

PERIODIC INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN

391-3-4-.10(5) and 40 C.F.R. Part 257.82

PLANT MCINTOSH ASH POND 1

GEORGIA POWER COMPANY

The Federal CCR Rule, and, for Existing Surface Impoundments where applicable, the Georgia CCR Rule (391-3-4-.10) require the owner or operator of a CCR surface impoundment to design, construct, operate and maintain an inflow design flood control system capable of adequately managing flow during and following the peak discharge of the specified inflow design flood. The owner or operator must prepare an inflow design flood system written plan documenting how the inflow design flood control system has been designed and constructed. *See* 40 C.F.R. § 257.82; Ga. Comp. R. & Regs. r. 391.3-4-.10(5)(b). In addition, the Rules require periodic inflow design flood control system plans within 5 years of development of the previous plan. *See* 40 C.F.R. § 257.82(c)(4); Ga. Comp. R. & Regs. r. 391.3-4-.10(5)(b).

The existing CCR surface impoundment known as McIntosh AP-1 is located in Effingham County, east of Rincon, Georgia on Plant McIntosh property. The Notification of Intent to Initiate Closure was placed in the Operating Record on 4/17/2019 and closure has been designed to have no negative impacts on the inflow design flood control plan. The facility has been undergoing closure by removal, has been substantially dewatered and all CCR has been removed from the impoundment.

AP-1 is subdivided into four cells, known as Cells A, B, C, and D. Cells A, B, and C served as storage cells on an alternating basis and Cell D served as a clear pond for the management of CCR from Plant McIntosh. The inflow design flood consists primarily of the rainfall that falls within the limits of AP-1 as process flows are no longer directed to the impoundment. Stormwater is temporarily stored within the limits of AP-1 then routed to the temporary water treatment system before being discharged through a permitted NPDES discharge point.

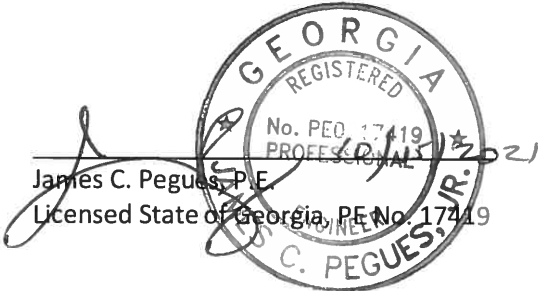
The inflow design flood has been calculated using the Natural Resources Conservation Service (NRCS) method, also known as the Soil Conservation Service (SCS) method, using the 100-yr storm event required for a low hazard potential surface impoundment. Runoff curve number data was determined using Table 2-2A from the Urban Hydrology for Small Watersheds (TR-55). Appendix A and B from the TR-55 were used to determine the rainfall distribution methodology. Precipitation values were determined from National Oceanic and Atmospheric Administration (NOAA) Precipitation Frequency Data Server (Atlas-14).

The NRCS provided information on the soil characteristics and hydrologic groups present at the site. It was determined that the hydrological group "A/D" should be used to best reflect the characteristics of the soils on site. This information was placed into Hydraflow Hydrographs 2019 and used to generate appropriate precipitation curves, storm basin routing information, and resulting rating curves to evaluate surface impoundment capacity.

Resulting calculations indicate AP-1 can safely manage the inflow design storm. This plan is supported by appropriate engineering calculations which are attached.

The facility is operated subject to and in accordance with § 257.3-3 of EPA's regulations.

I hereby certify that the inflow design flood control system plan meets the requirements of 40 C.F.R. § 257.82.



**Inflow Design Control System Plan:
Hydrologic and Hydraulic Calculation Summary**

for

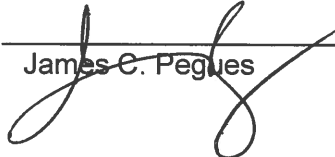
Plant McIntosh Ash Pond

Prepared by:

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Originator:  10/7/21
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Reviewer:  10/7/21
Jeremy K. Brown Date

Approval:  10/7/21
James C. Pegues Date

1.0 Purpose of Calculation

The purpose of this report is to demonstrate the hydraulic capacity of the subject CCR impoundment in order to prepare an inflow design flood control plan as required by the United States Environmental Protection Agency's (EPA) final rule for Disposal of CCR from Electric Utilities (EPA 40 CFR 257) and the State of Georgia CCR Rule (391-3-4-.10).

2.0 Summary of Conclusions

A hydrologic and hydraulic model was developed for Plant McIntosh Ash Pond 1 to determine the hydraulic capacity of the impoundment. The design storm for Plant McIntosh Ash Pond 1 is a 100-year rainfall event. Southern Company has selected a storm length of 24-hours for all inflow design flood control plans. The results of routing a 100-year, 24-hour rainfall event through the impoundment are presented in Table 1 below:

Table 1-Flood Routing Results for Plant McIntosh Ash Pond 1

Plant McIntosh	Normal Pool El (ft)	Top of embankment El (ft)	Principal Spillway Crest El (ft)	Peak Water Surface El (ft)	Freeboard* (ft)	Peak Inflow (cfs)	Peak Outflow (cfs)
Ash Pond	42.0	60.0 – 62.0 (El. Varies)	60.5	43.69	16.31	225.93	0.00

*Freeboard is measured from the top of embankment to the peak water surface elevation

3.0 Methodology

3.1 HYDROLOGIC ANALYSES

Plant McIntosh Ash Pond 1 is classified as a Low Hazard facility under the Federal and State CCR regulations. The design storm for a low hazard structure is a 100-year rainfall event. A summary of the design storm parameters and rainfall distribution methodology for these calculations is summarized below in Table 2.

Table 2. Plant McIntosh Ash Pond Storm Distribution

Hazard Classification	Return Frequency (years)	Storm Duration (hours)	Rainfall Total (Inches)	Rainfall Source	Storm Distribution
Low	100	24	10.1	NOAA Atlas 14	SCS Type III

The drainage area for Plant McIntosh Ash Pond 1 was delineated based on topographic survey data acquired for the Plant in 2021. Runoff characteristics were developed based on the Soil Conservation Service (SCS) methodologies as outlined in TR-55. An overall SCS curve number for the drainage area was developed based on the National Engineering Handbook Part 630, Chapter 9 which provides a breakdown of curve numbers for each soil type and land use combination. Soil types were obtained from the National Resource Conservation Services online soils database. Land use areas were delineated based on aerial photography. Time of Concentration calculations were developed based on the overland flow method as described in

the National Engineering Handbook Part 630, Chapter 15.

A table of the pertinent basin characteristics of Ash Pond 1 is provided below in Table 3.

Table 3—Plant McIntosh Ash Pond 1 Hydrologic Information

Drainage Basin Area (acres)	26.3
Hydrologic Curve Number, CN	98
Hydrologic Methodology	SCS Method
Time of Concentration (minutes)	6
Lag Time (minutes)	Not applicable
Hydrologic Software	Autodesk Hydraflow Hydrographs 2019

Runoff values were determined by importing the characteristics developed above into a hydrologic model with the Autodesk Hydraflow Hydrographs program.

Receipt of process flows from Plant McIntosh ceased in 2019, thus were not considered in this analysis.

3.2 HYDRAULIC ANALYSES

Storage values for Ash Pond 1 were determined by developing a stage-storage relationship utilizing contour data. The spillway system at Ash Pond 1 consists of a series of risers and culverts from the ash settling basins A, B, & C that discharge into Clear Pond D. Clear Pond D has the primary discharge spillway and culvert that discharges outside of Ash Pond 1's containments however it has been partially grouted closed as part of the closure-by-removal construction activities. The series of risers and culverts from the three (3) ash settling basins (A, B, & C) no longer discharge to Clear Pond D as their outlets have also been plugged and will be subsequently removed as part of the closure-by-removal construction activities. The hydraulic analyses assume conditions of the pond receiving a 100-year, 24-hour storm event at normal pool (El. 42.0), and no process flows from the plant. The analyses also assume that Clear Pond D's primary riser has been removed and the culvert has been plugged and the only flow path for pond discharge is overtopping as Ash Pond 1 does not have an emergency spillway of any type.

4.0 SUPPORTING INFORMATION

4.1 CURVE NUMBER

A conservative curve number of 98 was assumed for Plant McIntosh Ash Pond 1 as the pond drainage basin consists of the pond's perimeter road and the pond containment itself.

4.2 TIME OF CONCENTRATION

A time of concentration of 6 minutes was assumed as the Ash Pond has no contributory basin other than its own containment and the water therein. There is no offsite storm water impacting the ash pond basin.

4.3 STAGE-STORAGE TABLE

Pond No. 1 - McIntosh Ash Pond

Pond Data

Contours - User-defined contour areas. Average end area method used for volume calculation. Beginning Elevation = 43.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	43.00	173,621	0	0
1.00	44.00	305,804	239,713	239,713
2.00	45.00	371,852	338,828	578,541
3.00	46.00	424,134	397,993	976,534
4.00	47.00	468,385	446,260	1,422,793
5.00	48.00	505,113	486,749	1,909,542
6.00	49.00	539,880	522,497	2,432,039
7.00	50.00	575,371	557,625	2,989,664
8.00	51.00	612,855	594,113	3,583,777
9.00	52.00	649,198	631,027	4,214,804
10.00	53.00	682,504	665,851	4,880,655
11.00	54.00	714,227	698,365	5,579,020
12.00	55.00	744,332	729,280	6,308,300
13.00	56.00	774,043	759,187	7,067,487
14.00	57.00	803,398	788,721	7,856,208
15.00	58.00	832,256	817,826	8,674,034
16.00	59.00	860,534	846,395	9,520,429
17.00	60.00	910,544	885,541	10,405,970
18.00	61.00	990,265	950,400	11,356,370
19.00	62.00	1,070,000	1,030,130	12,386,500

4.4 RATING CURVE

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	28.00	---	---	---	---	0.00	---	---	---	---	---	0.000
0.20	1,480	28.20	---	---	---	---	0.00	---	---	---	---	---	0.000
0.40	2,960	28.40	---	---	---	---	0.00	---	---	---	---	---	0.000
0.60	4,440	28.60	---	---	---	---	0.00	---	---	---	---	---	0.000
0.80	5,920	28.80	---	---	---	---	0.00	---	---	---	---	---	0.000
1.00	7,401	29.00	---	---	---	---	0.00	---	---	---	---	---	0.000
1.20	8,881	29.20	---	---	---	---	0.00	---	---	---	---	---	0.000
1.40	10,361	29.40	---	---	---	---	0.00	---	---	---	---	---	0.000
1.60	11,841	29.60	---	---	---	---	0.00	---	---	---	---	---	0.000
1.80	13,321	29.80	---	---	---	---	0.00	---	---	---	---	---	0.000
2.00	14,801	30.00	---	---	---	---	0.00	---	---	---	---	---	0.000
2.20	18,114	30.20	---	---	---	---	0.00	---	---	---	---	---	0.000
2.40	21,428	30.40	---	---	---	---	0.00	---	---	---	---	---	0.000
2.60	24,739	30.60	---	---	---	---	0.00	---	---	---	---	---	0.000
2.80	28,052	30.80	---	---	---	---	0.00	---	---	---	---	---	0.000
3.00	31,365	31.00	---	---	---	---	0.00	---	---	---	---	---	0.000
3.20	34,677	31.20	---	---	---	---	0.00	---	---	---	---	---	0.000
3.40	37,990	31.40	---	---	---	---	0.00	---	---	---	---	---	0.000
3.60	41,303	31.60	---	---	---	---	0.00	---	---	---	---	---	0.000
3.80	44,615	31.80	---	---	---	---	0.00	---	---	---	---	---	0.000
4.00	47,928	32.00	---	---	---	---	0.00	---	---	---	---	---	0.000
4.20	52,642	32.20	---	---	---	---	0.00	---	---	---	---	---	0.000
4.40	57,356	32.40	---	---	---	---	0.00	---	---	---	---	---	0.000
4.60	62,070	32.60	---	---	---	---	0.00	---	---	---	---	---	0.000
4.80	66,784	32.80	---	---	---	---	0.00	---	---	---	---	---	0.000
5.00	71,499	33.00	---	---	---	---	0.00	---	---	---	---	---	0.000

4.4 RATING CURVE CONTINUED

5.20	76,213	33.20	--	--	--	--	0.00	--	--	--	--	0.000
5.40	80,927	33.40	--	--	--	--	0.00	--	--	--	--	0.000
5.60	85,641	33.60	--	--	--	--	0.00	--	--	--	--	0.000
5.80	90,355	33.80	--	--	--	--	0.00	--	--	--	--	0.000
6.00	95,069	34.00	--	--	--	--	0.00	--	--	--	--	0.000
6.20	102,627	34.20	--	--	--	--	0.00	--	--	--	--	0.000
6.40	110,186	34.40	--	--	--	--	0.00	--	--	--	--	0.000
6.60	117,744	34.60	--	--	--	--	0.00	--	--	--	--	0.000
6.80	125,302	34.80	--	--	--	--	0.00	--	--	--	--	0.000
7.00	132,861	35.00	--	--	--	--	0.00	--	--	--	--	0.000
7.20	140,419	35.20	--	--	--	--	0.00	--	--	--	--	0.000
7.40	147,977	35.40	--	--	--	--	0.00	--	--	--	--	0.000
7.60	155,535	35.60	--	--	--	--	0.00	--	--	--	--	0.000
7.80	163,094	35.80	--	--	--	--	0.00	--	--	--	--	0.000
8.00	170,652	36.00	--	--	--	--	0.00	--	--	--	--	0.000
8.20	185,680	36.20	--	--	--	--	0.00	--	--	--	--	0.000
8.40	200,708	36.40	--	--	--	--	0.00	--	--	--	--	0.000
8.60	215,736	36.60	--	--	--	--	0.00	--	--	--	--	0.000
8.80	230,764	36.80	--	--	--	--	0.00	--	--	--	--	0.000
9.00	245,792	37.00	--	--	--	--	0.00	--	--	--	--	0.000
9.20	260,819	37.20	--	--	--	--	0.00	--	--	--	--	0.000
9.40	275,847	37.40	--	--	--	--	0.00	--	--	--	--	0.000
9.60	290,875	37.60	--	--	--	--	0.00	--	--	--	--	0.000
9.80	305,903	37.80	--	--	--	--	0.00	--	--	--	--	0.000
10.00	320,931	38.00	--	--	--	--	0.00	--	--	--	--	0.000
10.20	368,085	38.20	--	--	--	--	0.00	--	--	--	--	0.000
10.40	415,239	38.40	--	--	--	--	0.00	--	--	--	--	0.000
10.60	462,394	38.60	--	--	--	--	0.00	--	--	--	--	0.000
10.80	509,548	38.80	--	--	--	--	0.00	--	--	--	--	0.000
11.00	556,702	39.00	--	--	--	--	0.00	--	--	--	--	0.000
11.20	603,856	39.20	--	--	--	--	0.00	--	--	--	--	0.000
11.40	651,010	39.40	--	--	--	--	0.00	--	--	--	--	0.000
11.60	698,165	39.60	--	--	--	--	0.00	--	--	--	--	0.000
11.80	745,319	39.80	--	--	--	--	0.00	--	--	--	--	0.000
12.00	792,473	40.00	--	--	--	--	0.00	--	--	--	--	0.000
12.20	873,856	40.20	--	--	--	--	0.00	--	--	--	--	0.000
12.40	955,240	40.40	--	--	--	--	0.00	--	--	--	--	0.000
12.60	1,036,623	40.60	--	--	--	--	0.00	--	--	--	--	0.000
12.80	1,118,007	40.80	--	--	--	--	0.00	--	--	--	--	0.000
13.00	1,199,390	41.00	--	--	--	--	0.00	--	--	--	--	0.000
13.20	1,280,773	41.20	--	--	--	--	0.00	--	--	--	--	0.000
13.40	1,362,157	41.40	--	--	--	--	0.00	--	--	--	--	0.000
13.60	1,443,540	41.60	--	--	--	--	0.00	--	--	--	--	0.000
13.80	1,524,923	41.80	--	--	--	--	0.00	--	--	--	--	0.000
14.00	1,606,307	42.00	--	--	--	--	0.00	--	--	--	--	0.000
14.20	1,710,728	42.20	--	--	--	--	0.00	--	--	--	--	0.000
14.40	1,815,150	42.40	--	--	--	--	0.00	--	--	--	--	0.000
14.60	1,919,571	42.60	--	--	--	--	0.00	--	--	--	--	0.000
14.80	2,023,993	42.80	--	--	--	--	0.00	--	--	--	--	0.000
15.00	2,128,414	43.00	--	--	--	--	0.00	--	--	--	--	0.000
15.20	2,232,836	43.20	--	--	--	--	0.00	--	--	--	--	0.000
15.40	2,337,257	43.40	--	--	--	--	0.00	--	--	--	--	0.000
15.60	2,441,679	43.60	--	--	--	--	0.00	--	--	--	--	0.000
15.80	2,546,100	43.80	--	--	--	--	0.00	--	--	--	--	0.000
16.00	2,650,521	44.00	--	--	--	--	0.00	--	--	--	--	0.000
16.20	2,777,292	44.20	--	--	--	--	0.00	--	--	--	--	0.000
16.40	2,904,063	44.40	--	--	--	--	0.00	--	--	--	--	0.000
16.60	3,030,833	44.60	--	--	--	--	0.00	--	--	--	--	0.000
16.80	3,157,604	44.80	--	--	--	--	0.00	--	--	--	--	0.000
17.00	3,284,375	45.00	--	--	--	--	0.00	--	--	--	--	0.000
17.20	3,411,146	45.20	--	--	--	--	0.00	--	--	--	--	0.000
17.40	3,537,916	45.40	--	--	--	--	0.00	--	--	--	--	0.000
17.60	3,664,687	45.60	--	--	--	--	0.00	--	--	--	--	0.000
17.80	3,791,458	45.80	--	--	--	--	0.00	--	--	--	--	0.000
18.00	3,918,229	46.00	--	--	--	--	0.00	--	--	--	--	0.000
18.20	4,057,420	46.20	--	--	--	--	0.00	--	--	--	--	0.000
18.40	4,198,611	46.40	--	--	--	--	0.00	--	--	--	--	0.000
18.60	4,335,802	46.60	--	--	--	--	0.00	--	--	--	--	0.000
18.80	4,474,993	46.80	--	--	--	--	0.00	--	--	--	--	0.000
19.00	4,614,184	47.00	--	--	--	--	0.00	--	--	--	--	0.000
19.20	4,753,375	47.20	--	--	--	--	0.00	--	--	--	--	0.000
19.40	4,892,566	47.40	--	--	--	--	0.00	--	--	--	--	0.000

4.4 RATING CURVE CONTINUED

19.60	5,031,757	47.60	---	---	---	---	0.00	---	---	---	---	---	0.000
19.80	5,170,948	47.80	---	---	---	---	0.00	---	---	---	---	---	0.000
20.00	5,310,140	48.00	---	---	---	---	0.00	---	---	---	---	---	0.000
20.20	5,459,822	48.20	---	---	---	---	0.00	---	---	---	---	---	0.000
20.40	5,609,504	48.40	---	---	---	---	0.00	---	---	---	---	---	0.000
20.60	5,759,186	48.60	---	---	---	---	0.00	---	---	---	---	---	0.000
20.80	5,908,868	48.80	---	---	---	---	0.00	---	---	---	---	---	0.000
21.00	6,058,550	49.00	---	---	---	---	0.00	---	---	---	---	---	0.000
21.20	6,208,232	49.20	---	---	---	---	0.00	---	---	---	---	---	0.000
21.40	6,357,914	49.40	---	---	---	---	0.00	---	---	---	---	---	0.000
21.60	6,507,596	49.60	---	---	---	---	0.00	---	---	---	---	---	0.000
21.80	6,657,278	49.80	---	---	---	---	0.00	---	---	---	---	---	0.000
22.00	6,806,960	50.00	---	---	---	---	0.00	---	---	---	---	---	0.000
22.20	6,956,642	50.20	---	---	---	---	0.00	---	---	---	---	---	0.000
22.40	7,106,324	50.40	---	---	---	---	0.00	---	---	---	---	---	0.000
22.60	7,256,006	50.60	---	---	---	---	0.00	---	---	---	---	---	0.000
22.80	7,405,688	50.80	---	---	---	---	0.00	---	---	---	---	---	0.000
23.00	7,555,370	51.00	---	---	---	---	0.00	---	---	---	---	---	0.000
23.20	7,705,052	51.20	---	---	---	---	0.00	---	---	---	---	---	0.000
23.40	7,854,734	51.40	---	---	---	---	0.00	---	---	---	---	---	0.000
23.60	8,004,416	51.60	---	---	---	---	0.00	---	---	---	---	---	0.000
23.80	8,154,098	51.80	---	---	---	---	0.00	---	---	---	---	---	0.000
24.00	8,303,780	52.00	---	---	---	---	0.00	---	---	---	---	---	0.000
24.20	8,453,462	52.20	---	---	---	---	0.00	---	---	---	---	---	0.000
24.40	8,603,144	52.40	---	---	---	---	0.00	---	---	---	---	---	0.000
24.60	8,752,826	52.60	---	---	---	---	0.00	---	---	---	---	---	0.000
24.80	8,902,508	52.80	---	---	---	---	0.00	---	---	---	---	---	0.000
25.00	9,052,190	53.00	---	---	---	---	0.00	---	---	---	---	---	0.000
25.20	9,201,872	53.20	---	---	---	---	0.00	---	---	---	---	---	0.000
25.40	9,351,554	53.40	---	---	---	---	0.00	---	---	---	---	---	0.000
25.60	9,501,236	53.60	---	---	---	---	0.00	---	---	---	---	---	0.000
25.80	9,650,918	53.80	---	---	---	---	0.00	---	---	---	---	---	0.000
26.00	9,800,600	54.00	---	---	---	---	0.00	---	---	---	---	---	0.000
26.20	9,950,282	54.20	---	---	---	---	0.00	---	---	---	---	---	0.000
26.40	10,100,000	54.40	---	---	---	---	0.00	---	---	---	---	---	0.000
26.60	10,250,000	54.60	---	---	---	---	0.00	---	---	---	---	---	0.000
26.80	10,400,000	54.80	---	---	---	---	0.00	---	---	---	---	---	0.000
27.00	10,550,000	55.00	---	---	---	---	0.00	---	---	---	---	---	0.000
27.20	10,700,000	55.20	---	---	---	---	0.00	---	---	---	---	---	0.000
27.40	10,850,000	55.40	---	---	---	---	0.00	---	---	---	---	---	0.000
27.60	11,000,000	55.60	---	---	---	---	0.00	---	---	---	---	---	0.000
27.80	11,150,000	55.80	---	---	---	---	0.00	---	---	---	---	---	0.000
28.00	11,300,000	56.00	---	---	---	---	0.00	---	---	---	---	---	0.000
28.20	11,450,000	56.20	---	---	---	---	0.00	---	---	---	---	---	0.000
28.40	11,600,000	56.40	---	---	---	---	0.00	---	---	---	---	---	0.000
28.60	11,750,000	56.60	---	---	---	---	0.00	---	---	---	---	---	0.000
28.80	11,900,000	56.80	---	---	---	---	0.00	---	---	---	---	---	0.000
29.00	12,050,000	57.00	---	---	---	---	0.00	---	---	---	---	---	0.000
29.20	12,200,000	57.20	---	---	---	---	0.00	---	---	---	---	---	0.000
29.40	12,350,000	57.40	---	---	---	---	0.00	---	---	---	---	---	0.000
29.60	12,500,000	57.60	---	---	---	---	0.00	---	---	---	---	---	0.000
29.80	12,650,000	57.80	---	---	---	---	0.00	---	---	---	---	---	0.000
30.00	12,800,000	58.00	---	---	---	---	0.00	---	---	---	---	---	0.000
30.20	12,950,000	58.20	---	---	---	---	0.00	---	---	---	---	---	0.000
30.40	13,100,000	58.40	---	---	---	---	0.00	---	---	---	---	---	0.000
30.60	13,250,000	58.60	---	---	---	---	0.00	---	---	---	---	---	0.000
30.80	13,400,000	58.80	---	---	---	---	0.00	---	---	---	---	---	0.000
31.00	13,550,000	59.00	---	---	---	---	0.00	---	---	---	---	---	0.000
31.20	13,700,000	59.20	---	---	---	---	0.00	---	---	---	---	---	0.000
31.40	13,850,000	59.40	---	---	---	---	0.00	---	---	---	---	---	0.000
31.60	14,000,000	59.60	---	---	---	---	0.00	---	---	---	---	---	0.000
31.80	14,150,000	59.80	---	---	---	---	0.00	---	---	---	---	---	0.000
32.00	14,300,000	60.00	---	---	---	---	0.00	---	---	---	---	---	0.000

...End

1.4 DRAINAGE BASIN

