

**ENGINEERING REPORT**

**FOR**

**ANNUAL CCR LANDFILL INSPECTION  
40 CFR §257.84(b)**

**FAYETTE POWER PROJECT  
COMBUSTION BY-PRODUCTS LANDFILL**

**PREPARED FOR  
LCRA  
FAYETTE POWER PROJECT**

**PREPARED BY  
LCRA ENGINEERING SERVICES  
January 15, 2016**



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## 1.0 BACKGROUND

This report is intended to ensure that the design, construction, operation and maintenance of the Fayette Power Project (FPP) Combustion By-products Landfill (CBL) is consistent with recognized and generally accepted good engineering standards in accordance with the Environmental Protection Agency's Coal Combustion Residual (CCR) rules under 40 CFR Part 257. More specifically this report meets the requirements of 40 CFR §257.84(b) Annual inspections by a qualified professional engineer.

As required by 40 CFR 257.84(b), this inspection report documents the initial annual inspection of the CBL, located at 6549 Power Plant Road, La Grange, Texas 78945. The CBL is registered by the Texas Commission on Environmental Quality (TCEQ) as an on-site nonhazardous industrial waste landfill (TCEQ Registration No. 31575) and as an on-site waste management unit (Notice of Waste Registration No. MU013) at the FPP.

The CBL and associated support facilities are located in the southwest portion of the FPP, south of the power plant and north of the Missouri-Kansas-Texas railroad line (Appendix A). LCRA deed recorded a 123-acre tract located within the FPP site for disposal of Class 2 nonhazardous industrial waste. To date, an approximately 30-acre area has been developed as Cell 1 and a 7.9 acre area has been developed as cell 2D. In a 2013 Notification Revision to TCEQ, LCRA raised the maximum elevation of the CBL from approximately 430 feet mean sea level (ft-msl) to 470 ft-msl and added Cell 2D. The support facilities for the CBL currently include the CBL Pond for collection of CBL contact water, the associated drainage channel that routes contact water from the CBL to the CBL Pond, and two stormwater drainage channels that route clean stormwater off-site

In accordance with 40 CFR 257.84(b)(3), the initial annual inspection was performed, document review was conducted, and this report was prepared prior to January 18, 2016.

## **2.0 DOCUMENT REVIEW**

Relevant documents were reviewed to ensure the CBL design, construction, operation, and maintenance activities are being conducted in accordance with recognized and generally accepted good engineering standards.

These records included slope stability and foundation analyses for the proposed final CBL geometry performed by Geosyntec Consultants Inc. Review of the findings within these documents indicate design and construction of the CBL is consistent with recognized and good engineering standards.

The weekly inspection program was commenced on September 16, 2015 as required under 40 CFR 257.84(a)(2). These weekly inspection reports for the period from September 16, 2015 through December 30, 2015 were reviewed.

Review of these documents did not result in findings indicating the CBL design, construction, operations or maintenance activities would result in potential structural weakness of the CBL as currently configured.

## **3.0 LANDFILL GEOMETRY & VOLUME CHANGE**

This is the initial annual inspection report as required under 40 CFR §257.84(b)(2) and as such will serve as the baseline for changes in geometry of the structure and approximate CCR volume.

The CBL structure is baselined for purposes of annual compliance inspection reporting in the aerial survey conducted on September 29, 2014. The annual aerial survey conducted on September 30, 2015 did not show a change in the landfill impounding structure from the previous 2014 survey. An approximate layout of the impounding structures is included in Appendix B.

Per 40 CFR 257.84(b)(2)(ii), the CCR volume as of the September 30, 2015 survey is approximately 1,298,438 cubic yards.

Cell 1 was constructed in 1988. A clay perimeter embankment was constructed around the west, north, and east sides of the cell, and a clay cell separation berm was constructed along the south boundary of the cell. The upper 12 inches of the clay subgrade on the floor of the cell was re-compacted. The floor of the cell was essentially constructed at natural grade with minimal excavation. In 1992, the north portion of Cell 1 was closed with a final cover system consisting of a 2-foot thick compacted clay layer overlain by 1 foot of general fill and at least 1 foot of topsoil.

To facilitate landfill operations, the Subcell 2D waste staging area was engineered and constructed. The waste staging area is used for: (i) product preparation; and (ii) future waste storage and disposal.

## 4.0 INSPECTION OF IMPOUNDING STRUCTURES

Inspection of the Fayette Power Project's Combustion Byproducts Landfill was conducted by Mr. Nathan M. Gullo, P.E. and Mr. Samuel C. Brown, P.E. on the morning of December 9, 2015 beginning at 0930 and concluding at 1130 hours. The weather was clear with temperatures in the low 60's at the time of inspection. The CBL location had received precipitation amounts of 3.61 inches over the previous 30 days and 55.77 inches for the 365 days prior to this inspection. Notable precipitation events over the past year included exceedance of the 100-year 2 day storm event with a recorded precipitation depth of 13.7 inches on October 25, 2015 and exceedance of the 100-year 3 day storm with a recorded precipitation depth of 14.6 inches on October 26, 2015. Precipitation data was provided from the LCRA Hydromet rain gauge number 563400 located at the FPP site.

### 4.1 LANDFILL CELL 1 WESTERN EMBANKMENT SLOPE

**Clay Embankment w/ 1 ft Vertical to 3 ft Horizontal slope**

**Approximate Length: 350 ft**

**Approximate Max Impoundment Height: 20 ft @ 410 ft-msl**

General Condition:  Good  Fair  Poor

Problems Noted:  None  Poor Grass Cover  Trees or Brush  Animal Burrows or Damage

Standing Water /Ponding  Wet Areas  Erosion  Depressions  Rutting  Cracks  Bulges

Misalignment  Sinkhole  Other: Hard Rocky Debris

**Comments:**

(1) Overall grass cover was in good condition at the time of inspection with an approximate height of 3-inches with very good cover. There were no visual signs of active animal activity or past history of such. The slopes are visually in alignment with the 3:1 design and no visual evidence of structural issues was observed (See Photo 1).

(2) Hard rocky material was present on the crest and appeared to be large broken waste ash material. This riprap rock like debris should be removed from the crest and disposed of in the waste impoundment area to prevent hazards to vehicles traveling on the crest and allow for proper mowing and vegetative growth in this area (See Photo 2). Due to the presence of the debris, this area looked to have been mowed around evidenced by higher grass cover in and around the area.

## 4.2 LANDFILL NORTHERN EMBANKMENT SLOPE

**Clay Embankment w/ 1 ft Vertical to 3 ft Horizontal slope**

**Approximate Length: 1,300 ft**

**Approximate Max Impoundment Height: 35 ft @ 420 ft-msl**

General Condition:  Good  Fair  Poor

Problems Noted:  None  Poor Grass Cover  Trees or Brush  Animal Burrows or Damage

Standing Water /Ponding  Wet Areas  Erosion  Depressions  Rutting  Cracks  Bulges

Misalignment  Sinkhole  Other:

### Comments:

(1) Overall grass cover was in very good condition at the time of inspection with an approximate height of 4 to 6-inches. There were no visual signs of active animal activity or past history of such. The slopes are visually in alignment with the 3:1 design and no visual evidence of structural issues was observed (See Photos 3 &4).

## 4.3 LANDFILL CELL 1 EASTERN EMBANKMENT SLOPE

**Clay Embankment w/ 1 ft Vertical to 3 ft Horizontal slope**

**Approximate Length: 550 ft**

**Approximate Max Impoundment Height: 30 ft @ 420 ft-msl**

General Condition:  Good  Fair  Poor

Problems Noted:  None  Poor Grass Cover  Trees or Brush  Animal Burrows or Damage

Standing Water /Ponding  Wet Areas  Erosion  Depressions  Rutting  Cracks  Bulges

Misalignment  Sinkhole  Other:

### Comments:

(1) Overall grass cover was in good visual condition at the time of inspection with an approximate height of 6-inches and very good cover. The slopes are visually in alignment with the 3:1 design and no visual evidence of structural issues was observed (See Photos 5 & 7).

(2) There was an area of apparent minor surface erosion leading to blotchy grass coverage on the north end from the crest extending down approximately 20-ft with a width of approximately 20-ft (See Photo 6). An ant mound was also observed in this same location. There was evidence of water ponding at the crest above this location and although no standing water was present at the time of inspection there was visible ponding to the south (See Photos 9 & 10). It is suspected water may have flowed from this area of ponding at the crest down the slope causing this minor erosion. It should also be noted FPP experienced a 100-year 24 hour storm on October 31 through November 1 approximately 1 month prior to this inspection.

#### 4.4 CELL 1 TOP TEMPORARY CAP

##### Clay Cap with Topsoil & Grass Vegetation

Approximate Length: 1,000 ft

Approximate Width: 120 ft

General Condition:  Good  Fair  Poor

Problems Noted:  None  Poor Grass Cover  Trees or Brush  Animal Burrows or Damage

Standing Water /Ponding  Wet Areas  Erosion  Depressions  Rutting  Cracks  Bulges

Misalignment  Sinkhole  Other:

##### Comments:

(1) Overall grass cover was in good visual condition at the time of inspection with an approximate height of 18-inches and very good cover. No visible evidence of erosion or structural issues was observed.

#### 4.5 VISIBLE LINERS

##### Clay & Synthetic Liners

General Condition:  Good  Fair  Poor

Problems Noted:  None  Tears  Damage  Trees or Brush  Animal Activity  Erosion

Depressions  Rutting  Cracks  Bulges  Other:

##### Comments:

(1) Overall the visible liner systems were intact and functioning as designed with no observed structural issues.

#### 4.6 RUN-ON/RUN OFF FACILITIES

##### Open Channels, Culverts, CBL Pond & Cell 2D Pond

General Condition:  Good  Fair  Poor

Problems Noted:  None  Poor Grass Cover  Trees or Brush  Animal Burrows or Damage

Excessive Sediment Buildup  Blockage  Erosion  Depressions  Rutting  Cracks  Freeboard

Exceeded  Misalignment  Sinkhole  Other:

##### Comments:

(1) Overall the hydraulic control and impounding structures were found to be maintained with no observed structural issues.

## 5.0 CONCLUSIONS

The FPP CBL structure was in good condition at the time of this inspection and does not appear to have an actual or potential structural weakness nor any existing conditions that are disrupting or have the potential to disrupt the operation and safety of the CBL. The operation and maintenance of the landfill is currently contracted to a landfill manager believed to have good competency with a plan in place to meet the 40 CFR Part 257 requirements for operation of the facility consistent with recognized and generally acceptable good engineering standards.

The CBL is designed, constructed, operated, and maintained consistent with recognized and generally accepted good engineering standards.

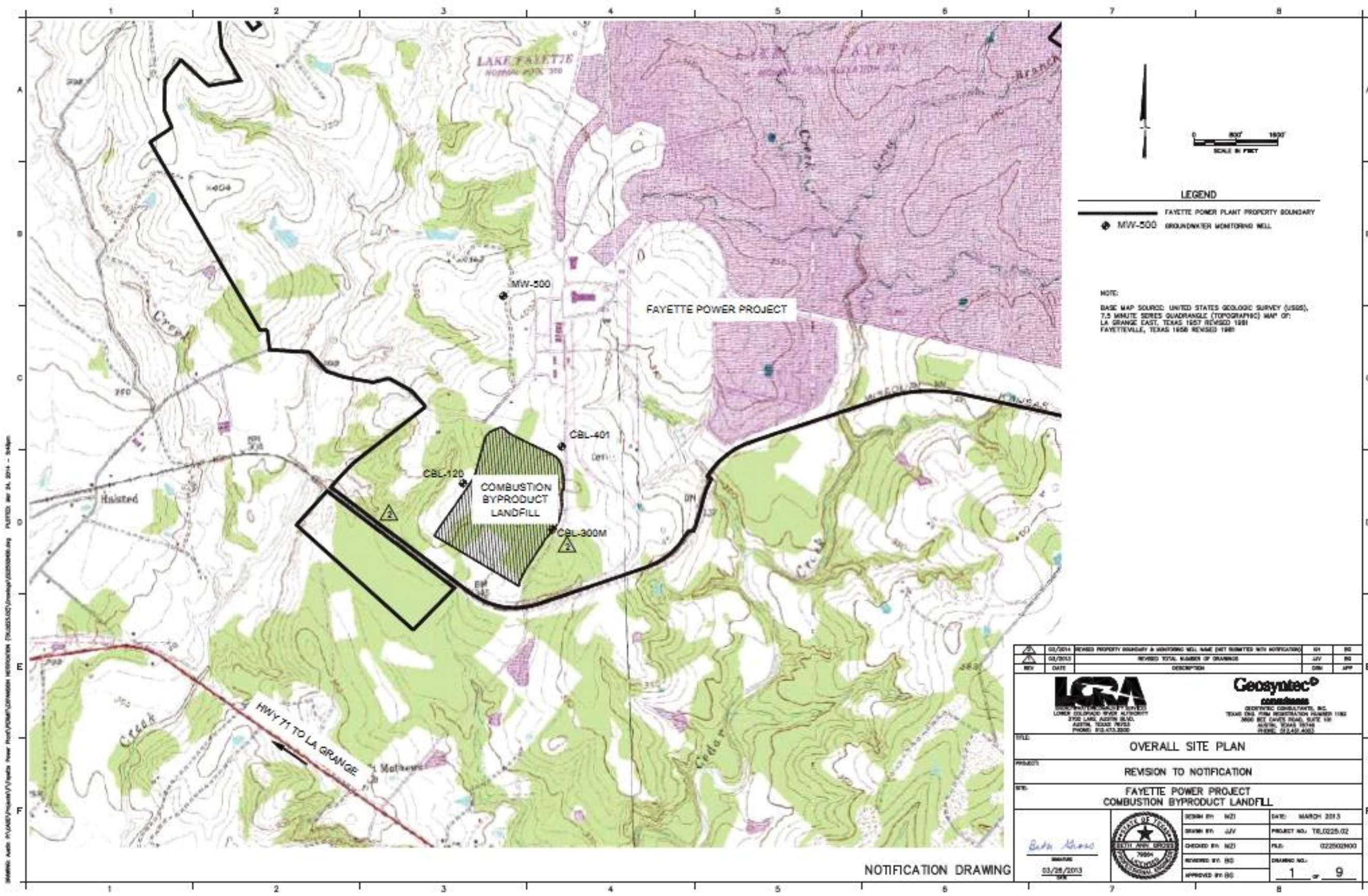
## 6.0 RECOMMENDATIONS

The following recommendations are made based on the document review and December 9, 2015 inspection:

- Item 2015-001, It was reported by FPP staff that the debris noted in Section 4.1, Comment 2 has been removed and properly disposed of within the landfill at the time this report was issued. This is also documented in the weekly inspection report dated December 16, 2015. Landfill slopes and capped areas should be kept clear from debris to prevent damage to the vegetative cover and allow for mowing and inspection activities to occur without debris hazards.
- Item 2015-002, Evidence of ponding and surface drainage over the slope noted in Section 4.3, Comment 2 should be addressed to prevent progression of minor erosion. The area should be graded to ensure positive drainage in the direction of the interior section of the landfill and ultimately to the stormwater runoff collection and detention system. The landfill manager has been notified of the issue by FPP but had not addressed it at the time of this report due to soil moisture conditions. The issue has been communicated and will be addressed as soon as practical.



**APPENDIX A**  
**FPP COMBUSTION BY-PRODUCTS LANDFILL**  
**LOCATION DRAWING**



**LEGEND**

- FAYETTE POWER PLANT PROPERTY BOUNDARY
- MW-500 GROUNDWATER MONITORING WELL

NOTE:  
 BASE MAP SOURCE: UNITED STATES GEOLOGIC SURVEY (USGS),  
 7.5 MINUTE SERIES QUADRANGLE (TOPOGRAPHIC) MAP OF:  
 LA GRANGE EAST, TEXAS 1957 REVISED 1981  
 FAYETTEVILLE, TEXAS 1958 REVISED 1985

I:\GIS\Projects\Fayette Power Plant\CADD\Utilities\NOTIFICATION (2).dwg PLOTTED: 03/28/2013 10:14:38 AM

03/20/14	REVISED PROPERTY BOUNDARY & MONITORING WELL NAME (NOT SUBMITTED WITH NOTIFICATION)	JDH	BC
03/20/13	REVISED TOTAL NUMBER OF DRAINAGE	JJV	BC
REV	DATE	DESCRIPTION	DRN

**LGRA**  
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TITLE		OVERALL SITE PLAN	
PROJECT		REVISION TO NOTIFICATION	
DESCRIPTION		FAYETTE POWER PROJECT COMBUSTION BYPRODUCT LANDFILL	

*Eduardo Alvarez*  
 03/28/2013  
 DATE

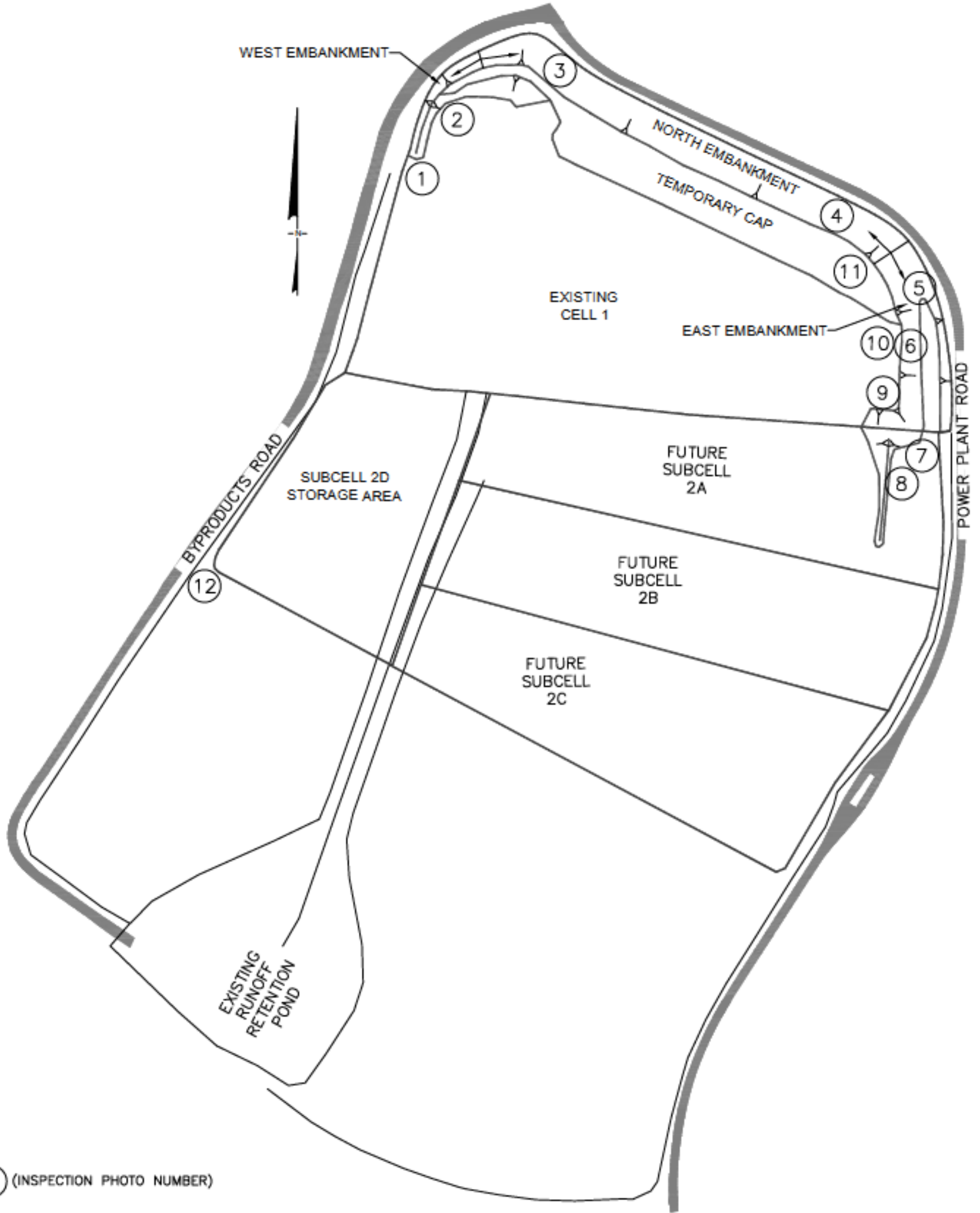
DESIGN BY	MZJ	DATE	MARCH 2013
DRAWN BY	JJV	PROJECT NO.	TL0225.02
CHECKED BY	MZJ	PLN.	022502N00
REVISOR BY	BC	DRWG NO.	
APPROVED BY	BC		1 of 9

**NOTIFICATION DRAWING**

**APPENDIX B**  
**FPP COMBUSTION BY-PRODUCTS LANDFILL**  
**INSPECTION DRAWING**

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FPP COMBUSTION BY-PRODUCTS LANDFILL  
INSPECTION DRAWING



**APPENDIX C**  
**INSPECTION PHOTOS**

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**PHOTO 1 – View of West Embankment from Toe Looking North (12-09-2015)**



**PHOTO 2 – View of West Embankment from Crest Looking South (12-09-2015)**



PHOTO 3 – View of North Embankment from Crest Looking East (12-09-2015)



PHOTO 4 – View of North Embankment from Toe Looking West (12-09-2015)



PHOTO 5 – View of East Embankment from Toe Looking South (12-09-2015)



PHOTO 6 – View of Ant Mound and Evidence of Surface Drainage on the North End of East Embankment Slope Near the Crest (12-09-2015)





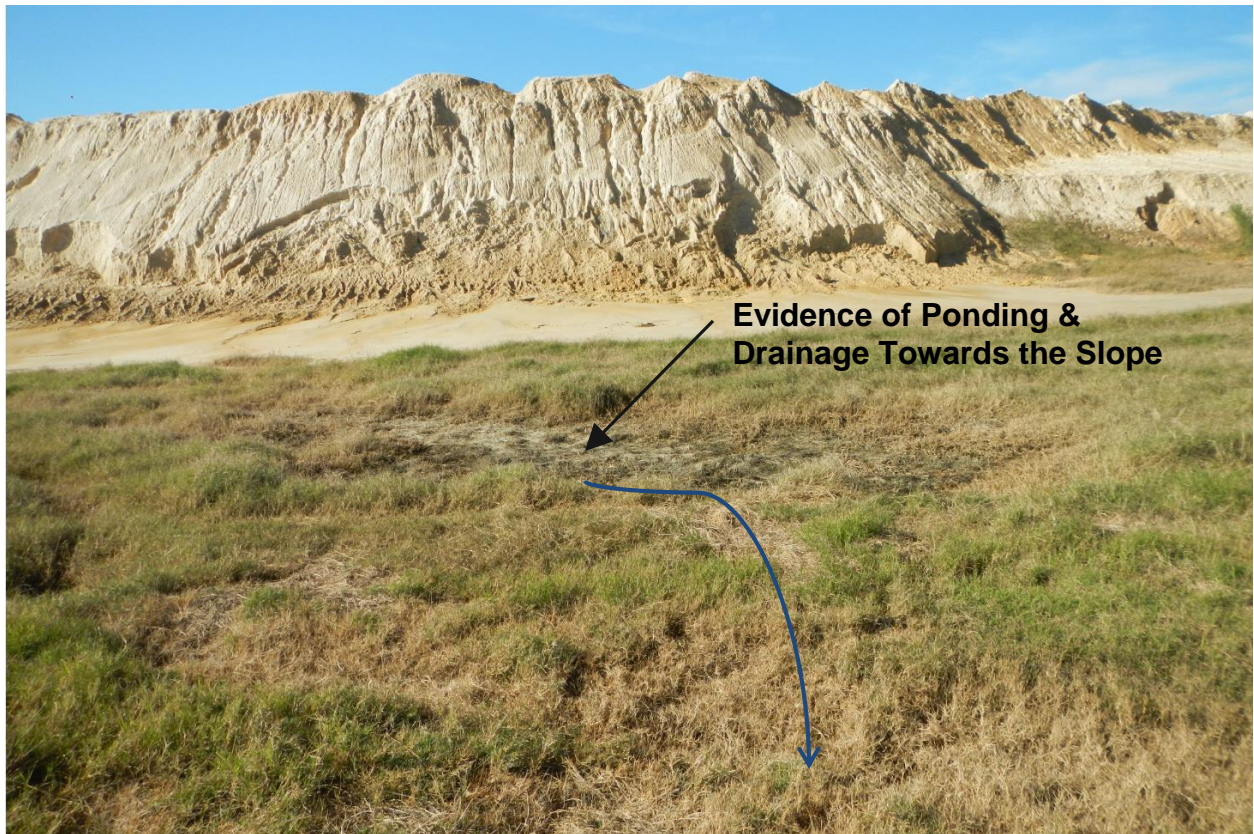
**PHOTO 7 – View of East Embankment from Toe Looking North (12-09-2015)**



**PHOTO 8 – View of Temporary Cover on South Side of CBL Cell 1 Looking West (12-09-2015)**



**PHOTO 9 – View of East Embankment Crest Looking North (12-09-2015)**



**PHOTO 10 – View of East Embankment Crest at North End (12-09-2015)**



**PHOTO 11 – View of Cell 1 Cap from East End of Crest Looking West (12-09-2015)**



**PHOTO 12 – View of CBL from Southwest Corner of Subcell 2D Storage Area (12-09-2015)**