AECOM

October 2016

Illinois Power Generating Company
6725 North 500th Street
Newton, IL 62448

RE: History of Construction
USEPA Final CCR Rule, 40 CFR § 257.73(c)
Newton Power Station
Newton, Illinois

On behalf of Illinois Power Generating Company, AECOM has prepared the following history of construction for the Primary Ash Pond at the Newton Power Station in accordance with 40 CFR § 257.73(c).

BACKGROUND

40 CFR § 257.73(c)(1) requires the owner or operator of an existing coal combustion residual (CCR) surface impoundment that either (1) has a height of five feet or more and a storage volume of 20 acre-feet or more, or (2) has a height of 20 feet or more to compile a history of construction by October 17, 2016 that contains, to the extent feasible, the information specified in 40 CFR § 257.73(c)(1)(i)–(xii).

The history of construction presented herein was compiled based on existing documentation, to the extent that it is reasonably and readily available (see 80 Fed. Reg. 21302, 21380 [April 17, 2015]), and AECOM's site experience. AECOM's document review included record drawings, geotechnical investigations, etc. for the Primary Ash Pond at the Newton Power Station.

HISTORY OF CONSTRUCTION

§ 257.73(c)(1)(i): The name and address of the person(s) owning or operating the CCR unit; the name associated with the CCR unit; and the identification number of the CCR unit if one has been assigned by the state.

Owner: Illinois Power Generating Company

Address: 1500 Eastport Drive
Collinsville, IL 62234

CCR Unit: Primary Ash Pond

The Primary Ash Pond does not have a state assigned identification number.

§ 257.73(c)(1)(ii): The location of the CCR unit identified on the most recent USGS $7^{1}/_{2}$ or 15 minute topographic quadrangle map or a topographic map of equivalent scale if a USGS map is not available.

The location of the Primary Ash Pond has been identified on an USGS 7-1/2 minute topographic quadrangle map in **Appendix A**.

§ 257.73(c)(1)(iii): A statement of the purpose for which the CCR unit is being used.

The Primary Ash Pond is being used to store and dispose of bottom ash and economizer ash and to clarify non-CCR plant process wastewater. A portion of the bottom ash is reclaimed from the Primary Ash Pond for beneficial reuse.

§ 257.73(c)(1)(iv): The name and size in acres of the watershed where the CCR unit is located.

The entire Primary Ash Pond and most of the Newton Power Station are located in the Weather Creek Watershed with a 12-digit Hydrologic Unit Code (HUC) of 051201140504 and a drainage area of 31,573 acres. The other portion of the Newton Power Station is located in the Newton Lake Watershed with a 12-digit Hydrologic Unit Code (HUC) of 051201140503 and a drainage area of 967 acres (USGS, 2016).

§ 257.73(c)(1)(v): A description of the physical and engineering properties of the foundation and abutment materials on which the CCR unit is constructed.

The foundation materials consist of upper clay and lower clay. The physical characteristics properties of the upper clay layer are described as lean clay, fat clay, clayey sand, fat clay with sand, lean clay with sand, silty sand, silty clay, silty clay with sand, sandy lean clay. The upper clay soils exhibit a stiff to hard consistency. The physical characteristics of the lower clay layer are described as glacial till consisting of sandy lean clay, silty sand, clayey silt with sand, silty clay with sand, well graded sand with silt, lean clay, fat clay, clayey sand, silty clay, lean clay with sand, clayey sand with silt, and fat clay with sand. The consistency of the lower clay is very stiff to hard. A summary of the available engineering properties of the foundation materials is presented in **Table 1** below. The engineering properties are based on previous geotechnical explorations and laboratory testing.

Table 1. Summary of Foundation Material Engineering Properties

Material	Unit Weight (pcf)	Effective (drained) Shear Strength Parameters		Total (undrained) Shear Strength Parameters	
		Effective Friction Angle ϕ′ (deg)	Effective Cohesion c′ (psf)	S_u/σ'_c	Minimum C_u (psf)
Upper Clay	130	29	0	0.40 ($\sigma'_c \geq$ 2,000 psf) 0.63 ($\sigma'_c <$ 2,000 psf)	-
Lower Clay	130	33	3,700	-	5,000

The Primary Ash Pond is an enclosed impoundment with embankments and does not have abutments.

§ 257.73(c)(1)(vi): A statement of the type, size, range, and physical and engineering properties of the materials used in constructing each zone or stage of the CCR unit; the method of site preparation and construction of each zone of the CCR unit; and the approximate dates of construction of each successive stage of construction of the CCR unit.

Physical properties for the embankment are described as lean clay, lean clay with sand, silty clay, silty clay with sand, sandy lean clay, fat clay, fat clay with gravel and sand, fat clay with sand and silt, fat clay with sand, and clayey silt. An available summary of the engineering properties of the Primary Ash Pond embankment is presented in **Table 2** below. The engineering properties are based on previous geotechnical explorations and laboratory testing.

Table 2. Summary of Construction Material Engineering Properties

Material	Unit Weight (pcf)	Drained Strength		Undrained Strength
		Effective Friction Angle ϕ′ (deg)	Effective Cohesion c′ (psf)	S_u/σ'_c
Embankment Fill	130	31	0	0.41 ($\sigma'_c \geq$ 500 psf) 1.39 ($\sigma'_c <$ 500 psf)

The method of site preparation and construction of the Primary Ash Pond is not reasonably and readily available.

The approximate dates of construction of each successive stage of construction of the Primary Ash Pond are provided in **Table 3** below.

Table 3. Approximate dates of construction of each successive stage of construction.

Date	Event
1977	Construction of Primary Ash Pond
2009	Both Primary Ash Pond discharge pipes were lined with cured-in-place pipe (CIPP)
2014	Three areas along the interior berm were re-graded and covered with rip-rap

§ 257.73(c)(1)(vii): At a scale that details engineering structures and appurtenances relevant to the design, construction, operation, and maintenance of the CCR unit, detailed dimensional drawings of the CCR unit, including a plan view and cross sections of the length and width of the CCR unit, showing all zones, foundation improvements, drainage provisions, spillways, diversion ditches, outlets, instrument locations, and slope protection, in addition to the normal operating pool surface elevation and the maximum pool surface elevation following peak discharge from the inflow design flood, the expected maximum depth of CCR within the CCR surface impoundment, and any identifiable natural or manmade features that could adversely affect operation of the CCR unit due to malfunction or mis-operation.

Drawings that contain items pertaining to the requested information for the Primary Ash Pond are listed in **Table 4** below. Items marked as "Not Available" are items not found during a review of the reasonably and readily available record documentation.

Table 4. List of drawings containing items pertaining to the information requested in § 257.73(c)(1)(vii).

	Primary Ash Pond
Dimensional plan view (all zones)	S-69
Dimensional cross sections	S-70
Foundation Improvements	Not Applicable
Drainage Provisions	Not Applicable
Spillways and Outlets	S-50
Diversion Ditches	Not Applicable
Instrument Locations	Plate 2, Fig. No. 2A
Slope Protection	S-70
Normal Operating Pool Elevation	Not Available
Maximum Pool Elevation	Not Available
Approximate Maximum Depth of CCR in 2016	49 feet

All drawings referenced in **Table 4** above can be found in **Appendix B** and **Appendix C**.

Based on the review of the drawings listed above, no natural or manmade features that could adversely affect operation of the CCR unit due to malfunction or mis-operation were identified.

§ 257.73(c)(1)(viii): A description of the type, purpose, and location of existing instrumentation.

Existing instrumentation at the Primary Ash Pond include vibrating-wire and open-standpipe piezometers. The purpose of the piezometers is to measure the pore water pressures within and around the impoundment. Two (2) open-standpipe piezometers (B-2 and B-3) were installed in 2010 and the locations are presented on Plate 2 in **Appendix C**. Fourteen (14) vibrating-wire piezometers were installed in 2015 and the locations are presented on Figure 2A in **Appendix C**.

§ 257.73(c)(1)(ix): Area-capacity curves for the CCR unit.

Area-capacity curves for the Primary Ash Pond are not reasonably and readily available.

§ 257.73(c)(1)(x): A description of each spillway and diversion design features and capacities and calculations used in their determination.

The Primary Ash Pond contains two concrete, stop-log weir box structures that discharge to the Secondary Pond. Weir box 1-A is located at the bottom of the embankment and is connected to the lower 30-inch diameter (dia.) cured-in-place pipe (CIPP). Weir Box 1-B is located approximately halfway up the embankment is connected to the upper 30-inch dia. CIPP. Both discharge pipes were originally 30-inch dia. corrugated metal pipe (CMP) and were lined in 2008 (see section § 257.73(c)(1)(xii) below for further information). The lower discharge pipe from weir box 1A passes through the embankment between the Primary Ash Pond and Secondary Pond. The upper discharge pipe from weir box 1B connects to the lower discharge pipe within the embankment. In 2016, the discharge capacity of the Primary Ash Pond was evaluated using HydroCAD 10 software modeling a 1,000-year, 24-hour rainfall event. The results of the HydroCAD 10 analysis are presented below in **Table 5**.

Table 5. Results of HydroCAD 10 analyses

	Primary Ash Pond
Approximate Minimum Berm Elevation[1] (ft)	552.7
Approximate Emergency Spillway Elevation[1] (ft)	Not Applicable
Starting Pool Elevation[1] (ft)	534.0
Peak Elevation[1] (ft)	534.9
Time to Peak (hr)	17.0
Surface Area (ac)	169.0
Storage[2] (ac-ft)	159.4

Note: 1. Elevations are based on NAVD88 datum

2. Storage given is from Starting Pool Elevation to Peak Elevation.

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§ 257.73(c)(1)(xi): The construction specifications and provisions for surveillance, maintenance, and repair of the CCR unit.

The construction specifications for the Primary Ash Pond are not reasonably and readily available.

The provisions for surveillance, maintenance, and repair of the Primary Ash Pond are located in *Operation and Maintenance Manual for Primary and Secondary Ash Ponds* (presented in **Appendix D**).

The operations and maintenance plan for the Primary Ash Pond is currently being revised by Illinois Power Generating Company. This section will be updated when the new operations and maintenance plan is available.

§ 257.73(c)(1)(xii): Any record or knowledge of structural instability of the CCR unit.

In September, 2008, a sinkhole was observed over the Primary Ash Pond discharge pipes. After performing a video inspection, it is believed that an open joint in the primary 30-inch dia. CMP discharge pipe allowed for soil to enter the discharge pipe and cause an internal void in the embankment. The sinkhole was backfilled and compacted with soil and a cured-in-place pipe (CIPP) was installed in both the upper and lower discharge pipes to prevent further internal erosion to the embankment. Following completion of the discharge pipe modification, grout was injected at several locations within the sinkhole to ensure any remaining voids were filled surrounding the discharge pipes. Information about this event can be found in the letter presented in **Appendix E**.

There is no record or knowledge of any other structural instability of the Primary Ash Pond at Newton Power Station.

LIMITATIONS

The signature of AECOM's authorized representative on this document represents that to the best of AECOM's knowledge, information and belief in the exercise of its professional judgment, it is AECOM's professional opinion that the aforementioned information is accurate as of the date of such signature. Any recommendation, opinion or decisions by AECOM are made on the basis of AECOM's experience, qualifications and professional judgment and are not to be construed as warranties or guaranties. In addition, opinions relating to environmental, geologic, and geotechnical conditions or other estimates are based on available data and that actual conditions may vary from those encountered at the times and locations where data are obtained, despite the use of due care.

Sincerely,

Claudia Prado

Claudia Prado
Project Manager

Victor Modeer, P.E., D.GE
Senior Project Manager

REFERENCES

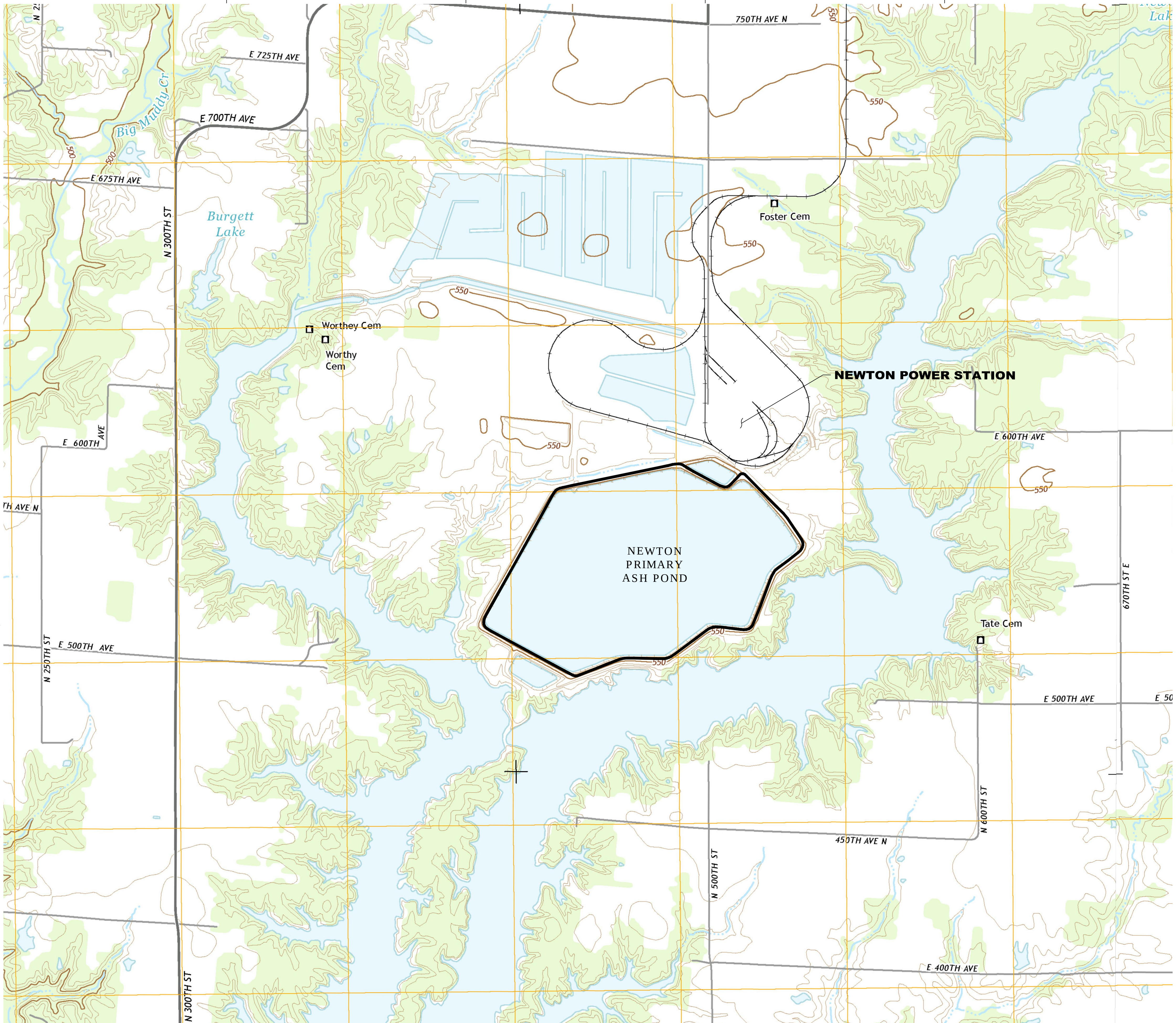
United States Environmental Protection Agency (USEPA). (2015). *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals From Electric Utilities; Final Rule.* 40 CFR Parts 257 and 261, 80 Fed. Reg. 21302, 21380 April 17, 2015.

United States Geological Survey (USGS). (2016). The National Map Viewer. http://viewer.nationalmap.gov/viewer/. USGS data first accessed in March of 2016.

APPENDICES

Appendix A: History of Construction Vicinity Map
Appendix B: Newton Power Station Drawings
Appendix C: Newton Primary Ash Pond Boring and Piezometer Locations
Appendix D: Operation and Maintenance Manual for Primary and Secondary Ash Ponds
Appendix E: Newton Power Plant Site Visit Report 9-12-08, Hanson (2008)

Appendix A: History of Construction Vicinity Map



LEGEND

CCR UNITS

SOURCE:
MAP PROVIDED FROM ELECTRONIC USGS DIGITAL RASTER GRAPHIC 7.5 MINUTE TOPOGRAPHIC MAP OF NEWTON, ILLINOIS AND LATONA, ILLINOIS, REVISED 2015.

QUADRANGLE LOCATION

N

0 1000 2000 3000

SCALE IN FEET

AECOM
1001 Highlands Plaza Drive, Suite 300
St. Louis, Mo. 63110
314 429-0100 (phone)
314-429-0462 (fax)

ILLINOIS POWER GENERATING COMPANY
6725 North 500th St.,
Newton, IL 62448

HISTORY OF CONSTRUCTION

NEWTON POWER STATION
NEWTON, ILLINOIS

ISSUED FOR BIDDING DATE BY

ISSUED FOR CONSTRUCTION DATE BY

REVISIONS

NO.	DESCRIPTION	DATE
△		
△		
△		
△		
△		

AECOM PROJECT NO:	60489731
DRAWN BY:	DJD
DESIGNED BY:	DJD
CHECKED BY:	MN
DATE CREATED:	2016-04-13
PLOT DATE:	
SCALE:	1" = 1000'
ACAD VER:	2014

SHEET TITLE

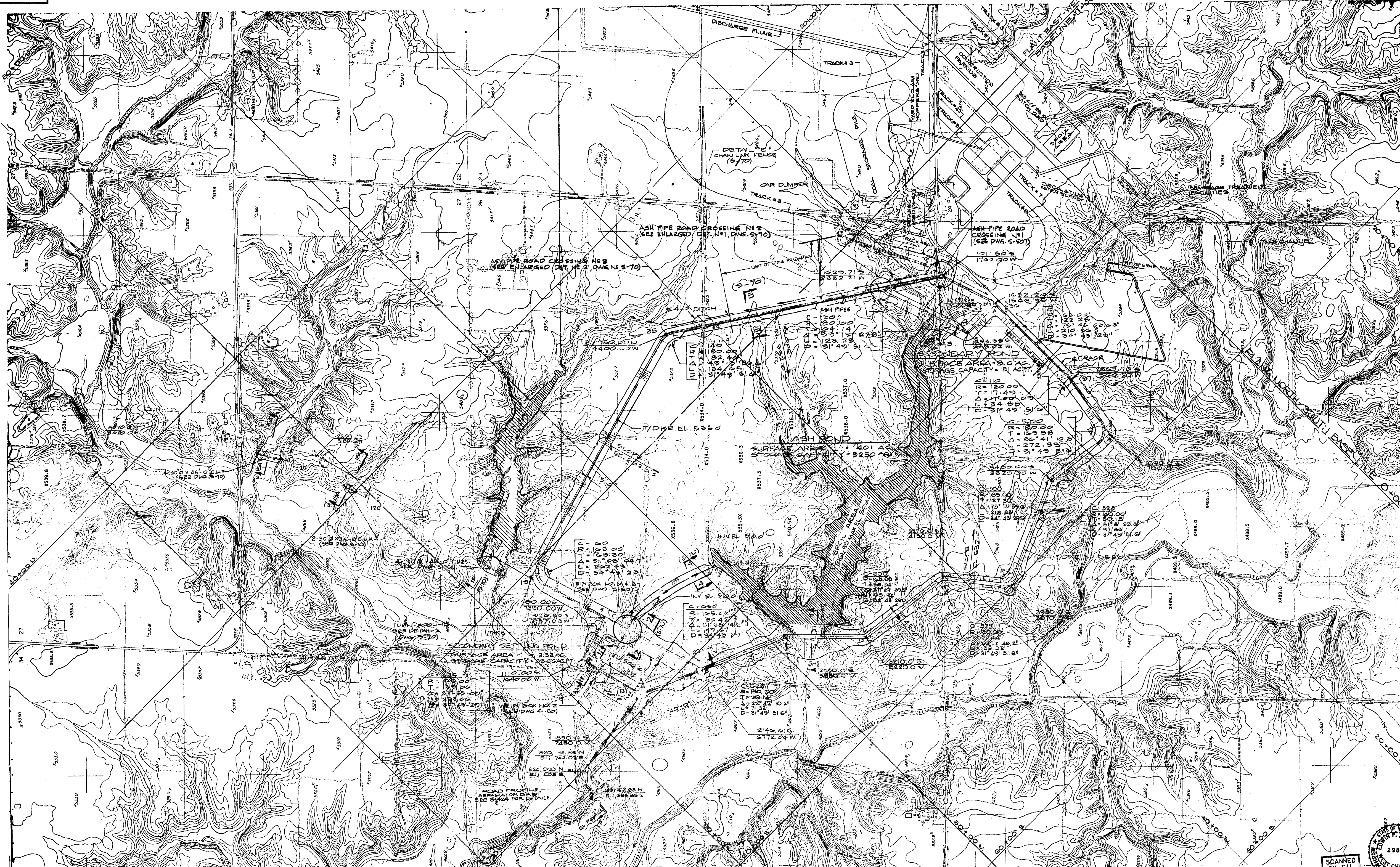
HISTORY OF CONSTRUCTION VICINITY MAP

01

Appendix B: Newton Power Station Drawings

1. "Ash Pond & SO_2 Disposal Pond", Drawing No. S-69, Revision N, 29 July, 1994, Sargent & Lundy Engineers.
2. "Ash Pond Dike, Profile, Details, & Sections", Drawing No. S-70, Revision M, 8 April, 1994, Sargent & Lundy Engineers.
3. "Weir Box Structures at Primary and Secondary Settling Ponds", Drawing No. S-50, Revision K, 25 March, 1994, Sargent & Lundy Engineers.

69-S



POINT NO.	SIDE	CURVE NO.	R	T	Δ	L	D
8	ASH POND		100'	52.87'	49°43' 13.6"	86.78	57°17' 45.60"
8	SECONDARY ASH POND		65'	140.29'	130°16' 46.4"	147.80	88°08' 51.69"
21	LAKESIDE (A)		165'	49.55	33°25' 06.4"	96.27	34°43' 29.00"
21	LAKESIDE (B)		65'	70.49	94°36' 00.0"	107.32	88°08' 51.69"
36	ASH POND (A)		57.5'	57.50	90°00' 00.0"	90.27	99°38' 41.53"
36	SECONDARY (B) POND		57.5	77.59	106°54' 52.35"	107.24	99°38' 41.53"
39	SECONDARY POND		57.5	161.37	140°46' 29.17"	141.21	99°58' 41.53"

PLANT 45° NORTH

NORTH

NOTES

7. THE WATER LEVEL IN ASH POND SHALL BE MAINTAINED AT AN ELEVATION 10'-0" ABOVE THE SEDIMENT LEVEL FOR ENVIRONMENTAL PURPOSES.

NOTES

1. FOR GENERAL NOTES SEE DWG. S-14.
2. ALL WORK SHOWN IN THIS DRAWING SHALL BE DONE BY SUPERSTRUCTURE CONTRACTOR IN ACCORDANCE WITH JOB SPEC. A-3022.
3. ALL EXTERIOR SIDE SLOPES OF DIKE BELOW ELEV. 510.0' THAT IS TO BE CONSTRUCTED BEFORE LAKE FILLING. SHALL BE PROVIDED WITH 24" STONE RIPRAP ON 24" SAND AND GRAVEL FILTER BEDDING AS SHOWN ON DWG. S-70. AND ALL DIKE CONSTRUCTION SHALL BE DONE IN ACCORDANCE WITH JOB SPEC. A-3017 AND A-3022.
4. ALL DIKE TOPS AND SIDE SLOPES AND ALL EXTERNAL DITCHES SHALL BE PROVIDED WITH 4" TOPSOIL AND SEEDED IN ACCORDANCE WITH JOB SPEC. A-3017 AND A-3022.
5. EXISTING LOW AREAS SHALL BE FILLED WITH SPOILMATERIAL AS REQUIRED FOR SPOIL DISPOSAL SPOILS SHALL BE PLACED IN LAYERS AND GRADED PROPERLY FOR DRAINAGE.
6. REMOVED "HOLD" FROM SO_2 POND AREAS FOR CLEARING. SLOPE STAKING & CROSS- SECTIONING ONLY.

REFERENCE DRAWINGS

S-19	SITE CONTOURS AND DEVELOPMENT PLAN SHEET 4.
S-39	GRADING AND DRAINAGE PLAN, PLANT AREA SHEET 2.
S-40	GRADING AND DRAINAGE PLAN, PLANT AREA SHEET 3.
S-50	WEIR BOX STRUCTURES AT PRIMARY AND SECONDARY SETTLING PONDS.
S-70	ASH POND DIKE PROFILE DETAILS & SECTION
S-507	GRADING & DRAINAGE PLAN- PLANT AREA- SHT7.

Drawing Release Record

Rev	Date	Init	Description
N	07-29-94	TM	SCANNED BY S&L
A	11-29-74	CRB	[illegible]
B	2-10-75	[illegible]	REMOVED SO_2 [illegible]
C			HOLD [illegible] DIKE & REMOVE FENCE.
D	7-15-75	[illegible]	[illegible]
E	12-21-75	CRB	REMOVED HOLD OF SO_2 POND
F	7-12-76	CRB	REV. DIKE [illegible]
G	9-13-76	CRB	ADD WEIR BOX [illegible] REMOVE HOLD ON
	—	—	WEIR BOX #1 & #2 DEL. [illegible]
	—	—	REV. ROAD ARRANGEMENT
H	1-24-77	CRB	ADD. SEC. 15-15
J	10-21-77	SPL	SHOWN LIMIT OF STONE RIPRAP
K	11-8-79	[illegible]	REV. STORAGE CAPACITIES CORRESPONDING TO T/DIKE EL. 535.0
L	7-8-80	RTJ	[illegible] REVISION
M	2-20-[illegible]	[illegible]	SENT TO CLIENT

ASH POND & SO_2 DISPOSAL POND
NEWTON POWER STATION UNIT 1
CENTRAL ILL PUBLIC SERVICE CO.
NEWTON, ILLINOIS

SCALE 1" = 400'-0" & U.N.
DRAWN B. SANCHEZ 8-6-74
CHECKED C. R. Bhattacharya 8-6-74
ENGINEER A. J. Skala 8-6-74
APPROVED [illegible] 8-[illegible]-74
JOB NO. 4136-03 4136-15 [illegible]

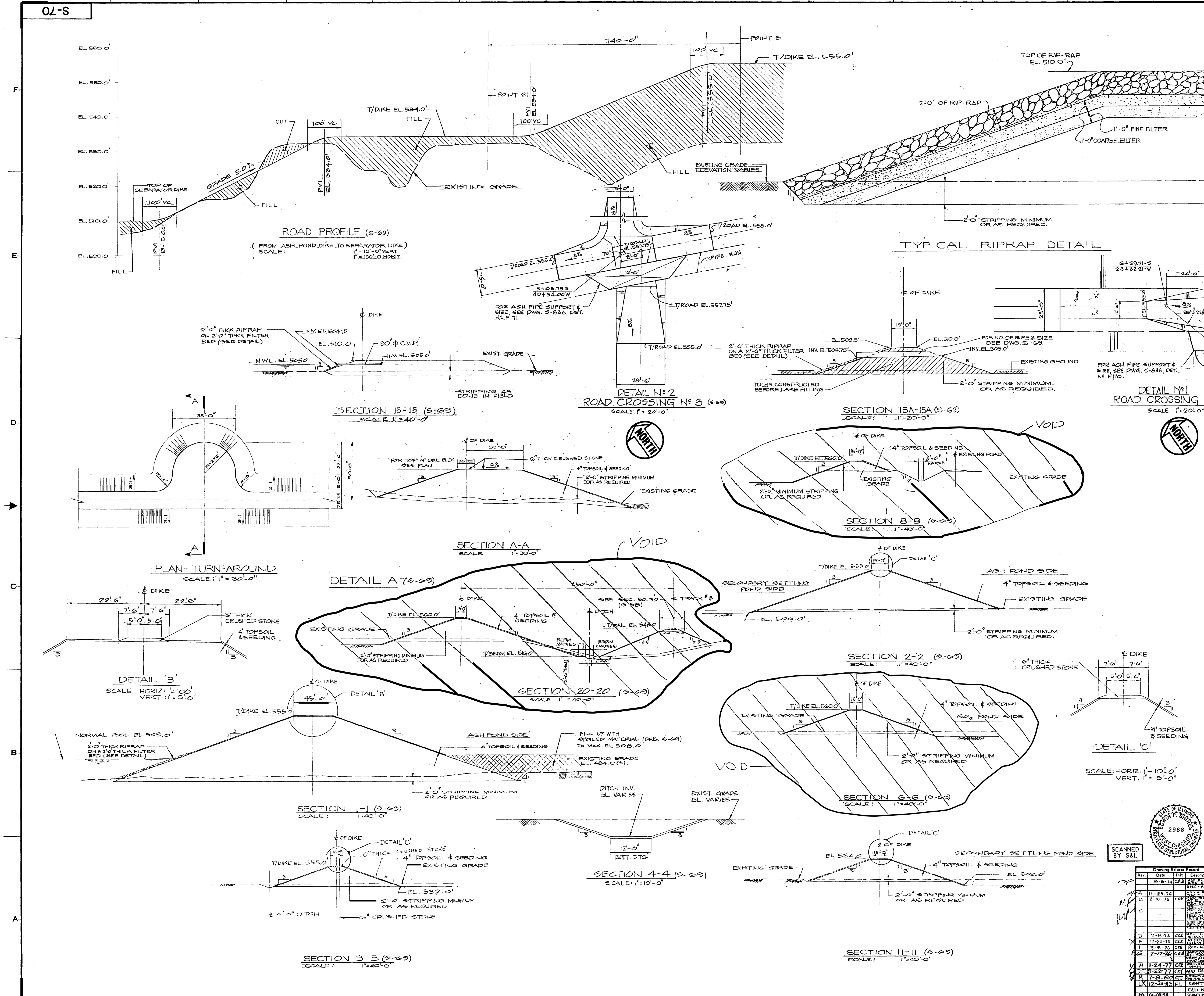
SARGENT & LUNDY ENGINEERS CHICAGO

DRAWING NO. S-69

STATE OF ILLINOIS EDWIN P. SHIRES 2988 WEST CHICAGO REGISTERED STRUCTURAL ENGINEER

SCANNED BY S&L

S-70



NOTES

1. FOR GENERAL NOTES SEE DWG S-14.
2. ALL DIKE CONSTRUCTION SHALL CONFORM TO THE REQUIREMENTS AND SHALL BE DONE IN ACCORDANCE WITH JOB SPEC. A-3017.
3. ALL SIDE SLOPE OF DIKES AND DITCHES SHALL BE 3:1, UNLESS NOTED, AND SHALL BE PROVIDED WITH 4" TOP SOIL AND SEEDED IN ACCORDANCE WITH JOB SPEC. A-3017 AND A-3022.
4. STONE RIPRAP SHALL BE DONE AS INDICATED IN THIS DRAWING AND SHALL BE IN ACCORDANCE WITH JOB SPEC. A-3017.
5. ALL DIKE FILL SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS FOR COMPACTED FILL TYPE CC-F2.

REFERENCE DRAWINGS

S-69	ASH POND AND SO_2 DISPOSAL POND.
S-836	ASH PIPE SUPPORTS - SECTIONS & DETAILS - SHT. 2

STATE OF ILLINOIS · EDWIN P. SHIRES · 2988 · WEST CHICAGO · REGISTERED STRUCTURAL ENGINEER

SCANNED BY S&L

Drawing Release Record

Rev.	Date	Init.	Description
	8-6-74	CRB	ASH BASIN DIKE CONST. SPEC - A-3022
A	11-29-74		APP. & REV. SECTION
B	2-10-75	CRB	ADD BERM AT EL. 544.0 REV. DIKE SECTIONS
C			REV. DIM. OF FILTER BED; HOLD ON SEC. 15, 8-8 & 6-6; VOID DET. E & REV. DIKE X-SECTIONS
D	7-15-75	CRB	REV. DIKE ELEVATION
E	12-24-75	CRB	REMOVED HOLD OF SO_2 POND
F	3-8-76	CRB	REV. SEC. 8-8
G	7-12-76	CRB	REV. DIKE EL. REMOVE NOTE A & C VOID SECT.
H	1-24-77	CRB	REV. SECTION 15-15
J	8-22-77	SKT	ADD DET. B & C
K	7-8-80	RJJ	EXTEND ROAD FOR PIPE CROSSING
L	12-20-83	FL	SENT TO CLIENT
M	04-08-94		SCANNED BY S&L

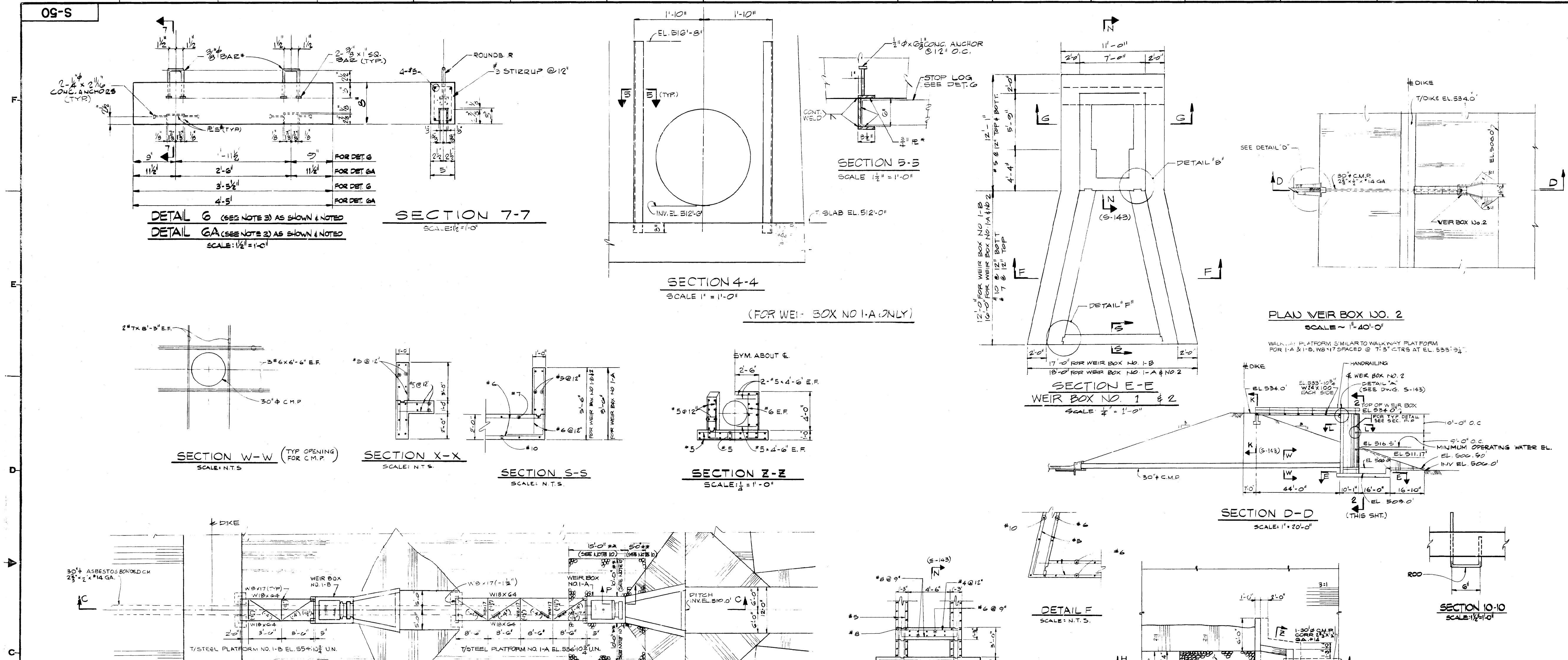
ASH POND DIKE
PROFILE, DETAILS & SECTIONS
NEWTON POWER STATION UNIT 1
CENTRAL ILL. PUBLIC SERVICE CO
NEWTON, ILLINOIS

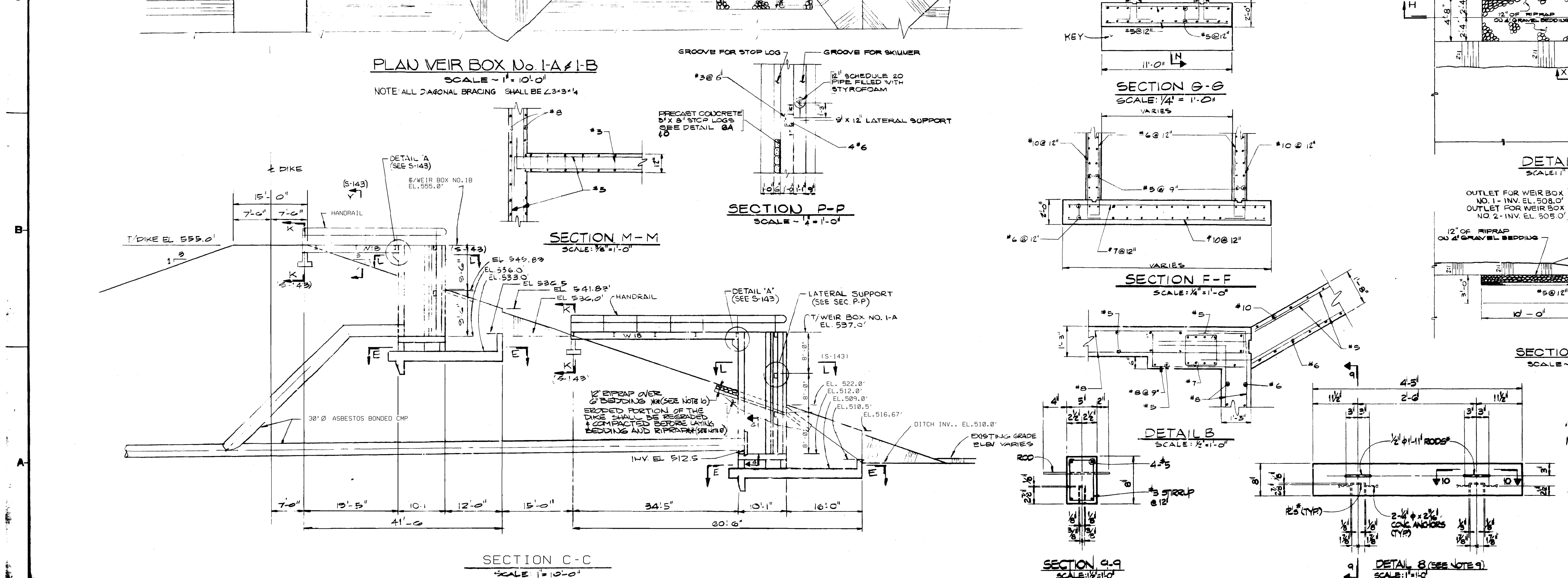
SCALE AS NOTED
DRAWN RMSIO 8-6-74
CHECKED C.R. Bhattacharya 8-6-74
ENGINEER A.J. Skale 8-6-74
APPROVED E.P. Shires 8-6-74

JOB NO. ~~4486-03~~ 4527-00

SARGENT & LUNDY ENGINEERS CHICAGO

DRAWING NO. S-70





NOTES

1. FOR GENERAL NOTES SEE DWG. S-14
2. NUMBER OF STOP LOGS REQUIRED FOR DET. 6A
   FOR WEIR BOX 1A 19 STOP LOGS REQUIRED
   18 S.L. FUTURE
   FOR WEIR BOX 1B 14 S.L. REQUIRED
   14 S.L. FUTURE
   FOR WEIR BOX 2 20 S.L. REQUIRED
   21 S.L. FUTURE
3. NUMBER OF STOP LOGS REQUIRED FOR DET. 6
   FOR WEIR BOX 1A 4 S.L. REQUIRED
   3 S.L. FUTURE
4. ALL WORKS SHOWN IN THIS DRAWING SHALL BE DONE BY SUPERSTRUCTURE CONTRACTOR IN ACCORDANCE WITH SPECIFICATION A-3094 UNLESS NOTED.
5. STONE RIPRAP SHALL BE DONE TO CONFORM WITH THE DIMENSION AS SHOWN IN THIS DRAWING, UNLESS NOTED, AND SHALL BE IN ACCORDANCE WITH JOB SPECIFICATION A-3017 AND A-3022.
6. WEIR BOX NO. 1-B MAY BE CONSTRUCTED WHEN ASH LEVEL IN THE PRIMARY SETTLING POND REACHES ELEVATION 531.0'.
7. WALKWAY PLATFORM FOR WEIR BOX NO. 1-A HAS BEEN DESIGNED TO BE REUSED FOR WEIR BOX NO. 1-B, AFTER CUTTING OFF 15'-0" FROM THE WEST END. SEE DETAIL "A" AND SECTION S-S (DWG. S-143) FOR END DETAILS.
8. *INDICATES THE STEEL TO BE GALVANIZED ACCORDING TO S&L STANDARD 1743.
9. NUMBER OF STOP LOGS REQUIRED FOR DET. 8.
   FOR WEIR BOX 2-1 S.L. REQUIRED. STOP LOG SHALL BE USED WITH & IMMEDIATELY BELOW THE FLOW MEASURING WEIR ONLY.
10. **DENOTES WORK TO BE DONE BY THE "EROSION REPAIR WORK CONTRACTOR" IN ACCORDANCE WITH S&L SPEC. 6121-001.

REFERENCE DRAWINGS

S-64	WEIR BOXES PLANS, SECTIONS & DETAILS
S-69	ASH POND & SO_2 DISPOSAL POND
S-70	ASH POND DIKE, PROFILE, DETAILS & SECTIONS
S-143	OIL SEPARATOR & WEIR BOX SECTIONS & DETAILS

SCANNED BY S&L

Drawing Release Record

Rev.	Date	Init.	Description
	12-16-74	CRB	FOR CONST.
A	2-10-75	CRB	REV. SKIMMER DETAIL FOR 12"Ø PIPE.
B	3-25-75	CRB	ADD DETAILS
C	7-16-75	CRB	REV. WEIR BOX ON SEC. POND
D	8-6-76	K.F.	ADDED DETAILS OF STL. EMBMT.
E	9-17-76	K.F.	ADDED KEYS AND REV. DETAILS
F	1-26-77	K.F.	REV. OUTLET WORK STRUCTURE
G	10-21-77	K.F.	REMOVE DET. C & SECT. J-J ADD DET 6A, DET 8 SEC. 9-9 & SEC. 10-10
H1	3-26-79		FOR CLIENT COMMENTS
H	7-16-79	KJF	FOR CONST.
J	12-20-83	FL	SENT TO CLIENT
K	03-25-94		SCANNED BY S&L

WEIR BOX STRUCTURES AT PRIMARY AND SECONDARY SETTLING PONDS
NEWTON POWER STATION UNIT 1
CENTRAL ILL. PUBLIC SERVICE CO.
NEWTON, ILLINOIS

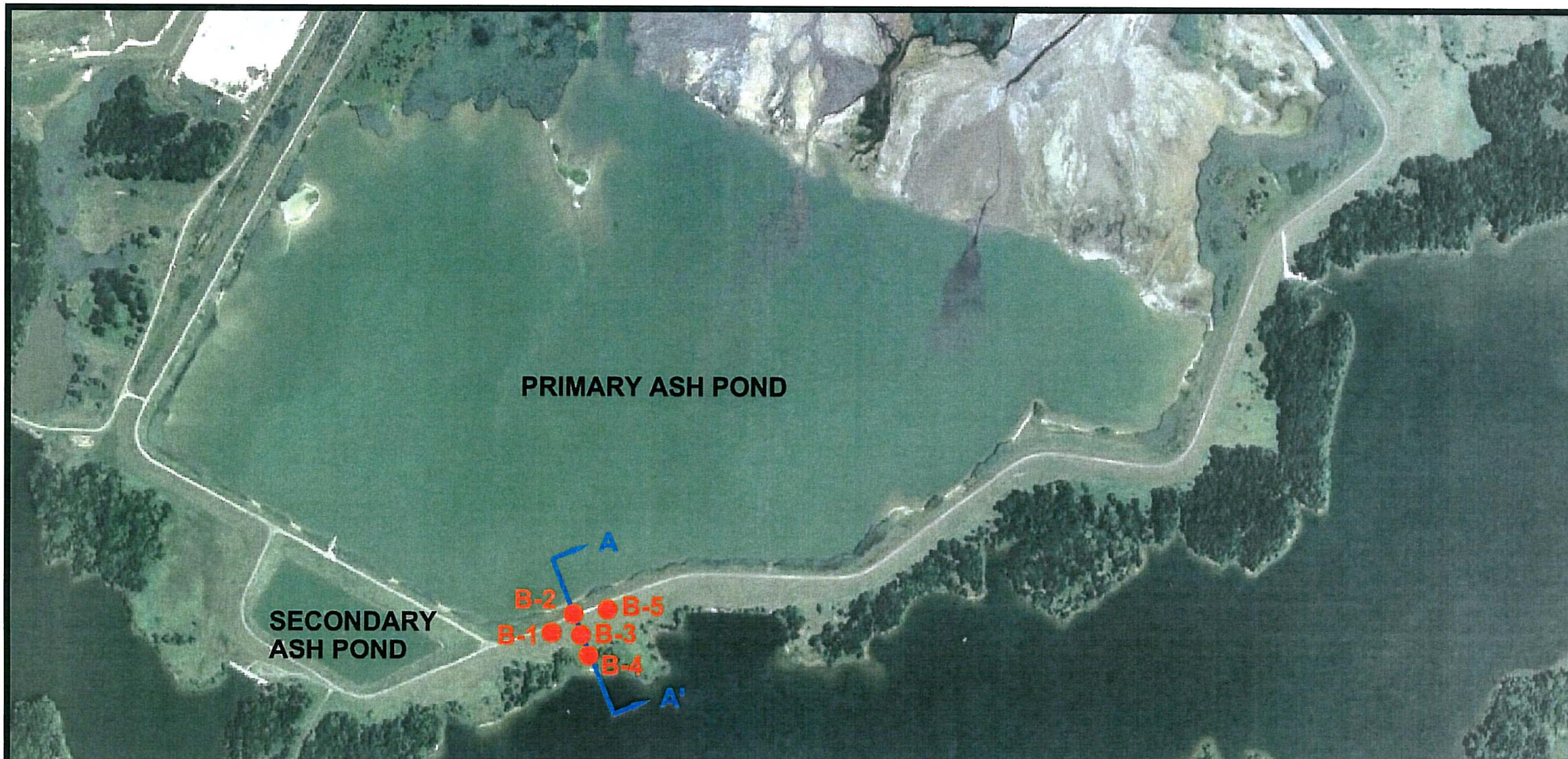
SCALE: AS NOTED
DRAWN: B. SANCHEZ 12-16-74
CHECKED: C. R. Bhattacharya 12-16-74
ENGINEER: A. J. Skale 12-18-74
APPROVED: E. L. Shires 11-12-79

SARGENT & LUNDY ENGINEERS CHICAGO

JOB NO. 4486-03

DRAWING NO. S-50

Appendix C: Newton Primary Ash Pond Boring and Piezometer Locations



NOTES

1. Plan adapted from an aerial photograph courtesy of Google Earth.

LEGEND

● Boring Location

Slope Stability Cross Section

0 400 800 1,600

SCALE IN FEET

N

Drawn By: SLC	Ck'd By: SLC	App'vd By: SLC
Date: 11-10-10	Date: 12/21/10	Date: 1/4/11

GEOTECHNOLOGY INC
FROM THE GROUND UP

Newton Power Station
Newton, Illinois

AERIAL PHOTOGRAPH OF SITE AND BORING LOCATIONS

Project Number J017150.01

PLATE 2

XXX–X### — EXPLORATION METHOD (B=BORING, C=CPT, P=PIEZOMETER); ID NUMBER; STATION ABBREVIATION

SOURCE:
MAP PROVIDED BY GOOGLE EARTH PRO 2015

LEGEND

PIEZOMETER LOCATION

CCR UNIT BERM ALIGNMENT

0 600

APPROXIMATE SCALE FEET

N

Illinois Power Generating Company		PROJECT NO. 60440378
AECOM		
DRN. BY: djd October 2015 DSGN. BY: eg CHKD. BY: eg	Newton Primary Ash Pond Piezometer Locations	FIG. NO. 2A

File: P:\PROJECTS\GEOTECH\60428794_DYNEGYCCR\04TASKS\00 PROGRAM TASKS\1.0 TASK 1 INITIAL UNIT ASSESSMENT\CCR FACT SHEETS\SITE MAPS\FIGURE 2A PIEZOMETER LOCATION PLAN (NEWTON PRIMARY ASH POND).DWG Last edited: NOV. 04, 15 @ 1:32 p.m. by: david_deguire

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Appendix D: Operation and Maintenance Manual for Primary and Secondary Ash Ponds

Newton Power Station

Operational Procedure

x-xxx-xxxx--xxx

Operation & Maintenance Manual for Primary and Secondary Ash Ponds

Effective Date: xx/xx/xxxx

Reason for Change: New Procedure

Approved By: *x* Date: xx/xx/xxxx

x
Lindel Wenthe

Responsible Department: Newton Power Station, Technical Services Department

- ☐ This entire document shall be in the field during procedure performance.
- ☐ The following portions of this procedure shall be in the field during procedure performance: ______________________
- ☐ __________ from this procedure shall be in the field during procedure performance.
- ☐ No part of this procedure is required to be in the field during procedure performance.

Table of Contents

1.0 Purpose

1.1 This procedure is intended to ensure the safe and environmentally responsible operation and use of all water impoundment and levee structures at Newton Power Station facility. The primary purpose of Newton's Primary, Secondary Ash Ponds, and SO2 Chemical Pond are for the storage of fly ash and treatment of fly ash sluice water to meet NPDES Permit Conditions. This procedure then assures:

1.1.1 The embankment structures and flow regulating structures are properly operated and maintained.

1.1.2 Inspections of these structures are conducted.

1.1.3 A maintenance program will be performed.

1.1.4 Communication takes place with the Dam Safety Staff regarding the structures' condition and operation.

2.0 Scope

2.1 This procedure applies to all onsite personnel and the Dam Safety Group staff.

3.0 Responsibilities

3.1 On-site Technical Services – Conducts ash pond and levee embankment and structure observations and completes the inspections, reporting any undesirable conditions to the Supervising Engineer, Dam Safety.

3.2 On-site personnel – Operates the facilities as described in this Operational Procedure. Reports any conditions noted during routine activities to the shift supervisor. Coordinates scheduling of maintenance as required to maintain proper operations of the ash pond facility.

3.3 Shift Supervisor (SS) - Calls Technical Service personnel when structure concerns are reported. Make entries into the shift log book indicating the concern and actions taken.

3.4 Supervising Engineer, Dam Safety - Conducts annual detailed dam safety inspections and provides a report with findings and recommendations.

4.0 Historical Information

4.1 Construction began in 1972 and concluded in 1982. Unit 1 was placed in service in 1977; Unit 2 went into commercial operation in 1982.

5.0 Flow Regulating Structures

5.1 Embankments

- Primary Ash Pond (Bottom Ash)
  Top of ash pond berm elevation was designed at Elevation 555.00'. Therefore, normal high pool elevation is 450.00. This allows for 2.9 feet of storage depth over the top of the ash pond outlet structure; or approximately 116 acre-ft storage or 37,850,000 gallons (45% of 89 acres times 2.9' deep).

- Secondary Ash Pond (Bottom Ash)

5.2 Structures

- Primary Ash Pond Outlet Structures - The water level in the pond is regulated by stop logs in the concrete outlet structures on the south side of the Primary Ash pond. Plans showing the outlet structures and walkways are on file. The main pond outlet structure shall be checked regularly (at least weekly or more often if there are excessive rain events) to ensure proper pond discharge. Elevation of the top of the main structure is 537.00'. Elevation of the walkway is 537.00'. Normal depth of flow over the drop structure is 3 to 4 inches during non-rainfall discharge. A 30-inch diameter CMP exits the outlet structure directly to the secondary settling pond.
- Secondary Ash Pond Outlet Structures - The water level in the pond is regulated by the pond outlet structures on the south side of the Secondary Ash pond. Plans showing the outlet structures and walkways are on file. The Secondary Ash Pond outlet structure shall be checked regularly (at least weekly or more often if there are excessive rain events) to ensure proper pond discharge. Elevation of the top of the structure is 534.00'. Elevation of the walkway is 534.00'. Minimum operating water level elevation is 516.50'. Normal depth of flow over the drop structure is 3 to 4 inches during non-rainfall discharge. A 30-inch diameter CMP exits the outlet structure directly to Newton Lake.
- Primary Ash Pond Process Water Discharge Pipe – This culvert regulates the level of water in the Primary Ash Pond. There are two possible inlets in the Primary ash pond outlet structures. Inlet Flowline elevations of the Primary Ash Pond pipe are 512.50' and 536.00'. Both inlets are connected into the same 30" CMP roughly halfway through the embankment. The outlet elevation of these combined pipes is 508.00'. These combined pipes failed once in the past at the point of connection of the top pipe into the main pipe and caused the embankment to erode from the inside and

caused a sinkhole to develop. The solution that was devised to deal with the problem was to line the entire 30" CMP with a cured in place liner. This rehabilitated the corrugated metal pipe and restored the interior integrity of the outlet pipe. The embankment was then filled with clam material and returned to service.

- Secondary Ash Pond Bottom Ash/Process Water Culvert Pipe – This 30" corrugated metal culvert pipe regulates the level of water in the Secondary Ash Pond. This pipe was also lined with a cured in-place liner. Inlet flowline elevation of the Secondary Ash Pond outlet pipe is 506.00'. The outlet elevation of this pipe is 505.00'.

6.0 Operations Requirements

Normal Operation - Plant personnel shall monitor the level of all ash pond basins within the perimeter ash pond berm on a daily basis. If levels within any of the basins exceed the prescribed maximum levels, action shall be taken immediately to remedy the situation.

Normal Operating Levels	
Primary Ash Pond Outlet	508'
Secondary Ash Pond Outlet Structure	505'
Primary Ash Pond Water Level	536'
Secondary Ash Pond Water Level	516.5'

Emergency Conditions – If a condition arises where there is a possibility of an embankment failure, then the following procedures will be followed:

1. Notify the Supervising Engineer Dam Safety immediately.
2. The pond level will be lowered by portable pumps. Monitor the embankment for changed conditions.
3. Initiate Emergency Action Plan

7.0 Maintenance Requirements

7.1 Maintenance Program - The plant's impoundment and flood prevention structures shall be inspected and maintained in a manner to ensure safe and environmentally responsible operations. A regular maintenance program shall be performed and shall consist of the following inspection items:

1. Earth embankments: Walk the crest, side slopes, and downstream toe of the dam concentrating on surface erosion, seepage, cracks, settlement, slumps, slides, and animal burrows. Frequency of inspection: Quarterly.

2. Vegetation: Grass should be a thick vigorous growth to stabilize the earth embankment soils and prevent erosion form occurring. Note the height of the grass; if greater than one foot a mowing of the area should be scheduled before the next inspection. There should be NO trees on the earth embankment and none within a minimum of 20 feet of the embankment toe or other structures. Frequency of inspection: Weekly.
3. Pond Outlet Structure: Check for any debris or other obstructions around the concrete inlet which may block or restrict the flow of water. Check for the development of any rusty areas on the concrete, and seepage, cracking, breaking, or spalling of concrete. Check for settlement or cracking in the walkway structure. Frequency of inspection: Monthly.
4. Outlet Pipe Slide Gate: Check the structure for development of any rusty areas on the concrete, and seepage, cracking, breaking, or spalling of concrete. Check the slide gate stem, grease the stem, and operate the slide gate through its full range of motion to ensure proper operation. Check for buildup of debris in the manhole. Frequency of inspection: Quarterly.
5. Pond/Levee Perimeter: Check the perimeter of the embankment and levee for a distance of at least 100 feet from the toe for signs of seepage or boils. Inspection frequency for levee will be determined by Dam Safety Engineer during flood events. Frequency of ash pond embankment inspection: Quarterly for ash pond embankment.
6. Special Inspections – Special inspections of ash pond berms shall be performed after earthquakes, floods, water level exceedance in the ponds, or heavy rainfall events. Inspection and report shall be equal to an annual inspection level of detail. Water level in the pond should be noted after a heavy rainfall. Dam Safety staff shall accompany plant personnel on special inspections. Frequency: As required.

8.0 Maintenance Logs

8.1 Plant personnel shall maintain an up-to-date log of operations (water levels, gate adjustments, inlet and outlet flows, serpentine channels, etc.), visual observations, unusual occurrences, and maintenance performed. The log book shall be reviewed during the Annual Engineering Inspection. Logs shall be kept for the life of the plant.

9.0 Contact Numbers

Plant Environmental Supervisor: David Heath / 618-783-0311
Plant Shift Supervisors Office: 217-783-0344

Plant Control Room: 217-783-0501 / 217-783-0502
Supervising Engineer Dam Safety: Steve Bluemner / 314-554-6298
Dam Safety Staff Contact: Dan Haarmann / 217-371-4853

10.0 References

10.1 AER - DSP-004, “Dam Safety Program for Non-Illinois Department of Natural Resources (non-IDNR) Regulated Facilities”

10.2 Drawings

Drawing Number	Sheet Name	Date
S-50	Weir Box Structures at Primary and Secondary Settling Ponds	12-16-74
S-69	Ash Pond and SO2 Disposal Pond	8-6-74
S-70	Ash Pond Dike Profile, Details & Sections	8-6-74
S-836	Ash Pipe Supports Sections and Details SHT #2	2-8-80

11.0 Records

	Record Type	Responsible Person	Retention Period	Location
11.1	Copies of weekly inspections	Plant Technical Services	Life of plant	Onsite Environmental Supervisor and Dam Safety Department office
11.2	Copies of Quarterly inspections	Plant Technical Services	Life of plant	Onsite Environmental Supervisor and Dam Safety Department office
11.3	Log Book	Plant Technical Services	Life of plant	Onsite Environmental Supervisor office

Appendix E: Newton Power Plant Site Visit Report 9-12-08, Hanson (2008)

MEMORANDUM
(Form QAP 17.2.3, Rev. 2)

TO: Dan Whalen DATE: 9/15/08

FROM: John Jenkins

SUBJECT: Ameren Newton Power Plant
Site Visit Report 9-12-08

On Friday September 12, 2008, I made a site visit to Newton Power Station to observe a sinkhole that has developed on the ash pond dike. I was accompanied by Matt Frerking and Jim Marshall of Ameren.

The sinkhole has developed on the downstream crest of the dike between the primary (upper) and secondary (lower) ash ponds (see attached photos). The sinkhole was first observed the morning of September 12, 2008 after a heavy rain. The sinkhole is circular in shape with a diameter of approximately 12 ft. The depth to the bottom of the sinkhole is estimated to be 10 to 12 ft. The sinkhole has developed directly over the location where two discharge pipes between the primary and secondary ponds are joined (see attached Section C-C). The discharge pipes are 30 in. diameter corrugated metal pipes (CMP) installed in the late 1970's. There was no indication of ground movement in the form of settlement or bulging of the dike embankment outside the area of the sinkhole. The water level in the primary ash pond is approximately El. 536 and the water level in the secondary pond is maintained at minimum El. 516.5. There has been no significant fluctuation of the water levels in either pond for over 6 months. The top of the dike is at El. 555 and the top of the discharge pipe below the sinkhole location is approximately El. 514. Therefore, the depth below the ground surface to the top of the pipe at the sinkhole location is approximately 41 ft.

Based on the location of the sinkhole relative to the discharge pipes and considering the age of the metal pipes, it appears that the most likely cause of the sinkhole is due to loss of soil material through a hole or holes in the discharge pipes. In particular, the connection between the two pipes is suspect. The pipe discharges into the secondary pond below the water level and therefore there is no way to visually observe the discharge for soil deposits. If the cause of the sinkhole is due to loss of material through holes in the pipes, this process could have been occurring over several years. There is the possibility that there is a void or voids that extend from the ground surface to the discharge pipes, and it would be expected that the sinkhole would continue to develop over time. It is possible that additional settlement or sloughing of soil material on the downstream crest of the embankment in the immediate vicinity of the sinkhole will occur in the near future. However, considering the relatively low level of water in the primary ash pond relative to the top of the dike embankment, the dike should remain stable even if local failures in the upper portion of the dike occur.

It was agreed that the following actions be taken.

- The existing sinkhole should be filled with soil material to prevent further sloughing and expanding of the sides of the sinkhole. The material should be placed with a backhoe and compacted with the backhoe bucket. No mechanical compaction of the soil should be attempted. The top of the filled area should be crowned to prevent ponding in the area of the sinkhole, and the sinkhole area should be monitored daily for additional settlement or movement.
- The primary ash pond level should be lowered in order to allow the pipes to be dewatered and inspected by camera. Jim Marshall estimates that it may take more than a week to draw the water down to the required depth.
- Based on the results of the camera survey, a plan for repair of the discharge pipes will be developed. The repair plan may include slipform lining of the pipes and/or excavation to repair isolated areas.
- Due to the unknown extent of the sinkhole void and to the possibility of additional voids being present along the length of the discharge pipe, Hanson will evaluate alternative methods for investigating the presence of voids below the ground surface, including the use of ground penetrating radar.

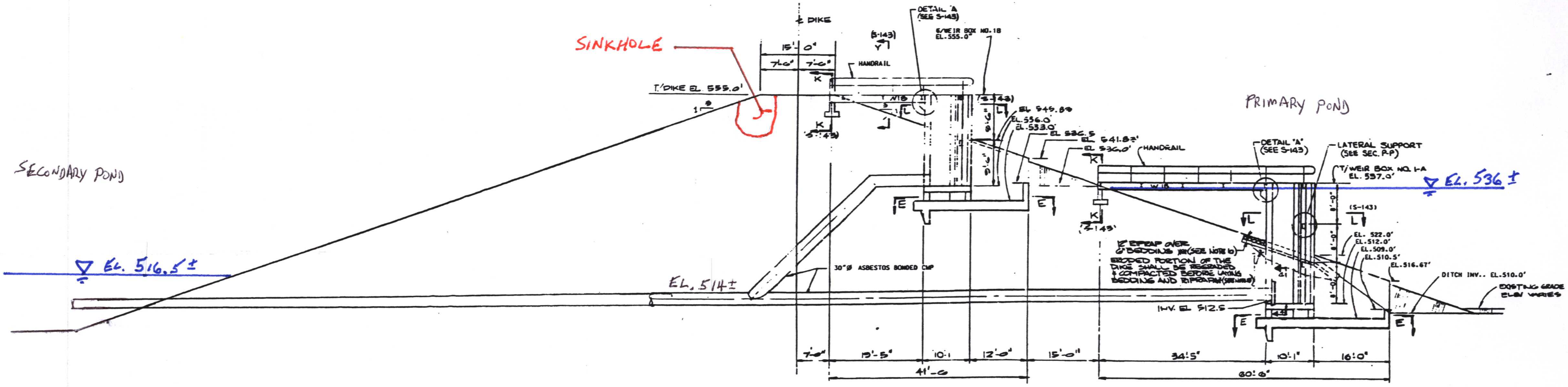
View of Sinkhole Looking Northwest Along Dike

View of Sinkhole Looking Southeast Along Dike

Close-Up of Sinkhole

View of Bottom of Sinkhole

View of Sinkhole Looking Southwest Towards the Secondary Pond and Lake



SECTION C–C
SCALE: 1"=10'-0"