Haw Branch Mitigation Project
Onslow County, North Carolina

Year 2 Monitoring Report

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1.0 SUMMARY

This Annual Report details the monitoring activities during the 2007 growing season on the Haw Branch Mitigation Site. Construction of the site was completed in December 2005. The 2007 data represents results from the second year of hydrologic, vegetation, and stability monitoring for both wetlands and streams.

Restoration of the Haw Branch site involves stream restoration, and riverine wetland restoration. Restoration of the site included the construction of a stable meandering channel across hydric agricultural fields. The channel was designed and constructed using natural channel design techniques. Restoration also involved raising the local water table by filling drainage ditches on-site and creation of microtopography across the site. After construction, it was determined that there is 11,169 linear feet of stream restoration and 25.0 acres of riverine wetland restoration.

This Annual Report presents the data from seven hydrologic monitoring stations, twenty vegetation monitoring plots, two crest gauges, a rain gauge, and twenty-one cross sections, as required by the approved Restoration Plan for the site. Four of the hydrologic stations are equipped with manual groundwater gauges and three stations are equipped with automated gauges and a manual calibration gauge.

In 2007, three of seven hydrology monitoring gauges at the site recorded wetland hydroperiods of at least 7 percent of the growing season. The remaining gauges exhibited a wetland hydroperiod for a portion of the growing season, and overall the hydrologic conditions of the site reflect the severe drought conditions in 2007. Prior year results documented monitoring well hydroperiods significantly above the specified success criteria. Considering the abnormal weather in 2007, it was concluded the site hydrology is performing as predicted by the design model.

Weather station data from the Hoffmann Forest Weather Station were used in conjunction with a manual rain gauge located on the site to document local precipitation amounts. The manual gauge is used to validate observations made at the automated weather station. In 2007, the Haw Branch mitigation site experienced extreme drought, consistent with statewide trends. The rainfall total from the Hoffmann gauge was below normal limits in January, March, July, August, September, and November. The on-site gauge was below normal limits for March, June, and August, September, October, and November. At no time did rainfall exceed normal limits and most monthly on-site gauge readings within normal limits, were at the low end and below average. The Hoffman Forest rainfall data for the 2007 January through November shows a cumulative deficit of 20.99 inches below average.

This Annual Report documents vegetation survivability based on twenty vegetation-monitoring plots, as specified in the approved mitigation plan for this site. Twenty monitoring plots that are 10 meter x 10 meters or 0.025 of an acre in size were used to predict survivability of the woody vegetation planted on site. Plots are randomly located to represent the different zones within the project. For 2007, the vegetation monitoring documented a survivability range of 520 stems per acre to 720 stems per acre with an overall average of 664 stems per acre. Overall, the site is on track for meeting the initial vegetation success criteria of 320 stems per acre surviving after the third growing season as specified in the Restoration Plan for the site.

The restored stream channel has remained stable and is providing the intended habitat and hydrologic functions. Four bankfull events were recorded during the year. All monitored cross sections show very little adjustment in stream dimension, and it was concluded that the site remains on track to achieve the stream success criteria specified in the Restoration Plan for the site.

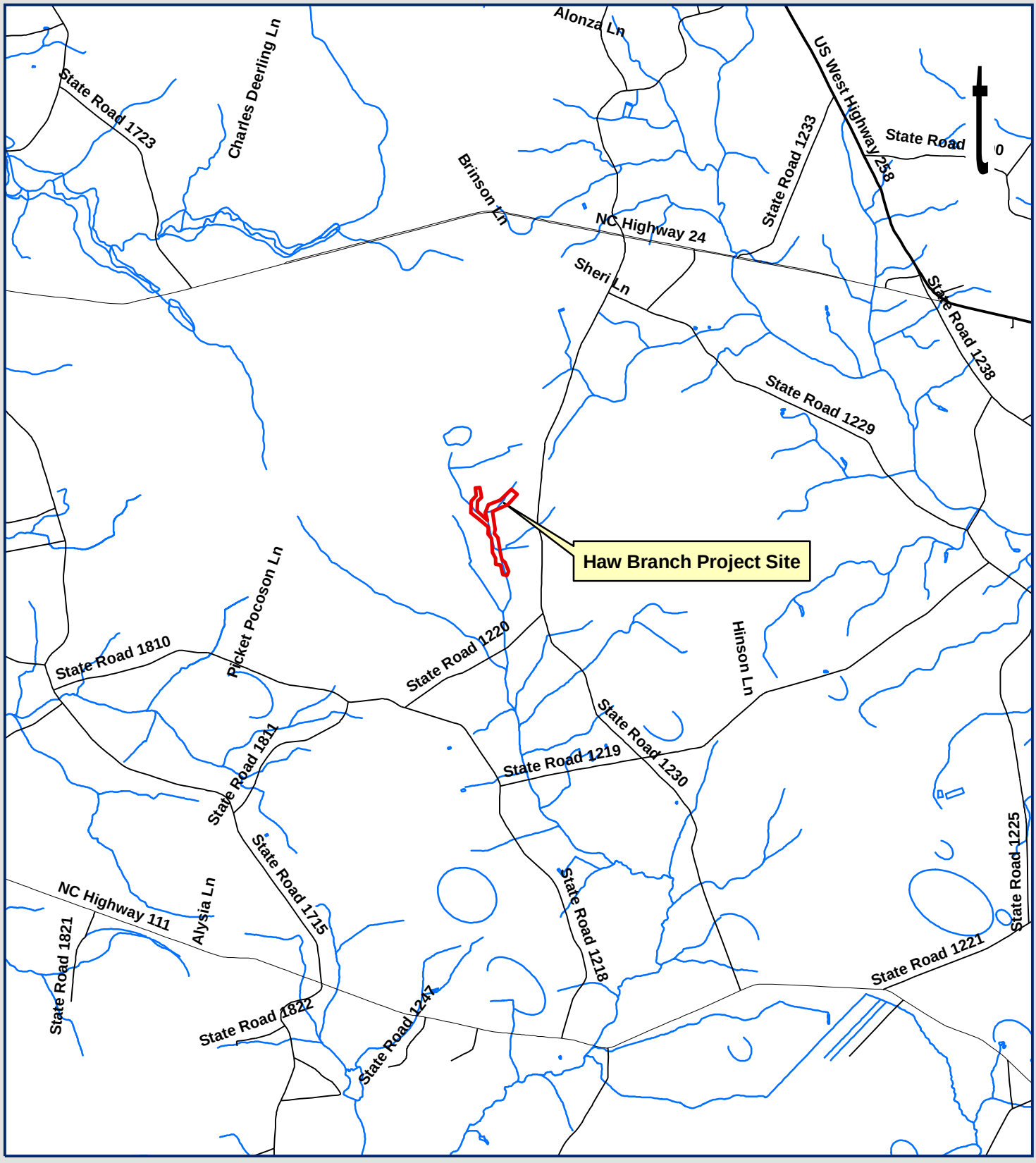


Figure 1.
Haw Branch Stream Mitigation Site
Project Location Map
Onslow County, NC

1 inch equals 1 miles

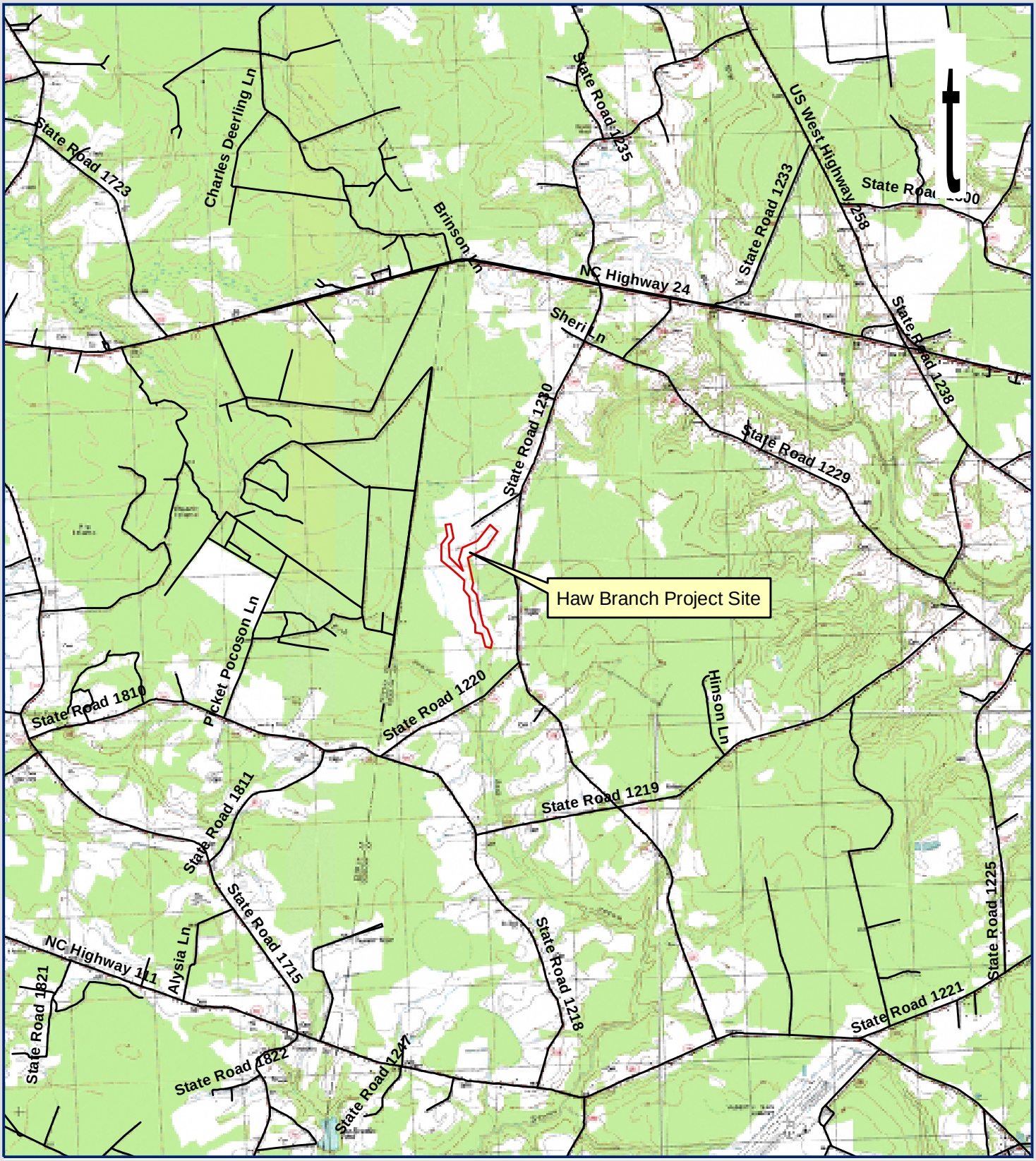
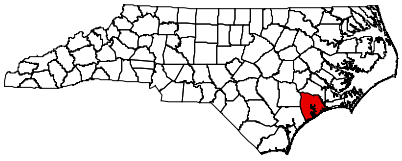


Figure 2.
Haw Branch Stream Mitigation Site
USGS Topographic Map
Onslow County, NC

1 inch equals 1 miles



2.0 INTRODUCTION

2.1 PROJECT DESCRIPTION

The Haw Branch wetland and stream restoration site is located near the community of Richlands in Onslow County, North Carolina (Figure 1 and Figure 2). The site has a past history of agricultural use consisting primarily of row crop agriculture. Ditches on the site were used to increase subsurface drainage when the land was under agricultural production. Construction of the site, including planting of trees, was completed in December 2005. Groundwater, surface water, and rain gauges were functional beginning January 2006. The 2007 monitoring season represents the second year of monitoring for the site. As-built sheets for the Haw Branch Mitigation site are shown in Appendix A.

2.2 PURPOSE

Monitoring of the Haw Branch Site is required to demonstrate successful restoration based on the criteria found in the Restoration Plan and through a comparison to reference site conditions. Hydrologic, vegetation, and stream monitoring are conducted on an annual basis. Success criteria must be met for five consecutive years. Table 1 details the project history and schedule.

Table 1. Project History

Project History	
January 2005	Construction Completed
January 2006	Post-restoration Monitoring Begins
November 2006	1st Annual Monitoring Report
November 2007	2nd Annual Monitoring Report
November 2008 (scheduled)	3rd Annual Monitoring Report
November 2009 (scheduled)	4th Annual Monitoring Report
November 2010 (scheduled)	5th Annual Monitoring Report

3.0 HYDROLOGY

3.1 HYDROLOGIC SUCCESS CRITERIA

As stated in the approved Restoration Plan, to meet the hydrologic success criteria, the monitoring data must show that for each normal year of rainfall within the monitoring period, the site has been inundated or saturated within 12 inches of the soil surface for a minimum of 7 percent of the growing season (17 days). The day count is based on the growing season for Onslow County, which is 239 days long (18 March through 11 November). As specified in the approved Restoration Plan, data are collected from three automated and three manual groundwater gauges. The Restoration Plan further specified that in order for the hydrologic data to be considered successful it must be demonstrated that precipitation is either within or below normal limits.

3.2 DESCRIPTION OF HYDROLOGIC MONITORING EFFORTS

Three manual groundwater gauges, three automated Infinities groundwater gauges, and two manual stream crest gauges were installed across the site prior to the beginning of the 2006 growing season (Figure 3). An additional groundwater gauge was installed at the site for the 2007 growing season. This gauge was recorded as a manual gauge until the automatic gauge was installed on September 24. The monitoring protocol for the site specifies that automated monitoring stations will be downloaded and checked for malfunctions on a monthly basis. During monthly site visits, manual groundwater gauges are read, the crest gauge is read, and rainfall totals are collected from the on-site rain gauge. During the 2007 growing season, all automated loggers performed well and no periods of missing data were incurred. The hydrologic monitoring data are presented in Appendix C.

WETLAND HYDROPERIOD

> 7 %
5–7 %
< 5 %

NAD 83

UT1a

UT1b

UT2

XSEC1
XSEC2
XSEC3
XSEC4
XSEC5
XSEC6
XSEC7
XSEC8
XSEC14
XSEC15
XSEC16
XSEC17
XSEC18
XSEC19

AUTOMATIC WELL #7
AUTOMATIC WELL #3
MANUAL WELL #2
AUTOMATIC WELL #1
MANUAL WELL #4
RAIN GAUGE

VEGETATION PLOT #17
VEGETATION PLOT #18
VEGETATION PLOT #15
VEGETATION PLOT #11
VEGETATION PLOT #16
VEGETATION PLOT #9
VEGETATION PLOT #14
VEGETATION PLOT #13
VEGETATION PLOT #20
VEGETATION PLOT #19
VEGETATION PLOT #10

PA1
PA5
PA6

CONSERVATION EASEMENT
CONSERVATION EASEMENT

Figure 3a

Haw Branch

100 50 0 100 200
SCALE (FT)

UT1b

XSEC9

MATCHLINE SHEET 1B STA. 49+50.00

CONSERVATION EASEMENT

VEGETATION PLOT

VEGETATION PLOT #7

XSEC10

CREST GAUGE #1

VEGETATION PLOT #6

XSEC11

VEGETATION PLOT #5

AUTOMATIC WELL #6

XSEC12

VEGETATION PLOT #4

MANUAL WELL #8

CONSERVATION EASEMENT

PA7

VEGETATION PLOT #3

XSEC13

NAD 83

UT3

PA1

PA2

PA3

VEGETATION PLOT #1

CREST GAUGE #2

PA4

VEGETATION PLOT #2

WETLAND HYDROPERIOD

> 7 %

5–7 %

< 5 %

Figure 3b

Haw Branch

100 50 0 100 200

SCALE (FT)

Automated Gauges
Automatic groundwater gauges record water table elevations twice daily at 08:00 and 20:00 (8:00 AM and 8:00 PM). Infinities gauges employ pressure sensors that record water depth above the bottom of the sensor (with atmospheric pressure compensation). Immediately adjacent to each automatic gauge is a manual calibration gauge. The calibration water table depth is recorded at monthly downloads. To determine wetland hydroperiods the automatically recorded data are compared to the calibration data to determine a standard correction factor between the calibration gauge and the automatic gauge for each location. The standard correction factor is applied to correct daily readings. The corrected daily readings are used to determine wetland hydroperiods.

Manual Gauges
Water table depths are recorded monthly in manual groundwater wells. To calculate wetland hydroperiods, interpolations are made between monthly readings by correlating twice daily automatic gauge readings. Each manual gauge is correlated to an automatic gauge based on proximity, landscape position, and the relationship of their groundwater depth readings (i.e. if their readings are separated by a consistent value). Once the appropriate automatic gauge has been selected a correction factor is calculated for each monthly gauge reading. This correction factor typically varies by several inches on a monthly basis. A daily rate of change between monthly correction factors is calculated to determine the daily correction factor. The daily correction factor is then applied to the automatic gauge readings to calculate an estimated daily water table depth for the manual gauge. These daily readings are used to determine wetland hydroperiods.

Data Interpretation
Wetland hydroperiods are calculated from twice daily water table depth recordings. A wetland hydroperiod is defined as when the water table is equal to or less than 12 inches below ground surface for at least 24 hours. If a water table falls below 12 inches for two consecutive readings (24 hours) then the wetland hydroperiod ends at the last reading within 12 inches. If a water table falls below -12 inches for only one reading then maintains a reading above -12 inches for a minimum of 24 hours then the wetland hydroperiod is calculated continuously. This methodology accounts for minor technical malfunctions occasionally experienced by the automatic gauges.

3.3 RESULTS OF HYDROLOGIC MONITORING

3.3.1 Site Data

The following hydroperiod statistics were calculated for each monitoring station during the growing season: 1) most consecutive days that the water table was within twelve inches of the soil surface; 2) cumulative number of days that the water table was within twelve inches of the soil surface; and 3) number of times that the water table rose to within twelve inches of the soil surface. The results of these calculations are presented in Table 2. Figure 4 provides charts of the water depth for each of the monitoring gauges on the site. Raw hydrograph data collected from the monitoring gauges are provided in Appendix C.

Figure 4a. 2007 Haw Branch Groundwater Gauges

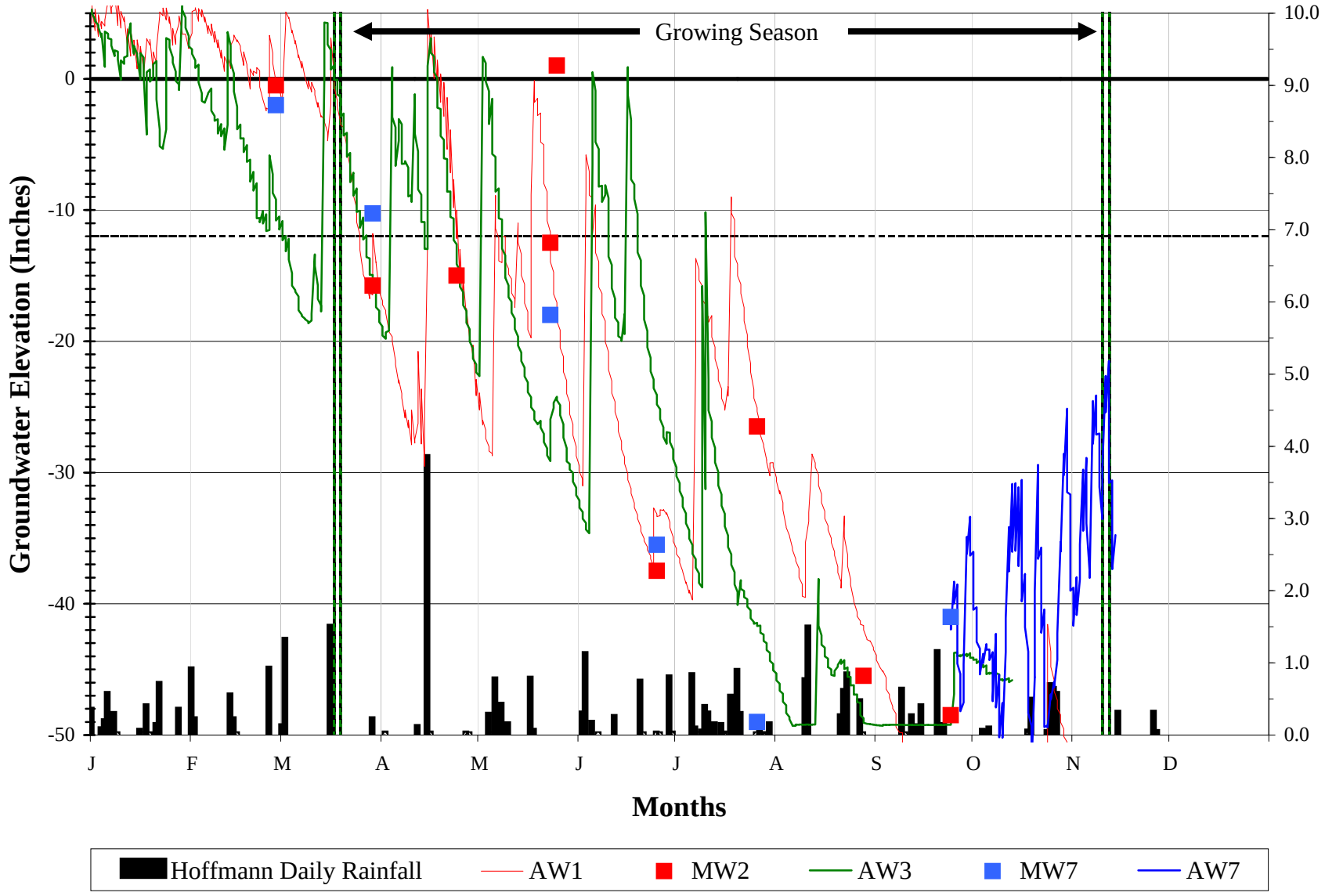


Figure 4b. 2007 Haw Branch Groundwater Gauges

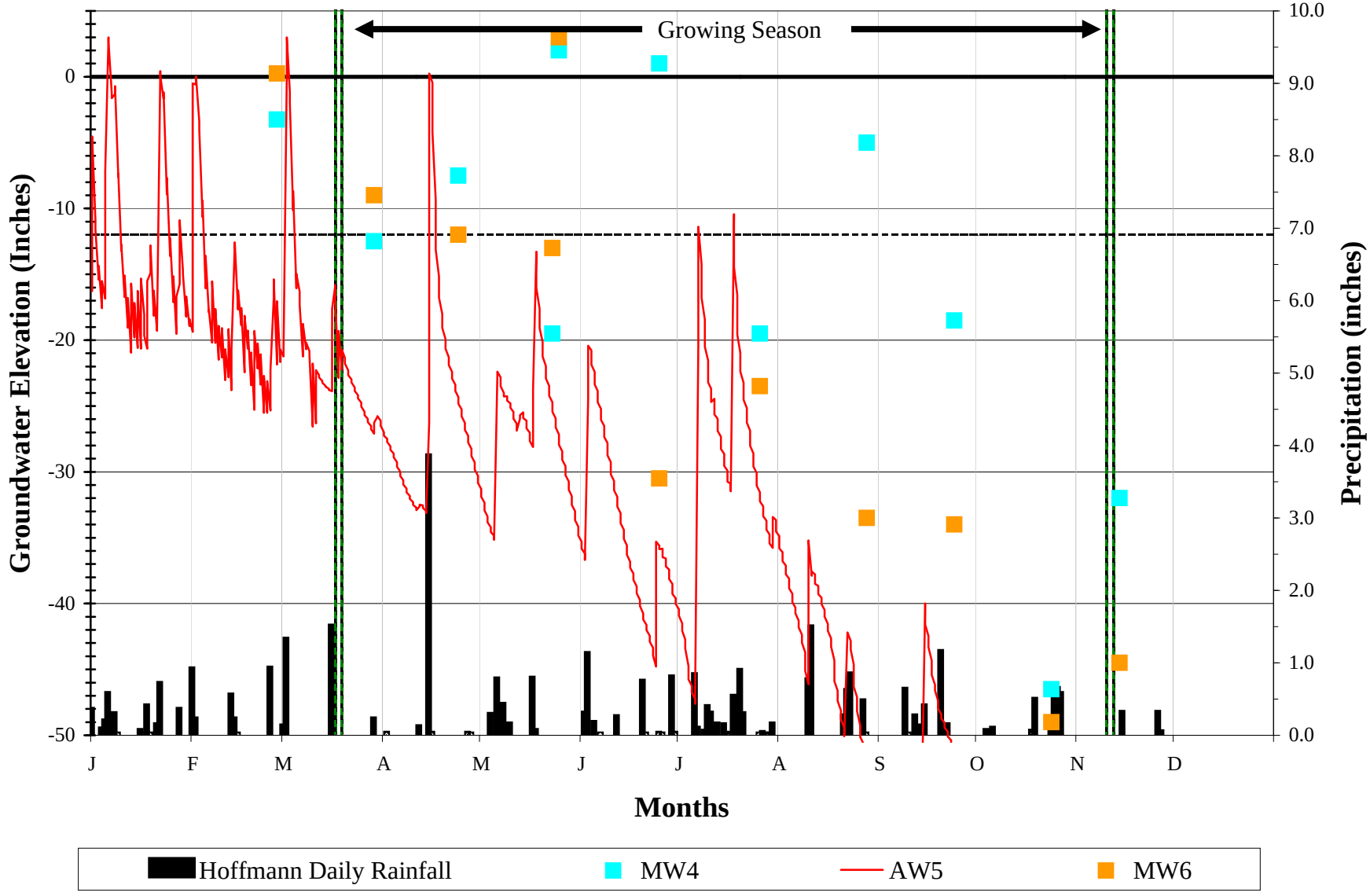


Table 2. Site Hydrologic Monitoring Results for 2007 (Year 2).

2007 Max Hydroperiod (Growing Season 26-Mar through 11-Nov, 239 days)					
Gauge	Consecutive		Cumulative		Occurrences
	Days	Percent of growing Season	Days	Percent of growing Season	
AW1	9	4 %	27	11 %	6
MW2	8	3 %	23	10 %	4
AW3	16	7 %	61	26 %	7
MW4	34	14 %	134	56 %	9
AW5	2	1 %	2	1 %	1
MW6	28	12 %	75	31 %	9
MW7/AW7	15	6 %	27	11 %	4

Year 1 and Year 2 monitoring data demonstrates that most of the site is functioning as designed, with varying degrees of wetness and saturation across the site. Three gauges, AW3, MW4 and MW6, meet or exceed the 7% hydrologic success criteria for the 2007 growing season. The remaining gauges documented periods of saturated conditions at the site which is significant considering the extreme drought experienced during the growing season in 2007. In 2006 all gauges, with the exception of AW5, recorded hydroperiods greater than the specified success criteria. AW5 has recorded a short hydroperiod in both years.

3.3.2 Reference Data

The approved Restoration Plan provides that if the rainfall data for any given year during the monitoring period is not normal, the reference wetland data can be used to determine if there is a positive correlation between the performance of the restoration site and the natural hydrology of the reference site. The Haw Branch reference well is located in Hoffman Forest and is maintained and controlled by North Carolina State University (NCSU). Reference well data has not been received in time to be included in this Annual Report, but will be submitted as an addendum when received.

3.3.3 Climate Data

Figure 5 is the 2007 monthly rainfall recordings taken on-site and the daily rainfall readings from a Hoffmann Forest weather station in Onslow County. No on-site rain gauge data was collected for January and February. The rainfall total from the Hoffmann gauge was below normal limits in January, March, July, August, September, and November. The on-site gauge was below normal limits for March, June, August, September, October, and November (November data only through 14th for on-site rain gauge). At no time during the growing season did rainfall exceed normal limits and most rainfall readings were at the low end of the normal limits.

3.4 HYDROLOGIC CONCLUSIONS

3.4.1 Drought Conditions

The entire state of North Carolina experienced increasingly severe drought conditions throughout 2007, with some areas experiencing the lowest average stream flows on record. The first signs of drought began in February in the western part of the state. By early spring, abnormally dry conditions had spread across the state, and the western edge of the state began to see “moderate” drought conditions. From late spring through the summer, conditions steadily worsened. By August, 98% of North Carolina’s land area was designated as being in either “severe”, “extreme”, or “exceptional” drought. Additionally, lowest-ever average stream flows

were recorded at 13 monitoring stations in August, including 9 in central North Carolina, two in the mountains, and two on the coastal plain. Nearly the entire state was categorized as experiencing "extreme" drought in September, with the southwest portion of the state categorized as experiencing "exceptional" drought. Figure 6 depicts the increasing severity of the drought throughout the year.

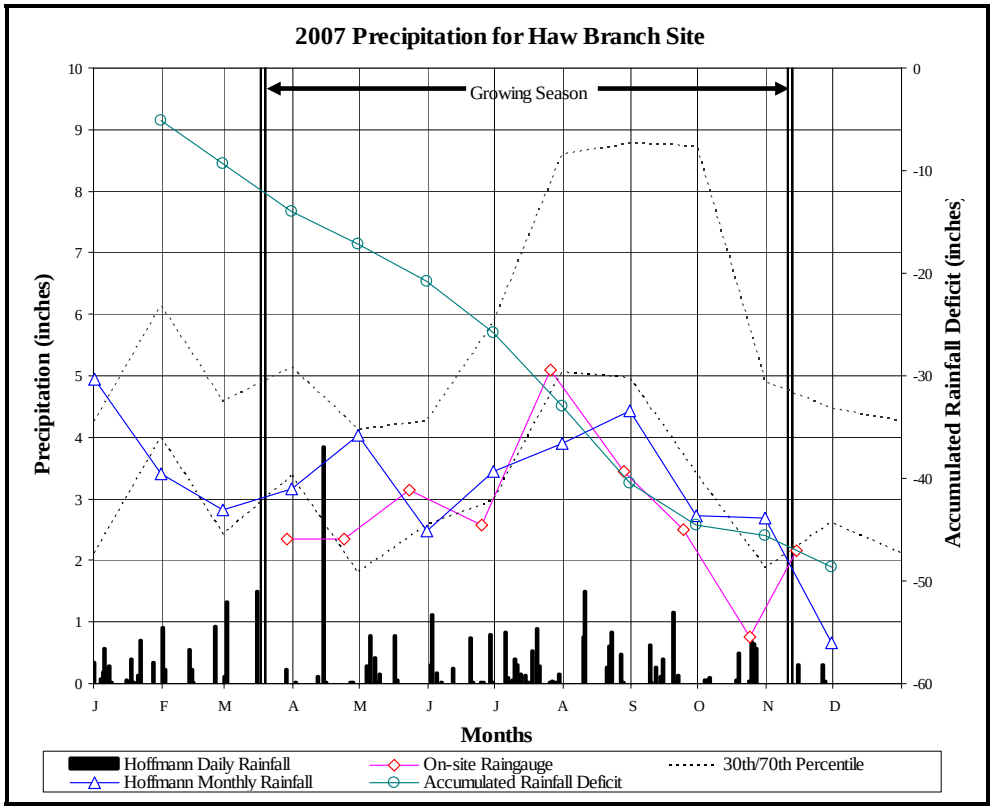


Figure 5. 2007 Haw Branch Precipitation

The Haw Branch restoration site experienced drought conditions consistent with statewide trends. The Hoffmann monitoring station, near the Haw Branch site, received normal to slightly less-than-normal precipitation from January through June (**Table 3**). During July, August, and September the Hoffman precipitation was below normal limits. In July, the Hoffmann site received 3.59 inches of rain (3.63 inches below average), and in August the site received 4.44 inches (3.11 inches below average). The accumulated rainfall deficit—the difference between the long-term average and the observed monthly precipitation levels, aggregated monthly—began at -1.76 inches in January and increased to -4.57 inches in March. The deficit partially recovered in April, but then increased steadily through the summer, reaching -12.91 inches by the end of August and -20.99 inches by late November (data missing for last three days of that month). Persistent and worsening drought conditions impacted the wetland hydroperiods and channel hydrology at the Haw Branch restoration site.

3.4.2 Hydrologic Conclusions

Data collected from all the groundwater monitoring gauges on Haw Branch Mitigation Site indicate that three of seven hydrology monitoring stations (AW3, MW4, and MW6) recorded hydroperiods of at least 7 percent of the growing season. The remaining gauges AW1, MW2, AW5, and MW/AW7, recorded a hydroperiod of

Table 3. Comparison of Normal Rainfall to Observed Rainfall

Month	Average	Normal Limits		*Hoffmann Precipitation	On-Site Precipitation	Accumulated Rainfall Deficit
		30 Percent	70 Percent			
January	5.17	4	6.13	3.41	---	-1.76
February	4.16	2.43	4.59	2.83	---	-3.09
March	4.64	3.37	5.14	3.16	2.35	-4.57
April	3.15	1.79	4.12	4.03	2.35	-3.69
May	3.67	2.58	4.27	2.72	3.15	-4.64
June	4.95	2.98	5.86	3.42	2.58	-6.17
July	7.22	5.06	8.6	3.59	5.10	-9.8
August	7.55	4.97	8.77	4.44	3.45	-12.91
September	6.77	3.4	8.74	2.72	2.5	-16.96
October	3.70	1.88	4.9	2.68	0.75	-17.98
November	3.67	2.61	4.47	0.66	2.16	-20.99
Total	**54.65**	**35.07**	**65.59**	**30.25**	**24.39**	---

*Data from NHOF Station (Hoffmann Forest)

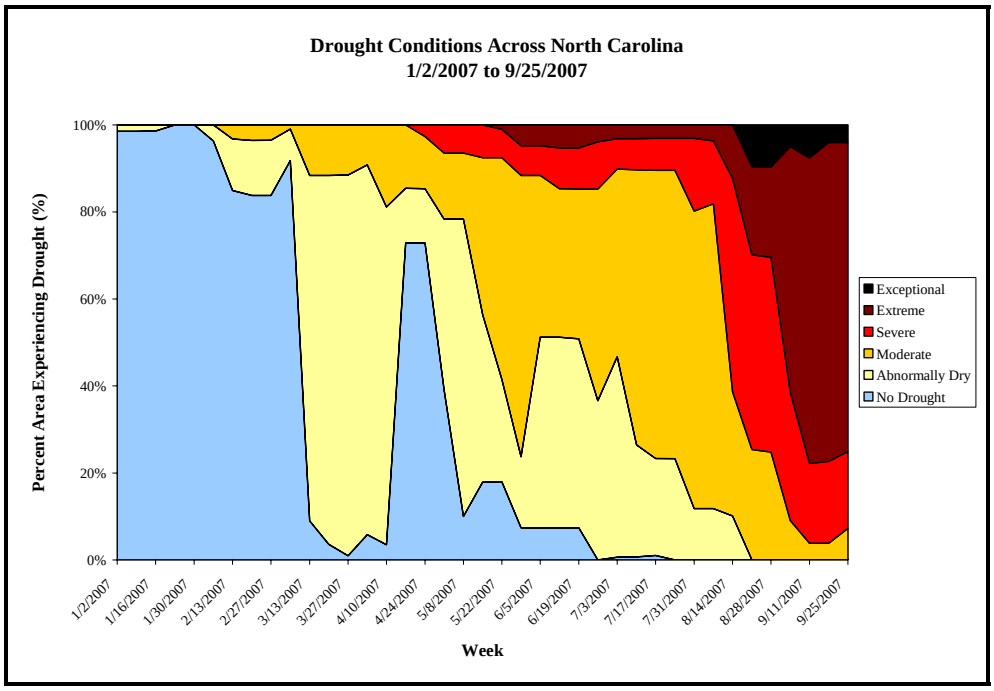


Figure 6. 2007 North Carolina Drought Conditions

4, 3, 1, and 6 percent of the growing season, respectively. AW5 recorded a lower than success criteria hydroperiod in 2006 as well. .

Rainfall data indicates that the early 2007 growing season was abnormally dry. Of particular concern was the low rainfall during March. This is the first month of the growing season and is historically the period when the water table is closest to the surface for the longest continuous period. At the end of November the rainfall deficient for the year was 20.99 inches below normal.

Considering the monitoring results for both 2006 and 2007 and the abnormal drought conditions in 2007, it was concluded that most of the site is performing as designed and is on track to meet the success criteria specified in the Restoration Plan for the site.

The southeastern portion of the Haw Branch mitigation site is not performing as well as expected. AW 5 has consistently recorded hydroperiods that fall short of the success criteria. At the beginning of 2007, a shorter well (18 inches deep) was installed at AW5 to determine if a deep sand lens was draining water from the well. Based on further evaluation, it is likely that due to the close proximity of a deep drainage ditch to the east of the well and outside of the easement area, the water table is lower than anticipated in this portion of the mitigation site.

4.0 VEGETATION

4.1 SUCCESS CRITERIA

The interim measure of vegetative success for the Haw Branch Mitigation Plan will be the survival of at least 320 3-year old planted trees per acre at the end of Year 3 of the monitoring period. The final vegetative success criteria will be the survival of 260 5-year old planted trees per acre at the end of Year 5 of the monitoring period. Up to 20% of the site species composition may be comprised of invaders. Remedial action may be required should these (i.e. loblolly pine (*Pinus taeda*), red maple (*Acer rubrum*), sweet gum (*Liquidambar styraciflua*), etc.) present a problem and exceed 20% composition.

4.2 DESCRIPTION OF SPECIES AND MONITORING PROTOCOL

The following monitoring protocol was designed to predict vegetative survivability. Twenty plots were established on the Haw Branch Site, to monitor approximately 2% of the site. Sixteen plots are located adjacent to newly constructed streambeds to monitor the vegetation in the stream restoration buffer. The other four plots are indiscriminately located to represent the range of conditions that exist on the site. The plots were randomly located within each zone and randomly oriented within the wetland restoration area.

Plot construction involved using metal fence posts at each of the four corners to clearly and permanently establish the area that was to be sampled. Ropes were hung connecting all four corners to help in determining if trees close to the plot boundary were inside or outside of the plot. Trees on and just outside of the boundary that appear to have greater than 50% of their canopy inside the boundary were counted inside the plot. A piece of white PVC pipe ten feet tall was placed over the metal post on one corner to facilitate visual location of plots throughout the five-year monitoring period.

All of the planted stems inside the plot were flagged with orange flagging and marked with a 3 foot tall piece of half inch PVC to mark them as the planted stems (vs. any colonizers) and to help in locating them in the future. Each stem was then tagged with a permanent numbered aluminum tag.

4.3 RESULTS OF VEGETATION MONITORING

Table 4 presents stem counts for each monitoring plot. Each planted tree species is identified across the top row, and each plot is identified down the left column. The numbers on the top row correlate to the ID column in Table 5. Trees are flagged in the field on an as-needed basis before the flags degrade. Flags are utilized because they will not interfere with the growth of the tree. Volunteer species are also flagged during this process.

Volunteer species will also be monitored throughout the five-year monitoring period. Below is a table of the most commonly found woody volunteer species. Volunteer woody species were observed in and around Plot 4 and 5, but were deemed too small to tally. If these trees persist into the next growing season, they will be

Table 4. Tree Species Recorded in the Wetland Restoration Area

ID	Scientific Name	Common Name	Wetland Status
1	*Quercus michauxii*	Swamp Chestnut Oak	FACW-
2	*Quercus phellos*	Coastal Willow Oak	FACW-
3	*Betula nigra*	River Birch	FACW
4	*Fraxinus pennsylvanica*	Green Ash	FACW
5	*Quercus lyrata*	Overcup Oak	OBL
6	*Celtis laevigata*	Sugar Berry	FACW
7	*Nyssa biflora*	Swamp Tupelo	OBL
8	*Taxodium distichum*	Bald Cypress	OBL
9	*Platanus occidentalis*	Sycamore	FACW-

Table 5. 2007 Vegetation Monitoring Plot Species Composition

Plot	1	2	3	4	5	6	7	8	9	Total	Stems/Acre
1	4	0	9	0	2	3	0	0	0	18	720
2	3	0	0	0	1	0	0	0	9	13	520
3	3	2	4	0	2	3	0	0	4	18	720
4	3	2	2	0	4	2	0	2	0	15	600
5	0	0	8	1	4	1	4	0	0	18	720
6	0	0	3	4	5	2	2	1	0	17	680
7	1	0	7	0	3	3	1	0	0	15	600
8	4	0	0	0	2	3	5	0	0	14	560
9	0	0	1	2	5	7	3	0	0	18	720
10	4	0	1	1	3	1	4	3	0	17	680
11	0	0	5	3	2	2	3	2	0	17	680
12	0	0	5	0	5	1	2	2	2	17	680
13	0	0	4	0	1	6	7	0	0	18	720
14	1	0	0	7	2	7	0	0	0	17	680
15	4	2	1	1	4	4	1	0	1	18	720
16	2	2	3	0	4	1	3	0	2	17	680
17	2	0	1	0	6	0	5	0	1	15	600
18	5	6	4	0	1	0	0	0	0	16	640
19	5	0	4	0	4	1	0	0	3	17	680
20	0	0	1	0	16	0	0	0	0	17	680

Average Stems/Acre: 664
Range of Stems/Acre: 520-720

flagged and added to the overall stems per acre assessment of the site. Sweetgum (*Liquidambar styraciflua*) is the most common volunteer, though Red Maple (*Acer rubrum*) was also observed.

Table 6. Volunteers Tree Species within the Wetland Restoration Area:

ID	Scientific Name	Common Name	FAC Status
A	*Liquidambar styraciflua*	Sweetgum	FAC+
B	*Acer rubrum*	Red Maple	FAC
C	*Betula nigra*	River Birch	FACW

4.4 VEGETATION OBSERVATIONS

After construction of the mitigation site, a permanent ground cover seed mixture of Virginia wild rye (*Elymus virginicus*), switch grass (*Panicum virgatum*), and fox sedge (*Carex vulpinoidea*) was broadcast on the site at a rate of 10 pounds per acre. These species are present on the site. An application of Oust, a pre-emergent herbicide, was applied to give the planted stems an edge on the growth potential at the start of the spring. This practice was successful as there is ample ground cover across the site and the planted trees are growing very well. Hydrophytic herbaceous vegetation, including rush (*Juncus effusus*), spike-rush (*Eleocharis obtusa*), and sedge (*Carex* sp.), were observed across the site, particularly in areas of periodic inundation. The presence of these herbaceous wetland plants helps to confirm wetland hydrology on the site.

There are quite a few weedy species occurring on the site, though none seem to be posing any problems for the woody or herbaceous hydrophytic vegetation. The weedy species are mostly annuals and pose very little threat to planted tree survivability on site. Commonly seen weedy vegetation includes wild dill (*Foeniculum vulgare*), and golden rod (*Solidago* spp.). Around plots 13 and 14, herbaceous vegetation is sparse.

4.5 VEGETATION CONCLUSIONS

The site was planted in coastal plain small stream swamp species in December 2005. There were twenty vegetation-monitoring plots established throughout the planting areas. The data reflects that the overall site is on track to meet the interim success criteria of 320 trees per acre by the end of Year 3 and the final success criteria of 260 trees per acre by the end of Year 5 as specified in the Restoration Plan for the site.

5.0 STREAM MONITORING

5.1 SUCCESS CRITERIA

As stated in the approved Mitigation Plan, the stream restoration success criteria for the site includes the following:

- Bankfull Events: Two bankfull flow events must be documented within the five-year monitoring period.
- Cross-sections: There should be little change in as-built cross-sections. Cross-sections shall be classified using the Rosgen stream classification method and all monitored cross-sections should fall within the quantitative parameters defined for "E" or "C" type channels.
- Longitudinal Profiles: The longitudinal profiles should show that the bedform features are remaining stable, e.g. they are not aggrading or degrading. Bedforms observed should be consistent with those observed in "E" and "C" type channels.
- Photo Reference Stations: Photographs will be used to subjectively evaluate channel aggradation or degradation, bank erosion, success of riparian vegetation and effectiveness of erosion control measures.

5.2 DESCRIPTION OF STREAM MONITORING

To document the stated success criteria, the following monitoring program was instituted following construction completion on the Haw Branch Site:

Bankfull Events: Two crest gauges were installed on the site to document bankfull events (Figure 3). The gauges are checked monthly and the highest out-of-bank flow event that occurred during the past month is recorded.

Cross-sections: Two permanent cross sections were installed per 1,000 linear feet of stream restoration work, with one of the locations being a riffle cross section and one location being a pool cross section. A total of 21 permanent cross sections were established across the mitigation site. Each cross section was marked on both banks with permanent pins to establish the exact transect used. Permanent cross-section pins were surveyed and located relative to a common benchmark to facilitate easy comparison of year-to-year data. The annual cross-section surveys include points measured at all breaks in slope, including top of bank, bankfull, inner berm, edge of water, and thalweg. Riffle cross sections are classified using the Rosgen stream classification system. Permanent cross sections for 2007 (Year 2) were surveyed in July 2007.

Longitudinal Profiles: A longitudinal profile was not surveyed for the 2007 (Year 2) monitoring season. A longitudinal profile of approximately 3,000 feet was surveyed in 2006 along the restoration reach. The longitudinal survey will take place in Years 3 and 5 as well. Measurements include thalweg, water surface, bankfull, and top of low bank. Each of these measurements is taken at the head of each feature, e.g. riffle, run, pool, and glide, and the max pool depth. A common benchmark will be used each year to facilitate comparison of year-to-year data. The longitudinal survey for 2006 (Year 1) was conducted in September 2006.

Photo Reference Stations: Photographs are used to visually document restoration success. Reference stations are marked with wooden stakes and Global Positioning Satellite (GPS) coordinates have been determined for each location. Reference photos are taken at each permanent cross-section from both streambanks. The survey tape is centered in the photographs of the bank, and the water line is located in the lower edge of the frame with as much of the bank as possible included in each photo. In-stream structures (e.g., rock vanes, cross vanes, and constructed riffles) are also photographed. Photo reference stations will be photographed at least once per year for at least 5 years following construction.

5.3 RESULTS OF STREAM MONITORING

One crest gauge was installed near the downstream end of UT1B and UT3 (Figure 3a and 3b) following site construction. During 2007, bankfull events on the site were documented during at least four site visits at CG2 and two site visits at CG1 (Table 7). The largest stream flow documented by the UT3 CG2 crest gauge was a flow that occurred during February and was approximately 2.3 feet above the bankfull stage at the crest gauge. The largest stream flow documented by the UT1B CG1 crest gauge was a flow that occurred during February and was approximately 1.6 feet above the bankfull stage at the crest gauge. Stream monitoring data is provided in Appendix B.

Table 7. Crest gauge data for 2007

Month	UT1B CG1	UT3 CG2
January	NA	NA
February	1.6	2.3
March	0	0
April	0	0
May	0	1.0
June	0	0.3
July	NA	0.3
August	0	0
September	0.2	0
October	0	0
November	0	0

Year 2 cross-section monitoring data for stream stability were collected during July 2007 and compared to baseline data collected in early 2006 and Year 1 data collected in September 2006. The Year 2 cross-section survey shows that there has been very little adjustment to stream profile or dimension since construction. All monitored cross-sections fell within the quantitative parameters defined for "E" or "C" type channels. Cross sections with photographs can be viewed in Appendix B.

In-stream structures installed within the restored stream included log vanes, log weirs, and root wads. Visual observations of structures throughout the past growing season have indicated that nearly all structures are functioning as designed. Log weirs placed in riffle areas have maintained riffle elevations and provided a downstream scour hole that provides habitat. Some minor areas of localized erosion have been observed and will be monitored over the coming years to determine whether maintenance action is needed. All structural problem areas are minor and localized, and no corrective actions are recommended at this time. **Table 8** provides a summary of areas requiring continued observation.

Table 8. Stream Areas Requiring Observation

Station	Feature	Problem
10+00 UT3	RB	Minor erosion on RB
12+00 UT3	Ditch Plug	LB Washed out ditch plug
15+50 UT3	Channel	Cattails in channel
16+75 UT3	DS Log Weir	Erosion on both banks
12+00 UT2	Log Vane	Buried by sediments
18+10 UT2	Channel	Mid-channel aggradation
68+85 UT1B	Log Vane	Undercut

Photographs have been taken throughout the monitoring season to document the evolution of the restored stream channel (Appendix D). During the time the survey was done, Haw Branch was experiencing an extreme drought consistent with a statewide drought.

5.4 STREAM CONCLUSIONS

Overall the Haw Branch stream is performing as designed. Cross section data indicates that little change has occurred since the stream was built. Three bankfull events occurred at the site in 2007. The drought year resulted in a dry channel for a portion of the monitoring season in the eastern part of the mitigation site. A dry channel was not observed in UT3. Problem areas are minimal and localized, and no corrective actions are

recommended at this time. It was concluded that the site is on track to achieve the success criteria specified in the Restoration Plan for the site.

6.0 OVERALL CONCLUSIONS AND RECOMMENDATIONS

- Year 1 and Year 2 hydrologic monitoring documents that the majority of the site is on track to achieve the wetland hydrology criteria specified in the Restoration Plan for the site. In 2006, six of the seven gauges recorded hydroperiods greater than the specified success criteria. Of the seven hydrology monitoring gauges, three recorded consecutive hydroperiods for at least 7 percent of the growing season in 2007. The remaining gauges exhibited a hydroperiod for a portion of the growing season.

- The restored stream channel has remained stable and is providing the intended habitat and hydrologic functions. Multiple bankfull events were again recorded at the site in 2007. All monitoring cross sections showed very little adjustment in stream dimension and the site is on track to achieve the stream success criteria specified in the Restoration Plan for the site.

- The site was planted in coastal plain small stream swamp species in December 2005. There were twenty vegetation-monitoring plots established throughout the planting areas. 2007 vegetative monitoring data documents an average tree density of 664 stems per acre in 2007, with a range of 520 to 720 stems per acre, and the site remains on track to meet the interim criteria of 320 trees per acres by the end of Year 3 and the final success criteria of 260 live trees per acre by the end of Year 5 as specified in the Restoration Plan for the site.

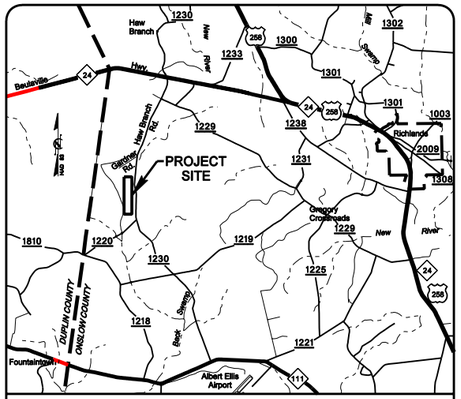
- Vegetation, hydrologic and stream monitoring will continue through 2010.

APPENDIX A

As-Built Survey

HAW BRANCH

PROJECT: 0211R



VICINITY MAP

INDEX OF SHEETS

1	TITLE SHEET
1-A	STREAM CONVENTIONAL SYMBOLS GENERAL NOTES, STANDARD SPECIFICATIONS, AND VEGETATION SELECTION
1-B	CONVENTIONAL SYMBOLS
2 TO 2-B	TYPICAL POOL AND RIFFLE CROSS SECTIONS, STRUCTURE DETAILS
4 TO 15	PLAN VIEW OF PROPOSED AND EXISTING STREAM DESIGN
16 TO 17	WETLAND OVERVIEW

EBX NEUSE I, LLC
HAW BRANCH

ONSLOW COUNTY

LOCATION: SOUTH OF TOWN OF HAW BRANCH ALONG SR 1230

TYPE OF WORK: AS–BUILT PLANS

NAD 83

STATE	BUCK PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	0211R	1	32

NO.	DATE	CHECKED BY	APPROVED BY
1	2/15/06	JOHN HUTTON	KEVIN TWEEDY

GRAPHIC SCALES

30 15 0 30 60
PLANS

30 15 0 30 60
PROFILE (HORIZONTAL)

5 2.5 0 5 10
PROFILE (VERTICAL)

DESIGN SUMMARY

EXISTING STREAM LENGTH = 4,370 FEET

AS–BUILT STREAM LENGTH = 10,005 FEET

AS–BUILT RIVERINE WETLAND RESTORATION = 25.0 ACRES

PREPARED FOR THE OFFICE OF:
EBX NEUSE I, LLC

2530 MERIDIAN PARKWAY, SUITE 200
DURHAM, NORTH CAROLINA 27713

EBX CONTACT:
THOMAS L. RINKER
PROJECT MANAGER

PREPARED IN THE OFFICE OF:

BUCK ENGINEERING
8000 Regency Parkway Suite 200
Cary, North Carolina 27511
Phone: 919-463-5488
Fax: 919-463-5490

December 2005
COMPLETION DATE:

KEVIN TWEEDY, PE
PROJECT ENGINEER

JOHN HUTTON
PROJECT MANAGER

PROJECT ENGINEER

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CONSTRUCTION SEQUENCE

General Construction Sequence

The following construction sequence shall be used during implementation of the mitigation plan.

1. Onsite meeting with personnel from State Land Quality Section.
2. The Contractor will prepare construction accesses and stockpile areas as shown in the plans. If necessary, erect any safety fences, silt fences, or barriers. Stockpile materials that will be needed during the initial stages of construction.
3. The Contractor shall maintain and use existing culverted stream crossings during the initial stages of construction. The Contractor shall prepare stream crossings at locations shown on the construction plans in accordance with the NC Erosion and Sediment Control Planning and Design Manual. Ditches and stream reaches on site will be left open during the initial stages of construction to allow for drainage and to keep site accessible.
4. Construction traffic shall be restricted to the area denoted as "Limits of Disturbance" on the construction plans.
5. The Contractor will begin by excavating floodplain areas to design grades in all areas except within 10 feet of the top of existing stream banks. The Contractor may fill ditches which do not contain any water during the grading operations. Along ditches with water or stream reaches, excavated material should be stockpiled in areas shown on the plans. In any areas where excavation depths will exceed 1.0 foot, topsoil shall be stockpiled and placed back over these areas to a depth of eight inches to achieve design grades and create a soil base for vegetation.
6. Contractor shall begin construction on each stream reach and complete that stream reach before moving to the next stream. Excavation of new stream channels shall begin on the downstream end and work upstream to allow for drainage. The new channel sections shall be left open on the downstream end to allow for drainage during rain events. A temporary sediment trap shall be installed at the downstream end.
7. The most southern end of Reach UT1 shall be constructed first. This section requires the use of a temporary pump-around operation as noted on the plans. The Contractor shall install temporary coffer dams and pump around operations for these sections. The portion of the channel isolated shall be dewatered and the removed water shall flow through a special stilling basin according to project special provisions.
8. Once UT1 is completed, construction of UT2 will begin.
9. Contractor shall excavate new channel sections in the dry. When new channel sections cross existing ditches and streams, the Contractor may excavate to within 10 feet of the existing channels, but Contractor shall not disturb existing channels until all other sections of the new channel have been constructed and stabilized.
10. Once an excavated section of channel has been constructed to design grades and approved by the Engineer, in-stream structures, matting and transplants shall be placed in that section per the direction of the Engineer and the channel made ready to accept water from the old channel.
11. Upon completion of UT1 and UT2, Contractor shall begin construction of UT3
12. Contractor shall begin Reach UT3 by excavating floodplain bench areas to design grades. Excavated material will be used to construct the access road along Reach UT2.
13. Once the new floodplain of UT3 has been excavated, Contractor shall begin excavating the new stream channel. When new channel section crosses the existing stream, the Contractor may excavate to within 10 feet of the existing channels, but Contractor shall not disturb the existing channel until all other sections of the new channel have been constructed and stabilized.
14. Disking and roughing of field areas adjacent to the stream channel shall be completed prior to turning water into the new stream channel segments. Disking shall not be performed within 10 feet of the new stream channel banks. The Contractor shall NOT disk or rough any areas where excavation activities have not been completed.
15. Once the new channels have been accepted by the Engineer, the temporary sediment trap at the downstream end shall be removed. Water from the old channel stream channel may then be turned into the new stream channel. Apply stabilization practices to the area where the water was turned, and immediately begin filling the old abandoned stream channels.
16. Excavate any new ditches shown on the plans to design elevations, per the direction of the Engineer.
17. Once a section of new channel has been completed, the Contractor will apply temporary seeding, permanent seeding, and mulch to that area as designated in the plans and specifications. Permanent seeding mixtures shall be applied as shown on the vegetation plan. Temporary seeding shall be applied in all areas susceptible to erosion (i.e. disturbed ditch banks, steep slopes, and spoil areas) such that ground cover is established within 15 working days or 30 calendar days, whichever is shorter, following completion of any phase of grading. Permanent ground cover shall be established for all disturbed areas within 15 working days or 90 calendar days (whichever is shorter) following completion of construction.
18. The Contractor shall insure that the site is free of trash and leftover materials prior to demobilization of equipment from the site.
19. Plant woody vegetation according to planting details and specifications. Planting of woody vegetation should only occur during winter or early spring.

CONSTRUCTION QUANTITIES

Item #	Description	Quantity	Unit
A			
B			
C	Mobilization / Demobilization	1	LS
D	Temporary Silt Fence	4,056	LF
E	Sand Bags	N/A	EA
F.1	Temporary Seeding	1,077	POUNDS
F.2	Straw Mulch	194	BALE
F.3	Excelsior Matting	N/A	SY
F.4	Lime	N/A	TON
F.5	Fertilizer	N/A	TON
G.1	Permanent Seeding (wetlands)	830	POUNDS
G.2	Permanent Seeding (access road)	N/A	POUNDS
H.1	Excavation, Fill and Grading	20,000	CY
H.2	Backfill	N/A	CY
H.3	Off-Site Soil Disposal	N/A	CY
H.4	Roughing of Soil Surface	48	ACRES
H.5	Clearing	2	ACRES
H.6	Grubbing	0.5	ACRES
I.1	Washed No. 57 Stone	40	TON
I.2	Stone, Class A	66	TON
I.3	Stone, Class B	117	TON
I.4	Class A/B Stone	N/A	TON
I.5	ABC Stone (crusher run)	N/A	TON
I.6	Boulders	N/A	TON
I.7	Class II	2	TON
J.1	Root Wads (on-site)	190	EA
J.2	Root Wads (off-site)	N/A	EA
J.3	Logs (15-30 ft)	N/A	EA
J.4	Logs (8-15 ft)	111	EA
K	Non woven Filter Fabric, Type II	720	SY
L.1	Temporary Culvert - _36__" CSP	60	LF
L.2	Permanent Culvert - _48__" CSP	30	LF
L.3	Permanent Culvert - _____"	N/A	LF
L.4	Corrugated Pipe	N/A	LF
M	Coconut Fiber (COIR) Matting	16,690	SY
N.1	Shrub and Tree Transplants	1,000	SY
N.2	Sod Mats	N/A	SY
O.1	Live Stakes	8,925	STEMS
O.2	Cutting Bundles	N/A	EA
P	Pump Around Operations	1	LS
Q	Special Stilling Basins	3	EA
R	Impervious Dikes	48	LF
S.1	Fencing	N/A	LF
S.2	Large Gates	N/A	EA
S.3	Walk Gates	N/A	EA
T.1	Tree Purchase	N/A	STEMS
T.2	Tree Planting	32,460	STEMS
U	Waste Disposal	N/A	LS

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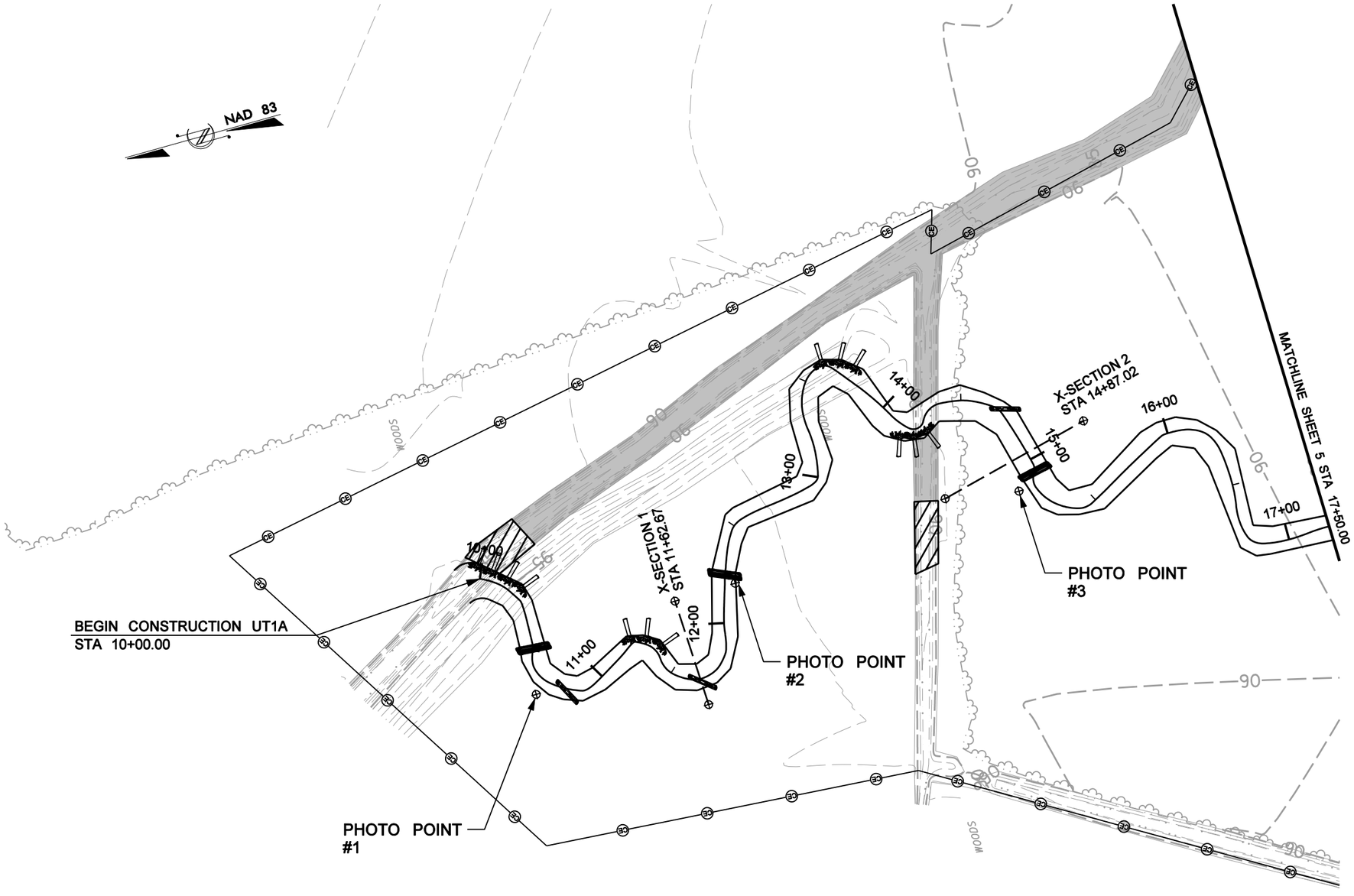

FILL EXISTING CHANNEL

DITCH PLUG

PLAN VIEW
AS-BUILT

30 15 0 30 60
SCALE (FT)

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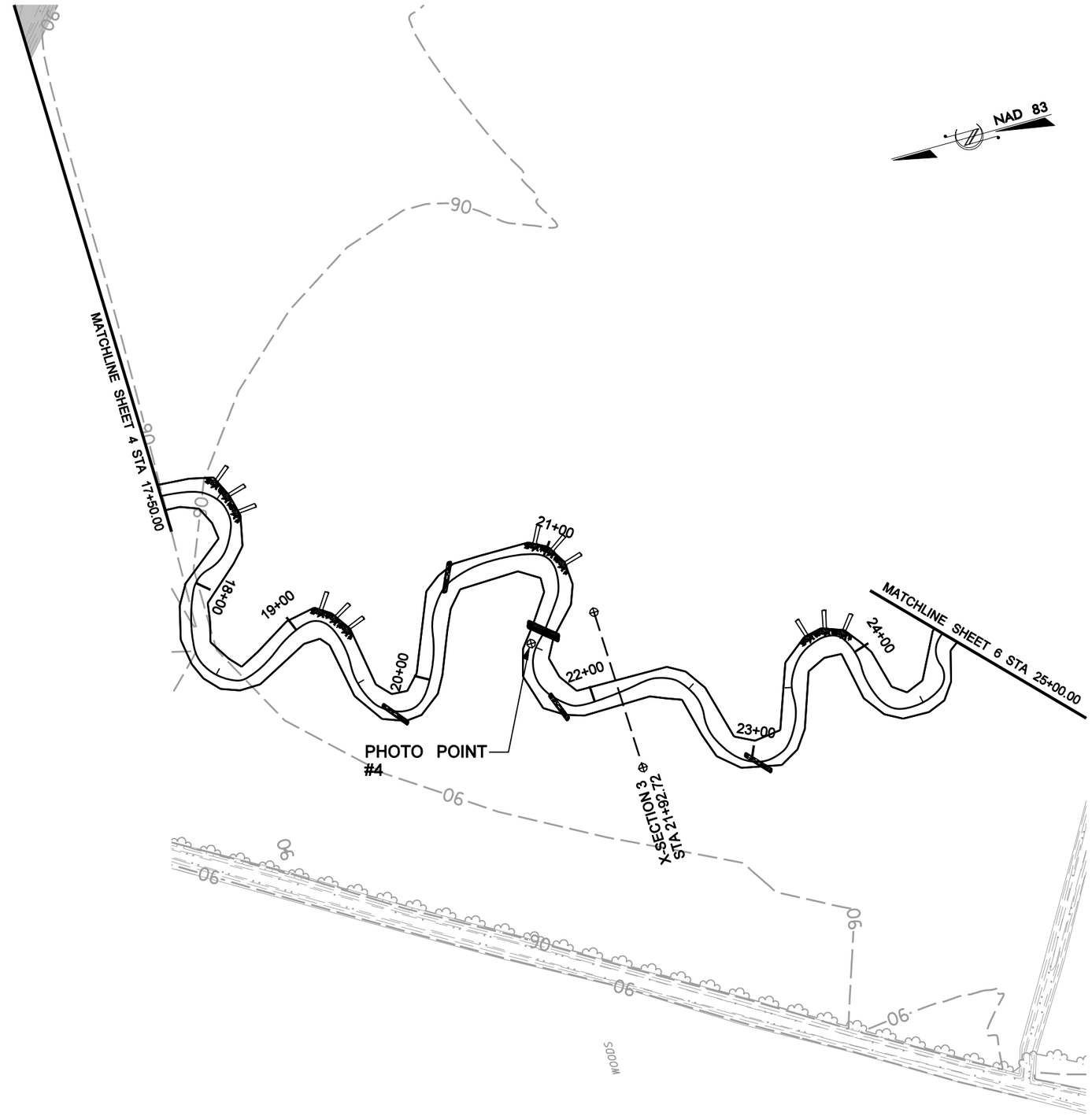

FILL EXISTING CHANNEL

PLAN VIEW AS-BUILT

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SCALE (FT)

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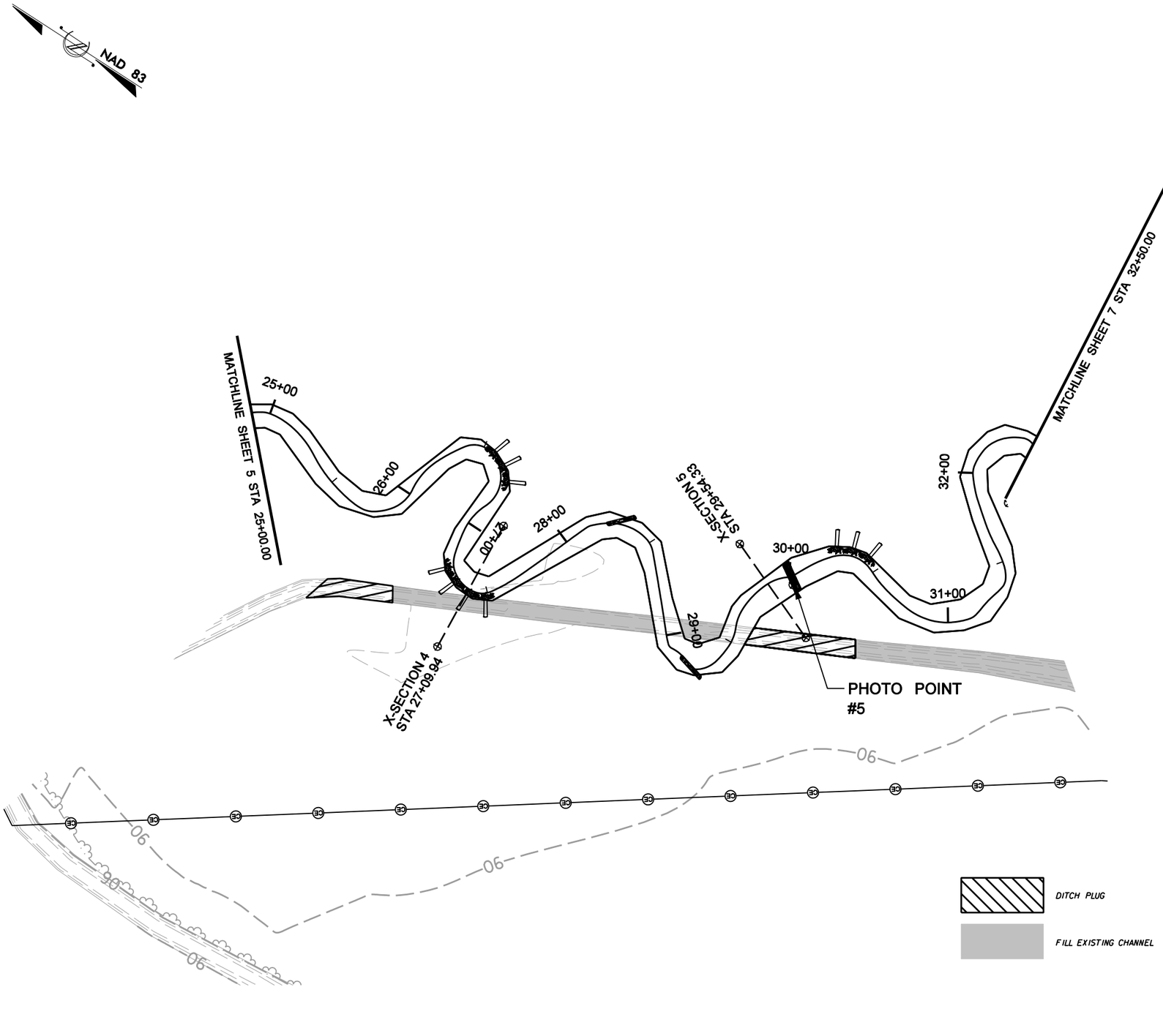

PLAN VIEW
AS-BUILT

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SCALE (FT)

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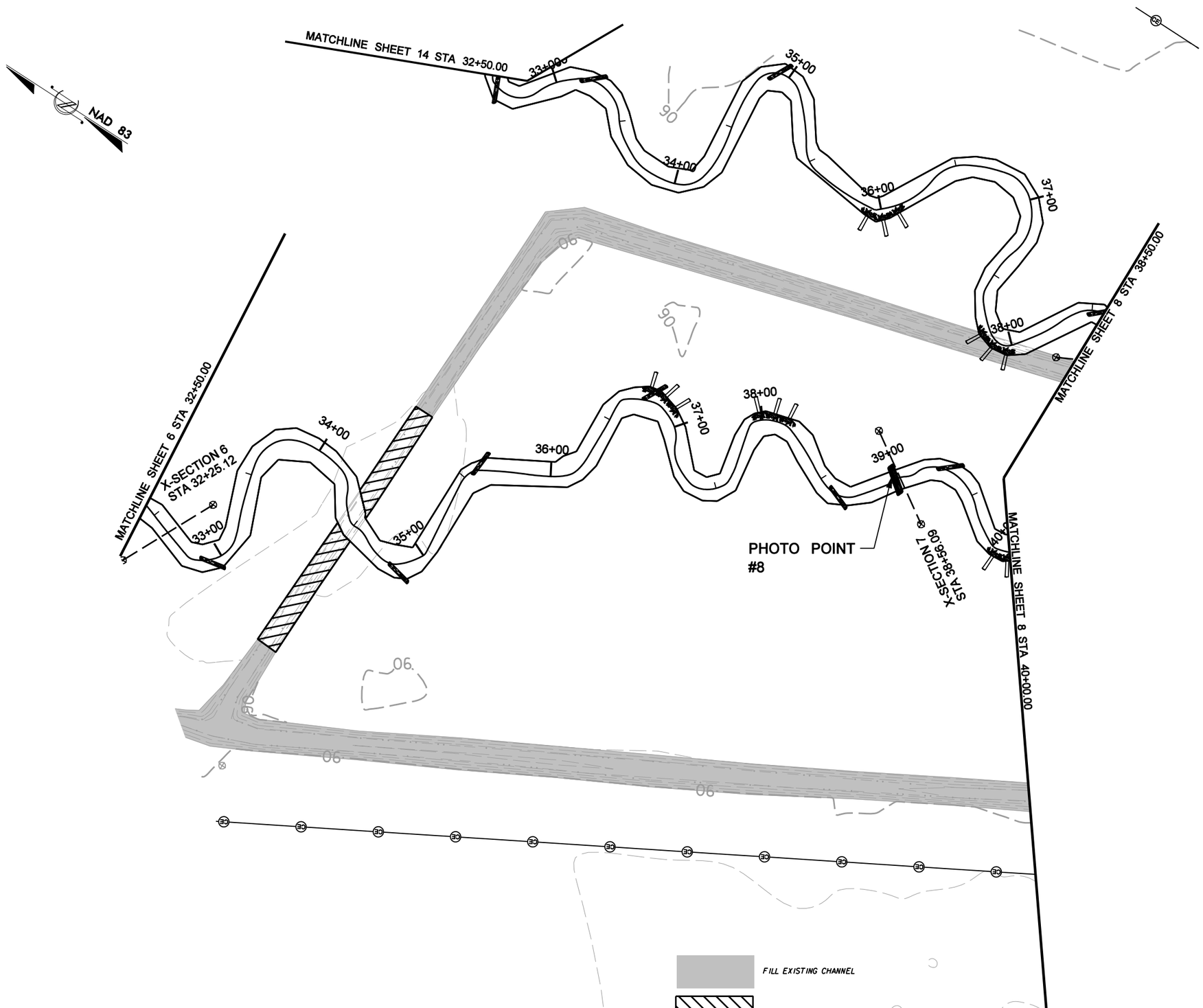

PLAN VIEW
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SCALE (FT)

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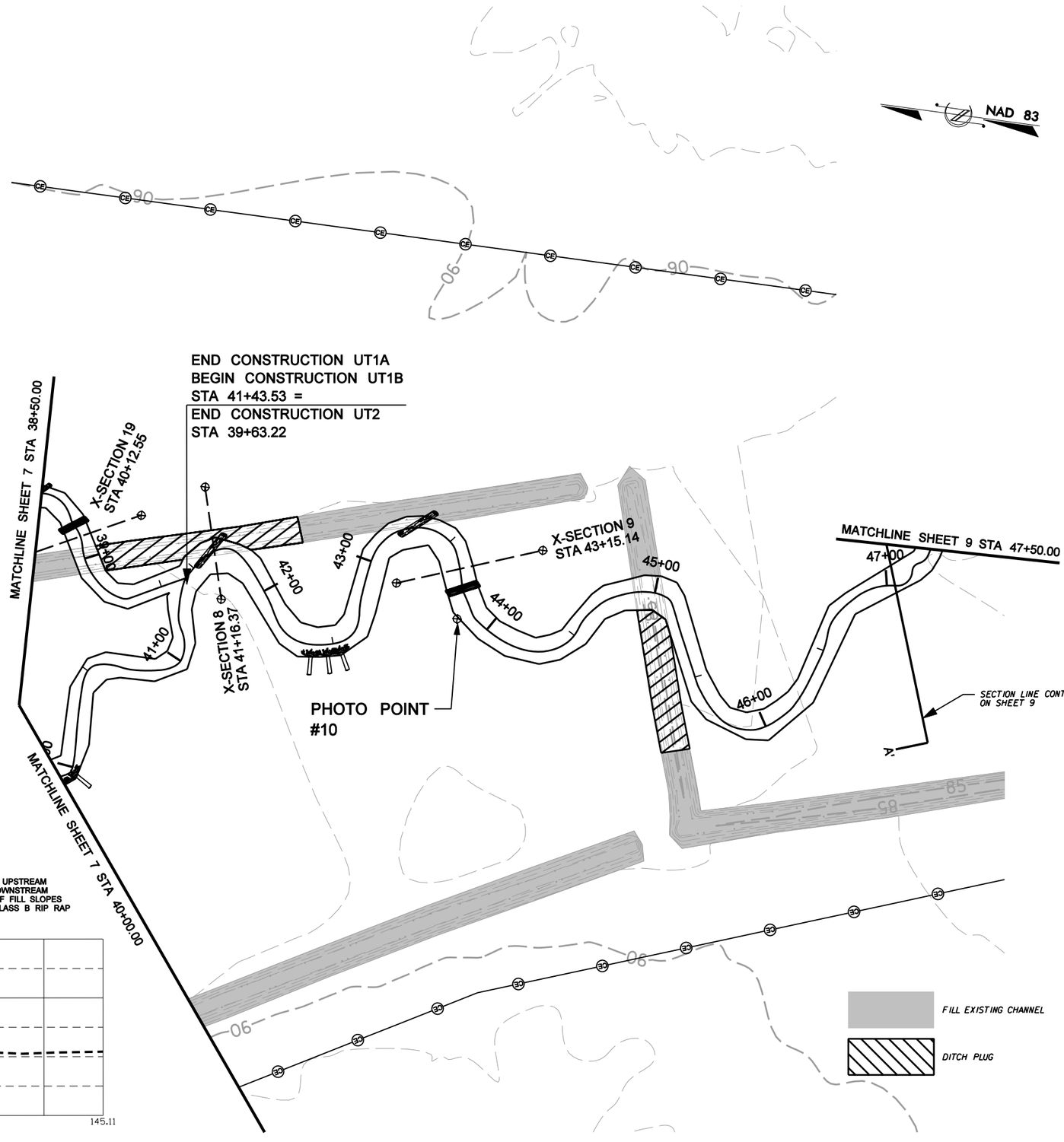

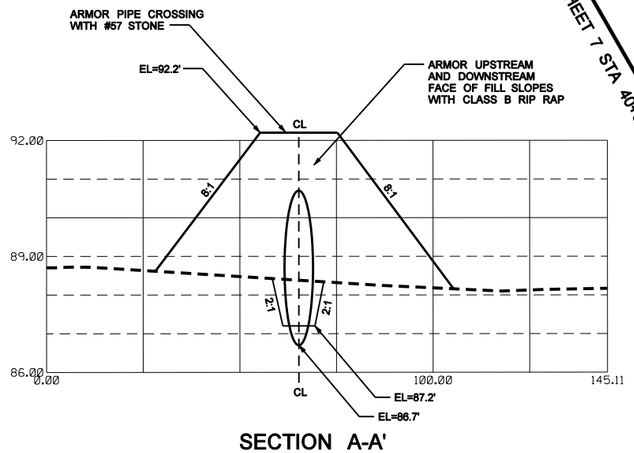

SECTION A-A'

PLAN VIEW
AS-BUILT

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SCALE (FT)

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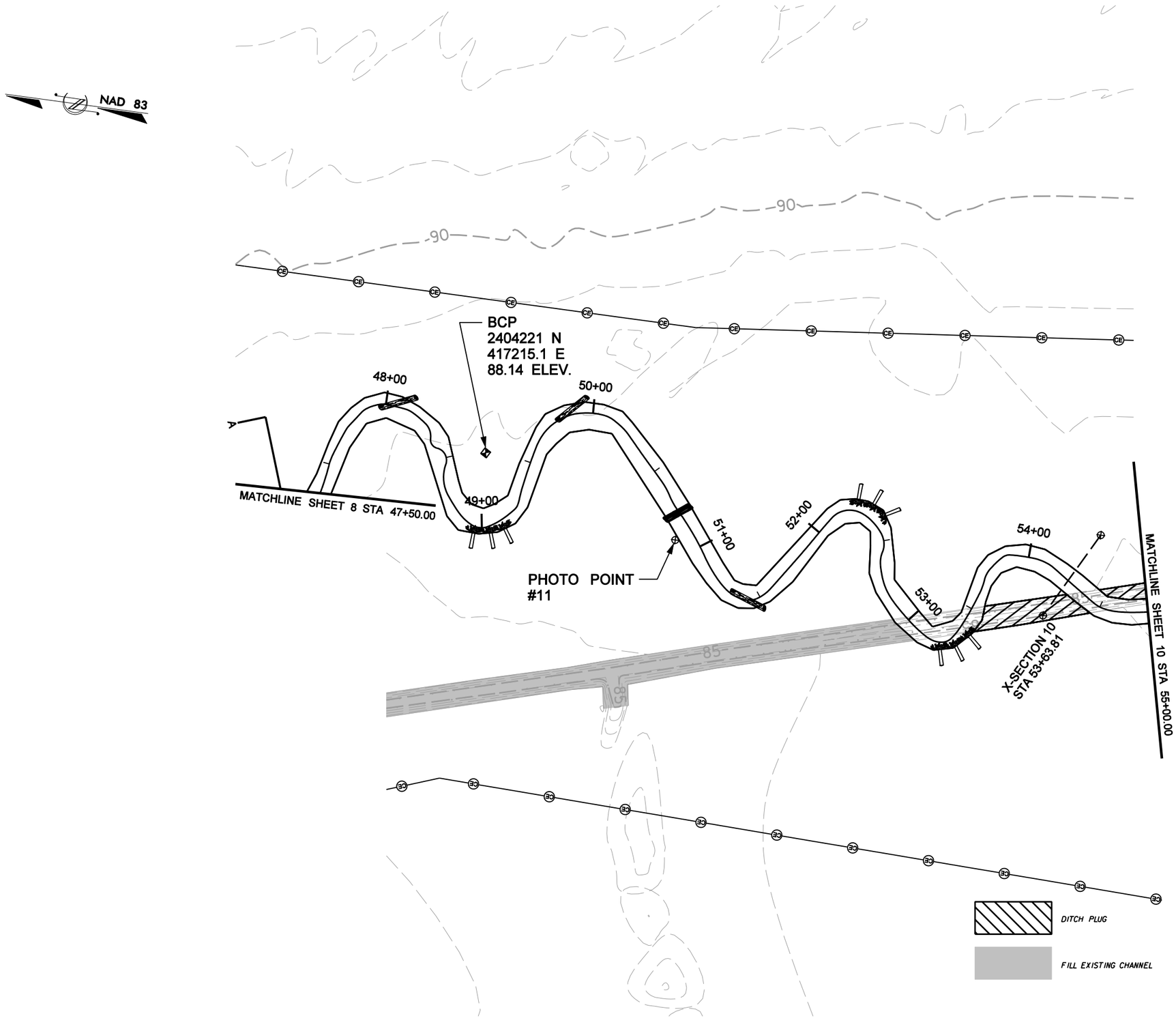

PLAN VIEW
AS-BUILT

30 15 0 30 60
SCALE (FT)

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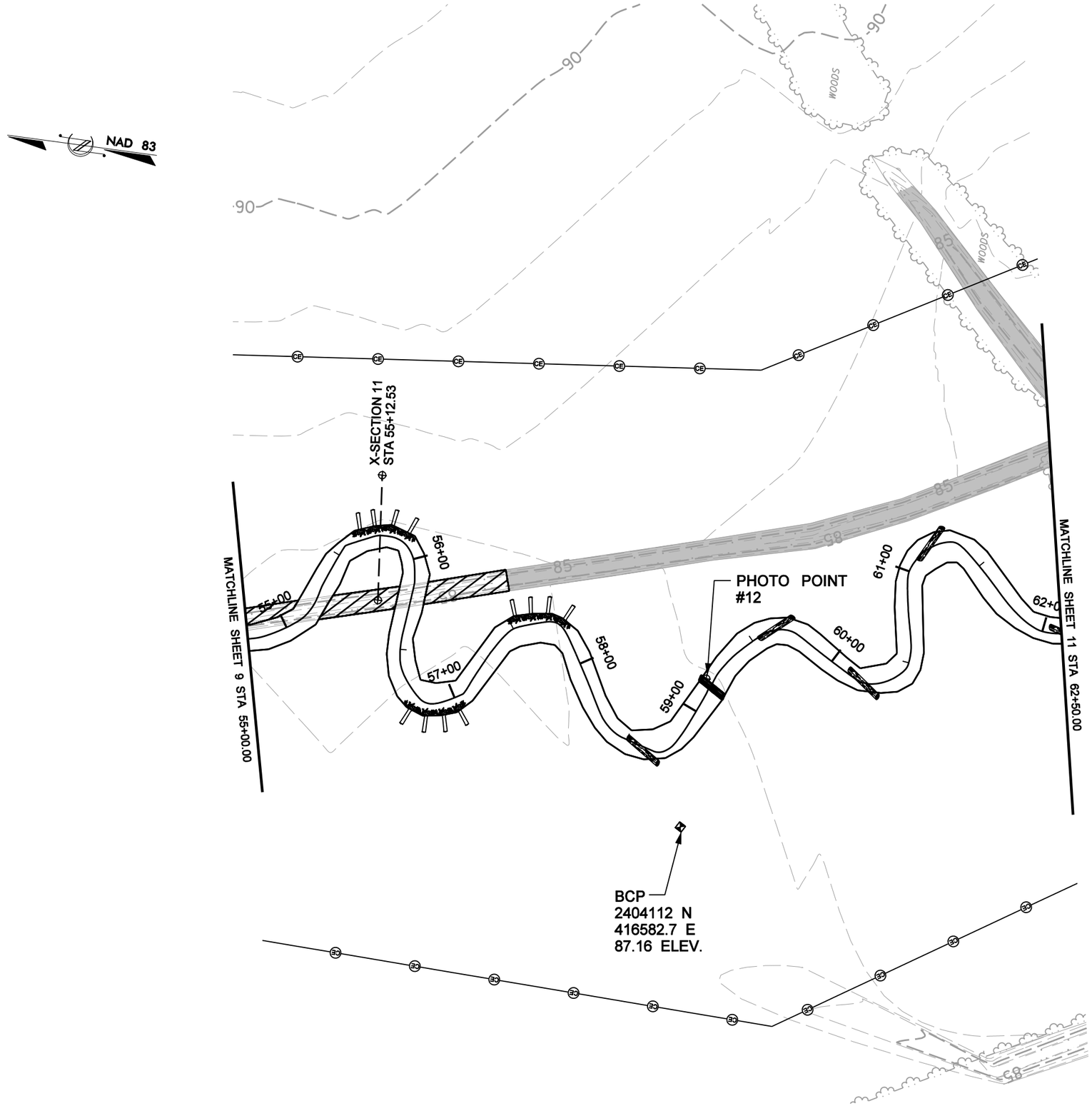

PLAN VIEW
AS-BUILT

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SCALE (FT)

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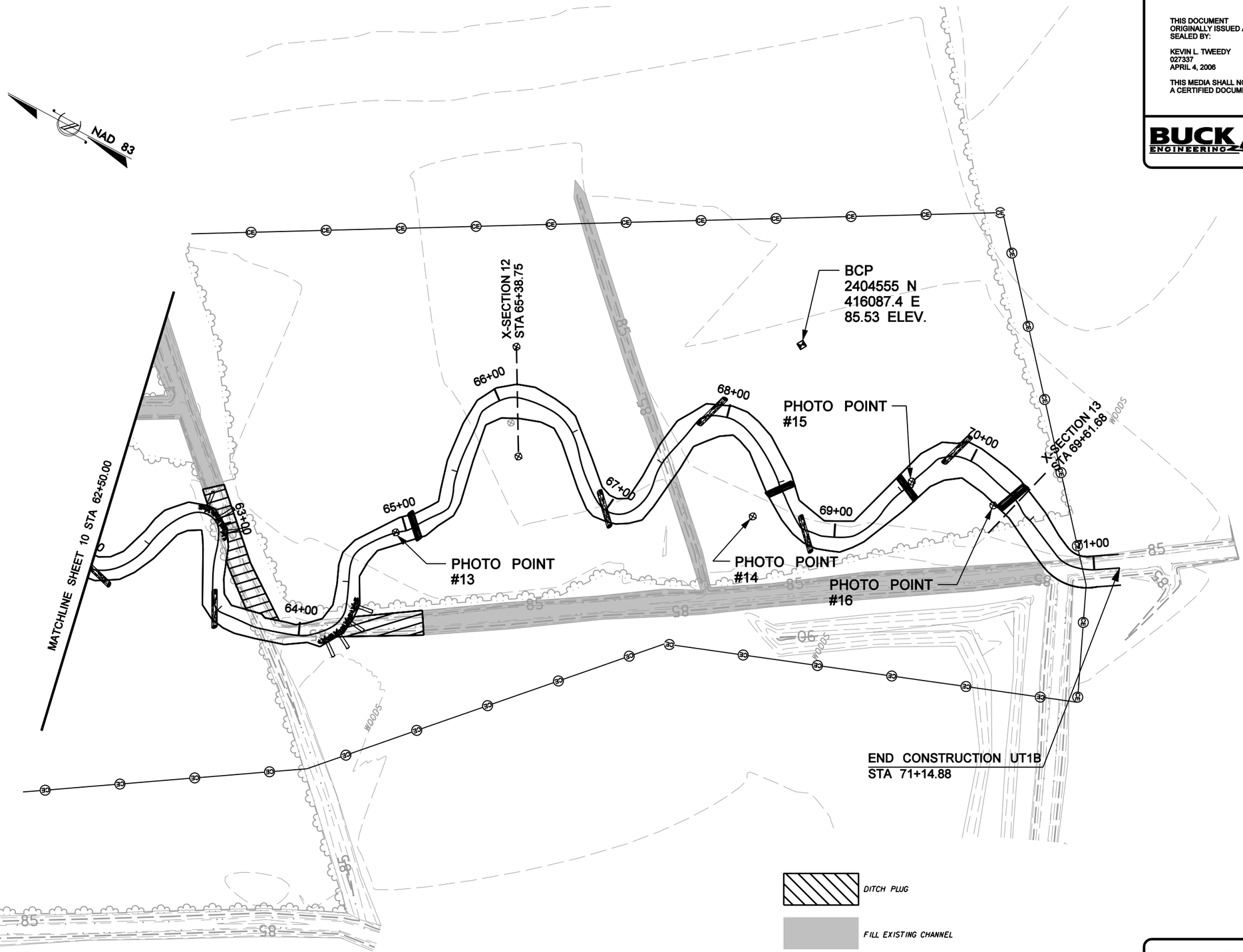

PLAN VIEW
AS-BUILT

30 15 0 30 60
SCALE (FT)

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NAD 83

ACCESS ROAD

X-SECTION 15
STA 11+57.11

PHOTO POINT
#7

MATCHLINE SHEET 13 STA 17+50.00

11+00
12+00
13+00
14+00
15+00
16+00
17+00

X-SECTION 14
STA 19+64.47

10+00

BEGIN CONSTRUCTION UT2
STA 10+00.00

DITCH PLUG

FILL EXISTING CHANNEL

PLAN VIEW
AS-BUILT

30 15 0 30 60
SCALE (FT)

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Phone: 919-463-5488
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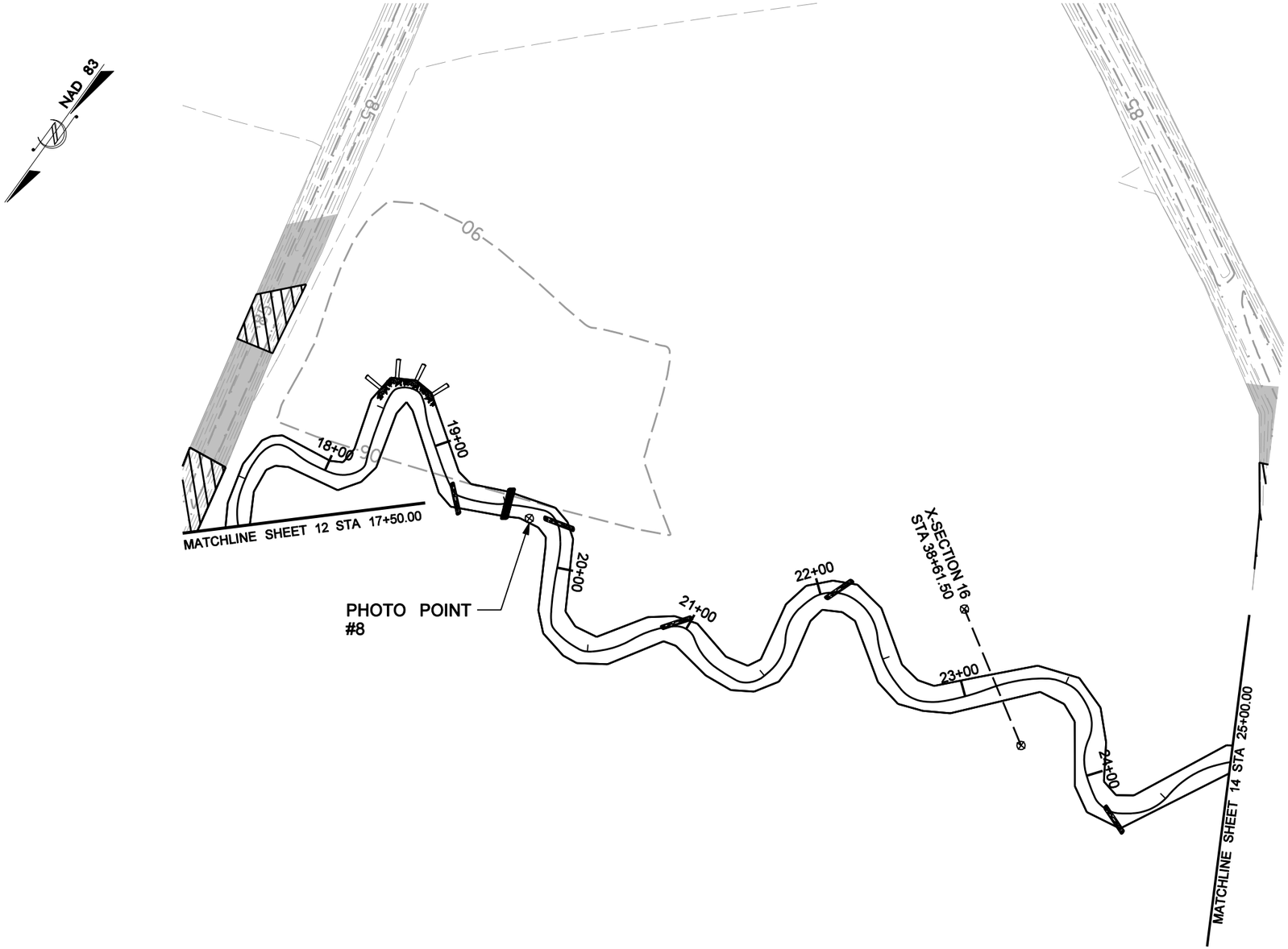

PLAN VIEW
AS-BUILT

30 15 0 30 60
SCALE (FT)

4/6/2006
0211R
C:\Projects\Design\as-built\0211R_EBX_AB_PSH_13.dgn

2/26/03

BUCK PROJECT REFERENCE NO.	SHEET NO.
0211R	14

PROJECT ENGINEER

THIS DOCUMENT
ORIGINALLY ISSUED AND
SEALED BY:

KEVIN L. TWEEDY
027337
MAY 4, 2006

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BUCK ENGINEERING
8000 Regency Parkway Suite 200
Cary, North Carolina 27511
Phone: 919-463-5488
Fax: 919-463-5490

NAD 83

ACCESS ROAD

MATCHLINE SHEET 13 STA 25+00.00

25+00

26+00

27+00

28+00

29+00

30+00

31+00

32+00

33+00

PHOTO POINT
#9

X-SECTION 17
STA 24+13.12

X-SECTION 18
STA 35+21.10

MATCHLINE SHEET 7 STA 32+50.00

DITCH PLUG

FILL EXISTING CHANNEL

PLAN VIEW
AS-BUILT

30 15 0 30 60
SCALE (FT)

4/12/2006
I:\0211R\Design\as-built\0211R_EBX_AB_PSH_14.dgn

2/26/03

BUCK PROJECT REFERENCE NO.	SHEET NO.
0211R	15

PROJECT ENGINEER

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BUCK ENGINEERING
8000 Regency Parkway Suite 200
Cary, North Carolina 27511
Phone: 919-463-5488
Fax: 919-463-5490

NAD 83

STA 10+00.00
BEGIN CONSTRUCTION UT3

PHOTO POINT #16

PHOTO POINT #15

PHOTO POINT #18

PHOTO POINT #19

END CONSTRUCTION UT3
STA 19+11.09

X-SECTION 20
STA 63+15.13

X-SECTION 21
STA 67+21.00

10+00
11+00
12+00
13+00
14+00
15+00
16+00
17+00
18+00
19+00

22°PT
20°PT

WOODS

FILL EXISTING CHANNEL

DITCH PLUG

PLAN VIEW
AS-BUILT

30 15 0 30 60
SCALE (FT)

4/12/2006
0211R_PSH_15.dgn
C:\Projects\0211R\Design\as-built\0211R_EBX_AB_PSH_15.dgn

2/26/03

BUCK PROJECT REFERENCE NO.	SHEET NO.
0211R	16

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Cary, North Carolina 27511
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Fax: 919-463-5490

NAD 83

CONSERVATION EASEMENT

AUTOMATIC WELL #3

MANUAL WELL #2

VEGETATION PLOT #17

AUTOMATIC WELL #1

VEGETATION PLOT #20

VEGETATION PLOT #19

VEGETATION PLOT #18

VEGETATION PLOT #16

VEGETATION PLOT #15

VEGETATION PLOT #11

VEGETATION PLOT #16

VEGETATION PLOT #14

VEGETATION PLOT #9

VEGETATION PLOT #10

CONSERVATION EASEMENT

VEGETATION PLOT #13

MANUAL WELL #4

RAIN GAUGE

MATCHLINE SHEET 17 STA 42+60.00

50' STREAM RESTORATION BUFFER

WETLAND BOUNDARY

WETLAND OVERVIEW

100 50 0 100 200
SCALE (FT)

4/6/2006
C:\projects\0211R\design\as-built\0211R_EBX_AB_PSH_16.dgn

2/26/03

BUCK PROJECT REFERENCE NO.	SHEET NO.
0211R	17

PROJECT ENGINEER

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APRIL 4, 2006

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8000 Regency Parkway Suite 200
Cary, North Carolina 27511
Phone: 919-463-5488
Fax: 919-463-5490

MATCHLINE SHEET 18 STA 42+50.00

VEGETATION PLOT #8

CONSERVATION EASEMENT

VEGETATION PLOT #7

CONSERVATION EASEMENT

VEGETATION PLOT #6

CREST GAUGE #1

VEGETATION PLOT #5

AUTOMATIC WELL #5

VEGETATION PLOT #4

MANUAL WELL #6

CONSERVATION EASEMENT

VEGETATION PLOT #3

VEGETATION PLOT #1

CREST GAUGE #2

VEGETATION PLOT #2

NAD 83

50' STREAM RESTORATION BUFFER

WETLAND BOUNDARY

WETLAND OVERVIEW

100 50 0 100 200
SCALE (FT)

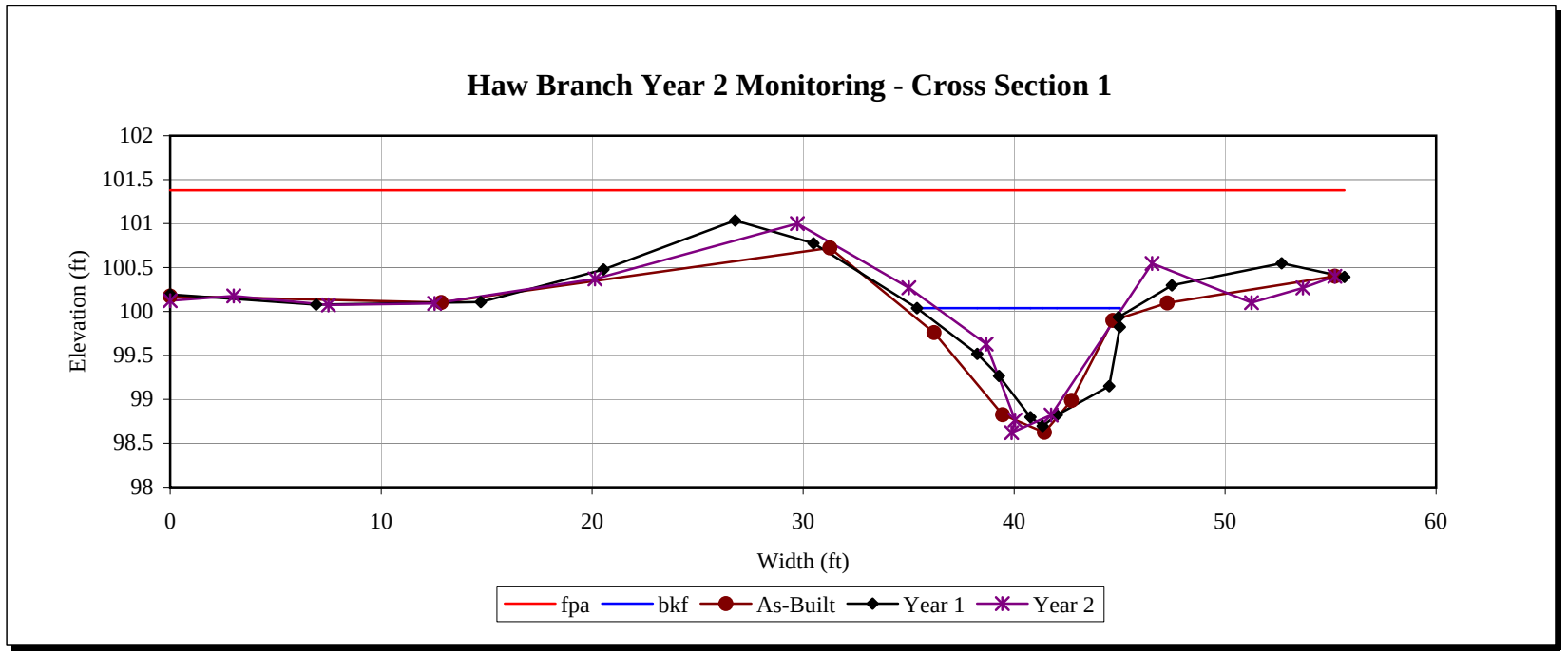
4/6/2006
C:\projects\0211R\design\as-built\0211R_EBX_AB_PSH_17.dgn

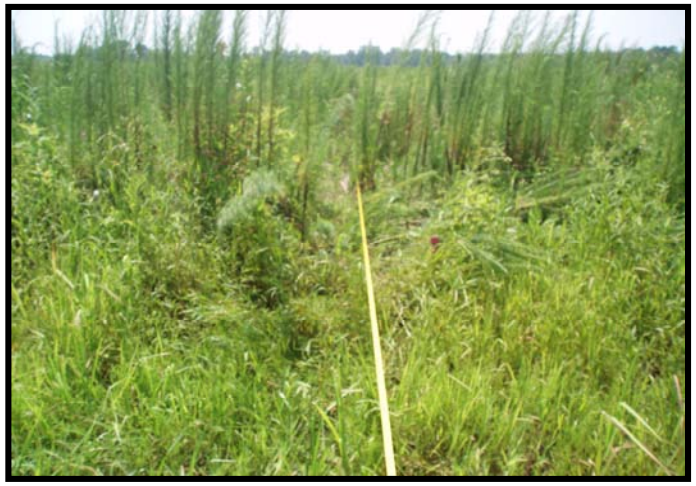
APPENDIX B

Cross Section Data

Looking at left bank.

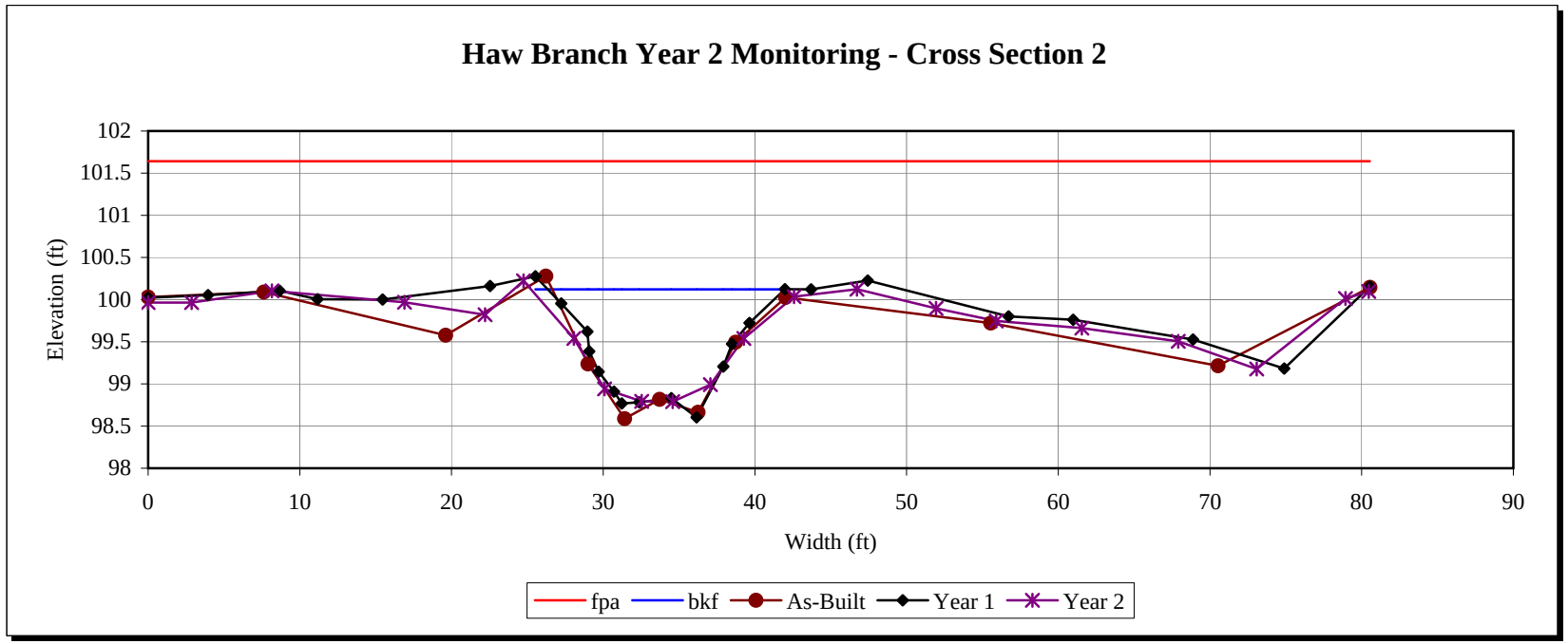
Looking at right bank.





Looking at left bank.

Looking at right bank.



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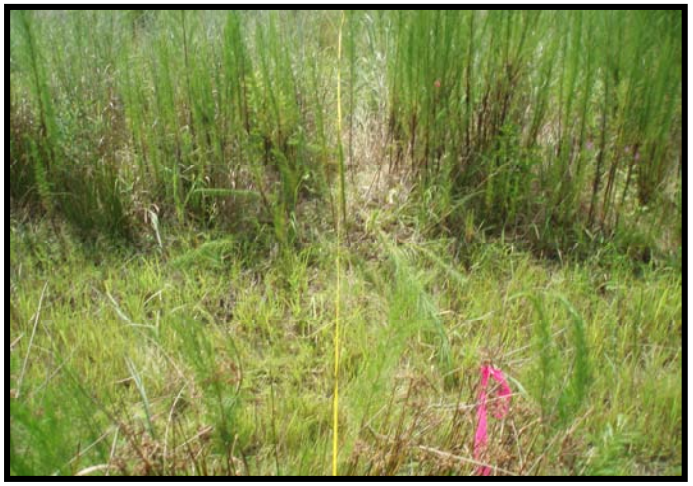
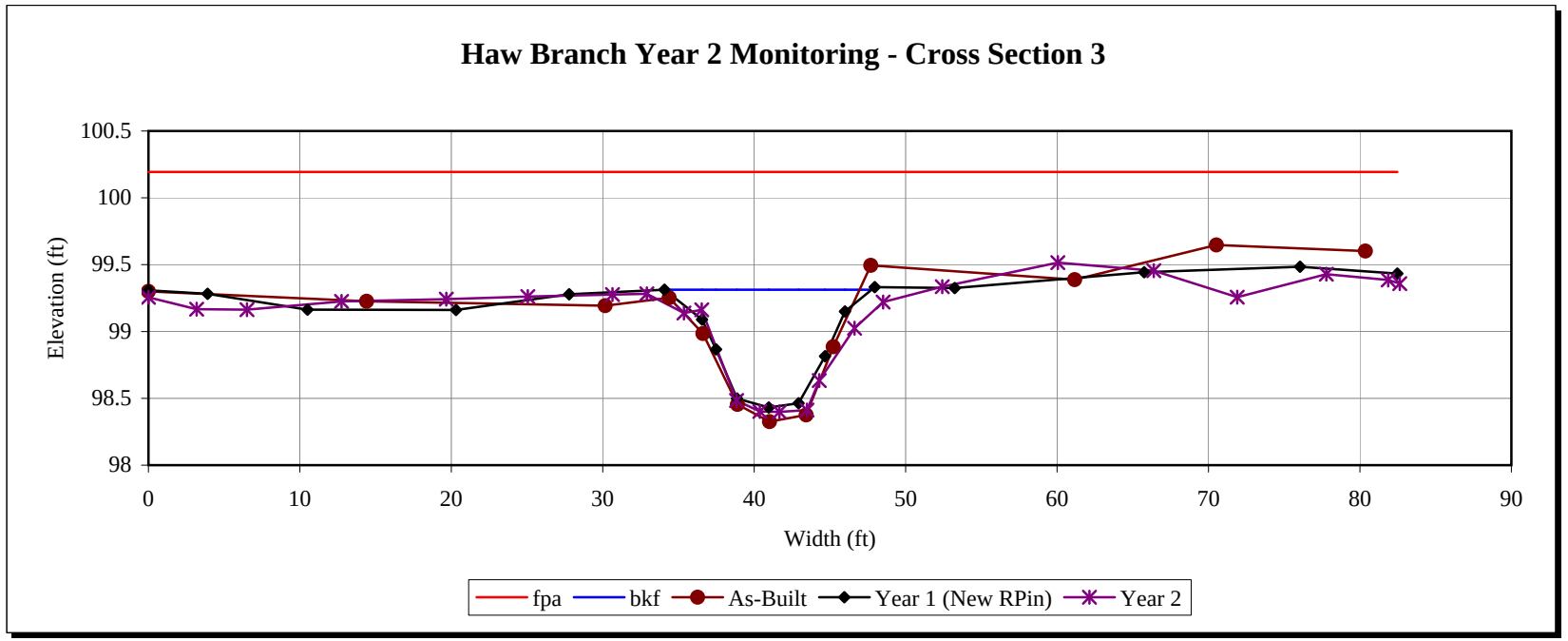
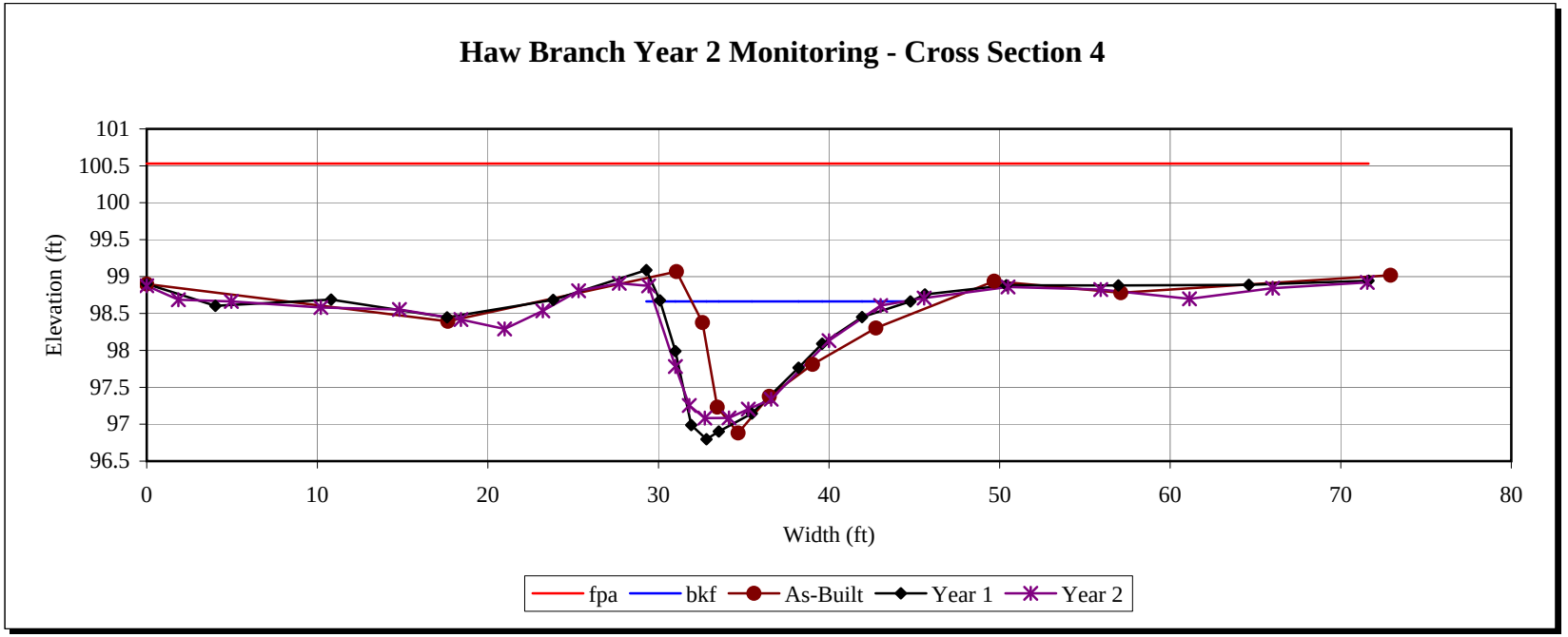


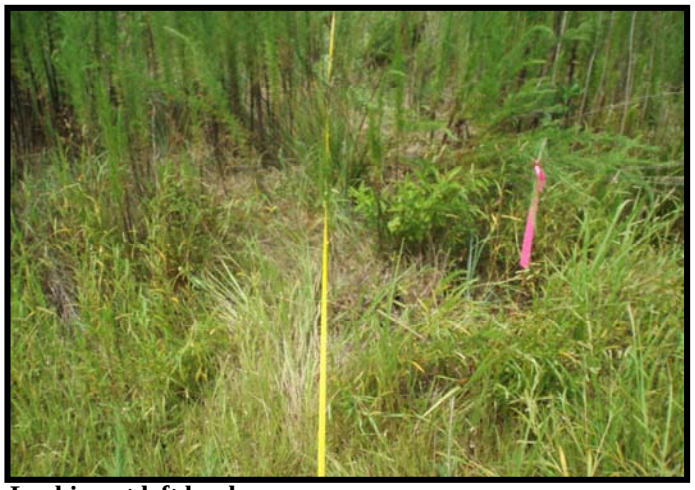
Looking at right bank.



Looking at left bank.

Looking at right bank.





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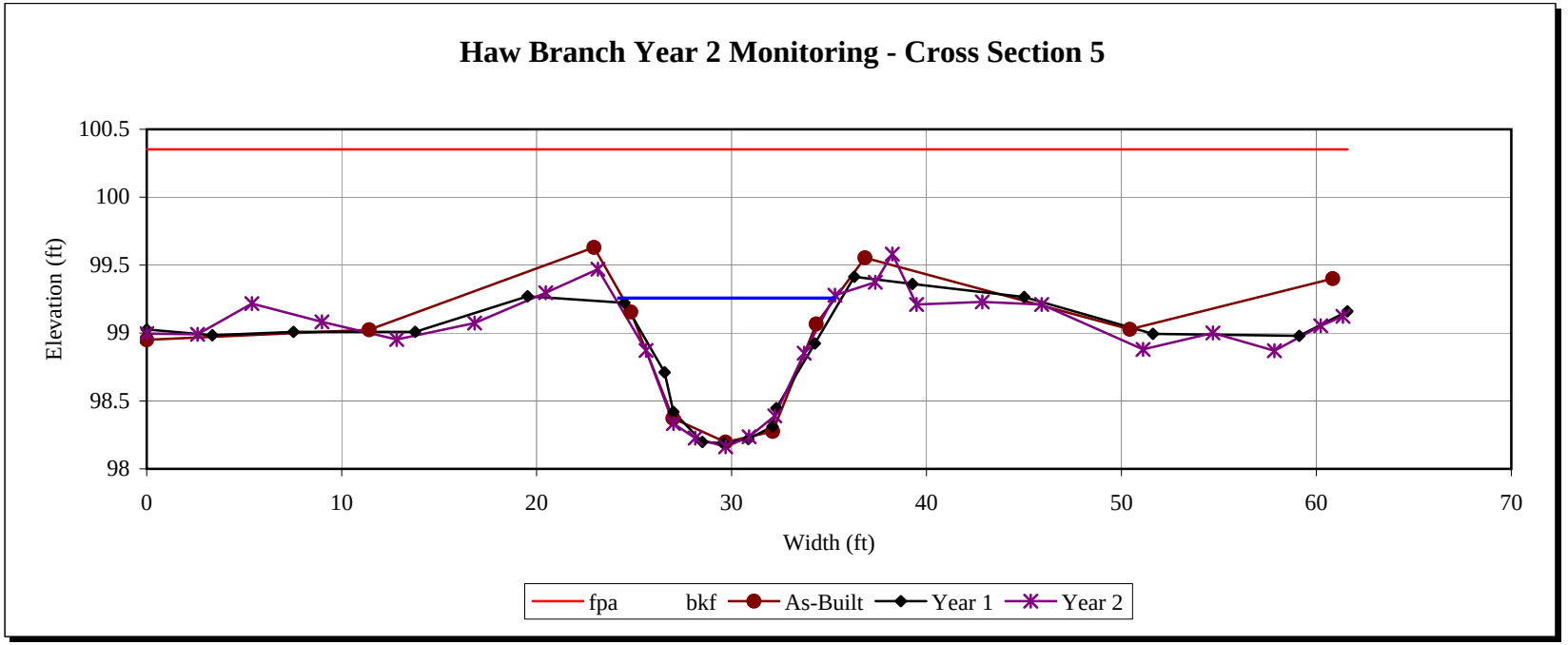
Looking at right bank.



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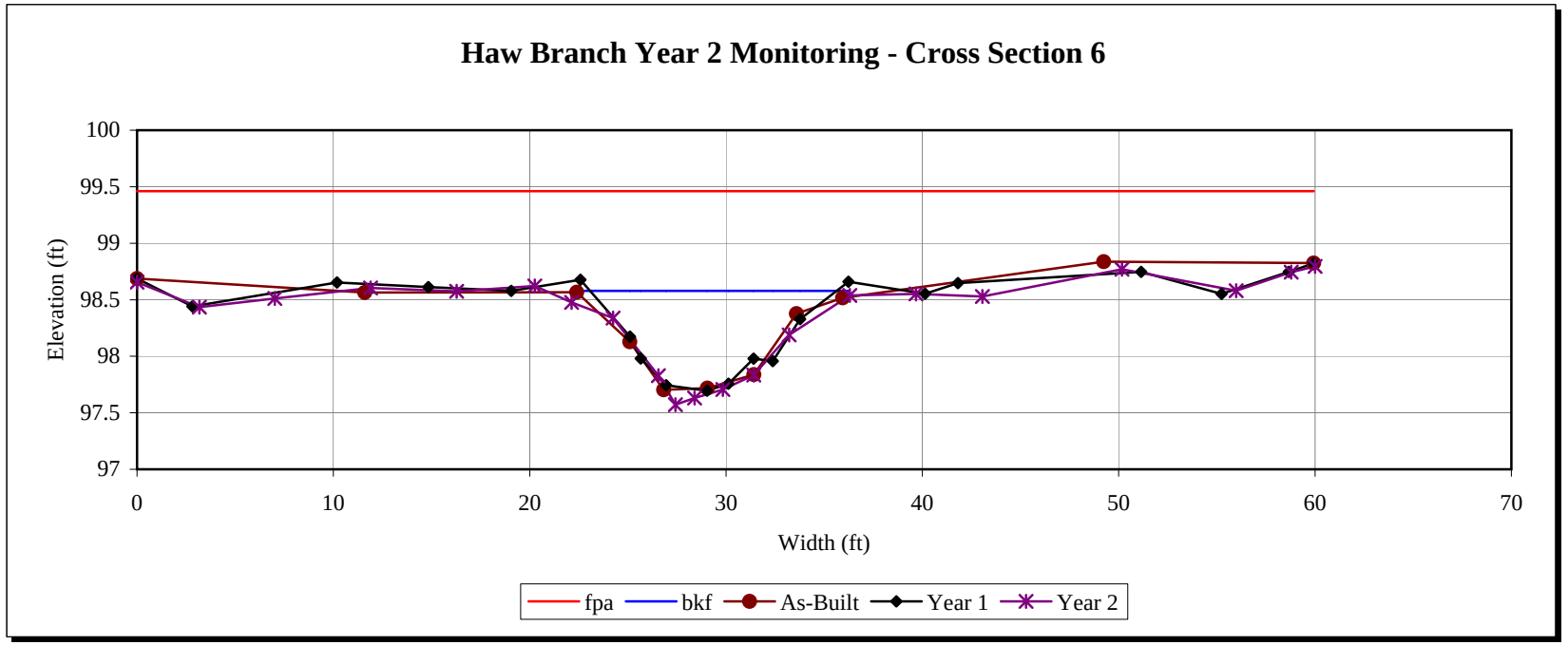
Looking at right bank.



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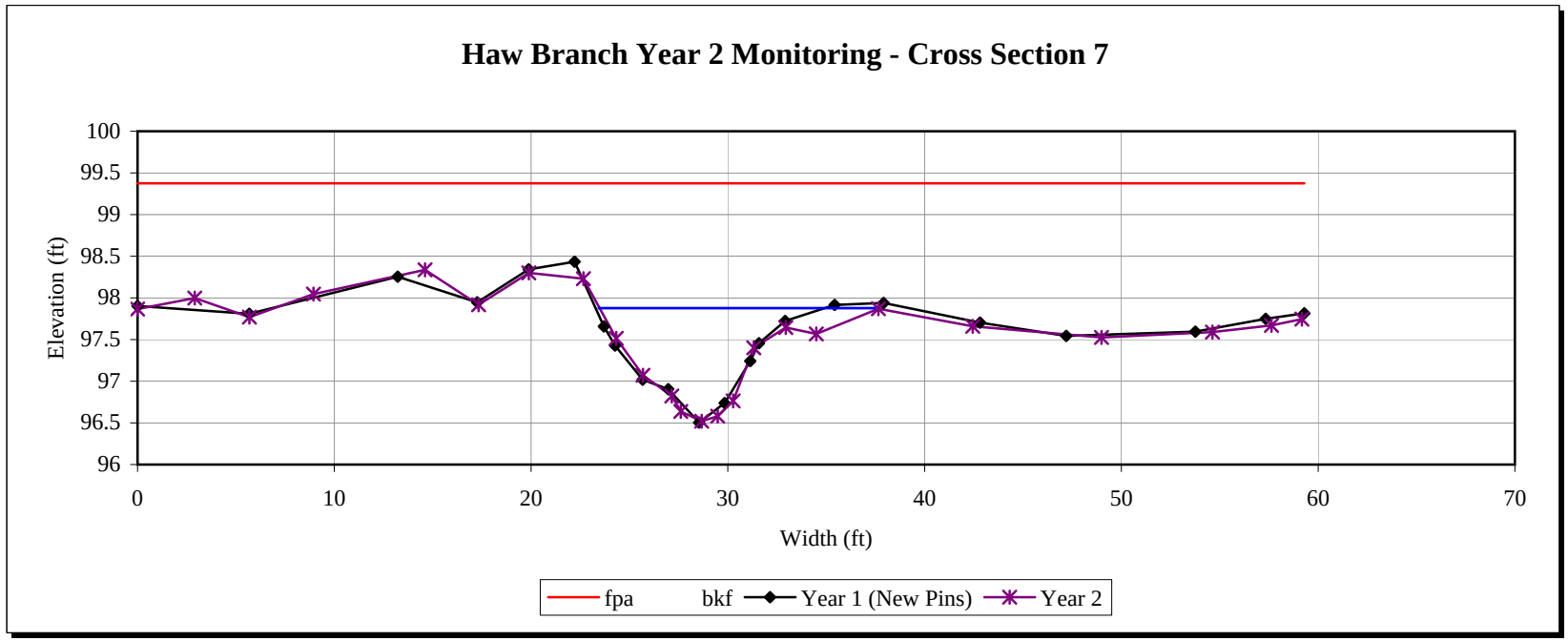
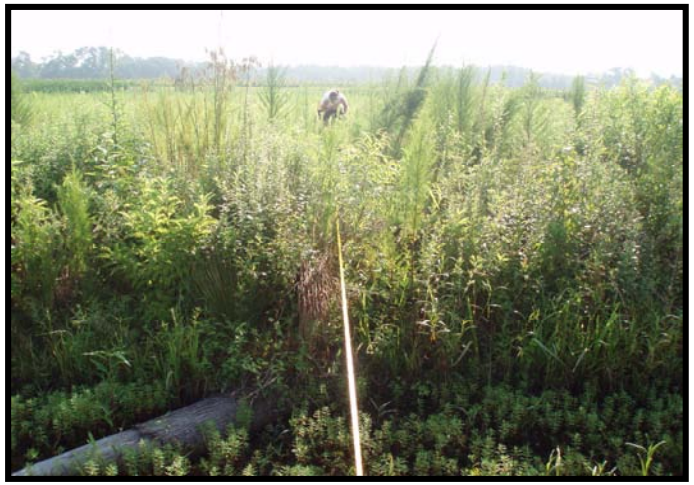
Looking at right bank.





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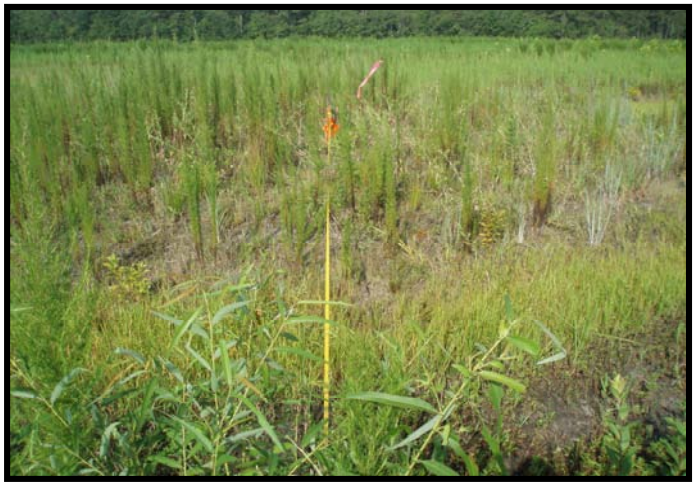

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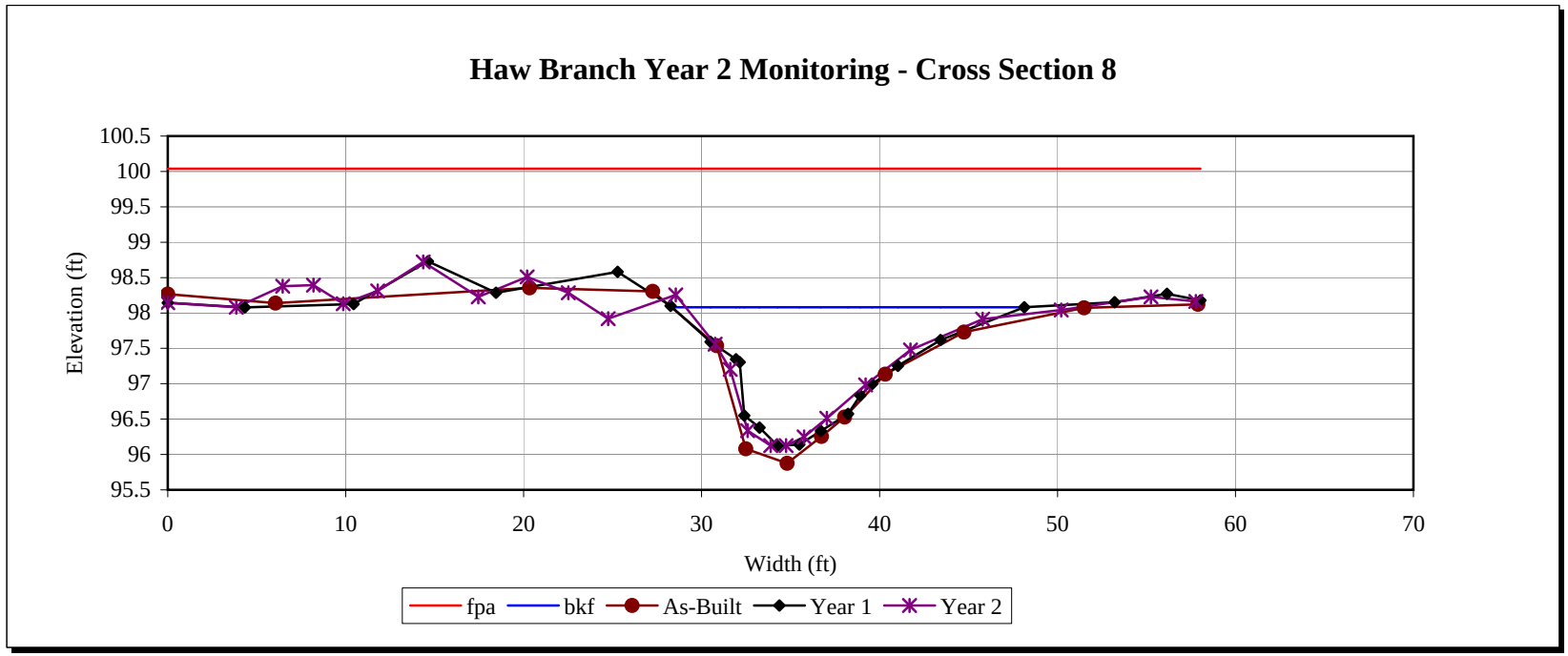

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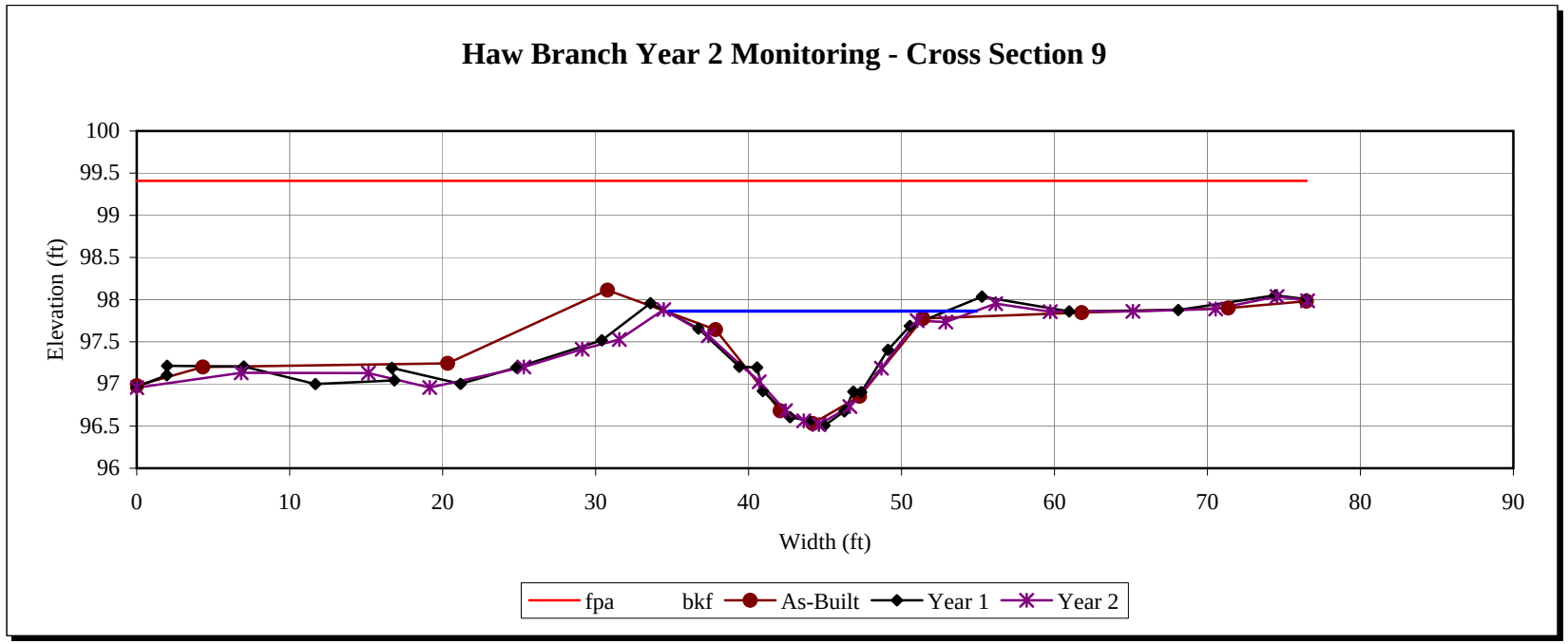
Looking at right bank.



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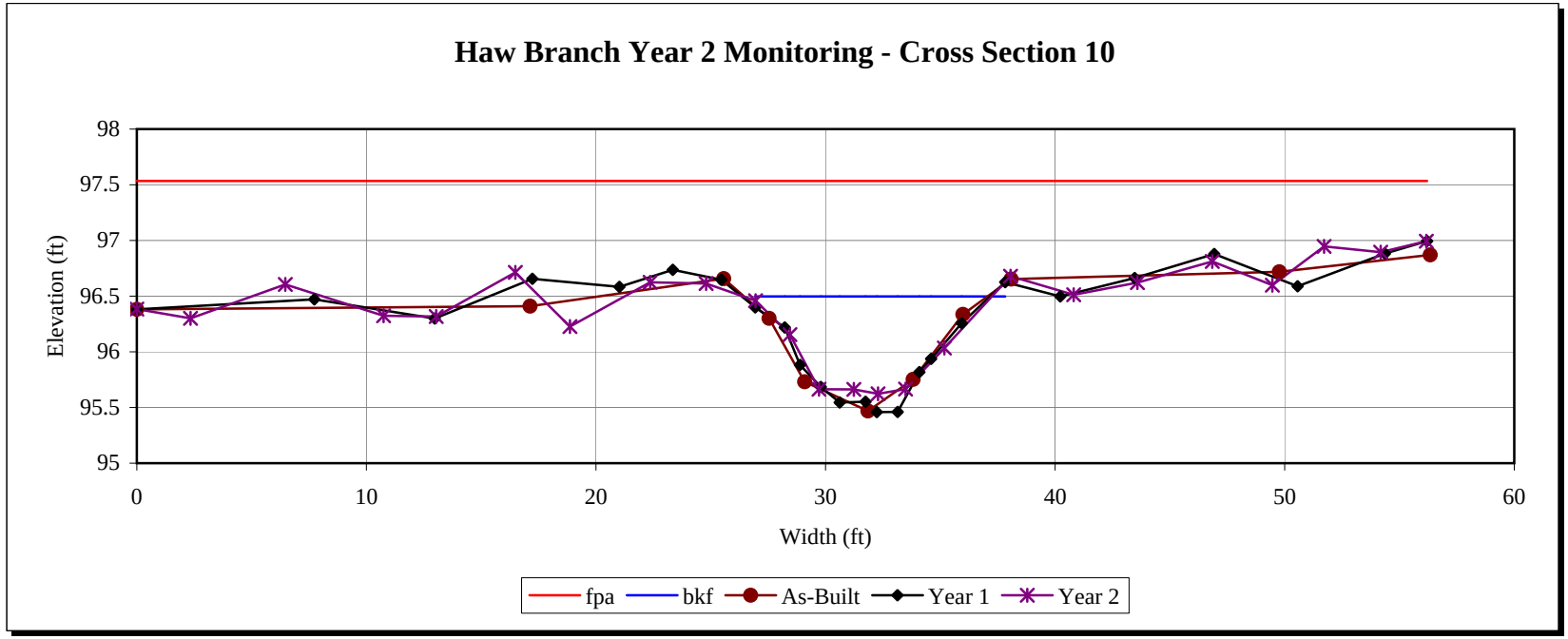

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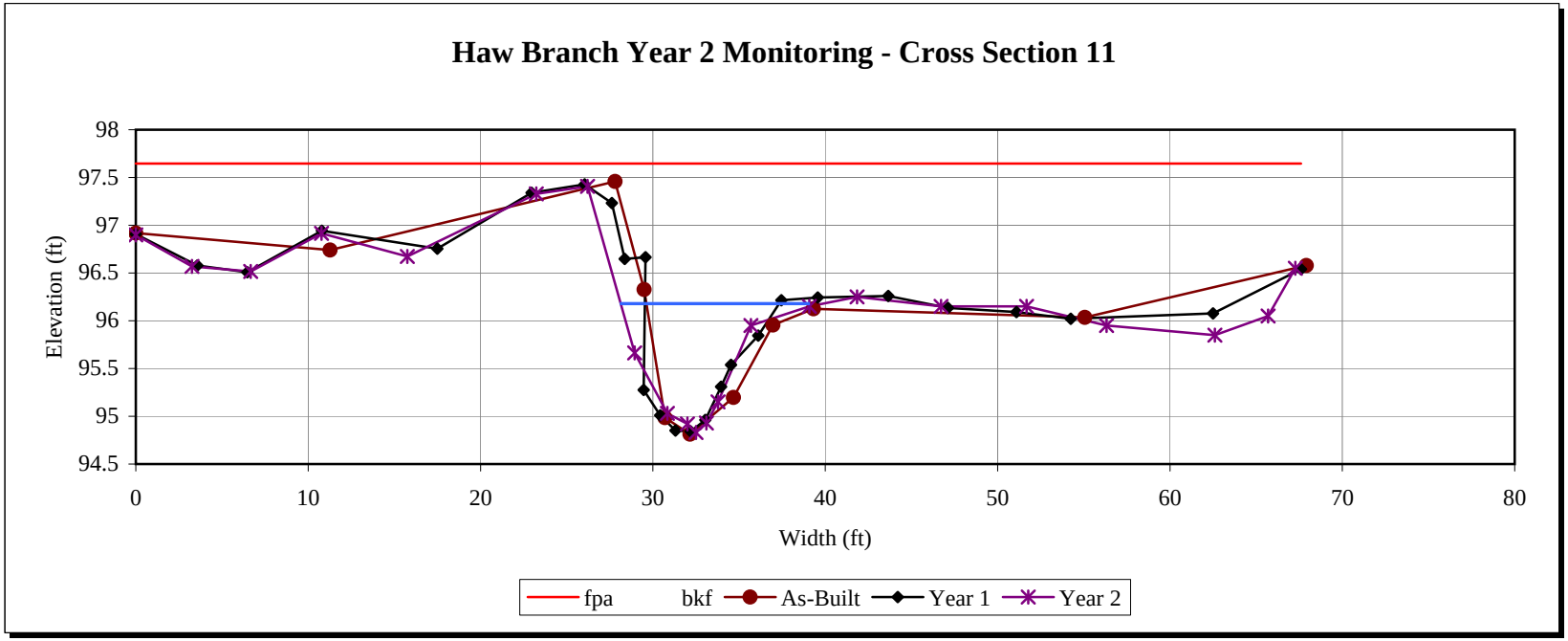

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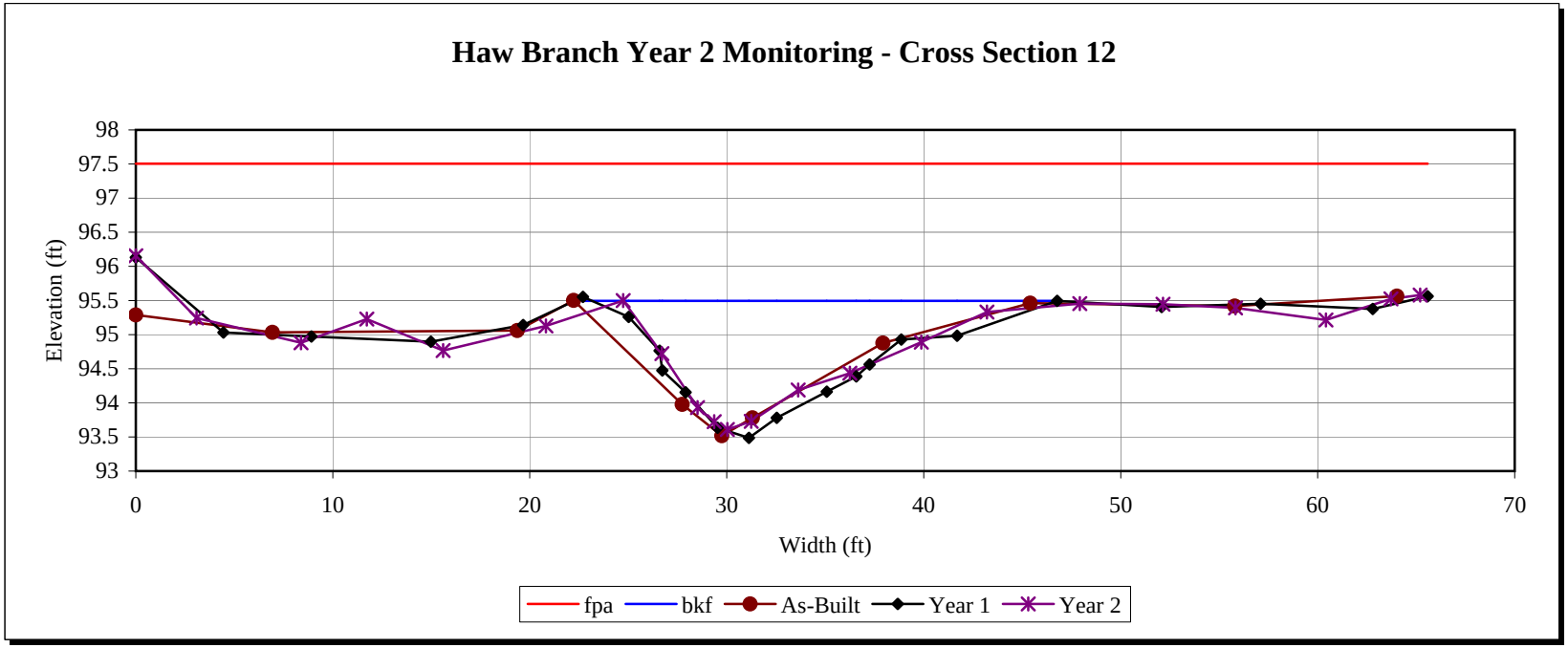

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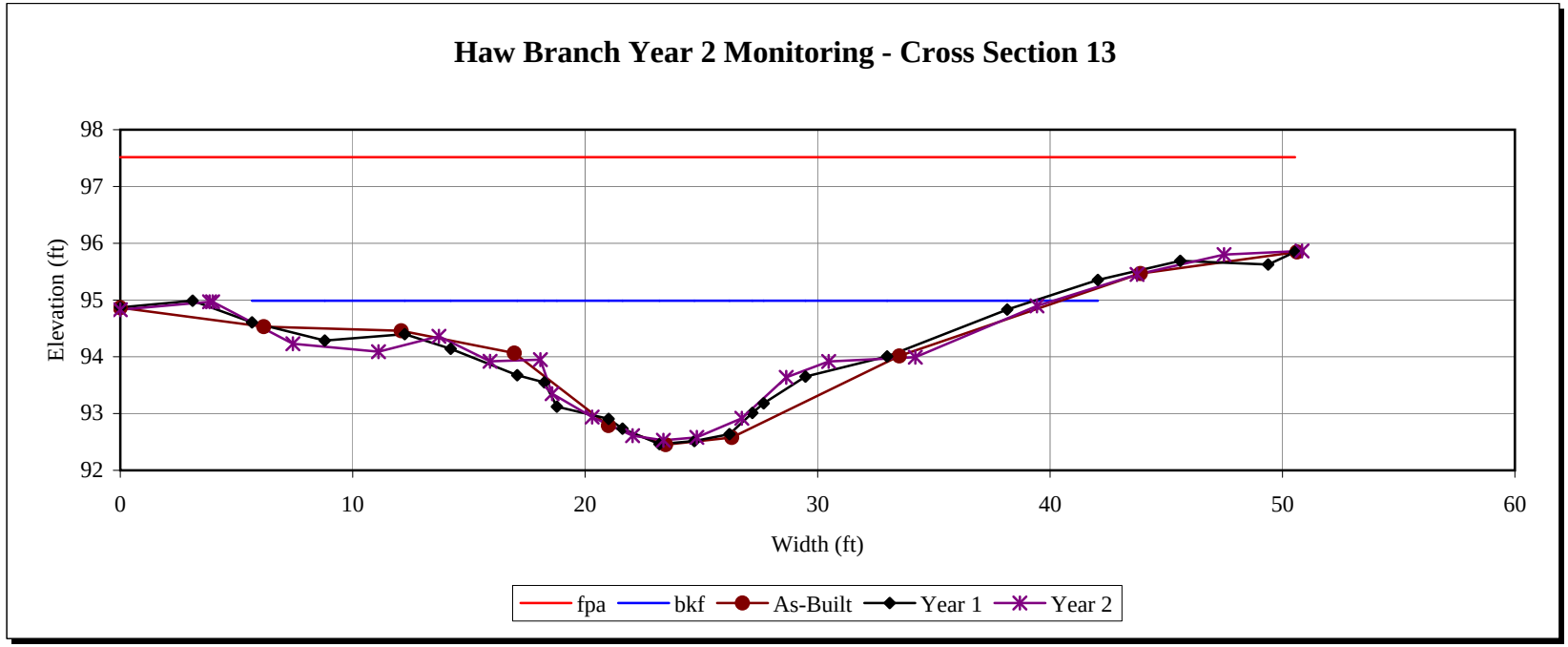
Looking at right bank.



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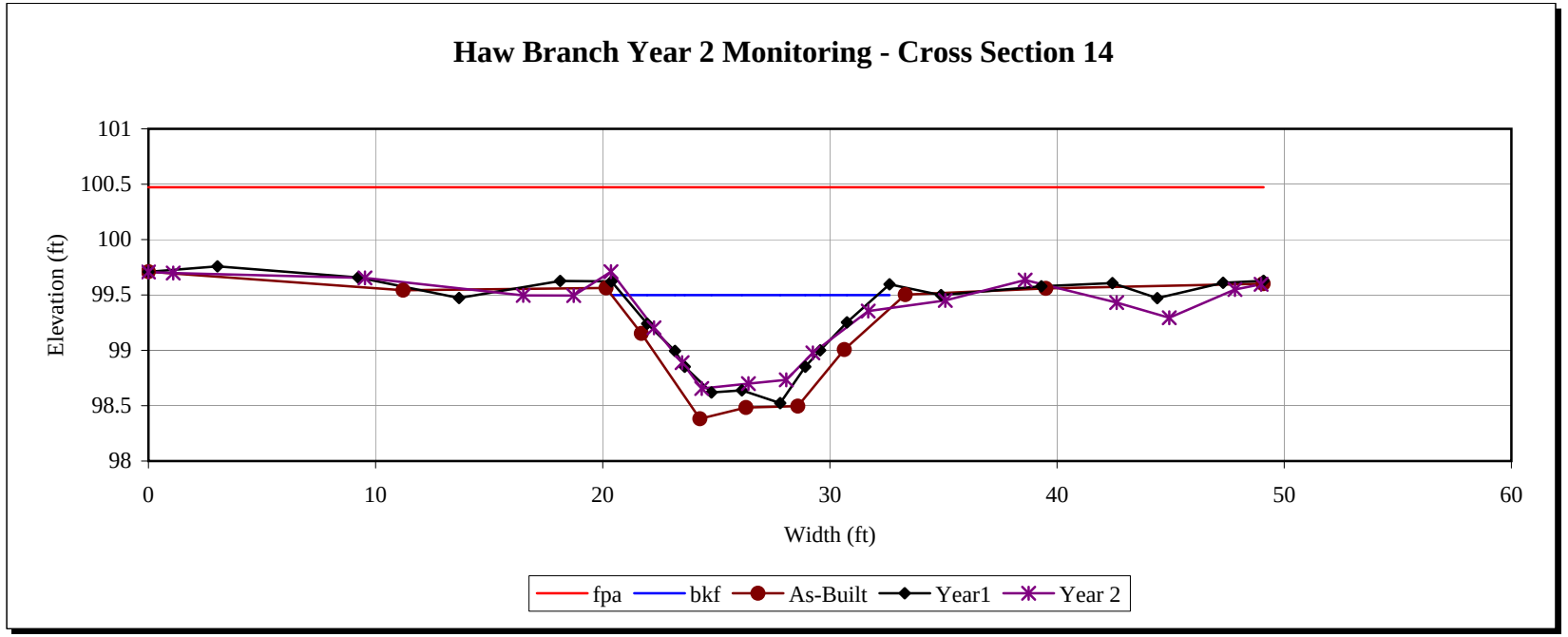

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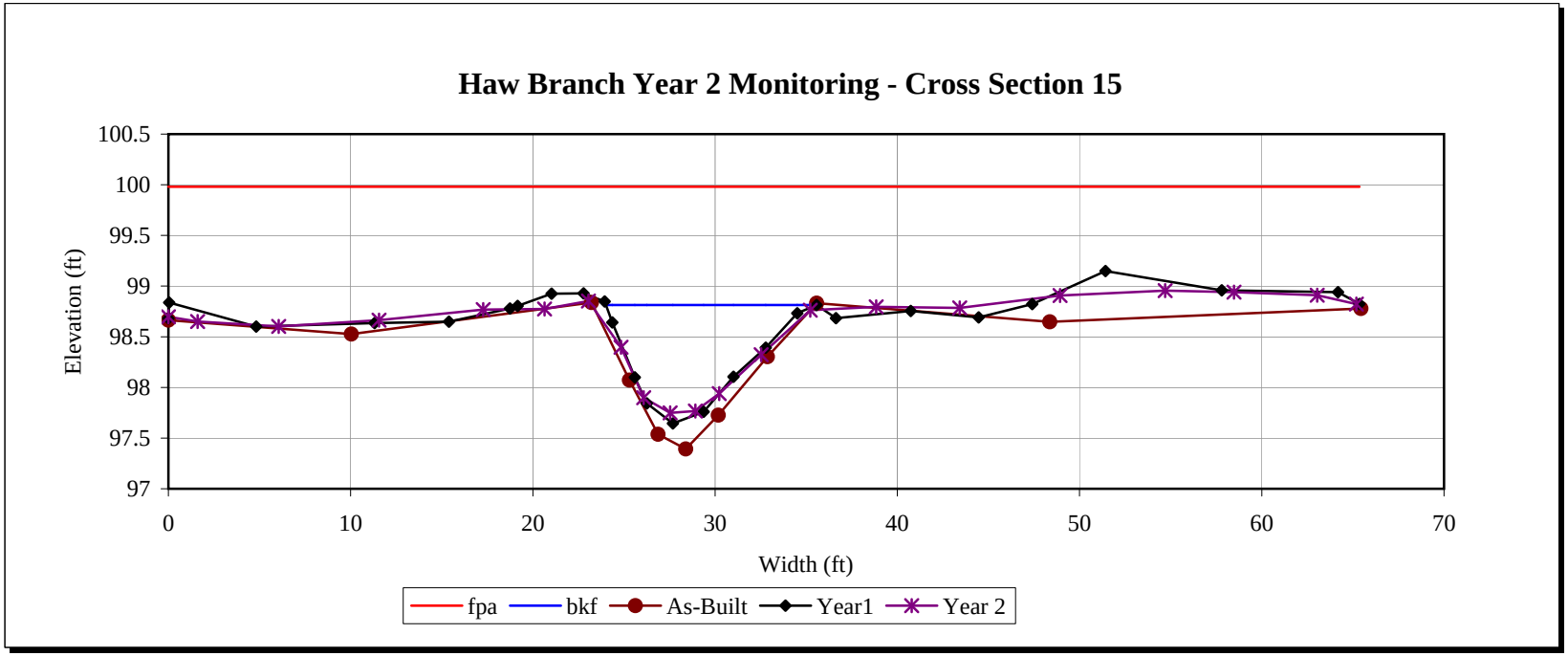

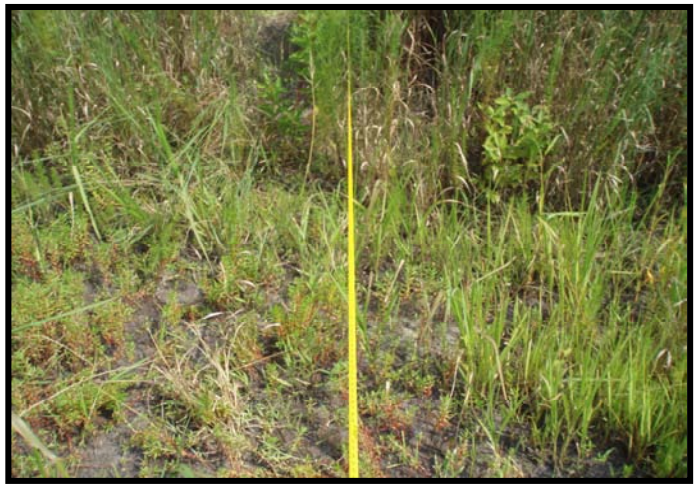

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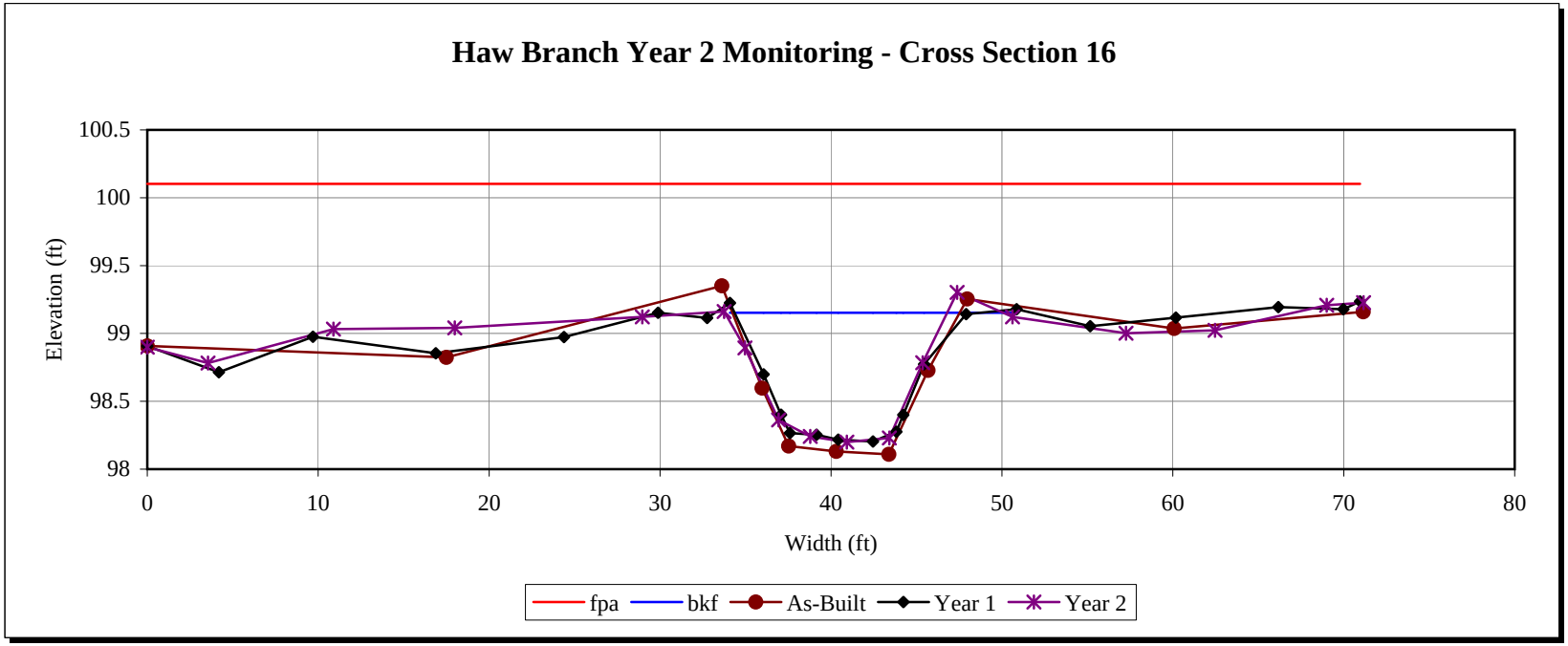

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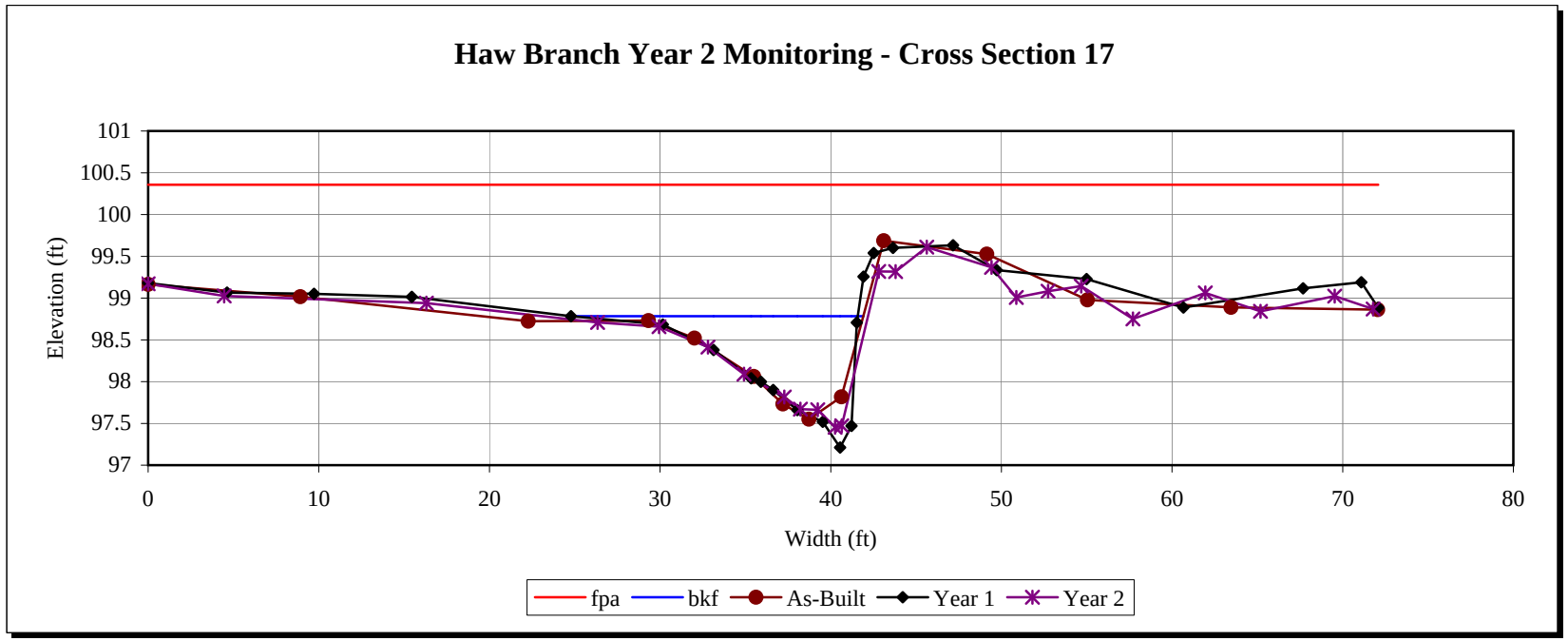

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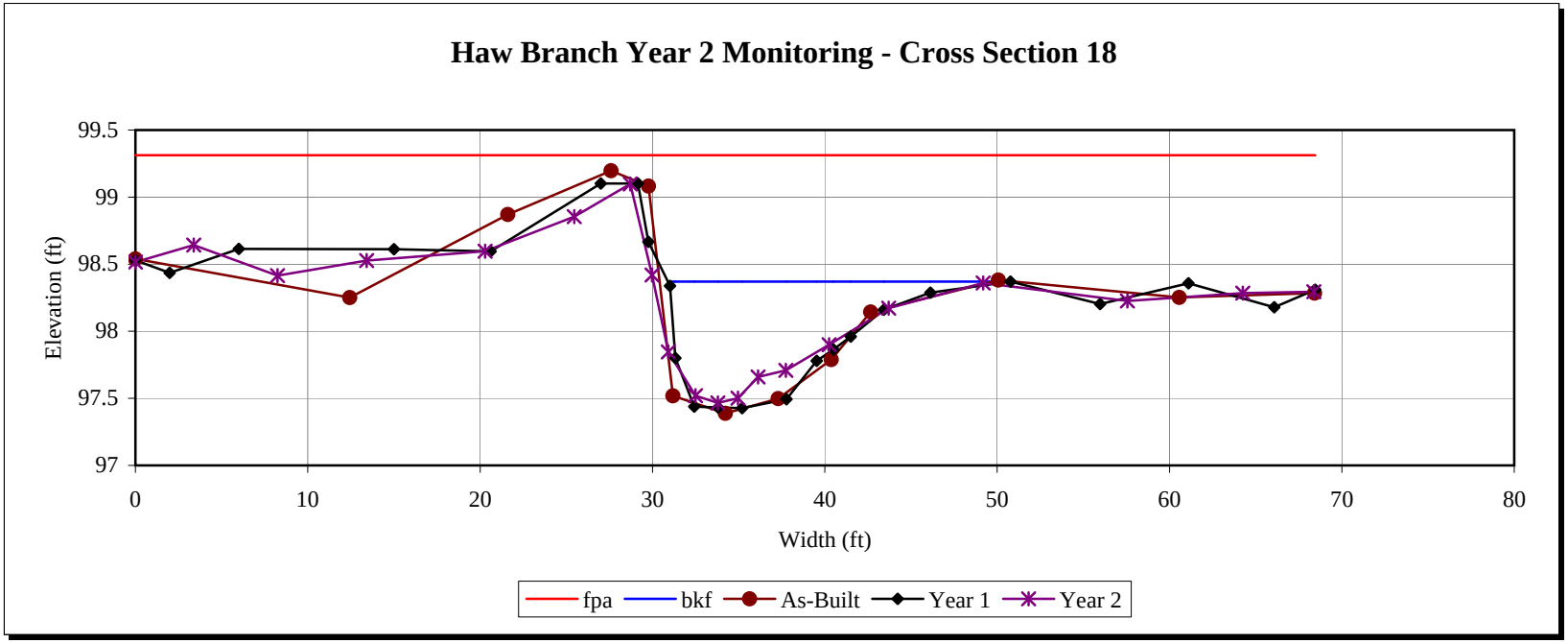
Looking at right bank.



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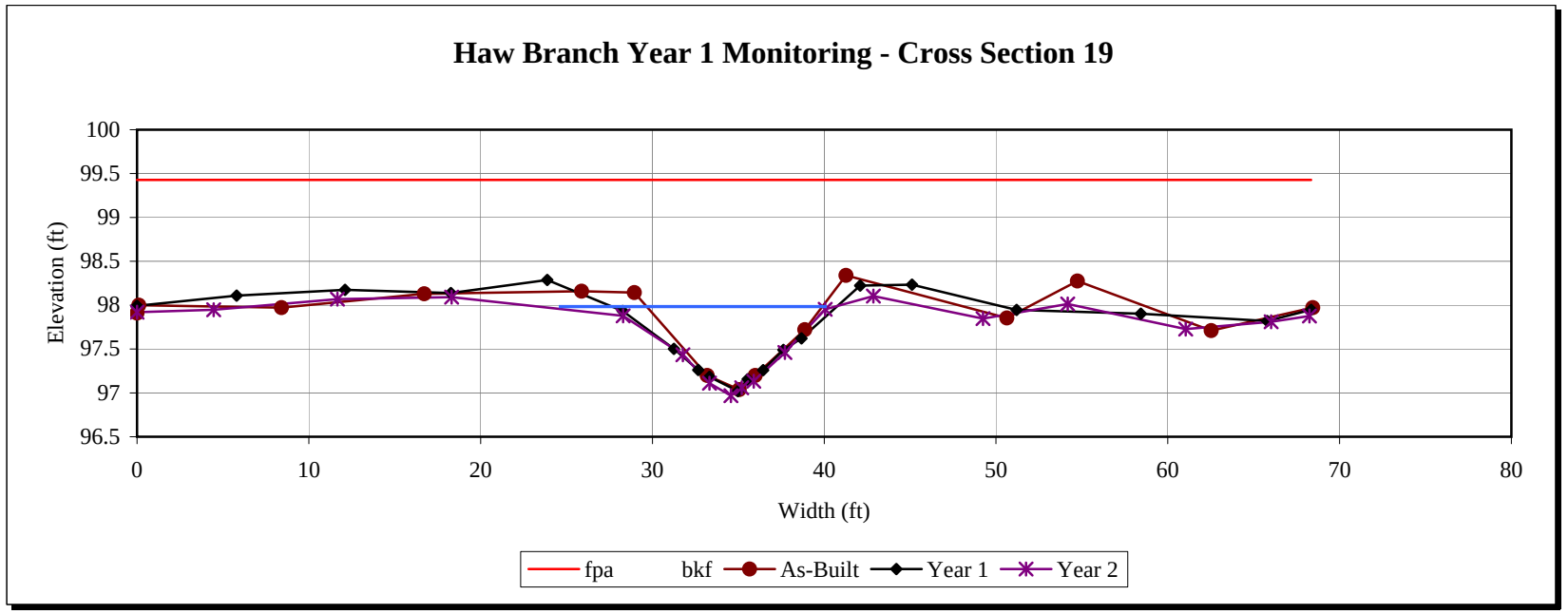

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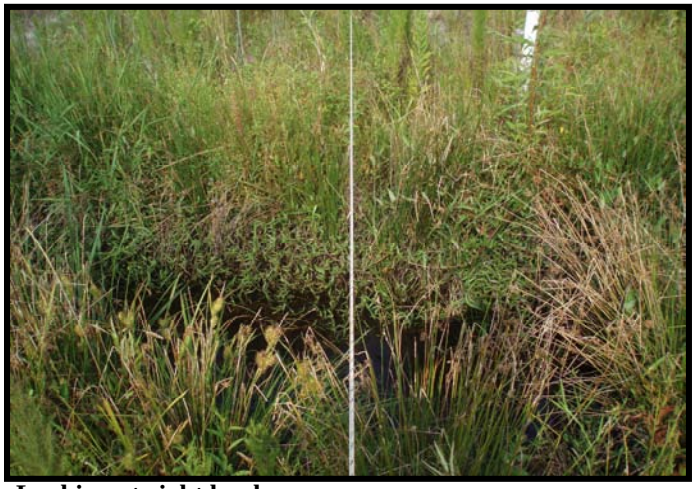

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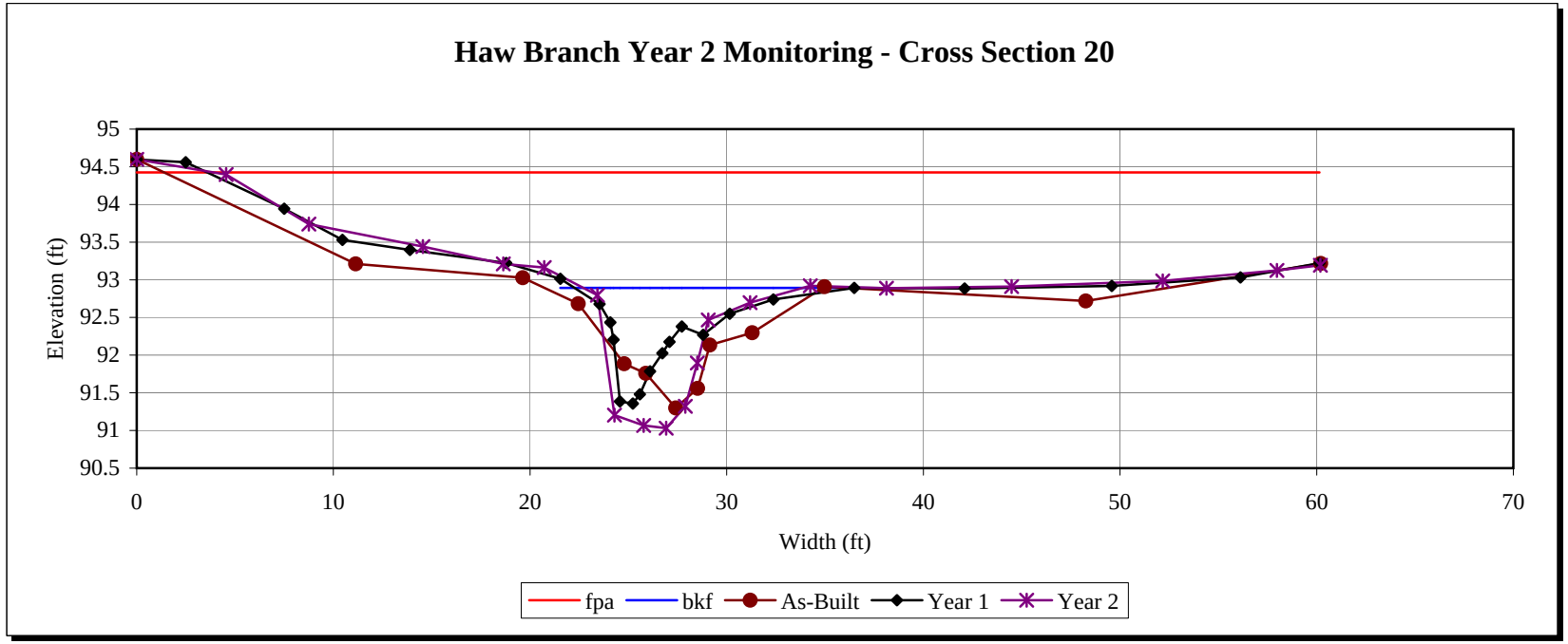

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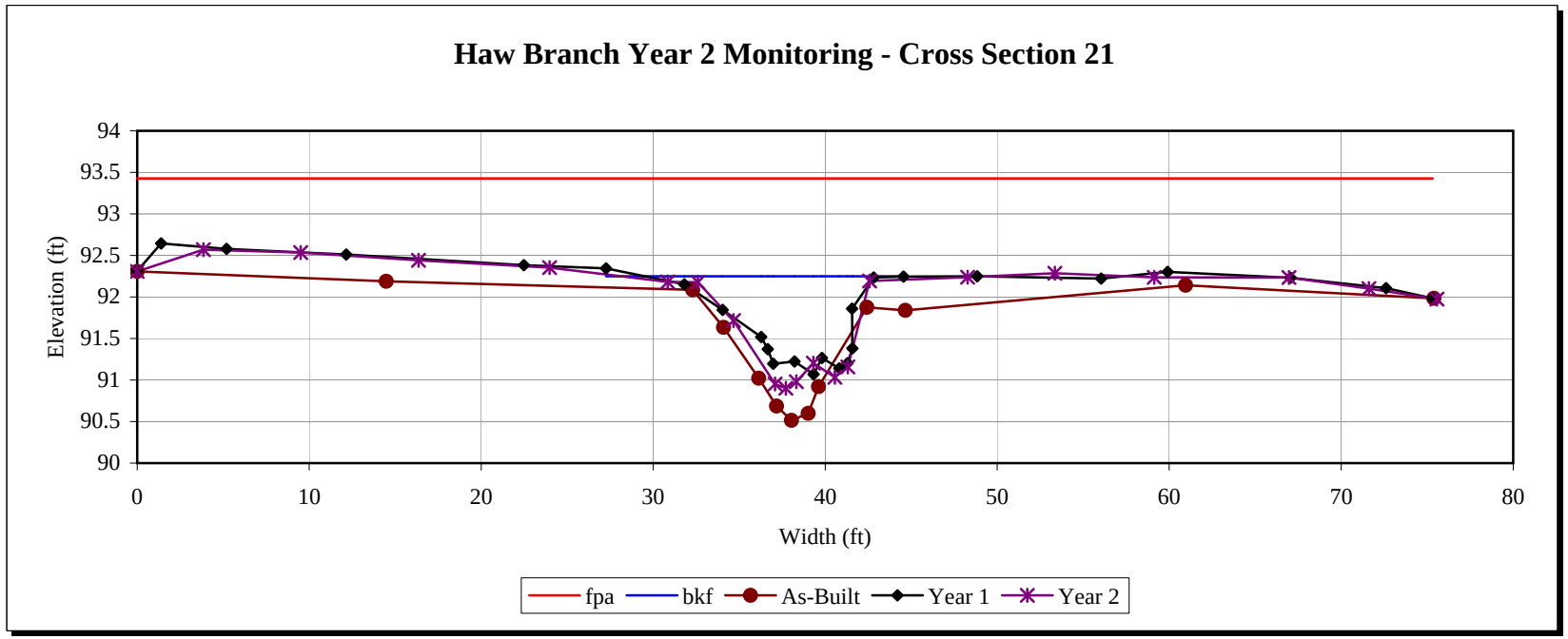

APPENDIX C

Gauge Data

											Weatherstation Rainfall Data	
Date	Time	Water Level (inches)										
dd-mmm-yyyy	hh:mm:ss	AW1	AW3	AW5	MW2	MW4	MW6	MW7	AW7	On-site Raingauge	Hoffmann Daily Rainfall	Hoffmann Monthly Rainfall
1-Jan-2007	08:00:00	4.2	4.6	-16.3							0.35	4.94
1-Jan-2007	20:00:00	5.6	6.2	-4.5								
2-Jan-2007	08:00:00	3.7	5.1	-10.9							0	
2-Jan-2007	20:00:00	5.3	4.6	-11.6								
3-Jan-2007	08:00:00	3.2	4.0	-15.4							0	
3-Jan-2007	20:00:00	4.9	4.5	-14.4								
4-Jan-2007	08:00:00	3.8	4.3	-17.6							0.08	
4-Jan-2007	20:00:00	4.4	4.7	-15.5								
5-Jan-2007	08:00:00	4.0	5.0	-16.9							0.19	
5-Jan-2007	20:00:00	4.5	6.6	-7.1								
6-Jan-2007	08:00:00	6.0	8.1	3.0							0.57	
6-Jan-2007	20:00:00	7.0	6.8	2.7								
7-Jan-2007	08:00:00	5.0	6.3	-1.3							0.24	
7-Jan-2007	20:00:00	5.4	7.1	-1.6								
8-Jan-2007	08:00:00	5.9	6.9	-1.3							0.29	
8-Jan-2007	20:00:00	6.5	6.2	-0.7								
9-Jan-2007	08:00:00	4.1	5.4	-7.6							0.01	
9-Jan-2007	20:00:00	6.0	4.8	-7.4								
10-Jan-2007	08:00:00	3.9	3.8	-13.2							0	
10-Jan-2007	20:00:00	5.1	3.2	-12.7								
11-Jan-2007	08:00:00	4.3	2.7	-16.7							0	
11-Jan-2007	20:00:00	4.7	3.3	-15.1								
12-Jan-2007	08:00:00	2.5	3.4	-19.1							0	
12-Jan-2007	20:00:00	3.8	3.8	-16.8								
13-Jan-2007	08:00:00	1.7	3.7	-21.0							0	
13-Jan-2007	20:00:00	3.8	3.9	-15.7								
14-Jan-2007	08:00:00	1.8	3.6	-19.8							0	
14-Jan-2007	20:00:00	2.9	3.8	-17.2								
15-Jan-2007	08:00:00	0.8	3.9	-20.6							0	
15-Jan-2007	20:00:00	3.0	3.7	-16.3								
16-Jan-2007	08:00:00	1.6	3.7	-20.7							0.06	
16-Jan-2007	20:00:00	2.5	3.6	-15.3								
17-Jan-2007	08:00:00	0.6	1.9	-18.1							0.01	
17-Jan-2007	20:00:00	0.4	1.4	-19.7								
18-Jan-2007	08:00:00	2.8	3.2	-20.7							0.4	

											Weatherstation Rainfall Data	
Date	Time	Water Level (inches)										
dd-mmm-yyyy	hh:mm:ss	AW1	AW3	AW5	MW2	MW4	MW6	MW7	AW7	On-site Raingauge	Hoffmann Daily Rainfall	Hoffmann Monthly Rainfall
18-Jan-2007	20:00:00	3.1	4.9	-15.5								
19-Jan-2007	08:00:00	2.5	4.5	-14.9							0.01	
19-Jan-2007	20:00:00	3.0	4.1	-12.8								
20-Jan-2007	08:00:00	0.6	3.3	-18.1							0	
20-Jan-2007	20:00:00	2.1	2.6	-16.2								
21-Jan-2007	08:00:00	1.2	2.5	-19.3							0.14	
21-Jan-2007	20:00:00	2.3	3.2	-18.9								
22-Jan-2007	08:00:00	4.8	5.5	0.4							0.71	
22-Jan-2007	20:00:00	5.1	5.2	0.1								
23-Jan-2007	08:00:00	4.8	4.7	-1.7							0	
23-Jan-2007	20:00:00	5.4	4.7	-1.2								
24-Jan-2007	08:00:00	4.5	4.6	-8.9							0	
24-Jan-2007	20:00:00	5.4	4.6	-7.7								
25-Jan-2007	08:00:00	4.2	4.3	-13.6							0	
25-Jan-2007	20:00:00	4.7	3.9	-12.3								
26-Jan-2007	08:00:00	2.6	2.5	-17.1							0	
26-Jan-2007	20:00:00	3.8	3.5	-15.1								
27-Jan-2007	08:00:00	2.6	3.3	-19.5							0	
27-Jan-2007	20:00:00	3.4	3.1	-16.7								
28-Jan-2007	08:00:00	4.2	5.0	-15.7							0.35	
28-Jan-2007	20:00:00	4.8	5.0	-10.9								
29-Jan-2007	08:00:00	3.5	2.6	-14.8							0	
29-Jan-2007	20:00:00	3.4	3.5	-15.0								
30-Jan-2007	08:00:00	3.4	3.0	-18.2							0	
30-Jan-2007	20:00:00	3.4	3.2	-16.7								
31-Jan-2007	08:00:00	2.3	1.9	-18.9							0	
31-Jan-2007	20:00:00	2.8	2.6	-18.4								3.41
1-Feb-2007	08:00:00	3.5	2.9	-19.4							0.91	
1-Feb-2007	20:00:00	5.1	5.3	-0.5								
2-Feb-2007	08:00:00	5.2	5.3	-0.6							0.22	
2-Feb-2007	20:00:00	5.4	5.0	0.0								
3-Feb-2007	08:00:00	4.4	4.5	-3.4							0	
3-Feb-2007	20:00:00	5.4	4.4	-4.1								
4-Feb-2007	08:00:00	4.7	4.1	-10.7							0	
4-Feb-2007	20:00:00	5.3	3.9	-9.4								

											Weatherstation Rainfall Data	
Date	Time	Water Level (inches)										
dd-mmm-yyyy	hh:mm:ss	AW1	AW3	AW5	MW2	MW4	MW6	MW7	AW7	On-site Raingauge	Hoffmann Daily Rainfall	Hoffmann Monthly Rainfall
5-Feb-2007	08:00:00	4.3	3.2	-16.1							0	
5-Feb-2007	20:00:00	4.7	3.4	-13.6								
6-Feb-2007	08:00:00	3.5	0.9	-17.9							0	
6-Feb-2007	20:00:00	4.1	3.6	-17.7								
7-Feb-2007	08:00:00	3.3	3.4	-20.2							0	
7-Feb-2007	20:00:00	4.2	3.1	-15.5								
8-Feb-2007	08:00:00	2.8	3.0	-20.2							0	
8-Feb-2007	20:00:00	3.6	2.5	-17.6								
9-Feb-2007	08:00:00	2.4	1.7	-21.5							0	
9-Feb-2007	20:00:00	3.0	2.2	-18.9								
10-Feb-2007	08:00:00	1.6	2.1	-21.3							0	
10-Feb-2007	20:00:00	2.2	1.5	-19.1								
11-Feb-2007	08:00:00	0.6	-0.1	-23.0							0	
11-Feb-2007	20:00:00	1.7	1.4	-20.7								
12-Feb-2007	08:00:00	1.1	1.1	-22.8							0	
12-Feb-2007	20:00:00	1.7	1.6	-19.2								
13-Feb-2007	08:00:00	0.8	1.7	-23.8							0.55	
13-Feb-2007	20:00:00	2.6	3.1	-20.7								
14-Feb-2007	08:00:00	3.0	4.2	-12.8							0.22	
14-Feb-2007	20:00:00	3.3	3.4	-12.6								
15-Feb-2007	08:00:00	2.8	1.9	-17.7							0.01	
15-Feb-2007	20:00:00	3.0	2.5	-16.2								
16-Feb-2007	08:00:00	2.5	1.9	-18.9							0	
16-Feb-2007	20:00:00	2.3	1.8	-17.6								
17-Feb-2007	08:00:00	1.0	0.0	-22.4							0	
17-Feb-2007	20:00:00	2.1	2.0	-18.1								
18-Feb-2007	08:00:00	1.1	1.6	-20.6							0	
18-Feb-2007	20:00:00	0.9	0.3	-19.3								
19-Feb-2007	08:00:00	-0.8	-4.2	-23.4							0	
19-Feb-2007	20:00:00	0.8	0.5	-20.9								
20-Feb-2007	08:00:00	0.2	0.7	-25.3							0	
20-Feb-2007	20:00:00	0.6	-0.2	-19.3								
21-Feb-2007	08:00:00	0.4	0.1	-22.2							0	
21-Feb-2007	20:00:00	0.9	1.1	-20.2								
22-Feb-2007	08:00:00	0.6	1.3	-23.4							0	

											Weatherstation Rainfall Data	
Date	**Time**	**Water Level (inches)**										
dd-mmm-yyyy	**hh:mm:ss**	**AW1**	**AW3**	**AW5**	**MW2**	**MW4**	**MW6**	**MW7**	**AW7**	**On-site Raingauge**	**Hoffmann Daily Rainfall**	**Hoffmann Monthly Rainfall**
22-Feb-2007	20:00:00	-0.6	-1.6	-21.1								
23-Feb-2007	08:00:00	-1.6	-3.8	-25.5							0	
23-Feb-2007	20:00:00	-1.6	-5.1	-22.7								
24-Feb-2007	08:00:00	-2.4	-5.3	-25.5							0	
24-Feb-2007	20:00:00	-2.2	-5.2	-23.1								
25-Feb-2007	08:00:00	-2.4	-3.8	-25.3							0.92	
25-Feb-2007	20:00:00	3.3	3.1	-22.3								
26-Feb-2007	08:00:00	2.0	3.0	-16.8							0	
26-Feb-2007	20:00:00	1.2	2.4	-15.4								
27-Feb-2007	08:00:00	-0.2	1.6	-21.9	-0.5	-3.25	0.25	-2			0	
27-Feb-2007	20:00:00	0.0	1.2	-17.0								
28-Feb-2007	08:00:00	-0.9	0.5	-21.7							0	
28-Feb-2007	20:00:00	-0.7	-0.2	-20.7								2.83
01-Mar-2007	08:00:00	-1.8	-0.4	-21.2							0.12	
01-Mar-2007	20:00:00	-0.9	-0.8	-20.6								
02-Mar-2007	08:00:00	4.3	5.7	0.3							1.32	
02-Mar-2007	20:00:00	5.1	5.2	3.0								
03-Mar-2007	08:00:00	4.6	4.7	-1.1							0	
03-Mar-2007	20:00:00	4.7	3.9	-2.0								
04-Mar-2007	08:00:00	3.5	3.3	-10.2							0	
04-Mar-2007	20:00:00	3.7	2.5	-8.7								
05-Mar-2007	08:00:00	2.7	2.2	-16.1							0	
05-Mar-2007	20:00:00	2.9	1.9	-15.0								
06-Mar-2007	08:00:00	1.6	1.4	-16.3							0	
06-Mar-2007	20:00:00	1.8	0.8	-17.3								
07-Mar-2007	08:00:00	0.8	1.1	-21.2							0	
07-Mar-2007	20:00:00	1.3	-0.3	-18.8								
08-Mar-2007	08:00:00	0.1	-1.1	-20.7							0	
08-Mar-2007	20:00:00	0.1	-1.7	-20.2								
09-Mar-2007	08:00:00	-0.8	-1.8	-20.8							0	
09-Mar-2007	20:00:00	-0.1	-1.8	-21.2								
10-Mar-2007	08:00:00	-1.0	-1.1	-26.6							0	
10-Mar-2007	20:00:00	-0.3	-1.1	-21.8								
11-Mar-2007	08:00:00	-0.9	-0.7	-26.3							0	
11-Mar-2007	20:00:00	-1.2	-2.4	-22.3								

											Weatherstation Rainfall Data	
Date	Time	Water Level (inches)										
dd-mmm-yyyy	hh:mm:ss	AW1	AW3	AW5	MW2	MW4	MW6	MW7	AW7	On-site Raingauge	Hoffmann Daily Rainfall	Hoffmann Monthly Rainfall
12-Mar-2007	08:00:00	-2.2	-2.8	-22.6							0	
12-Mar-2007	20:00:00	-1.8	-3.2	-22.8								
13-Mar-2007	08:00:00	-2.9	-3.1	-23.1							0	
13-Mar-2007	20:00:00	-2.8	-4.2	-23.2								
14-Mar-2007	08:00:00	-3.1	-3.4	-23.5							0	
14-Mar-2007	20:00:00	-3.3	-4.4	-23.5								
15-Mar-2007	08:00:00	-4.1	-3.8	-23.7							0	
15-Mar-2007	20:00:00	-4.7	-5.4	-23.8								
16-Mar-2007	08:00:00	-1.9	-3.5	-23.9							1.5	
16-Mar-2007	20:00:00	3.1	3.6	-17.6								
17-Mar-2007	08:00:00	0.3	2.5	-15.8							0	
17-Mar-2007	20:00:00	-0.6	1.2	-17.2								
18-Mar-2007	08:00:00	-1.7	0.4	-22.9							0	
18-Mar-2007	20:00:00	-2.2	-1.0	-19.3								
19-Mar-2007	08:00:00	-3.3	-2.1	-22.3							0	
19-Mar-2007	20:00:00	-3.5	-3.8	-20.7								
20-Mar-2007	08:00:00	-3.7	-3.5	-21.4							0	
20-Mar-2007	20:00:00	-3.9	-4.5	-21.8								
21-Mar-2007	08:00:00	-5.1	-4.5	-22.3							0	
21-Mar-2007	20:00:00	-5.6	-5.6	-22.6								
22-Mar-2007	08:00:00	-6.7	-5.1	-23.0							0	
22-Mar-2007	20:00:00	-6.9	-6.3	-23.2								
23-Mar-2007	08:00:00	-8.2	-6.2	-23.6							0	
23-Mar-2007	20:00:00	-8.9	-7.8	-23.9								
24-Mar-2007	08:00:00	-9.9	-7.1	-24.2							0	
24-Mar-2007	20:00:00	-10.9	-8.5	-24.4								
25-Mar-2007	08:00:00	-11.9	-7.9	-24.7							0	
25-Mar-2007	20:00:00	-13.0	-10.6	-25.0								
26-Mar-2007	08:00:00	-14.7	-10.6	-25.4							0	
26-Mar-2007	20:00:00	-14.9	-10.9	-25.7								
27-Mar-2007	08:00:00	-15.6	-10.1	-26.0							0	
27-Mar-2007	20:00:00	-15.6	-11.0	-26.2								
28-Mar-2007	08:00:00	-16.7	-10.3	-26.5							0	
28-Mar-2007	20:00:00	-16.3	-11.6	-26.8								
29-Mar-2007	08:00:00	-16.5	-11.5	-27.1	-15.75	-12.5	-9	-10.25		2.35	0.22	

											Weatherstation Rainfall Data	
Date	Time	Water Level (inches)										
dd-mmm-yyyy	hh:mm:ss	AW1	AW3	AW5	MW2	MW4	MW6	MW7	AW7	On-site Raingauge	Hoffmann Daily Rainfall	Hoffmann Monthly Rainfall
29-Mar-2007	20:00:00	-11.8	-5.8	-26.3								
30-Mar-2007	08:00:00	-14.0	-7.3	-25.8							0	
30-Mar-2007	20:00:00	-14.0	-8.7	-25.8								
31-Mar-2007	08:00:00	-16.3	-9.2	-26.1							0	
31-Mar-2007	20:00:00	-16.2	-10.8	-26.5								3.16
01-Apr-2007	08:00:00	-16.9	-10.5	-27.0							0	
01-Apr-2007	20:00:00	-17.2	-11.5	-27.3								
02-Apr-2007	08:00:00	-17.7	-10.8	-27.5							0.02	
02-Apr-2007	20:00:00	-17.9	-12.3	-27.7								
03-Apr-2007	08:00:00	-19.2	-12.0	-28.1							0	
03-Apr-2007	20:00:00	-19.3	-13.1	-28.3								
04-Apr-2007	08:00:00	-19.7	-12.2	-28.6							0	
04-Apr-2007	20:00:00	-20.0	-13.8	-28.9								
05-Apr-2007	08:00:00	-21.5	-14.8	-29.3							0	
05-Apr-2007	20:00:00	-21.8	-15.8	-29.6								
06-Apr-2007	08:00:00	-23.2	-16.1	-30.0							0	
06-Apr-2007	20:00:00	-22.9	-16.2	-30.3								
07-Apr-2007	08:00:00	-24.0	-16.6	-30.6							0	
07-Apr-2007	20:00:00	-24.3	-17.6	-31.0								
08-Apr-2007	08:00:00	-25.8	-18.0	-31.3							0	
08-Apr-2007	20:00:00	-25.2	-18.1	-31.6								
09-Apr-2007	08:00:00	-26.6	-18.3	-31.8							0	
09-Apr-2007	20:00:00	-26.0	-18.3	-32.0								
10-Apr-2007	08:00:00	-27.9	-18.5	-32.3							0	
10-Apr-2007	20:00:00	-25.2	-18.6	-32.5								
11-Apr-2007	08:00:00	-27.7	-18.4	-32.7							0	
11-Apr-2007	20:00:00	-27.5	-17.9	-32.9								
12-Apr-2007	08:00:00	-26.3	-13.4	-32.6							0.11	
12-Apr-2007	20:00:00	-20.8	-14.2	-32.5								
13-Apr-2007	08:00:00	-27.8	-15.7	-32.5							0	
13-Apr-2007	20:00:00	-23.6	-16.8	-32.7								
14-Apr-2007	08:00:00	-29.5	-17.3	-33.0							0	
14-Apr-2007	20:00:00	-25.7	-17.7	-33.1								
15-Apr-2007	08:00:00	-12.3	0.1	-26.2							3.85	
15-Apr-2007	20:00:00	5.3	4.3	0.2								

											Weatherstation Rainfall Data	
Date	Time	Water Level (inches)										
dd-mmm-yyyy	hh:mm:ss	AW1	AW3	AW5	MW2	MW4	MW6	MW7	AW7	On-site Raingauge	Hoffmann Daily Rainfall	Hoffmann Monthly Rainfall
16-Apr-2007	08:00:00	2.0	4.3	-0.4							0.02	
16-Apr-2007	20:00:00	3.8	2.6	-4.2								
17-Apr-2007	08:00:00	0.0	2.2	-9.3							0	
17-Apr-2007	20:00:00	3.2	0.7	-13.1								
18-Apr-2007	08:00:00	-0.6	1.0	-15.2							0	
18-Apr-2007	20:00:00	1.4	-0.1	-16.8								
19-Apr-2007	08:00:00	-1.8	-0.1	-18.0							0	
19-Apr-2007	20:00:00	0.4	-1.2	-19.1								
20-Apr-2007	08:00:00	-2.9	-1.4	-19.9							0	
20-Apr-2007	20:00:00	-0.3	-2.9	-20.7								
21-Apr-2007	08:00:00	-5.4	-2.6	-21.3							0	
21-Apr-2007	20:00:00	-1.4	-4.3	-21.9								
22-Apr-2007	08:00:00	-7.2	-4.1	-22.4							0	
22-Apr-2007	20:00:00	-3.9	-5.9	-22.9								
23-Apr-2007	08:00:00	-9.8	-5.6	-23.4							0	
23-Apr-2007	20:00:00	-7.7	-7.9	-23.9								
24-Apr-2007	08:00:00	-12.2	-7.1	-24.3	-15	-7.5	-12			2.35	0	
24-Apr-2007	20:00:00	-10.0	-8.9	-24.8								
25-Apr-2007	08:00:00	-15.4	-8.3	-25.2							0	
25-Apr-2007	20:00:00	-13.0	-10.1	-25.8								
26-Apr-2007	08:00:00	-17.2	-10.0	-26.3							0	
26-Apr-2007	20:00:00	-15.3	-11.3	-26.8								
27-Apr-2007	08:00:00	-18.1	-10.6	-27.3							0.02	
27-Apr-2007	20:00:00	-17.5	-12.2	-27.8								
28-Apr-2007	08:00:00	-19.8	-11.9	-28.2							0.01	
28-Apr-2007	20:00:00	-19.6	-13.6	-28.8								
29-Apr-2007	08:00:00	-21.1	-13.7	-29.3							0	
29-Apr-2007	20:00:00	-20.3	-14.9	-29.8								
30-Apr-2007	08:00:00	-24.1	-14.9	-30.3							0	
30-Apr-2007	20:00:00	-22.9	-15.9	-30.9								4.03
01-May-2007	08:00:00	-25.2	-16.3	-31.3							0	
01-May-2007	20:00:00	-23.9	-17.4	-31.9								
02-May-2007	08:00:00	-26.4	-17.7	-32.3							0	
02-May-2007	20:00:00	-26.0	-18.5	-32.9								
03-May-2007	08:00:00	-26.8	-18.9	-33.4							0	

											Weatherstation Rainfall Data	
Date	Time	Water Level (inches)										
dd-mmm-yyyy	hh:mm:ss	AW1	AW3	AW5	MW2	MW4	MW6	MW7	AW7	On-site Raingauge	Hoffmann Daily Rainfall	Hoffmann Monthly Rainfall
03-May-2007	20:00:00	-27.4	-19.6	-33.8								
04-May-2007	08:00:00	-28.0	-19.8	-34.2							0.28	
04-May-2007	20:00:00	-28.4	-19.3	-34.6								
05-May-2007	08:00:00	-28.6	-19.2	-34.9							0.01	
05-May-2007	20:00:00	-28.7	-18.8	-35.2								
06-May-2007	08:00:00	-8.9	0.9	-22.7							0.77	
06-May-2007	20:00:00	-11.4	-2.9	-22.4								
07-May-2007	08:00:00	-12.1	-3.7	-22.8							0	
07-May-2007	20:00:00	-13.9	-6.6	-23.5								
08-May-2007	08:00:00	-14.0	-4.7	-24.0							0.42	
08-May-2007	20:00:00	-12.0	-3.1	-24.3								
09-May-2007	08:00:00	-12.0	-3.5	-24.3							0.02	
09-May-2007	20:00:00	-13.9	-6.5	-24.6								
10-May-2007	08:00:00	-14.5	-6.5	-24.8							0.15	
10-May-2007	20:00:00	-14.9	-6.3	-25.1								
11-May-2007	08:00:00	-15.3	-6.8	-25.4							0	
11-May-2007	20:00:00	-16.3	-9.0	-26.0								
12-May-2007	08:00:00	-16.8	-8.9	-26.3							0	
12-May-2007	20:00:00	-17.4	-9.4	-26.9								
13-May-2007	08:00:00	-11.0	-1.2	-26.0							0	
13-May-2007	20:00:00	-12.5	-4.2	-25.7								
14-May-2007	08:00:00	-13.4	-5.5	-25.5							0	
14-May-2007	20:00:00	-15.0	-8.4	-25.9								
15-May-2007	08:00:00	-15.7	-8.8	-26.1							0	
15-May-2007	20:00:00	-17.1	-10.9	-26.7								
16-May-2007	08:00:00	-17.7	-10.9	-27.0							0	
16-May-2007	20:00:00	-19.1	-13.0	-27.7								
17-May-2007	08:00:00	-19.7	-13.0	-28.1							0.78	
17-May-2007	20:00:00	-8.8	1.0	-23.8								
18-May-2007	08:00:00	-0.1	3.1	-13.3							0.06	
18-May-2007	20:00:00	-1.8	2.0	-16.0								
19-May-2007	08:00:00	-1.5	1.7	-17.6							0	
19-May-2007	20:00:00	-2.8	0.5	-19.1								
20-May-2007	08:00:00	-2.6	0.0	-20.1							0	
20-May-2007	20:00:00	-4.8	-2.2	-21.2								

											Weatherstation Rainfall Data	
Date	**Time**	**Water Level (inches)**										
dd-mmm-yyyy	**hh:mm:ss**	**AW1**	**AW3**	**AW5**	**MW2**	**MW4**	**MW6**	**MW7**	**AW7**	**On-site Raingauge**	**Hoffmann Daily Rainfall**	**Hoffmann Monthly Rainfall**
21-May-2007	08:00:00	-5.0	-2.3	-22.0							0	
21-May-2007	20:00:00	-8.0	-4.4	-22.9								
22-May-2007	08:00:00	-8.6	-4.6	-23.5							0	
22-May-2007	20:00:00	-10.8	-6.1	-24.2								
23-May-2007	08:00:00	-11.7	-6.1	-24.7	-12.5	-19.5	-13	-18		3.15	0	
23-May-2007		-13.9	-8.6	-25.4								
24-May-2007		-14.7	-8.6	-25.9							0	
24-May-2007		-16.4	-10.5	-26.6								
25-May-2007		-17.0	-10.6	-27.2	1	2	3				0	
25-May-2007		-18.5	-12.3	-27.9								
26-May-2007		-19.1	-12.6	-28.4							0	
26-May-2007		-20.5	-14.1	-29.1								
27-May-2007		-21.2	-14.6	-29.6							0	
27-May-2007		-22.3	-15.8	-30.3								
28-May-2007		-23.0	-16.3	-30.7							0	
28-May-2007		-24.0	-17.3	-31.4								
29-May-2007		-24.7	-17.7	-31.8							0	
29-May-2007		-25.6	-18.6	-32.5								
30-May-2007		-26.3	-19.1	-33.0							0	
30-May-2007		-27.2	-20.0	-33.7								
31-May-2007		-28.0	-20.5	-34.2							0	
31-May-2007		-28.7	-21.3	-34.8								2.49
1-Jun-2007		-29.5	-21.8	-35.3							0	
1-Jun-2007		-30.0	-22.4	-35.8								
2-Jun-2007		-30.5	-22.7	-36.2							0.3	
2-Jun-2007		-31.0	-22.4	-36.7								
3-Jun-2007		-8.4	1.2	-24.5							1.12	
3-Jun-2007		-5.8	1.7	-20.4								
4-Jun-2007		-7.0	1.2	-20.8							0	
4-Jun-2007		-8.9	-0.2	-21.9								
5-Jun-2007		-9.1	-0.9	-22.4							0.17	
5-Jun-2007		-11.8	-3.4	-23.4								
6-Jun-2007		-9.6	-1.5	-23.9							0	
6-Jun-2007		-13.2	-5.7	-24.7								
7-Jun-2007		-13.9	-5.9	-25.2							0.01	

											Weatherstation Rainfall Data	
Date	**Time**	**Water Level (inches)**										
dd-mmm-yyyy	**hh:mm:ss**	**AW1**	**AW3**	**AW5**	**MW2**	**MW4**	**MW6**	**MW7**	**AW7**	**On-site Raingauge**	**Hoffmann Daily Rainfall**	**Hoffmann Monthly Rainfall**
7-Jun-2007		-15.9	-8.6	-26.0								
8-Jun-2007		-16.4	-8.4	-26.5							0	
8-Jun-2007		-17.9	-10.6	-27.4								
9-Jun-2007		-18.4	-10.7	-27.8							0	
9-Jun-2007		-20.0	-12.9	-28.8								
10-Jun-2007		-20.8	-13.5	-29.3							0	
10-Jun-2007		-22.2	-15.2	-30.2								
11-Jun-2007		-23.0	-15.7	-30.7							0	
11-Jun-2007		-24.0	-16.6	-31.4								
12-Jun-2007		-24.6	-17.0	-31.9							0.25	
12-Jun-2007		-25.4	-17.8	-32.6								
13-Jun-2007		-26.2	-18.3	-33.1							0	
13-Jun-2007		-26.9	-19.1	-33.9								
14-Jun-2007		-27.6	-19.6	-34.4							0	
14-Jun-2007		-28.2	-20.3	-35.1								
15-Jun-2007		-28.8	-20.9	-35.6							0	
15-Jun-2007		-29.3	-21.5	-36.3								
16-Jun-2007		-30.1	-22.0	-36.8							0	
16-Jun-2007		-30.6	-22.7	-37.3								
17-Jun-2007		-31.2	-23.1	-37.7							0	
17-Jun-2007		-31.6	-23.9	-38.2								
18-Jun-2007		-32.3	-24.3	-38.7							0	
18-Jun-2007		-32.7	-25.0	-39.2								
19-Jun-2007		-33.2	-25.4	-39.7							0	
19-Jun-2007		-33.5	-26.0	-40.2								
20-Jun-2007		-34.1	-26.3	-40.8							0.74	
20-Jun-2007		-34.5	-26.3	-41.2								
21-Jun-2007		-35.0	-26.1	-41.6							0.01	
21-Jun-2007		-35.2	-26.6	-42.0								
22-Jun-2007		-35.7	-27.1	-42.4							0	
22-Jun-2007		-35.9	-27.7	-42.9								
23-Jun-2007		-36.4	-28.1	-43.4							0	
23-Jun-2007		-36.6	-28.7	-44.0								
24-Jun-2007		-37.2	-29.1	-44.8							0	
24-Jun-2007		-32.7	-25.9	-35.3								

											Weatherstation Rainfall Data	
Date	**Time**	**Water Level (inches)**										
dd-mmm-yyyy	**hh:mm:ss**	**AW1**	**AW3**	**AW5**	**MW2**	**MW4**	**MW6**	**MW7**	**AW7**	**On-site Raingauge**	**Hoffmann Daily Rainfall**	**Hoffmann Monthly Rainfall**
25-Jun-2007		-33.2	-25.1	-35.6	-37.5	1	-30.5	-35.5		2.58	0.02	
25-Jun-2007		-33.3	-24.7	-35.9								
26-Jun-2007		-33.3	-24.2	-35.8							0.01	
26-Jun-2007		-32.8	-24.5	-36.5								
27-Jun-2007		-32.9	-24.9	-36.6							0	
27-Jun-2007		-32.8	-25.6	-37.2								
28-Jun-2007		-33.2	-26.3	-37.4							0	
28-Jun-2007		-33.1	-27.3	-38.1								
29-Jun-2007		-33.8	-28.1	-38.5							0.8	
29-Jun-2007		-34.2	-29.1	-39.3								
30-Jun-2007		-34.9	-29.3	-39.6							0.02	
30-Jun-2007		-35.2	-29.8	-40.0								3.45
1-Jul-2007		-35.8	-30.0	-40.4							0	
1-Jul-2007		-36.2	-30.7	-40.9								
2-Jul-2007		-36.5	-31.2	-41.5							0	
2-Jul-2007		-36.9	-31.7	-42.1								
3-Jul-2007		-37.5	-32.1	-42.7							0	
3-Jul-2007		-37.5	-32.7	-43.4								
4-Jul-2007		-38.4	-33.0	-44.8							0	
4-Jul-2007		-38.3	-33.5	-45.8								
5-Jul-2007		-39.2	-33.8	-46.2							0	
5-Jul-2007		-39.0	-34.3	-46.7								
6-Jul-2007		-39.7	-34.6	-47.2							0.83	
6-Jul-2007		-39.5	-33.2	-47.6								
7-Jul-2007		-21.2	-6.5	-20.4							0.09	
7-Jul-2007		-13.7	0.5	-11.4								
8-Jul-2007		-14.5	-0.9	-14.2							0.01	
8-Jul-2007		-15.3	-4.8	-16.8								
9-Jul-2007		-15.8	-5.3	-18.4							0.05	
9-Jul-2007		-16.8	-8.2	-20.5								
10-Jul-2007		-17.2	-8.1	-21.6							0.39	
10-Jul-2007		-18.5	-9.4	-23.2								
11-Jul-2007		-18.1	-8.9	-23.7							0.3	
11-Jul-2007		-18.6	-8.1	-24.7								
12-Jul-2007		-18.0	-9.1	-24.4							0	

											Weatherstation Rainfall Data	
Date	Time	Water Level (inches)										
dd-mmm-yyyy	hh:mm:ss	AW1	AW3	AW5	MW2	MW4	MW6	MW7	AW7	On-site Raingauge	Hoffmann Daily Rainfall	Hoffmann Monthly Rainfall
12-Jul-2007		-19.7	-13.5	-25.6								
13-Jul-2007		-20.4	-14.2	-26.0							0.15	
13-Jul-2007		-21.3	-15.9	-26.9								
14-Jul-2007		-22.2	-16.7	-27.3							0	
14-Jul-2007		-23.0	-18.2	-28.3								
15-Jul-2007		-23.6	-18.6	-28.6							0.14	
15-Jul-2007		-24.3	-19.6	-29.5								
16-Jul-2007		-25.0	-19.8	-29.9							0.02	
16-Jul-2007		-25.2	-20.0	-30.7								
17-Jul-2007		-23.5	-17.9	-30.9							0.01	
17-Jul-2007		-24.2	-19.4	-31.5								
18-Jul-2007		-9.0	0.9	-10.4							0.53	
18-Jul-2007		-10.2	-1.2	-14.5								
19-Jul-2007		-10.7	-3.1	-16.6							0	
19-Jul-2007		-13.5	-7.7	-19.6								
20-Jul-2007		-14.1	-8.0	-21.0							0.89	
20-Jul-2007		-15.0	-9.2	-22.4								
21-Jul-2007		-15.7	-10.3	-23.2							0.29	
21-Jul-2007		-16.3	-13.2	-24.5								
22-Jul-2007		-17.4	-13.8	-25.2							0	
22-Jul-2007		-18.5	-15.8	-26.3								
23-Jul-2007		-19.5	-16.5	-26.9							0	
23-Jul-2007		-20.4	-18.3	-28.0								
24-Jul-2007		-21.7	-19.2	-28.6							0	
24-Jul-2007		-22.4	-20.5	-29.6								
25-Jul-2007		-23.7	-21.3	-30.1							0	
25-Jul-2007		-24.3	-22.3	-31.0								
26-Jul-2007		-25.1	-22.9	-31.5	-26.5	-19.5	-23.5	-49		5.1	0.01	
26-Jul-2007		-25.4	-23.6	-32.2								
27-Jul-2007		-26.4	-24.1	-32.6							0.03	
27-Jul-2007		-27.1	-24.8	-33.4								
28-Jul-2007		-27.9	-25.2	-33.7							0.01	
28-Jul-2007		-28.0	-25.9	-34.4								
29-Jul-2007		-29.0	-26.5	-34.7							0.01	
29-Jul-2007		-29.2	-27.3	-35.4								

											Weatherstation Rainfall Data	
Date	Time	Water Level (inches)										
dd-mmm-yyyy	hh:mm:ss	AW1	AW3	AW5	MW2	MW4	MW6	MW7	AW7	On-site Raingauge	Hoffmann Daily Rainfall	Hoffmann Monthly Rainfall
30-Jul-2007		-30.3	-27.8	-35.8							0.15	
30-Jul-2007		-29.3	-26.9	-33.4								
31-Jul-2007		-29.2	-27.0	-33.6							0	
31-Jul-2007		-29.5	-27.7	-34.5								3.91
1-Aug-2007		-30.4	-28.2	-34.9							0	
1-Aug-2007		-30.7	-29.0	-35.8								
2-Aug-2007		-31.6	-29.6	-36.1							0	
2-Aug-2007		-31.4	-30.3	-36.8								
3-Aug-2007		-32.3	-30.8	-37.1							0	
3-Aug-2007		-32.9	-31.4	-37.8								
4-Aug-2007		-34.1	-31.9	-38.1							0	
4-Aug-2007		-34.2	-32.6	-38.9								
5-Aug-2007		-34.8	-33.1	-39.2							0	
5-Aug-2007		-34.8	-33.9	-39.9								
6-Aug-2007		-35.7	-34.4	-40.3							0	
6-Aug-2007		-35.9	-35.0	-40.7								
7-Aug-2007		-36.6	-35.5	-41.3							0	
7-Aug-2007		-36.7	-36.2	-41.8								
8-Aug-2007		-37.3	-36.6	-42.4							0	
8-Aug-2007		-38.0	-37.2	-43.0								
9-Aug-2007		-38.5	-37.7	-43.7							0	
9-Aug-2007		-39.4	-38.4	-45.1								
10-Aug-2007		-39.5	-38.8	-46.1							0.76	
10-Aug-2007		-35.3	-15.8	-35.2								
11-Aug-2007		-33.7	-31.3	-37.9							1.49	
11-Aug-2007		-33.0	-10.2	-37.6								
12-Aug-2007		-29.0	-22.9	-37.8							0	
12-Aug-2007		-28.6	-25.3	-38.5								
13-Aug-2007		-29.3	-26.1	-38.7							0	
13-Aug-2007		-29.6	-27.3	-39.3								
14-Aug-2007		-30.2	-28.1	-39.6							0	
14-Aug-2007		-31.0	-29.2	-40.0								
15-Aug-2007		-31.6	-30.0	-40.5							0	
15-Aug-2007		-32.3	-31.0	-41.0								
16-Aug-2007		-33.0	-31.7	-41.5							0	

											Weatherstation Rainfall Data	
Date	**Time**	**Water Level (inches)**										
dd-mmm-yyyy	**hh:mm:ss**	**AW1**	**AW3**	**AW5**	**MW2**	**MW4**	**MW6**	**MW7**	**AW7**	**On-site Raingauge**	**Hoffmann Daily Rainfall**	**Hoffmann Monthly Rainfall**
16-Aug-2007		-33.5	-32.5	-42.1								
17-Aug-2007		-34.1	-33.1	-42.6							0	
17-Aug-2007		-34.4	-34.1	-43.3								
18-Aug-2007		-35.0	-34.8	-44.3							0	
18-Aug-2007		-35.3	-35.7	-45.9								
19-Aug-2007		-36.0	-36.2	-46.6							0	
19-Aug-2007		-36.3	-37.0	-47.4								
20-Aug-2007		-37.2	-37.6	-48.1							0	
20-Aug-2007		-37.6	-38.5	-48.8								
21-Aug-2007		-38.3	-39.1	-49.5							0.26	
21-Aug-2007		-38.8	-40.1	-50.1								
22-Aug-2007		-33.3	-38.2	-42.2							0.61	
22-Aug-2007		-34.9	-38.9	-42.2								
23-Aug-2007		-36.2	-39.0	-42.8							0.84	
23-Aug-2007		-37.1	-39.5	-43.5								
24-Aug-2007		-38.1	-39.7	-44.6							0	
24-Aug-2007		-38.6	-40.2	-46.3								
25-Aug-2007		-39.7	-40.5	-47.1							0	
25-Aug-2007		-39.8	-41.1	-48.2								
26-Aug-2007		-40.6	-41.4	-49.3							0	
26-Aug-2007		-41.0	-41.5	-50.1								
27-Aug-2007		-41.3	-41.4	-50.7							0.47	
27-Aug-2007		-41.6	-41.7	-51.3								
28-Aug-2007		-41.7	-41.7	-51.8	-45.5	-5	-33.5	-54		3.45	0.01	
28-Aug-2007		-42.0	-42.2	-52.5								
29-Aug-2007		-42.7	-42.3	-53.1							0	
29-Aug-2007		-42.7	-42.8	-53.6								
30-Aug-2007		-42.8	-43.0	-54.0							0	
30-Aug-2007		-42.8	-43.5	-54.2								
31-Aug-2007		-43.3	-43.7	-54.3							0	
31-Aug-2007		-43.5	-44.3	-54.5								4.44
1-Sep-2007		-43.9	-44.6	-54.7							0	
1-Sep-2007		-44.3	-45.1	-54.6								
2-Sep-2007		-44.8	-45.3	-54.6							0	
2-Sep-2007		-44.8	-45.8	-54.6								

											Weatherstation Rainfall Data	
Date	Time	Water Level (inches)										
dd-mmm-yyyy	hh:mm:ss	AW1	AW3	AW5	MW2	MW4	MW6	MW7	AW7	On-site Raingauge	Hoffmann Daily Rainfall	Hoffmann Monthly Rainfall
3-Sep-2007		-45.2	-46.1	-54.6							0	
3-Sep-2007		-45.1	-46.6	-54.6								
4-Sep-2007		-45.6	-46.9	-54.6							0	
4-Sep-2007		-46.5	-47.5	-54.6								
5-Sep-2007		-46.9	-47.7	-54.7							0	
5-Sep-2007		-47.1	-48.3	-54.7								
6-Sep-2007		-47.8	-48.6	-54.7							0	
6-Sep-2007		-48.0	-48.8	-54.7								
7-Sep-2007		-48.4	-49.3	-54.7							0	
7-Sep-2007		-49.4	-49.3	-54.6								
8-Sep-2007		-49.8	-49.3	-54.6							0	
8-Sep-2007		-49.8	-49.2	-54.6								
9-Sep-2007		-49.8	-49.2	-54.6							0.63	
9-Sep-2007		-51.0	-49.2	-54.6								
10-Sep-2007		-51.5	-49.2	-54.7							0.01	
10-Sep-2007		-51.8	-49.2	-54.6								
11-Sep-2007		-52.0	-49.2	-54.6							0	
11-Sep-2007		-52.0	-49.2	-54.6								
12-Sep-2007		-52.0	-49.2	-54.7							0.26	
12-Sep-2007		-52.0	-49.2	-54.7								
13-Sep-2007		-52.0	-49.2	-54.5							0	
13-Sep-2007		-52.0	-49.2	-54.5								
14-Sep-2007		-52.0	-49.2	-54.5							0.12	
14-Sep-2007		-52.0	-49.2	-54.4								
15-Sep-2007		-52.0	-38.1	-40.0							0.4	
15-Sep-2007		-52.0	-41.7	-41.6								
16-Sep-2007		-52.0	-42.4	-42.5							0	
16-Sep-2007		-52.0	-43.1	-43.3								
17-Sep-2007		-52.0	-43.3	-44.3							0	
17-Sep-2007		-52.0	-44.0	-45.4								
18-Sep-2007		-52.0	-44.2	-46.2							0	
18-Sep-2007		-51.9	-44.8	-46.6								
19-Sep-2007		-51.8	-45.0	-47.4							0	
19-Sep-2007		-51.9	-45.4	-48.0								
20-Sep-2007		-51.8	-45.5	-48.4							1.15	

											Weatherstation Rainfall Data	
Date	**Time**	**Water Level (inches)**										
dd-mmm-yyyy	**hh:mm:ss**	**AW1**	**AW3**	**AW5**	**MW2**	**MW4**	**MW6**	**MW7**	**AW7**	**On-site Raingauge**	**Hoffmann Daily Rainfall**	**Hoffmann Monthly Rainfall**
20-Sep-2007		-51.7	-45.1	-48.7								
21-Sep-2007		-51.6	-44.8	-49.1							0.01	
21-Sep-2007		-51.5	-44.7	-49.4								
22-Sep-2007		-51.5	-44.2	-49.7							0.14	
22-Sep-2007		-51.7	-44.6	-50.1								
23-Sep-2007		-51.6	-44.3	-50.4							0	
23-Sep-2007		-52.0	-45.0	-50.8								
24-Sep-2007		-52.0	-44.8	-51.1	-48.5	-18.5	-34	-41	-41	2.5	0	
24-Sep-2007		-52.3	-45.6	-51.4					-42.0			
25-Sep-2007		-52.4	-45.6	-51.8					-38.3		0	
25-Sep-2007		-52.7	-46.2	-52.1					-40.0			
26-Sep-2007		-52.7	-46.2	-52.3					-38.5		0	
26-Sep-2007		-53.1	-46.9	-52.8					-44.6			
27-Sep-2007		-53.0	-46.9	-53.2					-45.3		0	
27-Sep-2007		-53.4	-47.5	-53.7					-48.2			
28-Sep-2007		-53.4	-47.5	-53.9					-47.5		0	
28-Sep-2007		-53.9	-48.5	-54.1					-44.6			
29-Sep-2007		-54.1	-48.7	-54.6					-34.9		0	
29-Sep-2007		-54.5	-49.1	-54.3					-36.2			
30-Sep-2007		-54.7	-49.1	-54.4					-33.4		0	
30-Sep-2007		-55.0	-49.1	-54.4					-36.3			2.72
1-Oct-2007		-55.3	-49.2	-54.4					-36.0		0	
1-Oct-2007		-51.9	-49.2	-54.3					-40.5			
2-Oct-2007		-51.9	-49.2	-54.2					-40.3		0	
2-Oct-2007		-51.9	-49.2	-54.2					-42.9			
3-Oct-2007		-52.3	-49.2	-54.2					-43.4		0	
3-Oct-2007		-52.0	-49.3	-54.2					-45.4			
4-Oct-2007		-52.0	-49.3	-54.3					-43.8		0.06	
4-Oct-2007		-52.0	-49.3	-54.4					-44.5			
5-Oct-2007		-52.0	-49.3	-54.4					-43.1		0.05	
5-Oct-2007		-52.0	-49.2	-54.4					-43.5			
6-Oct-2007		-52.0	-49.2	-54.4					-43.5		0.09	
6-Oct-2007		-52.0	-49.2	-54.3					-44.3			
7-Oct-2007		-52.0	-49.2	-54.4					-43.7		0	
7-Oct-2007		-52.0	-49.2	-54.3					-47.4			

											Weatherstation Rainfall Data	
Date	Time	Water Level (inches)										
dd-mmm-yyyy	hh:mm:ss	AW1	AW3	AW5	MW2	MW4	MW6	MW7	AW7	On-site Raingauge	Hoffmann Daily Rainfall	Hoffmann Monthly Rainfall
8-Oct-2007		-52.0	-49.2	-54.4					-42.3		0	
8-Oct-2007		-52.0	-49.2	-54.3					-47.9			
9-Oct-2007		-52.0	-49.2	-54.3					-45.4		0	
9-Oct-2007		-52.0	-49.2	-54.2					-50.2			
10-Oct-2007		-52.0	-49.2	-54.2					-47.6		0	
10-Oct-2007		-52.0	-49.2	-54.2					-50.2			
11-Oct-2007		-52.0	-49.2	-54.2					-43.7		0	
11-Oct-2007		-52.0	-49.2	-54.3					-41.1			
12-Oct-2007		-52.0	-49.2	-54.4					-34.2		0	
12-Oct-2007		-52.0	-49.2	-54.4					-37.5			
13-Oct-2007		-52.0	-49.2	-54.5					-30.9		0	
13-Oct-2007		-52.0	-49.2	-54.5					-36.0			
14-Oct-2007		-52.0	-49.2	-54.5					-30.8		0	
14-Oct-2007		-52.0	-49.2	-54.5					-36.0			
15-Oct-2007		-52.0	-49.2	-54.6					-31.1		0	
15-Oct-2007		-52.0	-49.2	-54.5					-37.1			
16-Oct-2007		-52.0	-49.2	-54.5					-30.6		0	
16-Oct-2007		-52.0	-49.2	-54.5					-39.8			
17-Oct-2007		-52.0	-49.2	-54.5					-37.7		0	
17-Oct-2007		-52.0	-49.2	-54.5					-41.8			
18-Oct-2007		-52.0	-49.2	-54.5					-43.6		0.05	
18-Oct-2007		-52.0	-49.2	-54.4					-48.3			
19-Oct-2007		-52.0	-49.2	-54.4					-49.3		0.49	
19-Oct-2007		-52.0	-49.2	-54.4					-52.4			
20-Oct-2007		-52.0	-49.2	-54.5					-45.6		0	
20-Oct-2007		-52.0	-49.2	-54.5					-39.0			
21-Oct-2007		-52.0	-49.2	-54.5					-29.4		0	
21-Oct-2007		-52.0	-49.2	-54.4					-36.6			
22-Oct-2007		-52.0	-49.2	-54.3					-35.7		0	
22-Oct-2007		-52.0	-49.2	-54.0					-42.2			
23-Oct-2007		-52.0	-49.2	-54.0					-40.4		0	
23-Oct-2007		-52.0	-49.2	-54.0					-49.4			
24-Oct-2007		-52.0	-49.2	-54.0	-56.5	-46.5	-49		-49.3	0.75	0.04	
24-Oct-2007		-41.6	-49.2	-54.0					-49.4			
25-Oct-2007		-43.6	-49.2	-54.0					-46.9		0.69	

											Weatherstation Rainfall Data	
Date	Time	Water Level (inches)										
dd-mmm-yyyy	hh:mm:ss	AW1	AW3	AW5	MW2	MW4	MW6	MW7	AW7	On-site Raingauge	Hoffmann Daily Rainfall	Hoffmann Monthly Rainfall
25-Oct-2007		-44.8	-49.2	-54.0					-47.3			
26-Oct-2007		-45.8	-49.2	-54.0					-45.9		0.64	
26-Oct-2007		-46.6	-49.2	-54.0					-46.4			
27-Oct-2007		-47.4	-46.9	-54.0					-44.3		0.57	
27-Oct-2007		-48.0	-43.7	-53.8					-42.3			
28-Oct-2007		-48.5	-43.7	-53.0					-35.3		0	
28-Oct-2007		-49.0	-44.0	-52.4					-36.0			
29-Oct-2007		-49.5	-43.9	-52.4					-28.6		0	
29-Oct-2007		-50.1	-44.0	-52.6					-30.2			
30-Oct-2007		-50.5	-43.8	-53.1					-25.1		0	
30-Oct-2007		-51.0	-44.0	-53.3					-31.5			
31-Oct-2007		-51.3	-43.8	-53.5					-31.7		0	
31-Oct-2007		-51.7	-44.0	-53.6					-39.0			2.68
1-Nov-2007		-51.9	-43.8	-53.7					-38.8		0	
1-Nov-2007		-52.1	-44.1	-53.9					-41.7			
2-Nov-2007		-52.2	-44.1	-54.1					-38.0		0	
2-Nov-2007		-52.5	-44.3	-54.0					-40.8			
3-Nov-2007		-52.6	-44.2	-54.0					-38.1		0	
3-Nov-2007		-52.8	-44.5	-54.0					-35.5			
4-Nov-2007		-52.8	-44.3	-54.0					-29.8		0	
4-Nov-2007		-53.0	-44.7	-54.0					-34.4			
5-Nov-2007		-53.0	-44.6	-54.3					-28.9		0	
5-Nov-2007		-53.2	-44.8	-53.8					-33.9			
6-Nov-2007		-53.2	-44.7	-54.0					-37.6		0	
6-Nov-2007		-53.2	-45.4	-54.0					-38.0			
7-Nov-2007		-54.0	-45.2	-54.5					-24.5		0	
7-Nov-2007		-53.5	-45.3	-54.0					-27.8			
8-Nov-2007		-53.7	-45.2	-54.4					-24.1		0	
8-Nov-2007		-53.3	-45.3	-53.7					-27.1			
9-Nov-2007		-53.1	-45.2	-54.0					-27.0		0	
9-Nov-2007		-53.2	-45.3	-54.0					-31.1			
10-Nov-2007		-53.1	-45.4	-54.0					-33.6		0	
10-Nov-2007		-53.4	-45.8	-54.0					-29.6			
11-Nov-2007		-53.8	-45.7	-54.0					-22.6		0	
11-Nov-2007		-53.3	-45.9	-54.1					-25.4			

											Weatherstation Rainfall Data	
Date	**Time**	**Water Level (inches)**										
dd-mmm-yyyy	**hh:mm:ss**	**AW1**	**AW3**	**AW5**	**MW2**	**MW4**	**MW6**	**MW7**	**AW7**	**On-site Raingauge**	**Hoffmann Daily Rainfall**	**Hoffmann Monthly Rainfall**
12-Nov-2007		-53.6	-45.8	-54.2					-21.5		0	
12-Nov-2007		-53.1	-45.8	-54.0					-30.8			
13-Nov-2007		-53.3	-45.7	-54.0					-30.6		0	
13-Nov-2007		-53.0	-46.0	-54.0					-37.4			
14-Nov-2007		-53.1	-45.8	-54.0	-51	-32	-44.5		-34.8	2.16	0	
14-Nov-2007												
15-Nov-2007											0.31	
15-Nov-2007												
16-Nov-2007											0	
16-Nov-2007												
17-Nov-2007											0	
17-Nov-2007												
18-Nov-2007											0	
18-Nov-2007												
19-Nov-2007											0	
19-Nov-2007												
20-Nov-2007											0	
20-Nov-2007												
21-Nov-2007											0	
21-Nov-2007												
22-Nov-2007											0	
22-Nov-2007												
23-Nov-2007												
23-Nov-2007												
24-Nov-2007												
24-Nov-2007												
25-Nov-2007											0	
25-Nov-2007												
26-Nov-2007											0.31	
26-Nov-2007												
27-Nov-2007											0.04	
27-Nov-2007												
28-Nov-2007												
28-Nov-2007												
29-Nov-2007												

											Weatherstation Rainfall Data	
Date	**Time**	**Water Level (inches)**										
dd-mmm-yyyy	**hh:mm:ss**	**AW1**	**AW3**	**AW5**	**MW2**	**MW4**	**MW6**	**MW7**	**AW7**	**On-site Raingauge**	**Hoffmann Daily Rainfall**	**Hoffmann Monthly Rainfall**
29-Nov-2007												
30-Nov-2007												
30-Nov-2007												0.66
1-Dec-2007												
1-Dec-2007												
2-Dec-2007												
2-Dec-2007												
3-Dec-2007												
3-Dec-2007												
4-Dec-2007												
4-Dec-2007												
5-Dec-2007												
5-Dec-2007												
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9-Dec-2007												
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11-Dec-2007												
12-Dec-2007												
12-Dec-2007												
13-Dec-2007												
13-Dec-2007												
14-Dec-2007												
14-Dec-2007												
15-Dec-2007												
15-Dec-2007												
16-Dec-2007												
16-Dec-2007												

											Weatherstation Rainfall Data	
Date	**Time**	**Water Level (inches)**										
dd-mmm-yyyy	**hh:mm:ss**	**AW1**	**AW3**	**AW5**	**MW2**	**MW4**	**MW6**	**MW7**	**AW7**	**On-site Raingauge**	**Hoffmann Daily Rainfall**	**Hoffmann Monthly Rainfall**
17-Dec-2007												
17-Dec-2007												
18-Dec-2007												
18-Dec-2007												
19-Dec-2007												
19-Dec-2007												
20-Dec-2007												
20-Dec-2007												
21-Dec-2007												
21-Dec-2007												
22-Dec-2007												
22-Dec-2007												
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26-Dec-2007												
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27-Dec-2007												
28-Dec-2007												
28-Dec-2007												
29-Dec-2007												
29-Dec-2007												
30-Dec-2007												
30-Dec-2007												
31-Dec-2007												
31-Dec-2007												

APPENDIX D

2007 Site Photos

Problem Area Photos

10+00 UT-3 US. Minor erosion on right bank

12+00 UT-3 US. Left bank ditch plug washed out

Problem Area Photos

15+50 UT-3 US. Cattails choking channel

16+75 UT-3 RB. Erosion on both banks below log weir.

Problem Area Photos

12+00 UT-2 US. Log Vane buried by sediments.

18+10 UT-2 DS. Mid-channel aggradation.

Problem Area Photos

68-85 UT-1B DS. Undercut at log vane. Improper installation

Photo Point Pictures

PP 1. UT-1A, US

PP 1. UT-1A, DS

Photo Point Pictures

PP 2. UT-1A, US

PP 2. UT-1A, DS

Photo Point Pictures

PP 3. UT-1A, US

PP 3. UT-1A, DS

Photo Point Pictures

PP 4. UT-1A, US

PP 4. UT-1A, DS

Photo Point Pictures

PP 5. UT-1A, US

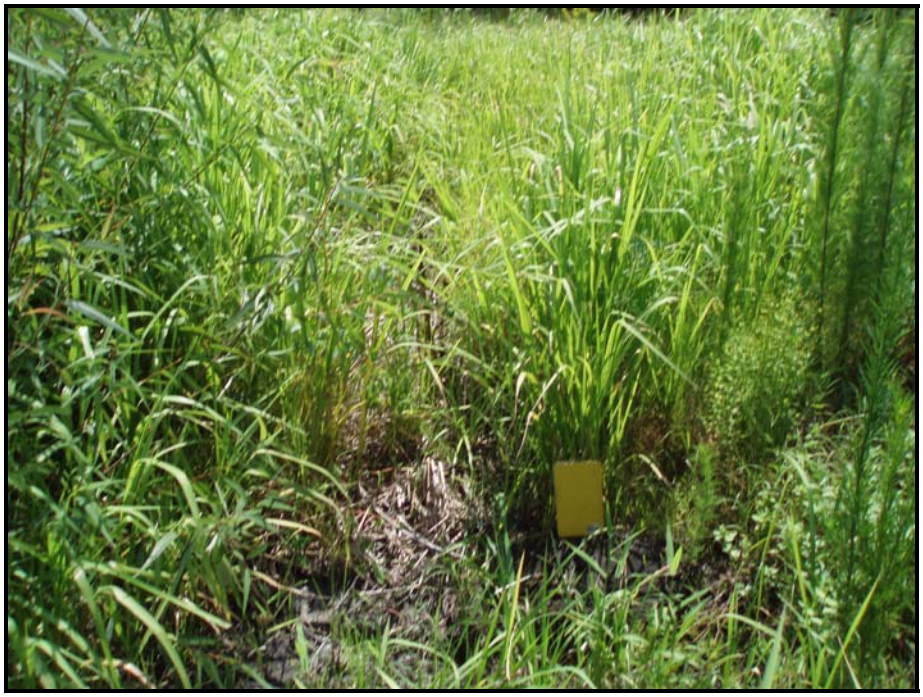
PP 5. UT-1A, DS

Photo Point Pictures

PP 6. UT-1A, US

PP 6. UT-1A, DS

Photo Point Pictures



PP 7. UT-2, US

PP 7. UT-2, DS

Photo Point Pictures

PP 8. UT-2, US

PP 8. UT-2, DS

Photo Point Pictures

PP 9. UT-2, US

PP 9. UT-2, DS

Photo Point Pictures

PP10. UT-1B, US

PP 10. UT-1B, DS

Photo Point Pictures

PP 11. UT-1B, US

PP 11. UT-1B, DS

Photo Point Pictures

PP 12. UT-1B, US

PP 12. UT-1B, DS

Photo Point Pictures

PP 13. UT-1B, US

PP 13. UT-1B, DS

Photo Point Pictures

PP 14. UT-1B, US

PP 14. UT-1B, DS

Photo Point Pictures

PP 15. UT-1B, US

PP 15. UT-1B, DS

Photo Point Pictures

PP 16. UT-1B, US

PP 16. UT-1B, DS

Photo Point Pictures

PP 15. UT-3, US

PP 15. UT-3, DS

Photo Point Pictures

PP 16. UT-3, US

PP 16. UT-3, DS

Photo Point Pictures

PP 18. UT-3, US

PP 18. UT-3, DS

Photo Point Pictures

PP 19. UT-3, US

PP 19. UT-3, DS

Photo Point Pictures

Vegetation Plot 1

Vegetation Plot 2

Photo Point Pictures

Vegetation Plot 3

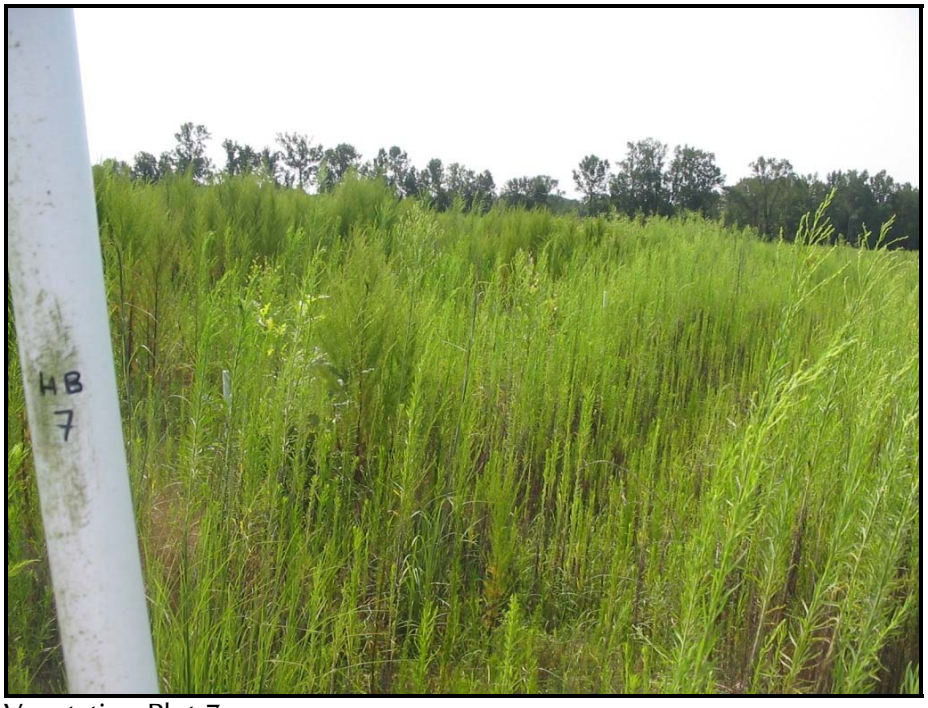
Vegetation Plot 4

Photo Point Pictures

Vegetation Plot 5

Vegetation Plot 6

Photo Point Pictures



Vegetation Plot 7

Vegetation Plot 8

Photo Point Pictures

Vegetation Plot 9

Vegetation Plot 10

Photo Point Pictures

Vegetation Plot 11

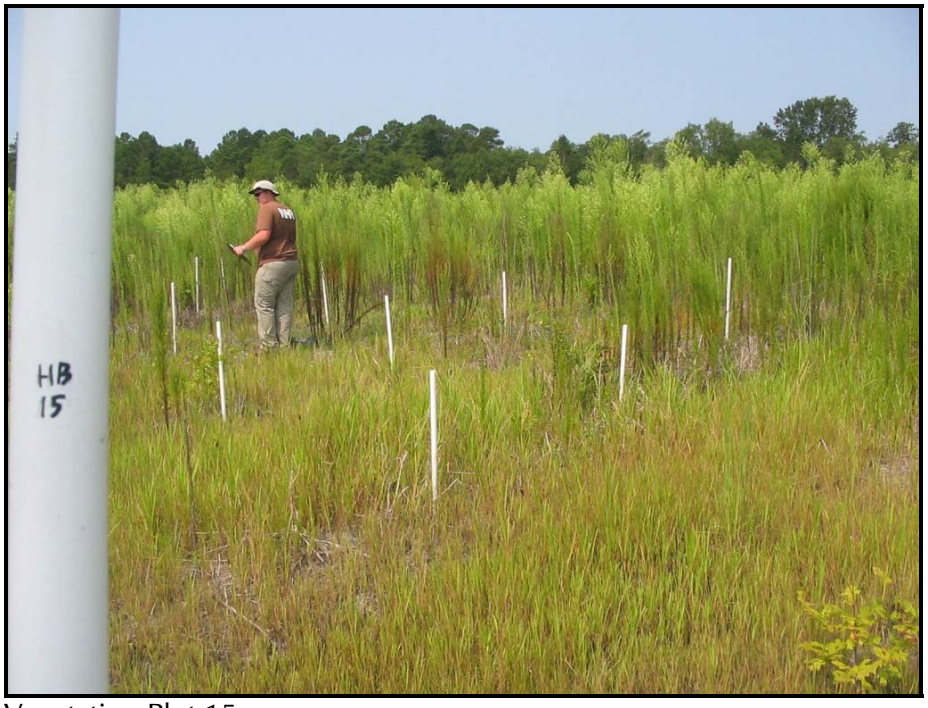
Vegetation Plot 12

Photo Point Pictures

Vegetation Plot 13

Vegetation Plot 14

Photo Point Pictures



Vegetation Plot 15

Vegetation Plot 16

Photo Point Pictures

Vegetation Plot 17

Vegetation Plot 18

Photo Point Pictures

Vegetation Plot 19

Vegetation Plot 20