

Landfill Leachate: Everything you want to know

- City of Asheboro – Sarah Laughlin
- City of High Point – Carrie Hyler
- City of New Bern – Sara Rhodes



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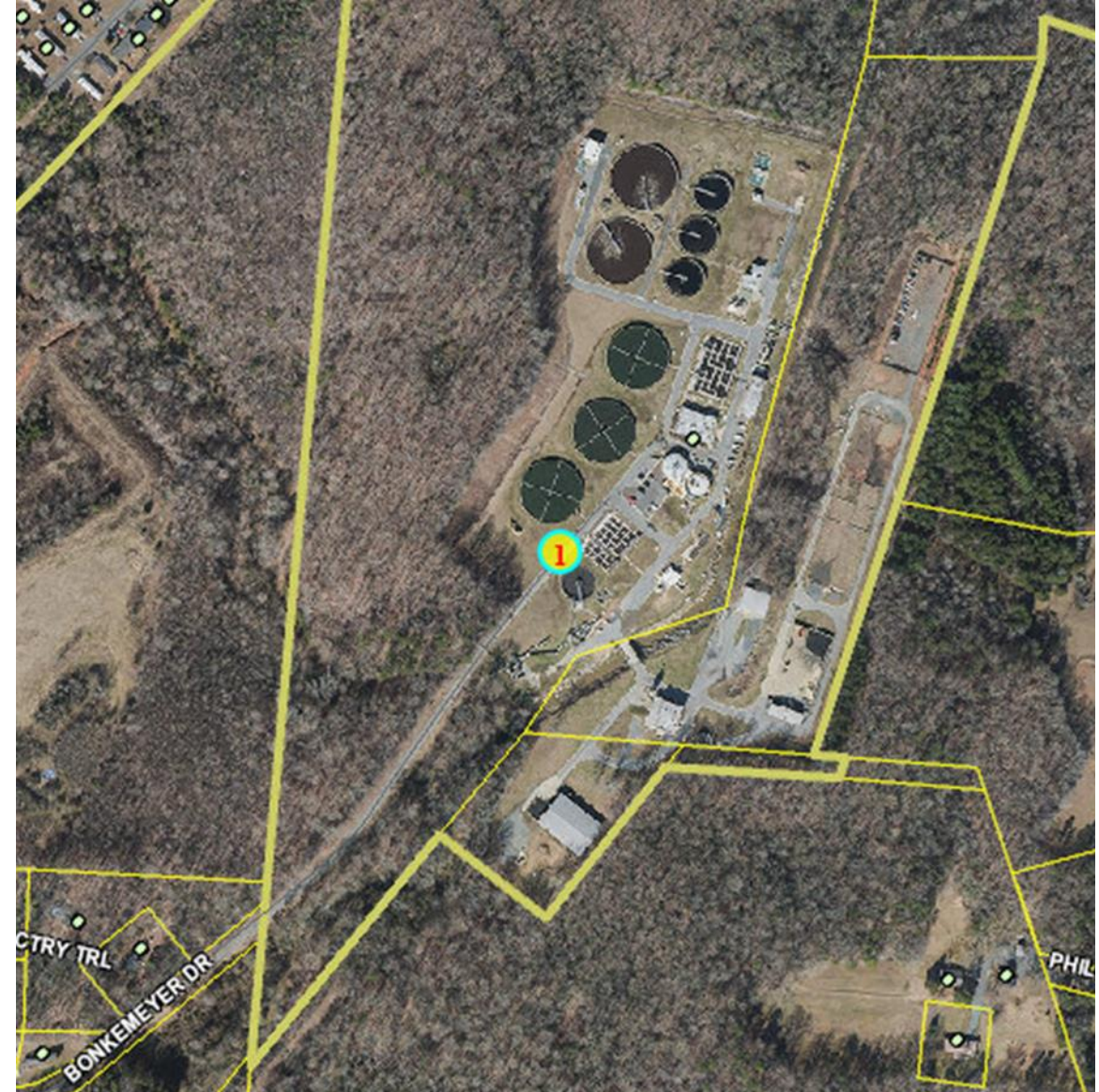
- City of Asheboro, City of High Point, City of New Bern
 - Landfill Background
 - WWTP Background
 - Permit
 - Inspections
 - Average Leachate data
 - Lessons learned

Great Oak Landfill

- Private Landfill Owned by Waste Management
- Lease the land from Randolph County
- Opened January 2, 2017
- Non-Hazardous Municipal, commercial, industrial waste (MSWLF) Lined landfill
- Expected to be open 30 years
- No Pretreatment
 - one 250,000 gal holding tank without mixing
 - Leachate enters the top of the tank and discharges from the bottom
 - Flow meter and sampler owned and maintained by Great Oak
- Pump station on site for leachate and minimal domestic (COA maintained)
- Leachate tank and lift station have telemetry
- High level alarm at the Lift station will shutdown the leachate discharge from storage tank
- State permitted for 4,000 tons/day but average 2,500-3,000 tons/day
- Currently 8 cells are open with 4 leachate sumps (14 cells are planned)
- Methane gas collection

Asheboro WWTP

- Permitted 9 MGD
- Average 3.5 MGD
- Primary Treatment, Trickling Filter, Secondary Treatment, Nitrification, Final Clarifiers, Sand Filter, Chlorine Disinfection, 2 anaerobic Digesters, belt press, Land application
- 14 SIU permits, 4 Local permits, 3 groundwater permits



Great Oak SIU Permit

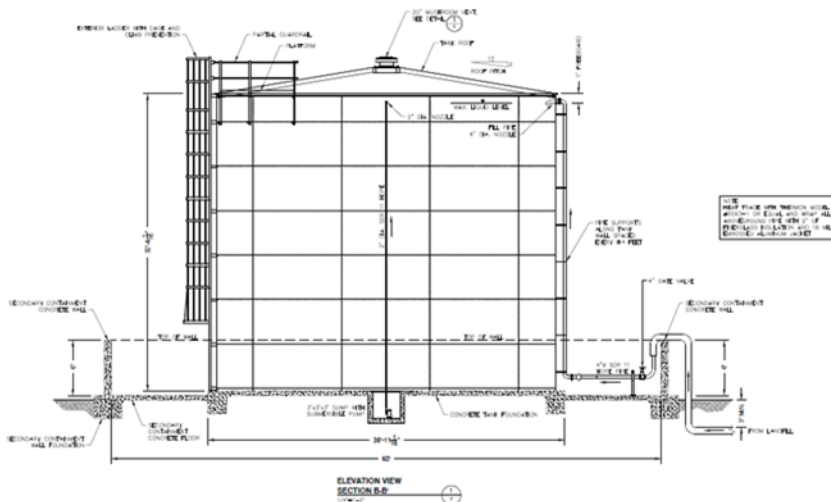
- IUP First issued 12/9/2016
 - 2 time/Month monitoring for Bod, cod, tss, TKN, NH₄.
Quartely for all metals, 624/625 plus Bis(2ethylhexyl)phthalate, Carbazole, o-cresol, p-cresol, n-decane, fluoranthene, n-octadecane, 2,4,6-trichlorophenol
 - BOD, TSS, NH₄ only limited parameters. Monitoring only for the rest.
- Current IUP issued 6/22/2021
 - 2 times/semi-annually monitoring for Bod, cod, tss, TKN, NH₄. Semi-annually for all metals, 624/625 plus Bis(2ethylhexyl)phthalate, Carbazole, o-cresol, p-cresol, n-decane, fluoranthene, n-octadecane, 2,4,6-trichlorophenol
 - Limits: BOD 1000.8 lbs, TSS 51.2 lbs, NH₄ 187 lbs.
- City does all monitoring
- Composite samples used except where grabs are required
- Monthly Average 40,000 gpd, daily max 42,000 gpd (100,000 gpd requested at full build)
- Leachate, equipment washdown over the cells, methane gas condensate



Annual Inspection

Things to look for on Site tour:

- each cell and capacity status
- new cell construction and get opening date
- New cells can be pumped out until opening
- Leachate sumps, pumps, control panels, cleanouts
- Methane gas collection
 - Are they at reuse or burning off
- # of tons/day of trash accepted
- Sampling Site and Leachate Tank
 - Tracom metering manhole trapezoidal flume
 - One piece Fiberglass reinforced 48" dia
 - ISCO 5800 Refrigerated sampler
 - ISCO meter with bubbler
- 250,000 gal storage tank



Great Oak Average Leachate Data

- Flow - the tank is set to discharge around 25 - 30 gpm.
- BOD
 - 3149.7 mg/l
 - 289.7 Lbs
- TSS
 - 222.1 mg/l
 - 15.6 lbs
- Ammonia
 - 330.1 mg/l
 - 30.1 lbs
- COD
 - 5,388.8 mg/l
- TKN
 - 464 mg/l
- Metals, 624/625 vary from sample to sample as expected.
- pH 7.0 – 7.5 typically
 - The leachate has a very neutral ph however it is very corrosive (oxidizer)

Lessons Learned

- Leachate storage tank should have mixing at minimum – Great oak cleans tank out 1-2 times per year due to sludge buildup
- Flow measurement – Ultrasonic was originally chosen, recently switched to bubbler. Leachate has excessive foam when the leachate sumps are cleaned (HCl based cleaner).
 - Leachate sumps are required to be cleaned. Great oak does this semi-annually typically.
- COA made an agreement with WM in 2019 to receive a lower tipping fee in exchange for no surcharge
- Leachate is billed at \$1.39 per 100cf
- The landfill lift station has been a nuisance from the beginning. Until the lift station is repaired 42,000 gpd is the max discharge we can pump without a high level.
 - The leachate seems to off gas and create air pockets – if the leachate is not constantly
- discharging this gets worse
 - COA Maintenance flushes the force main (HDPE) at least once per week to keep pumping pressures down. Recently a solid block was cut out of the force main.
- Leachate sumps have cleanouts. Great Oak has implemented visual inspections of these cleanouts.
- Great Oak has 1,4 Dioxane – results vary between 30,000 – 80,000 ug/l. Pretreatment will be required once the state imposes a numerical limit
- COA has not done any PFAS testing. Great Oak did some sampling as required by the state.
- When a new cell opens expect a large volume of leachate until the cell gets established
 - Hurricane Florence and Matthew arrived right at the opening of a new cell which caused major flow

OVERVIEW

- LANDFILL BACKGROUND
- WWTP INFORMATION
- PERMIT
- INSPECTIONS
- LEACHATE DATA
- ADDITIONAL INFORMATION

KERSEY VALLEY LANDFILL

- NON-HAZARDOUS MUNICIPAL, COMMERCIAL, INDUSTRIAL WASTE (MSWLF) LINED LANDFILL
- 164 ACRES, EXPANDING TO 175 ACRES, OWNED BY THE CITY OF HIGH POINT
- ACCEPTS WASTE FROM DAVIDSON, FORSYTH, GUILFORD AND RANDOLPH COUNTIES
- PERMITTED DISPOSAL RATE 200,000 TONS PER YEAR; CURRENT AVG IS 100,000 TONS
- GROSS CAPACITY = 10.5 MILLION CY
- FIRST SW PERMIT ISSUED 1980, OPERATIONAL PERMIT ISSUED AND BEGAN OPERATIONS 1993
- FIRST DISCHARGE PERMIT ISSUED IN 1988
- UPGRADED TO SIU PERMIT IN 2012

KERSEY VALLEY LANDFILL

- LANDFILL OFFICE ON SEPTIC TANK AND HAULED SEPARATELY TO ES WWTP
- 5 PASSIVE METHANE FLARES FOR ODOR CONTROL ONLY
- CURRENTLY 3 CELLS ARE OPEN (AREA 2, PHASES 4, 5A & 5B)
- NO PRETREATMENT...YET
 - PIPE 001: LEACHATE POND – CLOSED 2019
 - PIPE 002: AERATED 330,000 GALLON TANK (BACK UP/EMERGENCY USE ONLY)
 - PIPE 003 LEACHATE PUMP STATION
 - FLOW METER, SAMPLER AND pH METER
 - SCADA ENABLED
 - BACK-UP GENERATOR



AREA 1
PHASES 1-3

The map shows a large green area on the left, a central area outlined in red, and a large cleared area on the right. Roads labeled include Kersey Valley Rd, Kivett Dr, and 1113. A location pin for 'McC... Foun' is visible in the top right.

FUTURE
AREA 3
PHASES
6-8

AREA 2
PHASES 4-5

LANDFILL LEACHATE POND



LANDFILL LEACHATE TANK



LANDFILL LEACHATE PUMP STATION



SAMPLER, pH meter

EASTSIDE WWTP

- PERMITTED 26 MGD; AVERAGE 14.8 MGD
- PLANS TO EXPAND TO 32 MGD
- PRELIMINARY TREATMENT (BAR SCREENS, GRIT CHAMBERS, PRE-AERATION)
- 5 PRIMARY CLARIFIERS
- 5 STAGE BIOLOGICAL NUTRIENT REMOVAL (BNR)
- 4 FINAL CLARIFIERS
- UV DISINFECTION
- SLUDGE IS INCINERATED – USED AS SOIL AMENDMENT CREATED AT CITY'S COMPOST FACILITY
- 17 SIU PERMITS (9 CIUs), 5 LOCAL PERMITS



KERSEY VALLEY LANDFILL SIU PERMIT

- FIRST ISSUED SIU PERMIT 7/1/2012
- REASON BASED ON HAULING WW TO WWTP
 - #LOADS >25,000 GPD
 - POTENTIAL TO IMPACT WWTP
- MONTHLY MONITORING & REPORT
 - FLOW, BOD, TSS, NH₃, Cu, Ni, Zn
 - PARAMETERS MONITORED BASED ON INITIAL SAMPLING EVALUATION
 - DAILY SAMPLES X 1.5 MONTHS
 - POLLUTANTS PRESENT THAT AVERAGES >MA LOCAL LIMITS
- CURRENT IUP ISSUED 7/1/2022
- MONTHLY MONITORING & REPORT
 - PARAMETERS SAME AS ABOVE, ADDED 1,4-DIOXANE
 - MONTHLY COMPOSITE FOR “SCREENING”
 - CITY COLLECTS PERMITTED PARAMETERS 2X YR BUT 1,4-DIOXANE AS A GRAB SAMPLE

INSPECTIONS

- SCHEDULE CHANGES (DAYS RECEIVING WASTE)
- # OF TONS RECEIVED YTD
- LEACHATE PUMP STATION
 - VERIFY OPERATION HACH AS950 ALL WEATHER REFRIGERATED SAMPLER
 - VERIFY pH METER CALIBRATION
 - VERIFY FLOW METER CALIBRATION (SEIMENS MAG METER 5000)
- PLANNED EXPANSIONS, SITE CHANGES, ETC.

LEACHATE DATA

- PERMITTED PARAMETERS – 5 YR AVERAGE

PARAMETER	mg/L
Flow (MGD)	0.012
pH (S.U)	7.3
Ammonia	243
BOD	88
Copper	0.005
Nickel	0.058
TSS	140
Zinc	0.34
1,4-Dioxane (µg/L)	110

OTHER INFORMATION

- LANDFILL LEACHATE IS REGULATED UNDER SOLID WASTE LANDFILL PERMIT
 - REQUIRES SEMI-ANNUAL SAMPLE REQUIREMENT
 - USE SOLID WASTE ANALYSIS METHODS – NOT VALID SAMPLE METHODS/TECHNIQUE TO MEET SIU PERMIT MONITORING & ANALYSIS REQUIREMENTS
 - PFAS SAMPLING REQUIREMENT STARTED JULY 1 REQUIRES DRAFT METHOD 1633 - RESULTS WILL BE COPIED TO PRETREATMENT
- AREA 1 SOUTH/SOUTHWEST SIDE BORDERS UNLINED, PRE-REGULATION LANDFILL
- AREA 2 SOUTHEAST SIDE BORDERS C & D LANDFILL AND C & D TREATMENT & PROCESSING OPERATION OWNED BY WASTE INDUSTRIES



City of New Bern
Pretreatment Coordinator –Sara Rhodes

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COASTAL ENVIRONMENTAL PARTNERSHIP: CRSWMA

- Public land fill owned by CRSWMA
- 500 acres of land, 100 under landfill
- Two transfer stations (Pamlico & Carteret County)
- Services Jones, Craven, Carteret and Pamlico County
- Opened in 1993
- Expected to be open 60-80 more years
- Pretreatment Permit originally issued on July 15, 1996
- 4 Cells completed, 1 active



CRSWMA



COASTAL ENVIRONMENTAL PARTNERSHIP: CRSWMA

(CONTINUED)



GAS WELL

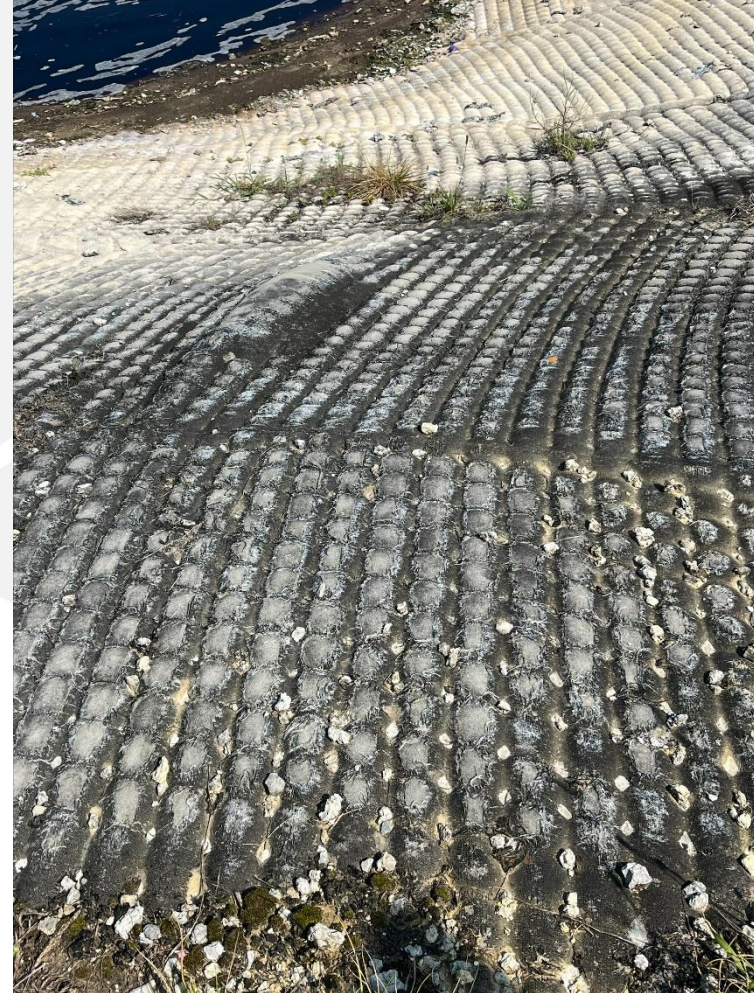


CLEAN OUT



LEACHATE PUMP STATION

CRSWMA: LAGOONS



NEW BERN WWTP

- Permitted: 6.5 MGD
- Average: 3.85 MGD
- 4 SIU Permits
- 4 Permits related to WW
- Class A bio-solids



CRSWMA SIU PERMIT

- First issued July 15, 1996
- Current permit issued January 1, 2023
- Monthly monitoring
- Monitoring 2X a year for POTW
- TTO every 6 months
- Yearly inspection
- Average 60,000 gpd
- Maximum of 1,000,000 gpd



CRSWMA LIMITS:

- BOD :300 mg/L
- TSS: 250 MG/L
- pH: 6.8-9
- O&G: 100 mg/L
- NH3: 40 mg/L
- Cyanide, Copper, Silver, Lead: .2 mg/L
- Cadmium: .05 mg/L
- Chromium: .58 mg/L
- Mercury .005 mg/L
- Nickel: .37 mg/L
- Zinc: 1.48 mg/L
- TTO: 2.13 mg/L

2022 AVERAGE DATA

- Flow (gpd) average: 17,787
- BOD: 22.15
- TSS: 6.6
- pH: 8.34
- Oil & Grease: 6.1
- NH₃: 1.685
- TN: 46.19
- Cyanide: .009
- Phenol: .045
- Silver: .0045
- Arsenic: .063
- Cadmium: .001
- Chromium: .083
- Copper: .0165
- Mercury: .0002
- Nickel: .115
- Lead: .0045
- Selenium: .01
- Zinc: .885
- Phosphorus: .785
- Molybdenum: .01

ADDITIONAL INFORMATION



Questions

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