and soils.
NR 664.0115 Certification of closure.
NR 664.0116 Survey plat.
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NR 664.0191 Assessment of existing tank system's integrity.
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NR 664.0194 General operating requirements.
NR 664.0195 Inspections.
NR 664.0196 Response to leaks or spills and disposition of leaking or unfit-for-use tank systems.
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NR 664.0229 Special requirements for ignitable or reactive waste.
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NR 664.0251 Design and operating requirements.
NR 664.0252 Action leakage rate.
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NR 664.0257 Special requirements for incompatible wastes.
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NR 664.0304 Response actions.
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NR 664.0551 Grandfathered corrective action management units (CAMUs).
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NR 664.0601 Environmental performance standards.
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NR 664.1032 Standards: process vents.
NR 664.1033 Standards: closed-vent systems and control devices.
NR 664.1034 Test methods and procedures.
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NR 664.1056 Standards: open-ended valves or lines.
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NR 664.1059 Standards: delay of repair.
NR 664.1060 Standards: closed-vent systems and control devices.
NR 664.1061 Alternative standards for valves in gas or vapor service or in light liquid service: percentage of valves allowed to leak.
NR 664.1062 Alternative standards for valves in gas or vapor service or in light liquid service: skip period leak detection and repair.
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NR 664.1201 Design and operating standards.
NR 664.1202 Closure and long-term care.

Subchapter A — General

NR 664.0001 Purpose, scope and applicability. (1) The purpose of this chapter is to establish minimum state standards which define the acceptable management of hazardous waste.

(2) The standards in this chapter apply to owners and operators of all facilities which treat, store or dispose of hazardous waste, except as specifically provided otherwise in this chapter or ch. NR 661.

(3) The requirements of this chapter apply to a person disposing of hazardous waste by means of ocean disposal subject to a permit issued under 33 USC 1401 to 1445.

Note: This chapter does apply to the treatment or storage of hazardous waste before it is loaded onto an ocean vessel for incineration or disposal at sea. Title 33 USC 1401 to 1445 is also known as the ocean dumping portion of the federal marine protection, research and sanctuaries act.

(4) The requirements of this chapter apply to a person disposing of hazardous waste by means of underground injection subject to a permit issued under an underground injection control (UIC) program approved or promulgated under 42 USC 300f to 300j-26 only to the extent they are required by 40 CFR 144.14.

Note: This chapter does apply to the above ground treatment or storage of hazardous waste before it is injected underground. Title 42 USC 300f to 300j-26 is also known as the federal safe drinking water act.

(5) The requirements of this chapter do not apply to the owner or operator of a POTW who treats, stores or disposes of hazardous waste in compliance with s. NR 670.001 (3) (b) 9.

(7) The requirements of this chapter do not apply to any of the following:

(a) The owner or operator of a facility licensed or registered by the department to manage either of the following:

1. Municipal or industrial solid waste, if the only hazardous waste the facility disposes of is from very small quantity generators and the facility has been approved by the department to accept hazardous waste from very small quantity generators.

2. Household and very small quantity generator waste, if the facility complies with the requirements of ch. NR 666 subch. HH.

Note: The specific requirements for solid waste landfills accepting hazardous waste from very small quantity generators are contained in s. NR 506.155. Very small quantity generators have the option of ensuring delivery of their hazardous waste to certain solid waste disposal facilities under s. NR 662.014.

(b) The owner or operator of a facility managing recyclable materials described in s. NR 661.0006 (1) (b), (c) and (d), except to the extent they are referred to in subch. C, F, G or H of ch. NR 666, or ch. NR 679.

(c) A generator accumulating waste on-site in compliance with s. NR 662.014, 662.015, 662.016, or 662.017, or treating waste in containers or tanks, provided the requirements under s. NR 662.014, 662.016, or 662.017 are met.

(d) A farmer disposing of waste pesticides from the farmer's own use in compliance with s. NR 662.070.

(e) The owner or operator of a totally enclosed treatment facility, as defined in s. NR 660.10.

(f) The owner or operator of an elementary neutralization unit or a wastewater treatment unit as defined in s. NR 660.10, provided that if the owner or operator is diluting hazardous ignitable (D001) wastes (other than the D001 high TOC subcategory defined in s. NR 668.40, the table "Treatment Standards for Hazardous Wastes"), or reactive (D003) waste, to remove the characteristic before land disposal, the owner or operator shall comply with s. NR 664.0017 (2).

(h) 1. Except as provided in subd. 2., a person engaged in treatment or containment activities during immediate response to any of the following situations:

a. A discharge of a hazardous waste.

b. An imminent and substantial threat of a discharge of hazardous waste.

c. A discharge of a material which, when discharged, becomes a hazardous waste.

d. An immediate threat to human health, public safety, property or the environment, from the known or suspected presence of military munitions, other explosive material or an explosive device, as determined by an explosive or munitions emergency response specialist as defined in s. NR 660.10.

2. An owner or operator of a facility otherwise regulated by this chapter shall comply with all applicable requirements of subchs. C and D.

3. Any person who is covered by subd. 1. and who continues or initiates hazardous waste treatment or containment activities after the immediate response is over is subject to all applicable requirements of this chapter and chs. NR 200 to 210, 212 to 214 and 216 for those activities.

4. In the case of an explosives or munitions emergency response, if a federal, state, tribal or local official acting within the scope of that person's official responsibilities, or an explosives or munitions emergency response specialist, determines that immediate removal of the material or waste is necessary to protect human health or the environment, that official or specialist may authorize the removal of the material or waste by transporters who do not have EPA identification numbers or hazardous waste transportation licenses and without the preparation of a manifest. In the case of emergencies involving military munitions, the responding military emergency response specialist's organizational unit shall retain records for 3 years identifying the dates of the response, the responsible persons responding, the type and description of material addressed and its disposition.

(i) A transporter storing manifested shipments of hazardous waste in containers meeting the requirements of s. NR 662.030 at a transfer facility for a period of 10 days or less.

(j) The addition of absorbent material to waste in a container (as defined in s. NR 660.10) or the addition of waste to absorbent material in a container, provided that these actions occur at the time waste is first placed in the container; and ss. NR 664.0017 (2), 664.0171 and 664.0172 are complied with.

(k) Universal waste handlers and universal waste transporters (as defined in s. NR 660.10) handling any of the following wastes. These handlers are regulated under ch. NR 673, when handling any of the following universal wastes:

1. Batteries as described in s. NR 673.02.

2. Pesticides as described in s. NR 673.03.

3. Thermostats and mercury-containing equipment as described in s. NR 673.04.

4. Lamps as described in s. NR 673.05.

(m) A reverse distributor accumulating potentially creditable hazardous waste pharmaceuticals and evaluated hazardous waste pharmaceuticals, as defined in s. NR 666.500. Reverse distributors are subject to regulation under subch. P of ch. NR 666 in lieu of this chapter for the accumulation of potentially creditable hazardous waste pharmaceuticals and evaluated hazardous waste pharmaceuticals.

(8) The requirements of this chapter apply to owners or operators of all facilities which treat, store or dispose of hazardous wastes referred to in ch. NR 668.

(9) Section NR 666.205 identifies when the requirements of this chapter apply to the storage of military munitions classified as solid waste under s. NR 666.202. The treatment and disposal of hazardous waste military munitions are subject to the applicable licensing, procedural and technical standards in chs. NR 660 to 670.

(10) The requirements of subchs. B, C and D and s. NR 664.0101 do not apply to remediation waste management sites. (However, some remediation waste management sites may be a part of a facility that is subject to a license issued under s. 291.25, Stats., and ch. NR 670 because the facility is also treating, storing or disposing of hazardous wastes that are not remediation wastes. In these cases, subchs. B, C and D, and s. NR 664.0101 do apply to the facility subject to the license.) Instead of meeting the requirements of subchs. B, C and D, owners or operators of remediation waste management sites shall do all of the following:

(a) Obtain an EPA identification number as specified in s. NR 660.07.

(b) Obtain a detailed chemical and physical analysis of a representative sample of the hazardous remediation wastes to be managed at the site. At a minimum, the analysis shall contain all of the information which must be known to treat, store or dispose of the waste according to this chapter and ch. NR 668, and shall be kept accurate and up to date.

(c) Prevent people who are unaware of the danger from entering, and minimize the possibility for unauthorized people or livestock to enter onto the active portion of the remediation waste management site, unless the owner or operator can demonstrate to the department all of the following:

1. Physical contact with the waste, structures or equipment within the active portion of the remediation waste management site will not injure people or livestock who may enter the active portion of the remediation waste management site.

2. Disturbance of the waste or equipment by people or livestock, who enter onto the active portion of the remediation waste management site, will not cause a violation of the requirements of this chapter.

(d) Inspect the remediation waste management site for malfunctions, deterioration, operator errors and discharges that may be causing, or may lead to, a release of hazardous waste constituents to the environment, or a threat to human health. The owner or operator shall conduct these inspections often enough to identify problems in time to correct them before they harm human health or the environment, and shall remedy the problem before it leads to a human health or environmental hazard. Where a hazard is imminent or has already occurred, the owner or operator shall take remedial action immediately.

(e) Provide personnel with classroom or on-the-job training on how to perform their duties in a way that ensures the remediation waste management site complies with the requirements of this chapter, and on how to respond effectively to emergencies.

(f) Take precautions to prevent accidental ignition or reaction

of ignitable or reactive waste, and prevent threats to human health and the environment from ignitable, reactive and incompatible waste.

(g) For remediation waste management sites regulated under subchs. I to O and X, design, construct, operate and maintain a unit within a 100-year floodplain to prevent washout of any hazardous waste by a 100-year flood, unless the owner or operator can meet the demonstration of s. NR 664.0018 (2).

(h) Not place any non-containerized or bulk liquid hazardous waste in any salt dome formation, salt bed formation, underground mine or cave.

(i) Develop and maintain a construction quality assurance program for all surface impoundments, waste piles and landfill units that are required to comply with ss. NR 664.0221 (3) and (4), 664.0251 (3) and (4) and 664.0301 (3) and (4) at the remediation waste management site, according to the requirements of s. NR 664.0019.

(j) Develop and maintain procedures to prevent accidents and a contingency and emergency plan to control accidents that occur. These procedures shall address proper design, construction, maintenance and operation of remediation waste management units at the site. The goal of the plan shall be to minimize the possibility of, and the hazards from a fire, explosion or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil or surface water that could threaten human health or the environment. The plan shall explain specifically how to treat, store and dispose of the hazardous remediation waste in question, and shall be implemented immediately whenever a fire, explosion or release of hazardous waste or hazardous waste constituents which could threaten human health or the environment occurs.

(k) Designate at least one employee, either on the facility premises or on call (that is, available to respond to an emergency by reaching the facility quickly), to coordinate all emergency response measures. This emergency coordinator shall be thoroughly familiar with all aspects of the facility's contingency plan, all operations and activities at the facility, the location and characteristics of waste handled, the location of all records within the facility, and the facility layout. In addition, this person shall have the authority to commit the resources needed to carry out the contingency plan.

(L) Develop, maintain and implement a plan to meet the requirements in pars. (b) to (f), (i) and (j).

(m) Maintain records documenting compliance with pars. (a) to (L).

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06; CR 16-007: am. (7) (k) 3. Register July 2017 No. 739, eff. 8-1-17; CR 19-082: am. (7) (b), (c), cr. (7) (m) Register August 2020 No 776, eff. 9-1-20; correction in (7) (b) made under s. 35.17, Stats., Register August 2020 No 776; correction in (2) made under s. 13.92 (4) (b) 7., Stats., Register April 2021 No. 784.

NR 664.0003 Relationship to interim license standards. A facility owner or operator who has fully complied with the requirements for an interim license, as defined in s. 291.25, Stats., and s. NR 670.070, shall comply with ch. NR 665 in lieu of this chapter, until final administrative disposition of the owner or operator's operating license application is made, except as provided under subch. S.

Note: As stated in s. 291.25, Stats., the treatment, storage or disposal of hazardous waste is prohibited except according to a license. Section 291.25(4), Stats., provides for the interim licensing of an existing facility which meets certain conditions until final administrative disposition of the owner's or operator's operating license application is made.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0004 Imminent danger action. Notwithstanding any other provisions of this chapter, enforcement actions may be brought pursuant to 42 USC 6973 (a) and s. 291.85, Stats.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06; CR 19-082: am. Register August 2020 No 776, eff. 9-1-20.

Subchapter B — General Facility Standards

NR 664.0010 Applicability. (1) This subchapter applies to owners and operators of all hazardous waste facilities, except as provided in s. NR 664.0001 and sub. (2).

(2) Section NR 664.0018 (2) applies only to facilities regulated under subchs. I to O and X.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0011 Identification number. Every facility owner or operator shall apply to the department for an EPA identification number according to the procedures in s. NR 660.07.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0012 Required notices. (1) The owner or operator of a facility that is arranging or has arranged to receive hazardous waste subject to subch. H of ch. NR 662 from a foreign source shall submit all of the following required notices:

(a) In accordance with s. NR 662.084 (2), for imports when the competent authority of the country of export does not require the foreign exporter to submit to it a notification proposing export and obtain consent from EPA and the competent authorities for the countries of transit, the owner or operator of the facility, if acting as the importer, shall provide notification of the proposed transboundary movement in English to EPA using the allowable methods listed in s. NR 662.084 (2) (a) at least 60 days before the first shipment is expected to depart the country of export. The notification may cover up to one year of shipments of wastes having similar physical and chemical characteristics, the same United Nations classification, the same hazardous waste codes and OECD waste codes, and being sent from the same foreign exporter.

(b) In accordance with s. NR 662.084 (4) (b) 15., a copy of the movement document bearing all required signatures within 3 working days of receipt of the shipment to the foreign exporter; to the competent authorities of the countries of export and transit that control the shipment as an export and transit shipment of hazardous waste respectively; and on or after the electronic import-export reporting compliance date, to EPA electronically using EPA's Waste Import Export Tracking System (WIETS), or its successor system. The original of the signed movement document shall be maintained at the facility for at least 3 years. The owner or operator of a facility may satisfy this recordkeeping requirement by retaining electronically submitted documents in the facility's account on EPA's waste import export tracking system, or its successor system, provided that copies are readily available for viewing and production if requested by EPA or by the department. No owner or operator of a facility shall be held liable for the inability to produce the documents for inspection under this paragraph if the owner or operator of a facility can demonstrate that the inability to produce the document is due exclusively to technical difficulty with EPA's waste import export tracking system, or its successor system for which the owner or operator of a facility bears no responsibility.

(c) In accordance with s. NR 662.084 (6) (d), if the facility has physical control of the waste and it will be sent to an alternate facility or returned to the country of export, the owner or operator of the facility shall inform EPA, using the allowable methods listed in s. NR 662.084 (2) (a) of the need to return or arrange alternate management of the shipment.

Published under s. 35.93, Wis. Stats., by the Legislative Reference Bureau.

(d) In accordance with s. NR 662.084 (7), the owner or operator shall do all of the following:

1. Send copies of the signed and dated confirmation of recovery or disposal, as soon as possible, but no later than 30 days after completing recovery or disposal on the waste in the shipment and no later than one calendar year following receipt of the waste, to the foreign exporter, to the competent authority of the country of export that controls the shipment as an export of hazardous waste, and for shipments recycled or disposed of on or after the electronic import-export reporting compliance date, to EPA electronically using EPA's Waste Import Export Tracking System or its successor system.

2. If the facility performed any of recovery operations R12, R13, or RC16, or disposal operations D13 through D15, or DC17, promptly send copies of the confirmation of recovery or disposal that it receives from the final recovery or disposal facility within one year of shipment delivery to the final recovery or disposal facility that performed one of recovery operations R1 through R11, or RC16, or one of disposal operations D1 through D12, or DC15 to DC16. Copies of the confirmation shall be also be sent to the competent authority of the country of export that controls the shipment as an export of hazardous waste, and on or after the electronic import-export reporting compliance date, to EPA electronically using EPA's waste import export tracking system, or its successor system. The recovery and disposal operations in this subdivision are defined in s. NR 662.081.

(2) The owner or operator of a facility that receives hazardous waste from an off-site source (except where the owner or operator is also the generator) shall inform the generator in writing that the owner or operator has the appropriate licenses for, and will accept the waste the generator is shipping. The owner or operator shall keep a copy of this written notice as part of the operating record.

(3) Before transferring ownership or operation of a facility during its operating life, or of a disposal facility during the long-term care period, the owner or operator shall notify the new owner or operator in writing of the requirements of this chapter and ch. NR 670.

Note: An owner's or operator's failure to notify the new owner or operator of the requirements of this chapter in no way relieves the new owner or operator of that person's obligation to comply with all applicable requirements.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06; CR 19-082: cr. (1) (intro.), r. and recr. (1) (a), (b), cr. (c), (d) Register August 2020 No 776, eff. 9-1-20; correction in (1) (b) made under s. 35.17, Stats., Register August 2020 No. 776; correction in (1) (b) made under s. 13.92 (4) (b) 7., Stats., Register April 2021 No. 784.

NR 664.0013 General waste analysis. (1) (a) Before an owner or operator treats, stores or disposes of any hazardous wastes, or nonhazardous wastes if applicable under s. NR 664.0113 (4), the owner or operator shall obtain a detailed chemical and physical analysis of a representative sample of the wastes. At a minimum, the analysis shall contain all the information which must be known to treat, store or dispose of the waste according to this chapter and ch. NR 668.

1. Chemical and physical samples shall be analyzed by a laboratory certified or registered under ch. NR 149, except for field analyses for pH, specific conductance and temperature.

(b) The analysis may include data developed under ch. NR 661, and existing published or documented data on the hazardous waste or on hazardous waste generated from similar processes.

Note: For example, the facility's records of analyses performed on the waste before the effective date of these rules, or studies conducted on hazardous waste generated from processes similar to that which generated the waste to be managed at the facility, may be included in the data base required to comply with par. (a). The owner or operator of an off-site facility may arrange for the generator of the hazardous waste to supply part of the information required by par. (a), except as otherwise specified in s. NR 668.07(2) and (3). If the generator does not supply the information, and the owner or operator chooses to accept a hazardous waste, the owner or operator is responsible for obtaining the information required to comply with this section.

(c) The analysis shall be repeated as necessary to ensure that it is accurate and up to date. At a minimum, the analysis shall be repeated when any of the following occurs:

1. The owner or operator is notified, or has reason to believe, that the process or operation generating the hazardous wastes, or non-hazardous wastes if applicable under s. NR 664.0113 (4), has changed.

2. For off-site facilities, the results of the inspection required in par. (d) indicate that the hazardous waste received at the facility does not match the waste designated on the accompanying manifest or shipping paper.

(d) The owner or operator of an off-site facility shall inspect and, if necessary, analyze each hazardous waste movement received at the facility to determine whether it matches the identity of the waste specified on the accompanying manifest or shipping paper.

(2) The owner or operator shall develop and follow a written waste analysis plan which describes the procedures which the owner or operator will carry out to comply with sub. (1). The owner or operator shall keep this plan at the facility. At a minimum, the plan shall specify all of the following:

(a) The parameters for which each hazardous waste, or non-hazardous waste if applicable under s. NR 664.0113 (4), will be analyzed and the rationale for the selection of these parameters (i.e., how analysis for these parameters will provide sufficient information on the waste's properties to comply with sub. (1)).

(b) The test methods which will be used to test for these parameters.

(c) The sampling method which will be used to obtain a representative sample of the waste to be analyzed. A representative sample may be obtained using one of the following:

1. One of the sampling methods described in ch. NR 661 Appendix I.

2. An equivalent sampling method.

Note: See s. NR 660.21 for related discussion.

(d) The frequency with which the initial analysis of the waste will be reviewed or repeated to ensure that the analysis is accurate and up to date.

(e) For off-site facilities, the waste analyses that hazardous waste generators have agreed to supply.

(f) Where applicable, the methods that will be used to meet the additional waste analysis requirements for specific waste management methods specified in ss. NR 664.0017, 664.0314, 664.0341, 664.1034 (4), 664.1063 (4), 664.1083 and 668.07.

(g) For surface impoundments exempted from land disposal restrictions under s. NR 668.04 (1), the procedures and schedules for all of the following:

1. The sampling of impoundment contents.

2. The analysis of test data.

3. The annual removal of residues which are not delisted under s. NR 660.22 or which exhibit a characteristic of hazardous waste and meet any of the following criteria:

a. The residues do not meet applicable treatment standards of subch. D of ch. NR 668.

b. Where no treatment standards have been established, any of the following applies:

1) The residues are prohibited from land disposal under s. NR 668.32 or 42 USC 6924(d).

2) The residues are prohibited from land disposal under s. NR 668.33.

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(h) For owners and operators seeking an exemption to the air emission standards of subch. CC according to s. NR 664.1082, any of the following:

1. If direct measurement is used for the waste determination, the procedures and schedules for waste sampling and analysis, and the results of the analysis of test data to verify the exemption.

2. If knowledge of the waste is used for the waste determination, any information prepared by the facility owner or operator or by the generator of the hazardous waste, if the waste is received from off-site, that is used as the basis for knowledge of the waste.

(3) For off-site facilities, the waste analysis plan required in sub. (2) shall also specify the procedures which will be used to inspect and, if necessary, analyze each movement of hazardous waste received at the facility to ensure that it matches the identity of the waste designated on the accompanying manifest or shipping paper. At a minimum, the plan shall describe all of the following:

(a) The procedures which will be used to determine the identity of each movement of waste managed at the facility.

(b) The sampling method which will be used to obtain a representative sample of the waste to be identified, if the identification method includes sampling.

Note: Chapter NR 670 requires that the waste analysis plan be submitted with the feasibility and plan of operation report.

(c) The procedures that the owner or operator of an off-site landfill receiving containerized hazardous waste will use to determine whether a hazardous waste generator or treater has added a biodegradable sorbent to the waste in the container.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06; correction in (2) (c) 1. made under s. 13.92 (4) (b) 7., Stats., Register March 2013 No. 687; correction in (1) (b) made under s. 13.92 (4) (b) 7., Stats., Register April 2021 No. 784.

NR 664.0014 Security. (1) The owner or operator shall prevent the unknowing entry, and minimize the possibility for the unauthorized entry, of persons or livestock onto the active portion of the facility, unless the owner or operator can demonstrate to the department all of the following:

(a) Physical contact with the waste, structures, or equipment within the active portion of the facility will not injure unknowing or unauthorized persons or livestock which may enter the active portion of a facility.

(b) Disturbance of the waste or equipment, by the unknowing or unauthorized entry of persons or livestock onto the active portion of a facility, will not cause a violation of the requirements of this chapter.

Note: Chapter NR 670 requires that an owner or operator who wishes to make the demonstration referred to in pars. (a) and (b) shall do so with the feasibility report or feasibility and plan of operation report.

(2) Unless the owner or operator has made a successful demonstration under sub. (1) (a) and (b), a facility shall have any of the following:

(a) A 24-hour surveillance system (e.g., television monitoring or surveillance by guards or facility personnel) which continuously monitors and controls entry onto the active portion of the facility.

(b) All of the following:

1. An artificial or natural barrier (e.g., a fence in good repair or a fence combined with a cliff), which completely surrounds the active portion of the facility.

2. A means to control entry, at all times, through the gates or other entrances to the active portion of the facility (e.g., an attendant, television monitors, locked entrance or controlled roadway access to the facility).

Note: The requirements of sub. (2) are satisfied if the facility or plant within which the active portion is located itself has a surveillance system, or a barrier and a means to control entry, which complies with the requirements of par. (a) or (b).

(3) Unless the owner or operator has made a successful demonstration under sub. (1) (a) and (b), a sign with the legend, "Danger—Unauthorized Personnel Keep Out", shall be posted at each entrance to the active portion of a facility, and at other locations, in sufficient numbers to be seen from any approach to this active portion. The legend shall be written in English and in any other language predominant in the area surrounding the facility, and shall be legible from a distance of at least 25 feet. Existing signs with a legend other than "Danger—Unauthorized Personnel Keep Out" may be used if the legend on the sign indicates that only authorized personnel are allowed to enter the active portion, and that entry onto the active portion can be dangerous.

Note: See s. NR 664.0117(2) for discussion of security requirements at disposal facilities during the long-term care period.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0015 General inspection requirements. (1) The owner or operator shall inspect the facility for malfunctions and deterioration, operator errors and discharges which may be causing, or may lead to, release of hazardous waste constituents to the environment or a threat to human health. The owner or operator shall conduct these inspections often enough to identify problems in time to correct them before they harm human health or the environment.

(2) (a) The owner or operator shall develop and follow a written schedule for inspecting monitoring equipment, safety and emergency equipment, security devices and operating and structural equipment (such as dikes and sump pumps) that are important to preventing, detecting or responding to environmental or human health hazards.

(b) The owner or operator shall keep this schedule at the facility.

(c) The schedule shall identify the types of problems (e.g., malfunctions or deterioration) which are to be looked for during the inspection (e.g., inoperative sump pump, leaking fitting, eroding dike, etc.).

Note: Chapter NR 670 requires the inspection schedule to be submitted with the feasibility and plan of operation report. The department shall evaluate the schedule along with the rest of the report to ensure that it adequately protects human health and the environment. As part of this review, the department may modify or amend the schedule as may be necessary.

(d) The frequency of inspection may vary for the items on the schedule. However, the frequency should be based on the rate of deterioration of the equipment and the probability of an environmental or human health incident if the deterioration, malfunction or any operator error goes undetected between inspections. Areas subject to spills, such as loading and unloading areas, shall be inspected daily when in use. At a minimum, the inspection schedule shall include the items and frequencies called for in ss. NR 664.0174, 664.0193, 664.0195, 664.0226, 664.0254, 664.0303, 664.0347, 664.0602, 664.1033, 664.1052, 664.1053, 664.1058 and 664.1083 to 664.1089, where applicable. Chapter NR 670 requires the inspection schedule to be submitted with part B of the license application. The department will evaluate the schedule along with the rest of the application to ensure that it adequately protects human health and the environment. As part of this review, the department may modify or amend the schedule as necessary.

(3) The owner or operator shall remedy any deterioration or malfunction of equipment or structures which the inspection reveals on a schedule which ensures that the problem does not lead to an environmental or human health hazard. Where a hazard is imminent or has already occurred, remedial action shall be taken immediately.

Published under s. 35.93, Wis. Stats., by the Legislative Reference Bureau.

(4) The owner or operator shall record inspections in an inspection log or summary and shall keep these records for at least 3 years from the date of inspection. At a minimum, these records shall include the date and time of the inspection, the name of the inspector, a notation of the observations made and the date and nature of any repairs or other remedial actions.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06; CR 19-082: am. (2) (d) Register August 2020 No 776, eff. 9-1-20.

NR 664.0016 Personnel training. (1) (a) Facility personnel shall successfully complete a program of classroom instruction or on-the-job training that teaches them to perform their duties in a way that ensures the facility's compliance with the requirements of this chapter. The owner or operator shall ensure that this program includes all the elements described in the document required under sub. (4) (c).

Note: Chapter NR 670 requires that owners and operators submit with the feasibility and plan of operation report, an outline of the training program used (or to be used) at the facility and a brief description of how the training program is designed to meet actual job tasks.

(b) This program shall be directed by a person trained in hazardous waste management procedures, and shall include instruction which teaches facility personnel hazardous waste management procedures (including contingency plan implementation) relevant to the positions in which they are employed.

(c) At a minimum, the training program shall be designed to ensure that facility personnel are able to respond effectively to emergencies by familiarizing them with emergency procedures, emergency equipment and emergency systems, including, where applicable, all of the following:

1. Procedures for using, inspecting, repairing and replacing facility emergency and monitoring equipment.
2. Key parameters for automatic waste feed cut-off systems.
3. Communications or alarm systems.
4. Response to fires or explosions.
5. Response to groundwater contamination incidents.
6. Shutdown of operations.

(d) For facility employees that receive emergency response training pursuant to occupational safety and health administration (OSHA) rules 29 CFR 1910.120 (p) (8) and (q), the facility is not required to provide separate emergency response training pursuant to this section, provided that the overall facility training meets all the requirements of this section.

(2) Facility personnel shall successfully complete the program required in sub. (1) within 6 months after August 1, 2006 or 6 months after the date of their employment or assignment to a facility, or to a new position at a facility, whichever is later. Employees hired after August 1, 2006 may not work in unsupervised positions until they have completed the training requirements of sub. (1).

(3) Facility personnel shall take part in an annual review of the initial training required in sub. (1).

(4) The owner or operator shall maintain all of the following documents and records at the facility:

(a) The job title for each position at the facility related to hazardous waste management, and the name of the employee filling each job.

(b) A written job description for each position listed under par. (a). This description may be consistent in its degree of specificity with descriptions for other similar positions in the same company location or bargaining unit, but shall include the requisite skill, education or other qualifications, and duties of employees assigned to each position.

(c) A written description of the type and amount of both introductory and continuing training that will be given to each person filling a position listed under par. (a).

(d) Records that document that the training or job experience required under subs. (1), (2) and (3) has been given to, and completed by, facility personnel.

(5) Training records on current personnel shall be kept until closure of the facility. Training records on former employees shall be kept for at least 3 years from the date the employee last worked at the facility. Personnel training records may accompany personnel transferred within the same company.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06; CR 16-007: cr. (1) (d) Register July 2017 No. 739, eff. 8-1-17.

NR 664.0017 General requirements for ignitable, reactive or incompatible wastes. (1) The owner or operator shall take precautions to prevent accidental ignition or reaction of ignitable or reactive waste. This waste shall be separated and protected from sources of ignition or reaction including, but not limited to, open flames, smoking, cutting and welding, hot surfaces, frictional heat, sparks (static, electrical or mechanical), spontaneous ignition (e.g., from heat-producing chemical reactions) and radiant heat. While ignitable or reactive waste is being handled, the owner or operator shall confine smoking and open flame to specially designated locations. "No Smoking" signs shall be conspicuously placed wherever there is a hazard from ignitable or reactive waste.

(2) Where specifically required by other sections of this chapter, the owner or operator of a facility that treats, stores or disposes ignitable or reactive waste, or mixes incompatible waste or incompatible wastes and other materials, shall take precautions to prevent reactions which do any of the following:

(a) Generate extreme heat or pressure, fire or explosions or violent reactions.

(b) Produce uncontrolled toxic mists, fumes, dusts or gases in sufficient quantities to threaten human health or the environment.

(c) Produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosions.

(d) Damage the structural integrity of the device or facility.

(e) Through other like means threaten human health or the environment.

(3) When required to comply with sub. (1) or (2), the owner or operator shall document that compliance. This documentation may be based on references to published scientific or engineering literature, data from trial tests (e.g., bench scale or pilot scale tests), waste analyses (as specified in s. NR 664.0013), or the results of the treatment of similar wastes by similar treatment processes and under similar operating conditions.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0018 Location standards.

Note: There is no location standard for seismic considerations in Wisconsin. See appendix VI of 40 CFR part 264 for more information.

(2) FLOODPLAINS. (a) A facility located in a 100-year floodplain shall be designed, constructed, operated and maintained to prevent washout of any hazardous waste by a 100-year flood, unless the owner or operator can demonstrate any of the following to the department's satisfaction:

1. Procedures are in effect which will cause the waste to be removed safely, before flood waters can reach the facility, to a location where the wastes will not be vulnerable to flood waters.

2. For existing surface impoundments, waste piles, landfills and miscellaneous units, no adverse effects on human health or the environment will result if washout occurs, considering all of the following:

a. The volume and physical and chemical characteristics of the waste in the facility.

b. The concentration of hazardous constituents that would potentially affect surface waters as a result of washout.

c. The impact of the concentrations on the current or potential uses of and water quality standards established for the affected surface waters.

d. The impact of hazardous constituents on the sediments of affected surface waters or the soils of the 100-year floodplain that could result from washout.

Note: The location where wastes are moved must be a facility which is either licensed by the department under ch. NR 670, authorized to manage hazardous waste by a state with a hazardous waste management program authorized under 40 CFR part 271, or interim licensed under chs. NR 665 and 670.

(b) As used in par. (a):

1. "100-year floodplain" means any land area which is subject to a one percent or greater chance of flooding in any given year from any source.

2. "Washout" means the movement of hazardous waste from the active portion of the facility as a result of flooding.

3. "100-year flood" means a flood that has a one percent chance of being equaled or exceeded in any given year.

(3) SALT DOME FORMATIONS, SALT BED FORMATIONS, UNDERGROUND MINES AND CAVES. The placement of any noncontainerized or bulk liquid hazardous waste in any salt dome formation, salt bed formation, underground mine or cave is prohibited.

(4) WETLAND. A hazardous waste facility may not be located in a wetland.

(5) CRITICAL HABITAT. A hazardous waste facility may not be located in a critical habitat.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0019 Construction quality assurance program. (1) CQA PROGRAM. (a) A construction quality assurance (CQA) program is required for all surface impoundment, waste pile and landfill units that are required to comply with ss. NR 664.0221 (3) and (4), 664.0251 (3) and (4) and 664.0301 (3) and (4). The program shall ensure that the constructed unit meets or exceeds all design criteria and specifications in the approved feasibility and plan of operation report. The program shall be developed and implemented under the direction of a CQA officer who is a registered professional engineer.

(b) The CQA program shall address all of the following physical components, where applicable:

1. Foundations.

2. Dikes.

3. Low-permeability soil liners.

4. Geomembranes (flexible membrane liners).

5. Leachate collection and removal systems and leak detection systems.

6. Final cover systems.

(2) WRITTEN CQA PLAN. The owner or operator of units subject to the CQA program under sub. (1) shall develop and implement a written CQA plan. The plan shall identify steps that will be used to monitor and document the quality of materials and the condition and manner of their installation. The CQA plan shall include all of the following:

(a) Identification of applicable units, and a description of how they will be constructed.

(b) Identification of key personnel in the development and implementation of the CQA plan, and CQA officer qualifications.

(c) A description of inspection and sampling activities for all unit components identified in sub. (1) (b), including observations and tests that will be used before, during and after construction to ensure that the construction materials and the installed unit components meet the design specifications. The description shall cover sampling size and locations, frequency of testing, data evaluation procedures, acceptance and rejection criteria for construction materials, plans for implementing corrective measures and data or other information to be recorded and retained in the operating record under s. NR 664.0073.

(3) CONTENTS OF PROGRAM. (a) The CQA program shall include observations, inspections, tests and measurements sufficient to ensure all of the following:

1. Structural stability and integrity of all components of the unit identified in sub. (1) (b).

2. Proper construction of all components of the liners, leachate collection and removal system, leak detection system and final cover system, according to approved feasibility and plan of operation report specifications and good engineering practices, and proper installation of all components (e.g., pipes) according to design specifications.

3. Conformity of all materials used with design and other material specifications under ss. NR 664.0221, 664.0251 and 664.0301.

(b) The CQA program shall include test fills for compacted soil liners, using the same compaction methods as in the full scale unit, to ensure that the liners are constructed to meet the hydraulic conductivity requirements of ss. NR 664.0221 (3) (a) 1. b., 664.0251 (3) (a) 1. b. and 664.0301 (3) (a) 1. b. in the field. Compliance with the hydraulic conductivity requirements shall be verified by using in-situ testing on the constructed test fill. The department may accept an alternative demonstration, in lieu of a test fill, where data are sufficient to show that a constructed soil liner will meet the hydraulic conductivity requirements of ss. NR 664.0221 (3) (a) 1. b., 664.0251 (3) (a) 1. b. and 664.0301 (3) (a) 1. b. in the field.

(4) CERTIFICATION. Waste may not be received in a unit subject to s. NR 664.0019 until the owner or operator has submitted to the department by certified mail or hand delivery a certification signed by the CQA officer that the approved CQA plan has been successfully carried out and that the unit meets the requirements of s. NR 664.0221 (3) or (4), 664.0251 (3) or (4) or 664.0301 (3) or (4); and the procedure in s. NR 670.030 (12) (b) 2. has been completed. Documentation supporting the CQA officer's certification shall be furnished to the department upon request. The department may choose to perform a site inspection after reviewing the CQA documentation. An inspection by the department or the submittal of additional information is subject to the fees stated in ch. NR 670 Appendix II.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06; correction in (4) made under s. 13.92 (4) (b) 7., Stats., Register March 2013 No. 687.

NR 664.0025 Construction certification for a new facility. Owners and operators of all newly constructed treatment or storage facilities shall submit a written statement to the department, within 15 days after the construction is completed, certifying that the facility was constructed in substantial compliance with the approved feasibility and plan of operation report.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

Subchapter C — Preparedness and Prevention

NR 664.0030 Applicability. This subchapter applies to owners and operators of all hazardous waste facilities, except as s. NR 664.0001 provides otherwise.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0031 Design and operation of facility. Facil-

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ities shall be designed, constructed, maintained and operated to minimize the possibility of a fire, explosion or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil or surface water which could threaten human health or the environment.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0032 Required equipment. All facilities shall be equipped with all of the following, unless it can be demonstrated to the department that none of the hazards posed by waste handled at the facility could require any of the following particular kinds of equipment:

(1) An internal communications or alarm system capable of providing immediate emergency instruction (voice or signal) to facility personnel.

(2) A device, such as a telephone (immediately available at the scene of operations) or a hand-held 2-way radio, capable of summoning emergency assistance from local police departments, fire departments or state or local emergency response teams.

(3) Portable fire extinguishers, fire control equipment (including special extinguishing equipment, such as that using foam, inert gas or dry chemicals), spill control equipment and decontamination equipment.

(4) Water at adequate volume and pressure to supply water hose streams, foam producing equipment, automatic sprinklers or water spray systems.

Note: Chapter NR 670 requires that an owner or operator who wishes to make the demonstration referred to in this section shall do so with the feasibility and plan of operation report.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0033 Testing and maintenance of equipment. All facility communications or alarm systems, fire protection equipment, spill control equipment and decontamination equipment, where required, shall be tested and maintained as necessary to assure its proper operation in time of emergency.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0034 Access to communications or alarm system. (1) Whenever hazardous waste is being poured, mixed, spread or otherwise handled, all personnel involved in the operation shall have immediate access to an internal alarm or emergency communication device, either directly or through visual or voice contact with another employee, unless the department has ruled that such a device is not required under s. NR 664.0032.

(2) If there is ever just one employee on the premises while the facility is operating, that employee shall have immediate access to a device, such as a telephone (immediately available at the scene of operation) or a hand-held 2-way radio, capable of summoning external emergency assistance, unless the department has ruled that such a device is not required under s. NR 664.0032.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0035 Required aisle space. The owner or operator shall maintain aisle space to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment and decontamination equipment to any area of facility operation in an emergency, unless it can be demonstrated to the department that aisle space is not needed for any of these purposes.

Note: Chapter NR 670 requires that an owner or operator who wishes to make the demonstration referred to in this section must do so with the feasibility and plan of operation report.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0037 Arrangements with local authorities. (1) The owner or operator shall attempt to make all of the following arrangements, as appropriate for the type of waste handled at the facility and the potential need for the services of these organizations:

(a) Arrangements to familiarize police, fire departments and emergency response teams with the layout of the facility, properties of hazardous waste handled at the facility and associated hazards, places where facility personnel would normally be working, entrances to and roads inside the facility and possible evacuation routes.

(b) Where more than one police and fire department might respond to an emergency, agreements designating primary emergency authority to a specific police and a specific fire department, and agreements with any others to provide support to the primary emergency authority.

(c) Agreements with state emergency response teams, emergency response contractors and equipment suppliers.

(d) Arrangements to familiarize local hospitals with the properties of hazardous waste handled at the facility and the types of injuries or illnesses which could result from fires, explosions or releases at the facility.

(2) Where state or local authorities decline to enter into these arrangements, the owner or operator shall document the refusal in the operating record.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

Subchapter D — Contingency Plan and Emergency Procedures

NR 664.0050 Applicability. This subchapter applies to owners and operators of all hazardous waste facilities, except as s. NR 664.0001 provides otherwise.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0051 Purpose and implementation of contingency plan. (1) The owner or operator shall have a contingency plan for the facility. The contingency plan shall be designed to minimize hazards to human health or the environment from fires, explosions or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil or surface water.

(2) The provisions of the plan shall be carried out immediately whenever there is a fire, explosion or release of hazardous waste or hazardous waste constituents which could threaten human health or the environment.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0052 Content of contingency plan. (1) The contingency plan shall describe the actions facility personnel shall take to comply with ss. NR 664.0051 and 664.0056 in response to fires, explosions or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil or surface water at the facility.

(2) If the owner or operator has already prepared a spill prevention, control and countermeasures (SPCC) plan according to 40 CFR part 112, or some other emergency or contingency plan, the owner or operator need only amend that plan to incorporate hazardous waste management provisions that are sufficient to comply with the requirements of this chapter. The owner or operator may develop one contingency plan that meets all regulatory requirements. The department recommends that the plan be based on the national response team's (NRT) integrated contingency plan guidance. When modifications are made to non-hazardous waste provisions in an integrated contingency plan, the changes do not trigger the need for a hazardous waste license modification.

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(3) The plan shall describe arrangements agreed to by local police departments, fire departments, hospitals, contractors and state and local emergency response teams to coordinate emergency services, pursuant to s. NR 664.0037.

(4) The plan shall list names, addresses and phone numbers (office and home) of all persons qualified to act as emergency coordinator (see s. NR 664.0055), and this list shall be kept up to date. Where more than one person is listed, one shall be named as primary emergency coordinator and others shall be listed in the order in which they will assume responsibility as alternates. For new facilities, this information shall be supplied to the department at the time of certification, rather than at the time of feasibility and plan of operation report submittal.

(5) The plan shall include a list of all emergency equipment at the facility (such as fire extinguishing systems, spill control equipment, communications and alarm systems (internal and external) and decontamination equipment), where this equipment is required. This list shall be kept up to date. In addition, the plan shall include the location and a physical description of each item on the list, and a brief outline of its capabilities.

(6) The plan shall include an evacuation plan for facility personnel where there is a possibility that evacuation could be necessary. This plan shall describe the signal or signals to be used to begin evacuation, evacuation routes and alternate evacuation routes (in cases where the primary routes could be blocked by releases of hazardous waste or fires).

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06; CR 16-007: am. (2) Register July 2017 No. 739, eff. 8-1-17; CR 19-082: am. (2) Register August 2020 No 776, eff. 9-1-20.

NR 664.0053 Copies of contingency plan. A copy of the contingency plan and all revisions to the plan shall be:

(1) Maintained at the facility.

(2) Submitted to all local police departments, fire departments, hospitals and state and local emergency response teams that may be called upon to provide emergency services.

Note: The contingency plan shall be submitted to the department with the feasibility and plan of operation report under ch. NR 670 and, after modification or approval, will become a condition of any approval or modification issued.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0054 Amendment of contingency plan. The contingency plan shall be reviewed, and immediately amended, if necessary, whenever any of the following occurs:

(1) The facility license is revised.

(2) The plan fails in an emergency.

(3) The facility changes—in its design, construction, operation, maintenance or other circumstances—in a way that materially increases the potential for fires, explosions or releases of hazardous waste or hazardous waste constituents, or changes the response necessary in an emergency.

(4) The list of emergency coordinators changes.

(5) The list of emergency equipment changes.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0055 Emergency coordinator. At all times, there shall be at least one employee either on the facility premises or on call (i.e., available to respond to an emergency by reaching the facility within a short period of time) with the responsibility for coordinating all emergency response measures. This emergency coordinator shall be thoroughly familiar with all aspects of the facility's contingency plan, all operations and activities at the facility, the location and characteristics of waste handled, the location of all records within the facility and the facility layout. In addition, this person shall have the authority to commit the resources needed to carry out the contingency plan.

Note: The emergency coordinator's responsibilities are more fully spelled out in s. NR 664.0056. Applicable responsibilities for the emergency coordinator vary, depending on factors such as type and variety of wastes handled by the facility, and type and complexity of the facility.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0056 Emergency procedures. (1) Whenever there is an imminent or actual emergency situation, the emergency coordinator (or a designee when the emergency coordinator is on call) shall immediately do all of the following:

(a) Activate internal facility alarms or communication systems, where applicable, to notify all facility personnel.

(b) Notify appropriate state or local agencies with designated response roles if their help is needed.

(2) Whenever there is a release, fire or explosion, the emergency coordinator shall immediately identify the character, exact source, amount and areal extent of any released materials. The emergency coordinator may do this by observation or review of facility records or manifests and, if necessary, by chemical analysis.

(3) Concurrently, the emergency coordinator shall assess possible hazards to human health or the environment that may result from the release, fire or explosion. This assessment shall consider both direct and indirect effects of the release, fire or explosion (e.g., the effects of any toxic, irritating or asphyxiating gases that are generated, or the effects of any hazardous surface water run-off from water or chemical agents used to control fire and heat-induced explosions).

(4) If the emergency coordinator determines that the facility has had a release, fire or explosion which could threaten human health, or the environment, outside the facility, that person shall report the findings according to all of the following:

(a) If the emergency coordinator's assessment indicates that evacuation of local areas may be advisable, the emergency coordinator shall immediately notify appropriate local authorities. The emergency coordinator shall be available to help appropriate officials decide whether local areas should be evacuated.

(b) The emergency coordinator shall immediately notify either the government official designated as the on-scene coordinator for that geographical area (in the applicable regional contingency plan under 40 CFR part 300), or the national response center (using its 24-hour toll free number 800/424-8802) and the division of emergency government (using its 24-hour toll free number 800/943-0003). The report shall include all of the following:

1. Name and telephone number of reporter.
2. Name and address of facility.
3. Time and type of incident (e.g., release, fire).
4. Name and quantity of materials involved, to the extent known.
5. The extent of injuries, if any.
6. The possible hazards to human health, or the environment, outside the facility.

(5) During an emergency, the emergency coordinator shall take all reasonable measures necessary to ensure that fires, explosions and releases do not occur, recur or spread to other hazardous waste at the facility. These measures shall include, where applicable, stopping processes and operations, collecting and containing released waste and removing or isolating containers.

(6) If the facility stops operations in response to a fire, explosion or release, the emergency coordinator shall monitor for leaks, pressure buildup, gas generation or ruptures in valves, pipes or other equipment, wherever this is appropriate.

(7) Immediately after an emergency, the emergency coordinator shall provide for treating, storing or disposing of recovered

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waste, contaminated soil or surface water or any other material that results from a release, fire or explosion at the facility.

Note: Unless the owner or operator can demonstrate, according to s. NR 661.0003 (3) or (4), that the recovered material is not a hazardous waste, the owner or operator becomes a generator of hazardous waste and shall manage it according to all applicable requirements under chs. NR 662 and 663 and this chapter.

(8) The emergency coordinator shall ensure all of the following, in the affected areas of the facility:

(a) No waste that may be incompatible with the released material is treated, stored or disposed of until cleanup procedures are completed.

(b) All emergency equipment listed in the contingency plan is cleaned and fit for its intended use before operations are resumed.

(9) The owner or operator shall note in the operating record the time, date and details of any incident that requires implementing the contingency plan. Within 15 days after the incident, the owner or operator shall submit a written report on the incident to the department. The report shall include all of the following:

(a) Name, address and telephone number of the owner or operator.

(b) Name, address and telephone number of the facility.

(c) Date, time and type of incident (e.g., fire, explosion).

(d) Name and quantity of materials involved.

(e) The extent of injuries, if any.

(f) An assessment of actual or potential hazards to human health or the environment, where this is applicable.

(g) Estimated quantity and disposition of recovered material that resulted from the incident.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06; CR 16-007: r. (9), renum. (10) to (9) Register July 2017 No. 739, eff. 8-1-17.

Subchapter E — Manifest System, Recordkeeping and Reporting

NR 664.0070 Applicability. This subchapter applies to owners and operators of both on-site and off-site facilities, except as s. NR 664.0001 provides otherwise. Sections NR 664.0071, 664.0072 and 664.0076 do not apply to owners and operators of on-site facilities that do not receive any hazardous waste from off-site sources, and to owners and operators of off-site facilities with respect to waste military munitions exempted from manifest requirements under s. NR 666.203 (1). Section NR 664.0073 (2) only applies to licensees who treat, store or dispose of hazardous wastes on-site where the wastes were generated.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06; CR 06-102: am. Register March 2007 No. 615, eff. 4-1-07.

NR 664.0071 Use of manifest system. (1) (a) If a facility receives hazardous waste accompanied by a manifest, the owner or operator, or an agent, shall sign and date each copy of the manifest as indicated in par. (b) to certify that the hazardous waste covered by the manifest was received, that the hazardous waste was received except as noted in the discrepancy space of the manifest, or that the hazardous waste was rejected as noted in the manifest discrepancy space.

(b) If a facility receives a hazardous waste shipment accompanied by a manifest, the owner, operator or an agent shall do all of the following:

1. Sign and date, by hand, each copy of the manifest.

2. Note any discrepancies, as defined in s. NR 664.0072 (1), on each copy of the manifest.

3. Immediately give the transporter at least one copy of the manifest.

4. Within 30 days of delivery, send a copy of page 2 of the manifest to the generator.

5. Submit paper manifests according to all of the following requirements:

a. Beginning on June 30, 2018, send page 1 of any paper manifest and any paper continuation sheet to the e-manifest system for purposes of data entry and processing, or in lieu of submitting the paper copy to EPA, the owner or operator may transmit to the EPA system an image file of page 1 of the manifest and any continuation sheet, or both a data file and image file corresponding to page 1 of the manifest and any continuation sheet, within 30 days of the date of delivery. Submissions of copies to the e-manifest system shall be made at the mailing address or electronic mail submission address specified at the e-manifest program website's directory of services. Beginning on June 30, 2021, EPA will not accept mailed paper manifests from facilities for processing in e-manifest.

b. Beginning on June 30, 2021, the requirement to submit page 1 of the paper manifest and any paper continuation sheet to the e-manifest system for purposes of data entry and processing may be met by the owner or operator only by transmitting to the EPA system an image file of page 1 of the manifest and any continuation sheet, or by transmitting to the EPA system both a data file and the image file corresponding to page 1 of the manifest and any continuation sheet, within 30 days of the date of delivery. Submissions of copies to the e-manifest system shall be made to the electronic mail submission address specified at the e-manifest program website's directory of services.

6. Retain at the facility a copy of each manifest for at least 3 years from the date of delivery.

(c) The owner or operator of a facility receiving hazardous waste subject to subch. H of ch. NR 662 from a foreign source shall do all of the following:

1. Additionally list the relevant consent number from consent documentation supplied by EPA to the facility for each waste listed on the manifest, matched to the relevant list number for the waste from block 9b. If additional space is needed, the owner or operator should use a Continuation Sheet, EPA Form 8700-22A.

2. Send a copy of the manifest within 30 days of delivery to EPA using the addresses listed in s. NR 662.082 (5). In addition, the facility shall submit the copy to the e-manifest system as specified in par. (b) 5.

6. Pay a manifest fee for each manifest submitted as designated in ch. NR 670 Appendix II. The department will bill each facility annually for accumulated manifest review fees.

(2) If a facility receives, from a rail or water (bulk shipment) transporter, hazardous waste which is accompanied by a shipping paper containing all the information required on the manifest (excluding the EPA identification numbers, generator's certification, and signatures), the owner or operator, or an agent, shall do all of the following:

(a) Sign and date each copy of the manifest or shipping paper (if the manifest has not been received) to certify that the hazardous waste covered by the manifest or shipping paper was received.

(b) Note any significant discrepancies (as defined in s. NR 664.0072 (1)) in the manifest or shipping paper (if the manifest has not been received) on each copy of the manifest or shipping paper.

Note: The department does not intend that the owner or operator of a facility whose procedures under s. NR 664.0013 (3) include waste analysis shall perform that analysis before signing the shipping paper and giving it to the transporter. Section NR 664.0072 (2), however, requires reporting an unreconciled discrepancy discovered during later analysis.

(c) Immediately give the rail or water (bulk shipment) transporter at least one copy of the manifest or shipping paper (if the manifest has not been received).

(d) Within 30 days after the delivery, send one copy of the signed and dated manifest or a signed and dated copy of the shipping paper (if the manifest has not been received within 30 days after delivery) to the generator and, within 45 days, send one copy of the manifest to the department in an electronic format specified by the department.

Note: Section NR 662.023 (3) requires the generator to send 3 copies of the manifest to the facility when hazardous waste is sent by rail or water (bulk shipment).

(e) Retain at the facility a copy of the manifest and shipping paper (if signed in lieu of the manifest at the time of delivery) for at least 3 years from the date of delivery.

(f) Pay a manifest fee for each manifest submitted as designated in ch. NR 670 Appendix II. The department will bill each facility annually for accumulated manifest review fees.

(3) Whenever a shipment of hazardous waste is initiated from a facility, the owner or operator of that facility shall comply with the requirements under ch. NR 662. The provisions of ss. NR 662.015, 662.016, and 662.017 are applicable to the on-site accumulation of hazardous wastes by generators. Therefore, the provisions under ss. NR 662.015, 662.016, and 662.017 only apply to owners or operators who are shipping hazardous waste that they generated at that facility or operating as a large quantity generator consolidating hazardous waste from very small quantity generators under s. NR 662.017 (6).

Note: The provisions under s. NR 662.016 or 662.017 are applicable to the on-site accumulation of hazardous waste by generators. Therefore, the provisions under s. NR 662.016 or 662.017 only apply to owners or operators that are shipping hazardous waste that they generated at that facility.

(4) In accordance with s. NR 662.084 (4) (b) 15., within 3 working days of the receipt of a shipment subject to subch. H of ch. NR 662, the owner or operator of a facility shall provide a copy of the movement document bearing all required signatures to the foreign exporter; to the competent authorities of the countries of export and transit that control the shipment as an export and transit of hazardous waste respectively; and on or after the electronic import-export reporting compliance date, to EPA electronically using EPA's waste import export tracking system, or its successor system. The original copy of the movement document shall be maintained at the facility for at least 3 years from the date of signature. The owner or operator of a facility may satisfy this recordkeeping requirement by retaining electronically submitted documents in the facility's account on EPA's waste import export tracking system, or its successor system, provided that copies are readily available for viewing and production if requested by any EPA or department. No owner or operator of a facility shall be held liable for the inability to produce the documents for inspection under this section if the owner or operator of a facility can demonstrate that the inability to produce the document is due exclusively to technical difficulty with EPA's waste import export tracking system, or its successor system, for which the owner or operator of a facility bears no responsibility.

(5) The owner or operator of a facility shall determine whether the consignment state for a shipment regulates any additional wastes (beyond those regulated federally) as hazardous wastes under its state hazardous waste program. The owner or operator of a facility shall also determine whether the consignment state or generator state requires the facility to submit any copies of the manifest to these states.

(6) An electronic manifest that is obtained, completed, and transmitted in accordance with s. NR 662.020 (1) (c), and used in accordance with this paragraph in lieu of the paper manifest form is the legal equivalent of paper manifest forms bearing handwritten signatures, and satisfies for all purposes any requirement in these regulations to obtain, complete, sign, provide, use, or retain a manifest. Legal equivalence to paper manifests include all of the following:

(a) Any requirement for the owner or operator of a facility to sign a manifest or manifest certification by hand, or to obtain a handwritten signature, is satisfied by signing with or obtaining a valid and enforceable electronic signature within the meaning specified in 40 CFR 262.25 (a) and s. NR 662.025 (1).

(b) Any requirement to give, provide, send, forward, or to return to another person a copy of the manifest is satisfied when a copy of an electronic manifest is transmitted to the other person.

(c) Any requirement for a manifest to accompany a hazardous waste shipment is satisfied when a copy of an electronic manifest is accessible during transportation and forwarded to the person or persons who are scheduled to receive delivery of the waste shipment.

(d) Any requirement for an owner or operator to keep or retain a copy of each manifest is satisfied by the retention of the facility's electronic manifest copies in its account on the e-manifest system, provided that the copies are readily available for viewing and production if requested by the department.

(e) No owner or operator may be held liable for the inability to produce an electronic manifest for inspection under this section if the owner or operator can demonstrate that the inability to produce the electronic manifest is due exclusively to a technical difficulty with EPA's electronic manifest system for which the owner or operator bears no responsibility.

(7) An owner or operator may participate in the electronic manifest system either by accessing the electronic manifest system from the owner's or operator's electronic equipment, or by accessing the electronic manifest system from portable equipment brought to the owner's or operator's site by the transporter who delivers the waste shipment to the facility.

(8) If a facility receives hazardous waste that is accompanied by a paper replacement manifest for a manifest that was originated electronically, all of the following procedures apply to the delivery of the hazardous waste by the final transporter:

(a) Upon delivery of the hazardous waste to the designated facility, the owner or operator shall sign and date each copy of the paper replacement manifest by hand in item 20, designated facility certification of receipt, and note any discrepancies in item 18, discrepancy indication space, of the paper replacement manifest.

(b) The owner or operator of the facility shall return one copy of the paper manifest replacement to the final transporter.

(c) Within 30 days of delivery of the waste to the designated facility, the owner or operator of the facility shall send one signed and dated copy of the paper replacement manifest to the generator, and send an additional signed and dated copy of the paper replacement manifest to the electronic manifest system.

(d) The owner or operator of the facility shall retain at the facility one copy of the paper replacement manifest for at least 3 years from the date of delivery.

(9) If an owner or operator using an electronic manifest signs this manifest electronically using an electronic signature method that is undergoing pilot or demonstration tests aimed at demonstrating the practicality or legal dependability of the signature method, then the owner or operator shall also sign with an ink signature the facility's certification of receipt or discrepancies on the printed copy of the manifest provided by the transporter. Upon executing its ink signature on the printed copy, the owner or operator shall retain the original copy among its records for at least 3 years from the date of delivery of the waste.

(10) (a) As prescribed in 40 CFR 264.1311, and determined in 40 CFR 264.1312, an owner or operator who is a user of the

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electronic manifest system shall be assessed a user fee by EPA for the submission and processing of each electronic and paper manifest. EPA shall update the schedule of user fees and publish them to the user community, as provided in 40 CFR 264.1313.

(b) An owner or operator subject to user fees under this section shall make user fee payments in accordance with the requirements of 40 CFR 264.1314, subject to the informal fee dispute resolution process of 40 CFR 264.1316, and subject to the sanctions for delinquent payments under 40 CFR 264.1315.

(11) Electronic manifest signatures shall meet the criteria described in 40 CFR 262.25 (a) and s. NR 662.025.

(12) Post-receipt manifest data corrections. After a facility has certified to the receipt of hazardous wastes by signing Item 20 of the manifest, any post-receipt data corrections may be submitted at any time by any interested person, for example the waste handler, shown on the manifest.

(a) Interested persons shall make all corrections to manifest data by electronic submission, either by directly entering corrected data to the web-based service provided in e-manifest for the corrections, or by an upload of a data file containing data corrections relating to one or more previously submitted manifests.

(b) Each correction submission shall include all of the following information:

1. The manifest tracking number and date of receipt by the facility of the original manifests for which data are being corrected.

2. The item numbers of the original manifest that is the subject of the submitted corrections.

3. For each item number with corrected data, the data previously entered and the corresponding data as corrected by the correction submission.

(c) Each correction submission shall include a statement that the person submitting the corrections certifies that to the best of his or her knowledge or belief, the corrections that are included in the submission will cause the information reported about the previously received hazardous wastes to be true, accurate, and complete in accordance with all of the following:

1. The certification statement shall be executed with a valid electronic signature.

2. A batch upload of data corrections may be submitted under one certification statement.

(d) Upon receipt by the system of any correction submission, other interested persons shown on the manifest will be provided electronic notice of the submitter's corrections.

(e) Other interested persons shown on the manifest may respond to the submitter's corrections with comments to the submitter, or by submitting another correction to the system, certified by the respondent as specified in par. (c), and with notice of the corrections to other interested persons shown on the manifest.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06; CR 06-102: am. Register March 2007 No. 615, eff. 4-1-07; corrections in (1) (b) 6., (2) (f) made under s. 13.92 (4) (b) 7., Stats., Register March 2013 No. 687; CR 19-082: am. (1) (b) 4., r. and recr. (1) (b) 5., 6., (c) (intro.), cr. (1) (c) 1., 2., r. and recr. (3), (4), cr. (6) to (12) Register August 2020 No 776, eff. 9-1-20; correction in (1) (b) 6., (c) (intro.), (3), (6) (intro.), (9), (12) (a), (b) (intro.), (c) 1. made under s. 35.17, Stats., Register August 2020 No 776.

NR 664.0072 Manifest discrepancies. (1) Manifest discrepancies are any of the following:

(a) Significant differences, as defined by sub. (2), between the quantity or type of hazardous waste designated on the manifest or shipping paper, and the quantity or type of hazardous waste a facility actually receives.

(b) Rejected wastes, which may be a full or partial shipment of hazardous waste that the treatment, storage or disposal facility cannot accept.

(c) Container residues, which are residues that exceed the quantity limits for empty containers set forth in s. NR 661.0007 (2).

(2) Significant discrepancies in quantity are, for bulk waste, variations greater than 10% in weight, and for batch waste, any variation in piece count, such as a discrepancy of one drum in a truckload. Significant discrepancies in type are obvious differences which can be discovered by inspection or waste analysis, such as waste solvent substituted for waste acid or toxic constituents not reported on the manifest or shipping paper.

(3) Upon discovering a significant discrepancy, the owner or operator shall attempt to reconcile the discrepancy with the waste generator or transporter (e.g., with telephone conversations). If the discrepancy is not resolved within 15 days after receiving the waste, the owner or operator shall immediately submit to the department a letter describing the discrepancy and attempts to reconcile it, and a copy of the manifest or shipping paper at issue.

(4) (a) Upon rejecting waste or identifying a container residue that exceeds the quantity limits for empty containers set forth in s. NR 661.0007 (2), the facility owner or operator shall consult with the generator prior to forwarding the waste to another facility that can manage the waste. If it is impossible to locate an alternative facility that can receive the waste, the facility owner or operator may return the rejected waste or residue to the generator. The facility owner or operator shall send the waste to the alternative facility or to the generator within 60 days of the rejection or the container residue identification.

(b) While the facility owner or operator is making arrangements for forwarding rejected wastes or residues to another facility under this section, it shall ensure that either the delivering transporter retains custody of the waste, or the facility owner or operator shall provide for secure, temporary custody of the waste, pending delivery of the waste to the first transporter designated on the manifest prepared under sub. (5) or (6).

(5) Except as provided in par. (g), for full or partial load rejections and residues that are to be sent off-site to an alternate facility, the facility owner or operator shall prepare a new manifest in accordance with s. NR 662.020 (1) and the following instructions:

(a) Write the generator's EPA ID number in Item 1 of the new manifest. Write the generator's name and mailing address in Item 5 of the new manifest. If the mailing address is different from the generator's site address, then write the generator's site address in the designated space for Item 5.

(b) Write the name of the alternate designated facility and the facility's EPA ID number in the designated facility block (Item 8) of the new manifest.

(c) Copy the manifest tracking number found in Item 4 of the old manifest to the special handling and additional information block of the new manifest, and indicate that the shipment is a residue or rejected waste from the previous shipment.

(d) Copy the manifest tracking number found in Item 4 of the new manifest to the manifest reference number line in the discrepancy block of the old manifest (Item 18a).

(e) Write the DOT description for the rejected load or the residue in Item 9 (U.S. DOT description) of the new manifest and write the container types, quantity and volume of waste.

(f) Sign the generator's or offeror's certification to certify, as the offeror of the shipment, that the waste has been properly packaged, marked and labeled and is in proper condition for

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transportation, and mail a signed copy of the manifest to the generator identified in Item 5 of the new manifest.

(g) For full load rejections that are made while the transporter remains present at the facility, the facility owner or operator may forward the rejected shipment to the alternate facility by completing Item 18b of the original manifest and supplying the information on the next destination facility in the alternate facility space. The facility owner or operator shall retain a copy of this manifest for its records, and then give the remaining copies of the manifest to the transporter to accompany the shipment. If the original manifest is not used, then the facility owner or operator shall use a new manifest and comply with pars. (a) to (f).

(6) Except as provided in par. (g), for rejected wastes and residues that must be sent back to the generator, the facility owner or operator shall prepare a new manifest in accordance with s. NR 662.020 (1) and the following instructions:

(a) Write the facility's EPA ID number in Item 1 of the new manifest. Write the facility's name and mailing address in Item 5 of the new manifest. If the mailing address is different from the facility's site address, then write the facility's site address in the designated space for Item 5 of the new manifest.

(b) Write the name of the initial generator and the generator's EPA ID number in the designated facility block (Item 8) of the new manifest.

(c) Copy the manifest tracking number found in Item 4 of the old manifest to the special handling and additional information block of the new manifest, and indicate that the shipment is a residue or rejected waste from the previous shipment.

(d) Copy the manifest tracking number found in Item 4 of the new manifest to the manifest reference number line in the discrepancy block of the old manifest (Item 18a).

(e) Write the DOT description for the rejected load or the residue in Item 9 (U.S. DOT Description) of the new manifest and write the container types, quantity and volume of waste.

(f) Sign the generator's or offeror's certification to certify, as offeror of the shipment, that the waste has been properly packaged, marked and labeled and is in proper condition for transportation.

(g) For full load rejections that are made while the transporter remains at the facility, the facility owner or operator may return the shipment to the generator with the original manifest by completing Item 18a and 18b of the manifest and supplying the generator's information in the alternate facility space. The facility owner or operator shall retain a copy for its records and then give the remaining copies of the manifest to the transporter to accompany the shipment. If the original manifest is not used, then the facility owner or operator shall use a new manifest and comply with pars. (a) to (f) and (h).

(h) For full or partial load rejections and container residues contained in non-empty containers that are returned to the generator, the facility shall also comply with the exception reporting requirements specified in s. NR 662.042 (1).

(7) If a facility owner or operator rejects a waste or identifies a container residue that exceeds the quantity limits for empty containers set forth in s. NR 661.0007 (2) after it has signed, dated and returned a copy of the manifest to the delivering transporter or to the generator, the facility owner or operator shall amend its copy of the manifest to indicate the rejected wastes or residues in the discrepancy space of the amended manifest. The facility owner or operator shall also copy the manifest tracking number from Item 4 of the new manifest to the discrepancy space of the amended manifest, and shall re-sign and date the manifest to certify to the information as amended. The facility owner or operator shall retain the amended manifest for at least 3 years from the date of amendment and shall, within 30 days, send a copy of the amended manifest to the transporter and generator that received copies prior to their being amended. Within 45 days, the facility owner or operator shall also send one copy of the amended manifest to the department in an electronic format specified by the department.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06; CR 06-102: am. Register March 2007 No. 615, eff. 4-1-07; CR 16-007: am. (6) (a) Register July 2017 No. 739, eff. 8-1-17; CR 18-082: am. (1) (c), (4) (a), (5) (f), (6) (a), (g), cr. (6) (h), am. (7) Register August 2020 No 776, eff. 9-1-20.

NR 664.0073 Operating record. (1) The owner or operator shall keep a written operating record at the facility.

(2) All of the following information shall be recorded, as it becomes available, and maintained in the operating record for 3 years unless noted as follows:

(a) A description and the quantity of each hazardous waste received, and the methods and dates of its treatment, storage or disposal at the facility as required by ch. NR 664 Appendix I. This information shall be maintained in the operating record until closure of the facility.

(b) The location of each hazardous waste within the facility and the quantity at each location. For disposal facilities, the location and quantity of each hazardous waste shall be recorded on a map or diagram that shows each cell or disposal area. For all facilities, this information shall include cross-references to manifest document numbers, if the waste was accompanied by a manifest. This information shall be maintained in the operating record until closure of the facility.

Note: See s. NR 664.0119 for related requirements.

(c) Records and results of waste analyses and waste determinations performed as specified in ss. NR 664.0013, 664.0017, 664.0314, 664.0341, 664.1034, 664.1063, 664.1083, 668.04 (1) and 668.07.

(d) Summary reports and details of all incidents that require implementing the contingency plan as specified in s. NR 664.0056 (9).

(e) Records and results of inspections as required by s. NR 664.0015 (4) (except these data need be kept only 3 years).

(f) Maintain in the operating record for 3 years the monitoring, testing or analytical data, and corrective actions where required by subch. F and ss. NR 664.0019, 664.0191, 664.0193, 664.0195, 664.0222, 664.0223, 664.0226, 664.0252 to 664.0254, 664.0302 to 664.0304, 664.0309, 664.0347, 664.0602, 664.1034 (3) to (6), 664.1035, 664.1063 (4) to (9), 664.1064, and 664.1082 to 664.1090. Records and results pertaining to groundwater monitoring and cleanup shall be maintained in the operating record until closure of the facility.

(g) For off-site facilities, notices to generators as specified in s. NR 664.0012 (2).

(h) All closure cost estimates under s. NR 664.0142, and, for disposal facilities, all long-term care cost estimates under s. NR 664.0144. This information shall be maintained in the operating record until closure of the facility.

(i) A certification by the licensee no less often than annually, that the licensee has a program in place to reduce the volume and toxicity of hazardous waste generated at the facility to the degree determined by the licensee to be economically practicable; and the proposed method of treatment, storage or disposal is that practicable method currently available to the licensee which minimizes the present and future threat to human health and the environment.

(j) Records of the quantities (and date of placement) for each shipment of hazardous waste placed in land disposal units under an extension to the effective date of any land disposal restriction

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granted pursuant to s. NR 668.05 or a petition pursuant to s. NR 668.06, and the applicable notice required by a generator under s. NR 668.07 (1). This information shall be maintained in the operating record until closure of the facility.

(k) For an off-site treatment facility, a copy of the notice required by the generator or the owner or operator under s. NR 668.07.

(L) For an on-site treatment facility, the information contained in the notice (except the manifest number) required by the generator or the owner or operator under s. NR 668.07.

(m) For an off-site land disposal facility, a copy of the notice required by the generator or the owner or operator of a treatment facility under s. NR 668.07.

(n) For an on-site land disposal facility, the information contained in the notice required by the generator or owner or operator of a treatment facility under s. NR 668.07, except for the manifest number.

(o) For an off-site storage facility, a copy of the notice required by the generator or the owner or operator under s. NR 668.07.

(p) For an on-site storage facility, the information contained in the notice (except the manifest number) required by the generator or the owner or operator under s. NR 668.07.

(q) Any records required under s. NR 664.0001 (10) (m).

(r) Monitoring, testing or analytical data where required by s. NR 664.0347 shall be maintained in the operating record for 5 years.

(s) Certifications as required by s. NR 664.0196 (6) shall be maintained in the operating record until closure of the facility.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06; correction in (2) (a) made under s. 13.92 (4) (b) 7., Stats., Register March 2013 No. 687; CR 16-007: am. (2) (intro.), (a), (b), (f), (h), (j), cr. (2) (r), (s) Register July 2017 No. 739, eff. 8-1-17; correction in (2) (d) made under s. 13.92 (4) (b) 7., Stats., Register July 2017 No. 739, eff. 8-1-17.

NR 664.0074 Availability, retention and disposition of records. (1) All records, including plans, required under this chapter shall be furnished upon request, and made available at all reasonable times for inspection, by any officer, employee or representative of the department.

(2) The retention period for all records required under this chapter is extended automatically during the course of any unresolved enforcement action regarding the facility or as requested by the department.

(3) A copy of records of waste disposal locations and quantities under s. NR 664.0073 (2) (b) shall be submitted to the department and local land authority upon closure of the facility.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0075 Annual report. The owner or operator shall prepare and submit a single copy of an annual report to the department by March 1 of each year. The annual report shall be submitted on department forms, shall cover facility activities during the previous calendar year and shall, at a minimum, include all of the following:

(1) The EPA identification number, name and address of the facility.

(2) The calendar year covered by the report.

(3) For off-site facilities, the EPA identification number of each hazardous waste generator from which the facility received a hazardous waste during the year. For imported shipments, the report shall give the name and address of the foreign generator.

(4) A description and the quantity of each hazardous waste the facility received during the year. For off-site facilities, this information shall be listed by EPA identification number of each generator.

(5) The method of treatment, storage or disposal for each hazardous waste.

(7) The most recent closure cost estimate under s. NR 664.0142, and, for disposal facilities, the most recent long-term care cost estimate under s. NR 664.0144.

(8) For generators who treat, store or dispose of hazardous waste on-site, a description of the efforts undertaken during the year to reduce the volume and toxicity of waste generated.

(9) For generators who treat, store or dispose of hazardous waste on-site, a description of the changes in volume and toxicity of waste actually achieved during the year in comparison to previous years to the extent the information is available for the years prior to 1984.

(10) The certification signed by the owner or operator of the facility or an authorized representative.

Note: Information on annual reporting is available at: http://dnr.wi.gov/topic/Waste/AnnualReport.html.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0076 Unmanifested waste report. (1) If a facility accepts for treatment, storage or disposal any hazardous waste from an off-site source without an accompanying manifest, or without an accompanying shipping paper as described in s. NR 663.20 (5), and if the waste is not excluded from the manifest requirement by chs. NR 660 to 679, then the owner or operator shall prepare and submit a report to the department within 15 days after receiving the waste. The unmanifested waste report shall contain all of the following information:

(a) The EPA identification number, name and address of the facility.

(b) The date the facility received the waste.

(c) The EPA identification number, name and address of the generator and the transporter, if available.

(d) A description and the quantity of each unmanifested hazardous waste the facility received.

(e) The method of treatment, storage or disposal for each hazardous waste.

(f) The certification signed by the owner or operator of the facility or an authorized representative.

(g) A brief explanation of why the waste was unmanifested, if known.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06; CR 06-102: am. Register March 2007 No. 615, eff. 4-1-07.

NR 664.0077 Additional reports. In addition to submitting the annual reports and unmanifested waste reports described in ss. NR 664.0075 and 664.0076, the owner or operator shall also report all of the following to the department:

(1) Releases, fires and explosions as specified in s. NR 664.0056 (9).

(2) Facility closures specified in s. NR 664.0115.

(3) Other information as required by subchs. F, K to N, AA, BB and CC.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06; correction in (1) made under s. 13.92 (4) (b) 7., Stats., Register July 2017 No. 739, eff. 8-1-17.

Subchapter F —Releases From Solid Waste Management Units

NR 664.0090 Applicability.

Note: Groundwater monitoring requirements in chs. NR 140 and 141 also apply.

(1) (a) Except as provided in sub. (2), this subchapter applies to owners or operators of facilities that treat, store or dispose of

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hazardous waste. The owner or operator shall satisfy the requirements identified in par. (b) for all wastes (or constituents thereof) contained in solid waste management units at the facility, regardless of the time at which waste was placed in the units.

(b) All solid waste management units shall comply with the requirements in s. NR 664.0101. A surface impoundment or waste pile unit or landfill that receives hazardous waste after July 26, 1982 (in this subchapter, referred to as a "regulated unit") shall comply with the requirements of ss. NR 664.0091 to 664.0100 in lieu of s. NR 664.0101 for purposes of detecting, characterizing and responding to releases to the uppermost aquifer. The financial responsibility requirements of s. NR 664.0101 apply to regulated units.

(2) The owner or operator's regulated unit or units are not regulated for releases into the uppermost aquifer under this subchapter if any of the following apply:

(a) The owner or operator is exempted under s. NR 664.0001.

(b) The owner or operator operates a unit which the department finds meets all of the following conditions:

1. Is an engineered structure.

2. Does not receive or contain liquid waste or waste containing free liquids.

3. Is designed and operated to exclude liquid, precipitation and other run-on and run-off.

4. Has both inner and outer layers of containment enclosing the waste.

5. Has a leak detection system built into each containment layer.

6. The owner or operator shall provide continuing operation and maintenance of these leak detection systems during the active life of the unit and the closure and long-term care periods.

7. To a reasonable degree of certainty, shall not allow hazardous constituents to migrate beyond the outer containment layer prior to the end of the long-term care period.

(d) The department finds that there is no potential for migration of liquid from a regulated unit to the uppermost aquifer during the active life of the regulated unit (including the closure period) and the long-term care period specified under s. NR 664.0117. A qualified geologist or geotechnical engineer shall certify this demonstration. In order to provide an adequate margin of safety in the prediction of potential migration of liquid, the owner or operator shall base any predictions made under this paragraph on assumptions that maximize the rate of liquid migration.

(e) The owner or operator designs and operates a pile in compliance with s. NR 664.0250 (3).

(3) This subchapter applies during the active life of the regulated unit (including the closure period). After closure of the regulated unit, this subchapter:

(a) Does not apply if all waste, waste residues, contaminated containment system components and contaminated subsoils are removed or decontaminated at closure.

(b) Applies during the long-term care period under s. NR 664.0117 if the owner or operator is conducting a detection monitoring program under s. NR 664.0098.

(c) Applies during the compliance period under s. NR 664.0096 if the owner or operator is conducting a compliance monitoring program under s. NR 664.0099 or a corrective action program under s. NR 664.0100.

(4) This subchapter may apply to miscellaneous units when necessary to comply with ss. NR 664.0601 to 664.0603.

(5) This subchapter applies to all owners and operators subject to s. NR 670.001 (3) (g), when the department issues either a long-term care license or an enforceable document (as defined in s. NR 670.001 (3) (g)) at the facility. When the department issues an enforceable document, references in this subchapter to "in the license" mean "in the enforceable document".

(6) The department may replace all or part of the requirements of ss. NR 664.0091 to 664.0100 applying to a regulated unit with alternative requirements for groundwater monitoring and corrective action for releases to groundwater set out in the license (or in an enforceable document) (as defined in s. NR 670.001 (3) (g)) where the department determines that all of the following apply:

(a) The regulated unit is situated among solid waste management units (or areas of concern), a release has occurred and both the regulated unit and one or more solid waste management units (or areas of concern) are likely to have contributed to the release.

(b) It is not necessary to apply the groundwater monitoring and corrective action requirements of ss. NR 664.0091 to 664.0100 because alternative requirements will protect human health and the environment.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0091 Required programs. (1) Owners and operators subject to this subchapter shall conduct a monitoring and response program according to the following:

(a) Whenever hazardous constituents under s. NR 664.0093 from a regulated unit are detected at a point of standards application under s. NR 664.0095, the owner or operator shall institute a compliance monitoring program under s. NR 664.0099. Detected is defined as statistically significant evidence of contamination as described in s. NR 664.0098 (6).

(b) Whenever the groundwater protection standard under s. NR 664.0092 is exceeded, the owner or operator shall institute a corrective action program under s. NR 664.0100. Exceeded is defined as statistically significant evidence of increased contamination as described in s. NR 664.0099 (4).

(c) Whenever hazardous constituents under s. NR 664.0093 from a regulated unit exceed concentration limits under s. NR 664.0094 in groundwater between the point of standards application under s. NR 664.0095 and the downgradient facility property boundary, the owner or operator shall institute a corrective action program under s. NR 664.0100.

(d) In all other cases, the owner or operator shall institute a detection monitoring program under s. NR 664.0098.

(e) Chemical and physical samples shall be analyzed by a laboratory certified or registered under ch. NR 149, except for field analyses for pH, specific conductance and temperature.

(2) The department shall specify in the facility license the specific elements of the monitoring and response program. The department may include one or more of the programs identified in sub. (1) in the facility license as may be necessary to protect human health and the environment and shall specify the circumstances under which each of the programs will be required. In deciding whether to require the owner or operator to be prepared to institute a particular program, the department shall consider the potential adverse effects on human health and the environment that might occur before final administrative action on an application to modify the license to incorporate such a program could be taken.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0092 Groundwater protection standard. The owner or operator shall comply with conditions specified in the facility license that are designed to ensure that hazardous constituents under s. NR 664.0093 detected in the groundwater from

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a regulated unit do not exceed the concentration limits under s. NR 664.0094 or the enforcement standards listed in ch. NR 140, whichever are more stringent, in the uppermost aquifer underlying the waste management area beyond the point of standards application under s. NR 664.0095 during the compliance period under s. NR 664.0096. The department shall establish this groundwater protection standard in the license when hazardous constituents have been detected in the groundwater.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0093 Hazardous constituents. (1) The department shall specify in the facility license the hazardous constituents to which the groundwater protection standard of s. NR 664.0092 applies. Hazardous constituents are constituents identified in ch. NR 661 Appendix VIII, that have been detected in groundwater in the uppermost aquifer underlying a regulated unit and that are reasonably expected to be in or derived from waste contained in a regulated unit, unless the department has excluded them under sub. (2).

(2) The department shall exclude a ch. NR 661 Appendix VIII constituent from the list of hazardous constituents specified in the license if it finds that the constituent is not capable of posing a substantial present or potential hazard to human health or the environment. In deciding whether to grant an exemption, the department shall consider all of the following:

(a) Potential adverse effects on groundwater quality, considering all of the following:

1. The physical and chemical characteristics of the waste in the regulated unit, including its potential for migration.

2. The hydrogeological characteristics of the facility and surrounding land.

3. The quantity of groundwater and the direction of groundwater flow.

4. The proximity and withdrawal rates of groundwater users.

5. The current and future uses of groundwater in the area.

6. The existing quality of groundwater, including other sources of contamination and their cumulative impact on the groundwater quality.

7. The potential for health risks caused by human exposure to waste constituents.

8. The potential damage to wildlife, crops, vegetation and physical structures caused by exposure to waste constituents.

9. The persistence and permanence of the potential adverse effects.

(b) Potential adverse effects on hydraulically-connected surface water quality, considering all of the following:

1. The volume and physical and chemical characteristics of the waste in the regulated unit.

2. The hydrogeological characteristics of the facility and surrounding land.

3. The quantity and quality of groundwater, and the direction of groundwater flow.

4. The patterns of rainfall in the region.

5. The proximity of the regulated unit to surface waters.

6. The current and future uses of surface waters in the area and any water quality standards established for those surface waters.

7. The existing quality of surface water, including other sources of contamination and the cumulative impact on surface-water quality.

8. The potential for health risks caused by human exposure to waste constituents.

9. The potential damage to wildlife, crops, vegetation and physical structures caused by exposure to waste constituents.

10. The persistence and permanence of the potential adverse effects.

(2m) The department may not grant an exclusion under sub. (2) that would allow a violation of ch. NR 140 enforcement standards, except as provided by s. NR 140.28.

(3) In making any determination under sub. (2) about the use of groundwater in the area around the facility, the department shall consider any identification of underground sources of drinking water and exempted aquifers made under 40 CFR 144.7.

Note: There are no exempted aquifers in Wisconsin.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0094 Concentration limits. (1) The department shall specify in the facility license concentration limits in the groundwater for hazardous constituents established under s. NR 664.0093. The concentration that is specified for a hazardous constituent shall meet the following conditions:

(a) May not exceed the background level of that constituent in the groundwater at the time that the limit is specified in the license.

(b) For any of the constituents listed in Table 1, may not exceed the respective value given in that table if the background level of the constituent is below the value given in Table 1.

Table 1
Maximum Concentration of Constituents for Groundwater Protection

Constituent	Maximum concentration[1]
Arsenic	0.05
Barium	1.0
Cadmium	0.01
Chromium	0.05
Lead	0.05
Mercury	0.002
Selenium	0.01
Silver	0.05
Endrin (1,2,3,4,10,10-Hexachloro-1,7-epoxy 1,4,4a,5,6,7,8,9a-octahydro-1,4-endo, endo-5,8-dimethanonaphthalene)	0.0002
Lindane (1,2,3,4,5,6-Hexachlorocyclohexane, gamma isomer)	0.004
Methoxychlor (1,1,1-Trichloro-2,2-bis (p-methoxyphenylethane)	0.1
Toxaphene ($C_{10}H_{10}Cl_8$, Technical chlorinated camphene, 67-69 percent chlorine)	0.005
2,4-D (2,4-Dichlorophenoxyacetic acid)	0.1
2,4,5-TP Silvex (2,4,5-Trichlorophenoxypropionic acid)	0.01

[1] Milligrams per liter.

(c) May not exceed an alternate limit established by the department under sub. (2).

(d) May not exceed the enforcement standards established under ch. NR 140, except as provided by s. NR 140.28.

(2) The department shall establish an alternate concentration limit for a hazardous constituent if it finds that the constituent will not pose a substantial present or potential hazard to human health or the environment as long as the alternate concentration limit is not exceeded. In establishing alternate concentration limits, the department shall consider all of the following factors:

(a) Potential adverse effects on groundwater quality, considering all of the following:

1. The physical and chemical characteristics of the waste in the regulated unit, including its potential for migration.

2. The hydrogeological characteristics of the facility and surrounding land.

3. The quantity of groundwater and the direction of groundwater flow.

4. The proximity and withdrawal rates of groundwater users.

5. The current and future uses of groundwater in the area.

6. The existing quality of groundwater, including other sources of contamination and their cumulative impact on the groundwater quality.

7. The potential for health risks caused by human exposure to waste constituents.

8. The potential damage to wildlife, crops, vegetation and physical structures caused by exposure to waste constituents.

9. The persistence and permanence of the potential adverse effects.

(b) Potential adverse effects on hydraulically-connected surface-water quality, considering all of the following:

1. The volume and physical and chemical characteristics of the waste in the regulated unit.

2. The hydrogeological characteristics of the facility and surrounding land.

3. The quantity and quality of groundwater, and the direction of groundwater flow.

4. The patterns of rainfall in the region.

5. The proximity of the regulated unit to surface waters.

6. The current and future uses of surface waters in the area and any water quality standards established for those surface waters.

7. The existing quality of surface water, including other sources of contamination and the cumulative impact on surface water quality.

8. The potential for health risks caused by human exposure to waste constituents.

9. The potential damage to wildlife, crops, vegetation and physical structures caused by exposure to waste constituents.

10. The persistence and permanence of the potential adverse effects.

(2m) The department may not establish an alternate concentration limit under sub. (2) that is inconsistent with ch. NR 140.

(3) In making any determination under sub. (2) about the use of groundwater in the area around the facility the department shall consider any identification of underground sources of drinking water and exempted aquifers made under 40 CFR 144.7.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0095 Point of standards application. (1) The department shall specify in the facility license the point of standards application at which the groundwater protection standard of s. NR 664.0092 applies and at which monitoring shall be conducted. The point of standards application is a vertical surface located at the hydraulically downgradient limit of the waste management area that extends down into the uppermost aquifer underlying the regulated units.

(2) The waste management area is the limit projected in the horizontal plane of the area on which waste will be placed during the active life of a regulated unit.

(a) The waste management area includes horizontal space taken up by any liner, dike or other barrier designed to contain waste in a regulated unit.

(b) If the facility contains more than one regulated unit, an imaginary line circumscribing the several regulated units describes the waste management area.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0096 Compliance period. (1) The department shall specify in the facility license the compliance period during which the groundwater protection standard of s. NR 664.0092 applies. The compliance period is the number of years equal to the active life of the waste management area (including any waste management activity prior to licensing, and the closure period.)

(2) The compliance period begins when the owner or operator initiates a compliance monitoring program meeting the requirements of s. NR 664.0099.

(3) If the owner or operator is engaged in a corrective action program at the end of the compliance period specified in sub. (1), the compliance period is extended until the owner or operator can demonstrate that the groundwater protection standard of s. NR 664.0092 has not been exceeded for a period of 3 consecutive years.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0097 General groundwater monitoring requirements. The owner or operator shall comply with the following requirements for any groundwater monitoring program developed to satisfy s. NR 664.0098, 664.0099 or 664.0100:

(1) The groundwater monitoring system shall consist of a sufficient number of wells, installed at appropriate locations and depths to yield groundwater samples from the uppermost aquifer that do all of the following:

(a) Represent the quality of background water that has not been affected by leakage from a regulated unit. A determination of background quality may include sampling of wells that are not hydraulically upgradient of the waste management area where all of the following conditions are met:

1. Hydrogeologic conditions do not allow the owner or operator to determine what wells are hydraulically upgradient.

2. Sampling at other wells shall provide an indication of background groundwater quality that is representative or more representative than that provided by the upgradient wells.

(b) Represent the quality of groundwater passing the point of standards application.

(c) Allow for the detection of contamination when hazardous waste or hazardous constituents have migrated from the waste management area to the uppermost aquifer.

(2) If a facility contains more than one regulated unit, separate groundwater monitoring systems are not required for each regulated unit provided that provisions for sampling the groundwater in the uppermost aquifer will enable detection and measurement at the point of standards application of hazardous constituents from the regulated units that have entered the groundwater in the uppermost aquifer.

(3) All monitoring wells shall be cased in a manner that maintains the integrity of the monitoring-well bore hole. This casing shall be screened or perforated and packed with gravel or sand, where necessary, to enable collection of groundwater samples. The annular space (i.e., the space between the bore hole and well casing) above the sampling depth shall be sealed to prevent contamination of samples and the groundwater.

(4) The groundwater monitoring program shall include consistent sampling and analysis procedures that are designed to ensure monitoring results that provide a reliable indication of groundwater quality below the waste management area. At a minimum the program shall include procedures and techniques for all of the following:

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(a) Sample collection.

(b) Sample preservation and shipment.

(c) Analytical procedures.

(d) Chain of custody control.

(5) The groundwater monitoring program shall include sampling and analytical methods that are appropriate for groundwater sampling and that accurately measure hazardous constituents in groundwater samples.

(6) The groundwater monitoring program shall include a determination of the groundwater surface elevation each time groundwater is sampled.

(7) In detection monitoring or where appropriate in compliance monitoring, data on each hazardous constituent specified in the license shall be collected from background wells and wells at the points of standards applications. The number and kinds of samples collected to establish background shall be appropriate for the form of statistical test employed, following generally accepted statistical principles. The sample size shall be as large as necessary to ensure with reasonable confidence that a contaminant release to groundwater from a facility will be detected. The owner or operator shall determine an appropriate sampling procedure and interval for each hazardous constituent listed in the facility license which shall be specified in the unit license upon approval by the department. This sampling procedure shall be any of the following:

(a) A sequence of at least 4 samples, taken at an interval that assures, to the greatest extent technically feasible, that an independent sample is obtained, by reference to the uppermost aquifer's effective porosity, hydraulic conductivity and hydraulic gradient, and the fate and transport characteristics of the potential contaminants.

(b) An alternate sampling procedure proposed by the owner or operator and approved by the department.

(8) The owner or operator shall specify one of the following statistical methods to be used in evaluating groundwater monitoring data for each hazardous constituent which, upon approval by the department, shall be specified in the unit license. The statistical test chosen shall be conducted separately for each hazardous constituent in each well. Where practical quantification limits (pql's) are used in any of the following statistical procedures to comply with sub. (9) (e), the pql shall be proposed by the owner or operator and approved by the department. Use of any of the following statistical methods shall be protective of human health and the environment and shall comply with the performance standards outlined in sub. (9).

(a) A parametric analysis of variance (ANOVA) followed by multiple comparisons procedures to identify statistically significant evidence of contamination. The method shall include estimation and testing of the contrasts between each compliance well's mean and the background mean levels for each constituent.

(b) An analysis of variance (ANOVA) based on ranks followed by multiple comparisons procedures to identify statistically significant evidence of contamination. The method shall include estimation and testing of the contrasts between each compliance well's median and the background median levels for each constituent.

(c) A tolerance or prediction interval procedure in which an interval for each constituent is established from the distribution of the background data, and the level of each constituent in each compliance well is compared to the upper tolerance or prediction limit.

(d) A control chart approach that gives control limits for each constituent.

(e) Another statistical test method submitted by the owner or operator and approved by the department.

(9) Any statistical method chosen under sub. (8) for specification in the unit license shall comply with all of the following performance standards, as appropriate:

(a) The statistical method used to evaluate groundwater monitoring data shall be appropriate for the distribution of chemical parameters or hazardous constituents. If the distribution of the chemical parameters or hazardous constituents is shown by the owner or operator to be inappropriate for a normal theory test, then the data should be transformed or a distribution-free theory test should be used. If the distributions for the constituents differ, more than one statistical method may be needed.

(b) If an individual well comparison procedure is used to compare an individual compliance well constituent concentration with background constituent concentrations or a groundwater protection standard, the test shall be done at a Type I error level no less than 0.01 for each testing period. If a multiple comparisons procedure is used, the Type I experiment wise error rate for each testing period shall be no less than 0.05; however, the Type I error of no less than 0.01 for individual well comparisons shall be maintained. This performance standard does not apply to tolerance intervals, prediction intervals or control charts.

(c) If a control chart approach is used to evaluate groundwater monitoring data, the specific type of control chart and its associated parameter values shall be proposed by the owner or operator and approved by the department if it finds them to be protective of human health and the environment.

(d) If a tolerance interval or a prediction interval is used to evaluate groundwater monitoring data, the levels of confidence and, for tolerance intervals, the percentage of the population that the interval must contain, shall be proposed by the owner or operator and approved by the department if it finds these parameters to be protective of human health and the environment. These parameters shall be determined after considering the number of samples in the background database, the data distribution and the range of the concentration values for each constituent of concern.

(e) The statistical method shall account for data below the limit of detection with one or more statistical procedures that are protective of human health and the environment. Any practical quantification limit (pql) approved by the department under sub. (8) that is used in the statistical method shall be the lowest concentration level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions that are available to the facility.

(f) If necessary, the statistical method shall include procedures to control or correct for seasonal and spatial variability as well as temporal correlation in the data.

(10) Groundwater monitoring data collected in accordance with sub. (7) including actual levels of constituents shall be maintained in the facility operating record. The department shall specify in the license when the data must be submitted for review.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0098 Detection monitoring program. An owner or operator required to establish a detection monitoring program under this subchapter shall, at a minimum, discharge all of the following responsibilities:

(1) The owner or operator shall monitor for indicator parameters (e.g., specific conductance, total organic carbon or total organic halogen), waste constituents or reaction products that provide a reliable indication of the presence of hazardous constituents in groundwater. The department shall specify the pa-

rameters or constituents to be monitored in the facility license, after considering all of the following factors:

(a) The types, quantities and concentrations of constituents in wastes managed at the regulated unit.

(b) The mobility, stability and persistence of waste constituents or their reaction products in the unsaturated zone beneath the waste management area.

(c) The detectability of indicator parameters, waste constituents and reaction products in groundwater.

(d) The concentrations or values and coefficients of variation of proposed monitoring parameters or constituents in the groundwater background.

(2) The owner or operator shall install a groundwater monitoring system at the point of standards application as specified under s. NR 664.0095. The groundwater monitoring system shall comply with s. NR 664.0097 (1) (b), (2) and (3).

(3) The owner or operator shall conduct a groundwater monitoring program for each chemical parameter and hazardous constituent specified in the license pursuant to sub. (1) in accordance with s. NR 664.0097 (7). The owner or operator shall maintain a record of groundwater analytical data as measured and in a form necessary for the determination of statistical significance under s. NR 664.0097 (8).

(4) The department shall specify the frequencies for collecting samples and conducting statistical tests to determine whether there is statistically significant evidence of contamination for any parameter or hazardous constituent specified in the license under sub. (1) in accordance with s. NR 664.0097 (7).

(5) The owner or operator shall determine the groundwater flow rate and direction in the uppermost aquifer at least annually.

(6) The owner or operator shall determine whether there is statistically significant evidence of contamination for any chemical parameter or hazardous constituent specified in the license pursuant to sub. (1) at a frequency specified under sub. (4).

(a) In determining whether statistically significant evidence of contamination exists, the owner or operator shall use the methods specified in the license under s. NR 664.0097 (8). These methods shall compare data collected at the points of standards applications to the background groundwater quality data.

(b) The owner or operator shall determine whether there is statistically significant evidence of contamination at each monitoring well at the point of standards application within a reasonable period of time after completion of sampling. The department shall specify in the facility license what period of time is reasonable, after considering the complexity of the statistical test and the availability of laboratory facilities to perform the analysis of groundwater samples.

(7) If the owner or operator determines pursuant to sub. (6) that there is statistically significant evidence of contamination for chemical parameters or hazardous constituents specified pursuant to sub. (1) at any monitoring well at the point of standards application, the owner or operator shall do all of the following:

(a) Notify the department of this finding in writing within 7 days. The notification shall indicate what chemical parameters or hazardous constituents have shown statistically significant evidence of contamination.

(b) Immediately sample the groundwater in all monitoring wells and determine whether constituents in the list of ch. NR 664 Appendix IX are present, and if so, in what concentration. However, the department may allow sampling for a site-specific subset of constituents from the ch. NR 664 Appendix IX list and other representative or related waste constituents.

(c) For any ch. NR 664 Appendix IX compounds found in the analysis pursuant to par. (b), the owner or operator may resample within one month and repeat the analysis for those compounds detected. If the results of the second analysis confirm the initial results, then these constituents will form the basis for compliance monitoring. If the owner or operator does not resample for the compounds found pursuant to par. (b), the hazardous constituents found during this initial ch. NR 664 Appendix IX analysis will form the basis for compliance monitoring.

(d) Within 90 days, submit to the department an application to modify the license to establish a compliance monitoring program meeting the requirements of s. NR 664.0099. The application shall include all of the following information:

1. An identification of the concentration of any ch. NR 664 Appendix IX constituent detected in the groundwater at each monitoring well at the point of standards application.

2. Any proposed changes to the groundwater monitoring system at the facility necessary to meet the requirements of s. NR 664.0099.

3. Any proposed additions or changes to the monitoring frequency, sampling and analysis procedures or methods, or statistical methods used at the facility necessary to meet the requirements of s. NR 664.0099.

4. For each hazardous constituent detected at the point of standards application, a proposed concentration limit under s. NR 664.0094 (1) (a) or (b), or a notice of intent to seek an alternate concentration limit under s. NR 664.0094 (2).

(e) Within 180 days, submit to the department all of the following:

1. All data necessary to justify an alternate concentration limit sought under s. NR 664.0094 (2).

2. An engineering feasibility plan for a corrective action program necessary to meet the requirement of s. NR 664.0100, unless any of the following conditions are met:

a. All hazardous constituents identified under par. (b) are listed in s. NR 664.0094, Table 1, and their concentrations do not exceed the respective values given in that table.

b. The owner or operator has sought an alternate concentration limit under s. NR 664.0094 (2) for every hazardous constituent identified under par. (b).

(f) If the owner or operator determines, pursuant to sub. (6), that there is a statistically significant difference for chemical parameters or hazardous constituents specified pursuant to sub. (1) at any monitoring well at the point of standards application, owner or operator may demonstrate that a source other than a regulated unit caused the contamination or that the detection is an artifact caused by an error in sampling, analysis or statistical evaluation or natural variation in the groundwater. The owner or operator may make a demonstration under this paragraph in addition to, or in lieu of, submitting an application to modify the license under par. (d); however, the owner or operator is not relieved of the requirement to submit an application to modify the license within the time specified in par. (d) unless the demonstration made under this paragraph successfully shows that a source other than a regulated unit caused the increase, or that the increase resulted from error in sampling, analysis or evaluation. In making a demonstration under this paragraph, the owner or operator shall do all of the following:

1. Notify the department in writing within 7 days of determining statistically significant evidence of contamination at the point of standards application that the owner or operator intends to make a demonstration under this paragraph.

2. Within 90 days, submit a report to the department which demonstrates that a source other than a regulated unit caused the

contamination or that the contamination resulted from error in sampling, analysis or evaluation.

3. Within 90 days, submit to the department an application to modify the license to make any appropriate changes to the detection monitoring program for the facility.

4. Continue to monitor in accordance with the detection monitoring program established under this section.

(8) If the owner or operator determines that the detection monitoring program no longer satisfies the requirements of this section, owner or operator shall, within 90 days, submit an application to modify the license to make any appropriate changes to the program.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06; corrections in (7) (b), (c), (d) 1. made under s. 13.92 (4) (b) 7., Stats., Register March 2013 No. 687; CR 16-007: am. (4), (7) (b) Register July 2017 No. 739, eff. 8-1-17.

NR 664.0099 Compliance monitoring program. An owner or operator required to establish a compliance monitoring program under this subchapter shall, at a minimum, do all of the following:

(1) The owner or operator shall monitor the groundwater to determine whether regulated units are in compliance with the groundwater protection standard under s. NR 664.0092. The department shall specify the groundwater protection standard in the facility license, including all of the following:

(a) A list of the hazardous constituents identified under s. NR 664.0093.

(b) Concentration limits under s. NR 664.0094 for each of those hazardous constituents.

(c) The point of standards application under s. NR 664.0095.

(d) The compliance period under s. NR 664.0096.

(2) The owner or operator shall install a groundwater monitoring system at the point of standards application as specified under s. NR 664.0095. The groundwater monitoring system shall comply with s. NR 664.0097 (1) (b), (2) and (3).

(3) The department shall specify the sampling procedures and statistical methods appropriate for the constituents and the facility, consistent with s. NR 664.0097 (7) and (8).

(a) The owner or operator shall conduct a sampling program for each chemical parameter or hazardous constituent in accordance with s. NR 664.0097 (7).

(b) The owner or operator shall record groundwater analytical data as measured and in form necessary for the determination of statistical significance under s. NR 664.0097 (8) for the compliance period of the facility.

(4) The owner or operator shall determine whether there is statistically significant evidence of increased contamination for any chemical parameter or hazardous constituent specified in the license, pursuant to sub. (1), at a frequency specified under sub. (6).

(a) In determining whether statistically significant evidence of increased contamination exists, the owner or operator shall use the methods specified in the license under s. NR 664.0097 (8). The methods shall compare data collected at the points of standards applications to a concentration limit developed in accordance with s. NR 664.0094.

(b) The owner or operator shall determine whether there is statistically significant evidence of increased contamination at each monitoring well at the point of standards application within a reasonable time period after completion of sampling. The department shall specify that time period in the facility license, after considering the complexity of the statistical test and the availability of laboratory facilities to perform the analysis of groundwater samples.

(5) The owner or operator shall determine the groundwater flow rate and direction in the uppermost aquifer at least annually.

(6) The department shall specify the frequencies for collecting samples and conducting statistical tests to determine statistically significant evidence of increased contamination in accordance with s. NR 664.0097 (7).

(7) The owner or operator shall analyze samples from all monitoring wells at the point of standards application for all constituents contained in ch. NR 664 Appendix IX at least annually to determine whether additional hazardous constituents are present in the uppermost aquifer and, if so, at what concentration, pursuant to procedures in s. NR 664.0098 (6). If the owner or operator finds ch. NR 664 Appendix IX constituents in the groundwater that are not already identified in the license as monitoring constituents, the owner or operator may resample within one month and repeat the ch. NR 664 Appendix IX analysis. If the second analysis confirms the presence of new constituents, the owner or operator shall report the concentration of these additional constituents to the department within 7 days after the completion of the second analysis and add them to the monitoring list. If the owner or operator chooses not to resample, then the owner or operator shall report the concentrations of these additional constituents to the department within 7 days after completion of the initial analysis and add them to the monitoring list.

(8) If the owner or operator determines pursuant to sub. (4) that any concentration limits under s. NR 664.0094 are being exceeded at any monitoring well at the point of standards application the owner or operator shall do all of the following:

(a) Notify the department of this finding in writing within 7 days. The notification shall indicate what concentration limits have been exceeded.

(b) Submit to the department an application to modify the license to establish a corrective action program meeting the requirements of s. NR 664.0100 within 180 days, or within 90 days if an engineering feasibility study has been previously submitted to the department under s. NR 664.0098 (7) (e). The application shall at a minimum include all of the following information:

1. A detailed description of corrective actions that will achieve compliance with the groundwater protection standard specified in the license under sub. (1).

2. A plan for a groundwater monitoring program that will demonstrate the effectiveness of the corrective action. Such a groundwater monitoring program may be based on a compliance monitoring program developed to meet the requirements of this section.

(9) If the owner or operator determines, pursuant to sub. (4), that the groundwater concentration limits under this section are being exceeded at any monitoring well at the point of standards application, the owner or operator may demonstrate that a source other than a regulated unit caused the contamination or that the detection is an artifact caused by an error in sampling, analysis or statistical evaluation or natural variation in the groundwater. In making a demonstration under this subsection, the owner or operator shall do all of the following:

(a) Notify the department in writing within 7 days that the owner or operator intends to make a demonstration under this subsection.

(b) Within 90 days, submit a report to the department which demonstrates that a source other than a regulated unit caused the standard to be exceeded or that the apparent noncompliance with the standards resulted from error in sampling, analysis or evaluation.

(c) Within 90 days, submit to the department an application to

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modify the license to make any appropriate changes to the compliance monitoring program at the facility.

(d) Continue to monitor in accord with the compliance monitoring program established under this section.

(10) If the owner or operator determines that the compliance monitoring program no longer satisfies the requirements of this section, the owner or operator shall, within 90 days, submit an application to modify the license to make any appropriate changes to the program.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06; correction in (7) made under s. 13.92 (4) (b) 7., Stats., Register March 2013 No. 687; CR 16-007: am. (6) Register July 2017 No. 739, eff. 8-1-17.

NR 664.0100 Corrective action program. An owner or operator required to establish a corrective action program under this subchapter shall, at a minimum, do all of the following:

(1) The owner or operator shall take corrective action to ensure that regulated units are in compliance with the groundwater protection standard under s. NR 664.0092. The department shall specify the groundwater protection standard in the facility license, including all of the following:

(a) A list of the hazardous constituents identified under s. NR 664.0093.

(b) Concentration limits under s. NR 664.0094 for each of those hazardous constituents.

(c) The point of standards application under s. NR 664.0095.

(d) The compliance period under s. NR 664.0096.

(2) The owner or operator shall implement a corrective action program that prevents hazardous constituents from exceeding their respective concentration limits at the point of standards application by removing the hazardous waste constituents or treating them in place. The license shall specify the specific measures that will be taken.

(3) The owner or operator shall begin corrective action within a reasonable time period after the groundwater protection standard is exceeded. The department shall specify that time period in the facility license. If a facility license includes a corrective action program in addition to a compliance monitoring program, the license shall specify when the corrective action will begin and such a requirement shall operate in lieu of s. NR 664.0099 (8) (b).

(4) In conjunction with a corrective action program, the owner or operator shall establish and implement a groundwater monitoring program to demonstrate the effectiveness of the corrective action program. Such a monitoring program may be based on the requirements for a compliance monitoring program under s. NR 664.0099 and shall be as effective as that program in determining compliance with the groundwater protection standard under s. NR 664.0092 and in determining the success of a corrective action program under sub. (5), where appropriate.

(5) In addition to the other requirements of this section, the owner or operator shall conduct a corrective action program to remove or treat in place any hazardous constituents under s. NR 664.0093 that exceed concentration limits under s. NR 664.0094 in groundwater at all of the following locations:

(a) Between the point of standards application under s. NR 664.0095 and the downgradient property boundary.

(b) Beyond the facility boundary, where necessary to protect human health and the environment, unless the owner or operator demonstrates to the satisfaction of the department that, despite the owner's or operator's best efforts, the owner or operator was unable to obtain the necessary permission to undertake that action. The owner or operator is not relieved of all responsibility to clean up a release that has migrated beyond the facility boundary where off-site access is denied. On-site measures to address the releases shall be determined on a case-by-case basis.

(c) Corrective action measures under this subsection shall be initiated and completed within a reasonable period of time considering the extent of contamination.

(d) Corrective action measures under this subsection may be terminated once the concentration of hazardous constituents under s. NR 664.0093 is reduced to levels below their respective concentration limits under s. NR 664.0094.

(6) The owner or operator shall continue corrective action measures during the compliance period to the extent necessary to ensure that the groundwater protection standard is not exceeded. If the owner or operator is conducting corrective action at the end of the compliance period, the owner or operator shall continue that corrective action for as long as necessary to achieve compliance with the groundwater protection standard. The owner or operator may terminate corrective action measures taken beyond the period equal to the active life of the waste management area (including the closure period) if the owner or operator can demonstrate, based on data from the groundwater monitoring program under sub. (4), that the groundwater protection standard of s. NR 664.0092 has not been exceeded for a period of 3 consecutive years.

(7) The owner or operator shall report in writing to the department on the effectiveness of the corrective action program. The owner or operator shall submit these reports annually.

(8) If the owner or operator determines that the corrective action program no longer satisfies the requirements of this section, the owner or operator shall, within 90 days, submit an application to modify the license to make any appropriate changes to the program.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06; CR 16-007: am. (7) Register July 2017 No. 739, eff. 8-1-17.

NR 664.0101 Corrective action for solid waste management units. (1) The owner or operator of a facility seeking a license for the treatment, storage or disposal of hazardous waste shall institute corrective action as necessary to protect human health and the environment for all releases of hazardous waste or constituents from any solid waste management unit at the facility, regardless of the time at which waste was placed in the unit.

(2) Corrective action shall be specified in the license in accordance with this section and subch. S. The license shall contain schedules of compliance for the corrective action, where the corrective action cannot be completed prior to issuance of the license, and assurances of financial responsibility for completing the corrective action. Corrective action requirements shall be consistent with s. 291.37, Stats. Financial assurance requirements regarding corrective action requirements shall be consistent with s. 289.41 (2) to (12), Stats.

(3) The owner or operator shall implement corrective actions beyond the facility property boundary, where necessary to protect human health and the environment, unless the owner or operator demonstrates to the satisfaction of the department that, despite the owner's or operator's best efforts, the owner or operator was unable to obtain the necessary permission to undertake the actions. The owner or operator is not relieved of all responsibility to clean up a release that has migrated beyond the facility boundary where off-site access is denied. On-site measures to address the releases shall be determined on a case-by-case basis. Assurances of financial responsibility for the corrective action shall be provided.

(4) The requirements of this section do not apply to remediation waste management sites unless they are part of a facility sub-

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ject to a license for treating, storing or disposing of hazardous wastes that are not remediation wastes.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06; CR 19-082: am. (2) Register August 2020 No 776, eff. 9-1-20; correction in (2) made under s. 35.17, Stats., Register August 2020 No. 776.

Subchapter G — Closure and Long-Term Care

NR 664.0110 Applicability. Except as s. NR 664.0001 provides otherwise:

(1) Sections NR 664.0111 to 664.0115 (which concern closure) apply to the owners and operators of all hazardous waste management facilities.

(2) Sections NR 664.0116 to 664.0120 (which concern long-term care) apply to the owners and operators of all of the following:

(a) All hazardous waste disposal facilities.

(b) Waste piles and surface impoundments from which the owner or operator intends to remove the wastes at closure to the extent that these sections are made applicable to the facilities in s. NR 664.0228 or 664.0258.

(c) Tank systems that are required under s. NR 664.0197 to meet the requirements for landfills.

(d) Containment buildings that are required under s. NR 664.1102 to meet the requirements for landfills.

(3) The department may replace all or part of the requirements of this subchapter (and the unit-specific standards referenced in s. NR 664.0111 (3) applying to a regulated unit), with alternative requirements set out in an operating license or in an enforceable document (as defined in s. NR 670.001 (3) (g)), where the department determines that both of the following conditions are met:

(a) The regulated unit is situated among solid waste management units (or areas of concern), a release has occurred and both the regulated unit and one or more solid waste management units (or areas of concern) are likely to have contributed to the release.

(b) It is not necessary to apply the closure requirements of this subchapter (and those referenced in this subchapter) because the alternative requirements will protect human health and the environment and will satisfy the closure performance standard of s. NR 664.0111 (1) and (2).

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0111 Closure performance standard. The owner or operator shall close the facility in a manner that does all of the following:

(1) Minimizes the need for further maintenance.

(2) Controls, minimizes or eliminates, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated run-off or hazardous waste decomposition products to the ground or surface waters or to the atmosphere.

(3) Complies with the closure requirements of this subchapter, including, but not limited to, the requirements of ss. NR 664.0178, 664.0197, 664.0228, 664.0258, 664.0310, 664.0351, 664.0601 to 664.0603 and 664.1102.

(4) Meets, in the case of a landfill or surface impoundment, applicable requirements in ch. NR 140 and applicable soil cleanup standards in ch. NR 720 or meets the applicable closure requirements of sub. (2) or (3), whichever are more stringent.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0112 Closure plan; amendment of plan. (1) WRITTEN PLAN. (a) The owner or operator of a hazardous waste management facility shall have a written closure plan. In addition, certain surface impoundments and waste piles from which the owner or operator intends to remove or decontaminate the hazardous waste at partial or final closure are required by ss. NR 664.0228 (3) (a) 1. and 664.0258 (3) (a) 1. to have contingent closure plans. The plan shall be submitted with the feasibility and plan of operation report, in accordance with s. NR 670.014 (2) (m), and approved by the department as part of the operating license issuance procedures under subchs. L and M of ch. NR 670. In accordance with s. NR 670.032, the approved closure plan will become a condition of any hazardous waste operating license.

(b) The department's approval of the plan shall ensure that the approved closure plan is consistent with s. NR 664.0111, this section and ss. NR 664.0113 to 664.0115 and the applicable requirements of subch. F, ss. NR 664.0178, 664.0197, 664.0228, 664.0258, 664.0310, 664.0351, 664.0601 and 664.1102. Until final closure is completed and certified in accordance with s. NR 664.0115, a copy of the approved plan and all approved revisions shall be furnished to the department upon request, including requests by mail.

(2) CONTENT OF PLAN. The plan shall identify steps necessary to perform partial or final closure of the facility, or both, at any point during its active life. The closure plan shall include at least all of the following:

(a) A description of how each hazardous waste management unit at the facility will be closed in accordance with s. NR 664.0111.

(b) A description of how final closure of the facility will be conducted in accordance with s. NR 664.0111. The description shall identify the maximum extent of the operations which will be unclosed during the active life of the facility.

(c) An estimate of the maximum inventory of hazardous wastes ever on-site over the active life of the facility and a detailed description of the methods to be used during partial closures and final closure, including, but not limited to, methods for removing, transporting, treating, storing or disposing of all hazardous wastes, and identification of the types of the off-site hazardous waste management units to be used, if applicable.

(d) A detailed description of the steps needed to remove or decontaminate all hazardous waste residues and contaminated containment system components, equipment, structures and soils during partial and final closure, including, but not limited to, procedures for cleaning equipment and removing contaminated soils, methods for sampling and testing surrounding soils and criteria for determining the extent of decontamination required to satisfy the closure performance standard.

(e) A detailed description of other activities necessary during the closure period to ensure that all partial closures and final closure satisfy the closure performance standards, including, but not limited to, groundwater monitoring, leachate collection and run-on and run-off control.

(f) A schedule for closure of each hazardous waste management unit and for final closure of the facility. The schedule shall include, at a minimum, the total time required to close each hazardous waste management unit and the time required for intervening closure activities which will allow tracking of the progress of partial and final closure. (For example, in the case of a landfill unit, estimates of the time required to treat or dispose of all hazardous waste inventory and of the time required to place a final cover shall be included.)

(g) For facilities that use trust funds to establish financial assurance under s. NR 664.0143 or 664.0145 and that are expected to close prior to the expiration of the operating license, an estimate of the expected year of final closure.

(h) For facilities where the department has applied alternative

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requirements at a regulated unit under s. NR 664.0090 (6), 664.0110 (3) or 664.0140 (4), either the alternative requirements applying to the regulated unit, or a reference to the enforceable document containing those alternative requirements.

(3) AMENDMENT OF PLAN. The owner or operator shall submit a written notification of or request for an operating license modification to authorize a change in operating plans, facility design or the approved closure plan in accordance with the applicable procedures in ch. NR 670. The written notification or request shall include a copy of the amended closure plan for review or approval by the department.

(a) The owner or operator may submit a written notification or request to the department for an operating license modification to amend the closure plan at any time prior to the notification of partial or final closure of the facility.

(b) The owner or operator shall submit a written notification of or request for an operating license modification to authorize a change in the approved closure plan under any of the following circumstances:

1. Changes in operating plans or facility design affect the closure plan.

2. There is a change in the expected year of closure, if applicable.

3. In conducting partial or final closure activities, unexpected events require a modification of the approved closure plan.

4. The owner or operator requests the department to apply alternative requirements to a regulated unit under s. NR 664.0090 (6), 664.0110 (3) or 664.0140 (4).

(c) The owner or operator shall submit a written request for an operating license modification including a copy of the amended closure plan for approval at least 60 days prior to the proposed change in facility design or operation, or no later than 60 days after an unexpected event has occurred which has affected the closure plan. If an unexpected event occurs during the partial or final closure period, the owner or operator shall request an operating license modification no later than 30 days after the unexpected event. An owner or operator of a surface impoundment or waste pile that intends to remove all hazardous waste at closure and is not otherwise required to prepare a contingent closure plan under s. NR 664.0228 (3) (a) 1. or 664.0258 (3) (a) 1., shall submit an amended closure plan to the department no later than 60 days from the date that the owner or operator or department determines that the hazardous waste management unit must be closed as a landfill, subject to the requirements of s. NR 664.0310, or no later than 30 days from that date if the determination is made during partial or final closure. The department will approve, disapprove or modify this amended plan in accordance with the procedures in ch. NR 670. In accordance with s. NR 670.032, the approved closure plan will become a condition of any hazardous waste operating license issued.

(d) The department may request modifications to the plan under the conditions described in par. (b). The owner or operator shall submit the modified plan within 60 days of the department's request, or within 30 days if the change in facility conditions occurs during partial or final closure. Any modifications requested by the department will be approved in accordance with the procedures in ch. NR 670.

(4) NOTIFICATION OF PARTIAL CLOSURE AND FINAL CLOSURE. (a) The owner or operator shall notify the department in writing of the intent to close the facility at least 180 days prior to the partial or final closure of a hazardous waste facility.

(b) The date when the owner or operator "expects to begin closure" shall be either of the following:

1. No later than 30 days after the date on which any hazardous waste management unit receives the known final volume of hazardous wastes, or if there is a reasonable possibility that the hazardous waste management unit will receive additional hazardous wastes, no later than one year after the date on which the unit received the most recent volume of hazardous wastes. If the owner or operator of a hazardous waste management unit can demonstrate to the department that the hazardous waste management unit or facility has the capacity to receive additional hazardous wastes and the owner or operator has taken all steps to prevent threats to human health and the environment, including compliance with all applicable operating license requirements, the department may approve an extension to this one-year limit.

2. For units meeting the requirements of s. NR 664.0113 (4), no later than 30 days after the date on which the hazardous waste management unit receives the known final volume of non-hazardous wastes, or if there is a reasonable possibility that the hazardous waste management unit will receive additional non-hazardous wastes, no later than one year after the date on which the unit received the most recent volume of non-hazardous wastes. If the owner or operator can demonstrate to the department that the hazardous waste management unit has the capacity to receive additional non-hazardous wastes and the owner or operator has taken, and will continue to take, all steps to prevent threats to human health and the environment, including compliance with all applicable operating license requirements, the department may approve an extension to this one-year limit.

(c) If the facility's operating license is denied, suspended or revoked, or if the facility is otherwise ordered, by judicial decree or final order under 42 USC 6928 or by the department, to cease receiving hazardous wastes or to close, then the requirements of this subsection do not apply. However, the owner or operator shall close the facility in accordance with the deadlines established in s. NR 664.0113.

(5) REMOVAL OF WASTES AND DECONTAMINATION OR DISMANTLING OF EQUIPMENT. Nothing in this section shall preclude the owner or operator from removing hazardous wastes and decontaminating or dismantling equipment in accordance with the approved partial or final closure plan at any time before or after notification of partial or final closure.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06; CR 19-082: am. (4) (c) Register August 2020 No 776, eff. 9-1-20.

NR 664.0113 Closure; time allowed for closure. (1) Within 90 days after receiving the final volume of hazardous wastes, or the final volume of non-hazardous wastes if the owner or operator complies with all applicable requirements in subs. (4) and (5), at a hazardous waste management unit or facility, the owner or operator shall treat, remove from the unit or facility or dispose of on-site, all hazardous wastes in accordance with the approved closure plan. The department may approve a longer period if the owner or operator complies with all applicable requirements for requesting a modification to the operating license and demonstrates that the conditions in pars. (a) and (b) are met:

(a) Either of the following applies:

1. The activities required to comply with this subsection will, of necessity, take longer than 90 days to complete.

2. All of the following apply:

a. The hazardous waste management unit or facility has the capacity to receive additional hazardous wastes, or has the capacity to receive non-hazardous wastes if the owner or operator complies with subs. (4) and (5).

b. There is a reasonable likelihood that the owner or operator or another person will recommence operation of the hazardous waste management unit or the facility within one year.

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c. Closure of the hazardous waste management unit or facility would be incompatible with continued operation of the site.

(b) The owner or operator has taken and will continue to take all steps to prevent threats to human health and the environment, including compliance with all applicable operating license requirements.

(2) The owner or operator shall complete partial and final closure activities in accordance with the approved closure plan and within 180 days after receiving the final volume of hazardous wastes, or the final volume of non-hazardous wastes if the owner or operator complies with all applicable requirements in subs. (4) and (5), at the hazardous waste management unit or facility. The department may approve an extension to the closure period if the owner or operator complies with all applicable requirements for requesting a modification to the operating license and demonstrates that the conditions in pars. (a) and (b) are met:

(a) Either of the following applies:

1. The partial or final closure activities will, of necessity, take longer than 180 days to complete.

2. All of the following apply:

a. The hazardous waste management unit or facility has the capacity to receive additional hazardous wastes, or has the capacity to receive non-hazardous wastes if the owner or operator complies with subs. (4) and (5).

b. There is reasonable likelihood that the owner or operator or another person will recommence operation of the hazardous waste management unit or the facility within one year.

c. Closure of the hazardous waste management unit or facility would be incompatible with continued operation of the site.

(b) The owner or operator has taken and will continue to take all steps to prevent threats to human health and the environment from the unclosed but not operating hazardous waste management unit or facility, including compliance with all applicable operating license requirements.

(3) The demonstrations referred to in subs. (1) (a) and (2) (a) shall be made as follows:

(a) The demonstrations in sub. (1) (a) shall be made at least 30 days prior to the expiration of the 90-day period in sub. (1).

(b) The demonstration in sub. (2) (a) shall be made at least 30 days prior to the expiration of the 180-day period in sub. (2), unless the owner or operator is otherwise subject to the deadlines in sub. (4).

(4) The department may allow an owner or operator to receive only non-hazardous wastes in a landfill or surface impoundment unit after the final receipt of hazardous wastes at that unit if all the following conditions are met:

(a) The owner or operator requests an operating license modification in compliance with all applicable requirements in ch. NR 670 and in the license modification request demonstrates that all the following criteria are met:

1. The unit has the existing design capacity as indicated on the part A application to receive non-hazardous wastes.

2. There is a reasonable likelihood that the owner or operator or another person will receive non-hazardous wastes in the unit within one year after the final receipt of hazardous wastes.

3. The non-hazardous wastes will not be incompatible with any remaining wastes in the unit, or with the facility design and operating requirements of the unit or facility under this chapter.

4. Closure of the hazardous waste management unit would be incompatible with continued operation of the unit or facility.

5. The owner or operator is operating and will continue to operate in compliance with all applicable operating license requirements.

(b) The request to modify the operating license includes an amended waste analysis plan, groundwater monitoring and response program, human exposure assessment required under 42 USC 6939a and closure and long-term care plans, and updated cost estimates and demonstrations of financial assurance for closure and long-term care as necessary and appropriate, to reflect any changes due to the presence of hazardous constituents in the non-hazardous wastes, and changes in closure activities, including the expected year of closure if applicable under s. NR 664.0112 (2) (g), as a result of the receipt of non-hazardous wastes following the final receipt of hazardous wastes.

(c) The request to modify the operating license includes revisions, as necessary and appropriate, to affected conditions of the license to account for the receipt of non-hazardous wastes following receipt of the final volume of hazardous wastes.

(d) The request to modify the operating license and the demonstrations referred to in pars. (a) and (b) are submitted to the department no later than 120 days prior to the date on which the owner or operator of the facility receives the known final volume of hazardous wastes at the unit, or no later than 90 days after August 1, 2006, whichever is later.

(5) In addition to the requirements in sub. (4), an owner or operator of a hazardous waste surface impoundment that is not in compliance with the liner and leachate collection system requirements in 42 USC 6924(o)(1) and 6925(j)(1) or 42 USC 6924(o)(2) or (3) or 6925(j)(2), (3), (4) or (13) shall do all of the following:

(a) Submit with the request to modify the operating license both of the following:

1. A contingent corrective measures plan, unless a corrective action plan has already been submitted under s. NR 664.0099.

2. A plan for removing hazardous wastes in compliance with par. (b).

(b) Remove all hazardous wastes from the unit by removing all hazardous liquids, and removing all hazardous sludges to the extent practicable without impairing the integrity of the liners, if any.

(c) Removal of hazardous wastes shall be completed no later than 90 days after the final receipt of hazardous wastes. The department may approve an extension to this deadline if the owner or operator demonstrates that the removal of hazardous wastes will, of necessity, take longer than the allotted period to complete and that an extension will not pose a threat to human health and the environment.

(d) If a release that is a statistically significant increase (or decrease in the case of pH) over background values for detection monitoring parameters or constituents specified in the operating license or that exceeds the facility's groundwater protection standard at the point of standards application, if applicable, is detected in accordance with the requirements in subch. F, the owner or operator of the unit:

1. Shall implement corrective measures in accordance with the approved contingent corrective measures plan required by par. (a) no later than one year after detection of the release, or approval of the contingent corrective measures plan, whichever is later.

2. May continue to receive wastes at the unit following detection of the release only if the approved corrective measures plan includes a demonstration that continued receipt of wastes will not impede corrective action.

3. May be required by the department to implement correc-

tive measures in less than one year or to cease the receipt of wastes until corrective measures have been implemented if necessary to protect human health and the environment.

(e) During the period of corrective action, the owner or operator shall provide annual reports to the department that describe the progress of the corrective action program, compile all groundwater monitoring data, and evaluate the effect of the continued receipt of non-hazardous wastes on the effectiveness of the corrective action.

(f) The department may require the owner or operator to commence closure of the unit if the owner or operator fails to implement corrective action measures in accordance with the approved contingent corrective measures plan within one year as required in par. (d), or fails to make substantial progress in implementing corrective action and achieving the facility's groundwater protection standard or background levels if the facility has not yet established a groundwater protection standard.

(g) If the owner or operator fails to implement corrective measures as required in par. (d), or if the department determines that substantial progress has not been made pursuant to par. (f), the department shall:

1. Notify the owner or operator in writing that the owner or operator shall begin closure in accordance with the deadlines in subs. (1) and (2) and provide a detailed statement of reasons for this determination.

2. Provide the owner or operator and the public, through a newspaper notice, the opportunity to submit written comments on the decision no later than 20 days after the date of the notice.

3. If the department receives no written comments, the decision will become final 5 days after the close of the comment period. The department will notify the owner or operator that the decision is final, and that a revised closure plan, if necessary, shall be submitted within 15 days of the final notice and that closure shall begin in accordance with the deadlines in subs. (1) and (2).

4. If the department receives written comments on the decision, it shall make a final decision within 30 days after the end of the comment period, and provide the owner or operator in writing and the public through a newspaper notice, a detailed statement of reasons for the final decision. If the department determines that substantial progress has not been made, closure shall be initiated in accordance with the deadlines in subs. (1) and (2).

5. The final determinations made by the department under subds. 3. and 4. are not subject to administrative appeal.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06; CR 16-007: am. (5) (e) Register July 2017 No. 739, eff. 8-1-17.

NR 664.0114 Disposal or decontamination of equipment, structures and soils. During the partial and final closure periods, all contaminated equipment, structures and soils shall be properly disposed of or decontaminated unless otherwise specified in s. NR 664.0197, 664.0228, 664.0258 or 664.0310, or under the authority of ss. NR 664.0601 and 664.0603. By removing any hazardous wastes or hazardous constituents during partial and final closure, the owner or operator may become a generator of hazardous waste and shall handle that waste in accordance with all applicable requirements of ch. NR 662.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0115 Certification of closure. Within 60 days of completion of closure of each hazardous waste surface impoundment, waste pile and landfill unit, and within 60 days of the completion of final closure, the owner or operator shall submit to the department, by registered mail, a certification that the hazardous waste management unit or facility, as applicable, has been closed in accordance with the specifications in the approved closure plan. The certification shall be signed by the owner or operator and by a qualified professional engineer. Documentation supporting the professional engineer's certification shall be furnished to the department upon request until the department releases the owner or operator from the financial assurance requirements for closure under s. NR 664.0143 (11).

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06; CR 16-007: am. Register July 2017 No. 739, eff. 8-1-17.

NR 664.0116 Survey plat. No later than the submission of the certification of closure of each hazardous waste disposal unit, the owner or operator shall submit to the local zoning authority, or the authority with jurisdiction over local land use, and to the department, a survey plat indicating the location and dimensions of landfill cells or other hazardous waste disposal units with respect to permanently surveyed benchmarks. This plat shall be prepared and certified by a professional land surveyor. The plat filed with the local zoning authority, or the authority with jurisdiction over local land use, shall contain a note, prominently displayed, which states the owner's or operator's obligation to restrict disturbance of the hazardous waste disposal unit according to the applicable rules of this subchapter.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0117 Long-term care and use of property.

(1) (a) Long-term care for each hazardous waste management unit subject to the requirements of this section and ss. NR 664.0118 to 664.0120 shall begin after completion of closure of the unit and continue for a minimum of 40 years after that date and shall consist of at least both of the following:

1. Monitoring and reporting in accordance with the requirements of subchs. F, K, L, N and X.

2. Maintenance and monitoring of waste containment systems in accordance with the requirements of subchs. F, K, L, N and X.

(b) Any time preceding partial closure of a hazardous waste management unit subject to long-term care requirements or final closure, or any time during the long-term care period for a particular unit, the department may, in accordance with the operating license modification procedures in ch. NR 670 extend the long-term care period applicable to the hazardous waste management unit or facility if the department finds that the extended period is necessary to protect human health and the environment (e.g., leachate or groundwater monitoring results indicate a potential for migration of hazardous wastes at levels which may be harmful to human health and the environment).

(2) The department may require, at partial and final closure, continuation of any of the security requirements of s. NR 664.0014 during part or all of the long-term care period under either of the following circumstances:

(a) Hazardous wastes may remain exposed after completion of partial or final closure.

(b) Access by the public or domestic livestock may pose a hazard to human health.

(3) Post-closure use of property on or in which hazardous wastes remain after partial or final closure may never be allowed to disturb the integrity of the final cover, liners or any other components of the containment system, or the function of the facility's monitoring systems, unless the department finds that either of the following applies:

(a) The disturbance is necessary to the proposed use of the property, and will not increase the potential hazard to human health or the environment.

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(b) The disturbance is necessary to reduce a threat to human health or the environment.

(4) All long-term care activities shall be in accordance with the provisions of the approved long-term care plan as specified in s. NR 664.0118.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0118 Long-term care plan; amendment of plan. (1) WRITTEN PLAN. The owner or operator of a hazardous waste disposal unit shall have a written long-term care plan. In addition, certain surface impoundments and waste piles from which the owner or operator intends to remove or decontaminate the hazardous wastes at partial or final closure are required by ss. NR 664.0228 (3) (a) 2. and 664.0258 (3) (a) 2. to have contingent long-term care plans. Owners or operators of surface impoundments and waste piles not otherwise required to prepare contingent long-term care plans under ss. NR 664.0228 (3) (a) 2. and 664.0258 (3) (a) 2. shall submit a long-term care plan to the department within 90 days from the date that the owner or operator or department determines that the hazardous waste management unit must be closed as a landfill, subject to the requirements of s. NR 664.0117, this section, ss. NR 664.0119 and 664.0120. The plan shall be submitted with the feasibility and plan of operation report, in accordance with s. NR 670.014 (2) (m), and approved by the department as part of the operating license issuance procedures under subchs. L and M of ch. NR 670. In accordance with s. NR 670.032, the approved long-term care plan will become a condition of any hazardous waste operating license issued.

(2) CONTENT OF PLAN. For each hazardous waste management unit subject to the requirements of this section, the long-term care plan shall identify the activities that will be carried on after closure of each disposal unit and the frequency of these activities, and include at least all of the following:

(a) A description of the planned monitoring activities and frequencies at which they will be performed to comply with subchs. F, K, L, N and X during the long-term care period.

(b) A description of the planned maintenance activities, and frequencies at which they will be performed, to ensure both of the following:

1. The integrity of the cap and final cover or other containment systems in accordance with the requirements of subchs. F, K, L, N and X.

2. The function of the monitoring equipment in accordance with the requirements of subchs. F, K, L, N and X.

(c) The name, address and phone number of the person or office to contact about the hazardous waste disposal unit or facility during the long-term care period.

(d) For facilities where the department has applied alternative requirements at a regulated unit under s. NR 664.0090 (6), 664.0110 (3) or 664.0140 (4), either the alternative requirements that apply to the regulated unit, or a reference to the enforceable document containing those requirements.

(3) AVAILABILITY OF PLAN. Until final closure of the facility, a copy of the approved long-term care plan shall be furnished to the department upon request, including request by mail. After final closure has been certified, the person or office specified in sub. (2) (c) shall keep the approved long-term care plan during the remainder of the long-term care period.

(4) AMENDMENT OF PLAN. The owner or operator shall submit a written notification of or request for an operating license modification to authorize a change in the approved long-term care plan in accordance with the applicable requirements in ch. NR 670. The written notification or request shall include a copy of the amended long-term care plan for review or approval by the department.

(a) The owner or operator may submit a written notification or request to the department for an operating license modification to amend the long-term care plan at any time during the active life of the facility or during the long-term care period.

(b) The owner or operator shall submit a written notification of or request for an operating license modification to authorize a change in the approved long-term care plan whenever any of the following occurs:

1. Changes in operating plans or facility design affect the approved long-term care plan.

2. There is a change in the expected year of final closure, if applicable.

3. Events which occur during the active life of the facility, including partial and final closures, affect the approved long-term care plan.

4. The owner or operator requests the department to apply alternative requirements to a regulated unit under s. NR 664.0090 (6), 664.0110 (3) or 664.0140 (4).

(c) The owner or operator shall submit a written request for an operating license modification at least 60 days prior to the proposed change in facility design or operation, or no later than 60 days after an unexpected event has occurred which has affected the long-term care plan. An owner or operator of a surface impoundment or waste pile that intends to remove all hazardous waste at closure and is not otherwise required to submit a contingent long-term care plan under ss. NR 664.0228 (3) (a) 2. and 664.0258 (3) (a) 2. shall submit a long-term care plan to the department no later than 90 days after the date that the owner or operator or department determines that the hazardous waste management unit must be closed as a landfill, subject to the requirements of s. NR 664.0310. The department will approve, disapprove or modify this plan in accordance with the procedures in ch. NR 670. In accordance with s. NR 670.032, the approved long-term care plan will become an operating license condition.

(d) The department may request modifications to the plan under the conditions described in par. (b). The owner or operator shall submit the modified plan no later than 60 days after the department's request, or no later than 90 days if the unit is a surface impoundment or waste pile not previously required to prepare a contingent long-term care plan. Any modifications requested by the department will be approved, disapproved or modified in accordance with the procedures in ch. NR 670.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0119 Long-term care notices. (1) No later than 60 days after certification of closure of each hazardous waste disposal unit, the owner or operator shall submit to the local zoning authority, or the authority with jurisdiction over local land use, and to the department a record of the type, location and quantity of hazardous wastes disposed of within each cell or other disposal unit of the facility. For hazardous wastes disposed of before July 1, 1985, the owner or operator shall identify the type, location and quantity of the hazardous wastes to the best of the owner's or operator's knowledge and in accordance with any records the owner or operator has kept.

(2) Within 60 days of certification of closure of the first hazardous waste disposal unit and within 60 days of certification of closure of the last hazardous waste disposal unit, the owner or operator shall do both of the following:

(a) Record, in accordance with ch. 706, Stats., a notation on the deed to the facility property, or on some other instrument which is normally examined during title search, that will in per-

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petuity notify any potential purchaser of the property of all of the following:

1. The land has been used to manage hazardous wastes.

2. Its use is restricted under this subchapter.

3. The survey plat and record of the type, location and quantity of hazardous wastes disposed of within each cell or other hazardous waste disposal unit of the facility required by s. NR 664.0116 and sub. (1) have been filed with the local zoning authority or the authority with jurisdiction over local land use and with the department.

(b) Submit a certification, signed by the owner or operator, that the owner or operator has recorded the notation specified in par. (a), including a copy of the document in which the notation has been placed, to the department.

(3) If the owner or operator or any subsequent owner or operator of the land upon which a hazardous waste disposal unit is located wishes to remove hazardous wastes and hazardous waste residues, the liner, if any, or contaminated soils, the owner or operator shall request a modification to the long-term care license in accordance with the applicable requirements in ch. NR 670. The owner or operator shall demonstrate that the removal of hazardous wastes will satisfy the criteria of s. NR 664.0117 (3). By removing hazardous waste, the owner or operator may become a generator of hazardous waste and shall manage it in accordance with all applicable requirements of chs. NR 660 to 673. If the owner or operator is granted a license modification or otherwise granted approval to conduct the removal activities, the owner or operator may request that the department approve either of the following:

(a) The removal of the notation on the deed to the facility property or other instrument normally examined during title search.

(b) The addition of a notation to the deed or instrument indicating the removal of the hazardous waste.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0120 Certification of completion of long-term care. No later than 60 days after completion of the established long-term care period for each hazardous waste disposal unit, the owner or operator shall submit to the department, by registered mail, a certification that the long-term care period for the hazardous waste disposal unit was performed in accordance with the specifications in the approved long-term care plan. The owner or operator and a qualified professional engineer shall sign the certification. Documentation supporting the professional engineer's certification shall be furnished to the department upon request until the department releases the owner or operator from the financial assurance requirements for long-term care under s. NR 664.0145 (11).

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06; CR 16-007: am. Register July 2017 No. 739, eff. 8-1-17.

Subchapter H — Financial Requirements

NR 664.0140 Applicability. (1) The requirements of ss. NR 664.0142, 664.0143 and 664.0147 to 664.0151 apply to owners and operators of all hazardous waste facilities, except as provided otherwise in this section or in s. NR 664.0001.

(2) The requirements of ss. NR 664.0144 and 664.0145 apply only to owners and operators of one or more of the following:

(a) Disposal facilities.

(b) Piles and surface impoundments from which the owner or operator intends to remove the wastes at closure, to the extent that these sections are made applicable to the facilities in ss. NR 664.0228 and 664.0258.

(c) Tank systems that are required under s. NR 664.0197 to meet the requirements for landfills.

(d) Containment buildings that are required under s. NR 664.1102 to meet the requirements for landfills.

(3) States and the federal government are exempt from the requirements of s. NR 664.0147.

(4) The department may replace all or part of the requirements of this subchapter applying to a regulated unit with alternative requirements for financial assurance set out in the license or in an enforceable document (as defined in s. NR 670.001 (3) (g)), where the department does all of the following:

(a) Prescribes alternative requirements for the regulated unit under s. NR 664.0090 (6) or 664.0110 (3) or both.

(b) Determines that it is not necessary to apply the requirements of this subchapter because the alternative financial assurance requirements will protect human health and the environment.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0141 Definitions. When used in this subchapter, the following terms have the meanings given below.

(1) "Captive insurance company" means a closely-held company owned by one or more organizations, parents, whose original purpose was and may continue to be, to insure some or all of the risks of shareholders or affiliated organizations.

(2) "Closure plan" means the plan for closure prepared in accordance with the requirements of s. NR 664.0112.

(3) "Current closure cost estimate" means the most recent of the estimates prepared in accordance with s. NR 664.0142 (1) to (3).

(4) "Current long-term care cost estimate" means the most recent of the estimates prepared in accordance with s. NR 664.0144 (1) to (3).

(5) "Parent corporation" means a corporation which directly owns at least 50% of the voting stock of the corporation which is the facility owner or operator; the latter corporation is deemed a "subsidiary" of the parent corporation.

(6) "Long-term care plan" means the plan for long-term care prepared in accordance with the requirements of ss. NR 664.0117 to 664.0120.

(7) The following terms are used in the specifications for the financial tests for liability coverage. The definitions are intended to assist in the understanding of this chapter and are not intended to limit the meanings of terms in a way that conflicts with generally accepted accounting practices.

(a) "Assets" means all existing and all probable future economic benefits obtained or controlled by a particular entity.

(b) "Current assets" means cash or other assets or resources commonly identified as those which are reasonably expected to be realized in cash or sold or consumed during the normal operating cycle of the business.

(c) "Current liabilities" means obligations whose liquidation is reasonably expected to require the use of existing resources properly classifiable as current assets or the creation of other current liabilities.

(d) "Current plugging and abandonment cost estimate" means the most recent of the estimates prepared in accordance with ch. NR 815.

(e) "Independently audited" refers to an audit performed by an independent certified public accountant in accordance with generally accepted auditing standards.

(f) "Liabilities" means probable future sacrifices of economic benefits arising from present obligations to transfer assets or pro-

NR 664.0257 Special requirements for incompatible wastes. (1) Incompatible wastes, or incompatible wastes and materials, (see ch. NR 664 Appendix V for examples) may not be placed in the same pile, unless s. NR 664.0017 (2) is complied with.

(2) A pile of hazardous waste that is incompatible with any waste or other material stored nearby in containers, other piles, open tanks or surface impoundments shall be separated from the other materials, or protected from them by means of a dike, berm, wall or other device.

(3) Hazardous waste may not be piled on the same base where incompatible wastes or materials were previously piled, unless the base has been decontaminated sufficiently to ensure compliance with s. NR 664.0017 (2).

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06; correction in (1) made under s. 13.92 (4) (b) 7., Stats., Register March 2013 No. 687.

NR 664.0258 Closure and long-term care. (1) At closure, the owner or operator shall remove or decontaminate all waste residues, contaminated containment system components (liners, etc.), contaminated subsoils and structures and equipment contaminated with waste and leachate, and manage them as hazardous waste unless s. NR 661.0003 (4) applies.

(2) If, after removing or decontaminating all residues and making all reasonable efforts to effect removal or decontamination of contaminated components, subsoils, structures and equipment as required in sub. (1), the owner or operator finds that not all contaminated subsoils can be practicably removed or decontaminated, the owner or operator shall close the facility and perform long-term care in accordance with the closure and long-term care requirements that apply to landfills (s. NR 664.0310).

(3) (a) The owner or operator of a waste pile that does not comply with the liner requirements of s. NR 664.0251 (1) (a) and is not exempt from them in accordance with s. NR 664.0250 (3) or 664.0251 (2), shall do both of the following:

1. Include in the closure plan for the pile under s. NR 664.0112 both a plan for complying with sub. (1) and a contingent plan for complying with sub. (2) in case not all contaminated subsoils can be practicably removed at closure.

2. Prepare a contingent long-term care plan under s. NR 664.0118 for complying with sub. (2) in case not all contaminated subsoils can be practicably removed at closure.

(b) The cost estimates calculated under ss. NR 664.0142 and 664.0144 for closure and long-term care of a pile subject to this subsection shall include the cost of complying with the contingent closure plan and the contingent long-term care plan, but are not required to include the cost of expected closure under sub. (1).

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06; CR 19-082: am. (1) Register August 2020 No 776, eff. 9-1-20.

NR 664.0259 Special requirements for hazardous wastes F020, F021, F022, F023, F026 and F027. (1) Hazardous wastes F020, F021, F022, F023, F026 and F027 may not be placed in waste piles that are not enclosed (as defined in s. NR 664.0250 (3)) unless the owner or operator operates the waste pile in accordance with a management plan for these wastes that is approved by the department pursuant to the standards set out in this subsection, and in accord with all other applicable requirements of this chapter. All of the following factors shall be considered:

(a) The volume and physical and chemical characteristics of the wastes, including their potential to migrate through soil or to volatilize or escape into the atmosphere.

(b) The attenuative properties of underlying and surrounding soils or other materials.

(c) The mobilizing properties of other materials co-disposed with these wastes.

(d) The effectiveness of additional treatment, design or monitoring techniques.

(2) The department may determine that additional design, operating and monitoring requirements are necessary for piles managing hazardous wastes F020, F021, F022, F023, F026 and F027 in order to reduce the possibility of migration of these wastes to groundwater, surface water or air so as to protect human health and the environment.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

Subchapter M — Land Treatment

NR 664.0270 Applicability. Land treatment of any hazardous waste is prohibited. The department may not grant a variance under s. 291.31, Stats., to allow land treatment of any hazardous waste, as identified or listed in ch. NR 661.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

Subchapter N — Landfills

NR 664.0300 Applicability. This subchapter applies to owners and operators of facilities that dispose of hazardous waste in landfills, except as s. NR 664.0001 provides otherwise.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0301 Design and operating requirements. (1) Any landfill that is not covered by sub. (3) or s. NR 665.0301 (1) shall have a liner system for all portions of the landfill (except for existing portions of the landfill). The liner system shall have both of the following:

(a) A liner that is designed, constructed and installed to prevent any migration of wastes out of the landfill to the adjacent subsurface soil or groundwater or surface water at any time during the active life (including the closure period) of the landfill. The liner shall be constructed of materials that prevent wastes from passing into the liner during the active life of the facility. The liner shall be all of the following:

1. Constructed of materials that have appropriate chemical properties and sufficient strength and thickness to prevent failure due to pressure gradients (including static head and external hydrogeologic forces), physical contact with the waste or leachate to which they are exposed, climatic conditions, the stress of installation and the stress of daily operation.

2. Placed upon a foundation or base capable of providing support to the liner and resistance to pressure gradients above and below the liner to prevent failure of the liner due to settlement, compression or uplift.

3. Installed to cover all surrounding earth likely to be in contact with the waste or leachate.

(b) A leachate collection and removal system immediately above the liner that is designed, constructed, maintained and operated to collect and remove leachate from the landfill. The department shall specify design and operating conditions in the operating license to ensure that the leachate depth over the liner does not exceed 30 cm (one foot). The leachate collection and removal system shall be both of the following:

1. Constructed of materials that are both of the following:

a. Chemically resistant to the waste managed in the landfill and the leachate expected to be generated.

b. Of sufficient strength and thickness to prevent collapse under the pressures exerted by overlying wastes, waste cover materials and any equipment used at the landfill.

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2. Designed and operated to function without clogging through the scheduled closure of the landfill.

(2) The owner or operator will be exempted from the requirements of sub. (1) if the department finds, based on a demonstration by the owner or operator, that alternative design and operating practices, together with location characteristics, will prevent the migration of any hazardous constituents (see s. NR 664.0093) into the groundwater or surface water at any future time. In deciding whether to grant an exemption, the department will consider all of the following:

(a) The nature and quantity of the wastes.

(b) The proposed alternate design and operation.

(c) The hydrogeologic setting of the facility, including the attenuative capacity and thickness of the liners and soils present between the landfill and groundwater or surface water.

(d) All other factors which would influence the quality and mobility of the leachate produced and the potential for it to migrate to groundwater or surface water.

(3) The owner or operator of each new landfill unit on which construction commences after June 1, 1995, each lateral expansion of a landfill unit on which construction commences after June 1, 1995, and each replacement of an existing landfill unit that is to commence reuse after June 1, 1995 shall install 2 or more liners and a leachate collection and removal system above and between the liners. "Construction commences" is as defined in s. NR 660.10 under "existing facility".

(a) 1. The liner system shall include both of the following:

a. A top liner designed and constructed of materials (e.g., a geomembrane) to prevent the migration of hazardous constituents into the liner during the active life and long-term care period.

b. A composite bottom liner, consisting of at least 2 components. The upper component shall be designed and constructed of materials (e.g., a geomembrane) to prevent the migration of hazardous constituents into this component during the active life and long-term care period. The lower component shall be designed and constructed of materials to minimize the migration of hazardous constituents if a breach in the upper component were to occur. The lower component shall be constructed of at least 3 feet (91 cm) of compacted soil material with a hydraulic conductivity of no more than 1×10^{-7} cm/sec.

2. The liners shall comply with sub. (1) (a) 1., 2. and 3.

(b) The leachate collection and removal system immediately above the top liner shall be designed, constructed, operated and maintained to collect and remove leachate from the landfill during the active life and long-term care period. The department will specify design and operating conditions in the operating license to ensure that the leachate depth over the liner does not exceed 30 cm (one foot). The leachate collection and removal system shall comply with par. (c) 3. and 4.

(c) The leachate collection and removal system between the liners, and immediately above the bottom composite liner in the case of multiple leachate collection and removal systems, is also a leak detection system. This leak detection system shall be capable of detecting, collecting and removing leaks of hazardous constituents at the earliest practicable time through all areas of the top liner likely to be exposed to waste or leachate during the active life and long-term care period. The requirements for a leak detection system in this subsection are satisfied by installation of a system that is, at a minimum, all of the following:

1. Constructed with a bottom slope of 1% or more.

2. Constructed of granular drainage materials with a hydraulic conductivity of 1×10^{-2} cm/sec or more and a thickness of 12 inches (30.5 cm) or more; or constructed of synthetic or geonet drainage materials with a transmissivity of 3×10^{-5} m^2/sec or more.

3. Constructed of materials that are chemically resistant to the waste managed in the landfill and the leachate expected to be generated, and of sufficient strength and thickness to prevent collapse under the pressures exerted by overlying wastes, waste cover materials and equipment used at the landfill.

4. Designed and operated to minimize clogging during the active life and long-term care period.

5. Constructed with sumps and liquid removal methods (e.g., pumps) of sufficient size to collect and remove liquids from the sump and prevent liquids from backing up into the drainage layer. Each unit shall have its own sump. The design of each sump and removal system shall provide a method for measuring and recording the volume of liquids present in the sump and of liquids removed.

(d) The owner or operator shall collect and remove pumpable liquids in the leak detection system sumps to minimize the head on the bottom liner.

(e) The owner or operator of a leak detection system that is not located completely above the seasonal high water table shall demonstrate that the operation of the leak detection system will not be adversely affected by the presence of groundwater.

(4) The department may approve alternative design or operating practices to those specified in sub. (3) if the owner or operator demonstrates to the department that the design and operating practices, together with location characteristics, will do both of the following:

(a) Prevent the migration of any hazardous constituent into the groundwater or surface water at least as effectively as the liners and leachate collection and removal systems specified in sub. (3).

(b) Allow detection of leaks of hazardous constituents through the top liner at least as effectively.

(5) The double liner requirement in sub. (3) may be waived by the department for any monofill, if pars. (a) and (b) 1. or 2. apply:

(a) The monofill contains only hazardous wastes from foundry furnace emission controls or metal casting molding sand, and the wastes do not contain constituents which would render the wastes hazardous for reasons other than the toxicity characteristic in s. NR 661.0024, with EPA hazardous waste numbers D004 to D017.

(b) 1. All of the following conditions are met:

a. The monofill has at least one liner for which there is no evidence that the liner is leaking.

b. The monofill is located more than one-quarter mile from an underground source of drinking water (as that term is defined in 40 CFR 144.3).

c. The monofill is in compliance with generally applicable groundwater monitoring requirements for facilities with operating licenses under s. 291.25, Stats.

2. The owner or operator demonstrates that the monofill is located, designed and operated so as to assure that there will be no migration of any hazardous constituent into groundwater or surface water at any future time.

(6) The owner or operator of any replacement landfill unit is exempt from sub. (3) if both of the following apply:

(a) The existing unit was constructed in compliance with the design standards of 42 USC 6924(o)(1)(A)(i) and (5).

(b) There is no reason to believe that the liner is not functioning as designed.

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(7) The owner or operator shall design, construct, operate and maintain a run-on control system capable of preventing flow onto the active portion of the landfill during peak discharge from at least a 25-year storm.

(8) The owner or operator shall design, construct, operate and maintain a run-off management system to collect and control at least the water volume resulting from a 24-hour, 25-year storm.

(9) Collection and holding facilities (e.g., tanks or basins) associated with run-on and run-off control systems shall be emptied or otherwise managed expeditiously after storms to maintain design capacity of the system.

(10) If the landfill contains any particulate matter which may be subject to wind dispersal, the owner or operator shall cover or otherwise manage the landfill to control wind dispersal.

(11) The department shall specify in the operating license all design and operating practices that are necessary to ensure that the requirements of this section are satisfied.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06; CR 19-082: am. (5) (a) Register August 2020 No 776.

NR 664.0302 Action leakage rate. (1) The department shall approve an action leakage rate for landfill units subject to s. NR 664.0301 (3) or (4). The action leakage rate is the maximum design flow rate that the leak detection system can remove without the fluid head on the bottom liner exceeding one foot. The action leakage rate shall include an adequate safety margin to allow for uncertainties in the design (e.g., slope, hydraulic conductivity, thickness of drainage material), construction, operation and location of the leak detection system, waste and leachate characteristics, likelihood and amounts of other sources of liquids in the leak detection system and proposed response actions (e.g., the action leakage rate shall consider decreases in the flow capacity of the system over time resulting from siltation and clogging, rib layover and creep of synthetic components of the system, overburden pressures, etc.).

(2) To determine if the action leakage rate has been exceeded, the owner or operator shall convert the weekly or monthly flow rate from the monitoring data obtained under s. NR 664.0303 (3), to an average daily flow rate (gallons per acre per day) for each sump. Unless the department approves a different calculation, the average daily flow rate for each sump shall be calculated weekly during the active life and closure period, and monthly during the long-term care period when monthly monitoring is required under s. NR 664.0303 (3).

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0303 Monitoring and inspection. (1) During construction or installation, liners (except in the case of existing portions of landfills exempt from s. NR 664.0301 (1)) and cover systems (e.g., membranes, sheets or coatings) shall be inspected for uniformity, damage and imperfections (e.g., holes, cracks, thin spots or foreign materials). Both of the following inspections are required immediately after construction or installation:

(a) Synthetic liners and covers shall be inspected to ensure tight seams and joints and the absence of tears, punctures or blisters.

(b) Soil-based and admixed liners and covers shall be inspected for imperfections including lenses, cracks, channels, root holes or other structural non-uniformities that may cause an increase in the permeability of the liner or cover.

(2) While a landfill is in operation, it shall be inspected weekly and after storms to detect evidence of any of the following:

(a) Deterioration, malfunctions or improper operation of run-on and run-off control systems.

(b) Proper functioning of wind dispersal control systems, where present.

(c) The presence of leachate in and proper functioning of leachate collection and removal systems, where present.

(3) (a) An owner or operator required to have a leak detection system under s. NR 664.0301 (3) or (4) shall record the amount of liquids removed from each leak detection system sump at least once each week during the active life and closure period.

(b) After the final cover is installed, the amount of liquids removed from each leak detection system sump shall be recorded at least monthly. If the liquid level in the sump stays below the pump operating level for 2 consecutive months, the amount of liquids in the sumps shall be recorded at least quarterly. If the liquid level in the sump stays below the pump operating level for 2 consecutive quarters, the amount of liquids in the sumps shall be recorded at least semi-annually. If at any time during the long-term care period the pump operating level is exceeded at units on quarterly or semi-annual recording schedules, the owner or operator shall return to monthly recording of amounts of liquids removed from each sump until the liquid level again stays below the pump operating level for 2 consecutive months.

(c) "Pump operating level" is a liquid level proposed by the owner or operator and approved by the department based on pump activation level, sump dimensions and level that avoids backup into the drainage layer and minimizes head in the sump.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0304 Response actions. (1) The owner or operator of landfill units subject to s. NR 664.0301 (3) or (4) shall have an approved response action plan before receipt of waste. The response action plan shall set forth the actions to be taken if the action leakage rate has been exceeded. At a minimum, the response action plan shall describe the actions specified in sub. (2).

(2) If the flow rate into the leak detection system exceeds the action leakage rate for any sump, the owner or operator shall do all of the following:

(a) Notify the department in writing of the exceedence within 7 days of the determination.

(b) Submit a preliminary written assessment to the department within 14 days of the determination, as to the amount of liquids, likely sources of liquids, possible location, size and cause of any leaks and short-term actions taken and planned.

(c) Determine to the extent practicable the location, size and cause of any leak.

(d) Determine whether waste receipt should cease or be curtailed, whether any waste should be removed from the unit for inspection, repairs or controls and whether or not the unit should be closed.

(e) Determine any other short-term and longer-term actions to be taken to mitigate or stop any leaks.

(f) Within 30 days after the notification that the action leakage rate has been exceeded, submit to the department the results of the analyses specified pars. (c), (d) and (e), the results of actions taken and actions planned. Monthly thereafter, as long as the flow rate in the leak detection system exceeds the action leakage rate, the owner or operator shall submit to the department a report summarizing the results of any remedial actions taken and actions planned.

(3) To make the leak and remediation determinations in sub. (2) (c), (d) and (e), the owner or operator shall comply with par. (a) or (b):

(a) Do all of the following:

1. Assess the source of liquids and amounts of liquids by source.

2. Conduct a fingerprint, hazardous constituent or other analyses of the liquids in the leak detection system to identify the source of liquids and possible location of any leaks, and the hazard and mobility of the liquid.

3. Assess the seriousness of any leaks in terms of potential for escaping into the environment.

(b) Document why the assessments are not needed.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0309 Surveying and recordkeeping. The owner or operator of a landfill shall maintain both of the following items in the operating record required under s. NR 664.0073:

(1) On a map, the exact location and dimensions, including depth, of each cell with respect to permanently surveyed benchmarks.

(2) The contents of each cell and the approximate location of each hazardous waste type within each cell.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0310 Closure and long-term care. (1) At final closure of the landfill or upon closure of any cell, the owner or operator shall cover the landfill or cell with a final cover designed and constructed to do all of the following:

(a) Provide long-term minimization of migration of liquids through the closed landfill.

(b) Function with minimum maintenance.

(c) Promote drainage and minimize erosion or abrasion of the cover.

(d) Accommodate settling and subsidence so that the cover's integrity is maintained.

(e) Have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present.

(2) After final closure, the owner or operator shall comply with all long-term care requirements contained in ss. NR 664.0117 to 664.0120, including maintenance and monitoring throughout the long-term care period (specified in the operating license under s. NR 664.0117). The owner or operator shall do all of the following:

(a) Maintain the integrity and effectiveness of the final cover, including making repairs to the cap as necessary to correct the effects of settling, subsidence, erosion or other events.

(b) Continue to operate the leachate collection and removal system until leachate is no longer detected.

(c) Maintain and monitor the leak detection system in accordance with ss. NR 664.0301 (3) (c) 4. and (d) and 664.0303 (3), and comply with all other applicable leak detection system requirements of this chapter.

(d) Maintain and monitor the groundwater monitoring system and comply with all other applicable requirements of subch. F.

(e) Prevent run-on and run-off from eroding or otherwise damaging the final cover.

(f) Protect and maintain surveyed benchmarks used in complying with s. NR 664.0309.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0312 Special requirements for ignitable or reactive waste. (1) Except as provided in sub. (2), and in s. NR 664.0316, ignitable or reactive waste may not be placed in a landfill, unless the waste and landfill meet all applicable requirements of ch. NR 668 and both of the following:

(a) The resulting waste, mixture or dissolution of material no longer meets the definition of ignitable or reactive waste under s. NR 661.0021 or 661.0023.

(b) Section NR 664.0017 (2) is complied with.

(2) Except for prohibited wastes which remain subject to treatment standards in subch. D of ch. NR 668, ignitable wastes in containers may be landfilled without meeting the requirements of sub. (1), provided that the wastes are disposed of in such a way that they are protected from any material or conditions which may cause them to ignite. At a minimum, ignitable wastes shall be disposed of in non-leaking containers which are carefully handled and placed so as to avoid heat, sparks, rupture or any other condition that might cause ignition of the wastes; shall be covered daily with soil or other non-combustible material to minimize the potential for ignition of the wastes and may not be disposed of in cells that contain or will contain other wastes which may generate heat sufficient to cause ignition of the waste.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06; CR 19-082: am. (1) (a) Register August 2020 No 776, eff. 9-1-20.

NR 664.0313 Special requirements for incompatible wastes. Incompatible wastes, or incompatible wastes and materials, (see ch. NR 664 Appendix V for examples) may not be placed in the same landfill cell, unless s. NR 664.0017 (2) is complied with.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06; correction made under s. 13.92 (4) (b) 7., Stats., Register March 2013 No. 687.

NR 664.0314 Special requirements for bulk and containerized liquids. (1) The placement of bulk or noncontainerized liquid hazardous waste or hazardous waste containing free liquids (whether or not sorbents have been added) in any landfill is prohibited.

(2) To demonstrate the absence or presence of free liquids in either a containerized or a bulk waste, the following test shall be used: Method 9095B (paint filter liquids test) as described in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA SW-846, incorporated by reference in s. NR 660.11.

(3) Containers holding free liquids may not be placed in a landfill unless par. (a), (b), (c) or (d) applies:

(a) All free-standing liquid is handled in one of the following ways:

1. It has been removed by decanting, or other methods.

2. It has been mixed with sorbent or solidified so that free-standing liquid is no longer observed.

3. It has been otherwise eliminated.

(b) The container is very small, such as an ampule.

(c) The container is designed to hold free liquids for use other than storage, such as a battery or capacitor.

(d) The container is a lab pack as defined in s. NR 664.0316 and is disposed of in accordance with s. NR 664.0316.

(4) Sorbents used to treat free liquids to be disposed of in landfills shall be nonbiodegradable. Nonbiodegradable sorbents are materials listed or described in par. (a); materials that pass one of the tests in par. (b) or materials that are determined by EPA to be nonbiodegradable through the 40 CFR part 260 petition process.

(a) Nonbiodegradable sorbents are any of the following:

1. Inorganic minerals, other inorganic materials and elemental carbon (for example, aluminosilicates, clays, smectites, Fuller's earth, bentonite, calcium bentonite, montmorillonite, calcined montmorillonite, kaolinite, micas (illite), vermiculites, zeolites; calcium carbonate (organic free limestone); oxides or hydroxides, alumina, lime, silica (sand), diatomaceous earth; perlite (volcanic glass); expanded volcanic rock; volcanic ash; cement kiln dust; fly ash; rice hull ash; activated charcoal or activated carbon).

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2. High molecular weight synthetic polymers (for example, polyethylene, high density polyethylene (HDPE), polypropylene, polystyrene, polyurethane, polyacrylate, polynorborene, polyisobutylene, ground synthetic rubber, cross-linked allylstyrene and tertiary butyl copolymers). This does not include polymers derived from biological material or polymers specifically designed to be degradable.

3. Mixtures of these nonbiodegradable materials.

(b) The sorbent material may be determined to be nonbiodegradable using any of the following tests:

1. ASTM Method G21-70 (1984a)—Standard Practice for Determining Resistance of Synthetic Polymer Materials to Fungi, incorporated by reference in s. NR 660.11.

2. ASTM Method G22-76 (1984b)—Standard Practice for Determining Resistance of Plastics to Bacteria, incorporated by reference in s. NR 660.11.

3. OECD test 301B [CO_2 Evolution (Modified Sturm Test)], incorporated by reference in s. NR 660.11.

(5) The placement of any liquid which is not a hazardous waste in a landfill is prohibited unless the owner or operator of the landfill demonstrates to the department, or the department determines, that both of the following apply:

(a) The only reasonably available alternative to the placement in the landfill is placement in a landfill or unlined surface impoundment, whether or not operating under an operating license or interim license, which contains, or may reasonably be anticipated to contain, hazardous waste.

(b) Placement in the owner or operator's landfill will not present a risk of contamination of any underground source of drinking water (as that term is defined in 40 CFR 144.3).

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06; CR 16-007: r. (1), renum. (2) to (6) to (1) to (5) and, as renumbered, am.(1), (2), (4) (a) 1., 2., (5) Register July 2017 No. 739, eff. 8-1-17.

NR 664.0315 Special requirements for containers. Unless they are very small, such as an ampule, containers shall be either of the following:

(1) At least 90% full when placed in the landfill.

(2) Crushed, shredded or similarly reduced in volume to the maximum practical extent before burial in the landfill.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

NR 664.0316 Disposal of small containers of hazardous waste in overpacked drums (lab packs). Small containers of hazardous waste in overpacked drums (lab packs) may be placed in a landfill if all of the following requirements are met:

(1) Hazardous waste shall be packaged in non-leaking inside containers. The inside containers shall be of a design and constructed of a material that will not react dangerously with, be decomposed by or be ignited by the contained waste. Inside containers shall be tightly and securely sealed. The inside containers shall be of the size and type specified in the U.S. department of transportation (DOT) hazardous materials regulations (49 CFR parts 173, 178 and 179), if those regulations specify a particular inside container for the waste.

(2) The inside containers shall be overpacked in an open head DOT-specification metal shipping container (49 CFR parts 178 and 179) of no more than 416-liter (110 gallon) capacity and surrounded by, at a minimum, a sufficient quantity of sorbent material, determined to be nonbiodegradable in accordance with s. NR 664.0314 (4), to completely sorb all of the liquid contents of the inside containers. The metal outer container shall be full after it has been packed with inside containers and sorbent material.

(3) The sorbent material used may not be capable of reacting dangerously with, being decomposed by or being ignited by the contents of the inside containers, in accordance with s. NR 664.0017 (2).

(4) Incompatible wastes, as defined in s. NR 660.10, may not be placed in the same outside container.

(5) Reactive wastes, other than cyanide- or sulfide-bearing waste as defined in s. NR 661.0023 (1) (e), shall be treated or rendered non-reactive prior to packaging in accordance with subs. (1) to (4). Cyanide- and sulfide-bearing reactive waste may be packed in accordance with subs. (1) to (4) without first being treated or rendered non-reactive.

(6) The disposal is in compliance with the requirements of ch. NR 668. Persons who incinerate lab packs according to the requirements in s. NR 668.42 (3) (a) may use fiber drums in place of metal outer containers. The fiber drums shall meet the DOT specifications in 49 CFR 173.12 and be overpacked according to the requirements in sub. (2).

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06; CR 19-082: am. (2), (5) Register August 2020 No 776, eff. 9-1-20.

NR 664.0317 Special requirements for hazardous wastes F020, F021, F022, F023, F026 and F027. (1) Hazardous wastes F020, F021, F022, F023, F026 and F027 may not be placed in a landfill unless the owner or operator operates the landfill in accord with a management plan for these wastes that is approved by the department pursuant to the standards set out in this subsection, and in accord with all other applicable requirements of this chapter. All of the following factors shall be considered:

(a) The volume and physical and chemical characteristics of the wastes, including their potential to migrate through the soil or to volatilize or escape into the atmosphere.

(b) The attenuative properties of underlying and surrounding soils or other materials.

(c) The mobilizing properties of other materials co-disposed with these wastes.

(d) The effectiveness of additional treatment, design or monitoring requirements.

(2) The department may determine that additional design, operating and monitoring requirements are necessary for landfills managing hazardous wastes F020, F021, F022, F023, F026 and F027 in order to reduce the possibility of migration of these wastes to groundwater, surface water or air so as to protect human health and the environment.

History: CR 05-032: cr. Register July 2006 No. 607, eff. 8-1-06.

Subchapter O — Incinerators

NR 664.0340 Applicability. (1) This subchapter applies to owners and operators of hazardous waste incinerators (as defined in s. NR 660.10), except as s. NR 664.0001 provides otherwise.

(2) (a) Except as provided by pars. (b) to (d), the standards of this subchapter do not apply to a new hazardous waste incineration unit that becomes subject to hazardous waste license requirements after October 12, 2005, and no longer apply when an owner or operator of an existing hazardous waste incineration unit demonstrates compliance with the maximum achievable control technology (MACT) requirements of 40 CFR part 63, subpart EEE, by conducting a comprehensive performance test and submitting proof of a postmarked notification of compliance to the department under 40 CFR 63.1207 (j) and 63.1210 (d) documenting compliance with 40 CFR part 63, subpart EEE. Nevertheless, even after this demonstration of compli-

Published under s. 35.93, Stats. Updated on the first day of each month. Entire code is always current. The Register date on each page is the date the chapter was last published.

Cover Letter and Delivery Confirmation

© Republic Services of Wisconsin, Limited Partnership 2026

Appendix P: NR 664.0119(1) Compliance Documentation

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REPUBLIC SERVICES

Sustainability in Action

March 7, 2025

Sent via FedEx
Racine City Hall
730 Washington Ave., Room 103
Racine, WI 53403
Attn: Tara McMenamin

Re: Facility: Kestrel Hawk Landfill, 1969 Oakes Road, Racine, Wisconsin
Parcel Identification No.: 276-00-00-23-910-000
Final Landfill Closure Deed Notation by Republic Services of Wisconsin, Limited Partnership, a Delaware limited partnership

Dear Ms. McMenamin:

Pursuant to NR 664.0119 Wis. Admin. Code, we are required to submit to the City of Racine, as the local zoning authority, the enclosed Final Landfill Closure Deed Notation which includes the record of the type, location and quantity of hazardous wastes disposed of within each disposal unit of the referenced facility. In accordance with the Code, we will be recording the enclosed Deed Notation in the Racine County - Register of Deeds.

Should you have any questions, please reach out to M. Khalid Umer at 224-970-1127, kumer@republicservices.com.

Republic Services of Wisconsin, Limited Partnership,
a Delaware limited partnership

By: Republic Services of Wisconsin GP, LLC,
a Delaware limited liability company,
its General Partner

By: Adrienne Wilhoit
Name: Adrienne Wilhoit
Title: Vice President

Enclosure
cc: M. Khalid Umer

REPUBLIC SERVICES

Sustainability in Action

March 7, 2025

Sent via FedEx
Wisconsin Department of Natural Resources
PO Box 7921
Madison, WI 53707-7921
Attn: Doug Coenen

RE: Facility: Kestrel Hawk Landfill, 1969 Oakes Road, Racine, Wisconsin
Parcel Identification No.: 276-00-00-23-910-000
Final Landfill Closure Deed Notation by Republic Services of Wisconsin, Limited Partnership, a Delaware limited partnership

Dear Mr. Coenen:

Pursuant to NR 664.0119 Wis. Admin. Code, we are required to submit to the Wisconsin Department of Natural Resources, the enclosed Final Landfill Closure Deed Notation which includes the record of the type, location and quantity of hazardous wastes disposed of within each disposal unit of the Facility. In accordance with the Code, we will be recording the Deed of Notation in the Racine County – Register of Deeds.

Should you have any questions, please reach out to M. Khalid Umer at 224-970-1127, kumer@republicservices.com.

Republic Services of Wisconsin, Limited Partnership,
a Delaware limited partnership

By: Republic Services of Wisconsin GP, LLC,
a Delaware limited liability company,
its General Partner

By: Adrienne Wilhoit
Name: Adrienne Wilhoit
Title: Vice President

Enclosure

cc: M. Khalid Umer

REPUBLIC SERVICES

Sustainability in Action

March 24, 2025

Sent via Express Mail USPS
Wisconsin Department of Natural Resources
PO Box 7921
Madison, WI 53707-7921
Attn: Doug Coenen

RE: Facility: Kestrel Hawk Landfill, 1969 Oakes Road, Racine, Wisconsin
Parcel Identification No.: 276-00-00-23-910-000
Certification of Recording of the Final Landfill Closure Deed Notation by Republic Services of Wisconsin, Limited Partnership, a Delaware limited partnership

Dear Mr. Coenen:

Pursuant to NR 664.0119 Wis. Admin. Code, we are required to submit to the Wisconsin Department of Natural Resources, the enclosed Certification of Recording of the Final Landfill Closure Deed Notation which includes the record of the type, location and quantity of hazardous wastes disposed of within each disposal unit of the Facility.

Should you have any questions, please reach out to M. Khalid Umer at 224-970-1127, kumer@republicservices.com.

Republic Services of Wisconsin, Limited Partnership,
a Delaware limited partnership

By: Republic Services of Wisconsin GP, LLC,
a Delaware limited liability company,
its General Partner

By: _____
Name: Adrienne Wilhoit
Title: Vice President

Enclosure

cc: M. Khalid Umer

CERTIFICATION OF RECORDING

Republic Services of Wisconsin, Limited Partnership, a Delaware limited partnership, hereby certifies to the Wisconsin Department of Natural Resources that attached hereto as Schedule A is the Final Landfill Closure Deed Notation for property commonly known as the Kestrel Hawk Landfill, baving an address of 1969 Oakes Road, Racine, Wisconsin, 53406 recorded in the Racine County Register of Deeds on March 14, 2025 as Document No. 2696538.

Dated: March 24, 2025

Republic Services of Wisconsin, Limited Partnership, a Delaware limited partnership

By: Republic Services of Wisconsin GP, LLC, a Delaware limited liability company, its General Partner

By: _____
Name: Adrienne W. Wilhoit
Title: Vice President

SCHEDULE A

Final Landfill Closure Deed Notation

Document # 2696538
RACINE COUNTY REGISTER OF DEEDS
March 14, 2025 8:13 AM

Karie J. Pope

KARIE POPE
RACINE COUNTY
REGISTER OF DEEDS
Fee Amount: $30.00

**The above recording information verifies
this document has been electronically recorded**
Returned to Fidelity National Title Insurance Company - Richmond
Pages: 20

Prepared by and after
recording return to:
Nancy Schiavone, Esq.
c/o Republic Services, Inc.
18500 N Allied Way
Phoenix AZ 85054

FINAL LANDFILL CLOSURE DEED NOTATION

This Final Landfill Closure Deed Notation ("**Notation**") is made this 10th day of February 2025 by Republic Services of Wisconsin, Limited Partnership, a Delaware limited partnership ("**Owner**") having an office at co/ Republic Services, Inc., 18500 North Allied Way, Phoenix, Arizona 85054.

WITNESSETH:

WHEREAS, Owner is the fee simple owner of certain property commonly known as the Kestrel Hawk Landfill, having an address of 1969 Oakes Road, Racine, Wisconsin, 53406, Parcel Identification No. 276-00-00-23-910-000, shown and legally described on Exhibit A (the "**Property**");

WHEREAS, pursuant to NR 664.0119(2)(a) Wis. Admin. Code, Owner hereby records this Notation that will in perpetuity notify any potential purchaser of the Property that (a) a portion of the Property shown and legally described on Exhibit B (the "**HWLF Site**") has been used to manage hazardous wastes and as a hazardous waste landfill disposal site ("**HWLF**"); (b) the use of the HWLF Site is restricted as described herein; and (c) a survey plat and record of the type, location and quantity of hazardous wastes disposed within each cell or other hazardous waste disposal unit of the facility has been filed with the local zoning authority or the authority with jurisdiction over local land use and with the Wisconsin Department of Natural Resources ("**WDNR**");

WHEREAS, pursuant to NR 506.08(5) Wis. Admin. Code, Owner hereby records this Notation that will in perpetuity notify any potential purchaser of the Property that (a) a portion of the Property shown and legally described on Exhibit C attached hereto and incorporated herein (the "**MSWLF Site**") has been used as a municipal solid waste landfill disposal site ("**MSWLF**"); (b) the use of the MSWLF Site is restricted as described herein; and (c) a survey plat and record of the type, location and quantity of hazardous wastes disposed within each cell or other municipal solid waste disposal unit of the facility has been filed with the local zoning authority or the authority with jurisdiction over local land use and with the WDNR; and

This instrument is being filed as
an accommodation only.
It has not been examined
as to its execution,
or affect on title.

50000 10000

WHEREAS, the HWFL Site and the MSWLF Site are collectively referred to herein as the "Sites".

NOW THEREFORE, Owner provides the following deed Notation:

1. HWLF Site Deed Notation.

a. HWLF Deed Notation. Pursuant to NR 664.0119(2)(a) Wis. Admin. Code, Owner is hereby providing record notice that the HWLF Site has been used as a hazardous waste landfill disposal site and that this notice should be filed. A survey plat of the HWLF Site is attached hereto as Exhibit B and the location of hazardous waste deposited in the HWLF Site is defined by the estimated waste boundaries identified on the survey plat. To the Owner's best knowledge based upon available historical information, between the period of January 1980 and December 1982 the amount of hazardous waste deposited in the HWLF Site is approximately 953,094 lbs.

b. HWLF Deed Restriction. Pursuant to NR 664.0119(2)(a) Wis. Admin. Code, Owner hereby places the following restriction on the HWLF Site: Post-closure use of the Property may never be allowed to be disturb the integrity of the final cover, liners or any other components of the containment system, or the function of the facility's monitoring systems, unless the WDNR finds that either of the following applies: (a) the disturbance is necessary to the proposed use of the property, and will not increase the potential hazard to human health or the environment; and (b) the disturbance is necessary to reduce a threat to human health or the environment.

2. MSWLF Site Deed Notation.

a. MSWLF Deed Notation. Pursuant to NR 506.08(5) Wis. Admin. Code, Owner is hereby providing record notice that the MSWLF Site has been used as a MSWLF and that this notice should be filed.

b. MSWLF Deed Restriction. Pursuant to NR 506.08(5) Wis. Admin. Code, Owner hereby places the following restriction on the MSWLF Site: Post-closure use of the MSWLF Site is restricted in use to prevent disturbing the integrity of the final cover, liner or any other components of the containment system or the function of the monitoring systems on the MSWLF Site.

3. Restrictions to Run with the Land. The restrictions and requirements described in this Notation shall run with the Sites and be binding upon, inure to the benefit of the Owner of the Sites, and the Owner's successors, assignees, and lessees and their authorized agents, employees, contractors, representatives, agents, lessees, licensees, invitees, guests, or persons acting under their direction or control (each, hereinafter a "**Related Party**") and shall continue as a servitude running in perpetuity with the Sites. No transfer, mortgage, lease, license, easement or other conveyance of any interests in or right to occupancy in all or any part of the Sites by any person shall affect the restrictions set forth herein. This Notation is imposed upon the entire Sites as described on Exhibits B and C.

4. Binding upon Future Owners. By taking title to an interest or occupancy of the Sites, any subsequent Owner or Related Party agrees to comply with all the restrictions set forth in Paragraph 1 above and with all other terms of this Notation.

5. Wisconsin Law. This Notation shall be governed by, and shall be construed and enforced according to, the laws of the State of Wisconsin.

6. Modification and Termination. This Notation shall not be amended, modified, or terminated without WDNR's prior written approval.

7. Conflict of and Compliance with Laws. If any provision of this Notation is also subject of any law regulation established by any federal, state, or local government, the strictest standard or requirement will apply. Compliance with this Notation does not relieve the Owner of its obligation to comply with any other applicable laws.

8. Change in Law. Policy or Regulation. In no event shall this Notation be rendered unenforceable if Wisconsin's laws, regulations, or remediation polices change as to form or content. All statutory references include any successor provisions.

9. Authority to Execute and Record. The Owner hereby represents that the person executing this Notation on behalf of Owner is an authorized representative of the Owner, and further represents and certifies that such authorized representative is fully empowered to execute and record, or have recorded, this Notation.

10. Access for Department. The Owner shall grant to WDNR and its designated representatives the right to enter upon the Sites at reasonable times for the purposes of monitoring compliance with this Notation and ensuring its protectiveness; this right includes the right to take samples and inspect the Sites.

SIGNATURE ON FOLLOWING PAGE

IN WITNESS WHEREOF, Owner has executed this Final Landfill Closure Deed Notation as of the day and year first above written.

Republic Services of Wisconsin, Limited Partnership, a Delaware limited partnership

By: Republic Services of Wisconsin GP, LLC, a Delaware limited liability company, its General Partner

By: _____
Name: Adrienne W. Wilhoit
Title: Vice President

STATE OF ARIZONA)
) ss.
COUNTY OF MARICOPA

The foregoing instrument was acknowledged before me this 10th day of February 2025, by Adrienne W. Wilhoit, as Vice President of Republic Services of Wisconsin GP, LLC, a Delaware limited liability company, the General Partner of Republic Services of Wisconsin, Limited Partnership, a Delaware limited partnership, on behalf of the company.

KIARA GONZALEZ
Notary Public - Arizona
Maricopa County
Commission # 678775
My Comm. Expires Feb 2, 2029

_____
Notary Public, State of Arizona
My commission expires: 2/2/29

Exhibit A

Property

THAT PART OF THE NORTH HALF OF SECTION 23, TOWNSHIP 3 NORTH, RANGE 22 EAST OF THE PRINCIPAL MERIDIAN, DESCRIBED AS FOLLOWS:

COMMENCING AT A FOUND BRASS DISK AT THE SOUTHEAST CORNER OF THE NORTHEAST QUARTER OF SAID SECTION 23; THENCE NORTH 01 DEGREES 46 MINUTES 38 SECONDS WEST, ALONG THE EAST LINE OF SAID NORTHEAST QUARTER, A DISTANCE OF 340.90 FEET TO A 1-1/4" FOUND IRON PIPE; THENCE OVER AND ACROSS SAID NORTH HALF THE FOLLOWING COURSES AND DISTANCES:

THENCE SOUTH 85 DEGREES 16 MINUTES 39 SECONDS WEST, A DISTANCE OF 126.67 FEET TO THE POINT OF BEGINNING;

THENCE SOUTH 81 DEGREES 37 MINUTES 27 SECONDS WEST, A DISTANCE OF 547.45 FEET; THENCE NORTH 87 DEGREES 50 MINUTES 01 SECONDS WEST, A DISTANCE OF 46.82 FEET; THENCE NORTH 84 DEGREES 08 MINUTES 26 SECONDS WEST, A DISTANCE OF 35.49 FEET; THENCE NORTH 86 DEGREES 20 MINUTES 13 SECONDS WEST, A DISTANCE OF 28.35 FEET; THENCE NORTH 61 DEGREES 00 MINUTES 31 SECONDS WEST, A DISTANCE OF 26.53 FEET; THENCE NORTH 85 DEGREES 38 MINUTES 26 SECONDS WEST, A DISTANCE OF 73.86 FEET; THENCE NORTH 83 DEGREES 52 MINUTES 53 SECONDS WEST, A DISTANCE OF 50.98 FEET; THENCE NORTH 90 DEGREES 00 MINUTES 00 SECONDS WEST, A DISTANCE OF 22.63 FEET; THENCE SOUTH 87 DEGREES 08 MINUTES 06 SECONDS WEST, A DISTANCE OF 18.13 FEET; THENCE SOUTH 81 DEGREES 28 MINUTES 41 SECONDS WEST, A DISTANCE OF 1353.77 FEET; THENCE SOUTH 83 DEGREES 54 MINUTES 35 SECONDS WEST, A DISTANCE OF 226.22 FEET; THENCE SOUTH 86 DEGREES 25 MINUTES 23 SECONDS WEST, A DISTANCE OF 21.77 FEET; THENCE NORTH 65 DEGREES 05 MINUTES 01 SECONDS WEST, A DISTANCE OF 13.97 FEET; THENCE NORTH 47 DEGREES 28 MINUTES 28 SECONDS WEST, A DISTANCE OF 14.74 FEET; THENCE NORTH 09 DEGREES 14 MINUTES 27 SECONDS WEST, A DISTANCE OF 19.73 FEET; THENCE NORTH 02 DEGREES 12 MINUTES 52 SECONDS WEST, A DISTANCE OF 665.48 FEET; THENCE NORTH 00 DEGREES 00 MINUTES 00 SECONDS EAST, A DISTANCE OF 62.96 FEET; THENCE NORTH 06 DEGREES 34 MINUTES 44 SECONDS EAST, A DISTANCE OF 32.96 FEET; THENCE NORTH 05 DEGREES 45 MINUTES 54 SECONDS EAST, A DISTANCE OF 124.55 FEET; THENCE NORTH 09 DEGREES 53 MINUTES 21 SECONDS EAST, A DISTANCE OF 2.10 FEET; THENCE NORTH 12 DEGREES 09 MINUTES 53 SECONDS EAST, A DISTANCE OF 64.35 FEET; THENCE NORTH 22 DEGREES 36 MINUTES 34 SECONDS EAST, A DISTANCE OF 32.74 FEET; THENCE NORTH 22 DEGREES 36 MINUTES 31 SECONDS EAST, A DISTANCE OF 32.74 FEET; THENCE NORTH 01 DEGREE 35 MINUTES 27 SECONDS EAST, A DISTANCE OF 40.67 FEET; THENCE NORTH 01 DEGREE 50 MINUTES 25 SECONDS EAST, A DISTANCE OF 9.53 FEET; THENCE SOUTH 84 DEGREES 32 MINUTES 17 SECONDS

WEST, A DISTANCE OF 27.55 FEET; THENCE NORTH 85 DEGREES 13 MINUTES 57 SECONDS WEST, A DISTANCE OF 27.12 FEET; THENCE SOUTH 89 DEGREES 30 MINUTES 41 SECONDS WEST, PASSING AT A DISTANCE OF 68.95 FEET, A POINT IN THE WEST LINE OF SAID NORTHEAST QUARTER, CONTINUING FOR A TOTAL DISTANCE OF 113.24 FEET;

THENCE SOUTH 89 DEGREES 50 MINUTES 32 SECONDS WEST, A DISTANCE OF 376.38 FEET; THENCE SOUTH 87 DEGREES 39 MINUTES 20 SECONDS WEST, A DISTANCE OF 143.57 FEET; THENCE SOUTH 87 DEGREES 25 MINUTES 35 SECONDS WEST, A DISTANCE OF 279.29 FEET; THENCE NORTH 59 DEGREES 16 MINUTES 49 SECONDS WEST, A DISTANCE OF 292.71 FEET; THENCE NORTH 00 DEGREES 00 MINUTES 14 SECONDS WEST, A DISTANCE OF 880.97 FEET; THENCE SOUTH 89 DEGREES 48 MINUTES 54 SECONDS EAST, A DISTANCE OF 85.99 FEET; THENCE NORTH 89 DEGREES 59 MINUTES 54 SECONDS EAST, PASSING AT A DISTANCE OF 980.95 FEET, A POINT IN THE WEST LINE OF SAID NORTHEAST QUARTER, CONTINUING FOR A TOTAL DISTANCE OF 1184.32 FEET;

THENCE SOUTH 85 DEGREES 44 MINUTES 00 SECONDS EAST, A DISTANCE OF 126.69 FEET; THENCE SOUTH 49 DEGREES 11 MINUTES 39 SECONDS EAST, A DISTANCE OF 6.59 FEET TO THE BEGINNING OF A NON-TANGENT CURVE CONCAVE TO THE SOUTHWEST;

THENCE ALONG SAID NON-TANGENT CURVE CONCAVE TO THE SOUTHWEST HAVING A RADIUS OF 206.68 FEET, A CHORD THAT BEARS SOUTH 74 DEGREES 32 MINUTES 48 SECONDS EAST A CHORD DISTANCE OF 83.52 FEET, AND AN ARC DISTANCE OF 84.10 FEET TO THE BEGINNING OF A REVERSE NON-TANGENT CURVE CONCAVE TO THE NORTH;

THENCE ALONG SAID REVERSE NON-TANGENT CURVE CONCAVE TO THE NORTH HAVING A RADIUS OF 213.32 FEET, A CHORD THAT BEARS NORTH 75 DEGREES 12 MINUTES 15 SECONDS EAST A CHORD DISTANCE OF 289.74 FEET, AND AN ARC DISTANCE OF 318.52 FEET;

THENCE NORTH 30 DEGREES 53 MINUTES 33 SECONDS EAST, A DISTANCE OF 4.82 FEET TO THE BEGINNING OF A NON-TANGENT CURVE CONCAVE TO THE SOUTHEAST;

THENCE ALONG SAID NON-TANGENT CURVE CONCAVE TO THE SOUTHEAST HAVING A RADIUS OF 206.69 FEET, A CHORD THAT BEARS NORTH 50 DEGREES 02 MINUTES 48 SECONDS EAST A CHORD DISTANCE OF 131.19 FEET, AND AN ARC DISTANCE OF 133.50 FEET;

THENCE NORTH 75 DEGREES 37 MINUTES 08 SECONDS EAST, A DISTANCE OF 58.32 FEET; THENCE NORTH 78 DEGREES 47 MINUTES 51 SECONDS EAST, A DISTANCE OF 214.13 FEET; THENCE NORTH 90 DEGREES 00 MINUTES 00 SECONDS EAST, A DISTANCE OF 396.76 FEET; THENCE SOUTH 49 DEGREES 35 MINUTES 01 SECONDS

EAST, A DISTANCE OF 227.28 FEET; THENCE SOUTH 00 DEGREES 11 MINUTES 04 SECONDS WEST, A DISTANCE OF 715.01 FEET; THENCE SOUTH 18 DEGREES 57 MINUTES 06 SECONDS EAST, A DISTANCE OF 35.18 FEET; THENCE SOUTH 61 DEGREES 15 MINUTES 29 SECONDS EAST, A DISTANCE OF 104.18 FEET; THENCE NORTH 88 DEGREES 33 MINUTES 18 SECONDS EAST, A DISTANCE OF 469.76 FEET; THENCE NORTH 88 DEGREES 43 MINUTES 58 SECONDS EAST, A DISTANCE OF 271.35 FEET; THENCE NORTH 88 DEGREES 31 MINUTES 49 SECONDS EAST, A DISTANCE OF 52.01 FEET; THENCE SOUTH 86 DEGREES 31 MINUTES 45 SECONDS EAST, A DISTANCE OF 22.04 FEET; THENCE SOUTH 75 DEGREES 57 MINUTES 26 SECONDS EAST, A DISTANCE OF 19.24 FEET; THENCE SOUTH 68 DEGREES 29 MINUTES 23 SECONDS EAST, A DISTANCE OF 23.64 FEET; THENCE SOUTH 56 DEGREES 17 MINUTES 51 SECONDS EAST, A DISTANCE OF 24.04 FEET; THENCE SOUTH 46 DEGREES 43 MINUTES 25 SECONDS EAST, A DISTANCE OF 15.56 FEET; THENCE SOUTH 31 DEGREES 59 MINUTES 32 SECONDS EAST, A DISTANCE OF 18.87 FEET; THENCE SOUTH 20 DEGREES 05 MINUTES 11 SECONDS EAST, A DISTANCE OF 29.11 FEET; THENCE SOUTH 12 DEGREES 35 MINUTES 08 SECONDS EAST, A DISTANCE OF 29.83 FEET; THENCE SOUTH 05 DEGREES 06 MINUTES 03 SECONDS EAST, A DISTANCE OF 36.66 FEET; THENCE SOUTH 00 DEGREES 08 MINUTES 00 SECONDS WEST, A DISTANCE OF 249.47 FEET; THENCE SOUTH 01 DEGREE 33 MINUTES 05 SECONDS WEST, A DISTANCE OF 594.95 FEET; THENCE SOUTH 03 DEGREES 00 MINUTES 38 SECONDS EAST, A DISTANCE OF 17.23 FEET; THENCE SOUTH 02 DEGREES 23 MINUTES 03 SECONDS EAST, A DISTANCE OF 21.76 FEET; THENCE SOUTH 41 DEGREES 10 MINUTES 16 SECONDS WEST, A DISTANCE OF 28.88 FEET; THENCE SOUTH 59 DEGREES 43 MINUTES 54 SECONDS WEST, A DISTANCE OF 25.15 FEET; THENCE SOUTH 75 DEGREES 57 MINUTES 27 SECONDS WEST A DISTANCE OF 22.40 FEET TO THE POINT OF BEGINNING, CONTAINING 126.00 ACRES, MORE OR LESS, ALL IN THE CITY OF RACINE, COUNTY OF RACINE, WISCONSIN.

Address: 1969 Oakes Road, Racine, Wisconsin, 53406
Parcel Identification No.: 276-00-00-23-910-000

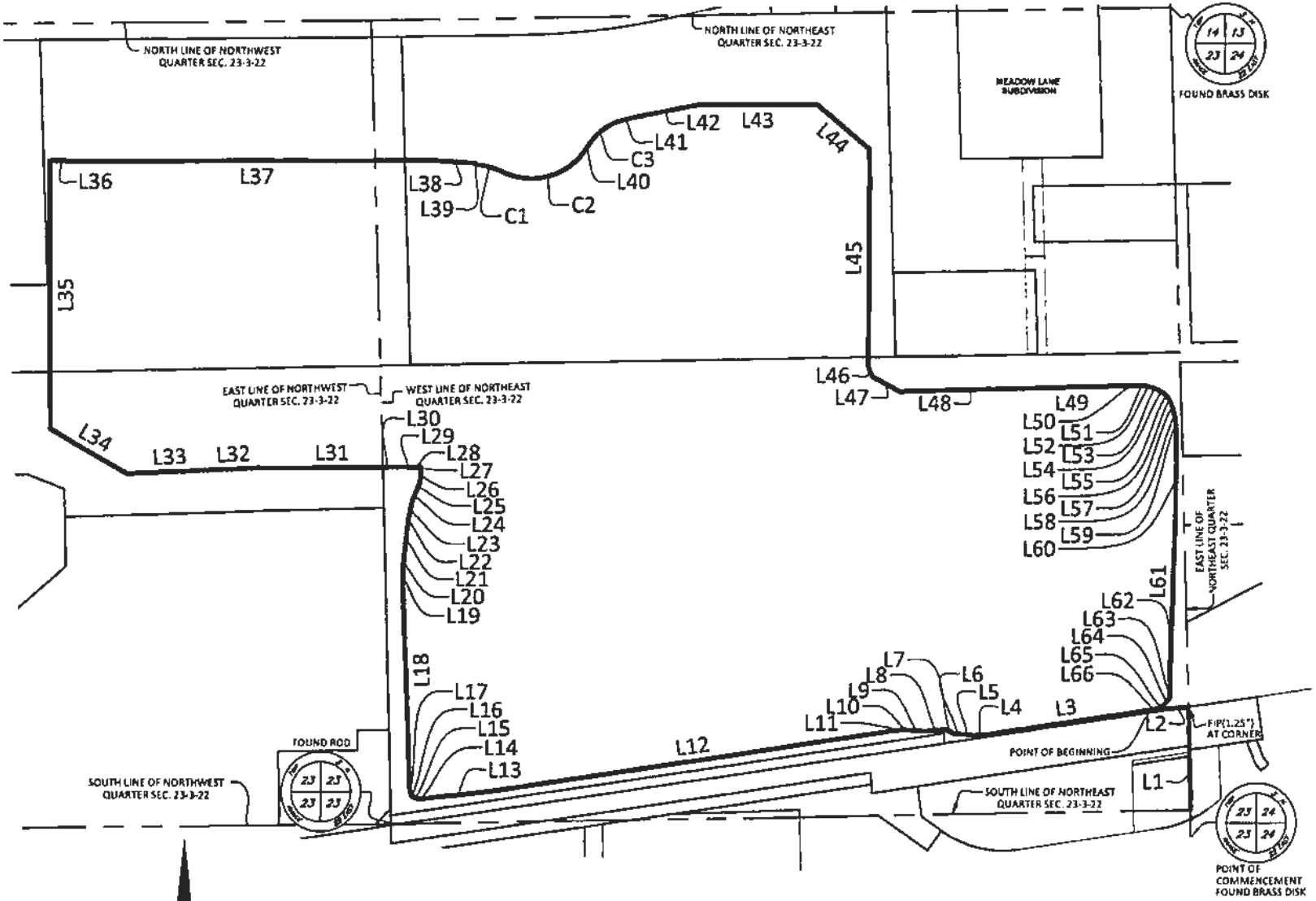
BOUNDARY EXHIBIT

WASTE BOUNDARY

PART OF THE NORTH HALF OF SECTION 23, TOWNSHIP 3 NORTH, RANGE 22 EAST OF THE PRINCIPAL MERIDIAN

HORIZONTAL DATUM

MEASURED BEARINGS SHOWN HEREON ARE ILLINOIS STATE PLANE EAST ZONE, BASED ON GLOBAL NAVIGATION SATELLITE SYSTEM OBSERVATIONS.



LEGEND

SUBJECT BOUNDARY LINE

SECTION LINE

DRAWN BY: VSP

REVIEWED BY: MOB

Weaver

BOUNDARY EXHIBIT

PREPARED FOR:

GHT © 2025 WEAVER CONSULTANTS GROUP. ALL RIGHTS RESERVED.

BOUNDARY EXHIBIT

WASTE BOUNDARY

PART OF THE NORTH HALF OF SECTION 23, TOWNSHIP 3 NORTH, RANGE 22
EAST OF THE PRINCIPAL MERIDIAN

LEGAL DESCRIPTION

THAT PART OF THE NORTH HALF OF SECTION 23, TOWNSHIP 3 NORTH, RANGE 22 EAST OF THE PRINCIPAL MERIDIAN, DESCRIBED AS FOLLOWS:
COMMENCING AT A FOUND BRASS DISK AT THE SOUTHEAST CORNER OF OF THE NORTHEAST QUARTER OF SAID SECTION 23; THENCE NORTH 01 DEGREES 46 MINUTES 38 SECONDS WEST, ALONG THE EAST LINE OF SAID NORTHEAST QUARTER, A DISTANCE OF 340.90 FEET TO A 1-1/4" FOUND IRON PIPE; THENCE OVER AND ACROSS SAID NORTH HALF THE FOLLOWING COURSES AND DISTANCES: THENCE SOUTH 85 DEGREES 16 MINUTES 39 SECONDS WEST, A DISTANCE OF 126.67 FEET TO THE POINT OF BEGINNING; THENCE SOUTH 81 DEGREES 37 MINUTES 27 SECONDS WEST, A DISTANCE OF 547.45 FEET; THENCE NORTH 87 DEGREES 50 MINUTES 01 SECONDS WEST, A DISTANCE OF 46.82 FEET; THENCE NORTH 84 DEGREES 08 MINUTES 26 SECONDS WEST, A DISTANCE OF 35.49 FEET; THENCE NORTH 86 DEGREES 20 MINUTES 13 SECONDS WEST, A DISTANCE OF 28.35 FEET; THENCE NORTH 61 DEGREES 00 MINUTES 31 SECONDS WEST, A DISTANCE OF 26.53 FEET; THENCE NORTH 85 DEGREES 38 MINUTES 26 SECONDS WEST, A DISTANCE OF 73.86 FEET; THENCE NORTH 83 DEGREES 52 MINUTES 53 SECONDS WEST, A DISTANCE OF 50.98 FEET; THENCE NORTH 90 DEGREES 00 MINUTES 00 SECONDS WEST, A DISTANCE OF 22.63 FEET; THENCE SOUTH 87 DEGREES 08 MINUTES 06 SECONDS WEST, A DISTANCE OF 18.13 FEET; THENCE SOUTH 81 DEGREES 28 MINUTES 41 SECONDS WEST, A DISTANCE OF 1353.77 FEET; THENCE SOUTH 83 DEGREES 54 MINUTES 35 SECONDS WEST, A DISTANCE OF 226.22 FEET; THENCE SOUTH 86 DEGREES 25 MINUTES 23 SECONDS WEST, A DISTANCE OF 21.77 FEET; THENCE NORTH 65 DEGREES 05 MINUTES 01 SECONDS WEST, A DISTANCE OF 13.97 FEET; THENCE NORTH 47 DEGREES 28 MINUTES 28 SECONDS WEST, A DISTANCE OF 14.74 FEET; THENCE NORTH 09 DEGREES 14 MINUTES 27 SECONDS WEST, A DISTANCE OF 19.73 FEET; THENCE NORTH 02 DEGREES 12 MINUTES 52 SECONDS WEST, A DISTANCE OF 665.48 FEET; THENCE NORTH 00 DEGREES 00 MINUTES 00 SECONDS EAST, A DISTANCE OF 62.96 FEET; THENCE NORTH 06 DEGREES 34 MINUTES 44 SECONDS EAST, A DISTANCE OF 32.96 FEET; THENCE NORTH 05 DEGREES 45 MINUTES 54 SECONDS EAST, A DISTANCE OF 124.55 FEET; THENCE NORTH 09 DEGREES 53 MINUTES 21 SECONDS EAST, A DISTANCE OF 2.10 FEET; THENCE NORTH 12 DEGREES 09 MINUTES 53 SECONDS EAST, A DISTANCE OF 64.35 FEET; THENCE NORTH 22 DEGREES 36 MINUTES 34 SECONDS EAST, A DISTANCE OF 32.74 FEET; THENCE NORTH 22 DEGREES 36 MINUTES 31 SECONDS EAST, A DISTANCE OF 32.74 FEET; THENCE NORTH 01 DEGREE 35 MINUTES 27 SECONDS EAST, A DISTANCE OF 40.67 FEET; THENCE NORTH 01 DEGREE 50 MINUTES 25 SECONDS EAST, A DISTANCE OF 9.53 FEET; THENCE SOUTH 84 DEGREES 32 MINUTES 17 SECONDS WEST, A DISTANCE OF 27.55 FEET; THENCE NORTH 85 DEGREES 13 MINUTES 57 SECONDS WEST, A DISTANCE OF 27.12 FEET; THENCE SOUTH 89 DEGREES 30 MINUTES 41 SECONDS WEST, PASSING AT A DISTANCE OF 68.95 FEET, A POINT IN THE WEST LINE OF SAID NORTHEAST QUARTER, CONTINUING FOR A TOTAL DISTANCE OF 113.24 FEET; THENCE SOUTH 89 DEGREES 50 MINUTES 32 SECONDS WEST, A DISTANCE OF 376.38 FEET; THENCE SOUTH 87 DEGREES 39 MINUTES 20 SECONDS WEST, A DISTANCE OF 143.57 FEET; THENCE SOUTH 87 DEGREES 25 MINUTES 35 SECONDS WEST, A DISTANCE OF 279.29 FEET; THENCE NORTH 59 DEGREES 16 MINUTES 49 SECONDS WEST, A DISTANCE OF 292.71 FEET; THENCE NORTH 00 DEGREES 00 MINUTES 14 SECONDS WEST, A DISTANCE OF 880.97 FEET; THENCE SOUTH 89 DEGREES 48 MINUTES 54 SECONDS EAST, A DISTANCE OF 85.99 FEET; THENCE NORTH 89 DEGREES 59 MINUTES 54 SECONDS EAST, PASSING AT A DISTANCE OF 980.95 FEET, A POINT IN THE WEST LINE OF SAID NORTHEAST QUARTER, CONTINUING FOR A TOTAL DISTANCE OF 1184.32 FEET; THENCE SOUTH 85 DEGREES 44 MINUTES 00 SECONDS EAST, A DISTANCE OF 126.69 FEET; THENCE SOUTH 49 DEGREES 11 MINUTES 39 SECONDS EAST, A DISTANCE OF 6.59 FEET TO THE BEGINNING OF A NON-TANGENT CURVE CONCAVE TO THE SOUTHWEST; THENCE ALONG SAID NON-TANGENT CURVE CONCAVE TO THE SOUTHWEST HAVING A RADIUS OF 206.68 FEET, A CHORD THAT BEARS SOUTH 74 DEGREES 32 MINUTES 48 SECONDS EAST A CHORD DISTANCE OF 83.52 FEET, AND AN ARC DISTANCE OF 84.10 FEET TO THE BEGINNING OF A REVERSE NON-TANGENT CURVE CONCAVE TO THE NORTH; THENCE ALONG SAID REVERSE NON-TANGENT CURVE CONCAVE TO THE NORTH HAVING A RADIUS OF 213.32 FEET, A CHORD THAT BEARS NORTH 75 DEGREES 12 MINUTES 15 SECONDS EAST A CHORD DISTANCE OF 289.74 FEET, AND AN ARC DISTANCE OF 318.52 FEET; THENCE NORTH 30 DEGREES 53 MINUTES 33 SECONDS EAST, A DISTANCE OF 4.82 FEET TO THE BEGINNING OF A NON-TANGENT CURVE CONCAVE TO THE SOUTHEAST; THENCE ALONG SAID NON-TANGENT CURVE CONCAVE TO THE SOUTHEAST HAVING A RADIUS OF 206.69 FEET, A CHORD THAT BEARS NORTH 50 DEGREES 02 MINUTES 48 SECONDS EAST A CHORD DISTANCE OF 131.19 FEET, AND AN ARC DISTANCE OF 133.50 FEET; THENCE NORTH 75 DEGREES 37 MINUTES 08 SECONDS EAST, A DISTANCE OF 58.32 FEET; THENCE NORTH 78 DEGREES 47 MINUTES 51 SECONDS EAST, A DISTANCE OF 214.13 FEET; THENCE NORTH 90 DEGREES 00 MINUTES 00 SECONDS EAST, A DISTANCE OF 396.76 FEET; THENCE SOUTH 49 DEGREES 35 MINUTES 01 SECONDS EAST, A DISTANCE OF 227.28 FEET; THENCE SOUTH 00 DEGREES 11 MINUTES 04 SECONDS WEST, A DISTANCE OF 715.01 FEET; THENCE SOUTH 18 DEGREES 57 MINUTES 06 SECONDS EAST, A DISTANCE OF 35.18 FEET; THENCE SOUTH 61 DEGREES 15 MINUTES 29 SECONDS EAST, A DISTANCE OF 104.18 FEET; THENCE NORTH 88 DEGREES 33 MINUTES 18 SECONDS EAST, A DISTANCE OF 469.76 FEET; THENCE NORTH 88 DEGREES 43 MINUTES 58 SECONDS EAST, A DISTANCE OF 271.35 FEET; THENCE NORTH 88 DEGREES 31 MINUTES 49 SECONDS EAST, A DISTANCE OF 52.01 FEET; THENCE SOUTH 86 DEGREES 31 MINUTES 45 SECONDS EAST, A DISTANCE OF 22.04 FEET; THENCE SOUTH 75 DEGREES 57 MINUTES 26 SECONDS EAST, A DISTANCE OF 19.24 FEET; THENCE SOUTH 68 DEGREES 29 MINUTES 23 SECONDS EAST, A DISTANCE OF 23.64 FEET; THENCE SOUTH 56 DEGREES 17 MINUTES 51 SECONDS EAST, A DISTANCE OF 24.04 FEET; THENCE SOUTH 46 DEGREES 43 MINUTES 25 SECONDS EAST, A DISTANCE OF 15.56 FEET; THENCE SOUTH 31 DEGREES 59 MINUTES 32 SECONDS EAST, A DISTANCE OF 18.87 FEET; THENCE SOUTH 20 DEGREES 05 MINUTES 11 SECONDS EAST, A DISTANCE OF 29.11 FEET; THENCE SOUTH 12 DEGREES 35 MINUTES 08 SECONDS EAST, A DISTANCE OF 29.83 FEET; THENCE SOUTH 05 DEGREES 06 MINUTES 03 SECONDS EAST, A DISTANCE OF 36.66 FEET; THENCE SOUTH 00 DEGREES 08 MINUTES 00 SECONDS WEST, A DISTANCE OF 249.47 FEET; THENCE SOUTH 01 DEGREE 33 MINUTES 05 SECONDS WEST, A DISTANCE OF 594.95 FEET; THENCE SOUTH 03 DEGREES 00 MINUTES 38 SECONDS EAST, A DISTANCE OF 17.23 FEET; THENCE SOUTH 02 DEGREES 23 MINUTES 03 SECONDS EAST, A DISTANCE OF 21.76 FEET; THENCE SOUTH 41 DEGREES 10 MINUTES 16 SECONDS WEST, A DISTANCE OF 28.88 FEET; THENCE SOUTH 59 DEGREES 43 MINUTES 54 SECONDS WEST, A DISTANCE OF 25.15 FEET; THENCE SOUTH 75 DEGREES 57 MINUTES 27 SECONDS WEST A DISTANCE OF 22.40 FEET TO THE POINT OF BEGINNING, CONTAINING 126.00 ACRES, MORE OR LESS, ALL IN RACINE COUNTY, WISCONSIN.

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DRAWN BY: VSP
REVIEWED BY: MDK
DATE: 7/16/2025
FILE: 0096-184-09

SHEET 2 OF 3

Weaver Consultants Group
NAPERVILLE, ILLINOIS

BOUNDARY EXHIBIT
WASTE BOUNDARY
KESTRAL HAWK LANDFILL
1969 OAKES RD, RACINE, WI 53406

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PREPARED FOR:
REPUBLIC SERVICES

BOUNDARY EXHIBIT

WASTE BOUNDARY

LINE TABLE		
LINE #	LENGTH	DIRECTION
L1	340.80'	N01°48'58"W
L2	126.67'	S85°16'38"W
L3	547.45'	S81°57'27"W
L4	46.82'	S87°50'01"W
L5	35.49'	N84°08'26"W
L6	28.35'	N86°20'13"W
L7	26.53'	N83°00'31"W
L8	79.86'	S85°38'28"W
L9	50.98'	N83°52'53"W
L10	22.63'	N90°00'00"W
L11	18.13'	S87°08'06"W
L12	1358.77'	S81°28'41"W
L13	226.22'	S83°54'35"W
L14	21.79'	S86°25'23"W

LINE TABLE		
LINE #	LENGTH	DIRECTION
L15	19.97'	N65°05'01"W
L16	24.74'	N47°28'28"W
L17	29.79'	N09°14'27"W
L18	665.48'	N02°12'52"W
L19	62.86'	N00°00'00"E
L20	32.96'	N06°34'44"E
L21	324.55'	N05°45'54"E
L22	2.10'	N09°53'21"E
L23	64.35'	N12°09'53"E
L24	32.74'	N22°36'34"E
L25	32.74'	N22°36'31"E
L26	40.67'	N01°35'27"E
L27	9.53'	N01°50'25"E
L28	27.55'	S84°32'17"W

LINE TABLE		
LINE #	LENGTH	DIRECTION
L29	27.12'	N85°18'57"W
L30	113.24'	S85°30'41"W
L31	976.38'	S89°50'32"W
L32	143.57'	S87°38'20"W
L33	279.29'	S87°25'35"W
L34	292.71'	N58°16'49"W
L35	880.97'	N00°00'14"W
L36	85.99'	S89°48'54"E
L37	1184.32'	N89°58'54"E
L38	126.69'	S85°44'00"E
L39	6.59'	S49°11'39"E
L40	4.82'	N30°55'33"E
L41	58.32'	N75°37'08"E
L42	214.13'	N78°47'51"E

LINE TABLE		
LINE #	LENGTH	DIRECTION
L43	396.76'	N90°00'00"E
L44	227.28'	S49°35'01"E
L45	715.01'	S00°11'04"W
L46	95.38'	S18°57'06"E
L47	104.18'	S61°15'19"E
L48	465.76'	N88°31'18"E
L49	271.35'	N88°43'58"E
L50	52.01'	N84°31'49"E
L51	22.04'	S86°31'45"E
L52	19.24'	S75°57'26"E
L53	23.64'	S68°29'23"E
L54	24.04'	S56°17'51"E
L55	35.56'	S46°43'25"E
L56	18.87'	S31°58'32"E

LINE TABLE		
LINE #	LENGTH	DIRECTION
L57	29.11'	S20°09'11"E
L58	29.83'	S12°35'08"E
L59	34.46'	S05°06'08"E
L60	249.47'	S00°08'00"W
L61	584.95'	S01°33'05"W
L62	17.23'	S03°00'36"E
L63	21.76'	S02°23'08"W
L64	28.88'	S41°10'16"W
L65	25.15'	S59°43'54"W
L66	22.40'	S75°57'27"W

CURVE TABLE				
CURVE #	ARC LENGTH	RADIUS	CHORD DIRECTION	CHORD LENGTH
C1	84.10'	206.68'	S74°32'48"E	83.52'
C2	318.52'	213.32'	N75°12'15"E	289.74'
C3	139.50'	206.69'	N50°02'48"E	131.15'

SURVEYOR'S CERTIFICATE

STATE OF ILLINOIS }
} SS
COUNTY OF DUPAGE }

THIS IS TO CERTIFY THAT THE ABOVE EXHIBIT WAS PREPARED UNDER THE DIRECT SUPERVISION OF MICHAEL D. BYTNER, A WISCONSIN PROFESSIONAL LAND SURVEYOR AND THAT THE EXHIBIT HEREON DRAWN IS A CORRECT REPRESENTATION THEREOF.

MICHAEL D. BYTNER, PLS

WISCONSIN PROFESSIONAL LAND SURVEYOR NO. S-2541
WEAVER CONSULTANTS GROUP

WISCONSIN
MICHAEL D. BYTNER
S-2541
WHEATON IL
LAND SURVEYOR

DRAWN BY: VSP
REVIEWED BY: MDB
DATE: 7/16/2025
FILE: 0286-184-09

SHEET 3 OF 3

Weaver Consultants Group
NAPERVILLE, ILLINOIS

BOUNDARY EXHIBIT
WASTE BOUNDARY
KESTRAL HAWK LANDFILL
1969 OAKES RD, RACINE, WI 53406

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PREPARED FOR:
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Exhibit B

HWLF Site

THAT PART OF THE NORTHEAST QUARTER OF SECTION 23, TOWNSHIP 3 NORTH, RANGE 22 EAST OF THE PRINCIPAL MERIDIAN, DESCRIBED AS FOLLOWS:

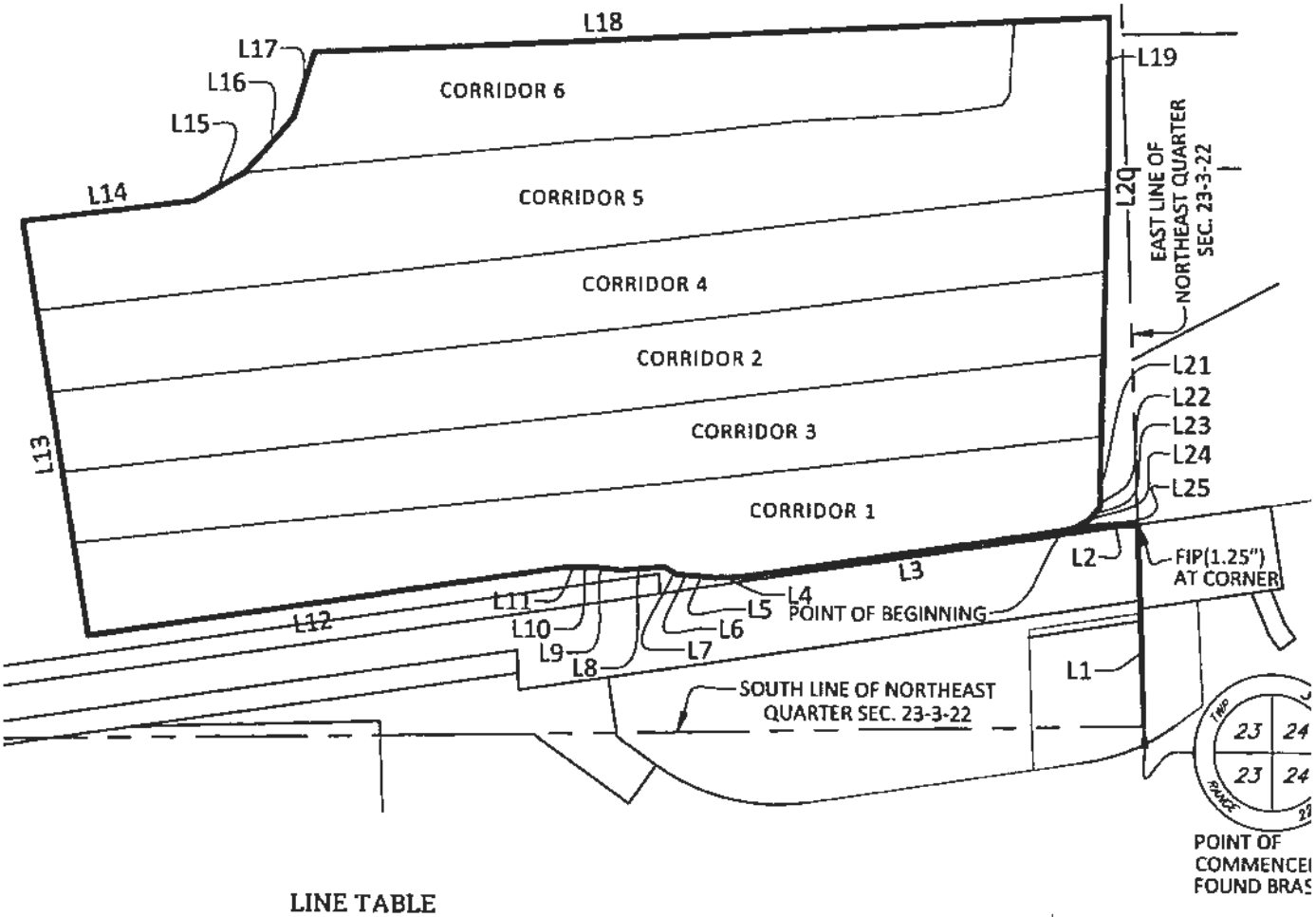
COMMENCING AT A FOUND BRASS DISK AT THE SOUTHEAST CORNER OF OF THE NORTHEAST QUARTER OF SAID SECTION 23; THENCE NORTH 01 DEGREES 46 MINUTES 38 SECONDS WEST, ALONG THE EAST LINE OF SAID NORTHEAST QUARTER, A DISTANCE OF 340.90 FEET TO A 1-1/4" FOUND IRON PIPE; THENCE OVER AND ACROSS SAID NORTHEAST QUARTER THE FOLLOWING COURSES AND DISTANCES:

THENCE SOUTH 85 DEGREES 16 MINUTES 39 SECONDS WEST, A DISTANCE OF 126.67 FEET TO THE POINT OF BEGINNING;

THENCE SOUTH 81 DEGREES 37 MINUTES 27 SECONDS WEST, A DISTANCE OF 547.45 FEET; THENCE SOUTH 87 DEGREES 50 MINUTES 01 SECONDS WEST, A DISTANCE OF 46.82 FEET; THENCE NORTH 84 DEGREES 08 MINUTES 26 SECONDS WEST, A DISTANCE OF 35.49 FEET; THENCE NORTH 86 DEGREES 20 MINUTES 13 SECONDS WEST, A DISTANCE OF 28.35 FEET; THENCE NORTH 61 DEGREES 00 MINUTES 31 SECONDS WEST, A DISTANCE OF 26.53 FEET; THENCE NORTH 85 DEGREES 38 MINUTES 26 SECONDS WEST, A DISTANCE OF 73.86 FEET; THENCE NORTH 83 DEGREES 52 MINUTES 53 SECONDS WEST, A DISTANCE OF 50.98 FEET; THENCE NORTH 90 DEGREES 00 MINUTES 00 SECONDS WEST, A DISTANCE OF 22.63 FEET; THENCE SOUTH 87 DEGREES 08 MINUTES 06 SECONDS WEST, A DISTANCE OF 18.13 FEET; THENCE SOUTH 81 DEGREES 28 MINUTES 41 SECONDS WEST, A DISTANCE OF 821.66 FEET; THENCE NORTH 09 DEGREES 00 MINUTES 08 SECONDS WEST, A DISTANCE OF 710.17 FEET; THENCE NORTH 82 DEGREES 41 MINUTES 27 SECONDS EAST, A DISTANCE OF 294.66 FEET; THENCE NORTH 60 DEGREES 42 MINUTES 21 SECONDS EAST, A DISTANCE OF 97.13 FEET; THENCE NORTH 41 DEGREES 16 MINUTES 54 SECONDS EAST, A DISTANCE OF 126.59 FEET; THENCE NORTH 17 DEGREES 49 MINUTES 50 SECONDS EAST, A DISTANCE OF 115.84 FEET; THENCE NORTH 87 DEGREES 23 MINUTES 00 SECONDS EAST, A DISTANCE OF 1348.42 FEET; THENCE SOUTH 00 DEGREES 08 MINUTES 00 SECONDS WEST, A DISTANCE OF 193.66 FEET; THENCE SOUTH 01 DEGREE 33 MINUTES 05 SECONDS WEST, A DISTANCE OF 594.95 FEET; THENCE SOUTH 03 DEGREES 00 MINUTES 38 SECONDS EAST, A DISTANCE OF 17.23 FEET; THENCE SOUTH 02 DEGREES 23 MINUTES 03 SECONDS WEST, A DISTANCE OF 21.76 FEET; THENCE SOUTH 41 DEGREES 10 MINUTES 16 SECONDS WEST, A DISTANCE OF 28.88 FEET; THENCE SOUTH 59 DEGREES 43 MINUTES 54 SECONDS WEST, A DISTANCE OF 25.15 FEET; THENCE SOUTH 75 DEGREES 57 MINUTES 27 SECONDS WEST, A DISTANCE OF 22.40 FEET TO THE POINT OF BEGINNING, CONTAINING 35.15 ACRES, MORE OR LESS, ALL IN THE CITY OF RACINE, COUNTY OF RACINE, WISCONSIN.

Address: 1969 Oakes Road, Racine, Wisconsin, 53406
Parcel Identification No.: 276-00-00-23-910-000

PART OF THE NORTHEAST QUARTER OF SECTION 23, TOWNSHIP 3 NORTH,
RANGE 22 EAST OF THE PRINCIPAL MERIDIAN



LINE TABLE

LINE	LENGTH	BEARING
L1	340.90	N01° 46' 40"W
L2	126.67	S85° 16' 40"W
L3	547.45	S81° 37' 30"W
L4	46.82	S87° 50' 00"W
L5	35.49	N84° 08' 30"W
L6	28.35	N86° 20' 10"W
L7	26.53	N61° 00' 30"W
L8	73.86	S85° 38' 30"W
L9	50.98	N83° 52' 50"W

LINE	LENGTH	BEARING
L10	22.63	N90° 00' 00"W
L11	18.13	S87° 08' 10"W
L12	821.66	S81° 28' 40"W
L13	710.17	N09° 00' 10"W
L14	294.66	N82° 41' 30"E
L15	97.13	N60° 42' 20"E
L16	126.59	N41° 16' 50"E
L17	115.84	N17° 49' 50"E
L18	1348.42	N87° 23' 00"E

LINE	LENGTH	BEARING
L19	193.66	S00° 08' 00"W
L20	594.95	S01° 33' 10"W
L21	17.23	S03° 00' 40"E
L22	21.76	S02° 23' 00"W
L23	28.88	S41° 10' 20"W
L24	25.15	S59° 43' 50"W
L25	22.40	S75° 57' 30"W

N

SCALE: 1" = 300'

0 150' 300' 600'

HORIZONTAL DATUM

MEASURED BEARINGS SHOWN HEREON ARE ILLINOIS STAT
PLANE EAST ZONE, BASED ON GLOBAL NAVIGATION SATELL
SYSTEM OBSERVATIONS.

LEGEND

SUBJECT BOUNDARY LINE
SECTION LINE
PARCEL LINE

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BOUNDARY EXHIBIT
HAZARDOUS WASTE BOUNDARY
KESTRAL HAWK LANDFILL
1969 OAKES RD, RACINE, WI 53406

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FILE: 012(
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BOUNDARY EXHIBIT

HAZARDOUS WASTE BOUNDARY

PART OF THE NORTHEAST QUARTER OF SECTION 23, TOWNSHIP 3 NORTH,
RANGE 22 EAST OF THE PRINCIPAL MERIDIAN

LEGAL DESCRIPTION

THAT PART OF THE NORTHEAST QUARTER OF SECTION 23, TOWNSHIP 3 NORTH, RANGE 22 EAST OF THE PRINCIPAL MERIDIAN, DESCRIBED AS FOLLOWS:

COMMENCING AT A FOUND BRASS DISK AT THE SOUTHEAST CORNER OF OF THE NORTHEAST QUARTER OF SAID SECTION 23;
THENCE NORTH 01 DEGREES 46 MINUTES 38 SECONDS WEST, ALONG THE EAST LINE OF SAID NORTHEAST QUARTER, A DISTANCE OF 340.90 FEET TO A 1-1/4" FOUND IRON PIPE;
THENCE OVER AND ACROSS SAID NORTHEAST QUARTER THE FOLLOWING COURSES AND DISTANCES:

THENCE SOUTH 85 DEGREES 16 MINUTES 39 SECONDS WEST, A DISTANCE OF 126.67 FEET TO THE POINT OF BEGINNING;
THENCE SOUTH 81 DEGREES 37 MINUTES 27 SECONDS WEST, A DISTANCE OF 547.45 FEET;
THENCE SOUTH 87 DEGREES 50 MINUTES 01 SECONDS WEST, A DISTANCE OF 46.82 FEET;
THENCE NORTH 84 DEGREES 08 MINUTES 26 SECONDS WEST, A DISTANCE OF 35.49 FEET;
THENCE NORTH 86 DEGREES 20 MINUTES 13 SECONDS WEST, A DISTANCE OF 28.35 FEET;
THENCE NORTH 61 DEGREES 00 MINUTES 31 SECONDS WEST, A DISTANCE OF 26.53 FEET;
THENCE NORTH 85 DEGREES 38 MINUTES 26 SECONDS WEST, A DISTANCE OF 73.86 FEET;
THENCE NORTH 83 DEGREES 52 MINUTES 53 SECONDS WEST, A DISTANCE OF 50.98 FEET;
THENCE NORTH 90 DEGREES 00 MINUTES 00 SECONDS WEST, A DISTANCE OF 22.63 FEET;
THENCE SOUTH 87 DEGREES 08 MINUTES 06 SECONDS WEST, A DISTANCE OF 18.13 FEET;
THENCE SOUTH 81 DEGREES 28 MINUTES 41 SECONDS WEST, A DISTANCE OF 821.66 FEET;
THENCE NORTH 09 DEGREES 00 MINUTES 08 SECONDS WEST, A DISTANCE OF 710.17 FEET;
THENCE NORTH 82 DEGREES 41 MINUTES 27 SECONDS EAST, A DISTANCE OF 294.66 FEET;
THENCE NORTH 60 DEGREES 42 MINUTES 21 SECONDS EAST, A DISTANCE OF 97.13 FEET;
THENCE NORTH 41 DEGREES 16 MINUTES 54 SECONDS EAST, A DISTANCE OF 126.59 FEET;
THENCE NORTH 17 DEGREES 49 MINUTES 50 SECONDS EAST, A DISTANCE OF 115.84 FEET;
THENCE NORTH 87 DEGREES 23 MINUTES 00 SECONDS EAST, A DISTANCE OF 1348.42 FEET;
THENCE SOUTH 00 DEGREES 08 MINUTES 00 SECONDS WEST, A DISTANCE OF 193.66 FEET;
THENCE SOUTH 01 DEGREE 33 MINUTES 05 SECONDS WEST, A DISTANCE OF 594.95 FEET;
THENCE SOUTH 03 DEGREES 00 MINUTES 38 SECONDS EAST, A DISTANCE OF 17.23 FEET;
THENCE SOUTH 02 DEGREES 23 MINUTES 03 SECONDS WEST, A DISTANCE OF 21.76 FEET;
THENCE SOUTH 41 DEGREES 10 MINUTES 16 SECONDS WEST, A DISTANCE OF 28.88 FEET;
THENCE SOUTH 59 DEGREES 43 MINUTES 54 SECONDS WEST, A DISTANCE OF 25.15 FEET;
THENCE SOUTH 75 DEGREES 57 MINUTES 27 SECONDS WEST, A DISTANCE OF 22.40 FEET TO THE POINT OF BEGINNING, CONTAINING 35.15 ACRES, MORE OR LESS, ALL IN RACINE COUNTY, WISCONSIN.

SURVEYOR'S CERTIFICATE

STATE OF ILLINOIS)
) SS
COUNTY OF DUPAGE)

THIS IS TO CERTIFY THAT THE ABOVE LEGAL DESCRIPTION WAS PREPARED UNDER THE DIRECT SUPERVISION OF MICHAEL D. BYTNER, A WISCONSIN PROFESSIONAL LAND SURVEYOR AND THAT THE EXHIBIT HEREON DRAWN IS A CORRECT REPRESENTATION THEREOF.



MICHAEL D. BYTNER, PLS

WISCONSIN PROFESSIDNAL LAND SURVEYOR NO. S-2541
WEAVER CONSULTANTS GROUP

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REVIEWED BY:	MDB
DATE:	2/26/2025
FILE:	0120-184-09
	EXHIBITS.DWG
SHEET	2 OF 2

Exhibit C

MSWLF Site

THAT PART OF THE NORTH HALF OF SECTION 23, TOWNSHIP 3 NORTH, RANGE 22 EAST OF THE PRINCIPAL MERIDIAN, DESCRIBED AS FOLLOWS:

COMMENCING AT A FOUND BRASS DISK AT THE SOUTHEAST CORNER OF THE NORTHEAST QUARTER OF SAID SECTION 23; THENCE NORTH 01 DEGREES 46 MINUTES 38 SECONDS WEST, ALONG THE EAST LINE OF SAID NORTHEAST QUARTER, A DISTANCE OF 340.90 FEET TO A 1-1/4" FOUND IRON PIPE; THENCE OVER AND ACROSS SAID NORTH HALF THE FOLLOWING COURSES AND DISTANCES:

THENCE SOUTH 85 DEGREES 16 MINUTES 39 SECONDS WEST, A DISTANCE OF 126.67 FEET TO THE POINT OF BEGINNING;

THENCE SOUTH 81 DEGREES 37 MINUTES 27 SECONDS WEST, A DISTANCE OF 547.45 FEET; THENCE NORTH 87 DEGREES 50 MINUTES 01 SECONDS WEST, A DISTANCE OF 46.82 FEET; THENCE NORTH 84 DEGREES 08 MINUTES 26 SECONDS WEST, A DISTANCE OF 35.49 FEET; THENCE NORTH 86 DEGREES 20 MINUTES 13 SECONDS WEST, A DISTANCE OF 28.35 FEET; THENCE NORTH 61 DEGREES 00 MINUTES 31 SECONDS WEST, A DISTANCE OF 26.53 FEET; THENCE NORTH 85 DEGREES 38 MINUTES 26 SECONDS WEST, A DISTANCE OF 73.86 FEET; THENCE NORTH 83 DEGREES 52 MINUTES 53 SECONDS WEST, A DISTANCE OF 50.98 FEET; THENCE NORTH 90 DEGREES 00 MINUTES 00 SECONDS WEST, A DISTANCE OF 22.63 FEET; THENCE SOUTH 87 DEGREES 08 MINUTES 06 SECONDS WEST, A DISTANCE OF 18.13 FEET; THENCE SOUTH 81 DEGREES 28 MINUTES 41 SECONDS WEST, A DISTANCE OF 1353.77 FEET; THENCE SOUTH 83 DEGREES 54 MINUTES 35 SECONDS WEST, A DISTANCE OF 226.22 FEET; THENCE SOUTH 86 DEGREES 25 MINUTES 23 SECONDS WEST, A DISTANCE OF 21.77 FEET; THENCE NORTH 65 DEGREES 05 MINUTES 01 SECONDS WEST, A DISTANCE OF 13.97 FEET; THENCE NORTH 47 DEGREES 28 MINUTES 28 SECONDS WEST, A DISTANCE OF 14.74 FEET; THENCE NORTH 09 DEGREES 14 MINUTES 27 SECONDS WEST, A DISTANCE OF 19.73 FEET; THENCE NORTH 02 DEGREES 12 MINUTES 52 SECONDS WEST, A DISTANCE OF 665.48 FEET; THENCE NORTH 00 DEGREES 00 MINUTES 00 SECONDS EAST, A DISTANCE OF 62.96 FEET; THENCE NORTH 06 DEGREES 34 MINUTES 44 SECONDS EAST, A DISTANCE OF 32.96 FEET; THENCE NORTH 05 DEGREES 45 MINUTES 54 SECONDS EAST, A DISTANCE OF 124.55 FEET; THENCE NORTH 09 DEGREES 53 MINUTES 21 SECONDS EAST, A DISTANCE OF 2.10 FEET; THENCE NORTH 12 DEGREES 09 MINUTES 53 SECONDS EAST, A DISTANCE OF 64.35 FEET; THENCE NORTH 22 DEGREES 36 MINUTES 34 SECONDS EAST, A DISTANCE OF 32.74 FEET; THENCE NORTH 22 DEGREES 36 MINUTES 31 SECONDS EAST, A DISTANCE OF 32.74 FEET; THENCE NORTH 01 DEGREE 35 MINUTES 27 SECONDS EAST, A DISTANCE OF 40.67 FEET; THENCE NORTH 01 DEGREE 50 MINUTES 25 SECONDS EAST, A DISTANCE OF 9.53 FEET; THENCE SOUTH 84 DEGREES 32 MINUTES 17 SECONDS

WEST, A DISTANCE OF 27.55 FEET; THENCE NORTH 85 DEGREES 13 MINUTES 57 SECONDS WEST, A DISTANCE OF 27.12 FEET; THENCE SOUTH 89 DEGREES 30 MINUTES 41 SECONDS WEST, PASSING AT A DISTANCE OF 68.95 FEET, A POINT IN THE WEST LINE OF SAID NORTHEAST QUARTER, CONTINUING FOR A TOTAL DISTANCE OF 113.24 FEET;

THENCE SOUTH 89 DEGREES 50 MINUTES 32 SECONDS WEST, A DISTANCE OF 376.38 FEET; THENCE SOUTH 87 DEGREES 39 MINUTES 20 SECONDS WEST, A DISTANCE OF 143.57 FEET; THENCE SOUTH 87 DEGREES 25 MINUTES 35 SECONDS WEST, A DISTANCE OF 279.29 FEET; THENCE NORTH 59 DEGREES 16 MINUTES 49 SECONDS WEST, A DISTANCE OF 292.71 FEET; THENCE NORTH 00 DEGREES 00 MINUTES 14 SECONDS WEST, A DISTANCE OF 880.97 FEET; THENCE SOUTH 89 DEGREES 48 MINUTES 54 SECONDS EAST, A DISTANCE OF 85.99 FEET; THENCE NORTH 89 DEGREES 59 MINUTES 54 SECONDS EAST, PASSING AT A DISTANCE OF 980.95 FEET, A POINT IN THE WEST LINE OF SAID NORTHEAST QUARTER, CONTINUING FOR A TOTAL DISTANCE OF 1184.32 FEET;

THENCE SOUTH 85 DEGREES 44 MINUTES 00 SECONDS EAST, A DISTANCE OF 126.69 FEET; THENCE SOUTH 49 DEGREES 11 MINUTES 39 SECONDS EAST, A DISTANCE OF 6.59 FEET TO THE BEGINNING OF A NON-TANGENT CURVE CONCAVE TO THE SOUTHWEST;

THENCE ALONG SAID NON-TANGENT CURVE CONCAVE TO THE SOUTHWEST HAVING A RADIUS OF 206.68 FEET, A CHORD THAT BEARS SOUTH 74 DEGREES 32 MINUTES 48 SECONDS EAST A CHORD DISTANCE OF 83.52 FEET, AND AN ARC DISTANCE OF 84.10 FEET TO THE BEGINNING OF A REVERSE NON-TANGENT CURVE CONCAVE TO THE NORTH;

THENCE ALONG SAID REVERSE NON-TANGENT CURVE CONCAVE TO THE NORTH HAVING A RADIUS OF 213.32 FEET, A CHORD THAT BEARS NORTH 75 DEGREES 12 MINUTES 15 SECONDS EAST A CHORD DISTANCE OF 289.74 FEET, AND AN ARC DISTANCE OF 318.52 FEET;

THENCE NORTH 30 DEGREES 53 MINUTES 33 SECONDS EAST, A DISTANCE OF 4.82 FEET TO THE BEGINNING OF A NON-TANGENT CURVE CONCAVE TO THE SOUTHEAST;

THENCE ALONG SAID NON-TANGENT CURVE CONCAVE TO THE SOUTHEAST HAVING A RADIUS OF 206.69 FEET, A CHORD THAT BEARS NORTH 50 DEGREES 02 MINUTES 48 SECONDS EAST A CHORD DISTANCE OF 131.19 FEET, AND AN ARC DISTANCE OF 133.50 FEET;

THENCE NORTH 75 DEGREES 37 MINUTES 08 SECONDS EAST, A DISTANCE OF 58.32 FEET; THENCE NORTH 78 DEGREES 47 MINUTES 51 SECONDS EAST, A DISTANCE OF 214.13 FEET; THENCE NORTH 90 DEGREES 00 MINUTES 00 SECONDS EAST, A DISTANCE OF 396.76 FEET; THENCE SOUTH 49 DEGREES 35 MINUTES 01 SECONDS

EAST, A DISTANCE OF 227.28 FEET; THENCE SOUTH 00 DEGREES 11 MINUTES 04 SECONDS WEST, A DISTANCE OF 715.01 FEET; THENCE SOUTH 18 DEGREES 57 MINUTES 06 SECONDS EAST, A DISTANCE OF 35.18 FEET; THENCE SOUTH 61 DEGREES 15 MINUTES 29 SECONDS EAST, A DISTANCE OF 104.18 FEET; THENCE NORTH 88 DEGREES 33 MINUTES 18 SECONDS EAST, A DISTANCE OF 469.76 FEET; THENCE NORTH 88 DEGREES 43 MINUTES 58 SECONDS EAST, A DISTANCE OF 271.35 FEET; THENCE NORTH 88 DEGREES 31 MINUTES 49 SECONDS EAST, A DISTANCE OF 52.01 FEET; THENCE SOUTH 86 DEGREES 31 MINUTES 45 SECONDS EAST, A DISTANCE OF 22.04 FEET; THENCE SOUTH 75 DEGREES 57 MINUTES 26 SECONDS EAST, A DISTANCE OF 19.24 FEET; THENCE SOUTH 68 DEGREES 29 MINUTES 23 SECONDS EAST, A DISTANCE OF 23.64 FEET; THENCE SOUTH 56 DEGREES 17 MINUTES 51 SECONDS EAST, A DISTANCE OF 24.04 FEET; THENCE SOUTH 46 DEGREES 43 MINUTES 25 SECONDS EAST, A DISTANCE OF 15.56 FEET; THENCE SOUTH 31 DEGREES 59 MINUTES 32 SECONDS EAST, A DISTANCE OF 18.87 FEET; THENCE SOUTH 20 DEGREES 05 MINUTES 11 SECONDS EAST, A DISTANCE OF 29.11 FEET; THENCE SOUTH 12 DEGREES 35 MINUTES 08 SECONDS EAST, A DISTANCE OF 29.83 FEET; THENCE SOUTH 05 DEGREES 06 MINUTES 03 SECONDS EAST, A DISTANCE OF 36.66 FEET; THENCE SOUTH 00 DEGREES 08 MINUTES 00 SECONDS WEST, A DISTANCE OF 249.47 FEET; THENCE SOUTH 01 DEGREE 33 MINUTES 05 SECONDS WEST, A DISTANCE OF 594.95 FEET; THENCE SOUTH 03 DEGREES 00 MINUTES 38 SECONDS EAST, A DISTANCE OF 17.23 FEET; THENCE SOUTH 02 DEGREES 23 MINUTES 03 SECONDS EAST, A DISTANCE OF 21.76 FEET; THENCE SOUTH 41 DEGREES 10 MINUTES 16 SECONDS WEST, A DISTANCE OF 28.88 FEET; THENCE SOUTH 59 DEGREES 43 MINUTES 54 SECONDS WEST, A DISTANCE OF 25.15 FEET; THENCE SOUTH 75 DEGREES 57 MINUTES 27 SECONDS WEST A DISTANCE OF 22.40 FEET TO THE POINT OF BEGINNING, CONTAINING 126.00 ACRES, MORE OR LESS, ALL IN THE CITY OF RACINE, COUNTY OF RACINE, WISCONSIN.

Address: 1969 Oakes Road, Racine, Wisconsin, 53406
Parcel Identification No.: 276-00-00-23-910-000

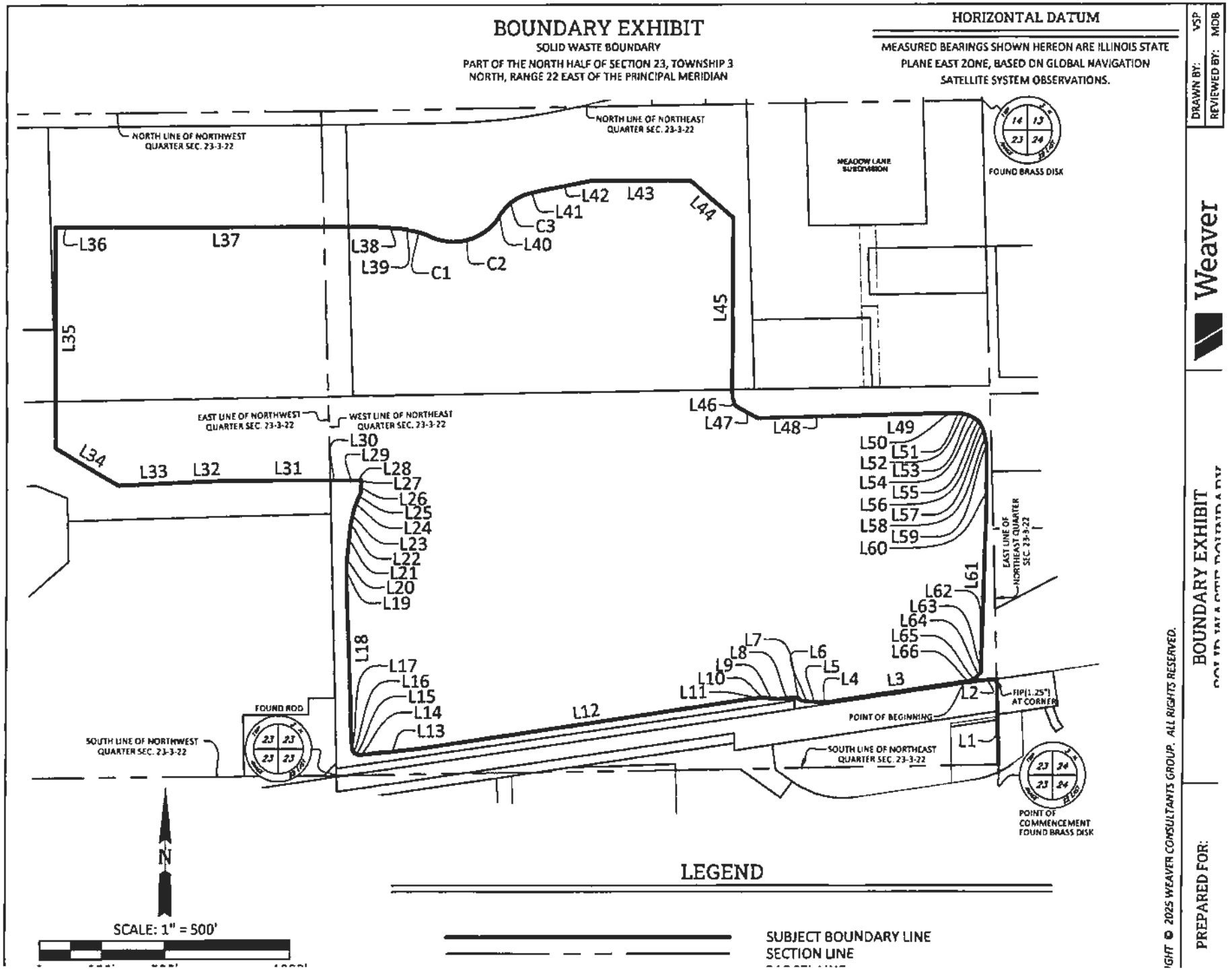
BOUNDARY EXHIBIT

SOLID WASTE BOUNDARY

PART OF THE NORTH HALF OF SECTION 23, TOWNSHIP 3 NORTH, RANGE 22 EAST OF THE PRINCIPAL MERIDIAN

HORIZONTAL DATUM

MEASURED BEARINGS SHOWN HEREON ARE ILLINOIS STATE PLANE EAST ZONE, BASED ON GLOBAL NAVIGATION SATELLITE SYSTEM OBSERVATIONS.



LEGEND

SUBJECT BOUNDARY LINE

SECTION LINE

DRAWN BY: VSP

REVIEWED BY: MDB

Weaver

BOUNDARY EXHIBIT

SOLID WASTE BOUNDARY

PREPARED FOR:

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BOUNDARY EXHIBIT

SOLID WASTE BOUNDARY

PART OF THE NORTH HALF OF SECTION 23, TOWNSHIP 3 NORTH, RANGE 22
EAST OF THE PRINCIPAL MERIDIAN

LEGAL DESCRIPTION

THAT PART OF THE NORTH HALF OF SECTION 23, TOWNSHIP 3 NORTH, RANGE 22 EAST OF THE PRINCIPAL MERIDIAN, DESCRIBED AS FOLLOWS:
COMMENCING AT A FOUND BRASS DISK AT THE SOUTHEAST CORNER OF OF THE NORTHEAST QUARTER OF SAID SECTION 23; THENCE NORTH 01 DEGREES 46 MINUTES 38 SECONDS WEST, ALONG THE EAST LINE OF SAID NORTHEAST QUARTER, A DISTANCE OF 340.90 FEET TO A 1-1/4" FOUND IRON PIPE; THENCE OVER AND ACROSS SAID NORTH HALF THE FOLLOWING COURSES AND DISTANCES: THENCE SOUTH 85 DEGREES 16 MINUTES 39 SECONDS WEST, A DISTANCE OF 126.67 FEET TO THE POINT OF BEGINNING; THENCE SOUTH 81 DEGREES 37 MINUTES 27 SECONDS WEST, A DISTANCE OF 547.45 FEET; THENCE NORTH 87 DEGREES 50 MINUTES 01 SECONDS WEST, A D STANCE OF 46.82 FEET; THENCE NORTH 84 DEGREES 08 MINUTES 26 SECONDS WEST, A DISTANCE OF 35 49 FEET; THENCE NORTH 86 DEGREES 20 MINUTES 13 SECONDS WEST, A DISTANCE OF 28.35 FEET; THENCE NORTH 61 DEGREES 00 MINUTES 31 SECONDS WEST, A DISTANCE OF 26.53 FEET; THENCE NORTH 85 DEGREES 38 MINUTES 26 SECONDS WEST, A DISTANCE OF 73.86 FEET; THENCE NORTH 83 DEGREES 52 MINUTES 53 SECONDS WEST, A DISTANCE OF 50.98 FEET; THENCE NORTH 90 DEGREES 00 MINUTES 00 SECONDS WEST, A DISTANCE OF 22.63 FEET; THENCE SOUTH 87 DEGREES 08 MINUTES 06 SECONDS WEST, A DISTANCE OF 18.13 FEET; THENCE SOUTH 81 DEGREES 28 MINUTES 41 SECONDS WEST, A DISTANCE OF 1353.77 FEET; THENCE SOUTH 83 DEGREES 54 MINUTES 35 SECONDS WEST, A DISTANCE OF 226.22 FEET; THENCE SOUTH 86 DEGREES 25 MINUTES 23 SECONDS WEST, A DISTANCE OF 21.77 FEET; THENCE NORTH 65 DEGREES 05 MINUTES 01 SECONDS WEST, A DISTANCE OF 13.97 FEET; THENCE NORTH 47 DEGREES 28 MINUTES 28 SECONDS WEST, A DISTANCE OF 14.74 FEET; THENCE NORTH 09 DEGREES 14 MINUTES 27 SECONDS WEST, A DISTANCE OF 19.73 FEET; THENCE NORTH 02 DEGREES 12 MINUTES 52 SECONDS WEST, A DISTANCE OF 665.48 FEET; THENCE NORTH 00 DEGREES 00 MINUTES 00 SECONDS EAST, A DISTANCE OF 62.96 FEET; THENCE NORTH 06 DEGREES 34 MINUTES 44 SECONDS EAST, A DISTANCE OF 32.96 FEET; THENCE NORTH 05 DEGREES 45 MINUTES 54 SECONDS EAST, A DISTANCE OF 124.55 FEET; THENCE NORTH 09 DEGREES 53 MINUTES 21 SECONDS EAST, A DISTANCE OF 2.10 FEET; THENCE NORTH 12 DEGREES 09 MINUTES 53 SECONDS EAST, A DISTANCE OF 64.35 FEET; THENCE NORTH 22 DEGREES 36 MINUTES 34 SECONDS EAST, A DISTANCE OF 32.74 FEET; THENCE NORTH 22 DEGREES 36 MINUTES 31 SECONDS EAST, A DISTANCE OF 32.74 FEET; THENCE NORTH 01 DEGREE 35 MINUTES 27 SECONDS EAST, A DISTANCE OF 40.67 FEET; THENCE NORTH 01 DEGREE 50 MINUTES 25 SECONDS EAST, A DISTANCE OF 9.53 FEET; THENCE SOUTH 84 DEGREES 32 MINUTES 17 SECONDS WEST, A DISTANCE OF 27.55 FEET; THENCE NORTH 85 DEGREES 13 MINUTES 57 SECONDS WEST, A DISTANCE OF 27.12 FEET; THENCE SOUTH 89 DEGREES 30 MINUTES 41 SECONDS WEST, PASSING AT A DISTANCE OF 68.95 FEET, A POINT IN THE WEST LINE OF SAID NORTHEAST QUARTER, CONTINUING FOR A TOTAL DISTANCE OF 113.24 FEET; THENCE SOUTH 89 DEGREES 50 MINUTES 32 SECONDS WEST, A DISTANCE OF 376.38 FEET; THENCE SOUTH 87 DEGREES 39 MINUTES 20 SECONDS WEST, A DISTANCE OF 143.57 FEET; THENCE SOUTH 87 DEGREES 25 MINUTES 35 SECONDS WEST, A DISTANCE OF 279.29 FEET; THENCE NORTH 59 DEGREES 16 MINUTES 49 SECONDS WEST, A DISTANCE OF 292.71 FEET; THENCE NORTH 00 DEGREES 00 MINUTES 14 SECONDS WEST, A DISTANCE OF 880.97 FEET; THENCE SOUTH 89 DEGREES 48 MINUTES 54 SECONDS EAST, A DISTANCE OF 85.99 FEET; THENCE NORTH 89 DEGREES 59 MINUTES 54 SECONDS EAST, PASSING AT A DISTANCE OF 980.95 FEET, A POINT IN THE WEST LINE OF SAID NORTHEAST QUARTER, CONTINUING FOR A TOTAL DISTANCE OF 1184.32 FEET; THENCE SOUTH 85 DEGREES 44 MINUTES 00 SECONDS EAST, A DISTANCE OF 126 69 FEET; THENCE SOUTH 49 DEGREES 11 MINUTES 39 SECONDS EAST, A DISTANCE OF 6.59 FEET TO THE BEGINNING OF A NON-TANGENT CURVE CONCAVE TO THE SOUTHWEST; THENCE ALONG SAID NON-TANGENT CURVE CONCAVE TO THE SOUTHWEST HAVING A RADIUS OF 206.68 FEET, A CHORD THAT BEARS SOUTH 74 DEGREES 32 MINUTES 48 SECONDS EAST A CHORD DISTANCE OF 83.52 FEET, AND AN ARC DISTANCE OF 84.10 FEET TO THE BEGINNING OF A REVERSE NON-TANGENT CURVE CONCAVE TO THE NORTH; THENCE ALONG SAID REVERSE NON-TANGENT CURVE CONCAVE TO THE NORTH HAVING A RADIUS OF 213.32 FEET, A CHORD THAT BEARS NORTH 75 DEGREES 12 MINUTES 35 SECONDS EAST A CHORD DISTANCE OF 289.74 FEET, AND AN ARC DISTANCE OF 318.52 FEET; THENCE NORTH 30 DEGREES 53 MINUTES 33 SECONDS EAST, A DISTANCE OF 4.82 FEET TO THE BEGINNING OF A NON-TANGENT CURVE CONCAVE TO THE SOUTHEAST; THENCE ALONG SAID NON-TANGENT CURVE CONCAVE TO THE SOUTHEAST HAVING A RADIUS OF 206.69 FEET, A CHORD THAT BEARS NORTH 50 DEGREES 02 MINUTES 48 SECONDS EAST A CHORD DISTANCE OF 131.19 FEET, AND AN ARC DISTANCE OF 133.50 FEET; THENCE NORTH 75 DEGREES 37 MINUTES 08 SECONDS EAST, A DISTANCE OF 58.32 FEET; THENCE NORTH 78 DEGREES 47 MINUTES 51 SECONDS EAST, A DISTANCE OF 214.13 FEET; THENCE NORTH 90 DEGREES 00 MINUTES 00 SECONDS EAST, A DISTANCE OF 396.76 FEET; THENCE SOUTH 49 DEGREES 35 MINUTES 01 SECONDS EAST, A DISTANCE OF 227.28 FEET; THENCE SOUTH 00 DEGREES 11 MINUTES 04 SECONDS WEST, A DISTANCE OF 715.01 FEET; THENCE SOUTH 18 DEGREES 57 MINUTES 06 SECONDS EAST, A DISTANCE OF 35.18 FEET; THENCE SOUTH 61 DEGREES 15 MINUTES 29 SECONDS EAST, A DISTANCE OF 104.18 FEET; THENCE NORTH 88 DEGREES 33 MINUTES 18 SECONDS EAST, A DISTANCE OF 469.76 FEET; THENCE NORTH 88 DEGREES 43 MINUTES 58 SECONDS EAST, A DISTANCE OF 271.35 FEET; THENCE NORTH 88 DEGREES 31 MINUTES 49 SECONDS EAST, A DISTANCE OF 52.01 FEET; THENCE SOUTH 86 DEGREES 31 MINUTES 45 SECONDS EAST, A DISTANCE OF 22.04 FEET; THENCE SOUTH 75 DEGREES 57 MINUTES 26 SECONDS EAST, A DISTANCE OF 19.24 FEET; THENCE SOUTH 68 DEGREES 29 MINUTES 23 SECONDS EAST, A DISTANCE OF 23.64 FEET; THENCE SOUTH 56 DEGREES 17 MINUTES 51 SECONDS EAST, A DISTANCE OF 24.04 FEET; THENCE SOUTH 46 DEGREES 43 MINUTES 25 SECONDS EAST, A DISTANCE OF 15.56 FEET; THENCE SOUTH 31 DEGREES 59 MINUTES 32 SECONDS EAST, A DISTANCE OF 18.87 FEET; THENCE SOUTH 20 DEGREES 05 MINUTES 11 SECONDS EAST, A DISTANCE OF 29.11 FEET; THENCE SOUTH 12 DEGREES 35 MINUTES 08 SECONDS EAST, A DISTANCE OF 29.83 FEET; THENCE SOUTH 05 DEGREES 06 MINUTES 03 SECONDS EAST, A DISTANCE OF 35.66 FEET; THENCE SOUTH 00 DEGREES 08 MINUTES 00 SECONDS WEST, A DISTANCE OF 249.47 FEET; THENCE SOUTH 01 DEGREE 33 MINUTES 05 SECONDS WEST, A DISTANCE OF 594.95 FEET; THENCE SOUTH 03 DEGREES 00 MINUTES 38 SECONDS EAST, A DISTANCE OF 37.23 FEET; THENCE SOUTH 02 DEGREES 23 MINUTES 03 SECONDS EAST, A DISTANCE OF 21.76 FEET; THENCE SOUTH 41 DEGREES 10 MINUTES 16 SECONDS WEST, A DISTANCE OF 28.88 FEET; THENCE SOUTH 59 DEGREES 43 MINUTES 54 SECONDS WEST, A DISTANCE OF 25.15 FEET; THENCE SOUTH 75 DEGREES 57 MINUTES 27 SECONDS WEST A DISTANCE OF 22.40 FEET TO THE POINT OF BEGINNING, CONTAINING 126.00 ACRES, MORE OR LESS, ALL IN RACINE COUNTY, WISCONSIN.

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PREPARED FOR:
REPUBLIC SERVICES

BOUNDARY EXHIBIT
SOLID WASTE BOUNDARY
KESTREL HAWK LANDFILL
1969 OAKES RD, RACINE, WI 53406

SOURCE OF SURVEY(S)
THIS SURVEY WAS PERFORMED BY WEAVER CONSULTANTS GROUP AT THE REQUEST OF REPUBLIC SERVICES FOR THE PURPOSE OF DELINEATING THE BOUNDARY OF THE PROPERTY OWNED BY THEM. THE SURVEY IS BASED ON RECORD INFORMATION AND IS NOT INTENDED TO BE USED FOR THE PURPOSE OF ESTABLISHING OR RE-ESTABLISHING PROPERTY CORNERS OR BOUNDARY LINES. ANY UNAUTHORIZED USE OF THIS SURVEY WITHOUT THE EXPRESS AUTHORIZATION OF WEAVER CONSULTANTS GROUP IS PROHIBITED.

Weaver Consultants Group
NAPERVILLE, ILLINOIS
630.717.4488 www.weavercg.com

DRAWN BY:	VSP
REVIEWED BY:	AKR
DATE:	2/16/2023
FILE:	0266-1844-09
	[illegible]

SHEET 2 OF 3

BOUNDARY EXHIBIT

SOLID WASTE BOUNDARY

LINE TABLE		
LINE #	LENGTH	DIRECTION
L1	340.90'	N01°46'38"W
L2	126.67'	S85°16'39"W
L3	547.45'	S81°37'27"W
L4	46.82'	S87°50'01"W
L5	35.49'	N84°08'26"W
L6	28.35'	N86°20'13"W
L7	26.53'	N62°00'31"W
L8	73.86'	S85°38'26"W
L9	50.98'	N83°52'53"W
L10	22.63'	N90°00'00"W
L11	14.13'	S87°08'06"W
L12	1353.77'	S81°28'41"W
L13	226.22'	S83°54'35"W
L14	21.77'	S86°25'23"W

LINE TABLE		
LINE #	LENGTH	DIRECTION
L15	33.87'	N65°05'01"W
L16	24.74'	N47°28'28"W
L17	39.73'	N09°14'27"W
L18	665.48'	N02°12'52"W
L19	62.96'	N00°00'00"E
L20	52.96'	N06°34'44"E
L21	124.55'	N05°45'54"E
L22	2.10'	N09°53'21"E
L23	64.35'	N12°09'53"E
L24	32.74'	N22°36'34"E
L25	32.74'	N22°36'31"E
L26	40.67'	N01°35'27"E
L27	9.53'	N01°50'25"E
L28	27.55'	S84°32'17"W

LINE TABLE		
LINE #	LENGTH	DIRECTION
L29	27.12'	N85°13'57"W
L30	213.24'	S89°30'41"W
L31	578.38'	S89°50'32"W
L32	343.57'	S87°29'20"W
L33	279.29'	S87°25'35"W
L34	292.71'	N59°16'49"W
L35	680.97'	N00°00'14"W
L36	65.99'	S89°48'54"E
L37	1184.82'	N89°59'54"E
L38	328.69'	S85°44'00"E
L39	6.58'	S49°11'39"E
L40	4.82'	N30°53'33"E
L41	58.32'	N75°37'08"E
L42	214.13'	N78°47'51"E

LINE TABLE		
LINE #	LENGTH	DIRECTION
L43	396.76'	N90°00'00"E
L44	227.28'	S49°33'01"E
L45	735.01'	S00°31'04"W
L46	35.18'	S18°57'06"E
L47	104.18'	S61°15'29"E
L48	469.76'	N86°38'18"E
L49	271.55'	N88°43'58"E
L50	52.01'	N86°31'49"E
L51	22.04'	S86°31'45"E
L52	19.24'	S75°57'26"E
L53	23.84'	S68°29'23"E
L54	24.04'	S56°17'51"E
L55	15.56'	S46°49'25"E
L56	18.87'	S31°59'32"E

LINE TABLE		
LINE #	LENGTH	DIRECTION
L57	29.13'	S20°05'11"E
L58	29.83'	S12°35'08"E
L59	36.66'	S05°06'08"E
L60	249.47'	S00°08'00"W
L61	594.95'	S01°33'05"W
L62	17.23'	S05°00'38"E
L63	21.76'	S02°21'03"W
L64	28.88'	S41°10'16"W
L65	25.15'	S58°43'54"W
L66	22.40'	S75°57'27"W

CURVE TABLE				
CURVE #	ARC LENGTH	RADIUS	CHORD DIRECTION	CHORD LENGTH
C1	84.10'	206.88'	S74°32'48"E	83.52'
C2	318.52'	219.32'	N75°13'15"E	289.74'
C3	133.50'	206.69'	N50°02'48"E	131.19'

SURVEYOR'S CERTIFICATE

STATE OF ILLINOIS)
) SS
COUNTY OF DUPAGE)

THIS IS TO CERTIFY THAT THE ABOVE EXHIBIT WAS PREPARED UNDER THE DIRECT SUPERVISION OF MICHAEL D. BYTNER, A WISCONSIN PROFESSIONAL LAND SURVEYOR AND THAT THE EXHIBIT HEREON DRAWN IS A CORRECT REPRESENTATION THEREOF.

MICHAEL D. BYTNER, PLS

WISCONSIN PROFESSIONAL LAND SURVEYOR NO. S-2541
WEAVER CONSULTANTS GROUP

WISCONSIN
MICHAEL D. BYTNER
S-2541
WHEATON IL
LAND SURVEYOR

DRAWN BY: VSP
REVIEWED BY: MDB
DATE: 1/26/2025
FILE: 0086-184-09

SHEET 3 OF 3

Weaver Consultants Group
NAPERVILLE, ILLINOIS

BOUNDARY EXHIBIT
SOLID WASTE BOUNDARY
KESTRAL HAWK LANDFILL
1969 OAKES RD, RACINE, WI 53406

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PREPARED FOR:
REPUBLIC SERVICES

Appendix Q: Long-Term Care Costs and Financial Assurance Documentation

- Q.1 – Long-Term Care Costs
- Q.2 – Corrective Action Costs
- Q.3 – Bonding Information

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Appendix Q.1
Long-Term Care Costs

© Republic Services of Wisconsin, Limited Partnership 2026

708 Heartland Trail, Suite 3000 (53717) Madison, WI 608.826.3600 FAX: 608.826.3941

PROJECT/PROPOSAL NAME	PREPARED		CHECKED		PROJECT/ PROPOSAL NO.
	By:	Date:	By:	Date:	
Kestrel Hawk Landfill – Feasibility Report and Plan of Operation – Long-Term Care Cost Assumptions	BreAnne Kahnk	6/25/2025	Todd Martin	6/30/2025	557469.0000

LONG-TERM CARE COSTS

Long-term care costs for Kestrel Hawk Landfill (KHL) were previously approved the Wisconsin Department of Natural Resources (WDNR) on August 23, 2024 during a plan modification to eliminate redundant costs associated with existing corrective action bond. Corrective action costs are not revised or discussed in this submittal. Long-term care costs contained in the August 23, 2024 approval letter totaled $15,749,578 and was based on 2023 dollars. This value was inflated to $16,164,188 (2024 dollars) for inclusion in the April 4, 2025 Application for Final Closure and Long-Term Care (now known as the NR 670 Feasibility and Plan of Operation Report [FPOR]).

To address comments in RFI 1 following WDNR's initial review, long-term care costs were adjusted accordingly. The long-term care costs for KHL were developed based on the following assumptions and basis of cost for each long-term care activity. General assumptions for KHL are presented below followed by the assumptions/basis of cost for individual long-term care activities. For the individual long-term care activities, the letter ID presented below corresponds with the letter ID noted on the long-term care cost table.

General Assumptions:

- Costs are presented in 2025 dollars and are rounded to the nearest dollar.
- KHL consists of the Old Unit and the Northwest Expansion. The Old Unit includes the Hazardous Waste Unit along with non-hazardous waste units. The entire KHL encompasses 125.4 acres.
- Inflation factors, when used, are based on the Wisconsin Department of Natural Resources Owner Financial Responsibility Inflation Factor Table that was revised on March 27, 2025.
- Corrective action related tasks are covered under separate financial assurance mechanism and are not included in this estimate. Items under corrective action include but are not limited to oil removal from the leachate extraction wells, impacted groundwater disposal, etc.

Individual Activities Assumptions/Basis of Cost:

(A) Activities include final cover repairs due to erosion, distressed vegetation, or isolated low areas in the final cover. As noted in Section 3.1.2 of the FPOR, final cover repairs will be completed on an as needed basis. It is assumed as the landfill stabilizes during the long-term care period, the frequency and area of final cover repairs will decrease. For the initial year of the long-term care period, it is assumed that up to 3% of the landfill area (approximately 3.8 acres) will require repairs and that as vegetation becomes more established the area requiring repairs will diminish down to 1 acre by the 5-year mark (average of 2.4 acres per year over the first five years). This area will decrease to approximately 0.5% of the landfill area (approximately 0.65 acres) for the remaining 35 years of the long-term care period. The unit cost includes minor filling of rills with topsoil, minor fine grading, reseeding, fertilizing, and mulching. Unit cost is based on an engineer estimate from experience at similar projects and the Wisconsin DOT Average Unit Price List and assumes the following:

  - Topsoil: 30 cubic yards (cy) per acre at $12 per cy ($360)
  - Mobilization and minor fine grading: 8 hours at $195 per hour for tracked skid loader and operator ($1,560)

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	By:	Date:	By:	Date:	
Kestrel Hawk Landfill – Feasibility Report and Plan of Operation – Long-Term Care Cost Assumptions	BreAnne Kahnk	6/25/2025	Todd Martin	6/30/2025	557469.0000

- Seeding: $1,500 per acre
- Mulch: $0.27 per square yard (FY2024 WDOT Average Unit Price List [$0.26] inflated to 2025 dollars using a factor of 1.0242) ($1,307 per acre)

(B) Per Section 3.1.2 of the FPOR, lawn mowing/vegetation control will be conducted annually. Costs are based on a 2025 quotation provided by a third party for rotational grazing of goats to control vegetation throughout the property owned by Republic Services of Wisconsin (231 acres). The total quotation was divided by the acreage of KHL (125.4 acres) to obtain a per acre cost for the landfill area only.

(C) Snow removal will be conducted on an as-needed basis. For budgeting purposes, 2 removal events per year are estimated, as that has been typical at the site in recent years. Unit cost is based on a quotation from a local 3rd party snow removal contractor and in 2025 dollars.

(D) Repairs will be completed on an as needed basis. Repairs may include repair of potholes and minor grading of gravel roads. Unit cost based on engineer's estimate from experience at similar projects and assumes the following:

- Crushed Stone: 1-quad axle load (22 tons) at $15 per ton ($330)
- Mobilization and equipment: 8 hours at $195 per hour for tracked skid loader and operator ($1,560)

(E) Sedimentation basins 1, 4, 5, 6, and 7 are cleaned on an as needed basis. Sedimentation basins 2 and 3 no longer exist. It is assumed that the basins will be cleaned annually for the first five years and then every five years for the remaining 35 years. Therefore, the annual cost in Years 6-40 was reduced to 1/5 of the total cost. Unit cost (2024) is based on the following assumptions:

- Up to 500 cubic yards of sediment are removed during a cleaning event of the sedimentation basins (combined).
- Removal to be completed in 2, 10 hour days.
- Excavator at $219 per hour for equipment and operator ($4,380).
- Dump Truck $152 per hour for equipment and operator ($3,040).

Unit cost ($7,420) inflated to 2025 dollars using a factor of 1.0242 ($7,600).

(F) Consists of general maintenance and repairs of ditching, downslope flumes, culverts, and drainage pipes. Maintenance can include removal of sediment from stormwater infrastructure. Repairs are anticipated to be minor, infrequent, and completed on an as needed basis. It is assumed that one $15,000 maintenance event will occur every 10 years. Cost is prorated to a per year basis. Unit cost based on engineers' estimate from experience at similar projects.

(G) Leachate disposal occurs throughout the year as leachate is pumped directly to the City of Racine sanitary sewer system at manhole MH15B for the Old Unit leachate and manhole LV-6 for leachate from the Northwestern Expansion. Leachate quantity is based on s. NR 512.12(3), Wisconsin Administrative Code. Both composite and non-composite final cover areas are located at KHL. Composite final cover areas encompass approximately 96.4 acres, with the remaining 29 aces consisting of non-composite final cover areas. Assuming a leachate generation rate of 1-inch per year for composite final cover areas (2,617,673 gallons) and 3-inches per year for non-composite final cover areas (2,362,422 gallons). The total annual leachate disposal for KHL is approximately 4,980,000 gallons (rounded). Unit cost is per the City of Racine wastewater utility as of 2025 ($0.01 per gallon).

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	By:	Date:	By:	Date:	
Kestrel Hawk Landfill – Feasibility Report and Plan of Operation – Long-Term Care Cost Assumptions	BreAnne Kahnk	6/25/2025	Todd Martin	6/30/2025	557469.0000

(H) Activities include annual operation and maintenance to ensure proper continuance of lift stations, manholes, cleanouts, and piping that are accessible from outside the waste mass. In addition, up to 5 hours per week for a third-party technician ($120 per hour based on 2025 rates) and $250 per week for reimbursable expenses are assumed to assist in the operation and maintenance of the leachate collection system. Costs for annual pump calibration ($405) and quarterly panel inspection ($1,690 per quarter) are included in this task item and are based on 2025 third party quotations to Republic Services.

(I) Leachate and groundwater collection lines will be jetted on an annual basis, with the exception of areas that only require biennial jetting as noted in Section 3.2.3 of the FPOR. Unit cost based on third party quotation to Republic Services from 2024 ($19,900) (Cost inflated to 2025 dollars using an inflation factor of 1.0242 [$20,382]).

(J) Leachate lines will be televised every five years. Unit costs are prorated over a five-year period to determine an annual cost. Leachate lines were last televised in 2023. Unit cost based on third party quotation to Republic Services in 2023 ($5,500) (Cost inflated to 2025 dollars using an inflation factor of 1.0615 [$5,838]). It is anticipated that 8 televising events will be required during the long-term care period. The total cost of televising throughout the long-term care period was divided by 40 years to obtain a per year estimated cost.

(K) Leachate pumps and associated controls will be replaced on an as needed basis. The basis of the cost assumes that 1 pump and its associated controls will be replaced annually. Unit cost based on third party quotation to Republic Services for 2025 and includes the replacement of the pump.

(L) Annual operation and maintenance to maintain the integrity and functionality of the gas collection system. Activities may include servicing of the blower and flare, surface emission monitoring, servicing of biogas and blower building equipment, balancing of landfill gas vacuum, and miscellaneous repairs. A 50 percent reduction in cost is assumed following the initial 5 years due to the planned decommissioning of the biogas building. Unit cost based on third party quotation for 2025 to Republic Services.

(M) Blower and flare system is assumed to require replacement every 20 years. Last blower and flare replacement occurred in 2023; therefore, up to 2 replacements are assumed to be required during the long-term care period. Cost for previous replacement in 2023 was $21,000 based on vendor invoice (Cost inflated to 2025 dollars using an inflation factor of 1.0615 [$22,292]). Total cost for the two estimated replacements was divided by 40 years to obtain a per year estimated cost.

(N) Assumes that up to 200 linear feet of 12-inch-diameter landfill gas header pipe will require replacement every five years (40 linear feet per year). Unit cost includes removal of impacted gas header and replacement of overlying final cover soils to the project specifications. Reseeding and mulching are included in Item A. Estimated unit cost per foot in 2025 dollars is $54.54 based on installation costs provided to Republic Services by third-party vendors.

(O) KHL has 41 dual gas/leachate extraction wells along with 65 gas extraction wells at the facility. It is assumed that a 79 vertical foot gas well will require replacement every 4 years (20 vertical feet per year) during the long-term care period at an estimated cost (in 2025 dollars) of $91.99 per vertical foot of gas well based on installation costs provided to Republic Services by third-party vendors.

(P) Groundwater monitoring wells are located around the perimeter of the landfill and over the last 17 years, no groundwater wells have required replacement. It is assumed that

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	By:	Date:	By:	Date:	
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groundwater wells will not require replacement during the long-term care program. However, it is assumed that well pumps will need replacement. For budgeting, 1 bladder pump is assumed to be replaced every 5 years. Groundwater well maintenance also includes lock replacement, pump servicing, and minor repairs to protective covers. Unit cost is based on an engineer estimate from experience at similar projects and from a third-party quotation for bladder pump replacement.

(Q) Environmental sampling will be completed in accordance with the environmental monitoring program detailed in Section 3.5 and Figure 5 of the FPOR. Includes quarterly groundwater sampling of NR 664 and Non-NR 140 compliance wells, semiannual groundwater sampling of NR 500 and Subtitle D wells, gradient control system monitoring, leachate/gas condensate monitoring, and surface water monitoring. Unit cost based on third party quotations. It is assumed that a local engineering firm will be collecting the required samples per the monitoring program for $34,490 annually based on a 2025 quotation. Laboratory analysis is based on a 2025 quotation from Pace Laboratory. It is assumed that sampling requirements will be reduced after the initial 5 years of the long-term care period; therefore, annual costs in Years 6-40 are reduced by 50 percent.

(R) Quarterly environmental reporting is completed for KHL. Quarterly letters include the NR 140/NR 664 exceedances report, quarterly reporting to the City of Racine wastewater treatment plant, and summary letters to Republic Services completed by a third-party environmental consulting firm. Unit cost is based on 2025 proposal for quarterly reporting and data management services provided to Republic Services. As noted in Item Q, it is assumed that quarterly sampling will be reduced to semiannual following year 5; therefore, the annual cost is reduced by 50 percent for Years 6-40.

(S) Weekly inspections will be conducted within the 38-acre Hazardous Waste Unit (HWU) per the Inspection Manual (Appendix I of the FPOR). Weekly inspections that correspond with the timing of the monthly and quarterly inspections are replaced with the monthly/quarterly inspection and included in Items T and U. Weekly inspections are assumed to be a "drive-by" inspection. Unit cost assumes the following:

- Inspector: One hour of onsite inspection and up to one hour of round-trip travel at $150 per hour ($300)
- Expenses: $50 for visit for expenses (car and gas)

(T) Monthly inspections will be conducted within the 38-acre HWU per the Inspection Manual (Appendix I of the FPOR). Monthly inspections that occur during the quarterly inspection will are covered in Item U. Unit cost assume the following:

- Inspector: Three hours of onsite inspection and up to one hour of round trip travel at $150 per hour ($600)
- Expenses: $50 for visit for expenses (car and gas)

(U) Quarterly inspections will be conducted within the 38-acre HWU per the Inspection Manual (Appendix I of the FPOR). Quarterly inspections that occur during the annual inspection will are covered in Item V. Unit cost assume the following:

- Inspector: Four hours of onsite inspection and up to one hour of round trip travel at $150 per hour ($600)
- Expenses: $50 for visit for expenses (car and gas)

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PROJECT/PROPOSAL NAME	PREPARED		CHECKED		PROJECT/ PROPOSAL NO.
	By:	Date:	By:	Date:	
Kestrel Hawk Landfill – Feasibility Report and Plan of Operation – Long-Term Care Cost Assumptions	BreAnne Kahnk	6/25/2025	Todd Martin	6/30/2025	557469.0000

(V) Annual inspections will be conducted for the entire KHL per the Inspection Manual (Appendix I of the FPOR). Unit cost assumes the following:

- Inspector: Eight hours of onsite inspection, up to one hour of round trip travel, and an hour of follow up reporting at $150 per hour ($1,500)
- Expenses: $50 for visit for expenses (car and gas)

(W) Annual reporting per the requirements of the August 30, 2017 Plan Modification Approval Letter is submitted to the WDNR in June by a third-party environmental consulting firm. Unit cost is based on a 2021 estimate that has been inflated annually. The 2024 estimate was inflated using a factor of 1.0242 to obtain a 2025 cost.

(X) Air compliance services include monthly monitoring of all landfill gas extraction wells, semiannual air permit monitoring reports, and annual air compliance certifications along with follow-up to remain in compliance with active air permits. Unit price is based on 2025 third-party quotation provided to Republic Services.

(Y) Hazardous waste reporting per NR 664.0075 is completed on an annual basis prior to March 1 by a third-party engineering consulting firm. Based on the 2024 Annual Hazardous Waste Report submitted in February 2025, annual base fee for Large Quantity Generator is $470 with an additional tonnage fee. Over the past four years the additional tonnage fee has ranged from $1 to $52, an average additional tonnage fee of $25 is assumed. Unit cost is based on the published annual base fee and tonnage fee from the February 2025 Annual Hazardous Waste report and the 2025 proposal for completion of the hazardous waste report.

(Z) Pumping of the gas condensate tank is conducted by a third-party contractor. Based on invoices from 2024, each removal activity was $450 per event and 21 removal events occurred in 2024. An inflation factor of 1.0242 was applied to the $450 per event for the 2025 unit cost. It is assumed that in Years 6-40, condensate generation will reduce with the reduction of landfill gas generation; therefore, the average annual cost was reduced by 50 percent during this period.

(AA) Electrical costs are based on the actual rates incurred in 2025. Based on June 2025 invoices, electrical costs were approximately $6,399 for the month of May. The monthly cost was rounded to $6,400 and multiplied by 12 for an estimated annual basis ($76,800). Cost does not account for the energy use during the selling process to SC Johnson as the sale price covers the additional cost.

(BB) Site security maintenance will be conducted on an as needed basis and is assumed to be required infrequently throughout the 40-year long-term care period. Maintenance could include repairs to the gates and miscellaneous fencing repairs. It should be noted that fencing replacement is covered under the Corrective Action costs that were split out from the long-term care costs and approved by the WDNR on August 23, 2024. Due to the anticipated low frequency of site controls/security measures maintenance, an allocation of 200 dollars is assumed.

(CC) Survey control points are to be maintained throughout the long-term care period. It is assumed that the control points be resurveyed every 5 years to ensure their integrity. Unit cost is based on a quotation for 2025 of $2,500 per survey event and is divided over 5 years to obtain a per year cost.

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PROJECT/PROPOSAL NAME	PREPARED		CHECKED		PROJECT/ PROPOSAL NO.
	By:	Date:	By:	Date:	
Kestrel Hawk Landfill – Feasibility Report and Plan of Operation – Long-Term Care Cost Assumptions	BreAnne Kahnk	6/25/2025	Todd Martin	6/30/2025	557469.0000

Professional Engineer Certification:

"I, BreAnne N. Kahnk, hereby certify that I am a licensed professional engineer in the State of Wisconsin in accordance with the requirements of ch. A−E 4, Wis. Adm. Code; that this document has been prepared in accordance with the Rules of Professional Conduct in ch. A-E 8, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 500 to 538 and chs. NR 664 and 670, Wis. Adm. Code."



BreAnne N. Kahnk, P.E.
Professional Engineer No. 46825

Table 1: Revised Long-Term Care Cost Estimate for 2025[1]
Kestrel Hawk Landfill (License #0572), Racine County, Wisconsin

	Major Annual Cost Item	Unit	Unit Cost (2025$)	Quantity	Avg. Cost Per Year (1-5 years)	Avg. Cost Per Year (6-40 years)
Final Cover and Stormwater Control Systems						
(A)	Final Cover Repairs (Year 1-5)	Acre	$4,727	2.4	$11,345	--
(A)	Final Cover Repairs (Year 6-40)	Acre	$4,727	0.65	--	$3,073
(B)	Lawn Mowing/Vegetation Control	Acre	$80	125.4	$9,989	$9,989
(C)	Snow Removal	LS	$575	2	$1,150	$1,150
(D)	Access Road Repair	LS	$1,890	1	$1,890	$1,890
(E)	Sedimentation Basin Cleaning	LS	$7,600	1	$7,600	$1,520
(F)	Stormwater Infrastructure Maintenance	LS	$1,500	1	$1,500	$1,500
				Category Subtotal	$33,473	$19,121
Leachate Management System						
(G)	Leachate Disposal	Gallon	$0.0100	4,980,000	$49,800	$49,800
(H)	Operation and Maintenance	LS	$51,365	1	$51,365	$51,365
(I)	Leachate/Groundwater Collection Line Cleaning	LS	$20,382	1	$20,382	$20,382
(J)	Leachate Line Televising	LS	$1,168	1	$1,168	$1,168
(K)	Leachate Pump and Controls Replacement	EA	$4,326	1	$4,326	$4,326
				Category Subtotal	$127,040	$127,040
Gas Collection and Management System						
(L)	Operation and Maintenance	LS	$96,498	1	$96,498	$48,249
(M)	Blower and Flare Replacement	LS	$1,115	1	$1,115	$1,115
(N)	Header/Lateral Repair	LF	$54.54	40	$2,182	$2,182
(O)	Gas Well Replacement	VF	$91.99	20	$1,840	$1,840
				Category Subtotal	$101,634	$53,385
Environmental Monitoring and Groundwater Maintenance						
(P)	Groundwater (GW) monitoring well maintenance	LS	$2,052	1	$2,052	$2,052
(Q)	Environmental Monitoring and Analysis					
	Labor - Third Party Engineering Firm	LS	$34,490	1	$34,490	$17,245
	Laboratory Analysis	LS	$34,880	1	$34,880	$17,440
(R)	Quarterly Monitoring Reports	LS	$38,800	1	$38,800	$19,400
				Category Subtotal	$110,222	$56,137
Inspections and Reporting						
(S)	Weekly Hazardous Waste Unit Inspections	EA	$350	40	$14,000	$14,000
(T)	Monthly Hazardous Waste Unit Inspections	EA	$650	8	$5,200	$5,200
(U)	Quarterly Hazardous Waste Unit Inspections	EA	$650	3	$1,950	$1,950
(V)	Annual Landfill Inspection	EA	$1,550	1	$1,550	$1,550
(W)	Annual Reporting	LS	$22,995	1	$22,995	$22,995
				Category Subtotal	$45,695	$45,695
Miscellaneous Costs						
(X)	Air Compliance Services	LS	$16,840	1	$16,840	$16,840
(Y)	Hazardous Waste Generator Fees and Reporting	LS	$3,495	1	$3,495	$3,495
(Z)	Condensate removal and disposal	LS	$9,679	1	$9,679	$4,839
(AA)	Electrical costs	LS	$76,800	1	$76,800	$76,800
(BB)	Site Security Maintenance	LS	$200	1	$200	$200
(CC)	Survey Benchmark Maintenance	LS	$500	1	$500	$500
				Category Subtotal	$107,514	$102,674
				Annual Subtotal	$525,578	$404,053
				Management and Administrative Fees[2]	$52,558	$40,405
				Contingency (10%)	$57,800	$44,400
				Annual Total	$635,936	$488,858
				Total Cost for Year 1 to 5	**$3,179,679**	**---**
				Total Cost for Year 6 to 40	**---**	**$17,110,033**
				Total 40-Year Long-Term Care Cost	**$20,289,712**	

Notes:

(1) Assumptions and basis of cost for long-term care activities is provided in the attached document.

(2) Management and administrative fees for 3rd party to implement items was assumed to be 10% of the annual subtotal.

Prepared by: B. Kahnk 6/17/2025

Checked By: T. Martin 6/30/2025

Appendix Q.2
Corrective Action Costs

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PROJECT/PROPOSAL NAME	PREPARED		CHECKED		PROJECT/ PROPOSAL NO.
	By:	Date:	By:	Date:	
Kestrel Hawk Landfill – Feasibility Report and Plan of Operation – Corrective Action Cost Assumptions	BreAnne Kahnk	9/19/2025 10/21/2025	T. Martin	9/22/2025 10/22/2025	557469.0000

CORRECTIVE ACTION COSTS

Corrective Action costs for Kestrel Hawk Landfill (KHL) were previously approved by the Wisconsin Department of Natural Resources (WDNR) on August 23, 2024 with a plan modification to eliminate redundant costs associated with an existing corrective action bond. To address comments in Request for Further Information (RFI) 2 following WDNR's review, corrective action costs have been updated to reflect site conditions and adjusted accordingly to 2025 dollars. The corrective action costs for KHL were developed based on the following assumptions and basis of cost for each activity. General assumptions for KHL are presented below followed by the assumptions/basis of cost for individual activities. For the individual corrective action activities, the letter ID presented below corresponds with the letter ID noted on the corrective action cost table.

General Assumptions:

- Costs are presented in 2025 dollars and are rounded to the nearest dollar.
- Inflation factors, when used, are based on the Wisconsin Department of Natural Resources Owner Financial Responsibility Inflation Factor Table that was revised on March 27, 2025.
- Corrective action is primarily related to collection and treatment of contaminated groundwater; however, activities that were noted as under corrective action in the updated long-term care costs are also included in this estimate.

Individual Activities Assumptions/Basis of Cost:

(A) Activities include annual operation and maintenance of the groundwater containment system and extraction system in the 141U area. This includes pump maintenance, well maintenance, and maintenance to associated lift stations. Unit cost assumes up to 4 hours per week for a third-party technician ($115 per hour based on 2025 rates) to inspect and maintain the groundwater containment and extraction system ($460 per week).

(B) Groundwater disposal occurs throughout the year and is comingled with generated leachate as it is pumped directly to the City of Racine sanitary sewer system at manhole MH15B. Groundwater quantity is based on an average volume reported over the last six years from the 2019-2024 Annual Reports for KHL. Reported volumes have varied from 500,665 to 1,511,900 gallons over the previous six years, averaging at 922,800 gallons. Unit cost is per the City of Racine wastewater utility as of 2025 ($0.0100 per gallon).

(C) Groundwater extraction pumps and associated controls will be replaced on an as needed basis. The basis of cost assumes that 1 pump will be replaced every other year ($2,500 per pump), 1 transducer ($75) is replaced every year, and the flow meter ($120) is replaced every three years. Therefore this assumes that 20 pumps, 40 transduces, and 14 flow meters will be replaced during the 40-year long-term care period. Unit cost is based on third party quotation to Republic Services for 2025.

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PROJECT/PROPOSAL NAME	PREPARED		CHECKED		PROJECT/ PROPOSAL NO.
	By:	Date:	By:	Date:	
Kestrel Hawk Landfill – Feasibility Report and Plan of Operation – Corrective Action Cost Assumptions	BreAnne Kahnk	9/19/2025 10/21/2025	T. Martin	9/22/2025 10/22/2025	557469.0000

(D) Iron-fouling bacteria pump treatment is completed on an annual basis to treat the extraction pumps in the 141U area. Unit cost assumes 12 hours of labor for a technician at $115 per hour and $700 per year for the treatment liquid and is based on a 2025 quotation provided by a 3rd party vendor to KHL.

(E) Polychlorinated biphenyls (PCB) oil product is required to be removed as noted in Section 3.2.3 of the FPOR. Unit cost assumes pick up and disposal of 1 oil drum per year based on the activities conducted in 2024. Cost from 2024 ($9,326) inflated to 2025 dollars using an inflation factor of 1.0242 ($9,552).

(F) It is assumed that minimal fence repairs will be required at KHL based on the operational history of the site. Due to the anticipated low frequency of site controls/security measures maintenance, an allocation of 200 dollars is assumed.

Professional Engineer Certification:

"I, BreAnne N. Kahnk, hereby certify that I am a licensed professional engineer in the State of Wisconsin in accordance with the requirements of ch. A–E 4, Wis. Adm. Code; that this document has been prepared in accordance with the Rules of Professional Conduct in ch. A-E 8, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 500 to 538 and chs. NR 664 and 670, Wis. Adm. Code."



BreAnne N. Kahnk, P.E.
Professional Engineer No. 46825

Table 2: Revised Corrective Action Cost Estimate for 2025[1]
Kestrel Hawk Landfill (License #0572), Racine County, Wisconsin

	Major Annual Cost Item	Unit	Unit Cost (2025$)	Quantity	Avg. Cost Per Year
Groundwater Management System					
(A)	Operation and Maintenance	Week	$460	52	$23,920
(B)	Groundwater Disposal	Gallon	$0.0100	922,800	$9,228
(C)	Groundwater Removal Pump and Controls Replacement	LS	$1,365	1	$1,365
(D)	Iron-fouling Bacteria Pump Treatment				
	- Labor	HR	$115	12	$1,380
	- Equipment	LS	$700	1	$700
				Category Subtotal	$36,593
Miscellaneous Costs					
(E)	PCB Oil Product Removal	LS	$9,552	1	$9,552
(F)	Fence Repair	LS	$200	1	$200
				Category Subtotal	$9,752
				Annual Subtotal	$46,345
				Management and Administrative Fees[2]	$4,634
				Contingency (10%)	$5,100
				Annual Total	$56,079
				Total 40-Year Corrective Action Cost	**$2,243,166**

Notes:

(1) Assumptions and basis of cost for corrective action related activities are provided in the attached document.

(2) Management and administrative fees for 3rd party to implement items are assumed to be 10% of the annual subtotal.

(3) All unit costs are uninflated 2025 costs except for line item (E), which uses an inflated 2024 unit cost.

Prepared by: B. Kahnk 10/21/2025

Checked By: T. Martin 10/22/2025

Appendix Q.3
Bonding Information

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DUPLICATE ORIGINAL

INCREASE PENALTY RIDER

BOND AMOUNT $16,322,862.64 BOND NO. 859763

To be attached and form a part of Bond No. 859763, executed by Evergreen National Indemnity Company as surety, on behalf of Republic Services of Wisconsin, Limited Partnership as current principal of record, and in favor of State of Wisconsin, Department of Natural Resources, as Obligee for Kestral Hawk LF Post Closure, and in the amount of Sixteen Million Three Hundred Twenty Two Thousand Eight Hundred Sixty Two Dollars and 64/100 ($16,322,862.64).

In consideration of the agreed premium charged for this bond, it is understood and agreed that Evergreen National Indemnity Company hereby consents that effective from the 1st Day of April, 2025, said bond shall be amended as follows:

THE BOND PENALTY SHALL BE INCREASED:

FROM: Sixteen Million Three Hundred Twenty Two Thousand Eight Hundred Sixty Two Dollars and 64/100 ($16,322,862.64)

TO: Sixteen Million Seven Hundred Eighteen Thousand One Hundred Seventy Seven Dollars and 05/100 ($16,718,177.05) Post Closure

The INCREASE of said bond penalty shall be effective as of the 1st Day of April, 2025.

Signed, sealed and dated this 12th Day of April, 2025

Evergreen National Indemnity Company
SURETY

BY _____
Amber Engel ATTORNEY-IN-FACT

EVERGREEN NATIONAL INDEMNITY COMPANY

Independence, Ohio

POWER OF ATTORNEY

Bond No. 859763

KNOW ALL MEN BY THESE PRESENTS: That the Evergreen National Indemnity Company, a corporation in the State of Ohio does hereby nominate, constitute and appoint:

Amber Engel

its true and lawful Attorney(s)-In-Fact to make, execute, attest, seal and deliver for and on its behalf, as Surety, and as its act and deed, where required, any and all bonds, undertakings, recognizances and written obligations in the nature thereof.

This Power of Attorney is granted and is signed by facsimile pursuant to the following Resolution adopted by its Board of Directors on the 23rd day of July, 2004:

"RESOLVED, That any two officers of the Company have the authority to make, execute and deliver a Power of Attorney constituting as Attorney(s)-in-fact such persons, firms, or corporations as may be selected from time to time.
FURTHER RESOLVED, that the signatures of such officers and the Seal of the Company may be affixed to any such Power of Attorney or any certificate relating thereto by facsimile; and any such Power of Attorney or certificate bearing such facsimile signatures or facsimile seal shall be valid and binding upon the Company; and any such powers so executed and certified by facsimile signatures and facsimile seal shall be valid and binding upon the Company in the future with respect to any bond or undertaking to which it is attached."

IN WITNESS WHEREOF, the Evergreen National Indemnity Company has caused its corporate seal to be affixed hereunto, and these presents to be signed by its duly authorized officers this 1st day of April, 2024.

EVERGREEN NATIONAL INDEMNITY COMPANY

By: _____
Robert W. Shepard, President

By: _____
David A. Canzone, CFO

Notary Public)
State of Ohio) SS:

On this 1st day of April, 2024, before the subscriber, a Notary for the State of Ohio, duly commissioned and qualified, personally came Robert W. Shepard and David A. Canzone of the Evergreen National Indemnity Company, to me personally known to be the individuals and officers described herein, and who executed the preceding instrument and acknowledged the execution of the same and being by me duly sworn, deposed and said that they are the officers of said Company aforesaid, and that the seal affixed to the preceding instrument is the Corporate Seal of said Company, and the said Corporate Seal and signatures as officers were duly affixed and subscribed to the said instrument by the authority and direction of said Corporation, and that the resolution of said Company, referred to in the preceding instrument, is now in force.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal at Cleveland, Ohio, the day and year above written.

WILLIAM J. KOVAL, JR.
NOTARY PUBLIC - STATE OF OHIO
My commission has no expiration date.
Section 147.03 R.C.

By: _____
William J. Koval, Jr., Notary Public
My commission has no expiration date
Section 147.03 R.C.

State of Ohio) SS:

I, the undersigned, Secretary of the Evergreen National Indemnity Company, a stock corporation of the State of Ohio, DO HEREBY CERTIFY that the foregoing Power of Attorney remains in full force and has not been revoked; and furthermore that the Resolution of the Board of Directors, set forth herein above, is now in force.

Signed and sealed in Independence, Ohio, this 6th day of May, 2025.

_____
Wan C. Collier, Secretary

USI Insurance Services
601 Union Street
Suite 1000
Seattle, WA 98101
www.usi.com
Tel: 206.441.6300

5/6/2025

FedEx Priority Overnight

Khalid Umer
Republic Services
26W580 Schick Road
Hanover Park, IL 60133
630-362-0063

RE: $ 16,322,862.64 Closure/Post Closure Bond
for Kestrel Hawk LF
for Republic Services of Wisconsin, Limited Partnership
Evergreen National Indemnity Company
Bond # 859763

Please find enclosed increase Penalty Rider increasing the bond:
from $ 16,322,862.64 to $ $ 16,718,177.05 the effective date of change,
4/1/2025 has been used for the above captioned bond per your request.

You will need to send the enclosed original documents to the respective Obligee at your earliest convenience along with any other required paperwork.

Should you require further assistance or if you have any questions, please do not hesitate to contact us at 206-731-1200 or email us at RSRenewal@usi.com.

Sincerely,

Amber

Amber Engel
Surety Department

ORIGIN ID:BFIA (854) 529-1602
AMBER ENGEL
USI INSURANCE SERVICES
601 UNION ST. SUITE 1000
SEATTLE, WA 98101
UNITED STATES US

SHIP DATE: 06MAY25
ACTWGT: 1.00 LB
CAD: 1124472/INET4535

BILL SENDER

TO **KHALID UMER**
REPUBLIC SERVICES
26W580 SCHICK ROAD
HANOVER PARK IL 60133
(630) 362-0063
INV:
PO:
REF:
DEPT:

58CJ3/630D/C6C4

J252025040801uv

FedEx Express

TRK# 0201 **8810 6417 8279**

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INCREASE PENALTY RIDER

BOND AMOUNT $2,181,801.00 BOND NO. 880280

To be attached and form a part of Bond No. 880280, executed by Evergreen National Indemnity Company as surety, on behalf of Republic Services of Wisconsin, Limited Partnership as current principal of record, and in favor of State of Wisconsin Department of Natural Resources, as Obligee for Corrective Action Bond form Kestrel Hawk Landfill, and in the amount of Two Million One Hundred Eighty One Thousand Eight Hundred One Dollars and 00/100 ($2,181,801.00).

In consideration of the agreed premium charged for this bond, it is understood and agreed that Evergreen National Indemnity Company hereby consents that effective from the 6th Day of September, 2024, said bond shall be amended as follows:

THE BOND PENALTY SHALL BE INCREASED:

FROM: Two Million One Hundred Eighty One Thousand Eight Hundred One Dollars and 00/100 ($2,181,801.00)

TO: Two Million Two Hundred Sixty One Thousand Two Hundred Eighteen Dollars and 56/100 ($2,261,218.56) Corrective Action

The INCREASE of said bond penalty shall be effective as of the 6th Day of September, 2024.

Signed, sealed and dated this 7th Day of October, 2024

Evergreen National Indemnity Company
SURETY

BY _____
Amber Engel, ATTORNEY-IN-FACT

EVERGREEN NATIONAL INDEMNITY COMPANY

Independence, Ohio

POWER OF ATTORNEY

Bond No. 880280

KNOW ALL MEN BY THESE PRESENTS: That the Evergreen National Indemnity Company, a corporation in the State of Ohio does hereby nominate, constitute and appoint:

Amber Engel

its true and lawful Attorney(s)-In-Fact to make, execute, attest, seal and deliver for and on its behalf, as Surety, and as its act and deed, where required, any and all bonds, undertakings, recognizances and written obligations in the nature thereof.

This Power of Attorney is granted and is signed by facsimile pursuant to the following Resolution adopted by its Board of Directors on the 23rd day of July, 2004:

"RESOLVED, That any two officers of the Company have the authority to make, execute and deliver a Power of Attorney constituting as Attorney(s)-in-fact such persons, firms, or corporations as may be selected from time to time.
FURTHER RESOLVED, that the signatures of such officers and the Seal of the Company may be affixed to any such Power of Attorney or any certificate relating thereto by facsimile; and any such Power of Attorney or certificate bearing such facsimile signatures or facsimile seal shall be valid and binding upon the Company; and any such powers so executed and certified by facsimile signatures and facsimile seal shall be valid and binding upon the Company in the future with respect to any bond or undertaking to which it is attached."

IN WITNESS WHEREOF, the Evergreen National Indemnity Company has caused its corporate seal to be affixed hereunto, and these presents to be signed by its duly authorized officers this 1st day of April, 2022.

EVERGREEN NATIONAL INDEMNITY COMPANY

By: _____
Matthew T. Tucker, President

By: _____
David A. Canzone, CFO

Notary Public)
State of Ohio) SS:

On this 1st day of April, 2022, before the subscriber, a Notary for the State of Ohio, duly commissioned and qualified, personally came Matthew T. Tucker and David A. Canzone of the Evergreen National Indemnity Company, to me personally known to be the individuals and officers described herein, and who executed the preceding instrument and acknowledged the execution of the same and being by me duly sworn, deposed and said that they are the officers of said Company aforesaid, and that the seal affixed to the preceding instrument is the Corporate Seal of said Company, and the said Corporate Seal and signatures as officers were duly affixed and subscribed to the said instrument by the authority and direction of said Corporation, and that the resolution of said Company, referred to in the preceding instrument, is now in force.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal at Cleveland, Ohio, the day and year above written.

Julie K Bowers
Notary Public
In and For the State of Ohio
My Commission Expires
August 13, 2024

_____
Julie K. Bowers, Notary Public
My Commission Expires August 13, 2024

State of Ohio) SS:

I, the undersigned, Secretary of the Evergreen National Indemnity Company, a stock corporation of the State of Ohio, DO HEREBY CERTIFY that the foregoing Power of Attorney remains in full force and has not been revoked; and furthermore that the Resolution of the Board of Directors, set forth herein above, is now in force.

Signed and sealed in Independence, Ohio, this 7th day of October, 2024.

_____
Wan C. Collier, Secretary

USI Insurance Services
601 Union Street
Suite 1000
Seattle, WA 98101
www.usi.com
Tel: 206.441.6300

October 7, 2024

FedEx Priority Overnight

Khalid Umer
Republic Services
26W580 Schick Road
Hanver Park, IL 60133
630-362-0063

RE: $ 2,181,801.00 Closure/Post Closure Bond
for Kestrel Hawk Landfill
for Republic Services of Wisconsin, Limited Partnership
Evergreen National Indemnity Company
Bond # 880280

Please find enclosed increase Penalty Rider increasing the bond:
from $ 2,181,801.00 to $ 2,261,218.56 the effective date of change,
9/6/2024 has been used for the above captioned bond per your request.

You will need to send the enclosed original documents to the respective Obligee at your earliest convenience along with any other required paperwork.

Should you require further assistance or if you have any questions, please do not hesitate to contact us at 206-731-1200 or email us at RSRenewal@usi.com.

Sincerely,

Amber Engel
Surety Department

ORIGIN ID:BFIA (854) 529-1602
AMBER ENGEL
USI INSURANCE SERVICES
601 UNION ST. SUITE 1000

SEATTLE, WA 98101
UNITED STATES US

SHIP DATE: 07OCT24
ACTWGT: 1.00 LB
CAD: 1124472/INET4535

BILL SENDER

TO **KHALID UMER**
REPUBLIC SERVICES
26W580 SCHICK ROAD

HANOVER PARK IL 60133
(630) 362-0063
INV:
PO:
REF:
DEPT:

58CJ2/B264/C6C4

J243024071381uv

FedEx Express

TRK# 0201 **7790 6828 0675**

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Appendix R: Excerpts from NON-Documents

- R.1 – Generator Waste Determinations
- R.2 – Gas Processing Residuals Documentation
- R.3 – WWTU Exemption Support

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Appendix R.1
Generator Waste Determinations

© Republic Services of Wisconsin, Limited Partnership 2026

REPUBLIC SERVICES

1969 Oakes Road, Racine, WI 53406
o 262.884.7081 f 262.884.7096 republicservices.com

November 16, 2020

Via Email

Doug Coenen, P.E.
Waste Management Specialist
Waste and Materials Management Program
Wisconsin Department of Natural Resources
101 S. Webster Street HW/5
P.O. Box 792
Madison, WI 53707-7921

Subject: Response to Addendum to Notice of Noncompliance
Hazardous Waste Compliance Assessment
Kestrel Hawk Landfill
EPA ID WID076171008

Dear Mr. Coenen:

In response to the Addendum to Notice of Noncompliance dated September 16, 2020 (the Addendum to NON) and the meeting held on October 21, 2020 between Kestrel Hawk Landfill (KHL) representatives and the Wisconsin Department of Natural Resources (WDNR), KHL is submitting information to resolve several of alleged noncompliance identified by the WDNR. This additional information is presented referencing the alleged area of noncompliance identified by the WDNR.

Non Item 2: Manifesting of Oil-Absorbent "Socks"

Item 2 of the NON indicated that KHL had improperly manifested oil absorbent socks as Toxic Substances Control Act (TSCA) regulated materials but not as hazardous wastes. KHL has adjusted the manifests related to the absorbent socks to be listed as F039. These shipments of oil absorbent socks were ultimately incinerated at the Deer Park Facility in LaPorte, TX.

In the NON, the WDNR recommended that KHL update the manifest records with Agnes Cook of the WDNR. TRC representatives have provided relevant information to the WDNR on shipments dated 10/2/2014, 9/22/2015, 9/29/2015, and 1/13/2017. Please see Attachment 1, Manifest Activity, for the revised hazardous waste manifest records in the WDNR system.

Regarding the final shipment manifest, dated 2/27/2019, our consultant, TRC, has been in contact with Safety-Kleen to get the manifest updated. Safety-Kleen has indicated that it cannot update the manifest at this time. KHL is therefore updating our credentials to the United States Environmental Protection Agency's electronic manifest system so that we can update it ourselves. We expect to have this completed by December 18, 2020 dependent

upon the availability of the manifest in the electronic manifest system. KHL will update the WDNR when the update is complete. The February 2019 waste shipment was ultimately transported to Deer Park facility and incinerated.

Non Item 3: LDR requirements for Oil-Absorbent "Socks"

A land disposal restriction (LDR) for the shipment of oil removed from the hazardous waste unit (HWU) and associated socks that was removed from the landfill in April 2020 is provided in Attachment 2, Hazardous Waste Unit Oil Manifest. Also included in Attachment 2, is an LDR associated with a shipment of oil removed from the HWU in 2017 demonstrating that an LDR was previously on file for these wastes.

Non Item 4: Waste Determinations for Gas Processing Residuals

The WDNR requested separator oil characteristics testing data, information showing that the landfill gas condensate tank sample is representative of waste, and comparison of generation rates.

Please see Attachment 3, piping and instrumentation diagram, which shows the sample locations for the oil and liquid samples from the oil water separator at the biogas building. We are requesting confidential treatment of this attachment pursuant to NR 291.15(2) and hereby certify that this information relates to a process unique to KHL disclosure of which would adversely affect the competitive position of KHL if made public. Also, note that there is no sampling location at the chiller to collect a landfill gas condensate sample or immediately downstream of the chiller. A sample of the landfill gas condensate was collected for characteristic testing from the condensate tank at the biogas building on March 16, 2020. This landfill gas condensate collected in the condensate tank is expected to exhibit the average properties of the condensate generated in the gas processing system and is therefore considered a representative sample per s. NR 660.10(101) Wisconsin Administrative Code (WAC).

A sample of the oil from the oil water separator was collected on July 14, 2020 and this sample did not exhibit hazardous characteristics. Please refer to Attachment 4 for the laboratory testing results compared to NR 661 testing requirements. Note that the oil was tested as a solid and it is therefore appropriate to divide the reported concentrations by 20 to compare against the toxicity characteristic leaching procedure limits; United States Environmental Protection Agency Guidance is included in Attachment 4. No detected parameter exceeded the NR 661 regulatory limits for characteristically hazardous materials.

Regarding the generation rates of the oil from the oil water separator. KHL personnel add approximately 100 gallons of hydraulic oil to the compressor system each month. Approximately 200 gallons of oil from the containers downstream of the oil water separator

are removed every two months. The rate of production of oil from the oil water separator approximates the volume input into the compressor system.

During the meeting on October 21, 2020, WDNR requested a response to Attachment B of the Addendum to the NON to understand the waste determination of the landfill gas condensate provided by KHL. Attachment 5 provides further justification and responses to the documents that were cited by the WDNR in Attachment B of the Addendum to the NON. Attachment 5 provides justification that the landfill gas condensate is not derived from a solid waste; therefore, the landfill gas condensate is not a listed hazardous waste.

Non Item 5: Waste Determination for Contaminated Groundwater and Leachate

During the meeting on October 21, 2020, KHL proposed reporting the liquids discharged through MH-15B as hazardous wastes with the understanding that the fee exemption for tonnage-based fees was applicable due to the discharge being routed to the City of Racine wastewater treatment plant. The WDNR requested a description of the leachate conveyance system to evaluate this proposed resolution. Attachment 6 provides a narrative summary of the leachate flows with engineering drawings and photographs to describe the system. After review of these documents, KHL is confident that the WDNR will agree that MH-15B is the appropriate location to evaluate flows from the old site of the KHL. This approach is consistent with monitoring performed by the City of Racine Waste Water Utility.

Non Item 12: Contingency Plan Distribution and Licensing

The Contingency Plan has been updated for the facility in 2020 and distributed to local emergency response entities. The cover letter providing the revised Hazardous Waste Unit Contingency Plan and delivery documentation is provided in Attachment 7.

Non Item 13: Operating Record

The WDNR requested a plan for KHL to develop an operating record for the HWU. KHL proposes to generate an operating record with the available information for the HWU. Consideration should be given to the conditions that the KHL was operated by a different organization during the time period that listed hazardous waste was disposed in the HWU and that the last recorded disposal of listed hazardous waste occurred in December 1982. KHL proposes to develop an operating record based on the available historical data that will include:

- The tabular summary of hazardous wastes received at the KHL (reproduction of Appendix A of the Hazardous Waste Contingency Plan)
- A figure identifying the location of the hazardous waste disposal area (modified version of Figure 2 of the Hazardous Waste Contingency Plan)
- A CD with the environmental monitoring database related to historical groundwater monitoring at the KHL.

- Quarterly environmental monitoring reporting letters presenting the findings of the HWU monitoring.
- The LDR's associated with off-site hazardous waste shipments
- The waste determinations

Non Item 17: Gas Condensate Volumes; 90-day Storage

Attachment 8 provides Table 10, Leachate, Gas Condensate, and Groundwater Containment Structure Removal Volumes, from the 2015 Annual Report. This includes the requested condensate removal quantities for the 4th Quarter of 2015 (October, November, and December).

Non Item 21: Transportation of Gas Condensate

Attachment 5 presents the justification for the landfill gas condensate waste determination not being a listed hazardous waste. The characteristic testing performed on the condensate collected at the biogas building demonstrates that the waste is not characteristically hazardous. Therefore, the manifest requirements under s. NR 662.020(6) do not apply to the transport of the condensate removed from the biogas building

In addition, Attachment 9 provides an authorization for delegation of signatory to allow the Environmental Manager sign documents that are required by s. NR 670.011 WAC. Following this letter is the certification statement required by s. NR 670.011 WAC.

We are working to address the other items in the addendum to the NON. These include the LDR for POTW discharges and NR 211 notice (Item 8), the Closure Plan (Item 9), the Long-Term Care Plan (Item 10), and the financial assurance cost estimates (Item 15). There are several NON items not specifically addressed in this letter that are related to the characterization of the gas processing unit liquids which include Items 4.1, 5.1, 5.2, 6, and 7. These items can be resolved after the WDNR's review of Attachment 5.

We appreciate the opportunity to provide this information to you, and we think that this response satisfies the data requested for the items listed as such. The remaining items will be discussed at upcoming meetings.

Sincerely,

Republic Services of Wisconsin, Limited Partnership



M. Khalid Umer, P.E.
Environmental Manager

Attachments: Certification Statement

1. Manifest Updates
2. Land Disposal Restrictions
3. Biogas Building Piping and Instrumentation Diagram
4. Oil-Water Separator: Oil Analytical Results
5. Characterization of Gas Processing Unit (GPU) Liquids
6. Leachate Collection System and Discharge Summary
7. Hazardous Waste Unit Contingency Plan Documentation
8. 2015 Gas Condensate Information
9. Delegation of Signature Authority

Certification Statement:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



M. Khalid Umer, P.E.
Environmental Manager

Attachment 1

Manifest Updates

HAZARDOUS WASTE MANIFEST RECORDS FOR SELECTED GENERATOR
SHIPPED BETWEEN 10/02/2014 AND 01/13/2017

EPA ID: WID076171008
Facility Name: KESTREL HAWK LF
Location Address: 1969 OAKES RD
RACINE, WI 53406-

Contact Person: KHALID UMER, ENVIRONMENTAL MANAGE
26W580 SCHICK ROAD
HANOVER PARK, IL 60133-
Phone: (630) 894-1554 ext:

FID: 252076990
SIC Code: 4953
County: RACINE

Activity	License Number	Expiration Date
043 SW Proc Contaminated Soil Treatment	3872	9/30/2017
044 SW Proc Waste Solidification	3089	9/30/2017
073 Landfill > 500,000 Cu Yd	572	9/30/2020
103 SW Yard Residuals Composting <20,000 Cu Yd		
201 HW Generator - Large		
297 Hazardous Waste Report Certifier		
298 Hazardous Waste Report Preparer		

005724045SKS Shipped: 01/13/2017 COPY 3 DNR Received: 07/02/2020 Batch/Seq: 2901 / 1
Received: 01/25/2017 TSD EPA ID: OHD000816629 TSD Facilty Name: SPRING GROVE RESOURCE RECOVERY INC

Transporter EPA ID	Transporter Name	Transporter Date
TXR000081205	SAFETY-KLEEN SYSTEMS INC	01/13/2017
MAD039322250	CLEAN HARBORS ENVIRONMENTAL SERVICES INC	01/20/2017

Page No.	Line No.	Waste Code/Description	Amount Shipped/Unit	Lbs Shipped
1	1	F039- MULTI-SOURCE LEACHATE	32 K	70
			Manifest Lbs. Total	**70**

NO SECONDARY COPY AVAILABLE

005053298SKS Shipped: 09/29/2015 COPY 3 DNR Received: 07/02/2020 Batch/Seq: 2900 / 1
Received: 10/27/2015 TSD EPA ID: TXD055141378 TSD Facilty Name: CLEAN HARBORS DEER PARK

Transporter EPA ID	Transporter Name	Transporter Date
TXR000081205	SAFETY-KLEEN SYSTEMS INC	09/25/2015

Page No.	Line No.	Waste Code/Description	Amount Shipped/Unit	Lbs Shipped
1	1	F039- MULTI-SOURCE LEACHATE	50 K	110
			Manifest Lbs. Total	**110**

NO SECONDARY COPY AVAILABLE

005053209SKS Shipped: 09/22/2015 COPY 3 DNR Received: 07/02/2020 Batch/Seq: 2899 / 1
Received: 10/14/2015 TSD EPA ID: TXD055141378 TSD Facilty Name: CLEAN HARBORS DEER PARK

Transporter EPA ID	Transporter Name	Transporter Date
TXR000081205	SAFETY-KLEEN SYSTEMS INC	09/22/2015
OKR000023085	BASIN ENVIRONMENTAL & SAFETY TECHNOLOGIES	10/01/2015
MAD039322250	CLEAN HARBORS ENVIRONMENTAL SERVICES INC	10/08/2015

Page No.	Line No.	Waste Code/Description	Amount Shipped/Unit	Lbs Shipped
1	1	F039- MULTI-SOURCE LEACHATE	624 K	1,373
			Manifest Lbs. Total	**1,373**

NO SECONDARY COPY AVAILABLE

004929873SKS Shipped: 07/07/2015 COPY 3 DNR Received: 08/10/2015 Batch/Seq: 2267 / 16
Received: 07/07/2015 TSD EPA ID: WID981097769 TSD Facilty Name: SAFETY-KLEEN SYSTEMS INC

Transporter EPA ID	Transporter Name	Transporter Date
TXR000081205	SAFETY-KLEEN SYSTEMS INC	07/07/2015

Page No.	Line No.	Waste Code/Description	Amount Shipped/Unit	Lbs Shipped
1	1	D039- TETRACHLOROETHYLENE	23 G	192
			Manifest Lbs. Total	**192**

NO SECONDARY COPY AVAILABLE

004899080SKS Shipped: 04/14/2015 COPY 3 DNR Received: 05/13/2015 Batch/Seq: 2230 / 12
Received: 04/14/2015 TSD EPA ID: WID981097769 TSD Facilty Name: SAFETY-KLEEN SYSTEMS INC

Transporter EPA ID	Transporter Name	Transporter Date
TXR000081205	SAFETY-KLEEN SYSTEMS INC	04/14/2015

Page No.	Line No.	Waste Code/Description	Amount Shipped/Unit	Lbs Shipped
1	1	D039- TETRACHLOROETHYLENE	20 G	167
			Manifest Lbs. Total	**167**

NO SECONDARY COPY AVAILABLE

004622237SKS Shipped: 01/27/2015 COPY 3 DNR Received: 02/13/2015 Batch/Seq: 2180 / 70
Received: 01/27/2015 TSD EPA ID: WID981097769 TSD Facilty Name: SAFETY-KLEEN SYSTEMS INC

Transporter EPA ID	Transporter Name	Transporter Date
TXR000081205	SAFETY-KLEEN SYSTEMS INC	01/27/2015

Page No.	Line No.	Waste Code/Description	Amount Shipped/Unit	Lbs Shipped
1	1	D039- TETRACHLOROETHYLENE	20 G	167
			Manifest Lbs. Total	**167**

NO SECONDARY COPY AVAILABLE

004596339SKS Shipped: 10/28/2014 COPY 3 DNR Received: 11/13/2014 Batch/Seq: 2138 / 40
Received: 10/28/2014 TSD EPA ID: WID981097769 TSD Facilty Name: SAFETY-KLEEN SYSTEMS INC

Transporter EPA ID	Transporter Name	Transporter Date
WID981097769	SAFETY-KLEEN SYSTEMS INC	10/28/2014

Page No.	Line No.	Waste Code/Description	Amount Shipped/Unit	Lbs Shipped
1	1	D039- TETRACHLOROETHYLENE	20 G	167
			Manifest Lbs. Total	**167**

NO SECONDARY COPY AVAILABLE

004455308SKS Shipped: 10/02/2014 COPY 3 DNR Received: 07/02/2020 Batch/Seq: 2898 / 1
Received: 10/28/2014 TSD EPA ID: TXD055141378 TSD Facilty Name: CLEAN HARBORS DEER PARK

Transporter EPA ID	Transporter Name	Transporter Date
WID981097769	SAFETY-KLEEN SYSTEMS INC	10/02/2014
TXR000081205	SAFETY-KLEEN SYSTEMS INC	10/09/2014
MAD039322250	CLEAN HARBORS ENVIRONMENTAL SERVICES INC	10/25/2014

Page No.	Line No.	Waste Code/Description	Amount Shipped/Unit	Lbs Shipped
1	1	F039- MULTI-SOURCE LEACHATE	127 K	279
			Manifest Lbs. Total	**279**

NO SECONDARY COPY AVAILABLE

Attachment 2

Land Disposal Restrictions

- 2020 Shipment
- 2017 Shipment

WSU SK SHIP# 231216750 *PCB*

007056179SKS

Please print or type. Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number: WID076171008
2. Page 1 of: 1
3. Emergency Response Phone: 1-800-468-1760
4. Manifest Tracking Number: 007056179 SKS

5. Generator's Name and Mailing Address
Kestrel Hawk
1969 Oakes Rd
RACINE WI 53406-0000
Generator's Phone: 262-770-1316

Generator's Site Address (if different than mailing address)

6. Transporter 1 Company Name: SAFETY-KLEEN SYSTEMS INC
U.S. EPA ID Number: TXR000081203

7. Transporter 2 Company Name: CLEAN HARBORS ENV SVC INC.
U.S. EPA ID Number: MAD039322250

8. Designated Facility Name and Site Address: CLEAN HARBORS DEER PARK
2027 INDEPENDENCE PARKWAY SOUT
LA PORTE , TX 77571
Facility's Phone: 281-930-2300
U.S. EPA ID Number: TXD055141379

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes		
X	1. UN2315, WASTE POLYCHLORINATED BIPHENYLS, LIQUID, 9, PG III	0001	DM	0200	K	F039	OUTS 205H	
	2.							
	3.							
	4.							

14. Special Handling Instructions and Additional Information
TSD:DE 82951920 KE19224 CSG:
1)ERG#171; Out of service date cont# 200416939263 10/02/20
24H EMERGENCY#800-468-1760-CH/SK/TFI-Contract retained by generator confers agency authority on initial transporter to add or substitute additional transporters on generator's beh.)f.

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Stephen W. Mack
Signature:
Month 04 Day 21 Year 2020

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Steve Schmitt
Signature:
Month 04 Day 21 Year 2020

Transporter 2 Printed/Typed Name: Mike Rossi
Signature:
Month 4 Day 23 Year 20

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator) U.S. EPA ID Number
Facility's Phone:

18c. Signature of Alternate Facility (or Generator) Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)
1. H040 2. 3. 4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name: A. Gohring
Signature: A. Gohring
Month 5 Day 7 Year 20

EPA Form 8700-22 (Rev. 02-17) Previous editions are obsolete.

DESIGNATED FACILITY TO EPA's e-MANIFEST SYSTEM

SAFETYKLEEN 04/16/2020 PAGE: 1

PLANT: WSU LDR NOTIFICATION FORM 05:05:51

GENERATOR NAME: Kestrel Hawk MANIFEST NO.: 007056175KS

OR SALES SERVICE NO.:

SK Shipping #: 231216750 CUST#: KE19224

Pursuant to 40 CFR 268.7(a), I hereby notify that this shipment contains waste restricted under 40 CFR part 268 land disposal restrictions (LDR).

A. GENERAL WASTE NOTIFICATION

LDR FORM LINE NO: 1 MANIFEST PAGE/LINE# 01/001 SKPRFL NO: 2008011

SKDOT#: 8844267

EPA WASTE CODES & LDR SUBCATEGORIES (IF ANY):
F039

Treatability group: NNW Non-Waste Water

Waste Constituent Notification: None

NOTES

[signature] Stephen Mack Ops Sup 04 / 21 / 2020

GENERATOR'S AUTHORIZED SIGNATURE NAME & TITLE (PRINTED OR TYPED) DATE

PLANT: WSU CSG: REF#: SN:

TOP COPY: GENERATOR MIDDLE COPY: FACILITY BOTTOM COPY: TRANSPORTER

221338739

WSU SK SHIP# ~~221338219~~

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
	WID076171008	1	1-800-468-1760	005724045 SKS

5. Generator's Name and Mailing Address
Kestrel Hawk
1969 Oakes Rd
RACINE WI 53406-4680
Generator's Phone: 262-770-1316

Generator's Site Address (if different than mailing address)

6. Transporter 1 Company Name: SAFETY-KLEEN SYSTEMS, INC. U.S. EPA ID Number: TXR000081205

7. Transporter 2 Company Name: Clean Harbors Environmental Services Inc U.S. EPA ID Number: MAD039322250

8. Designated Facility Name and Site Address
SPRING GROVE RESOURCE RECOVERY INC
4879 SPRING GROVE AVE
CINCINNATI, OH 45232
Facility's Phone: 513-681-6242
U.S. EPA ID Number: OHD000816629

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit WL/Vol.	13. Waste Codes
X	1. UN2315, POLYCHLORINATED BIPHENYLS, LIQUID, 9, PG II	001	DM	~~31.75~~ 32	K	NONE
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information
150:SG KE19224 GSG:
Out of Service: 1/13/17
1)ERG#171;
24 HR EMERGENCY #1-800-468-1760 (SK / TFI)
AUTH AS "AGENT-FOR" BY GEN TO RETAIN LICENSED SUB CARRIERS AS NECESSARY

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Tom MARQUIS Signature: [signature] Month 1 Day 13 Year 17

INT'L
16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER
17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: Micah Krueger Signature: [signature] Month 01 Day 13 Year 17
Transporter 2 Printed/Typed Name: Rich Long Signature: Rich Long Month 1 Day 20 Year 17

DESIGNATED FACILITY
18. Discrepancy
18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:
18b. Alternate Facility (or Generator) U.S. EPA ID Number
Facility's Phone:
18c. Signature of Alternate Facility (or Generator) Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)
1. H141 2. 3. 4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name: Kathy Adams Signature: Kathy Adams Month 1 Day 25 Year 17

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete. DESIGNATED FACILITY TO GENERATOR STATE (IF REQUIRED)

1) 7904302 / 8600570

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)

21. Generator ID Number: WI0076171008

22. Page: 3

23. Manifest Tracking Number: 005724045 SKH

24. Generator's Name: Kestrel Hawk

25. Transporter 3 Company Name — U.S. EPA ID Number

26. Transporter ____ Company Name — U.S. EPA ID Number

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes

GENERATOR

32. Special Handling Instructions and Additional Information

TRANSPORTER

33. Transporter ____ Acknowledgment of Receipt of Materials
Printed/Typed Name | Signature | Month | Day | Year

34. Transporter ____ Acknowledgment of Receipt of Materials
Printed/Typed Name | Signature | Month | Day | Year

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

EPA Form 8700-22A (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

SAFETY-KLEEN 01/12/2017 PAGE:1
PLANT: 450 LDR NOTIFICATION FORM 08:55:59
GENERATION NAME: Kestrel Hawk MANIFEST NO.: 005724045SKS
DR SALES SERVICE NO.:
Shipping #: 82135215 CUST#: KE19224
Pursuant to 40 CFR 268.7(a), I hereby notify that this shipment contains waste restricted under 40 CFR part 268 land disposal restrictions (LDR).

A. GENERAL WASTE NOTIFICATION

LDR FORM LINE NO: 1 MANIFEST PAGE/LINE# 01/001 SAPREL NO: 808574
SKID#: 79M4302

NOTES

GENERATOR'S AUTHORIZED SIGNATURE

Tom Marquis
NAME & TITLE (PRINTED OR TYPED)

1-13-17
DATE

PLANT: 450 CBS: RCP#: SN:
TOP COPY: GENERATOR MIDDLE COPY: FACILITY BOTTOM COPY: TRANSPORTER

CONFIDENTIAL BUSINESS INFORMATION PURSUANT TO S. NR 291.15(2) WAC

Attachment 3

Biogas Building Piping and Instrumentation Diagram

MOTORIZED EQUIPMENT

SYMBOL	EQUIPMENT TYPE	INLET VOLUME	INLET	DISCHARGE	MOTOR							SERIAL NUMBER	MANUFACTURER	MODEL	REMARKS
					RPM	HP	VOLT	PHASE	AMP	MANUFACTURER	MODEL				
CHL-01	CHILLER	-	-	-	-	-	460	3	-	-	-		BOHN	BLV4001H06	R-22
CLR-01	CHILLER	-	-	-	-	7.5	460	3	-	MARATHON	SK213TTLFL7726APL	410512A 1C	UNION INDUSTRIES	-	RATED @ 150 PSI @ 300 °F
CLR-02	CHILLER	-	-	-	-	5.0	460	3	-	MARATHON	6VA21311C4026QB-K	410512B AC	UNION INDUSTRIES	-	RATED @ 150 PSI @ 300 °F
CLR-04	CHILLER	-	-	-	1,745	5.0	460	3	-	GE	-	8889C	AMERICAN INDUSTRIES	A0CS-3015-0803	
CP-110	COMPRESSOR	1100 SCFM	P=10.40 PSIA	P=18.70 PSIA	3,575	200.0	460	3	225	TOSHIBA	3F4200L3H1	040103160	-	-	CP-601 MOTOR
CP-120	COMPRESSOR	1100 SCFM	P=10.40 PSIA	P=18.70 PSIA	3,575	200.0	460	3	225	TOSHIBA	3F4200L3H1	040103159	-	-	CP-600 MOTOR
CP-150	COMPRESSOR	1515 SCFM	P=4 PSIG	P=37.5 PSIG; T=350°F MAX	3,575	200.0	460	3	225	-	-	4002-79904-1	RO-FLO	17-L	
CP-200	COMPRESSOR	732 SCFM	P=14 PSIG	P=50 PSIG; T=350°F MAX	3,575	150.0	460	3	225	MARATHON	AA 445TTFN5536CEW	4002-79682-1	RO-FLO	12-S	
CTR-01	COOLING TOWER	-	-	-	-	-	-	-	-	GE	5K184AL17C	-	-	-	
FLR-01	FLARE	-	-	-	-	-	115	1	-	-	-	4922	FLARE KING, INC.	FKVP-H25 R123 EPT	12" TIP
P-01	LIQUID TRANSFER PUMP	-	-	-	3,450	0.5	115	1	9	-	-	072 09 FM	A.O. SMITH	C48A96B67	
P-02	COOLING WATER PUMP	320 GPM	-	-	3,800	10.0	160	3	12.5	BALDOR	JMM3312T	CQ5188-01-H30	BELL & GOSSETT	1531	65 FT HEAD
P-04	LUBE OIL PUMP	-	-	-	-	1.0	115	1	-	-	-	-	-	-	

UNMOTORIZED EQUIPMENT

SYMBOL	EQUIPMENT TYPE	PSI	INLET	DISCHARGE	SERIAL NUMBER	MANUFACTURER	MODEL	REMARKS
SEP-01	SEPARATOR	-	-	-	76953-1	INDUSTRIAL FILTER	VFS10363P/08	
SEP-02	CONDENSATE SEPARATOR	-	-	-	-	INDUSTRIAL FILTER	VAGU24/3165P1	
FI-01	FILTER ELEMENT	15 PSI @ 200°F	-	-	76953-1	INDUSTRIAL FILTER	VAGU30SP/0812	M443-142 ELEMENT AND DP304-40 DEMISTER
HTR-01	HEAT EXCHANGER	-	-	-	7-035075-07-2	AMERICAN STANDARD	130348-A-200	
HTR-02	HEAT EXCHANGER	-	-	-	0012926-101	AMERICAN STANDARD	DXM-S-4P-1C	GAS TO GAS ECONOMIZER
HTR-03	HEAT EXCHANGER	-	-	-	0012926-102	AMERICAN STANDARD	DXM-S-4P-1C	
PUR-01	PURIFIER	-	-	-	-	ANDERSON HI-EF PURIFIER	CUNY1483	TYPE: L10-1505
SEP-200	OIL/WATER SEPARATOR	-	17 GPM	-	-	H2K TECHNOLOGIES	-	192 SQFT SURFACE AREA

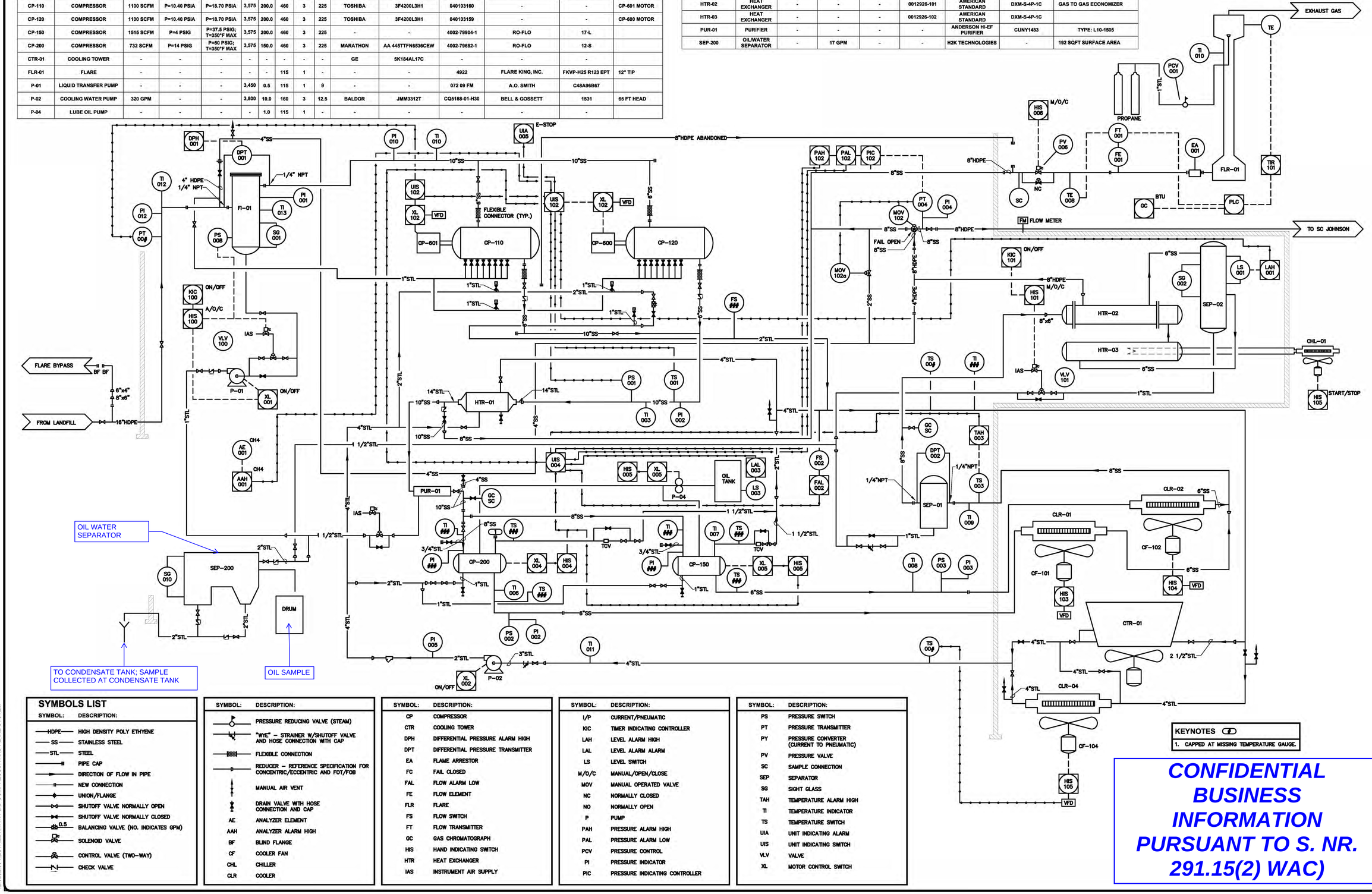
KJWW ENGINEERING CONSULTANTS
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REFERENCE SCALE IN INCHES
0 1 2 3

REV	DATE	DESCRIPTION	CHKD BY	APPD BY
DATE OF ISSUE 7/25/2014				
		M.J.L.		
		M.J.L.		

DRAWN BY
DESIGNED BY FDB
CHK BY SEM
APP BY
CHECKED BY
APPROVED BY



SYMBOLS LIST

SYMBOL:	DESCRIPTION:
HDPE	HIGH DENSITY POLY ETHYENE
SS	STAINLESS STEEL
STL	STEEL
	PIPE CAP
	DIRECTION OF FLOW IN PIPE
	NEW CONNECTION
	UNION/FLANGE
	SHUTOFF VALVE NORMALLY OPEN
	SHUTOFF VALVE NORMALLY CLOSED
0.5	BALANCING VALVE (NO. INDICATES GPM)
	SOLENOID VALVE
	CONTROL VALVE (TWO-WAY)
	CHECK VALVE

SYMBOL:	DESCRIPTION:
	PRESSURE REDUCING VALVE (STEAM)
	"WYE" – STRAINER W/SHUTOFF VALVE AND HOSE CONNECTION WITH CAP
	FLEXIBLE CONNECTION
	REDUCER – REFERENCE SPECIFICATION FOR CONCENTRIC/ECCENTRIC AND FOT/FOB
	MANUAL AIR VENT
	DRAIN VALVE WITH HOSE CONNECTION AND CAP
AE	ANALYZER ELEMENT
AAH	ANALYZER ALARM HIGH
BF	BLIND FLANGE
CF	COOLER FAN
CHL	CHILLER
CLR	COOLER

SYMBOL:	DESCRIPTION:
CP	COMPRESSOR
CTR	COOLING TOWER
DPH	DIFFERENTIAL PRESSURE ALARM HIGH
DPT	DIFFERENTIAL PRESSURE TRANSMITTER
EA	FLAME ARRESTOR
FC	FAIL CLOSED
FAL	FLOW ALARM LOW
FE	FLOW ELEMENT
FLR	FLARE
FS	FLOW SWITCH
FT	FLOW TRANSMITTER
GC	GAS CHROMATOGRAPH
HIS	HAND INDICATING SWITCH
HTR	HEAT EXCHANGER
IAS	INSTRUMENT AIR SUPPLY

SYMBOL:	DESCRIPTION:
I/P	CURRENT/PNEUMATIC
KIC	TIMER INDICATING CONTROLLER
LAH	LEVEL ALARM HIGH
LAL	LEVEL ALARM ALARM
LS	LEVEL SWITCH
M/O/C	MANUAL/OPEN/CLOSE
MOV	MANUAL OPERATED VALVE
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
P	PUMP
PAH	PRESSURE ALARM HIGH
PAL	PRESSURE ALARM LOW
PCV	PRESSURE CONTROL
PI	PRESSURE INDICATOR
PIC	PRESSURE INDICATING CONTROLLER

SYMBOL:	DESCRIPTION:
PS	PRESSURE SWITCH
PT	PRESSURE TRANSMITTER
PY	PRESSURE CONVERTER (CURRENT TO PNEUMATIC)
PV	PRESSURE VALVE
SC	SAMPLE CONNECTION
SEP	SEPARATOR
SG	SIGHT GLASS
TAH	TEMPERATURE ALARM HIGH
TI	TEMPERATURE INDICATOR
TS	TEMPERATURE SWITCH
UIA	UNIT INDICATING ALARM
UIS	UNIT INDICATING SWITCH
VLV	VALVE
XL	MOTOR CONTROL SWITCH

KEYNOTES
1. CAPPED AT MISSING TEMPERATURE GAUGE.

CONFIDENTIAL BUSINESS INFORMATION PURSUANT TO S. NR. 291.15(2) WAC)

CORNERSTONE Environmental Group, LLC

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KESTREL HAWK P&ID
COMPRESSOR AND FLARE SYSTEM
RACINE, WISCONSIN

PIPING & INSTRUMENTATION DIAGRAM

SHEET NO.
PID-1
PROJECT NO.
12.0282.00

12.0282.00 KESTREL HAWK P&ID COMPRESSOR AND FLARE SYSTEM

Attachment 4

Oil-Water Separator: Oil Analytical Results

Kestrel Hawk Landfill - Racine, Wisconsin
Biogas Building Oil from Oil-Water Separator

Parameter	Units	BIOGAS Building Oil 7/14/2020 50262318001[1]	NR 661 Regulatory Limits for Characteristic Hazardous[5]
Flashpoint	DegF	> 200 E [2]	< 140
pH at 25 Deg C	SU	5.6 j [3]	<= 2 or >=12.5
Arsenic, total	mg/Kg	4.91	5.0
Barium, total	mg/Kg	< 0.24	100.0
Cadmium, total	mg/Kg	< 0.081	1.0
Chromium, total	mg/Kg	0.381 J [4]	5.0
Lead, total	mg/Kg	< 0.208	5.0
Mercury, total	mg/Kg	0.0559	0.2
Selenium, total	mg/Kg	< 0.617	1.0
Silver, total	mg/Kg	< 0.228	5.0
2,4,5-TP (Silvex)	mg/Kg	< 0.321	1.0
2,4-D	mg/Kg	< 0.211	10.0
Chlordane, technical	mg/Kg	< 10.3 j	0.03
Endrin	mg/Kg	< 0.35 j	0.02
gamma-BHC (Lindane)	mg/Kg	< 0.344 j	0.4
Heptachlor	mg/Kg	< 0.428 j	0.008
Heptachlor Epoxide	mg/Kg	< 0.339 j	0.008
Methoxychlor	mg/Kg	< 0.484 j	10.0
Toxaphene	mg/Kg	< 12.4 j	0.5
1,4-Dichlorobenzene	mg/Kg	< 149	8
2,4,5-Trichlorophenol	mg/Kg	< 169	400.0
2,4,6-Trichlorophenol	mg/Kg	< 161	2.0
2,4-Dinitrotoluene	mg/Kg	< 143	0.13
2-Methylphenol	mg/Kg	< 150	200.0
3&4-Methylphenol	mg/Kg	< 156	200.0
Hexachlorobenzene	mg/Kg	< 177	0.13
Hexachlorobutadiene	mg/Kg	< 168	0.5
Hexachloroethane	mg/Kg	< 196	3.0
Nitrobenzene	mg/Kg	< 174	2.0
Pentachlorophenol	mg/Kg	< 134	100.0
Pyridine	mg/Kg	< 330	5.0
1,1-Dichloroethane	mg/Kg	< 0.196	0.5
1,1-Dichloroethene	mg/Kg	< 0.242	0.7
1,2-Dichloroethane	mg/Kg	< 0.26	0.5
1,4-Dichlorobenzene	mg/Kg	14.6	7.5
2-Butanone	mg/Kg	< 25.4	200.0
Benzene	mg/Kg	0.200 J	0.5
Carbon tetrachloride	mg/Kg	< 0.359	0.5
Chlorobenzene	mg/Kg	< 0.084	100.0
Chloroform	mg/Kg	< 0.412	6.0
Tetrachloroethene	mg/Kg	< 0.358	0.7
Trichloroethene	mg/Kg	< 0.234	0.5
Vinyl chloride	mg/Kg	< 0.464	0.20

Footnotes:

(1) Total concentrations are presented.

(2) E-flagged indicates that value exceeds calibration range

(3) j-flagged indicates an estimated quantitation based on the data review.

(4) J- flagged results indicate that the reported result is an estimate. These values are less than the minimum calibration level but greater than the estimated detection limit.

(5) mg/kg is equivalent to mg/L.

Created by: P. Popp, 7.30.2020, S. Edwards, 8.3.2020

Checked by: A. Rowley, 8.10.2020

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United States Environmental Protection Agency

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Frequent Questions

- Hazardous Waste
- RCRA Test Methods (SW-846)
  - 3000, 3500, and 3600 Series
  - 8000 Series: Chromatographic Separation Methods
  - 9000 Series: Miscellaneous Test Methods
  - Detection & Quantitation
  - General
  - Hazardous Waste Characteristics
  - Holding Time & Preservation
  - Inorganic
  - Methods Innovations Rule (MIR) & Method Defined Parameters (MDPs)
  - Performance-Based Measurement System (PBMS) & Flexible Approach
  - Quality Assurance (QA) – Quality Control (QC)
  - Sampling

What is the proper way to handle petroleum products (i.e., oils) for SW-846 Method 1311 (TCLP)?

What is the proper way to handle Petroleum Products (i.e., oils) for Method 1311 (TCLP)? We prefer to handle these as totals because we do not want to contaminate our ZHEs and pressure filtration apparatus with oil. However, we get some resistance from clients that feel we are not handling their samples by the regulatory procedure.

Waste oils need to be characterized if they will be disposed of instead of being recycled.

It is absolutely acceptable to analyze the total fraction in oil samples to determine if they are hazardous. However, the results must be properly interpreted. For oil that passes through a filter as described in the method, the total concentrations must be compared DIRECTLY to the TCLP limits. For oil that does NOT pass through the filter, it is considered a solid and the total concentrations can be divided by 20 in order to compare to the TCLP limits.

Here is a more detailed description of the steps to follow:
First, determine if the waste passes through a filter according to Section 7.1.1 of EPA Method 1311. If the waste passes through the filter, treat the filtrate as the TCLP sample, perform all appropriate determinative methods directly on this sample (diluted as necessary for analysis), and compare the results (corrected for any dilution) directly to the TCLP limits given in Table 7-1 of Chapter 7.

According to Section 7.1.2, if the percent solids are greater than 0.5% of the sample, the unfilterable portion is treated as a solid. Caution should be taken when attempting to dry waste samples that may be flammable. The unfilterable material can either be processed through TCLP as a solid or a total analysis can be performed on the material (i.e., divide the total result by 20 for comparison to TCLP limits). For details on how to convert total results to a number for comparison to TCLP limits, see the RCRA FAQ on this subject: https://waste.zendesk.com/hc/en-us/articles/217452377-Can-totals-analysis-be-used-in-lieu-of-the-TCLP-for-determining-the-toxicity-characteristic-

If the totals results corrected as described in the link above are below the TCLP limits, the waste can be considered nonhazardous. If the corrected total results exceed the TCLP limits, the sample can be considered hazardous. In order to demonstrate that such a sample (where total results exceed TCLP limits) is NOT hazardous, it would need to be carried through the TCLP procedure as a solid to determine if the leachate yields results less than the TCLP limits.

Following is a web link to an older reference document titled, Technical Assistance Document for Complying with the TC Rule and Implementing the Toxicity Characteristic Leaching Procedure (TCLP) that is quite comprehensive: http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P1007NTD.txt.

Was this article helpful? 0 out of 0 found this helpful

Have more questions? Submit a request

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

July 29, 2020

PEGGY POPP
TRC
708 HEARTLAND TRAIL
SUITE 3000
Madison, WI 53717

RE: Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

Dear PEGGY POPP:

Enclosed are the analytical results for sample(s) received by the laboratory on July 15, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace National - Mt. Juliet
- Pace Analytical Services - Indianapolis

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Sue Brotherton
sue.brotherton@pacelabs.com
(317)228-3100
Project Manager

Enclosures

cc: Jonathan Hotstream, TRC
Trihydro, Trihydro
KHALID UMER, REPUBLIC SERVICES INC.

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Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

CERTIFICATIONS

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

Pace Analytical Services Indianapolis

7726 Moller Road, Indianapolis, IN 46268
Illinois Accreditation #: 200074
Indiana Drinking Water Laboratory #: C-49-06
Kansas/TNI Certification #: E-10177
Kentucky UST Agency Interest #: 80226
Kentucky WW Laboratory ID #: 98019
Michigan Drinking Water Laboratory #9050
Ohio VAP Certified Laboratory #: CL0065
Oklahoma Laboratory #: 9204
Texas Certification #: T104704355
West Virginia Certification #: 330
Wisconsin Laboratory #: 999788130
USDA Soil Permit #: P330-19-00257

Pace Analytical Services National

12065 Lebanon Road, Mt. Juliet, TN 37122
Alabama Certification #: 40660
Alaska Certification 17-026
Arizona Certification #: AZ0612
Arkansas Certification #: 88-0469
California Certification #: 2932
Canada Certification #: 1461.01
Colorado Certification #: TN00003
Connecticut Certification #: PH-0197
DOD Certification: #1461.01
EPA# TN00003
Florida Certification #: E87487
Georgia DW Certification #: 923
Georgia Certification: NELAP
Idaho Certification #: TN00003
Illinois Certification #: 200008
Indiana Certification #: C-TN-01
Iowa Certification #: 364
Kansas Certification #: E-10277
Kentucky UST Certification #: 16
Kentucky Certification #: 90010
Louisiana Certification #: AI30792
Louisiana DW Certification #: LA180010
Maine Certification #: TN0002
Maryland Certification #: 324
Massachusetts Certification #: M-TN003
Michigan Certification #: 9958
Minnesota Certification #: 047-999-395
Mississippi Certification #: TN00003
Missouri Certification #: 340
Montana Certification #: CERT0086
Nebraska Certification #: NE-OS-15-05
Nevada Certification #: TN-03-2002-34
New Hampshire Certification #: 2975
New Jersey Certification #: TN002
New Mexico DW Certification
New York Certification #: 11742
North Carolina Aquatic Toxicity Certification #: 41
North Carolina Drinking Water Certification #: 21704
North Carolina Environmental Certificate #: 375
North Dakota Certification #: R-140
Ohio VAP Certification #: CL0069
Oklahoma Certification #: 9915
Oregon Certification #: TN200002
Pennsylvania Certification #: 68-02979
Rhode Island Certification #: LAO00356
South Carolina Certification #: 84004
South Dakota Certification
Tennessee DW/Chem/Micro Certification #: 2006
Texas Certification #: T 104704245-17-14
Texas Mold Certification #: LAB0152
USDA Soil Permit #: P330-15-00234
Utah Certification #: TN00003
Vermont Dept. of Health: ID# VT-2006
Virginia Certification #: VT2006
Virginia Certification #: 460132
Washington Certification #: C847
West Virginia Certification #: 233
Wisconsin Certification #: 9980939910
Wyoming UST Certification #: via A2LA 2926.01
A2LA-ISO 17025 Certification #: 1461.01
A2LA-ISO 17025 Certification #: 1461.02
AIHA-LAP/LLC EMLAP Certification #:100789

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

SAMPLE SUMMARY

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

Lab ID	Sample ID	Matrix	Date Collected	Date Received
50262318001	**Biogas Bldg Oil Sep**	Solid	07/14/20 14:20	07/15/20 09:05

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SAMPLE ANALYTE COUNT

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
50262318001	**Biogas Bldg Oil Sep**	EPA 8081	LEL	9	PAN
		EPA 8151	LEL	3	PAN
		EPA 6010B	TRB	7	PAN
		EPA 7471A	TCT	1	PAN
		EPA 8270C	AO	18	PAN
		EPA 8260B	ADM, BMB	15	PAN
		EPA 1010	SCM	1	PASI-I
		EPA 9045	SCM	1	PASI-I

PAN = Pace National - Mt. Juliet
PASI-I = Pace Analytical Services - Indianapolis

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SUMMARY OF DETECTION

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
50262318001	**Biogas Bldg Oil Sep**					
EPA 6010B	Arsenic	4.91	mg/kg	2.00	07/24/20 15:43	
EPA 6010B	Chromium	0.381J	mg/kg	1.00	07/24/20 15:43	J
EPA 7471A	Mercury	0.0559	mg/kg	0.0400	07/23/20 20:54	
EPA 8260B	Benzene	0.200J	mg/kg	0.400	07/24/20 17:34	J
EPA 8260B	1,4-Dichlorobenzene	14.6	mg/kg	2.00	07/28/20 01:00	
EPA 1010	Flashpoint	>200	deg F		07/15/20 13:08	
EPA 9045	pH at 25 Degrees C	5.6	Std. Units	0.10	07/23/20 13:03	H3

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PROJECT NARRATIVE

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

Date: July 29, 2020

Biogas Bldg Oil Sep (Lab ID: 50262318001)

- Pesticides (GC) by Method 8081 - Dilution due to matrix.
- Semi Volatile Organic Compounds (GC/MS) by Method 8270C - Waste Dilution
- Volatile Organic Compounds (GC/MS) by Method 8260B - Non-target compounds too high to run at a lower dilution.

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PROJECT NARRATIVE

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

Method: **EPA 8081**
Description: Pesticides (GC) 8081
Client: Republic Services - Wisconsin Landfills
Date: July 29, 2020

General Information:
1 sample was analyzed for EPA 8081 by Pace National Mt. Juliet. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

P4: Sample field preservation does not meet EPA or method recommendations for this analysis.
- Biogas Bldg Oil Sep (Lab ID: 50262318001)

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

QC Batch: 1514407

S4: Surrogate recovery not evaluated against control limits due to sample dilution.
- Biogas Bldg Oil Sep (Lab ID: 50262318001)
  - Decachlorobiphenyl (S)
  - Tetrachloro-m-xylene (S)

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

Method: **EPA 8151**
Description: Chlorinated Herb. (GC) 8151
Client: Republic Services - Wisconsin Landfills
Date: July 29, 2020

General Information:
1 sample was analyzed for EPA 8151 by Pace National Mt. Juliet. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

Method: **EPA 6010B**
Description: Metals (ICP) 6010B
Client: Republic Services - Wisconsin Landfills
Date: July 29, 2020

General Information:
1 sample was analyzed for EPA 6010B by Pace National Mt. Juliet. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

Method: **EPA 7471A**
Description: Mercury 7471A
Client: Republic Services - Wisconsin Landfills
Date: July 29, 2020

General Information:
1 sample was analyzed for EPA 7471A by Pace National Mt. Juliet. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

Method: **EPA 8270C**
Description: SVOA (GC/MS) 8270C
Client: Republic Services - Wisconsin Landfills
Date: July 29, 2020

General Information:
1 sample was analyzed for EPA 8270C by Pace National Mt. Juliet. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

QC Batch: 1516415

S4: Surrogate recovery not evaluated against control limits due to sample dilution.

- Biogas Bldg Oil Sep (Lab ID: 50262318001)
  - 2,4,6-Tribromophenol (S)
  - 2-Fluorobiphenyl (S)
  - 2-Fluorophenol (S)
  - Nitrobenzene-d5 (S)
  - Phenol-d5 (S)
  - p-Terphenyl-d14 (S)

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

Method: **EPA 8260B**
Description: VOA (GC/MS) 8260B
Client: Republic Services - Wisconsin Landfills
Date: July 29, 2020

General Information:
1 sample was analyzed for EPA 8260B by Pace National Mt. Juliet. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

Method: **EPA 1010**
Description: 1010 Flashpoint,Closed Cup
Client: Republic Services - Wisconsin Landfills
Date: July 29, 2020

General Information:
1 sample was analyzed for EPA 1010 by Pace Analytical Services Indianapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

Method: **EPA 9045**
Description: 9045 pH Soil
Client: Republic Services - Wisconsin Landfills
Date: July 29, 2020

General Information:
1 sample was analyzed for EPA 9045 by Pace Analytical Services Indianapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

H3: Sample was received or analysis requested beyond the recognized method holding time.
- Biogas Bldg Oil Sep (Lab ID: 50262318001)

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

Sample: Biogas Bldg Oil Sep **Lab ID: 50262318001** Collected: 07/14/20 14:20 Received: 07/15/20 09:05 Matrix: Solid

Results reported on a "wet-weight" basis

Comments:
- Pesticides (GC) by Method 8081 - Dilution due to matrix.
- Semi Volatile Organic Compounds (GC/MS) by Method 8270C - Waste Dilution
- Volatile Organic Compounds (GC/MS) by Method 8260B - Non-target compounds too high to run at a lower dilution.

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
Pesticides (GC) 8081	Analytical Method: EPA 8081 Preparation Method: 3580A Pace National - Mt. Juliet								
gamma-BHC (Lindane)	**<0.344**	mg/kg	2.00	0.344	100	07/27/20 14:17	07/28/20 13:55	58-89-9	P4
Chlordane (Technical)	**<10.3**	mg/kg	30.0	10.3	100	07/27/20 14:17	07/28/20 13:55	57-74-9	P4
Endrin	**<0.350**	mg/kg	2.00	0.350	100	07/27/20 14:17	07/28/20 13:55	72-20-8	P4
Heptachlor	**<0.428**	mg/kg	2.00	0.428	100	07/27/20 14:17	07/28/20 13:55	76-44-8	P4
Heptachlor epoxide	**<0.339**	mg/kg	2.00	0.339	100	07/27/20 14:17	07/28/20 13:55	1024-57-3	P4
Methoxychlor	**<0.484**	mg/kg	2.00	0.484	100	07/27/20 14:17	07/28/20 13:55	72-43-5	P4
Toxaphene	**<12.4**	mg/kg	40.0	12.4	100	07/27/20 14:17	07/28/20 13:55	8001-35-2	P4
Surrogates									
Decachlorobiphenyl (S)	105	%	60.0-140		100	07/27/20 14:17	07/28/20 13:55	2051-24-3	S4
Tetrachloro-m-xylene (S)	303	%	60.0-140		100	07/27/20 14:17	07/28/20 13:55	877-09-8	S4
Chlorinated Herb. (GC) 8151	Analytical Method: EPA 8151 Preparation Method: 3580A Pace National - Mt. Juliet								
2,4-D	**<0.211**	mg/kg	2.10	0.211	30	07/28/20 02:36	07/29/20 11:57	94-75-7	
2,4,5-TP (Silvex)	**<0.321**	mg/kg	2.10	0.321	30	07/28/20 02:36	07/29/20 11:57	93-72-1	
Surrogates									
2,4-DCAA (S)	316	%	22.0-132		30	07/28/20 02:36	07/29/20 11:57	19719-28-9	ST
Metals (ICP) 6010B	Analytical Method: EPA 6010B Preparation Method: 3050B Pace National - Mt. Juliet								
Arsenic	**4.91**	mg/kg	2.00	0.460	1	07/23/20 14:05	07/24/20 15:43	7440-38-2	
Barium	**<0.240**	mg/kg	0.500	0.240	1	07/23/20 14:05	07/24/20 15:43	7440-39-3	
Cadmium	**<0.0810**	mg/kg	0.500	0.0810	1	07/23/20 14:05	07/24/20 15:43	7440-43-9	
Chromium	**0.381J**	mg/kg	1.00	0.250	1	07/23/20 14:05	07/24/20 15:43	7440-47-3	J
Lead	**<0.208**	mg/kg	0.500	0.208	1	07/23/20 14:05	07/24/20 15:43	7439-92-1	
Selenium	**<0.617**	mg/kg	2.00	0.617	1	07/23/20 14:05	07/24/20 15:43	7782-49-2	
Silver	**<0.228**	mg/kg	1.00	0.228	1	07/23/20 14:05	07/24/20 15:43	7440-22-4	
Mercury 7471A	Analytical Method: EPA 7471A Preparation Method: 7471A Pace National - Mt. Juliet								
Mercury	**0.0559**	mg/kg	0.0400	0.0180	1	07/23/20 17:13	07/23/20 20:54	7439-97-6	
SVOA (GC/MS) 8270C	Analytical Method: EPA 8270C Preparation Method: 3580A Pace National - Mt. Juliet								
1,4-Dichlorobenzene	**<149**	mg/kg	5000	149	15000	07/28/20 15:36	07/29/20 09:42	106-46-7	
2,4-Dinitrotoluene	**<143**	mg/kg	5000	143	15000	07/28/20 15:36	07/29/20 09:42	121-14-2	
Hexachlorobenzene	**<177**	mg/kg	5000	177	15000	07/28/20 15:36	07/29/20 09:42	118-74-1	
Hexachloro-1,3-butadiene	**<168**	mg/kg	5000	168	15000	07/28/20 15:36	07/29/20 09:42	87-68-3	
Hexachloroethane	**<196**	mg/kg	5000	196	15000	07/28/20 15:36	07/29/20 09:42	67-72-1	
Nitrobenzene	**<174**	mg/kg	5000	174	15000	07/28/20 15:36	07/29/20 09:42	98-95-3	
Pyridine	**<330**	mg/kg	5000	330	15000	07/28/20 15:36	07/29/20 09:42	110-86-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

Sample: Biogas Bldg Oil Sep **Lab ID: 50262318001** Collected: 07/14/20 14:20 Received: 07/15/20 09:05 Matrix: Solid

Results reported on a "wet-weight" basis

Comments:
- Pesticides (GC) by Method 8081 - Dilution due to matrix.
- Semi Volatile Organic Compounds (GC/MS) by Method 8270C - Waste Dilution
- Volatile Organic Compounds (GC/MS) by Method 8260B - Non-target compounds too high to run at a lower dilution.

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
SVOA (GC/MS) 8270C	Analytical Method: EPA 8270C Preparation Method: 3580A Pace National - Mt. Juliet								
2-Methylphenol(o-Cresol)	**<150**	mg/kg	5000	150	15000	07/28/20 15:36	07/29/20 09:42	95-48-7	
3&4-Methylphenol(m&p Cresol)	**<156**	mg/kg	5000	156	15000	07/28/20 15:36	07/29/20 09:42		
Pentachlorophenol	**<134**	mg/kg	5000	134	15000	07/28/20 15:36	07/29/20 09:42	87-86-5	
2,4,5-Trichlorophenol	**<169**	mg/kg	5000	169	15000	07/28/20 15:36	07/29/20 09:42	95-95-4	
2,4,6-Trichlorophenol	**<161**	mg/kg	5000	161	15000	07/28/20 15:36	07/29/20 09:42	88-06-2	
Surrogates									
2-Fluorophenol (S)	0.00	%	60.0-140		15000	07/28/20 15:36	07/29/20 09:42	367-12-4	S4
Phenol-d5 (S)	0.00	%	60.0-140		15000	07/28/20 15:36	07/29/20 09:42	4165-62-2	S4
Nitrobenzene-d5 (S)	0.00	%	60.0-140		15000	07/28/20 15:36	07/29/20 09:42	4165-60-0	S4
2-Fluorobiphenyl (S)	0.00	%	60.0-140		15000	07/28/20 15:36	07/29/20 09:42	321-60-8	S4
2,4,6-Tribromophenol (S)	0.00	%	60.0-140		15000	07/28/20 15:36	07/29/20 09:42	118-79-6	S4
p-Terphenyl-d14 (S)	0.00	%	60.0-140		15000	07/28/20 15:36	07/29/20 09:42	1718-51-0	S4
VOA (GC/MS) 8260B	Analytical Method: EPA 8260B Preparation Method: 5035A Pace National - Mt. Juliet								
Benzene	**0.200J**	mg/kg	0.400	0.187	400	07/23/20 21:28	07/24/20 17:34	71-43-2	J
Carbon tetrachloride	**<0.359**	mg/kg	2.00	0.359	400	07/23/20 21:28	07/24/20 17:34	56-23-5	
Chlorobenzene	**<0.0840**	mg/kg	1.00	0.0840	400	07/23/20 21:28	07/24/20 17:34	108-90-7	
Chloroform	**<0.412**	mg/kg	1.00	0.412	400	07/23/20 21:28	07/24/20 17:34	67-66-3	
1,4-Dichlorobenzene	**14.6**	mg/kg	2.00	0.280	400	07/23/20 21:28	07/28/20 01:00	106-46-7	
1,1-Dichloroethane	**<0.196**	mg/kg	1.00	0.196	400	07/23/20 21:28	07/24/20 17:34	75-34-3	
1,2-Dichloroethane	**<0.260**	mg/kg	1.00	0.260	400	07/23/20 21:28	07/24/20 17:34	107-06-2	
1,1-Dichloroethene	**<0.242**	mg/kg	1.00	0.242	400	07/23/20 21:28	07/24/20 17:34	75-35-4	
2-Butanone (MEK)	**<25.4**	mg/kg	40.0	25.4	400	07/23/20 21:28	07/24/20 17:34	78-93-3	
Tetrachloroethene	**<0.358**	mg/kg	1.00	0.358	400	07/23/20 21:28	07/24/20 17:34	127-18-4	
Trichloroethene	**<0.234**	mg/kg	0.400	0.234	400	07/23/20 21:28	07/24/20 17:34	79-01-6	
Vinyl chloride	**<0.464**	mg/kg	1.00	0.464	400	07/23/20 21:28	07/24/20 17:34	75-01-4	
Surrogates									
Toluene-d8 (S)	93.4	%	75.0-131		400	07/23/20 21:28	07/24/20 17:34	2037-26-5	
Toluene-d8 (S)	104	%	75.0-131		400	07/23/20 21:28	07/28/20 01:00	2037-26-5	
4-Bromofluorobenzene (S)	108	%	67.0-138		400	07/23/20 21:28	07/24/20 17:34	460-00-4	
4-Bromofluorobenzene (S)	105	%	67.0-138		400	07/23/20 21:28	07/28/20 01:00	460-00-4	
1,2-Dichloroethane-d4 (S)	96.7	%	70.0-130		400	07/23/20 21:28	07/24/20 17:34	17060-07-0	
1,2-Dichloroethane-d4 (S)	118	%	70.0-130		400	07/23/20 21:28	07/28/20 01:00	17060-07-0	
1010 Flashpoint,Closed Cup	Analytical Method: EPA 1010 Pace Analytical Services - Indianapolis								
Flashpoint	**>200**	deg F			1		07/15/20 13:08		
9045 pH Soil	Analytical Method: EPA 9045 Pace Analytical Services - Indianapolis								
pH at 25 Degrees C	**5.6**	Std. Units	0.10	0.10	1		07/23/20 13:03		H3

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QUALITY CONTROL DATA

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

QC Batch: 1514407
QC Batch Method: 3580A
Analysis Method: EPA 8081
Analysis Description: Pesticides (GC) 8081
Laboratory: Pace National - Mt. Juliet

Associated Lab Samples: 50262318001

METHOD BLANK: R3553938-1 Matrix: Solid
Associated Lab Samples: 50262318001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
gamma-BHC (Lindane)	mg/kg	<0.0172	0.100	07/28/20 11:40	
Endrin	mg/kg	<0.0175	0.100	07/28/20 11:40	
Heptachlor	mg/kg	<0.0214	0.100	07/28/20 11:40	
Heptachlor epoxide	mg/kg	<0.0169	0.100	07/28/20 11:40	
Methoxychlor	mg/kg	<0.0242	0.100	07/28/20 11:40	
Chlordane (Technical)	mg/kg	<0.515	1.50	07/28/20 11:40	
Toxaphene	mg/kg	<0.619	2.00	07/28/20 11:40	
Decachlorobiphenyl (S)	%	102	60.0-140	07/28/20 11:40	
Tetrachloro-m-xylene (S)	%	99	60.0-140	07/28/20 11:40	

LABORATORY CONTROL SAMPLE & LCSD: R3553938-2 R3553938-3

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
gamma-BHC (Lindane)	mg/kg	0.200	0.182	0.184	91.0	92.0	60.0-140	1.09	29	
Endrin	mg/kg	0.200	0.183	0.176	91.5	88.0	60.0-140	3.90	29	
Heptachlor	mg/kg	0.200	0.179	0.180	89.5	90.0	60.0-140	0.557	29	
Heptachlor epoxide	mg/kg	0.200	0.184	0.185	92.0	92.5	60.0-140	0.542	28	
Methoxychlor	mg/kg	0.200	0.191	0.186	95.5	93.0	60.0-140	2.65	29	
Decachlorobiphenyl (S)	%				100	100	60.0-140			
Tetrachloro-m-xylene (S)	%				94.0	103	60.0-140			

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QUALITY CONTROL DATA

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

QC Batch: 1514985
QC Batch Method: 3580A
Analysis Method: EPA 8151
Analysis Description: Chlorinated Herb. (GC) 8151
Laboratory: Pace National - Mt. Juliet

Associated Lab Samples: 50262318001

METHOD BLANK: R3554319-1 Matrix: Solid
Associated Lab Samples: 50262318001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4-D	mg/kg	<0.211	2.10	07/29/20 11:13	
2,4,5-TP (Silvex)	mg/kg	<0.321	2.10	07/29/20 11:13	
2,4-DCAA (S)	%	80	22.0-132	07/29/20 11:13	

LABORATORY CONTROL SAMPLE & LCSD: R3554319-2 R3554319-3

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
2,4-D	mg/kg	5.00	3.64	3.28	72.8	65.6	40.0-120	10.4	20	
2,4,5-TP (Silvex)	mg/kg	5.00	3.80	3.36	76.0	67.2	42.0-120	12.3	20	
2,4-DCAA (S)	%				74.6	69.8	22.0-132			

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QUALITY CONTROL DATA

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

QC Batch: 1514088
QC Batch Method: 3050B
Analysis Method: EPA 6010B
Analysis Description: Metals (ICP) 6010B
Laboratory: Pace National - Mt. Juliet

Associated Lab Samples: 50262318001

METHOD BLANK: R3553048-1 Matrix: Solid
Associated Lab Samples: 50262318001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	mg/kg	<0.460	2.00	07/24/20 14:25	
Barium	mg/kg	<0.240	0.500	07/24/20 14:25	
Cadmium	mg/kg	<0.0810	0.500	07/24/20 14:25	
Chromium	mg/kg	<0.250	1.00	07/24/20 14:25	
Lead	mg/kg	<0.208	0.500	07/24/20 14:25	
Selenium	mg/kg	<0.617	2.00	07/24/20 14:25	
Silver	mg/kg	<0.228	1.00	07/24/20 14:25	

LABORATORY CONTROL SAMPLE: R3553048-2

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	100	96.1	96.1	80.0-120	
Barium	mg/kg	100	102	102	80.0-120	
Cadmium	mg/kg	100	98.9	98.9	80.0-120	
Chromium	mg/kg	100	101	101	80.0-120	
Lead	mg/kg	100	99.3	99.3	80.0-120	
Selenium	mg/kg	100	98.8	98.8	80.0-120	
Silver	mg/kg	20.0	18.6	93.1	80.0-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: R3553048-5 R3553048-6

Parameter	Units	L1242319-155 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/kg	4.56	100	100	94.6	93.5	90.1	88.9	75.0-125	1.25	20	
Barium	mg/kg	91.1	100	100	222	226	131	135	75.0-125	1.64	20	MH
Cadmium	mg/kg	0.123	100	100	93.6	92.3	93.5	92.2	75.0-125	1.38	20	
Chromium	mg/kg	15.8	100	100	113	112	97.4	96.5	75.0-125	0.800	20	
Lead	mg/kg	8.39	100	100	109	108	100	99.9	75.0-125	0.500	20	
Selenium	mg/kg	ND	100	100	90.2	89.2	90.2	89.2	75.0-125	1.07	20	
Silver	mg/kg	ND	20.0	20.0	17.2	17.0	86.0	85.2	75.0-125	0.933	20	

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QUALITY CONTROL DATA

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

QC Batch: 1514323
QC Batch Method: 7471A
Analysis Method: EPA 7471A
Analysis Description: Mercury 7471A
Laboratory: Pace National - Mt. Juliet
Associated Lab Samples: 50262318001

METHOD BLANK: R3552651-1 Matrix: Solid
Associated Lab Samples: 50262318001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.0180	0.0400	07/23/20 19:54	

LABORATORY CONTROL SAMPLE: R3552651-2

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	0.500	0.568	114	80.0-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: R3552651-3 R3552651-4

Parameter	Units	L1242544-03 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.0235	0.500	0.500	0.553	0.565	106	108	75.0-125	2.09	20	

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QUALITY CONTROL DATA

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

QC Batch: 1516415
QC Batch Method: 3580A
Analysis Method: EPA 8270C
Analysis Description: SVOA (GC/MS) 8270C
Laboratory: Pace National - Mt. Juliet

Associated Lab Samples: 50262318001

METHOD BLANK: R3554265-3 Matrix: Solid
Associated Lab Samples: 50262318001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,4-Dichlorobenzene	mg/kg	<2.97	99.9	07/29/20 01:27	
2,4-Dinitrotoluene	mg/kg	<2.87	99.9	07/29/20 01:27	
Hexachlorobenzene	mg/kg	<3.54	99.9	07/29/20 01:27	
Hexachloro-1,3-butadiene	mg/kg	<3.36	99.9	07/29/20 01:27	
Hexachloroethane	mg/kg	<3.93	99.9	07/29/20 01:27	
Nitrobenzene	mg/kg	<3.48	99.9	07/29/20 01:27	
Pyridine	mg/kg	<6.60	99.9	07/29/20 01:27	
2-Methylphenol(o-Cresol)	mg/kg	<3.00	99.9	07/29/20 01:27	
3&4-Methylphenol(m&p Cresol)	mg/kg	<3.12	99.9	07/29/20 01:27	
Pentachlorophenol	mg/kg	<2.69	99.9	07/29/20 01:27	
2,4,5-Trichlorophenol	mg/kg	<3.39	99.9	07/29/20 01:27	
2,4,6-Trichlorophenol	mg/kg	<3.21	99.9	07/29/20 01:27	
Nitrobenzene-d5 (S)	%	75.3	60.0-140	07/29/20 01:27	
2-Fluorobiphenyl (S)	%	93.7	60.0-140	07/29/20 01:27	
p-Terphenyl-d14 (S)	%	58.7	60.0-140	07/29/20 01:27	SR
Phenol-d5 (S)	%	80	60.0-140	07/29/20 01:27	
2-Fluorophenol (S)	%	75.5	60.0-140	07/29/20 01:27	
2,4,6-Tribromophenol (S)	%	105	60.0-140	07/29/20 01:27	

LABORATORY CONTROL SAMPLE & LCSD: R3554265-1 R3554265-2

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,4-Dichlorobenzene	mg/kg	100	83.7	85.0	83.7	85.0	60.0-140	1.54	29	
2,4-Dinitrotoluene	mg/kg	100	94.6	106	94.6	106	60.0-140	11.4	21	
Hexachlorobenzene	mg/kg	100	94.3	95.1	94.3	95.1	60.0-140	0.845	20	
Hexachloro-1,3-butadiene	mg/kg	100	106	95.4	106	95.4	60.0-140	10.5	26	
Hexachloroethane	mg/kg	100	90.1	84.3	90.1	84.3	60.0-140	6.65	31	
Nitrobenzene	mg/kg	100	76.7	74.4	76.7	74.4	60.0-140	3.04	24	
Pyridine	mg/kg	100	86.0	101	86.0	101	60.0-140	16.0	40	
2-Methylphenol(o-Cresol)	mg/kg	100	90.6	77.4	90.6	77.4	60.0-140	15.7	24	
3&4-Methylphenol(m&p Cresol)	mg/kg	100	95.1	86.0	95.1	86.0	60.0-140	10.0	24	
Pentachlorophenol	mg/kg	100	87.6	94.8	87.6	94.8	60.0-140	7.89	22	
2,4,5-Trichlorophenol	mg/kg	100	105	120	105	120	60.0-140	13.3	22	
2,4,6-Trichlorophenol	mg/kg	100	88.6	101	88.6	101	60.0-140	13.1	22	
Nitrobenzene-d5 (S)	%				87.8	80.3	60.0-140			
2-Fluorobiphenyl (S)	%				101	103	60.0-140			
p-Terphenyl-d14 (S)	%				84.2	93.9	60.0-140			
Phenol-d5 (S)	%				103	92.5	60.0-140			
2-Fluorophenol (S)	%				91.5	87.5	60.0-140			

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(317)228-3100

QUALITY CONTROL DATA

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

LABORATORY CONTROL SAMPLE & LCSD: R3554265-1 R3554265-2

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
2,4,6-Tribromophenol (S)	%				117	116	60.0-140			

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QUALITY CONTROL DATA

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

QC Batch: 1514544
QC Batch Method: 5035A
Analysis Method: EPA 8260B
Analysis Description: VOA (GC/MS) 8260B
Laboratory: Pace National - Mt. Juliet

Associated Lab Samples: 50262318001

METHOD BLANK: R3553646-3 Matrix: Solid
Associated Lab Samples: 50262318001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	mg/kg	<0.000467	0.00100	07/24/20 08:14	
Carbon tetrachloride	mg/kg	<0.000898	0.00500	07/24/20 08:14	
Chlorobenzene	mg/kg	<0.000210	0.00250	07/24/20 08:14	
Chloroform	mg/kg	<0.00103	0.00250	07/24/20 08:14	
1,1-Dichloroethane	mg/kg	<0.000491	0.00250	07/24/20 08:14	
1,2-Dichloroethane	mg/kg	<0.000649	0.00250	07/24/20 08:14	
1,1-Dichloroethene	mg/kg	<0.000606	0.00250	07/24/20 08:14	
2-Butanone (MEK)	mg/kg	<0.0635	0.100	07/24/20 08:14	
Tetrachloroethene	mg/kg	<0.000896	0.00250	07/24/20 08:14	
Trichloroethene	mg/kg	<0.000584	0.00100	07/24/20 08:14	
Vinyl chloride	mg/kg	<0.00116	0.00250	07/24/20 08:14	
Toluene-d8 (S)	%	105	75.0-131	07/24/20 08:14	
4-Bromofluorobenzene (S)	%	97.1	67.0-138	07/24/20 08:14	
1,2-Dichloroethane-d4 (S)	%	87.9	70.0-130	07/24/20 08:14	

LABORATORY CONTROL SAMPLE & LCSD: R3553646-1 R3553646-2

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Benzene	mg/kg	0.125	0.104	0.101	83.2	80.8	70.0-123	2.93	20	
Carbon tetrachloride	mg/kg	0.125	0.132	0.130	106	104	66.0-128	1.53	20	
Chlorobenzene	mg/kg	0.125	0.115	0.113	92.0	90.4	76.0-128	1.75	20	
Chloroform	mg/kg	0.125	0.138	0.135	110	108	72.0-123	2.20	20	
1,1-Dichloroethane	mg/kg	0.125	0.127	0.122	102	97.6	70.0-127	4.02	20	
1,2-Dichloroethane	mg/kg	0.125	0.0942	0.0924	75.4	73.9	65.0-131	1.93	20	
1,1-Dichloroethene	mg/kg	0.125	0.116	0.112	92.8	89.6	65.0-131	3.51	20	
2-Butanone (MEK)	mg/kg	0.625	0.445	0.455	71.2	72.8	30.0-160	2.22	24	
Tetrachloroethene	mg/kg	0.125	0.127	0.125	102	100	70.0-136	1.59	20	
Trichloroethene	mg/kg	0.125	0.138	0.129	110	103	76.0-126	6.74	20	
Vinyl chloride	mg/kg	0.125	0.126	0.125	101	100	63.0-134	0.797	20	
Toluene-d8 (S)	%				94.4	96.3	75.0-131			
4-Bromofluorobenzene (S)	%				106	108	67.0-138			
1,2-Dichloroethane-d4 (S)	%				94.0	94.9	70.0-130			

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QUALITY CONTROL DATA

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

QC Batch: 1515997
QC Batch Method: 5035A
Analysis Method: EPA 8260B
Analysis Description: VOA (GC/MS) 8260B
Laboratory: Pace National - Mt. Juliet

Associated Lab Samples: 50262318001

METHOD BLANK: R3553810-2 Matrix: Solid
Associated Lab Samples: 50262318001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,4-Dichlorobenzene	mg/kg	<0.000700	0.00500	07/27/20 17:16	
Toluene-d8 (S)	%	104	75.0-131	07/27/20 17:16	
4-Bromofluorobenzene (S)	%	107	67.0-138	07/27/20 17:16	
1,2-Dichloroethane-d4 (S)	%	110	70.0-130	07/27/20 17:16	

LABORATORY CONTROL SAMPLE: R3553810-1

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,4-Dichlorobenzene	mg/kg	0.125	0.136	109	77.0-121	
Toluene-d8 (S)	%			103	75.0-131	
4-Bromofluorobenzene (S)	%			103	67.0-138	
1,2-Dichloroethane-d4 (S)	%			105	70.0-130	

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QUALITY CONTROL DATA

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

QC Batch: 573256
QC Batch Method: EPA 9045
Analysis Method: EPA 9045
Analysis Description: 9045 pH
Laboratory: Pace Analytical Services - Indianapolis

Associated Lab Samples: 50262318001

SAMPLE DUPLICATE: 2643829

Parameter	Units	50261672013 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.6	8.6	0	2	H3

SAMPLE DUPLICATE: 2643830

Parameter	Units	50262509010 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.5	7.5	1	2	H3

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QUALIFIERS

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

J - Estimated concentration at or above the LOD and below the LOQ.

LOD - Limit of Detection adjusted for dilution factor, percent moisture, initial weight and final volume.

LOQ - Limit of Quantitation adjusted for dilution factor, percent moisture, initial weight and final volume.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

H3	Sample was received or analysis requested beyond the recognized method holding time.
J	Analyte detected below the reporting limit, therefore result is an estimate. This qualifier is also used for all TICs.
MH	Matrix spike recovery and/or matrix spike duplicate recovery was above laboratory control limits. Result may be biased high.
P4	Sample field preservation does not meet EPA or method recommendations for this analysis.
S4	Surrogate recovery not evaluated against control limits due to sample dilution.
SR	Surrogate recovery was below laboratory control limits. Results may be biased low.
ST	Surrogate recovery was above laboratory control limits. Results may be biased high.

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Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
50262318001	**Biogas Bldg Oil Sep**	3580A	1514407	EPA 8081	1514407
50262318001	**Biogas Bldg Oil Sep**	3580A	1514985	EPA 8151	1514985
50262318001	**Biogas Bldg Oil Sep**	3050B	1514088	EPA 6010B	1514088
50262318001	**Biogas Bldg Oil Sep**	7471A	1514323	EPA 7471A	1514323
50262318001	**Biogas Bldg Oil Sep**	3580A	1516415	EPA 8270C	1516415
50262318001	**Biogas Bldg Oil Sep**	5035A	1514544	EPA 8260B	1514544
50262318001	**Biogas Bldg Oil Sep**	5035A	1515997	EPA 8260B	1515997
50262318001	**Biogas Bldg Oil Sep**	EPA 1010	572237		
50262318001	**Biogas Bldg Oil Sep**	EPA 9045	573256		

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WO# : 50262318

50262318

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page : 1 Of 1

Section A — Required Client Information:

Company:	ESC
Address:	W125 S9808 North Cape Road
	Muskego, WI 53150
Email:	
Phone:	Fax:
Requested Due Date:	

Required Project Information:

Report To:	RKHP
Copy To:	TRC, Peggy Popp
	708 Heartland Trail, Madison WI 53717
Purchase Order #:	
Project Name:	Kestrel Hawk ~~GMH~~
Project #:	

Section C — Invoice Information:

Attention:	
Company Name:	RKHP
Address:	1989 Oakes Rd, Racine WI 53408
Pace Quote:	
Pace Project Manager:	sue.brotherton@pacelabs.com
Pace Profile #:	5180-10

Regulatory Agency: | State / Location: WI

Requested Analysis Filtered (Y/N): Y/N — N N

Analyses Test: ~~BOD, TSS~~ TCLP Ni Flashpoint

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Residual Chlorine (Y/N)	
1	~~GMH-East~~ Waste oil	~~WT~~ OL	G	—	—	7/14/2020	1420	-	8	8									001
2	~~GMH-South~~	~~WT~~																	
3	~~GMH-West~~	~~WT~~																	
4																			
5																			
6																			
7																			
8																			
9																			
10																			
11																			
12																			

MATRIX CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	Scott Fawcett TRC	7/14/20	1700	Fedex						
	Fedex	7-15-20	905	Jmuff	7-15-20	905	1.7	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Scott Fawcett

SIGNATURE of SAMPLER: Scott Fawcett — DATE Signed: 7/14/20

Pace Analytical

SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50262318

Date/Time and Initials of person examining contents: JH 7-15-20 1111

Courier: [X] Fed Ex [ ] UPS [ ] USPS [ ] Client [ ] Commercial [ ] Pace [ ] Other _____

Tracking #: 9004 4035 4350

Custody Seal on Cooler/Box Present: [ ] Yes [X] No **Seals Intact:** [ ] Yes [X] No

Packing Material: [X] Bubble Wrap [X] Bubble Bags [ ] None [ ] Other _____

Thermometer: 1 2 3 4 5 6 A B C (D) E F · Ice Type: [X] Wet [ ] Blue [ ] None | Samples collected today and on ice. [ ] Yes [ ] No [X] N/A

Cooler Temperature: 1.9/1.7 Ice Visible in Sample Containers?: [ ] Yes [X] No [ ] N/A

(Initial/Corrected) Temp should be above freezing to 6°C If temp. is Over 6°C or under 0°C, was the PM Notified?: [ ] Yes [ ] No [X] N/A

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp		X	All containers needing acid/base pres. Have been checked?: **exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.** All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			
USDA Regulated Soils? (ID, NY, WA, OR,CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		X				
Chain of Custody Present:	X		Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			X
Chain of Custody Filled Out:	X		Dissolved Metals field filtered?:			X
Short Hold Time Analysis (<72hr)?: Analysis:		X	Headspace Wisconsin Sulfide			X
Time 5035A TC placed in Freezer or Short Holds To Lab:				Present	Absent	~~N/A~~ X
			Residual Chlorine Check (SVOC 625 Pest/PCB 608) Residual Chlorine Check (Total/Amenable/Free Cyanide)			X
Rush TAT Requested:		X	Headspace in VOA Vials (>6mm):	X		
Containers Intact?:	X		Trip Blank Present?:		X	
Sample Labels (IDs/Dates/Times) Match COC?: Except TCs, which only require sample ID	X		Trip Blank Custody Seals?:		X	
Extra labels on Terracore Vials (soils only)?		X				

Comments:

per e-mail from Peggy Popp, change the sample ID to Biogas Bldg Oil Sep. 7/15/20kh

COC PAGE 1 of

Sample Container Count

Sample Line Item	WGFU	SBS DI BK Kit R	DG9H VG9H	VOA VIALS (>6mm)	VG9U	DG9U	DG9T	AG0U	AG1H	AG1U	AG3S	BP1U	BP1N	BP2U	BP3U	BP3N	BP3F	BP3S	BP3B	BP3Z	CG3H					Matrix	pH <2	pH >9	pH>12
1					6										2											WT			
2																										SL/NAL-WG-WP			
3																													
4																													
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													

Container Codes

Glass

DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpres amber glass
DG9H	40mL HCl amber voa vial	AG1H	1L HCl amber glass
DG9M	40mL MeOH clear vial	AG1S	1L H2SO4 amber glass
DG9P	40mL TSP amber vial	AG1T	1L Na Thiosulfate amber glass
DG9S	40mL H2SO4 amber vial	AG1U	1liter unpres amber glass
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass
DG9U	40mL unpreserved **amber** vial	AG2S	500mL H2SO4 amber glass
VG9H	40mL HCl clear vial	AG2U	500mL unpres amber glass
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 amber glass
VG9U	40mL unpreserved **clear** vial	AG3U	250mL unpres amber glass
VGFX	40mL w/hexane wipe vial	BG1H	1L HCl clear glass
VSG	Headspace septa vial & HCl	BG1S	1L H2SO4 clear glass
WGKU	8oz unpreserved clear jar	BG1T	1L Na Thiosulfate clear glass
WGFU	4oz clear soil jar	BG1U	1L unpreserved glass
JGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass
CG3H	250mL clear glass HCl	BG3U	250mL Unpres Clear Glass

Plastic / Misc.

BP1A	1L NaOH, Asc Acid plastic
BP1N	1L HNO3 plastic
BP1S	1L H2SO4 plastic
BP1U	1L unpreserved plastic
BP1Z	1L NaOH, Zn, Ac
BP2A	500mL NaOH, Asc Acid plastic
BP2N	500mL HNO3 plastic
BP2O	500mL NaOH plastic
BP2S	500mL H2SO4 plastic
BP2U	500mL unpreserved plastic
BP2Z	500mL NaOH, Zn Ac
BP3B	250mL NaOH plastic
BP3N	250mL HNO3 plastic
BP3F	250mL HNO3 plastic (field filtered)

BP3U	250mL unpreserved plastic
BP3S	250mL H2SO4 plastic
BP3Z	250mL NaOH, Zn Ac plastic

AF	Air Filter
C	Air Cassettes
R	Terra core kit
SP5T	120mL Coliform Na Thiosulfate
U	Summa Can
ZPLC	Ziploc Bag

WT	Water
SL	Solid
NAL	Non-aqueous liquid
WP	Wipe

Attachment 5

Characterization of Gas Processing Unit (GPU) Liquids

Regulation of Gas Condensate at Hazardous Waste Landfills

The relevant hazardous waste rules establish that liquid generated from processing landfill gas ("GPU Liquid") emanating from the hazardous waste section of the Kestrel Hawk Landfill ("KHL") is not hazardous waste unless it exhibits a characteristic of hazardous waste. This interpretation is based on the following principles that are undisputed:

- Landfill Gas Is Not a Solid Waste. Landfill gas is not a contained gas. "RCRA is limited to containerized gases (*i.e.*, section 1004(27) of RCRA excludes all other gases from the definition of solid wastes and thus cannot be considered hazardous wastes)." 54 Fed. Reg. 50967, 50973 (Dec. 11, 1989). As a result, landfill gas cannot be a solid waste.

- GPU Liquid Is a Solid Waste. GPU Liquid is a solid waste when it is discarded.

- GPU Liquid Is Not Listed. There is not a hazardous waste listing that is specific to GPU Liquid or landfill gas condensate. This is in distinct contrast to the F039 multi-source leachate listing, for example.

- GPU Liquid Is Not Characteristic. Testing shows that the GPU Liquid at KHL does not exhibit a hazardous waste characteristic.

DNR takes the position that the GPU Liquid is "derived-from" or "contains" the hazardous waste in KHL and is therefore a hazardous waste itself. Although some EPA guidance supports this position, a complete reading and analysis of the relevant authorities provides greater support to KHL's reading of the rules for the following reasons:

- Must Be Derived From Hazardous Waste. The derived-from rule applies to "any solid waste generated from the treatment, storage, or disposal of a hazardous waste." 40 C.F.R. § 261.3(c)(2)(i). Because hazardous waste must first be solid waste, the derived-from rule is only applicable when the source material "was a solid waste at the time of derivation" of the secondary material. Stensvaag, *Hazardous Waste Law and Practice* at 7-182 ("*Stensvaag*") (copy attached). The GPU Liquid is generated from the compression of landfill gas at the landfill gas processing unit, and landfill gas is not a solid waste.

- GPU Liquid Is Not Generated From Waste Disposed at KHL. The waste disposed at KHL generates landfill gas. It is the collection and preparation of that gas (which is not a solid waste) for use as a fuel that generates the GPU Liquid. Landfill gas and GPU Liquid are not comparable to leachate from a regulatory perspective because leachate is specifically identified as a type of derived-from material while landfill gas is not.

- Contained-In Policy Does Not Apply to Air. The principle that environmental media that contain hazardous waste have to be managed as hazardous waste appears to be limited to soil and water. We have been unable to find any instance where EPA applied contained in principles to an environmental media consisting of air or another uncontained gas.

- Source Responsibility. RCRA places the responsibility on the generator to make an accurate determination whether a solid waste is a hazardous waste using the steps prescribed in 40 CFR § 262.11. KHL believes that its determination followed these steps and that it has fulfilled its obligations under RCRA.

DNR has pointed to a number of authorities that it believes can be interpreted to point in the direction of applying derived-from principles to materials generated from uncontained gas generated from the treatment, storage or disposal of hazardous waste. The authorities provide examples of situations where materials generated from hazardous waste combustion exhaust gases are considered derived-from waste. They do not address situations where the material being processed or treated is a gaseous fuel that is not solid waste.

Residues generated from the processing of materials that are excluded from the scope of the solid waste definition cannot be covered by the derived-from rule. *Stensvaag* at 7-182-83 (discussing materials generated from the processing of non-hazardous secondary materials). As discussed in the following table, none of the authorities referenced by DNR directly address the status of GPU Liquid in light of EPA's definitive statement in 1989 about its lack of authority to regulate uncontained gas.

Source	Reason Cited	KHL Response
RO 12362 – January 11, 1985	States that condensate generated from landfill with listed hazardous waste is always a hazardous waste	This guidance was prepared as follow up on a symposium presentation and did not address an actual situation. The guidance appears to be aimed at condensate generated at landfill gas collection wells rather than liquids generated from the subsequent processing of the landfill gas. It pre-dates EPA's definitive statement in 1989 that EPA's statutory authority to regulate gases is limited to containerized gases.
54 Fed. Reg. 50973 (Dec. 11, 1989)	Uncontained gas not a solid waste but condensed light ends generated by distillation processes in chlorinated aliphatic hydrocarbon production are listed if ever disposed.	A specific listing for condensed material supports the conclusion that the material is not a hazardous waste unless it exhibits a characteristic or is specifically listed.
RO 11332 – March 11, 1988	Departiculate air filters, scrubber wastewater and ash from burning dioxin waste in a rotary kiln is derived-from hazardous waste.	The guidance pre-dates the definitive 1989 statement on containerized gases and addresses material generated from exhaust gases in a hazardous waste combustion unit. Like leachate, emission control dust from hazardous waste treatment is specifically identified as a derived-from waste. The dioxin waste was a solid waste when it was burned. This is in contrast to the landfill gas when it is compressed.

Source	Reason Cited	KHL Response
RO 11684 – August 11, 1992	BIF rules apply to resource recovery kiln/cement kiln burning hazardous waste. Off-gases from the resource recovery kilns are regulated under RCRA since they originate from treatment of hazardous waste.	This guidance deals with exhaust gases in a hazardous waste combustion unit. This guidance is consistent with the 1989 preamble, which states "[o]f course, thermal treatment *after* a material becomes a hazardous waste is fully regulated under RCRA." 54 Fed. Reg. at 50973. By contrast, GPU Liquid is generated from compression of a gas that is not a solid waste.
61 Fed. Reg. 4903, 4910 (Feb. 9, 1996)	Spent carbon deriving from the treatment of listed hazardous waste is considered to be a type of listed waste by virtue of the derived from rule found at 261.3(c)(2).	This rule was issued to implement EPA's authority to regulate emissions from hazardous waste treatment, storage and disposal units in RCRA § 3004(n). See 59 Fed. Reg. 62896, 62901 (Dec. 6, 1994). Like leachate, emission control waste from hazardous waste treatment is specifically identified as being covered by the derived-from rule. Preparing landfill gas for use as fuel is not hazardous waste treatment.
54 Fed. Reg. 43733 (Oct. 26, 1989)	Residues from thermal combustion of listed hazardous waste are considered to remain the listed hazardous waste until delisted.	The rule does not specifically discuss gaseous materials, and the rule addresses a hazardous waste combustion unit. In addition, the December 1989 preamble distinguishes thermal combustion from the processing of gaseous fuel as occurs at KHL.
RO 13491 – August 2, 1991	"Residues such as scrubber blowdown, continue to be regulated as hazardous wastes if they result from processing listed hazardous wastes, or if they exhibit a hazardous waste characteristic."	This guidance deals with exhaust gases in thermal treatment of spent carbon that is hazardous waste. That process is regulated differently than landfill gas, as acknowledged by the 1989 rule discussed above.
56 Fed. Reg. 7134, 7200 (Feb. 21, 1991)	Regeneration or reactivation of carbon used to control air emissions from hazardous waste treatment, storage or disposal facilities is subject to regulation as a RCRA thermal treatment unit.	The rule recognizes that uncontained gases are not solid waste "and therefore any condensed organics do not derive from treatment of a hazardous waste." The rule addresses thermal treatment of a solid waste (spent carbon) generated as part of an active hazardous waste treatment process such as steam stripping.
78 Fed. Reg. 9112, 9128 (Feb. 7, 2013)	EPA maintains separate and independent authority under RCRA to regulate certain types of uncontained gases whether or not they themselves are solid wastes (e.g., gases emitted from the management of hazardous waste)."	This is mainly a reference to BIFs and other hazardous waste combustion units. EPA has recognized since 1989 that these types of exhaust gases are regulated as part of the combustion process.
RO 1195, 11434 & 11593 – 11/13/86, 6/19/89 & 3/26/91	Contained-in policy applied to groundwater, soil and sediment.	The contained in policy has not been applied to uncontained gases or air emissions. In addition, some of these documents pre-date EPA's clear recognition that RCRA only permits the regulation of containerized gases.

DNR also relies on Section 14.4.3.3 of *McCoy's RCRA Unraveled* which states that "condensate derived from a fill containing listed hazardous waste is always a listed hazardous waste via the derived-from rule." *McCoy's* relies only on RO 12362 for this proposition, but that guidance is not conclusive for the reasons discussed in the table above. In addition, the condensate referenced in the guidance may not correspond with GPU Liquid. The condensate referenced in *McCoy's* and RO 12362 likely is the liquid or "condensate" that is generated in and removed from the landfill gas collection system itself. When RO 12362 was issued in 1985, units for processing landfill gas into a fuel were unknown. The compression and chilling that creates GPU Liquid occurs after the condensate referenced in RO 12362 is removed by the collection system.

KHL relies on the statement in *Stensvaag* that "the source material must be a solid waste at the time when the derivative material is generated" for the derivative material (such as gas condensate) to be covered by the derived-from rule. *Id*. at 7-182. In 2011, EPA confirmed that landfill gas can be considered a commodity fuel and that none of its prior interpretations that limit the scope of RCRA's solid waste authority to containerized gases had changed.[1] It becomes clear from this restatement of the basic principle that the GPU Liquid is generated from a material that is an uncontained gaseous commodity fuel that is not a solid waste. Consequently, the derived-from rule does not apply to the GPU Liquid.[2]

Separator Effluent Transport Does Not Need a Manifest

At KHL, the separator effluent is transported from the gas processing unit in a tanker truck to KHL property that is contiguous with the gas processing unit property but on the other side of Oakes Road. There, it is placed in a manhole that leads to the Racine POTW. The tanker truck travels along Oakes Road for a small distance because the gate where the tanker truck exits the gas processing unit is not directly across from the gate where the tanker truck enters the contiguous KHL property on the other side of Oakes Road.

Even if the separator effluent were a hazardous waste because it exhibited a characteristic or was specifically listed, a hazardous waste manifest would not be required for its transportation to the KHL manhole. Under NR 662.020(6) and 40 C.F.R. § 262.20(f) manifest requirements "do not apply to the transport of hazardous wastes on a public or private right-of-way within or along the border of contiguous property under the control of the same person, even if the contiguous property is divided by a public or private right-of-way."

On a federal level, this regulation was added in 1997. EPA intended that this regulation would exempt shipments subject to it from both the manifest and Part 263 transport requirements. 62 Fed. Reg. 6622, 6647 (Feb. 12, 1997). EPA originally proposed to amend the definition of "on-site," but was persuaded by public comments that amending that definition

[1] https://obamawhitehouse.archives.gov/sites/default/files/omb/assets/oira_2060/2060_11162011-2.pdf

[2] This position is clearly stated in a legal memo located in the Obama White House archives that was presented to OIRA in connection with the Non-Hazardous Secondary Materials rule. https://obamawhitehouse.archives.gov/sites/default/files/omb/assets/oira_2060/2060_11162011-3.pdf

could have unintended consequences. *Id*. at 6645. EPA noted that clarifying that contiguous properties can still be considered a single site for manifest and transport purposes was in the public interest since it would encourage consolidation of waste and minimize the number of hazardous waste storage sites. *Id*. at 6646.

SOLID WASTES DERIVED FROM LISTED HAZARDOUS WASTES

§ 7.49 Solid Wastes Derived from Listed Hazardous Wastes

We have seen that explicitly listed wastes[46] and mixtures containing such wastes[47] have the status of listed hazardous wastes.[48] A material that escapes listed status under these approaches may nevertheless be a listed hazardous waste by virtue of one final provision: the "derived-from" rule,[49] depicted in **Figure 4**, Question 5. This rule provides:

> (c) Unless and until it meets the criteria of paragraph (d):[50]
>
> * * *
>
> (2)(i) Except as otherwise provided in paragraph (c)(2)(ii) of this section,[51] any solid waste generated from the treatment, storage, or disposal of a hazardous waste, including any sludge, spill residue,

---

[46] *See* **Figure 4**, Questions 4-1A through 4-1C; §§ **7.3–7.44**.

[47] *See* **Figure 4**, Question 4-2; §§ **7.45–7.48**.

[48] We discuss the significance of listed (as opposed to unlisted) hazardous waste status in § **7.1** Significance of Listing and Criteria Underlying Listing.

[49] Insofar as we can tell, the Agency first referred to 40 C.F.R. § 261.3(c)(2) (1988) publicly as the "'derived from' rule" in 1983. *See* 48 Fed. Reg. 14,472, 14,489 (1983). That label is now used rather consistently. *See, e.g.*, 50 Fed. Reg. 49,163, 49,167 n.4 (1985); 50 Fed. Reg. 49,258, 49,262–63 (1985). The provision has also been referred to as the "residue rule." *See* 48 Fed. Reg. 14,472, 14,494 (1983). *See also* 50 Fed. Reg. 23,721, 23,722 (1985) (referring to "residue derived from . . . treatment").

We refer to section 261.3(c)(2) as the derived-from rule, to avoid any confusion with the separate portion of the regulation exempting from regulation residues of hazardous wastes remaining in empty containers. *See* 40 C.F.R. § 261.7 (1988); § **7.21** —Significance of Listing Residues; § **7.21** notes 71 & 79. We will address the empty container residue exemption in a subsequent volume.

[50] Under the criteria of section 261.3(d), a *listed* hazardous waste remains a hazardous waste until it has been: (a) delisted; and (b) exhibits no hazardous waste characteristic. *See* 40 C.F.R. § 261.3(d) (1988), *quoted in* § **7.45**. As with the mixture rule, *see* § **7.45** Mixtures Containing Listed Wastes; § **7.45** note 48, any solid waste derived from the treatment, storage, or disposal of an *unlisted* hazardous waste (i.e., a waste merely exhibiting a *characteristic*) will be a hazardous waste only if the derivative material exhibits a hazardous waste characteristic. *See* 40 C.F.R. § 261.3(d)(1) (1988), *quoted in* § **7.45**.

[51] Section 261.3(c)(2)(ii) sets forth several exceptions to the derived-from rule, which we discuss in §§ **7.52–7.55**.

> ash, emission control dust, or leachate (but not including precipitation run-off) is a hazardous waste. (However, materials that are reclaimed from solid wastes and that are used beneficially are not solid wastes and hence are not hazardous wastes under this provision unless the reclaimed material is burned for energy recovery or used in a manner constituting disposal.)[52]

This seemingly innocuous language has potentially profound ramifications, because a broad spectrum of derivative materials,[53] containing widely varying concentrations of hazardous constituents, may be generated from the treatment, storage, and disposal of listed hazardous wastes.

Before turning to a discussion of various types of derivative materials, it is important to stress that the derived-from rule involves what might be called a dual solid waste predicate. No material will be a listed hazardous waste under this rule, unless: (1) the source material, from which it was derived, was a solid waste at the time of derivation;[54] and (2) the derivative material is itself a solid waste.[55] Although these may appear to be elementary observations, the approach of the current regulatory solid waste definition to recyclable materials[56] is so complicated that each aspect of this dual solid waste predicate merits careful scrutiny.

Consider, first, the requirement that the source material must be a solid waste at the time when the derivative material is generated. The EPA has provided an example of a situation where this aspect of the solid waste predicate might not be met: the burning of hazardous secondary materials in an industrial furnace solely for material recovery.[57] As we explore elsewhere, such a secondary material may not be a solid waste under the current regulatory definition.[58] Assuming that to be the case,

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[52] 40 C.F.R. § 261.3(c)(2)(i) (1988).

[53] The EPA does not refer to "derivative" materials. We use this label to avoid repeating the cumbersome regulatory language: "solid waste generated from the treatment, storage, or disposal of a hazardous waste."

[54] The derived-from rule applies only to "solid waste generated from the treatment, storage, or disposal of a hazardous *waste* . . . ." 40 C.F.R. § 261.3(c)(2)(i) (1988) (emphasis added). Nothing can be a hazardous waste under Subtitle C unless it is a solid waste. *See* § **6.2** The Solid Waste Predicate.

[55] The derived-from rule applies only to a material that is itself a solid waste. 40 C.F.R. § 261.3(c)(2)(i) (1988).

[56] *See* §§ **3.8–3.49**.

[57] *See* 50 Fed. Reg. 49,163, 49,167 & n.4 (1985).

[58] Such a material will not be a solid waste by virtue of the burning for energy recovery provision of **Figure 3**, Question 8. *See* §§ **3.30–3.31**. Nevertheless, if the burning for material recovery constitutes reclamation, *see* § **3.34** note 94, the source material may be a solid waste, depending on the answers to **Figure 3**, Questions 9A and 9B. *See* §§ **3.35–3.42**.

the Agency has stressed that any residue resulting from such burning would not be a listed hazardous waste by virtue of the derived-from rule, even though that rule expressly refers to "ash":[59]

> An example would be a smelting furnace resmelting one of its own listed process residues. In such situations, the secondary material would not be a solid waste at the time of burning in the industrial furnace even though it is classified as a solid waste for purposes of storage prior to burning.[60] Note further that the derived-from rule . . . thus would not apply to wastes generated by the burning.[61]

It is important not to exaggerate the significance of this aspect of the solid waste predicate. To be sure, solid wastes (such as container residues) generated from the "storage" of hazardous secondary materials or commercial chemical products will escape application of the derived-from rule, if the derivative material is generated before the source material becomes a solid waste. For example, residual amounts of a listed commercial chemical product left behind in a drum which held the substance while it was still a product have not technically been generated from the storage of a solid and hazardous *waste.* Nevertheless, even without application of the derived-from rule, the residual commercial chemical product becomes a solid and hazardous waste when abandoned or held in lieu of abandonment.[62]

The second aspect of the solid waste predicate is that no material—even if derived from a listed hazardous (and solid) waste—will be a listed hazardous waste by virtue of the derived-from rule, unless the derivative material is itself a solid waste. The parenthetical clause in the derived-from rule addresses one situation in which this aspect of the predicate is not met: where a *product* is reclaimed (derived) from a listed hazardous waste and beneficially used in ways other than land application or burning for energy recovery.[63] We analyze this reclaimed

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[59] *See* 40 C.F.R. § 261.3(c)(2)(i) (1988).

[60] We find this portion of the EPA's discussion to be confusing, because we are not able to locate any portion of the solid waste definition providing that such a material would be a solid waste up to—but not at—the time of burning. The burning for energy recovery provision would not make the material a solid waste, even prior to burning. *See* **§§ 3.30–3.32**. The provisions declaring that a listed hazardous secondary material undergoing reclamation is a solid waste do not disengage at the moment of reclamation. *See* **§§ 3.33–3.42**. Indeed, the regulation provides that such a material is a solid waste "*when* reclaimed." 40 C.F.R. § 261.2(c)(3) (1988) (emphasis added). *See* **§ 3.36** Status of Materials Prior To and Following Reclamation.

[61] 50 Fed. Reg. 49,163, 49,167 n.4 (1985).

[62] *See* **§§ 3.2–3.7**; **§ 7.4** Solid Waste Predicate for Commercial Chemical Products.

[63] *See* 40 C.F.R. § 261.3(c)(2)(i) (1988), *quoted in* **§ 7.49**. Reclaimed materials burned for energy recovery, applied to land, or incorporated into products used in such

products principle, including the difficult task of distinguishing between products and wastes, elsewhere.[64] That separate discussion should be read carefully, because the EPA has articulated in preambles several limitations or corollaries to the reclaimed products principle—corollaries that go beyond the bare wording of the regulation.[65]

Finally, before addressing the various types of derivative materials, it is important to clarify the consequences of the derived-from rule. Several preamble discussions convey a misleading impression, because they refer to a "presumption of hazardousness" for derivative materials.[66] This jargon suggests that derivative wastes are not, in fact, hazardous, as long as their handler can establish through tests or other mechanisms the absence of hazardous properties. In fact, wastes generated from the treatment, storage, or disposal of *listed* hazardous wastes are presumptively hazardous only in the same way that *all* listed wastes can be so characterized: they are hazardous wastes unless and until delisted.[67]

§ 7.50 Types of Materials Subject to Derived-From Rule

The derived-from rule has the effect of ascribing listed hazardous waste status to solid wastes "generated from the treatment, storage, or disposal"[68] of listed wastes. What types of materials might be listed

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ways are usually solid wastes. *See* **Figure 3**, Questions 7, 7A, and 8; § **3.28** Materials Subject to Use Constituting Disposal Provision; § **3.32** Materials Used to Produce a Fuel or Contained in a Fuel; § **3.36** Status of Materials Prior To and Following Reclamation. *See also* 50 Fed. Reg. 49,163, 49,171, 49,174 (1985) (EPA finding that "Cadence product 312" or "CHEM-FUEL"—"a blend of hazardous spent solvent recovery still bottoms and other hydrocarbon-based hazardous waste . . . patented for use in blast furnaces"—is a solid and hazardous waste).

[64] *See* § **3.36** Status of Materials Prior To and Following Reclamation; § **3.36** note 42.

[65] *See* § **3.36** Status of Materials Prior To and Following Reclamation.

[66] *See, e.g.*, 50 Fed. Reg. 614, 649 (1985) ("wastes from precious metal reclamation are presumptively hazardous if the material being reclaimed is a hazardous waste); 48 Fed. Reg. 14,472, 14,494 (1983) ("waste residues from precious metal reclamation of regulated recyclable materials are presumptively hazardous"); 49 Fed. Reg. 427, 428 (1984) (derived-from rule "states that wastes derived from treating hazardous wastes are presumptively hazardous"); 49 Fed. Reg. 23,284, 23,284 (1984) (pickle liquor sludge is exempted from "presumption of hazardousness"); 50 Fed. Reg. 36,966, 36,967 (1985) (pickle liquor sludge excluded from "presumption of hazardousness").

[67] *See* 50 Fed. Reg. 614, 619 n.1 (1985) ("residues . . . are . . . considered to be listed hazardous wastes, and, for delisting purposes, to have the same constituents of concern as the hazardous wastes from which they are derived").

[68] 40 C.F.R. § 261.3(c)(2)(i) (1988), *quoted in* § **7.49**.

hazardous wastes by virtue of this language? That question can best be answered by focusing on two facets of the rule: (1) the material must be generated from (2) treatment, storage, or disposal.

Consider, first, the requirement that the material must be "generated from"[69] one of the enumerated activities.[70] Sometimes, it will be obvious that this condition has been met. For example, ash resulting from the thermal treatment of a listed hazardous waste has undeniably been generated from the treatment process.[71] At other times, however, the phrase must be given some common sense limits. Imagine, for example, a facility that exists solely to treat, store, and dispose of listed and unlisted hazardous waste. Such a facility may routinely generate solid wastes (empty coffee cups, discarded office supplies, and the like) that might arguably be generated from the facility's treatment, storage, and disposal activities.[72] Clearly, such solid wastes are not subject to the derived-from rule. We offer this somewhat trivial illustration to suggest that the phrase generated from must be read to exclude solid wastes that are wholly unlikely to contain any listed hazardous wastes (or listed hazardous waste constituents) handled by an operation.

Second, the derived-from rule applies only to solid wastes generated from the enumerated activities: treatment, storage, and disposal. We will analyze fully the definitions for each of these regulatory terms elsewhere, in discussing the actors that are regulated under Subtitle C.[73] For present purposes, it will be helpful to address each type of activity briefly, describing various materials that may be derived therefrom.

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[69] For convenience, we have equated this language with the phrase "derived from," referring to the regulatory provision as the derived-from rule. *See* § **7.49** note 49. As we discuss elsewhere, however, the phrase "derived from" may technically have a broader meaning than the phrase "generated by." *See* § **6.25** note 13 (discussing scope of household waste exclusion).

[70] The household waste exclusion uses the phrase "derived from," to describe the materials protected by that provision. *See* 40 C.F.R. § 261.4(b)(1) (1988), *quoted in* § **6.25**. As we discuss in connection with that language, it may be difficult, at multiple-use facilities, to determine which wastes are derived from households. *See* § **6.25** Types of Wastes Protected by Household Waste Exclusion; § **6.25** note 23.

[71] *See* 50 Fed. Reg. 23,721, 23,722 (1985). The Agency has justified application of the derived-from rule to incinerator ash by noting that "[a]sh from the incineration of hazardous wastes often contains heavy metals and, if combustion is not complete, undestroyed toxic organic materials." 45 Fed. Reg. 33,065, 33,096 (1980).

[72] We discuss similar interpretive problems in connection with the hazardous waste exclusions/exemptions for oil and gas special wastes ("associated with" language), *see* § **6.14** Exclusion/Exemption for Oil, Gas and Geothermal Energy Wastes, and for mining wastes ("solid wastes from" language). *See* § **6.19** Meaning of Wastes from Extraction, Beneficiation, and Processing.

[73] We will discuss treatment, storage, and disposal in a subsequent volume.

Treatment residues are perhaps the most common targets of the derived-from rule. Given the regulation's broad definition of "treatment,"[74] the derived-from rule applies to sludge generated by the treatment of wastewater containing a listed hazardous waste,[75] sludge residues from listed hazardous waste reclamation,[76] plant sweepings containing listed hazardous waste residues,[77] and residues (including ash) from the combustion of listed hazardous wastes.[78] We also believe,

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[74] The regulation provides:

> "Treatment" means any method, technique, or process, including neutralization, designed to change the physical, chemical, or biological character or composition of any hazardous waste so as to neutralize such waste, or so as to recover energy or material resources from the waste, or so as to render such waste non-hazardous, or less hazardous; safer to transport, store, or dispose of; or amenable for recovery, amenable for storage, or reduced in volume.

40 C.F.R. § 260.10 (1988) ("Treatment").

[75] The derived-from rule expressly refers to "sludge." 40 C.F.R. § 261.3(c)(2)(i) (1988), *quoted in* § **7.49**. *See also* 45 Fed. Reg. 33,065, 33,096 (1980) ("Sludges from wastewater treatment typically contain concentrated amounts of the toxic substances which were in the wastewater"). In discussing the need to exclude certain listed waste/wastewater mixtures from the operation of the mixture rule, *see* **Figure 4**, Question 4B, the EPA stressed that wastewater treatment sludges from the handling of such wastewater mixtures would otherwise be hazardous wastes under the derived-from rule. *See* 46 Fed. Reg. 56,582, 56,582–83 (1981).

The derived-from rule also applies to scrubber water from the incineration of hazardous waste. *See* 50 Fed. Reg. 30,271, 30,272–73 (1985) (rejecting suggestion of commenter that such materials should be exempt from the rule because "scrubber water exhibits fundamentally different chemical and physical properties than . . . organic wastes which are incinerated" and because application of the derived-from rule discourages incineration of dioxin-containing wastes). *But see id.* at 30,273 ("we are considering modifying the hazardous waste rules to designate as hazardous (rather than acute hazardous) wastes derived from the incineration or thermal treatment of certain dioxin-containing wastes" to remove incineration disincentive).

[76] Reclamation is treatment, within the meaning of Subtitle C, because it is a "process . . . designed to recover . . . material resources from the waste." 40 C.F.R. § 260.10 (1988) ("Treatment"), *quoted in* § **7.50** note 74. We have discussed elsewhere preamble references declaring that residues derived from reclaiming listed hazardous wastes are "considered to be listed for purposes of this regulation." 50 Fed. Reg. 614, 619 n.1 (1985). *See* § **3.36** Status of Materials Prior To and Following Reclamation; § **3.36** note 40. *See also* 48 Fed. Reg. 14,472, 14,494 (1983) ("wastes from precious metal reclamation are considered to be hazardous whenever the material being reclaimed is a hazardous waste").

[77] *See* 50 Fed. Reg. 1,978, 1,996 (1985) ("plant sweepings which contain an acute hazardous waste are residues of cleanup operations, and would be considered to be acute hazardous waste, unless put to direct use as a pesticide or incorporated back into product").

[78] "Treatment" is defined to include any "process . . . designed to . . . recover energy or material resources from the waste." 40 C.F.R. § 260.10 (1988) ("Treatment"), *quoted in* § **7.50** note 74. The derived-from rule specifically refers to "ash." *See* 40

although the EPA has taken a contrary position, that the derived-from rule applies to rinsate from the emptying of listed hazardous waste containers;[79] this issue is insignificant, because rinsate will be a listed hazardous waste under the mixture rule in any event.[80]

Disposal residues will also frequently be targets of the derived-from rule. Such derivative materials include leachate[81] (but not precipitation runoff),[82] and may also apparently include soils contaminated by listed

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C.F.R. § 261.3(c)(2)(i) (1988), *quoted in* § **7.49**. EPA has stressed that residues from burning listed wastes are themselves listed hazardous wastes, even if the burning activity is exempt from Subtitle C regulation. *See* 50 Fed. Reg. 49,163, 49,190 (1985) ("Although the actual burning for energy recovery is a type of recycling currently exempt from RCRA regulation, the exemption does not extend to solid waste generated by recycling"). *See also* 50 Fed. Reg. 23,721, 23,722 (1985) ("the residue resulting from the incineration of acute hazardous wastes . . . are still acute hazardous wastes, unless otherwise designated, or delisted").

[79] *See* § **7.26** General Approach to Containers, Liners, and Residues; § **7.26** note 90.

[80] *See* § **7.31** notes 55, 57, & 58; § **7.48** note 21.

[81] The derived-from rule specifically mentions "leachate." *See* 40 C.F.R. § 261.3(c)(2)(i) (1988), *quoted in* § **7.49**. *See also* 45 Fed. Reg. 33,065, 33,096 (1980) (leachate "typically contains solubilized heavy metals and organic materials and is virtually always highly toxic"). This aspect of the rule has important implications for leachate collection systems at treatment, storage, and disposal facilities, as well as for actors engaged in cleanup activities at sites at which disposal of listed hazardous wastes has taken place.

In *Chemical Waste Management Inc. v. EPA,* 869 F.2d 1526 (D.C. Cir. 1989), the court of appeals upheld the application of the derived-from rule to leachate, and further upheld the EPA's assertion that leachate derived from and handled after the effective date of a new hazardous waste listing description—one which did not exist at the time when the precursor, unlisted solid waste was land disposed—must be handled as a listed hazardous waste under the derived-from rule. *See id.* at 1530–31, 1536–37 (concluding that such an interpretation of the derived-from rule does not involve an unlawful retroactive application of law). The court noted that any other interpretation would create serious enforcement problems:

> No doubt there are many landfills which have accepted certain listed hazardous wastes both before and after the wastes were listed. Under the petitioners' approach, leachate generated from the wastes disposed after listing would be deemed hazardous and would be subject to the treatment standards; leachate derived from previous shipments of the same waste would not. There is, however, no possible way for determining which portions of the collected leachate were generated from the particular shipments of the underlying waste. . . . [T]he hazardousness of leachate will depend on the composition of the underlying wastes, not on the time at which those wastes were disposed.

Id. at 1536–37. The *Chemical Waste Management* opinion also has significant ramifications for the mixture rule; we will address the opinion more fully when we supplement this portion of the treatise.

[82] The derived-from rule expressly states that it does not include "precipitation runoff." *See* 40 C.F.R. § 261.3(c)(2)(i) (1988), *quoted in* § **7.49**. The preamble notes

hazardous waste spills.[83] Although ascribing listed status to these various materials may sometimes be controversial,[84] it should usually be relatively easy to spot materials generated from treatment or disposal. By contrast, ascertaining whether materials have been generated from the *storage* of listed wastes, within the meaning of the derived-from rule,

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that this exception is based "on the theory that the water in precipitation run-off in many cases may not have had sufficient contact with the waste to solubilize waste constituents." 45 Fed. Reg. 33,065, 33,096 (1980). The Agency has warned, however, that run-off is exempted only from operation of the derived-from rule and may be a hazardous waste by virtue of other aspects of the regulation. *See id.* ("Of course, if collected, run-off would be a solid waste and, if it exhibited any of the characteristics, would have to be managed as a hazardous waste"). *See also* 50 Fed. Reg. 1,978, 1,996 (1985) ("precipitation run-off is not *automatically* considered a hazardous waste") (emphasis added).

[83] The derived-from rule specifically mentions "spill residue." *See* 40 C.F.R. § 261.3(c)(2)(i) (1988), *quoted in* § **7.49**. EPA has stated that soil contaminated with dioxins at CERCLA cleanup sites "are acute hazardous wastes, since soil contaminated with hazardous waste spills are defined as being in the RCRA system." 50 Fed. Reg. 1,978, 1,994 (1985) (citing the derived-from rule). As we discuss elsewhere, contaminated soils may be listed wastes in any event under the mixture rule. *See* § **7.48** note 21. Moreover, if a commercial chemical product has been spilled, the contaminated soil is expressly listed as the fourth enumerated form. *See* § **7.32** Debris Resulting from Cleanup of Spill; § **7.33** Narrow Scope of Fourth Enumerated Form.

[84] Plainly, some solid wastes generated from treatment or disposal of listed hazardous wastes may have such low concentrations of listed wastes (or listed waste constituents) that the rigid approach of the derived-from rule is excessive. *See* 50 Fed. Reg. 23,721, 23,722 (1985) (EPA "recognizes . . . that while a waste described in these regulations generally is hazardous, a specific waste meeting the listing description from an individual facility may not be"). Nevertheless, the Agency concluded that there were strong practical reasons for adopting a rule known to be overinclusive:

> This is the best regulatory approach we can devise at this time for dealing with solid waste generated by hazardous waste management facilities. We are not now in a position to prescribe waste-specific treatment standards which would identify those processes which do and do not render wastes or treatment residues nonhazardous. To list treatment residues on a case-by-case basis would be an enormous job, and one which we think . . . is unnecessary.

45 Fed. Reg. 33,065, 33,096 (1980). Actors who believe that their derivative materials do not meet the hazardous waste listing criteria may seek to obtain delisting of the wastes. *See* §§ **7.56–7.78**.

The rigidity of the derived-from rule also makes it less likely that new hazardous constituents generated during treatment processes will be overlooked. *See* 45 Fed. Reg. 33,065, 33,096 (1980) ("one effect of treating wastes containing synthetic organic materials may be to create new hazardous constituents in the waste or treatment residue"). A petitioner seeking to delist a derivative waste must establish not only that the waste does not meet any of the criteria underlying initial listing, but must also convince the EPA that "factors (including additional constituents) other than those for which the waste was listed" do not justify continued listing of the derivative waste. 40 C.F.R. § 260.22(a)(2) (1988). *See* § **7.68** Three Delisting Touchstones; §§ **7.71–7.78**.

may not be so straightforward. Accordingly, we address such derivative wastes separately, in the next section.

Attachment 6

Leachate Collection System and Discharge Summary

Leachate Collection and Discharge Summary

Leachate, landfill gas condensate, and groundwater collected at the Kestrel Hawk Landfill (KHL) are discharged to the City of Racine sanitary sewer systems at two points: LMP6A and MH-15B; refer to Figure 1.

LMP6A

LMP6A collects leachate and landfill gas condensate from Phases 1, 2, 3, 4, and 5 of the Northwest Expansion. These inputs are from the municipal solid waste units of the KHL. LMP6A is discharged to City of Racine sanitary sewer at Manhole No. 7, located on 16th Street on the north side of the KHL, refer to Figure 1.

LMP6A is one of two monitoring locations used for compliance monitoring for the City of Racine wastewater discharge permit.

MH-15B

The liquids collected from the old site of the KHL are discharged to the City of Racine sanitary sewer at MH-15B. The old site has multiple systems in place to remove landfill leachate, landfill gas condensate, and impacted groundwater from the KHL. These systems include:

- Leachate extraction wells located in Corridors 1 through 6 (hazardous waste unit) and the former City of Racine Landfill;
- Leachate collection piping located at the base of Corridors 4, 5, 6, 7; 8, 9, and 10; and Corridor 11
- Groundwater collected from the containment structure (soil/bentonite slurry wall with an upgradient groundwater collection trench) that was constructed along the south and west perimeter of the hazardous waste unit;
- Groundwater collected from the containment structure at the south and west boundary of the former City of Racine Landfill;
- Landfill gas condensate from driplegs and trucked discharge from the biogas building;
- Groundwater collected from the 141U area recovery wells.

Figure 2 provides a schematic diagram of the flows and Figure 3 provides a plan view of the flows.

These liquids are conveyed via pipes through a set of manholes internal to the containment structure. This discharges to the 21st Street Sanitary Sewer extension; refer to Figures 2 and 3. The 21st Street Sanitary Sewer extension consists of seven manholes (manholes MH-10 to MH-15A from upstream to downstream). Photos from recent observations of the 21st Street Sanitary Sewer Extension manhole indicates that the piping incoming from the landfill is double walled.

At manhole MH-15B, the combined liquids from the old site of the KHL flow through a Parshall flume to monitor the volume of wastewater discharged and provide a sample location of the combined flow. MH-15B is the second monitoring location for compliance with the City of Racine wastewater discharge permit. Adjacent to MH-15B is manhole MH-15A, where the discharge from MH-15B has been observed mixing with non-landfill flows; refer to the attached photographs.

Figures

(TO CITY OF RACINE SANITARY SEWER)

SAN

16TH STREET

LMP6A

SANITARY SEWER MANHOLE NO. 7

NORTHWEST EXPANSION
EDGE OF WASTE

PHASE 5
(FUTURE)

PHASE 4

PHASE 3

PHASE 2

PHASE 1

NORTHWEST
EXPANSION

EXISTING SITE
EDGE OF WASTE

CORRIDOR 11

MH2

CORRIDORS 6, 7 NORTH AND 7 SOUTH

MH1

CORRIDORS 4 AND 5

LS4

LRC LANDFILL

LEACHATE FROM EXTRACTION WELLS
(CORRIDORS 1-6)

CITY OF
RACINE
LANDFILL

MH9

METERING
MANHOLE

LMP8A

LS8

MH7

LS6

SAN

MH11

SAN

MH12

LS5

SAN

MH13

SAN

MH14

MH15A

SAN

MH15B

(TO CITY OF RACINE SANITARY SEWER)

GROUNDWATER
REMEDIATION
(141U AREA)

SAN

MH10

20TH STREET

LEGEND

- SLURRY WALL
- LEACHATE LINE (AND FLOW DIRECTION)
- LEACHATE LINE CONVEYING LEACHATE AND GROUNDWATER (AND FLOW DIRECTION)
- 6" DIA. GROUNDWATER CONTAINMENT STRUCTURE (GCS)
- SANITARY SEWER CONVEYING LEACHATE AND GROUNDWATER
- SANITARY SEWER CONVEYING GROUNDWATER
- SAN — MUNICIPAL SEWER

PROJECT:
KESTREL HAWK LANDFILL
RACINE, WISCONSIN

TITLE:
SCHEMATIC FLOW DIAGRAM

DRAWN BY:	T. FIEBRANZ	PROJ NO.:	326037.0005
CHECKED BY:	S. EDWARDS		FIGURE 1
APPROVED BY:	J. HOTSTREAM		
DATE:	JULY 2020		

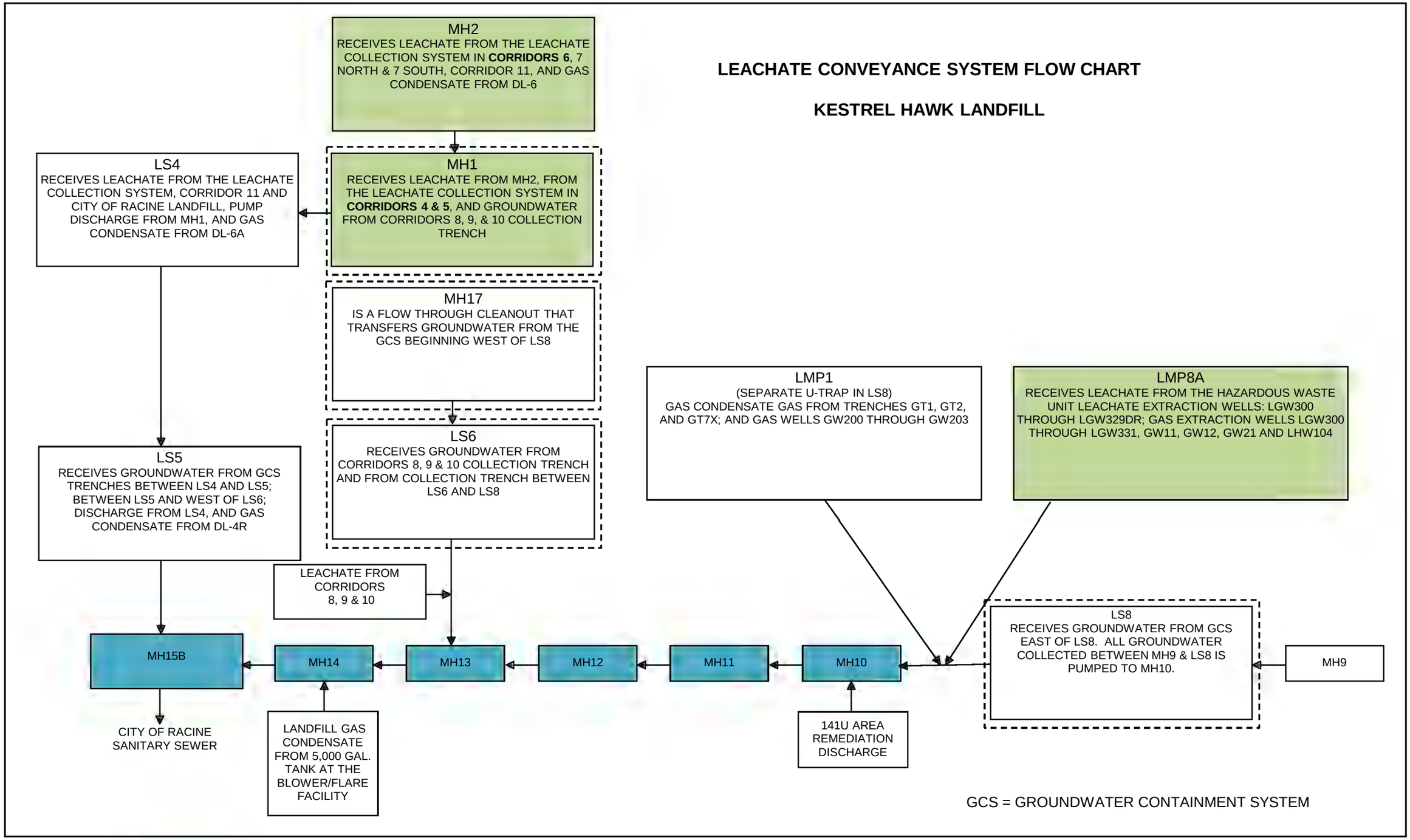
TRC
708 Heartland Trail
Suite 3000
Madison, WI 53717
Phone: 608.826.3600

FILE NO.: 326037.0006.03.dwg

1417 --- USER: TFiebranz --- ATTACHED XREFS: --- ATTACHED IMAGES:
DRAWING NAME: J:\Republic\Kestrel Hawk\326037 - 2019 Annual Report\0006\326037.0006.03.dwg --- PLOT DATE: July 27, 2020 - 12:33PM --- LAYOUT: SCHEMATIC FLOW DIAGRAM
Version: 2017-10-21

LEACHATE CONVEYANCE SYSTEM FLOW CHART

KESTREL HAWK LANDFILL



21st Street Sanitary Sewer Extension

Receives leachate from the hazardous waste unit

Receives groundwater from the groundwater containment system around the hazardous waste unit

FIGURE 2

\\madison-vfp\Records\-WPMSN\PJT2\379997\0000\Files for R-005\Figures\Figure 3_Rev. 6-6-20.xlsx 6/8/2020

MARKUPS BY J. HOTSTREAM 10/27/2020

NORTHWEST EXPANSION

HEAD MONITORING WELL ACCESS

12+75N LEACHATE COLLECTION PIPE

11+50N LEACHATE COLLECTION PIPE

10+50N LEACHATE COLLECTION PIPE

9+55N LEACHATE COLLECTION AND TRANSFER PIPES

CITY OF RACINE LANDFILL LEACHATE COLLECTION PIPE

CORRIDOR 11

CORRIDOR 7 NORTH LEACHATE COLLECTION PIPE

CORRIDOR 7

CORRIDOR 7 SOUTH LEACHATE COLLECTION PIPE

CORRIDOR 6 LEACHATE COLLECTION PIPE

PIPES DO NOT INTERSECT

HORIZONTAL GAS COLLECTION TRENCHES

CORRIDOR 5 LEACHATE COLLECTION PIPE

CORRIDOR 4 LEACHATE COLLECTION PIPE

WEST BARRIER WALL

SOIL/BENTONITE SLURRY WALL

TO TEMPORARY HORIZONTAL GAS WELL

TO TEMPORARY INTERIOR MANHOLE ODOR CONTROL

PIPES DO NOT INTERSECT

LEACHATE TRANSFER PIPE

GROUNDWATER COLLECTION PIPE/TRENCH

LEACHATE COLLECTION PIPE

FORMER CITY OF RACINE LANDFILL

CORRIDORS 8, 9, AND 10

HAZARDOUS WASTE UNIT (CORRIDORS 1–6)

APPROXIMATE LIMITS OF REFUSE

LEACHATE HEADWELL LHW–8, 9 & 10

GROUNDWATER COLLECTION PIPE/TRENCH

GAS EXTRACTION TRENCH

SOIL/BENTONITE SLURRY WALL

SEDIMENTATION BASIN NO.1

TIE–IN BETWEEN EXISTING AND NEW HEADER PIPE

16" TEE WITH CAP ON ABANDONED IN–PLACE BIO GAS LINE

METERING MANHOLE

SANITARY SEWER EXTENSION

ABANDONED IN–PLACE BIOGAS LINE

GAS MIGRATION CONTROL PIPE

CLAY BARRIER WALL

GAS HEADER PIPE

CONTAINMENT STRUCTURE GAS COLLECTION TRENCH VALVE

EAST BUILDING

141U EXTRACTION AREA

MONITORING POINT FOR DISCHARGES FROM THE KHL OLD SITE: CORRIDORS 1-11 AND THE FORMER CITY OF RACINE LANDFILL

DIRECTION OF LEACHATE/ WASTEWATER FLOW

LEGEND

- SPOT ELEVATION
- GROUND CONTOUR
- ACCESS ROAD
- FENCE
- TREES AND/OR SHRUBS
- APPROXIMATE LIMITS OF REFUSE
- UTILITY TOWER
- SITE DRAINAGE FLOW
- HORIZONTAL GAS EXTRACTION TRENCH
- SOIL/BENTONITE SLURRY WALL
- COMPACTED CLAY BARRIER WALL
- LEACHATE COLLECTION PIPE (PERFORATED)
- LEACHATE TRANSFER PIPE (NON–PERFORATED)
- GROUNDWATER COLLECTION PIPE/TRENCH
- HDPE GAS HEADER PIPE
- DOUBLE–WALLED LEACHATE/ CONDENSATE CONVEYANCE PIPE
- GRAVITY LEACHATE CONVEYANCE PIPE
- COMBINED GAS AND LEACHATE HEADER PIPE
- ABANDONED IN–PLACE BIOGAS LINE
- GAS MIGRATION CONTROL PIPE
- LHW100 LEACHATE HEADWELL LOCATION AND NUMBER
- LGW300 LEACHATE/GAS EXTRACTION WELL LOCATION AND NUMBER
- GW21 GAS EXTRACTION WELL LOCATION AND NUMBER
- GTR2 GAS TRENCH RISER LOCATION AND NUMBER
- GT1 GAS EXTRACTION TRENCH WELLHEAD LOCATION AND NUMBER
- MH14 MANHOLE LOCATION AND NUMBER
- CO3 CLEANOUT LOCATION AND NUMBER
- LS5 LIFT STATION LOCATION AND NUMBER
- MC1 MONITORING AND CONTROL ASSEMBLY LOCATION AND NUMBER
- DL2 DRIPLEG LOCATION AND NUMBER
- HEAD MONITORING WELL ACCESS
- CONTAINMENT STRUCTURE GAS COLLECTION TRENCH VALVE

NOTES

1. TOPOGRAPHIC BASE MAP WAS OBTAINED FROM AERO–METRIC ENGINEERING, INC. (DATE OF PHOTOGRAPHY: OCTOBER 6, 1994, JUNE 1995, MARCH 28, 2005, MARCH 29, 2008) AND COOPER AERIAL SURVEYS CO. (DATE OF PHOTOGRAPHY OCTOBER 20, 2019).
2. PIPING AND APPURTENANCE LOCATIONS WERE OBTAINED FROM MONTGOMERY WATSON DRAWING 1272013.25090320–D1, DATED MARCH 1997.
3. LOCATIONS OF PIPING AND APPURTENANCES ARE APPROXIMATE AND WILL REQUIRE FIELD VERIFICATION PRIOR TO FUTURE CONSTRUCTION ACTIVITIES.
4. GAS EXTRACTION WELL LOCATION AND LEACHATE/GAS EXTRACTION WELL LOCATIONS FOR GW205, GW207, GW208, GW212S/D, GW213S/D, LGW214S/D, GW408, LGW210S/D, LGW332, LGW335, AND ASSOCIATED PIPING TO THESE WELLS WERE OBTAINED FROM CONSTRUCTION DOCUMENTATION REPORT FOR 2001 LEACHATE/GAS SYSTEM IMPROVEMENTS PREPARED BY EMCON/OWT, DATED DECEMBER 2001, DRAWING NUMBERS 2 AND 3 FOR PROJECT NUMBER 821679.
5. DUAL EXTRACTION WELLS LGW45DR, LGW46DR, LGW204R, LGW315RR, LGW329DR WERE INSTALLED IN 2003. THE CONSTRUCTION WAS DOCUMENTED BY EARTH TECH INC., REPORT DATED JUNE 2004, PROJECT NUMBER 69974.
6. LGW–326DRR – OCTOBER 2004
   LHW–401 & 402 – BY RMT INC.
7. LGW 36S/D, LGW 38S/D, GW45S, GW46S REMOVED IN 2008.
8. LGW 36R, LGW 38R, LGW 320R, AND LGW 214DR INSTALLED IN 2008.
9. LGW314 WAS REPLACED WITH LGW314R IN 2010.
10. LGW–210DR, LGW–333R, LGW 332R, LHW 112RR AND LHW 114R WERE INSTALLED IN 2012.
11. GAS EXTRACTION WELL LOCATION GW206R WAS OBTAINED FROM THE 2015 LANDFILL GAS SYSTEM SOUTH PLAN VIEW DRAWING BY CQM, INC. DATED FEBRUARY 2016.

PROJECT:	KESTREL HAWK LANDFILL HAZARDOUS WASTE REPORT 2019 ANNUAL REPORT RACINE, WISCONSIN
TITLE:	EXISTING CONDITIONS - CORRIDORS 1 THROUGH 11 AND FORMER CITY OF RACINE LANDFILL
DRAWN BY:	T. FIEBRANZ
CHECKED BY:	S. EDWARDS
APPROVED BY:	J. HOTSTREAM
DATE:	JUNE 2020
PROJ. NO.:	326037.0005
	FIGURE 3

TRC
708 Heartland Trail
Suite 3000
Madison, WI 53717
Phone: 608.826.3600

FILE NO.: 326037.0005.11.dwg

24-06 — ATTACHED XREFS: basemap existing, 2019-11-22 — ATTACHED IMAGES:
DRAWING NAME: J:\Republic\Kestrel Hawk\326037 - 2019 Annual Report\0005\326037.0005.11.dwg — PLOT DATE: June 09, 2020 - 7:00AM — LAYOUT: FIGURE 7

Photographs


MH-15A
(Downstream from MH-15B)
Photo provided by Kestrel Hawk Landfill
2/26/2020
Inflow of other waste water (not associated with landfill)
Flume discharge from MH-15B


MH-15B
Photo provided by Kestrel Hawk Landfill
2/26/2020
Double walled pipe from KHL discharging to flume
Parshall flume to measure flow

Attachment 7

Hazardous Waste Unit Contingency Plan Documentation

REPUBLIC SERVICES

1969 Oakes Road, Racine, WI 53406
o 262.884.7081 f 262.884.7096 republicservices.com

June 29, 2020

City of Racine Fire Department
Attn: Mr. Steve Hansen, Chief
810 8th Street
Racine, WI 53403

City of Racine Police Department
Attn: Art Howell, Chief of Police
730 Center Street
Racine, WI 53403

Racine County Office of Emergency Management
Attn: David Maack
730 Wisconsin Avenue
Racine, WI 53403

All Saints Hospital – Spring Street Campus
Safety Department
Attn: Angela Sowle
3801 Spring Street
Racine, WI 53405

Subject: Hazardous Waste Unit Contingency Plan
Kestrel Hawk Landfill (WDNR License No. 0752)
1989 Oakes Road, Racine, WI 53406

Dear Emergency Coordinator:

Enclosed please find a Contingency Plan (Plan) dated June 2020 for the closed hazardous waste unit at Kestrel Hawk Landfill (landfill). The previous version of this plan submitted in April 2020 should be replaced with the enclosed updated Plan. The attached Plan reflects current landfill site conditions, modifications and changes to responsible personnel contacts.

The Plan has been developed in accordance with the requirements of Section NR 644.0050, Wisconsin Administrative Code. Please complete and return the attached acknowledgment to confirm receipt of the Contingency Plan.

Sincerely,

Kestrel Hawk Landfill



M. Khalid Umer, P.E.
Environmental Manager

cc: Kestrel Hawk Files

Krause, Tina

From: TrackingUpdates@fedex.com
Sent: Wednesday, July 1, 2020 1:27 PM
To: Krause, Tina
Subject: [EXTERNAL] FedEx Shipment 770828905430: Your package has been delivered

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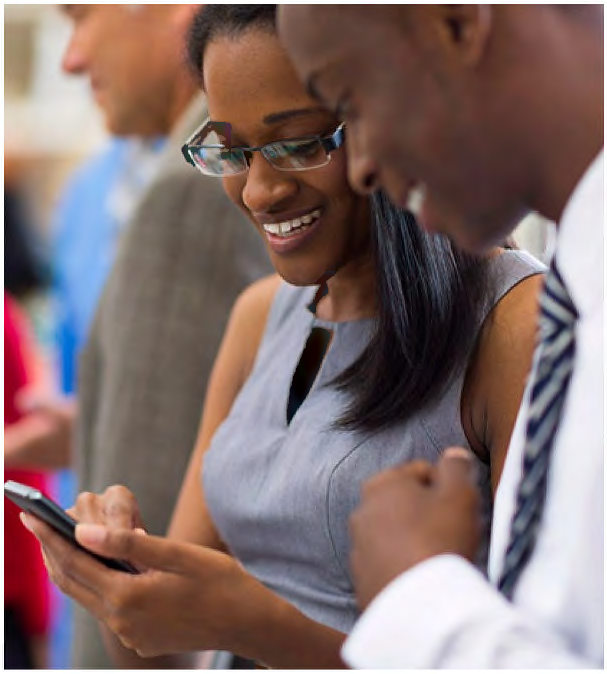
Delivered to 810 8TH ST, RACINE, WI 53403
Received by A.ANGELA

OBTAIN PROOF OF DELIVERY

TRACKING NUMBER 770828905430

FROM TRC Companies
TRC Environmental Corporation
708 Heartland Trail, Suite 3000
Madison, WI, US, 53717

TO	Mr. Steve Hansen, Chief 810 8th Street RACINE, WI, US, 53403
REFERENCE	OHGENL.0000.000.300214
SHIPPER REFERENCE	OHGENL.0000.000.300214
SHIP DATE	Tue 6/30/2020 07:16 PM
DELIVERED TO	Receptionist/Front Desk
ORIGIN	Madison, WI, US, 53717
DESTINATION	RACINE, WI, US, 53403
SPECIAL HANDLING	Direct Signature Required
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	2.00 LB
SERVICE TYPE	FedEx Standard Overnight



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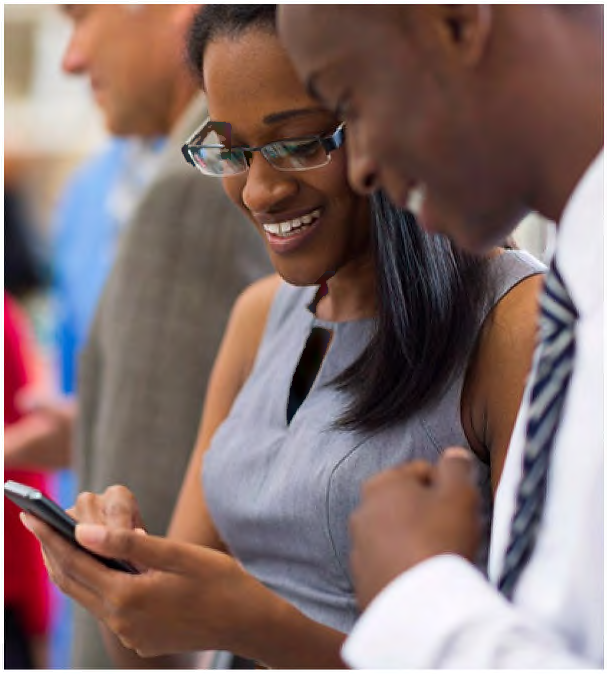
Delivered to 730 WISCONSIN AVE, RACINE, WI 53403
Received by C.CHRIS

OBTAIN PROOF OF DELIVERY

TRACKING NUMBER 770828945824

FROM TRC Companies
TRC Environmental Corporation
708 Heartland Trail, Suite 3000
Madison, WI, US, 53717

TO	David Maack 730 Wisconsin Avenue RACINE, WI, US, 53403
REFERENCE	OHGENL.0000.0000.300214
SHIPPER REFERENCE	OHGENL.0000.0000.300214
SHIP DATE	Tue 6/30/2020 07:16 PM
DELIVERED TO	Mailroom
ORIGIN	Madison, WI, US, 53717
DESTINATION	RACINE, WI, US, 53403
SPECIAL HANDLING	Direct Signature Required
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	2.00 LB
SERVICE TYPE	FedEx Standard Overnight



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Received by M.MARION

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TRACKING NUMBER 770828962816

FROM TRC Companies
TRC Environmental Corporation
708 Heartland Trail, Suite 3000
Madison, WI, US, 53717

TO	Angela Sowle 3801 Spring Street RACINE, WI, US, 53405
REFERENCE	OHGENL.0000.0000.300214
SHIPPER REFERENCE	OHGENL.0000.0000.300214
SHIP DATE	Tue 6/30/2020 07:16 PM
DELIVERED TO	Shipping/Receiving
ORIGIN	Madison, WI, US, 53717
DESTINATION	RACINE, WI, US, 53405
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	2.00 LB
SERVICE TYPE	FedEx Standard Overnight



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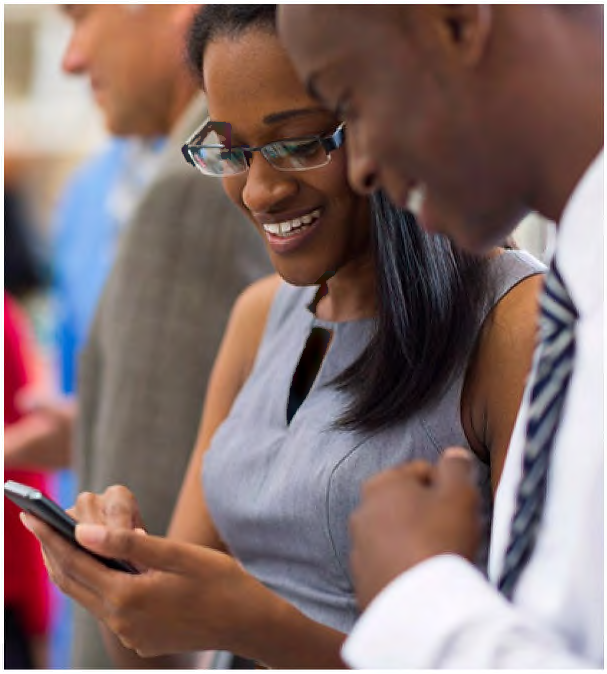
Delivered to 730 CENTER ST, RACINE, WI 53403
Received by C.CHERYL

OBTAIN PROOF OF DELIVERY

TRACKING NUMBER 770828923289

FROM TRC Companies
TRC Environmental Corporation
708 Heartland Trail, Suite 3000
Madison, WI, US, 53717

TO	Art Howell, Chief of Police 730 Center Street RACINE, WI, US, 53403
REFERENCE	OHGENL.0000.000.300214
SHIPPER REFERENCE	OHGENL.0000.000.300214
SHIP DATE	Tue 6/30/2020 07:16 PM
DELIVERED TO	Receptionist/Front Desk
ORIGIN	Madison, WI, US, 53717
DESTINATION	RACINE, WI, US, 53403
SPECIAL HANDLING	Direct Signature Required
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	2.00 LB
SERVICE TYPE	FedEx Standard Overnight



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Attachment 8

2015 Gas Condensate Information

Table 10

2015 Leachate, Gas Condensate, and Groundwater Containment Structure Removal Volumes

Kestrel Hawk Landfill

Racine, Wisconsin

QUARTER	LMP6A [(1)(A)] (gallons)	LMP8A [(2)] (gallons)	DL4R [(3)(G)] (gallons)	MH15B [(4)(A)] (gallons)	LS4 [(B)] (gallons)	LS5 [(C)(6)] (gallons)	LS6 [(D)(6)] (gallons)	LS8 [(E)] (gallons)	CORRIDORS 8, 9, 10 (gallons)	141U AREA [(F)(5)] (gallons)	BIO-GAS PLANT [(G)] (gallons)
First Quarter	2,962,060	283,950	17,193	1,387,790	465,760	864,500	55,728	30,600	31,235	19,553	4,400
Second Quarter	3,930,850	304,310	65,910	1,741,370	413,526	890,500	141,936	40,600	140,773	209,231	13,700
Third Quarter	1,378,050	165,520	11,115	1,004,490	322,834	691,600	77,376	29,000	16,085	146,170	19,000
Fourth Quarter	630,200	21,440	15,210	2,405,140	289,378	777,400	77,184	31,400	20,209	155,814	12,500
TOTAL	**8,901,160**	**775,220**	**109,428**	**6,538,790**	**1,491,498**	**3,224,000**	**352,224**	**131,600**	**208,302**	**530,768**	**49,600**

Footnotes:

(1) Represents total volume of leachate collected from Phase 1 through Phase 5 of the Northwest Expansion prior to discharge to the City of Racine sanitary sewer.

(2) Volume of leachate collected from the HWU (Corridors 1 through 6).

(3) Dripleg DL4R flow meter installed in February 2005 (pump rate: 325 gal/hr) .

(4) Represents total volume of leachate, gas condensate, and containment structure water collected at the existing Kestrel Hawk Landfill, including volumes from LMP8A, DL4R, and the Bio-gas Plant, but excluding the volume collected at the Northwest Expansion (LMP6A).

(5) Iron treatment program was continued to be utilized in 2015 for groundwater recovery well pumps.

(A) Due to flowmeter discrepancy as a result of foaming issues in the leachate, volumes were estimated based on the pumps during second and third quarters.

(B) Leachate volumes based on pump curve for a Flyght CS3085 3 HP (IMP434) pump with an assumed head of 25 feet (8200 gal/hr).

(C) Leachate volumes based on pump curve for a Flyght CS3102 5 HP (IMP437) pump with an assumed head of 33 feet (13,000 gal/hr).

(D) Leachate volumes based on pump curve for a Flyght CS3085 3 HP (IMP434) pump with an assumed head of 30 feet (4,800 gal/hr).

(E) Leachate volumes based on pump curve for a Flyght CS3085 3 HP (IMP434) pump with an assumed head of 34.5 feet (2,000 gal/hr).

(F) Leachate volumes based on data recorded on Kestrel Hawk Weekly/Monthly Inspection Forms.

(G) Condensate volumes provided by Republic. Bio-gas plant tank volumes pumped and hauled to MH-11.

Notes:

1. LS = lift station.
2. DL = dripleg.
3. LMP = leachate monitoring point.
4. MH = manhole.
5. Totals were measured at each LS or LMP. The volumes may reflect combined flows, depending on their positions in the flow system. Refer to Figure 11 for locations in the system.

Prepared by: Khalid Umer, Area Environmental Manager, Republic Services, Inc.

Calculations checked by: Khalid Umer, Area Environmental Manager, Republic Services, Inc.

Attachment 9

Delegation of Signature Authority

REPUBLIC SERVICES

1969 Oakes Road, Racine, WI 53406
o 262.884.7081 f 262.884.7096 republicservices.com

October 16, 2020

Doug Coenen, P.E.
Waste Management Specialist
Waste and Materials Management Program
Wisconsin Department of Natural Resources
101 S. Webster Street HW/5
P.O. Box 792
Madison, WI 53707-7921

Subject: Delegation of Signature Authority
Kestrel Hawk Landfill
EPA ID WID076171008

Dear Mr. Coenen:

On behalf of Republic Services of Wisconsin, Limited Partnership (Republic) and the Kestrel Hawk Landfill, I authorize Republic staff holding the position of Environmental Manager to sign license applications and reports as required by Wisconsin Administrative Code NR 670.011. Republic staff in the position of Environmental Manager are responsible for the operation and regulatory compliance of the Kestrel Hawk Landfill; therefore, the Environmental Manager has the authority and knowledge to act as a signatory for these documents.

Sincerely,

Republic Services of Wisconsin, Limited Partnership
By: Republic Services of Wisconsin GP, LLC, General Partner

Matthew R. Healy
Vice President

Appendix R.2
Gas Processing Residuals Documentation

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REPUBLIC SERVICES

1969 Oakes Road, Racine, WI 53406
o 262.884.7081 f 262.884.7096 republicservices.com

April 5, 2021

Via Email

Doug Coenen, P.E.
Waste Management Specialist
Waste and Materials Management Program
Wisconsin Department of Natural Resources
101 S. Webster Street HW/5
P.O. Box 792
Madison, WI 53707-7921

Subject: Response to Addendum to Notice of Noncompliance
Hazardous Waste Compliance Assessment
Kestrel Hawk Landfill
EPA ID WID076171008

Dear Mr. Coenen:

In response to the Notice of Noncompliance dated December 9, 2019 (the "NON"), and the Addendum to Notice of Noncompliance dated September 16, 2020 (the "Addendum to NON") and in accordance with conversations and correspondence between Kestrel Hawk Landfill ("KHL") and the Wisconsin Department of Natural Resources ("WDNR") from December 2019 to present, KHL is submitting the additional information requested by the items of the NON and the Addendum to NON listed below. The attachments to this report can be downloaded from this link which will be available until April 30, 2021. We believe that submission of these items fulfills the remaining requests and recommendations in the NON.

NON Item 2: Manifesting of Oil-Absorbent "Socks"

Item 2 of the NON and the Addendum to NON alleged that KHL had improperly manifested oil absorbent socks as Toxic Substances Control Act (TSCA)-regulated materials, but not as hazardous wastes. In the November 16, 2020 letter to the WDNR, KHL provided evidence resolving four out of five of the shipments.

Regarding the fifth shipment, dated February 27, 2019, we have updated the manifest to list the waste code as F039 using the United States Environmental Protection Agency's (USEPA) electronic manifest system on December 14, 2020. The updated manifest for the 2019 shipment is provided in Appendix C of the Hazardous Waste Generation Report, Attachment 1. Safety-Kleen was notified of the revisions to the five manifests, refer to Attachment 2 for this correspondence.

The shipments offsite from KHL of Oil-Absorbent "Socks" are now manifested as recommended by WDNR in the Addendum to NON, and the required recordkeeping and reporting are complete.

NON Item 4: Waste Determinations for Gas Processing Residuals

On November 16, 2020, we provided a response to the WDNR to justify the determination that the gas processing residuals were not hazardous wastes. In an email dated January 13, 2021, our legal counsel provided additional support for the differentiation between condensate from landfill gas extraction and the gas processing residuals resulting from the processing of landfill gas to generate fuel, refer to Appendix B of the Hazardous Waste Generation (HWG) Report Attachment 1. This response and attached items have been developed under the assumption that our current determination on the gas processing residuals stands. This conclusion resolves NON items 4, 4.1, 5, 5.1, 5.2, 17, and 21.

NON Item 6: Hazardous Waste Generator Annual Reporting

The revised Hazardous Waste Generation Report (HWG Report) is provided in Attachment 1. It presents revised quantities of hazardous waste generated based on the November 16, 2020 response by KHL. This revised HWG Report addresses the WDNR comments and recommendations in the Addendum to the NON.

NON Item 7: Hazardous Waste Generator Fees

The revised HWG Report provides resolution to the annual report fee computations. With concurrence from the WDNR, we will provide the $80 of outstanding hazardous waste tonnage fees for the years of 2014 through 2019.

NON Item 8: LDR for POTW Discharges and NR 211 Notice

To comply with the s. NR 668.07(1)(g) WAC requirement, our consultant, TRC, has developed a notification memorandum describing the generation and treatment of the leachate. The memorandum addresses land disposal restriction requirements for the hazardous wastes generated by KHL. This memorandum will be placed in the operating record for KHL which complies with the reporting requirements of s. NR 668.07(1)(g) WAC. This notification memorandum is provided in Attachment 3.

The s. NR 211 WAC discharge reports to the publicly operated treatment works and the United States Environmental Protection Agency are not needed because KHL reports self-monitoring results to the City of Racine Wastewater Utility quarterly. Please refer to s. NR 211.17(7) WAC for the applicability requirement for discharge reports.

NON Item 9: Closure Plan

The Closure Plan for KHL has been updated to include closure costs and adjust the current status of the closure timeframe. The Closure Plan is provided in Attachment 4 and addresses the recommendations in Item 9 of the Addendum to the NON.

NON Item 10: Long-Term Care Plan

The Long-Term Care Plan has been updated to include the components of leachate level monitoring for the HWU and the requirements of the groundwater corrective action program. The Long-Term Care Plan is provided in Attachment 5 and addresses the recommendations in Item 10 of the Addendum to the NON.

NON Item 13: Operating Record

An operating record is in development for ongoing use at Kestrel Hawk. The table of contents for the operating record is provided in Attachment 6. The operating record will provide a centralized and standardized location for these records. The operating record will be reviewed and added to on an annual basis. The continued maintenance of the operating record addresses the recommendations in Item 13 of the Addendum to the NON.

NON Item 15: Financial Assurance Cost Estimates

A closure cost estimate for KHL is provided in Appendix C of the Closure Plan, Attachment 4. The closure costs were calculated for the site in 2013 and subsequently approved by the WDNR on April 24, 2013. These closure costs address the remaining final cover to be placed for the hazardous and non-hazardous components of the landfill, 47 acres at the time of the closure costs. Considering final cover construction since 2013, there are 39.6 acres of the site that require future cover. The 2013 closure costs, including inflation to current day values, meet the requirements of NR 500 and NR 600.

The long-term care cost estimates were revised and are provided in Table 1 of the Long-Term Care Plan, Attachment 5. These costs were updated to be consistent with current waste determinations and operations at the KHL.

The provided closure costs and revised long-term care costs address the recommendations in Item 15 of the Addendum to the NON.

Conclusions

We appreciate the opportunity to provide this information to you, and we think that this response satisfies the data requested and recommendations for Items 2, 4, 6, 7, 8, 9, 10, 13, and 15 of the NON and Addendum to NON.

To date, we have submitted several responses and provided historical information to demonstrate our compliance with the applicable rules and regulations. We look forward

to hearing confirmation from the WDNR that these submittals are satisfactory and written documentation that all items raised in the NON and the Addendum to NON have been resolved.

Sincerely,

Republic Services of Wisconsin, Limited Partnership



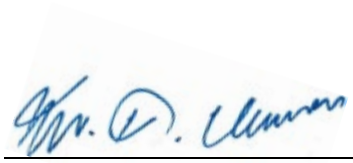
M. Khalid Umer, P.E.
Environmental Manager

Attachments: Certification Statement

1. Hazardous Waste Generation Report
2. TRC and Safety-Kleen Correspondence
3. NR 668.07(1)(g) Notification
4. Closure Plan
5. Long-Term Care Plan
6. Operating Record Table of Contents

Certification Statement:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



M. Khalid Umer, P.E.
Environmental Manager

Excerpt from April 2021 Hazardous Waste Generation Report

Appendix B: Waste Determination Outline

- Correspondence
- Analytical Testing
- Material Data Sheets

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Kestrel Hawk Landfill - Waste Determination Outline

Location	Waste Stream	Source	Destination	Is it a Solid Waste?	Is it a Hazardous Waste?	Waste Code	Comments
Northwest Expansion	Leachate	MSW Landfill	WWTP	No, excluded			Domestic sewer exclusion; refer to 4/9/2020 correspondence[(1)]. Testing on LMP6a indicates not characteristically hazardous per corrosivity and toxicity. Generator knowledge indicates that the flashpoint is not characteristically hazardous.
	Landfill Gas	MSW Landfill	Biogas Building	No			Determined not to be a containerized gas; therefore, not a solid waste. Refer to 3/12/2020 correspondence.
	Landfill Gas Condensate	MSW Landfill	WWTP	Yes	No	N/A	Testing on condensate sample collected on 3/16/20 did not exhibit a hazardous waste characteristic.
City of Racine Landfill	Leachate	MSW Landfill	WWTP	No, excluded			Domestic sewer exclusion; refer to 4/9/2020 correspondence. Leachate from a municipal solid waste landfill.
	Landfill Gas	MSW Landfill	Biogas Building	No			Determined not to be a containerized gas; therefore, not a solid waste. Refer to 3/12/2020 correspondence.
	Groundwater Containment Structure	MSW Landfill	via LS-5, WWTP	No, excluded			Domestic sewer exclusion; refer to 4/9/2020 correspondence. Collects groundwater and leachate from a municipal solid waste landfill.
	Landfill Gas Condensate	MSW Landfill	WWTP	Yes	No		Testing on condensate sample collected on 3/16/20 did not exhibit a hazardous waste characteristic.
Corridors 8, 9, 10 Landfill	Leachate	MSW Landfill	WWTP	No, excluded			Domestic sewer exclusion; refer to 4/9/2020 correspondence. Leachate from a municipal solid waste landfill.
	Landfill Gas	MSW Landfill	Biogas Building	No			Determined not to be a containerized gas; therefore, not a solid waste.
	Landfill Gas Condensate	MSW Landfill	WWTP	Yes	No		Testing on condensate sample collected on 3/16/20 did not exhibit a hazardous waste characteristic.
Hazardous Waste Unit Landfill	Leachate	Hazardous Waste Landfill	WWTP	No, excluded			Domestic sewer exclusion; refer to 4/9/2020 correspondence.
	Oil and Oily Sock Removal	Hazardous Waste Landfill	Off Site (picked up by Safety Kleen)	Yes	Yes	F039	Extracted from above the leachate in the HWU
	Landfill Gas	Hazardous Waste Landfill	Biogas Building	No			Determined not to be a containerized gas; therefore, not a solid waste.
	Landfill Gas Condensate	Hazardous Waste Landfill	WWTP	No, excluded			Domestic sewer exclusion; refer to 4/9/2020 correspondence.
	Groundwater Containment Structure	Groundwater	WWTP	No, excluded			Domestic sewer exclusion; refer to 4/9/2020 correspondence.
	141U Area Remediation Project	Groundwater	WWTP	No, excluded			Domestic sewer exclusion; refer to 4/9/2020 correspondence. Impacts to groundwater thought to be from landfill gas which is not derived from a solid waste, refer to 3/12/20 correspondence.

Kestrel Hawk Landfill - Waste Determination Outline

Location	Waste Stream	Source	Destination	Is it a Solid Waste?	Is it a Hazardous Waste?	Waste Code	Comments
Biogas Building	Landfill Gas Residuals (5,000 gallon tank)	MSW and Hazardous Waste Landfill	WWTP	Yes	No		Not derived from a solid waste; refer to 3/12/20 correspondence. Testing on residuals sample collected on 3/16/20 did not exhibit a hazardous waste characteristic.
	Oil Water Separator (Liquid)	Biogas Building Compressor	Landfill Gas Residuals (5,000 gallon tank)	Yes	No		Testing on residuals tank sample collected on 3/16/20 did not exhibit a hazardous waste characteristic. Refer to the 3/12/20, 4/9/20, and 1/13/21 correspondence.
	Oil Water Separator (Oil)	Biogas Building Compressor	Safety-Kleen	Yes	No		Testing on oil sample collected on 7/14/2020 did not exhibit a hazardous waste characteristic. Refer to the 3/12/20 and 1/13/21 correspondence.
	Spent Filters and System Components	Biogas Building Operations	Safety-Kleen and Municipal Solid Waste	Yes	No		Generator knowledge. Filters and absorbents used at the biogas building. Generally brought to the maintenance building for pickup by Safety-Kleen. Periodically disposed of in roll off containers as municipal solid waste.
	Scrap Equipment and Materials Stored in Trailer	Landfill Construction Events	Municipal Solid Waste Disposal	Yes	No		Generator knowledge. Equipment and parts remaining from construction events. To be removed and disposed of as municipal solid waste.
Maintenance Building	Used fluorescent bulbs	Office and Machining Shop	Safety-Kleen	Yes	No		Universal waste; collected annually.
	Safety-Kleen Model 91 Aqueous Parts Washer	Maintenance on landfill equipment	Safety-Kleen	Yes	No		Based on information provided by Safety-Kleen. Include data sheet on parts washer fluids.
	Used Oil Drums	Maintenance on landfill equipment	Safety-Kleen	Yes	No		Managed as used oil based on generator knowledge. Equipment does not operate in areas potentially exposed to hazardous waste.
	Used Oil Filters	Maintenance on landfill equipment	Safety-Kleen	Yes	No		Managed as used oil based on generator knowledge. Equipment does not operate in areas potentially exposed to hazardous waste.
	Used Anti-Freeze	Maintenance on landfill equipment	Safety-Kleen	Yes	No		Not a hazardous waste based on generator knowledge. Equipment does not operate in areas potentially exposed to hazardous waste.
	Shop Floor Drain Trench	Maintenance on landfill equipment	Safety-Kleen	Yes	No		Generator knowledge based on materials stored in building and fluids in machinery. Potentially oily waste waster stream that may contain solids and sludge. Collected at least annually.
	Partial/Full Aerosol Cans	Maintenance on landfill equipment		Yes	TBD		Generator knowledge based on materials listed on aerosol cans. Material to be managed in accordance with applicable requirements based on the characterization. USEPA passed a regulation to include this waste stream as universal waste, but this has not been adopted by WI.
	Miscellaneous	Operations	MSW Landfill	Yes	No		Containers from used oil, aerosol cans, and other miscellaneous items where the contents have been removed to the feasible extent.
	Safety-Kleen Parts Washer	(Historical) Maintenance on landfill equipment	Safety-Kleen	Yes	Yes	D039	KHL converted to an aqueous parts washer in July 2015. Collected by Safety-Kleen and disposed of at recycling/reuse facility. Solvent based degreaser characterized as hazardous due to tetrachoroethylene.
Office	Office Refuse	Office	MSW Landfill	Yes	No		Waste is excluded as a hazardous waste.

Footnotes:

(1) The domestic sewage exclusion determination dated 4/9/2020 was included in a letter submitted to the WDNR on 4/14/2020.

Created By: J. Hotstream

Checked By: J. Liello

Correspondence

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MEMORANDUM

Republic Services of Wisconsin, Limited Partnership
Kestrel Hawk Landfill

RCRA Regulation of Uncontained Gas

In its notice of noncompliance dated December 9, 2019 (the "NON"), the Wisconsin Department of Natural Resources ("WDNR") requests in item 4 that the Kestrel Hawk Landfill ("KHL") make a waste determination pursuant to the Resource Conservation and Recovery Act ("RCRA") for the landfill gas chiller condensate (the "Condensate"), which forms when the collected landfill gas is fed to a chiller.

Background

A solid waste can be a hazardous waste if it displays a characteristic of hazardous waste or if it is specifically listed as a listed hazardous waste. Previous testing (which is being confirmed) indicated that the Condensate does not display a characteristic of hazardous waste. The hazardous waste rules also do not specifically list the Condensate as a hazardous waste.

The result of the Condensate being neither a listed nor a characteristic hazardous waste is that it can be a hazardous waste only if it is (1) a solid waste generated from the treatment, storage or disposal of a hazardous waste (the "derived from rule") or (2) a mixture of a solid waste and a listed hazardous waste (the "mixture rule"). See NR 661.03, Wisc. Adm. Code; 40 C.F.R. § 261.3. The key to the analysis of the Condensate under these rules is the understanding that landfill gas is not a solid waste.

In order to be a hazardous waste, a material must first be a solid waste. Wisc. Stat. § 289.01(12); 42 U.S.C. § 6903(5). The definition of "solid waste" requires that the material be in a solid, liquid or contained gaseous form. Wisc. Stat. § 289.01(33); 42 U.S.C. § 6903(27). Here, the landfill gas is not a contained gas at the point of generation when it exits the landfill. Since the landfill gas is not a solid waste and therefore cannot be a hazardous waste, the Condensate is not derived from the treatment of a hazardous waste. Similarly, the mixture rule does not apply because landfill gas is not a listed hazardous waste – indeed, the landfill gas cannot be a hazardous waste at all because it is an uncontained gas that is not a solid waste.

Regulatory Guidance

This analysis is consistent with WDNR's prior conclusion that KHL landfill gas is not a solid waste. See Letter from Paul P. Didier, P.E., Director, Bureau of Solid Waste Management to Allen W. Williams, Jr. dated November 13, 1986 (copy attached). Since the landfill gas is not a hazardous waste, WDNR determined that the Condensate could only be a hazardous waste if the Condensate displayed a characteristic of hazardous waste.

The NON requests that KHL review RCRA Online Document 12363. It was interpreted that the NON intended to reference RCRA Online Document 12362 dated January 11, 1985 (the "1985 Guidance"). In the 1985 Guidance, the United States Environmental Protection Agency ("EPA") speculates in this letter that condensate from a landfill containing listed waste is a hazardous waste unless it has been subject to a delisting petition. In addition, the December 1987 Revised Conditional Approval of the Closure and Long Term Care Plan for KHL indicated, without any analysis, that the Condensate is a hazardous waste. It is not clear how WDNR reached this position.

The 1985 Guidance and the 1987 Approval admittedly contradict the conclusion of the 1986 WDNR letter but they do not address its reasoning. Subsequent EPA guidance and related case law has clarified that the reasoning and conclusion of the 1986 WDNR letter are correct. In connection with the 1989 listing of certain chlorinated aliphatic hydrocarbon manufacturing waste, EPA stated that its jurisdiction to regulate gases under RCRA was limited to containerized or condensed gases. 54 Fed. Reg. 50968, 50973 (Dec. 11, 1989). EPA explicitly acknowledged that this conclusion was a reconsideration of its prior position. Id. Because the KHL landfill gas is neither containerized nor condensed, it is not a solid waste for purposes of RCRA.

This issue was addressed more recently in a United States District Court for the Northern District of Illinois opinion. Northern Illinois Gas Company v. City of Evanston, 14-cv-9227 (N.D. Ill. Feb. 10, 2016). In this matter, the City of Evanston brought claims under RCRA alleging that the release of methane gas from pipelines constituted improper disposal of solid waste. The court reviewed the relevant authorities and determined that it was EPA's clear policy that there was no RCRA jurisdiction over uncontained gases. Id. at pages 7-15. Based on this policy, the court dismissed the City of Evanston's RCRA claim with respect to methane leaks.

The Condensate is not a listed or, assuming the current testing confirms previous results, characteristic hazardous waste by itself. It is not derived from a hazardous waste or a mixture containing hazardous waste because the landfill gas is not a solid waste based on the uncontained gas exclusion at the point of generation. WDNR has previously concurred in writing with this conclusion, consistent with the rules and EPA's interpretation of them.

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March 12, 2020

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Carroll D Besadny
Secretary

BOX 7921
MADISON, WISCONSIN 53707

'86 NOV 20 AM 9 50

November 13, 1986

IN REPLY REFER TO: 4430

WDNR CORRESPONDENCE

Mr. Allen W. Williams, Jr.
Foley & Lardner
First Wisconsin Center
777 East Wisconsin Avenue
Milwaukee, WI 53202-5367

RE: S.C. Johnson Landfill Methane Purchase

Dear Mr. Williams:

In your letter to me on October 22, 1986, you requested a determination on the regulatory status of landfill gas utilized in an industrial boiler. The specific case you discussed involved the purchase of landfill gas by S.C. Johnson and Son, Inc. from Biogas Development Corporation. We are prepared to advise you of the Wisconsin regulatory authority in such cases, but will only cite the federal regulations we are aware of. The reauthorized Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), section 124, addresses the methane recovery question. It appears that unless EPA promulgates regulations specific to methane recovery under subtitle C of the Solid Waste Disposal Act (SWDA), such activities are exempt from subtitle C regulation with the following exception. Condensate generated in methane recovery systems which meets any of the characteristics identified under section 3001, subtitle C, SWDA, will be considered, and therefore must be handled as, a hazardous waste. I suggest you contact Mr. David Stringham, Chief - Solid Waste Branch, U.S. Environmental Protection Agency - Region V, directly if you need further interpretation of this law.

In Wisconsin, landfill gas is not a solid waste as defined in sec. 144.01(15), Wis. Stats. Since a waste must first meet this statutory definition of a solid waste in order to be considered a hazardous waste (s. NR 181.12, Wis. Adm. Code), the gas is not a hazardous waste and the equipment for the processing, transporting or storage of the gas would not be regulated under ch. NR 181, Wis. Adm. Code. However, the gas collection system at the landfill must be approved as part of, or as a modification to, the facility's Plan of Operation under ch. NR 180, Wis. Adm. Code. While Land Reclamation Ltd. recently submitted plans for the gas collection system, they have not yet received Department approval.

The condensate collected in the gas pipeline, however, is a solid waste. The condensate must be tested to determine if it is a characteristic hazardous waste as defined in NR 181.15, Wis. Adm. Code. If the condensate exhibits any

of the hazardous characteristics, it must be handled, stored and disposed accordingly. One of the options for final disposal of the condensate could be treatment in a publicly owned treatment works or possibly the S.C. Johnson industrial pretreatment system.

In summary, the landfill gas piped to the S.C. Johnson & Son, Inc. facility, and used in one of their industrial boilers, is not a solid waste and therefore not a hazardous waste. If I can be of further assistance, please do not hesitate to call me at (608) 266-1327.

Sincerely,

Paul

Paul P. Didier, P.E., Director
Bureau of Solid Waste Management

PPD:jmc/9860Q

cc: D. Stringham - U.S. EPA/Region V
A. Glor - SED
Hazardous Waste Management Section
P. Flaherty - LC/5
R. Schuff - SW/3

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MEMORANDUM

Republic Services of Wisconsin, Limited Partnership
Kestrel Hawk Landfill

Domestic Sewage Exclusion

In its notice of noncompliance dated December 9, 2019 (the "NON"), the Wisconsin Department of Natural Resources ("WDNR") requests in item 5 that the Kestrel Hawk Landfill ("KHL") make a waste determination pursuant to the Resource Conservation and Recovery Act ("RCRA") for the liquids generated in association with the hazardous waste unit, including the groundwater collected from the area 141U extraction system and from the groundwater collection pipe/trench along the southern perimeter of the hazardous waste unit (collectively, the "Leachate").

During the investigation that led to the NON, KHL took the position that the Leachate is not a solid waste because it is covered by the domestic sewage exclusion that is part of RCRA. DNR questioned whether this exclusion applies before the Leachate actually mixes with sanitary wastes. The relevant authorities are clear that the Leachate is covered by the exclusion, and KHL plans to update its management and reporting of the Leachate to correspond with this understanding.

Background

The Leachate mixes with domestic sewage while passing through a sewer system to the Racine wastewater treatment plant (the "Racine POTW"), which is a publicly-owned treatment works. After treatment in the Racine POTW, the effluent is discharged pursuant to a Clean Water Act permit.

The statutory definition of solid waste in RCRA excludes "solid or dissolved material in domestic sewage." 42 U.S.C. § 6903(27). This same exclusion appears in the Wisconsin definition of solid waste. Wisc. Stat. § 289.01(33). The federal legislative history for the domestic sewage exclusion indicates that the purpose of the exemption was to make sure that RCRA did not regulate wastes that are regulated by the Clean Water Act. 45 Fed. Reg. 33084, 33097 (May 19, 1980).

This statutory exclusion is codified in the Wisconsin regulations, which excludes the following from the definition of solid waste: "Any mixture of domestic sewage and other wastes that passes through a sewer system to a publicly-owned treatment works for treatment. 'Domestic sewage' means untreated sanitary wastes that pass through a sewer system." NR 661.04(1)(a)(2), Wisc. Adm. Code. Parallel language appears in the federal RCRA regulations, except that the federal regulation includes exceptions for certain hazardous waste pharmaceuticals and pollutants causing pass through or interference, which are not at issue for the Leachate. 40 C.F.R. § 261.4(a)(1)(ii).

Regulatory Guidance

EPA has consistently interpreted this exclusion to apply even before material that would otherwise be solid waste actually mixes with domestic sewage. In the preamble establishing the regulatory language that implements the statutory exclusion, EPA states:

> EPA has, therefore, decided that a waste falls within the domestic sewage exemption when it first enters a sewer system that will mix it with sanitary wastes prior to storage or treatment by a POTW. EPA recognizes that this interpretation brings various wastes within the exemption before they are actually mixed with sanitary wastes. In light of the fact that the wastes will be mixed prior to treatment and that the mixture will be properly treated by the POTW, EPA believes that the need for administrative clarity in this otherwise complicated regulatory program warrants such an approach.

45 Fed. Reg. at 33097; see also RO 12963 (July 1987). EPA's reasoning was based on an assessment that any other approach would not provide regulatory clarity:

> Defining the point at which "mixture" occurs may seem to be a relatively straightforward task. Practical problems arise, however, in defining the point at which mixture of sanitary and other wastes occurs in a complex sewer system. Moreover it is particularly difficult to define this point for regulatory purposes in such a way that all parties understand when RCRA obligations begin and end.

Id. We have not been able to locate any Wisconsin guidance suggesting that WDNR's interpretation of its regulatory exemption is different from EPA's interpretation.

The Leachate is covered by the domestic sewage exclusion. It is sent to the Racine POTW through public sanitary sewer pipes where it mixes with sanitary wastes. WDNR need not consider the guidance that deals with private systems because the Racine POTW is a publicly owned treatment works. See https://waste.zendesk.com/hc/en-us/articles/212349677-When-does-the-domestic-sewage-exclusion-apply-Does-it-apply-to-wastes-removed-from-a-sewer-system-or-if-the-waste-goes-to-a-private-sewer-system-. Finally, this is not a situation where the exclusion does not apply because the material has leaked from the pipe or been sent to the POTW by truck, rail or dedicated pipe.

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April 9, 2020

Regulation of Gas Condensate at Hazardous Waste Landfills

The relevant hazardous waste rules establish that liquid generated from processing landfill gas ("GPU Liquid") emanating from the hazardous waste section of the Kestrel Hawk Landfill ("KHL") is not hazardous waste unless it exhibits a characteristic of hazardous waste. This interpretation is based on the following principles that are undisputed:

- Landfill Gas Is Not a Solid Waste. Landfill gas is not a contained gas. "RCRA is limited to containerized gases (*i.e.*, section 1004(27) of RCRA excludes all other gases from the definition of solid wastes and thus cannot be considered hazardous wastes)." 54 Fed. Reg. 50967, 50973 (Dec. 11, 1989). As a result, landfill gas cannot be a solid waste.

- GPU Liquid Is a Solid Waste. GPU Liquid is a solid waste when it is discarded.

- GPU Liquid Is Not Listed. There is not a hazardous waste listing that is specific to GPU Liquid or landfill gas condensate. This is in distinct contrast to the F039 multi-source leachate listing, for example.

- GPU Liquid Is Not Characteristic. Testing shows that the GPU Liquid at KHL does not exhibit a hazardous waste characteristic.

DNR takes the position that the GPU Liquid is "derived-from" or "contains" the hazardous waste in KHL and is therefore a hazardous waste itself. Although some EPA guidance supports this position, a complete reading and analysis of the relevant authorities provides greater support to KHL's reading of the rules for the following reasons:

- Must Be Derived From Hazardous Waste. The derived-from rule applies to "any solid waste generated from the treatment, storage, or disposal of a hazardous waste." 40 C.F.R. § 261.3(c)(2)(i). Because hazardous waste must first be solid waste, the derived-from rule is only applicable when the source material "was a solid waste at the time of derivation" of the secondary material. Stensvaag, *Hazardous Waste Law and Practice* at 7-182 ("*Stensvaag*") (copy attached). The GPU Liquid is generated from the compression of landfill gas at the landfill gas processing unit, and landfill gas is not a solid waste.

- GPU Liquid Is Not Generated From Waste Disposed at KHL. The waste disposed at KHL generates landfill gas. It is the collection and preparation of that gas (which is not a solid waste) for use as a fuel that generates the GPU Liquid. Landfill gas and GPU Liquid are not comparable to leachate from a regulatory perspective because leachate is specifically identified as a type of derived-from material while landfill gas is not.

- Contained-In Policy Does Not Apply to Air. The principle that environmental media that contain hazardous waste have to be managed as hazardous waste appears to be limited to soil and water. We have been unable to find any instance where EPA applied contained in principles to an environmental media consisting of air or another uncontained gas.

- Source Responsibility. RCRA places the responsibility on the generator to make an accurate determination whether a solid waste is a hazardous waste using the steps prescribed in 40 CFR § 262.11. KHL believes that its determination followed these steps and that it has fulfilled its obligations under RCRA.

DNR has pointed to a number of authorities that it believes can be interpreted to point in the direction of applying derived-from principles to materials generated from uncontained gas generated from the treatment, storage or disposal of hazardous waste. The authorities provide examples of situations where materials generated from hazardous waste combustion exhaust gases are considered derived-from waste. They do not address situations where the material being processed or treated is a gaseous fuel that is not solid waste.

Residues generated from the processing of materials that are excluded from the scope of the solid waste definition cannot be covered by the derived-from rule. *Stensvaag* at 7-182-83 (discussing materials generated from the processing of non-hazardous secondary materials). As discussed in the following table, none of the authorities referenced by DNR directly address the status of GPU Liquid in light of EPA's definitive statement in 1989 about its lack of authority to regulate uncontained gas.

Source	Reason Cited	KHL Response
RO 12362 – January 11, 1985	States that condensate generated from landfill with listed hazardous waste is always a hazardous waste	This guidance was prepared as follow up on a symposium presentation and did not address an actual situation. The guidance appears to be aimed at condensate generated at landfill gas collection wells rather than liquids generated from the subsequent processing of the landfill gas. It pre-dates EPA's definitive statement in 1989 that EPA's statutory authority to regulate gases is limited to containerized gases.
54 Fed. Reg. 50973 (Dec. 11, 1989)	Uncontained gas not a solid waste but condensed light ends generated by distillation processes in chlorinated aliphatic hydrocarbon production are listed if ever disposed.	A specific listing for condensed material supports the conclusion that the material is not a hazardous waste unless it exhibits a characteristic or is specifically listed.
RO 11332 – March 11, 1988	Departiculate air filters, scrubber wastewater and ash from burning dioxin waste in a rotary kiln is derived-from hazardous waste.	The guidance pre-dates the definitive 1989 statement on containerized gases and addresses material generated from exhaust gases in a hazardous waste combustion unit. Like leachate, emission control dust from hazardous waste treatment is specifically identified as a derived-from waste. The dioxin waste was a solid waste when it was burned. This is in contrast to the landfill gas when it is compressed.

Source	Reason Cited	KHL Response
RO 11684 – August 11, 1992	BIF rules apply to resource recovery kiln/cement kiln burning hazardous waste. Off-gases from the resource recovery kilns are regulated under RCRA since they originate from treatment of hazardous waste.	This guidance deals with exhaust gases in a hazardous waste combustion unit. This guidance is consistent with the 1989 preamble, which states "[o]f course, thermal treatment *after* a material becomes a hazardous waste is fully regulated under RCRA." 54 Fed. Reg. at 50973. By contrast, GPU Liquid is generated from compression of a gas that is not a solid waste.
61 Fed. Reg. 4903, 4910 (Feb. 9, 1996)	Spent carbon deriving from the treatment of listed hazardous waste is considered to be a type of listed waste by virtue of the derived from rule found at 261.3(c)(2).	This rule was issued to implement EPA's authority to regulate emissions from hazardous waste treatment, storage and disposal units in RCRA § 3004(n). See 59 Fed. Reg. 62896, 62901 (Dec. 6, 1994). Like leachate, emission control waste from hazardous waste treatment is specifically identified as being covered by the derived-from rule. Preparing landfill gas for use as fuel is not hazardous waste treatment.
54 Fed. Reg. 43733 (Oct. 26, 1989)	Residues from thermal combustion of listed hazardous waste are considered to remain the listed hazardous waste until delisted.	The rule does not specifically discuss gaseous materials, and the rule addresses a hazardous waste combustion unit. In addition, the December 1989 preamble distinguishes thermal combustion from the processing of gaseous fuel as occurs at KHL.
RO 13491 – August 2, 1991	"Residues such as scrubber blowdown, continue to be regulated as hazardous wastes if they result from processing listed hazardous wastes, or if they exhibit a hazardous waste characteristic."	This guidance deals with exhaust gases in thermal treatment of spent carbon that is hazardous waste. That process is regulated differently than landfill gas, as acknowledged by the 1989 rule discussed above.
56 Fed. Reg. 7134, 7200 (Feb. 21, 1991)	Regeneration or reactivation of carbon used to control air emissions from hazardous waste treatment, storage or disposal facilities is subject to regulation as a RCRA thermal treatment unit.	The rule recognizes that uncontained gases are not solid waste "and therefore any condensed organics do not derive from treatment of a hazardous waste." The rule addresses thermal treatment of a solid waste (spent carbon) generated as part of an active hazardous waste treatment process such as steam stripping.
78 Fed. Reg. 9112, 9128 (Feb. 7, 2013)	EPA maintains separate and independent authority under RCRA to regulate certain types of uncontained gases whether or not they themselves are solid wastes (e.g., gases emitted from the management of hazardous waste)."	This is mainly a reference to BIFs and other hazardous waste combustion units. EPA has recognized since 1989 that these types of exhaust gases are regulated as part of the combustion process.
RO 1195, 11434 & 11593 – 11/13/86, 6/19/89 & 3/26/91	Contained-in policy applied to groundwater, soil and sediment.	The contained in policy has not been applied to uncontained gases or air emissions. In addition, some of these documents pre-date EPA's clear recognition that RCRA only permits the regulation of containerized gases.

DNR also relies on Section 14.4.3.3 of *McCoy's RCRA Unraveled* which states that "condensate derived from a fill containing listed hazardous waste is always a listed hazardous waste via the derived-from rule." *McCoy's* relies only on RO 12362 for this proposition, but that guidance is not conclusive for the reasons discussed in the table above. In addition, the condensate referenced in the guidance may not correspond with GPU Liquid. The condensate referenced in *McCoy's* and RO 12362 likely is the liquid or "condensate" that is generated in and removed from the landfill gas collection system itself. When RO 12362 was issued in 1985, units for processing landfill gas into a fuel were unknown. The compression and chilling that creates GPU Liquid occurs after the condensate referenced in RO 12362 is removed by the collection system.

KHL relies on the statement in *Stensvaag* that "the source material must be a solid waste at the time when the derivative material is generated" for the derivative material (such as gas condensate) to be covered by the derived-from rule. *Id*. at 7-182. In 2011, EPA confirmed that landfill gas can be considered a commodity fuel and that none of its prior interpretations that limit the scope of RCRA's solid waste authority to containerized gases had changed.[1] It becomes clear from this restatement of the basic principle that the GPU Liquid is generated from a material that is an uncontained gaseous commodity fuel that is not a solid waste. Consequently, the derived-from rule does not apply to the GPU Liquid.[2]

Separator Effluent Transport Does Not Need a Manifest

At KHL, the separator effluent is transported from the gas processing unit in a tanker truck to KHL property that is contiguous with the gas processing unit property but on the other side of Oakes Road. There, it is placed in a manhole that leads to the Racine POTW. The tanker truck travels along Oakes Road for a small distance because the gate where the tanker truck exits the gas processing unit is not directly across from the gate where the tanker truck enters the contiguous KHL property on the other side of Oakes Road.

Even if the separator effluent were a hazardous waste because it exhibited a characteristic or was specifically listed, a hazardous waste manifest would not be required for its transportation to the KHL manhole. Under NR 662.020(6) and 40 C.F.R. § 262.20(f) manifest requirements "do not apply to the transport of hazardous wastes on a public or private right-of-way within or along the border of contiguous property under the control of the same person, even if the contiguous property is divided by a public or private right-of-way."

On a federal level, this regulation was added in 1997. EPA intended that this regulation would exempt shipments subject to it from both the manifest and Part 263 transport requirements. 62 Fed. Reg. 6622, 6647 (Feb. 12, 1997). EPA originally proposed to amend the definition of "on-site," but was persuaded by public comments that amending that definition

[1] https://obamawhitehouse.archives.gov/sites/default/files/omb/assets/oira_2060/2060_11162011-2.pdf

[2] This position is clearly stated in a legal memo located in the Obama White House archives that was presented to OIRA in connection with the Non-Hazardous Secondary Materials rule. https://obamawhitehouse.archives.gov/sites/default/files/omb/assets/oira_2060/2060_11162011-3.pdf

could have unintended consequences. *Id*. at 6645. EPA noted that clarifying that contiguous properties can still be considered a single site for manifest and transport purposes was in the public interest since it would encourage consolidation of waste and minimize the number of hazardous waste storage sites. *Id*. at 6646.

SOLID WASTES DERIVED FROM LISTED HAZARDOUS WASTES

§ 7.49 Solid Wastes Derived from Listed Hazardous Wastes

We have seen that explicitly listed wastes[46] and mixtures containing such wastes[47] have the status of listed hazardous wastes.[48] A material that escapes listed status under these approaches may nevertheless be a listed hazardous waste by virtue of one final provision: the "derived-from" rule,[49] depicted in **Figure 4**, Question 5. This rule provides:

> (c) Unless and until it meets the criteria of paragraph (d):[50]
>
> * * *
>
> (2)(i) Except as otherwise provided in paragraph (c)(2)(ii) of this section,[51] any solid waste generated from the treatment, storage, or disposal of a hazardous waste, including any sludge, spill residue,

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[46] *See* **Figure 4**, Questions 4-1A through 4-1C; §§ **7.3–7.44**.

[47] *See* **Figure 4**, Question 4-2; §§ **7.45–7.48**.

[48] We discuss the significance of listed (as opposed to unlisted) hazardous waste status in § **7.1** Significance of Listing and Criteria Underlying Listing.

[49] Insofar as we can tell, the Agency first referred to 40 C.F.R. § 261.3(c)(2) (1988) publicly as the "'derived from' rule" in 1983. *See* 48 Fed. Reg. 14,472, 14,489 (1983). That label is now used rather consistently. *See, e.g.*, 50 Fed. Reg. 49,163, 49,167 n.4 (1985); 50 Fed. Reg. 49,258, 49,262–63 (1985). The provision has also been referred to as the "residue rule." *See* 48 Fed. Reg. 14,472, 14,494 (1983). *See also* 50 Fed. Reg. 23,721, 23,722 (1985) (referring to "residue derived from . . . treatment").

We refer to section 261.3(c)(2) as the derived-from rule, to avoid any confusion with the separate portion of the regulation exempting from regulation residues of hazardous wastes remaining in empty containers. *See* 40 C.F.R. § 261.7 (1988); § **7.21** —Significance of Listing Residues; § **7.21** notes 71 & 79. We will address the empty container residue exemption in a subsequent volume.

[50] Under the criteria of section 261.3(d), a *listed* hazardous waste remains a hazardous waste until it has been: (a) delisted; and (b) exhibits no hazardous waste characteristic. *See* 40 C.F.R. § 261.3(d) (1988), *quoted in* § **7.45**. As with the mixture rule, *see* § **7.45** Mixtures Containing Listed Wastes; § **7.45** note 48, any solid waste derived from the treatment, storage, or disposal of an *unlisted* hazardous waste (i.e., a waste merely exhibiting a *characteristic*) will be a hazardous waste only if the derivative material exhibits a hazardous waste characteristic. *See* 40 C.F.R. § 261.3(d)(1) (1988), *quoted in* § **7.45**.

[51] Section 261.3(c)(2)(ii) sets forth several exceptions to the derived-from rule, which we discuss in §§ **7.52–7.55**.

> ash, emission control dust, or leachate (but not including precipitation run-off) is a hazardous waste. (However, materials that are reclaimed from solid wastes and that are used beneficially are not solid wastes and hence are not hazardous wastes under this provision unless the reclaimed material is burned for energy recovery or used in a manner constituting disposal.)[52]

This seemingly innocuous language has potentially profound ramifications, because a broad spectrum of derivative materials,[53] containing widely varying concentrations of hazardous constituents, may be generated from the treatment, storage, and disposal of listed hazardous wastes.

Before turning to a discussion of various types of derivative materials, it is important to stress that the derived-from rule involves what might be called a dual solid waste predicate. No material will be a listed hazardous waste under this rule, unless: (1) the source material, from which it was derived, was a solid waste at the time of derivation;[54] and (2) the derivative material is itself a solid waste.[55] Although these may appear to be elementary observations, the approach of the current regulatory solid waste definition to recyclable materials[56] is so complicated that each aspect of this dual solid waste predicate merits careful scrutiny.

Consider, first, the requirement that the source material must be a solid waste at the time when the derivative material is generated. The EPA has provided an example of a situation where this aspect of the solid waste predicate might not be met: the burning of hazardous secondary materials in an industrial furnace solely for material recovery.[57] As we explore elsewhere, such a secondary material may not be a solid waste under the current regulatory definition.[58] Assuming that to be the case,

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[52] 40 C.F.R. § 261.3(c)(2)(i) (1988).

[53] The EPA does not refer to "derivative" materials. We use this label to avoid repeating the cumbersome regulatory language: "solid waste generated from the treatment, storage, or disposal of a hazardous waste."

[54] The derived-from rule applies only to "solid waste generated from the treatment, storage, or disposal of a hazardous *waste* . . . ." 40 C.F.R. § 261.3(c)(2)(i) (1988) (emphasis added). Nothing can be a hazardous waste under Subtitle C unless it is a solid waste. *See* § **6.2** The Solid Waste Predicate.

[55] The derived-from rule applies only to a material that is itself a solid waste. 40 C.F.R. § 261.3(c)(2)(i) (1988).

[56] *See* §§ **3.8–3.49**.

[57] *See* 50 Fed. Reg. 49,163, 49,167 & n.4 (1985).

[58] Such a material will not be a solid waste by virtue of the burning for energy recovery provision of **Figure 3**, Question 8. *See* §§ **3.30–3.31**. Nevertheless, if the burning for material recovery constitutes reclamation, *see* § **3.34** note 94, the source material may be a solid waste, depending on the answers to **Figure 3**, Questions 9A and 9B. *See* §§ **3.35–3.42**.

the Agency has stressed that any residue resulting from such burning would not be a listed hazardous waste by virtue of the derived-from rule, even though that rule expressly refers to "ash":[59]

> An example would be a smelting furnace resmelting one of its own listed process residues. In such situations, the secondary material would not be a solid waste at the time of burning in the industrial furnace even though it is classified as a solid waste for purposes of storage prior to burning.[60] Note further that the derived-from rule . . . thus would not apply to wastes generated by the burning.[61]

It is important not to exaggerate the significance of this aspect of the solid waste predicate. To be sure, solid wastes (such as container residues) generated from the "storage" of hazardous secondary materials or commercial chemical products will escape application of the derived-from rule, if the derivative material is generated before the source material becomes a solid waste. For example, residual amounts of a listed commercial chemical product left behind in a drum which held the substance while it was still a product have not technically been generated from the storage of a solid and hazardous *waste.* Nevertheless, even without application of the derived-from rule, the residual commercial chemical product becomes a solid and hazardous waste when abandoned or held in lieu of abandonment.[62]

The second aspect of the solid waste predicate is that no material—even if derived from a listed hazardous (and solid) waste—will be a listed hazardous waste by virtue of the derived-from rule, unless the derivative material is itself a solid waste. The parenthetical clause in the derived-from rule addresses one situation in which this aspect of the predicate is not met: where a *product* is reclaimed (derived) from a listed hazardous waste and beneficially used in ways other than land application or burning for energy recovery.[63] We analyze this reclaimed

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[59] *See* 40 C.F.R. § 261.3(c)(2)(i) (1988).

[60] We find this portion of the EPA's discussion to be confusing, because we are not able to locate any portion of the solid waste definition providing that such a material would be a solid waste up to—but not at—the time of burning. The burning for energy recovery provision would not make the material a solid waste, even prior to burning. *See* **§§ 3.30–3.32**. The provisions declaring that a listed hazardous secondary material undergoing reclamation is a solid waste do not disengage at the moment of reclamation. *See* **§§ 3.33–3.42**. Indeed, the regulation provides that such a material is a solid waste "*when* reclaimed." 40 C.F.R. § 261.2(c)(3) (1988) (emphasis added). *See* **§ 3.36** Status of Materials Prior To and Following Reclamation.

[61] 50 Fed. Reg. 49,163, 49,167 n.4 (1985).

[62] *See* **§§ 3.2–3.7**; **§ 7.4** Solid Waste Predicate for Commercial Chemical Products.

[63] *See* 40 C.F.R. § 261.3(c)(2)(i) (1988), *quoted in* **§ 7.49**. Reclaimed materials burned for energy recovery, applied to land, or incorporated into products used in such

products principle, including the difficult task of distinguishing between products and wastes, elsewhere.[64] That separate discussion should be read carefully, because the EPA has articulated in preambles several limitations or corollaries to the reclaimed products principle—corollaries that go beyond the bare wording of the regulation.[65]

Finally, before addressing the various types of derivative materials, it is important to clarify the consequences of the derived-from rule. Several preamble discussions convey a misleading impression, because they refer to a "presumption of hazardousness" for derivative materials.[66] This jargon suggests that derivative wastes are not, in fact, hazardous, as long as their handler can establish through tests or other mechanisms the absence of hazardous properties. In fact, wastes generated from the treatment, storage, or disposal of *listed* hazardous wastes are presumptively hazardous only in the same way that *all* listed wastes can be so characterized: they are hazardous wastes unless and until delisted.[67]

§ 7.50 Types of Materials Subject to Derived-From Rule

The derived-from rule has the effect of ascribing listed hazardous waste status to solid wastes "generated from the treatment, storage, or disposal"[68] of listed wastes. What types of materials might be listed

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ways are usually solid wastes. *See* **Figure 3**, Questions 7, 7A, and 8; § **3.28** Materials Subject to Use Constituting Disposal Provision; § **3.32** Materials Used to Produce a Fuel or Contained in a Fuel; § **3.36** Status of Materials Prior To and Following Reclamation. *See also* 50 Fed. Reg. 49,163, 49,171, 49,174 (1985) (EPA finding that "Cadence product 312" or "CHEM-FUEL"—"a blend of hazardous spent solvent recovery still bottoms and other hydrocarbon-based hazardous waste . . . patented for use in blast furnaces"—is a solid and hazardous waste).

[64] *See* § **3.36** Status of Materials Prior To and Following Reclamation; § **3.36** note 42.

[65] *See* § **3.36** Status of Materials Prior To and Following Reclamation.

[66] *See, e.g.*, 50 Fed. Reg. 614, 649 (1985) ("wastes from precious metal reclamation are presumptively hazardous if the material being reclaimed is a hazardous waste); 48 Fed. Reg. 14,472, 14,494 (1983) ("waste residues from precious metal reclamation of regulated recyclable materials are presumptively hazardous"); 49 Fed. Reg. 427, 428 (1984) (derived-from rule "states that wastes derived from treating hazardous wastes are presumptively hazardous"); 49 Fed. Reg. 23,284, 23,284 (1984) (pickle liquor sludge is exempted from "presumption of hazardousness"); 50 Fed. Reg. 36,966, 36,967 (1985) (pickle liquor sludge excluded from "presumption of hazardousness").

[67] *See* 50 Fed. Reg. 614, 619 n.1 (1985) ("residues . . . are . . . considered to be listed hazardous wastes, and, for delisting purposes, to have the same constituents of concern as the hazardous wastes from which they are derived").

[68] 40 C.F.R. § 261.3(c)(2)(i) (1988), *quoted in* § **7.49**.

hazardous wastes by virtue of this language? That question can best be answered by focusing on two facets of the rule: (1) the material must be generated from (2) treatment, storage, or disposal.

Consider, first, the requirement that the material must be "generated from"[69] one of the enumerated activities.[70] Sometimes, it will be obvious that this condition has been met. For example, ash resulting from the thermal treatment of a listed hazardous waste has undeniably been generated from the treatment process.[71] At other times, however, the phrase must be given some common sense limits. Imagine, for example, a facility that exists solely to treat, store, and dispose of listed and unlisted hazardous waste. Such a facility may routinely generate solid wastes (empty coffee cups, discarded office supplies, and the like) that might arguably be generated from the facility's treatment, storage, and disposal activities.[72] Clearly, such solid wastes are not subject to the derived-from rule. We offer this somewhat trivial illustration to suggest that the phrase generated from must be read to exclude solid wastes that are wholly unlikely to contain any listed hazardous wastes (or listed hazardous waste constituents) handled by an operation.

Second, the derived-from rule applies only to solid wastes generated from the enumerated activities: treatment, storage, and disposal. We will analyze fully the definitions for each of these regulatory terms elsewhere, in discussing the actors that are regulated under Subtitle C.[73] For present purposes, it will be helpful to address each type of activity briefly, describing various materials that may be derived therefrom.

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[69] For convenience, we have equated this language with the phrase "derived from," referring to the regulatory provision as the derived-from rule. *See* § **7.49** note 49. As we discuss elsewhere, however, the phrase "derived from" may technically have a broader meaning than the phrase "generated by." *See* § **6.25** note 13 (discussing scope of household waste exclusion).

[70] The household waste exclusion uses the phrase "derived from," to describe the materials protected by that provision. *See* 40 C.F.R. § 261.4(b)(1) (1988), *quoted in* § **6.25**. As we discuss in connection with that language, it may be difficult, at multiple-use facilities, to determine which wastes are derived from households. *See* § **6.25** Types of Wastes Protected by Household Waste Exclusion; § **6.25** note 23.

[71] *See* 50 Fed. Reg. 23,721, 23,722 (1985). The Agency has justified application of the derived-from rule to incinerator ash by noting that "[a]sh from the incineration of hazardous wastes often contains heavy metals and, if combustion is not complete, undestroyed toxic organic materials." 45 Fed. Reg. 33,065, 33,096 (1980).

[72] We discuss similar interpretive problems in connection with the hazardous waste exclusions/exemptions for oil and gas special wastes ("associated with" language), *see* § **6.14** Exclusion/Exemption for Oil, Gas and Geothermal Energy Wastes, and for mining wastes ("solid wastes from" language). *See* § **6.19** Meaning of Wastes from Extraction, Beneficiation, and Processing.

[73] We will discuss treatment, storage, and disposal in a subsequent volume.

Treatment residues are perhaps the most common targets of the derived-from rule. Given the regulation's broad definition of "treatment,"[74] the derived-from rule applies to sludge generated by the treatment of wastewater containing a listed hazardous waste,[75] sludge residues from listed hazardous waste reclamation,[76] plant sweepings containing listed hazardous waste residues,[77] and residues (including ash) from the combustion of listed hazardous wastes.[78] We also believe,

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[74] The regulation provides:

> "Treatment" means any method, technique, or process, including neutralization, designed to change the physical, chemical, or biological character or composition of any hazardous waste so as to neutralize such waste, or so as to recover energy or material resources from the waste, or so as to render such waste non-hazardous, or less hazardous; safer to transport, store, or dispose of; or amenable for recovery, amenable for storage, or reduced in volume.

40 C.F.R. § 260.10 (1988) ("Treatment").

[75] The derived-from rule expressly refers to "sludge." 40 C.F.R. § 261.3(c)(2)(i) (1988), *quoted in* § **7.49**. *See also* 45 Fed. Reg. 33,065, 33,096 (1980) ("Sludges from wastewater treatment typically contain concentrated amounts of the toxic substances which were in the wastewater"). In discussing the need to exclude certain listed waste/wastewater mixtures from the operation of the mixture rule, *see* **Figure 4**, Question 4B, the EPA stressed that wastewater treatment sludges from the handling of such wastewater mixtures would otherwise be hazardous wastes under the derived-from rule. *See* 46 Fed. Reg. 56,582, 56,582–83 (1981).

The derived-from rule also applies to scrubber water from the incineration of hazardous waste. *See* 50 Fed. Reg. 30,271, 30,272–73 (1985) (rejecting suggestion of commenter that such materials should be exempt from the rule because "scrubber water exhibits fundamentally different chemical and physical properties than . . . organic wastes which are incinerated" and because application of the derived-from rule discourages incineration of dioxin-containing wastes). *But see id.* at 30,273 ("we are considering modifying the hazardous waste rules to designate as hazardous (rather than acute hazardous) wastes derived from the incineration or thermal treatment of certain dioxin-containing wastes" to remove incineration disincentive).

[76] Reclamation is treatment, within the meaning of Subtitle C, because it is a "process . . . designed to recover . . . material resources from the waste." 40 C.F.R. § 260.10 (1988) ("Treatment"), *quoted in* § **7.50** note 74. We have discussed elsewhere preamble references declaring that residues derived from reclaiming listed hazardous wastes are "considered to be listed for purposes of this regulation." 50 Fed. Reg. 614, 619 n.1 (1985). *See* § **3.36** Status of Materials Prior To and Following Reclamation; § **3.36** note 40. *See also* 48 Fed. Reg. 14,472, 14,494 (1983) ("wastes from precious metal reclamation are considered to be hazardous whenever the material being reclaimed is a hazardous waste").

[77] *See* 50 Fed. Reg. 1,978, 1,996 (1985) ("plant sweepings which contain an acute hazardous waste are residues of cleanup operations, and would be considered to be acute hazardous waste, unless put to direct use as a pesticide or incorporated back into product").

[78] "Treatment" is defined to include any "process . . . designed to . . . recover energy or material resources from the waste." 40 C.F.R. § 260.10 (1988) ("Treatment"), *quoted in* § **7.50** note 74. The derived-from rule specifically refers to "ash." *See* 40

although the EPA has taken a contrary position, that the derived-from rule applies to rinsate from the emptying of listed hazardous waste containers;[79] this issue is insignificant, because rinsate will be a listed hazardous waste under the mixture rule in any event.[80]

Disposal residues will also frequently be targets of the derived-from rule. Such derivative materials include leachate[81] (but not precipitation runoff),[82] and may also apparently include soils contaminated by listed

---

C.F.R. § 261.3(c)(2)(i) (1988), *quoted in* § **7.49**. EPA has stressed that residues from burning listed wastes are themselves listed hazardous wastes, even if the burning activity is exempt from Subtitle C regulation. *See* 50 Fed. Reg. 49,163, 49,190 (1985) ("Although the actual burning for energy recovery is a type of recycling currently exempt from RCRA regulation, the exemption does not extend to solid waste generated by recycling"). *See also* 50 Fed. Reg. 23,721, 23,722 (1985) ("the residue resulting from the incineration of acute hazardous wastes . . . are still acute hazardous wastes, unless otherwise designated, or delisted").

[79] *See* § **7.26** General Approach to Containers, Liners, and Residues; § **7.26** note 90.

[80] *See* § **7.31** notes 55, 57, & 58; § **7.48** note 21.

[81] The derived-from rule specifically mentions "leachate." *See* 40 C.F.R. § 261.3(c)(2)(i) (1988), *quoted in* § **7.49**. *See also* 45 Fed. Reg. 33,065, 33,096 (1980) (leachate "typically contains solubilized heavy metals and organic materials and is virtually always highly toxic"). This aspect of the rule has important implications for leachate collection systems at treatment, storage, and disposal facilities, as well as for actors engaged in cleanup activities at sites at which disposal of listed hazardous wastes has taken place.

In *Chemical Waste Management Inc. v. EPA,* 869 F.2d 1526 (D.C. Cir. 1989), the court of appeals upheld the application of the derived-from rule to leachate, and further upheld the EPA's assertion that leachate derived from and handled after the effective date of a new hazardous waste listing description—one which did not exist at the time when the precursor, unlisted solid waste was land disposed—must be handled as a listed hazardous waste under the derived-from rule. *See id.* at 1530–31, 1536–37 (concluding that such an interpretation of the derived-from rule does not involve an unlawful retroactive application of law). The court noted that any other interpretation would create serious enforcement problems:

> No doubt there are many landfills which have accepted certain listed hazardous wastes both before and after the wastes were listed. Under the petitioners' approach, leachate generated from the wastes disposed after listing would be deemed hazardous and would be subject to the treatment standards; leachate derived from previous shipments of the same waste would not. There is, however, no possible way for determining which portions of the collected leachate were generated from the particular shipments of the underlying waste. . . . [T]he hazardousness of leachate will depend on the composition of the underlying wastes, not on the time at which those wastes were disposed.

Id. at 1536–37. The *Chemical Waste Management* opinion also has significant ramifications for the mixture rule; we will address the opinion more fully when we supplement this portion of the treatise.

[82] The derived-from rule expressly states that it does not include "precipitation runoff." *See* 40 C.F.R. § 261.3(c)(2)(i) (1988), *quoted in* § **7.49**. The preamble notes

hazardous waste spills.[83] Although ascribing listed status to these various materials may sometimes be controversial,[84] it should usually be relatively easy to spot materials generated from treatment or disposal. By contrast, ascertaining whether materials have been generated from the *storage* of listed wastes, within the meaning of the derived-from rule,

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that this exception is based "on the theory that the water in precipitation run-off in many cases may not have had sufficient contact with the waste to solubilize waste constituents." 45 Fed. Reg. 33,065, 33,096 (1980). The Agency has warned, however, that run-off is exempted only from operation of the derived-from rule and may be a hazardous waste by virtue of other aspects of the regulation. *See id.* ("Of course, if collected, run-off would be a solid waste and, if it exhibited any of the characteristics, would have to be managed as a hazardous waste"). *See also* 50 Fed. Reg. 1,978, 1,996 (1985) ("precipitation run-off is not *automatically* considered a hazardous waste") (emphasis added).

[83] The derived-from rule specifically mentions "spill residue." *See* 40 C.F.R. § 261.3(c)(2)(i) (1988), *quoted in* § **7.49**. EPA has stated that soil contaminated with dioxins at CERCLA cleanup sites "are acute hazardous wastes, since soil contaminated with hazardous waste spills are defined as being in the RCRA system." 50 Fed. Reg. 1,978, 1,994 (1985) (citing the derived-from rule). As we discuss elsewhere, contaminated soils may be listed wastes in any event under the mixture rule. *See* § **7.48** note 21. Moreover, if a commercial chemical product has been spilled, the contaminated soil is expressly listed as the fourth enumerated form. *See* § **7.32** Debris Resulting from Cleanup of Spill; § **7.33** Narrow Scope of Fourth Enumerated Form.

[84] Plainly, some solid wastes generated from treatment or disposal of listed hazardous wastes may have such low concentrations of listed wastes (or listed waste constituents) that the rigid approach of the derived-from rule is excessive. *See* 50 Fed. Reg. 23,721, 23,722 (1985) (EPA "recognizes . . . that while a waste described in these regulations generally is hazardous, a specific waste meeting the listing description from an individual facility may not be"). Nevertheless, the Agency concluded that there were strong practical reasons for adopting a rule known to be overinclusive:

> This is the best regulatory approach we can devise at this time for dealing with solid waste generated by hazardous waste management facilities. We are not now in a position to prescribe waste-specific treatment standards which would identify those processes which do and do not render wastes or treatment residues nonhazardous. To list treatment residues on a case-by-case basis would be an enormous job, and one which we think . . . is unnecessary.

45 Fed. Reg. 33,065, 33,096 (1980). Actors who believe that their derivative materials do not meet the hazardous waste listing criteria may seek to obtain delisting of the wastes. *See* §§ **7.56–7.78**.

The rigidity of the derived-from rule also makes it less likely that new hazardous constituents generated during treatment processes will be overlooked. *See* 45 Fed. Reg. 33,065, 33,096 (1980) ("one effect of treating wastes containing synthetic organic materials may be to create new hazardous constituents in the waste or treatment residue"). A petitioner seeking to delist a derivative waste must establish not only that the waste does not meet any of the criteria underlying initial listing, but must also convince the EPA that "factors (including additional constituents) other than those for which the waste was listed" do not justify continued listing of the derivative waste. 40 C.F.R. § 260.22(a)(2) (1988). *See* § **7.68** Three Delisting Touchstones; §§ **7.71–7.78**.

may not be so straightforward. Accordingly, we address such derivative wastes separately, in the next section.

Hotstream, Jonathan

From: Wehland, Charles T. <ctwehland@JonesDay.com>
Sent: Wednesday, January 13, 2021 4:48 PM
To: Coenen, Douglas W - DNR
Cc: Bonar-Bridges, James I - DNR; Ellenbecker, Michael J - DNR; Keller, Andrea L - DNR; Umer, Khalid; Hotstream, Jonathan
Subject: RE: Kestrel Hawk Landfill
Attachments: 600008CZ.PDF

Doug –

Thanks for your quick response. It motivated us to look for more support for the statements in Attachment 5 to Kestrel Hawk Landfill's Nov. 16 letter about the history of RO 12362. That work confirmed our impression that RO 12362 is limited to condensate generated during landfill gas collection. It does not address liquids subsequently generated by landfill gas processing units because units for processing landfill gas into a fuel were largely unknown in 1985 when EPA issued the guidance. KHL bases this view on the origin of RO 12362 as a follow up to EPA's position expressed at a landfill gas symposium in April 1984.

The 1984 date of the symposium is important to understanding what EPA considered "condensate" for purposes of RO 12362. Collection of landfill gas was not consistently required and few landfills processed that gas for further use. RO 12362 does not provide a definition of condensate. In the same vein, McCoy's 14.3.3.3 discussion of landfill gas condensate refers to it simply as condensation generated from collected landfill gas. Landfill gas processing units became more common after 1996 when EPA issued Clean Air Act New Source Performance Standards for municipal solid waste landfills (40 C.F.R. Part 60, Subparts WWW and Cc). See 1996 EPA Landfill Gas-to-Energy Project Development Handbook at pages 1-1 and 1-2 (copy attached).

The general absence of landfill gas processing units at the time of the 1984 symposium on which RO 12362 is based means that the only "condensate" that EPA could be referencing is the condensate that accumulates in landfill gas collection systems. This understanding is reflected in the 1996 Handbook where EPA distinguishes between condensate generated as part of a landfill gas collection system and other materials generated from the subsequent processing of collected landfill gas for further use as a fuel. See page 9-15. The Handbook limits the definition of condensate to "[l]iquid formed when warm landfill gas cools as it travels through the collection system." See pages 3-4 and 268.

The liquids generated in the gas processing unit at KHL do not meet this definition of "condensate." Those liquids are not generated by the cooling of warm gas in the collection system, but instead from its compression to prepare it for use as fuel by SC Johnson. The gas processing unit liquids are not the "condensate" discussed in RO 12362 and McCoy's. As discussed in detail in the Nov. 16 response, the gas processing unit liquids cannot be hazardous waste by virtue of "derived from" or "contained in" principles.

The use of the term "condensate" in RO 12362 should be considered within this historical context. As you know, RO 12362 is the only source listed in McCoy's as support for its statements about the regulatory status of landfill gas condensate. Consequently, any information that is pertinent to the interpretation of RO 12362 is equally pertinent to the interpretation of McCoy's.

Finally, KHL understands that DNR wants a comprehensive submittal that includes updates to the closure plan, long-term care plan, cost estimate (and associated financial assurance for) closure/long-term care, hazardous waste generator report, and NR 668 (LDR) notifications as described in the Nov. 16 letter. KHL is working diligently to assemble and provide that information to DNR.

Please let me know if you have questions or want to discuss any aspect of these issues.

Best,
Chuck

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Sent: Monday, January 4, 2021 8:24 AM
To: Wehland, Charles T. <ctwehland@JonesDay.com>
Cc: Bonar-Bridges, James I - DNR <James.BonarBridges@wisconsin.gov>; Ellenbecker, Michael J - DNR <Michael.Ellenbecker@wisconsin.gov>; Keller, Andrea L - DNR <Andrea.Keller@wisconsin.gov>; Umer, Khalid <kumer@republicservices.com>
Subject: RE: Kestrel Hawk Landfill

** External mail **

Thank you, Chuck. We will certainly consider this further input. We are awaiting the responses to the remaining NON Addendum issues and will get back to you then. It might be helpful if KHL revised the November 16 letter (Attachment 5) to include this discussion so that everything is in one place. If there is something that helps to support that McCoy's and RO 12362 appears to refer to the liquid or "condensate" that is generated in and removed from the landfill gas collection system itself, please feel free to include it.

I hope your holidays were enjoyable.

Doug

Doug Coenen, P.E.
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From: Wehland, Charles T. <ctwehland@JonesDay.com>
Sent: Wednesday, December 30, 2020 10:02 AM
To: Coenen, Douglas W - DNR <Douglas.Coenen@wisconsin.gov>
Cc: Bonar-Bridges, James I - DNR <James.BonarBridges@wisconsin.gov>; Ellenbecker, Michael J - DNR <Michael.Ellenbecker@wisconsin.gov>; Keller, Andrea L - DNR <Andrea.Keller@wisconsin.gov>
Subject: Kestrel Hawk Landfill

Doug,

Holiday greetings and happy new year. I hope that you are enjoying this quiet period. I am taking the opportunity to reach out to highlight one of Kestrel Hawk Landfill's responses to the NON Addendum because I think it may provide a path forward that could be satisfactory to everyone.

During our virtual meeting in October, DNR stated that its view of the status of liquids generated by KHL's gas processing unit relied on McCoy's discussion of landfill gas condensate and the 1985 EPA letter on which the discussion is based (RO 12362). KHL re-evaluated those analyses for its November 16 response letter and now believes that McCoy's and RO 12362 do not address liquids generated by gas processing units because units for processing landfill gas into a fuel were unknown in 1985.

The condensate referenced in McCoy's and RO 12362 appears to be the liquid or "condensate" that is generated in and removed from the landfill gas collection system itself. At KHL, that condensate is mixed with leachate and sent to the POTW, and it would be counted as hazardous waste along with the leachate according to the interpretation provided in our Nov. 16 letter. This approach is consistent with the interpretation in McCoy's and RO 12362.

The compression and chilling that creates liquids during the fuel production activities at the gas processing unit occurs after the condensate referenced in McCoy's and RO 12362 is generated within the landfill gas collection system. The point, of course, is that there would be no inconsistency in applying McCoy's and RO 12362 to the condensate from the landfill gas collection system that those references appear to cover and then using the uncontained gas principles discussed in our November 16 submittal to determine the status of the liquids generated by the gas processing unit.

I hope that you continue to enjoy this holiday season, and KHL will look forward to DNR's response in due course.

Best regards,
Chuck

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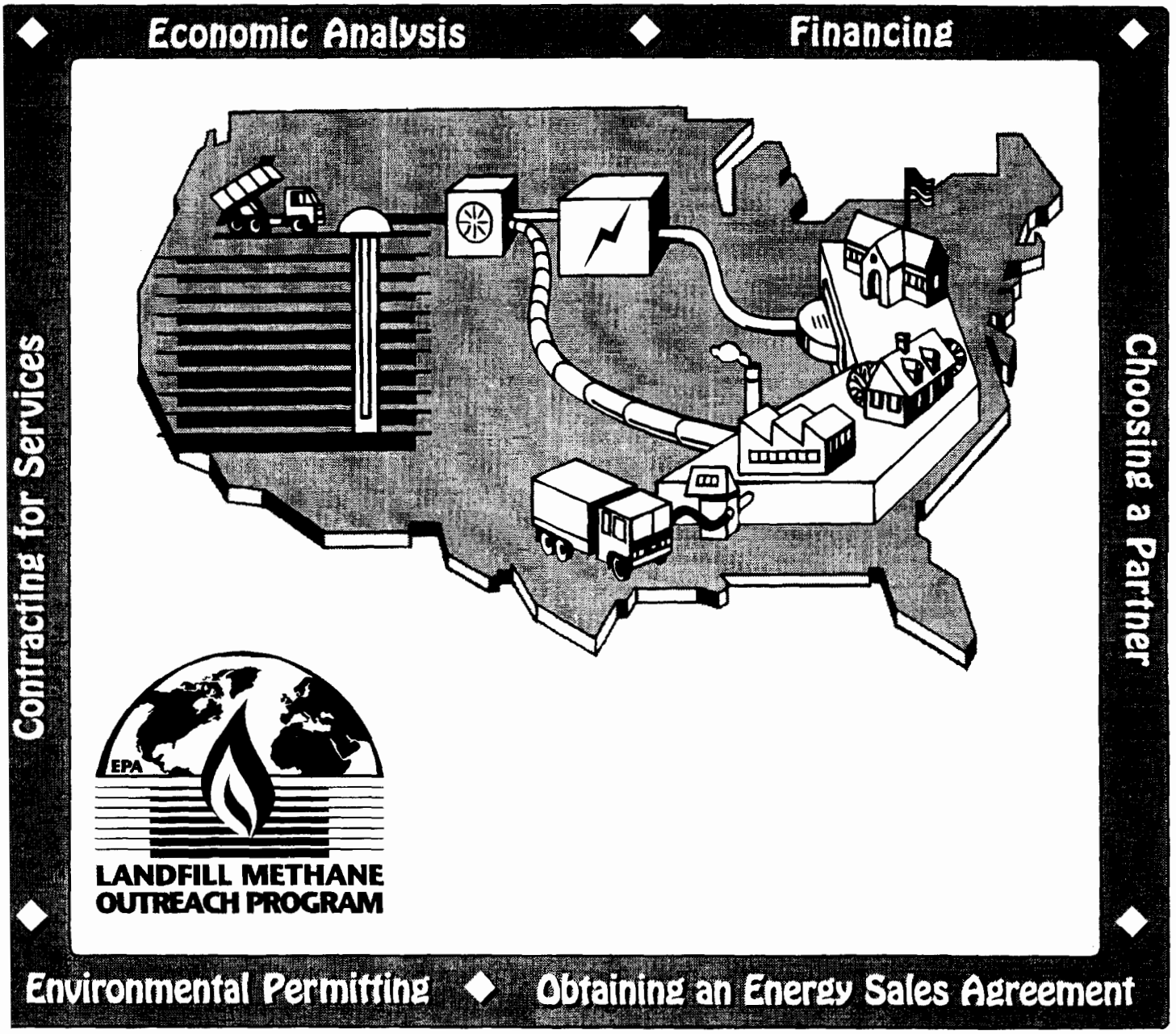
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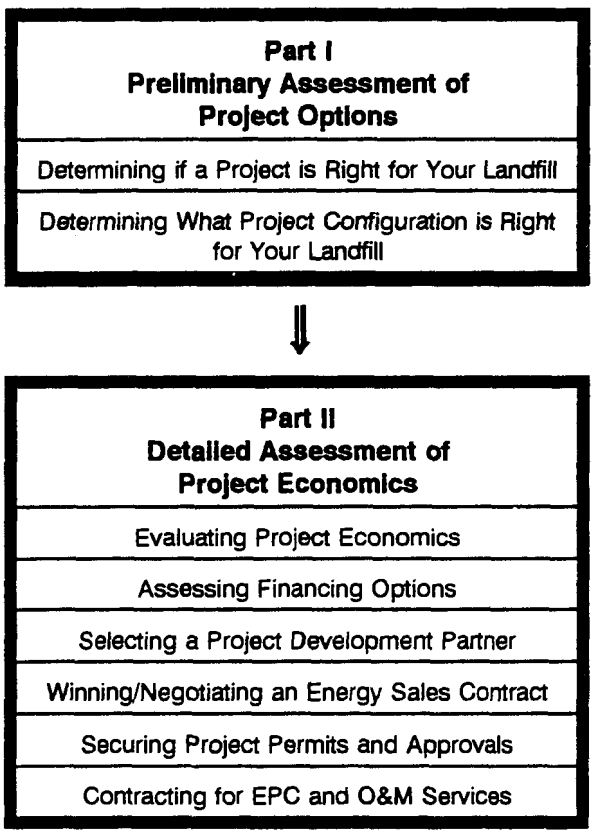
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1. INTRODUCTION

Each person in the United States generates about 4.5 pounds of solid waste per day–almost one ton per year. Most of this waste is deposited in municipal solid waste landfills. As this landfilled waste decomposes (a process that may take 30 years or more), it produces landfill gas. Landfill gas contributes to the formation of smog and poses an explosion hazard if uncontrolled. Furthermore, because landfill gas is about 50 percent methane, it is both a potent greenhouse gas and a valuable source of energy.

Substantial opportunities exist across the country to harness this energy resource and turn what would otherwise be a liability into an asset. The purpose of this handbook is to help landfill owners, operators, and others considering landfill gas projects determine whether landfill gas energy recovery is likely to succeed at a particular landfill, and to clarify the steps involved in developing a successful project.

The Project Development Process



The handbook is organized according to the process of landfill gas project development, as the flowchart on this page illustrates. It contains two major sections: **Part I – Preliminary Assessment of Project Options** provides the landfill owner/operator with basic screening criteria to assess the viability of a landfill energy recovery project and make a preliminary economic comparison of the primary energy recovery options; and **Part II – Detailed Assessment of Project Options** outlines and discusses the major steps involved in development of a landfill gas energy recovery project, from estimating expenses and revenues to constructing and operating the project. The flowchart on this page can be found at the front of each chapter, with the current section and chapter highlighted. Additional information is contained in Appendices A through J of the handbook.

1.1 THE BENEFITS OF LANDFILL GAS ENERGY RECOVERY

Landfill gas energy recovery offers significant environmental, economic, and energy benefits. These benefits are enjoyed by many, including the landfill owner/operator, the project developer, the energy product purchaser and consumer, and the community living near the landfill.

1.1.1 Environmental Benefits

Landfill gas contains volatile organic compounds, which are major contributors to ground-level ozone and which include air toxics. When little is done to control them, these pollutants are continuously released to the atmosphere as waste decomposes. When landfill gas is collected and burned in an energy recovery system, these harmful pollutants are destroyed.

Regulations already require many landfills to collect their landfill gas emissions, and new federal air regulations will soon require additional control. Once the gas is collected, landfill owner/operators have two choices: (1) flare the gas; or (2) produce energy for sale or on-site use. Both options address local air quality and safety concerns, but only energy recovery capitalizes on the energy value of landfill gas, while displacing the use of fossil fuels. Offsetting coal and oil use further reduces emissions of a number of pollutants, including sulfur dioxide, a major contributor to acid rain, as well as the production of ash and scrubber sludge from utilities. Furthermore, landfill gas collection systems operated for energy recovery are often more carefully managed than those designed to flare the gas. This means that more of the gas generated in the landfill may be collected and combusted, with fewer emissions to the atmosphere.

Landfill gas energy recovery also has the potential to significantly reduce the risk of global climate change. Landfill gas is the single largest source of anthropogenic methane emissions in the United States, contributing almost 40 percent of these emissions each year. Reducing methane emissions is critical in the fight against global climate change because each ton of methane emitted into the atmosphere has as much global warming impact as 21 tons of carbon dioxide over a 100 year time period. In addition, methane cycles through the atmosphere about 20 times more quickly than carbon dioxide, which means that stopping methane emissions today can make quick progress toward slowing global climate change.

1.1.2 Economic Benefits

New federal regulations, promulgated in March 1996, require several hundred landfills across the country to collect and combust their landfill gas emissions. Once installation and operation of a collection system is a required cost of doing business, incurring the extra cost of installing an energy recovery system becomes a more attractive investment. Sale or use of landfill gas will often lower the overall cost of compliance and, when site-specific conditions are favorable, the landfill may realize a profit.

More widespread use of landfill gas as an energy resource will also create jobs related to the design, operation, and manufacture of energy recovery systems and lead to advancements in U.S. environmental technology. Local communities will also benefit, in terms of both jobs and revenues, through the development of local energy resources at area landfills.

1.1.3 Energy Benefits

Landfill gas is a local, renewable energy resource. Because landfill gas is generated continuously, it provides a reliable fuel for a range of energy applications, including power generation and direct use. Electric utilities that participate in landfill gas-to-energy projects can benefit by enhancing customer relations, broadening their resource base, and gaining valuable experience in renewable energy development. Landfill gas power projects provide

Condensate Collection and Treatment

An important part of any gas collection system is the condensate collection and treatment system. Condensate forms when warm gas from the landfill cools as it travels through the collection system. If condensate is not removed, it can block the collection system and disrupt the energy recovery process. Condensate control typically begins in the field collection system, where sloping pipes and headers are used to allow drainage into collecting ("knockout") tanks or traps. These systems are typically augmented by post-collection condensate removal as well. Some of the methods for disposal of condensate are discharge to the public sewer system, on-site treatment, and recirculation to the landfill. The best method for a particular landfill will depend upon the characteristics of the condensate (which may vary depending on site-specific waste constituents), regulatory considerations, and the cost of treatment and disposal.

Blower/Compressor

A blower is necessary to pull the gas from the collection wells into the collection header, and a compressor may be required to compress the gas before it can enter the energy recovery system. The size, type, and number of blowers and compressors needed depends on the gas flow rate and the desired level of compression, which is typically determined by the energy conversion equipment.

Flare

A flare is simply a device for igniting and burning the landfill gas. Flares are considered a component of each energy recovery option because they may be needed during energy recovery system startup and downtime. In addition, it may be most cost-effective to gradually increase the size of the energy recovery system and to flare excess gas between system upgrades (e.g., before addition of another engine). Flare designs include open (or candle) flares and enclosed flares. Enclosed flares are more expensive but may be preferable (or required) because they allow for stack testing and can achieve slightly higher combustion efficiencies. In addition, enclosed flares may reduce noise and light nuisances.

Collection System Costs

Total collection system costs will vary widely, based on a number of site specific factors. If the landfill is deep, collection costs will tend to be higher due to the fact that well depths will need to be increased. Collection costs also increase with the number of wells installed. Table 3-1 presents estimated capital and operating and maintenance costs for collection systems (including flares) at typical landfills with 1, 5, and 10 million metric tons of waste in place. For a landfill with 1 million metric tons of waste, collection system and flare capital costs will likely be approximately $628,000, increasing to about $2.1 million for a 5 million metric ton landfill and $3.6 million for a 10 million metric ton landfill. Annual operation and maintenance costs for the landfill gas collection system may range from $89,000 for the typical 1 million metric ton landfill, increasing to $152,000 for the 5 million metric ton landfill and $218,000 for the 10 million metric ton landfill. [All cost data are in 1994 dollars.]

Flaring costs have been incorporated into the estimated costs of landfill gas collection systems (which are presented in Table 3.1 and in more detail in Chapter 5), since excess gas may need to be flared at any time, even if an energy recovery system is installed. Flare systems typically account for 5 to 15 percent of the capital cost of the entire collection system

Analytical Testing

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Biogas Building Oil
(7/14/2020)

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Kestrel Hawk Landfill - Racine, Wisconsin
Biogas Building Oil from Oil-Water Separator

Parameter	Units	BIOGAS Building Oil 7/14/2020 50262318001[1]	NR 661 Regulatory Limits for Characteristic Hazardous[5]
Flashpoint	DegF	> 200 E [2]	< 140
pH at 25 Deg C	SU	5.6 j [3]	<= 2 or >=12.5
Arsenic, total	mg/Kg	4.91	5.0
Barium, total	mg/Kg	< 0.24	100.0
Cadmium, total	mg/Kg	< 0.081	1.0
Chromium, total	mg/Kg	0.381 J [4]	5.0
Lead, total	mg/Kg	< 0.208	5.0
Mercury, total	mg/Kg	0.0559	0.2
Selenium, total	mg/Kg	< 0.617	1.0
Silver, total	mg/Kg	< 0.228	5.0
2,4,5-TP (Silvex)	mg/Kg	< 0.321	1.0
2,4-D	mg/Kg	< 0.211	10.0
Chlordane, technical	mg/Kg	< 10.3 j	0.03
Endrin	mg/Kg	< 0.35 j	0.02
gamma-BHC (Lindane)	mg/Kg	< 0.344 j	0.4
Heptachlor	mg/Kg	< 0.428 j	0.008
Heptachlor Epoxide	mg/Kg	< 0.339 j	0.008
Methoxychlor	mg/Kg	< 0.484 j	10.0
Toxaphene	mg/Kg	< 12.4 j	0.5
1,4-Dichlorobenzene	mg/Kg	< 149	8
2,4,5-Trichlorophenol	mg/Kg	< 169	400.0
2,4,6-Trichlorophenol	mg/Kg	< 161	2.0
2,4-Dinitrotoluene	mg/Kg	< 143	0.13
2-Methylphenol	mg/Kg	< 150	200.0
3&4-Methylphenol	mg/Kg	< 156	200.0
Hexachlorobenzene	mg/Kg	< 177	0.13
Hexachlorobutadiene	mg/Kg	< 168	0.5
Hexachloroethane	mg/Kg	< 196	3.0
Nitrobenzene	mg/Kg	< 174	2.0
Pentachlorophenol	mg/Kg	< 134	100.0
Pyridine	mg/Kg	< 330	5.0
1,1-Dichloroethane	mg/Kg	< 0.196	0.5
1,1-Dichloroethene	mg/Kg	< 0.242	0.7
1,2-Dichloroethane	mg/Kg	< 0.26	0.5
1,4-Dichlorobenzene	mg/Kg	14.6	7.5
2-Butanone	mg/Kg	< 25.4	200.0
Benzene	mg/Kg	0.200 J	0.5
Carbon tetrachloride	mg/Kg	< 0.359	0.5
Chlorobenzene	mg/Kg	< 0.084	100.0
Chloroform	mg/Kg	< 0.412	6.0
Tetrachloroethene	mg/Kg	< 0.358	0.7
Trichloroethene	mg/Kg	< 0.234	0.5
Vinyl chloride	mg/Kg	< 0.464	0.20

Footnotes:

(1) Total concentrations are presented.

(2) E-flagged indicates that value exceeds calibration range

(3) j-flagged indicates an estimated quantitation based on the data review.

(4) J- flagged results indicate that the reported result is an estimate. These values are less than the minimum calibration level but greater than the estimated detection limit.

(5) mg/kg is equivalent to mg/L.

Created by: P. Popp, 7.30.2020, S. Edwards, 8.3.2020

Checked by: A. Rowley, 8.10.2020

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Frequent Questions

- Hazardous Waste
- RCRA Test Methods (SW-846)
  - 3000, 3500, and 3600 Series
  - 8000 Series: Chromatographic Separation Methods
  - 9000 Series: Miscellaneous Test Methods
  - Detection & Quantitation
  - General
  - Hazardous Waste Characteristics
  - Holding Time & Preservation
  - Inorganic
  - Methods Innovations Rule (MIR) & Method Defined Parameters (MDPs)
  - Performance-Based Measurement System (PBMS) & Flexible Approach
  - Quality Assurance (QA) – Quality Control (QC)
  - Sampling

What is the proper way to handle petroleum products (i.e., oils) for SW-846 Method 1311 (TCLP)?

What is the proper way to handle Petroleum Products (i.e., oils) for Method 1311 (TCLP)? We prefer to handle these as totals because we do not want to contaminate our ZHEs and pressure filtration apparatus with oil. However, we get some resistance from clients that feel we are not handling their samples by the regulatory procedure.

Waste oils need to be characterized if they will be disposed of instead of being recycled.

It is absolutely acceptable to analyze the total fraction in oil samples to determine if they are hazardous. However, the results must be properly interpreted. For oil that passes through a filter as described in the method, the total concentrations must be compared DIRECTLY to the TCLP limits. For oil that does NOT pass through the filter, it is considered a solid and the total concentrations can be divided by 20 in order to compare to the TCLP limits.

Here is a more detailed description of the steps to follow:
First, determine if the waste passes through a filter according to Section 7.1.1 of EPA Method 1311. If the waste passes through the filter, treat the filtrate as the TCLP sample, perform all appropriate determinative methods directly on this sample (diluted as necessary for analysis), and compare the results (corrected for any dilution) directly to the TCLP limits given in Table 7-1 of Chapter 7.

According to Section 7.1.2, if the percent solids are greater than 0.5% of the sample, the unfilterable portion is treated as a solid. Caution should be taken when attempting to dry waste samples that may be flammable. The unfilterable material can either be processed through TCLP as a solid or a total analysis can be performed on the material (i.e., divide the total result by 20 for comparison to TCLP limits). For details on how to convert total results to a number for comparison to TCLP limits, see the RCRA FAQ on this subject: https://waste.zendesk.com/hc/en-us/articles/217452377-Can-totals-analysis-be-used-in-lieu-of-the-TCLP-for-determining-the-toxicity-characteristic-

If the totals results corrected as described in the link above are below the TCLP limits, the waste can be considered nonhazardous. If the corrected total results exceed the TCLP limits, the sample can be considered hazardous. In order to demonstrate that such a sample (where total results exceed TCLP limits) is NOT hazardous, it would need to be carried through the TCLP procedure as a solid to determine if the leachate yields results less than the TCLP limits.

Following is a web link to an older reference document titled, Technical Assistance Document for Complying with the TC Rule and Implementing the Toxicity Characteristic Leaching Procedure (TCLP) that is quite comprehensive: http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P1007NTD.txt.

Was this article helpful? 0 out of 0 found this helpful

Have more questions? Submit a request

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

July 29, 2020

PEGGY POPP
TRC
708 HEARTLAND TRAIL
SUITE 3000
Madison, WI 53717

RE: Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

Dear PEGGY POPP:

Enclosed are the analytical results for sample(s) received by the laboratory on July 15, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace National - Mt. Juliet
- Pace Analytical Services - Indianapolis

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Sue Brotherton
sue.brotherton@pacelabs.com
(317)228-3100
Project Manager

Enclosures

cc: Jonathan Hotstream, TRC
Trihydro, Trihydro
KHALID UMER, REPUBLIC SERVICES INC.

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7726 Moller Road
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(317)228-3100

CERTIFICATIONS

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

Pace Analytical Services Indianapolis
7726 Moller Road, Indianapolis, IN 46268
Illinois Accreditation #: 200074
Indiana Drinking Water Laboratory #: C-49-06
Kansas/TNI Certification #: E-10177
Kentucky UST Agency Interest #: 80226
Kentucky WW Laboratory ID #: 98019
Michigan Drinking Water Laboratory #9050
Ohio VAP Certified Laboratory #: CL0065
Oklahoma Laboratory #: 9204
Texas Certification #: T104704355
West Virginia Certification #: 330
Wisconsin Laboratory #: 999788130
USDA Soil Permit #: P330-19-00257

Pace Analytical Services National
12065 Lebanon Road, Mt. Juliet, TN 37122
Alabama Certification #: 40660
Alaska Certification 17-026
Arizona Certification #: AZ0612
Arkansas Certification #: 88-0469
California Certification #: 2932
Canada Certification #: 1461.01
Colorado Certification #: TN00003
Connecticut Certification #: PH-0197
DOD Certification: #1461.01
EPA# TN00003
Florida Certification #: E87487
Georgia DW Certification #: 923
Georgia Certification: NELAP
Idaho Certification #: TN00003
Illinois Certification #: 200008
Indiana Certification #: C-TN-01
Iowa Certification #: 364
Kansas Certification #: E-10277
Kentucky UST Certification #: 16
Kentucky Certification #: 90010
Louisiana Certification #: AI30792
Louisiana DW Certification #: LA180010
Maine Certification #: TN0002
Maryland Certification #: 324
Massachusetts Certification #: M-TN003
Michigan Certification #: 9958
Minnesota Certification #: 047-999-395
Mississippi Certification #: TN00003
Missouri Certification #: 340
Montana Certification #: CERT0086
Nebraska Certification #: NE-OS-15-05
Nevada Certification #: TN-03-2002-34
New Hampshire Certification #: 2975
New Jersey Certification #: TN002
New Mexico DW Certification
New York Certification #: 11742
North Carolina Aquatic Toxicity Certification #: 41
North Carolina Drinking Water Certification #: 21704
North Carolina Environmental Certificate #: 375
North Dakota Certification #: R-140
Ohio VAP Certification #: CL0069
Oklahoma Certification #: 9915
Oregon Certification #: TN200002
Pennsylvania Certification #: 68-02979
Rhode Island Certification #: LAO00356
South Carolina Certification #: 84004
South Dakota Certification
Tennessee DW/Chem/Micro Certification #: 2006
Texas Certification #: T 104704245-17-14
Texas Mold Certification #: LAB0152
USDA Soil Permit #: P330-15-00234
Utah Certification #: TN00003
Vermont Dept. of Health: ID# VT-2006
Virginia Certification #: VT2006
Virginia Certification #: 460132
Washington Certification #: C847
West Virginia Certification #: 233
Wisconsin Certification #: 9980939910
Wyoming UST Certification #: via A2LA 2926.01
A2LA-ISO 17025 Certification #: 1461.01
A2LA-ISO 17025 Certification #: 1461.02
AIHA-LAP/LLC EMLAP Certification #:100789

REPORT OF LABORATORY ANALYSIS

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7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

SAMPLE SUMMARY

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

Lab ID	Sample ID	Matrix	Date Collected	Date Received
50262318001	**Biogas Bldg Oil Sep**	Solid	07/14/20 14:20	07/15/20 09:05

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SAMPLE ANALYTE COUNT

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
50262318001	**Biogas Bldg Oil Sep**	EPA 8081	LEL	9	PAN
		EPA 8151	LEL	3	PAN
		EPA 6010B	TRB	7	PAN
		EPA 7471A	TCT	1	PAN
		EPA 8270C	AO	18	PAN
		EPA 8260B	ADM, BMB	15	PAN
		EPA 1010	SCM	1	PASI-I
		EPA 9045	SCM	1	PASI-I

PAN = Pace National - Mt. Juliet
PASI-I = Pace Analytical Services - Indianapolis

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SUMMARY OF DETECTION

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
50262318001	**Biogas Bldg Oil Sep**					
EPA 6010B	Arsenic	4.91	mg/kg	2.00	07/24/20 15:43	
EPA 6010B	Chromium	0.381J	mg/kg	1.00	07/24/20 15:43	J
EPA 7471A	Mercury	0.0559	mg/kg	0.0400	07/23/20 20:54	
EPA 8260B	Benzene	0.200J	mg/kg	0.400	07/24/20 17:34	J
EPA 8260B	1,4-Dichlorobenzene	14.6	mg/kg	2.00	07/28/20 01:00	
EPA 1010	Flashpoint	>200	deg F		07/15/20 13:08	
EPA 9045	pH at 25 Degrees C	5.6	Std. Units	0.10	07/23/20 13:03	H3

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

Date: July 29, 2020

Biogas Bldg Oil Sep (Lab ID: 50262318001)

- Pesticides (GC) by Method 8081 - Dilution due to matrix.
- Semi Volatile Organic Compounds (GC/MS) by Method 8270C - Waste Dilution
- Volatile Organic Compounds (GC/MS) by Method 8260B - Non-target compounds too high to run at a lower dilution.

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PROJECT NARRATIVE

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

Method: **EPA 8081**
Description: Pesticides (GC) 8081
Client: Republic Services - Wisconsin Landfills
Date: July 29, 2020

General Information:
1 sample was analyzed for EPA 8081 by Pace National Mt. Juliet. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

P4: Sample field preservation does not meet EPA or method recommendations for this analysis.
- Biogas Bldg Oil Sep (Lab ID: 50262318001)

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

QC Batch: 1514407

S4: Surrogate recovery not evaluated against control limits due to sample dilution.
- Biogas Bldg Oil Sep (Lab ID: 50262318001)
  - Decachlorobiphenyl (S)
  - Tetrachloro-m-xylene (S)

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

Method: **EPA 8151**
Description: Chlorinated Herb. (GC) 8151
Client: Republic Services - Wisconsin Landfills
Date: July 29, 2020

General Information:
1 sample was analyzed for EPA 8151 by Pace National Mt. Juliet. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

Method: **EPA 6010B**
Description: Metals (ICP) 6010B
Client: Republic Services - Wisconsin Landfills
Date: July 29, 2020

General Information:
1 sample was analyzed for EPA 6010B by Pace National Mt. Juliet. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

Method: **EPA 7471A**
Description: Mercury 7471A
Client: Republic Services - Wisconsin Landfills
Date: July 29, 2020

General Information:
1 sample was analyzed for EPA 7471A by Pace National Mt. Juliet. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

Method: **EPA 8270C**
Description: SVOA (GC/MS) 8270C
Client: Republic Services - Wisconsin Landfills
Date: July 29, 2020

General Information:
1 sample was analyzed for EPA 8270C by Pace National Mt. Juliet. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

QC Batch: 1516415

S4: Surrogate recovery not evaluated against control limits due to sample dilution.

- Biogas Bldg Oil Sep (Lab ID: 50262318001)
  - 2,4,6-Tribromophenol (S)
  - 2-Fluorobiphenyl (S)
  - 2-Fluorophenol (S)
  - Nitrobenzene-d5 (S)
  - Phenol-d5 (S)
  - p-Terphenyl-d14 (S)

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

Method: **EPA 8260B**
Description: VOA (GC/MS) 8260B
Client: Republic Services - Wisconsin Landfills
Date: July 29, 2020

General Information:
1 sample was analyzed for EPA 8260B by Pace National Mt. Juliet. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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7726 Moller Road
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(317)228-3100

PROJECT NARRATIVE

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

Method: **EPA 1010**
Description: 1010 Flashpoint,Closed Cup
Client: Republic Services - Wisconsin Landfills
Date: July 29, 2020

General Information:
1 sample was analyzed for EPA 1010 by Pace Analytical Services Indianapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

Method: **EPA 9045**
Description: 9045 pH Soil
Client: Republic Services - Wisconsin Landfills
Date: July 29, 2020

General Information:
1 sample was analyzed for EPA 9045 by Pace Analytical Services Indianapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

H3: Sample was received or analysis requested beyond the recognized method holding time.
- Biogas Bldg Oil Sep (Lab ID: 50262318001)

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

Sample: Biogas Bldg Oil Sep **Lab ID: 50262318001** Collected: 07/14/20 14:20 Received: 07/15/20 09:05 Matrix: Solid

Results reported on a "wet-weight" basis

Comments:
- Pesticides (GC) by Method 8081 - Dilution due to matrix.
- Semi Volatile Organic Compounds (GC/MS) by Method 8270C - Waste Dilution
- Volatile Organic Compounds (GC/MS) by Method 8260B - Non-target compounds too high to run at a lower dilution.

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
Pesticides (GC) 8081	Analytical Method: EPA 8081 Preparation Method: 3580A Pace National - Mt. Juliet								
gamma-BHC (Lindane)	**<0.344**	mg/kg	2.00	0.344	100	07/27/20 14:17	07/28/20 13:55	58-89-9	P4
Chlordane (Technical)	**<10.3**	mg/kg	30.0	10.3	100	07/27/20 14:17	07/28/20 13:55	57-74-9	P4
Endrin	**<0.350**	mg/kg	2.00	0.350	100	07/27/20 14:17	07/28/20 13:55	72-20-8	P4
Heptachlor	**<0.428**	mg/kg	2.00	0.428	100	07/27/20 14:17	07/28/20 13:55	76-44-8	P4
Heptachlor epoxide	**<0.339**	mg/kg	2.00	0.339	100	07/27/20 14:17	07/28/20 13:55	1024-57-3	P4
Methoxychlor	**<0.484**	mg/kg	2.00	0.484	100	07/27/20 14:17	07/28/20 13:55	72-43-5	P4
Toxaphene	**<12.4**	mg/kg	40.0	12.4	100	07/27/20 14:17	07/28/20 13:55	8001-35-2	P4
Surrogates									
Decachlorobiphenyl (S)	105	%	60.0-140		100	07/27/20 14:17	07/28/20 13:55	2051-24-3	S4
Tetrachloro-m-xylene (S)	303	%	60.0-140		100	07/27/20 14:17	07/28/20 13:55	877-09-8	S4
Chlorinated Herb. (GC) 8151	Analytical Method: EPA 8151 Preparation Method: 3580A Pace National - Mt. Juliet								
2,4-D	**<0.211**	mg/kg	2.10	0.211	30	07/28/20 02:36	07/29/20 11:57	94-75-7	
2,4,5-TP (Silvex)	**<0.321**	mg/kg	2.10	0.321	30	07/28/20 02:36	07/29/20 11:57	93-72-1	
Surrogates									
2,4-DCAA (S)	316	%	22.0-132		30	07/28/20 02:36	07/29/20 11:57	19719-28-9	ST
Metals (ICP) 6010B	Analytical Method: EPA 6010B Preparation Method: 3050B Pace National - Mt. Juliet								
Arsenic	**4.91**	mg/kg	2.00	0.460	1	07/23/20 14:05	07/24/20 15:43	7440-38-2	
Barium	**<0.240**	mg/kg	0.500	0.240	1	07/23/20 14:05	07/24/20 15:43	7440-39-3	
Cadmium	**<0.0810**	mg/kg	0.500	0.0810	1	07/23/20 14:05	07/24/20 15:43	7440-43-9	
Chromium	**0.381J**	mg/kg	1.00	0.250	1	07/23/20 14:05	07/24/20 15:43	7440-47-3	J
Lead	**<0.208**	mg/kg	0.500	0.208	1	07/23/20 14:05	07/24/20 15:43	7439-92-1	
Selenium	**<0.617**	mg/kg	2.00	0.617	1	07/23/20 14:05	07/24/20 15:43	7782-49-2	
Silver	**<0.228**	mg/kg	1.00	0.228	1	07/23/20 14:05	07/24/20 15:43	7440-22-4	
Mercury 7471A	Analytical Method: EPA 7471A Preparation Method: 7471A Pace National - Mt. Juliet								
Mercury	**0.0559**	mg/kg	0.0400	0.0180	1	07/23/20 17:13	07/23/20 20:54	7439-97-6	
SVOA (GC/MS) 8270C	Analytical Method: EPA 8270C Preparation Method: 3580A Pace National - Mt. Juliet								
1,4-Dichlorobenzene	**<149**	mg/kg	5000	149	15000	07/28/20 15:36	07/29/20 09:42	106-46-7	
2,4-Dinitrotoluene	**<143**	mg/kg	5000	143	15000	07/28/20 15:36	07/29/20 09:42	121-14-2	
Hexachlorobenzene	**<177**	mg/kg	5000	177	15000	07/28/20 15:36	07/29/20 09:42	118-74-1	
Hexachloro-1,3-butadiene	**<168**	mg/kg	5000	168	15000	07/28/20 15:36	07/29/20 09:42	87-68-3	
Hexachloroethane	**<196**	mg/kg	5000	196	15000	07/28/20 15:36	07/29/20 09:42	67-72-1	
Nitrobenzene	**<174**	mg/kg	5000	174	15000	07/28/20 15:36	07/29/20 09:42	98-95-3	
Pyridine	**<330**	mg/kg	5000	330	15000	07/28/20 15:36	07/29/20 09:42	110-86-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

Sample: Biogas Bldg Oil Sep **Lab ID: 50262318001** Collected: 07/14/20 14:20 Received: 07/15/20 09:05 Matrix: Solid

Results reported on a "wet-weight" basis

Comments:
- Pesticides (GC) by Method 8081 - Dilution due to matrix.
- Semi Volatile Organic Compounds (GC/MS) by Method 8270C - Waste Dilution
- Volatile Organic Compounds (GC/MS) by Method 8260B - Non-target compounds too high to run at a lower dilution.

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
SVOA (GC/MS) 8270C	Analytical Method: EPA 8270C Preparation Method: 3580A Pace National - Mt. Juliet								
2-Methylphenol(o-Cresol)	**<150**	mg/kg	5000	150	15000	07/28/20 15:36	07/29/20 09:42	95-48-7	
3&4-Methylphenol(m&p Cresol)	**<156**	mg/kg	5000	156	15000	07/28/20 15:36	07/29/20 09:42		
Pentachlorophenol	**<134**	mg/kg	5000	134	15000	07/28/20 15:36	07/29/20 09:42	87-86-5	
2,4,5-Trichlorophenol	**<169**	mg/kg	5000	169	15000	07/28/20 15:36	07/29/20 09:42	95-95-4	
2,4,6-Trichlorophenol	**<161**	mg/kg	5000	161	15000	07/28/20 15:36	07/29/20 09:42	88-06-2	
Surrogates									
2-Fluorophenol (S)	0.00	%	60.0-140		15000	07/28/20 15:36	07/29/20 09:42	367-12-4	S4
Phenol-d5 (S)	0.00	%	60.0-140		15000	07/28/20 15:36	07/29/20 09:42	4165-62-2	S4
Nitrobenzene-d5 (S)	0.00	%	60.0-140		15000	07/28/20 15:36	07/29/20 09:42	4165-60-0	S4
2-Fluorobiphenyl (S)	0.00	%	60.0-140		15000	07/28/20 15:36	07/29/20 09:42	321-60-8	S4
2,4,6-Tribromophenol (S)	0.00	%	60.0-140		15000	07/28/20 15:36	07/29/20 09:42	118-79-6	S4
p-Terphenyl-d14 (S)	0.00	%	60.0-140		15000	07/28/20 15:36	07/29/20 09:42	1718-51-0	S4
VOA (GC/MS) 8260B	Analytical Method: EPA 8260B Preparation Method: 5035A Pace National - Mt. Juliet								
Benzene	**0.200J**	mg/kg	0.400	0.187	400	07/23/20 21:28	07/24/20 17:34	71-43-2	J
Carbon tetrachloride	**<0.359**	mg/kg	2.00	0.359	400	07/23/20 21:28	07/24/20 17:34	56-23-5	
Chlorobenzene	**<0.0840**	mg/kg	1.00	0.0840	400	07/23/20 21:28	07/24/20 17:34	108-90-7	
Chloroform	**<0.412**	mg/kg	1.00	0.412	400	07/23/20 21:28	07/24/20 17:34	67-66-3	
1,4-Dichlorobenzene	**14.6**	mg/kg	2.00	0.280	400	07/23/20 21:28	07/28/20 01:00	106-46-7	
1,1-Dichloroethane	**<0.196**	mg/kg	1.00	0.196	400	07/23/20 21:28	07/24/20 17:34	75-34-3	
1,2-Dichloroethane	**<0.260**	mg/kg	1.00	0.260	400	07/23/20 21:28	07/24/20 17:34	107-06-2	
1,1-Dichloroethene	**<0.242**	mg/kg	1.00	0.242	400	07/23/20 21:28	07/24/20 17:34	75-35-4	
2-Butanone (MEK)	**<25.4**	mg/kg	40.0	25.4	400	07/23/20 21:28	07/24/20 17:34	78-93-3	
Tetrachloroethene	**<0.358**	mg/kg	1.00	0.358	400	07/23/20 21:28	07/24/20 17:34	127-18-4	
Trichloroethene	**<0.234**	mg/kg	0.400	0.234	400	07/23/20 21:28	07/24/20 17:34	79-01-6	
Vinyl chloride	**<0.464**	mg/kg	1.00	0.464	400	07/23/20 21:28	07/24/20 17:34	75-01-4	
Surrogates									
Toluene-d8 (S)	93.4	%	75.0-131		400	07/23/20 21:28	07/24/20 17:34	2037-26-5	
Toluene-d8 (S)	104	%	75.0-131		400	07/23/20 21:28	07/28/20 01:00	2037-26-5	
4-Bromofluorobenzene (S)	108	%	67.0-138		400	07/23/20 21:28	07/24/20 17:34	460-00-4	
4-Bromofluorobenzene (S)	105	%	67.0-138		400	07/23/20 21:28	07/28/20 01:00	460-00-4	
1,2-Dichloroethane-d4 (S)	96.7	%	70.0-130		400	07/23/20 21:28	07/24/20 17:34	17060-07-0	
1,2-Dichloroethane-d4 (S)	118	%	70.0-130		400	07/23/20 21:28	07/28/20 01:00	17060-07-0	
1010 Flashpoint,Closed Cup	Analytical Method: EPA 1010 Pace Analytical Services - Indianapolis								
Flashpoint	**>200**	deg F			1		07/15/20 13:08		
9045 pH Soil	Analytical Method: EPA 9045 Pace Analytical Services - Indianapolis								
pH at 25 Degrees C	**5.6**	Std. Units	0.10	0.10	1		07/23/20 13:03		H3

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

QC Batch: 1514407
QC Batch Method: 3580A
Analysis Method: EPA 8081
Analysis Description: Pesticides (GC) 8081
Laboratory: Pace National - Mt. Juliet

Associated Lab Samples: 50262318001

METHOD BLANK: R3553938-1 Matrix: Solid
Associated Lab Samples: 50262318001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
gamma-BHC (Lindane)	mg/kg	<0.0172	0.100	07/28/20 11:40	
Endrin	mg/kg	<0.0175	0.100	07/28/20 11:40	
Heptachlor	mg/kg	<0.0214	0.100	07/28/20 11:40	
Heptachlor epoxide	mg/kg	<0.0169	0.100	07/28/20 11:40	
Methoxychlor	mg/kg	<0.0242	0.100	07/28/20 11:40	
Chlordane (Technical)	mg/kg	<0.515	1.50	07/28/20 11:40	
Toxaphene	mg/kg	<0.619	2.00	07/28/20 11:40	
Decachlorobiphenyl (S)	%	102	60.0-140	07/28/20 11:40	
Tetrachloro-m-xylene (S)	%	99	60.0-140	07/28/20 11:40	

LABORATORY CONTROL SAMPLE & LCSD: R3553938-2 R3553938-3

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
gamma-BHC (Lindane)	mg/kg	0.200	0.182	0.184	91.0	92.0	60.0-140	1.09	29	
Endrin	mg/kg	0.200	0.183	0.176	91.5	88.0	60.0-140	3.90	29	
Heptachlor	mg/kg	0.200	0.179	0.180	89.5	90.0	60.0-140	0.557	29	
Heptachlor epoxide	mg/kg	0.200	0.184	0.185	92.0	92.5	60.0-140	0.542	28	
Methoxychlor	mg/kg	0.200	0.191	0.186	95.5	93.0	60.0-140	2.65	29	
Decachlorobiphenyl (S)	%				100	100	60.0-140			
Tetrachloro-m-xylene (S)	%				94.0	103	60.0-140			

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QUALITY CONTROL DATA

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

QC Batch: 1514985
QC Batch Method: 3580A
Analysis Method: EPA 8151
Analysis Description: Chlorinated Herb. (GC) 8151
Laboratory: Pace National - Mt. Juliet

Associated Lab Samples: 50262318001

METHOD BLANK: R3554319-1 Matrix: Solid
Associated Lab Samples: 50262318001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4-D	mg/kg	<0.211	2.10	07/29/20 11:13	
2,4,5-TP (Silvex)	mg/kg	<0.321	2.10	07/29/20 11:13	
2,4-DCAA (S)	%	80	22.0-132	07/29/20 11:13	

LABORATORY CONTROL SAMPLE & LCSD: R3554319-2 R3554319-3

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
2,4-D	mg/kg	5.00	3.64	3.28	72.8	65.6	40.0-120	10.4	20	
2,4,5-TP (Silvex)	mg/kg	5.00	3.80	3.36	76.0	67.2	42.0-120	12.3	20	
2,4-DCAA (S)	%				74.6	69.8	22.0-132			

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QUALITY CONTROL DATA

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

QC Batch: 1514088
QC Batch Method: 3050B
Analysis Method: EPA 6010B
Analysis Description: Metals (ICP) 6010B
Laboratory: Pace National - Mt. Juliet

Associated Lab Samples: 50262318001

METHOD BLANK: R3553048-1 Matrix: Solid
Associated Lab Samples: 50262318001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	mg/kg	<0.460	2.00	07/24/20 14:25	
Barium	mg/kg	<0.240	0.500	07/24/20 14:25	
Cadmium	mg/kg	<0.0810	0.500	07/24/20 14:25	
Chromium	mg/kg	<0.250	1.00	07/24/20 14:25	
Lead	mg/kg	<0.208	0.500	07/24/20 14:25	
Selenium	mg/kg	<0.617	2.00	07/24/20 14:25	
Silver	mg/kg	<0.228	1.00	07/24/20 14:25	

LABORATORY CONTROL SAMPLE: R3553048-2

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	100	96.1	96.1	80.0-120	
Barium	mg/kg	100	102	102	80.0-120	
Cadmium	mg/kg	100	98.9	98.9	80.0-120	
Chromium	mg/kg	100	101	101	80.0-120	
Lead	mg/kg	100	99.3	99.3	80.0-120	
Selenium	mg/kg	100	98.8	98.8	80.0-120	
Silver	mg/kg	20.0	18.6	93.1	80.0-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: R3553048-5 R3553048-6

Parameter	Units	L1242319-155 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/kg	4.56	100	100	94.6	93.5	90.1	88.9	75.0-125	1.25	20	
Barium	mg/kg	91.1	100	100	222	226	131	135	75.0-125	1.64	20	MH
Cadmium	mg/kg	0.123	100	100	93.6	92.3	93.5	92.2	75.0-125	1.38	20	
Chromium	mg/kg	15.8	100	100	113	112	97.4	96.5	75.0-125	0.800	20	
Lead	mg/kg	8.39	100	100	109	108	100	99.9	75.0-125	0.500	20	
Selenium	mg/kg	ND	100	100	90.2	89.2	90.2	89.2	75.0-125	1.07	20	
Silver	mg/kg	ND	20.0	20.0	17.2	17.0	86.0	85.2	75.0-125	0.933	20	

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QUALITY CONTROL DATA

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

QC Batch: 1514323
QC Batch Method: 7471A
Analysis Method: EPA 7471A
Analysis Description: Mercury 7471A
Laboratory: Pace National - Mt. Juliet
Associated Lab Samples: 50262318001

METHOD BLANK: R3552651-1 Matrix: Solid
Associated Lab Samples: 50262318001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.0180	0.0400	07/23/20 19:54	

LABORATORY CONTROL SAMPLE: R3552651-2

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	0.500	0.568	114	80.0-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: R3552651-3 R3552651-4

Parameter	Units	L1242544-03 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.0235	0.500	0.500	0.553	0.565	106	108	75.0-125	2.09	20	

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QUALITY CONTROL DATA

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

QC Batch: 1516415
QC Batch Method: 3580A
Analysis Method: EPA 8270C
Analysis Description: SVOA (GC/MS) 8270C
Laboratory: Pace National - Mt. Juliet

Associated Lab Samples: 50262318001

METHOD BLANK: R3554265-3 Matrix: Solid
Associated Lab Samples: 50262318001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,4-Dichlorobenzene	mg/kg	<2.97	99.9	07/29/20 01:27	
2,4-Dinitrotoluene	mg/kg	<2.87	99.9	07/29/20 01:27	
Hexachlorobenzene	mg/kg	<3.54	99.9	07/29/20 01:27	
Hexachloro-1,3-butadiene	mg/kg	<3.36	99.9	07/29/20 01:27	
Hexachloroethane	mg/kg	<3.93	99.9	07/29/20 01:27	
Nitrobenzene	mg/kg	<3.48	99.9	07/29/20 01:27	
Pyridine	mg/kg	<6.60	99.9	07/29/20 01:27	
2-Methylphenol(o-Cresol)	mg/kg	<3.00	99.9	07/29/20 01:27	
3&4-Methylphenol(m&p Cresol)	mg/kg	<3.12	99.9	07/29/20 01:27	
Pentachlorophenol	mg/kg	<2.69	99.9	07/29/20 01:27	
2,4,5-Trichlorophenol	mg/kg	<3.39	99.9	07/29/20 01:27	
2,4,6-Trichlorophenol	mg/kg	<3.21	99.9	07/29/20 01:27	
Nitrobenzene-d5 (S)	%	75.3	60.0-140	07/29/20 01:27	
2-Fluorobiphenyl (S)	%	93.7	60.0-140	07/29/20 01:27	
p-Terphenyl-d14 (S)	%	58.7	60.0-140	07/29/20 01:27	SR
Phenol-d5 (S)	%	80	60.0-140	07/29/20 01:27	
2-Fluorophenol (S)	%	75.5	60.0-140	07/29/20 01:27	
2,4,6-Tribromophenol (S)	%	105	60.0-140	07/29/20 01:27	

LABORATORY CONTROL SAMPLE & LCSD: R3554265-1 R3554265-2

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,4-Dichlorobenzene	mg/kg	100	83.7	85.0	83.7	85.0	60.0-140	1.54	29	
2,4-Dinitrotoluene	mg/kg	100	94.6	106	94.6	106	60.0-140	11.4	21	
Hexachlorobenzene	mg/kg	100	94.3	95.1	94.3	95.1	60.0-140	0.845	20	
Hexachloro-1,3-butadiene	mg/kg	100	106	95.4	106	95.4	60.0-140	10.5	26	
Hexachloroethane	mg/kg	100	90.1	84.3	90.1	84.3	60.0-140	6.65	31	
Nitrobenzene	mg/kg	100	76.7	74.4	76.7	74.4	60.0-140	3.04	24	
Pyridine	mg/kg	100	86.0	101	86.0	101	60.0-140	16.0	40	
2-Methylphenol(o-Cresol)	mg/kg	100	90.6	77.4	90.6	77.4	60.0-140	15.7	24	
3&4-Methylphenol(m&p Cresol)	mg/kg	100	95.1	86.0	95.1	86.0	60.0-140	10.0	24	
Pentachlorophenol	mg/kg	100	87.6	94.8	87.6	94.8	60.0-140	7.89	22	
2,4,5-Trichlorophenol	mg/kg	100	105	120	105	120	60.0-140	13.3	22	
2,4,6-Trichlorophenol	mg/kg	100	88.6	101	88.6	101	60.0-140	13.1	22	
Nitrobenzene-d5 (S)	%				87.8	80.3	60.0-140			
2-Fluorobiphenyl (S)	%				101	103	60.0-140			
p-Terphenyl-d14 (S)	%				84.2	93.9	60.0-140			
Phenol-d5 (S)	%				103	92.5	60.0-140			
2-Fluorophenol (S)	%				91.5	87.5	60.0-140			

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REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

QUALITY CONTROL DATA

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

LABORATORY CONTROL SAMPLE & LCSD: R3554265-1 R3554265-2

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
2,4,6-Tribromophenol (S)	%				117	116	60.0-140			

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Indianapolis, IN 46268
(317)228-3100

QUALITY CONTROL DATA

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

QC Batch: 1514544
QC Batch Method: 5035A
Analysis Method: EPA 8260B
Analysis Description: VOA (GC/MS) 8260B
Laboratory: Pace National - Mt. Juliet

Associated Lab Samples: 50262318001

METHOD BLANK: R3553646-3 Matrix: Solid
Associated Lab Samples: 50262318001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	mg/kg	<0.000467	0.00100	07/24/20 08:14	
Carbon tetrachloride	mg/kg	<0.000898	0.00500	07/24/20 08:14	
Chlorobenzene	mg/kg	<0.000210	0.00250	07/24/20 08:14	
Chloroform	mg/kg	<0.00103	0.00250	07/24/20 08:14	
1,1-Dichloroethane	mg/kg	<0.000491	0.00250	07/24/20 08:14	
1,2-Dichloroethane	mg/kg	<0.000649	0.00250	07/24/20 08:14	
1,1-Dichloroethene	mg/kg	<0.000606	0.00250	07/24/20 08:14	
2-Butanone (MEK)	mg/kg	<0.0635	0.100	07/24/20 08:14	
Tetrachloroethene	mg/kg	<0.000896	0.00250	07/24/20 08:14	
Trichloroethene	mg/kg	<0.000584	0.00100	07/24/20 08:14	
Vinyl chloride	mg/kg	<0.00116	0.00250	07/24/20 08:14	
Toluene-d8 (S)	%	105	75.0-131	07/24/20 08:14	
4-Bromofluorobenzene (S)	%	97.1	67.0-138	07/24/20 08:14	
1,2-Dichloroethane-d4 (S)	%	87.9	70.0-130	07/24/20 08:14	

LABORATORY CONTROL SAMPLE & LCSD: R3553646-1 R3553646-2

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Benzene	mg/kg	0.125	0.104	0.101	83.2	80.8	70.0-123	2.93	20	
Carbon tetrachloride	mg/kg	0.125	0.132	0.130	106	104	66.0-128	1.53	20	
Chlorobenzene	mg/kg	0.125	0.115	0.113	92.0	90.4	76.0-128	1.75	20	
Chloroform	mg/kg	0.125	0.138	0.135	110	108	72.0-123	2.20	20	
1,1-Dichloroethane	mg/kg	0.125	0.127	0.122	102	97.6	70.0-127	4.02	20	
1,2-Dichloroethane	mg/kg	0.125	0.0942	0.0924	75.4	73.9	65.0-131	1.93	20	
1,1-Dichloroethene	mg/kg	0.125	0.116	0.112	92.8	89.6	65.0-131	3.51	20	
2-Butanone (MEK)	mg/kg	0.625	0.445	0.455	71.2	72.8	30.0-160	2.22	24	
Tetrachloroethene	mg/kg	0.125	0.127	0.125	102	100	70.0-136	1.59	20	
Trichloroethene	mg/kg	0.125	0.138	0.129	110	103	76.0-126	6.74	20	
Vinyl chloride	mg/kg	0.125	0.126	0.125	101	100	63.0-134	0.797	20	
Toluene-d8 (S)	%				94.4	96.3	75.0-131			
4-Bromofluorobenzene (S)	%				106	108	67.0-138			
1,2-Dichloroethane-d4 (S)	%				94.0	94.9	70.0-130			

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REPORT OF LABORATORY ANALYSIS

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7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

QUALITY CONTROL DATA

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

QC Batch: 1515997
QC Batch Method: 5035A
Analysis Method: EPA 8260B
Analysis Description: VOA (GC/MS) 8260B
Laboratory: Pace National - Mt. Juliet

Associated Lab Samples: 50262318001

METHOD BLANK: R3553810-2 Matrix: Solid
Associated Lab Samples: 50262318001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,4-Dichlorobenzene	mg/kg	<0.000700	0.00500	07/27/20 17:16	
Toluene-d8 (S)	%	104	75.0-131	07/27/20 17:16	
4-Bromofluorobenzene (S)	%	107	67.0-138	07/27/20 17:16	
1,2-Dichloroethane-d4 (S)	%	110	70.0-130	07/27/20 17:16	

LABORATORY CONTROL SAMPLE: R3553810-1

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,4-Dichlorobenzene	mg/kg	0.125	0.136	109	77.0-121	
Toluene-d8 (S)	%			103	75.0-131	
4-Bromofluorobenzene (S)	%			103	67.0-138	
1,2-Dichloroethane-d4 (S)	%			105	70.0-130	

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Indianapolis, IN 46268
(317)228-3100

QUALITY CONTROL DATA

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

QC Batch: 573256
QC Batch Method: EPA 9045
Analysis Method: EPA 9045
Analysis Description: 9045 pH
Laboratory: Pace Analytical Services - Indianapolis

Associated Lab Samples: 50262318001

SAMPLE DUPLICATE: 2643829

Parameter	Units	50261672013 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.6	8.6	0	2	H3

SAMPLE DUPLICATE: 2643830

Parameter	Units	50262509010 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.5	7.5	1	2	H3

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7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

QUALIFIERS

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

J - Estimated concentration at or above the LOD and below the LOQ.

LOD - Limit of Detection adjusted for dilution factor, percent moisture, initial weight and final volume.

LOQ - Limit of Quantitation adjusted for dilution factor, percent moisture, initial weight and final volume.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

H3	Sample was received or analysis requested beyond the recognized method holding time.
J	Analyte detected below the reporting limit, therefore result is an estimate. This qualifier is also used for all TICs.
MH	Matrix spike recovery and/or matrix spike duplicate recovery was above laboratory control limits. Result may be biased high.
P4	Sample field preservation does not meet EPA or method recommendations for this analysis.
S4	Surrogate recovery not evaluated against control limits due to sample dilution.
SR	Surrogate recovery was below laboratory control limits. Results may be biased low.
ST	Surrogate recovery was above laboratory control limits. Results may be biased high.

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Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Biogas Bldg Oil Sep
Pace Project No.: 50262318

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
50262318001	**Biogas Bldg Oil Sep**	3580A	1514407	EPA 8081	1514407
50262318001	**Biogas Bldg Oil Sep**	3580A	1514985	EPA 8151	1514985
50262318001	**Biogas Bldg Oil Sep**	3050B	1514088	EPA 6010B	1514088
50262318001	**Biogas Bldg Oil Sep**	7471A	1514323	EPA 7471A	1514323
50262318001	**Biogas Bldg Oil Sep**	3580A	1516415	EPA 8270C	1516415
50262318001	**Biogas Bldg Oil Sep**	5035A	1514544	EPA 8260B	1514544
50262318001	**Biogas Bldg Oil Sep**	5035A	1515997	EPA 8260B	1515997
50262318001	**Biogas Bldg Oil Sep**	EPA 1010	572237		
50262318001	**Biogas Bldg Oil Sep**	EPA 9045	573256		

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WO# : 50262318

50262318

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page : 1 Of 1

Section A Required Client Information:	Required Project Information:	Section C Invoice Information:
Company: ESC	Report To: RKHP	Attention:
Address: W125 S9808 North Cape Road	Copy To: TRC, Peggy Popp	Company Name: RKHP
Muskego, WI 53150	708 Heartland Trail, Madison WI 53717	Address: 1989 Oakes Rd, Racine WI 53408
Email:	Purchase Order #:	Pace Quote:
Phone: Fax:	Project Name: Kestrel Hawk ~~GMH~~	Pace Project Manager: sue.brotherton@pacelabs.com
Requested Due Date:	Project #:	Pace Profile #: 5180-10

Regulatory Agency:

State / Location: WI

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test: Y/N	Analyses Test: PCB, FSS TCLP Pb Flashpoint	Residual Chlorine (Y/N)	
	MATRIX: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Other OT, Tissue TS																	N	N		
1	~~GMH-East~~ Waste oil	OL WT	G	—	—	7/14	1420	-	8	8									X		001
2	~~GMH-South~~	~~WT~~																	*		
3	~~GMH-West~~	~~WT~~																	*		
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	Scott Forsmark TRC	7/14/20	1700	TRC Scott Forsmark						
	TRC	7-15-20	905		7-15-20	905	1.7	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Scott Forsmark

SIGNATURE of SAMPLER: Scott Forsmark

DATE Signed: 7/14/20

Pace Analytical

SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50262318

Date/Time and Initials of person examining contents: JH 7-15-20 1111

Courier: [X] Fed Ex [ ] UPS [ ] USPS [ ] Client [ ] Commercial [ ] Pace [ ] Other _____

Tracking #: 9004 4035 4350

Custody Seal on Cooler/Box Present: [ ] Yes [X] No **Seals Intact:** [ ] Yes [X] No

Packing Material: [X] Bubble Wrap [X] Bubble Bags [ ] None [ ] Other _____

Thermometer: 1 2 3 4 5 6 A B C (D) E F · Ice Type: [X] Wet [ ] Blue [ ] None | Samples collected today and on ice. [ ] Yes [ ] No [X] N/A

Cooler Temperature: 1.9/1.7 Ice Visible in Sample Containers?: [ ] Yes [X] No [ ] N/A

(Initial/Corrected) Temp should be above freezing to 6°C If temp. is Over 6°C or under 0°C, was the PM Notified?: [ ] Yes [ ] No [X] N/A

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp		X	All containers needing acid/base pres. Have been checked?: **exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.** All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			
USDA Regulated Soils? (ID, NY, WA, OR,CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		X				
Chain of Custody Present:	X		Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			X
Chain of Custody Filled Out:	X		Dissolved Metals field filtered?:			X
Short Hold Time Analysis (<72hr)?: Analysis:		X	Headspace Wisconsin Sulfide			X
Time 5035A TC placed in Freezer or Short Holds To Lab:				Present	Absent	~~N/A~~ X
			Residual Chlorine Check (SVOC 625 Pest/PCB 608) Residual Chlorine Check (Total/Amenable/Free Cyanide)			X
Rush TAT Requested:		X	Headspace in VOA Vials (>6mm):	X		
Containers Intact?:	X		Trip Blank Present?:		X	
Sample Labels (IDs/Dates/Times) Match COC?: Except TCs, which only require sample ID	X		Trip Blank Custody Seals?:		X	
Extra labels on Terracore Vials (soils only)?		X				

Comments:

per e-mail from Peggy Popp, change the sample ID to Biogas Bldg Oil Sep. 7/15/20kh

COC PAGE 1 of

Sample Container Count

Sample Line Item	WGFU	SBS DI BK Kit R	DG9H VG9H	VOA VIALS (>6mm)	VG9U	DG9U	DG9T	AG0U	AG1H	AG1U	AG3S	BP1U	BP1N	BP2U	BP3U	BP3N	BP3F	BP3S	BP3B	BP3Z	CG3H					Matrix	pH <2	pH >9	pH>12
1					6										2											WT			
2																										SL/NAL-WG-WP			
3																													
4																													
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													

Container Codes

Glass

DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpres amber glass
DG9H	40mL HCl amber voa vial	AG1H	1L HCl amber glass
DG9M	40mL MeOH clear vial	AG1S	1L H2SO4 amber glass
DG9P	40mL TSP amber vial	AG1T	1L Na Thiosulfate amber glass
DG9S	40mL H2SO4 amber vial	AG1U	1liter unpres amber glass
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass
DG9U	40mL unpreserved **amber** vial	AG2S	500mL H2SO4 amber glass
VG9H	40mL HCl clear vial	AG2U	500mL unpres amber glass
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 amber glass
VG9U	40mL unpreserved **clear** vial	AG3U	250mL unpres amber glass
VGFX	40mL w/hexane wipe vial	BG1H	1L HCl clear glass
VSG	Headspace septa vial & HCl	BG1S	1L H2SO4 clear glass
WGKU	8oz unpreserved clear jar	BG1T	1L Na Thiosulfate clear glass
WGFU	4oz clear soil jar	BG1U	1L unpreserved glass
JGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass
CG3H	250mL clear glass HCl	BG3U	250mL Unpres Clear Glass

Plastic / Misc.

BP1A	1L NaOH, Asc Acid plastic
BP1N	1L HNO3 plastic
BP1S	1L H2SO4 plastic
BP1U	1L unpreserved plastic
BP1Z	1L NaOH, Zn, Ac
BP2A	500mL NaOH, Asc Acid plastic
BP2N	500mL HNO3 plastic
BP2O	500mL NaOH plastic
BP2S	500mL H2SO4 plastic
BP2U	500mL unpreserved plastic
BP2Z	500mL NaOH, Zn Ac
BP3B	250mL NaOH plastic
BP3N	250mL HNO3 plastic
BP3F	250mL HNO3 plastic (field filtered)

BP3U	250mL unpreserved plastic
BP3S	250mL H2SO4 plastic
BP3Z	250mL NaOH, Zn Ac plastic

AF	Air Filter
C	Air Cassettes
R	Terra core kit
SP5T	120mL Coliform Na Thiosulfate
U	Summa Can
ZPLC	Ziploc Bag

WT	Water
SL	Solid
NAL	Non-aqueous liquid
WP	Wipe

Condensate Tank
(3/16/2020)

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Kestrel Hawk Landfill
Racine, Wisconsin
Biogas Building Residuals Tank Testing

Parameter	Units	COND TANK 3/16/2020 50252134001	NR 661 Regulatory Limits for Characteristic Hazardous
Corrosivity	MM/YR	0.0850 J	6.35
pH, field	SU	6.03	<= 2 or >=12.5
Conductance, specific	µmhos/cm	159	
Temperature	DegC	10.1	
Color, field		NONE	
Odor, field		STRONG	
Turbidity, field		LOW	
Corrosivity	MM/YR	0.0850 J	
Flashpoint	DegF	> 200	< 140
Oil and grease	mg/L	31.8 j	
pH at 25 DegC	SU	6.4	<= 2 or >=12.5
Arsenic, total	µg/L	1070	5,000
Barium, total	µg/L	< 33	100,000
Cadmium, total	µg/L	< 33	1,000
Chromium, total	µg/L	< 33	5,000
Lead, total	µg/L	< 33	5,000
Mercury, total	µg/L	< 3.3	200
Selenium, total	µg/L	< 33	1,000
Silver, total	µg/L	< 33	5,000
2,4,5-TP (Silvex)	µg/L	< 0.667	1,000
2,4-D	µg/L	< 0.667	10,000
Chlordane, technical	µg/L	< 1.67	30
Endrin	µg/L	< 1.67	20
gamma-BHC (Lindane)	µg/L	< 1.67	400
Heptachlor	µg/L	< 1.67	8
Heptachlor Epoxide	µg/L	< 1.67	8
Methoxychlor	µg/L	< 1.67	10,000
Toxaphene	µg/L	< 3.33	500
2,4,5-Trichlorophenol	µg/L	< 167	400,000
2,4,6-Trichlorophenol	µg/L	< 167	2,000
2,4-Dinitrotoluene	µg/L	< 167	130
2-Methylphenol	µg/L	< 167	200,000
3&4-Methylphenol	µg/L	< 167	200,000
Hexachlorobenzene	µg/L	< 167	130
Hexachlorobutadiene	µg/L	< 167	500
Hexachloroethane	µg/L	< 167	3,000
Nitrobenzene	µg/L	< 167	2,000
Pentachlorophenol	µg/L	< 167	100,000
Pyridine	µg/L	< 167	5,000
1,1-Dichloroethene	µg/L	< 16.7	700
1,2-Dichloroethane	µg/L	< 16.7	500
1,4-Dichlorobenzene	µg/L	< 16.7	7,500
2-Butanone	µg/L	28,500 j	200,000
Benzene	µg/L	< 16.7	500
Carbon tetrachloride	µg/L	< 16.7	500
Chlorobenzene	µg/L	< 16.7	100,000
Chloroform	µg/L	< 83.3	6,000
Tetrachloroethene	µg/L	< 16.7	700
Trichloroethene	µg/L	< 16.7	500
Vinyl chloride	µg/L	< 16.7	200

Created By: P. Popp

Checked By: S. Edwards

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

March 30, 2020

PEGGY POPP
TRC
708 HEARTLAND TRAIL
SUITE 3000
Madison, WI 53717

RE: Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

Dear PEGGY POPP:
Enclosed are the analytical results for sample(s) received by the laboratory on March 17, 2020. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Pace Analytical Melville does not hold certification for method 1110A in water matrix in the state of WI

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Sue Brotherton
sue.brotherton@pacelabs.com
(317)228-3100
Project Manager

Enclosures

cc: Jonathan Hotstream, TRC
Trihydro, Trihydro
KHALID UMER, REPUBLIC SERVICES INC.

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CERTIFICATIONS

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

Pace Analytical Services Indianapolis
7726 Moller Road, Indianapolis, IN 46268
Illinois Accreditation #: 200074
Indiana Drinking Water Laboratory #: C-49-06
Kansas/TNI Certification #: E-10177
Kentucky UST Agency Interest #: 80226
Kentucky WW Laboratory ID #: 98019
Michigan Drinking Water Laboratory #9050
Ohio VAP Certified Laboratory #: CL0065
Oklahoma Laboratory #: 9204
Texas Certification #: T104704355
West Virginia Certification #: 330
Wisconsin Laboratory #: 999788130
USDA Soil Permit #: P330-19-00257

Pace Analytical Services Long Island
575 Broad Hollow Rd, Melville, NY 11747
New York Certification #: 10478 Primary Accrediting Body
New Jersey Certification #: NY158
Pennsylvania Certification #: 68-00350
Connecticut Certification #: PH-0435
Maryland Certification #: 208
Rhode Island Certification #: LAO00340
Massachusetts Certification #: M-NY026
New Hampshire Certification #: 2987

Pace Analytical Services National
12065 Lebanon Road, Mt. Juliet, TN 37122
Alabama Certification #: 40660
Alaska Certification 17-026
Arizona Certification #: AZ0612
Arkansas Certification #: 88-0469
California Certification #: 2932
Canada Certification #: 1461.01
Colorado Certification #: TN00003
Connecticut Certification #: PH-0197
DOD Certification: #1461.01
EPA# TN00003
Florida Certification #: E87487
Georgia DW Certification #: 923
Georgia Certification: NELAP
Idaho Certification #: TN00003
Illinois Certification #: 200008
Indiana Certification #: C-TN-01
Iowa Certification #: 364
Kansas Certification #: E-10277
Kentucky UST Certification #: 16
Kentucky Certification #: 90010
Louisiana Certification #: AI30792
Louisiana DW Certification #: LA180010
Maine Certification #: TN0002
Maryland Certification #: 324
Massachusetts Certification #: M-TN003
Michigan Certification #: 9958
Minnesota Certification #: 047-999-395
Mississippi Certification #: TN00003
Missouri Certification #: 340
Montana Certification #: CERT0086
Nebraska Certification #: NE-OS-15-05
Nevada Certification #: TN-03-2002-34
New Hampshire Certification #: 2975
New Jersey Certification #: TN002
New Mexico DW Certification
New York Certification #: 11742
North Carolina Aquatic Toxicity Certification #: 41
North Carolina Drinking Water Certification #: 21704
North Carolina Environmental Certificate #: 375
North Dakota Certification #: R-140
Ohio VAP Certification #: CL0069
Oklahoma Certification #: 9915
Oregon Certification #: TN200002
Pennsylvania Certification #: 68-02979
Rhode Island Certification #: LAO00356
South Carolina Certification #: 84004
South Dakota Certification
Tennessee DW/Chem/Micro Certification #: 2006
Texas Certification #: T 104704245-17-14
Texas Mold Certification #: LAB0152
USDA Soil Permit #: P330-15-00234
Utah Certification #: TN00003
Vermont Dept. of Health: ID# VT-2006
Virginia Certification #: VT2006
Virginia Certification #: 460132
Washington Certification #: C847
West Virginia Certification #: 233
Wisconsin Certification #: 9980939910
Wyoming UST Certification #: via A2LA 2926.01
A2LA-ISO 17025 Certification #: 1461.01
A2LA-ISO 17025 Certification #: 1461.02
AIHA-LAP/LLC EMLAP Certification #:100789

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

Lab ID	Sample ID	Matrix	Date Collected	Date Received
50252134001	**GC Tank**	Water	03/16/20 09:30	03/17/20 09:30

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
50252134001	**GC Tank**	EPA 8081B	LEL	9	PAN
		EPA 8151A	LEL	3	PAN
		EPA 6010B	CCE	7	PAN
		EPA 7470A	ABL	1	PAN
		EPA 8270C	JNJ	18	PAN
		EPA 8260D	BMB	14	PAN
		EPA 1664A	DLH	1	PAN
		EPA 1010	SCM	1	PASI-I
		EPA 1110A	MEM1	1	PASI-L
		EPA 9045	SCM	1	PASI-I

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SUMMARY OF DETECTION

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
50252134001	**GC Tank**					
	Field pH	6.03	Std. Units		03/16/20 09:30	
	Field Temperature	10.1	deg C		03/16/20 09:30	
	Field Specific Conductance	159	umhos/cm		03/16/20 09:30	
EPA 6010B	Arsenic	1.07	mg/L	0.100	03/25/20 10:29	
EPA 8260D	2-Butanone (MEK)	28.5	mg/L	0.500	03/23/20 15:49	CC
EPA 1664A	Oil and Grease	31.8	mg/L	5.00	03/25/20 13:53	P4
EPA 1010	Flashpoint	>200	deg F		03/19/20 11:30	
EPA 9045	pH at 25 Degrees C	6.4	Std. Units	0.10	03/24/20 11:23	H3

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

Date: March 30, 2020

GC Tank (Lab ID: 50252134001)

- Semi Volatile Organic Compounds (GC/MS) by Method 8270C - Dilution due to matrix.

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PROJECT NARRATIVE

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

Method: **EPA 8081B**
Description: Pesticides (GC) 8081B TCLP
Client: Republic Services - Wisconsin Landfills
Date: March 30, 2020

General Information:
1 sample was analyzed for EPA 8081B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

Method: **EPA 8151A**
Description: Chlorinated Herb. (GC) 8151A
Client: Republic Services - Wisconsin Landfills
Date: March 30, 2020

General Information:
1 sample was analyzed for EPA 8151A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

Method: **EPA 6010B**
Description: Metals (ICP) 6010B TCLP
Client: Republic Services - Wisconsin Landfills
Date: March 30, 2020

General Information:
1 sample was analyzed for EPA 6010B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

Method: **EPA 7470A**
Description: Mercury 7470A TCLP
Client: Republic Services - Wisconsin Landfills
Date: March 30, 2020

General Information:
1 sample was analyzed for EPA 7470A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

Method: **EPA 8270C**
Description: SVOA (GC/MS) 8270C TCLP
Client: Republic Services - Wisconsin Landfills
Date: March 30, 2020

General Information:
1 sample was analyzed for EPA 8270C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

Method: **EPA 8260D**
Description: VOA (GC/MS) 8260D TCLP
Client: Republic Services - Wisconsin Landfills
Date: March 30, 2020

General Information:
1 sample was analyzed for EPA 8260D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

QC Batch: 1448595

CC: The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The result may be biased.

- GC Tank (Lab ID: 50252134001)
  - 2-Butanone (MEK)

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

Method: **EPA 1664A**
Description: Wet Chemistry 1664A
Client: Republic Services - Wisconsin Landfills
Date: March 30, 2020

General Information:
1 sample was analyzed for EPA 1664A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

P4: Sample field preservation does not meet EPA or method recommendations for this analysis.
- GC Tank (Lab ID: 50252134001)

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

Method: **EPA 1010**
Description: 1010 Flashpoint,Closed Cup
Client: Republic Services - Wisconsin Landfills
Date: March 30, 2020

General Information:
1 sample was analyzed for EPA 1010. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

Method: **EPA 1110A**
Description: Corrosivity Toward Steel
Client: Republic Services - Wisconsin Landfills
Date: March 30, 2020

General Information:
1 sample was analyzed for EPA 1110A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

Method: **EPA 9045**
Description: 9045 pH Soil
Client: Republic Services - Wisconsin Landfills
Date: March 30, 2020

General Information:
1 sample was analyzed for EPA 9045. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

H3: Sample was received or analysis requested beyond the recognized method holding time.
- GC Tank (Lab ID: 50252134001)

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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(317)228-3100

ANALYTICAL RESULTS

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

Sample: GC Tank **Lab ID: 50252134001** Collected: 03/16/20 09:30 Received: 03/17/20 09:30 Matrix: Water
Comments: • Semi Volatile Organic Compounds (GC/MS) by Method 8270C - Dilution due to matrix.

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Field pH	**6.03**	Std. Units			1		03/16/20 09:30		
Field Temperature	**10.1**	deg C			1		03/16/20 09:30		
Field Specific Conductance	**159**	umhos/cm			1		03/16/20 09:30		
Pesticides (GC) 8081B TCLP	Analytical Method: EPA 8081B Preparation Method: 3510C Leachate Method/Date: 1311; 03/23/20 20:15								
Chlordane (Technical)	**<0.00167**	mg/L	0.00500	0.00167	1	03/26/20 16:42	03/27/20 11:04	57-74-9	
Endrin	**<0.00167**	mg/L	0.00500	0.00167	1	03/26/20 16:42	03/27/20 11:04	72-20-8	
Heptachlor	**<0.00167**	mg/L	0.00500	0.00167	1	03/26/20 16:42	03/27/20 11:04	76-44-8	
Heptachlor epoxide	**<0.00167**	mg/L	0.00500	0.00167	1	03/26/20 16:42	03/27/20 11:04	1024-57-3	
gamma-BHC (Lindane)	**<0.00167**	mg/L	0.00500	0.00167	1	03/26/20 16:42	03/27/20 11:04	58-89-9	
Methoxychlor	**<0.00167**	mg/L	0.00500	0.00167	1	03/26/20 16:42	03/27/20 11:04	72-43-5	
Toxaphene	**<0.00333**	mg/L	0.0100	0.00333	1	03/26/20 16:42	03/27/20 11:04	8001-35-2	
Surrogates									
Decachlorobiphenyl (S)	132	%	10.0-128		1	03/26/20 16:42	03/27/20 11:04	2051-24-3	ST
Tetrachloro-m-xylene (S)	110	%	10.0-127		1	03/26/20 16:42	03/27/20 11:04	877-09-8	
Chlorinated Herb. (GC) 8151A	Analytical Method: EPA 8151A Preparation Method: 8151A Leachate Method/Date: 1311; 03/23/20 20:15								
2,4,5-TP (Silvex)	**<0.000667**	mg/L	0.00200	0.000667	1	03/26/20 07:06	03/26/20 18:39	93-72-1	
2,4-D	**<0.000667**	mg/L	0.00200	0.000667	1	03/26/20 07:06	03/26/20 18:39	94-75-7	
Surrogates									
2,4-DCAA (S)	78.4	%	14.0-158		1	03/26/20 07:06	03/26/20 18:39	19719-28-9	
Metals (ICP) 6010B TCLP	Analytical Method: EPA 6010B Preparation Method: 3015 Leachate Method/Date: 1311; 03/23/20 20:15								
Arsenic	**1.07**	mg/L	0.100	0.0330	1	03/25/20 08:48	03/25/20 10:29	7440-38-2	
Barium	**<0.0330**	mg/L	0.100	0.0330	1	03/25/20 08:48	03/25/20 10:29	7440-39-3	
Cadmium	**<0.0330**	mg/L	0.100	0.0330	1	03/25/20 08:48	03/25/20 10:29	7440-43-9	
Chromium	**<0.0330**	mg/L	0.100	0.0330	1	03/25/20 08:48	03/25/20 10:29	7440-47-3	
Lead	**<0.0330**	mg/L	0.100	0.0330	1	03/25/20 08:48	03/25/20 10:29	7439-92-1	
Selenium	**<0.0330**	mg/L	0.100	0.0330	1	03/25/20 08:48	03/25/20 10:29	7782-49-2	
Silver	**<0.0330**	mg/L	0.100	0.0330	1	03/25/20 08:48	03/25/20 10:29	7440-22-4	
Mercury 7470A TCLP	Analytical Method: EPA 7470A Preparation Method: 7470A Leachate Method/Date: 1311; 03/23/20 20:15								
Mercury	**<0.00330**	mg/L	0.0100	0.00330	1	03/25/20 08:20	03/25/20 11:19	7439-97-6	
SVOA (GC/MS) 8270C TCLP	Analytical Method: EPA 8270C Preparation Method: 3510C Leachate Method/Date: 1311; 03/23/20 20:15								
1,4-Dichlorobenzene	**<0.167**	mg/L	0.500	0.167	5	03/25/20 16:04	03/26/20 07:57	106-46-7	
2,4-Dinitrotoluene	**<0.167**	mg/L	0.500	0.167	5	03/25/20 16:04	03/26/20 07:57	121-14-2	
Hexachlorobenzene	**<0.167**	mg/L	0.500	0.167	5	03/25/20 16:04	03/26/20 07:57	118-74-1	
Hexachloro-1,3-butadiene	**<0.167**	mg/L	0.500	0.167	5	03/25/20 16:04	03/26/20 07:57	87-68-3	
Hexachloroethane	**<0.167**	mg/L	0.500	0.167	5	03/25/20 16:04	03/26/20 07:57	67-72-1	

REPORT OF LABORATORY ANALYSIS

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(317)228-3100

ANALYTICAL RESULTS

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

Sample: GC Tank **Lab ID: 50252134001** Collected: 03/16/20 09:30 Received: 03/17/20 09:30 Matrix: Water
Comments: • Semi Volatile Organic Compounds (GC/MS) by Method 8270C - Dilution due to matrix.

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
SVOA (GC/MS) 8270C TCLP	Analytical Method: EPA 8270C Preparation Method: 3510C Leachate Method/Date: 1311; 03/23/20 20:15								
Nitrobenzene	**<0.167**	mg/L	0.500	0.167	5	03/25/20 16:04	03/26/20 07:57	98-95-3	
Pyridine	**<0.167**	mg/L	0.500	0.167	5	03/25/20 16:04	03/26/20 07:57	110-86-1	
3&4-Methylphenol(m&p Cresol)	**<0.167**	mg/L	0.500	0.167	5	03/25/20 16:04	03/26/20 07:57		
2-Methylphenol(o-Cresol)	**<0.167**	mg/L	0.500	0.167	5	03/25/20 16:04	03/26/20 07:57	95-48-7	
Pentachlorophenol	**<0.167**	mg/L	0.500	0.167	5	03/25/20 16:04	03/26/20 07:57	87-86-5	
2,4,5-Trichlorophenol	**<0.167**	mg/L	0.500	0.167	5	03/25/20 16:04	03/26/20 07:57	95-95-4	
2,4,6-Trichlorophenol	**<0.167**	mg/L	0.500	0.167	5	03/25/20 16:04	03/26/20 07:57	88-06-2	
Surrogates									
2-Fluorophenol (S)	32.2	%	10.0-120		5	03/25/20 16:04	03/26/20 07:57	367-12-4	
Phenol-d5 (S)	32.7	%	10.0-120		5	03/25/20 16:04	03/26/20 07:57	4165-62-2	
Nitrobenzene-d5 (S)	52.1	%	10.0-127		5	03/25/20 16:04	03/26/20 07:57	4165-60-0	
2-Fluorobiphenyl (S)	52.3	%	10.0-130		5	03/25/20 16:04	03/26/20 07:57	321-60-8	
2,4,6-Tribromophenol (S)	59.5	%	10.0-155		5	03/25/20 16:04	03/26/20 07:57	118-79-6	
p-Terphenyl-d14 (S)	53.0	%	10.0-128		5	03/25/20 16:04	03/26/20 07:57	1718-51-0	
VOA (GC/MS) 8260D TCLP	Analytical Method: EPA 8260D Preparation Method: 8260D Leachate Method/Date: 1311; 03/21/20 15:57								
Benzene	**<0.0167**	mg/L	0.0500	0.0167	1	03/23/20 15:49	03/23/20 15:49	71-43-2	
Carbon tetrachloride	**<0.0167**	mg/L	0.0500	0.0167	1	03/23/20 15:49	03/23/20 15:49	56-23-5	
Chlorobenzene	**<0.0167**	mg/L	0.0500	0.0167	1	03/23/20 15:49	03/23/20 15:49	108-90-7	
Chloroform	**<0.0833**	mg/L	0.250	0.0833	1	03/23/20 15:49	03/23/20 15:49	67-66-3	
1,2-Dichloroethane	**<0.0167**	mg/L	0.0500	0.0167	1	03/23/20 15:49	03/23/20 15:49	107-06-2	
1,4-Dichlorobenzene	**<0.0167**	mg/L	0.0500	0.0167	1	03/23/20 15:49	03/23/20 15:49	106-46-7	
1,1-Dichloroethene	**<0.0167**	mg/L	0.0500	0.0167	1	03/23/20 15:49	03/23/20 15:49	75-35-4	
2-Butanone (MEK)	**28.5**	mg/L	0.500	0.167	1	03/23/20 15:49	03/23/20 15:49	78-93-3	CC
Tetrachloroethene	**<0.0167**	mg/L	0.0500	0.0167	1	03/23/20 15:49	03/23/20 15:49	127-18-4	
Trichloroethene	**<0.0167**	mg/L	0.0500	0.0167	1	03/23/20 15:49	03/23/20 15:49	79-01-6	
Vinyl chloride	**<0.0167**	mg/L	0.0500	0.0167	1	03/23/20 15:49	03/23/20 15:49	75-01-4	
Surrogates									
Toluene-d8 (S)	111	%	80.0-120		1	03/23/20 15:49	03/23/20 15:49	2037-26-5	
4-Bromofluorobenzene (S)	101	%	77.0-126		1	03/23/20 15:49	03/23/20 15:49	460-00-4	
1,2-Dichloroethane-d4 (S)	110	%	70.0-130		1	03/23/20 15:49	03/23/20 15:49	17060-07-0	
Wet Chemistry 1664A	Analytical Method: EPA 1664A Preparation Method: 1664A								
Oil and Grease	**31.8**	mg/L	5.00	1.16	1	03/25/20 08:01	03/25/20 13:53		P4
1010 Flashpoint,Closed Cup	Analytical Method: EPA 1010								
Flashpoint	**>200**	deg F			1		03/19/20 11:30		
Corrosivity Toward Steel	Analytical Method: EPA 1110A								
Corrosion Rate	**0.0850J**	mm/yr	6.35		1		03/27/20 11:57		
9045 pH Soil	Analytical Method: EPA 9045								
pH at 25 Degrees C	**6.4**	Std. Units	0.10	0.10	1		03/24/20 11:23		H3

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QUALITY CONTROL DATA

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

QC Batch: 1450384
QC Batch Method: 3510C
Analysis Method: EPA 8081B
Analysis Description: Pesticides (GC) 8081B TCLP
Associated Lab Samples: 50252134001

METHOD BLANK: R3513239-1 Matrix: Solid
Associated Lab Samples: 50252134001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
gamma-BHC (Lindane)	mg/L	<0.00167	0.00500	03/27/20 09:21	
Endrin	mg/L	<0.00167	0.00500	03/27/20 09:21	
Heptachlor	mg/L	<0.00167	0.00500	03/27/20 09:21	
Methoxychlor	mg/L	<0.00167	0.00500	03/27/20 09:21	
Heptachlor epoxide	mg/L	<0.00167	0.00500	03/27/20 09:21	
Chlordane (Technical)	mg/L	<0.00167	0.00500	03/27/20 09:21	
Toxaphene	mg/L	<0.00333	0.0100	03/27/20 09:21	
Decachlorobiphenyl (S)	%	110	10.0-128	03/27/20 09:21	
Tetrachloro-m-xylene (S)	%	97.5	10.0-127	03/27/20 09:21	

LABORATORY CONTROL SAMPLE: R3513239-2

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
gamma-BHC (Lindane)	mg/L	0.0100	0.0102	102	55.0-129	
Endrin	mg/L	0.0100	0.0100	100	57.0-134	
Heptachlor	mg/L	0.0100	0.00920	92.0	27.0-132	
Heptachlor epoxide	mg/L	0.0100	0.00977	97.7	57.0-130	
Methoxychlor	mg/L	0.0100	0.0151	151	54.0-155	P9
Decachlorobiphenyl (S)	%			103	10.0-128	
Tetrachloro-m-xylene (S)	%			99.1	10.0-127	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: R3513239-3 R3513239-4

Parameter	Units	L1199882-01 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
gamma-BHC (Lindane)	mg/L	ND	0.0100	0.0100	0.0106	0.0107	106	107	14.0-141	0.939	40	
Endrin	mg/L	ND	0.0100	0.0100	0.0107	0.0109	107	109	10.0-160	1.85	39	
Heptachlor	mg/L	ND	0.0100	0.0100	0.00978	0.00973	97.8	97.3	16.0-136	0.513	40	
Heptachlor epoxide	mg/L	ND	0.0100	0.0100	0.0102	0.0104	102	104	10.0-160	1.94	36	
Methoxychlor	mg/L	ND	0.0100	0.0100	0.0158	0.0166	158	166	10.0-160	4.94	34	MH,P9
Decachlorobiphenyl (S)	%						103	106	10.0-128			
Tetrachloro-m-xylene (S)	%						99.9	99.9	10.0-127			

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QUALITY CONTROL DATA

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

QC Batch: 1450100
QC Batch Method: 8151A
Associated Lab Samples: 50252134001

Analysis Method: EPA 8151A
Analysis Description: Chlorinated Herb. (GC) 8151A

METHOD BLANK: R3513061-1 Matrix: Solid
Associated Lab Samples: 50252134001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4-D	mg/L	<0.000667	0.00200	03/26/20 16:55	
2,4,5-TP (Silvex)	mg/L	<0.000667	0.00200	03/26/20 16:55	
2,4-DCAA (S)	%	80.8	14.0-158	03/26/20 16:55	

LABORATORY CONTROL SAMPLE: R3513061-2

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4,5-TP (Silvex)	mg/L	0.0500	0.0437	87.4	50.0-125	
2,4-D	mg/L	0.0500	0.0349	69.8	50.0-120	
2,4-DCAA (S)	%			90.6	14.0-158	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: R3513061-3 R3513061-4

Parameter	Units	L1199727-01 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
2,4,5-TP (Silvex)	mg/L	ND	0.0500	0.0500	0.0474	0.0488	94.8	97.6	50.0-125	2.91	20	
2,4-D	mg/L	ND	0.0500	0.0500	0.0381	0.0400	76.2	80.0	50.0-120	4.87	20	
2,4-DCAA (S)	%						88.6	81.2	14.0-158			

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QUALITY CONTROL DATA

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

QC Batch: 1449837
QC Batch Method: 3015
Associated Lab Samples: 50252134001

Analysis Method: EPA 6010B
Analysis Description: Metals (ICP) 6010B TCLP

METHOD BLANK: R3512375-1 Matrix: Solid
Associated Lab Samples: 50252134001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	mg/L	<0.0330	0.100	03/25/20 10:13	
Barium	mg/L	<0.0330	0.100	03/25/20 10:13	
Cadmium	mg/L	<0.0330	0.100	03/25/20 10:13	
Chromium	mg/L	<0.0330	0.100	03/25/20 10:13	
Lead	mg/L	0.0522J	0.100	03/25/20 10:13	J
Selenium	mg/L	<0.0330	0.100	03/25/20 10:13	
Silver	mg/L	<0.0330	0.100	03/25/20 10:13	

LABORATORY CONTROL SAMPLE: R3512375-2

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/L	10.0	9.35	93.5	80.0-120	
Barium	mg/L	10.0	9.42	94.2	80.0-120	
Cadmium	mg/L	10.0	9.46	94.6	80.0-120	
Chromium	mg/L	10.0	9.76	97.6	80.0-120	
Lead	mg/L	10.0	9.36	93.6	80.0-120	
Selenium	mg/L	10.0	9.34	93.4	80.0-120	
Silver	mg/L	2.00	1.79	89.7	80.0-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: R3512375-4 R3512375-5

Parameter	Units	L1199727-01 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/L	ND	10.0	10.0	9.46	9.42	94.6	94.2	75.0-125	0.410	20	
Barium	mg/L	0.331	10.0	10.0	9.82	9.75	94.9	94.2	75.0-125	0.659	20	
Cadmium	mg/L	ND	10.0	10.0	9.54	9.50	95.4	95.0	75.0-125	0.433	20	
Chromium	mg/L	ND	10.0	10.0	9.81	9.76	98.1	97.6	75.0-125	0.559	20	
Lead	mg/L	ND	10.0	10.0	9.32	9.30	92.7	92.5	75.0-125	0.220	20	
Selenium	mg/L	ND	10.0	10.0	9.45	9.40	94.5	94.0	75.0-125	0.557	20	
Silver	mg/L	ND	2.00	2.00	1.81	1.80	90.3	90.1	75.0-125	0.129	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: R3512375-6 R3512375-7

Parameter	Units	50252134001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/L	1.07	10.0	10.0	10.3	10.3	92.0	92.8	75.0-125	0.709	20	
Barium	mg/L	ND	10.0	10.0	9.57	9.58	95.7	95.8	75.0-125	0.132	20	

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QUALITY CONTROL DATA

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: R3512375-6 R3512375-7

Parameter	Units	50252134001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cadmium	mg/L	ND	10.0	10.0	9.42	9.45	94.2	94.5	75.0-125	0.252	20	
Chromium	mg/L	ND	10.0	10.0	9.74	9.78	97.4	97.8	75.0-125	0.374	20	
Lead	mg/L	ND	10.0	10.0	9.24	9.22	91.9	91.7	75.0-125	0.207	20	
Selenium	mg/L	ND	10.0	10.0	9.17	9.27	91.7	92.7	75.0-125	1.10	20	
Silver	mg/L	ND	2.00	2.00	1.78	1.77	89.0	88.4	75.0-125	0.695	20	

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QUALITY CONTROL DATA

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

QC Batch: 1449809
QC Batch Method: 7470A
Analysis Method: EPA 7470A
Analysis Description: Mercury 7470A TCLP
Associated Lab Samples: 50252134001

METHOD BLANK: R3512324-1 Matrix: Solid
Associated Lab Samples: 50252134001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/L	<0.00330	0.0100	03/25/20 11:15	

LABORATORY CONTROL SAMPLE: R3512324-2

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	0.0300	0.0290	96.8	80.0-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: R3512324-3 R3512324-4

Parameter	Units	50252134001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/L	ND	0.0300	0.0300	0.0285	0.0287	94.9	95.6	75.0-125	0.679	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: R3512324-5 R3512324-6

Parameter	Units	L1200978-02 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/L	ND	0.0300	0.0300	0.0282	0.0275	93.9	91.7	75.0-125	2.37	20	

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QUALITY CONTROL DATA

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

QC Batch: 1449707
QC Batch Method: 3510C
Analysis Method: EPA 8270C
Analysis Description: SVOA (GC/MS) 8270C TCLP
Associated Lab Samples: 50252134001

METHOD BLANK: R3512585-2
Matrix: Solid
Associated Lab Samples: 50252134001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,4-Dichlorobenzene	mg/L	<0.0333	0.100	03/25/20 23:50	
2,4-Dinitrotoluene	mg/L	<0.0333	0.100	03/25/20 23:50	
Hexachlorobenzene	mg/L	<0.0333	0.100	03/25/20 23:50	
Hexachloro-1,3-butadiene	mg/L	<0.0333	0.100	03/25/20 23:50	
Hexachloroethane	mg/L	<0.0333	0.100	03/25/20 23:50	
Nitrobenzene	mg/L	<0.0333	0.100	03/25/20 23:50	
2-Methylphenol(o-Cresol)	mg/L	<0.0333	0.100	03/25/20 23:50	
3&4-Methylphenol(m&p Cresol)	mg/L	<0.0333	0.100	03/25/20 23:50	
Pentachlorophenol	mg/L	<0.0333	0.100	03/25/20 23:50	
2,4,5-Trichlorophenol	mg/L	<0.0333	0.100	03/25/20 23:50	
2,4,6-Trichlorophenol	mg/L	<0.0333	0.100	03/25/20 23:50	
Pyridine	mg/L	<0.0333	0.100	03/25/20 23:50	
2-Fluorophenol (S)	%	33.8	10.0-120	03/25/20 23:50	
Phenol-d5 (S)	%	20.5	10.0-120	03/25/20 23:50	
Nitrobenzene-d5 (S)	%	48.3	10.0-127	03/25/20 23:50	
2-Fluorobiphenyl (S)	%	51.5	10.0-130	03/25/20 23:50	
2,4,6-Tribromophenol (S)	%	66	10.0-155	03/25/20 23:50	
p-Terphenyl-d14 (S)	%	63.7	10.0-128	03/25/20 23:50	

LABORATORY CONTROL SAMPLE: R3512585-1

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,4-Dichlorobenzene	mg/L	0.500	0.264	52.8	18.0-120	
2,4-Dinitrotoluene	mg/L	0.500	0.415	83.0	49.0-124	
Hexachlorobenzene	mg/L	0.500	0.353	70.6	44.0-120	
Hexachloro-1,3-butadiene	mg/L	0.500	0.288	57.6	19.0-120	
Hexachloroethane	mg/L	0.500	0.277	55.4	15.0-120	
Nitrobenzene	mg/L	0.500	0.284	56.8	27.0-120	
2-Methylphenol(o-Cresol)	mg/L	0.500	0.253	50.6	28.0-120	
3&4-Methylphenol(m&p Cresol)	mg/L	0.500	0.272	54.4	31.0-120	
Pentachlorophenol	mg/L	0.500	0.460	92.0	23.0-120	
2,4,5-Trichlorophenol	mg/L	0.500	0.338	67.6	44.0-120	
2,4,6-Trichlorophenol	mg/L	0.500	0.284	56.8	42.0-120	
Pyridine	mg/L	0.500	0.103	20.6	10.0-120	
2-Fluorophenol (S)	%			33.8	10.0-120	
Phenol-d5 (S)	%			21.5	10.0-120	
Nitrobenzene-d5 (S)	%			46.8	10.0-127	
2-Fluorobiphenyl (S)	%			57.7	10.0-130	
2,4,6-Tribromophenol (S)	%			77.5	10.0-155	
p-Terphenyl-d14 (S)	%			62.3	10.0-128	

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QUALITY CONTROL DATA

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: R3512585-3 R3512585-4

Parameter	Units	L1199727-01 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,4-Dichlorobenzene	mg/L	ND	0.500	0.500	0.257	0.235	51.4	47.0	17.0-120	8.94	40	
2,4-Dinitrotoluene	mg/L	ND	0.500	0.500	0.380	0.367	76.0	73.4	39.0-125	3.48	25	
Hexachlorobenzene	mg/L	ND	0.500	0.500	0.339	0.343	67.8	68.6	35.0-122	1.17	24	
Hexachloro-1,3-butadiene	mg/L	ND	0.500	0.500	0.302	0.287	60.4	57.4	12.0-120	5.09	34	
Hexachloroethane	mg/L	ND	0.500	0.500	0.274	0.257	54.8	51.4	10.0-120	6.40	40	
Nitrobenzene	mg/L	ND	0.500	0.500	0.294	0.276	58.8	55.2	12.0-120	6.32	30	
2-Methylphenol(o-Cresol)	mg/L	ND	0.500	0.500	0.247	0.233	49.4	46.6	10.0-120	5.83	30	
3&4-Methylphenol(m&p Cresol)	mg/L	ND	0.500	0.500	0.260	0.245	52.0	49.0	10.0-120	5.94	36	
Pentachlorophenol	mg/L	ND	0.500	0.500	0.428	0.417	85.6	83.4	10.0-128	2.60	37	
2,4,5-Trichlorophenol	mg/L	ND	0.500	0.500	0.324	0.316	64.8	63.2	33.0-120	2.50	31	
2,4,6-Trichlorophenol	mg/L	ND	0.500	0.500	0.278	0.272	55.6	54.4	26.0-120	2.18	31	
Pyridine	mg/L	ND	0.500	0.500	0.0746	0.104	14.9	20.8	10.0-120	32.9	37	
2-Fluorophenol (S)	%						33.6	32.8	10.0-120			
Phenol-d5 (S)	%						20.6	20.2	10.0-120			
Nitrobenzene-d5 (S)	%						50.7	47.3	10.0-127			
2-Fluorobiphenyl (S)	%						54.6	55.1	10.0-130			
2,4,6-Tribromophenol (S)	%						74.5	72.5	10.0-155			
p-Terphenyl-d14 (S)	%						61.8	60.1	10.0-128			

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REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

QUALITY CONTROL DATA

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

QC Batch: 1448595
QC Batch Method: 8260D
Analysis Method: EPA 8260D
Analysis Description: VOA (GC/MS) 8260D TCLP
Associated Lab Samples: 50252134001

METHOD BLANK: R3511655-3
Matrix: Solid
Associated Lab Samples: 50252134001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	mg/L	<0.0167	0.0500	03/23/20 10:01	
Carbon tetrachloride	mg/L	<0.0167	0.0500	03/23/20 10:01	
Chlorobenzene	mg/L	<0.0167	0.0500	03/23/20 10:01	
Chloroform	mg/L	<0.0833	0.250	03/23/20 10:01	
1,2-Dichloroethane	mg/L	<0.0167	0.0500	03/23/20 10:01	
1,1-Dichloroethene	mg/L	<0.0167	0.0500	03/23/20 10:01	
2-Butanone (MEK)	mg/L	<0.167	0.500	03/23/20 10:01	
Tetrachloroethene	mg/L	<0.0167	0.0500	03/23/20 10:01	
Trichloroethene	mg/L	<0.0167	0.0500	03/23/20 10:01	
Vinyl chloride	mg/L	<0.0167	0.0500	03/23/20 10:01	
1,4-Dichlorobenzene	mg/L	<0.0167	0.0500	03/23/20 10:01	
Toluene-d8 (S)	%	101	80.0-120	03/23/20 10:01	
4-Bromofluorobenzene (S)	%	90.3	77.0-126	03/23/20 10:01	
1,2-Dichloroethane-d4 (S)	%	114	70.0-130	03/23/20 10:01	

LABORATORY CONTROL SAMPLE & LCSD: R3511655-1 R3511655-2

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Benzene	mg/L	0.250	0.259	0.261	104	104	70.0-123	0.769	20	
Carbon tetrachloride	mg/L	0.250	0.256	0.279	102	112	68.0-126	8.60	20	
Chlorobenzene	mg/L	0.250	0.254	0.268	102	107	80.0-121	5.36	20	
Chloroform	mg/L	0.250	0.286	0.294	114	118	73.0-120	2.76	20	
1,2-Dichloroethane	mg/L	0.250	0.282	0.281	113	112	70.0-128	0.355	20	
1,1-Dichloroethene	mg/L	0.250	0.259	0.270	104	108	71.0-124	4.16	20	
2-Butanone (MEK)	mg/L	1.25	1.83	1.84	146	147	44.0-160	0.545	20	
Tetrachloroethene	mg/L	0.250	0.282	0.302	113	121	72.0-132	6.85	20	
Trichloroethene	mg/L	0.250	0.280	0.297	112	119	78.0-124	5.89	20	
Vinyl chloride	mg/L	0.250	0.255	0.274	102	110	67.0-131	7.18	20	
1,4-Dichlorobenzene	mg/L	0.250	0.227	0.243	90.8	97.2	79.0-120	6.81	20	
Toluene-d8 (S)	%				112	112	80.0-120			
4-Bromofluorobenzene (S)	%				92.9	94.7	77.0-126			
1,2-Dichloroethane-d4 (S)	%				118	116	70.0-130			

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Indianapolis, IN 46268
(317)228-3100

QUALITY CONTROL DATA

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

QC Batch: 1449747
QC Batch Method: 1664A
Analysis Method: EPA 1664A
Analysis Description: Wet Chemistry 1664A
Associated Lab Samples: 50252134001

METHOD BLANK: R3512429-1 Matrix: Water
Associated Lab Samples: 50252134001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Oil and Grease	mg/L	<1.16	5.00	03/25/20 11:01	

LABORATORY CONTROL SAMPLE & LCSD: R3512429-2 R3512429-3

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Oil and Grease	mg/L	40.0	37.6	36.9	94.0	92.3	78.0-114	1.88	20	

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QUALITY CONTROL DATA

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

QC Batch: 155156
QC Batch Method: EPA 1110A
Analysis Method: EPA 1110A
Analysis Description: 1110 Corrosivity Toward Steel
Associated Lab Samples: 50252134001

SAMPLE DUPLICATE: 746765

Parameter	Units	50252134001 Result	Dup Result	RPD	Max RPD	Qualifiers
Corrosion Rate	mm/yr	0.0850J	0.0840J		20	

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QUALITY CONTROL DATA

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

QC Batch: 553487 Analysis Method: EPA 9045
QC Batch Method: EPA 9045 Analysis Description: 9045 pH
Associated Lab Samples: 50252134001

SAMPLE DUPLICATE: 2552628

Parameter	Units	50252602001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	5.1	5.1	0	2	H3

SAMPLE DUPLICATE: 2552629

Parameter	Units	50252698001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	10.1	10.1	0	2	H3,PO

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(317)228-3100

QUALIFIERS

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

J - Estimated concentration at or above the LOD and below the LOQ.

LOD - Limit of Detection adjusted for dilution factor, percent moisture, initial weight and final volume.

LOQ - Limit of Quantitation adjusted for dilution factor, percent moisture, initial weight and final volume.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PAN	Pace Analytical National
PASI-I	Pace Analytical Services - Indianapolis
PASI-L	Pace Analytical Services - Melville

ANALYTE QUALIFIERS

CC	The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The result may be biased.
H3	Sample was received or analysis requested beyond the recognized method holding time.
J	Analyte detected below the reporting limit, therefore result is an estimate. This qualifier is also used for all TICs.
MH	Matrix spike recovery and/or matrix spike duplicate recovery was above laboratory control limits. Result may be biased high.
P4	Sample field preservation does not meet EPA or method recommendations for this analysis.
P9	RPD between the primary and confirmatory analysis exceeded 40%.
PO	The reported result is outside the range of the pH buffer solutions used to check the calibration of the pH meter.
ST	Surrogate recovery was above laboratory control limits. Results may be biased high.

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Indianapolis, IN 46268
(317)228-3100

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
50252134001	**GC Tank**				
50252134001	**GC Tank**	3510C	1450384	EPA 8081B	1450384
50252134001	**GC Tank**	8151A	1450100	EPA 8151A	1450100
50252134001	**GC Tank**	3015	1449837	EPA 6010B	1449837
50252134001	**GC Tank**	7470A	1449809	EPA 7470A	1449809
50252134001	**GC Tank**	3510C	1449707	EPA 8270C	1449707
50252134001	**GC Tank**	8260D	1448595	EPA 8260D	1448595
50252134001	**GC Tank**	1664A	1449747	EPA 1664A	1449747
50252134001	**GC Tank**	EPA 1010	552848		
50252134001	**GC Tank**	EPA 1110A	155156		
50252134001	**GC Tank**	EPA 9045	553487		

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CHAIN-OF-CUSTODY Analytical Request Document

Pace Analytical

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevent fields

WO# : 50252134

50252134

Company: RKHP	Billing Information: RKHP 1989 Oakes Rd Racine WI 53408
Address:	
Report To: RKHP	Email To:
Copy To: TRE Poppe Poppe 108 Heartland Trail Madison WI 53717	Site Collection Info/Address:
Customer Project Name/Number: KHP Condensate Tank 3/2020	State: WI County/City: Racine Time Zone Collected: [ ] PT [ ] MT [ ] CT [ ] ET
Phone: Email:	Site/Facility ID #: Compliance Monitoring? [ ] Yes [ ] No
Collected By (print): Scott Freimark	Purchase Order #: Quote #: DW PWS ID #: DW Location Code:
Collected By (signature):	Turnaround Date Required: Immediately Packed on Ice: [ ] Yes [ ] No
Sample Disposal: [ ] Dispose as appropriate [ ] Return [ ] Archive: _____ [ ] Hold: _____	Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day (Expedite Charges Apply) Field Filtered (if applicable): [ ] Yes [ ] No Analysis: _____

* Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Wastewater (WW), Product (P), Soil/Solid (SL), Oil (OL), Wipe (WP), Air (AR), Tissue (TS), Bioassay (B), Vapor (V), Other (OT)

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start) Date	Collected (or Composite Start) Time	Composite End Date	Composite End Time	Res Cl	# of Ctns	PH	Flashpoint	TRLA SVOC /Metals/Herb/Pests	TCLP VOC								Analyses
GC Tank	GC	G	3/16/20	0930	—	—		10	X	X	X	X								001

** Preservative Types: (1) nitric acid, (2) sulfuric acid, (3) hydrochloric acid, (4) sodium hydroxide, (5) zinc acetate, (6) methanol, (7) sodium bisulfate, (8) sodium thiosulfate, (9) hexane, (A) ascorbic acid, (B) ammonium sulfate, (C) ammonium hydroxide, (D) TSP, (U) Unpreserved, (O) Other _____

Lab Profile/Line:

Lab Sample Receipt Checklist:

Custody Seals Present/Intact	Y N NA
Custody Signatures Present	Y N NA
Collector Signature Present	Y N NA
Bottles Intact	Y N NA
Correct Bottles	Y N NA
Sufficient Volume	Y N NA
Samples Received on Ice	Y N NA
VOA - Headspace Acceptable	Y N NA
USDA Regulated Soils	Y N NA
Samples in Holding Time	Y N NA
Residual Chlorine Present	Y N NA
Cl Strips: _____	
Sample pH Acceptable	Y N NA
pH Strips: _____	
Sulfide Present	Y N NA
Lead Acetate Strips: _____	

LAB USE ONLY:
Lab Sample # / Comments:

see sovr

Customer Remarks / Special Conditions / Possible Hazards:

Type of Ice Used: Wet Blue Dry None

Packing Material Used:

Radchem sample(s) screened (<500 cpm): Y N NA

SHORT HOLDS PRESENT (<72 hours): Y N N/A

Lab Tracking #: 2478307

Samples received via: FEDEX UPS Client Courier Pace Courier

Lab Sample Temperature Info:
Temp Blank Received: Y N NA
Therm ID#: 8
Cooler 1 Temp Upon Receipt: 0.8 oC
Cooler 1 Therm Corr. Factor: 0.0 oC
Cooler 1 Corrected Temp: 0.5 oC
Comments:
1.0 1.3 017

Relinquished by/Company: (Signature)	Date/Time: 3/16/20 1200	Received by/Company: (Signature) fedex	Date/Time:
Relinquished by/Company: (Signature) fedex	Date/Time: 3-17 930	Received by/Company: (Signature)	Date/Time: 3-17 930
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:

MTJL LAB USE ONLY
Table #:
Acctnum:
Template:
Prelogin:
PM:
PB:

Trip Blank Received: Y N NA
HCL MeOH TSP Other

Non Conformance(s): YES / NO

Page: _____ of: _____

Pace Analytical

SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50252134

Date/Time and Initials of person examining contents: JH 3-17 1044

Courier: ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace ☐ Other _____

Tracking #: 7700 2791 4253 4139 4025 2967

Custody Seal on Cooler/Box Present: ☐ Yes ☒ No **Seals Intact:** ☐ Yes ☒ No

Packing Material: ☒ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other _____

Thermometer: 1 2 3 4 5 6 A (B) C D E F Ice Type: ☒ Wet ☐ Blue ☐ None | Samples collected today and on ice: ☐ Yes ☐ No ☒ N/A

Cooler Temperature: 01/0.5 1.0/1.0 1.3/1.3 0.7/0.7 Ice Visible in Sample Containers?: ☐ Yes ☒ No ☐ N/A

(Initial/Corrected) Temp should be above freezing to 6°C If temp. is Over 6°C or under 0°C, was the PM Notified?: ☐ Yes ☐ No ☒ N/A

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.		X	All containers needing acid/base pres. Have been checked?: **exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.** All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		X				
Chain of Custody Present:	X		Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			X
Chain of Custody Filled Out:	X		Dissolved Metals field filtered?:			X
Short Hold Time Analysis (<72hr)?: Analysis:		X	Headspace Wisconsin Sulfide			X
Time 5035A TC placed in Freezer or Short Holds To Lab:				Present	Absent	N/A
			Residual Chlorine Check (SVOC 625 Pest/PCB 608)		X	X 3-14-17
			Residual Chlorine Check (Total/Amenable/Free Cyanide)			X
Rush TAT Requested:		X	Headspace in VOA Vials (>6mm):			X
Containers Intact?:	X		Trip Blank Present?:		X	
Sample Labels (IDs/Dates/Times) Match COC?: Except TCs, which only require sample ID	X		Trip Blank Custody Seals?:		1	
Extra labels on Terracore Vials (soils only)?		X				

Comments:

COC PAGE 1 of 1

Sample Container Count

Sample Line Item	WGFU	SBS DI BK Kit R	DG9H VG9H	VOA VIALS (>6mm)	VG9U	DG9U	DG9T	AG0U	AG1H	AG1U	AG3S	BP1U	BP1N	BP2U	BP3U	BP3N	BP3F	BP3S	BP3B	BP3Z	CG3H					Matrix	pH <2	pH >9	pH>12
1										6					4											4			
2																													
3																													
4																													
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													

Container Codes

Glass

DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpres amber glass
DG9H	40mL HCl amber voa vial	AG1H	1L HCl amber glass
DG9M	40mL MeOH clear vial	AG1S	1L H2SO4 amber glass
DG9P	40mL TSP amber vial	AG1T	1L Na Thiosulfate amber glass
DG9S	40mL H2SO4 amber vial	AG1U	1liter unpres amber glass
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass
DG9U	40mL unpreserved **amber** vial	AG2S	500mL H2SO4 amber glass
VG9H	40mL HCl clear vial	AG2U	500mL unpres amber glass
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 amber glass
VG9U	40mL unpreserved **clear** vial	AG3U	250mL unpres amber glass
VGFX	40mL w/hexane wipe vial	BG1H	1L HCl clear glass
VSG	Headspace septa vial & HCl	BG1S	1L H2SO4 clear glass
WGKU	8oz unpreserved clear jar	BG1T	1L Na Thiosulfate clear glass
WGFU	4oz clear soil jar	BG1U	1L unpreserved glass
JGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass
CG3H	250mL clear glass HCl	BG3U	250mL Unpres Clear Glass

Plastic / Misc.

BP1A	1L NaOH, Asc Acid plastic
BP1N	1L HNO3 plastic
BP1S	1L H2SO4 plastic
BP1U	1L unpreserved plastic
BP1Z	1L NaOH, Zn, Ac
BP2A	500mL NaOH, Asc Acid plastic
BP2N	500mL HNO3 plastic
BP2O	500mL NaOH plastic
BP2S	500mL H2SO4 plastic
BP2U	500mL unpreserved plastic
BP2Z	500mL NaOH, Zn Ac
BP3B	250mL NaOH plastic
BP3N	250mL HNO3 plastic
BP3F	250mL HNO3 plastic (field filtered)
BP3U	250mL unpreserved plastic
BP3S	250mL H2SO4 plastic
BP3Z	250mL NaOH, Zn Ac plastic

AF	Air Filter
C	Air Cassettes
R	Terra core kit
SP5T	120mL Coliform Na Thiosulfate
U	Summa Can
ZPLC	Ziploc Bag

WT	Water
SL	Solid
NAL	Non-aqueous liquid
WP	Wipe

LMP6A/MH-15B
(10/2019)

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Kestrel Hawk Landfill
Racine, Wisconsin
Annual Leachate Monitoring
October 2019

Parameter	Units	LMP8A 10/24/2019 50239692001	LMP6A 10/24/2019 50239698002	MH-15B 10/24/2019 50239698001	Regulatory Limit per NR 661.24
pH, field	SU	7.47	7.40	7.47	<= 2 or >=12.5
Conductance, specific	µmhos/cm	2290	13400	2290	
Temperature	DegC	15.2	16.9	15.2	
Color, field		GREY	AMBER	GREY	
Odor, field		STRONG	STRONG	STRONG	
Turbidity, field		MOD	MOD	MOD	
Alkalinity as CaCO3, total	mg/L	1760	8340	980	
BOD	mg/L	436 j	254 j	21.3 j	
Chloride, total	mg/L	668	4570	63.4	
Cyanide, total	mg/L		0.034 j	< 0.0029	
Fluoride, total	mg/L	0.27 j-	1.3 j-	0.31 j-	
Gross alpha	pci/L		< 53.7 +-22.5	< 9.15 +-4.53	
Gross beta	pci/L		518 +-97.9	81.9 +-15.6	
Hardness as CaCO3, total	mg/L	905	641	762	
Nitrogen, ammonia, total	mg/L	156 j-	1470 j+	105 j+	
Nitrogen, nitrate + nitrite, total	mg/L		2.1	1.7	
Nitrogen, total kjeldahl	mg/L	161	1440 P4	14.0	
Oil and grease	mg/L	66.5	4.0 j	0.70 J	
Phenolics, total recoverable	mg/L		0.14 j+	< 0.0041 j+	
Phosphorus, total	mg/L	5.3	12.0 j	0.62	
Solids, total dissolved	mg/L		14200	1730	
Solids, total suspended	mg/L	1750	4	18	
Sulfate, total	mg/L	50.1	103	313	
Sulfide, dissolved	mg/L		< 1.2 j	< 1.2 j	
Antimony, total	µg/L		20.7	< 0.18	
Arsenic, total	µg/L		37.5	0.62	5,000
Beryllium, total	µg/L		5.4	< 0.89	
Cadmium, total	µg/L	2.1 j+	19.7 j+	< 0.03	1,000
Chromium, total	µg/L		935	1.5	5,000
Copper, total	µg/L		86.8	< 4.7	
Iron, total	µg/L	124000	10900	1200	
Lead, total	µg/L	50.6	101	< 0.11	5,000
Manganese, total	µg/L	549	145	92.1	
Mercury, total	µg/L	< 0.069 j-	< 0.069 j	< 0.069 j	200
Nickel, total	µg/L		1500	48.3	
Selenium, total	µg/L		19.0	< 0.24	1,000
Silver, total	µg/L		0.74	< 0.042	5,000
Sodium, total	µg/L	398000	3970000 B0	369000 B0	
Thallium, total	µg/L		< 0.24	< 0.049	
Zinc, total	µg/L		784	4.6 Ju	
2,4,5-T	µg/L		< 10.2	< 0.49	
2,4,5-TP (Silvex)	µg/L		< 10.3	< 0.49	1,000
2,4-D	µg/L		< 9.4	< 0.45	10,000
4,4'-DDD	µg/L		< 0.067	< 0.061	
4,4'-DDE	µg/L		< 0.06	< 0.055	
4,4'-DDT	µg/L		< 0.04	< 0.036	
Aldrin	µg/L		< 0.049	< 0.045	
alpha-BHC	µg/L		< 0.025	< 0.023	
Aroclor-1016	µg/L		< 0.072 j	< 0.072 j	
Aroclor-1221	µg/L		< 0.087	< 0.087	
Aroclor-1232	µg/L		< 0.077	< 0.077	
Aroclor-1242	µg/L		< 0.077	< 0.077	
Aroclor-1248	µg/L		< 0.064	< 0.064	
Aroclor-1254	µg/L		< 0.081	< 0.081	

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Parameter	Units	LMP8A 10/24/2019 50239692001	LMP6A 10/24/2019 50239698002	MH-15B 10/24/2019 50239698001	Regulatory Limit per NR 661.24
Aroclor-1260	µg/L		< 0.071 j	< 0.071 j	
Aroclor-1262	µg/L		< 0.1	< 0.1	
beta-BHC	µg/L		< 0.049	< 0.045	
Chlordane, technical	µg/L		< 0.3	< 0.27	30
delta-BHC	µg/L		< 0.044	< 0.04	
Dieldrin	µg/L		< 0.071	< 0.065	
Endosulfan I	µg/L		< 0.023 j	< 0.021 j	
Endosulfan II	µg/L		< 0.066	< 0.06	
Endosulfan sulfate	µg/L		< 0.045	< 0.041	
Endrin	µg/L		< 0.07	< 0.064	20
Endrin aldehyde	µg/L		< 0.076	< 0.069	
gamma-BHC (Lindane)	µg/L		< 0.031 j	< 0.028 j	400
Heptachlor	µg/L		< 0.042	< 0.038	8
Heptachlor Epoxide	µg/L		< 0.043	< 0.039	8
Methoxychlor	µg/L		< 0.27	< 0.24	10,000
Toxaphene	µg/L		< 0.62	< 0.57	500
1,2-Diphenylhydrazine	µg/L	< 18.4	< 18.4	< 3.7	
1-Methylnaphthalene	µg/L	< 12.2	< 12.2	< 2.4	
2,2'-Oxybis(1-Chloropropane)	µg/L	< 19.7	< 19.7	< 3.9	
2,3,4,6-Tetrachlorophenol	µg/L	< 24	< 24	< 4.8	2,000
2,4,5-Trichlorophenol	µg/L	< 24.5	< 24.5	< 4.9	400,000
2,4,6-Trichlorophenol	µg/L	< 23.8	< 23.8	< 4.8	
2,4-Dichlorophenol	µg/L	< 22	< 22 j	< 4.4 j	
2,4-Dimethylphenol	µg/L	< 23	< 23 j	< 4.6 j	
2,4-Dinitrophenol	µg/L	< 19.4	< 19.4 j	< 3.9 j	
2,4-Dinitrotoluene	µg/L	< 27.8	< 27.8	< 5.6	130
2,6-Dinitrotoluene	µg/L	< 21.8	< 21.8	< 4.4	
2-Chloronaphthalene	µg/L	< 10	< 10	< 2	
2-Chlorophenol	µg/L	< 21.2	< 21.2 j	< 4.2 j	
2-Methylnaphthalene	µg/L	< 10.1	< 10.1	< 2	
2-Methylphenol	µg/L	< 18.9	< 18.9 j	< 3.8 j	200,000
2-Nitroaniline	µg/L	< 29	< 29	< 5.8	
2-Nitrophenol	µg/L	< 26.4	< 26.4 j	< 5.3 j	
3&4-Methylphenol	µg/L	< 19.7	< 19.7 j	< 3.9 j	200,000
3,3'-Dichlorobenzidine	µg/L	< 18.9	< 18.9 j	< 3.8 j	
3-Nitroaniline	µg/L	< 25.2	< 25.2	< 5	
4,6-Dinitro-2-methylphenol	µg/L	< 29.2	< 29.2 j	< 5.8 j	
4-Bromophenyl-phenylether	µg/L	< 17.8	< 17.8	< 3.6	
4-Chloro-3-methylphenol	µg/L	< 27.2	< 27.2 j	< 5.4 j	
4-Chlorophenyl-p+D62henylether	µg/L	< 14.3	< 14.3	< 2.9	
4-Nitroaniline	µg/L	< 24.4	< 24.4 j	< 4.9 j	
4-Nitrophenol	µg/L	< 30.2	< 30.2	< 6	
Acenaphthene	µg/L	< 15.2	< 15.2	< 3	
Acenaphthylene	µg/L	< 16.6	< 16.6	< 3.3	
Acetophenone	µg/L	< 17.5	< 17.5	< 3.5	
Anthracene	µg/L	< 20.6	< 20.6	< 4.1	
Benzidine	µg/L	< 23.8	< 23.8 j	< 4.8 j	
Benzo(a)anthracene	µg/L	< 21.1	< 21.1	< 4.2	
Benzo(a)pyrene	µg/L	< 25.6	< 25.6	< 5.1	
Benzo(b)fluoranthene	µg/L	< 23.6	< 23.6	< 4.7	
Benzo(g,h,i)perylene	µg/L	< 25.2	< 25.2	< 5	
Benzo(k)fluoranthene	µg/L	< 24.8	< 24.8	< 5	
Benzyl Alcohol	µg/L	< 19.4	< 19.4 j	< 3.9 j	
bis(2-Chloroethoxy)methane	µg/L	< 18.8	< 18.8	< 3.8	

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bis(2-Chloroethyl)ether	µg/L	< 19.6	< 19.6 j	< 3.9 j	
bis(2-Ethylhexyl)phthalate	µg/L	483	< 25	48.4	
Butylbenzylphthalate	µg/L	< 24.2	< 24.2	< 4.8	
Chrysene	µg/L	< 20	< 20	< 4	
Dibenz(a,h)anthracene	µg/L	< 27	< 27	< 5.4	
Dibenzofuran	µg/L	< 16.2	< 16.2	< 3.2	
Diethylphthalate	µg/L	< 23.4	< 23.4	< 4.7	
Dimethylphthalate	µg/L	< 25.8	< 25.8	< 5.2	
di-n-butylphthalate	µg/L	< 32.8	< 32.8	< 6.6	
di-n-octylphthalate	µg/L	< 29.2	< 29.2	< 5.8	
Diphenylamine	µg/L	< 22.4	< 22.4	< 4.5	
Fluoranthene	µg/L	< 21.4	< 21.4	< 4.3	
Fluorene	µg/L	< 16.8	< 16.8	< 3.4	
Hexachlorobenzene	µg/L	< 19.6	< 19.6	< 3.9	130
Hexachlorocyclopentadiene	µg/L	< 7.8	< 7.8	< 1.6	
Hexachloroethane	µg/L	< 4.7	< 4.7	< 0.94	3,000
Indeno(1,2,3-cd)pyrene	µg/L	< 26.6	< 26.6	< 5.3	
Isophorone	µg/L	< 21.6	< 21.6	< 4.3	
Nitrobenzene	µg/L	< 20.6	< 20.6 j	< 4.1 j	2,000
n-Nitrosodimethylamine	µg/L	< 14.3	< 14.3 j	< 2.9 j	
n-Nitrosodi-n-Propylamine	µg/L	< 21.4	< 21.4	< 4.3	
n-Nitrosodiphenylamine	µg/L	< 22.4	< 22.4	< 4.5	
Pentachlorophenol	µg/L	< 22.4	< 22.4 j	< 4.5 j	100,000
Phenanthrene	µg/L	< 21.3	< 21.3	< 4.3	
Phenol	µg/L	< 12	< 12 j	< 2.4 j	
Pyrene	µg/L	< 21.6	< 21.6	< 4.3	
Pyridine	µg/L	< 10.3	< 10.3	< 2.1	5,000
1,1,1-Trichloroethane	µg/L	< 2.9	< 6.3 j	< 0.63 j	
1,1,2,2-Tetrachloroethane	µg/L		< 4.9 j	< 0.49 j	
1,1,2-Trichloroethane	µg/L	< 5.8	< 4.4 j	< 0.44 j	
1,1-Dichloroethane	µg/L	< 3.9	< 5.1 j	< 0.51 j	
1,1-Dichloroethene	µg/L	< 3.7	< 5.5 j	< 0.55 j	700
1,2-Dibromo-3-chloropropane	µg/L	< 4.9	< 8.2 j	< 0.82 j	
1,2-Dibromoethane	µg/L	< 5.7	< 4.9 j	< 0.49 j	
1,2-Dichlorobenzene	µg/L	< 4.1	< 4.8 j	< 0.48 j	
1,2-Dichloroethane	µg/L	< 3.3	< 5.1 j	< 0.51 j	500
1,2-Dichloropropane	µg/L	< 5.2	< 6.5 j	< 0.65 j	
1,3-Dichlorobenzene	µg/L	< 4.4	< 4.8 j	< 0.48 j	
1,4-Dichlorobenzene	µg/L	< 1.2	< 5.4 j	< 0.54 j	7,500
2-Butanone	µg/L	< 27	< 19.6 j	< 2 j	200,000
2-Chloroethylvinylether	µg/L		< 10.9 j	< 1.1 j	
Acetone	µg/L	< 100	126 j	< 1.7 j	
Acrolein	µg/L		< 185 j	< 18.5 j	
Acrylonitrile	µg/L		< 13.1 j	< 1.3 j	
Benzene	µg/L	< 3.1	< 5.1 j	< 0.51 j	500
Bromodichloromethane	µg/L	< 4.9	< 6.2 j	< 0.62 j	
Bromoform	µg/L	< 5.2	< 7.5 j	< 0.75 j	
Bromomethane	µg/L	< 6.7	< 11.5 j	< 1.2 j	
Carbon disulfide	µg/L	< 2.4	< 5.6 j	< 0.56 j	
Carbon tetrachloride	µg/L	< 2.8	< 5 j	< 0.5 j	500
Chlorobenzene	µg/L	< 4.4	< 5.4 j	< 0.54 j	100,000
Chlorodibromomethane	µg/L	< 6	< 5.3 j	< 0.53 j	
Chloroethane	µg/L	< 4.3	< 6.5 j	< 0.65 j	
Chloroform	µg/L	< 3.8	< 6.4 j	< 0.64 j	6,000

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Chloromethane	µg/L	< 7.7	< 10 j	< 1 j	
cis-1,2-Dichloroethene	µg/L	< 4.5	< 5 j	< 0.5 j	
cis-1,3-Dichloropropene	µg/L	< 5.1	< 5.6 j	< 0.56 j	
Dibromomethane	µg/L	< 7.9	< 5.5 j	< 0.55 j	
Dichlorodifluoromethane	µg/L	< 2.8	< 10 j	< 1 j	
Ethylbenzene	µg/L	< 3.6	7.7 j	< 0.54 j	
Fluorotrichloromethane	µg/L	< 1.6	< 6 j	< 0.6 j	
Methylene chloride	µg/L	< 6	< 9.7 j	< 0.97 j	
Methyl-tert-butyl-ether	µg/L	< 5.9	< 4.4 j	< 0.44 j	
Naphthalene	µg/L	< 4.5	< 6.4 j	< 0.64 j	
Styrene	µg/L	< 4.5	< 5.8 j	< 0.58 j	
Tetrachloroethene	µg/L	< 4.6	< 6.1 j	< 0.61 j	700
Tetrahydrofuran	µg/L	< 200	626 j	11.1 j	
Toluene	µg/L	< 0.7	8.2 j	< 0.51 j	
trans-1,2-dichloroethene	µg/L	< 3.9	< 4.9 j	< 0.49 j	
trans-1,3-dichloropropene	µg/L	< 5.9	< 5.7 j	< 0.57 j	
Trichloroethene	µg/L	< 2.4	< 6.3 j	< 0.63 j	500
Vinyl chloride	µg/L	< 1.8	< 7.2 j	< 0.72 j	200
Xylene, total	µg/L	< 3.9	< 10.6 j	< 1.1 j	

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Leachate volume pumped	1000 gal	355.580	22.890	855.220	
pH, field	SU	7.60	7.68	7.77	<= 2 or >=12.5
Conductance, specific	µmhos/cm	16600	6120	2370	
Temperature	DegC	12.3	11.6	10.5	
Color, field		BLACK	BROWN	NONE	
Odor, field		STRONG	STRONG	STRONG	
Turbidity, field		MOD	HIGH	NONE	
Alkalinity as CaCO3, total	mg/L	8650	1700	507	
BOD	mg/L	270 j	112 j	13.1 j	
Chloride, total	mg/L	5360	1310	399	
COD	mg/L	5360 j+		83.9 j+	
Cyanide, total	mg/L	0.024 j		< 0.0018	
Fluoride, total	mg/L	1.4	0.47	0.35	
Gross alpha	pci/L	< 101 +-50.0		< 6.80 +-3.61	
Gross beta	pci/L	562 +-117		17.7 +-4.00	
Hardness as CaCO3, total	mg/L	517	744	640	
Nitrogen, ammonia, total	mg/L	1530 j	280 j-	31.8 j-	
Nitrogen, nitrate + nitrite, total	mg/L	< 0.3		3.5	
Nitrogen, total kjeldahl	mg/L	1570 j	281 j	30.8 j	
Oil and grease	mg/L	0.79 Jj-	57.3 j-	< 0.57 j-	
Phenolics, total recoverable	mg/L	0.105 Jj		0.0126 j-	
Phosphorus, total	mg/L	13.8 j	4.9 j	0.11 j	
Solids, total dissolved	mg/L	13100		1210	
Solids, total suspended	mg/L	< 2.5	1350	< 2.5	
Sulfate, total	mg/L	7.1	99.2	81.5	
Sulfide, dissolved	mg/L	< 12 j		< 1.2 j	
Antimony, total	µg/L	13.4		2.0	
Arsenic, total	µg/L	26.0		2.1	5,000
Beryllium, total	µg/L	< 0.19		< 0.038	
Cadmium, total	µg/L	5.6	0.34 J	< 0.024	1,000
Chromium, total	µg/L	878		3.3	5,000
Copper, total	µg/L	71.6		< 4.8	
Iron, total	µg/L	8200	71200	490	
Lead, total	µg/L	84.8	12.3	< 0.15	5,000
Manganese, total	µg/L	75.4	304	84.2	
Mercury, total	µg/L	< 0.12	< 0.12	< 0.12	200
Nickel, total	µg/L	1310		21.2	
Selenium, total	µg/L	16.7 j-		< 0.27 j-	1,000
Silver, total	µg/L	0.52 J		< 0.04	5,000
Sodium, total	µg/L	3920000	924000	237000	
Thallium, total	µg/L	< 0.25		< 0.05	

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Zinc, total	µg/L	425		< 8.7	
2,4,5-T	µg/L	< 11.6 j-		< 0.58 j-	
2,4,5-TP (Silvex)	µg/L	< 12.8		< 0.64	1,000
2,4-D	µg/L	< 11.4		< 0.57	10,000
4,4'-DDD	µg/L	< 0.064		< 0.064	
4,4'-DDE	µg/L	< 0.057		< 0.057	
4,4'-DDT	µg/L	< 0.038		< 0.038	
Aldrin	µg/L	< 0.047		< 0.047	
alpha-BHC	µg/L	< 0.024		< 0.024	
Aroclor-1016	µg/L	< 0.069 j		< 0.069 j	
Aroclor-1221	µg/L	< 0.083 j		< 0.083 j	
Aroclor-1232	µg/L	< 0.073 j		< 0.073 j	
Aroclor-1242	µg/L	0.38 j		< 0.074 j	
Aroclor-1248	µg/L	< 0.061 j		< 0.061 j	
Aroclor-1254	µg/L	< 0.077 j		< 0.077 j	
Aroclor-1260	µg/L	< 0.068 j		< 0.068 j	
Aroclor-1262	µg/L	< 0.095 j		< 0.095 j	
beta-BHC	µg/L	< 0.047		< 0.047	
Chlordane, technical	µg/L	< 0.28		< 0.28	30
delta-BHC	µg/L	< 0.042		< 0.042	
Dieldrin	µg/L	< 0.068		< 0.068	
Endosulfan I	µg/L	< 0.022		< 0.022	
Endosulfan II	µg/L	< 0.063		< 0.063	
Endosulfan sulfate	µg/L	< 0.043		< 0.043	
Endrin	µg/L	< 0.067		< 0.067	20
Endrin aldehyde	µg/L	< 0.072		< 0.072	
gamma-BHC (Lindane)	µg/L	< 0.03		< 0.03	400
Heptachlor	µg/L	< 0.04		< 0.04	8
Heptachlor Epoxide	µg/L	< 0.041		< 0.041	8
Methoxychlor	µg/L	< 0.25		< 0.25	10,000
Toxaphene	µg/L	< 0.59		< 0.59	500
1,2-Diphenylhydrazine	µg/L	< 36.7	< 38.6	< 3.5	
1-Methylnaphthalene	µg/L	< 24.4	< 25.7	< 2.3	
2,2'-Oxybis(1-Chloropropane)	µg/L	< 39.4	< 41.5	< 3.8	
2,3,4,6-Tetrachlorophenol	µg/L	< 47.9	< 50.4	< 4.6	2,000
2,4,5-Trichlorophenol	µg/L	< 49	< 51.6	< 4.7	400,000
2,4,6-Trichlorophenol	µg/L	< 47.7	< 50.2	< 4.5	
2,4-Dichlorophenol	µg/L	< 43.9	< 46.2	< 4.2	
2,4-Dimethylphenol	µg/L	< 46.1	< 48.5	< 4.4	
2,4-Dinitrophenol	µg/L	< 38.7	< 40.7	< 3.7	
2,4-Dinitrotoluene	µg/L	< 55.6	< 58.5	< 5.3	130

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2,6-Dinitrotoluene	µg/L	< 43.7	< 46	< 4.2	
2-Chloronaphthalene	µg/L	< 20	< 21.1	< 1.9	
2-Chlorophenol	µg/L	< 42.5	< 44.7	< 4	
2-Methylnaphthalene	µg/L	< 20.2	< 21.3	< 1.9	
2-Methylphenol	µg/L	< 37.8	< 39.8	< 3.6	200,000
2-Nitroaniline	µg/L	< 58	< 61.1	< 5.5	
2-Nitrophenol	µg/L	< 52.7	< 55.5	< 5	
3&4-Methylphenol	µg/L	< 39.4	< 41.5	< 3.8	200,000
3,3'-Dichlorobenzidine	µg/L	< 37.8 j-	< 39.8 j-	< 3.6 j-	
3-Nitroaniline	µg/L	< 50.3	< 52.9	< 4.8	
4,6-Dinitro-2-methylphenol	µg/L	< 58.4	< 61.5	< 5.6	
4-Bromophenyl-phenylether	µg/L	< 35.5	< 37.4	< 3.4	
4-Chloro-3-methylphenol	µg/L	< 54.3	< 57.2	< 5.2	
4-Chlorophenyl-phenylether	µg/L	< 28.6	< 30.1	< 2.7	
4-Nitroaniline	µg/L	< 48.7 j-	< 51.3 j-	< 4.6 j-	
4-Nitrophenol	µg/L	< 60.5	< 63.7	< 5.8	
Acenaphthene	µg/L	< 30.4	< 32	< 2.9	
Acenaphthylene	µg/L	< 33.2	< 34.9	< 3.2	
Acetophenone	µg/L	< 35	< 36.8	< 3.3	
Anthracene	µg/L	< 41.1	< 43.3	< 3.9	
Benzidine	µg/L	< 47.5 j-	< 50 j-	< 4.5 j-	
Benzo(a)anthracene	µg/L	< 42.2	< 44.4	< 4	
Benzo(a)pyrene	µg/L	< 51.3	< 54	< 4.9	
Benzo(b)fluoranthene	µg/L	< 47.1	< 49.6	< 4.5	
Benzo(g,h,i)perylene	µg/L	< 50.5	< 53.2	< 4.8	
Benzo(k)fluoranthene	µg/L	< 49.5	< 52.1	< 4.7	
Benzyl Alcohol	µg/L	< 38.7	< 40.7	< 3.7	
bis(2-Chloroethoxy)methane	µg/L	< 37.7	< 39.7	< 3.6	
bis(2-Chloroethyl)ether	µg/L	< 39.1	< 41.2	< 3.7	
bis(2-Ethylhexyl)phthalate	µg/L	< 49.9	593	< 4.8	
Butylbenzylphthalate	µg/L	< 48.5	< 51.1	< 4.6	
Chrysene	µg/L	< 39.9	< 42	< 3.8	
Dibenz(a,h)anthracene	µg/L	< 53.9	< 56.7	< 5.1	
Dibenzofuran	µg/L	< 32.4	< 34.1	< 3.1	
Diethylphthalate	µg/L	< 46.8	< 49.3	< 4.5	
Dimethylphthalate	µg/L	< 51.6	< 54.3	< 4.9	
di-n-butylphthalate	µg/L	< 65.6	< 69.1	< 6.2	
di-n-octylphthalate	µg/L	< 58.3	< 61.4	< 5.6	
Diphenylamine	µg/L	< 44.7	< 47.1	< 4.3	
Fluoranthene	µg/L	< 42.9	< 45.2	< 4.1	
Fluorene	µg/L	< 33.6	< 35.4	< 3.2	
Hexachlorobenzene	µg/L	< 39.1	< 41.2	< 3.7	130
Hexachlorocyclopentadiene	µg/L	< 15.6	< 16.4	< 1.5	
Hexachloroethane	µg/L	< 9.4	< 9.9	< 0.9	3,000

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Indeno(1,2,3-cd)pyrene	µg/L	< 53.2	< 56	< 5.1	
Isophorone	µg/L	< 43.3	< 45.6	< 4.1	
Nitrobenzene	µg/L	< 41.2	< 43.4	< 3.9	2,000
n-Nitrosodimethylamine	µg/L	< 28.6	< 30.1	< 2.7	
n-Nitrosodi-n-Propylamine	µg/L	< 42.7	< 44.9	< 4.1	
n-Nitrosodiphenylamine	µg/L	< 44.9	< 47.3	< 4.3	
Pentachlorophenol	µg/L	< 44.7	< 47.1	< 4.3	100,000
Phenanthrene	µg/L	< 42.6	< 44.8	< 4.1	
Phenol	µg/L	< 24	< 25.3	< 2.3	
Pyrene	µg/L	< 43.2	< 45.5	< 4.1	
Pyridine	µg/L	< 20.6	< 21.7	< 2	5,000
1,1,1,2-Tetrachloroethane	µg/L	< 2.7		< 0.27	
1,1,1-Trichloroethane	µg/L	< 2.3	< 2.2	< 0.23	
1,1,2-Trichloroethane	µg/L	< 1.9	< 2.5	< 0.19	
1,1-Dichloroethane	µg/L	< 3.4	< 3.4	< 0.34	
1,1-Dichloroethene	µg/L	< 6.7	< 2.6	< 0.67	700
1,2-Dibromo-3-chloropropane	µg/L	< 10	< 6.1	< 1	
1,2-Dibromoethane	µg/L	< 2.3	< 1.9	< 0.23	
1,2-Dichlorobenzene	µg/L	< 2.8	< 2.8	< 0.28	
1,2-Dichloroethane	µg/L	< 2.1	< 2.7	< 0.21	500
1,2-Dichloropropane	µg/L	< 3.8	< 3.6	< 0.38	
1,3-Dichlorobenzene	µg/L	< 3.2	< 3.3	< 0.32	
1,4-Dichlorobenzene	µg/L	< 2.8	< 3.3	< 0.28	7,500
2-Butanone	µg/L	< 13.2	< 14.1	7.3	200,000
2-Chloroethylvinylether	µg/L	< 4.4		< 0.44	
Acetone	µg/L	< 70.1	< 36.5	27.5	
Acrolein	µg/L	< 164		< 16.4	
Acrylonitrile	µg/L	< 12.5		< 1.2	
Benzene	µg/L	5.8 J	< 3.5	< 0.34	500
Bromodichloromethane	µg/L	< 8.7	< 2.8	< 0.87	
Bromoform	µg/L	< 2.1	< 2.1	< 0.21	
Bromomethane	µg/L	< 9 j	< 4.6 j	< 0.9 j	
Carbon disulfide	µg/L	< 9.2	< 2.6	< 0.92	
Carbon tetrachloride	µg/L	< 3.1	< 2.2	< 0.31	500
Chlorobenzene	µg/L	< 3.3	< 3.4	< 0.33	100,000
Chlorodibromomethane	µg/L	< 2.5	< 2.6	< 0.25	
Chloroethane	µg/L	< 4.5	< 7.2	< 0.45	
Chloroform	µg/L	< 9.9	< 3.9	< 0.99	6,000
Chloromethane	µg/L	< 9.2	< 4.2	< 0.92	
cis-1,2-Dichloroethene	µg/L	< 8.7	< 3.6	< 0.87	
cis-1,3-Dichloropropene	µg/L	< 3.2	< 3.1	< 0.32	
Dibromomethane	µg/L	< 2.9	< 2.6	< 0.29	
Dichlorodifluoromethane	µg/L	< 2.4 j	< 7.4 j	< 0.24 j	

Kestrel Hawk Landfill
Racine, Wisconsin
Annual Leachate Monitoring
October 2020

PARAMETER	UNITS	LMP6A 10/27/2020 50271483002	LMP8A 10/27/2020 50271486001	MH-15B 10/27/2020 50271483001	Regulatory Limit per NR 661.24
Ethylbenzene	µg/L	9.5 J	< 3.1	< 0.29	
Fluorotrichloromethane	µg/L	< 3.6	< 3.4	< 0.36	
Methylene chloride	µg/L	< 6.7	< 7.9	< 0.67	
Methyl-tert-butyl-ether	µg/L	< 2.5	< 1.8	< 0.25	
Naphthalene	µg/L	6.4	< 1.4	< 0.16	
Styrene	µg/L	< 3.4	< 3.2	< 0.34	
Tetrachloroethene	µg/L	< 2.1	< 2.4	< 0.21	700
Tetrahydrofuran	µg/L	864	60.1 J	10.5	
Toluene	µg/L	18.4	< 3.3	< 0.31	
trans-1,2-dichloroethene	µg/L	< 8.7	< 3.7	< 0.87	
trans-1,3-dichloropropene	µg/L	< 2.4	< 2.4	< 0.24	
Trichloroethene	µg/L	< 3.7	< 3.4	< 0.37	500
Vinyl chloride	µg/L	< 4.2	< 4.5	< 0.42	200
Xylene, total	µg/L	< 13	< 7.1	< 1.3	

Material Data Sheets

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safety-kleen
A Clean Harbors Company

WASTE MATERIAL PROFILE SHEET

Profile No. 2008011

A. GENERAL INFORMATION

GENERATOR EPA ID #/REGISTRATION # ***WID076171008*** GENERATOR NAME: ***Kestrel Hawk***

GENERATOR CODE (Assigned by Clean Harbors) ***KE19224*** CITY ***Racine*** STATE/PROVINCE ***WI*** ZIP/POSTAL CODE ***53406***

ADDRESS ***1969 Oakes Rd*** PHONE: **(262) 770-1316**

CUSTOMER CODE (Assigned by Clean Harbors) ***RE24836*** CUSTOMER NAME: ***Republic Services***

ADDRESS ***1969 Oakes Rd*** CITY ***Racine*** STATE/PROVINCE ***WI*** ZIP/POSTAL CODE ***53406***

B. WASTE DESCRIPTION

WASTE DESCRIPTION: ***LEACHATE PCB OIL***

PROCESS GENERATING WASTE: **LEACHATE COLLECTED FROM HAZARDOUS WASTE LANDFILL**

IS THIS WASTE CONTAINED IN SMALL PACKAGING CONTAINED WITHIN A LARGER SHIPPING CONTAINER ? **No**

C. PHYSICAL PROPERTIES (at 25C or 77F)

PHYSICAL STATE
- SOLID WITHOUT FREE LIQUID
- POWDER
- MONOLITHIC SOLID
- [x] LIQUID WITH NO SOLIDS
- LIQUID/SOLID MIXTURE
- % FREE LIQUID
- % SETTLED SOLID
- % TOTAL SUSPENDED SOLID
- SLUDGE
- GAS/AEROSOL

NUMBER OF PHASES/LAYERS

[x] 1 2 3

% BY VOLUME (Approx.)

TOP ***0.00***

MIDDLE ***0.00***

BOTTOM ***0.00***

VISCOSITY (If liquid present)
- 1 - 100 (e.g. Water)
- [x] 101 - 500 (e.g. Motor Oil)
- 501 - 10,000 (e.g. Molasses)
- > 10,000

COLOR

VARIES

ODOR
- [x] NONE
- MILD
- STRONG

Describe:

BOILING POINT °F (°C)
- <= 95 (<=35)
- 95 - 100 (35-38)
- 101 - 129 (38-54)
- [x] >= 130 (>54)

MELTING POINT °F (°C)
- < 140 (<60)
- 140-200 (60-93)
- > 200 (>93)

TOTAL ORGANIC CARBON
- <= 1%
- 1-9%
- [x] >= 10%

FLASH POINT °F (°C)
- < 73 (<23)
- 73 - 100 (23-38)
- 101 -140 (38-60)
- 141 -200 (60-93)
- [x] > 200 (>93)

pH
- <= 2
- 2.1 - 6.9
- [x] 7 (Neutral)
- 7.1 - 12.4
- >= 12.5

SPECIFIC GRAVITY
- < 0.8 (e.g. Gasoline)
- [x] 0.8-1.0 (e.g. Ethanol)
- 1.0 (e.g. Water)
- 1.0-1.2 (e.g. Antifreeze)
- > 1.2 (e.g. Methylene Chloride)

ASH
- < 0.1
- 0.1 - 1.0
- 1.1 - 5.0
- 5.1 - 20.0
- > 20
- [x] Unknown

BTU/LB (MJ/kg)
- < 2,000 (<4.6)
- 2,000-5,000 (4.6-11.6)
- 5,000-10,000 (11.6-23.2)
- [x] > 10,000 (>23.2)

Actual:

D. COMPOSITION (List the complete composition of the waste, include any inert components and/or debris. Ranges for individual components are acceptable. If a trade name is used, please supply an MSDS. Please do not use abbreviations.)

CHEMICAL	MIN	--	MAX	UOM
PETROLEUM OIL	0.0000000	--	100.0000000	%
POLYCHLORINATED BIPHENYL	500.0000000	--	1200.0000000	PPM

DOES THIS WASTE CONTAIN ANY HEAVY GAUGE METAL DEBRIS OR OTHER LARGE OBJECTS (EX., METAL PLATE OR PIPING >1/4" THICK OR >12" LONG, METAL REINFORCED HOSE >12" LONG, METAL WIRE >12" LONG, METAL VALVES, PIPE FITTINGS, CONCRETE REINFORCING BAR OR PIECES OF CONCRETE >3")? YES NO

If yes, describe, including dimensions:

DOES THIS WASTE CONTAIN ANY METALS IN POWDERED OR OTHER FINELY DIVIDED FORM? YES [x] NO

DOES THIS WASTE CONTAIN OR HAS IT CONTACTED ANY OF THE FOLLOWING; ANIMAL WASTES, HUMAN BLOOD, BLOOD PRODUCTS, BODY FLUIDS, MICROBIOLOGICAL WASTE, PATHOLOGICAL WASTE, HUMAN OR ANIMAL DERIVED SERUMS OR PROTEINS OR ANY OTHER POTENTIALLY INFECTIOUS MATERIAL? YES [x] NO

I acknowledge that this waste material is neither infectious nor does it contain any organism known to be a threat to human health. This certification is based on my knowledge of the material. Select the answer below that applies:

The waste was never exposed to potentially infectious material. YES NO

Chemical disinfection or some other form of sterilization has been applied to the waste. YES NO

I ACKNOWLEDGE THAT THIS PROFILE MEETS THE CLEAN HARBORS BATTERY PACKAGING REQUIREMENTS. YES NO

I ACKNOWLEDGE THAT MY FRIABLE ASBESTOS WASTE IS DOUBLE BAGGED AND WETTED. YES NO

SPECIFY THE SOURCE CODE ASSOCIATED WITH THE WASTE. ***G26*** SPECIFY THE FORM CODE ASSOCIATED WITH THE WASTE. ***W205***

E. CONSTITUENTS

Are these values based on testing or knowledge? ☑ Knowledge ☐ Testing

If based on knowledge, please describe in detail, the rationale applied to identify and characterize the waste material. Please include reference to Material Safety Data Sheets (MSDS) when applicable. Include the chemical or trade-name represented by the MSDS, and or detailed process or operating procedures which generate the waste.

CUSTOMER KNOWLEDGE OF WASTE STREAM

Please indicate which constituents below apply. Concentrations must be entered when applicable to assist in accurate review and expedited approval of your waste profile. Please note that the total regulated metals and other constituents sections require answers.

RCRA	REGULATED METALS	REGULATORY LEVEL (mg/l)	TCLP mg/l	TOTAL	UOM	NOT APPLICABLE
D004	ARSENIC	5.0				☑
D005	BARIUM	100.0				☑
D006	CADMIUM	1.0				☑
D007	CHROMIUM	5.0				☑
D008	LEAD	5.0				☑
D009	MERCURY	0.2				☑
D010	SELENIUM	1.0				☑
D011	SILVER	5.0				☑
	VOLATILE COMPOUNDS					
D018	BENZENE	0.5				
D019	CARBON TETRACHLORIDE	0.5				
D021	CHLOROBENZENE	100.0				
D022	CHLOROFORM	6.0				
D028	1,2-DICHLOROETHANE	0.5				
D029	1,1-DICHLOROETHYLENE	0.7				
D035	METHYL ETHYL KETONE	200.0				
D039	TETRACHLOROETHYLENE	0.7				
D040	TRICHLOROETHYLENE	0.5				
D043	VINYL CHLORIDE	0.2				
	SEMI-VOLATILE COMPOUNDS					
D023	o-CRESOL	200.0				
D024	m-CRESOL	200.0				
D025	p-CRESOL	200.0				
D026	CRESOL (TOTAL)	200.0				
D027	1,4-DICHLOROBENZENE	7.5				
D030	2,4-DINITROTOLUENE	0.13				
D032	HEXACHLOROBENZENE	0.13				
D033	HEXACHLOROBUTADIENE	0.5				
D034	HEXACHLOROETHANE	3.0				
D036	NITROBENZENE	2.0				
D037	PENTACHLOROPHENOL	100.0				
D038	PYRIDINE	5.0				
D041	2,4,5-TRICHLOROPHENOL	400.0				
D042	2,4,6-TRICHLOROPHENOL	2.0				
	PESTICIDES AND HERBICIDES					
D012	ENDRIN	0.02				
D013	LINDANE	0.4				
D014	METHOXYCHLOR	10.0				
D015	TOXAPHENE	0.5				
D016	2,4-D	10.0				
D017	2,4,5-TP (SILVEX)	1.0				
D020	CHLORDANE	0.03				
D031	HEPTACHLOR (AND ITS EPOXIDE)	0.008				

OTHER CONSTITUENTS	MAX	UOM	NOT APPLICABLE
BROMINE			☑
CHLORINE			☑
FLUORINE			☑
IODINE			☑
SULFUR			☑
POTASSIUM			☑
SODIUM			☑
AMMONIA			☑
CYANIDE AMENABLE			☑
CYANIDE REACTIVE			☑
CYANIDE TOTAL			☑
SULFIDE REACTIVE			☑

HOCs

☐ NONE
☑ < 1000 PPM
☐ >= 1000 PPM

PCBs

☐ NONE
☐ < 50 PPM
☑ >=50 PPM

IF PCBS ARE PRESENT, IS THE WASTE REGULATED BY TSCA 40 CFR 761?

☑ YES ☐ NO

ADDITIONAL HAZARDS

DOES THIS WASTE HAVE ANY UNDISCLOSED HAZARDS OR PRIOR INCIDENTS ASSOCIATED WITH IT, WHICH COULD AFFECT THE WAY IT SHOULD BE HANDLED?

YES ☑ NO (If yes, explain)

CHOOSE ALL THAT APPLY

DEA REGULATED SUBSTANCES	EXPLOSIVE	FUMING	OSHA REGULATED CARCINOGENS
POLYMERIZABLE	RADIOACTIVE	REACTIVE MATERIAL	☑ NONE OF THE ABOVE

F. REGULATORY STATUS

- [x] YES [ ] NO USEPA HAZARDOUS WASTE?
  F039
- [x] YES [ ] NO DO ANY STATE WASTE CODES APPLY?
  731 B001 B003 CR01 IL05 MA02
  Texas Waste Code
- [ ] YES [x] NO DO ANY CANADIAN PROVINCIAL WASTE CODES APPLY?
- [x] YES [ ] NO IS THIS WASTE PROHIBITED FROM LAND DISPOSAL WITHOUT FURTHER TREATMENT PER 40 CFR PART 268?
  LDR CATEGORY: ***This is subject to LDR.***
  VARIANCE INFO:
- [ ] YES [x] NO IS THIS A UNIVERSAL WASTE?
- [ ] YES [ ] NO IS THE GENERATOR OF THE WASTE CLASSIFIED AS A VERY SMALL QUANTITY GENERATOR (VSQG) OR A STATE EQUIVALENT DESIGNATION?
- [ ] YES [x] NO IS THIS MATERIAL GOING TO BE MANAGED AS A RCRA EXEMPT COMMERCIAL PRODUCT, WHICH IS FUEL (40 CFR 261.2 (C)(2)(II))?
- [ ] YES [x] NO DOES TREATMENT OF THIS WASTE GENERATE A F006 OR F019 SLUDGE?
- [ ] YES [ ] NO IS THIS WASTE STREAM SUBJECT TO THE INORGANIC METAL BEARING WASTE PROHIBITION FOUND AT 40 CFR 268.3(C)?
- [ ] YES [x] NO DOES THIS WASTE CONTAIN VOC'S IN CONCENTRATIONS >=500 PPM?
- [ ] YES [x] NO DOES THE WASTE CONTAIN GREATER THAN 20% OF ORGANIC CONSTITUENTS WITH A VAPOR PRESSURE >= .3KPA (.044 PSIA)?
- [ ] YES [x] NO DOES THIS WASTE CONTAIN AN ORGANIC CONSTITUENT WHICH IN ITS PURE FORM HAS A VAPOR PRESSURE > 76.6 KPA (11.1 PSIA)?
- [ ] YES [x] NO IS THIS CERCLA REGULATED (SUPERFUND) WASTE ?
- [ ] YES [x] NO IS THE WASTE SUBJECT TO ONE OF THE FOLLOWING NESHAP RULES?
  Hazardous Organic NESHAP (HON) rule (subpart G) Pharmaceuticals production (subpart GGG)
- [ ] YES [x] NO IF THIS IS A US EPA HAZARDOUS WASTE, DOES THIS WASTE STREAM CONTAIN BENZENE?
  - [ ] YES [ ] NO Does the waste stream come from a facility with one of the SIC codes listed under benzene NESHAP or is this waste regulated under the benzene NESHAP rules because the original source of the waste is from a chemical manufacturing, coke by-product recovery, or petroleum refinery process?
  - [ ] YES [ ] NO Is the generating source of this waste stream a facility with Total Annual Benzene (TAB) >10 Mg/year?

  What is the TAB quantity for your facility? _____ Megagram/year (1 Mg = 2,200 lbs)

  The basis for this determination is: Knowledge of the Waste Or Test Data Knowledge Testing

  Describe the knowledge :

G. DOT/TDG INFORMATION

DOT/TDG PROPER SHIPPING NAME:

UN3432, WASTE POLYCHLORINATED BIPHENYLS, SOLID, 9, PG III

H. TRANSPORTATION REQUIREMENTS

ESTIMATED SHIPMENT FREQUENCY ONE TIME WEEKLY MONTHLY QUARTERLY [x] YEARLY OTHER

[x] **CONTAINERIZED**

1-1 CONTAINERS/SHIPMENT

STORAGE CAPACITY: ***1***

CONTAINER TYPE:

PORTABLE TOTE TANK BOX|CARTON|CASE

CUBIC YARD BOX [x] DRUM

OTHER:

DRUM SIZE: ***55***

BULK LIQUID

GALLONS/SHIPMENT: ***0 Min -0 Max*** GAL.

BULK SOLID

SHIPMENT UOM: TON YARD

TONS/YARDS/SHIPMENT: ***0 Min - 0 Max***

I. SPECIAL REQUEST

COMMENTS OR REQUESTS:

GENERATOR'S CERTIFICATION

I certify that I am authorized to execute this document as an authorized agent. I hereby certify that all information submitted in this and attached documents is correct to the best of my knowledge.I also certify that any samples submitted are representative of the actual waste.If Clean Harbors discovers a discrepancy during the approval process, Generator grants Clean Harbors the authority to amend the profile, as Clean Harbors deems necessary, to reflect the discrepancy.

AUTHORIZED SIGNATURE NAME (PRINT) TITLE DATE

SAFETY DATA SHEET

Section 1. Identification

Product name	Castrol AP Gear 80W-90
SDS #	460826
Code	460826-US06

Relevant identified uses of the substance or mixture and uses advised against

Product use	Gear lubricant . For specific application advice see appropriate Technical Data Sheet or consult our company representative.
Supplier	BP Lubricants USA Inc. 1500 Valley Road Wayne, NJ 07470 Telephone: (973) 633-2200
EMERGENCY HEALTH INFORMATION:	1 (800) 447-8735 Outside the US: +1 703-527-3887 (CHEMTREC)
EMERGENCY SPILL INFORMATION:	1 (800) 424-9300 CHEMTREC (USA)
OTHER PRODUCT INFORMATION	1 (866) 4 BP - MSDS (866-427-6737 Toll Free - North America) email: bpcares@bp.com

Section 2. Hazards identification

OSHA/HCS status	This material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Classification of the substance or mixture	Not classified.

GHS label elements

Signal word	No signal word.
Hazard statements	No known significant effects or critical hazards.

Precautionary statements

General	Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand.
Prevention	Not applicable.
Response	Not applicable.
Storage	Not applicable.
Disposal	Not applicable.
Hazards not otherwise classified	Defatting to the skin.

Section 3. Composition/information on ingredients

Highly refined base oil (IP 346 DMSO extract < 3%). Proprietary performance additives.

Substance/mixture Mixture

Ingredient name	CAS number	%
Base oil - highly refined	Varies - See Key to abbreviations	≥90
Amines, C12-14-tert-alkyl	68955-53-3	≤0.3

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Check for and remove any contact lenses. Get medical attention.

Skin contact Wash skin thoroughly with soap and water or use recognized skin cleanser. Remove contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention if symptoms occur.

Inhalation If inhaled, remove to fresh air. Get medical attention if symptoms occur.

Ingestion Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.

Protection of first-aiders No action shall be taken involving any personal risk or without suitable training.

Most important symptoms/effects, acute and delayed

See Section 11 for more detailed information on health effects and symptoms.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician Treatment should in general be symptomatic and directed to relieving any effects.

Specific treatments No specific treatment.

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media In case of fire, use foam, dry chemical or carbon dioxide extinguisher or spray.

Unsuitable extinguishing media Do not use water jet.

Specific hazards arising from the chemical In a fire or if heated, a pressure increase will occur and the container may burst.

Hazardous combustion products Combustion products may include the following:
carbon dioxide
carbon monoxide

Special protective actions for fire-fighters Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters Fire-fighters should wear positive pressure self-contained breathing apparatus (SCBA) and full turnout gear.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Put on appropriate personal protective equipment. Floors may be slippery; use care to avoid falling.
For emergency responders	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
Environmental precautions	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill	Stop leak if without risk. Move containers from spill area. Absorb with an inert material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
Large spill	Stop leak if without risk. Move containers from spill area. Prevent entry into sewers, water courses, basements or confined areas. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations. Dispose of via a licensed waste disposal contractor.

Section 7. Handling and storage

Precautions for safe handling

Protective measures	Put on appropriate personal protective equipment (see Section 8).
Advice on general occupational hygiene	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Wash thoroughly after handling. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
Conditions for safe storage, including any incompatibilities	Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Store and use only in equipment/containers designed for use with this product. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.
Not suitable	Prolonged exposure to elevated temperature

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Base oil - highly refined	**ACGIH TLV (United States).** TWA: 5 mg/m³ 8 hours. Issued/Revised: 11/2009 Form: Inhalable fraction **OSHA PEL (United States).** TWA: 5 mg/m³ 8 hours. Issued/Revised: 6/1993
Amines, C12-14-tert-alkyl	None.

While specific OELs for certain components may be shown in this section, other components may be present in any mist, vapor or dust produced. Therefore, the specific OELs may not be applicable to the product as a whole and are provided for guidance only.

Section 8. Exposure controls/personal protection

Appropriate engineering controls

All activities involving chemicals should be assessed for their risks to health, to ensure exposures are adequately controlled. Personal protective equipment should only be considered after other forms of control measures (e.g. engineering controls) have been suitably evaluated. Personal protective equipment should conform to appropriate standards, be suitable for use, be kept in good condition and properly maintained.
Your supplier of personal protective equipment should be consulted for advice on selection and appropriate standards. For further information contact your national organisation for standards.
Provide exhaust ventilation or other engineering controls to keep the relevant airborne concentrations below their respective occupational exposure limits.
The final choice of protective equipment will depend upon a risk assessment. It is important to ensure that all items of personal protective equipment are compatible.

Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period.
Appropriate techniques should be used to remove potentially contaminated clothing.
Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection

Safety glasses with side shields.

Skin protection

Hand protection

Wear protective gloves if prolonged or repeated contact is likely. Wear chemical resistant gloves. Recommended: Nitrile gloves. The correct choice of protective gloves depends upon the chemicals being handled, the conditions of work and use, and the condition of the gloves (even the best chemically resistant glove will break down after repeated chemical exposures). Most gloves provide only a short time of protection before they must be discarded and replaced. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. Gloves should therefore be chosen in consultation with the supplier/ manufacturer and with a full assessment of the working conditions.

Consult your supervisor or Standard Operating Procedure (S.O.P) for special handling instructions.

Body protection

Use of protective clothing is good industrial practice.
Cotton or polyester/cotton overalls will only provide protection against light superficial contamination that will not soak through to the skin. Overalls should be laundered on a regular basis. When the risk of skin exposure is high (e.g. when cleaning up spillages or if there is a risk of splashing) then chemical resistant aprons and/or impervious chemical suits and boots will be required.
Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection

Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection

In case of insufficient ventilation, wear suitable respiratory equipment.
The correct choice of respiratory protection depends upon the chemicals being handled, the conditions of work and use, and the condition of the respiratory equipment. Safety procedures should be developed for each intended application. Respiratory protection equipment should therefore be chosen in consultation with the supplier/manufacturer and with a full assessment of the working conditions.

Section 9. Physical and chemical properties

Appearance	
Physical state	Liquid.
Color	Brown.
Odor	Not available.
Odor threshold	Not available.
pH	Not available.
Melting point	Not available.
Boiling point	Not available.
Flash point	Closed cup: 180°C (356°F) [Pensky-Martens.]
Pour point	-30 °C
Evaporation rate	Not available.
Flammability (solid, gas)	Not applicable. Based on - Physical state
Lower and upper explosive (flammable) limits	Not available.
Vapor pressure	Not available.
Vapor density	Not available.
Density	895 kg/m³ (0.895 g/cm³) at 15°C
Solubility	insoluble in water.
Partition coefficient: n-octanol/water	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Kinematic: 139 mm^2/s (139 cSt) at 40°C Kinematic: 14.3 mm^2/s (14.3 cSt) at 100°C

Section 10. Stability and reactivity

Reactivity	No specific test data available for this product. Refer to Conditions to avoid and Incompatible materials for additional information.
Chemical stability	The product is stable.
Possibility of hazardous reactions	Under normal conditions of storage and use, hazardous reactions will not occur. Under normal conditions of storage and use, hazardous polymerization will not occur.
Conditions to avoid	Avoid all possible sources of ignition (spark or flame).
Incompatible materials	Reactive or incompatible with the following materials: oxidizing materials.
Hazardous decomposition products	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Information on the likely routes of exposure	Routes of entry anticipated: Dermal, Inhalation.
Potential acute health effects	
Eye contact	No known significant effects or critical hazards.
Skin contact	No known significant effects or critical hazards.

Section 11. Toxicological information

Inhalation	Vapor inhalation under ambient conditions is not normally a problem due to low vapor pressure.
Ingestion	No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact	No specific data.
Skin contact	Adverse symptoms may include the following: irritation dryness cracking
Inhalation	May be harmful by inhalation if exposure to vapor, mists or fumes resulting from thermal decomposition products occurs.
Ingestion	No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects	Not available.
Potential delayed effects	Not available.

Long term exposure

Potential immediate effects	Not available.
Potential delayed effects	Not available.

Potential chronic health effects

General	No known significant effects or critical hazards.
Carcinogenicity	No known significant effects or critical hazards.
Mutagenicity	No known significant effects or critical hazards.
Teratogenicity	No known significant effects or critical hazards.
Developmental effects	No known significant effects or critical hazards.
Fertility effects	No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

Section 12. Ecological information

Toxicity

No testing has been performed by the manufacturer.

Persistence and degradability

Expected to be biodegradable.

Bioaccumulative potential

This product is not expected to bioaccumulate through food chains in the environment.

Mobility in soil

Soil/water partition coefficient (K_{OC})	Not available.
Mobility	Spillages may penetrate the soil causing ground water contamination.

Section 12. Ecological information

Other adverse effects No known significant effects or critical hazards.

Other ecological information Spills may form a film on water surfaces causing physical damage to organisms. Oxygen transfer could also be impaired.

Section 13. Disposal considerations

Disposal methods The generation of waste should be avoided or minimized wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	DOT Classification	TDG Classification	IMDG	IATA
UN number	Not regulated.	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	-	-	-	-
Transport hazard class(es)	-	-	-	-
Packing group	-	-	-	-
Environmental hazards	No.	No.	No.	No.
Additional information	-	-	-	-

Special precautions for user Not available.

Transport in bulk according to Annex II of MARPOL and the IBC Code Not available.

Section 15. Regulatory information

U.S. Federal regulations

United States inventory (TSCA 8b) All components are listed or exempted.

SARA 302/304

Composition/information on ingredients

No products were found.

SARA 311/312

Classification Not applicable.

SARA 313

Section 15. Regulatory information

Form R - Reporting requirements	This product does not contain any hazardous ingredients at or above regulated thresholds.
Supplier notification	This product does not contain any hazardous ingredients at or above regulated thresholds.

State regulations

Massachusetts	The following components are listed: MINERAL OIL, PETROLEUM PARAFFIN OILS, CATALYTIC DEWAXED HEAVY
New Jersey	The following components are listed: MINERAL OIL (UNTREATED and MILDLY TREATED)
Pennsylvania	The following components are listed: MINERAL OIL MIST
California Prop. 65	**WARNING:** This product contains a chemical known to the State of California to cause cancer. Ethyl acrylate

Other regulations

Australia inventory (AICS)	All components are listed or exempted.
Canada inventory	All components are listed or exempted.
China inventory (IECSC)	All components are listed or exempted.
Japan inventory (ENCS)	All components are listed or exempted.
Korea inventory (KECI)	All components are listed or exempted.
Philippines inventory (PICCS)	All components are listed or exempted.
Taiwan Chemical Substances Inventory (TCSI)	Not determined.
REACH Status	For the REACH status of this product please consult your company contact, as identified in Section 1.

Section 16. Other information

National Fire Protection Association (U.S.A.)



History

Date of issue/Date of revision	06/10/2016.
Date of previous issue	04/25/2016.
Prepared by	Product Stewardship
Key to abbreviations	ACGIH = American Conference of Industrial Hygienists ATE = Acute Toxicity Estimate BCF = Bioconcentration Factor CAS Number = Chemical Abstracts Service Registry Number GHS = Globally Harmonized System of Classification and Labelling of Chemicals IATA = International Air Transport Association IBC = Intermediate Bulk Container IMDG = International Maritime Dangerous Goods LogPow = logarithm of the octanol/water partition coefficient MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution) OEL = Occupational Exposure Limit SDS = Safety Data Sheet STEL = Short term exposure limit TWA = Time weighted average UN = United Nations UN Number = United Nations Number, a four digit number assigned by the United

Section 16. Other information

Nations Committee of Experts on the Transport of Dangerous Goods.
Varies = may contain one or more of the following 101316-69-2, 101316-70-5, 101316-71-6, 101316-72-7, 64741-88-4, 64741-89-5, 64741-95-3, 64741-96-4, 64741-97-5, 64742-01-4, 64742-44-5, 64742-45-6, 64742-52-5, 64742-53-6, 64742-54-7, 64742-55-8, 64742-56-9, 64742-57-0, 64742-58-1, 64742-62-7, 64742-63-8, 64742-64-9, 64742-65-0, 64742-70-7, 72623-85-9, 72623-86-0, 72623-87-1, 74869-22-0, 90669-74-2

Indicates information that has changed from previously issued version.

Notice to reader

All reasonably practicable steps have been taken to ensure this data sheet and the health, safety and environmental information contained in it is accurate as of the date specified below. No warranty or representation, express or implied is made as to the accuracy or completeness of the data and information in this data sheet.

The data and advice given apply when the product is sold for the stated application or applications. You should not use the product other than for the stated application or applications without seeking advice from BP Group.

It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. The BP Group shall not be responsible for any damage or injury resulting from use, other than the stated product use of the material, from any failure to adhere to recommendations, or from any hazards inherent in the nature of the materiel. Purchasers of the product for supply to a third party for use at work, have a duty to take all necessary steps to ensure that any person handling or using the product is provided with the information in this sheet. Employers have a duty to tell employees and others who may be affected of any hazards described in this sheet and of any precautions that should be taken. You can contact the BP Group to ensure that this document is the most current available. Alteration of this document is strictly prohibited.

SAFETY DATA SHEET

Section 1. Identification

Product name	Dual Range HV 46
SDS #	460278
Code	460278-US06

Relevant identified uses of the substance or mixture and uses advised against

Product use	Hydraulic fluid. For specific application advice see appropriate Technical Data Sheet or consult our company representative.
Supplier	BP Lubricants USA Inc. 1500 Valley Road Wayne, NJ 07470 Telephone: +1-888-CASTROL Product Information: +1-877-641-1600
EMERGENCY HEALTH INFORMATION:	+1-800-447-8735
EMERGENCY SPILL INFORMATION:	+1-800-424-9300 (CHEMTREC USA) +1-703-527-3887 (CHEMTREC outside the US)

Section 2. Hazards identification

OSHA/HCS status	This material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Classification of the substance or mixture	Not classified.

GHS label elements

Signal word	No signal word.
Hazard statements	No known significant effects or critical hazards.

Precautionary statements

Prevention	Not applicable.
Response	Not applicable.
Storage	Not applicable.
Disposal	Not applicable.

Hazards not otherwise classified	Defatting to the skin. Note: High Pressure Applications Injections through the skin resulting from contact with the product at high pressure constitute a major medical emergency. See 'Notes to physician' under First-Aid Measures, Section 4 of this Safety Data Sheet.

Section 3. Composition/information on ingredients

Substance/mixture: Mixture

Highly refined base oil (IP 346 DMSO extract < 3%). Proprietary performance additives.

Ingredient name	CAS number	%
Distillates (petroleum), hydrotreated heavy paraffinic Base oil - highly refined	64742-54-7 Varies - See Key to abbreviations	≥90 ≤3

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

Section 3. Composition/information on ingredients

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Check for and remove any contact lenses. Get medical attention.
Skin contact	Wash skin thoroughly with soap and water or use recognized skin cleanser. Remove contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention if symptoms occur.
Inhalation	If inhaled, remove to fresh air. Get medical attention if symptoms occur.
Ingestion	Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.
Protection of first-aiders	No action shall be taken involving any personal risk or without suitable training.

Most important symptoms/effects, acute and delayed

See Section 11 for more detailed information on health effects and symptoms.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician	Treatment should in general be symptomatic and directed to relieving any effects. Note: High Pressure Applications Injections through the skin resulting from contact with the product at high pressure constitute a major medical emergency. Injuries may not appear serious at first but within a few hours tissue becomes swollen, discolored and extremely painful with extensive subcutaneous necrosis. Surgical exploration should be undertaken without delay. Thorough and extensive debridement of the wound and underlying tissue is necessary to minimize tissue loss and prevent or limit permanent damage. Note that high pressure may force the product considerable distances along tissue planes.
Specific treatments	No specific treatment.

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media	In case of fire, use foam, dry chemical or carbon dioxide extinguisher or spray.
Unsuitable extinguishing media	Do not use water jet.
Specific hazards arising from the chemical	In a fire or if heated, a pressure increase will occur and the container may burst.
Hazardous combustion products	Combustion products may include the following: carbon oxides (CO, CO_2) (carbon monoxide, carbon dioxide)
Special protective actions for fire-fighters	No action shall be taken involving any personal risk or without suitable training. Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire.
Special protective equipment for fire-fighters	Fire-fighters should wear positive pressure self-contained breathing apparatus (SCBA) and full turnout gear.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Put on appropriate personal protective equipment. Floors may be slippery; use care to avoid falling.
For emergency responders	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
Environmental precautions	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill	Stop leak if without risk. Move containers from spill area. Absorb with an inert material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
Large spill	Stop leak if without risk. Move containers from spill area. Prevent entry into sewers, water courses, basements or confined areas. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations. Dispose of via a licensed waste disposal contractor.

Section 7. Handling and storage

Precautions for safe handling

Protective measures	Put on appropriate personal protective equipment (see Section 8).
Advice on general occupational hygiene	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Wash thoroughly after handling. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
Conditions for safe storage, including any incompatibilities	Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Store and use only in equipment/containers designed for use with this product. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Distillates (petroleum), hydrotreated heavy paraffinic	**ACGIH TLV (United States).** TWA: 5 mg/m³ 8 hours. Issued/Revised: 11/2009 Form: Inhalable fraction **OSHA PEL (United States).** TWA: 5 mg/m³ 8 hours. Issued/Revised: 6/1993
Base oil - highly refined	**ACGIH TLV (United States).** TWA: 5 mg/m³ 8 hours. Issued/Revised: 11/2009 Form: Inhalable fraction **OSHA PEL (United States).** TWA: 5 mg/m³ 8 hours. Issued/Revised: 6/1993

Section 8. Exposure controls/personal protection

While specific OELs for certain components may be shown in this section, other components may be present in any mist, vapor or dust produced. Therefore, the specific OELs may not be applicable to the product as a whole and are provided for guidance only.

Appropriate engineering controls

All activities involving chemicals should be assessed for their risks to health, to ensure exposures are adequately controlled. Personal protective equipment should only be considered after other forms of control measures (e.g. engineering controls) have been suitably evaluated. Personal protective equipment should conform to appropriate standards, be suitable for use, be kept in good condition and properly maintained.
Your supplier of personal protective equipment should be consulted for advice on selection and appropriate standards. For further information contact your national organisation for standards.
Provide exhaust ventilation or other engineering controls to keep the relevant airborne concentrations below their respective occupational exposure limits.
The final choice of protective equipment will depend upon a risk assessment. It is important to ensure that all items of personal protective equipment are compatible.

Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period.
Appropriate techniques should be used to remove potentially contaminated clothing.
Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection

Safety glasses with side shields.

Skin protection

Hand protection

Wear protective gloves if prolonged or repeated contact is likely. Wear chemical resistant gloves. Recommended: Nitrile gloves. The correct choice of protective gloves depends upon the chemicals being handled, the conditions of work and use, and the condition of the gloves (even the best chemically resistant glove will break down after repeated chemical exposures). Most gloves provide only a short time of protection before they must be discarded and replaced. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. Gloves should therefore be chosen in consultation with the supplier/ manufacturer and with a full assessment of the working conditions.

Body protection

Use of protective clothing is good industrial practice.
Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Cotton or polyester/cotton overalls will only provide protection against light superficial contamination that will not soak through to the skin. Overalls should be laundered on a regular basis. When the risk of skin exposure is high (e.g. when cleaning up spillages or if there is a risk of splashing) then chemical resistant aprons and/or impervious chemical suits and boots will be required.

Other skin protection

Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection

In case of insufficient ventilation, wear suitable respiratory equipment.
The correct choice of respiratory protection depends upon the chemicals being handled, the conditions of work and use, and the condition of the respiratory equipment. Safety procedures should be developed for each intended application. Respiratory protection equipment should therefore be chosen in consultation with the supplier/manufacturer and with a full assessment of the working conditions.

Section 9. Physical and chemical properties

Appearance

Physical state	Liquid.
Color	Purple.
Odor	Not available.
Odor threshold	Not available.
pH	Not available.
Melting point	Not available.
Boiling point	Not available.
Flash point	Closed cup: >190°C (>374°F) [Pensky-Martens.]
Pour point	-42 °C
Evaporation rate	Not available.
Flammability (solid, gas)	Not applicable. Based on - Physical state
Lower and upper explosive (flammable) limits	Not available.
Vapor pressure	Not available.
Vapor density	Not available.
Density	<1000 kg/m^3 (<1 g/cm^3) at 15°C
Solubility	insoluble in water.
Partition coefficient: n-octanol/water	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Kinematic: 45.92 mm^2/s (45.92 cSt) at 40°C Kinematic: 8.2 mm^2/s (8.2 cSt) at 100°C

Section 10. Stability and reactivity

Reactivity	No specific test data available for this product. Refer to Conditions to avoid and Incompatible materials for additional information.
Chemical stability	The product is stable.
Possibility of hazardous reactions	Under normal conditions of storage and use, hazardous reactions will not occur. Under normal conditions of storage and use, hazardous polymerization will not occur.
Conditions to avoid	Avoid all possible sources of ignition (spark or flame).
Incompatible materials	Reactive or incompatible with the following materials: oxidizing materials.
Hazardous decomposition products	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Aspiration hazard

Name	Result
Base oil - highly refined	ASPIRATION HAZARD - Category 1

Information on the likely routes of exposure	Routes of entry anticipated: Dermal, Inhalation.

Potential acute health effects

Eye contact	No known significant effects or critical hazards.

Section 11. Toxicological information

Skin contact	No known significant effects or critical hazards.
Inhalation	Vapor inhalation under ambient conditions is not normally a problem due to low vapor pressure.
Ingestion	No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact	No specific data.
Skin contact	Adverse symptoms may include the following: irritation dryness cracking
Inhalation	No specific data.
Ingestion	No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects	Not available.
Potential delayed effects	Not available.

Long term exposure

Potential immediate effects	Not available.
Potential delayed effects	Not available.

Potential chronic health effects

General	No known significant effects or critical hazards.
Carcinogenicity	No known significant effects or critical hazards.
Mutagenicity	No known significant effects or critical hazards.
Teratogenicity	No known significant effects or critical hazards.
Developmental effects	No known significant effects or critical hazards.
Fertility effects	No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

Section 12. Ecological information

Toxicity

No testing has been performed by the manufacturer.

Persistence and degradability

Expected to be biodegradable.

Bioaccumulative potential

This product is not expected to bioaccumulate through food chains in the environment.

Mobility in soil

Soil/water partition coefficient (K_{OC})	Not available.
Mobility	Spillages may penetrate the soil causing ground water contamination.

Section 12. Ecological information

Other adverse effects No known significant effects or critical hazards.

Other ecological information Spills may form a film on water surfaces causing physical damage to organisms. Oxygen transfer could also be impaired.

Section 13. Disposal considerations

Disposal methods The generation of waste should be avoided or minimized wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	DOT Classification	TDG Classification	IMDG	IATA
UN number	Not regulated.	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	-	-	-	-
Transport hazard class(es)	-	-	-	-
Packing group	-	-	-	-
Environmental hazards	No.	No.	No.	No.
Additional information	-	-	-	-

Special precautions for user Not available.

Transport in bulk according to Annex II of MARPOL and the IBC Code Not available.

Section 15. Regulatory information

U.S. Federal regulations

United States inventory (TSCA 8b) All components are active or exempted.

SARA 302/304

Composition/information on ingredients

No products were found.

SARA 311/312

Classification Not applicable.

SARA 313

Section 15. Regulatory information

Form R - Reporting requirements	This product does not contain any hazardous ingredients at or above regulated thresholds.
Supplier notification	This product does not contain any hazardous ingredients at or above regulated thresholds.

State regulations

Massachusetts	The following components are listed: OIL MIST, MINERAL
New Jersey	None of the components are listed.
Pennsylvania	None of the components are listed.

California Prop. 65

⚠ **WARNING**: This product can expose you to chemicals including Ethylene oxide, which is known to the State of California to cause cancer and birth defects or other reproductive harm. This product can expose you to chemicals including Naphthalene, Ethyl acrylate, Propylene oxide and 1,4-Dioxane, which are known to the State of California to cause cancer, and Ethylene Glycol, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Other regulations

Australia inventory (AICS)	All components are listed or exempted.
Canada inventory	All components are listed or exempted.
China inventory (IECSC)	All components are listed or exempted.
Japan inventory (ENCS)	All components are listed or exempted.
Korea inventory (KECI)	All components are listed or exempted.
Philippines inventory (PICCS)	All components are listed or exempted.
Taiwan Chemical Substances Inventory (TCSI)	Not determined.
REACH Status	For the REACH status of this product please consult your company contact, as identified in Section 1.

Section 16. Other information

National Fire Protection Association (U.S.A.)



History

Date of issue/Date of revision	12/05/2019.
Date of previous issue	08/02/2019.
Prepared by	Product Stewardship
Key to abbreviations	ACGIH = American Conference of Industrial Hygienists ATE = Acute Toxicity Estimate BCF = Bioconcentration Factor CAS Number = Chemical Abstracts Service Registry Number GHS = Globally Harmonized System of Classification and Labelling of Chemicals IATA = International Air Transport Association IBC = Intermediate Bulk Container IMDG = International Maritime Dangerous Goods LogPow = logarithm of the octanol/water partition coefficient MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution) OEL = Occupational Exposure Limit SDS = Safety Data Sheet STEL = Short term exposure limit TWA = Time weighted average UN = United Nations UN Number = United Nations Number, a four digit number assigned by the United

Section 16. Other information

Nations Committee of Experts on the Transport of Dangerous Goods.
Varies = may contain one or more of the following 64741-88-4, 64741-89-5, 64741-95-3, 64741-96-4, 64742-01-4, 64742-44-5, 64742-45-6, 64742-52-5, 64742-53-6, 64742-54-7, 64742-55-6, 64742-56-9, 64742-57-0, 64742-58-1, 64742-62-7, 64742-63-6, 64742-65-0, 64742-70-7, 72623-85-9, 72623-86-0, 72623-87-1

Indicates information that has changed from previously issued version.

Notice to reader

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It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. The BP Group shall not be responsible for any damage or injury resulting from use, other than the stated product use of the material, from any failure to adhere to recommendations, or from any hazards inherent in the nature of the material. Purchasers of the product for supply to a third party for use at work, have a duty to take all necessary steps to ensure that any person handling or using the product is provided with the information in this sheet. Employers have a duty to tell employees and others who may be affected of any hazards described in this sheet and of any preceutions that should be taken. You can contact the BP Group to ensure that this document is the most current available. Alteration of this document is strictly prohibited.

SAFETY DATA SHEET

Castrol Heavy Duty Multipurpose ATF

Section 1. Identification

GHS product identifier	Castrol Heavy Duty Multipurpose ATF
Product code	465389-US06
SDS #	465389
Historic SDS #:	0000003231 465389-US13

Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/ mixture	Automatic transmission fluid For specific application advice see appropriate Technical Data Sheet or consult our company representative.
Manufacturer	BP Lubricants USA, Inc 1500 Valley Road Wayne, NJ USA 07470
Supplier	Wakefield Canada, Limited 3620 Lakeshore Blvd West Toronto, Ontario, Canada M8W 1P2 Phone Number - 416-252-5511 Fax Number - 416-252-7315 BP Lubricants USA, Inc 1500 Valley Road Wayne, NJ USA 07470 Phone Number - 973-633-2296 Fax Number - 973-633-7475
EMERGENCY HEALTH INFORMATION:	1 (800) 447-8735 Outside the US: +1 703-527-3887 (CHEMTREC)
EMERGENCY TELEPHONE NUMBER	1 (800) 424-9300 CHEMTREC (USA)

Section 2. Hazard identification

Classification of the substance or mixture	Not classified.

GHS label elements

Signal word	No signal word.
Hazard statements	No known significant effects or critical hazards.

Precautionary statements

General	P103 - Read label before use. P102 - Keep out of reach of children. P101 - If medical advice is needed, have product container or label at hand.
Prevention	Not applicable.
Response	Not applicable.
Storage	Not applicable.
Disposal	Not applicable.

Section 2. Hazard identification

Other hazards which do not result in classification Defatting to the skin.

Section 3. Composition/information on ingredients

Substance/mixture Mixture

Ingredient name	CAS number	% (w/w)
Base oil - highly refined	Varies - See Key to abbreviations	≥90

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First-aid measures

Description of necessary first aid measures

Eye contact In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Check for and remove any contact lenses. Get medical attention.

Skin contact Wash skin thoroughly with soap and water or use recognized skin cleanser. Remove contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention if symptoms occur.

Inhalation If inhaled, remove to fresh air. Get medical attention if symptoms occur.

Ingestion Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.

Protection of first-aiders No action shall be taken involving any personal risk or without suitable training.

Most important symptoms/effects, acute and delayed

See Section 11 for more detailed information on health effects and symptoms.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician Treatment should in general be symptomatic and directed to relieving any effects.

Specific treatments No specific treatment.

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media In case of fire, use foam, dry chemical or carbon dioxide extinguisher or spray.

Unsuitable extinguishing media Do not use water jet.

Specific hazards arising from the chemical In a fire or if heated, a pressure increase will occur and the container may burst.

Hazardous thermal decomposition products Combustion products may include the following:
carbon dioxide
carbon monoxide

Special protective actions for fire-fighters Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters Fire-fighters should wear positive pressure self-contained breathing apparatus (SCBA) and full turnout gear.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Put on appropriate personal protective equipment. Floors may be slippery; use care to avoid falling.
For emergency responders	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
Environmental precautions	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill	Stop leak if without risk. Move containers from spill area. Absorb with an inert material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
Large spill	Stop leak if without risk. Move containers from spill area. Prevent entry into sewers, water courses, basements or confined areas. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations. Dispose of via a licensed waste disposal contractor.

Section 7. Handling and storage

Precautions for safe handling

Protective measures	Put on appropriate personal protective equipment (see Section 8).
Advice on general occupational hygiene	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Wash thoroughly after handling. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
Conditions for safe storage, including any incompatibilities	Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Store and use only in equipment/containers designed for use with this product. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.
Not suitable	Prolonged exposure to elevated temperature

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Base oil - highly refined	**CA Alberta Provincial (Canada).** 15 min OEL: 10 mg/m³ 15 minutes. Issued/Revised: 7/2009 Form: Mist 8 hrs OEL: 5 mg/m³ 8 hours. Issued/Revised: 4/2004 Form: Mist **CA Quebec Provincial (Canada).** STEV: 10 mg/m³ 15 minutes. Issued/Revised: 1/2000 Form: mist TWAEV: 5 mg/m³ 8 hours. Issued/Revised: 1/2000 Form: mist

Section 8. Exposure controls/personal protection

Appropriate engineering controls

All activities involving chemicals should be assessed for their risks to health, to ensure exposures are adequately controlled. Personal protective equipment should only be considered after other forms of control measures (e.g. engineering controls) have been suitably evaluated. Personal protective equipment should conform to appropriate standards, be suitable for use, be kept in good condition and properly maintained.
Your supplier of personal protective equipment should be consulted for advice on selection and appropriate standards. For further information contact your national organisation for standards.
Provide exhaust ventilation or other engineering controls to keep the relevant airborne concentrations below their respective occupational exposure limits.
The final choice of protective equipment will depend upon a risk assessment. It is important to ensure that all items of personal protective equipment are compatible.

Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection

Safety glasses with side shields.

Skin protection

Hand protection

Wear protective gloves if prolonged or repeated contact is likely. Wear chemical resistant gloves. Recommended: Nitrile gloves. The correct choice of protective gloves depends upon the chemicals being handled, the conditions of work and use, and the condition of the gloves (even the best chemically resistant glove will break down after repeated chemical exposures). Most gloves provide only a short time of protection before they must be discarded and replaced. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. Gloves should therefore be chosen in consultation with the supplier/manufacturer and with a full assessment of the working conditions.

Body protection

Use of protective clothing is good industrial practice.
Cotton or polyester/cotton overalls will only provide protection against light superficial contamination that will not soak through to the skin. Overalls should be laundered on a regular basis. When the risk of skin exposure is high (e.g. when cleaning up spillages or if there is a risk of splashing) then chemical resistant aprons and/or impervious chemical suits and boots will be required.
Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection

Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection

In case of insufficient ventilation, wear suitable respiratory equipment.
The correct choice of respiratory protection depends upon the chemicals being handled, the conditions of work and use, and the condition of the respiratory equipment. Safety procedures should be developed for each intended application. Respiratory protection equipment should therefore be chosen in consultation with the supplier/manufacturer and with a full assessment of the working conditions.

Section 9. Physical and chemical properties

Appearance

Physical state	Liquid.
Color	Red. [Dark]
Odor	Petroleum-like. [Slight]
Odor threshold	Not available.
pH	Not available.
Melting point	Not available.
Boiling point	Not available.
Flash point	Open cup: 185°C (365°F) [Cleveland.]
Pour point	-51 °C
Drop Point	Not available.
Evaporation rate	Not available.
Flammability (solid, gas)	Not applicable. Based on - Physical state
Lower and upper explosive (flammable) limits	Not available.
Vapor pressure	Not available.
Vapor density	Not available.
Density	855 kg/m^3 (0.855 g/cm^3) at 15°C
Relative density	Not available.
Solubility	insoluble in water.
Partition coefficient: n-octanol/water	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Kinematic: 34.26 mm^2/s (34.26 cSt) at 40°C Kinematic: 7.7 mm^2/s (7.7 cSt) at 100°C

Aerosol product

Section 10. Stability and reactivity

Reactivity	No specific test data available for this product. Refer to Conditions to avoid and Incompatible materials for additional information.
Chemical stability	The product is stable.
Possibility of hazardous reactions	Under normal conditions of storage and use, hazardous reactions will not occur. Under normal conditions of storage and use, hazardous polymerization will not occur.
Conditions to avoid	Avoid all possible sources of ignition (spark or flame).
Incompatible materials	Reactive or incompatible with the following materials: oxidizing materials.
Hazardous decomposition products	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Information on the likely routes of exposure	Routes of entry anticipated: Dermal, Inhalation.

Potential acute health effects

Eye contact	No known significant effects or critical hazards.
Skin contact	Defatting to the skin. May cause skin dryness and irritation.
Inhalation	Vapor inhalation under ambient conditions is not normally a problem due to low vapor pressure.
Ingestion	No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact	No specific data.
Inhalation	May be harmful by inhalation if exposure to vapor, mists or fumes resulting from thermal decomposition products occurs.
Skin contact	Adverse symptoms may include the following: irritation dryness cracking
Ingestion	No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects	Not available.
Potential delayed effects	Not available.

Long term exposure

Potential immediate effects	Not available.
Potential delayed effects	Not available.

Potential chronic health effects

General	No known significant effects or critical hazards.
Carcinogenicity	No known significant effects or critical hazards.
Mutagenicity	No known significant effects or critical hazards.
Teratogenicity	No known significant effects or critical hazards.
Developmental effects	No known significant effects or critical hazards.
Fertility effects	No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

Section 12. Ecological information

Toxicity

No testing has been performed by the manufacturer.

Persistence and degradability

Expected to be biodegradable.

Bioaccumulative potential

This product is not expected to bioaccumulate through food chains in the environment.

Mobility in soil

Soil/water partition coefficient (K_{OC})	Not available.

Section 12. Ecological information

Mobility Spillages may penetrate the soil causing ground water contamination.

Other ecological information Spills may form a film on water surfaces causing physical damage to organisms. Oxygen transfer could also be impaired.

Section 13. Disposal considerations

Disposal methods The generation of waste should be avoided or minimized wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	DOT Classification	TDG Classification	IMDG	IATA
UN number	Not regulated.	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	-	-	-	-
Transport hazard class(es)	-	-	-	-
Packing group	-	-	-	-
Environmental hazards	No.	No.	No.	No.
Additional information	-	-	-	-

Special precautions for user Not available.

Transport in bulk according to Annex II of MARPOL and the IBC Code Not available.

Section 15. Regulatory information

Other regulations

Australia inventory (AICS)	All components are listed or exempted.
Canada inventory	All components are listed or exempted.
China inventory (IECSC)	All components are listed or exempted.
Japan inventory (ENCS)	At least one component is not listed.
Korea inventory (KECI)	All components are listed or exempted.
Philippines inventory (PICCS)	All components are listed or exempted.

Section 15. Regulatory information

Taiwan Chemical Substances Inventory (TCSI)	Not determined.
United States inventory (TSCA 8b)	All components are listed or exempted.
REACH Status	For the REACH status of this product please consult your company contact, as identified in Section 1.

Section 16. Other information

History

Date of issue/Date of revision	13/12/2016
Date of previous issue	12/12/2016.
Version	5.02
Prepared by	Product Stewardship
Key to abbreviations	ATE = Acute Toxicity Estimate BCF = Bioconcentration Factor CAS Number = Chemical Abstracts Service Registry Number GHS = Globally Harmonized System of Classification and Labelling of Chemicals IATA = International Air Transport Association IBC = Intermediate Bulk Container IMDG = International Maritime Dangerous Goods LogPow = logarithm of the octanol/water partition coefficient MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution) UN = United Nations HPR = Hazardous Products Regulations Varies = may contain one or more of the following 101316-69-2, 101316-70-5, 101316-71-6, 101316-72-7, 64741-88-4, 64741-89-5, 64741-95-3, 64741-96-4, 64741-97-5, 64742-01-4, 64742-44-5, 64742-45-6, 64742-52-5, 64742-53-6, 64742-54-7, 64742-55-8, 64742-56-9, 64742-57-0, 64742-58-1, 64742-62-7, 64742-63-8, 64742-64-9, 64742-65-0, 64742-70-7, 72623-85-9, 72623-86-0, 72623-87-1, 74869-22-0, 90669-74-2
References	Not available.

Indicates information that has changed from previously issued version.

Notice to reader

All reasonably practicable steps have been taken to ensure this data sheet and the health, safety and environmental information contained in it is accurate as of the date specified below. No warranty or representation, express or implied is made as to the accuracy or completeness of the data and information in this data sheet.

The data and advice given apply when the product is sold for the stated application or applications. You should not use the product other than for the stated application or applications without seeking advice from BP Group.

It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. The BP Group shall not be responsible for any damage or injury resulting from use, other than the stated product use of the material, from any failure to adhere to recommendations, or from any hazards inherent in the nature of the material. Purchasers of the product for supply to a third party for use at work, have a duty to take all necessary steps to ensure that any person handling or using the product is provided with the information in this sheet. Employers have a duty to tell employees and others who may be affected of any hazards described in this sheet and of any precautions that should be taken. You can contact the BP Group to ensure that this document is the most current available. Alteration of this document is strictly prohibited.

SAFETY DATA SHEET

Section 1. Identification

Product name	Castrol Vecton Long Drain 10W-30 CK-4
SDS #	469365
Code	469365-US06

Relevant identified uses of the substance or mixture and uses advised against

Product use	Engine Oils. For specific application advice see appropriate Technical Data Sheet or consult our company representative.
Supplier	BP Lubricants USA Inc. 1500 Valley Road Wayne, NJ 07470 Telephone: (973) 633-2200
EMERGENCY HEALTH INFORMATION:	1 (800) 447-8735 Outside the US: +1 703-527-3887 (CHEMTREC)
EMERGENCY SPILL INFORMATION:	1 (800) 424-9300 CHEMTREC (USA)

Section 2. Hazards identification

OSHA/HCS status	This material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Classification of the substance or mixture	Not classified.

GHS label elements

Signal word	No signal word.
Hazard statements	No known significant effects or critical hazards.

Precautionary statements

General	Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand.
Prevention	Not applicable.
Response	Not applicable.
Storage	Not applicable.
Disposal	Not applicable.
Hazards not otherwise classified	Defatting to the skin. USED ENGINE OILS Used engine oil may contain hazardous components which have the potential to cause skin cancer. See Toxicological Information, section 11 of this Safety Data Sheet.

Section 3. Composition/information on ingredients

Substance/mixture Mixture

Highly refined base oil (IP 346 DMSO extract < 3%). Proprietary performance additives.

Ingredient name	CAS number	%
Base oil - highly refined	Varies - See Key to abbreviations	≥75 - ≤90
Phosphorodithioic acid, mixed O,O-bis(sec-Bu and isooctyl) esters, zinc salts	113706-15-3	≤3
Phenol, dodecyl-, branched	74499-35-7 / 121158-58-5	≤0.3

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Check for and remove any contact lenses. Get medical attention.

Skin contact Wash skin thoroughly with soap and water or use recognized skin cleanser. Remove contaminated clothing and shoes. Wash clothing before reuse. Get medical attention if symptoms occur. Clean shoes thoroughly before reuse.

Inhalation If inhaled, remove to fresh air. Get medical attention if symptoms occur.

Ingestion Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.

Protection of first-aiders No action shall be taken involving any personal risk or without suitable training.

Most important symptoms/effects, acute and delayed

See Section 11 for more detailed information on health effects and symptoms.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician Treatment should in general be symptomatic and directed to relieving any effects.

Specific treatments No specific treatment.

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media In case of fire, use foam, dry chemical or carbon dioxide extinguisher or spray.

Unsuitable extinguishing media Do not use water jet.

Specific hazards arising from the chemical In a fire or if heated, a pressure increase will occur and the container may burst.

Hazardous combustion products Combustion products may include the following:
carbon oxides (CO, CO_2) (carbon monoxide, carbon dioxide)

Special protective actions for fire-fighters No action shall be taken involving any personal risk or without suitable training. Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire.

Special protective equipment for fire-fighters Fire-fighters should wear positive pressure self-contained breathing apparatus (SCBA) and full turnout gear.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Put on appropriate personal protective equipment. Floors may be slippery; use care to avoid falling.
For emergency responders	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
Environmental precautions	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill	Stop leak if without risk. Move containers from spill area. Absorb with an inert material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
Large spill	Stop leak if without risk. Move containers from spill area. Prevent entry into sewers, water courses, basements or confined areas. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in conteiner for disposal according to local regulations. Dispose of via a licensed waste disposal contractor.

Section 7. Handling and storage

Precautions for safe handling

Protective measures	Put on appropriate personal protective equipment (see Section 8).
Advice on general occupational hygiene	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Wash thoroughly after handling. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
Conditions for safe storage, including any incompatibilities	Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Store and use only in equipment/containers designed for use with this product. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.
Not suitable	Prolonged exposure to elevated temperature

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Base oil - highly refined	**ACGIH TLV (United States).** TWA: 5 mg/m³ 8 hours. Issued/Revised: 11/2009 Form: Inhalable fraction **OSHA PEL (United States).** TWA: 5 mg/m³ 8 hours. Issued/Revised: 6/1993
Phosphorodithioic acid, mixed O,O-bis(sec-Bu and isooctyl) esters, zinc salts	None.
Phenol, dodecyl-, branched	None.

Section 8. Exposure controls/personal protection

Appropriate engineering controls

All activities involving chemicals should be assessed for their risks to health, to ensure exposures are adequately controlled. Personal protective equipment should only be considered after other forms of control measures (e.g. engineering controls) have been suitably evaluated. Personal protective equipment should conform to appropriate standards, be suitable for use, be kept in good condition and properly maintained.
Your supplier of personal protective equipment should be consulted for advice on selection and appropriate standards. For further information contact your national organisation for standards.
Provide exhaust ventilation or other engineering controls to keep the relevant airborne concentrations below their respective occupational exposure limits.
The final choice of protective equipment will depend upon a risk assessment. It is important to ensure that all items of personal protective equipment are compatible.

Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period.
Appropriate techniques should be used to remove potentially contaminated clothing.
Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection

Safety glasses with side shields.

Skin protection

Hand protection

Wear protective gloves if prolonged or repeated contact is likely. Wear chemical resistant gloves. Recommended: Nitrile gloves. The correct choice of protective gloves depends upon the chemicals being handled, the conditions of work and use, and the condition of the gloves (even the best chemically resistant glove will break down after repeated chemical exposures). Most gloves provide only a short time of protection before they must be discarded and replaced. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. Gloves should therefore be chosen in consultation with the supplier/ manufacturer and with a full assessment of the working conditions.

Body protection

Use of protective clothing is good industrial practice.
Personal protective equipment for the body should be selected based on the tesk being performed and the risks involved and should be approved by a specialist before handling this product.
Cotton or polyester/cotton overalls will only provide protection against light superficial contamination that will not soak through to the skin. Overalls should be laundered on a regular basis. When the risk of skin exposure is high (e.g. when cleaning up spillages or if there is a risk of splashing) then chemical resistant aprons and/or impervious chemical suits and boots will be required.

Other skin protection

Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection

In case of insufficient ventilation, wear suitable respiratory equipment.
The correct choice of respiratory protection depends upon the chemicals being handled, the conditions of work and use, and the condition of the respiratory equipment. Safety procedures should be developed for each intended application. Respiratory protection equipment should therefore be chosen in consultation with the supplier/manufacturer and with a full assessment of the working conditions.

Section 9. Physical and chemical properties

Appearance

Physical state	Liquid.
Color	Brown.
Odor	Not available.
Odor threshold	Not available.
pH	Not available.

Section 9. Physical and chemical properties

Melting point	Not available.
Boiling point	Not available.
Flash point	Closed cup: >200°C (>392°F) [Pensky-Martens.]
Pour point	-39 °C
Evaporation rate	Not available.
Flammability (solid, gas)	Not applicable. Based on - Physical state
Lower and upper explosive (flammable) limits	Not available.
Vapor pressure	Not available.
Vapor density	Not available.
Density	<1000 kg/m³ (<1 g/cm³) at 15°C
Solubility	insoluble in water.
Partition coefficient: n-octanol/water	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Kinematic: 83.88 mm²/s (83.88 cSt) at 40°C Kinematic: 12 to 12.5 mm²/s (12 to 12.5 cSt) at 100°C

Section 10. Stability and reactivity

Reactivity	No specific test data available for this product. Refer to Conditions to avoid and Incompatible materials for additional information.
Chemical stability	The product is stable.
Possibility of hazardous reactions	Under normal conditions of storage and use, hazardous reactions will not occur. Under normal conditions of storage and use, hazardous polymerization will not occur.
Conditions to avoid	Avoid all possible sources of ignition (spark or flame).
Incompatible materials	Reactive or incompatible with the following materials: oxidizing materials.
Hazardous decomposition products	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Information on the likely routes of exposure	Routes of entry anticipated: Dermal, Inhalation.

Potential acute health effects

Eye contact	No known significant effects or critical hazards.
Skin contact	No known significant effects or critical hazards.
Inhalation	Vapor inhalation under ambient conditions is not normally a problem due to low vapor pressure.
Ingestion	No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact	No specific data.

Section 11. Toxicological information

Skin contact	Adverse symptoms may include the following: irritation dryness cracking
Inhalation	No specific data.
Ingestion	No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects	Not available.
Potential delayed effects	Not available.

Long term exposure

Potential immediate effects	Not available.
Potential delayed effects	Not available.

Potential chronic health effects

General	USED ENGINE OILS Combustion products resulting from the operation of internal combustion engines contaminate engine oils during use. Used engine oil may contain hazardous components which have the potential to cause skin cancer. Frequent or prolonged contact with all types and makes of used engine oil must therefore be avoided and a high standard of personal hygiene maintained.
Carcinogenicity	No known significant effects or critical hazards.
Mutagenicity	No known significant effects or critical hazards.
Teratogenicity	No known significant effects or critical hazards.
Developmental effects	No known significant effects or critical hazards.
Fertility effects	No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

Section 12. Ecological information

Toxicity

No testing has been performed by the manufacturer.

Persistence and degradability

Expected to be biodegradable.

Bioaccumulative potential

This product is not expected to bioaccumulate through food chains in the environment.

Mobility in soil

Soil/water partition coefficient (K_{OC})	Not available.
Mobility	Spillages may penetrate the soil causing ground water contamination.

Other adverse effects: No known significant effects or critical hazards.

Section 12. Ecological information

Other ecological information Spills may form a film on water surfaces causing physical damage to organisms. Oxygen transfer could also be impaired.

Section 13. Disposal considerations

Disposal methods The generation of waste should be avoided or minimized wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	DOT Classification	TDG Classification	IMDG	IATA
UN number	Not regulated.	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	-	-	-	-
Transport hazard class(es)	-	-	-	-
Packing group	-	-	-	-
Environmental hazards	No.	No.	No.	No.
Additional information	-	-	-	-

Special precautions for user Not available.

Transport in bulk according to Annex II of MARPOL and the IBC Code Not available.

Section 15. Regulatory information

U.S. Federal regulations

United States inventory (TSCA 8b) All components are listed or exempted.

SARA 302/304

Composition/information on ingredients

No products were found.

SARA 311/312

Classification Not applicable.

SARA 313

Section 15. Regulatory information

	Product name	CAS number	Concentration
Form R - Reporting requirements	Phosphorodithioic acid, mixed O,O-bis(sec-Bu and isooctyl) esters, zinc salts	113706-15-3	1.0799
Supplier notification	Phosphorodithioic acid, mixed O,O-bis(sec-Bu and isooctyl) esters, zinc salts	113706-15-3	1.0799

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

State regulations

Massachusetts	The following components are listed: OIL MIST, MINERAL; OIL MIST, MINERAL
New Jersey	The following components are listed: ZINC compounds; MINERAL OIL (UNTREATED and MILDLY TREATED); MINERAL OIL (UNTREATED and MILDLY TREATED)
Pennsylvania	The following components are listed: ZINC COMPOUNDS

California Prop. 65

⚠ **WARNING**: This product can expose you to chemicals including Benzene, Lead, Cadmium, which are known to the State of California to cause cancer and birth defects or other reproductive harm. This product can expose you to chemicals including Nickel, which is known to the State of California to cause cancer, and Ethylene Glycol, Toluene, which are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Other regulations

Australia inventory (AICS)	All components are listed or exempted.
Canada inventory	All components are listed or exempted.
China inventory (IECSC)	At least one component is not listed.
Japan inventory (ENCS)	All components are listed or exempted.
Korea inventory (KECI)	All components are listed or exempted.
Philippines inventory (PICCS)	All components are listed or exempted.
Taiwan Chemical Substances Inventory (TCSI)	Not determined.
REACH Status	For the REACH status of this product please consult your company contact, as identified in Section 1.

Section 16. Other information

National Fire Protection Association (U.S.A.)



History

Date of issue/Date of revision	02/05/2018.
Date of previous issue	01/12/2018.
Prepared by	Product Stewardship
Key to abbreviations	ACGIH = American Conference of Industrial Hygienists ATE = Acute Toxicity Estimate BCF = Bioconcentration Factor CAS Number = Chemical Abstracts Service Registry Number GHS = Globally Harmonized System of Classification and Labelling of Chemicals IATA = International Air Transport Association IBC = Intermediate Bulk Container IMDG = International Maritime Dangerous Goods LogPow = logarithm of the octanol/water partition coefficient MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as

Section 16. Other information

modified by the Protocol of 1978. ("Marpol" = marine pollution)
OEL = Occupational Exposure Limit
SDS = Safety Data Sheet
STEL = Short term exposure limit
TWA = Time weighted average
UN = United Nations
UN Number = United Nations Number, a four digit number assigned by the United Nations Committee of Experts on the Transport of Dangerous Goods.
Varies = may contain one or more of the following 101316-69-2, 101316-70-5, 101316-71-6, 101316-72-7, 64741-88-4, 64741-89-5, 64741-95-3, 64741-96-4, 64741-97-5, 64742-01-4, 64742-44-5, 64742-45-6, 64742-52-5, 64742-53-6, 64742-54-7, 64742-55-8, 64742-56-9, 64742-57-0, 64742-58-1, 64742-62-7, 64742-63-8, 64742-64-9, 64742-65-0, 64742-70-7, 72623-85-9, 72623-86-0, 72623-87-1, 74869-22-0, 90669-74-2

Indicates information that has changed from previously issued version.

Notice to reader

All reasonably practicable steps have been taken to ensure this data sheet and the health, safety and environmental information contained in it is accurate as of the date specified below. No warranty or representation, express or implied is made as to the accuracy or completeness of the data and information in this data sheet.

The data and advice given apply when the product is sold for the stated application or applications. You should not use the product other than for the stated application or applications without seeking advice from BP Group.

It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. The BP Group shall not be responsible for any damage or injury resulting from use, other than the stated product use of the material, from any failure to adhere to recommendations, or from any hazards inherent in the nature of the material. Purchasers of the product for supply to a third party for use at work, have e duty to take all necessery steps to ensure that any person handling or using the product is provided with the information in this sheet. Employers have a duty to tell employees and others who may be affected of any hazards described in this sheet and of any precautions that should be taken. You can contact the BP Group to ensure that this document is the most current evaileble. Alteration of this document is strictly prohibited.

The ArmaKleen Company

safety-kleen

Safety Data Sheet

Material Name: ArmaKleen 4 in 1 Cleaner Concentrate **SDS ID: 820071**

Section 1 - PRODUCT AND COMPANY IDENTIFICATION

Material Name

ArmaKleen 4 in 1 Cleaner Concentrate

Product Code

6365, 6466, 6366
Formula Code 42000146

Synonyms

Not available.

Product Use Recommended Use

Aqueous, alkaline, concentrated cleaner that is to be diluted with water and used for cleaning aluminum, magnesium, titanium, ferrous and non-ferrous alloys as well as plastic, glass, and composite materials. Concentrated cleaner must be diluted prior to use to meet local and state VOC emission regulations. If this product is used in combination with other products, refer to the Safety Data Sheet for those products.

Restrictions on Use

For professional use only.

MANUFACTURER
Church & Dwight
The ArmaKleen™ Company
469 North Harrison Street
Princeton, NJ 08543
Phone: (800) 332-5424
www.churchdwight.com

SUPPLIER
Safety-Kleen Systems, Inc.
2600 North Central Expressway
Suite 200
Richardson, TX 75080
Phone: 1-800-669-5740
www.safety-kleen.com

IMPORTER/DISTRIBUTOR
Safety-Kleen Canada Inc.
25 Regan Road
Brampton, Ontario, Canada L1A 1B2
Phone: 1-800-669-5740

Emergency Telephone Number

Medical: 1-888-234-1828 Chemical: 1-800-424-9300 (CHEMTREC)

Issue Date

March 6, 2017

Supersedes Issue Date

April 27, 2015

Original Issue Date

October 22, 2009

Section 2 - HAZARDS IDENTIFICATION

Classification in accordance with Schedule 1 of Canada's Hazardous Products Regulations (HPR) (SOR/2015-17) and paragraph (d) of 29 CFR 1910.1200 in the United States

Acute Toxicity - Oral - Category 4
Skin Corrosion/Irritation - Category 1A
Serious Eye Damage/Eye Irritation - Category 1
Skin Sensitization - Category 1A
Specific Target Organ Toxicity - Repeated Exposure - Category 2
Health Hazard Not Otherwise Classified - Category 1.

GHS Label Elements
Symbol(s)



Signal Word
Danger.
Hazard Statement(s)
Causes severe skin burns and eye damage.
May cause allergic skin reaction.
May cause damage to organs through prolonged or repeated exposure.
Causes severe damage to the respiratory tract.
Precautionary Statement(s)
Prevention
Do not breathe dust/fume/gas/mist/vapors/spray. Wear protective gloves/protective clothing/eye protection/face protection. Wash thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace. Do not eat, drink or smoke when using this product.
Response
If exposed: Call a POISON CENTER or doctor/physician. IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. Immediately call a POISON CENTER or doctor physician. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. If skin irritation or rash occurs: Get medical advice/attention. Wash contaminated clothing before reuse. IF INHALED: Remove person to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor physician.
Storage
Store locked up.
Disposal
Dispose of contents/container in accordance with local/regional/national/international regulations.
Statement of Unknown Toxicity
69% of the mixture consists of ingredient(s) of unknown acute toxicity.
Other hazards
Repeated exposure may cause skin dryness or cracking.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

CAS	Component Name	Percent
7732-18-5	Water	53-60
124-07-2	Octanoic acid	5.0 -5.5
68439-46-3	Alcohols, C9-11, ethoxylated	3.8-4.2
68987-81-5	Alcohols, C6-10, ethoxylated propoxylated	2.9-3.2
61791-26-2	Amines, tallow alkyl, ethoxylated	2.9-3.2

1310-73-2	Sodium hydroxide	2.5-2.7
68154-99-4	Alcohols, C8-10, ethers with polyethylene-polypropylene glycol monobenzyl ether	1.4-1.6
497-19-8	Disodium carbonate	1.9-2.1
110-15-6	Succinic acid	1.6-1.8
23783-26-8	Acetic acid, hydroxyphosphono-	2.9-3.2

Section 4 - FIRST AID MEASURES

Inhalation

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor.

Skin

IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. If skin irritation or rash occurs: Get medical advice/attention. Wash contaminated clothing before reuse.

Eyes

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor.

Ingestion

IF SWALLOWED: Rinse mouth. If swallowed, do NOT induce vomiting. Immediately call a POISON CENTER or doctor. Do not induce vomiting.

Most Important Symptoms/Effects

Acute

Harmful if swallowed. Causes skin burns, eye burns, allergic skin reaction. Causes severe damage to the respiratory tract.

Delayed

Repeated exposure may cause skin dryness or cracking. May cause damage to organs through prolonged or repeated exposure.

Indication of any immediate medical attention and special treatment needed

Treat symptomatically and supportively.

Section 5 - FIRE FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media

Use extinguishing agents appropriate for surrounding fire.

Unsuitable Extinguishing Media

Do not use high-pressure water streams. Avoid using a direct stream of water.

Special Hazards Arising from the Chemical

Negligible fire hazard.

Hazardous Combustion Products

Burning may produce Carbon monoxide, Nitrogen oxide.

Advice for firefighters

Containers may rupture or explode if exposed to heat.

Fire Fighting Measures

Move container from fire area if it can be done without risk. Keep storage containers cool with water spray. Heated containers may rupture. "Empty" containers may retain residue and can be dangerous. Product is not sensitive to mechanical impact or statie discharge.

Special Protective Equipment and Precautions for Firefighters

A positive-pressure, self-contained breathing apparatus (SCBA) and full-body protective equipment are required for fire emergencies.

Section 6 - ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

Wear personal protective clothing and equipment, see Section 8.

Methods and Materials for Containment and Cleaning Up

Remove all ignition sources. Do not touch or walk through spilled product. Keep unnecessary and unprotected personnel from entering. Ventilate area and avoid breathing vapor or mist. Contain spill as a liquid for possible recovery, or sorb with compatible sorbent material and shovel with a clean, spark proof tool into a sealable container for disposal. Additionally, for large spills: Dike far ahead of liquid spill for collection and later disposal.

Environmental Precautions

Prevent material from entering drains or sewers.

Section 7 - HANDLING AND STORAGE

Precautions for Safe Handling

Keep away from sparks or flame. Do not breathe dust or vapors. Contaminated work clothing should not be allowed out of the workplace. Wear protective gloves/protective clothing/eye protection/face protection. Wash thoroughly after handling.

Conditions for Safe Storage, Including any Incompatibilities

Keep container tightly closed when not in use and during transport. Store containers in a cool, dry place. Do not pressurize, cut, weld, braze, solder, drill, or grind containers. Keep containers away from heat, flame, sparks, static electricity, or other sources of ignition. Empty product containers may retain product residue and can be dangerous.

Incompatible Materials

Strong acids, reducing agents, oxidizers.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Component Exposure Limits

Sodium hydroxide	**1310-73-2**
Alberta, British Columbia, Manitoba, New Brunswick, Northwest Territories, Nova Scotia, Nunavut, Ontario, Prince Edward Island, Quebec, Saskatchewan	2 mg/m3 Ceiling
ACGIH:	2 mg/m3 Ceiling

ACGIH - Threshold Limit Values - Biological Exposure Indices (BEI)

There are no biological limit values for any of this product's components.

Engineering Controls

Provide general ventilation needed to maintain concentration of vapor or mist below applicable exposure limits. Where adequate general ventilation is unavailable, use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below applicable exposure limits.

Individual Protection Measures, such as Personal Protective Equipment

Eye/face protection

Wear safety glasses. Additional protection like goggles, face shields, or respirators may be needed dependent upon anticipated use and concentrations of mists or vapors. Eye wash fountain and emergency showers are recommended. Contact lens use is not recommended.

Respiratory Protection

A respiratory protection program which meets USA's OSHA General Industry Standard 29 CFR 1910.134 or Canada's CSA Standard Z94.4-M1982 requirements must be followed whenever workplace conditions warrant a respirator's use. Consult a qualified Industrial Hygienist or Safety Professional for respirator selection guidance.

Glove Recommendations

Where skin contact is likely, wear gloves impervious to product; use of natural rubber (latex) or equivalent gloves is not recommended. To avoid prolonged or repeated contact where spills and splashes are likely, wear appropriate chemical-resistant face shield, boots, apron, whole body suits or other protective clothing. When product is heated and skin contact is likely, wear heat-resistant gloves, boots, and other protective clothing.

Protective Materials

Personal protective equipment should be selected based upon the conditions under which this material is used. A hazard assessment of the work area for PPE requirements should be conducted by a qualified professional pursuant to regulatory requirements. The following PPE should be considered the minimum required: Safety glasses, Gloves, Lab coat or apron.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Amber clear liquid	**Physical State**	Liquid
Odor	Mild	**Color**	Clear, amber
Odor Threshold	Not available	**pH**	11.9 (aqueous solution)
Melting Point	0 °C	**Boiling Point**	100 °C
Boiling Point Range	Not available	**Freezing point**	Not available
Evaporation Rate	Not available	**Flammability (solid, gas)**	Not available
Autoignition Temperature	Not available	**Flash Point**	>100 °C
Lower Explosive Limit	Not available	**Decomposition temperature**	Not available
Upper Explosive Limit	Not available	**Vapor Pressure**	Not available
Vapor Density (air=1)	Not available	**Specific Gravity (water=1)**	1.055
Water Solubility	(complete)	**Partition coefficient: n-octanol/water**	Not available
Viscosity	Not available	**Solubility (Other)**	Not available
Density	Not available	**Molecular Weight**	Not available

Volatile Organic Compounds (As regulated)	2.5% Solution	0.51 WT%; 0.044 LB/US gal; 5.25 g/L; As per 40 CFR Part 51.100(s) Product Vapor Pressure @20°C = 17.5 mmHg Product does not contain photochemically reactive solvents
	5.0% Solution	1.02 WT%; 0.088 LB/US gal; 10.5 g/L; As per 40 CFR Part 51.100(s) Product Vapor Pressure @20°C = 17.5 mmHg VOC Vapor Pressure @38°C = 0.644 mmHg Product does not contain photochemically reactive solvents
	10% Solution	2.04 WT%; 0.175 LB/US gal; 21g/L; As per 40 CFR Part 51.100(s) Product Vapor Pressure @20°C = 17.5 mmHg VOC Vapor Pressure @38°C = 0.734 mmHg Product does not contain photochemically reactive solvents
	100% Concentrate	21.1 WT%; 1.76 LB/US gal; 210.92 g/L; As per 40 CFR Part 51.100(s) Product Vapor Pressure @20°C = 17.5 mmHg Product does not contain photochemically reactive solvents

Section 10 - STABILITY AND REACTIVITY

Reactivity

May react on contact with strong acids.

Chemical Stability

Stable under normal temperatures and pressures.

Possibility of Hazardous Reactions

Polymerization is not known to occur under normal temperature and pressures. Not reactive with water.

Conditions to Avoid

Avoid sparks or flame.

Incompatible Materials

Strong acids, reducing agents, oxidizers.

Hazardous decomposition products

Oxides of carbon, nitrogen oxides. See also SECTION 5: HAZARDOUS COMBUSTION PRODUCTS.

Thermal decomposition products

Carbon monoxide, nitrogen oxides (NOx).

Section 11 - TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Inhalation

Causes severe damage to the respiratory tract.

Skin Contact

Causes burns. May cause allergic skin reaction.

Eye Contact

Causes eye burns.

Ingestion

Harmful if swallowed. May cause irritation.

Acute and Chronic Toxicity

Component Analysis - LD50/LC50

The components of this material have been reviewed in various sources and the following selected endpoints are published:

Octanoic acid (124-07-2)

Dermal LD50 Rabbit >5 g/kg

Alcohols, C9-11, ethoxylated (68439-46-3)

Oral LD50 Rat 1400 mg/kg

Amines, tallow alkyl, ethoxylated (61791-26-2)

Oral LD50 Rat 500 mg/kg

Sodium hydroxide (1310-73-2)
Dermal LD50 Rabbit 1350 mg/kg
Disodium carbonate (497-19-8)
Oral LD50 Rat 4090 mg/kg; Dermal LD50 Mouse 2210 mg/kg;Inhalation LC50 Rat 2300 mg/m3 2 h
Succinic acid (110-15-6)
Oral LD50 Rat 2260 mg/kg

Product Toxicity Data

Acute Toxicity Estimate

Dermal	> 2000 mg/kg
Oral	871.4859 mg/kg

Immediate Effects
Harmful if swallowed. Causes burns, eye burns, skin burns. May cause allergic skin reaction. Causes severe damage to the respiratory tract.

Delayed Effects
Repeated exposure may cause skin dryness or cracking. May cause damage to organs through prolonged or repeated exposure.

Irritation/Corrosivity Data
Causes burns. Causes severe damage to the respiratory tract.

Respiratory Sensitization
Based on best current information, there is no known human sensitization associated with this product.

Dermal Sensitization
May cause allergic skin reaction.

Component Carcinogenicity
None of this product's components are listed by ACGIH, IARC, NTP, DFG or OSHA

Germ Cell Mutagenicity
Based on best current information, there is no known teratogenicity associated with this product.
Experimental evidence suggests that this product does not cause mutagenesis.

Tumorigenic Data
No data available

Reproductive Toxicity
Based on best current information, there is no known reproductive toxicity associated with this product.

Specific Target Organ Toxicity - Single Exposure
No target organs identified.

Specific Target Organ Toxicity - Repeated Exposure
May cause damage to organs through prolonged or repeated exposure.

Aspiration hazard
Based on available data, the classification criteria are not met.

Medical Conditions Aggravated by Exposure
Individuals with pre-existing respiratory tract (nose, throat, and lungs), eye, and/or skin disorders may have increased susceptibility to the effects of exposure.

Section 12 - ECOLOGICAL INFORMATION

Component Analysis - Aquatic Toxicity

Octanoic acid	**124-07-2**
Fish:	LC50 96 h Oryzias latipes 310 mg/L [semi-static]; LC50 96 h Brachydanio rerio 110 mg/L [semi-static]

Sodium hydroxide	**1310-73-2**
Fish:	LC50 96 h Oncorhynchus mykiss 45.4 mg/L [static]
Disodium carbonate	**497-19-8**
Fish:	LC50 96 h Lepomis macrochirus 300 mg/L [static]; LC50 96 h Pimephales promelas 310 - 1220 mg/L [static]
Invertebrate:	EC50 48 h Daphnia magna 265 mg/L IUCLID

Invertebrate Toxicity

No additional information is available.

Persistence and Degradability

No information available for the product.

Bioaccumulative Potential

No information available for the product.

Mobility

No information available for the product.

Section 13 - DISPOSAL CONSIDERATIONS

Disposal Methods

Dispose in accordance with federal, state, provincial, and local regulations. Regulations may also apply to empty containers. The responsibility for proper waste disposal lies with the owner of the waste. Contact ArmaKleen regarding proper recycling or disposal.

Section 14 - TRANSPORT INFORMATION

US DOT Information: Not regulated for transport.
IATA Information: Not regulated for transport.
TDG Information: Not regulated for transport.

Section 15 - REGULATORY INFORMATION

Canada Regulations

CEPA - Priority Substances List

None of this product's components are on the list.

Ozone Depleting Substances

None of this product's components are on the list

Council of Ministers of the Environment - Soil Quality Guidelines

None of this product's components are on the list

Council of Ministers of the Environment - Water Quality Guidelines

None of this product's components are on the list

U.S. Federal Regulations

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), and/or require an OSHA process safety plan.

Sodium hydroxide	**1310-73-2**

CERCLA:	1000 lb final RQ ; 454 kg final RQ

SARA Section 311/312 (40 CFR 370 Subparts B and C)

Acute Health: Yes **Chronic Health:** No **Fire:** No **Pressure:** No **Reactivity:** No

Component Analysis - Inventory

Octanoic acid (124-07-2), Sodium hydroxide (1310-73-2), Succinic acid (110-15-6)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR - KECI/KECL	KR - TCCA	CN	NZ	MX	TW
Yes	DSL	EIN	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes

Alcohols, C9-11, ethoxylated (68439-46-3), Alcohols, C6-10, ethoxylated propoxylated (68987-81-5), Amines, tallow alkyl, ethoxylated (61791-26-2), Alcohols, C8-10, ethers with polyethylene-polypropylene glycol monobenzyl ether (68154-99-4)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR - KECI/KECL	KR - TCCA	CN	NZ	MX	TW
Yes	DSL	No	Yes	Yes	No	No	Yes	No	Yes	Yes	Yes	Yes

Disodium carbonate (497-19-8)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR - KECI/KECL	KR - TCCA	CN	NZ	MX	TW
Yes	DSL	EIN	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes

Acetic acid, hydroxyphosphono- (23783-26-8)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR - KECI/KECL	KR - TCCA	CN	NZ	MX	TW
Yes	DSL	ELN	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes

Section 16 - OTHER INFORMATION

NFPA Ratings

Health: 1 Fire: 0 Reactivity: 0

Hazard Scale: 0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe

Summary of Changes

Revision to comply with WHMIS 2015.

Key / Legend

ACGIH - American Conference of Governmental Industrial Hygienists; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CA/MA/MN/NJ/PA - California/Massachusetts/Minnesota/New Jersey/Pennsylvania*; CAS - Chemical Abstracts Service; CFR - Code of Federal Regulations (US); CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CLP - Classification, Labelling, and Packaging; CPR - Controlled Products Regulations; DOT - Department of Transportation; DSL - Domestic Substances List; EPA - Environmental Protection Agency; F - Fahrenheit; IDL - Ingredient Disclosure List; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; LEL - Lower Explosive Limit; LLV - Level Limit Value; LOLI - List Of LIsts™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; NDSL – Non-Domestic Substance List (Canada); NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR -

New Jersey Trade Secret Registry; NTP - National Toxicology Program; OSHA - Occupational Safety and Health Administration; PEL- Permissible Exposure Limit; RCRA - Resource Conservation and Recovery Act; SARA - Superfund Amendments and Reauthorization Act; STEL - Short-term Exposure Limit; TDG - Transportation of Dangerous Goods; TLV - Threshold Limit Value; TSCA - Toxic Substances Control Act; TWA - Time Weighted Average; UEL - Upper Explosive Limit; UN/NA - United Nations /North American; US - United States; WHMIS - Workplace Hazardous Materials Information System (Canada).

Other Information

This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200 and Canada's Hazardous Product Regulations (HPR)

Disclaimer:

User assumes all risks incident to the use of this product. To the best of our knowledge, the information contained herein is accurate. However, ArmaKleen assumes no liability whatsoever for the accuracy or completeness of the information contained herein. No representations or warranties, either expressed or implied, of merchantability, fitness for a particular purpose or of any other nature are made hereunder with respect to the information or the product to which the information refers. The data contained on this sheet apply to the product as supplied to the user.

Safety Data Sheet

Shell Spirax S4 TXM

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Shell Spirax S4 TXM

Product code : 001D8246

Manufacturer or supplier's details

Supplier : Viva Energy Australia Pty Ltd
(Formerly: The Shell Company of Australia)
(ABN 46 004 610 459)
720 Bourke Street
Docklands
Victoria 3008
Australia

Telephone : +61 (0)3 8823 4444 ;

Telefax : +61 (0)3 8823 4800

Emergency telephone number : 1800 651 818 (Australia). POISONS INFORMATION CENTRE: 13 11 26 (Australia).

Recommended use of the chemical and restrictions on use

Recommended use : Transmission oil.

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification

Not a dangerous substance or mixture according to the Globally Harmonised System (GHS).

GHS label elements

Hazard pictograms : No Hazard Symbol required

Signal word : No signal word

Hazard statements : PHYSICAL HAZARDS:
Not classified as a physical hazard under GHS criteria.
HEALTH HAZARDS:
Not classified as a health hazard under GHS criteria.
ENVIRONMENTAL HAZARDS:
Not classified as an environmental hazard under GHS criteria.

Precautionary statements :

Prevention:
No precautionary phrases.

Response:
No precautionary phrases.

Storage:
No precautionary phrases.

Disposal:

No precautionary phrases.

Sensitising components : Contains borated ester.May produce an allergic reaction.

Other hazards which do not result in classification

Prolonged or repeated skin contact without proper cleaning can clog the pores of the skin resulting in disorders such as oil acne/folliculitis.Used oil may contain harmful impurities.Not classified as flammable but will burn.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature : Highly refined mineral oils and additives.
The highly refined mineral oil contains <3% (w/w) DMSO-extract, according to IP346.

: * contains one or more of the following CAS-numbers: 64742-53-6, 64742-54-7, 64742-55-8, 64742-56-9, 64742-65-0, 68037-01-4, 72623-86-0, 72623-87-1, 8042-47-5, 848301-69-9.

Hazardous components

Chemical name	CAS-No.	Classification	Concentration [%]
Zinc dialkyldithiophosphate	4259-15-8	Eye Dam.1; H318 Aquatic Chronic2; H411	1 - 2.4
Borated ester	Not Assigned	Skin Sens.1; H317	0.1 - 0.9
Interchangeable low viscosity base oil (<20,5 cSt @40°C) *	Not Assigned	Asp. Tox.1; H304	0 - 90

For explanation of abbreviations see section 16.

SECTION 4. FIRST-AID MEASURES

General advice : Not expected to be a health hazard when used under normal conditions.

If inhaled : No treatment necessary under normal conditions of use.
If symptoms persist, obtain medical advice.

In case of skin contact : Remove contaminated clothing. Flush exposed area with water and follow by washing with soap if available.
If persistent irritation occurs, obtain medical attention.

In case of eye contact : Flush eye with copious quantities of water.
If persistent irritation occurs, obtain medical attention.

If swallowed : In general no treatment is necessary unless large quantities are swallowed, however, get medical advice.

Most important symptoms and effects, both acute and delayed	:	Oil acne/folliculitis signs and symptoms may include formation of black pustules and spots on the skin of exposed areas. Ingestion may result in nausea, vomiting and/or diarrhoea.
Protection of first-aiders	:	When administering first aid, ensure that you are wearing the appropriate personal protective equipment according to the incident, injury and surroundings.
Notes to physician	:	Treat symptomatically.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	:	Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.
Unsuitable extinguishing media	:	Do not use water in a jet.
Specific hazards during firefighting	:	Hazardous combustion products may include: A complex mixture of airborne solid and liquid particulates and gases (smoke). Carbon monoxide may be evolved if incomplete combustion occurs. Unidentified organic and inorganic compounds.
Specific extinguishing methods	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Special protective equipment for firefighters	:	Proper protective equipment including chemical resistant gloves are to be worn; chemical resistant suit is indicated if large contact with spilled product is expected. Self-Contained Breathing Apparatus must be worn when approaching a fire in a confined space. Select fire fighter's clothing approved to relevant Standards (e.g. Europe: EN469).
Hazchem Code	:	NONE

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Avoid contact with skin and eyes.
Environmental precautions	:	Use appropriate containment to avoid environmental contamination. Prevent from spreading or entering drains, ditches or rivers by using sand, earth, or other appropriate barriers. Local authorities should be advised if significant spillages cannot be contained.

Methods and materials for containment and cleaning up	:	Slippery when spilt. Avoid accidents, clean up immediately. Prevent from spreading by making a barrier with sand, earth or other containment material. Reclaim liquid directly or in an absorbent. Soak up residue with an absorbent such as clay, sand or other suitable material and dispose of properly.
Additional advice	:	For guidance on selection of personal protective equipment see Chapter 8 of this Safety Data Sheet. For guidance on disposal of spilled material see Chapter 13 of this Safety Data Sheet.

SECTION 7. HANDLING AND STORAGE

General Precautions	:	Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols. Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material.
Advice on safe handling	:	Avoid prolonged or repeated contact with skin. Avoid inhaling vapour and/or mists. When handling product in drums, safety footwear should be worn and proper handling equipment should be used. Properly dispose of any contaminated rags or cleaning materials in order to prevent fires.
Avoidance of contact	:	Strong oxidising agents.
Product Transfer	:	This material has the potential to be a static accumulator. Proper grounding and bonding procedures should be used during all bulk transfer operations.

Storage

Other data	:	Keep container tightly closed and in a cool, well-ventilated place. Use properly labeled and closable containers. Store at ambient temperature.
Packaging material	:	Suitable material: For containers or container linings, use mild steel or high density polyethylene. Unsuitable material: PVC.
Container Advice	:	Polyethylene containers should not be exposed to high temperatures because of possible risk of distortion.

SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Oil mist, mineral	Not Assigned	TWA (Mist)	5 mg/m3	AU OEL
Oil mist, mineral	Not Assigned	TWA ((inhalable fraction))	5 mg/m3	US. ACGIH Threshold Limit Values
Oil mist, mineral	Not Assigned	TWA (Mist)	5 mg/m3	Australia. Workplace Exposure Standards for Airborne Contaminants.
Oil mist, mineral	Not Assigned	TWA (Mist)	5 mg/m3	OSHA Z-1
	Not Assigned	TWA (Inhalable fraction)	5 mg/m3	ACGIH

Biological occupational exposure limits

No biological limit allocated.

Monitoring Methods

Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls. For some substances biological monitoring may also be appropriate.
Validated exposure measurement methods should be applied by a competent person and samples analysed by an accredited laboratory.
Examples of sources of recommended exposure measurement methods are given below or contact the supplier. Further national methods may be available.
National Institute of Occupational Safety and Health (NIOSH), USA: Manual of Analytical Methods http://www.cdc.gov/niosh/
Occupational Safety and Health Administration (OSHA), USA: Sampling and Analytical Methods http://www.osha.gov/
Health and Safety Executive (HSE), UK: Methods for the Determination of Hazardous Substances http://www.hse.gov.uk/
Institut für Arbeitsschutz Deutschen Gesetzlichen Unfallversicherung (IFA) , Germany http://www.dguv.de/inhalt/index.jsp
L'Institut National de Recherche et de Securité, (INRS), France http://www.inrs.fr/accueil

Engineering measures : The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include:
Adequate ventilation to control airborne concentrations.

Where material is heated, sprayed or mist formed, there is greater potential for airborne concentrations to be generated.

General Information:
Define procedures for safe handling and maintenance of controls.
Educate and train workers in the hazards and control

measures relevant to normal activities associated with this product.
Ensure appropriate selection, testing and maintenance of equipment used to control exposure, e.g. personal protective equipment, local exhaust ventilation.
Drain down system prior to equipment break-in or maintenance.
Retain drain downs in sealed storage pending disposal or subsequent recycle.
Always observe good personal hygiene measures, such as washing hands after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned.
Practice good housekeeping.

Personal protective equipment

Protective measures

Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.

Respiratory protection : No respiratory protection is ordinarily required under normal conditions of use.
In accordance with good industrial hygiene practices, precautions should be taken to avoid breathing of material.
If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation.
Check with respiratory protective equipment suppliers.
Where air-filtering respirators are suitable, select an appropriate combination of mask and filter.
Select a filter suitable for the combination of organic gases and vapours [Type A/Type P boiling point >65°C (149°F)].

Hand protection
Remarks : Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g. Europe: EN374, US: F739) made from the following materials may provide suitable chemical protection. PVC, neoprene or nitrile rubber gloves Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.

For continuous contact we recommend gloves with breakthrough time of more than 240 minutes with preference for > 480 minutes where suitable gloves can be identified. For short-term/splash protection we recommend the same, but

recognize that suitable gloves offering this level of protection may not be available and in this case a lower breakthrough time maybe acceptable so long as appropriate maintenance and replacement regimes are followed. Glove thickness is not a good predictor of glove resistance to a chemical as it is dependent on the exact composition of the glove material. Glove thickness should be typically greater than 0.35 mm depending on the glove make and model.

Eye protection	:	If material is handled such that it could be splashed into eyes, protective eyewear is recommended.
Skin and body protection	:	Skin protection is not ordinarily required beyond standard work clothes. It is good practice to wear chemical resistant gloves.
Thermal hazards	:	Not applicable

Environmental exposure controls

General advice	:	Take appropriate measures to fulfill the requirements of relevant environmental protection legislation. Avoid contamination of the environment by following advice given in Chapter 6. If necessary, prevent undissolved material from being discharged to waste water. Waste water should be treated in a municipal or industrial waste water treatment plant before discharge to surface water. Local guidelines on emission limits for volatile substances must be observed for the discharge of exhaust air containing vapour.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Liquid at room temperature.
Colour	:	amber
Odour	:	Slight hydrocarbon
Odour Threshold	:	Data not available
pH	:	Not applicable
pour point	:	-42 °C / -44 °FMethod: ISO 3016
Melting / freezing point		Data not available
Initial boiling point and boiling range	:	> 280 °C / 536 °Festimated value(s)
Flash point	:	220 °C / 428 °F Method: ISO 2592
Evaporation rate	:	Data not available
Flammability (solid, gas)	:	Data not available

Upper explosion limit	:	Typical 10 %(V)
Lower explosion limit	:	Typical 1 %(V)
Vapour pressure	:	< 0.5 Pa (20 °C / 68 °F) estimated value(s)
Relative vapour density	:	> 1estimated value(s)
Relative density	:	0.882 (15 °C / 59 °F)
Density	:	882 kg/m3 (15.0 °C / 59.0 °F) Method: ISO 12185
Solubility(ies)		
Water solubility	:	negligible
Solubility in other solvents	:	Data not available
Partition coefficient: n-octanol/water	:	Pow: > 6(based on information on similar products)
Auto-ignition temperature	:	> 320 °C / 608 °F
Viscosity		
Viscosity, dynamic	:	Data not available
Viscosity, kinematic	:	60 mm2/s (40.0 °C / 104.0 °F) Method: ISO 3104
		9.4 mm2/s (100 °C / 212 °F) Method: ISO 3104
Explosive properties	:	Not classified
Oxidizing properties	:	Data not available
Conductivity	:	This material is not expected to be a static accumulator.
Decomposition temperature	:	Data not available

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	The product does not pose any further reactivity hazards in addition to those listed in the following sub-paragraph.
Chemical stability	:	Stable.
Possibility of hazardous reactions	:	Reacts with strong oxidising agents.

Conditions to avoid	:	Extremes of temperature and direct sunlight.
Incompatible materials	:	Strong oxidising agents.
Hazardous decomposition products	:	Hazardous decomposition products are not expected to form during normal storage.

SECTION 11. TOXICOLOGICAL INFORMATION

Basis for assessment	:	Information given is based on data on the components and the toxicology of similar products.Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s).
Exposure routes	:	Skin and eye contact are the primary routes of exposure although exposure may occur following accidental ingestion.

Acute toxicity

Product:

Acute oral toxicity	:	LD50 rat: > 5,000 mg/kg Remarks: Expected to be of low toxicity:
Acute inhalation toxicity	:	Remarks: Not considered to be an inhalation hazard under normal conditions of use.
Acute dermal toxicity	:	LD50 Rabbit: > 5,000 mg/kg Remarks: Expected to be of low toxicity:

Skin corrosion/irritation

Product:

Remarks: Expected to be slightly irritating., Prolonged or repeated skin contact without proper cleaning can clog the pores of the skin resulting in disorders such as oil acne/folliculitis.

Serious eye damage/eye irritation

Product:

Remarks: Expected to be slightly irritating.

Components:

Zinc dialkyldithiophosphate:
Remarks: Based on available data, the classification criteria are not met.

Respiratory or skin sensitisation

Product:

Remarks: Not expected to be a skin sensitiser.

Components:

Borated ester:
Remarks: May cause an allergic skin reaction in sensitive individuals.

Chronic toxicity

Germ cell mutagenicity

Product:

: Remarks: Not considered a mutagenic hazard.

Carcinogenicity

Product:

Remarks: Not expected to be carcinogenic.

Remarks: Product contains mineral oils of types shown to be non-carcinogenic in animal skin-painting studies., Highly refined mineral oils are not classified as carcinogenic by the International Agency for Research on Cancer (IARC).

Material	GHS/CLP Carcinogenicity Classification
Highly refined mineral oil	No carcinogenicity classification.

Reproductive toxicity

Product:

:
Remarks: Not expected to impair fertility., Not expected to be a developmental toxicant.

STOT - single exposure

Product:

Remarks: Not expected to be a hazard.

STOT - repeated exposure

Product:

Remarks: Not expected to be a hazard.

Aspiration toxicity

Product:

Not considered an aspiration hazard.

Further information

Product:

Remarks: Used oils may contain harmful impurities that have accumulated during use. The concentration of such impurities will depend on use and they may present risks to health and the environment on disposal., ALL used oil should be handled with caution and skin contact avoided as far as possible.

Remarks: Slightly irritating to respiratory system.

SECTION 12. ECOLOGICAL INFORMATION

Basis for assessment : Ecotoxicological data have not been determined specifically for this product.
Information given is based on a knowledge of the components and the ecotoxicology of similar products.
Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s).(LL/EL/IL50 expressed as the nominal amount of product required to prepare aqueous test extract).

Ecotoxicity

Product:

Toxicity to fish (Acute toxicity) :
Remarks: Expected to be practically non toxic:
LL/EL/IL50 > 100 mg/l

Toxicity to crustacean (Acute toxicity) :
Remarks: Expected to be practically non toxic:
LL/EL/IL50 > 100 mg/l

Toxicity to algae/aquatic plants (Acute toxicity) :
Remarks: Expected to be practically non toxic:
LL/EL/IL50 > 100 mg/l

Toxicity to fish (Chronic toxicity) : Remarks: Data not available

Toxicity to crustacean (Chronic toxicity) : Remarks: Data not available

Toxicity to microorganisms (Acute toxicity) : Remarks: Data not available

Persistence and degradability

Product:

Biodegradability : Remarks: Expected to be not readily biodegradable., Major constituents are expected to be inherently biodegradable, but contains components that may persist in the environment.

Bioaccumulative potential

Product:

Bioaccumulation	:	Remarks: Contains components with the potential to bioaccumulate.
Partition coefficient: n-octanol/water	:	Pow: > 6Remarks: (based on information on similar products)

Mobility in soil

Product:

Mobility	:	Remarks: Liquid under most environmental conditions., If it enters soil, it will adsorb to soil particles and will not be mobile. Remarks: Floats on water.

Other adverse effects

no data available

Product:

Additional ecological information	:	Product is a mixture of non-volatile components, which are not expected to be released to air in any significant quantities., Not expected to have ozone depletion potential, photochemical ozone creation potential or global warming potential. Poorly soluble mixture., May cause physical fouling of aquatic organisms. Mineral oil is not expected to cause any chronic effects to aquatic organisms at concentrations less than 1 mg/l.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues	:	Waste product should not be allowed to contaminate soil or ground water, or be disposed of into the environment. Waste, spills or used product is dangerous waste. Disposal should be in accordance with applicable regional, national, and local laws and regulations. Local regulations may be more stringent than regional or national requirements and must be complied with.
Contaminated packaging	:	Dispose in accordance with prevailing regulations, preferably to a recognized collector or contractor. The competence of the collector or contractor should be established beforehand. Disposal should be in accordance with applicable regional, national, and local laws and regulations.

SECTION 14. TRANSPORT INFORMATION

National Regulations

ADG
Not regulated as a dangerous good

International Regulations

IATA-DGR
Not regulated as a dangerous good

IMDG-Code
Not regulated as a dangerous good

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Pollution category	:	Not applicable
Ship type	:	Not applicable
Product name	:	Not applicable
Special precautions	:	Not applicable

Special precautions for user

Remarks	:	Special Precautions: Refer to Chapter 7, Handling & Storage, for special precautions which a user needs to be aware of or needs to comply with in connection with transport.
Additional Information	:	MARPOL Annex 1 rules apply for bulk shipments by sea.

SECTION 15. REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture

Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP)	:	No poison schedule number allocated

Product classified as per Work Health Safety Regulations – Implementation of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS) 2012 and SDS prepared as per national model code of practice for preparation of safety data sheet for Hazardous chemicals 2011 based on Globally Harmonized Classification version 3.

National Model Code of Practice for the Labelling of Workplace Hazardous Chemicals (2011).

Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG code).

Other international regulations

The components of this product are reported in the following inventories:

EINECS	:	All components listed or polymer exempt.
TSCA	:	All components listed.
AICS	:	All components listed.

SECTION 16. OTHER INFORMATION

Full text of H-Statements

H304	May be fatal if swallowed and enters airways.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H411	Toxic to aquatic life with long lasting effects.

Full text of other abbreviations

Aquatic Chronic	Chronic aquatic toxicity
Asp. Tox.	Aspiration hazard
Eye Dam.	Serious eye damage
Skin Sens.	Skin sensitisation

Abbreviations and Acronyms : The standard abbreviations and acronyms used in this document can be looked up in reference literature (e.g. scientific dictionaries) and/or websites.

Date of preparation or review : 05.09.2016

Further information

Other information : A vertical bar (|) in the left margin indicates an amendment from the previous version.

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

Appendix R.3
WWTU Exemption Support

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REPUBLIC SERVICES
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April 14, 2020

Doug Coenen, P.E.
Waste Management Specialist
Waste and Materials Management Program
Wisconsin Department of Natural Resources
101 S. Webster Street HW/5
P.O. Box 792
Madison, WI 53707-7921

Subject: Response to Compliance Assessment Findings
Kestrel Hawk Landfill – EPA ID WID076171008

Dear Doug:

In response to the Notice of Noncompliance dated December 9, 2019 (the "NON") and in accordance with the work plan submitted to you on January 30, 2020, Kestrel Hawk Landfill ("KHL") is submitting the additional information requested by the items of the NON listed below.

Absorbent Socks (NON Items 1-3, 6)

At the end of 2019, approximately 14 gallons of oily material was skimmed from the leachate and placed in a drum along with a few absorbent socks. In an abundance of caution, KHL has characterized the material as F039 and informed Safety-Kleen that there are applicable land disposal restrictions. Attached is the updated waste profile sheet indicating the F039 waste code and land disposal restriction.

Gas Processing Residuals (NON 4, 6, 16-17, 21)

The gas processing residuals consist of condensate from the landfill gas. As discussed in our March 12 letter, Republic's legal advisors have concluded that the condensate is not a hazardous waste, subject to final confirmation that the condensate does not display a characteristic of hazardous waste. Since March 12, Republic has received the attached analytical results confirming that the condensate does not display a characteristic of hazardous waste. Because the condensate is not a hazardous waste, the hazardous waste storage requirements, transportation, tank system, and generator reporting requirements are not applicable.

Leachate Characterization (NON Items 6, 8 and 16)

The leachate is exempt from the definition of solid waste because it is covered by the domestic sewage exclusion. Attached is a memorandum prepared by Republic's legal advisors reaching this conclusion. Since the leachate is not a solid waste, the leachate

is not subject to annual waste generation reporting, the land disposal restrictions or hazardous waste tank requirements.

Republic recognizes that the leachate has been reported as a hazardous waste in past generator reports. Moving forward, Republic does not intend to include leachate in its future generator reports.

Groundwater Characterization (NON 5, 8, 16)

The attached memorandum prepared by our legal advisors regarding the domestic sewage exclusion also applies to the groundwater discharged by the landfill to the City of Racine POTW. Based on this characterization, the land disposal restriction requirements do not apply to the groundwater.

Hazardous Waste Generator Annual Reporting (NON 6)

Attached is a table presenting the current waste streams that have been identified for KHL. Based on the determinations provided to WDNR for the landfill gas condensate and the leachate, the identified hazardous waste generated at KHL is the oil material and absorbents removed from the portions of KHL where hazardous waste was disposed annually. Partial and full aerosol cans are also identified in the Waste Determination Outline as potentially hazardous depending on the contents to address anticipated regulations and waste streams that may be generated in the future. In the future, characteristic testing will be performed on additional waste streams, as needed.

The development of the requested Hazardous Waste Generation Report is in progress. This report will provide the available records for the requested period and the determination based on our current understanding of the waste streams. We anticipate providing this report by May 22, 2020.

Hazardous Waste Generator Fees (NON 7)

Kestrel Hawk is evaluating the previous quantities of hazardous waste reported to the WDNR in the development of the Hazardous Waste Generation Report noted above. The potential fee impacts will be identified with the results of that report.

Closure Requirements (NON 9-10)

The hazardous waste unit ("HWU") of KHL consists of corridors 1 through 6. A Closure Plan for the HWU was approved by WDNR on March 31, 1988 (the "1988 Closure Plan"). In addition to the HWU, the 1988 Closure Plan also addressed installing final cover above the barrier wall consisting of portions of corridors 7 - 11 (the "Nonhazardous Disposal Area"). The HWU and Nonhazardous Disposal Area are depicted on the attached figure. As show on the figures, the HWU and Nonhazardous Disposal area are physically and hydraulically separated. Figures

from the October 2005 Old Site Hydrogeologic Report are provided in Attachment 5 depicting the location of the HWU, final cover conditions and locations, and a cross section showing the barrier wall and final cover orientations.

The requirements of the 1988 Closure Plan have been implemented for the HWU corridors. These closure activities meet the requirements of NR 655.0111, NR 655.0112 and NR 665.0310. The Nonhazardous Disposal Area remains active and has not yet been closed. Our consultant TRC is developing a Closure Status Report that provides further detail regarding the current closure conditions. The Closure Status Report will be submitted to WDNR by May 22, 2020.

Our current understanding is that KHL has not requested closure certification for the HWU because the Long-Term Care Plan dated August 1988 provided that long-term care of the HWU would not commence until the Nonhazardous Disposal Area was closed. However, considering the current conditions, KHL would like to discuss preparation of an updated closure and long-term care plan for the HWU with WDNR to clarify its status and document that relevant regulatory requirements have been met.

Training (NON 11)

Revisions to the training program and implementation of appropriate documentation for the training performed at the KHL are currently being developed. It is anticipated that an updated training program can be provided by June 12, 2020.

Contingency Plan Distribution and Licensing (NON 12)

The current contingency plan is being delivered to local hospitals and police departments. Necessary revisions to the contingency plan for the KHL will be implemented by June 12, 2020. In addition, any necessary license modifications will be included in the updated contingency plan. The updated contingency plan will be delivered to local hospitals and police departments.

Operating Record (NON 13)

The operating record for the KHL will be updated as necessary once KHL and WDNR discuss whether an updated closure and long-term care plan will be prepared as discussed above.

FPOR (NON 14)

KHL believes that a feasibility study and plan of operation ("FPOR") are not necessary to address delayed closure because the HWU is effectively closed at this time.

Financial Assurance Cost Estimates (NON 15)

These costs are dependent, in part, upon the attached waste determinations performed for KHL. Updated costs based on these waste determinations will be provided by June 12, 2020. KHL would propose to update the cost estimates as necessary with the updated closure and long-term care plan for the HWU discussed above.

Emergency Communications (NON 18)

Whenever hazardous waste is being poured, mixed, spread or otherwise handled at the HWU, the contractors performing such work have immediate access to a cellular telephone, which serves as an emergency communication device. This arrangement meets the requirements of NR 665.0034.

Hazardous Waste Facility Annual Reporting (NON 19)

Depending on the outcome of discussions with WDNR regarding an updated closure and long-term care plan as discussed above, a letter form of an annual report will be submitted annually beginning March 1, 2021.

Solid Waste Program Annual Reports (NON 20)

Based on the information provided above and in our previous letters, the solid waste program annual reports for the KHL will be updated accordingly and provided to WDNR by May 22, 2020.

We appreciate the opportunity to provide this information to you, and we think that this response satisfies the data requested. For your convenience, we have attached a table summarizing the response to each item in the NON. Please feel free to let me know if you have any questions or if you would like to discuss it in further detail.

Sincerely,

Republic Services of Wisconsin, Limited Partnership



M. Khalid Umer, P.E.
Environmental Manager

Attachments:
1. Waste Material Profile
2. Condensate Analytical Results
3. Domestic Sewage Exclusion Memorandum
4. Waste Determination Outline
5. Closure Figures
6. Summary Table for NON Responses

Attachment 1

Waste Material Profile

safety-kleen
A Clean Harbors Company

WASTE MATERIAL PROFILE SHEET

Profile No. 2008011

A. GENERAL INFORMATION

GENERATOR EPA ID #/REGISTRATION # ***WID076171008*** GENERATOR NAME: ***Kestrel Hawk***

GENERATOR CODE (Assigned by Clean Harbors) ***KE19224*** CITY ***Racine*** STATE/PROVINCE ***WI*** ZIP/POSTAL CODE ***53406***

ADDRESS ***1969 Oakes Rd*** PHONE: **(262) 770-1316**

CUSTOMER CODE (Assigned by Clean Harbors) ***RE24836*** CUSTOMER NAME: ***Republic Services***

ADDRESS ***1969 Oakes Rd*** CITY ***Racine*** STATE/PROVINCE ***WI*** ZIP/POSTAL CODE ***53406***

B. WASTE DESCRIPTION

WASTE DESCRIPTION: ***LEACHATE PCB OIL***

PROCESS GENERATING WASTE: **LEACHATE COLLECTED FROM HAZARDOUS WASTE LANDFILL**

IS THIS WASTE CONTAINED IN SMALL PACKAGING CONTAINED WITHIN A LARGER SHIPPING CONTAINER ? **No**

C. PHYSICAL PROPERTIES (at 25C or 77F)

PHYSICAL STATE
- SOLID WITHOUT FREE LIQUID
- POWDER
- MONOLITHIC SOLID
- [x] LIQUID WITH NO SOLIDS
- LIQUID/SOLID MIXTURE
- % FREE LIQUID
- % SETTLED SOLID
- % TOTAL SUSPENDED SOLID
- SLUDGE
- GAS/AEROSOL

NUMBER OF PHASES/LAYERS

[x] 1 2 3

% BY VOLUME (Approx.)

TOP ***0.00***
MIDDLE ***0.00***
BOTTOM ***0.00***

VISCOSITY (If liquid present)
- 1 - 100 (e.g. Water)
- [x] 101 - 500 (e.g. Motor Oil)
- 501 - 10,000 (e.g. Molasses)
- > 10,000

COLOR

VARIES

ODOR
- [x] NONE
- MILD
- STRONG

Describe:

BOILING POINT °F (°C)
- <= 95 (<=35)
- 95 - 100 (35-38)
- 101 - 129 (38-54)
- [x] >= 130 (>54)

MELTING POINT °F (°C)
- < 140 (<60)
- 140-200 (60-93)
- > 200 (>93)

TOTAL ORGANIC CARBON
- <= 1%
- 1-9%
- [x] >= 10%

FLASH POINT °F (°C)
- < 73 (<23)
- 73 - 100 (23-38)
- 101 -140 (38-60)
- 141 -200 (60-93)
- [x] > 200 (>93)

pH
- <= 2
- 2.1 - 6.9
- [x] 7 (Neutral)
- 7.1 - 12.4
- >= 12.5

SPECIFIC GRAVITY
- < 0.8 (e.g. Gasoline)
- [x] 0.8-1.0 (e.g. Ethanol)
- 1.0 (e.g. Water)
- 1.0-1.2 (e.g. Antifreeze)
- > 1.2 (e.g. Methylene Chloride)

ASH
- < 0.1
- 0.1 - 1.0
- 1.1 - 5.0
- 5.1 - 20.0
- > 20
- [x] Unknown

BTU/LB (MJ/kg)
- < 2,000 (<4.6)
- 2,000-5,000 (4.6-11.6)
- 5,000-10,000 (11.6-23.2)
- [x] > 10,000 (>23.2)

Actual:

D. COMPOSITION (List the complete composition of the waste, include any inert components and/or debris. Ranges for individual components are acceptable. If a trade name is used, please supply an MSDS. Please do not use abbreviations.)

CHEMICAL	MIN	--	MAX	UOM
PETROLEUM OIL	0.0000000	--	100.0000000	%
POLYCHLORINATED BIPHENYL	500.0000000	--	1200.0000000	PPM

DOES THIS WASTE CONTAIN ANY HEAVY GAUGE METAL DEBRIS OR OTHER LARGE OBJECTS (EX., METAL PLATE OR PIPING >1/4" THICK OR >12" LONG, METAL REINFORCED HOSE >12" LONG, METAL WIRE >12" LONG, METAL VALVES, PIPE FITTINGS, CONCRETE REINFORCING BAR OR PIECES OF CONCRETE >3")? YES NO

If yes, describe, including dimensions:

DOES THIS WASTE CONTAIN ANY METALS IN POWDERED OR OTHER FINELY DIVIDED FORM? YES [x] NO

DOES THIS WASTE CONTAIN OR HAS IT CONTACTED ANY OF THE FOLLOWING; ANIMAL WASTES, HUMAN BLOOD, BLOOD PRODUCTS, BODY FLUIDS, MICROBIOLOGICAL WASTE, PATHOLOGICAL WASTE, HUMAN OR ANIMAL DERIVED SERUMS OR PROTEINS OR ANY OTHER POTENTIALLY INFECTIOUS MATERIAL? YES [x] NO

I acknowledge that this waste material is neither infectious nor does it contain any organism known to be a threat to human health. This certification is based on my knowledge of the material. Select the answer below that applies:

The waste was never exposed to potentially infectious material. YES NO

Chemical disinfection or some other form of sterilization has been applied to the waste. YES NO

I ACKNOWLEDGE THAT THIS PROFILE MEETS THE CLEAN HARBORS BATTERY PACKAGING REQUIREMENTS. YES NO

I ACKNOWLEDGE THAT MY FRIABLE ASBESTOS WASTE IS DOUBLE BAGGED AND WETTED. YES NO

SPECIFY THE SOURCE CODE ASSOCIATED WITH THE WASTE. ***G26*** SPECIFY THE FORM CODE ASSOCIATED WITH THE WASTE. ***W205***

E. CONSTITUENTS

Are these values based on testing or knowledge? ☑ Knowledge ☐ Testing

If based on knowledge, please describe in detail, the rationale applied to identify and characterize the waste material. Please include reference to Material Safety Data Sheets (MSDS) when applicable. Include the chemical or trade-name represented by the MSDS, and or detailed process or operating procedures which generate the waste.

CUSTOMER KNOWLEDGE OF WASTE STREAM

Please indicate which constituents below apply. Concentrations must be entered when applicable to assist in accurate review and expedited approval of your waste profile. Please note that the total regulated metals and other constituents sections require answers.

RCRA	REGULATED METALS	REGULATORY LEVEL (mg/l)	TCLP mg/l	TOTAL	UOM	NOT APPLICABLE
D004	ARSENIC	5.0				☑
D005	BARIUM	100.0				☑
D006	CADMIUM	1.0				☑
D007	CHROMIUM	5.0				☑
D008	LEAD	5.0				☑
D009	MERCURY	0.2				☑
D010	SELENIUM	1.0				☑
D011	SILVER	5.0				☑
	VOLATILE COMPOUNDS					
D018	BENZENE	0.5				
D019	CARBON TETRACHLORIDE	0.5				
D021	CHLOROBENZENE	100.0				
D022	CHLOROFORM	6.0				
D028	1,2-DICHLOROETHANE	0.5				
D029	1,1-DICHLOROETHYLENE	0.7				
D035	METHYL ETHYL KETONE	200.0				
D039	TETRACHLOROETHYLENE	0.7				
D040	TRICHLOROETHYLENE	0.5				
D043	VINYL CHLORIDE	0.2				
	SEMI-VOLATILE COMPOUNDS					
D023	o-CRESOL	200.0				
D024	m-CRESOL	200.0				
D025	p-CRESOL	200.0				
D026	CRESOL (TOTAL)	200.0				
D027	1,4-DICHLOROBENZENE	7.5				
D030	2,4-DINITROTOLUENE	0.13				
D032	HEXACHLOROBENZENE	0.13				
D033	HEXACHLOROBUTADIENE	0.5				
D034	HEXACHLOROETHANE	3.0				
D036	NITROBENZENE	2.0				
D037	PENTACHLOROPHENOL	100.0				
D038	PYRIDINE	5.0				
D041	2,4,5-TRICHLOROPHENOL	400.0				
D042	2,4,6-TRICHLOROPHENOL	2.0				
	PESTICIDES AND HERBICIDES					
D012	ENDRIN	0.02				
D013	LINDANE	0.4				
D014	METHOXYCHLOR	10.0				
D015	TOXAPHENE	0.5				
D016	2,4-D	10.0				
D017	2,4,5-TP (SILVEX)	1.0				
D020	CHLORDANE	0.03				
D031	HEPTACHLOR (AND ITS EPOXIDE)	0.008				

OTHER CONSTITUENTS	MAX	UOM	NOT APPLICABLE
BROMINE			☑
CHLORINE			☑
FLUORINE			☑
IODINE			☑
SULFUR			☑
POTASSIUM			☑
SODIUM			☑
AMMONIA			☑
CYANIDE AMENABLE			☑
CYANIDE REACTIVE			☑
CYANIDE TOTAL			☑
SULFIDE REACTIVE			☑

HOCs

☐ NONE
☑ < 1000 PPM
☐ >= 1000 PPM

PCBs

☐ NONE
☐ < 50 PPM
☑ >=50 PPM

IF PCBS ARE PRESENT, IS THE WASTE REGULATED BY TSCA 40 CFR 761?

☑ YES ☐ NO

ADDITIONAL HAZARDS

DOES THIS WASTE HAVE ANY UNDISCLOSED HAZARDS OR PRIOR INCIDENTS ASSOCIATED WITH IT, WHICH COULD AFFECT THE WAY IT SHOULD BE HANDLED?

☐ YES ☑ NO (If yes, explain)

CHOOSE ALL THAT APPLY

☐ DEA REGULATED SUBSTANCES	☐ EXPLOSIVE	☐ FUMING	☐ OSHA REGULATED CARCINOGENS
☐ POLYMERIZABLE	☐ RADIOACTIVE	☐ REACTIVE MATERIAL	☑ NONE OF THE ABOVE

F. REGULATORY STATUS

☑ YES ☐ NO USEPA HAZARDOUS WASTE?

F039

☑ YES ☐ NO DO ANY STATE WASTE CODES APPLY?

731 B001 B003 CR01 IL05 MA02

Texas Waste Code

☐ YES ☑ NO DO ANY CANADIAN PROVINCIAL WASTE CODES APPLY?

☑ YES ☐ NO IS THIS WASTE PROHIBITED FROM LAND DISPOSAL WITHOUT FURTHER TREATMENT PER 40 CFR PART 268?

LDR CATEGORY: ***This is subject to LDR.***
VARIANCE INFO:

☐ YES ☑ NO IS THIS A UNIVERSAL WASTE?

☐ YES ☐ NO IS THE GENERATOR OF THE WASTE CLASSIFIED AS A VERY SMALL QUANTITY GENERATOR (VSQG) OR A STATE EQUIVALENT DESIGNATION?

☐ YES ☑ NO IS THIS MATERIAL GOING TO BE MANAGED AS A RCRA EXEMPT COMMERCIAL PRODUCT, WHICH IS FUEL (40 CFR 261.2 (C)(2)(II))?

☐ YES ☑ NO DOES TREATMENT OF THIS WASTE GENERATE A F006 OR F019 SLUDGE?

☐ YES ☐ NO IS THIS WASTE STREAM SUBJECT TO THE INORGANIC METAL BEARING WASTE PROHIBITION FOUND AT 40 CFR 268.3(C)?

☐ YES ☑ NO DOES THIS WASTE CONTAIN VOC'S IN CONCENTRATIONS >=500 PPM?

☐ YES ☑ NO DOES THE WASTE CONTAIN GREATER THAN 20% OF ORGANIC CONSTITUENTS WITH A VAPOR PRESSURE >= .3KPA (.044 PSIA)?

☐ YES ☑ NO DOES THIS WASTE CONTAIN AN ORGANIC CONSTITUENT WHICH IN ITS PURE FORM HAS A VAPOR PRESSURE > 76.6 KPA (11.1 PSIA)?

☐ YES ☑ NO IS THIS CERCLA REGULATED (SUPERFUND) WASTE ?

☐ YES ☑ NO IS THE WASTE SUBJECT TO ONE OF THE FOLLOWING NESHAP RULES?

Hazardous Organic NESHAP (HON) rule (subpart G) Pharmaceuticals production (subpart GGG)

☐ YES ☑ NO IF THIS IS A US EPA HAZARDOUS WASTE, DOES THIS WASTE STREAM CONTAIN BENZENE?

YES NO Does the waste stream come from a facility with one of the SIC codes listed under benzene NESHAP or is this waste regulated under the benzene NESHAP rules because the original source of the waste is from a chemical manufacturing, coke by-product recovery, or petroleum refinery process?

YES NO Is the generating source of this waste stream a facility with Total Annual Benzene (TAB) >10 Mg/year?

What is the TAB quantity for your facility? Megagram/year (1 Mg = 2,200 lbs)

The basis for this determination is: Knowledge of the Waste Or Test Data Knowledge Testing

Describe the knowledge :

G. DOT/TDG INFORMATION

DOT/TDG PROPER SHIPPING NAME:

UN3432, WASTE POLYCHLORINATED BIPHENYLS, SOLID, 9, PG III

H. TRANSPORTATION REQUIREMENTS

ESTIMATED SHIPMENT FREQUENCY ONE TIME WEEKLY MONTHLY QUARTERLY ☑ YEARLY OTHER

☑ **CONTAINERIZED**

1-1 CONTAINERS/SHIPMENT

STORAGE CAPACITY: ***1***

CONTAINER TYPE:

PORTABLE TOTE TANK BOX|CARTON|CASE

CUBIC YARD BOX ☑ DRUM

OTHER:

DRUM SIZE: ***55***

BULK LIQUID

GALLONS/SHIPMENT: ***0 Min -0 Max*** GAL.

BULK SOLID

SHIPMENT UOM: TON YARD

TONS/YARDS/SHIPMENT: ***0 Min - 0 Max***

I. SPECIAL REQUEST

COMMENTS OR REQUESTS:

GENERATOR'S CERTIFICATION

I certify that I am authorized to execute this document as an authorized agent. I hereby certify that all information submitted in this and attached documents is correct to the best of my knowledge.I also certify that any samples submitted are representative of the actual waste.If Clean Harbors discovers a discrepancy during the approval process, Generator grants Clean Harbors the authority to amend the profile, as Clean Harbors deems necessary, to reflect the discrepancy.

AUTHORIZED SIGNATURE NAME (PRINT) TITLE DATE

Attachment 2

Condensate Analytical Results

Kestrel Hawk Landfill
Racine, Wisconsin
Biogas Building Condensate Tank Testing

Parameter	Units	COND TANK 3/16/2020 50252134001	NR 661 Regulatory Limits for Characteristic Hazardous
Corrosivity	MM/YR	0.0850 J	6.35
pH, field	SU	6.03	<= 2 or >=12.5
Conductance, specific	µmhos/cm	159	
Temperature	DegC	10.1	
Color, field		NONE	
Odor, field		STRONG	
Turbidity, field		LOW	
Corrosivity	MM/YR	0.0850 J	
Flashpoint	DegF	> 200	< 140
Oil and grease	mg/L	31.8 j	
pH at 25 DegC	SU	6.4	<= 2 or >=12.5
Arsenic, total	µg/L	1070	5,000
Barium, total	µg/L	< 33	100,000
Cadmium, total	µg/L	< 33	1,000
Chromium, total	µg/L	< 33	5,000
Lead, total	µg/L	< 33	5,000
Mercury, total	µg/L	< 3.3	200
Selenium, total	µg/L	< 33	1,000
Silver, total	µg/L	< 33	5,000
2,4,5-TP (Silvex)	µg/L	< 0.667	1,000
2,4-D	µg/L	< 0.667	10,000
Chlordane, technical	µg/L	< 1.67	30
Endrin	µg/L	< 1.67	20
gamma-BHC (Lindane)	µg/L	< 1.67	400
Heptachlor	µg/L	< 1.67	8
Heptachlor Epoxide	µg/L	< 1.67	8
Methoxychlor	µg/L	< 1.67	10,000
Toxaphene	µg/L	< 3.33	500
2,4,5-Trichlorophenol	µg/L	< 167	400,000
2,4,6-Trichlorophenol	µg/L	< 167	2,000
2,4-Dinitrotoluene	µg/L	< 167	130
2-Methylphenol	µg/L	< 167	200,000
3&4-Methylphenol	µg/L	< 167	200,000
Hexachlorobenzene	µg/L	< 167	130
Hexachlorobutadiene	µg/L	< 167	500
Hexachloroethane	µg/L	< 167	3,000
Nitrobenzene	µg/L	< 167	2,000
Pentachlorophenol	µg/L	< 167	100,000
Pyridine	µg/L	< 167	5,000
1,1-Dichloroethene	µg/L	< 16.7	700
1,2-Dichloroethane	µg/L	< 16.7	500
1,4-Dichlorobenzene	µg/L	< 16.7	7,500
2-Butanone	µg/L	28,500 j	200,000
Benzene	µg/L	< 16.7	500
Carbon tetrachloride	µg/L	< 16.7	500
Chlorobenzene	µg/L	< 16.7	100,000
Chloroform	µg/L	< 83.3	6,000
Tetrachloroethene	µg/L	< 16.7	700
Trichloroethene	µg/L	< 16.7	500
Vinyl chloride	µg/L	< 16.7	200

Created By: P. Popp

Checked By: S. Edwards

Kestrel Hawk Landfill
Racine, Wisconsin
Biogas Building Condensate Tank Testing

Parameter	Units	COND TANK 3/16/2020 50252134001	NR 661 Regulatory Limits for Characteristic Hazardous
Corrosivity	MM/YR	0.0850 J	6.35
pH, field	SU	6.03	<= 2 or >=12.5
Conductance, specific	µmhos/cm	159	
Temperature	DegC	10.1	
Color, field		NONE	
Odor, field		STRONG	
Turbidity, field		LOW	
Corrosivity	MM/YR	0.0850 J	
Flashpoint	DegF	> 200	< 140
Oil and grease	mg/L	31.8 j	
pH at 25 DegC	SU	6.4	<= 2 or >=12.5
Arsenic, total	µg/L	1070	5,000
Barium, total	µg/L	< 33	100,000
Cadmium, total	µg/L	< 33	1,000
Chromium, total	µg/L	< 33	5,000
Lead, total	µg/L	< 33	5,000
Mercury, total	µg/L	< 3.3	200
Selenium, total	µg/L	< 33	1,000
Silver, total	µg/L	< 33	5,000
2,4,5-TP (Silvex)	µg/L	< 0.667	1,000
2,4-D	µg/L	< 0.667	10,000
Chlordane, technical	µg/L	< 1.67	30
Endrin	µg/L	< 1.67	20
gamma-BHC (Lindane)	µg/L	< 1.67	400
Heptachlor	µg/L	< 1.67	8
Heptachlor Epoxide	µg/L	< 1.67	8
Methoxychlor	µg/L	< 1.67	10,000
Toxaphene	µg/L	< 3.33	500
2,4,5-Trichlorophenol	µg/L	< 167	400,000
2,4,6-Trichlorophenol	µg/L	< 167	2,000
2,4-Dinitrotoluene	µg/L	< 167	130
2-Methylphenol	µg/L	< 167	200,000
3&4-Methylphenol	µg/L	< 167	200,000
Hexachlorobenzene	µg/L	< 167	130
Hexachlorobutadiene	µg/L	< 167	500
Hexachloroethane	µg/L	< 167	3,000
Nitrobenzene	µg/L	< 167	2,000
Pentachlorophenol	µg/L	< 167	100,000
Pyridine	µg/L	< 167	5,000
1,1-Dichloroethene	µg/L	< 16.7	700
1,2-Dichloroethane	µg/L	< 16.7	500
1,4-Dichlorobenzene	µg/L	< 16.7	7,500
2-Butanone	µg/L	28,500 j	200,000
Benzene	µg/L	< 16.7	500
Carbon tetrachloride	µg/L	< 16.7	500
Chlorobenzene	µg/L	< 16.7	100,000
Chloroform	µg/L	< 83.3	6,000
Tetrachloroethene	µg/L	< 16.7	700
Trichloroethene	µg/L	< 16.7	500
Vinyl chloride	µg/L	< 16.7	200

Created By: P. Popp
Checked By: S. Edwards

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

March 30, 2020

PEGGY POPP
TRC
708 HEARTLAND TRAIL
SUITE 3000
Madison, WI 53717

RE: Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

Dear PEGGY POPP:
Enclosed are the analytical results for sample(s) received by the laboratory on March 17, 2020. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Pace Analytical Melville does not hold certification for method 1110A in water matrix in the state of WI

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Sue Brotherton
sue.brotherton@pacelabs.com
(317)228-3100
Project Manager

Enclosures

cc: Jonathan Hotstream, TRC
Trihydro, Trihydro
KHALID UMER, REPUBLIC SERVICES INC.

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Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

CERTIFICATIONS

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

Pace Analytical Services Indianapolis
7726 Moller Road, Indianapolis, IN 46268
Illinois Accreditation #: 200074
Indiana Drinking Water Laboratory #: C-49-06
Kansas/TNI Certification #: E-10177
Kentucky UST Agency Interest #: 80226
Kentucky WW Laboratory ID #: 98019
Michigan Drinking Water Laboratory #9050
Ohio VAP Certified Laboratory #: CL0065
Oklahoma Laboratory #: 9204
Texas Certification #: T104704355
West Virginia Certification #: 330
Wisconsin Laboratory #: 999788130
USDA Soil Permit #: P330-19-00257

Pace Analytical Services Long Island
575 Broad Hollow Rd, Melville, NY 11747
New York Certification #: 10478 Primary Accrediting Body
New Jersey Certification #: NY158
Pennsylvania Certification #: 68-00350
Connecticut Certification #: PH-0435
Maryland Certification #: 208
Rhode Island Certification #: LAO00340
Massachusetts Certification #: M-NY026
New Hampshire Certification #: 2987

Pace Analytical Services National
12065 Lebanon Road, Mt. Juliet, TN 37122
Alabama Certification #: 40660
Alaska Certification 17-026
Arizona Certification #: AZ0612
Arkansas Certification #: 88-0469
California Certification #: 2932
Canada Certification #: 1461.01
Colorado Certification #: TN00003
Connecticut Certification #: PH-0197
DOD Certification: #1461.01
EPA# TN00003
Florida Certification #: E87487
Georgia DW Certification #: 923
Georgia Certification: NELAP
Idaho Certification #: TN00003
Illinois Certification #: 200008
Indiana Certification #: C-TN-01
Iowa Certification #: 364
Kansas Certification #: E-10277
Kentucky UST Certification #: 16
Kentucky Certification #: 90010
Louisiana Certification #: AI30792
Louisiana DW Certification #: LA180010
Maine Certification #: TN0002
Maryland Certification #: 324
Massachusetts Certification #: M-TN003
Michigan Certification #: 9958
Minnesota Certification #: 047-999-395
Mississippi Certification #: TN00003
Missouri Certification #: 340
Montana Certification #: CERT0086
Nebraska Certification #: NE-OS-15-05
Nevada Certification #: TN-03-2002-34
New Hampshire Certification #: 2975
New Jersey Certification #: TN002
New Mexico DW Certification
New York Certification #: 11742
North Carolina Aquatic Toxicity Certification #: 41
North Carolina Drinking Water Certification #: 21704
North Carolina Environmental Certificate #: 375
North Dakota Certification #: R-140
Ohio VAP Certification #: CL0069
Oklahoma Certification #: 9915
Oregon Certification #: TN200002
Pennsylvania Certification #: 68-02979
Rhode Island Certification #: LAO00356
South Carolina Certification #: 84004
South Dakota Certification
Tennessee DW/Chem/Micro Certification #: 2006
Texas Certification #: T 104704245-17-14
Texas Mold Certification #: LAB0152
USDA Soil Permit #: P330-15-00234
Utah Certification #: TN00003
Vermont Dept. of Health: ID# VT-2006
Virginia Certification #: VT2006
Virginia Certification #: 460132
Washington Certification #: C847
West Virginia Certification #: 233
Wisconsin Certification #: 9980939910
Wyoming UST Certification #: via A2LA 2926.01
A2LA-ISO 17025 Certification #: 1461.01
A2LA-ISO 17025 Certification #: 1461.02
AIHA-LAP/LLC EMLAP Certification #:100789

REPORT OF LABORATORY ANALYSIS

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7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

SAMPLE SUMMARY

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

Lab ID	Sample ID	Matrix	Date Collected	Date Received
50252134001	**GC Tank**	Water	03/16/20 09:30	03/17/20 09:30

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SAMPLE ANALYTE COUNT

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
50252134001	**GC Tank**	EPA 8081B	LEL	9	PAN
		EPA 8151A	LEL	3	PAN
		EPA 6010B	CCE	7	PAN
		EPA 7470A	ABL	1	PAN
		EPA 8270C	JNJ	18	PAN
		EPA 8260D	BMB	14	PAN
		EPA 1664A	DLH	1	PAN
		EPA 1010	SCM	1	PASI-I
		EPA 1110A	MEM1	1	PASI-L
		EPA 9045	SCM	1	PASI-I

REPORT OF LABORATORY ANALYSIS

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Indianapolis, IN 46268
(317)228-3100

SUMMARY OF DETECTION

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
50252134001	**GC Tank**					
	Field pH	6.03	Std. Units		03/16/20 09:30	
	Field Temperature	10.1	deg C		03/16/20 09:30	
	Field Specific Conductance	159	umhos/cm		03/16/20 09:30	
EPA 6010B	Arsenic	1.07	mg/L	0.100	03/25/20 10:29	
EPA 8260D	2-Butanone (MEK)	28.5	mg/L	0.500	03/23/20 15:49	CC
EPA 1664A	Oil and Grease	31.8	mg/L	5.00	03/25/20 13:53	P4
EPA 1010	Flashpoint	>200	deg F		03/19/20 11:30	
EPA 9045	pH at 25 Degrees C	6.4	Std. Units	0.10	03/24/20 11:23	H3

REPORT OF LABORATORY ANALYSIS

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7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

PROJECT NARRATIVE

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

Date: March 30, 2020

GC Tank (Lab ID: 50252134001)

- Semi Volatile Organic Compounds (GC/MS) by Method 8270C - Dilution due to matrix.

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PROJECT NARRATIVE

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

Method: **EPA 8081B**
Description: Pesticides (GC) 8081B TCLP
Client: Republic Services - Wisconsin Landfills
Date: March 30, 2020

General Information:
1 sample was analyzed for EPA 8081B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

Method: **EPA 8151A**
Description: Chlorinated Herb. (GC) 8151A
Client: Republic Services - Wisconsin Landfills
Date: March 30, 2020

General Information:
1 sample was analyzed for EPA 8151A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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Indianapolis, IN 46268
(317)228-3100

PROJECT NARRATIVE

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

Method: **EPA 6010B**
Description: Metals (ICP) 6010B TCLP
Client: Republic Services - Wisconsin Landfills
Date: March 30, 2020

General Information:
1 sample was analyzed for EPA 6010B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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Indianapolis, IN 46268
(317)228-3100

PROJECT NARRATIVE

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

Method: **EPA 7470A**
Description: Mercury 7470A TCLP
Client: Republic Services - Wisconsin Landfills
Date: March 30, 2020

General Information:
1 sample was analyzed for EPA 7470A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

PROJECT NARRATIVE

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

Method: **EPA 8270C**
Description: SVOA (GC/MS) 8270C TCLP
Client: Republic Services - Wisconsin Landfills
Date: March 30, 2020

General Information:
1 sample was analyzed for EPA 8270C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

Method: **EPA 8260D**
Description: VOA (GC/MS) 8260D TCLP
Client: Republic Services - Wisconsin Landfills
Date: March 30, 2020

General Information:
1 sample was analyzed for EPA 8260D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

QC Batch: 1448595

CC: The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The result may be biased.

- GC Tank (Lab ID: 50252134001)
  - 2-Butanone (MEK)

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

Method: **EPA 1664A**
Description: Wet Chemistry 1664A
Client: Republic Services - Wisconsin Landfills
Date: March 30, 2020

General Information:
1 sample was analyzed for EPA 1664A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

P4: Sample field preservation does not meet EPA or method recommendations for this analysis.
- GC Tank (Lab ID: 50252134001)

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

Method: **EPA 1010**
Description: 1010 Flashpoint,Closed Cup
Client: Republic Services - Wisconsin Landfills
Date: March 30, 2020

General Information:
1 sample was analyzed for EPA 1010. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

Method: **EPA 1110A**
Description: Corrosivity Toward Steel
Client: Republic Services - Wisconsin Landfills
Date: March 30, 2020

General Information:
1 sample was analyzed for EPA 1110A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

Method: **EPA 9045**
Description: 9045 pH Soil
Client: Republic Services - Wisconsin Landfills
Date: March 30, 2020

General Information:
1 sample was analyzed for EPA 9045. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

H3: Sample was received or analysis requested beyond the recognized method holding time.
- GC Tank (Lab ID: 50252134001)

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

Sample: GC Tank **Lab ID: 50252134001** Collected: 03/16/20 09:30 Received: 03/17/20 09:30 Matrix: Water
Comments: • Semi Volatile Organic Compounds (GC/MS) by Method 8270C - Dilution due to matrix.

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Field pH	**6.03**	Std. Units			1		03/16/20 09:30		
Field Temperature	**10.1**	deg C			1		03/16/20 09:30		
Field Specific Conductance	**159**	umhos/cm			1		03/16/20 09:30		
Pesticides (GC) 8081B TCLP	Analytical Method: EPA 8081B Preparation Method: 3510C Leachate Method/Date: 1311; 03/23/20 20:15								
Chlordane (Technical)	**<0.00167**	mg/L	0.00500	0.00167	1	03/26/20 16:42	03/27/20 11:04	57-74-9	
Endrin	**<0.00167**	mg/L	0.00500	0.00167	1	03/26/20 16:42	03/27/20 11:04	72-20-8	
Heptachlor	**<0.00167**	mg/L	0.00500	0.00167	1	03/26/20 16:42	03/27/20 11:04	76-44-8	
Heptachlor epoxide	**<0.00167**	mg/L	0.00500	0.00167	1	03/26/20 16:42	03/27/20 11:04	1024-57-3	
gamma-BHC (Lindane)	**<0.00167**	mg/L	0.00500	0.00167	1	03/26/20 16:42	03/27/20 11:04	58-89-9	
Methoxychlor	**<0.00167**	mg/L	0.00500	0.00167	1	03/26/20 16:42	03/27/20 11:04	72-43-5	
Toxaphene	**<0.00333**	mg/L	0.0100	0.00333	1	03/26/20 16:42	03/27/20 11:04	8001-35-2	
Surrogates									
Decachlorobiphenyl (S)	132	%	10.0-128		1	03/26/20 16:42	03/27/20 11:04	2051-24-3	ST
Tetrachloro-m-xylene (S)	110	%	10.0-127		1	03/26/20 16:42	03/27/20 11:04	877-09-8	
Chlorinated Herb. (GC) 8151A	Analytical Method: EPA 8151A Preparation Method: 8151A Leachate Method/Date: 1311; 03/23/20 20:15								
2,4,5-TP (Silvex)	**<0.000667**	mg/L	0.00200	0.000667	1	03/26/20 07:06	03/26/20 18:39	93-72-1	
2,4-D	**<0.000667**	mg/L	0.00200	0.000667	1	03/26/20 07:06	03/26/20 18:39	94-75-7	
Surrogates									
2,4-DCAA (S)	78.4	%	14.0-158		1	03/26/20 07:06	03/26/20 18:39	19719-28-9	
Metals (ICP) 6010B TCLP	Analytical Method: EPA 6010B Preparation Method: 3015 Leachate Method/Date: 1311; 03/23/20 20:15								
Arsenic	**1.07**	mg/L	0.100	0.0330	1	03/25/20 08:48	03/25/20 10:29	7440-38-2	
Barium	**<0.0330**	mg/L	0.100	0.0330	1	03/25/20 08:48	03/25/20 10:29	7440-39-3	
Cadmium	**<0.0330**	mg/L	0.100	0.0330	1	03/25/20 08:48	03/25/20 10:29	7440-43-9	
Chromium	**<0.0330**	mg/L	0.100	0.0330	1	03/25/20 08:48	03/25/20 10:29	7440-47-3	
Lead	**<0.0330**	mg/L	0.100	0.0330	1	03/25/20 08:48	03/25/20 10:29	7439-92-1	
Selenium	**<0.0330**	mg/L	0.100	0.0330	1	03/25/20 08:48	03/25/20 10:29	7782-49-2	
Silver	**<0.0330**	mg/L	0.100	0.0330	1	03/25/20 08:48	03/25/20 10:29	7440-22-4	
Mercury 7470A TCLP	Analytical Method: EPA 7470A Preparation Method: 7470A Leachate Method/Date: 1311; 03/23/20 20:15								
Mercury	**<0.00330**	mg/L	0.0100	0.00330	1	03/25/20 08:20	03/25/20 11:19	7439-97-6	
SVOA (GC/MS) 8270C TCLP	Analytical Method: EPA 8270C Preparation Method: 3510C Leachate Method/Date: 1311; 03/23/20 20:15								
1,4-Dichlorobenzene	**<0.167**	mg/L	0.500	0.167	5	03/25/20 16:04	03/26/20 07:57	106-46-7	
2,4-Dinitrotoluene	**<0.167**	mg/L	0.500	0.167	5	03/25/20 16:04	03/26/20 07:57	121-14-2	
Hexachlorobenzene	**<0.167**	mg/L	0.500	0.167	5	03/25/20 16:04	03/26/20 07:57	118-74-1	
Hexachloro-1,3-butadiene	**<0.167**	mg/L	0.500	0.167	5	03/25/20 16:04	03/26/20 07:57	87-68-3	
Hexachloroethane	**<0.167**	mg/L	0.500	0.167	5	03/25/20 16:04	03/26/20 07:57	67-72-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

Sample: GC Tank **Lab ID: 50252134001** Collected: 03/16/20 09:30 Received: 03/17/20 09:30 Matrix: Water
Comments: • Semi Volatile Organic Compounds (GC/MS) by Method 8270C - Dilution due to matrix.

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
SVOA (GC/MS) 8270C TCLP	Analytical Method: EPA 8270C Preparation Method: 3510C Leachate Method/Date: 1311; 03/23/20 20:15								
Nitrobenzene	**<0.167**	mg/L	0.500	0.167	5	03/25/20 16:04	03/26/20 07:57	98-95-3	
Pyridine	**<0.167**	mg/L	0.500	0.167	5	03/25/20 16:04	03/26/20 07:57	110-86-1	
3&4-Methylphenol(m&p Cresol)	**<0.167**	mg/L	0.500	0.167	5	03/25/20 16:04	03/26/20 07:57		
2-Methylphenol(o-Cresol)	**<0.167**	mg/L	0.500	0.167	5	03/25/20 16:04	03/26/20 07:57	95-48-7	
Pentachlorophenol	**<0.167**	mg/L	0.500	0.167	5	03/25/20 16:04	03/26/20 07:57	87-86-5	
2,4,5-Trichlorophenol	**<0.167**	mg/L	0.500	0.167	5	03/25/20 16:04	03/26/20 07:57	95-95-4	
2,4,6-Trichlorophenol	**<0.167**	mg/L	0.500	0.167	5	03/25/20 16:04	03/26/20 07:57	88-06-2	
Surrogates									
2-Fluorophenol (S)	32.2	%	10.0-120		5	03/25/20 16:04	03/26/20 07:57	367-12-4	
Phenol-d5 (S)	32.7	%	10.0-120		5	03/25/20 16:04	03/26/20 07:57	4165-62-2	
Nitrobenzene-d5 (S)	52.1	%	10.0-127		5	03/25/20 16:04	03/26/20 07:57	4165-60-0	
2-Fluorobiphenyl (S)	52.3	%	10.0-130		5	03/25/20 16:04	03/26/20 07:57	321-60-8	
2,4,6-Tribromophenol (S)	59.5	%	10.0-155		5	03/25/20 16:04	03/26/20 07:57	118-79-6	
p-Terphenyl-d14 (S)	53.0	%	10.0-128		5	03/25/20 16:04	03/26/20 07:57	1718-51-0	
VOA (GC/MS) 8260D TCLP	Analytical Method: EPA 8260D Preparation Method: 8260D Leachate Method/Date: 1311; 03/21/20 15:57								
Benzene	**<0.0167**	mg/L	0.0500	0.0167	1	03/23/20 15:49	03/23/20 15:49	71-43-2	
Carbon tetrachloride	**<0.0167**	mg/L	0.0500	0.0167	1	03/23/20 15:49	03/23/20 15:49	56-23-5	
Chlorobenzene	**<0.0167**	mg/L	0.0500	0.0167	1	03/23/20 15:49	03/23/20 15:49	108-90-7	
Chloroform	**<0.0833**	mg/L	0.250	0.0833	1	03/23/20 15:49	03/23/20 15:49	67-66-3	
1,2-Dichloroethane	**<0.0167**	mg/L	0.0500	0.0167	1	03/23/20 15:49	03/23/20 15:49	107-06-2	
1,4-Dichlorobenzene	**<0.0167**	mg/L	0.0500	0.0167	1	03/23/20 15:49	03/23/20 15:49	106-46-7	
1,1-Dichloroethene	**<0.0167**	mg/L	0.0500	0.0167	1	03/23/20 15:49	03/23/20 15:49	75-35-4	
2-Butanone (MEK)	**28.5**	mg/L	0.500	0.167	1	03/23/20 15:49	03/23/20 15:49	78-93-3	CC
Tetrachloroethene	**<0.0167**	mg/L	0.0500	0.0167	1	03/23/20 15:49	03/23/20 15:49	127-18-4	
Trichloroethene	**<0.0167**	mg/L	0.0500	0.0167	1	03/23/20 15:49	03/23/20 15:49	79-01-6	
Vinyl chloride	**<0.0167**	mg/L	0.0500	0.0167	1	03/23/20 15:49	03/23/20 15:49	75-01-4	
Surrogates									
Toluene-d8 (S)	111	%	80.0-120		1	03/23/20 15:49	03/23/20 15:49	2037-26-5	
4-Bromofluorobenzene (S)	101	%	77.0-126		1	03/23/20 15:49	03/23/20 15:49	460-00-4	
1,2-Dichloroethane-d4 (S)	110	%	70.0-130		1	03/23/20 15:49	03/23/20 15:49	17060-07-0	
Wet Chemistry 1664A	Analytical Method: EPA 1664A Preparation Method: 1664A								
Oil and Grease	**31.8**	mg/L	5.00	1.16	1	03/25/20 08:01	03/25/20 13:53		P4
1010 Flashpoint,Closed Cup	Analytical Method: EPA 1010								
Flashpoint	**>200**	deg F			1		03/19/20 11:30		
Corrosivity Toward Steel	Analytical Method: EPA 1110A								
Corrosion Rate	**0.0850J**	mm/yr	6.35		1		03/27/20 11:57		
9045 pH Soil	Analytical Method: EPA 9045								
pH at 25 Degrees C	**6.4**	Std. Units	0.10	0.10	1		03/24/20 11:23		H3

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QUALITY CONTROL DATA

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

QC Batch: 1450384
QC Batch Method: 3510C
Analysis Method: EPA 8081B
Analysis Description: Pesticides (GC) 8081B TCLP
Associated Lab Samples: 50252134001

METHOD BLANK: R3513239-1 Matrix: Solid
Associated Lab Samples: 50252134001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
gamma-BHC (Lindane)	mg/L	<0.00167	0.00500	03/27/20 09:21	
Endrin	mg/L	<0.00167	0.00500	03/27/20 09:21	
Heptachlor	mg/L	<0.00167	0.00500	03/27/20 09:21	
Methoxychlor	mg/L	<0.00167	0.00500	03/27/20 09:21	
Heptachlor epoxide	mg/L	<0.00167	0.00500	03/27/20 09:21	
Chlordane (Technical)	mg/L	<0.00167	0.00500	03/27/20 09:21	
Toxaphene	mg/L	<0.00333	0.0100	03/27/20 09:21	
Decachlorobiphenyl (S)	%	110	10.0-128	03/27/20 09:21	
Tetrachloro-m-xylene (S)	%	97.5	10.0-127	03/27/20 09:21	

LABORATORY CONTROL SAMPLE: R3513239-2

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
gamma-BHC (Lindane)	mg/L	0.0100	0.0102	102	55.0-129	
Endrin	mg/L	0.0100	0.0100	100	57.0-134	
Heptachlor	mg/L	0.0100	0.00920	92.0	27.0-132	
Heptachlor epoxide	mg/L	0.0100	0.00977	97.7	57.0-130	
Methoxychlor	mg/L	0.0100	0.0151	151	54.0-155	P9
Decachlorobiphenyl (S)	%			103	10.0-128	
Tetrachloro-m-xylene (S)	%			99.1	10.0-127	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: R3513239-3 R3513239-4

Parameter	Units	L1199882-01 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
gamma-BHC (Lindane)	mg/L	ND	0.0100	0.0100	0.0106	0.0107	106	107	14.0-141	0.939	40	
Endrin	mg/L	ND	0.0100	0.0100	0.0107	0.0109	107	109	10.0-160	1.85	39	
Heptachlor	mg/L	ND	0.0100	0.0100	0.00978	0.00973	97.8	97.3	16.0-136	0.513	40	
Heptachlor epoxide	mg/L	ND	0.0100	0.0100	0.0102	0.0104	102	104	10.0-160	1.94	36	
Methoxychlor	mg/L	ND	0.0100	0.0100	0.0158	0.0166	158	166	10.0-160	4.94	34	MH,P9
Decachlorobiphenyl (S)	%						103	106	10.0-128			
Tetrachloro-m-xylene (S)	%						99.9	99.9	10.0-127			

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QUALITY CONTROL DATA

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

QC Batch: 1450100
QC Batch Method: 8151A
Associated Lab Samples: 50252134001

Analysis Method: EPA 8151A
Analysis Description: Chlorinated Herb. (GC) 8151A

METHOD BLANK: R3513061-1 Matrix: Solid
Associated Lab Samples: 50252134001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4-D	mg/L	<0.000667	0.00200	03/26/20 16:55	
2,4,5-TP (Silvex)	mg/L	<0.000667	0.00200	03/26/20 16:55	
2,4-DCAA (S)	%	80.8	14.0-158	03/26/20 16:55	

LABORATORY CONTROL SAMPLE: R3513061-2

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4,5-TP (Silvex)	mg/L	0.0500	0.0437	87.4	50.0-125	
2,4-D	mg/L	0.0500	0.0349	69.8	50.0-120	
2,4-DCAA (S)	%			90.6	14.0-158	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: R3513061-3 R3513061-4

Parameter	Units	L1199727-01 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
2,4,5-TP (Silvex)	mg/L	ND	0.0500	0.0500	0.0474	0.0488	94.8	97.6	50.0-125	2.91	20	
2,4-D	mg/L	ND	0.0500	0.0500	0.0381	0.0400	76.2	80.0	50.0-120	4.87	20	
2,4-DCAA (S)	%						88.6	81.2	14.0-158			

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QUALITY CONTROL DATA

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

QC Batch: 1449837
QC Batch Method: 3015
Analysis Method: EPA 6010B
Analysis Description: Metals (ICP) 6010B TCLP
Associated Lab Samples: 50252134001

METHOD BLANK: R3512375-1 Matrix: Solid
Associated Lab Samples: 50252134001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	mg/L	<0.0330	0.100	03/25/20 10:13	
Barium	mg/L	<0.0330	0.100	03/25/20 10:13	
Cadmium	mg/L	<0.0330	0.100	03/25/20 10:13	
Chromium	mg/L	<0.0330	0.100	03/25/20 10:13	
Lead	mg/L	0.0522J	0.100	03/25/20 10:13	J
Selenium	mg/L	<0.0330	0.100	03/25/20 10:13	
Silver	mg/L	<0.0330	0.100	03/25/20 10:13	

LABORATORY CONTROL SAMPLE: R3512375-2

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/L	10.0	9.35	93.5	80.0-120	
Barium	mg/L	10.0	9.42	94.2	80.0-120	
Cadmium	mg/L	10.0	9.46	94.6	80.0-120	
Chromium	mg/L	10.0	9.76	97.6	80.0-120	
Lead	mg/L	10.0	9.36	93.6	80.0-120	
Selenium	mg/L	10.0	9.34	93.4	80.0-120	
Silver	mg/L	2.00	1.79	89.7	80.0-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: R3512375-4 R3512375-5

Parameter	Units	L1199727-01 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/L	ND	10.0	10.0	9.46	9.42	94.6	94.2	75.0-125	0.410	20	
Barium	mg/L	0.331	10.0	10.0	9.82	9.75	94.9	94.2	75.0-125	0.659	20	
Cadmium	mg/L	ND	10.0	10.0	9.54	9.50	95.4	95.0	75.0-125	0.433	20	
Chromium	mg/L	ND	10.0	10.0	9.81	9.76	98.1	97.6	75.0-125	0.559	20	
Lead	mg/L	ND	10.0	10.0	9.32	9.30	92.7	92.5	75.0-125	0.220	20	
Selenium	mg/L	ND	10.0	10.0	9.45	9.40	94.5	94.0	75.0-125	0.557	20	
Silver	mg/L	ND	2.00	2.00	1.81	1.80	90.3	90.1	75.0-125	0.129	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: R3512375-6 R3512375-7

Parameter	Units	50252134001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/L	1.07	10.0	10.0	10.3	10.3	92.0	92.8	75.0-125	0.709	20	
Barium	mg/L	ND	10.0	10.0	9.57	9.58	95.7	95.8	75.0-125	0.132	20	

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QUALITY CONTROL DATA

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: R3512375-6 R3512375-7

Parameter	Units	50252134001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cadmium	mg/L	ND	10.0	10.0	9.42	9.45	94.2	94.5	75.0-125	0.252	20	
Chromium	mg/L	ND	10.0	10.0	9.74	9.78	97.4	97.8	75.0-125	0.374	20	
Lead	mg/L	ND	10.0	10.0	9.24	9.22	91.9	91.7	75.0-125	0.207	20	
Selenium	mg/L	ND	10.0	10.0	9.17	9.27	91.7	92.7	75.0-125	1.10	20	
Silver	mg/L	ND	2.00	2.00	1.78	1.77	89.0	88.4	75.0-125	0.695	20	

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QUALITY CONTROL DATA

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

QC Batch: 1449809 Analysis Method: EPA 7470A
QC Batch Method: 7470A Analysis Description: Mercury 7470A TCLP
Associated Lab Samples: 50252134001

METHOD BLANK: R3512324-1 Matrix: Solid
Associated Lab Samples: 50252134001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/L	<0.00330	0.0100	03/25/20 11:15	

LABORATORY CONTROL SAMPLE: R3512324-2

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	0.0300	0.0290	96.8	80.0-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: R3512324-3 R3512324-4

Parameter	Units	50252134001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/L	ND	0.0300	0.0300	0.0285	0.0287	94.9	95.6	75.0-125	0.679	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: R3512324-5 R3512324-6

Parameter	Units	L1200978-02 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/L	ND	0.0300	0.0300	0.0282	0.0275	93.9	91.7	75.0-125	2.37	20	

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QUALITY CONTROL DATA

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

QC Batch: 1449707 Analysis Method: EPA 8270C
QC Batch Method: 3510C Analysis Description: SVOA (GC/MS) 8270C TCLP
Associated Lab Samples: 50252134001

METHOD BLANK: R3512585-2 Matrix: Solid
Associated Lab Samples: 50252134001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,4-Dichlorobenzene	mg/L	<0.0333	0.100	03/25/20 23:50	
2,4-Dinitrotoluene	mg/L	<0.0333	0.100	03/25/20 23:50	
Hexachlorobenzene	mg/L	<0.0333	0.100	03/25/20 23:50	
Hexachloro-1,3-butadiene	mg/L	<0.0333	0.100	03/25/20 23:50	
Hexachloroethane	mg/L	<0.0333	0.100	03/25/20 23:50	
Nitrobenzene	mg/L	<0.0333	0.100	03/25/20 23:50	
2-Methylphenol(o-Cresol)	mg/L	<0.0333	0.100	03/25/20 23:50	
3&4-Methylphenol(m&p Cresol)	mg/L	<0.0333	0.100	03/25/20 23:50	
Pentachlorophenol	mg/L	<0.0333	0.100	03/25/20 23:50	
2,4,5-Trichlorophenol	mg/L	<0.0333	0.100	03/25/20 23:50	
2,4,6-Trichlorophenol	mg/L	<0.0333	0.100	03/25/20 23:50	
Pyridine	mg/L	<0.0333	0.100	03/25/20 23:50	
2-Fluorophenol (S)	%	33.8	10.0-120	03/25/20 23:50	
Phenol-d5 (S)	%	20.5	10.0-120	03/25/20 23:50	
Nitrobenzene-d5 (S)	%	48.3	10.0-127	03/25/20 23:50	
2-Fluorobiphenyl (S)	%	51.5	10.0-130	03/25/20 23:50	
2,4,6-Tribromophenol (S)	%	66	10.0-155	03/25/20 23:50	
p-Terphenyl-d14 (S)	%	63.7	10.0-128	03/25/20 23:50	

LABORATORY CONTROL SAMPLE: R3512585-1

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,4-Dichlorobenzene	mg/L	0.500	0.264	52.8	18.0-120	
2,4-Dinitrotoluene	mg/L	0.500	0.415	83.0	49.0-124	
Hexachlorobenzene	mg/L	0.500	0.353	70.6	44.0-120	
Hexachloro-1,3-butadiene	mg/L	0.500	0.288	57.6	19.0-120	
Hexachloroethane	mg/L	0.500	0.277	55.4	15.0-120	
Nitrobenzene	mg/L	0.500	0.284	56.8	27.0-120	
2-Methylphenol(o-Cresol)	mg/L	0.500	0.253	50.6	28.0-120	
3&4-Methylphenol(m&p Cresol)	mg/L	0.500	0.272	54.4	31.0-120	
Pentachlorophenol	mg/L	0.500	0.460	92.0	23.0-120	
2,4,5-Trichlorophenol	mg/L	0.500	0.338	67.6	44.0-120	
2,4,6-Trichlorophenol	mg/L	0.500	0.284	56.8	42.0-120	
Pyridine	mg/L	0.500	0.103	20.6	10.0-120	
2-Fluorophenol (S)	%			33.8	10.0-120	
Phenol-d5 (S)	%			21.5	10.0-120	
Nitrobenzene-d5 (S)	%			46.8	10.0-127	
2-Fluorobiphenyl (S)	%			57.7	10.0-130	
2,4,6-Tribromophenol (S)	%			77.5	10.0-155	
p-Terphenyl-d14 (S)	%			62.3	10.0-128	

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QUALITY CONTROL DATA

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: R3512585-3 R3512585-4

Parameter	Units	L1199727-01 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,4-Dichlorobenzene	mg/L	ND	0.500	0.500	0.257	0.235	51.4	47.0	17.0-120	8.94	40	
2,4-Dinitrotoluene	mg/L	ND	0.500	0.500	0.380	0.367	76.0	73.4	39.0-125	3.48	25	
Hexachlorobenzene	mg/L	ND	0.500	0.500	0.339	0.343	67.8	68.6	35.0-122	1.17	24	
Hexachloro-1,3-butadiene	mg/L	ND	0.500	0.500	0.302	0.287	60.4	57.4	12.0-120	5.09	34	
Hexachloroethane	mg/L	ND	0.500	0.500	0.274	0.257	54.8	51.4	10.0-120	6.40	40	
Nitrobenzene	mg/L	ND	0.500	0.500	0.294	0.276	58.8	55.2	12.0-120	6.32	30	
2-Methylphenol(o-Cresol)	mg/L	ND	0.500	0.500	0.247	0.233	49.4	46.6	10.0-120	5.83	30	
3&4-Methylphenol(m&p Cresol)	mg/L	ND	0.500	0.500	0.260	0.245	52.0	49.0	10.0-120	5.94	36	
Pentachlorophenol	mg/L	ND	0.500	0.500	0.428	0.417	85.6	83.4	10.0-128	2.60	37	
2,4,5-Trichlorophenol	mg/L	ND	0.500	0.500	0.324	0.316	64.8	63.2	33.0-120	2.50	31	
2,4,6-Trichlorophenol	mg/L	ND	0.500	0.500	0.278	0.272	55.6	54.4	26.0-120	2.18	31	
Pyridine	mg/L	ND	0.500	0.500	0.0746	0.104	14.9	20.8	10.0-120	32.9	37	
2-Fluorophenol (S)	%						33.6	32.8	10.0-120			
Phenol-d5 (S)	%						20.6	20.2	10.0-120			
Nitrobenzene-d5 (S)	%						50.7	47.3	10.0-127			
2-Fluorobiphenyl (S)	%						54.6	55.1	10.0-130			
2,4,6-Tribromophenol (S)	%						74.5	72.5	10.0-155			
p-Terphenyl-d14 (S)	%						61.8	60.1	10.0-128			

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QUALITY CONTROL DATA

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

QC Batch: 1448595
QC Batch Method: 8260D
Analysis Method: EPA 8260D
Analysis Description: VOA (GC/MS) 8260D TCLP
Associated Lab Samples: 50252134001

METHOD BLANK: R3511655-3
Matrix: Solid
Associated Lab Samples: 50252134001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	mg/L	<0.0167	0.0500	03/23/20 10:01	
Carbon tetrachloride	mg/L	<0.0167	0.0500	03/23/20 10:01	
Chlorobenzene	mg/L	<0.0167	0.0500	03/23/20 10:01	
Chloroform	mg/L	<0.0833	0.250	03/23/20 10:01	
1,2-Dichloroethane	mg/L	<0.0167	0.0500	03/23/20 10:01	
1,1-Dichloroethene	mg/L	<0.0167	0.0500	03/23/20 10:01	
2-Butanone (MEK)	mg/L	<0.167	0.500	03/23/20 10:01	
Tetrachloroethene	mg/L	<0.0167	0.0500	03/23/20 10:01	
Trichloroethene	mg/L	<0.0167	0.0500	03/23/20 10:01	
Vinyl chloride	mg/L	<0.0167	0.0500	03/23/20 10:01	
1,4-Dichlorobenzene	mg/L	<0.0167	0.0500	03/23/20 10:01	
Toluene-d8 (S)	%	101	80.0-120	03/23/20 10:01	
4-Bromofluorobenzene (S)	%	90.3	77.0-126	03/23/20 10:01	
1,2-Dichloroethane-d4 (S)	%	114	70.0-130	03/23/20 10:01	

LABORATORY CONTROL SAMPLE & LCSD: R3511655-1 R3511655-2

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Benzene	mg/L	0.250	0.259	0.261	104	104	70.0-123	0.769	20	
Carbon tetrachloride	mg/L	0.250	0.256	0.279	102	112	68.0-126	8.60	20	
Chlorobenzene	mg/L	0.250	0.254	0.268	102	107	80.0-121	5.36	20	
Chloroform	mg/L	0.250	0.286	0.294	114	118	73.0-120	2.76	20	
1,2-Dichloroethane	mg/L	0.250	0.282	0.281	113	112	70.0-128	0.355	20	
1,1-Dichloroethene	mg/L	0.250	0.259	0.270	104	108	71.0-124	4.16	20	
2-Butanone (MEK)	mg/L	1.25	1.83	1.84	146	147	44.0-160	0.545	20	
Tetrachloroethene	mg/L	0.250	0.282	0.302	113	121	72.0-132	6.85	20	
Trichloroethene	mg/L	0.250	0.280	0.297	112	119	78.0-124	5.89	20	
Vinyl chloride	mg/L	0.250	0.255	0.274	102	110	67.0-131	7.18	20	
1,4-Dichlorobenzene	mg/L	0.250	0.227	0.243	90.8	97.2	79.0-120	6.81	20	
Toluene-d8 (S)	%				112	112	80.0-120			
4-Bromofluorobenzene (S)	%				92.9	94.7	77.0-126			
1,2-Dichloroethane-d4 (S)	%				118	116	70.0-130			

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QUALITY CONTROL DATA

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

QC Batch: 1449747 Analysis Method: EPA 1664A
QC Batch Method: 1664A Analysis Description: Wet Chemistry 1664A
Associated Lab Samples: 50252134001

METHOD BLANK: R3512429-1 Matrix: Water
Associated Lab Samples: 50252134001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Oil and Grease	mg/L	<1.16	5.00	03/25/20 11:01	

LABORATORY CONTROL SAMPLE & LCSD: R3512429-2 R3512429-3

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Oil and Grease	mg/L	40.0	37.6	36.9	94.0	92.3	78.0-114	1.88	20	

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QUALITY CONTROL DATA

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

QC Batch: 155156
QC Batch Method: EPA 1110A
Analysis Method: EPA 1110A
Analysis Description: 1110 Corrosivity Toward Steel
Associated Lab Samples: 50252134001

SAMPLE DUPLICATE: 746765

Parameter	Units	50252134001 Result	Dup Result	RPD	Max RPD	Qualifiers
Corrosion Rate	mm/yr	0.0850J	0.0840J		20	

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QUALITY CONTROL DATA

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

QC Batch: 553487
QC Batch Method: EPA 9045
Analysis Method: EPA 9045
Analysis Description: 9045 pH
Associated Lab Samples: 50252134001

SAMPLE DUPLICATE: 2552628

Parameter	Units	50252602001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	5.1	5.1	0	2	H3

SAMPLE DUPLICATE: 2552629

Parameter	Units	50252698001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	10.1	10.1	0	2	H3,PO

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QUALIFIERS

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

J - Estimated concentration at or above the LOD and below the LOQ.

LOD - Limit of Detection adjusted for dilution factor, percent moisture, initial weight and final volume.

LOQ - Limit of Quantitation adjusted for dilution factor, percent moisture, initial weight and final volume.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

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TNI - The NELAC Institute.

LABORATORIES

PAN	Pace Analytical National
PASI-I	Pace Analytical Services - Indianapolis
PASI-L	Pace Analytical Services - Melville

ANALYTE QUALIFIERS

CC	The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The result may be biased.
H3	Sample was received or analysis requested beyond the recognized method holding time.
J	Analyte detected below the reporting limit, therefore result is an estimate. This qualifier is also used for all TICs.
MH	Matrix spike recovery and/or matrix spike duplicate recovery was above laboratory control limits. Result may be biased high.
P4	Sample field preservation does not meet EPA or method recommendations for this analysis.
P9	RPD between the primary and confirmatory analysis exceeded 40%.
PO	The reported result is outside the range of the pH buffer solutions used to check the calibration of the pH meter.
ST	Surrogate recovery was above laboratory control limits. Results may be biased high.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: KHP Condensate Tank 3/2020
Pace Project No.: 50252134

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
50252134001	**GC Tank**				
50252134001	**GC Tank**	3510C	1450384	EPA 8081B	1450384
50252134001	**GC Tank**	8151A	1450100	EPA 8151A	1450100
50252134001	**GC Tank**	3015	1449837	EPA 6010B	1449837
50252134001	**GC Tank**	7470A	1449809	EPA 7470A	1449809
50252134001	**GC Tank**	3510C	1449707	EPA 8270C	1449707
50252134001	**GC Tank**	8260D	1448595	EPA 8260D	1448595
50252134001	**GC Tank**	1664A	1449747	EPA 1664A	1449747
50252134001	**GC Tank**	EPA 1010	552848		
50252134001	**GC Tank**	EPA 1110A	155156		
50252134001	**GC Tank**	EPA 9045	553487		

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WO# : 50252134

50252134

Affix Label Here or List Pace Workorder Number or

SE ONLY

ager:

Company: RKHP	Billing Information: RKHP 1989 Oakes Rd Racine WI 53408
Address:	
Report To: RKHP	Email To:
Copy To: TRE Poppe Pope 208 Heartland Trail Madison WI 53717	Site Collection Info/Address:
Customer Project Name/Number: KHP Condensate Tank 3/2020	State: WI County/City: Roerve Time Zone Collected: [ ] PT [ ] MT [ ] CT [ ] ET
Phone: Email:	Site/Facility ID #: Compliance Monitoring? [ ] Yes [ ] No
Collected By (print): Scott Freimark	Purchase Order #: Quote #: DW PWS ID #: DW Location Code:
Collected By (signature):	Turnaround Date Required: Immediately Packed on Ice: [ ] Yes [ ] No
Sample Disposal: [ ] Dispose as appropriate [ ] Return [ ] Archive: [ ] Hold:	Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day (Expedite Charges Apply)
	Field Filtered (if applicable): [ ] Yes [ ] No Analysis:

** Preservative Types: (1) nitric acid, (2) sulfuric acid, (3) hydrochloric acid, (4) sodium hydroxide, (5) zinc acetate, (6) methanol, (7) sodium bisulfate, (8) sodium thiosulfate, (9) hexane, (A) ascorbic acid, (B) ammonium sulfate, (C) ammonium hydroxide, (D) TSP, (U) Unpreserved, (O) Other _____

* Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Wastewater (WW), Product (P), Soil/Solid (SL), Oil (OL), Wipe (WP), Air (AR), Tissue (TS), Bioassay (B), Vapor (V), Other (OT)

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start) Date	Collected (or Composite Start) Time	Composite End Date	Composite End Time	Res Cl	# of Ctns	Analyses: PH	Flashpoint	TCLP SVOC (Acids/Hcbs/Pests)	TCLP VOC	Lab Profile/Line
GC Tank	GC	G	3/16/20	0930	—	—		10	X	X	X	X	001

Lab Sample Receipt Checklist:

Custody Seals Present/Intact	Y	N	NA
Custody Signatures Present	Y	N	NA
Collector Signature Present	Y	N	NA
Bottles Intact	Y	N	NA
Correct Bottles	Y	N	NA
Sufficient Volume	Y	N	NA
Samples Received on Ice	Y	N	NA
VOA - Headspace Acceptable	Y	N	NA
USDA Regulated Soils	Y	N	NA
Samples in Holding Time	Y	N	NA
Residual Chlorine Present	Y	N	NA
Cl Strips:			
Sample pH Acceptable	Y	N	NA
pH Strips:			
Sulfide Present	Y	N	NA
Lead Acetate Strips:			

LAB USE ONLY:
Lab Sample # / Comments:

see SOW

Customer Remarks / Special Conditions / Possible Hazards:

Type of Ice Used: Wet Blue Dry None

Packing Material Used:

Radchem sample(s) screened (<500 cpm): Y N NA

SHORT HOLDS PRESENT (<72 hours): Y N N/A

Lab Tracking #: 2478307

Samples received via: FEDEX UPS Client Courier Pace Courier

Lab Sample Temperature Info:
Temp Blank Received: (Y) N NA
Therm ID#: 8
Cooler 1 Temp Upon Receipt: 0.5 oC
Cooler 1 Therm Corr. Factor: 0.0 oC
Cooler 1 Corrected Temp: 0.5 oC
Comments:
1.0 1.3 0.7

Relinquished by/Company: (Signature)	Date/Time: 3/16/20 1200	Received by/Company: (Signature) fedex	Date/Time:
Relinquished by/Company: (Signature) fedex	Date/Time: 3-17 930	Received by/Company: (Signature)	Date/Time: 3-17 930
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:

MTJL LAB USE ONLY

Table #:
Acctnum:
Template:
Prelogin:
PM:
PB:

Trip Blank Received: Y N NA
HCL MeOH TSP Other

Non Conformance(s): YES / NO

Page: _____ of: _____

Pace Analytical

SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50252134

Date/Time and Initials of person examining contents: JH 3-17 1044

Courier: ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace ☐ Other _____

Tracking #: 7700 2791 4253 4139 4025 2967

Custody Seal on Cooler/Box Present: ☐ Yes ☒ No **Seals Intact:** ☐ Yes ☒ No

Packing Material: ☒ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other _____

Thermometer: 1 2 3 4 5 6 A (B) C D E F Ice Type: ☒ Wet ☐ Blue ☐ None | Samples collected today and on ice: ☐ Yes ☐ No ☒ N/A

Cooler Temperature: 01/0.5 1.0/1.0 1.3/1.3 0.7/0.7 Ice Visible in Sample Containers?: ☐ Yes ☒ No ☐ N/A

(Initial/Corrected) Temp should be above freezing to 6°C If temp. is Over 6°C or under 0°C, was the PM Notified?: ☐ Yes ☐ No ☒ N/A

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.		X	All containers needing acid/base pres. Have been checked?: **exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.** All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			
USDA Regulated Soils? (ID, NY, WA, OR,CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		X				
Chain of Custody Present:	X		Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			X
Chain of Custody Filled Out:	X		Dissolved Metals field filtered?:			X
Short Hold Time Analysis (<72hr)?: **Analysis:**		X	Headspace Wisconsin Sulfide			X
Time 5035A TC placed in Freezer or Short Holds To Lab:				Present	Absent	N/A
			Residual Chlorine Check (SVOC 625 Pest/PCB 608)		X	X JH 3-17
			Residual Chlorine Check (Total/Amenable/Free Cyanide)			X
Rush TAT Requested:		X	Headspace in VOA Vials (>6mm):			X
Containers Intact?:	X		Trip Blank Present?:		X	
Sample Labels (IDs/Dates/Times) Match COC?: Except TCs, which only require sample ID	X		Trip Blank Custody Seals?:		1	
Extra labels on Terracore Vials (soils only)?		X				

Comments:

COC PAGE 1 of 1

Sample Container Count

Sample Line Item	WGFU	SBS DI BK Kit R	DG9H VG9H	VOA VIALS (>6mm)	VG9U	DG9U	DG9T	AG0U	AG1H	AG1U	AG3S	BP1U	BP1N	BP2U	BP3U	BP3N	BP3F	BP3S	BP3B	BP3Z	CG3H					Matrix	pH <2	pH >9	pH>12
1										6					4											5			
2																													
3																													
4																													
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													

Container Codes

Glass

DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpres amber glass
DG9H	40mL HCl amber voa vial	AG1H	1L HCl amber glass
DG9M	40mL MeOH clear vial	AG1S	1L H2SO4 amber glass
DG9P	40mL TSP amber vial	AG1T	1L Na Thiosulfate amber glass
DG9S	40mL H2SO4 amber vial	AG1U	1liter unpres amber glass
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass
DG9U	40mL unpreserved **amber** vial	AG2S	500mL H2SO4 amber glass
VG9H	40mL HCl clear vial	AG2U	500mL unpres amber glass
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 amber glass
VG9U	40mL unpreserved **clear** vial	AG3U	250mL unpres amber glass
VGFX	40mL w/hexane wipe vial	BG1H	1L HCl clear glass
VSG	Headspace septa vial & HCl	BG1S	1L H2SO4 clear glass
WGKU	8oz unpreserved clear jar	BG1T	1L Na Thiosulfate clear glass
WGFU	4oz clear soil jar	BG1U	1L unpreserved glass
JGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass
CG3H	250mL clear glass HCl	BG3U	250mL Unpres Clear Glass

Plastic / Misc.

BP1A	1L NaOH, Asc Acid plastic
BP1N	1L HNO3 plastic
BP1S	1L H2SO4 plastic
BP1U	1L unpreserved plastic
BP1Z	1L NaOH, Zn, Ac
BP2A	500mL NaOH, Asc Acid plastic
BP2N	500mL HNO3 plastic
BP2O	500mL NaOH plastic
BP2S	500mL H2SO4 plastic
BP2U	500mL unpreserved plastic
BP2Z	500mL NaOH, Zn Ac
BP3B	250mL NaOH plastic
BP3N	250mL HNO3 plastic
BP3F	250mL HNO3 plastic (field filtered)

BP3U	250mL unpreserved plastic
BP3S	250mL H2SO4 plastic
BP3Z	250mL NaOH, Zn Ac plastic

AF	Air Filter
C	Air Cassettes
R	Terra core kit
SP5T	120mL Coliform Na Thiosulfate
U	Summa Can
ZPLC	Ziploc Bag

WT	Water
SL	Solid
NAL	Non-aqueous liquid
WP	Wipe

Attachment 3

Domestic Sewage Exclusion Memorandum

JONES DAY | One Firm Worldwide℠

MEMORANDUM

Republic Services of Wisconsin, Limited Partnership
Kestrel Hawk Landfill

Domestic Sewage Exclusion

In its notice of noncompliance dated December 9, 2019 (the "NON"), the Wisconsin Department of Natural Resources ("WDNR") requests in item 5 that the Kestrel Hawk Landfill ("KHL") make a waste determination pursuant to the Resource Conservation and Recovery Act ("RCRA") for the liquids generated in association with the hazardous waste unit, including the groundwater collected from the area 141U extraction system and from the groundwater collection pipe/trench along the southern perimeter of the hazardous waste unit (collectively, the "Leachate").

During the investigation that led to the NON, KHL took the position that the Leachate is not a solid waste because it is covered by the domestic sewage exclusion that is part of RCRA. DNR questioned whether this exclusion applies before the Leachate actually mixes with sanitary wastes. The relevant authorities are clear that the Leachate is covered by the exclusion, and KHL plans to update its management and reporting of the Leachate to correspond with this understanding.

Background

The Leachate mixes with domestic sewage while passing through a sewer system to the Racine wastewater treatment plant (the "Racine POTW"), which is a publicly-owned treatment works. After treatment in the Racine POTW, the effluent is discharged pursuant to a Clean Water Act permit.

The statutory definition of solid waste in RCRA excludes "solid or dissolved material in domestic sewage." 42 U.S.C. § 6903(27). This same exclusion appears in the Wisconsin definition of solid waste. Wisc. Stat. § 289.01(33). The federal legislative history for the domestic sewage exclusion indicates that the purpose of the exemption was to make sure that RCRA did not regulate wastes that are regulated by the Clean Water Act. 45 Fed. Reg. 33084, 33097 (May 19, 1980).

This statutory exclusion is codified in the Wisconsin regulations, which excludes the following from the definition of solid waste: "Any mixture of domestic sewage and other wastes that passes through a sewer system to a publicly-owned treatment works for treatment. 'Domestic sewage' means untreated sanitary wastes that pass through a sewer system." NR 661.04(1)(a)(2), Wisc. Adm. Code. Parallel language appears in the federal RCRA regulations, except that the federal regulation includes exceptions for certain hazardous waste pharmaceuticals and pollutants causing pass through or interference, which are not at issue for the Leachate. 40 C.F.R. § 261.4(a)(1)(ii).

Regulatory Guidance

EPA has consistently interpreted this exclusion to apply even before material that would otherwise be solid waste actually mixes with domestic sewage. In the preamble establishing the regulatory language that implements the statutory exclusion, EPA states:

> EPA has, therefore, decided that a waste falls within the domestic sewage exemption when it first enters a sewer system that will mix it with sanitary wastes prior to storage or treatment by a POTW. EPA recognizes that this interpretation brings various wastes within the exemption before they are actually mixed with sanitary wastes. In light of the fact that the wastes will be mixed prior to treatment and that the mixture will be properly treated by the POTW, EPA believes that the need for administrative clarity in this otherwise complicated regulatory program warrants such an approach.

45 Fed. Reg. at 33097; see also RO 12963 (July 1987). EPA's reasoning was based on an assessment that any other approach would not provide regulatory clarity:

> Defining the point at which "mixture" occurs may seem to be a relatively straightforward task. Practical problems arise, however, in defining the point at which mixture of sanitary and other wastes occurs in a complex sewer system. Moreover it is particularly difficult to define this point for regulatory purposes in such a way that all parties understand when RCRA obligations begin and end.

Id. We have not been able to locate any Wisconsin guidance suggesting that WDNR's interpretation of its regulatory exemption is different from EPA's interpretation.

The Leachate is covered by the domestic sewage exclusion. It is sent to the Racine POTW through public sanitary sewer pipes where it mixes with sanitary wastes. WDNR need not consider the guidance that deals with private systems because the Racine POTW is a publicly owned treatment works. See https://waste.zendesk.com/hc/en-us/articles/212349677-When-does-the-domestic-sewage-exclusion-apply-Does-it-apply-to-wastes-removed-from-a-sewer-system-or-if-the-waste-goes-to-a-private-sewer-system-. Finally, this is not a situation where the exclusion does not apply because the material has leaked from the pipe or been sent to the POTW by truck, rail or dedicated pipe.

Charles T. Wehland
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(312) 269-4388

Jane K. Murphy
jkmurphy@jonesday.com
(312) 269-4239

April 9, 2020

Attachment 4

Waste Determination Outline

Waste Determination Outline
Kestrel Hawk Landfill
Racine, Wisconsin

Location	Waste Stream	Source	Destination	Is it a Solid Waste?	Is it a Hazardous Waste?	Waste Code	Comments
Northwest Expansion	Leachate	MSW Landfill	WWTP	No, excluded			Domestic sewer exclusion; refer to 3/26/2020 correspondence. Testing on LMP6a indicates not characteristically hazardous per corrosivity and toxicity. Generator knowledge indicates that the flashpoint is not characteristically hazardous.
	Landfill Gas	MSW Landfill	Biogas Building	No			Determined not to be a containerized gas; therefore, not a solid waste. Refer to 3/12/2020 correspondence.
	Landfill Gas Condensate	MSW Landfill	WWTP	Yes	No		Testing on condensate sample collected on 3/16/20 did not exhibit a hazardous waste characteristic.
City of Racine Landfill	Leachate	MSW Landfill	WWTP	No, excluded			Domestic sewer exclusion; refer to 3/26/2020 correspondence. Leachate from a municipal solid waste landfill.
	Landfill Gas	MSW Landfill	Biogas Building	No			Determined not to be a containerized gas; therefore, not a solid waste. Refer to 3/12/2020 correspondence.
	Groundwater Containment Structure	MSW Landfill	via LS-5, WWTP	No, excluded			Domestic sewer exclusion; refer to 3/26/2020 correspondence. Collects groundwater and leachate from a municipal solid waste landfill.
	Landfill Gas Condensate	MSW Landfill	WWTP	Yes	No		Testing on condensate sample collected on 3/16/20 did not exhibit a hazardous waste characteristic.
Corridors 8, 9, 10 Landfill	Leachate	MSW Landfill	WWTP	No, excluded			Domestic sewer exclusion; refer to 3/26/2020 correspondence. Leachate from a municipal solid waste landfill.
	Landfill Gas	MSW Landfill	Biogas Building	No			Determined not to be a containerized gas; therefore, not a solid waste.
	Landfill Gas Condensate	MSW Landfill	WWTP	Yes	No		Testing on condensate sample collected on 3/16/20 did not exhibit a hazardous waste characteristic.
Hazardous Waste Unit Landfill	Leachate	Hazardous Waste Landfill	WWTP	No, excluded			Domestic sewer exclusion; refer to 3/26/2020 correspondence.
	Oil and Oily Sock Removal	Hazardous Waste Landfill	Off Site (picked up by Safety Kleen)	Yes	Yes	F039	Extracted from above the leachate in the HWU
	Landfill Gas	Hazardous Waste Landfill	Biogas Building	No			Determined not to be a containerized gas; therefore, not a solid waste.
	Landfill Gas Condensate	Hazardous Waste Landfill	WWTP	Yes	No		Testing on condensate sample collected on 3/16/20 did not exhibit a hazardous waste characteristic.
	Groundwater Containment Structure	Groundwater	WWTP	No, excluded			Domestic sewer exclusion; refer to 3/26/2020 correspondence.
	141U Area Remediation Project	Groundwater	WWTP	No, excluded			Domestic sewer exclusion; refer to 3/26/2020 correspondence. Impacts to groundwater thought to be from landfill gas which is not derived from a solid waste, refer to 3/12/20 correspondence.

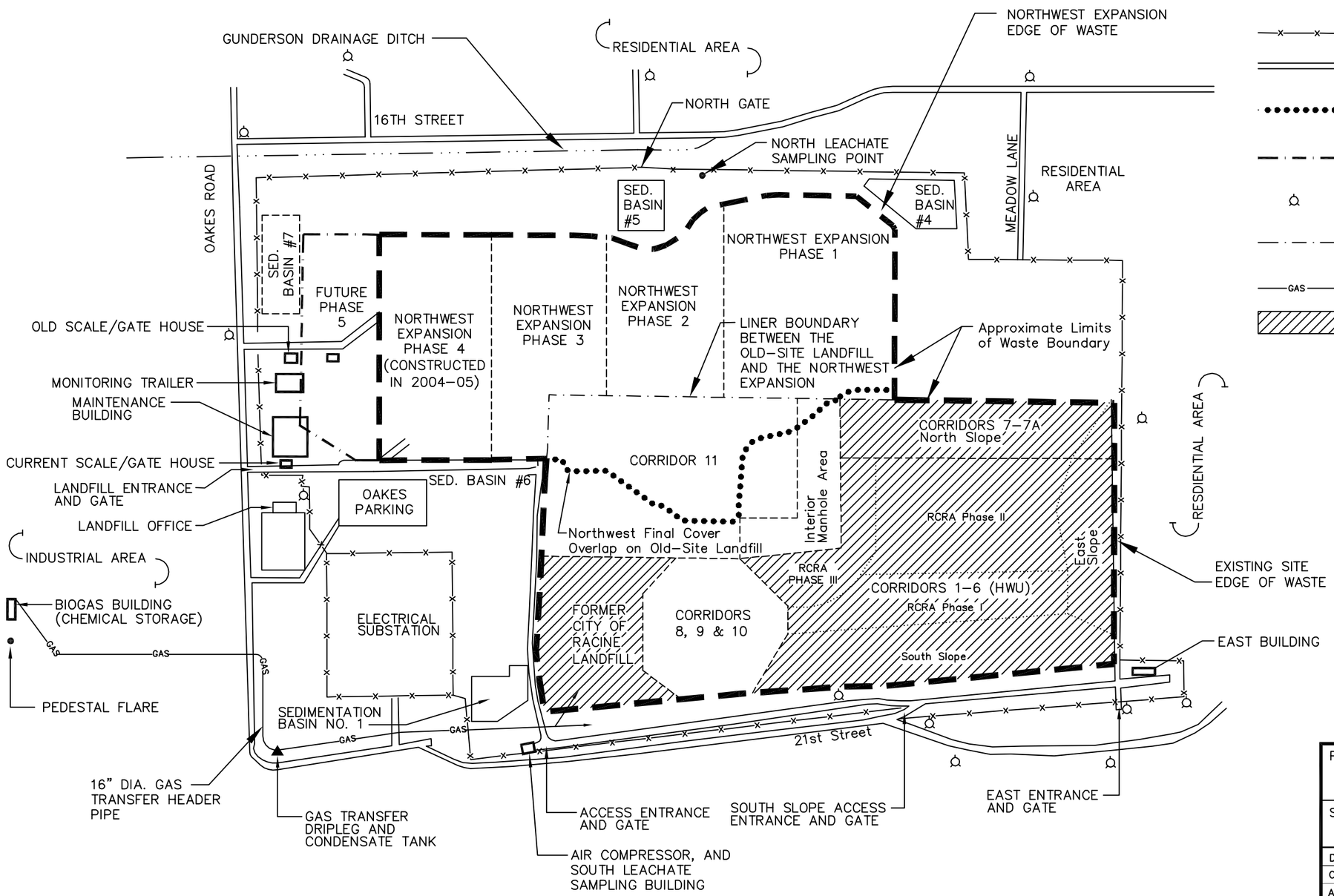
Waste Determination Outline
Kestrel Hawk Landfill
Racine, Wisconsin

Location	Waste Stream	Source	Destination	Is it a Solid Waste?	Is it a Hazardous Waste?	Waste Code	Comments
Biogas Building	Landfill Gas Condensate (5,000 gallon tank)	MSW and Hazardous Waste Landfill	WWTP	Yes	No		Testing on condensate sample collected on 3/16/20 did not exhibit a hazardous waste characteristic.
	Oil Water Separator (Liquid)	Biogas Building Compressor	Landfill Gas Condensate (5,000 gallon tank)	Yes	No		Testing on condensate tank sample collected on 3/16/20 did not exhibit a hazardous waste characteristic. Refer to 3/26/20 correspondence.
	Oil Water Separator (Oil)	Biogas Building Compressor	Safety-Kleen	Yes	No		Not a hazardous waste based on generator knowledge. Condensate tank sample collected on 3/16/20 did not exhibit a hazardous waste characteristic; refer to 3/26 correspondence.
	Spent Filters and System Components	Biogas Building Operations	Safety-Kleen and Municipal Solid Waste	Yes	No		Generator knowledge. Filters and absorbents used at the biogas building. Generally brought to the maintenance building for pickup by Safety-Kleen. Periodically disposed of in roll off containers as municipal solid waste.
	Scrap Equipment and Materials Stored in Trailer	Landfill Construction Events	Municipal Solid Waste Disposal	Yes	No		Generator knowledge. Equipment and parts remaining from construction events. To be removed and disposed of as municipal solid waste.
Maintenance Building	Used fluorescent bulbs	Office and Machining Shop	Safety-Kleen	Yes	No		Universal waste; collected annually.
	Safety-Kleen Model 91 Aqueous Parts Washer	Maintenance on landfill equipment	Safety-Kleen	Yes	No		Based on information provided by Safety-Kleen.
	Used Oil Drums	Maintenance on landfill equipment	Safety-Kleen	Yes	No		Managed as used oil based on generator knowledge. Equipment does not operate in areas potentially exposed to hazardous waste.
	Used Oil Filters	Maintenance on landfill equipment	Safety-Kleen	Yes	No		Managed as used oil based on generator knowledge. Equipment does not operate in areas potentially exposed to hazardous waste.
	Used Anti-Freeze	Maintenance on landfill equipment	Safety-Kleen	Yes	No		Not a hazardous waste based on generator knowledge. Equipment does not operate in areas potentially exposed to hazardous waste.
	Shop Floor Drain Trench	Maintenance on landfill equipment	Safety-Kleen	Yes	No		Generator knowledge based on materials stored in building and fluids in machinery. Potentially oily waste waster stream that may contain solids and sludge. Collected at least annually.
	Partial/Full Aerosol Cans	Maintenance on landfill equipment		Yes	TBD		Generator knowledge based on materials listed on aerosol cans. Material to be managed in accordance with applicable requirements based on the characterization. USEPA passed a regulation to include this waste stream as universal waste, but this has not been adopted by WI.
	Miscellaneous	Operations	MSW Landfill	Yes	No		Containers from used oil, aerosol cans, and other miscellaneous items where the contents have been removed to the feasible extent.
Office	Office Refuse	Office	MSW Landfill	Yes	No		Waste is not hazardous based on generator knowledge.

Created By: J. Hotstream
Checked By: J. Liello

Attachment 5

Closure Figures



LEGEND

- APPROXIMATE CORRIDOR AND PHASING LINER BOUNDARIES
- APPROXIMATE LIMITS OF WASTE BOUNDARY FOR OLD–SITE LANDFILL AND THE NORTHWEST EXPANSION LANDFILL THAT HAS BEEN CONSTRUCTED
- EXISTING FENCE LINE
- EXISTING ROADS
- NORTHWEST EXPANSION FINAL COVER OVERLAY ON TO OLD–SITE LANDFILL
- BOUNDARY LIMITS FOR FUTURE NORTHWEST EXPANSION LANDFILL PHASES
- FIRE HYDRANT
- LINER BOUNDARY BETWEEN THE OLD–SITE AND THE NORTHWEST EXPANSION LANDFILLS
- GAS — 16" DIA. GAS TRANSFER HEADER PIPE
- OLD SITE INVESTIGATION AREA

PROJECT: **KESTREL HAWK LANDFILL**
OLD SITE HYDROGEOLOGIC EVALUATION
PHASE I SUMMARY REPORT

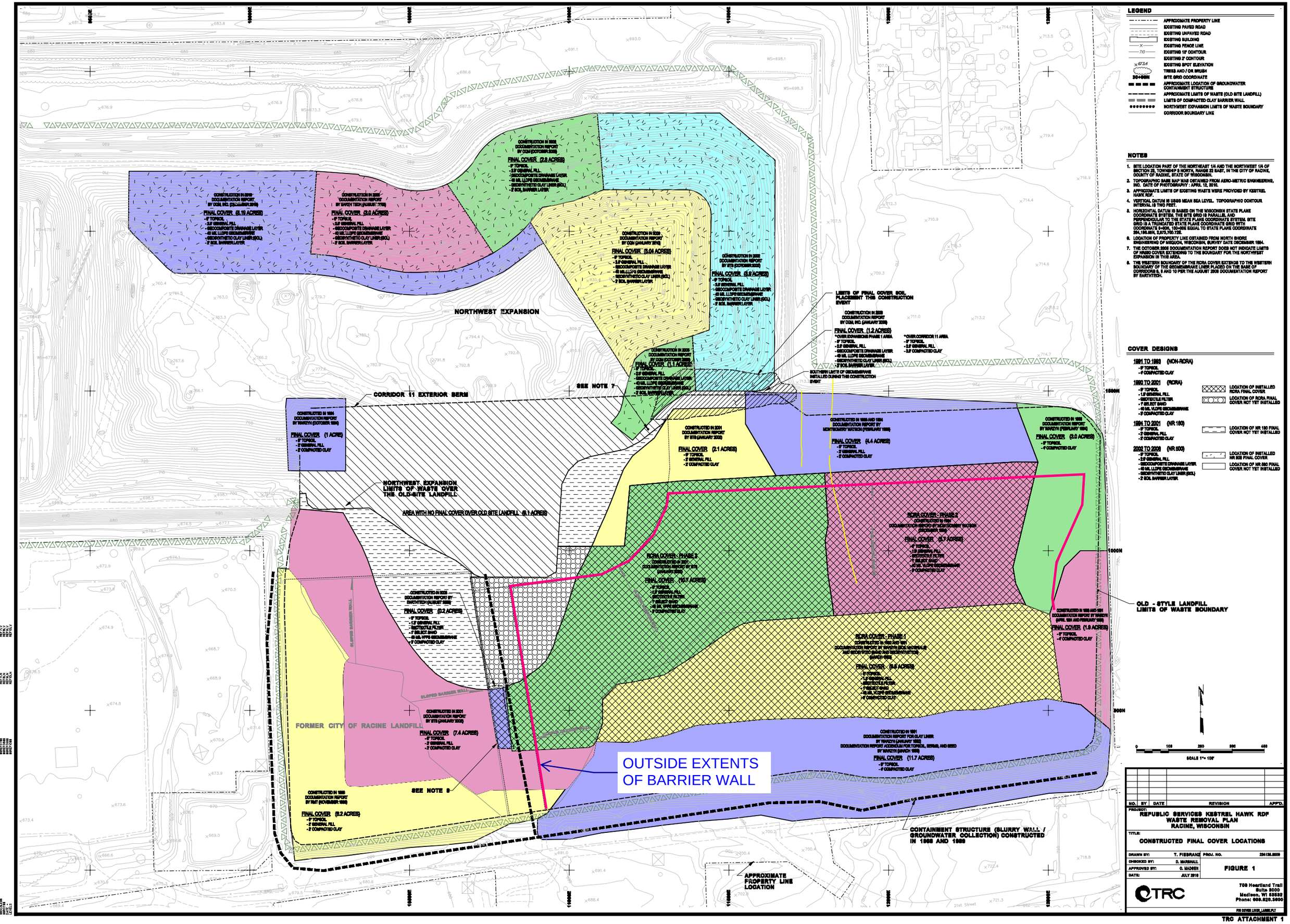
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SITE PLAN AND OLD SITE INVESTIGATION AREA

DRAWN BY: NOLDENR	SCALE:	PROJ. NO.	4865.94
CHECKED BY: DM	NOT TO SCALE	FILE NO.	48659423.DWG
APPROVED BY: JO	DATE PRINTED:	**FIGURE 3**	
DATE: OCTOBER 2005			

RMT

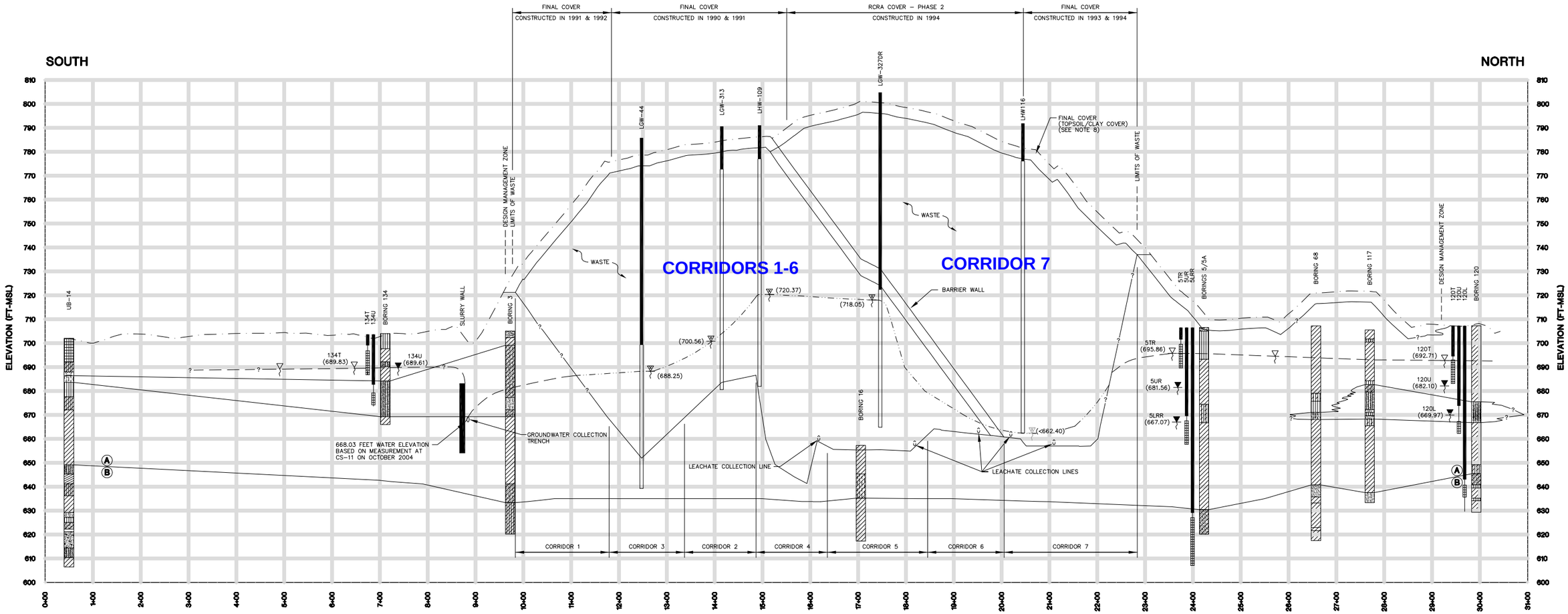
744 Heartland Trail
Madison, WI 53717–1934
P.O. Box 8923 53708–8923
Phone: 608–831–4444
Fax: 608–831–3334

PLOT DATA
$$SCALE$$
$$DWG$$
$$USER$$
$$PRF$$
$$PTABLE$$
$$PLOTTER$$
$$ROT$$
$$SYTIME$$
Attached Xref's: x


LEGEND
APPROXIMATE PROPERTY LINE
EXISTING PAVED ROAD
EXISTING UNPAVED ROAD
EXISTING BUILDING
EXISTING FENCE LINE
EXISTING 10' CONTOUR
EXISTING 2' CONTOUR
EXISTING SPOT ELEVATION
TREES AND / OR BRUSH
SITE GRID COORDINATE
APPROXIMATE LOCATION OF GROUNDWATER CONTAINMENT STRUCTURE
APPROXIMATE LIMITS OF WASTE (OLD SITE LANDFILL)
LIMITS OF COMPACTED CLAY BARRIER WALL
NORTHWEST EXPANSION LIMITS OF WASTE BOUNDARY
CORRIDOR BOUNDARY LINE
NOTES
1. SITE LOCATION PART OF THE NORTHEAST 1/4 AND THE NORTHWEST 1/4 OF SECTION 29, TOWNSHIP 4 NORTH, RANGE 23 EAST, IN THE CITY OF RACINE, COUNTY OF RACINE, STATE OF WISCONSIN.
2. TOPOGRAPHIC BASE MAP WAS OBTAINED FROM AERO-METRIC ENGINEERING, INC. DATE OF PHOTOGRAPHY : APRIL 12, 2016.
3. APPROXIMATE LIMITS OF EXISTING WASTE WERE PROVIDED BY KESTREL HAWK RDF.
4. VERTICAL DATUM IS USGS MEAN SEA LEVEL. TOPOGRAPHIC CONTOUR INTERVAL IS TWO FEET.
5. HORIZONTAL DATUM IS BASED ON THE WISCONSIN STATE PLANE COORDINATE SYSTEM. THE SITE GRID IS PARALLEL AND PERPENDICULAR TO THE STATE PLANE COORDINATE SYSTEM. SITE GRID IS A TRUNCATED STATE PLANE COORDINATE GRID WITH COORDINATE 0+00N, 100+00E EQUAL TO STATE PLANE COORDINATE 264,186.884, 2,573,700.738.
6. LOCATION OF PROPERTY LINE OBTAINED FROM NORTH SHORE ENGINEERING OF MEQUON, WISCONSIN, SURVEY DATE DECEMBER 1994.
7. THE OCTOBER 2005 DOCUMENTATION REPORT DOES NOT INDICATE LIMITS OF NR680 COVER EXTENDING TO THE BOUNDARY FOR THE NORTHWEST EXPANSION IN THIS AREA.
8. THE WESTERN BOUNDARY OF THE RCRA COVER EXTENDS TO THE WESTERN BOUNDARY OF THE GEOMEMBRANE LINER PLACED ON THE BASE OF CORRIDORS 9, 8 AND 10 PER THE AUGUST 2008 DOCUMENTATION REPORT BY EARTHTECH.
COVER DESIGNS
1991 TO 1993 (NON-RCRA)
- 9" TOPSOIL
- 4' COMPACTED CLAY
1993 TO 2001 (RCRA)
- 9" TOPSOIL
- 1.5' GENERAL FILL
- GEOTEXTILE FILTER
- 1' SELECT SAND
- 40 MIL LLDPE GEOMEMBRANE
- 3' COMPACTED CLAY
LOCATION OF INSTALLED RCRA FINAL COVER
LOCATION OF RCRA FINAL COVER NOT YET INSTALLED
1994 TO 2001 (NR 180)
- 9" TOPSOIL
- 2' GENERAL FILL
- 2' COMPACTED CLAY
LOCATION OF NR 180 FINAL COVER NOT YET INSTALLED
2002 TO 2008 (NR 680)
- 9" TOPSOIL
- 2.5' GENERAL FILL
- GEOCOMPOSITE DRAINAGE LAYER
- 40 MIL LLDPE GEOMEMBRANE
- GEOSYNTHETIC CLAY LINER (GCL)
- 2 SOIL BARRIER LAYER
LOCATION OF INSTALLED NR 680 FINAL COVER
LOCATION OF NR 680 FINAL COVER NOT YET INSTALLED
CONSTRUCTION IN 2008 DOCUMENTATION REPORT BY CGM (OCTOBER 2008)
FINAL COVER (2.8 ACRES)
- 9" TOPSOIL
- 2.5' GENERAL FILL
- GEOCOMPOSITE DRAINAGE LAYER
- 40 MIL LLDPE GEOMEMBRANE
- GEOSYNTHETIC CLAY LINER (GCL)
- 2 SOIL BARRIER LAYER
CONSTRUCTION IN 2008 DOCUMENTATION REPORT BY EARTHTECH (AUGUST 2008)
FINAL COVER (3.0 ACRES)
- 9" TOPSOIL
- 2.5' GENERAL FILL
- GEOCOMPOSITE DRAINAGE LAYER
- 40 MIL LLDPE GEOMEMBRANE
- GEOSYNTHETIC CLAY LINER (GCL)
- 2 SOIL BARRIER LAYER
CONSTRUCTION IN 2009 DOCUMENTATION REPORT BY CGM (JANUARY 2010)
FINAL COVER (8.04 ACRES)
- 9" TOPSOIL
- 2.5' GENERAL FILL
- GEOCOMPOSITE DRAINAGE LAYER
- 40 MIL LLDPE GEOMEMBRANE
- GEOSYNTHETIC CLAY LINER (GCL)
- 2 SOIL BARRIER LAYER
CONSTRUCTION IN 2008 DOCUMENTATION REPORT BY CGM (OCTOBER 2008)
FINAL COVER (1.1 ACRES)
- 9" TOPSOIL
- 2.5' GENERAL FILL
- GEOCOMPOSITE DRAINAGE LAYER
- 40 MIL LLDPE GEOMEMBRANE
- GEOSYNTHETIC CLAY LINER (GCL)
- 2 SOIL BARRIER LAYER
CONSTRUCTION IN 2008 DOCUMENTATION REPORT BY STS (OCTOBER 2008)
FINAL COVER (5.8 ACRES)
- 9" TOPSOIL
- 2.5' GENERAL FILL
- GEOCOMPOSITE DRAINAGE LAYER
- 40 MIL LLDPE GEOMEMBRANE
- GEOSYNTHETIC CLAY LINER (GCL)
- 2 SOIL BARRIER LAYER
LIMITS OF FINAL COVER SOIL PLACEMENT THIS CONSTRUCTION EVENT
CONSTRUCTION IN 2009 DOCUMENTATION REPORT BY CGM, INC. (JANUARY 2009)
FINAL COVER (1.2 ACRES)
*OVER EXPANSION PHASE 1 AREA
- 9" TOPSOIL
- 2.5' GENERAL FILL
- GEOCOMPOSITE DRAINAGE LAYER
- 40 MIL LLDPE GEOMEMBRANE
- GEOSYNTHETIC CLAY LINER (GCL)
- 2 SOIL BARRIER LAYER
*OVER CORRIDOR 11 AREA
- 9" TOPSOIL
- 2.5' GENERAL FILL
- 3.5' COMPACTED CLAY
SOUTHERN LIMITS OF GEOMEMBRANE INSTALLED DURING THIS CONSTRUCTION EVENT
CONSTRUCTED IN 1994 DOCUMENTATION REPORT BY MARATH (OCTOBER 1994)
FINAL COVER (1 ACRE)
- 9" TOPSOIL
- 2' GENERAL FILL
- 3' COMPACTED CLAY
CONSTRUCTED IN 2001 DOCUMENTATION REPORT BY STS (JANUARY 2002)
FINAL COVER (2.1 ACRES)
- 9" TOPSOIL
- 2' GENERAL FILL
- 3' COMPACTED CLAY
CONSTRUCTED IN 1998 AND 1994 DOCUMENTATION REPORT BY MONTGOMERY WATSON (FEBRUARY 1998)
FINAL COVER (4.4 ACRES)
- 9" TOPSOIL
- 2' GENERAL FILL
- 3' COMPACTED CLAY
CONSTRUCTED IN 1998 DOCUMENTATION REPORT BY MARATH (FEBRUARY 1994)
FINAL COVER (3.0 ACRES)
- 9" TOPSOIL
- 4' COMPACTED CLAY
CONSTRUCTED IN 1998 DOCUMENTATION REPORT BY MARATH (APRIL 1994 AND FEBRUARY 1998)
FINAL COVER (1.9 ACRES)
- 9" TOPSOIL
- 4' COMPACTED CLAY
CONSTRUCTED IN 2003 DOCUMENTATION REPORT BY EARTHTECH (AUGUST 2008)
FINAL COVER (0.2 ACRES)
- 9" TOPSOIL
- 1.5' GENERAL FILL
- GEOTEXTILE FILTER
- 1' SELECT SAND
- 40 MIL VPPE GEOMEMBRANE
- 3' COMPACTED CLAY
CONSTRUCTED IN 2001 DOCUMENTATION REPORT BY STS (JANUARY 2002)
FINAL COVER (7.4 ACRES)
- 9" TOPSOIL
- 2' GENERAL FILL
- 3' COMPACTED CLAY
CONSTRUCTED IN 1998 DOCUMENTATION REPORT BY RMT (NOVEMBER 1998)
FINAL COVER (8.2 ACRES)
- 9" TOPSOIL
- 2' GENERAL FILL
- 3' COMPACTED CLAY
RCRA COVER - PHASE 3
CONSTRUCTED IN 2001 DOCUMENTATION REPORT BY STS (JANUARY 2002)
FINAL COVER (10.7 ACRES)
- 9" TOPSOIL
- 1.5' GENERAL FILL
- GEOTEXTILE FILTER
- 1' SELECT SAND
- 40 MIL VPPE GEOMEMBRANE
- 3' COMPACTED CLAY
RCRA COVER - PHASE 2
CONSTRUCTED IN 1998 DOCUMENTATION REPORT BY MONTGOMERY WATSON (DECEMBER 1998)
FINAL COVER (8.7 ACRES)
- 9" TOPSOIL
- 1.5' GENERAL FILL
- GEOTEXTILE FILTER
- 1' SELECT SAND
- 40 MIL VPPE GEOMEMBRANE
- 3' COMPACTED CLAY
RCRA COVER - PHASE 1
CONSTRUCTED IN 1998 AND 1994 DOCUMENTATION REPORT BY MARATH (SOIL MATERIALS AND GEOSYNTHETIC LINER) AND EARTHTECH (CAP CONSTRUCTION) (MARCH 1998)
FINAL COVER (9.6 ACRES)
- 9" TOPSOIL
- 1.5' GENERAL FILL
- GEOTEXTILE FILTER
- 1' SELECT SAND
- 40 MIL VLDPE GEOMEMBRANE
- 3' COMPACTED CLAY
CONSTRUCTED IN 1991 DOCUMENTATION REPORT FOR CLAY LINER BY MARATH (JANUARY 1992) DOCUMENTATION REPORT ADDENDUM FOR TOPSOIL, BERMS, AND SEED BY MARATH (MARCH 1998)
FINAL COVER (11.7 ACRES)
- 9" TOPSOIL
- 3' COMPACTED CLAY
CONSTRUCTED IN 1998 DOCUMENTATION REPORT BY MARATH (OCTOBER 1998)
FINAL COVER (1 ACRE)
- 9" TOPSOIL
- 2' GENERAL FILL
- 3' COMPACTED CLAY
NORTHWEST EXPANSION
CORRIDOR 11 EXTERIOR BERM
SEE NOTE 7
NORTHWEST EXPANSION LIMITS OF WASTE OVER THE OLD-SITE LANDFILL
AREA WITH NO FINAL COVER OVER OLD SITE LANDFILL (6.1 ACRES)
SLOPED BARRIER WALL
FORMER CITY OF RACINE LANDFILL
SEE NOTE 8
OUTSIDE EXTENTS OF BARRIER WALL
OLD - STYLE LANDFILL LIMITS OF WASTE BOUNDARY
CONTAINMENT STRUCTURE (SLURRY WALL / GROUNDWATER COLLECTION) CONSTRUCTED IN 1988 AND 1989
APPROXIMATE PROPERTY LINE LOCATION
21st Street
1000E
1100E
1200E
1300E
1000N
900N
SCALE 1"= 100'
NO. BY DATE REVISION APP'D.
PROJECT:
REPUBLIC SERVICES KESTREL HAWK RDF
WASTE REMOVAL PLAN
RACINE, WISCONSIN
TITLE:
CONSTRUCTED FINAL COVER LOCATIONS
DRAWN BY: T. FIEBRANZ PROJ. NO. 234136.0000
CHECKED BY: D. MARSHALL
APPROVED BY: C. MADSEN
DATE: JULY 2016
FIGURE 1
TRC
708 Heartland Trail
Suite 3000
Madison, WI 53532
Phone: 608.826.3600
FIN COVER LIVER_LARGE.PLT
TRC ATTACHMENT 1

CALLOUTS BY: J. HOTSTREAM 4/13/2020

EXTENTION OF RCRA FINAL COVER OVER BARRIER WALL



B-B'

LEGEND

- STRATIGRAPHIC BOUNDARY (DASHED WHERE INFERRED)
- EXISTING GROUND SURFACE (3/28/05)
- LEACHATE HEAD SURFACE
- WATER TABLE SURFACE
- (679.04) GROUND WATER OR LEACHATE ELEVATION IN WELL (FT. M.S.L.)
- LEACHATE LEVEL IN LHW OR LGW WELLS (FT. M.S.L.)
- WATER TABLE ELEVATION IN MONITORING WELLS (FT. M.S.L.)
- POTENTIOMETRIC HEAD ELEVATION IN MONITORING WELLS (FT. M.S.L.)
- (A) UNIT A
- (B) UNIT B

MONITORING WELL CONSTRUCTION
- WELL SEAL
- WELL CASING
- WELL SCREEN

LEACHATE HEAD OR GAS WELL CONSTRUCTION
- GRAVEL PACK OR WELL SEAL
- WELL SCREEN

SLURRY WALL CONSTRUCTION

GEOLOGIC SYMBOLOGY

CLAYS
- LEAN CLAY/ LEAN CLAY WITH SAND/GRAVEL (CL)
- SANDY LEAN CLAY/SANDY LEAN CLAY WITH GRAVEL (CL)
- SILTY CLAY/SILTY CLAY WITH SAND/GRAVEL (CL-ML)
- SANDY SILTY CLAY/SANDY SILTY CLAY WITH GRAVEL (CL-ML)

SANDS
- WELL-GRADED/POORLY-GRADED SAND (SW OR SP)
- WELL-GRADED/POORLY-GRADED SAND, WITH GRAVEL (SW OR SP)

SILTS
- SILT/SILT WITH SAND GRAVEL (ML)
- CLAYEY SILT
- SANDY SILT/SANDY SILT WITH GRAVEL (ML)
- GRAVELLY SILT/GRAVELLY SILT WITH SAND (ML)
- ELASTIC SILT/ELASTIC SILT W/ SAND ELASTIC SILT W/ GRAVEL (MH)

GRAVELS
- WELL-GRADED/POORLY-GRADED GRAVEL (GW OR GP)

MISCELLANEOUS MATERIALS
- PEAT
- TOPSOIL
- EARTHEN FILL

NOTES

1. THE CORRELATION LINES ARE BASED ON INTERPOLATION BETWEEN BORINGS AND MAY NOT REPRESENT ACTUAL SUBSURFACE CONDITIONS.
2. HORIZONTAL DISTANCES ARE MEASURED AND THE GROUNDWATER AND LEACHATE HEAD DATA ARE PLOTTED WITH RESPECT TO THE CENTER OF EACH BORING LOCATION. WELL CONSTRUCTION SCHEMATICS ARE OFFSET FOR CLARITY.
3. REFER TO FIGURE 5 FOR NOTES REGARDING THE EXISTING TOPOGRAPHY AND CROSS SECTION LOCATIONS.
4. ELEVATIONS ARE SHOWN IN REFERENCE TO USGS MEAN SEA LEVEL (M.S.L.) DATUM.
5. THE GROUNDWATER ELEVATIONS ARE BASED ON MEASUREMENTS TAKEN BY RMT ON OCTOBER 18 & 19, 2004. THE LEACHATE ELEVATIONS ARE BASED ON MEASUREMENTS TAKEN BY RMT BETWEEN OCTOBER 19 AND 21, 2004.
6. BORINGS SHOWN TO BE ABOVE OR BELOW EXISTING GROUND SURFACE (MARCH 28, 2005) PREDATE EITHER FILL OR EXCAVATION ACTIVITIES IN THOSE AREAS. WASTE IN AREAS 8, 9 AND 10 AS INDICATED IN BORINGS 144, 145 AND 168 WAS REMOVED PRIOR TO CONSTRUCTION OF SLURRY WALL IN 1991.
7. EXISTING GROUNDWATER CONTAINMENT STRUCTURE LOCATIONS AND DEPTHS WERE APPROXIMATED FROM A COPY OF THE CONSTRUCTION OBSERVATION REPORT FOR THE GROUNDWATER CONTAINMENT STRUCTURE PLAN SET RECEIVED AUGUST 1991. (FOTH & VAN DYKE).
8. FINAL COVER THICKNESS SHOWN AS 4.5-FEET THICK. ACTUAL THICKNESS MAY VARY BASED ON LOCATION WITHIN SPECIFIC FINAL COVER PHASING.
9. LANDFILL BASE ELEVATIONS AT LOCATIONS WHERE NO BORINGS OR WELLS ARE PRESENT ARE PROJECTED BASED ON INFORMATION FROM ADJACENT BORINGS OR WELLS.
10. THE TOP OF UNIT B ELEVATIONS BENEATH THE LANDFILL ARE BASED ON A PROJECTED CONTOUR MAP USING STRATIGRAPHIC DATA FROM SOIL BORINGS INSTALLED AROUND THE PERIMETER AND WITHIN THE LANDFILL.
11. THE BASEGRADES WITHIN CORRIDOR 4 WERE EXCAVATED 20' BELOW THE CORRIDOR 4 LEACHATE COLLECTION PIPE 400 FEET FROM THE EAST PIPE END. REFER TO APPENDIX A OF THIS REPORT FOR ADDITIONAL INFORMATION.

PROFILE SCALE: 20' — SCALE: 1"= 20'
HORIZONTAL 0 — 100' — SCALE: 1"=100'
VERTICAL EXAGGERATED = 5X

NO.	BY	DATE	REVISION	APP'D.
3.				
2.				
1.				

PROJECT:
KESTREL HAWK LANDFILL
OLD SITE HYDROGEOLOGIC EVALUATION
PHASE I SUMMARY REPORT

SHEET TITLE:
CROSS SECTION B-B'

DRAWN BY:	MEYERHOC	SCALE:	PROJ. NO. 4865.94
CHECKED BY:	TS	AS SHOWN	FILE NO. 48659420_REV1.DWG
APPROVED BY:	JO	DATE PRINTED:	**FIGURE 7**
DATE:	OCTOBER 2005		

RMT
744 Heartland Trail
Madison, WI 53717-1934
P.O. Box 8923 53708-8923
Phone: 608-831-4444
Fax: 608-831-3334

$$ESCALE$$
$$ESTATUS$$
$$ESYMBOLS$$
Arizona Power at x

PAT AAM
$$DWGS$$
$$ESCALE$$
$$ESTATUS$$
$$ESYMBOLS$$
$$FSPACES$$
$$FSPOTSIZE$$

Attachment 6

Summary Table for NON Responses

Draft of April 14, 2020

Republic Services of Wisconsin, Limited Partnership
Kestrel Hawk Landfill
Response to WDNR Notice of Noncompliance

December 9, 2019 Notice of Non-Compliance Item	Kestrel Hawk Landfill Response	Summary of Conclusion
1 – Waste Determinations for Absorbent "Socks"	March 12, 2020 Letter	Absorbent socks containing leachate from corridors 1-6 have been assigned a F039 waste code.
2 – Manifesting of Oil-Absorbent "Socks"	Provide update on status by April 29	An updated hazardous waste profile sheet was prepared and provided for the oil-absorbent socks. Contacting WDNR to address previous manifests.
3 – LDR Requirements for Oil-Absorbent "Socks"	April 14, 2020 Letter	Land disposal restriction notification provided to Safety-Kleen for the socks. Expect to have LDR notice for April 29.
4 – Waste Determination for Gas Processing Residuals	March 12, 2020 Letter; April 14, 2020 Letter	Landfill gas condensate is not a hazardous waste based on the uncontained gas exclusion; condensate does not display a characteristic of hazardous waste.
5 – Waste Determination for Contaminated Groundwater	April 14, 2020 Letter	Exempt from the definition of solid waste because it is covered by the domestic sewage exclusion.
6 – Hazardous Waste Generator Annual Reporting	April 14, 2020 Letter	The requested Hazardous Waste Generation Report will be submitted by May 22, 2020.
7 – Hazardous Waste Generator Fees	Will submit updated paperwork by May 22	Determination on the need hazardous waste generator fees will be determined with the May 22, 2020 generation report.
8 – LDR for POTW Discharges	April 14, 2020 Letter	Land disposal restriction requirements do not apply to the discharges based on the domestic sewage exclusion.
9 – Closure Plan 10 – Long-Term Care Plan	April 14, 2020 Letter	Closure activities have been completed; only remaining activities are post-closure. Updated long-term care plan to be submitted after additional guidance received from WDNR.
11- Training	April 14, 2020 Letter	Updated training program will be provided by June 12, 2020.
12 – Contingency Plan Distribution and Licensing	April 14, 2020 Letter	Current contingency plan provided to local hospitals and police departments. Updated contingency plan and, to the extent required, license modification to be implemented and delivered by June 12, 2020.

Republic Services of Wisconsin, Limited Partnership
Kestrel Hawk Landfill
Response to WDNR Notice of Noncompliance

December 9, 2019 Notice of Non-Compliance Item	Kestrel Hawk Landfill Response	Summary of Conclusion
13 – Operating Record	April 14, 2020 Letter	Documentation for operating record currently maintained by KHL; additional updates may be needed following discussions with WDNR regarding closure status.
14 – FPOR	April 14, 2020 Letter	No FPOR needed since the hazardous waste unit is effectively closed at this time.
15 – Financial Assurance Cost Estimates	April 14, 2020 Letter	Updated costs based on updated waste determinations to be provided by June 12, 2020; updated financial assurance cost estimates to be provided with updated Long-Term Care Plan as discussed above.
16 – Tank System Requirements 17 – Gas condensate Volumes; 90-day Storage	March 12, 2020 Letter; April 14, 2020 Letter	Since groundwater discharged to City of Racine POTW and condensate are not hazardous wastes, these requirements do not apply.
18 – Emergency Communications	April 14, 2020	Whenever hazardous waste is being poured, mixed, spread or otherwise handled at the HWU, the contractors performing such work have immediate access to a cellular telephone, which serves as an emergency communication device.
19 – Hazardous Waste Facility Annual Reporting	April 14, 2020	Depending on the outcome of discussions with WDNR regarding closure status, a letter form of an annual report will be submitted annually beginning March 1, 2021.
20 – Solid Waste Program Annual Reports	Will submit evaluation by May 22	These volumes are being reviewed with the historical hazardous waste volumes.
21 – Transportation of Gas Condensate	March 12, 2020 Letter; April 14, 2020 Letter	Landfill gas condensate is not a hazardous waste based on the uncontained gas exclusion; condensate does not display a characteristic of hazardous waste based on laboratory testing.

Appendix S: Endangered Resources Review

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Note: In order to fill and save this form electronically, it must be opened using Adobe Reader or Acrobat software. Save a copy of the file, open Adobe Reader, select File > Open and browse for the file you saved.

State of Wisconsin
Department of Natural Resources
Bureau of Natural Heritage Conservation
Endangered Resources Review Program
PO Box 7921, Madison WI 53707-7921
https://dnr.wi.gov/topic/ERReview/
DNRERReview@wisconsin.gov

Endangered Resources (ER) Review Verification

Broad Incidental Take Permit/Authorization for No/Low Impact Activities

Form 1700-079 (R 05/2024)

Notice: This form is authorized by s. 29.604, Wis. Stats. This completed signed form, once submitted to **DNRERReview@wi.gov** using the Submit by Email button at the bottom of the form, fulfills the requirement of an Endangered Resources Review and should be attached to other permits requiring an ER Review to show that Endangered Resources requirements have been met. Personal information collected on this form will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Public Records law [ss. 19.31-19.39, Wis. Stats.].

Instructions: **Complete this form if your project is covered under the Broad Incidental Take Permit/Authorization for No/Low Impact Activities and therefore does not require an Endangered Resources Review.**

Section 1: Applicant and Project Information

Requester Name	Organization or Agency Name
Danielle Anderson	TRC Environmental Corporation

Project Name	County	Township	Range	Section
Kestrel Hawk Landfill	Racine	03 N	22 (◉E ○W)	23

DPS Project # (if applicable)	Telephone Number	Email Address
	(262) 879-4966	danderson@trccompanies.com

Project Description

The Kestrel Hawk Landfill is a closed landfill seeking to obtain their Long-Term Care License from the WDNR. Construction activities will be minimal and completed on an as-needed basis consisting of repairs (when needed) and general maintenance over at least the next 40 years. Repair and general maintenance operations can include inspecting and replacing wells/pipes, fixing erosional issues, removing silt and/or repairing sedimentation basins, vehicle traffic due to maintenance, vegetation management, etc. Vegetation management can consist of preventing the establishment of woody vegetation and semi-regular mowing of the landfill cap as well as other existing manicured areas.

Indicate who you are completing this form as:

- ○ DNR Staff
- ◉ Certified Reviewer
- ○ Other: _____

Section 2: Broad Incidental Take Permit/Authorization Coverage Information

How is your project covered under the Broad Incidental Take Permit/Authorization for No/Low Impact Activities?

- ☐ It is included in the list of activities in Table 1 – No/Low Impact Table for All Species at All Times of the Year.
- ☒ It is included in the list of activities in Table 2 – No/Low Impact Table by Taxa Group for DNR Staff and ER Certified Reviewers Only and the Taxa groups for the species of concern are covered.
- ☐ It is included in the list of activities in Table 2 – No/Low Impact Table by Taxa Group for DNR Staff ER Certified Reviewers Only and the species of concern are covered by the Avoidance Measures document.

Activity Number(s)

2-A21: Continuing Operations

Section 3: Applicant Certification

By my signature below, I certify that to the best of my knowledge, the information stated above is complete and accurate.

Danielle Anderson	6/24/2025	Danielle Anderson
Signature	Date Signed	Requester/Submitter Name (please print)

Leave Blank – DNR Use Only Approve/Deny Form ☐

◉ Approved ○ Denied

DNR Reviewer Name	DNR Reviewer Date
Melissa Tumbleson	07/01/2025