



TDEC Management of The Former EWS Facility - Photo Presentation

September 19, 2017

Background and TDEC Activities

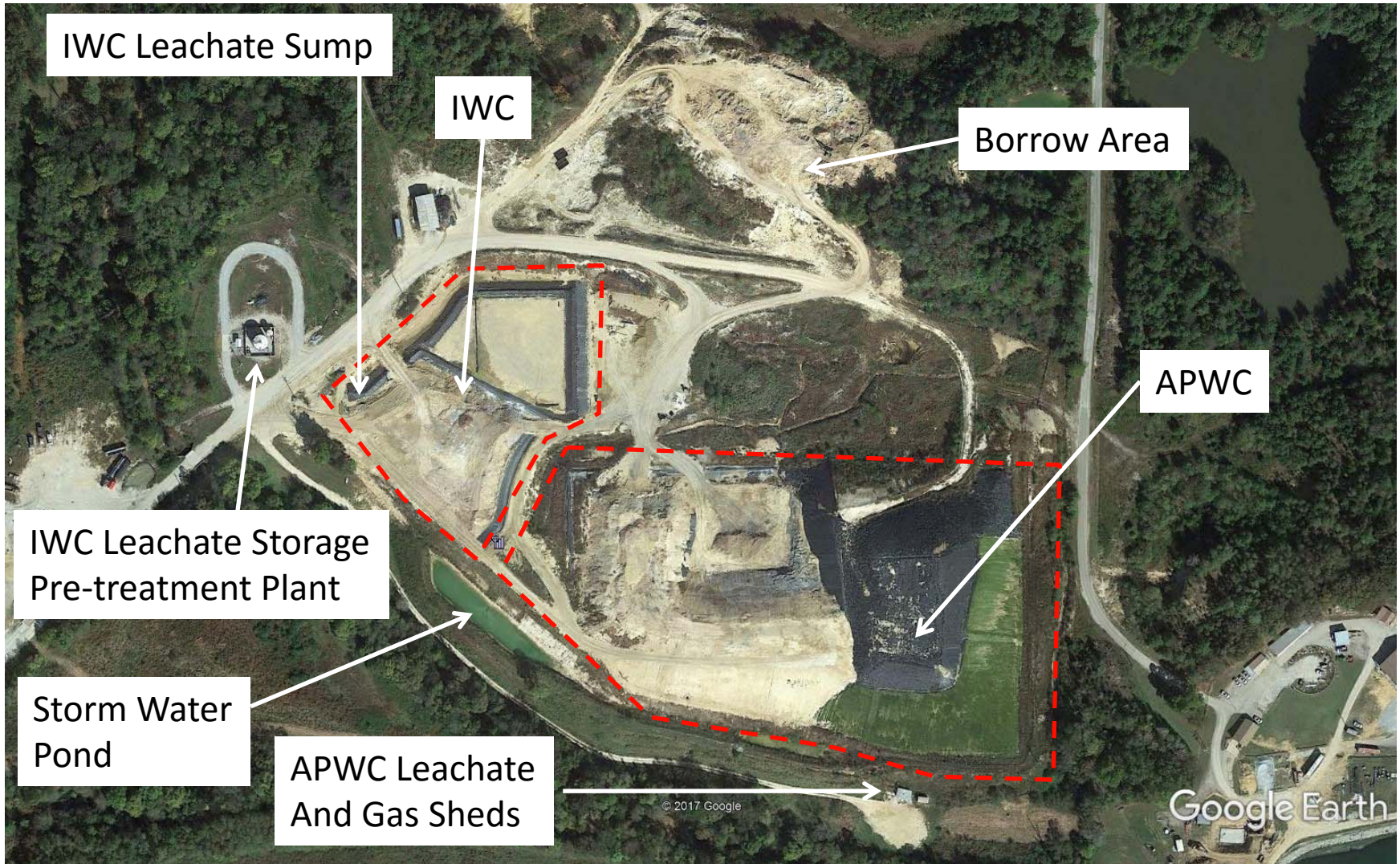
Background and TDEC activities
after EWS Bankruptcy.

Craig Almanza / Pat Flood (TDEC)
Presenters

Background - Chronology

- Environmental Waste Solutions (EWS) was a Class II Industrial Waste Landfill with two separate units; Industrial Waste Cell (IWC) and Aluminum Processing Waste Cell (APWC)
- EWS owners abandon facility on April 14, 2017
- TDEC immediately responded (April 17, 2017) to ensure protection of the environment and to keep existing systems (gas, leachate, pre-treatment, etc.) operational
- Temporary closure of the IWC commenced in May, 2017
- Work to re-grade the APWC to prevent liquid infiltration, repair erosion, and mitigate odor also commenced in May, 2017
- TDEC, Class II, **Solid Waste Permit Terminated** July 7, 2017

Background (Continued)



Temporary Closure of IWC

Surveying Existing Grades



Initial Clay Placement



Temporary Closure of IWC

Clay Placement



Temporary Closure of IWC

Clay Placement Complete



Top Soil Placement



Temporary Closure of IWC

Grass Seed, Fertilizer, Straw and Matting Placement



Temporary Closure of IWC

Storm Water Berm and Down Chute Erosion Control



Temporary Closure of IWC



Interim Earthwork on APWC to Control Odor / Infiltration

APWC Viewed From Top of IWC (During IWC Clay Placement)



Interim Earthwork on APWC to Control Odor / Infiltration

Drone View of APWC (“Black Mountain”) - Tire Pile On APWC Before TDEC Covered



Interim Earthwork on APWC to Control Odor / Infiltration

Drone View Of APWC – Tire Pile Covered



Interim Earthwork on APWC to Control Odor / Infiltration

Drone View Of APWC Clay Placement Area To Minimize Odor / Water Infiltration



Interim Earthwork on APWC to Control Odor / Infiltration

Clay Placement on APWC – View From Ground



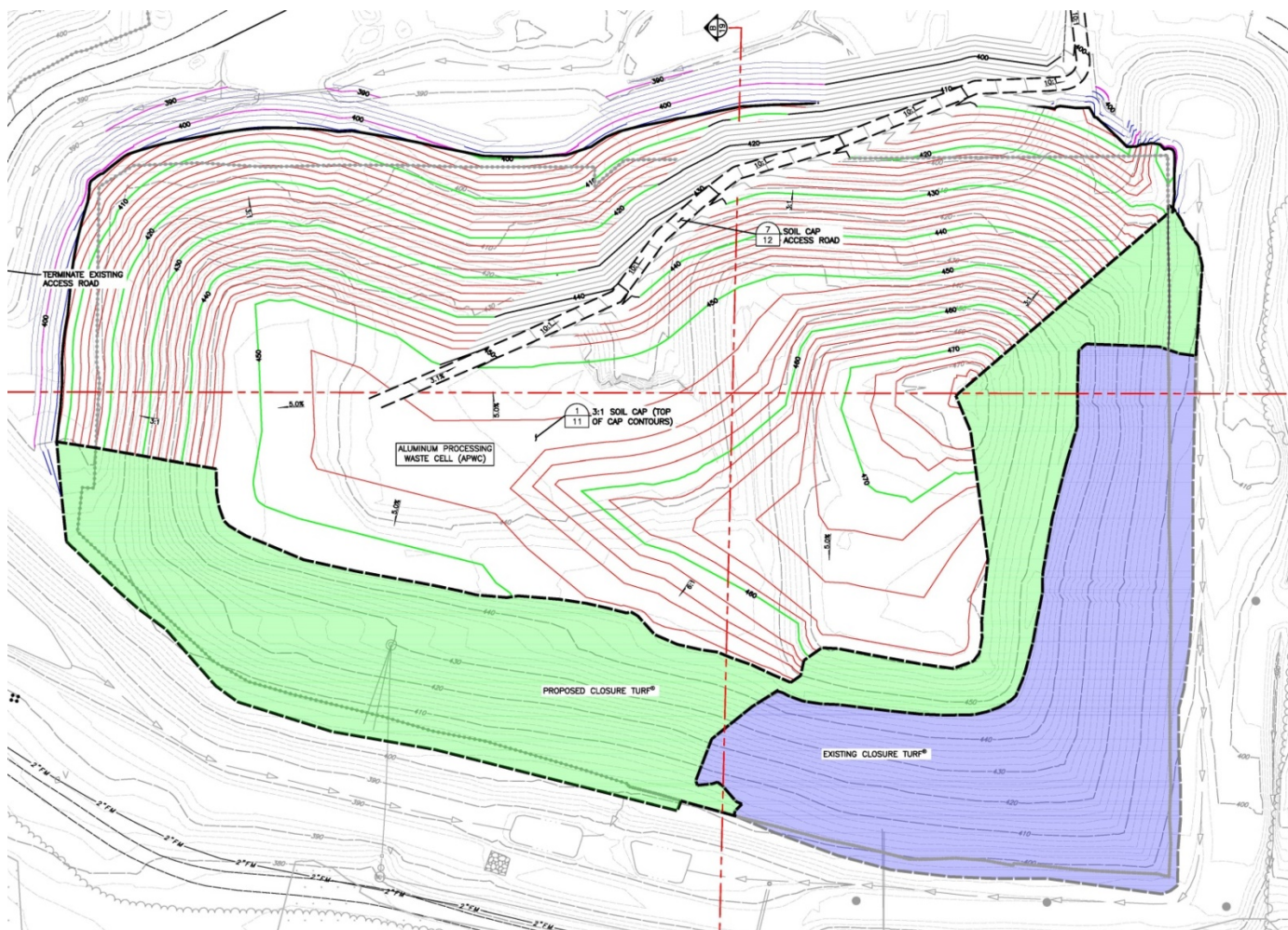
Interim Earthwork on APWC to Control Odor / Infiltration

Drone Close-Up Of Clay Placement Areas



APWC Final Closure Design

Final Closure Design Taking Into Account Line-Of-Sight Study

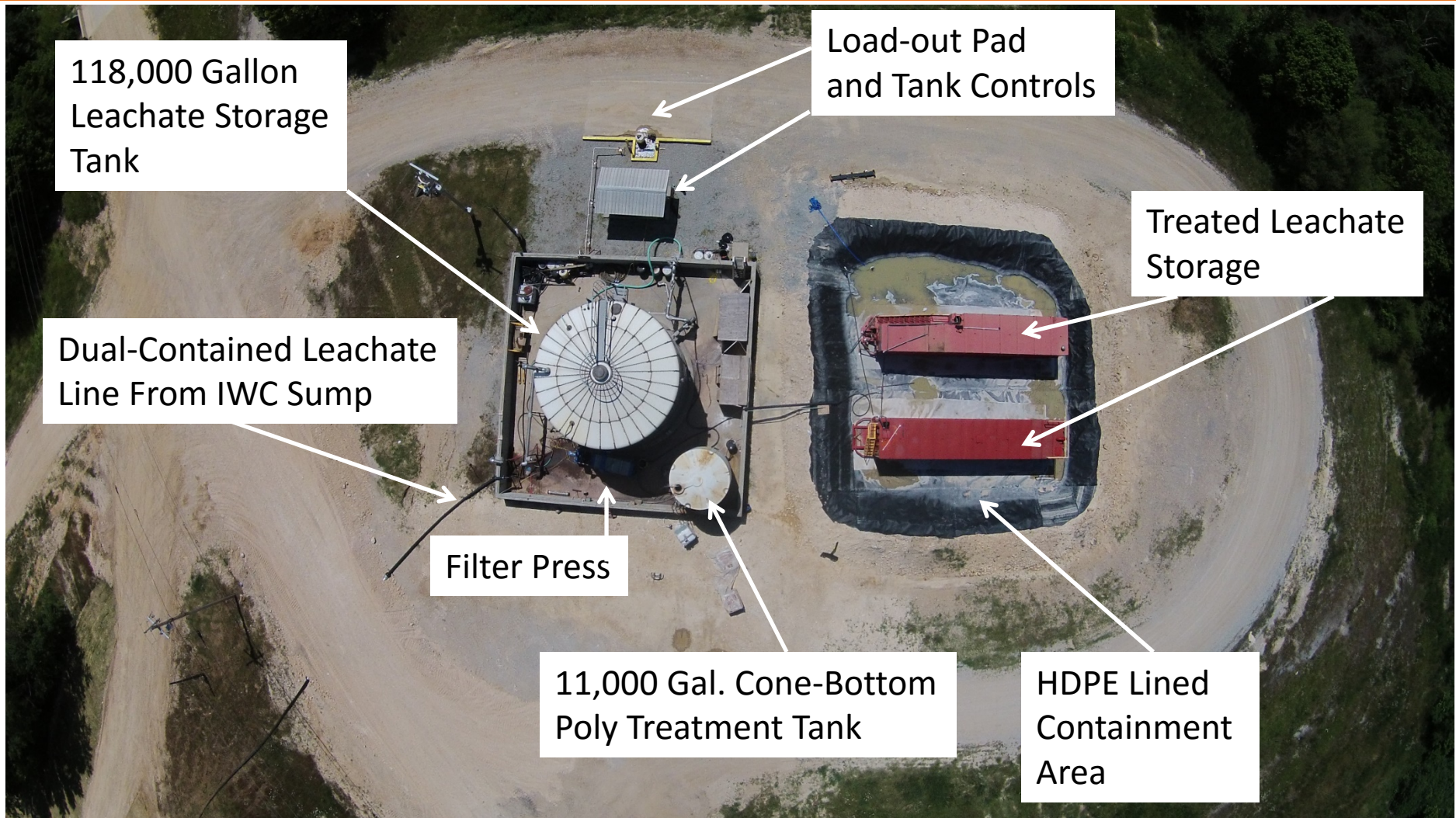


Management of Leachate (IWC)

IWC Side Slope Leachate Collection Risers



Management of Leachate (IWC)



Management of Leachate (IWC)

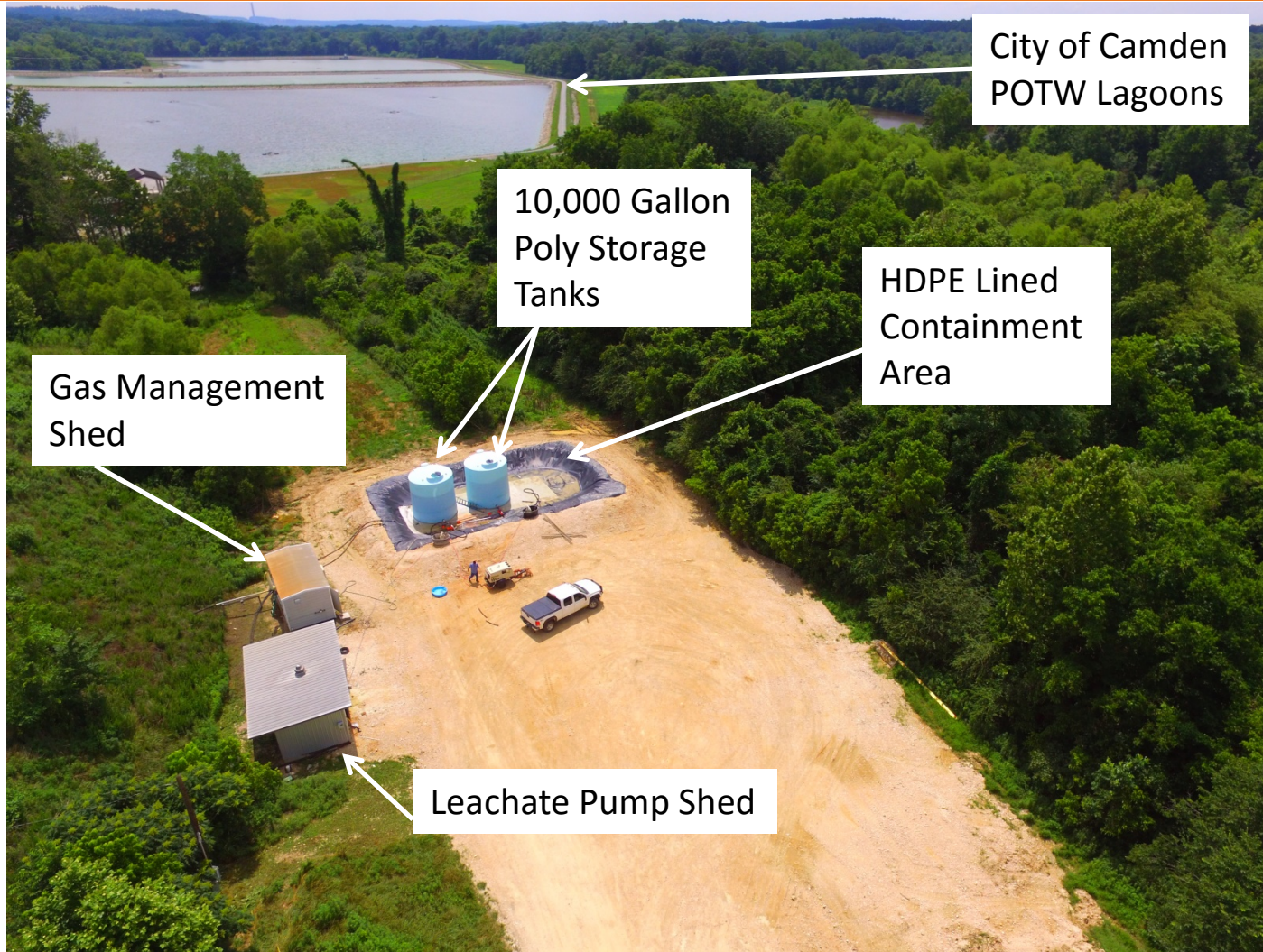
Filter Press



Additional After-Press Filtration



Management of Leachate (APWC)



Gas Management

Gas Management Building



Header Line to Gas Management Bldg.



Ammonia Monitoring

Stationary Ammonia Monitor – Adjacent To Community



Ammonia Monitoring

Stationary Ammonia Monitor – On-Site Red Barn



Ammonia Monitoring

Stationary Monitor



Portable Monitor



Groundwater Overview

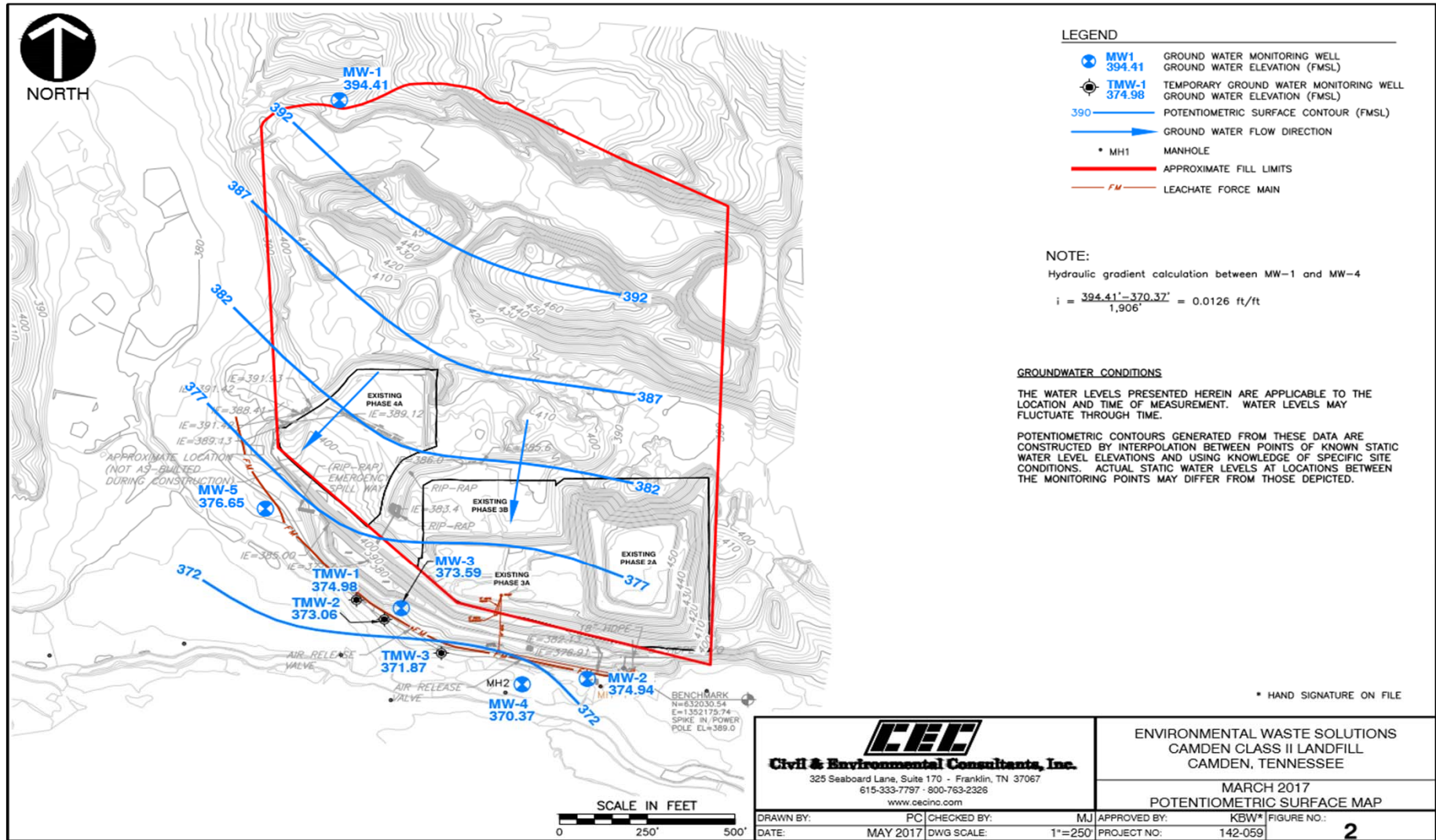
Groundwater overview

Michael David (TDEC)
Presenter

Groundwater Monitoring Overview

- Groundwater sampling has been conducted at the landfill since April of 2008.
- The site has 7 wells that are sampled currently on a quarterly schedule. Wells are sampled for a list of 81 chemical parameters.
- Monitoring wells are positioned to intercept groundwater flow from waste cells and landfill operations.
- Wells are installed in the uppermost geologic unit at the site (Harriman and Ross Formations). Comprised of a mixture of chert and clay. The site was previously used as a chert mine.
- Depth to groundwater is approximately 10-25 ft. below ground surface. Well depths range from about 12 to 33 feet.
- The direction of groundwater flow is generally to the south toward Charlie and Cane Creeks.

Groundwater Flow March 2017



GW Assessment

- EWS facility has been in Groundwater Quality Assessment Monitoring program based on 2015 data, mainly due to chloride.
- Data indicates that chloride levels peaked in late 2015. Since then, chloride levels have been generally trending down.
- TDEC continues to monitor.

Chloride

- Chloride is a salt.
- 250 mg/L (ppm) Secondary Drinking Water Standard
- Secondary drinking water standards are non-enforceable guidelines regulating contaminants that may cause cosmetic or aesthetic effects, such as taste, odor, or color. (Salty taste)
- Indicator parameter common for landfill leachate. Stormwater runoff can also cause elevated chloride levels.

Cadmium

- Cadmium first detected in MW-3 in November, 2016 (below maximum contaminant level – 0.005 ppm).
- Cadmium first detected in MW-3 above maximum contaminant level in June 2017.
- Sampling / analytical error resulted in cadmium detected in June, 2017 at MW-4 (duplicate sample).
- Turbidity is believed to elevate measured cadmium levels in MW-3
 - Upon re-sampling, turbidity was reduced 52% and measured cadmium was reduced by 60%

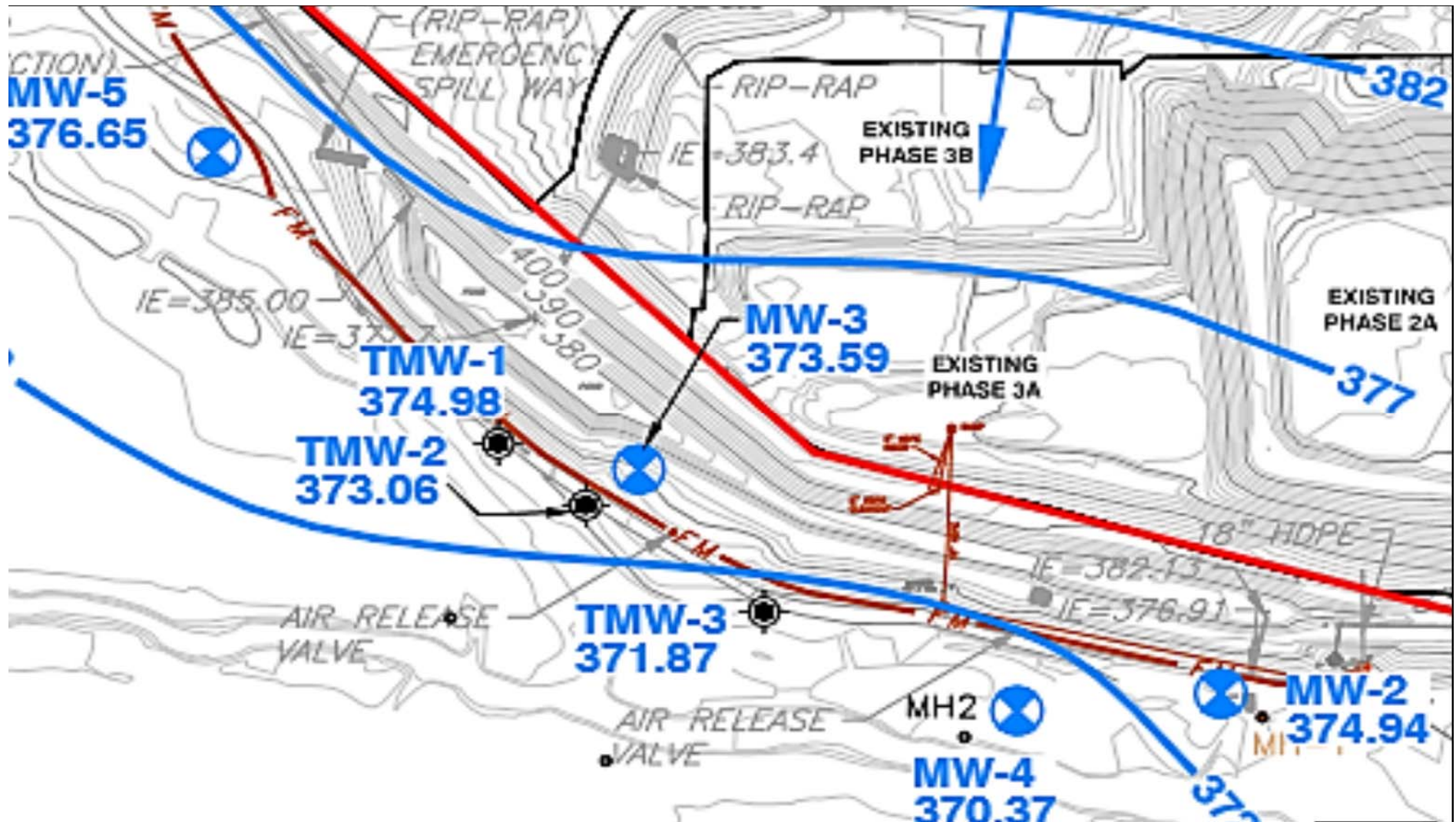
Turbidity

- Turbidity is the measure of relative clarity of a liquid, measured in NTUs.
- Monitoring goal is to test water, not sediment (suspended solids) in water.
- NTUs of 10 or lower are desirable to ensure suspended solids are not causing sample bias.
- Total metal concentrations tend to increase as turbidity increases.
- When dealing with ppm levels, a small amount of sediment can make a big difference.
- TDEC is looking at evaluating sampling methods to ensure groundwater sampling results are representative of groundwater in the aquifer.

Source of Cadmium

- Cadmium in groundwater appears to be very localized and of limited extent.
- There are no indications of a leak in the liner system.
- Possible sources are: Previous EWS operations including spills, leachate line cleanout releases, storm water runoff from sediment basin or storm water channels.
- As the groundwater assessment continues we will gather more information, and further evaluate.

Extent of Cadmium Contamination



Local Water Use

- City Water
 - The City of Camden obtains drinking water from the Tennessee River at a pumping station intake located over 5 miles away from the landfill.
 - The city water intake point is located approximately ½ mile upstream of the location where Cypress Creek empties into Kentucky Lake.
 - If there ever was a release from EWS, it would not flow upstream to the City of Camden water intake
- Residential Wells
 - Well usage survey has not identified down gradient residential well usage within a mile of the site.
 - Groundwater from EWS flows to creeks south of the site.
 - Creeks act as barriers to groundwater flow to the south.

Groundwater Conclusion

- The sampling data indicates that some parameters, which are indicators of leachate, are elevated in groundwater at the site. More data needs to be gathered concerning the cadmium detections before we can draw any conclusions.
- Final closure of the site should improve groundwater conditions in the long run.
 - Reduced water infiltration.
 - Reduced stormwater runoff and water contact with soil and waste.
- Sampling techniques will be evaluated to ensure that representative samples are taken and that turbidity is not influencing the lab results.
- Surface water and sediment samples will be taken in Charlie and Cane Creeks for metals.
- GW Reports and sampling information is available for review by the public. We encourage you to review the information and ask questions. We want to keep you informed.

Drone Flyover Presentation

Drone flyover performed by
Benton County Emergency
Management Agency on Thursday,
September 14th

Richard Kee (EMA)
Presenter

Construction Schedule (APWC)

Tentative Construction Schedule

Craig Almanza (TDEC)
Presenter

Construction – Tentative Schedule (APWC)

Item	September																														October																														November																														December																													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Contractor Bidding	[Orange]																																																																																																																							
Construction Award																[Green]																																																																																																								
Mobilization																[Grey]																																																																																																								
Project Construction																															[Blue]																																																																																									
Demobilization																																																													[Light Green]																																																											
CQA Report																																																													[Pink]																																																											
CQA Report Approval																																																																												[Yellow]																																												
Final Closure																																																																												[Red]																																												

Construction schedule dependent on the following:

- Weather
- Issues discovered during construction that may require additional time to address
- Plastic resin (geosynthetic) production backlog due to recent shut-down of plants due to hurricanes.

APWC Final Closure Design

APWC Final Closure Design

By

Civil & Environmental Consultants, Inc.

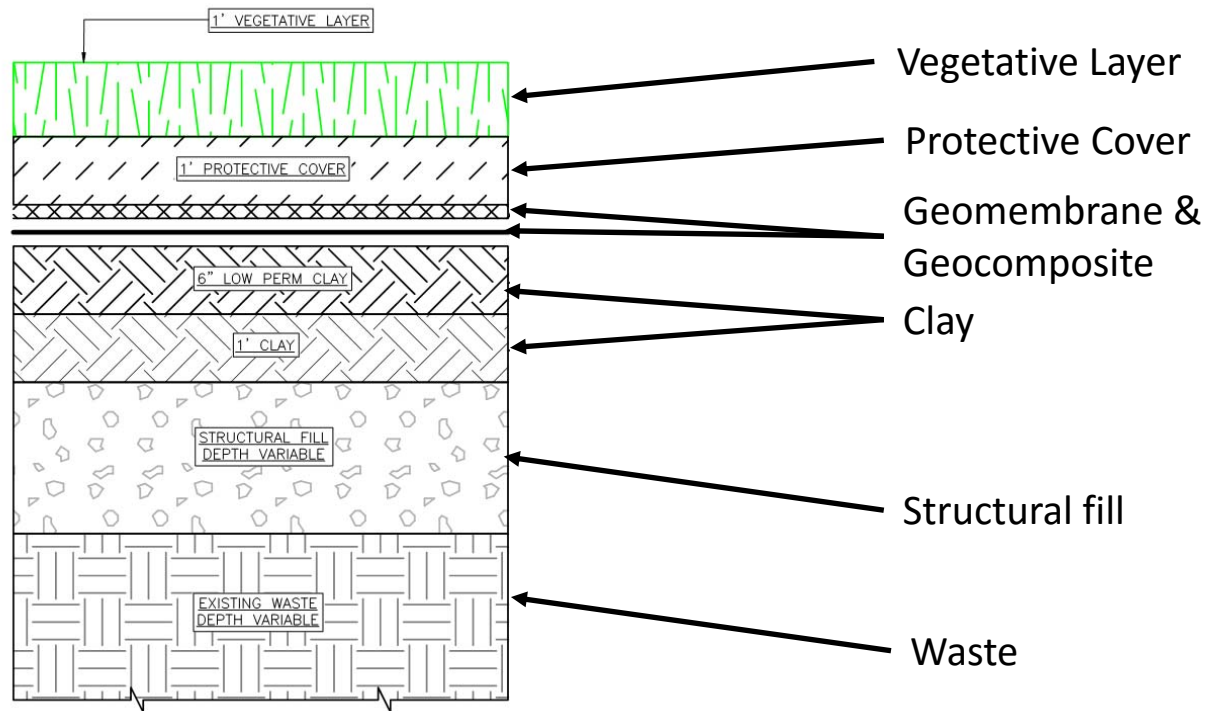
(TDEC Consulting Engineer)

Presenters

Chris Murray / Brian Wolf

Final Cover-Cap Configuration

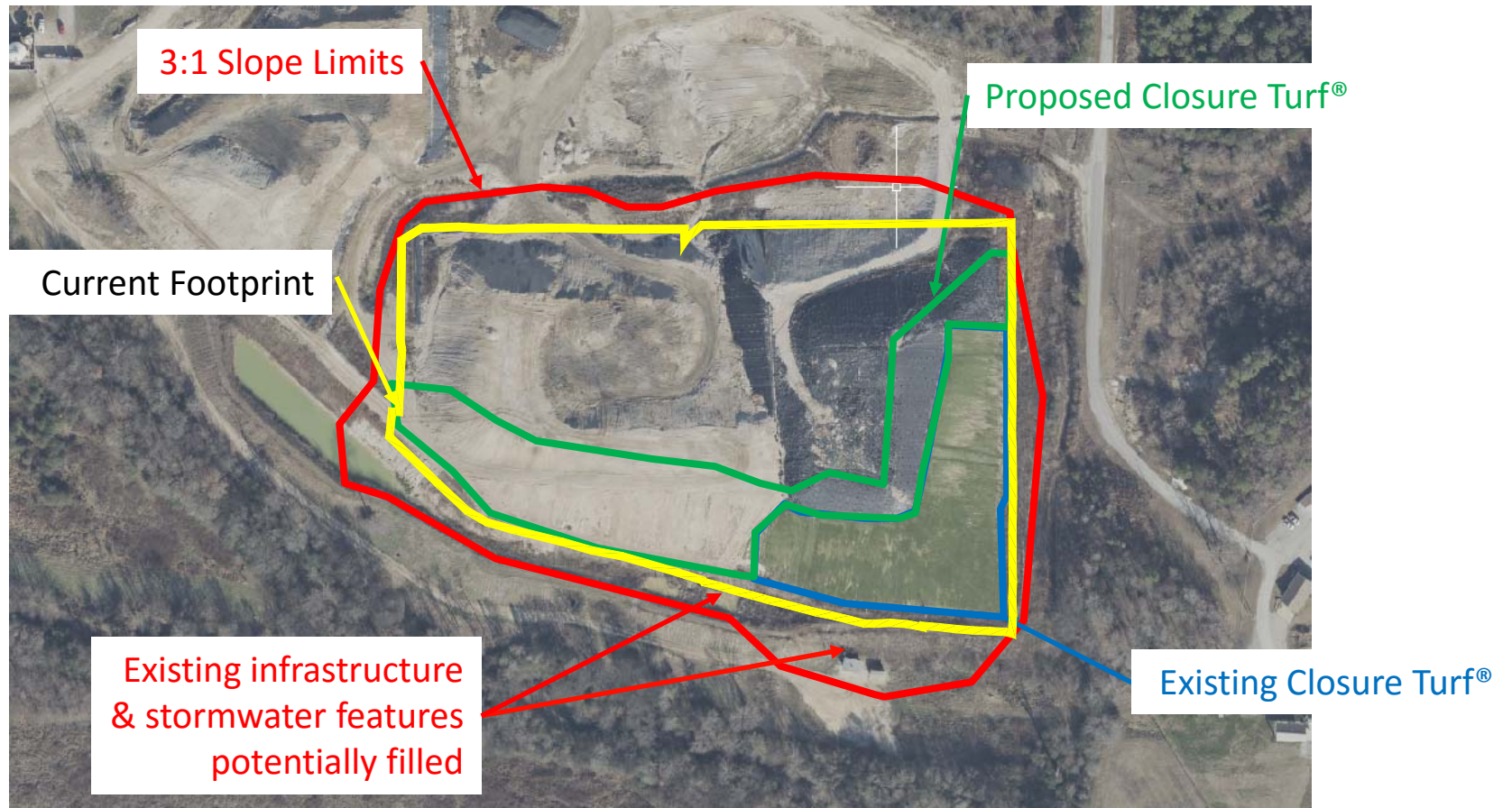
Typical Subtitle D Cap



Final Cover-Cap Configuration

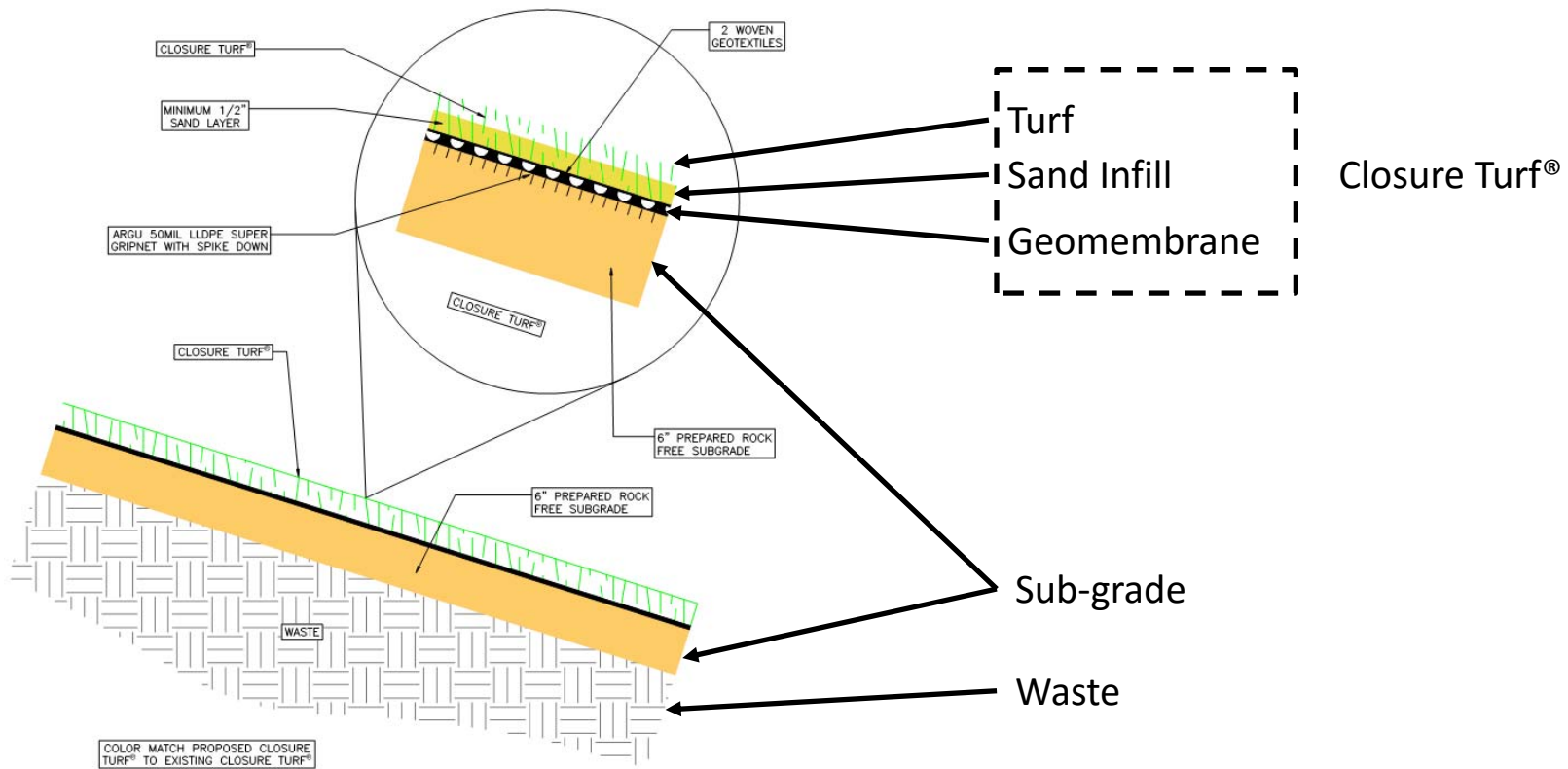
- Typical Subtitle D Cap
 - State and Federal Regulations stipulate maximum slope of 3 horizontal:1 vertical
 - Provides a long term **stable** solution
 - Current conditions are approximately 2H:1V
 - Typical Subtitle D Cap will not work unless:
 - Waste is removed to lay back slopes;
 - Toe of slope is extended; or
 - Alternate cap design

Need for Closure Turf®

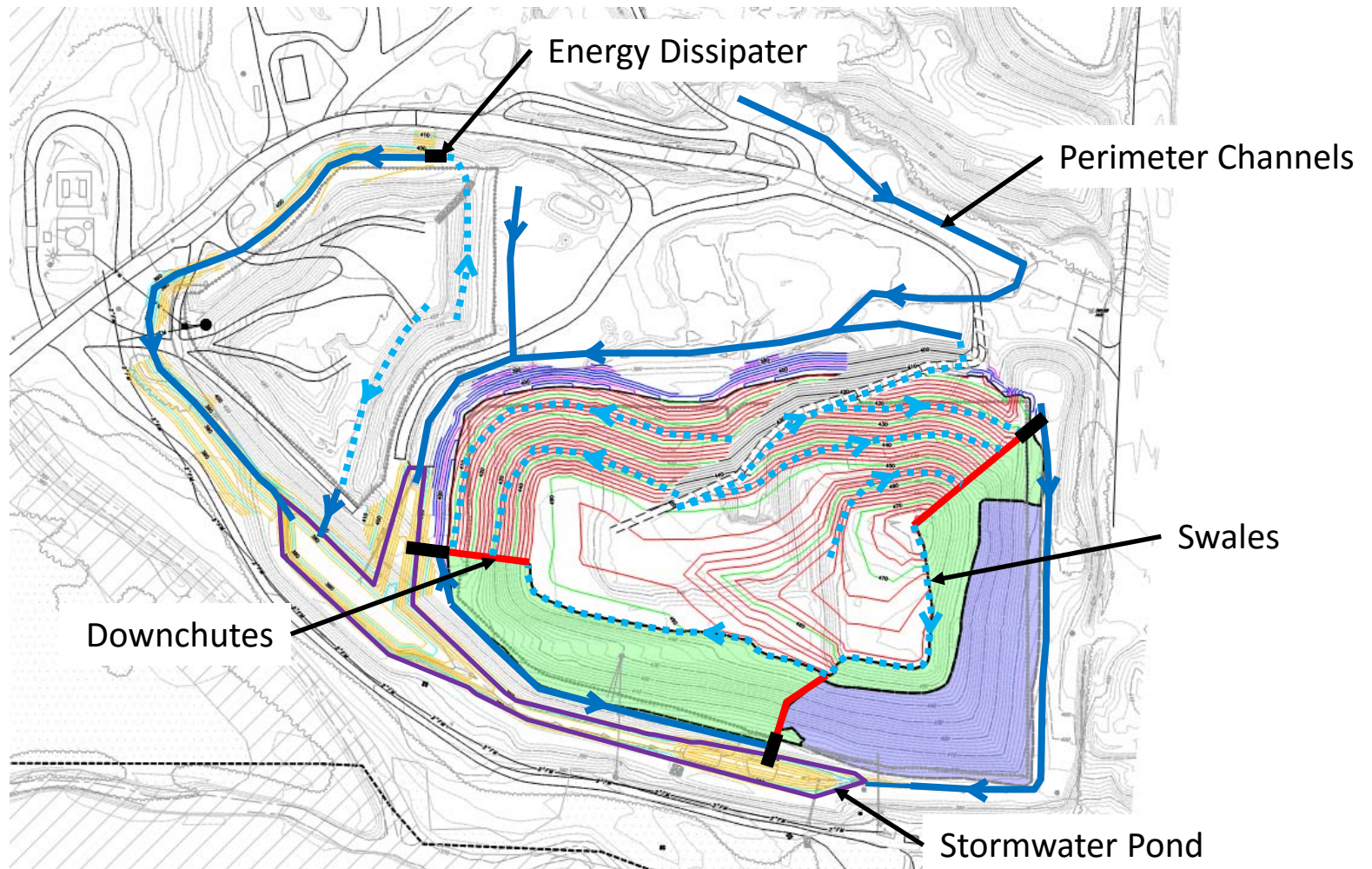


Closure Turf®

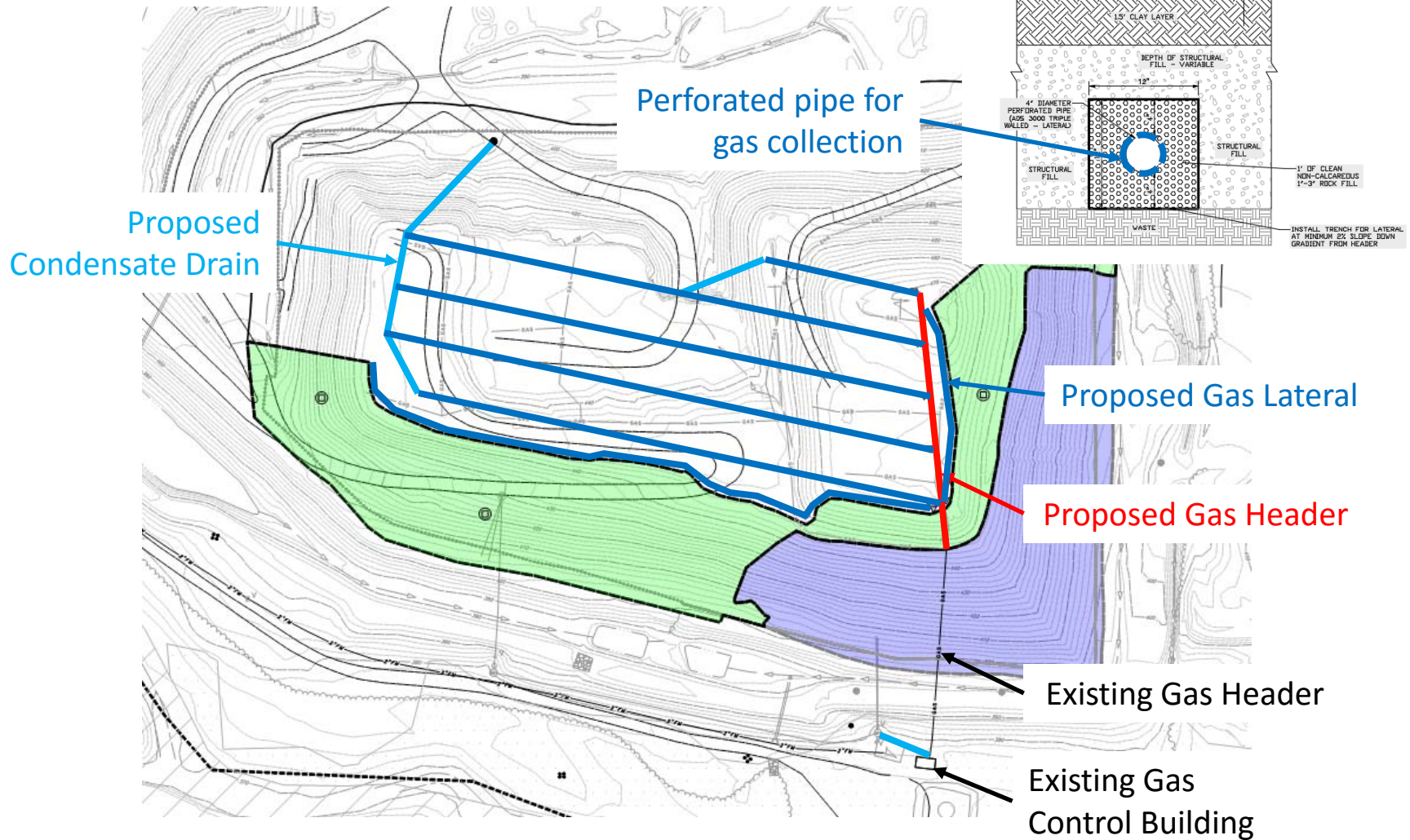
- Synthetic (Closure Turf®)



Stormwater Management Plan



Landfill Gas Management



Final Thoughts - Construction

Final Thoughts - Construction

Craig Almanza (TDEC)
Presenter

Final Thoughts - Construction

- “Black Mountain” Scrim will be removed in ½ acre or less sections and immediately covered with soil in an effort to control odors during construction; **HOWEVER, THERE MAY BE ODORS ASSOCIATED WITH THIS ACTIVITY.** Our goal is to minimize these odors.
- Contractor is contractually obligated to control dust caused by construction. Water truck will be on-site and used to control dust
- Contractors is contractually obligated to control the tracking of dirt on public roads. Sweeper or other means to clean roads will be on-site and available.
- Truck traffic and noise will be present during construction. Hours of operation for construction are Monday – Saturday (Sun-up to Sun-down). Sundays may be worked to catch-up schedule delays.
- TDEC will provide contact number for complaints during construction