


***“Protecting What’s Built,  
Restoring What’s Broken”***



***Specialists in Landfill Chemical Cleaning,  
Leachate Treatment & Re-Use***

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1



**INTRODUCTION**

**Products:**


- Pipe and Well Renew Products
- PFT Renew Probiotic Treatment
- Free Flow for Micro Irrigation & Soils

**Services:**

- Chemical Cleaning
- Phytocap Design, Consulting and Management

***Protecting the Environment  
is a daily choice.***  
Rodney Hamby,  
Landfill Superintendent, Catawba County, NC


2




# Products

**Products for Customer Use:**

- **Pipe and Well Renew (P&WR) Products.**
  - Concentrated PWR for cleaning sensitive equipment.
  - P&WR HCL or P&WR 950. Premixed-Ready to Use.
  - All PWR available NSF Certified.
- **Free Flow for Micro Irrigation & Soils**
  - Formulated for de-scaling and soil treatment
  - Improved soil permeability & nutrient availability



3



# Products

**Products for Customer Use:**

- **P.F.T. Renew**
  - High activity strains developed from Love Canal.
  - Specific strains for severe industrial type water.
  - Patented process for growth and shelf life
  - Eliminates Odors, reduces Ammonia, Lowers COD and BOD

4

# Custom Phytocap Consulting

**Leachate Re-use**

*System Design*

**Phytocap irrigation**

5

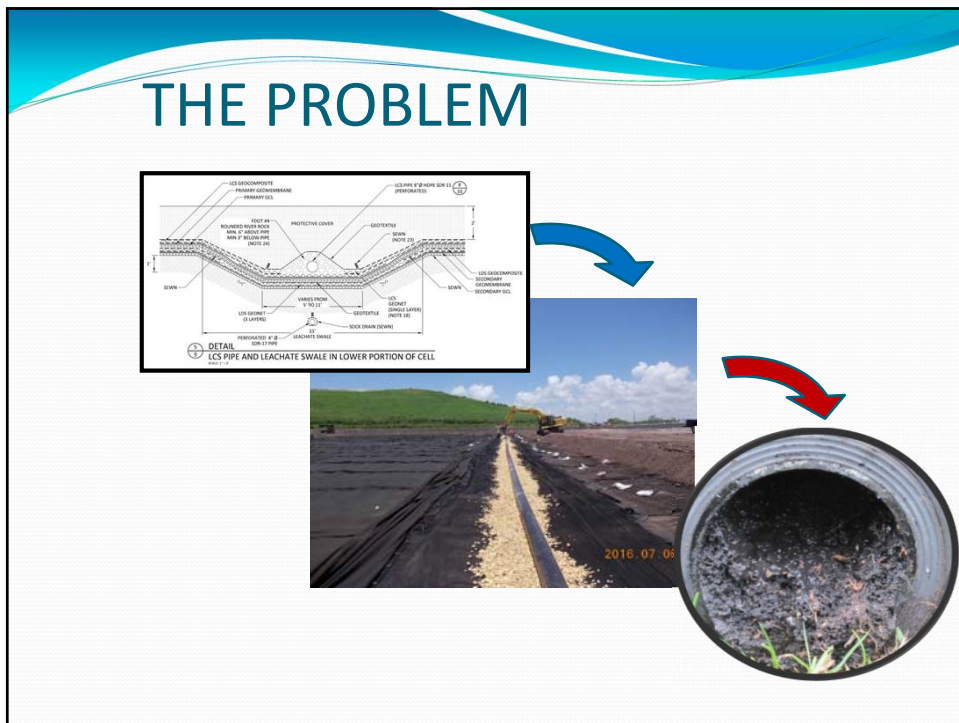
**Wastewater Treatment Plants**

**Landfills**

6



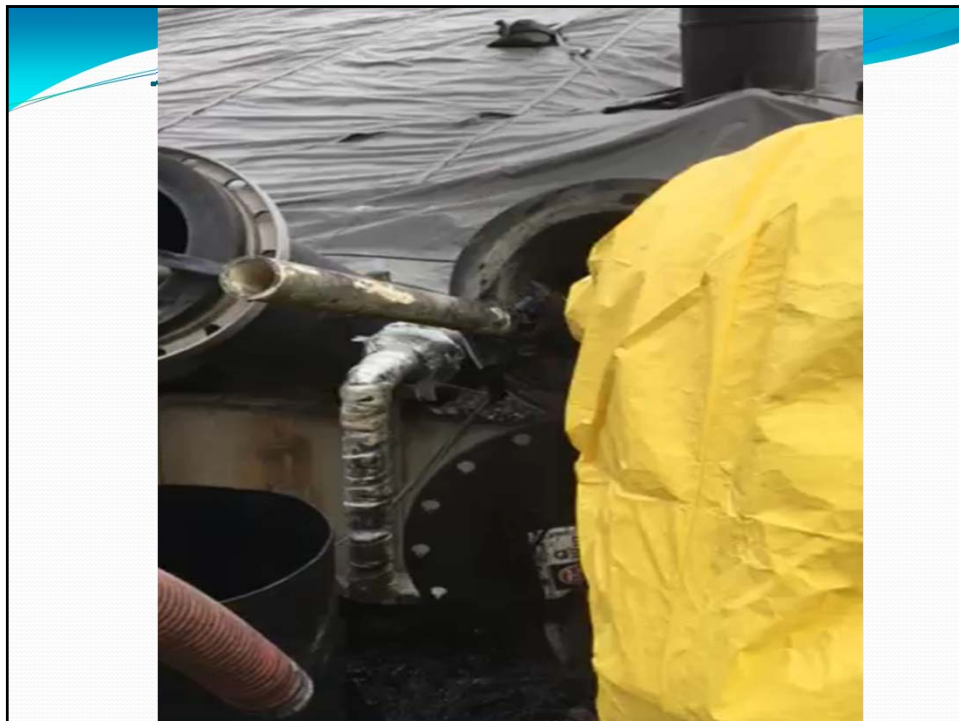
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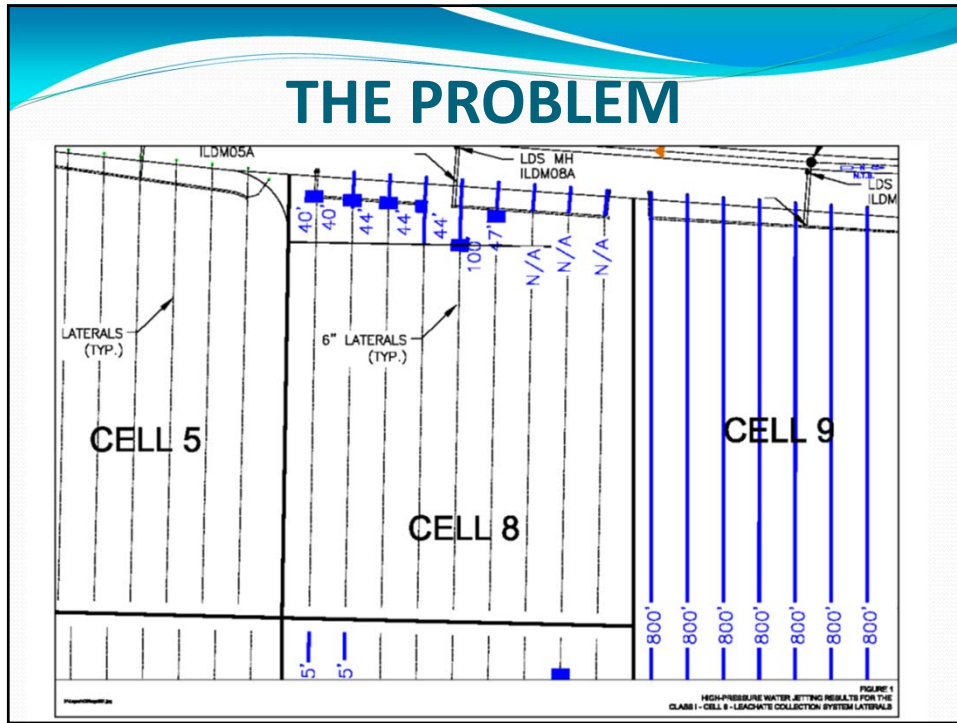
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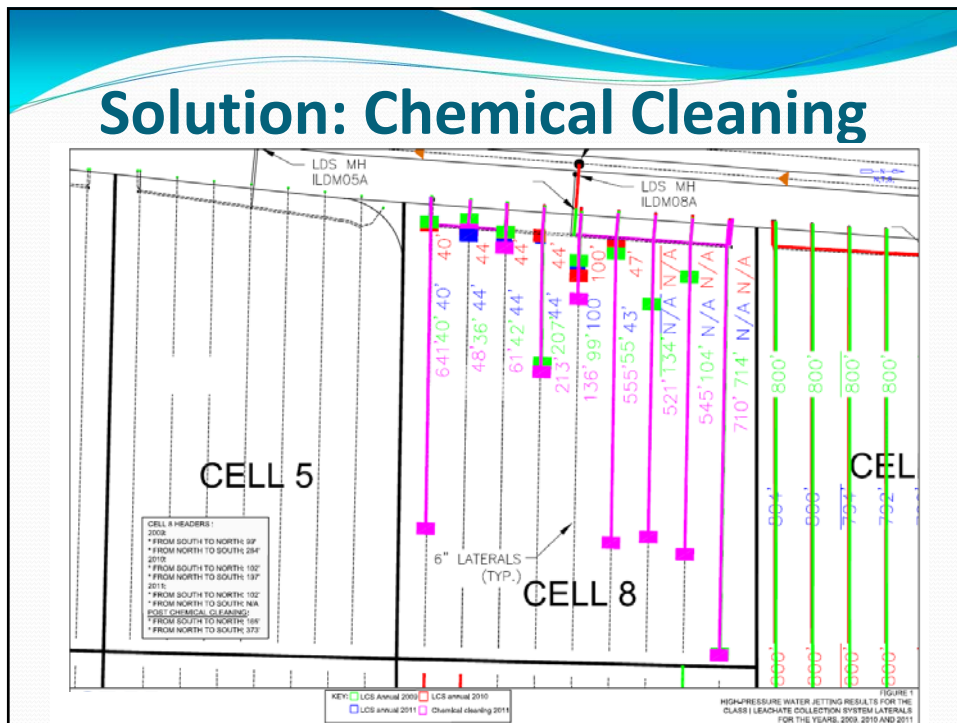
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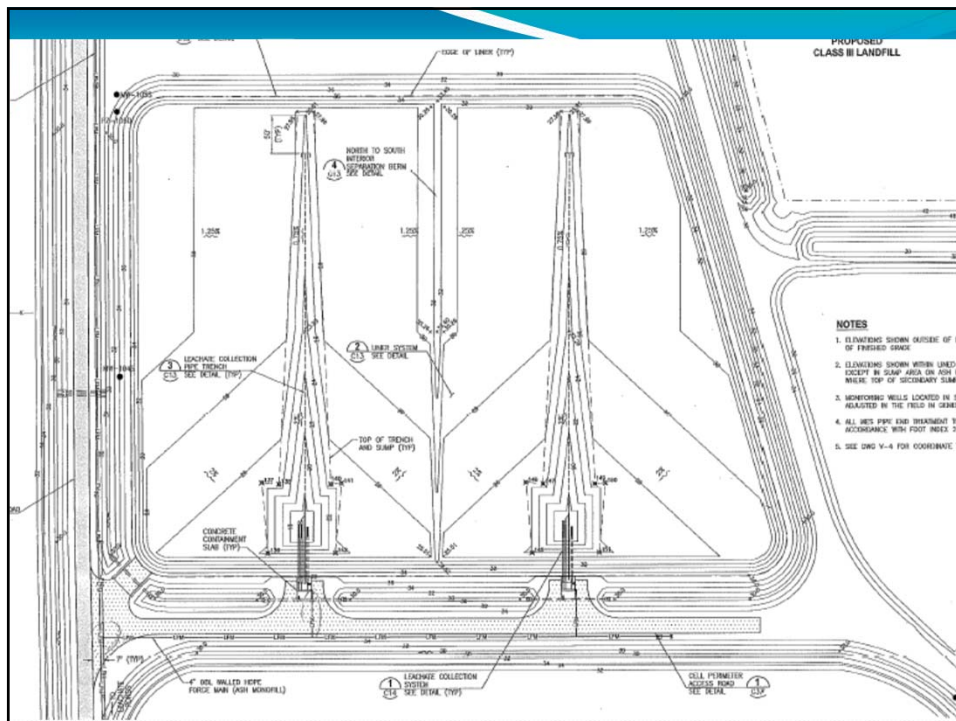


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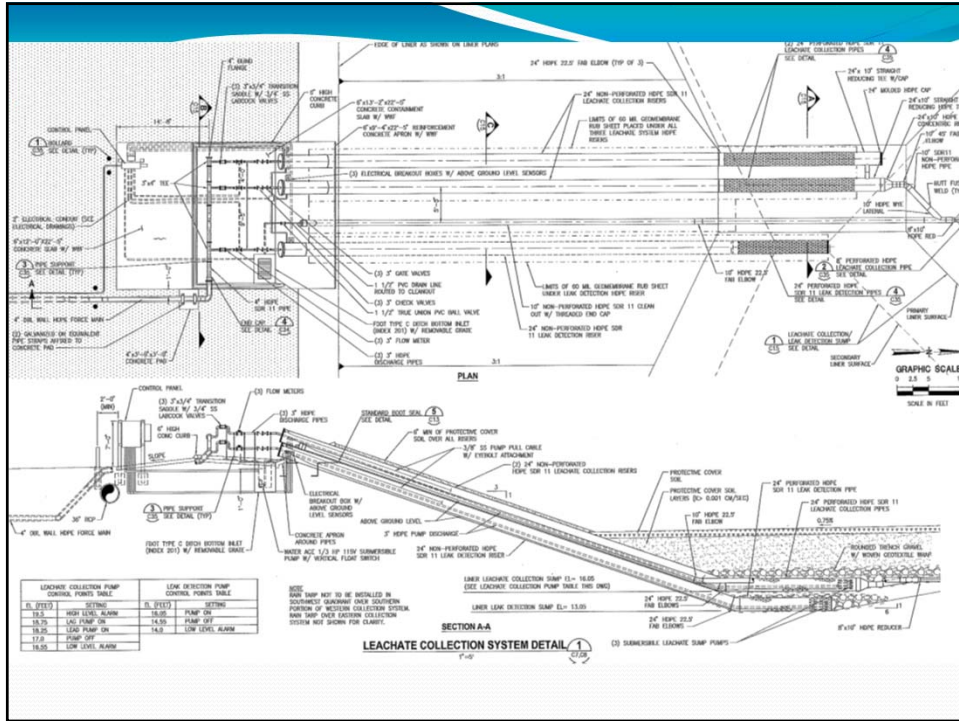
# Chemical Cleaning - FOAM



13



14



15



16





17



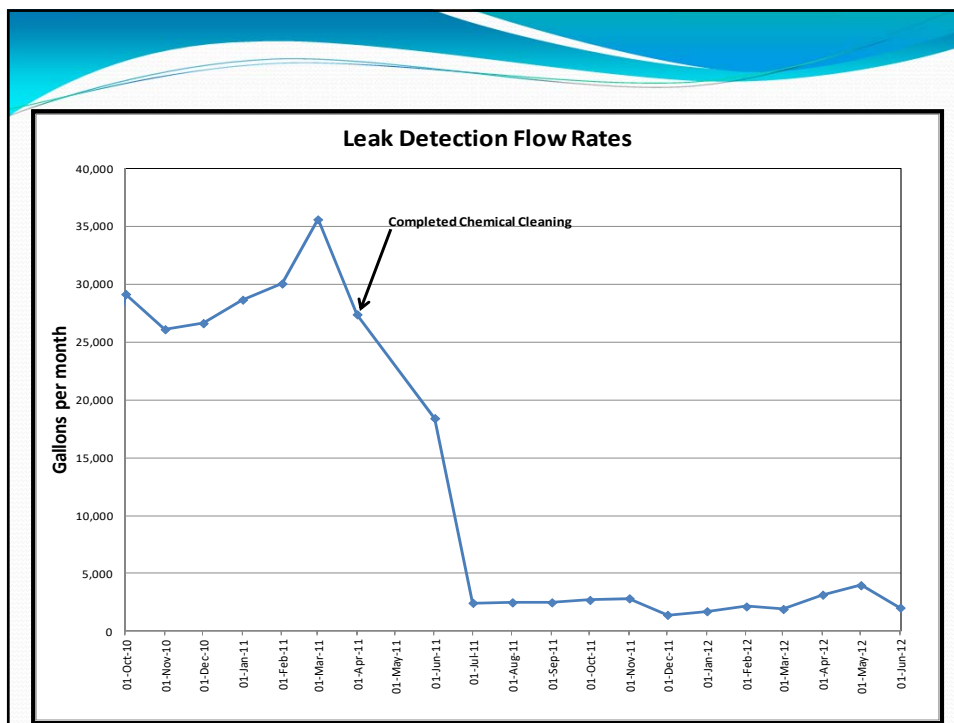
18

## Cleaning Demonstration Results

- Chemical Cleaning
  - Over 2,000 feet per week (up to 12,000)
  - \$20 to \$40/foot (as low as \$6/foot)
  - Flow increases up to 6X

*“Chemical cleaning determined to be the best technology for removing heavy precipitate buildup” – CDM Smith*

19



20





23

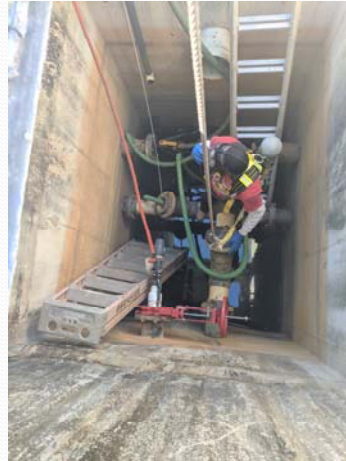
## Results LCS 1 Cleaned, LCS 2 Control

Month	Rain (Inches)	NCLF Phase I Collected Gallons	Phas			
			LCS #1 Subcells 1 & 2 Gallons		LCS #2 Subcells 3 & 4 Gallons	
			Primary	Secondary	Primary	Secondary
			**See Note #4**			
<b>2012</b>						
January	0.00	112,488	42,811	70	26,111	210
February	0.00	89,130	32,479	0	32,865	90
March	0.99	99,292	41,250	50	34,336	270
April	0.79	94,065	41,190	40	31,451	271
May	2.32	91,733	51,862	50	33,794	280
June	11.11	125,786	41,374	30	47,717	6,229
July	6.47	96,999	114,836	490	29,042	3,697
August	7.69	112,521	71,227	370	31,031	7,088
September	4.26	144,561	68,099	250	26,717	6,199
October						
November						
December						
<b>YEAR TO DATE TOTALS</b>	33.63	966,576	505,127	1,350	293,064	24,334

24

## Single LCS Lateral Ash Monofill

- Time to fill a 5 gallon bucket
- Before
  - 2 minutes, 34 seconds
  - 2.57 minutes
  - 2.95 gallons per minute
- After
  - 19 seconds
  - 0.32 minutes
  - 15.6 gallons per minute



**8X improvement in flow**

- Video Inspector: “We’ve never seen this much flow”

25

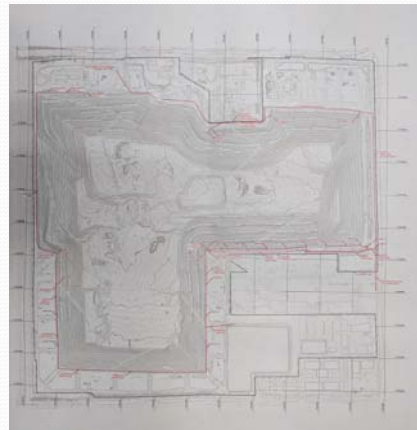
## MSW LF, Force Main, 37 Pump Stations

### Before

- Operating Pressure: 80-100 psi
- Multiple pumps per station
- Booster pump Stns-2
- Flow rates: 5-25 gpm per pump

### After

- Operating Pressure: 5-10 psi
- Single pumps
- Booster pumps taken off line
- Flow rates: 55-100 gpm per pump



Time reduction on liner?

26

## Chemical Cleaning



27

## Side Slope Risers & LCS Line

Before

- Monthly discharge of 100,000 gallons per month.

After

- Monthly discharge of 500,000 gallons per month.

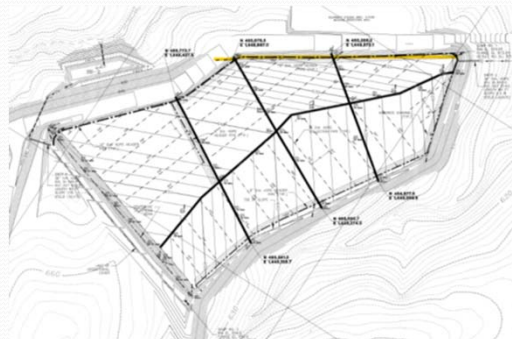


Time reduction on liner?

28

## C & D Landfill

- Gravity Main & LCS blockages
- Severe Seeps on LF side
- Perforated LCS, GMs and Manholes.
- Cleaning next to site discharge: Neutralization



29

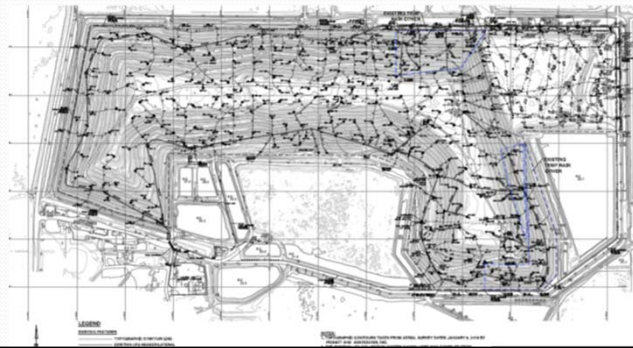
## Chemical Cleaning - LFG



30

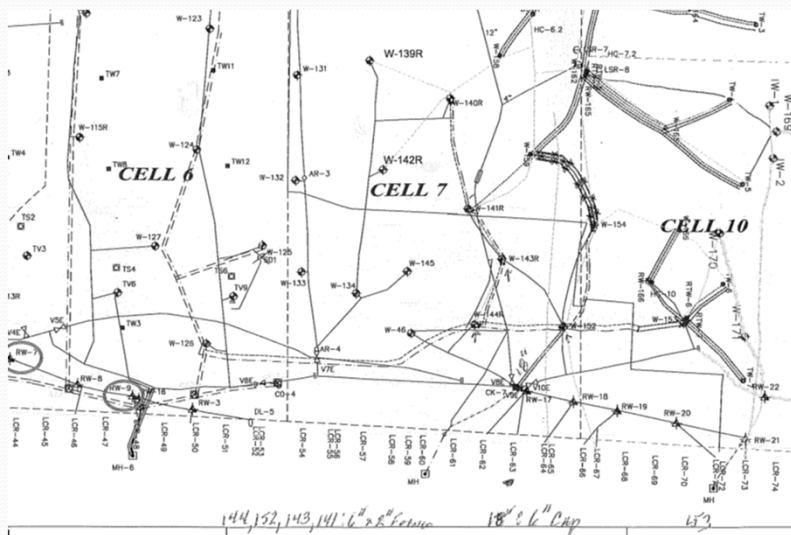
## Condensate Line

- 8,500 feet of LFG condensate line.
- 4 x 100% blockages, Zero Flow.
- Over \$1M to replace, \$90 thousand to clean.
- Fighting 100-120 psi to clean.



31

## Chemical Cleaning – LFG Wells




32



## Chemical Cleaning - LFG

Well Data Log Sheet, Monthly Testing Report



Well #	Date Time	PH	PW	D.P.	T°F	OP	CFM	Landfill Gas Analysis:				Status:	Well	Valve	Req. Action	Days:			Corrective Action
								CH4	CO2	O2	Bal.					S	15	120	
154	01/14/15 9:20	-17.9	-16.9	0.23	99	1,000	5.91	39.6	31.3	3.6	25.5	ACTIVE	OPEN						
154	02/12/15 12:22	-6.8	-6.5	0.20	92	1,000	5.66	32.9	30.9	4.6	31.6	ACTIVE	OPEN						
154	03/18/15 9:17	-11.8	-11.2	0.10	120	1,000	3.79	34.6	33.7	4.5	27.2	ACTIVE	OPEN						
154	04/06/15 13:50	-8.6	-9.2	0.20	105	1,000	5.51	33.2	26.8	2.6	37.4	ACTIVE	OPEN						
154	05/11/15 12:29	-6.2	-3.2	0.24	122	1,000	5.89	37.6	42.4	0.0	0.0	ACTIVE	OPEN						
154	06/03/15 9:48	-5.7	-2.0	0.21	122	1,000	5.51	35.3	44.7	0.0	0.0	ACTIVE	OPEN						

*Flooded* *D.P. Pressure* *header sec* *well sec*  
*low DP, equal PH & PW*

*Jan - Apr 15 ⇒ flooded*  
*May & June ⇒ better & higher quality gas*

33

## Chemical Cleaning - LFG

### Three Step Process

1. Mix for maximum foaming.  
-This portion may be repeated multiple times.
2. Mix for lower end dissolution.
3. Treatment of system to delay/prevent blockage.

34

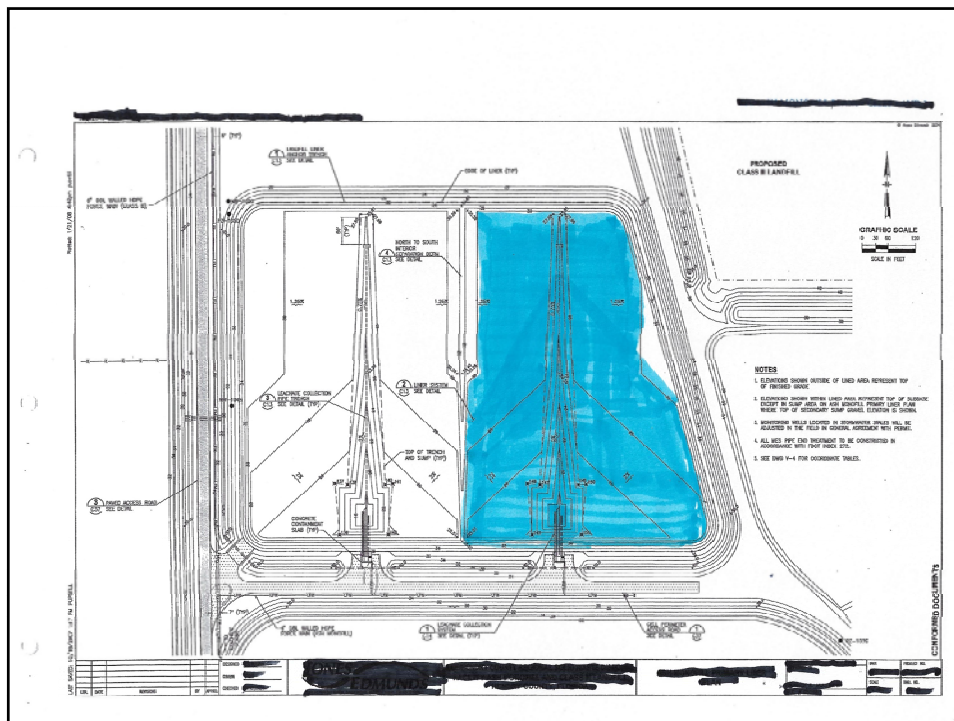
# What have we learned

Every landfill has differences and similarities.

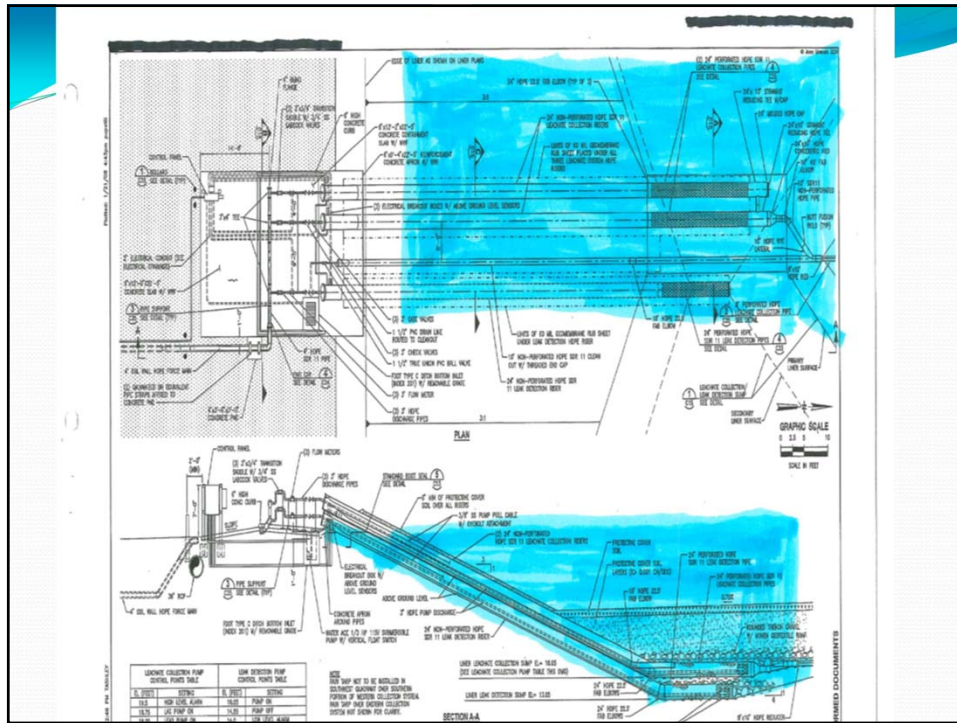
Cells within landfills have differences and similarities

High leachate levels from scaling are a common problem

35



36



37



38

**What have we learned**

**Transducers Scale**

**Timing of Sump pump & recharge helps.**

**Scheduled Maintenance is better than crisis fix.**

39



**PROGRESSIVE**  
ENVIRONMENTAL SERVICES

**Questions, Answers and Surmisals**

**“Protecting the Environment is a daily choice.”**

Rodney Hamby,  
Landfill Superintendent, Catawba County, NC

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40