ATTACHMENT 4 – 2016 HISTORY OF CONSTRUCTION REPORT

City Water, Light & Power
Ash Impoundments
Springfield, Sangamon County, Illinois

History of Construction Report for Coal Combustion Residuals Surface Impoundments

October 2021

Prepared for:
City Water, Light & Power
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Springfield, Illinois 62703

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APPENDICES

1. INTRODUCTION

City Water, Light and Power (CWLP) Lakeside Ash Pond and Dallman Ash Pond are coal combustion residuals (CCR) surface impoundments. A review of the construction history for the CCR surface impoundments was conducted as required by 40 IAC Part 845.220(a)(1):

Andrews Engineering, Inc. (AEI) performed the review of information, which included the following documents:

- Coal Ash Impoundment Site Assessment Final Report (May 2011)
- Historical Aerial Photographs (April 1995 – March 2014)
- Engineering Report: Proposed Embankment Modification; CWLP Ash Disposal Area (July 1987).
- Construction Grading Plan for the Dallman Ash Pond (August 1976)

2. CCR UNIT INFORMATION

Both the Lakeside Ash Pond and the Dallman Ash Pond are owned and operated by CWLP. The CWLP main office is located at 4th Floor, Municipal Center East, 800 E. Monroe Street, Springfield, IL 62757. The ponds are operated under National Pollutant Discharge Elimination System (NPDES) Permit Number IL0024767.

3. LOCATION

The Lakeside Ash Pond and the Dallman Ash Pond are located north of East Lake Shore Drive, just east of Interstate 55. The CCR units are located in the eastern half of Range 5 West, Township 15 North, Section 12 in Sangamon County, Illinois (Springfield East Quadrangle, Illinois, USGS). The locations of the CCR units are shown in Figure 1 of this report.

4. PURPOSE

The Lakeside Ash Pond is primarily a diked embankment with some incising along the east perimeter and was placed into service prior to 1958. The original Lakeside Ash Pond was been divided into four separate ponds since it was expanded vertically in 1988: three lime softening ponds and the settling pond. The current Lakeside Ash Pond is approximately 27.6 acres and ceased receiving ash in 2009.

The Dallman Ash Pond was placed into service in approximately 1976 and is approximately 34.5 acres. Fly ash and bottom ash from the CWLP power plant are sluiced to the Dallman Ash Pond with raw lake water.

Settled water from both the Dallman Ash Pond and Lakeside Ash Pond flow into opposite sides of a Clarification Pond before being discharged to Sugar Creek at Outfall 004.

5. WATERSHED AREA

The site is located within the South Fork Sangamon Watershed (USGS 07130007). However, since both ash ponds were built from diked embankments, virtually no surface water flows into the surface impoundments. Therefore, the watershed area for both of the ash ponds would be roughly equal to their surface area. The Dallman Ash Pond is approximately 34.5 acres. The Lakeside Ash Pond is approximately 27.6 acres.

6. FOUNDATION

The Sugar Creek historically meandered across the site, generally from the west to east with an overall flow direction to the north. During the construction of the ash ponds, the creek was abandoned and relocated to the west of the site. The old creek bed was filled with different types of soil, ranging from cohesive soils characterized as silty clays, to granular fill characterized as poorly graded silty to clayey sands. Most of the soil analysis was performed during hydrogeological investigations performed for the east adjacent CCR landfill.

The cohesive soils of the creek fill were tested as part of the CCR landfill permitting process. The landfill location is shown in Figure 1. The soils exhibited the following range of index and engineering properties:

- Liquid limit = 34 to 46
- Plasticity index = 9 to 26
- Gravel content = 0 percent
- Sand content = 2 to 48 percent
- Silt/Clay content = 52 to 98 percent
- Dry density = 80 to 104 pcf
- Hydraulic conductivity 7.6×10^{-8} to 2.1×10^{-5} cm/sec

Sieve analysis on the granular fill yielded the following results:

- Gravel content = 0 to 2 percent
- Sand content = 55 to 65 percent
- Silt/Clay content = 33 to 45 percent

Prior to the area development, the upper layer of soil at the site consisted of mainly brown, light brown, and brownish-gray silty clays and clayey silts having soft to stiff consistency. This includes all eolian soils (loess) deposited near the surface, isolated pockets and lenses of fine grained silty to clayey sand at some locations and alluvial silts and silty clays. Recompacted silty clay samples from the native soils have exhibited hydraulic conductivity values between 1×10^{-7} to 1×10^{-9} cm/sec. The in-place creek sediment's soils permeability typically range from 1×10^{-6} to 1×10^{-8} cm/sec. Much of the shallow soils were displaced during area development.

7. CONSTRUCTION

7.1 Lakeside Ash Pond

The Lakeside Ash Pond is a diked pond. The pond was built prior to 1958 and was bounded by the Lake Springfield Spaulding Dam to the south. The original pond was approximately 44

acres. The soil berms comprising the east, north, and west boundaries were built approximately 18 to 20 feet above the inside bottom elevation, with side slopes ranging between 2.5 to 3.0H:1.0V.

The Lakeside Ash Pond system was expanded vertically in 1988. The vertical expansion consists of berms built on top and inside of the existing embankments in such a way that the toe of the outer slope of the expansion berms matches up with the top of the inner slope of the existing embankments. The berms were built on top of a stable base comprised of bottom ash on the inside of the existing berms. The vertical expansion berms are approximately ten feet in height. The berms were constructed with compacted cohesive materials. The top and outer slopes are covered with a 6-inch topsoil layer. The top of the berms are 10 feet wide. The outer slope of the berms was built at a 2H:1V slope. The inner slope of the berms was built at a 1H:1V slopes. During the vertical expansion in 1988, the Lakeside Ash Pond was separated to create lime softening ponds on the south section of the pond.

7.2 Dallman Ash Pond

The Dallman Ash Pond was built 1976; it has not been expanded. The berms for the Dallman Ash Pond were built to a height of approximately 27 feet, using slopes of 2.5H:1V for both the inner and outer slopes. Riprap was placed at the bottom section of the outer slopes for the west and north berms. The south berm for the Dallman Ash Pond is shared by the Clarification Pond located to the south.

8. DRAWINGS

The following drawings are included in Appendix A of this report:

- Figure 1 – Site Map identifying the location of the CCR units.
- Figure 2 – Plan View of the surface impoundments and the locations of outlets, normal operating pool elevations, maximum pool elevations, and maximum depths of each CCR unit.
- Construction Drawings – Plan Views and Cross Sections of each CCR unit.

Plan Drawings and Cross Sections of the Lakeside Ash Pond are taken from the construction design drawings included in the 1987 Proposed Embankment Modifications report by Hanson Engineers, Inc. No as-built drawings are available for either the original pond construction prior to 1958 or the expansion in 1988. No construction design drawings are available for the original pond construction. The Plan Drawing shows the proposed expansion with two lime softening ponds. The third lime softening pond was constructed from the southern portion of the expanded settling pond at a later time.

The Plan Drawing of the Dallman Ash Pond is taken from the 1976 Construction Grading Plan. Cross Sections for the Dallman Ash Pond have been created based on this Plan Drawing. No as-built drawings are available for the construction of the Dallman Ash Pond.

Neither CCR unit contains foundation improvements, drainage provisions, diversion ditches, or instrumentation. No identifiable natural or manmade features that could adversely affect operation of the CCR unit due to malfunction or misoperation are known to CWLP personnel.

9. INSTRUMENTATION

According to CWLP personnel, none of the CCR units contains any such unit instrumentation, which would include dedicated piezometers, pool elevation and freeboard instrumentation or more sophisticated measuring devices for measuring pressure, seepage, internal movement, slope movement, and/or vibration. Due to the limited extent of the impoundments, such instrumentation was deemed unnecessary.

10. AREA-CAPACITY CURVES

Area-capacity curves for the CCR units are included in Appendix B of this report. Area-capacity curves for the CCR units are calculated based on information from the construction drawings discussed in Section 8 of this report.

11. SPILLWAYS

Neither ash pond has constructed or natural spillways.

12. SURVEILLANCE, MAINTENANCE, AND REPAIR

Visual inspections of the CCR units are performed on a weekly basis for the purpose of identifying appearances of actual or potential structural weaknesses and other conditions that are disrupting or have the potential to disrupt the operation or safety of the CCR units or appurtenant structures. Erosional features, such as ruts or gullies, are promptly filled with soil and seeded. Any repairs completed as part of maintenance are specifically monitored during the weekly inspections for future occurrences. Because of the limited extent of the impoundments, only minimal maintenance is necessary.

13. STRUCTURAL CONDITION OF CCR UNITS

Signs of erosion have been periodically observed on the north and west outer berms of the Dallman Ash Pond in the forms of ruts and gullies that typically range from 6 to 24 inches deep. The erosion appears to be caused by stormwater flow collecting at points along the top of the berm before flowing down the outer slope in concentrated streams. Ruts and gullies are routinely filled with soil and monitored in the observed locations. Erosion of similar severity was discussed in the 2011 Site Assessment Final Report, which recommended that the erosion be repaired on an as-needed basis.

Indications of seepage have been observed on outer berms of the Lakeside Ash Pond and lime softening ponds, between the top of the original pond berms and the vertical expansion berms. These range from staining or dampness to areas with noticeable drainage. Signs of seepage have been observed along the west berm, as well as isolated portions on the east and west portions of the north berm of the Lakeside Ash Pond. This seepage is discussed in the 2011 Site Assessment Final Report.

As reported in the 2021 Annual Inspection, no visual indications of actual or potential structural weaknesses of the surface impoundments have been observed. Based on the review of historical aerial photographs completed during the 2016 Annual Inspection, there were no

observed indications of mass movement on any of the constructed berms for the surface impoundments.

14. STATEMENT

This History of Construction Report for Coal Combustion Residuals Surface Impoundments was completed for CWLP by Andrews Engineering, Inc. in accordance with the requirements under 35 IAC Part 845.220 (a)(1).

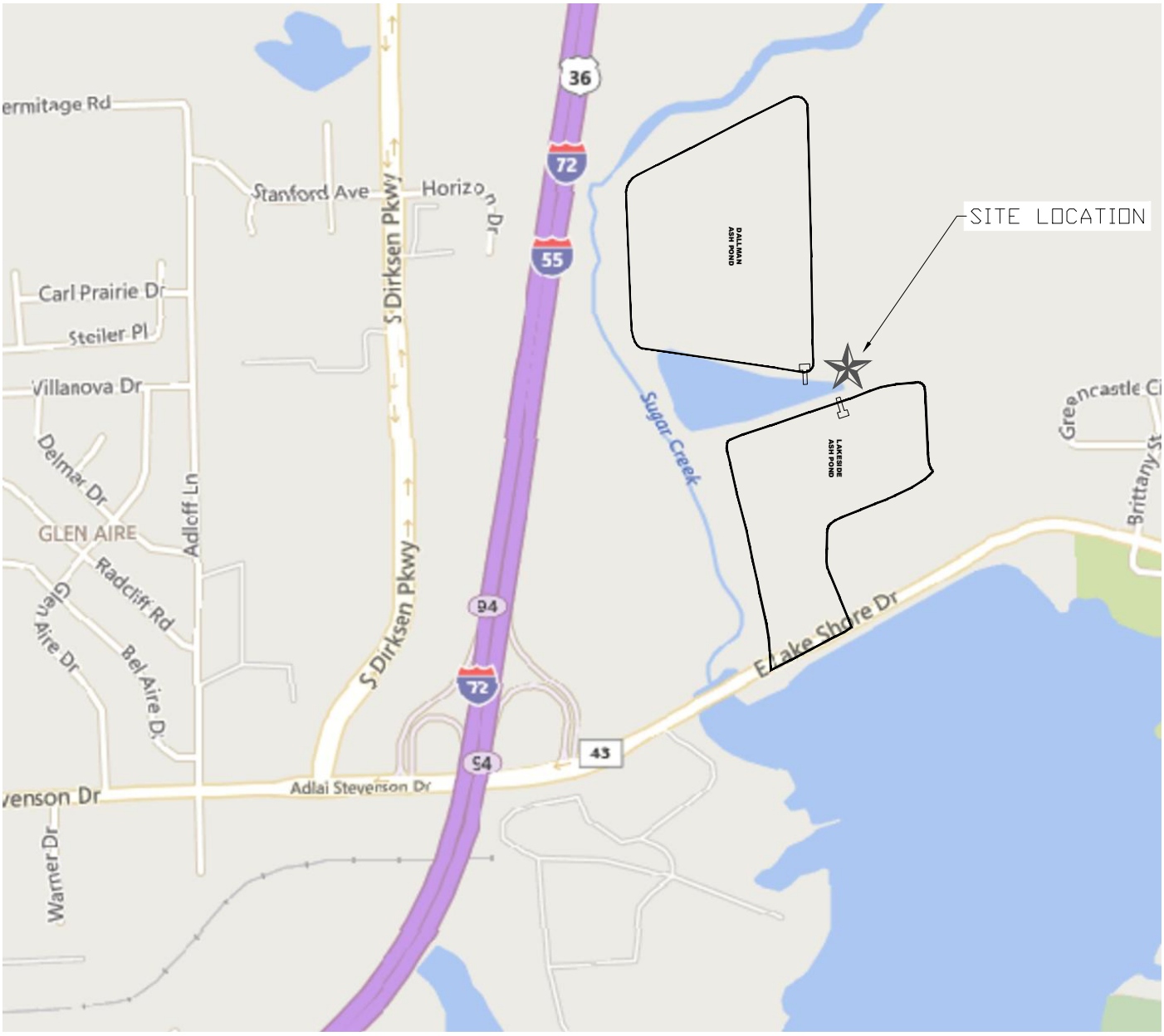
Paul M. Van Metre, P.E.

10-20-21

Date

APPENDIX A

Figures



SITE LOCATION

N

0 500 1000 2000

SCALE: IN FEET

NOTE:
BASE IMAGE DERIVED FROM BING

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Professional Design Engineering and Land Surveying Firm #184-001541

APPROVED BY: PMV	DESIGNED BY: PMV	DRAWN BY: RMC

SITE LOCATION MAP

PLANS PREPARED FOR

CWLP

SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: OCTOBER 2016

PROJECT ID: 150077/0011

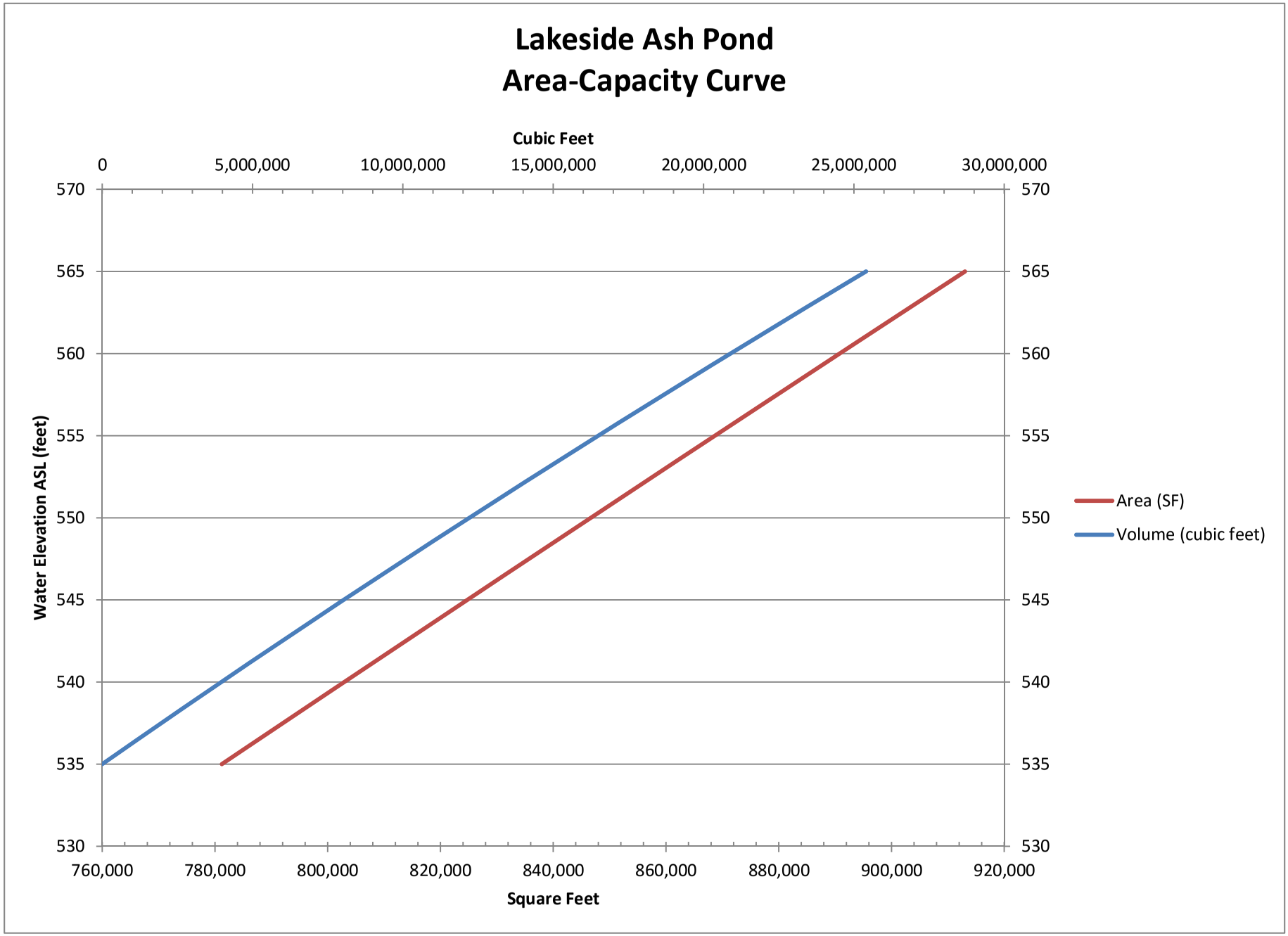
SHEET NUMBER:

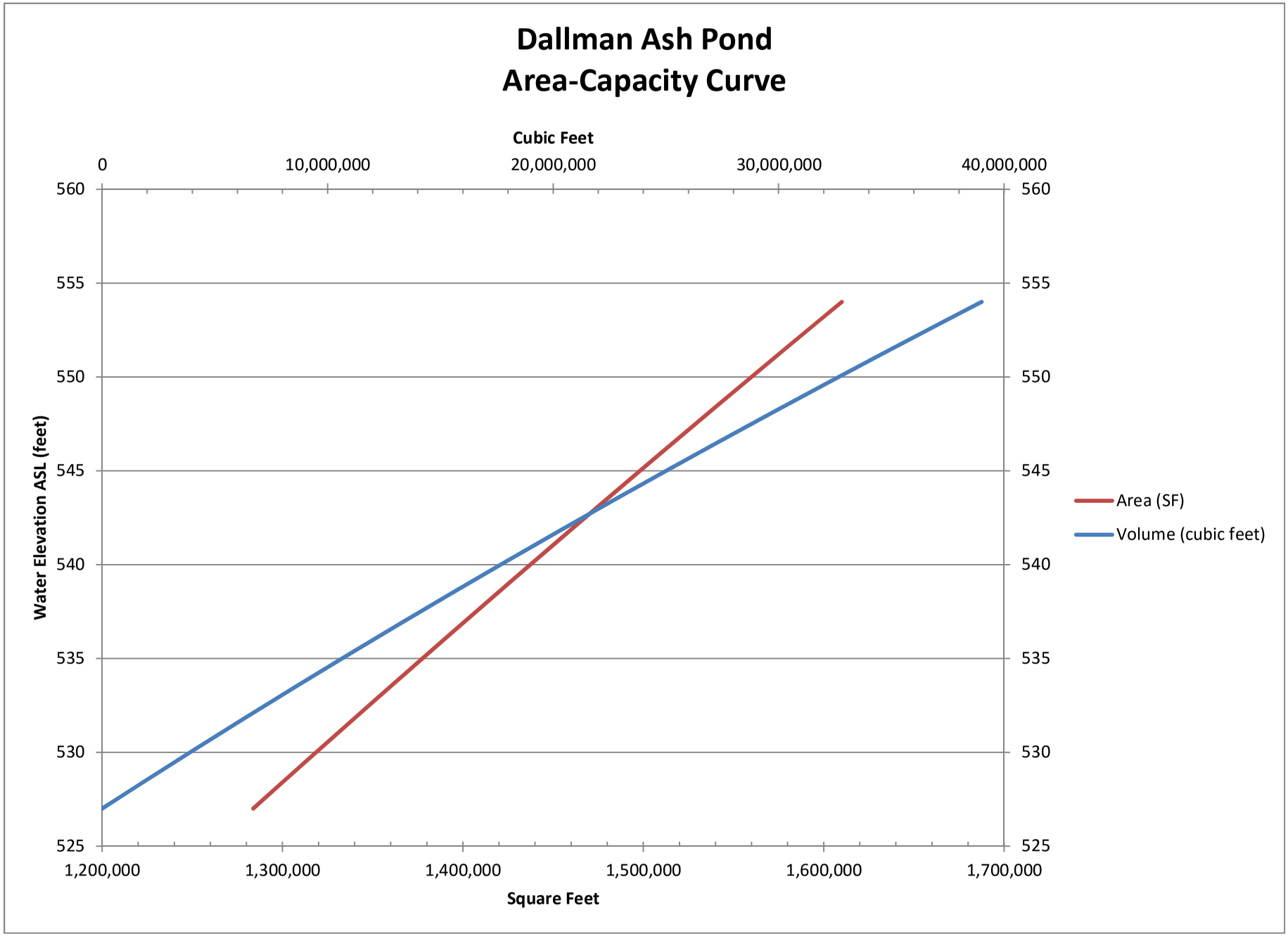
FIG. 1


0
150
SCALE
RISER AND OUTFALL
RISER AND OUTFALL
LAKESIDE ASH POND
NORMAL OPERATING POOL ELEVATION : 564.00' ASL
MAXIMUM POOL ELEVATION : 564.00' ASL
MAXIMUM DEPTH : 29.00' ASL
DALLMAN ASH POND
NORMAL OPERATING POOLELEVATION : 551.00' ASL
MAXIMUM POOL ELEVATION : 554.00' ASL
MAXIMUM DEPTH : 27.00' ASL

APPENDIX B

Area-Capacity Curves


Lakeside Ash Pond
Area-Capacity Curve
Cubic Feet
0
5,000,000
10,000,000
15,000,000
20,000,000
25,000,000
30,000,000
Water Elevation ASL (feet)
570
565
560
555
550
545
540
535
530
760,000
780,000
800,000
820,000
840,000
860,000
880,000
900,000
920,000
Square Feet
Area (SF)
Volume (cubic feet)


Dallman Ash Pond
Area-Capacity Curve
Cubic Feet
0
10,000,000
20,000,000
30,000,000
40,000,000
Water Elevation ASL (feet)
560
555
550
545
540
535
530
525
1,200,000
1,300,000
1,400,000
1,500,000
1,600,000
1,700,000
Square Feet
Area (SF)
Volume (cubic feet)