

Southwest Florida Water Management District

# Northern Tampa Bay Minimum Flows & Levels White Papers



*White Papers Supporting The Establishment of  
Minimum Flows and Levels For:*

- Isolated Cypress Wetlands
- Category 1 and 2 Lakes
- Seawater Intrusion
- Environmental Aquifer Levels, and
- Tampa Bypass Canal

PEER REVIEW FINAL DRAFT  
March 19, 1999

## **Northern Tampa Bay Minimum Flows and Levels Overview**

The Northern Tampa Bay area is comprised of the counties of Pinellas, Pasco and the northern portion of Hillsborough. These counties are located in southwest Florida and surround the northern half of Tampa Bay. Pinellas County is almost entirely urbanized, as are much of northwest Hillsborough County and southwestern Pasco County. Inland areas of Pasco are rapidly becoming urbanized also. Potable water supplies for these counties and municipalities within these counties are principally from eleven regional wellfields located in Hillsborough and Pasco counties drawing from the Upper Floridan aquifer.

The first of the regional wellfields began operating in the early 1930's. The eleventh wellfield began operating in 1992. In addition to other sources, wellfields continue to be brought on-line in the area to meet the potable water supply needs of the Northern Tampa Bay area.

The surface water environment within the Northern Tampa Bay area is highly interconnected with the ground water system. Because of the karst geology that characterizes the area, a discontinuous and leaky confining layer provides a relatively good hydraulic connection between the surficial aquifer and the underlying Upper Floridan aquifer. Although localized areas of good confinement exist, overall the Upper Floridan aquifer is described as poorly to moderately confined within the Northern Tampa Bay area. As a result, water levels in the aquifers are linked, and fluctuate similarly.

Without ground water withdrawals, recharge from rainfall to the surficial aquifer and discharge by evapotranspiration and flow from the surficial aquifer are the only significant driving forces of these fluctuations. Very little ground water is contributed to the area from lateral inflow. The variable head in the surficial aquifer in turn largely regulates the recharge to the Upper Floridan aquifer through the leaky semi-confining unit. Therefore, the fluctuations in the surficial aquifer affect the fluctuations in the Upper Floridan aquifer.

An additional stress is introduced to this process when ground water withdrawals from the Upper Floridan aquifer are added. Ground water withdrawals lower the potentiometric surface of the Upper Floridan aquifer, which in turn increase leakage from the surficial aquifer to the Upper Floridan aquifer. This additional recharge is referred to as induced recharge. The result is a lowering of the water table. Assessments have shown that in leaky areas of the Northern Tampa Bay area, most of the water withdrawn from the Upper Floridan aquifer by pumping is derived by vertical leakage downward from the surficial aquifer (Liu and Poimann, 1996). Thus, Upper Floridan aquifer water level fluctuations caused by ground water withdrawals affect surficial aquifer water level fluctuations, as well as the water levels of lakes

and wetlands that are connected to the surficial aquifer.

Waters and wetlands account for approximately 23 percent of the land area within the Northern Tampa Bay area.

In the mid 1980's, the District declared the northwest Hillsborough County area and limited portions of Pinellas and Pasco Counties, within which several of the wellfields are located, to be an "area of special concern" regarding the condition of local water resources.

In 1987, the District undertook a water resource assessment project ("WRAP") to examine the water resources within the area of special concern. In 1989, based on preliminary information from the WRAP, the District declared an area as the "Northern Tampa Bay Water Use Caution Area" in recognition of environmental stress identified by the District.

In 1992, the WRAP study area was expanded and became identified as the "Northern Tampa Bay Water Resource Assessment Project" ("NTBWRAP"). The NTBWRAP is the District's most recent attempt at determining the condition of the water resources in the area of the regional wellfields. (The NTBWRAP is among the materials provided with the White Papers).

Due to environmental stress to the water resources in the Northern Tampa Bay area, Section 373.02 Florida Statutes (F.S.), as amended by the Florida Legislature in 1996, directed the District to establish minimum flows and levels for the region before October 1, 1997.

Section 373.042, F.S. defines the minimum flow to a surface water course to be the flow below which additional withdrawals would cause significant harm to the water resources or ecology of the area. Section 373.042, F.S. defines the minimum level of an aquifer or surface water body to be the level below which additional withdrawals would cause significant harm to the water resources of the area. The 1996 amendments to the statute required the District to adopt minimum flows and levels in Hillsborough, Pasco, and Pinellas County for priority waters that are experiencing or may be expected to experience adverse impacts. In response to this legislative direction, the District established 41 minimum wetland levels, minimum levels for 15 lakes, sea water intrusion aquifer levels, narrative aquifer levels and a minimum flow for the Tampa Bypass Canal. Work is ongoing to establish minimum flows and levels in the future for additional water bodies.

Section 373.042, F.S. requires the District to use the best data available to set minimum flows and levels. The legislative requirement to set the levels by October 1, 1997 was absolute, that is, there was a limited time to collect additional information. Because of the time deadline, and the associated requirement to use the best information available, the District was constrained to use existing data complete with any associated limitations of that data.

The process to develop the methods for determination of minimum flows and levels was an open

public process with all interested parties invited to participate in the development of methodologies for determining the limit at which significant harm occurs to the lakes, wetlands, surface water courses and aquifers for which levels must be established. Many lay and technical representatives of the interested local governments, environmental groups and individuals did participate in the rule development process through months of meetings, public workshops, and public hearings.

Following this public process the District staff finalized methodologies and minimum levels and flows for approval by the Governing Board. However, effective July 1, 1997, subparagraph 373.042(1)(a), F.S. was added. That paragraph directs the District to consider changes and structural alterations to watersheds, surface waters, and aquifers and the effects such changes and alterations have had when establishing minimum flows and levels. Therefore, at the Board's direction, staff reviewed the previous work, additional data as appropriate, continued meetings and workshops with affected parties and held public workshops with the Governing Board to ensure that the changes to the statute had been assimilated into the methodologies.

On October 28, 1998, the Governing Board approved the subject minimum flows and levels.

As permitted under subsection 373.042(4), F.S., five parties requested Scientific Peer Review of the scientific and technical data and methodologies used to determine the flows and levels. The purpose of this series of reports is to document for the Scientific Peer Review Panel scientific and technical data and methodologies used to determine the flows and levels for priority waters in the Northern Tampa Bay area.

The reports are organized in the following sections. This first section provides a general explanation of the area, hydrogeology, the Legislature's direction to the District and the processes and constraints for the District's establishment of minimum flows and levels. The next four sections describe the specific methods developed for determination of minimum levels in certain wetlands, certain lakes, and in the Upper Floridan aquifer, respectively. The last section describes the methods used to develop the minimum flow for the Tampa Bypass Canal.





FINAL DRAFT

# Establishment of Minimum Levels

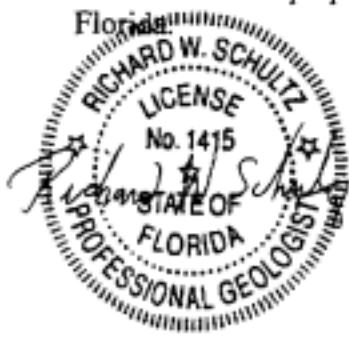


## in Palustrine Cypress Wetlands

March 18, 1999

**Southwest Florida Water Management District**

The geological evaluation and interpretations contained in "Establishment of Minimum Levels in Wetlands" were prepared by, or reviewed by, a Certified Professional Geologist in the State of Florida.



Richard W. Schultz  
March 18, 1999

License # 0001415

# **Establishment of Minimum Levels in Palustrine Cypress Wetlands**

## **Introduction**

In December 1996, a group of wetland scientists representing the District and other interested parties were convened as the "wetland subcommittee of the MFL Technical Committee" to develop a method for establishing a wetland minimum level pursuant to Section 373.042(1), Florida Statutes. Summaries of the wetland subcommittee meetings are provided as Appendix A. The purpose of this paper is to describe the method used to establish a minimum level for palustrine cypress wetlands in the northern Tampa Bay area as begun by the wetlands subcommittee and completed by the District.

The subcommittee members agreed that a relationship exists between a wetland's ecological condition and hydrologic condition. Important hydrologic parameters include not only the water stage (level), but also the duration of time water occurs at each stage. Lowered surficial aquifer levels caused by groundwater withdrawal have a negative influence on wetland water levels and hydroperiods (SWFWMD, 1996). Wetlands typically exhibit a characteristic response, including certain changes in vegetation and soils, when subjected to these altered hydrologic conditions (Rochow, 1994). The degree of ecological response is directly related to the magnitude of the hydrologic change.

Due to time constraints, the subcommittee chose to use existing data as our primary source of information from which to derive a minimum level. Wetland studies and monitoring programs conducted in the vicinity of large groundwater withdrawals in the region have established an extensive body of data on wetland vegetation, soils, and hydrologic conditions (Rochow, 1994). Data collected by various entities on various projects over a period of two decades was evaluated for this study. Due to the variety of sources, the body of existing data represents a variety of collection methods, study periods, frequency and intensity of data collection efforts, and reporting formats. In conformance with a statutory requirement, the best available information was used in establishing a minimum level for palustrine cypress wetlands.

Considering statutory requirements, and the constraints associated with meeting these requirements, the purpose of this study was to achieve the following objectives:

1. Investigate the relationship between certain ecological parameters and hydrologic parameters in wetlands.
2. Identify a hydrologic threshold, expressed as a water level, beyond which it would be reasonable to expect that "significant harm" will occur in a wetland.

## Methods

### Selection of reference wetlands

Compilation of existing data from all known sources in the region yielded varying levels of information on 655 wetland sites, comprising a variety of wetland types, and mostly located in the vicinity of municipal wellfields in Hillsborough and Pasco counties. The subcommittee focused on isolated cypress swamps because the bulk of available data was collected from this wetland type<sup>1</sup>. In addition, this type of wetland is abundant throughout the study area.

Water level data varied considerably among wetland sites examined for inclusion in this study. Water levels were measured at various frequencies ranging from daily readings to occasional observations. Variations in frequency occur not only among sets but also within sets. The period of record also varies considerably among the wetland sites examined since the data originate from a host of studies conducted by various parties for various purposes over more than two decades. The period of record used in our study, water years 1989 through 1995, was chosen because it is believed long enough to be considered representative of long term conditions and lessens the effect of a single year with uncommonly wet or dry conditions. Although a longer period of record may have provided better hydrologic information, requirements for a longer period of record would further reduce the number of available wetland sites.

Reference wetlands selected for this analysis were required to meet the following criteria:

1. Wetlands are classified as palustrine (isolated) cypress swamps.
2. Adequate water level data, collected at least monthly, allow comparison with other wetlands during the period over the period of water years 1989 through 1995.<sup>2</sup>
3. Ditches or other features that divert or obstruct surface water flows have not substantially altered the drainage characteristics of the basin contributing runoff directly to the wetland.
4. Sites are accessible to collect/verify ecological assessment information and survey normal pool indicators.
5. Wetland size is greater than one half acre.

Thirty-six of the original 655 wetland monitoring sites met the selection criteria and were chosen as reference wetlands. Data from each of the reference wetlands consists of measured water levels, both above and below ground surface, categorical ratings of nine ecological assessment criteria, and a determination of the normal pool elevation. The location of these wetlands is shown in Figure 1.

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<sup>1</sup> Further studies will seek to determine an appropriate minimum level in other wetland types and in regions where other wetland types are more prevalent.

<sup>2</sup> We ultimately accepted twenty-eight sites with six years, six sites with five years and two sites with four years of data within the study period.



## Ecological assessment of reference wetlands

Wetlands affected by groundwater withdrawal exhibit a characteristic pattern of changes including soil loss, tree mortality, and changes in vegetation composition and zonation. Wetland monitoring programs implemented by the District and water supply entities assess wetlands similarly by some measure of these parameters. In order to provide a consistent rating format for wetland ecological assessments, all reference wetlands in this study were assessed using a single rating method developed by Biological Research Associates, Inc.

The rating method provides for the measurement of nine parameters including groundcover composition, shrub strata composition, overstory composition, canopy condition, incidence of leaning or fallen trees, "weedy species" (i.e. abundance of opportunistic invaders), "succession" (i.e. changes in vegetation zonation), soil subsidence (i.e. soil loss), and presence of hydrologic indicators. Each of the nine field measurements is recorded using a categorical rating of one, two or three. A rating of three represents the least departure from what is assumed to be the unaltered condition while a rating of one represents the greatest degree of departure. Categorical descriptions for each rated parameter are summarized in Table 1.

All of the ecological parameters used in the field evaluation form for wetlands are ultimately related to hydrologic conditions in the wetland. This relationship is complex, however, and appears to be affected by other factors, such as fire frequency, soil organic content, and the proximity of invading species. As a result, variability exists among individual parameters within a wetland and among wetlands. The parameters are not equally responsive to hydrologic change and raw scores for affected wetlands are often comprised of a mix of ones, twos, and threes.

The period of elapsed time from the initial hydrologic impact is also a determining factor in wetland response. Tree fall, for instance, is generally not prevalent in an affected wetland until sufficient time has elapsed for soil loss to expose tree roots. Another example parameter is change in overstory composition, which tends to occur much slower than changes in the composition of lower vegetation strata. As a result, the nature and degree of change in the measured ecological parameters varies over time.

To help ensure that the relationship between wetland ecological conditions and hydrologic conditions was not obscured by less sensitive indicators, a Spearman rank correlation matrix was calculated between the field measured categorical responses and the median value of the stage frequency curve (P50)<sup>3</sup>. The results are summarized graphically in Figure 2 and presented, in full, in Appendix B. The ecological parameters appear to be divided into two broad groups. The first group, consisting of the five highest correlations, is comprised of succession, hydrology, weedy species, soil subsidence, and shrub composition. The remaining four parameters, including groundcover composition, canopy condition, leaning/fallen trees, and overstory

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<sup>3</sup> Hydrologic conditions are not completely represented by a stage frequency curve. There are other factors such as seasonal variations and the rate of change of water levels may affect a wetland's ecological response. Because this method of analysis utilizes the median value (P50) of the stage duration curve, it is possible that not all of the ecological parameters being measured in the field are related to this P50 value. Additional variability may be caused by errors in field measurements.

composition, have a noticeably lower degree of correlation with the median stage. In addition, the correlation between P50 and the categories leaning/fallen trees and overstory composition is not statistically significant ( $\alpha = 0.05$ ).

The parameters ground cover, canopy condition, leaning/fallen trees, and overstory composition were dropped from the rating method used in this study because of their relatively low correlation with the P50 of the stage duration curves. In addition, the parameter labeled hydrology was omitted because it is a measure of the cause (hydrologic change) rather than the effect (ecological response). This parameter represents the investigator's assessment of whether the wetland is being inundated on a regular or normal frequency to the proper level. In certain wetland monitoring programs, this parameter is used as a surrogate for the actual water levels when evaluating wetlands without hydrologic data. It was unnecessary in this analysis because actual water level data exists for all selected reference sites.

Only the four most sensitive ecological parameters: Succession, Weedy Species, Soil Subsidence, and Shrubs were used to rank the reference wetlands. This subset of the nine measured parameters was chosen to reduce variability and to focus on early change indicators rather than those associated with a delayed response. The final four ecological parameters are also correlated with each other and are redundant to an extent (e.g. the correlation between Soil Subsidence and Shrubs is 64 percent). All four categories were retained in the ecological assessment to minimize the effects of subjectivity in field measurements. In this manner, an erroneous score in one category will have minimal effect upon the overall score. Table 2 lists the reference wetlands along with the field ratings for each of the four ecological parameters and the overall median score.

The subcommittee was unwilling to identify a threshold rating beyond which significant harm had occurred in a wetland because the determination of "harm" was considered a value judgement without scientific definition. The subcommittee agreed, however, that those wetlands with median ratings greater than 2.5 were "not significantly changed", while those with median ratings of 2.5 or less were "significantly changed", based on the four most sensitive ecological assessment criteria. Wetlands with median scores less than two were later classified by the District as "severely altered"<sup>4</sup>. The final reference data set contains twenty-one wetlands in which alterations in ecological conditions are not considered significant, eleven with significant alteration, and four with severe alteration.

#### **Establishment of normal pool elevation as a datum**

An elevation datum was established in each wetland to standardize the measured water levels and facilitate comparison among wetlands. The datum used is often referred to as the "normal pool" elevation, a wetland level commonly used in the design of wetland stormwater treatment systems (SWFWMD, 1988). This level can be consistently identified in cypress swamps based on the similar vertical locations of several indicators of inundation (Hull et al., 1989; Biological

<sup>4</sup> The District's Governing Board subsequently made a policy decision to equate significant harm, as referenced in law, with significant change in a wetland, as determined by the subcommittee. The terms "change" and "alteration" are used synonymously in this paper.

Research Associates, 1996). In wetlands where declining water levels have caused the downward migration of certain normal pool indicators, more persistent indicators of the unaltered normal pool elevation were used to establish the datum. All analyses have been conducted relative to this elevation.

Replicate measurements were taken of normal pool indicators in each wetland. Indicators used include:

1. The elevation of the root crown of *Lyonia lucida* was used whenever mature specimens were present in the wetland and this indicator appeared coincident with other indicators.
2. The lower limit of epiphytic bryophytes growing on cypress trees (a.k.a. moss collars) was used when this indicator appeared coincident with other indicators and showed no evidence of downward migration due to declining water levels.
3. The upper limit of adventitious roots on *Hypericum fasciculatum* was used when coincident with other longer-term indicators.
4. The inflection point on the buttress of cypress trees was used in the absence of other suitable indicators except when the ground surface appeared sunken due to soil subsidence.
5. The ground elevation of cypress growing at the outside edge of the dome was used if no other suitable indicators could be measured.

All indicators were marked using flagging tape and nails until they were located by a registered professional surveyor<sup>5</sup>. Surveyed elevations of all normal pool indicators in reference wetlands are provided in Appendix C. Normal pool elevations were independently verified by an environmental consultant retained by the West Coast Regional Water Supply Authority (Berryman & Hennigar, 1997).

#### **Hydrologic assessment of reference wetlands**

Water level data were first converted into water elevations referenced to 1929 National Geodetic Vertical Datum (NGVD). Although some data were already referenced to NGVD, other data were referenced to ground level at the point of measurement or the "palmetto line" (i.e. the waterward extent of *Serenoa repens*). Each site was surveyed by a registered professional surveyor to establish a benchmark referenced to NGVD. The survey data, supplemented by personal communication with the individuals who collected the original data, were then used to convert the raw water level data to water elevations. To maintain consistency of the time spans, all data were averaged to monthly water level elevations. Water level data for all reference wetlands is provided in Appendix D.

Hydrographs were prepared for all the wetland sites showing the water levels and the normal

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<sup>5</sup> The six Green Swamp sites had benchmarks that had been previously surveyed. Staff gage readings at these sites can be referenced to NGVD. Normal pool indicator elevations at these sites were determined by measuring the distance above a known water level elevation.

pool elevation. This was done to identify abnormal data including inappropriate normal pool elevations, or abnormal water level information. Sites containing problems or potential problems were eliminated until those problems were resolved. Appendix E contains the hydrographs for all thirty-six reference sites used in this analysis.

Stage frequencies were calculated for each wetland site. Stage, in this case, corresponds to the departure of the water level from the normal pool elevation. The Cunnane formula (Cunnane, 1978) was used in calculating the cumulative frequencies:

$$p = (i - 0.4) / (n + 0.2)$$

*where i = the cumulative number of days*

*and n = the total number of days*

Some sites had missing data and it is unknown whether the missing observations are due to the data not being collected or whether the staff gages and wells were dry and simply not recorded. With missing data, a placeholder was inserted for missing data to keep adjacent readings from having unrealistic time weights assigned to them. For example, if data existed for January and March but not February, a blank entry was inserted for February to maintain the uniform time step. In the above example, depending upon how one calculates the time step, January might be weighted by 58 days and March by 31 days whereas by using a placeholder each would receive only their respective time weights of 30 and 31 days.

Because some data is missing, not all sites have stages to associate with all frequencies. For example, if 30 percent of the time the site is dry, stage frequency can only be characterized for the 70 percent of the time that the site has water level data. For this reason, the stage frequency curves are constructed in terms of percentage of time the stage is below historic normal pool (1-p). Although some curves stop before reaching 100 percent, we presume this would be less than the lowest observed value. This presumption affects a very small portion of the overall data and as such should have little or no effect upon the results.

## **Results and Conclusions**

Figure 3 combines the results of the stage frequency analysis with the results of the ecological assessments. The figure shows that the stage duration curves of wetlands categorized as not significantly altered exhibit the least departure from normal pool when compared to wetlands categorized as significantly or severely altered. The figure also shows that stage frequency curves of wetlands showing little or no alteration exhibit a great deal of similarity and the P50 values for these wetlands occur within a relatively narrow range. In comparison, stage frequency curves for wetlands categorized as significantly or severely altered show a higher degree of dispersion and a much wider range of lower P50 values, reflecting a relatively wide gradient of

hydrologic conditions in altered wetlands without an effective lower limit to water level lowering.

Figure 3 suggests that a hydrologic threshold for significant ecological change can be represented conceptually by a stage frequency curve that separates wetlands rated not significantly altered (above the curve) from wetlands rated significantly altered (below the curve). The difference between the P50 elevation and the elevation of normal pool appears to be a useful threshold statistic to distinguish wetlands on this basis.

A Kolmogorov-Smirnov two sample test was used to test the hypothesis that wetlands rated as not significantly altered come from the same sampling distribution as wetlands in other alteration categories. Results of this test are summarized in Figure 4. Full data are provided in Appendix F. The hypothesis is rejected when wetlands rated as not significantly altered are compared to either of the more severe alteration categories. The hypothesis cannot be rejected, however, when wetlands rated as significantly altered are compared to those rated as severely altered. As a result, wetlands categorized as significantly altered and severely altered were combined into one alteration category.

A Kolmogorov-Smirnov one sample test was performed for each alteration category to test the assumption that the data are normally distributed. In each case, we are unable to reject an assumption of normality. The results are summarized in Figures 5 and 6. Using estimates of the mean and standard deviation obtained by a "bootstrapping" technique (Mooney & Duval, 1993) yielded essentially the same results. Full data are provided in Appendix G.

A threshold statistic (P50 departure from normal pool) distinguishing wetlands rated as not significantly altered from the combined categories of altered wetlands was determined by graphing the normal cumulative frequency function for each category (Figure 7). The intersection of the CFF lines identifies the level at which alpha and beta errors are equal. This intersection occurs at a point between 1.8 and 1.9 feet below normal pool. Using this threshold, the probability of incorrectly predicting that a wetland will be significantly altered is estimated at 5 percent and the probability of incorrectly predicting that a wetland is not significantly altered is estimated at 5 percent.

Based on this analysis, a palustrine cypress swamp is predicted to show signs of significant alteration if the median stage (based on a six year stage record) is lowered to a level between 1.8 and 1.9 feet below the unaltered normal pool elevation. As a policy decision, the District Governing Board determined that wetlands identified as significantly altered had been "significantly harmed". The District Governing Board adopted minimum levels for an initial group of forty-one "sentry" wetlands<sup>6</sup>, establishing this level 1.8 feet below the elevation of normal pool<sup>7</sup>. A wetland is determined to be below its minimum level if the median stage (based on a long-term stage record) is below the adopted minimum level.

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<sup>6</sup> It is anticipated that additional sentry wetlands will be added over time to establish a more comprehensive monitoring network over the entire area.

<sup>7</sup> At the time of adoption by the Governing Board, results indicated that the appropriate offset was 1.8 feet below normal pool. Subsequent corrections to the elevation data increased the calculated value to 1.87 feet.



## Literature Cited

Berryman & Hennigar, 1997. Establishment of normal pool elevations in forested wetlands for the purpose of establishing minimum wetland levels. Report submitted to the West Coast Regional Supply Authority. October, 1997.

Biological Research Associates, 1996. Use of lasting indicators of historic inundation patterns in isolated wetlands as reference elevations to determine areal extent and intensity of reduced water levels near areas of groundwater withdrawals. Report submitted to the West Coast Regional Water Supply Authority. November, 1996.

Cunnane, C., 1978. Unbiased plotting positions – a review. *J. Hydrology*, v.37 p.205-222.

Hull, H. C. Jr., J. M. Post Jr., M. Lopez and R. G. Perry. 1989. Analysis of water level indicators in wetlands: Implications for the design of surface water management systems. In: *Wetlands: Concerns and Successes. Proceedings of the American Water Resources Association*, Tampa, D. Fisk (Ed.), pages 195-204.

Mooney, C. Z. and R. I. Duval, 1993. *Bootstrapping – A Nonparametric Approach to Statistical Inference. Quantitative Applications in the Social Sciences*, Vol. 95, Sage Publications, Thousand Oaks, California.

Rochow, T. R., 1994. The Effects of Water Table Changes on Fresh-water Marsh and Cypress Wetlands in the Northern Tampa Bay Region – a Review. Technical Report 1994-1, Southwest Florida Water Management District. February, 1994.

Southwest Florida Water Management District, 1988. Basis of Review for Surface Water Permit Applications in the Southwest Florida Water Management District.

Southwest Florida Water Management District, 1996. Northern Tampa Bay Water Resources Assessment Project. Vol. 1. Surface-Water/Ground-Water Interrelationships. Brooksville, FL.

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Figure 1. Locations of Reference Wetlands

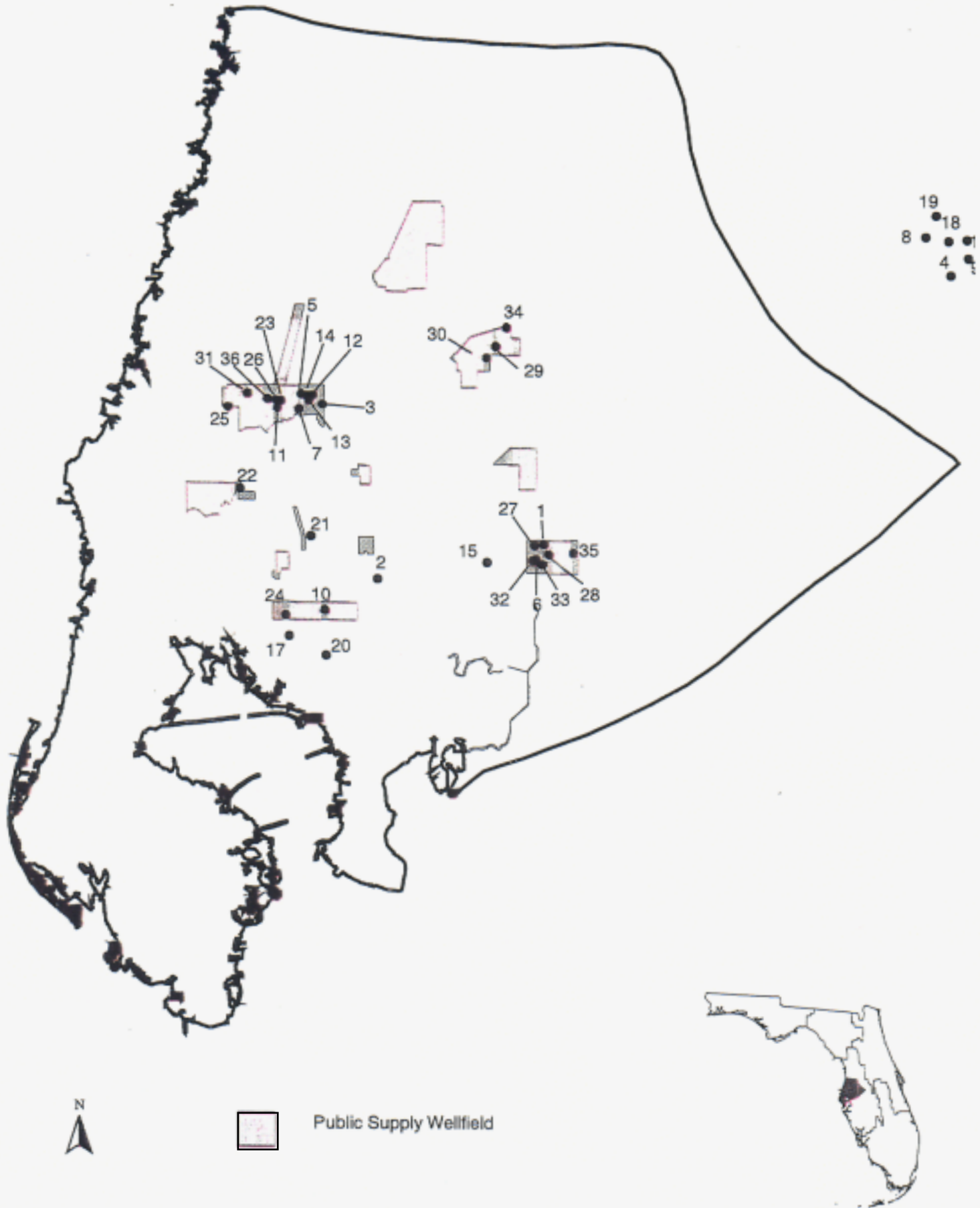


Figure 2. Spearman Rank Correlations - P50 Departure From Normal Pool vs Ecological Ratings

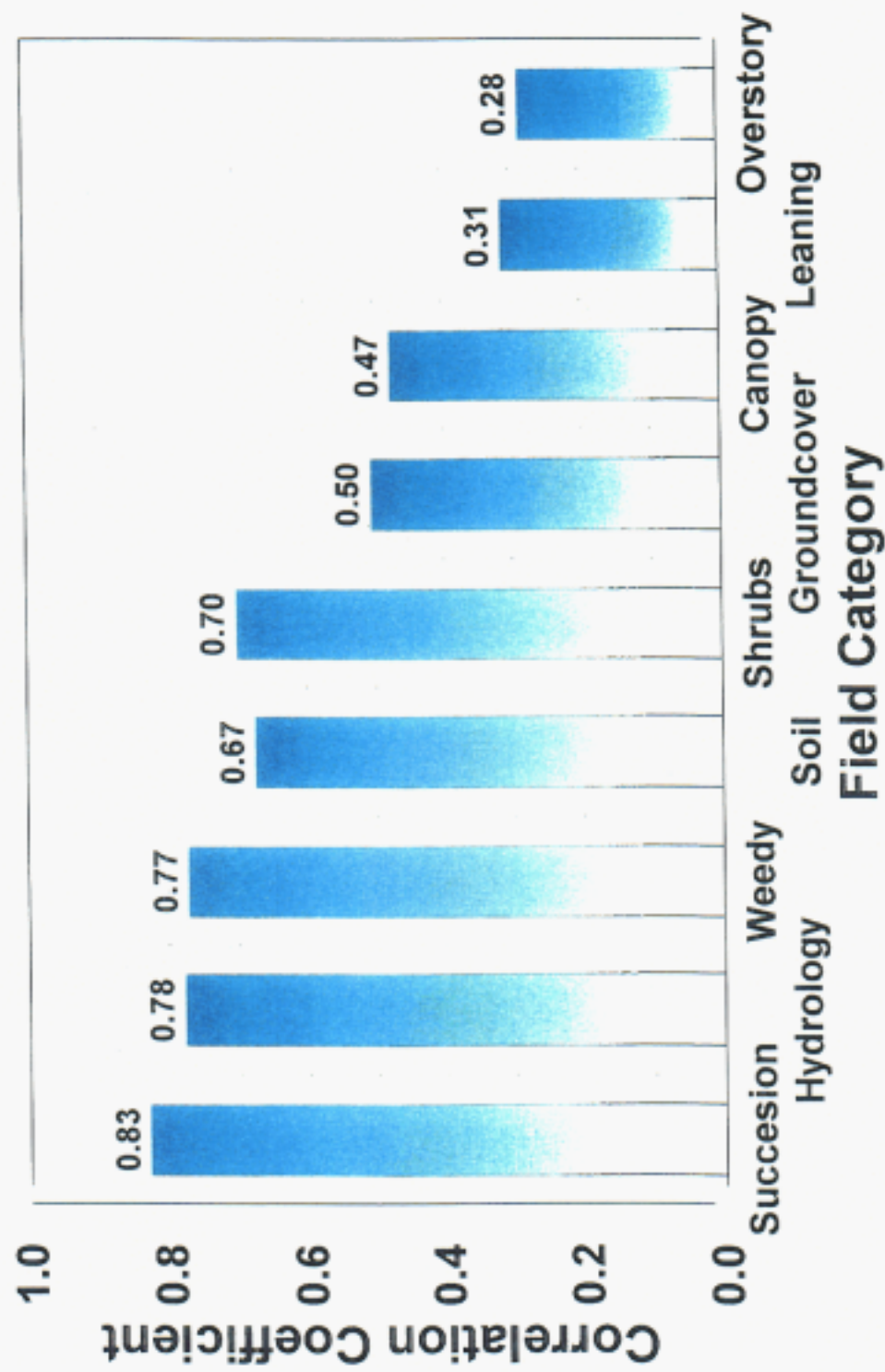


Figure 3. Stage Frequency Curves for Reference Wetlands

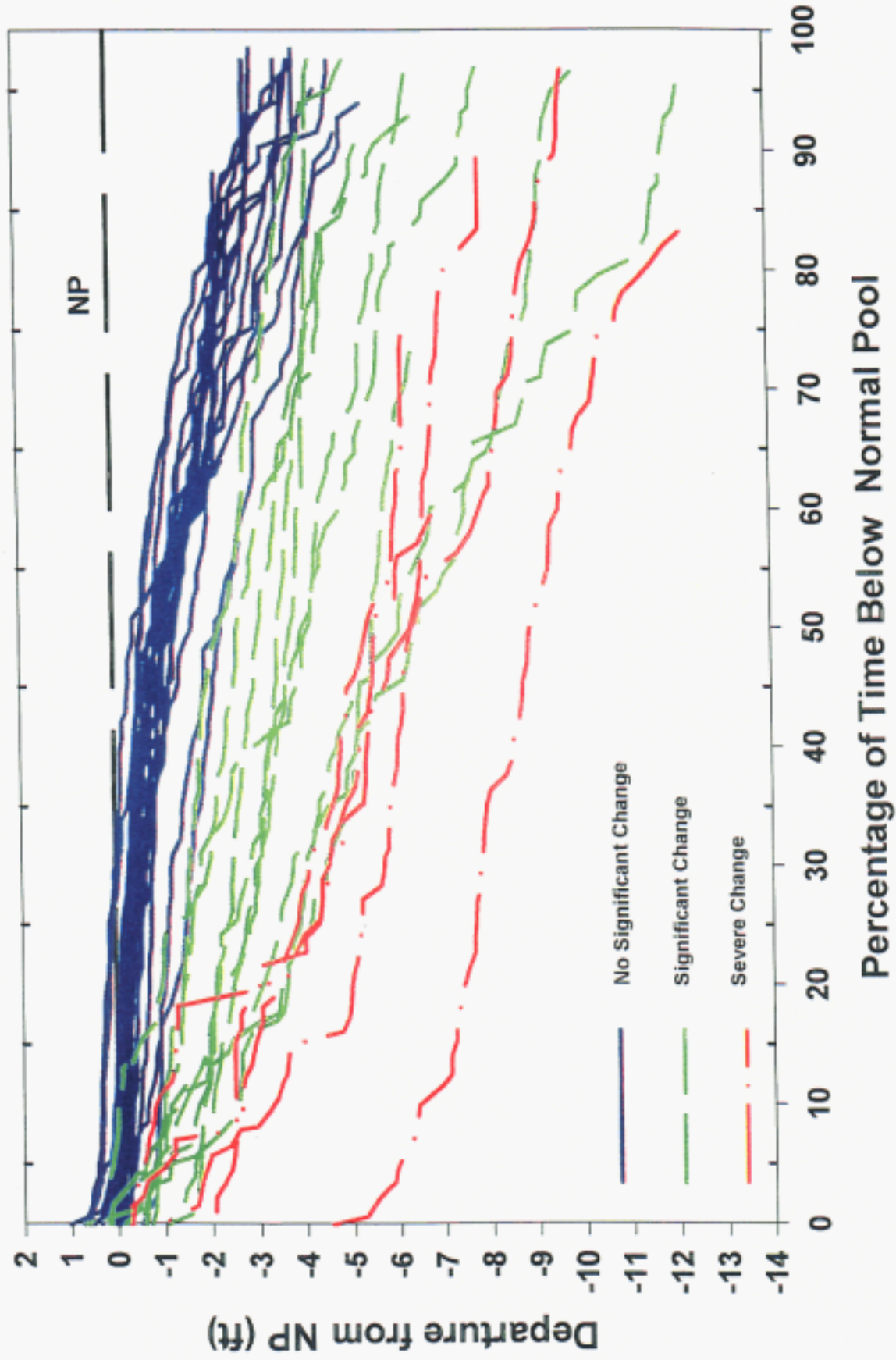
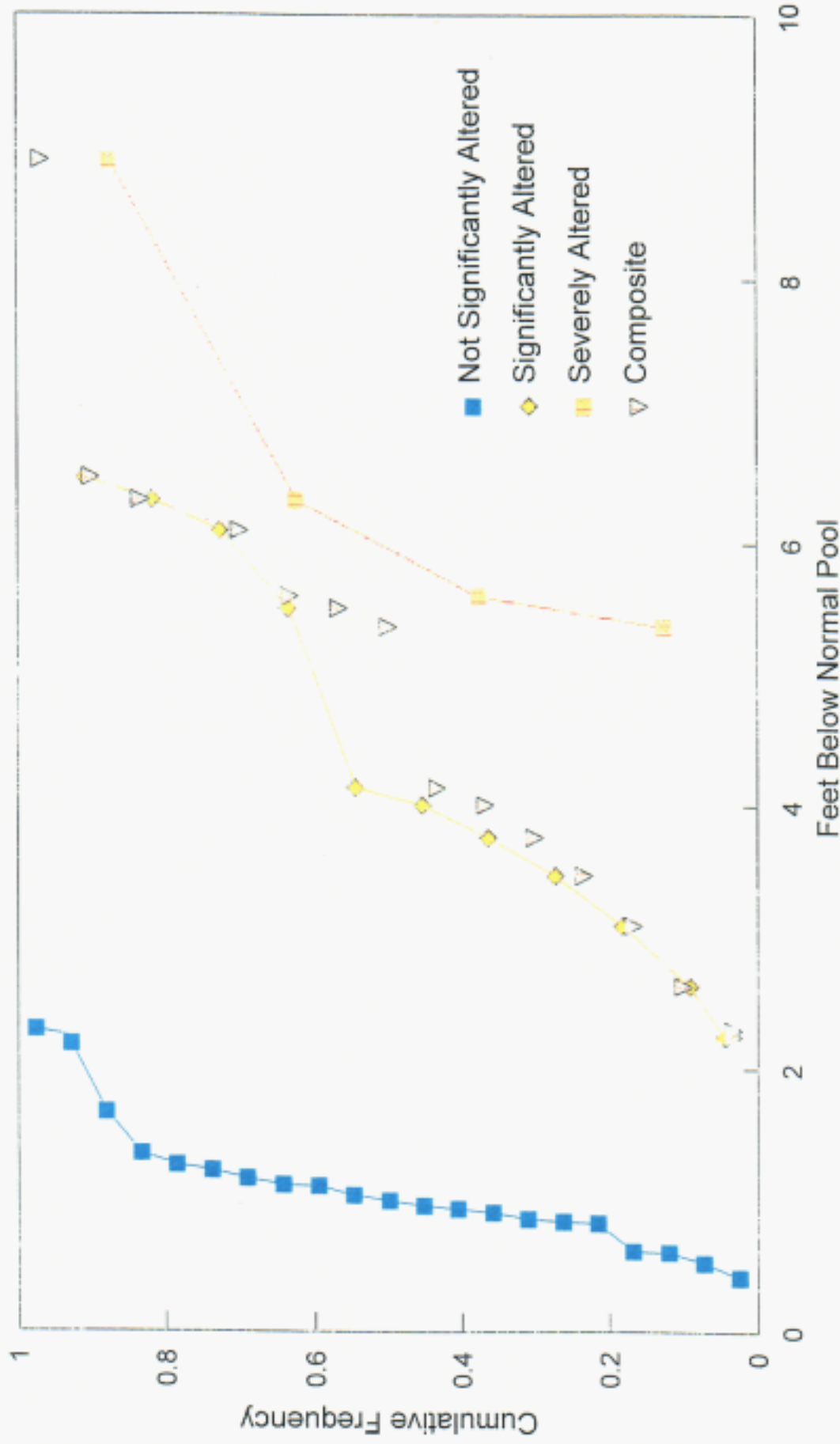




Figure 4 Kolmogorov-Smirnov Two Sample Test for Equality of Distributions  
 Cumulative Frequency vs Water Level



Blue is sign. different from all others  
 No sign. difference between all others

Figure 5 Kolmogorov-Smirnov One Sample Test For Wet Lands Classified as "Not Significantly Altered"

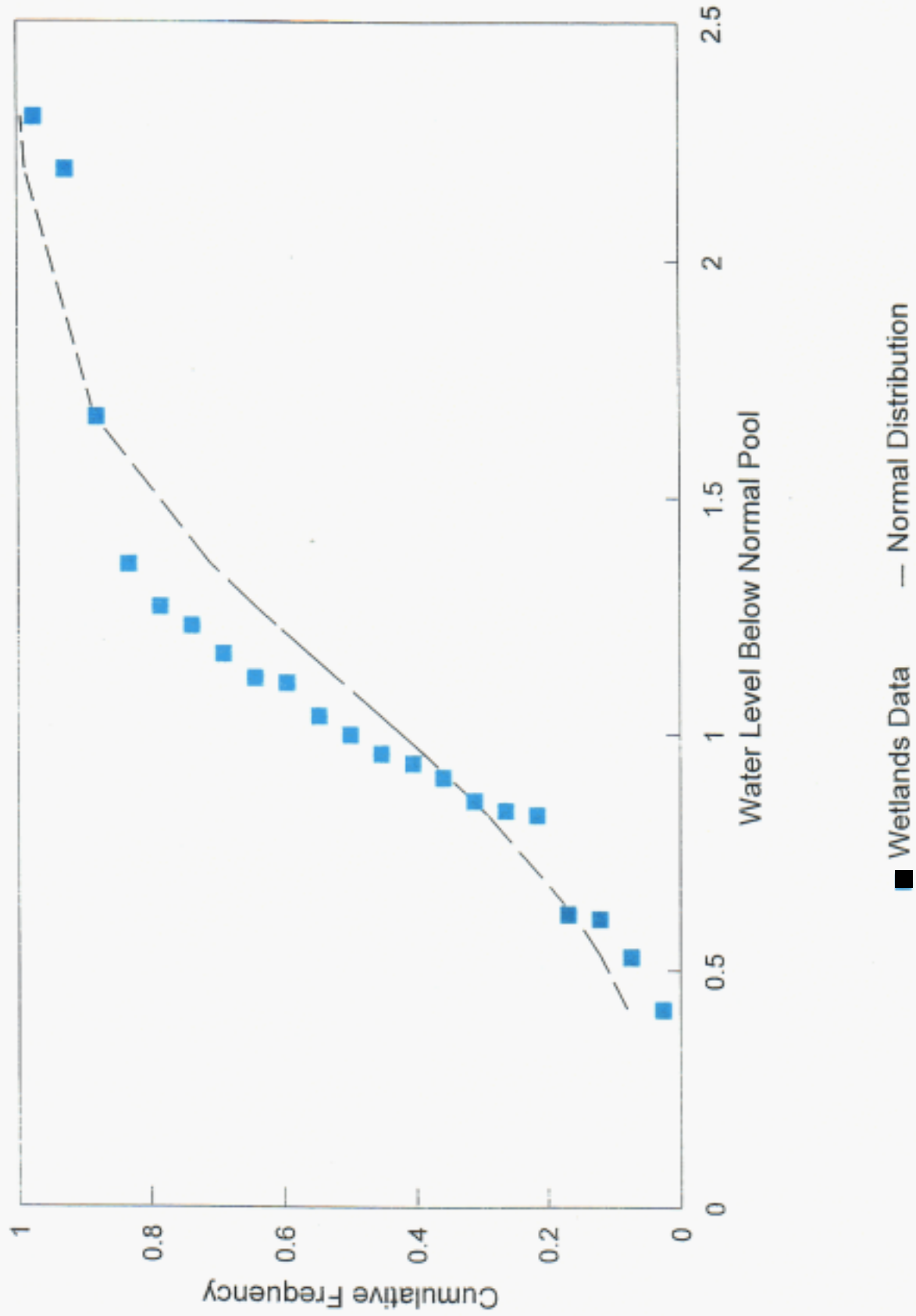


Figure 6. Kolmogorov-Smirnov One Sample Test for Wetlands in the Combined Alteration Category.

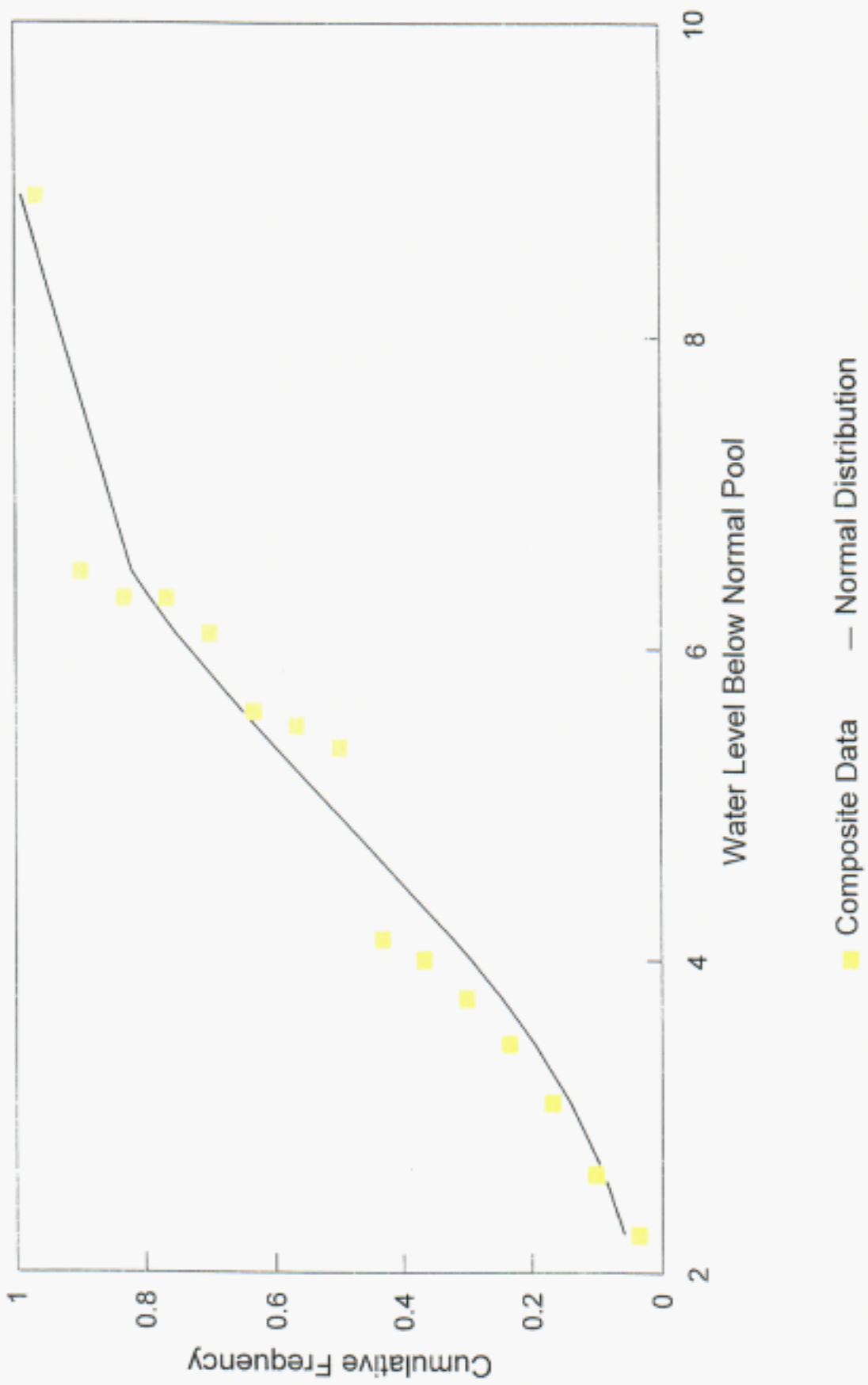


Figure 7. Cumulative Frequency Function Curves for Wetlands Categorized as "Not Significantly Altered" and Wetlands in the Composited Alteration Category

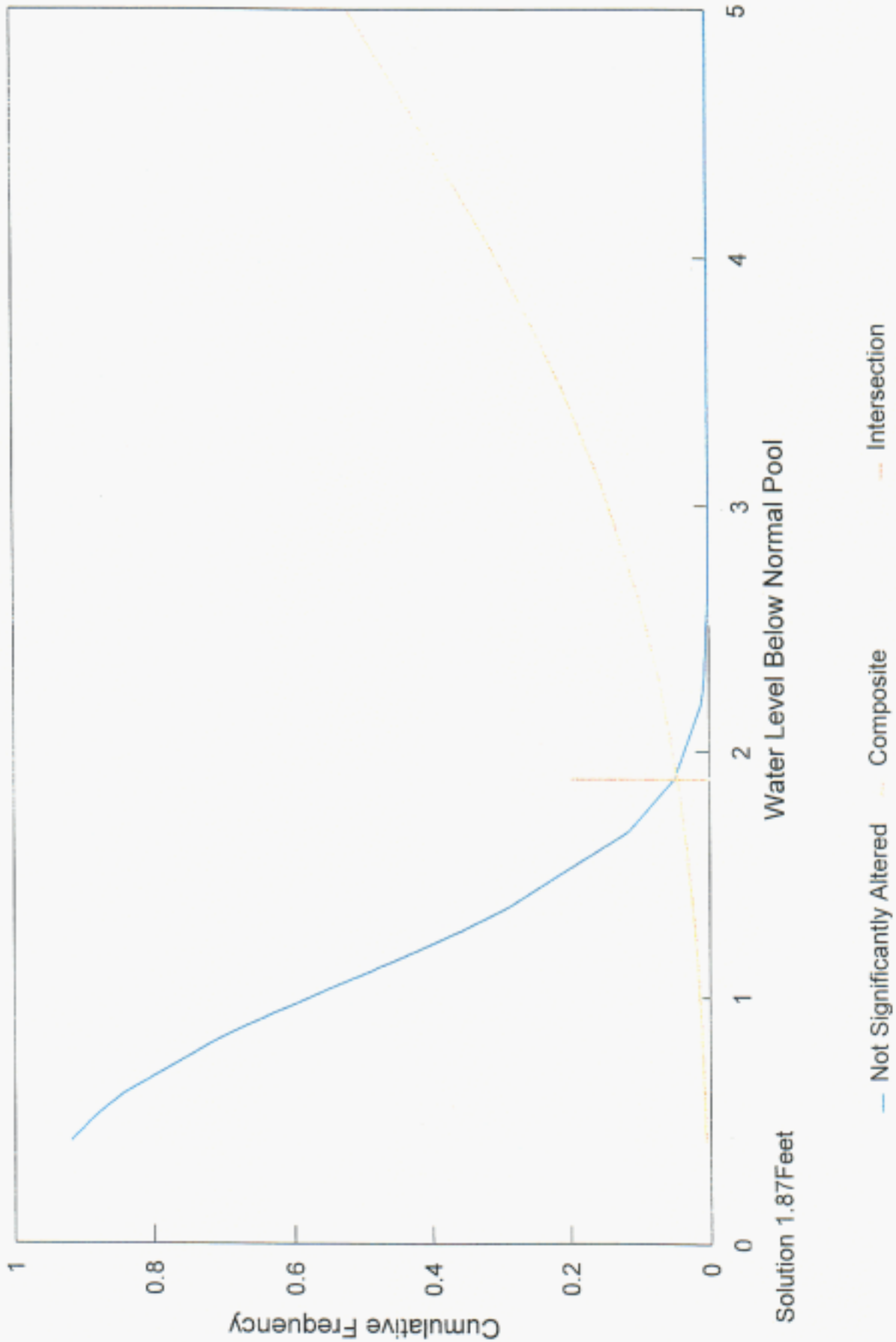


Table 1. Descriptions of ecological rating categories used to classify reference wetlands.

<b>Indicator</b>	<b>Rating = 1</b>	<b>Rating = 2</b>	<b>Rating = 3</b>
<i>Weedy Species</i>	dominant	common	rare
<i>Hydrology</i>	water marks absent	water marks present but faint (inappropriate for season)	water marks clearly evident and seasonally appropriate
<i>Succession</i>	species characteristic of drier systems present in abundance	species characteristic of drier systems occasionally present (or occurring at edge of wetland)	species characteristic of drier systems neither abundant nor occasionally present
<i>Soil</i>	fissured, oxidized, obvious subsidence >6 inches	unseasonably dry, subsidence up to 6 inches	seasonally appropriate
<i>Shrubs</i>	<50% OBL or FACW	50 - 75% OBL or FACW	>75% OBL or FACW
<i>Canopy Foliage</i>	>50% standing dead or thin	10 - 50% standing dead or thin	<10% standing dead or thin
<i>Groundcover</i>	<50% OBL or FACW	50 - 75% OBL or FACW	>75% OBL or FACW
<i>Leaning or Fallen Trees</i>	>50% leaning or fallen	10 - 50% leaning or fallen	<10% leaning or fallen
<i>Overstory Dominance</i>	<50% OBL or FACW	50 - 75% OBL or FACW	>75% OBL or FACW



Table 2. Ecological ratings of reference wetlands.

Name	Site	P50(ft)	Field Scores				Median Score
			Weedy	Succession	Soil	Shrubs	
NW115	1	-0.42	3	3	3	3	3
WC342718	2	-0.53	3	3	2	3	3
STK N	3	-0.81	3	3	3	3	3
G1	4	-0.62	3	3	3	3	3
STK M	5	-0.83	3	3	3	3	3
NW125	6	-0.84	3	3	3	3	3
S68	7	-0.86	3	3	3	3	3
G6	8	-0.91	3	3	3	3	3
G3	9	-0.94	3	3	3	3	3
NW81	10	-0.96	3	3	3	3	3
S97	11	-1.00	3	3	2	3	3
S75	12	-1.04	3	3	3	3	3
S.E. REC	13	-1.11	3	3	3	3	3
S70	14	-1.12	3	3	3	3	3
MB96	15	-1.17	3	3	3	3	3
G4	16	-1.23	3	3	3	3	3
142817	17	-1.27	3	3	3	3	3
G2	18	-1.36	3	3	3	3	3
G5	19	-1.67	3	3	3	3	3
WC302818	20	-2.19	1	3	3	3	3
NC242717	21	-2.25	2	2	2	3	2
EW11	22	-2.30	3	3	3	3	3
S94	23	-2.63	3	2	2	3	2.5
WC102817	24	-3.09	1	3	2	3	2.5
S10	25	-3.47	2	2	2	3	2
STK CEN	26	-3.76	2	2	2	3	2
MB88	27	-4.01	2	2	2	2	2
MB3C	28	-4.14	3	2	2	2	2
W11	29	-5.37	1	1	2	3	1.5
W17	30	-5.51	1	2	3	3	2.5
S30	31	-5.60	1	1	1	2	1
W160	32	-6.10	2	2	2	2	2
MB30	33	-6.33	2	2	2	1	2
W41	34	-6.33	1	2	2	1	1.5
MB35	35	-6.50	2	2	2	2	2
S44	36	-8.90	1	1	1	1	1

Appendix A. Summaries of wetland subcommittee meetings.

## December 16, 1996 SWFWMD MFL Wetland Subcommittee Meeting

**ATTENDEES:** Jim Bays/CH2M HILL  
Shirley Denton/BRA  
Chris Shea/WCRWSA  
Ross McWilliams  
Phil Davis/SDI  
Ted Rochow/SWFWMD  
Manny Lopez/SWFWMD  
Richard Schultz/SWFWMD

**FROM:** Jim Bays/TPA

**DATE:** December 17, 1996

The Minimum Flows & Levels Wetlands Subcommittee met at the SWFWMD Tampa office at 1330 December 16, 1996. The purpose of the meeting was to review progress in assembling an inventory of wetland monitoring locations in the northern Tampa Bay area that could be suitable for developing relationships between wetland functions and hydrological parameters. This meeting followed a progress-report conference call held at 1600 on Thursday December 12.

### Action Items:

1. Richard Schultz would coordinate with Shirley Denton to meld his summary of well and wetland monitoring locations with her summary of wetland monitoring stations that have quantitative ecological information
2. All members of the subcommittee were requested to develop a list of ecological or biological parameters that could potentially be used to indicate when ecological change has taken place. These lists would then be compared and discussed, with the goal of developing a common or condensed list of parameters that we could then extract from the data set and used for analysis.

### General:

- Richard Shultz showed that of the master list of 655 wetland monitoring sites assembled by Shirley Denton, 302 of the sites occurred within 0.5 miles of 1 to 6 monitoring wells. Of these 302 wetlands, 252 were within 0.5 miles of a surficial and a Floridan well. Richard was going to identify the subset which of these with staff gage data. It was felt that perhaps 80 sites may have staff gage data entered in the data base.
- Richard prepared a pie chart that demonstrated that the bulk of the wetlands in the data base are cypress wetlands, with several other types included. It is not clear if the data set completely reflects the distribution of wetland types within the region.
- There was considerable discussion about wetland type nomenclature. A convention will have to be reached on how to classify certain types of wetlands, when the final data set is established (e.g. what to call the cypress "donut", riverine forest, etc.).

- Manny suggested accessing data bases on wetlands from ERP files that were created for mitigation. Discussion followed; Manny would look into how available these data were, and what level of effort may be involved.
- Chris Shea had reviewed Shirley's list, and had made some corrections. These were to be given to Shirley. He thought it best to have the consultants review the summary for accuracy. The time allotted to the MFL workshop might not be sufficient to allow this.
- Ted suggested using some sites as a prototype for analysis and interpretation. He presented examples of wetland cover time series in several wetlands in Starkey and Cypress Creek well fields.
- Considerable discussion followed on how to associate a range of wetland ecological parameters with hydrological parameters. Richard suggested relating the SWFWMD wetland health ratings to spatial drawdown extent. Shirley suggested that the 1-3 rankings used in her analysis could be useful. Ross was concerned about means of measuring subsidence as difficult to quantify. Ted suggested that long-term monitoring of loss of sensitive species is a useful indicator of change. Manny echoed that the use of indicator species would be a useful focus. Chris cautioned that use of indicator species may be too complex, and that a simpler index could be more useful. Work is currently being performed on this by Berryman & Henigar.
- More discussion followed in this vein, but concluded with the assignment that all would be tasked with preparing a list of indicators, e.g. indicator wetland species (maidencane, pickerelweed), upper transitional species, weedy species, soil subsidence, treefall. These would be compared and a common set of indicators would be developed, if possible.

## December 19, 1996 MFL Wetland Subcommittee Meeting

ATTENDEES: MFL Wetland Subcommittee  
FROM: Jim Bays/CH2M HILL  
DATE: December 31, 1996; Revised January 3, 1996 after 1/2/97 review by subcommittee

The Minimum Flows and Levels Technical Subcommittee met on Thursday December 19, 1996 at 1:30 p.m. Subcommittee members include:

- Jim Bays/CH2M HILL
- Phil Davis/SDI (not present)
- Shirley Denton/BRA
- Manny Lopez/SWFWMD
- Ross McWilliams for Hillsborough County
- Ted Rochow/SWFWMD
- Richard Schultz/SWFWMD
- Chris Shea/WCRWSA

Others in attendance included Patty Fesmire/WCRWSA, Scott Emery for Hillsborough County and Clark Hull for SWFWMD.

The meeting purpose was to review progress in assembling a data base of ecological data from monitoring stations within the Hillsborough-Pasco-Pinellas County area, and to further discussion on analytical approaches. No set agenda was provided.

Broad discussion centered around each topic. The following summarizes major points and action items resulting from the meeting.

- Data Base Progress

- Shirley Denton produced a hard copy of the data base. The types and relative quality of the data available for each site were indicated by a code system developed by Shirley. The data base was reviewed during the meeting, and vegetation type categories were discussed, and adjusted. Some corrections were needed; these would be addressed by Shea and Rochow for Authority and SWFWMD stations, respectively.
- Wetland types in the data base were tallied by type code, yielding the following:
  - 91 sites w/herbaceous data
  - 51 sites with canopy data
  - 60 sites with herbaceous plant data and long-term hydroperiod data
  - 48 sites with canopy and long-term hydroperiod data.
- Sites preferred for analysis will initially be focused on those with good long-term hydroperiod data.
- Sites will be classified using the following general wetland type categories:
  - S cypress strand

- C            cypress isolated
  - R            hardwood contiguous
  - H            hardwood
  - M            marsh
  - CM          cypress marsh
- Wet prairies were found to be difficult to establish as a separate system, but initially for practical purposes will be classified with marshes. Wet prairie fringes surrounding cypress domes will be included with cypress.
  - Approaches to Analysis:
    - Denton proposed that the subcommittee may need to consider using a cumulative hydrologic variable to address potential concerns about different data collection frequencies. One possible approach included a cumulative hydroperiod over a five year period.
    - Considerable discussion followed on the use of a Normal Pool elevation as a means of "normalizing" hydroperiod which can be used to provide a standard relative elevation for comparison of wetlands. WCWRS is measuring these elevations in all of the well field wetlands.
    - Discussion of Ecological Indicators: This topic was not specifically discussed. Proposed indicators would be discussed at the next meeting, scheduled for January 2 at SWFWMD.



## January 2, 1997 MFL Wetland Subcommittee Meeting

ATTENDEES: MFL Wetland Subcommittee  
FROM: Jim Bays/CH2M HILL  
DATE: January 8, 1997

The Minimum Flows and Levels Technical Subcommittee met on Thursday January 2, 1997, at 0900 a.m. Subcommittee members include:

- Jim Bays/CH2M HILL
- Phil Davis/SDI (not present)
- Shirley Denton/BRA
- Manny Lopez/SFWWMD
- Ross McWilliams for Hillsborough County (not present)
- Ted Rochow/SFWWMD
- Richard Schultz/SFWWMD
- Chris Shea/WCRWSA

Others in attendance included Scott Emery for Hillsborough County and Clark Hull for SFWWMD.

The meeting purpose was to (1) review progress in assembling a data base of ecological data from monitoring stations within the Hillsborough-Pasco-Pinellas County area, and (2) to review proposed ecological indicators of hydrologic change. An agenda is attached.

Minutes of the December 19, 1996 meeting were reviewed and amended. A revised copy is attached.

The following summarizes major points and action items resulting from the meeting.

- "Normal Pool" Hydroperiod Assessment
  - Ted Rochow posted three example relationships that may serve to describe vegetative trends in response to hydroperiod changes. These are attached to this memorandum.
  - Considerable discussion followed on the definition of normal or mean pool, and how it is determined. Clark provided a diagram of a cypress trunk illustrating the relative position and indicators used in setting Normal Pool and Seasonal High Water., and example hydroperiods in isolated and riverine wetlands. The attendees agreed that some form of standard relative elevation for measuring hydroperiods was desirable and a significant improvement from using wetland ground surface, but there is disagreement as to whether normal, seasonal high, or other standard elevation should be used. At this point, it was determined that we will proceed with the hydroperiod data such as it is, and try to work out elevation related concerns later.
- Data Base Progress
  - Shirley Denton produced a revised hard copy of the data base. Some corrections to wetland type and data assessment were still thought to be needed, but it was the sense

of the attendees that we need to start performing at least preliminary analyses now, and that there is not sufficient time to perfectly classify all wetland sites.

- Ecological Indicators

- The following list of categories of ecological indicators of hydrologic change were developed by going around the table and everyone presented and contributed their thoughts on what indicators may prove useful, a priority for their analysis, and expected utility of the available data.

Priority	Category
A	Indicator Plant Species and Community Zonation (includes aquatic and terrestrial composition)
B	Fire (scarring, lateral intrusion into wetlands, return frequency)
A	Tree Canopy Condition (mortality / tree fall / basal area / density)
B	Loss of wildlife habitat (including reptiles, amphibians, birds, mammals, habitat use characteristics, e.g. bird rookery)
B	Soil subsidence

- The priorities for the above reflects judgments about the availability and quality of the data, as well as an interest in developing "early" indicators of change.
- The following list of plant indicators was developed for initial testing by Rochow. At the meeting, comparisons were made with a list of indicator plant species developed by Dr. John Rice for WCRWSA. After some discussion, Subcommittee members agreed that for initial trial analyses the following list would be suitable.

Decreasers (decrease with decreasing hydroperiod)	Increases (increase with decreasing hydroperiod)
<i>Eriocaulon</i> sp.	<i>Eupatorium</i>
<i>Sphagnum</i> sp.	<i>Andropogon</i>
<i>Pontederia</i>	<i>Amphicarpum</i>
<i>Nymphaea</i>	<i>Euthamia minor</i>
<i>Nymphoides</i>	<i>Rubus</i>
<i>Utricularia inflata/purpurea</i>	<i>Erianthus</i>
<i>Sagittaria</i>	<i>Axonopus</i>
<i>Bacopa caroliniana</i>	<i>Lycopus</i>
<i>Polygala lutea/nana/cymosa.</i>	<i>Pinus</i>
<i>Xyris (fimbriata)</i>	<i>Paederia</i>
<i>Rhynchospora tracyi/corniculata/inundata</i>	<i>Paspalum notatum</i>
<i>Eleocharis</i> sp. (except <i>baldwinii</i> )	<i>Blechnum</i>
<i>Drosera</i> sp.	<i>Woodwardia</i>
<i>Hypericum fasciculatum</i>	
<i>Juncus repens</i>	<i>Smilax</i> sp. ( <i>glauca</i> )

- This list of decreaseers and increaseers conflicts in some ways with the classification developed by the WCRWSA consultant. Shea would try to bring John Rice to the next scheduled meeting of the Subcommittee to discuss.

- The understanding of the attendees was that the cover estimates for each of these species for a given station would be summed by category, and that this data would be portrayed with hydroperiod data. This step is exploratory at this point; there is no standard way of presenting this information. Schultz and Rochow were going to work together with the available SWFWMD data to show ways of analyzing the data.
- The necessity of protecting lake edge wetlands was mentioned and it was noted that information developed for cypress wetlands would help in protecting these wetlands.
- The next meeting was scheduled for 0900 January 7, 1997 at SWFWMD Tampa. For that meeting, we will review any of the initial analyses performed by Rochow and Shultz and any others, and to discuss the WCWRS indicator work with John Rice, if he is available.

## January 7, 1997 MFL Wetland Subcommittee Meeting

ATTENDEES: MFL Wetland Subcommittee  
FROM: Jim Bays/CH2M HILL  
DATE: January 8, 1997

The Minimum Flows and Levels Technical Subcommittee met on Tuesday January 7, 1997, at 0900 a.m. Subcommittee members include:

- Jim Bays/CH2M HILL
- Phil Davis/SDI
- Shirley Denton/BRA
- Manny Lopez/SWFWMD
- Ross McWilliams for Hillsborough County
- Ted Rochow/SWFWMD
- Richard Schultz/SWFWMD
- Chris Shea/WCRWSA

Others in attendance included Scott Emery for Hillsborough County Jenny Hinton for FDEP, Dr. John Rice and Dan Schmutz of Berryman & Henigar for WCRWSA.

The meeting purpose was to (1) receive an impromptu presentation by John Rice and Dan Schmutz on their recent work in developing a list of "decreaser" and "increaser" indicator plant species, and discuss ways that this information could be applied to the MFL process, and (2) to review the progress in assembling a data base of ecological data from monitoring stations within the Hillsborough-Pasco-Pinellas County area. An agenda is attached.

Minutes of the January 2, 1996 meeting were briefly reviewed; Rochow provided several corrections that were included. A revised copy is attached.

The following summarizes major points and action items resulting from the meeting.

### • Wetland Trend Vegetative Indicator Review

- John Rice and Dan Schmutz provided a summary overview of their work for the Authority in developing a list of plant species that show statistically significant increasing or decreasing trends as hydroperiods decrease in altered wetlands. This work has been performed as part of the Authority Environmental Management Plan. Dan illustrated the concept that plant species are distributed along a complex spatial and temporal hydroperiod gradient, and that by statistically comparing the occurrence and relative abundance of plants before and after hydrologic changes have been noted, it is possible to assign a "decreaser", "increaser", "transitional" or other status to the plant. This analysis used sophisticated and innovative resampling methods from a data set comprised of transect plant cover totals averaged for a given wetland, with each transect sample event comprising a data point. Some data sources extend over a 17-year period.

- Considerable discussion followed; substantial overlap was found with the list developed by the MFL wetlands group. Some important points included the high specificity of a species list for specific wellfield study areas (species unique to well fields included 59 Crossbar, 14 Cypress Creek, 44 Starkey, 31 North Pasco); the lack of precise topographic information for individual quadrats; difficulties with varying degrees of taxonomic identification between observers and seasons; apparent goodness of a classification as a decreaser or increaser depending in some cases on the "starting point"; importance of using species - genera or families is probably too broad a category.
- This method was found to be superior than the use of the National Wetlands Inventory (NWI) classification for trend assessment and monitoring applications. It was noted that the NWI was prepared as a wetland classification tool, not for trend assessment.
- It was also noted that use of the trend indicator alone would not be complete; other types of data should be used (e.g. hydroperiod).
- Other important factors were described as not taken into account directly by this method, including depth of inundation, fire history.
- Concern was expressed that rushing through our analysis for the sake of the legislative deadline may lead to a faulty conclusion on the use of appropriate indicator plants. We may have to define a stopgap measure to use, until a more complete analysis is performed.
- Much more discussion followed on the use of adjacent shallow wells as an indicator of hydroperiod or surrogate for a wetland, with a return to the need for precisely surveyed topographic data at all quadrats and transects, and concern expressed over the need to consider the wetland depth and side slopes when correlating with shallow well data to develop hydroperiod relationships.
- Much of the discussion appeared to be return to ideas and suggestions that would improve a monitoring program. Discussions about how to relate this information to significant harm were not conclusive at this time.
- John suggested that the data analysis effort could be streamlined by focusing on wet season vegetative measurements.
- The MFL Wetlands Subcommittee extended their thanks and appreciation to Dan and John for their time, high quality analysis and presentation, and their suggestions.
- Data Base Progress
  - Shirley Denton provided an electronic copy of vegetative data to Richard Schultz for his use.
  - Discussion on the data base focused briefly on the concept that it may not be possible to fully explore the data for all wetlands. Some effort would have to be spent on reducing the effort to a more manageable group of demonstration sites that would illustrate a methodology for analysis. The compiled "shorter list" of wetland stations may have to suffice for now.
- Ecological Indicators
  - Ted and Richard provided a summary overview of the analysis of some of Ted's data using a ratio of increaser to decreaser categories established at the 1/2/97 meeting. They have applied this list to the observations in Wetland B at Cypress Creek, and plotted the data with a steep change in water table elevation of 6 feet measured in an adjacent well. The results show a very rapid inflection in the ratio with a decline in

water table elevation. More sites will be analyzed by Ted and Rich, and results will be reviewed at the next meeting.

- In order to broaden the analysis from simply herbaceous species, other data sets will be needed. Bays will work with Shea to assemble a tree canopy data set for similar analysis, and Shirley Denton will assemble a data base of the ranked site assessment data. Chris will assemble a list describing the status of the survey work in the well fields, and Bays will fax to the group.
- All agreed on the benefit of several lines of analysis to describe ecological changes, with expectations that they will converge on a range of hydrologic changes that may used to assign minimum levels.
- Progress of the group was reviewed by all, and the following summary is offered:
  1. Progress has been slow. However, The emphasis has been on establishing a common quantitative data base and approach for assessing what changes have taken place in relation to hydrological changes, and of these, what can be deemed significant.
  2. The group has assembled a list of decreaser and increaser plant species that will be used as a tool for describing hydrologic change, and could be used in a wetland site assessment methodology.
  3. The group has prepared a prioritized list of or ecological indicators for analysis. Data availability and quality weighed strongly in the priority ranking. All yield valuable information on change to a wetland, and its importance. However, for the time being, we will focus on the herbaceous and canopy data, where it exists.
  4. The group has assembled a data base of wetland stations that could be used to quantitatively characterize vegetative and other indicator response to change in hydroperiod, and be extension, changes in adjacent aquifer wells. A list of adjacent wells has been identified for correlation of ecological changes with hydrological changes. Analysis will soon reveal the benefit of this approach.

The next meeting was scheduled for 0900 Wednesday January 15 at SWFWMD.



Minimum Flows and Levels Subcommittee

Suggested Agenda

January 7, 1997

0900 @ SWFWMD Tampa office  
US HWY. 301

1. Review and Correct Meeting Minutes
  - January 2, 1997 Minutes
2. Review and Discuss Candidate Ecological Indicators of Hydrologic Conditions
  - John Rice/Berryman & Henigar will provide information on the background and implementation of the Wetland Indicator Study currently underway with WCRWSA.
  - Rochow and Schultz to provide update on their preliminary analysis of indicators.
  - Any other subcommittee member with data analyzed is invited to present preliminary results.
  - A suggested goal: From preliminary analysis, identify any hydrologic changes that appear associated with changes in vegetative indicators, and discuss potential means to relate shifts in vegetative indicators to other measures of wetland change.
3. Review Data Base Progress (This item was not discussed in detail during January 2 meeting)
  - Data base development update (Denton, Schultz, Shea)
  - Data availability and practicability to "normalize" hydroperiod to historic wetland NP (Denton, Shea)
  - SWFWMD hydrologic data availability (Shultz)
  - A suggested goal: Prepare a preliminary list of cypress wetland stations with adequate quantitative vegetative, hydroperiod, and adjacent SA/FA well data for the past 5 years.
4. Preview Data Analysis and Propose Examples (This item was not discussed in detail during January 2 meeting)
  - Suggested/preferred approaches (All)
  - Examples (All)
  - A suggested goal: Prepare a preliminary list of steps to reduce the data and depict an example of how the ecological indicator data could be portrayed on a hydrological regime gradient. How will these data be related to assessment of change/harm?
5. Review Additional Issues from Members (All)
6. Recap the Meeting
  - Summarize Significant Progress
  - Prioritize Action Items
  - Confirm Tasks
  - Set Schedule

Note

(Name)            Parentheses indicate person with primary responsibility

## OUTLINE SUMMARY OF AQUIFER SUBCOMMITTEE/WETLAND SUBCOMMITTEE MEETING WEDNESDAY JANUARY 8, 1997

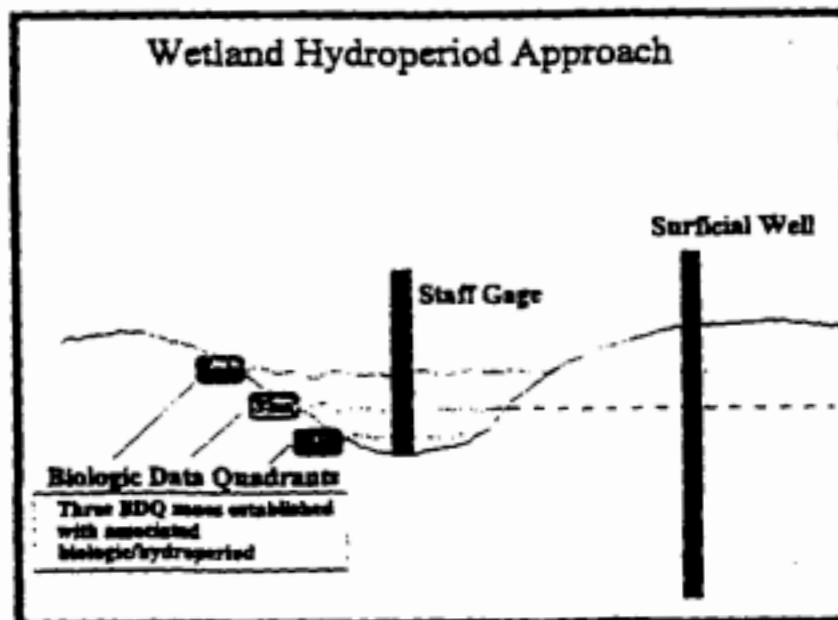
This meeting took place after the TAC meeting concluded. No notes were produced from this meeting. The following is a general concept outline of the discussions that transpired.

Aquifer Committee purpose for meeting with the wetlands committee:

1. To develop an understanding of what data/levels information and format (ie. Significant Harm parameters) the wetlands committee is producing or plans to produce.
2. To communicate the Aquifer committee's focus, ie. trying to develop a hydroperiod (water level duration) relationship between the UFA, SAS, and surface features (ie. wetlands, and lakes).

- A generic wetland was drawn on a board and the following questions were posed;

1. How are the biologists were viewing the needed levels?
2. How many levels are needed?
3. What type of levels will they be, fixed, time duration, etc.?
4. Do we have enough data to relate the Hydroperiod concept to the data?
5. What type of data could the aquifer anticipate to receive from the wetlands committee to use in establishing levels in the UFA? What format?



Discussions continued over the hydroperiod method and how the wetlands committee was going to identify the significant harm criteria. A need for one and only one system was expressed. That is one system which is acceptable and or defensible.

Later the discussions included the districts hydrograph/environmental overlay method, presented to the TAC earlier in the day. As this discussion continued and it was pointed out that this was the only method presented to and/or by the Aquifer committee, if no other feasible method could be devised within January, the District staff would be constrained by time to use this method. However, District staff also stated that they would continue to look for a better method, but they really desired the committee's involvement to refine the hydrograph/overlay method.

## January 15, 1997 MFL Wetland Subcommittee Meeting (with update on January 21 Conference Call)

ATTENDEES: MFL Wetland Subcommittee  
FROM: Jim Bays/CH2M HILL  
DATE: January 21, 1997

The Minimum Flows and Levels Technical Subcommittee met on Wednesday January 15, 1997, at 0900 a.m. Subcommittee members include:

- Jim Bays/CH2M HILL
- Phil Davis/SDI (not present)
- Shirley Denton/BRA
- Manny Lopez/SWFWMD
- Ross McWilliams for Hillsborough County
- Ted Rochow/SWFWMD
- Richard Schultz/SWFWMD
- Chris Shea/WCRWSA

Others in attendance included Jenny Hinton and her intern Robin for FDEP.

The meeting purpose was to review progress in developing different methodologies for assessing minimum wetland water levels. An agenda is attached.

No changes were proposed for the minutes of the January 8, 1996 meeting.

The following summarizes major points and action items resulting from the meeting.

- Ecological Indicators (Plan A)
  - Ted and Richard provided a summary overview of the analysis of some of Ted's data using a ratio of increaser to decreaser categories established at the 1/2/97 meeting. They have applied this list to the observations to the data set of 20 wetlands with readily available data. For about half of the sites, the indicator analysis showed a "flip" in the I/D ratio at some point in the time series. Others show what appear to be natural fluctuations in the ratio, or no change. Attempts to associate the "flip" with wetland water level changes have met with uneven success, primarily because the wetlands appeared to dry up and therefore yield no useful data. Richard has regressed available wetland water elevations with adjacent shallow wells for wetlands J and K at Starkey WF. R-squared values are low, and scatter is high. Richard was going to continue to pursue these analyses, and check the suitability of the wells selected.
- Wetland Water Regime (Plan B)
  - Bays provided a handout showing a method for estimating an average water elevation for a single wetland, and two ways of establishing a measure of the "minimum"

elevation associated with a type of wetland, using cypress as an example. Other handouts included graphics showing the average relative elevation of occurrence of different canopy and ground cover species relative to the wetland average water elevation and hydroperiod. These measures could be used to associate a "normal" water regime for a given wetland type which would include an assessment of the statistical variability in these measures. This statistical "minimum" level could be mapped out on a landscape scale using the District's GIS map, which could then be treated as a statistical surface to be intersected by a map of the surficial aquifer levels.

- Wetland Water Regime - Surficial Aquifer (Plan C)
  - Shirley Denton described efforts by BRA and SDI to develop a family of stage-duration curves for different types of wetlands in different ranks of apparent ecological condition. This effort is ongoing, but could lead to identifying minimum levels associated with certain degrees of ecological change, that could then be used to set surficial aquifer levels.
- District Overlay Method (Plan D)
  - Richard briefly reviewed the District's Overlay Method. This method establishes a drawdown contour around a well field through either flow modeling or regression analysis of Floridan aquifer and well field pumping, which is then overlain with a map of wetland health based upon the District Rapid Assessment Method (RAM). This allows the distribution and condition of affected wetlands to be spatially correlated with different drawdown contours. This method is the most well developed of all approaches at this time. Richard stated that the District staff are becoming increasingly involved in developing this method, which may affect his or his staff's availability in testing different methods proposed by the group.
- It was agreed that a field visit to wetlands exhibiting a wide range of ecological conditions would be performed in the Starkey Well Field in February. (Note added: Based on the January 21, 1997 conference call, the field visit has been set for February 11 and 12, and expanded to include wetlands in areas affected by causes other than groundwater production. The location and scope of activities for the field visit will be established at another meeting to be held at SWFWMD at 9:30 on January 29, 1997).

At this point, it is not appropriate to state any consensus by the group, but there has been agreement that whatever method is proposed, it is not expected to be sufficiently precise to allow description of harm to a specific wetland. Rather, this method will have a landscape type of application. Also, there is agreement that the different approaches being developed have a great deal of overlap in their technical basis, and may be found to be complementary in the long run.

The next meeting was scheduled as a conference call for 02:00 p.m. Tuesday January 21.

*Note added during preparation of minutes:* The conference call meeting was held and updates were provided by Ted, Richard, Jim, and Shirley. It was decided that although the indicator method is yielding useful information, it may not be as productive in the short term to continue pursuing this method as a means of setting minimum levels. Richard agreed to perform some additional example analyses that would illustrate how the method

could be used to establish a minimum level, by tracking the performance of the indicator over time, and focusing water level analysis on the time period when the ratio "flipped", which would indicate that a minimum level had been achieved which resulted in a pronounced vegetative change. The work performed by Ted and Rich has significant technical merit, and has been independently corroborated in large part by analysis performed for the Authority by Berryman & Henigar. Suggestions were made for examining and reconsidering the list of species selected for analysis when time was less pressing.

Jim presented several figures describing how hydroperiod and stage-duration relationships may be compared between wetlands. Although each wetland is unique, there does appear to be a range of stage-duration relationships that define cypress wetlands, and it may be possible to define an average or other level that will maintain cypress wetlands in an unaffected condition. It may also be possible to define stage-duration relationships that are more closely associated with other types of wetland or upland communities. The length of the data record is very important when performing this type of data analysis.

Shirley is actively involved in collecting field data on a subset of wetlands defined in the data base analysis that would allow her to tie the existing water level data to wetland vegetation zones in a similar relationship as described by Jim's analysis. If the data allow, the wetland vegetation-stage relationship could be associated with the adjacent surficial aquifer water table fluctuation, which in turn could be modeled.

Richard reported that the District is continuing to map the wetlands and develop the statistical relationships between the FA and pumpage for the District Overlay Method.

The next meeting was scheduled for January 29 at 9:30 am at SWFWMD. The field trips were set for February 11 and 12.



MEETING SUMMARY

CH2MHILL

**January 29, 1997 MFL Wetland Subcommittee Meeting**

ATTENDEES: MFL Wetland Subcommittee  
 FROM: Jim Bays/CH2M HILL  
 DATE: February 4, 1997

The Minimum Flows and Levels Technical Subcommittee met on Wednesday January 29, 1997, at 0900 a.m. Subcommittee members include:

- Jim Bays/CH2M HILL
- Phil Davis/SDI
- Shirley Denton/BRA (by teleconference)
- Manny Lopez/SWFWMD
- Ross McWilliams for Hillsborough County
- Ted Rochow/SWFWMD
- Richard Schultz/SWFWMD
- Chris Shea/WCRWSA
- Clark Hull/SWFWMD

The meeting purpose was to establish an itinerary for a field trip to be held on February 11 and 12, 1997 to review a series of wetlands and discuss methodological approaches towards setting minimum levels. An agenda is attached.

No changes were proposed for the minutes of the January 15, 1996 meeting.

The following summarizes major points and action items resulting from the meeting.

- Proposed Itinerary for Starkey Well Field Review on February 11, 1997
  - Meet at the Starkey Park kiosk near the west entrance at 0900.
  - Four-wheel drive vehicles will be provided by CH2M HILL, SWFWMD, WCRWSA.
  - This is an all-day trip. Please bring your own lunch and water.
  - Nine sites will be visited include the following, identified by the District and West Coast identification numbers:

STK D/S-27  
 STK Powerline/S-44  
 STK Central/S-87  
 STK T/S-106  
 S-104  
 STK S/S-65  
 STK East/S-73

STK Grass Prairie/S-29 etc  
STK South Central/S-85

- These wetlands span a range of low or no effects to severe effects, according to the District's wetland health assessment and Berryman & Henigar's stress categories.
- Chris Shea will assemble the period of record water level data collected by the Authority. Recent descriptions of the ecological history of each site will be provided by the Authority.
- The District will assemble water level data for each wetland from their files, including adjacent shallow and deep monitor well data, if available.
- Proposed Itinerary for Field Review of Northwest Hillsborough Wetlands on February 12, 1997
  - Meet at Lake Park parking lot at 0800. Any cars not driven during the day will be parked in the park maintenance yard.
  - We will visit up to 8 wetlands. At the time of this writing, I am still coordinating with Peter NeSmith/WAR for access and directions. This field trip will visit a wide range of wetlands in a developed setting, spanning a range of apparent ecological condition. A final itinerary will be faxed to all subcommittee members.
  - Vehicles will be provided by CH2M HILL, SWFWMD, WCRWSA.

The types of field work to be performed during this field trip are expected to include the following: review long-term wetland hydrographs, relative elevation measurements, vegetative cover, apparent health, wildlife habitats, and soils.

## January 29, 1997 MFL Wetland Subcommittee Meeting (Revised)

ATTENDEES: MFL Wetland Subcommittee  
FROM: Jim Bays/CH2M HILL  
DATE: February 4, 1997

The Minimum Flows and Levels Technical Subcommittee met on Wednesday January 29, 1997, at 0900 a.m. Subcommittee members include:

- Jim Bays/CH2M HILL
- Phil Davis/SDI
- Shirley Denton/BRA (by teleconference)
- Manny Lopez/SWFWMD
- Ross McWilliams for Hillsborough County
- Ted Rochow/SWFWMD
- Richard Schultz/SWFWMD
- Chris Shea/WCRWSA
- Clark Hull/SWFWMD

The meeting purpose was to establish an itinerary for a field trip to be held on February 11 and 12, 1997 to review a series of wetlands and discuss methodological approaches towards setting minimum levels. An agenda is attached.

No changes were proposed for the minutes of the January 15, 1996 meeting.

The following summarizes major points and action items resulting from the meeting.

- Proposed Itinerary for Starkey Well Field Review on February 11, 1997
  - Meet at the Starkey Park kiosk near the west entrance at 0900.
  - Four-wheel drive vehicles will be provided by CH2M HILL, SWFWMD, WCRWSA.
  - Nine sites will be visited include the following, identified by the District and West Coast identification numbers:

- STK D/S-27
- STK Powerline/S-44
- STK Central/S-87
- STK T/S-106
- S-104
- STK S/S-65
- STK East/S-73
- STK Grass Prairie/S-29 etc

## STK South Central/S-85

- These wetlands span a range of low or no effects to severe effects, according to the District's wetland health assessment and Berryman & Henigar's stress categories.
- Chris Shea will assemble the period of record water level data collected by the Authority. Recent descriptions of the ecological history of each site will be provided by the Authority.
- The District will assemble water level data for each wetland from their files, including adjacent shallow and deep monitor well data, if available.
- Proposed Itinerary for Field Review of Northwest Hillsborough Wetlands on February 12, 1997: A tentative list is provided below.
  1. NC212718 is
  2. 272718is
  3. C162818cn
  4. NC042818cn
  5. C142717ic
  6. NC262717ic
  7. SC332717ic
- WCRWSA will provide graphs of hydrographs and stage duration curves for all wetlands, as well as available plant ecology and wildlife data.
- Peter Nesmith of WAR will help lead the field trip.
- Meet at Lake Park at 0800 on Wednesday, February 12.

## February 11 and 12, 1997 Wetlands Subcommittee Field Review

ATTENDEES: MFL Wetland Subcommittee  
FROM: Jim Bays/CH2M HILL  
DATE: February 14, 1997

The Minimum Flows and Levels Wetlands Technical Subcommittee met on Tuesday and Wednesday, February 11 and 12, 1997. Subcommittee members include:

- Jim Bays/CH2M HILL
- Phil Davis/SDI (replaced for the field trip by Kathleen Bowdoin/SDI)
- Shirley Denton/BRA (replaced by John Bailey/BRA on Wednesday)
- Manny Lopez/SWFWMD (Tuesday)
- Scott Emery for Hillsborough County (Tuesday)
- Ross McWilliams for Hillsborough County (Wednesday)
- Ted Rochow/SWFWMD
- Richard Schultz/SWFWMD (Tuesday)
- Chris Shea/WCRWSA
- Dave Parsons/WCRWSA for survey assistance
- Clark Hull/SWFWMD
- Steve Shaw/Berryman & Henigar (Tuesday)
- John Rice/Berryman & Henigar (Tuesday)
- Peter NeSmith/Water & Air Research (Wednesday)

The meeting purpose was to review a series of wetlands on the Starkey Well Field (Tuesday) and the Northwest Hillsborough area (Wednesday). We surveyed in critical elevations along a vegetative transect extending from upland to wetland interior, and wetland health ratings were recorded by Ted Rochow. In this way, the available stage data and wetland water elevation data can be summarized in a manner similar to that which has been collected by the lake subcommittee. This should allow a direct comparison between wetlands stage exceedence data and apparent vegetative condition.

- Five sites were visited at the Starkey Well Field on February 11:

STK D/S-27  
STK Powerline/S-44  
STK East/S-73  
STK Grass Prairie "B" and S-7  
STK South Central/S-85

John Rice passed out an analysis of the available hydroperiod and vegetation data for Starkey S-24 for the 1988-1996 period, and made a short presentation discussing his findings concerning an application of the increaser/decreaser ratio. Other information on

the vegetation and wetland water level information for the wetlands was distributed and discussed.

- The following six sites were visited in the NW Hillsborough area on February 12:

NE212718 is  
272718is  
C162818cn  
NC042818cn  
C142717ic  
SC332717ic

Chris Shea was going to work up the survey data. Jim Bays would reduce the vegetation data. Peter NeSmith will reduce the WAR water level information and prepare stage duration curves. A conference call was scheduled for Monday a.m., February 17 @0900. Jim Bays would distribute call-in information.

- Thank you all for your time, patience, and knowledgeable assistance during these two days.



Appendix B. Spearman rank correlation matrix – P50 departure from normal pool vs. ecological ratings.

# Spearman Correlation Matrix

	P50	Succession	Hydrology	Weedy	Soil	Shrubs	Groundcover	Canopy	Leaning	Overstory
P50	1	0.829	0.777	0.771	0.674	0.698	0.505	0.475	0.311	0.285
Succession		1	0.000	0.000	0.000	0.000	0.002	0.003	0.065	0.092
Hydrology			1	0.733	0.804	0.668	0.463	0.479	0.425	0.311
Weedy				1	0.000	0.000	0.004	0.003	0.010	0.064
Soil					1	0.799	0.552	0.588	0.483	0.276
Shrubs						1	0.000	0.000	0.003	0.103
Groundcover							1	0.505	0.235	0.271
Canopy								1	0.167	0.110
Leaning									1	0.315
Overstory										1

Correlation Coefficient  
p value



Appendix C. Elevations of normal pool indicators in reference wetlands.

**Appendix C Normal pool indicator elevations in reference wetlands.**

**Morris Bridge WF**

**Normal Pool Elevations**

ID#	NW115	L 1		
	(=X4)	L 2	42.4	MEAN=
		L 3	42.5	42.4
		L 4	42.5	
		L 5	42.3	STDEV=
		L 6	42.7	0.14
		L 7	42.4	
		L 8	42.3	

**NW HILLSB. WF**

**NORMAL POOL**

ID#	WC342718	L1	54.8	MEAN =
		L2	54.8	54.8
		L3	54.8	
		L4	54.6	STDEV=
		L5	54.8	0.10
		L6	54.8	
		L7	54.9	
		L8	54.8	
		L9	54.6	
		L10	54.7	

**Starkey WF**

**Normal Pools**

ID#	"N"	L1	47	
		L2	46.8	MEAN =
		L3	47	46.9
		L4	46.9	
		L5	47	STDEV=
		L6	47	0.11
		L7	46.7	
		L8	46.8	
		L9	46.9	

Green Swamp

Normal Pool

ID# G1

L1	100.5
L2	100.5
L3	100.6
L4	100.6
L5	100.4
L6	100.6
L7	100.4
L8	100.4
L9	100.3
L10	100.5

MEAN =  
100.5

STDEV=  
0.10

Starkey WF

Normal Pool

ID# "M"

S11/T26/R17

L1	44.8
L2	44.7
L3	44.9
L4	44.8
L5	44.9
L6	44.7
L7	44.6
L8	44.6

MEAN =  
44.8

STDEV=  
0.12

Morris Bridge WF

Normal Pool Elevations

ID# MB-60

(=NW125)

M1	34.8
M2	34.8
M3	34.8
M4	34.9
M5	34.8
M6	34.7
M7	34.8
M8	34.8
M9	34.8
M10	34.7

MEAN=  
34.8

STDEV=  
0.06



Starkey WF  
Normal Pool  
ID# S-68

LM 1 43.9  
LM2 43.8  
LM3 43.9  
LM4 43.9  
LM5 44  
LM6 43.9  
LM7 43.9  
LM8 43.9  
LM9 43.9  
LM10 43.9

MEAN=  
43.9  
  
STDEV=  
0.05

GREEN SWAMP  
NORMAL POOL  
ID# G6

M1 97.7  
M2 97.7  
M3 97.8  
M4 97.7  
M5 97.7  
M6 97.8  
M7 97.8  
M8 97.8  
M9 97.8  
M10 97.8

MEAN =  
97.6  
  
STDEV=  
0.04

GREEN SWAMP  
NORMAL POOL  
ID# G3

L1 102.6  
L2 102.8  
L3 102.8  
L4 102.8  
L5 102.7  
L6 102.7  
L7 102.9  
L8 102.9  
L9 102.7  
L10 102.6

MEAN =  
102.7  
  
STDEV=  
0.10

NW HILLSB. WF  
Normal Pool  
ID# NW61

C1	34.5
C2	34.3
C3	34.1
C4	34.2
C5	34
C6	34
C7	34.4
C8	34.1
C9	34.1
C10	34.1

MEAN =  
34.2  
STDEV=  
0.17

Starkey WF  
Normal Pool  
ID# S97

L1	44.3
L2	44.2
L3	44.3
L4	44.4
L5	44.2
L6	44.2
L7	44.2
L8	44.2
L9	44.1
L10	44.1

MEAN =  
44.2  
STDEV=  
0.09

Starkey WF  
Normal Pool  
ID# S75

L1	47.4
L2	47.5
L3	47.1
L4	47
L5	47.1
L6	46.9
L7	47.2
L8	47.2

MEAN =  
47.2  
STDEV=  
0.20

Starkey WF  
Normal Pool

ID#	EASTERN REC. S1/T26/R17	L1	46.6	
		L2	46.3	
		L3	46.5	MEAN =
		L4	46.4	46.4
		L5	46.4	
		L6	46.4	STDEV=
		L7	46.4	0.13
		L8	46.2	
		L9	46.2	

Starkey WF  
Normal Pool

ID#	S-70	LM 1	44.6	MEAN=
		LM 2	44.5	44.7
		LM 3	44.8	
		LM 4	44.7	STDEV=
		LM 5	44.6	0.10
		LM 6	44.6	
		LM 7	44.6	
		LM 8	44.7	
		LM 9	44.7	
		LM 10	44.8	

Morris Bridge WF  
Normal Pool Elevations

ID#	MB-98	M1	35.4	MEAN=
		M2	35.4	35.4
		M3	35.3	
		M4	35.4	STDEV=
		M5	35.4	0.05
		M6	35.4	
		M7	35.3	
		M8	35.3	
		M9	35.4	
		M10	35.4	

GREEN SWAMP  
NORMAL POOL  
ID# G4

L1 102.9  
L2 103.0  
L3 102.9  
L4 102.8  
L5 102.9  
L6 102.9  
L7 102.9  
L8 102.9  
L9 102.7  
L10 102.8  
L11 102.8

MEAN =  
102.9  
STDEV=  
0.08

NW HILLSB. WF  
NORMAL POOL  
ID# 142817

L1 15.8  
L2 15.8  
L3 15.5  
L4 15.9  
L5 15.7  
L6 15.7  
L7 15.7  
L8 15.7  
L9 15.7  
L10 15.7

MEAN =  
15.7  
STDEV=  
0.10

GREEN SWAMP  
NORMAL POOL  
ID# G2

H1 100.3  
H2 100.4  
H3 100.3  
H4 100.3  
H5 100.3  
H6 100.5  
H7 100.3

MEAN =  
100.4  
STDEV=  
0.08

GREEN SWAMP  
NORMAL POOL  
ID# G5

L1	92.0
L2	91.8
L3	92.0
L4	91.8
L5	92.0
L6	91.9
L7	91.9
L8	91.8
L9	91.8
L10	92.0

MEAN =  
91.9  
STDEV=  
0.08

NW Hillsb. WF  
Normal Pool  
ID# WC302818

L1	20.7
L2	21.1
L3	20.9
L4	21.1
L5	21.6
L6	20.8
L7	21
L8	21.3
L9	21.4
L10	21.5

MEAN =  
21.1  
STDEV=  
0.30

NW Hillsb. WF  
Normal Pool  
ID# NC242717

L1	51.4
L2	51.3
L3	50.9
L4	51.1
L5	51
L6	51.1
L7	50.7
L8	50.5
L9	51.1
L10	50.6

MEAN =  
51.0  
STDEV=  
0.29

Eldridge Wilde WF  
Normal Pool  
ID# EW11

L1 38.4  
L2 38.4  
L3 38.5  
L4 38.4  
L5 38.8  
L6 38.5  
L7 38.5  
L8 38.5

MEAN=  
38.5  
  
STDEV=  
0.13

Starkey WF  
Normal Pool  
ID# STK-84

L1 39.8  
L2 39.7  
L3 39.8  
L4 39.6  
L5 39.8  
L6 39.6  
L7 39.7  
L8 39.7  
L9 39.7  
L10 39.8

MEAN=  
39.7  
  
STDEV=  
0.08

NW Hillsb. WF  
Normal Pool  
ID# WC102817

B1 23.5  
B2 23.6  
B3 23.6  
B4 23.4  
B5 23.5  
B6 23.5  
B7 24  
B8 23.9  
B9 23.7  
B10 23.7

MEAN =  
23.6  
  
STDEV=  
0.19



Starkey WF  
Normal Pool  
ID# S-10

L1	29.1	MEAN=	29.2
L2	29.4		
L3	29.3	STDEV=	0.13
L4	29		
L5	29.1		
L6	29.1		
L7	29		
L8	29.3		
L9	29.2		
L10	29.2		

Starkey WF  
Normal Pool  
ID# STK CEN

L1	45.1	MEAN =	45.1
L3	44.8		
L4	45	STDEV=	0.23
L5	45.3		
L6	44.9		
L7	45.3		
L8	45.4		
L2	43.8 (deleted)		

Morris Bridge WF  
Normal Pool Elevations

ID# MB88	L2	41.1 (deleted)	MEAN=	41.6
(Clay Gully Cypress)	L1	41.6		
	L3	41.4	STDEV=	0.08
	H1	41.6		
	H2	41.6		
	H3	41.6		
	H4	41.6		
	H5	41.5		

Morris Bridge WF  
Normal Pool Elevations  
ID# MB-14  
(=MB3C)

B1	35.1
B2	35.1
B3	35.1
B4	35.1
B5	35
B6	35
B7	35.1
B8	35
B9	35.2
B10	35.2

MEAN=  
35.1  
STDEV=  
0.07

Cypress Ck. W.F.  
Normal Pool Elevations

ID# W-11

L1	69.5
L2	69.4
L3	69.6
L4	69.2
L5	69.5
L6	69.4
L7	69.3
L8	69.1

MEAN =  
69.4  
STDEV=  
0.17

Cypress Ck. W.F.  
Normal Pool Elevations

ID# W-17

L1	65
L2	64.6
L3	64.5
L4	64.9
L5	65.1
L6	65.2
L7	64.7
L8	65.2

MEAN =  
64.9  
STDEV=  
0.27

Starkey WF  
Normal Pool  
ID# S-30

B1	32
B2	32
B3	31.6
B4	32.1
B5	32
B6	31.8
B7	31.8
B8	31.9
B9	32.1
B10	31.6

MEAN=  
31.9  
  
STDEV=  
0.19

Morris Bridge WF  
Normal Pool Elevations  
ID# W160  
(= MB91)

MB1	36.3
MB2	36.3
MB3	36.3
MB4	36.2
MB5	36.2
MB6	36.3
MB7	36.2
MB8	36.2
MB9	36.3
MB10	36.2

MEAN=  
36.3  
  
STDEV=  
0.05

Morris Bridge WF  
Normal Pool Elevations  
ID# MB 30

B1	34
B2	33.7
B3	33.9
B4	34
B5	34.4
B6	34.2
B7	34
B8	34.4
B9	34.3
B10	34.1

MEAN=  
34.1  
  
STDEV=  
0.23

CYPRESS CK. WF  
NORMAL POOL  
ID# W41

C1	74.9
C2	74.9
C3	75
C4	74.9
C5	75.1
C6	74.8
C7	74.7
C8	74.7
C9	75
C10	74.9

MEAN =  
74.9

STDEV=  
0.13

Morris Bridge WF  
Normal Pool  
ID# MB35

L1	35.5
L2	35.5
L3	35.2
L4	35.6
L5	35.6
L6	35.7
L7	35.5

MEAN =  
35.5

STDEV=  
0.16

Starkey WF  
Normal Pools  
ID# S-44

L1	35.1
L2	35.3
L3	35.3
L4	35.1
L5	35.5
L6	35.4
L7	35.4
L8	35.1
L9	34.9
L10	35.5

MEAN=  
35.3

STDEV=  
0.20

Appendix D. Water level data for reference wetlands.

PERFORMANCE DATA

P50 DATA

Date	Level	HNP	Date	Level	HNP	Lev.-HNP	Time	Freq.	Median
10/13/88	42.48	42.44	04/10/91	41.45	42.44	-0.99	28		
11/02/88	42.07	42.44	03/13/91	41.45	42.44	-0.99	35		
12/08/88	42.88	42.44	05/08/91	41.45	42.44	-0.99	28		
01/05/89	42.58	42.44	11/13/91	41.45	42.44	-0.99	34		
02/02/89	42.72	42.44	08/12/91	41.45	42.44	-0.99	35		
03/09/89	42.42	42.44	02/06/91	41.45	42.44	-0.99	28		
04/05/89	42.02	42.44	10/16/90	41.45	42.44	-0.99	19		
05/17/89	41.45	42.44	09/27/90	41.45	42.44	-0.99	44		
06/07/89	41.45	42.44	11/14/90	41.45	42.44	-0.99	29		
07/19/89	41.45	42.44	01/08/91	41.45	42.44	-0.99	29		
08/08/89	41.48	42.44	12/11/90	41.45	42.44	-0.99	27		
09/27/89	41.70	42.44	12/04/91	41.45	42.44	-0.99	21		
10/24/89	41.48	42.44	08/11/92	41.45	42.44	-0.99	28		
11/17/89	41.45	42.44	07/14/92	41.45	42.44	-0.99	27		
12/12/89	41.45	42.44	06/22/93	41.45	42.44	-0.99	33		
01/16/90	41.45	42.44	09/01/93	41.45	42.44	-0.99	42		
02/14/90	41.45	42.44	07/21/93	41.45	42.44	-0.99	29		
03/20/90	41.45	42.44	06/17/92	41.45	42.44	-0.99	41		
04/17/90	41.45	42.44	02/13/92	41.45	42.44	-0.99	22		
05/24/90	41.45	42.44	01/22/92	41.45	42.44	-0.99	49		
06/19/90	41.45	42.44	03/17/92	41.45	42.44	-0.99	33		
07/17/90	41.45	42.44	05/07/92	41.45	42.44	-0.99	30		
08/14/90	41.45	42.44	04/07/92	41.45	42.44	-0.99	21		
09/27/90	41.45	42.44	11/17/89	41.45	42.44	-0.99	24		
10/16/90	41.45	42.44	12/12/89	41.45	42.44	-0.99	25		
11/14/90	41.45	42.44	01/16/90	41.45	42.44	-0.99	35		
12/11/90	41.45	42.44	05/17/89	41.45	42.44	-0.99	42		
01/08/91	41.45	42.44	08/08/89	41.45	42.44	-0.99	21		
02/05/91	41.45	42.44	07/19/89	41.45	42.44	-0.99	42		
03/13/91	41.45	42.44	08/07/89	41.45	42.44	-0.99	21		
04/10/91	41.45	42.44	06/18/90	41.45	42.44	-0.99	26		
05/08/91	41.45	42.44	07/17/90	41.45	42.44	-0.99	28		
06/12/91	41.45	42.44	08/14/90	41.45	42.44	-0.99	28		
07/23/91	42.70	42.44	05/24/90	41.45	42.44	-0.99	37		
08/07/91	42.76	42.44	02/14/90	41.45	42.44	-0.99	29		
09/15/91	42.32	42.44	03/20/90	41.45	42.44	-0.99	34		
10/10/91	42.12	42.44	04/17/90	41.45	42.44	-0.99	28		
11/13/91	41.45	42.44	10/24/89	41.45	42.44	-0.985	27	0.545	
12/04/91	41.45	42.44	09/27/89	41.70	42.44	-0.745	49	0.528	
01/22/92	41.45	42.44	05/09/89	41.82	42.44	-0.62	19	0.518	
02/13/92	41.45	42.44	04/05/89	42.02	42.44	-0.42	27	0.508	
03/17/92	41.45	42.44	05/20/93	42.02	42.44	-0.42	28	0.497	-0.42
04/07/92	41.45	42.44	09/01/92	42.02	42.44	-0.42	21	0.489	
05/07/92	41.45	42.44	11/02/88	42.07	42.44	-0.37	20	0.481	
06/17/92	41.45	42.44	10/10/91	42.12	42.44	-0.32	22	0.472	
07/14/92	41.45	42.44	01/20/93	42.12	42.44	-0.32	43	0.455	
08/11/92	41.45	42.44	06/13/95	42.16	42.44	-0.28	35	0.442	
09/01/92	42.02	42.44	12/08/92	42.18	42.44	-0.26	33	0.429	
10/21/92	42.58	42.44	12/07/93	42.26	42.44	-0.18	20	0.421	
11/05/92	42.32	42.44	04/20/95	42.28	42.44	-0.18	36	0.407	
12/08/92	42.18	42.44	05/17/94	42.32	42.44	-0.12	28	0.396	
01/20/93	42.12	42.44	02/18/93	42.32	42.44	-0.12	29	0.384	
02/18/93	42.32	42.44	06/18/91	42.32	42.44	-0.12	42	0.368	
03/17/93	42.80	42.44	11/05/92	42.32	42.44	-0.12	15	0.382	
04/22/93	42.60	42.44	01/28/94	42.36	42.44	-0.08	52	0.341	
05/20/93	42.02	42.44	07/20/94	42.39	42.44	-0.05	36	0.327	
06/22/93	41.45	42.44	06/14/94	42.40	42.44	-0.04	26	0.316	
07/21/93	41.45	42.44	03/09/89	42.42	42.44	-0.02	35	0.303	
08/01/93	41.45	42.44	02/16/94	42.46	42.44	0.02	19	0.295	
10/13/93	42.78	42.44	04/19/94	42.46	42.44	0.02	33	0.282	
11/17/93	42.52	42.44	10/13/88	42.48	42.44	0.04	13	0.277	
12/07/93	42.28	42.44	11/17/93	42.52	42.44	0.08	35	0.263	
01/28/94	42.36	42.44	01/05/89	42.58	42.44	0.14	28	0.252	
02/18/94	42.48	42.44	03/15/95	42.58	42.44	0.14	28	0.241	
03/17/94	42.78	42.44	10/21/92	42.58	42.44	0.14	50	0.222	
04/19/94	42.46	42.44	04/22/93	42.60	42.44	0.16	36	0.208	
05/17/94	42.32	42.44	02/15/95	42.66	42.44	0.22	35	0.194	
06/14/94	42.40	42.44	01/11/95	42.68	42.44	0.24	21	0.186	
07/20/94	42.39	42.44	12/08/88	42.68	42.44	0.24	36	0.171	
08/24/94	42.98	42.44	07/23/91	42.70	42.44	0.26	41	0.155	
09/22/94	43.00	42.44	02/02/89	42.72	42.44	0.28	28	0.144	
10/11/94	42.80	42.44	12/21/94	42.74	42.44	0.3	49	0.125	
11/02/94	42.88	42.44	06/07/91	42.78	42.44	0.32	15	0.119	
12/21/94	42.74	42.44	06/15/95	42.78	42.44	0.32	25	0.109	
01/11/95	42.68	42.44	10/13/93	42.78	42.44	0.32	42	0.093	
02/15/95	42.86	42.44	03/17/94	42.78	42.44	0.34	29	0.082	
03/15/95	42.58	42.44	03/17/93	42.80	42.44	0.36	27	0.071	
04/20/95	42.28	42.44	10/11/94	42.80	42.44	0.36	19	0.063	
05/09/95	41.82	42.44	09/21/95	42.86	42.44	0.42	37	0.049	
06/13/95	42.16	42.44	11/02/94	42.86	42.44	0.42	22	0.040	
07/21/95	43.16	42.44	06/24/94	42.98	42.44	0.54	35	0.027	
08/15/95	42.78	42.44	09/22/94	43.00	42.44	0.56	29	0.015	
09/21/95	42.86	42.44	07/21/95	43.16	42.44	0.72	38	0.000	

Elevation of ground = 52.64 = Elev. of pipe (54.89 ft) - stick up (2.25) Personal Comm. P. NeSmith  
 HYDROGRAPH DATA P50 DATA

Date	Raw Level	Level Elev	HNP	Date	Level Elev	Level Elev	Lev.-HNP	Time	Freq	Median
11/01/88	1.25	53.89	54.77	08/01/89	0.50	53.14	-1.63	31		
12/01/88	0.50	53.14	54.77	12/01/88	0.50	53.14	-1.53	30	0.976	
01/01/89	1.17	53.81	54.77	05/01/89	0.83	53.47	-1.30	30	0.964	
02/01/89	1.15	53.79	54.77	02/01/89	1.15	53.79	-0.98	31	0.951	
03/01/89	1.29	53.93	54.77	01/01/89	1.17	53.81	-0.96	31	0.939	
04/01/89	1.37	54.01	54.77	08/01/89	1.25	53.89	-0.88	31	0.926	
05/01/89	0.83	53.47	54.77	11/01/89	1.25	53.89	-0.88	31	0.914	
06/01/89	0.50	53.14	54.77	11/01/88	1.25	53.89	-0.88	30	0.902	
07/01/89	1.58	54.22	54.77	05/01/82	1.25	53.89	-0.88	30	0.890	
08/01/89	1.25	53.89	54.77	12/01/89	1.29	53.93	-0.84	30	0.878	
09/01/89	1.33	53.97	54.77	03/01/89	1.29	53.93	-0.84	28	0.867	
10/01/89	1.30	53.94	54.77	11/01/84	1.30	53.94	-0.83	31	0.854	
11/01/89	1.25	53.89	54.77	06/01/84	1.30	53.94	-0.83	31	0.842	
12/01/89	1.29	53.93	54.77	05/01/80	1.30	53.94	-0.83	30	0.830	
01/01/90	1.87	54.31	54.77	05/01/85	1.30	53.94	-0.83	30	0.818	
02/01/90	1.75	54.39	54.77	10/01/89	1.30	53.94	-0.83	30	0.806	
03/01/90	1.31	53.95	54.77	03/01/90	1.31	53.95	-0.82	28	0.794	
04/01/90	1.35	53.99	54.77	09/01/89	1.33	53.97	-0.80	31	0.782	
05/01/90	1.30	53.94	54.77	06/01/90	1.33	53.97	-0.80	31	0.770	
06/01/90	1.33	53.97	54.77	04/01/90	1.35	53.99	-0.78	31	0.757	
07/01/90	1.58	54.22	54.77	04/01/89	1.37	54.01	-0.76	31	0.745	
08/01/90	1.58	54.22	54.77	01/01/92	1.40	54.04	-0.73	31	0.732	
09/01/90	1.60	54.24	54.77	12/01/90	1.40	54.04	-0.73	30	0.720	
10/01/90	1.54	54.18	54.77	01/01/91	1.42	54.06	-0.71	31	0.708	
11/01/90	1.55	54.19	54.77	03/01/91	1.50	54.14	-0.63	28	0.697	
12/01/90	1.40	54.04	54.77	01/01/93	1.50	54.14	-0.63	31	0.684	
01/01/91	1.42	54.06	54.77	03/01/92	1.50	54.14	-0.63	29	0.673	
02/01/91	1.50	54.14	54.77	11/01/91	1.50	54.14	-0.63	31	0.660	
03/01/91	1.50	54.14	54.77	02/01/91	1.50	54.14	-0.63	31	0.648	
04/01/91	1.60	54.24	54.77	07/01/92	1.51	54.15	-0.62	30	0.636	
05/01/91	1.65	54.29	54.77	04/01/95	1.53	54.17	-0.61	31	0.623	
06/01/91	1.70	54.34	54.77	10/01/90	1.54	54.18	-0.59	30	0.611	
07/01/91	1.80	54.24	54.77	10/01/91	1.55	54.19	-0.58	30	0.599	
08/01/91	1.58	54.22	54.77	11/01/90	1.55	54.19	-0.58	31	0.587	
09/01/91	1.60	54.24	54.77	12/01/94	1.55	54.19	-0.58	30	0.575	
10/01/91	1.55	54.19	54.77	07/01/90	1.58	54.22	-0.55	30	0.563	
11/01/91	1.50	54.14	54.77	08/01/90	1.58	54.22	-0.55	31	0.550	
12/01/91	1.67	54.31	54.77	07/01/89	1.58	54.22	-0.55	30	0.538	
01/01/92	1.40	54.04	54.77	04/01/93	1.58	54.22	-0.55	31	0.526	
02/01/92	1.60	54.24	54.77	08/01/91	1.58	54.22	-0.55	31	0.513	
03/01/92	1.50	54.14	54.77	11/01/92	1.60	54.24	-0.53	31	0.501	
04/01/92	1.66	54.50	54.77	09/01/93	1.60	54.24	-0.53	31	0.488	-0.53
05/01/92	1.25	53.89	54.77	05/01/94	1.60	54.24	-0.53	30	0.477	
06/01/92	1.70	54.34	54.77	06/01/93	1.60	54.24	-0.53	31	0.464	
07/01/92	1.51	54.15	54.77	01/01/95	1.60	54.24	-0.53	31	0.452	
08/01/92	1.60	54.24	54.77	06/01/92	1.60	54.24	-0.53	31	0.439	
09/01/92	1.60	54.44	54.77	09/01/91	1.60	54.24	-0.53	31	0.427	
10/01/92	1.85	54.29	54.77	02/01/92	1.60	54.24	-0.53	31	0.414	
11/01/92	1.60	54.24	54.77	06/01/95	1.60	54.24	-0.53	31	0.402	
12/01/92	1.75	54.39	54.77	07/01/91	1.60	54.24	-0.53	30	0.390	
01/01/93	1.50	54.14	54.77	09/01/90	1.60	54.24	-0.53	31	0.378	
02/01/93	1.71	54.35	54.77	04/01/91	1.60	54.24	-0.53	31	0.365	
03/01/93	1.70	54.34	54.77	02/01/95	1.63	54.27	-0.51	31	0.353	
04/01/93	1.58	54.22	54.77	10/01/92	1.65	54.29	-0.48	30	0.341	
05/01/93	1.70	54.34	54.77	03/01/95	1.65	54.29	-0.48	28	0.329	
06/01/93	1.80	54.44	54.77	05/01/91	1.65	54.29	-0.48	30	0.317	
07/01/93	1.80	54.44	54.77	12/01/91	1.67	54.31	-0.46	30	0.305	
08/01/93	1.60	54.24	54.77	01/01/90	1.67	54.31	-0.46	31	0.293	
09/01/93	1.60	54.24	54.77	01/01/94	1.70	54.34	-0.43	31	0.280	
10/01/93	1.70	54.34	54.77	02/01/94	1.70	54.34	-0.43	31	0.268	
11/01/93	1.60	54.44	54.77	10/01/94	1.70	54.34	-0.43	30	0.256	
12/01/93	1.70	54.34	54.77	12/01/93	1.70	54.34	-0.43	30	0.244	
01/01/94	1.70	54.34	54.77	06/01/92	1.70	54.34	-0.43	31	0.232	
02/01/94	1.70	54.34	54.77	05/01/93	1.70	54.34	-0.43	30	0.220	
03/01/94	2.00	54.84	54.77	03/01/93	1.70	54.34	-0.43	28	0.208	
04/01/94	1.80	54.44	54.77	10/01/93	1.70	54.34	-0.43	30	0.196	
05/01/94	1.60	54.24	54.77	06/01/91	1.70	54.34	-0.43	31	0.184	
06/01/94	1.30	53.94	54.77	02/01/93	1.71	54.35	-0.42	31	0.171	
07/01/94	2.20	54.84	54.77	12/01/92	1.75	54.39	-0.38	30	0.159	
08/01/94	2.00	54.64	54.77	02/01/90	1.75	54.39	-0.38	31	0.147	
09/01/94	2.00	54.64	54.77	07/01/95	1.78	54.42	-0.36	30	0.135	
10/01/94	1.70	54.34	54.77	09/01/92	1.80	54.44	-0.33	31	0.123	
11/01/94	1.30	53.94	54.77	07/01/93	1.80	54.44	-0.33	30	0.110	
12/01/94	1.55	54.19	54.77	04/01/94	1.80	54.44	-0.33	31	0.098	
01/01/95	1.60	54.24	54.77	11/01/93	1.80	54.44	-0.33	31	0.086	
02/01/95	1.63	54.27	54.77	06/01/93	1.80	54.44	-0.33	31	0.073	
03/01/95	1.65	54.29	54.77	04/01/92	1.86	54.50	-0.27	31	0.061	
04/01/95	1.53	54.17	54.77	05/01/95	1.90	54.54	-0.23	31	0.048	
05/01/95	1.30	53.94	54.77	03/01/94	2.00	54.64	-0.13	28	0.037	
06/01/95	1.60	54.24	54.77	09/01/94	2.00	54.64	-0.13	31	0.025	
07/01/95	1.78	54.42	54.77	06/01/94	2.00	54.64	-0.13	31	0.012	
08/01/95	1.90	54.54	54.77	07/01/94	2.20	54.84	0.07	30	0.000	



raw DATA

Date	Level Elev	HNP	Date	Level	HNP	Lev.-HNP	Time	Freq	Median
10/12/88	48.71	48.91	03/15/91		48.91			30	
11/09/88	48.38	48.91	10/12/88	48.71	48.91	-0.20		20	
12/14/88	47.08	48.91	03/19/92	45.99	48.91	-0.92		43	
01/11/89	46.58	48.91	04/23/92	45.99	48.91	-0.92		35	
02/07/89	46.78	48.91	05/14/92	45.99	48.91	-0.92		21	
03/15/89	46.43	48.91	01/09/92	45.99	48.91	-0.92		28	
04/13/89	45.99	48.91	04/13/89	45.99	48.91	-0.92		28	
05/18/89	45.99	48.91	05/18/89	45.99	48.91	-0.92		35	
06/15/89	45.99	48.91	06/15/89	45.99	48.91	-0.92		28	
07/13/89	46.39	48.91	06/22/94	45.99	48.91	-0.92		41	
08/16/89	46.11	48.91	11/28/90	45.99	48.91	-0.92		34	
09/14/89	45.99	48.91	09/14/89	45.99	48.91	-0.92		29	
10/12/89	46.27	48.91	01/17/91	45.99	48.91	-0.92		35	
11/04/89	45.99	48.91	11/04/89	45.99	48.91	-0.92		23	
12/07/89	45.99	48.91	12/07/89	45.99	48.91	-0.92		33	
01/11/90	46.52	48.91	05/12/94	45.99	48.91	-0.92		22	
02/08/90	45.99	48.91	02/08/90	45.99	48.91	-0.92		28	
03/14/90	46.41	48.91	04/20/94	45.99	48.91	-0.92		35	
04/12/90	45.99	48.91	04/12/90	45.99	48.91	-0.92		29	
05/17/90	45.99	48.91	05/17/90	45.99	48.91	-0.92		35	
06/20/90	45.99	48.91	06/20/90	45.99	48.91	-0.92		34	
07/28/90	46.83	48.91	12/21/93	45.99	48.91	-0.92		41	
08/22/90	46.47	48.91	05/19/93	45.99	48.91	-0.92		41	
09/19/90	46.41	48.91	06/16/93	45.99	48.91	-0.92		27	
10/25/90	46.33	48.91	04/24/95	45.99	48.91	-0.92		32	
11/28/90	45.99	48.91	06/03/92	45.99	48.91	-0.92		20	
12/13/90	45.99	48.91	12/13/90	45.99	48.91	-0.92		15	
01/17/91	45.99	48.91	05/22/95	45.99	48.91	-0.92		28	
02/13/91	45.99	48.91	02/13/91	45.99	48.91	-0.92		27	
03/15/91		48.91	06/01/95	45.99	48.91	-0.92		10	
04/18/91	46.17	48.91	08/05/92	45.99	48.91	-0.92		27	
05/16/91	46.39	48.91	02/05/92	45.99	48.91	-0.92		27	
06/19/91	46.53	48.91	07/09/92	45.99	48.91	-0.92		36	
07/18/91	46.85	48.91	12/12/91	45.99	48.91	-0.92		28	0.817
08/13/91	46.85	48.91	11/14/91	45.99	48.91	-0.92		29	0.805
09/25/91	46.43	48.91	08/16/89	46.11	48.91	-0.80		34	0.592
10/16/91	46.27	48.91	04/16/91	46.17	48.91	-0.74		32	0.579
11/14/91	46.99	48.91	01/07/93	46.19	48.91	-0.72		29	0.588
12/12/91	45.99	48.91	07/29/93	46.25	48.91	-0.66		44	0.551
01/09/92	45.99	48.91	10/16/91	46.27	48.91	-0.64		21	0.542
02/05/92	45.99	48.91	10/12/89	46.27	48.91	-0.64		28	0.531
03/19/92	45.99	48.91	03/23/95	46.29	48.91	-0.62		51	0.511
04/23/92	45.99	48.91	10/25/90	46.33	48.91	-0.58		38	0.497
05/14/92	45.99	48.91	11/09/88	46.38	48.91	-0.53		28	0.486
06/03/92	45.99	48.91	07/13/89	46.39	48.91	-0.52		28	0.475
07/09/92	45.99	48.91	05/16/91	46.39	48.91	-0.52		30	0.463
08/05/92	45.99	48.91	03/16/94	46.40	48.91	-0.51		27	0.453
09/22/92	46.59	48.91	03/14/90	46.41	48.91	-0.50		34	0.440
10/29/92	46.49	48.91	09/19/90	46.41	48.91	-0.50		28	0.429
11/18/92	46.57	48.91	09/25/91	46.43	48.91	-0.48		43	0.412
12/09/92	46.51	48.91	03/15/89	46.43	48.91	-0.48		36	0.397
01/07/93	46.19	48.91	02/17/93	46.43	48.91	-0.48		41	0.381
02/17/93	46.43	48.91	10/19/93	46.43	48.91	-0.48		40	0.366
03/10/93	46.81	48.91	01/26/94	46.45	48.91	-0.46		36	0.352
04/08/93	46.87	48.91	11/10/93	46.47	48.91	-0.44		22	0.343
05/18/93	45.99	48.91	08/22/90	46.47	48.91	-0.44		27	0.332
06/15/93	45.99	48.91	10/29/92	46.49	48.91	-0.42		37	0.318
07/29/93	46.25	48.91	12/06/94	46.49	48.91	-0.42		19	0.310
08/31/93	46.58	48.91	07/26/94	46.50	48.91	-0.41		38	0.296
09/09/93	46.93	48.91	12/06/92	46.51	48.91	-0.40		21	0.288
10/19/93	46.43	48.91	01/11/90	46.52	48.91	-0.39		35	0.274
11/10/93	46.47	48.91	06/19/91	46.53	48.91	-0.38		34	0.261
12/21/93	45.99	48.91	02/17/94	46.57	48.91	-0.34		22	0.252
01/28/94	46.45	48.91	11/16/92	46.57	48.91	-0.34		20	0.244
02/17/94	46.57	48.91	01/11/89	46.58	48.91	-0.33		28	0.233
03/18/94	46.40	48.91	08/31/93	46.58	48.91	-0.33		33	0.220
04/20/94	45.99	48.91	09/22/92	46.59	48.91	-0.32		48	0.201
05/12/94	45.99	48.91	03/10/93	46.61	48.91	-0.30		21	0.193
06/22/94	45.99	48.91	07/19/95	46.65	48.91	-0.26		48	0.174
07/28/94	46.50	48.91	08/13/91	46.65	48.91	-0.26		26	0.164
08/15/94	46.77	48.91	01/31/95	46.67	48.91	-0.24		56	0.142
10/20/94	46.81	48.91	04/08/93	46.67	48.91	-0.24		29	0.131
11/17/94	46.71	48.91	11/17/94	46.71	48.91	-0.20		26	0.120
12/08/94	46.49	48.91	09/15/94	46.77	48.91	-0.14		49	0.101
01/31/95	46.67	48.91	02/07/89	46.78	48.91	-0.13		27	0.090
03/23/95	46.29	48.91	10/20/94	46.81	48.91	-0.10		35	0.076
04/24/95	45.99	48.91	07/26/90	46.83	48.91	-0.08		36	0.062
05/22/95	45.99	48.91	07/18/91	46.85	48.91	-0.06		29	0.051
06/01/95	45.99	48.91	09/09/93	46.93	48.91	0.02		9	0.047
07/19/95	46.85	48.91	08/10/95	47.01	48.91	0.10		22	0.038
08/10/95	47.01	48.91	12/14/88	47.08	48.91	0.17		35	0.025
09/20/95	47.17	48.91	09/20/95	47.17	48.91	0.28		41	0.009
10/12/95	47.43	48.91	10/12/95	47.43	48.91	0.52		22	0.000

-0.61

HYDROGRAPH DATA

P50 DATA

Date	Level	HNP
10/31/88	99.83	100.50
11/30/88	99.41	100.50
12/31/88	100.28	100.50
01/31/89	100.18	100.50
02/28/89	100.11	100.50
03/31/89	99.87	100.50
04/30/89	99.29	100.50
05/31/89	98.94	100.50
06/30/89	98.32	100.50
07/31/89	100.30	100.50
08/31/89	100.25	100.50
10/31/89	100.12	100.50
11/30/89	99.82	100.50
12/31/89	100.03	100.50
01/31/90	100.25	100.50
02/28/90	100.17	100.50
03/31/90	100.06	100.50
04/30/90	98.98	100.50
05/31/90	98.36	100.50
06/30/90	98.34	100.50
07/31/90	99.87	100.50
08/31/90	100.28	100.50
09/30/90	100.05	100.50
10/31/90	100.20	100.50
11/19/90	99.99	100.50
12/31/90	99.24	100.50
01/30/91	99.12	100.50
02/28/91	99.55	100.50
03/31/91	99.82	100.50
04/30/91	100.12	100.50
05/31/91	100.21	100.50
06/30/91	100.31	100.50
07/31/91	100.37	100.50
08/31/91	100.17	100.50
09/30/91	99.83	100.50
10/31/91	98.30	100.50
11/30/91	97.61	100.50
12/31/91	97.60	100.50
01/31/92	97.90	100.50
02/28/92	98.10	100.50
03/31/92	98.55	100.50
04/30/92	97.60	100.50
05/31/92	97.60	100.50
06/30/92	97.59	100.50
07/31/92	97.59	100.50
08/31/92	98.85	100.50
09/30/92	99.58	100.50
10/31/92	100.23	100.50
11/30/92	100.05	100.50
12/31/92	99.95	100.50
01/31/93	100.10	100.50
02/28/93	100.30	100.50
03/31/93	100.35	100.50
04/30/93	100.22	100.50
05/31/93	99.18	100.50
06/30/93	98.07	100.50
07/31/93	99.49	100.50
08/31/93	98.82	100.50
09/30/93	99.98	100.50
10/31/93	99.73	100.50
11/30/93	98.68	100.50
12/31/93	97.63	100.50
01/31/94	99.28	100.50
02/28/94	99.77	100.50
03/31/94	99.87	100.50
04/30/94	98.02	100.50
05/31/94	97.58	100.50
06/30/94	99.01	100.50
07/31/94	100.38	100.50
08/31/94	100.37	100.50
09/30/94	100.31	100.50
10/31/94	100.27	100.50
11/30/94	100.19	100.50
12/31/94	100.15	100.50
01/31/95	100.18	100.50
02/28/95	100.11	100.50
03/31/95	99.99	100.50
04/30/95	99.97	100.50
05/31/95	100.08	100.50
06/30/95	99.85	100.50
07/31/95	100.28	100.50
08/31/95	100.37	100.50
09/30/95	100.35	100.50

Date	Level	HNP	Lev. - HNP	Time Step	Freq	Median
05/31/94	97.58	100.5	-2.92	31		
07/31/92	97.59	100.5	-2.91	31	0.978	
06/30/92	97.59	100.5	-2.91	30	0.984	
12/31/91	97.60	100.5	-2.90	31	0.952	
05/31/92	97.60	100.5	-2.90	31	0.940	
01/31/92	97.60	100.5	-2.90	31	0.928	
04/30/92	97.60	100.5	-2.90	30	0.918	
11/30/91	97.61	100.5	-2.89	30	0.904	
12/31/93	97.63	100.5	-2.87	31	0.892	
04/30/94	98.02	100.5	-2.48	30	0.880	
06/30/93	98.07	100.5	-2.43	30	0.869	
02/28/92	98.10	100.5	-2.40	29	0.857	
10/31/91	98.30	100.5	-2.20	31	0.845	
06/30/89	98.32	100.5	-2.18	30	0.833	
06/30/90	98.34	100.5	-2.16	30	0.822	
05/31/90	98.36	100.5	-2.14	31	0.809	
08/31/93	98.62	100.5	-1.88	31	0.797	
03/31/92	98.65	100.5	-1.85	31	0.785	
11/30/93	98.68	100.5	-1.82	30	0.773	
08/31/92	98.85	100.5	-1.65	31	0.761	
05/31/89	98.94	100.5	-1.56	31	0.749	
04/30/90	98.98	100.5	-1.52	30	0.737	
06/30/94	99.01	100.5	-1.49	30	0.726	
01/30/91	99.12	100.5	-1.38	30	0.714	
06/31/93	99.18	100.5	-1.32	31	0.702	
12/31/90	99.24	100.5	-1.26	42	0.685	
01/31/94	99.28	100.5	-1.22	31	0.673	
04/30/89	99.29	100.5	-1.21	30	0.662	
11/30/88	99.41	100.5	-1.09	30	0.650	
07/31/93	99.49	100.5	-1.01	31	0.638	
02/28/91	99.55	100.5	-0.95	29	0.626	
03/31/91	99.62	100.5	-0.88	31	0.614	
09/30/91	99.63	100.5	-0.87	30	0.603	
06/30/95	99.65	100.5	-0.85	30	0.591	
03/31/94	99.67	100.5	-0.83	31	0.579	
10/31/93	99.73	100.5	-0.77	31	0.567	
02/28/94	99.77	100.5	-0.73	28	0.556	
11/30/89	99.82	100.5	-0.68	30	0.544	
10/31/88	99.83	100.5	-0.67	31	0.532	
03/31/89	99.87	100.5	-0.63	31	0.520	
07/31/90	99.87	100.5	-0.63	31	0.507	
09/30/92	99.88	100.5	-0.62	30	0.496	-0.62
12/31/92	99.95	100.5	-0.55	31	0.484	
04/30/95	99.97	100.5	-0.53	30	0.472	
09/30/93	99.98	100.5	-0.52	30	0.460	
11/19/90	99.99	100.5	-0.51	19	0.453	
03/31/95	99.99	100.5	-0.51	31	0.441	
12/31/99	100.03	100.5	-0.47	31	0.428	
11/30/92	100.05	100.5	-0.45	30	0.417	
09/30/90	100.06	100.5	-0.45	30	0.405	
03/31/90	100.06	100.5	-0.44	31	0.393	
05/31/95	100.08	100.5	-0.44	31	0.381	
01/31/93	100.10	100.5	-0.40	31	0.369	
02/28/95	100.11	100.5	-0.39	28	0.358	
02/28/89	100.11	100.5	-0.39	28	0.347	
04/30/91	100.12	100.5	-0.38	30	0.335	
10/31/89	100.12	100.5	-0.38	61	0.311	
12/31/94	100.15	100.5	-0.35	31	0.299	
01/31/95	100.15	100.5	-0.35	31	0.287	
02/28/90	100.17	100.5	-0.33	28	0.276	
08/31/91	100.17	100.5	-0.33	31	0.264	
01/31/89	100.18	100.5	-0.32	31	0.252	
11/30/94	100.19	100.5	-0.31	30	0.240	
10/31/90	100.20	100.5	-0.30	31	0.228	
05/31/91	100.21	100.5	-0.29	31	0.216	
04/30/93	100.22	100.5	-0.28	30	0.204	
10/31/92	100.23	100.5	-0.27	31	0.192	
01/31/90	100.25	100.5	-0.25	31	0.180	
08/31/89	100.25	100.5	-0.25	31	0.167	
12/31/88	100.26	100.5	-0.24	31	0.155	
10/31/94	100.27	100.5	-0.23	31	0.143	
08/31/90	100.28	100.5	-0.22	31	0.131	
07/31/95	100.28	100.5	-0.22	31	0.119	
02/28/93	100.30	100.5	-0.20	28	0.108	
07/31/89	100.30	100.5	-0.20	31	0.096	
09/30/94	100.31	100.5	-0.19	30	0.084	
06/30/91	100.31	100.5	-0.19	30	0.072	
08/30/95	100.35	100.5	-0.15	30	0.061	
03/31/93	100.36	100.5	-0.15	31	0.049	
06/31/95	100.37	100.5	-0.13	31	0.038	
07/31/91	100.37	100.5	-0.13	31	0.024	
06/31/94	100.37	100.5	-0.13	31	0.012	
07/31/94	100.38	100.5	-0.12	31	0.000	

POU DATA

Date	Level Elev	HNP	Date	Level	HNP	Lev.-HNP	Time	Frag	Median
10/12/88	44.28	44.78	01/09/92	43.59	44.78	-1.17	28		
11/09/88	43.59	44.78	12/12/91	43.59	44.78	-1.17	28		
12/14/88	44.46	44.78	11/14/91	43.59	44.78	-1.17	29		
01/11/89	44.14	44.78	04/23/92	43.59	44.78	-1.17	35		
02/07/89	44.43	44.78	03/19/92	43.59	44.78	-1.17	43		
03/15/89	44.08	44.78	02/06/92	43.59	44.78	-1.17	27		
04/13/89	43.59	44.78	02/13/91	43.59	44.78	-1.17	27		
05/18/89	43.59	44.78	01/17/91	43.59	44.78	-1.17	35		
06/15/89	43.59	44.78	12/13/90	43.59	44.78	-1.17	15		
07/13/89	43.59	44.78	05/18/91	43.59	44.78	-1.17	30		
08/16/89	43.59	44.78	04/18/91	43.59	44.78	-1.17	20		
09/14/89	44.07	44.78	03/27/91	43.59	44.78	-1.17	42		
10/12/89	44.20	44.78	05/14/92	43.59	44.78	-1.17	21		
11/04/89	43.59	44.78	05/22/94	43.59	44.78	-1.17	41		
12/07/89	43.59	44.78	05/12/94	43.59	44.78	-1.17	22		
01/11/90	44.50	44.78	04/20/94	43.59	44.78	-1.17	35		
02/08/90	44.04	44.78	06/01/95	43.59	44.78	-1.17	10		
03/14/90	44.28	44.78	05/22/95	43.59	44.78	-1.17	28		
04/12/90	43.59	44.78	07/28/94	43.59	44.78	-1.17	36		
05/17/90	43.59	44.78	08/05/92	43.59	44.78	-1.17	27		
06/20/90	43.59	44.78	07/08/92	43.59	44.78	-1.17	35		
07/25/90	44.81	44.78	08/03/92	43.59	44.78	-1.17	20		
08/22/90	44.36	44.78	12/21/93	43.59	44.78	-1.17	41		
09/19/90	44.02	44.78	09/15/93	43.59	44.78	-1.17	27		
10/25/90	43.68	44.78	05/18/93	43.59	44.78	-1.17	41		
11/28/90	43.59	44.78	11/28/90	43.59	44.78	-1.17	34		
12/13/90	43.59	44.78	11/09/88	43.59	44.78	-1.17	28		
01/17/91	43.59	44.78	12/07/89	43.59	44.78	-1.17	33		
02/13/91	43.59	44.78	04/12/90	43.59	44.78	-1.17	29		
03/27/91	43.59	44.78	04/13/89	43.59	44.78	-1.17	29		
04/18/91	43.59	44.78	11/04/89	43.59	44.78	-1.17	23		
05/16/91	43.59	44.78	05/18/89	43.59	44.78	-1.17	35		
06/19/91	44.35	44.78	06/15/89	43.59	44.78	-1.17	28		
07/16/91	44.62	44.78	08/16/89	43.59	44.78	-1.17	34		
08/13/91	44.50	44.78	07/13/89	43.59	44.78	-1.17	28		
09/25/91	44.50	44.78	05/17/90	43.59	44.78	-1.17	35		
10/18/91	44.28	44.78	08/20/90	43.59	44.78	-1.17	34		
11/14/91	43.59	44.78	04/24/95	43.69	44.78	-1.075	32	0.550	
12/12/91	43.59	44.78	07/29/93	43.72	44.78	-1.04	44	0.533	
01/09/92	43.59	44.78	08/31/93	43.75	44.78	-1.00867	33	0.520	
02/05/92	43.59	44.78	10/25/90	43.66	44.78	-0.9	36	0.505	
03/19/92	43.59	44.78	03/18/94	44.00	44.78	-0.785	27	0.495	-0.63
04/23/92	43.59	44.78	09/19/90	44.02	44.78	-0.74	28	0.484	
05/14/92	43.59	44.78	02/08/90	44.04	44.78	-0.72	25	0.473	
06/03/92	43.59	44.78	09/14/89	44.07	44.78	-0.69	29	0.462	
07/09/92	43.59	44.78	03/15/89	44.08	44.78	-0.68	36	0.447	
08/05/92	43.59	44.78	01/11/89	44.14	44.78	-0.62	28	0.438	
09/22/92	44.50	44.78	01/28/94	44.16	44.78	-0.6	36	0.422	
10/29/92	44.34	44.78	03/23/95	44.19	44.78	-0.57	51	0.402	
11/18/92	44.58	44.78	01/07/93	44.20	44.78	-0.58	29	0.391	
12/09/92	44.51	44.78	08/10/94	44.20	44.78	-0.58	13	0.386	
01/07/93	44.20	44.78	10/12/89	44.20	44.78	-0.58	28	0.375	
02/17/93	44.32	44.78	12/06/94	44.22	44.78	-0.54	19	0.367	
03/10/93	44.52	44.78	11/10/93	44.26	44.78	-0.5	22	0.359	
04/08/93	44.62	44.78	10/19/93	44.26	44.78	-0.5	40	0.343	
05/19/93	43.59	44.78	02/17/94	44.26	44.78	-0.5	22	0.334	
06/15/93	43.59	44.78	10/12/88	44.26	44.78	-0.5	12	0.330	
07/29/93	43.72	44.78	03/14/90	44.28	44.78	-0.48	34	0.318	
08/31/93	43.75	44.78	10/15/91	44.28	44.78	-0.48	21	0.308	
09/09/93	44.72	44.78	07/19/95	44.30	44.78	-0.48	48	0.289	
10/19/93	44.26	44.78	02/17/93	44.32	44.78	-0.44	41	0.273	
11/10/93	44.26	44.78	10/29/92	44.34	44.78	-0.42	37	0.258	
12/21/93	43.59	44.78	08/22/90	44.36	44.78	-0.4	27	0.248	
01/28/94	44.16	44.78	06/19/91	44.35	44.78	-0.4	34	0.234	
02/17/94	44.26	44.78	02/07/89	44.43	44.78	-0.33	27	0.224	
03/18/94	44.00	44.78	12/14/88	44.46	44.78	-0.3	35	0.210	
04/20/94	43.59	44.78	11/17/94	44.46	44.78	-0.3	28	0.199	
05/12/94	43.59	44.78	01/11/90	44.50	44.78	-0.28	35	0.185	
06/22/94	43.59	44.78	09/22/92	44.50	44.78	-0.28	48	0.167	
07/28/94	43.59	44.78	08/13/91	44.50	44.78	-0.28	26	0.156	
08/10/94	44.20	44.78	09/25/91	44.50	44.78	-0.28	43	0.139	
09/15/94	44.66	44.78	12/09/92	44.51	44.78	-0.25	21	0.131	
10/20/94	44.58	44.78	03/10/93	44.52	44.78	-0.24	21	0.123	
11/17/94	44.48	44.78	01/31/95	44.52	44.78	-0.24	56	0.101	
12/08/94	44.22	44.78	11/18/92	44.58	44.78	-0.18	20	0.093	
01/31/95	44.52	44.78	10/20/94	44.58	44.78	-0.18	35	0.079	
03/23/95	44.19	44.78	07/28/90	44.61	44.78	-0.15	36	0.065	
04/24/95	43.89	44.78	04/05/93	44.62	44.78	-0.14	29	0.054	
05/22/95	43.59	44.78	07/18/91	44.62	44.78	-0.14	29	0.042	
06/01/95	43.59	44.78	09/20/95	44.68	44.78	-0.1	41	0.028	
07/18/95	44.30	44.78	08/15/94	44.68	44.78	-0.1	36	0.012	
08/10/95	44.70	44.78	08/10/95	44.70	44.78	-0.08	22	0.004	
09/20/95	44.68	44.78	09/09/93	44.72	44.78	-0.04	9	0.000	

Reference a correction of 0.83feet to correct difference between 0 point on data and 0 point on new survey elevation:  
 HYDROGRAPH DATA P50 DATA

Date	Raw Level	Level Elev	HNP	Date	Level	Level Elev	Lev -HNP	Time	Freq	Median
10/13/88	34.84	34.84	34.79	08/12/91	33.16	33.16	-0.70		35	
11/02/88	33.88	33.88	34.79	05/08/91	33.16	33.16	-0.70		28	
12/08/88	35.46	35.46	34.79	11/13/91	33.16	33.16	-0.70		34	
01/05/89	35.32	35.32	34.79	01/22/92	33.16	33.16	-0.70		49	
02/02/89	35.45	35.45	34.79	12/04/91	33.16	33.16	-0.70		21	
03/09/89	35.34	35.34	34.79	04/10/91	33.16	33.16	-0.70		28	
04/05/89	34.25	34.25	34.79	12/11/90	33.16	33.16	-0.70		27	
05/17/89	33.16	33.16	34.79	09/27/90	33.16	33.16	-0.70		44	
06/07/89	33.16	33.16	34.79	01/08/91	33.16	33.16	-0.70		29	
07/19/89	34.88	34.88	34.79	03/13/91	33.16	33.16	-0.70		35	
08/09/89	35.04	35.04	34.79	02/08/91	33.16	33.16	-0.70		28	
09/27/89	35.31	35.47	34.79	09/01/90	33.16	33.16	-0.70		42	
10/24/89	34.70	34.70	34.79	07/21/90	33.16	33.16	-0.70		29	
11/17/89	33.88	33.88	34.79	05/14/94	33.16	33.16	-0.70		28	
12/12/89	33.36	33.36	34.79	08/13/95	33.16	33.16	-0.70		35	
01/16/90	35.16	35.16	34.79	05/09/95	33.16	33.16	-0.70		19	
02/14/90	34.64	34.64	34.79	06/22/90	33.16	33.16	-0.70		33	
03/20/90	34.84	34.84	34.79	04/07/92	33.16	33.16	-0.70		54	
04/17/90	33.46	33.46	34.79	02/13/92	33.16	33.16	-0.70		22	
05/24/90	33.16	33.16	34.79	05/07/92	33.16	33.16	-0.70		30	
06/19/90	33.16	33.16	34.79	07/14/92	33.16	33.16	-0.70		27	
07/17/90	33.16	33.16	34.79	08/17/92	33.16	33.16	-0.70		41	
08/14/90	33.16	33.16	34.79	08/14/90	33.16	33.16	-0.70		28	
09/27/90	33.16	33.16	34.79	05/24/90	33.16	33.16	-0.70		37	
10/16/90	35.40	35.40	34.79	08/07/89	33.16	33.16	-0.70		21	
11/14/90	34.44	34.44	34.79	05/17/89	33.16	33.16	-0.70		42	
12/11/90	33.16	33.16	34.79	08/19/90	33.16	33.16	-0.70		26	
01/08/91	33.16	33.16	34.79	07/17/90	33.16	33.16	-0.70		28	
02/06/91	33.16	33.16	34.79	12/12/89	33.36	33.36	-0.50		28	0.841
03/13/91	33.16	33.16	34.79	04/17/90	33.46	33.46	-0.40		28	0.830
04/10/91	33.16	33.16	34.79	11/02/88	33.88	33.88	0.02		20	0.622
05/08/91	33.16	33.16	34.79	11/17/89	33.88	33.88	0.02		24	0.813
06/12/91	33.16	33.16	34.79	05/20/93	34.12	34.12	0.26		28	0.602
07/23/91	35.58	35.58	34.79	04/05/89	34.28	34.28	0.40		27	0.591
08/07/91	35.68	35.68	34.79	08/11/92	34.34	34.34	0.48		28	0.560
09/18/91	34.96	34.96	34.79	12/08/92	34.36	34.36	0.50		33	0.568
10/10/91	34.86	34.86	34.79	12/07/90	34.40	34.40	0.54		20	0.580
11/13/91	33.16	33.16	34.79	11/14/90	34.44	34.44	0.58		29	0.549
12/04/91	33.16	33.16	34.79	05/17/94	34.50	34.50	0.84		28	0.538
01/22/92	33.16	33.16	34.79	02/14/90	34.64	34.64	0.78		29	0.526
02/13/92	33.16	33.16	34.79	10/10/91	34.68	34.68	0.80		22	0.518
04/07/92	33.16	33.16	34.79	10/24/89	34.70	34.70	0.84		27	0.507
05/07/92	33.16	33.16	34.79	04/19/94	34.70	34.70	0.84		33	0.495
06/17/92	33.16	33.16	34.79	04/20/95	34.82	34.82	0.96		36	0.481
07/14/92	33.16	33.16	34.79	11/05/92	34.84	34.84	0.98		15	0.475
08/11/92	34.34	34.34	34.79	03/20/90	34.84	34.84	0.98		34	0.482
10/21/92	35.26	35.26	34.79	07/19/89	34.88	34.88	1.02		42	0.445
11/05/92	34.84	34.84	34.79	11/17/93	34.94	34.94	1.08		35	0.432
12/05/92	34.36	34.36	34.79	10/13/88	34.94	34.94	1.08		13	0.427
01/20/93	35.28	35.28	34.79	07/20/94	34.94	34.94	1.08		38	0.413
02/18/93	35.42	35.42	34.79	09/18/91	34.96	34.96	1.10		42	0.396
03/17/93	35.70	35.70	34.79	08/09/89	35.04	35.04	1.18		21	0.388
04/22/93	35.38	35.38	34.79	01/11/95	35.12	35.12	1.26		21	0.380
05/20/93	34.12	34.12	34.79	01/18/90	35.16	35.16	1.30		36	0.368
06/22/93	33.16	33.16	34.79	01/28/94	35.16	35.16	1.30		52	0.348
07/21/93	33.16	33.16	34.79	10/21/92	35.26	35.26	1.40		71	0.319
09/01/93	33.16	33.16	34.79	02/16/94	35.26	35.26	1.40		19	0.311
09/20/93	35.29	35.29	34.79	01/20/93	35.28	35.28	1.42		43	0.294
10/13/93	35.38	35.38	34.79	09/20/93	35.28	35.28	1.43		19	0.287
11/17/93	34.94	34.94	34.79	09/27/89	35.31	35.47	1.45		49	0.288
12/07/93	34.40	34.40	34.79	01/05/89	35.32	35.32	1.46		28	0.257
01/28/94	35.16	35.16	34.79	02/15/95	35.34	35.34	1.48		35	0.244
02/18/94	35.26	35.26	34.79	03/09/89	35.34	35.34	1.48		35	0.230
03/17/94	35.36	35.36	34.79	03/17/94	35.36	35.36	1.50		29	0.219
04/19/94	34.70	34.70	34.79	12/21/94	35.36	35.36	1.50		49	0.200
05/17/94	34.50	34.50	34.79	04/22/93	35.38	35.38	1.52		36	0.186
06/14/94	33.16	33.16	34.79	10/13/93	35.38	35.38	1.52		23	0.177
07/20/94	34.64	34.64	34.79	10/16/90	35.40	35.40	1.54		19	0.169
08/24/94	35.74	35.74	34.79	03/15/95	35.41	35.41	1.56		25	0.158
09/22/94	35.74	35.74	34.79	02/18/93	35.42	35.42	1.56		29	0.147
10/11/94	35.56	35.56	34.79	12/08/88	35.46	35.46	1.60		38	0.133
11/02/94	35.58	35.58	34.79	02/02/89	35.48	35.48	1.62		28	0.122
12/21/94	35.38	35.38	34.79	08/15/95	35.52	35.52	1.66		25	0.113
01/11/95	35.12	35.12	34.79	10/11/94	35.56	35.56	1.70		19	0.105
02/15/95	35.34	35.34	34.79	07/23/91	35.58	35.58	1.72		41	0.089
03/15/95	35.41	35.41	34.79	11/02/94	35.58	35.58	1.72		22	0.081
04/20/95	34.82	34.82	34.79	09/21/95	35.60	35.60	1.74		37	0.068
05/09/95	33.16	33.16	34.79	10/17/95	35.60	35.60	1.74		26	0.058
06/13/95	33.16	33.16	34.79	08/07/91	35.68	35.68	1.82		15	0.050
07/21/95	35.80	35.80	34.79	03/17/93	35.70	35.70	1.84		27	0.040
08/15/95	35.52	35.52	34.79	08/24/94	35.74	35.74	1.88		35	0.028
09/21/95	35.60	35.60	34.79	09/22/94	35.74	35.74	1.88		29	0.015
10/17/95	35.80	35.80	34.79	07/21/95	35.80	35.80	1.94		38	0.000

0.64

Elevation of ground per WCRWGA = 42.30 feet  
 HYDROGRAPH DATA

P50 DATA

Date	Raw Level	Level Elev	HNP	Date	Level	Level Elev	Lev.-HNP	Time	Freq	Median
10/01/88	1.19	43.49	43.9	04/01/92					31	
11/01/88	0.70	43.00	43.9	11/01/90					31	
12/01/88	1.39	43.89	43.9	01/01/91					31	
01/01/89	1.15	43.45	43.9	05/01/92					30	
02/01/89	1.31	43.81	43.9	05/01/89	-2.00	40.30	-3.80	31	0.941	
03/01/89	0.95	43.25	43.9	07/01/92	-1.50	40.80	-3.10	30	0.929	
04/01/89	0.58	42.88	43.9	05/01/89	-1.45	40.85	-3.05	30	0.917	
05/01/89	-1.45	40.85	43.9	05/01/89	-1.40	40.90	-3.00	31	0.905	
06/01/89	-2.00	40.30	43.9	06/01/92	-1.40	40.90	-3.00	31	0.893	
07/01/89	-1.30	41.00	43.9	05/21/95	-1.39	40.92	-2.98	28	0.882	
08/01/89	-1.40	40.90	43.9	07/01/89	-1.30	41.00	-2.90	30	0.871	
09/01/89	-0.20	42.10	43.9	01/01/92	-0.88	41.42	-2.48	31	0.859	
10/01/89	0.53	42.83	43.9	03/01/92	-0.85	41.45	-2.45	29	0.848	
11/01/89	-0.60	41.70	43.9	06/01/94	-0.82	41.48	-2.42	31	0.836	
12/01/89	0.45	42.75	43.9	12/01/91	-0.65	41.85	-2.25	30	0.824	
01/01/90	0.90	43.20	43.9	05/01/90	-0.60	41.70	-2.20	30	0.812	
02/01/90	0.32	42.62	43.9	11/01/89	-0.60	41.70	-2.20	31	0.800	
03/01/90	1.03	43.33	43.9	06/01/94	-0.52	41.78	-2.12	30	0.789	
04/01/90	0.74	43.04	43.9	08/01/92	-0.45	41.85	-2.05	31	0.777	
05/01/90	-0.60	41.70	43.9	05/24/95	-0.34	41.97	-1.94	28	0.766	
06/01/90	0.29	42.59	43.9	09/01/89	-0.20	42.10	-1.80	31	0.754	
07/01/90	1.55	43.85	43.9	02/01/92	-0.20	42.10	-1.80	31	0.742	
08/01/90	1.42	43.72	43.9	03/01/91	-0.11	42.19	-1.71	28	0.731	
09/01/90	1.31	43.61	43.9	02/01/91	-0.10	42.20	-1.70	31	0.719	
10/01/90	1.09	43.39	43.9	12/01/90	0.19	42.49	-1.41	30	0.707	
11/01/90		42.30	43.9	06/01/93	0.28	42.58	-1.34	31	0.695	
12/01/90	0.19	42.49	43.9	06/01/90	0.29	42.59	-1.31	31	0.683	
01/01/91		42.30	43.9	02/01/90	0.32	42.62	-1.28	31	0.671	
02/01/91	-0.10	42.20	43.9	11/01/91	0.32	42.62	-1.28	31	0.659	
03/01/91	-0.11	42.19	43.9	05/01/91	0.42	42.72	-1.18	30	0.648	
04/01/91	0.66	42.96	43.9	12/01/89	0.45	42.75	-1.15	30	0.636	
05/01/91	0.42	42.72	43.9	07/01/94	0.48	42.78	-1.12	30	0.625	
06/01/91	0.73	43.03	43.9	07/19/95	0.50	42.80	-1.10	28	0.614	
07/01/91	1.00	43.30	43.9	10/01/89	0.53	42.83	-1.07	30	0.602	
08/01/91	1.28	43.58	43.9	04/01/89	0.56	42.86	-1.04	31	0.590	
09/01/91	1.07	43.37	43.9	08/01/94	0.61	42.91	-0.99	31	0.578	
10/01/91	0.87	43.17	43.9	08/01/93	0.65	42.95	-0.95	31	0.566	
11/01/91	0.32	42.62	43.9	04/01/91	0.68	42.98	-0.94	31	0.554	
12/01/91	-0.85	41.85	43.9	04/01/94	0.68	42.98	-0.92	31	0.542	
01/01/92	-0.88	41.42	43.9	11/01/88	0.70	43.00	-0.90	31	0.530	
02/01/92	-0.20	42.10	43.9	08/01/91	0.73	43.03	-0.87	31	0.518	
03/01/92	-0.86	41.45	43.9	04/28/95	0.73	43.03	-0.87	27	0.508	
04/01/92		42.30	43.9	04/01/90	0.74	43.04	-0.86	31	0.496	-0.86371
05/01/92		42.30	43.9	10/01/91	0.87	43.17	-0.73	30	0.484	
06/01/92	-1.40	40.90	43.9	01/01/90	0.90	43.20	-0.70	31	0.472	
07/01/92	-1.50	40.80	43.9	05/01/93	0.93	43.23	-0.67	30	0.460	
08/01/92	-0.45	41.85	43.9	03/01/89	0.96	43.25	-0.65	28	0.449	
09/01/92	1.13	43.43	43.9	12/01/93	0.98	43.28	-0.62	30	0.438	
10/01/92	1.42	43.72	43.9	07/01/91	1.00	43.30	-0.60	30	0.428	
11/01/92	1.28	43.58	43.9	07/01/93	1.00	43.30	-0.60	30	0.415	
12/01/92	1.32	43.62	43.9	03/01/90	1.03	43.33	-0.57	28	0.404	
01/01/93	1.15	43.45	43.9	12/21/94	1.06	43.36	-0.55	30	0.392	
02/01/93	1.23	43.55	43.9	03/03/95	1.08	43.38	-0.54	42	0.378	
03/01/93	1.45	43.75	43.9	09/01/91	1.07	43.37	-0.53	31	0.364	
04/01/93	1.45	43.75	43.9	10/01/90	1.09	43.39	-0.51	30	0.352	
05/01/93	0.93	43.23	43.9	09/01/94	1.12	43.42	-0.48	31	0.340	
06/01/93	0.26	42.56	43.9	09/01/92	1.13	43.43	-0.47	31	0.328	
07/01/93	1.06	43.30	43.9	01/01/93	1.15	43.45	-0.45	31	0.316	
08/01/93	0.65	42.95	43.9	01/01/89	1.15	43.45	-0.45	31	0.304	
09/01/93	1.66	43.96	43.9	01/01/94	1.17	43.47	-0.43	31	0.292	
10/01/93	1.27	43.57	43.9	01/18/95	1.17	43.47	-0.43	28	0.281	
11/01/93	1.42	43.72	43.9	10/01/88	1.19	43.49	-0.41	30	0.270	
12/01/93	0.96	43.28	43.9	11/21/94	1.21	43.51	-0.40	33	0.257	
01/01/94	1.17	43.47	43.9	03/01/94	1.21	43.51	-0.39	28	0.246	
02/01/94	1.45	43.75	43.9	02/16/95	1.24	43.54	-0.36	29	0.235	
03/01/94	1.21	43.51	43.9	02/01/93	1.25	43.55	-0.35	31	0.223	
04/01/94	0.88	42.88	43.9	11/01/92	1.26	43.56	-0.34	31	0.211	
05/01/94	-0.52	41.78	43.9	10/01/93	1.27	43.57	-0.33	30	0.199	
06/01/94	-0.82	41.48	43.9	08/01/91	1.28	43.58	-0.32	31	0.187	
07/01/94	0.48	42.78	43.9	09/01/90	1.31	43.61	-0.29	31	0.175	
08/01/94	0.61	42.91	43.9	02/01/89	1.31	43.61	-0.29	31	0.163	
09/01/94	1.12	43.42	43.9	12/01/92	1.32	43.62	-0.28	30	0.152	
10/19/94	1.38	43.66	43.9	10/19/94	1.36	43.66	-0.24	48	0.133	
11/21/94	1.21	43.51	43.9	08/29/95	1.39	43.69	-0.21	41	0.117	
12/21/94	1.06	43.36	43.9	12/01/88	1.39	43.69	-0.21	30	0.106	
01/18/95	1.17	43.47	43.9	09/27/95	1.42	43.72	-0.18	29	0.094	
02/18/95	1.24	43.54	43.9	10/01/92	1.42	43.72	-0.18	30	0.083	
03/03/95	1.06	43.36	43.9	11/01/93	1.42	43.72	-0.18	31	0.071	
04/28/95	0.73	43.03	43.9	08/01/90	1.42	43.72	-0.18	31	0.059	
05/24/95	-0.34	41.97	43.9	03/01/93	1.45	43.75	-0.15	28	0.048	
06/21/95	-1.39	40.92	43.9	02/01/94	1.45	43.75	-0.15	31	0.036	
07/18/95	0.50	42.80	43.9	04/01/93	1.46	43.75	-0.15	31	0.024	
08/29/95	1.39	43.69	43.9	07/01/90	1.65	43.85	-0.05	30	0.012	
09/27/95	1.42	43.72	43.9	09/01/93	1.66	43.86	0.06	31	0.000	

PSO DATA

Date	Level	HNP	Date	Level	HNP	Lev.-HNP	Time	Freq.
10/31/88	97.30	97.7	06/30/90	93.83	97.7	-4.07	30	
11/30/88	97.20	97.7	07/31/92	93.72	97.7	-3.98	31	0.978
12/31/88	97.70	97.7	08/30/92	93.73	97.7	-3.97	30	0.985
01/31/89	97.80	97.7	05/31/90	93.74	97.7	-3.96	31	0.953
02/28/89	97.55	97.7	02/22/92	93.74	97.7	-3.96	22	0.944
03/31/89	97.34	97.7	05/31/92	93.74	97.7	-3.96	31	0.932
04/30/89	96.94	97.7	01/31/92	93.74	97.7	-3.96	31	0.920
05/31/89	94.47	97.7	11/30/91	93.75	97.7	-3.95	30	0.909
06/30/89	93.78	97.7	12/31/91	93.75	97.7	-3.95	31	0.897
07/31/89	96.12	97.7	06/30/89	93.78	97.7	-3.94	30	0.885
08/31/89	96.82	97.7	12/31/90	93.81	97.7	-3.89	31	0.873
09/30/89	94.67	97.7	05/31/94	93.86	97.7	-3.84	31	0.861
10/31/89	94.00	97.7	10/31/91	93.83	97.7	-3.77	31	0.849
11/30/89	93.98	97.7	04/30/92	93.98	97.7	-3.74	30	0.838
12/31/89	96.15	97.7	11/30/89	93.98	97.7	-3.72	30	0.828
01/31/90	97.08	97.7	10/31/89	94.00	97.7	-3.70	31	0.814
02/28/90	96.97	97.7	04/30/94	94.26	97.7	-3.44	30	0.802
03/31/90	96.89	97.7	05/31/89	94.47	97.7	-3.23	31	0.790
04/30/90	94.50	97.7	11/30/90	94.49	97.7	-3.21	30	0.779
05/31/90	93.74	97.7	03/31/92	94.48	97.7	-3.21	38	0.784
06/30/90	93.83	97.7	04/30/90	94.50	97.7	-3.20	30	0.753
07/31/90	95.25	97.7	09/30/89	94.67	97.7	-3.03	30	0.741
08/31/90	96.78	97.7	06/30/94	94.77	97.7	-2.93	30	0.728
09/30/90	95.94	97.7	12/31/93	94.86	97.7	-2.84	31	0.717
10/31/90	95.89	97.7	01/30/91	95.08	97.7	-2.62	30	0.706
11/30/90	94.48	97.7	08/31/92	95.20	97.7	-2.50	31	0.694
12/31/90	93.81	97.7	07/31/90	95.26	97.7	-2.45	31	0.682
01/30/91	95.08	97.7	06/31/90	95.26	97.7	-2.44	31	0.670
02/28/91	95.64	97.7	02/28/91	95.54	97.7	-2.18	29	0.659
03/31/91	96.52	97.7	10/31/90	95.66	97.7	-2.01	31	0.647
04/30/91	97.13	97.7	09/30/91	95.72	97.7	-1.98	30	0.635
05/31/91	97.53	97.7	06/30/90	95.94	97.7	-1.76	30	0.624
06/30/91	97.68	97.7	11/30/93	96.03	97.7	-1.67	30	0.612
07/31/91	97.77	97.7	06/30/93	96.06	97.7	-1.64	30	0.600
08/31/91	97.45	97.7	07/31/89	96.12	97.7	-1.58	31	0.588
09/30/91	95.72	97.7	12/31/89	96.16	97.7	-1.55	31	0.576
10/31/91	93.93	97.7	03/31/91	96.52	97.7	-1.18	31	0.564
11/30/91	93.75	97.7	07/31/90	96.59	97.7	-1.11	55	0.543
12/31/91	93.78	97.7	05/31/93	96.86	97.7	-1.04	31	0.531
01/31/92	93.74	97.7	03/31/90	96.89	97.7	-1.01	31	0.519
02/22/92	93.74	97.7	06/06/90	96.78	97.7	-0.94	6	0.517
03/31/92	94.49	97.7	08/31/90	96.78	97.7	-0.92	31	0.505
04/30/92	93.98	97.7	01/31/94	96.81	97.7	-0.89	31	0.493
05/31/92	93.74	97.7	06/31/89	96.82	97.7	-0.88	31	0.481
06/30/92	93.73	97.7	08/31/93	96.82	97.7	-0.88	31	0.469
07/31/92	93.72	97.7	03/31/94	96.88	97.7	-0.82	31	0.457
08/31/92	95.20	97.7	04/30/89	96.94	97.7	-0.78	30	0.445
09/30/92	97.02	97.7	02/28/90	96.97	97.7	-0.73	28	0.434
10/31/92	97.50	97.7	09/30/92	97.02	97.7	-0.58	30	0.423
11/30/92	97.38	97.7	10/31/93	97.06	97.7	-0.64	31	0.411
12/31/92	97.32	97.7	07/31/94	97.08	97.7	-0.62	31	0.399
01/31/93	97.40	97.7	01/31/90	97.08	97.7	-0.62	31	0.387
02/28/93	97.78	97.7	04/30/95	97.08	97.7	-0.62	30	0.375
03/31/93	97.81	97.7	04/30/91	97.13	97.7	-0.57	30	0.364
04/30/93	97.82	97.7	02/28/94	97.13	97.7	-0.57	28	0.353
05/31/93	96.86	97.7	09/30/93	97.18	97.7	-0.52	30	0.341
06/30/93	96.06	97.7	11/30/88	97.20	97.7	-0.50	30	0.330
07/31/93	97.37	97.7	10/31/88	97.30	97.7	-0.40	31	0.318
08/31/93	96.82	97.7	12/31/92	97.32	97.7	-0.38	31	0.306
09/30/93	97.18	97.7	03/31/89	97.34	97.7	-0.36	31	0.294
10/31/93	97.06	97.7	07/31/93	97.37	97.7	-0.33	31	0.282
11/30/93	96.03	97.7	11/30/92	97.36	97.7	-0.32	30	0.270
12/31/93	94.86	97.7	01/31/93	97.40	97.7	-0.30	31	0.258
01/31/94	96.81	97.7	03/31/95	97.40	97.7	-0.30	31	0.246
02/28/94	97.13	97.7	08/31/91	97.45	97.7	-0.25	31	0.234
03/31/94	96.88	97.7	10/31/92	97.50	97.7	-0.20	31	0.222
04/30/94	94.28	97.7	05/31/91	97.53	97.7	-0.17	31	0.210
05/31/94	93.88	97.7	02/28/89	97.55	97.7	-0.15	28	0.199
06/30/94	94.77	97.7	02/28/95	97.57	97.7	-0.13	28	0.189
07/31/94	97.08	97.7	01/31/89	97.60	97.7	-0.10	31	0.177
08/31/94	97.82	97.7	12/31/94	97.82	97.7	-0.08	31	0.165
09/30/94	97.81	97.7	04/30/93	97.82	97.7	-0.08	30	0.153
10/31/94	97.74	97.7	11/30/94	97.83	97.7	-0.07	30	0.141
11/30/94	97.83	97.7	06/30/91	97.86	97.7	-0.04	30	0.130
12/31/94	97.82	97.7	01/31/95	97.87	97.7	-0.03	31	0.118
01/31/95	97.87	97.7	12/31/88	97.70	97.7	0.00	31	0.106
02/28/95	97.57	97.7	09/30/96	97.70	97.7	0.00	30	0.094
03/31/95	97.40	97.7	10/31/94	97.74	97.7	0.04	31	0.082
04/30/95	97.08	97.7	08/31/95	97.74	97.7	0.04	31	0.070
05/31/95	95.28	97.7	10/31/95	97.77	97.7	0.08	31	0.058
06/06/95	96.78	97.7	07/31/91	97.77	97.7	0.07	31	0.048
07/31/95	96.59	97.7	02/28/93	97.78	97.7	0.08	28	0.036
08/31/95	97.74	97.7	09/30/94	97.81	97.7	0.11	30	0.024
09/30/95	97.70	97.7	03/31/93	97.81	97.7	0.11	31	0.012
10/31/95	97.77	97.7	08/31/94	97.82	97.7	0.12	31	0.000

-0.91



## H50 DATA

Date	Level	HNP	Date	Level	HNP	Lev.-HNP	TIME	Freq.	Median
10/31/88	100.79	102.7	07/30/90		102.7	-102.70	30		
11/30/88	102.59	102.7	08/30/90		102.7	-102.70	31		
12/29/88	102.41	102.7	05/31/90	99.85	102.7	-3.05	31	0.964	
01/31/89	102.81	102.7	12/31/91	99.85	102.7	-3.05	31	0.882	
02/28/89	102.35	102.7	11/30/91	99.88	102.7	-3.04	30	0.941	
03/31/89	101.99	102.7	05/31/92	99.88	102.7	-3.04	31	0.929	
04/30/89	101.12	102.7	08/30/92	99.87	102.7	-3.03	30	0.917	
05/31/89	102.15	102.7	12/31/93	99.87	102.7	-3.03	31	0.905	
06/30/89	102.59	102.7	01/31/92	99.89	102.7	-3.01	31	0.993	
07/14/89	102.84	102.7	08/31/93	99.89	102.7	-3.01	31	0.851	
08/31/89	102.53	102.7	05/31/94	99.75	102.7	-2.95	31	0.989	
09/30/89	102.37	102.7	05/30/90	99.76	102.7	-2.94	30	0.858	
10/31/89	102.23	102.7	08/30/93	99.80	102.7	-2.90	30	0.846	
11/30/89	101.88	102.7	10/31/91	99.84	102.7	-2.86	31	0.834	
12/31/89	102.26	102.7	04/30/92	99.88	102.7	-2.84	30	0.823	
01/31/90	102.80	102.7	07/31/92	99.87	102.7	-2.83	31	0.811	
02/28/90	102.47	102.7	08/31/92	99.90	102.7	-2.80	31	0.799	
03/31/90	102.32	102.7	09/30/92	100.01	102.7	-2.69	30	0.787	
04/30/90	100.15	102.7	11/30/93	100.02	102.7	-2.68	30	0.775	
05/31/90	99.85	102.7	04/30/90	100.15	102.7	-2.55	30	0.764	
06/30/90	99.78	102.7	07/31/93	100.39	102.7	-2.31	31	0.752	
07/30/90		102.7	02/29/92	100.40	102.7	-2.30	29	0.741	
08/30/90		102.7	05/31/93	100.82	102.7	-2.08	31	0.729	
09/30/90	101.91	102.7	04/30/94	100.83	102.7	-2.07	30	0.717	
10/31/90	102.43	102.7	12/31/92	100.85	102.7	-2.05	31	0.705	
11/30/90	101.87	102.7	03/31/92	100.88	102.7	-2.04	31	0.693	
12/31/90	100.70	102.7	12/31/90	100.70	102.7	-2.00	31	0.681	
01/30/91	101.15	102.7	10/31/88	100.79	102.7	-1.91	31	0.669	
02/28/91	101.48	102.7	11/30/92	100.86	102.7	-1.84	30	0.658	
03/31/91	101.78	102.7	10/31/93	100.87	102.7	-1.83	31	0.646	
04/30/91	102.33	102.7	09/30/91	101.03	102.7	-1.67	30	0.634	
05/31/91	102.49	102.7	06/30/95	101.03	102.7	-1.87	30	0.622	
06/30/91	102.67	102.7	04/30/89	101.12	102.7	-1.58	30	0.611	
07/31/91	102.71	102.7	01/30/91	101.15	102.7	-1.55	30	0.599	
08/31/91	102.37	102.7	01/31/94	101.31	102.7	-1.39	31	0.587	
09/30/91	101.03	102.7	05/30/94	101.41	102.7	-1.29	30	0.576	
10/31/91	99.84	102.7	10/31/92	101.48	102.7	-1.24	31	0.564	
11/30/91	99.86	102.7	02/28/91	101.48	102.7	-1.22	29	0.552	
12/31/91	99.85	102.7	03/31/94	101.67	102.7	-1.03	31	0.540	
01/31/92	99.89	102.7	11/30/89	101.68	102.7	-1.02	30	0.529	
02/29/92	100.40	102.7	01/31/93	101.72	102.7	-0.98	31	0.517	
03/31/92	100.86	102.7	09/30/93	101.75	102.7	-0.95	30	0.505	
04/30/92	99.86	102.7	03/31/91	101.78	102.7	-0.92	31	0.493	
05/31/92	99.86	102.7	05/31/95	101.80	102.7	-0.90	31	0.481	
06/30/92	99.87	102.7	09/30/90	101.91	102.7	-0.79	31	0.469	
07/31/92	99.87	102.7	02/28/94	101.92	102.7	-0.78	28	0.458	
08/31/92	99.90	102.7	04/30/95	101.98	102.7	-0.74	30	0.447	
09/30/92	100.01	102.7	11/30/90	101.97	102.7	-0.73	30	0.435	
10/31/92	101.48	102.7	03/31/89	101.99	102.7	-0.71	31	0.423	
11/30/92	100.86	102.7	05/31/89	102.15	102.7	-0.55	31	0.411	
12/31/92	100.85	102.7	10/31/89	102.23	102.7	-0.47	31	0.399	
01/31/93	101.72	102.7	03/31/95	102.25	102.7	-0.45	31	0.387	
02/28/93	102.45	102.7	12/31/89	102.26	102.7	-0.44	31	0.375	
03/31/93	102.82	102.7	03/31/90	102.32	102.7	-0.38	31	0.363	
04/30/93	102.48	102.7	04/30/91	102.33	102.7	-0.37	30	0.352	
05/31/93	100.82	102.7	02/28/89	102.35	102.7	-0.35	28	0.341	
06/30/93	99.80	102.7	08/31/91	102.37	102.7	-0.33	31	0.329	
07/31/93	100.39	102.7	09/30/89	102.37	102.7	-0.33	30	0.317	
08/31/93	99.89	102.7	12/29/88	102.41	102.7	-0.29	29	0.306	
09/30/93	101.78	102.7	10/31/90	102.43	102.7	-0.27	31	0.294	
10/31/93	100.87	102.7	02/28/93	102.46	102.7	-0.25	28	0.283	
11/30/93	100.02	102.7	04/30/93	102.48	102.7	-0.24	30	0.272	
12/31/93	99.87	102.7	02/28/90	102.47	102.7	-0.23	28	0.261	
01/31/94	101.31	102.7	02/28/95	102.47	102.7	-0.23	53	0.240	
02/28/94	101.92	102.7	05/31/91	102.49	102.7	-0.21	31	0.228	
03/31/94	101.67	102.7	12/31/94	102.51	102.7	-0.19	31	0.216	
04/30/94	100.83	102.7	07/31/95	102.52	102.7	-0.18	31	0.204	
05/31/94	99.75	102.7	08/31/89	102.53	102.7	-0.17	48	0.186	
06/30/94	101.41	102.7	11/30/94	102.54	102.7	-0.16	30	0.174	
07/31/94	102.74	102.7	01/06/95	102.58	102.7	-0.12	6	0.172	
08/31/94	102.78	102.7	11/30/88	102.59	102.7	-0.11	30	0.160	
09/30/94	102.75	102.7	06/30/89	102.59	102.7	-0.11	30	0.149	
10/31/94	102.60	102.7	01/31/90	102.60	102.7	-0.10	31	0.137	
11/30/94	102.54	102.7	10/31/94	102.60	102.7	-0.10	31	0.125	
12/31/94	102.51	102.7	01/31/89	102.61	102.7	-0.09	33	0.112	
01/06/95	102.58	102.7	03/31/93	102.62	102.7	-0.08	31	0.100	
02/28/95	102.47	102.7	07/14/89	102.64	102.7	-0.08	14	0.095	
03/31/95	102.25	102.7	09/30/95	102.65	102.7	-0.04	30	0.083	
04/30/95	101.96	102.7	06/30/91	102.57	102.7	-0.03	30	0.072	
05/31/95	101.80	102.7	08/31/95	102.71	102.7	0.01	31	0.060	
06/30/95	101.03	102.7	07/31/91	102.71	102.7	0.01	31	0.048	
07/31/95	102.52	102.7	10/31/95	102.72	102.7	0.02	31	0.036	
08/31/95	102.71	102.7	07/31/94	102.74	102.7	0.04	31	0.024	
09/30/95	102.66	102.7	09/30/94	102.75	102.7	0.05	30	0.012	
10/31/95	102.72	102.7	08/31/94	102.76	102.7	0.06	31	0.000	

-0.94

WELLNO ELEV AT WELL = ELEV AT TOP OF WELL (34.93) - STICK UP ( 1.22) = 33.71 Feet  
 HYDROGRAPH DATA

HYDROGRAPH DATA				P50 DATA						
Date	Raw Level	Level Elev	HNP	Date	Level	Elev	Lev.-HNP	Time	Freq	Median
10/01/88	-1.04	32.67	34.17	06/01/89	-5.10	28.81	-5.56	31		
11/01/88	-0.23	33.48	34.17	08/01/91	-4.95	28.76	-5.41	31	0.976	
12/01/88	0.71	34.42	34.17	05/01/92	-4.95	28.76	-5.41	30	0.984	
01/01/89	0.38	34.09	34.17	05/01/91	-4.95	28.76	-5.41	30	0.952	
02/01/89	0.50	34.21	34.17	07/01/91	-4.95	28.76	-5.41	30	0.940	
03/01/89	0.08	33.79	34.17	12/01/93	-4.50	29.21	-4.96	30	0.928	
04/01/89	-0.98	32.75	34.17	07/01/92	-4.50	29.21	-4.96	30	0.916	
05/01/89	-3.33	30.38	34.17	05/01/94	-4.50	29.21	-4.96	30	0.904	
06/01/89	-5.10	28.81	34.17	11/01/91	-4.38	29.33	-4.84	31	0.892	
07/01/89	0.17	33.88	34.17	05/01/90	-4.00	29.71	-4.46	30	0.880	
08/01/89	0.58	34.29	34.17	08/01/94	-3.60	29.81	-4.36	31	0.868	
09/01/89	0.78	34.49	34.17	11/01/93	-3.85	29.86	-4.31	31	0.856	
10/01/89	0.77	34.48	34.17	08/01/93	-3.80	29.91	-4.26	31	0.843	
11/01/89	0.04	33.75	34.17	12/01/91	-3.67	30.04	-4.13	30	0.831	
12/01/89	0.42	34.13	34.17	01/01/92	-3.50	30.21	-3.96	31	0.819	
01/01/90	0.63	34.34	34.17	10/01/93	-3.40	30.31	-3.86	30	0.807	
02/01/90	0.60	34.31	34.17	05/01/89	-3.33	30.38	-3.79	30	0.795	
03/01/90	0.52	34.23	34.17	01/01/94	-3.20	30.51	-3.66	31	0.783	
04/01/90	-1.28	32.43	34.17	09/01/93	-3.20	30.51	-3.66	31	0.771	
05/01/90	-4.00	29.71	34.17	05/01/93	-3.10	30.61	-3.56	30	0.759	
06/01/90	-0.10	33.61	34.17	03/01/94	-2.82	30.89	-3.28	28	0.748	
07/01/90	0.75	34.46	34.17	05/01/95	-2.78	30.94	-3.23	31	0.736	
08/01/90	0.16	33.66	34.17	12/01/90	-2.50	31.21	-2.96	30	0.724	
09/01/90	-0.60	33.11	34.17	08/01/95	-2.40	31.31	-2.86	30	0.712	
10/01/90	0.55	34.26	34.17	04/01/91	-2.40	31.31	-2.86	31	0.699	
11/01/90	-0.52	33.19	34.17	02/01/94	-2.30	31.41	-2.76	31	0.687	
12/01/90	-2.50	31.21	34.17	01/01/91	-2.20	31.51	-2.66	31	0.675	
01/01/91	-2.20	31.51	34.17	02/01/92	-2.10	31.61	-2.56	31	0.663	
02/01/91	-1.40	32.31	34.17	04/01/92	-1.96	31.75	-2.42	31	0.650	
03/01/91	-1.81	32.10	34.17	03/01/92	-1.81	31.90	-2.27	29	0.639	
04/01/91	-2.40	31.31	34.17	03/01/91	-1.81	32.10	-2.07	28	0.628	
05/01/91	-4.95	28.76	34.17	04/01/94	-1.46	32.26	-1.91	31	0.615	
06/01/91	0.30	34.01	34.17	02/01/91	-1.40	32.31	-1.86	31	0.603	
07/01/91	-4.95	28.76	34.17	04/01/90	-1.28	32.43	-1.74	31	0.591	
08/01/91	-4.96	28.76	34.17	10/01/88	-1.04	32.67	-1.50	30	0.579	
09/01/91	0.75	34.46	34.17	04/01/89	-0.98	32.75	-1.42	31	0.567	
10/01/91	-0.50	33.21	34.17	09/01/90	-0.60	33.11	-1.06	31	0.554	
11/01/91	-4.38	29.33	34.17	12/01/92	-0.56	33.16	-1.01	30	0.543	
12/01/91	-3.67	30.04	34.17	11/01/90	-0.52	33.19	-0.98	31	0.530	
01/01/92	-3.50	30.21	34.17	08/01/92	-0.50	33.21	-0.96	31	0.518	
02/01/92	-2.10	31.81	34.17	10/01/91	-0.50	33.21	-0.96	30	0.506	
03/01/92	-1.81	31.90	34.17	07/01/94	-0.50	33.21	-0.96	30	0.494	-0.96
04/01/92	-1.96	31.75	34.17	11/01/88	-0.23	33.48	-0.89	31	0.482	
05/01/92	-4.95	28.76	34.17	04/01/95	-0.13	33.59	-0.59	28	0.471	
06/01/92		33.71	34.17	11/01/92	-0.10	33.61	-0.56	31	0.459	
07/01/92	-4.50	29.21	34.17	06/01/93	-0.10	33.61	-0.56	31	0.446	
08/01/92	-0.50	33.21	34.17	06/01/90	-0.10	33.61	-0.56	31	0.434	
09/01/92	0.75	34.46	34.17	06/01/92		33.71	-0.46	31	0.422	
10/01/92	0.60	34.31	34.17	11/01/89	0.04	33.75	-0.42	31	0.409	
11/01/92	-0.10	33.61	34.17	12/01/94	0.05	33.76	-0.41	30	0.398	
12/01/92	-0.55	33.16	34.17	03/01/89	0.08	33.79	-0.38	28	0.386	
01/01/93	0.11	33.62	34.17	01/01/93	0.11	33.82	-0.35	31	0.374	
02/01/93	0.65	34.38	34.17	06/01/90	0.15	33.88	-0.31	31	0.362	
03/01/93	0.75	34.48	34.17	07/01/89	0.17	33.88	-0.29	30	0.350	
04/01/93	0.60	34.31	34.17	07/01/93	0.30	34.01	-0.16	30	0.338	
05/01/93	-3.10	30.61	34.17	08/01/91	0.30	34.01	-0.16	31	0.326	
06/01/93	-0.10	33.61	34.17	03/01/95	0.33	34.04	-0.13	31	0.314	
07/01/93	0.30	34.01	34.17	01/01/89	0.38	34.09	-0.08	31	0.301	
08/01/93	-3.80	29.91	34.17	11/01/94	0.40	34.11	-0.06	31	0.289	
09/01/93	-3.20	30.51	34.17	12/01/89	0.42	34.13	-0.04	30	0.277	
10/01/93	-3.40	30.31	34.17	02/01/89	0.50	34.21	0.04	31	0.265	
11/01/93	-3.85	29.86	34.17	03/01/90	0.52	34.23	0.06	28	0.254	
12/01/93	-4.50	29.21	34.17	10/01/90	0.55	34.26	0.09	30	0.242	
01/01/94	-3.20	30.51	34.17	02/01/95	0.56	34.26	0.09	31	0.230	
02/01/94	-2.30	31.41	34.17	08/01/89	0.58	34.29	0.12	31	0.217	
03/01/94	-2.82	30.89	34.17	02/01/90	0.60	34.31	0.14	31	0.205	
04/01/94	-1.45	32.26	34.17	04/01/93	0.60	34.31	0.14	31	0.193	
05/01/94	-4.50	29.21	34.17	10/01/92	0.60	34.31	0.14	30	0.181	
06/01/94	-3.90	29.81	34.17	01/01/90	0.63	34.34	0.17	31	0.169	
07/01/94	-0.50	33.21	34.17	02/01/93	0.65	34.36	0.19	31	0.156	
08/01/94	0.80	34.51	34.17	10/01/94	0.70	34.41	0.24	30	0.144	
09/01/94	0.80	34.51	34.17	12/01/88	0.71	34.42	0.25	30	0.133	
10/01/94	0.70	34.41	34.17	09/01/91	0.75	34.46	0.29	31	0.120	
11/01/94	0.40	34.11	34.17	07/01/90	0.75	34.46	0.29	30	0.108	
12/01/94	0.08	33.76	34.17	09/01/92	0.75	34.46	0.29	31	0.096	
01/01/95	1.05	34.76	34.17	03/01/93	0.75	34.46	0.29	28	0.085	
02/01/95	0.55	34.26	34.17	10/01/89	0.77	34.48	0.31	30	0.073	
03/01/95	0.33	34.04	34.17	09/01/89	0.78	34.49	0.32	31	0.061	
04/01/95	-0.13	33.59	34.17	06/01/94	0.80	34.51	0.34	31	0.049	
05/01/95	-2.78	30.94	34.17	08/01/94	0.80	34.51	0.34	31	0.036	
06/01/95	-2.40	31.31	34.17	07/01/95	0.86	34.66	0.49	31	0.024	
07/01/95	0.95	34.66	34.17	01/01/95	1.05	34.76	0.59	30	0.012	
08/01/95	1.10	34.81	34.17	08/01/95	1.10	34.81	0.64	30	0.000	



Data provided has been corrected to a ground level datum:  
 Elevation of ground per WCRWSA = 45.90 feet  
 HYDROGRAPH DATA

HYDROGRAPH DATA				PSD DATA						
Date	Raw Level	Level Elev	HNP	Date	Level	Level Elev	Lev.-HNP	Time	Freq	Median
10/01/88	1.12	47.02	47.18	06/01/92	-2.30	43.60	-3.57	31		
11/01/88	0.77	46.67	47.18	05/01/92	-2.30	43.60	-3.57	30		0.977
12/01/88	2.29	48.19	47.18	04/01/92	-2.30	43.60	-3.57	31		0.965
01/01/89	1.10	47.00	47.18	04/01/94	-2.30	43.60	-3.57	31		0.863
02/01/89	1.26	47.16	47.18	05/01/94	-2.25	43.65	-3.52	30		0.841
03/01/89	0.93	46.83	47.18	06/01/89	-1.90	44.00	-3.17	31		0.929
04/01/89	0.64	46.54	47.18	06/01/94	-1.70	44.20	-2.98	31		0.917
05/01/89	-0.90	45.00	47.18	02/01/91	-1.50	44.40	-2.77	31		0.905
06/01/89	-1.90	44.00	47.18	05/01/90	-1.43	44.47	-2.70	30		0.893
07/01/89	-1.15	44.75	47.18	03/01/92	-1.35	44.55	-2.63	28		0.882
08/01/89	-0.60	45.30	47.18	07/01/89	-1.16	44.75	-2.42	30		0.870
09/01/89	0.24	46.14	47.18	06/01/93	-1.13	44.77	-2.41	31		0.858
10/01/89	0.36	46.26	47.18	08/01/92	-1.10	44.80	-2.38	31		0.846
11/01/89	-0.77	45.13	47.18	07/01/94	-1.10	44.80	-2.38	30		0.835
12/01/89	0.24	46.14	47.18	12/01/93	-1.10	44.80	-2.38	30		0.823
01/01/90	0.28	46.18	47.18	08/01/93	-1.10	44.80	-2.38	31		0.811
02/01/90	-0.43	45.47	47.18	03/01/91	-1.00	44.90	-2.27	28		0.800
03/01/90	0.37	46.27	47.18	01/01/91	-1.00	44.90	-2.27	31		0.788
04/01/90	0.20	46.10	47.18	06/01/90	-0.98	44.92	-2.25	31		0.776
05/01/90	-1.43	44.47	47.18	05/01/89	-0.90	45.00	-2.17	30		0.765
06/01/90	-0.98	44.92	47.18	02/01/92	-0.87	45.03	-2.14	31		0.753
07/01/90	0.65	46.55	47.18	01/01/92	-0.85	45.04	-2.13	31		0.741
08/01/90	1.23	47.13	47.18	03/01/94	-0.85	45.05	-2.13	28		0.730
09/01/90	1.18	47.05	47.18	12/01/90	-0.80	45.10	-2.07	30		0.718
10/01/90	0.81	46.71	47.18	11/01/89	-0.77	45.13	-2.05	31		0.706
11/01/90	0.02	45.92	47.18	06/01/91	-0.75	45.15	-2.02	31		0.694
12/01/90	-0.80	45.10	47.18	12/01/91	-0.73	45.17	-2.00	30		0.683
01/01/91	-1.00	44.90	47.18	04/01/91	-0.70	45.20	-1.98	31		0.671
02/01/91	-1.60	44.40	47.18	06/01/89	-0.60	45.30	-1.88	31		0.659
03/01/91	-1.00	44.90	47.18	01/01/94	-0.54	45.36	-1.81	31		0.647
04/01/91	-0.70	45.20	47.18	05/01/91	-0.50	45.40	-1.77	30		0.635
05/01/91	-0.50	45.40	47.18	02/01/90	-0.43	45.47	-1.70	31		0.623
06/01/91	-0.75	45.15	47.18	11/01/91	-0.20	45.70	-1.48	31		0.611
07/01/91	0.65	46.55	47.18	10/01/93	-0.15	45.75	-1.42	30		0.599
08/01/91	1.22	47.12	47.18	02/01/94	0.00	45.90	-1.27	31		0.587
09/01/91	1.62	47.62	47.18	07/01/92		45.90	-1.27	30		0.575
10/01/91	0.58	46.48	47.18	11/01/90	0.02	45.92	-1.25	31		0.564
11/01/91	-0.20	45.70	47.18	11/01/93	0.10	46.00	-1.17	31		0.552
12/01/91	-0.73	45.17	47.18	07/01/93	0.10	46.00	-1.17	30		0.540
01/01/92	-0.86	45.04	47.18	09/01/92	0.15	46.05	-1.13	31		0.528
02/01/92	-0.87	45.03	47.18	04/01/90	0.20	46.10	-1.07	31		0.516
03/01/92	-1.35	44.55	47.18	06/01/94	0.23	46.13	-1.05	31		0.504
04/01/92	-2.30	43.60	47.18	09/01/89	0.24	46.14	-1.03	31		0.492
05/01/92	-2.30	43.60	47.18	12/01/89	0.24	46.14	-1.03	30		0.480
06/01/92	-2.30	43.60	47.18	01/01/90	0.28	46.18	-0.99	31		0.468
07/01/92		45.90	47.18	10/01/89	0.36	46.26	-0.91	30		0.457
08/01/92	-1.10	44.80	47.18	03/01/90	0.37	46.27	-0.90	28		0.446
09/01/92	0.18	46.05	47.18	09/01/93	0.49	46.39	-0.78	31		0.434
10/01/92	1.17	47.07	47.18	09/27/95	1.22	46.47	-0.70	28		0.423
11/01/92	1.10	47.00	47.18	10/01/91	0.58	46.48	-0.70	30		0.411
12/01/92	1.17	47.07	47.18	04/01/89	0.84	46.54	-0.63	31		0.399
01/01/93	0.98	46.88	47.18	07/01/91	0.65	46.55	-0.62	30		0.387
02/01/93	0.95	46.85	47.18	07/01/90	0.65	46.55	-0.62	30		0.376
03/01/93	1.10	47.00	47.18	05/01/93	0.68	46.58	-0.59	30		0.364
04/01/93	1.21	47.11	47.18	08/28/95	1.04	46.64	-0.53	41		0.348
05/01/93	0.88	46.68	47.18	11/01/88	0.77	46.67	-0.50	31		0.336
06/01/93	-1.13	44.77	47.18	03/30/95	0.74	46.69	-0.48	42		0.320
07/01/93	0.10	46.00	47.18	10/01/90	0.81	46.71	-0.46	30		0.308
08/01/93	-1.10	44.80	47.18	06/21/95	-1.50	46.80	-0.38	28		0.298
09/01/93	0.49	46.39	47.18	07/19/95	-0.14	46.80	-0.38	28		0.287
10/01/93	-0.15	45.75	47.18	02/16/96	0.93	46.80	-0.38	29		0.276
11/01/93	0.10	46.00	47.18	03/01/89	0.93	46.83	-0.34	28		0.265
12/01/93	-1.10	44.80	47.18	02/01/93	0.95	46.85	-0.32	31		0.253
01/01/94	-0.64	46.38	47.18	05/24/95	-1.18	46.88	-0.31	28		0.242
02/01/94	0.00	46.90	47.18	01/01/93	0.98	46.88	-0.30	31		0.230
03/01/94	-0.65	46.25	47.18	01/18/95	0.95	46.88	-0.30	28		0.219
04/01/94	-2.30	43.60	47.18	11/21/94	1.05	46.94	-0.23	33		0.208
05/01/94	-2.25	43.65	47.18	04/28/95	0.50	47.00	-0.17	27		0.196
06/01/94	-1.70	44.20	47.18	11/01/92	1.10	47.00	-0.17	31		0.184
07/01/94	-1.10	44.80	47.18	03/01/93	1.10	47.00	-0.17	28		0.173
08/01/94	0.23	46.13	47.18	01/01/89	1.10	47.00	-0.17	31		0.161
09/01/94	1.24	47.14	47.18	12/21/94	0.94	47.02	-0.16	30		0.149
10/19/94	1.29	47.19	47.18	10/01/88	1.12	47.02	-0.15	30		0.138
11/21/94	1.08	46.94	47.18	09/01/90	1.15	47.05	-0.12	31		0.126
12/21/94	0.94	47.02	47.18	10/01/92	1.17	47.07	-0.10	30		0.114
01/18/95	0.95	46.88	47.18	12/01/92	1.17	47.07	-0.10	30		0.102
02/18/95	0.93	46.80	47.18	04/01/93	1.21	47.11	-0.08	31		0.090
03/20/95	0.74	46.69	47.18	08/01/91	1.22	47.12	-0.05	31		0.078
04/28/95	0.50	47.00	47.18	08/01/90	1.23	47.13	-0.04	31		0.066
05/24/95	-1.18	46.88	47.18	09/01/94	1.24	47.14	-0.03	31		0.054
06/21/95	-1.50	46.80	47.18	02/01/89	1.26	47.18	-0.01	31		0.042
07/19/95	-0.14	46.80	47.18	10/19/94	1.29	47.19	0.02	48		0.024
08/29/95	1.04	46.64	47.18	09/01/91	1.62	47.52	0.34	31		0.012
09/27/95	1.22	46.47	47.18	12/01/88	2.29	48.18	1.02	30		0.000

-1.04

FOR LATA

Date	Level	HNP	Date	Level	HNP	Lev.-HNP	Time	Freq	Median
10/31/88	45.83	48.37	06/30/94	43.28	48.37	-3.09	30		
11/30/88	45.71	48.37	08/05/92	43.30	48.37	-3.07	5	0.988	
12/31/88	48.06	48.37	07/31/92	43.31	48.37	-3.06	31	0.974	
01/31/89	45.97	48.37	06/30/92	43.31	48.37	-3.06	30	0.982	
02/28/89	45.94	48.37	05/31/92	43.32	48.37	-3.05	31	0.950	
03/31/89	45.79	48.37	05/31/94	43.33	48.37	-3.04	31	0.938	
04/30/89	45.20	48.37	05/31/90	43.39	48.37	-2.98	31	0.926	
05/31/89	43.83	48.37	08/30/89	43.40	48.37	-2.97	30	0.914	
06/30/89	43.40	48.37	07/31/94	43.47	48.37	-2.90	31	0.902	
07/31/89	44.29	48.37	04/30/92	43.59	48.37	-2.78	30	0.890	
08/31/89	44.54	48.37	05/31/89	43.63	48.37	-2.74	31	0.878	
09/30/89	44.71	48.37	01/31/91	43.77	48.37	-2.60	31	0.866	
10/31/89	44.77	48.37	06/30/90	43.78	48.37	-2.59	30	0.854	
11/30/89	44.09	48.37	08/31/93	43.81	48.37	-2.56	31	0.842	
12/31/89	44.89	48.37	02/28/91	43.83	48.37	-2.54	28	0.831	
01/31/90	45.44	48.37	04/30/94	43.85	48.37	-2.52	30	0.820	
02/28/90	45.31	48.37	06/30/95	43.85	48.37	-2.52	30	0.808	
03/31/90	45.37	48.37	12/31/90	43.89	48.37	-2.48	31	0.796	
04/30/90	44.39	48.37	05/31/95	44.05	48.37	-2.32	31	0.784	
05/31/90	43.39	48.37	11/30/89	44.09	48.37	-2.28	30	0.772	
06/30/90	43.78	48.37	06/30/93	44.23	48.37	-2.14	30	0.760	
07/31/90	46.08	48.37	07/19/95	44.29	48.37	-2.09	19	0.753	
08/31/90	45.92	48.37	07/31/89	44.29	48.37	-2.08	31	0.741	
09/30/90	45.55	48.37	01/31/92	44.38	48.37	-2.01	31	0.729	
10/31/90	45.59	48.37	03/31/91	44.38	48.37	-2.01	31	0.716	
11/30/90	44.56	48.37	04/30/90	44.39	48.37	-1.98	30	0.705	
12/31/90	43.89	48.37	12/31/91	44.41	48.37	-1.98	31	0.692	
01/31/91	43.77	48.37	03/31/92	44.49	48.37	-1.88	31	0.680	
02/28/91	43.83	48.37	08/31/89	44.54	48.37	-1.83	31	0.668	
03/31/91	44.36	48.37	11/30/90	44.56	48.37	-1.81	30	0.656	
04/30/91	45.03	48.37	07/31/93	44.58	48.37	-1.79	31	0.644	
05/31/91	45.36	48.37	02/29/92	44.61	48.37	-1.76	29	0.633	
06/30/91	45.88	48.37	12/31/93	44.70	48.37	-1.67	31	0.621	
07/31/91	45.88	48.37	09/30/89	44.71	48.37	-1.66	30	0.609	
08/31/91	46.18	48.37	10/31/89	44.77	48.37	-1.60	31	0.597	
09/30/91	46.06	48.37	12/31/89	44.89	48.37	-1.48	31	0.585	
10/31/91	45.70	48.37	08/31/94	44.91	48.37	-1.46	31	0.573	
11/30/91	46.07	48.37	04/30/91	45.03	48.37	-1.34	30	0.561	
12/31/91	44.41	48.37	11/30/91	45.07	48.37	-1.30	30	0.549	
01/31/92	44.36	48.37	03/31/94	45.09	48.37	-1.28	31	0.537	
02/29/92	44.61	48.37	04/30/89	45.20	48.37	-1.17	30	0.525	
03/31/92	44.49	48.37	01/31/94	45.21	48.37	-1.16	31	0.513	
04/30/92	43.89	48.37	04/30/95	45.25	48.37	-1.12	30	0.502	
05/31/92	43.32	48.37	02/28/90	45.31	48.37	-1.06	28	0.491	
06/30/92	43.31	48.37	05/31/93	45.35	48.37	-1.02	31	0.478	-1.11
07/31/92	43.31	48.37	05/31/91	45.36	48.37	-1.01	31	0.466	
08/08/92	43.30	48.37	11/30/93	45.36	48.37	-1.01	30	0.455	
09/30/92	45.87	48.37	03/31/90	45.37	48.37	-1.00	31	0.442	
10/31/92	46.08	48.37	10/31/90	45.39	48.37	-0.96	31	0.430	
11/30/92	45.96	48.37	01/31/90	45.44	48.37	-0.93	31	0.418	
12/31/92	45.90	48.37	02/28/94	45.47	48.37	-0.90	28	0.407	
01/31/93	45.82	48.37	10/31/93	45.48	48.37	-0.89	31	0.395	
02/28/93	45.77	48.37	09/30/90	45.55	48.37	-0.82	30	0.383	
03/31/93	45.96	48.37	06/30/91	45.66	48.37	-0.71	30	0.372	
04/30/93	48.04	48.37	03/31/96	45.89	48.37	-0.68	31	0.360	
05/31/93	45.36	48.37	10/31/91	46.70	48.37	-0.67	31	0.347	
06/30/93	44.23	48.37	09/30/93	46.70	48.37	-0.67	30	0.336	
07/31/93	44.58	48.37	11/30/88	46.71	48.37	-0.66	30	0.324	
08/31/93	43.81	48.37	02/28/93	46.77	48.37	-0.60	28	0.313	
09/30/93	46.70	48.37	12/17/94	46.77	48.37	-0.60	17	0.306	
10/31/93	45.48	48.37	03/31/89	46.79	48.37	-0.58	31	0.294	
11/30/93	45.36	48.37	01/31/93	46.82	48.37	-0.55	31	0.282	
12/31/93	44.70	48.37	10/31/88	46.83	48.37	-0.54	31	0.270	
01/31/94	45.21	48.37	07/31/91	46.86	48.37	-0.51	31	0.258	
02/28/94	45.47	48.37	09/30/94	46.87	48.37	-0.50	30	0.246	
03/31/94	45.09	48.37	09/30/92	46.87	48.37	-0.50	56	0.224	
04/30/94	43.85	48.37	02/28/95	46.89	48.37	-0.48	28	0.213	
05/31/94	43.33	48.37	12/31/92	46.90	48.37	-0.47	31	0.201	
06/30/94	43.28	48.37	08/31/90	46.92	48.37	-0.45	31	0.189	
07/31/94	43.47	48.37	11/30/94	46.94	48.37	-0.43	30	0.177	
08/31/94	44.91	48.37	02/28/89	46.94	48.37	-0.43	28	0.166	
09/30/94	45.87	48.37	03/31/93	46.95	48.37	-0.42	31	0.154	
10/31/94	46.12	48.37	01/31/95	46.96	48.37	-0.41	46	0.137	
11/30/94	46.94	48.37	11/30/92	46.96	48.37	-0.41	30	0.125	
12/17/94	45.77	48.37	01/31/89	46.97	48.37	-0.40	31	0.113	
01/31/95	45.96	48.37	04/30/93	46.04	48.37	-0.33	30	0.101	
02/28/95	46.89	48.37	12/31/88	46.05	48.37	-0.32	31	0.089	
03/31/95	45.89	48.37	09/30/91	46.06	48.37	-0.31	30	0.077	
04/30/95	46.26	48.37	10/31/92	46.06	48.37	-0.31	31	0.065	
05/31/95	44.08	48.37	09/31/95	46.06	48.37	-0.31	43	0.048	
06/30/95	43.85	48.37	07/31/90	46.08	48.37	-0.29	31	0.036	
07/18/95	44.29	48.37	09/30/95	46.10	48.37	-0.27	30	0.024	
08/31/95	46.08	48.37	10/31/94	46.12	48.37	-0.25	31	0.012	
09/30/95	46.10	48.37	06/31/91	46.18	48.37	-0.21	31	0.000	

... .. has been corrected to a ground level datum:

Elevation of ground per WCRWSA = 43.40 feet  
HYDROGRAPH DATA

Note: 0.07 feet discrepancy between WCRWSA and SWFWMD surveys  
P50 DATA

Date	Raw Level	Level Elev	HNP	Date	Level	Level Elev	Lev.-HNP	Time	Freq	Median
10/01/88	0.32	43.72	44.88	07/01/89					30	
11/01/88	0.12	43.62	44.88	08/01/92	-2.14	41.28	-3.40		31	
12/01/88	0.50	43.90	44.88	10/01/92	-2.14	41.28	-3.40		30	
01/01/89	0.37	43.77	44.88	06/01/99	-2.14	41.28	-3.40		31	
02/01/89	0.45	43.88	44.88	05/01/92	-2.14	41.28	-3.40		30	
03/01/89	0.42	43.82	44.88	04/01/92	-2.14	41.28	-3.40		31	
04/01/89	0.00	43.40	44.88	07/01/92	-2.14	41.28	-3.40		30	
05/01/89	-2.14	41.28	44.88	08/01/92	-2.14	41.28	-3.40		31	
06/01/89	-2.14	41.28	44.88	08/21/95	-2.14	41.28	-3.40		43	
07/01/89			44.88	05/01/89	-2.14	41.28	-3.40		30	
08/01/89	0.32	43.72	44.88	08/01/93	-2.00	41.40	-3.28		31	0.885
09/01/89	0.47	43.87	44.88	01/01/91	-1.50	41.90	-2.78		31	0.853
10/01/89	0.46	43.86	44.88	04/01/91	-1.41	41.99	-2.87		31	0.841
11/01/89	0.00	43.40	44.88	05/01/91	-1.28	42.14	-2.52		30	0.830
12/01/89	0.50	43.90	44.88	05/09/95	-1.20	42.20	-2.48		13	0.825
01/01/90	0.36	43.76	44.88	06/01/94	-1.17	42.23	-2.43		31	0.813
02/01/90	0.25	43.65	44.88	06/01/93	-1.10	42.30	-2.38		31	0.801
03/01/90	0.12	43.52	44.88	05/01/94	-1.10	42.30	-2.38		30	0.788
04/01/90	0.00	43.40	44.88	12/01/91	-1.10	42.30	-2.38		30	0.777
05/01/90	-0.10	43.30	44.88	06/01/91	-1.00	42.40	-2.28		31	0.765
06/01/90	-0.10	43.30	44.88	07/01/91	-1.00	42.40	-2.28		30	0.754
07/01/90	0.81	44.21	44.88	02/01/91	-0.90	42.50	-2.18		31	0.742
08/01/90	0.57	43.97	44.88	09/01/91	-0.88	42.52	-2.14		31	0.730
09/01/90	0.42	43.82	44.88	04/01/94	-0.87	42.53	-2.13		31	0.718
10/01/90	0.23	43.63	44.88	07/01/94	-0.70	42.70	-1.98		30	0.708
11/01/90	0.06	43.46	44.88	08/01/91	-0.57	42.83	-1.83		31	0.694
12/01/90	0.00	43.40	44.88	12/01/93	-0.55	42.85	-1.81		30	0.683
01/01/91	-1.50	41.90	44.88	02/01/92	-0.55	42.85	-1.81		31	0.671
02/01/91	-0.90	42.50	44.88	03/01/91	-0.50	42.90	-1.76		28	0.660
03/01/91	-0.50	42.90	44.88	01/01/92	-0.35	43.05	-1.61		31	0.648
04/01/91	-1.41	41.99	44.88	11/01/91	-0.15	43.25	-1.41		31	0.636
05/01/91	-1.28	42.14	44.88	05/01/90	-0.10	43.30	-1.36		30	0.624
06/01/91	-1.00	42.40	44.88	08/01/90	-0.10	43.30	-1.36		31	0.612
07/01/91	-1.00	42.40	44.88	04/28/95	-0.01	43.39	-1.27		27	0.602
08/01/91	-0.57	42.83	44.88	03/01/92	0.00	43.40	-1.26		29	0.590
09/01/91	-0.88	42.52	44.88	11/01/89	0.00	43.40	-1.26		31	0.578
10/01/91	0.29	43.69	44.88	04/01/89	0.00	43.40	-1.26		31	0.568
11/01/91	-0.15	43.25	44.88	04/01/90	0.00	43.40	-1.26		31	0.554
12/01/91	-1.10	42.30	44.88	12/01/90	0.00	43.40	-1.26		30	0.543
01/01/92	-0.35	43.05	44.88	11/01/90	0.05	43.45	-1.21		31	0.531
02/01/92	-0.98	42.85	44.88	03/01/90	0.12	43.52	-1.14		28	0.520
03/01/92	0.00	43.40	44.88	11/01/88	0.12	43.52	-1.14		31	0.508
04/01/92	-2.14	41.28	44.88	03/01/94	0.15	43.55	-1.11		28	0.487
05/01/92	-2.14	41.28	44.88	01/01/94	0.15	43.55	-1.11		31	0.485
06/01/92	-2.14	41.28	44.88	10/01/90	0.23	43.63	-1.03		30	0.473
07/01/92	-2.14	41.28	44.88	02/01/90	0.25	43.65	-1.01		31	0.461
08/01/92	-2.14	41.28	44.88	07/01/93	0.28	43.68	-0.98		30	0.450
09/01/92	0.88	44.28	44.88	10/01/91	0.29	43.69	-0.97		30	0.438
10/01/92	-2.14	41.28	44.88	08/01/89	0.32	43.72	-0.94		31	0.426
11/01/92	0.83	44.23	44.88	10/01/88	0.32	43.72	-0.94		30	0.415
12/01/92	0.72	44.12	44.88	05/01/93	0.32	43.72	-0.94		30	0.403
01/01/93	0.60	44.00	44.88	03/30/95	0.32	43.72	-0.94		42	0.387
02/01/93	0.64	44.04	44.88	01/01/90	0.36	43.76	-0.90		31	0.375
03/01/93	0.90	44.30	44.88	01/01/89	0.37	43.77	-0.89		31	0.363
04/01/93	0.73	44.13	44.88	03/01/89	0.42	43.82	-0.84		28	0.352
05/01/93	0.32	43.72	44.88	09/01/90	0.42	43.82	-0.84		31	0.340
06/01/93	-1.10	42.30	44.88	10/01/93	0.43	43.83	-0.83		30	0.328
07/01/93	0.28	43.68	44.88	02/01/89	0.45	43.85	-0.81		31	0.316
08/01/93	-2.00	41.40	44.88	10/01/89	0.46	43.85	-0.81		30	0.305
09/01/93	0.79	44.19	44.88	09/01/89	0.47	43.87	-0.79		31	0.293
10/01/93	0.43	43.83	44.88	11/01/93	0.48	43.88	-0.78		31	0.281
11/01/93	0.48	43.86	44.88	12/21/94	0.48	43.88	-0.78		30	0.269
12/01/93	-0.65	42.85	44.88	12/01/88	0.50	43.90	-0.78		30	0.257
01/01/94	0.15	43.55	44.88	12/01/89	0.50	43.90	-0.78		30	0.246
02/01/94	0.55	43.95	44.88	02/16/95	0.51	43.91	-0.75		29	0.234
03/01/94	0.15	43.55	44.88	02/01/94	0.55	43.95	-0.71		31	0.222
04/01/94	-0.87	42.53	44.88	11/21/94	0.56	43.96	-0.70		33	0.210
05/01/94	-1.10	42.30	44.88	07/19/95	0.56	43.96	-0.70		28	0.199
06/01/94	-1.17	42.23	44.88	08/01/90	0.57	43.97	-0.69		31	0.187
07/01/94	-0.70	42.70	44.88	01/18/95	0.59	43.99	-0.67		28	0.176
08/01/94	0.64	44.04	44.88	01/01/93	0.60	44.00	-0.66		31	0.164
09/01/94	0.97	44.37	44.88	02/01/93	0.64	44.04	-0.62		31	0.152
10/19/94	0.75	44.15	44.88	08/01/94	0.64	44.04	-0.62		31	0.140
11/21/94	0.58	43.96	44.88	12/01/92	0.72	44.12	-0.54		30	0.128
12/21/94	0.48	43.88	44.88	04/01/93	0.73	44.13	-0.53		31	0.118
01/18/95	0.59	43.99	44.88	10/19/94	0.75	44.15	-0.51		48	0.098
02/16/95	0.51	43.91	44.88	09/01/93	0.79	44.19	-0.47		31	0.086
03/30/95	0.32	43.72	44.88	07/01/90	0.81	44.21	-0.46		30	0.074
04/26/95	-0.01	43.39	44.88	11/01/92	0.83	44.23	-0.43		31	0.062
05/09/95	-1.20	42.20	44.88	09/01/92	0.88	44.28	-0.38		31	0.050
06/21/95	-2.14	41.28	44.88	03/01/93	0.90	44.30	-0.38		28	0.039
07/19/95	0.56	43.96	44.88	08/01/94	0.97	44.37	-0.29		31	0.027
08/29/95	1.08	44.48	44.88	06/29/95	1.08	44.48	-0.20		41	0.011
09/27/95	1.08	44.48	44.88	09/27/95	1.08	44.48	-0.18		29	0.000

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WATER LEVELS PROVIDED WITH PALMETTO LINE AS DATUM:

Elevation of palmetto line calculated from: Table 3 of "Annual Report: Ecological Monitoring of the Morris Bridge Wellfield Water Years plus the SWFWMD survey which included the staff gage and ground elevation at the staff gage

Staff gage elevation 33.7

Staff gage (ground level) elevation calculated as 33.7 ft which is given as 1.2 feet below palmetto line  
34.9 = palmetto line elev.

HYDROGRAPH DATA

P50 DATA

Date	Raw Level	Level Elev	HNP	Date	Level Elev	HNP	Level Elev	Lev.-HNP	Time	Freq	Mediar
10/20/89	0.21	35.11	35.37	01/03/92	-4.09	30.81	35.37	-4.56	14		
11/17/89	-0.09	34.81	35.37	12/14/90	-3.49	31.41	35.37	-3.96	14	0.985	
12/18/89	-0.74	34.16	35.37	05/20/92	-3.49	31.41	35.37	-3.96	23	0.972	
01/26/90	0.08	34.98	35.37	01/24/91	-2.89	32.01	35.37	-3.36	41	0.949	
02/26/90	0.06	34.96	35.37	12/20/91	-2.84	32.06	35.37	-3.31	28	0.934	
03/23/90	-0.14	34.76	35.37	06/29/90	-2.49	32.41	35.37	-2.96	42	0.910	
04/19/90	-0.44	34.46	35.37	02/24/92	-2.49	32.41	35.37	-2.96	52	0.882	
05/18/90	-1.64	33.26	35.37	04/27/92	-2.49	32.41	35.37	-2.96	33	0.863	
06/29/90	-2.49	32.41	35.37	11/30/90	-2.06	32.84	35.37	-2.53	42	0.840	
07/30/90	-1.39	33.51	35.37	05/31/94	-2.06	32.84	35.37	-2.53	46	0.815	
08/24/90	-1.79	33.11	35.37	02/20/91	-2.04	32.86	35.37	-2.51	27	0.800	
09/21/90	-1.19	33.71	35.37	03/22/91	-1.94	32.96	35.37	-2.41	30	0.783	
10/19/90	-1.09	33.81	35.37	08/30/93	-1.84	33.08	35.37	-2.31	33	0.765	
11/30/90	-2.06	32.84	35.37	08/24/90	-1.79	33.11	35.37	-2.28	25	0.751	
12/14/90	-3.49	31.41	35.37	05/18/90	-1.64	33.28	35.37	-2.11	29	0.735	
01/24/91	-2.89	32.01	35.37	03/25/92	-1.59	33.31	35.37	-2.06	30	0.718	
02/20/91	-2.04	32.86	35.37	11/22/91	-1.54	33.36	35.37	-2.01	31	0.701	
03/22/91	-1.94	32.96	35.37	05/15/94	-1.49	33.41	35.37	-1.96	15	0.683	
04/19/91	-1.09	33.81	35.37	04/15/94	-1.49	33.41	35.37	-1.96	15	0.684	
05/31/91	-0.09	34.81	35.37	07/30/90	-1.39	33.51	35.37	-1.86	31	0.667	
06/28/91	0.21	35.11	35.37	06/29/92	-1.39	33.51	35.37	-1.86	40	0.645	
07/16/91	0.11	35.01	35.37	07/28/93	-1.32	33.58	35.37	-1.79	40	0.623	
08/28/91	0.86	35.56	35.37	07/29/92	-1.24	33.66	35.37	-1.71	30	0.606	
09/23/91	-0.14	34.76	35.37	09/21/90	-1.19	33.71	35.37	-1.66	28	0.591	
10/22/91	-0.54	34.36	35.37	06/18/93	-1.19	33.71	35.37	-1.86	21	0.579	
11/22/91	-1.54	33.36	35.37	10/19/90	-1.09	33.81	35.37	-1.56	28	0.564	
12/20/91	-2.84	32.06	35.37	04/19/91	-1.09	33.81	35.37	-1.56	28	0.548	
01/03/92	-4.09	30.81	35.37	12/29/93	-0.89	34.01	35.37	-1.36	30	0.532	
02/24/92	-2.49	32.41	35.37	12/18/89	-0.74	34.16	35.37	-1.21	31	0.514	
03/25/92	-1.59	33.31	35.37	03/31/94	-0.69	34.21	35.37	-1.16	31	0.497	
04/27/92	-2.49	32.41	35.37	01/22/93	-0.54	34.36	35.37	-1.01	24	0.484	
05/20/92	-3.49	31.41	35.37	10/22/91	-0.54	34.36	35.37	-1.01	29	0.468	
06/29/92	-1.39	33.51	35.37	12/29/92	-0.44	34.46	35.37	-0.91	48	0.441	
07/29/92	-1.24	33.66	35.37	11/29/93	-0.44	34.46	35.37	-0.91	32	0.424	
08/21/92	-0.19	34.71	35.37	04/19/90	-0.44	34.46	35.37	-0.91	27	0.409	
09/29/92	0.21	35.11	35.37	01/18/94	-0.29	34.81	35.37	-0.76	20	0.398	
10/23/92	0.06	34.96	35.37	02/28/94	-0.29	34.81	35.37	-0.76	41	0.375	
11/11/92	-0.29	34.81	35.37	11/11/92	-0.29	34.81	35.37	-0.76	19	0.364	
12/29/92	-0.44	34.46	35.37	05/28/93	-0.24	34.66	35.37	-0.71	31	0.347	
01/22/93	-0.54	34.36	35.37	10/28/93	-0.24	34.66	35.37	-0.71	29	0.331	
02/23/93	-0.09	34.81	35.37	08/21/92	-0.19	34.71	35.37	-0.66	23	0.318	
03/17/93	0.21	35.11	35.37	09/23/91	-0.14	34.76	35.37	-0.61	28	0.303	
04/27/93	0.01	34.91	35.37	03/23/90	-0.14	34.76	35.37	-0.61	25	0.289	
05/28/93	-0.24	34.66	35.37	11/17/89	-0.09	34.81	35.37	-0.56	28	0.273	
06/18/93	-1.19	33.71	35.37	09/29/93	-0.09	34.81	35.37	-0.56	30	0.257	
07/28/93	-1.32	33.58	35.37	05/31/91	-0.09	34.81	35.37	-0.56	42	0.234	
08/30/93	-1.84	33.06	35.37	02/23/93	-0.09	34.81	35.37	-0.56	32	0.216	
09/29/93	-0.09	34.81	35.37	07/15/94 XX		34.90	35.37	-0.47	30	0.199	
10/28/93	-0.24	34.66	35.37	09/15/94	0.01	34.91	35.37	-0.46	16	0.190	
11/28/93	-0.44	34.46	35.37	04/27/93	0.01	34.91	35.37	-0.46	41	0.168	
12/29/93	-0.89	34.01	35.37	10/23/92	0.06	34.96	35.37	-0.41	24	0.154	
01/18/94	-0.29	34.81	35.37	02/26/90	0.06	34.96	35.37	-0.41	31	0.137	
02/28/94	-0.29	34.81	35.37	01/26/90	0.08	34.98	35.37	-0.39	39	0.116	
03/31/94	-0.69	34.21	35.37	07/18/91	0.11	35.01	35.37	-0.36	18	0.106	
04/15/94	-1.49	33.41	35.37	08/30/94	0.14	35.04	35.37	-0.33	46	0.080	
05/31/94	-2.06	32.84	35.37	03/17/93	0.21	35.11	35.37	-0.26	22	0.068	
06/15/94	-1.49	33.41	35.37	09/29/92	0.21	35.11	35.37	-0.26	39	0.048	
07/15/94		34.90	35.37	06/28/91	0.21	35.11	35.37	-0.26	28	0.031	
08/30/94	0.14	35.04	35.37	10/20/89	0.21	35.11	35.37	-0.26	14	0.023	
09/15/94	0.01	34.91	35.37	08/28/91	0.66	35.56	35.37	0.19	41	0.000	

-1.17

PSD DATA

Date	Level	HNP	Date	Level	HNP	Lev.-HNP	Time	Freq.	Median
10/31/88	102.18	102.7	09/30/89		102.7	-102.70	31		
11/30/88	101.85	102.7	08/31/89		102.7	-102.70	30		
12/31/88	102.68	102.7	03/30/94		102.7	-102.70	31		
01/31/89	102.59	102.7	11/30/89		102.7	-102.70	31		
02/28/89	102.53	102.7	04/30/94		102.7	-102.70	28		
03/31/89	102.30	102.7	08/31/93	100.40	102.7	-2.30	31		
04/30/89	101.39	102.7	05/31/94	100.40	102.7	-2.30	30		
05/31/89	100.41	102.7	11/30/93	100.40	102.7	-2.30	31		
06/30/89	101.82	102.7	12/31/93	100.40	102.7	-2.30	30		
07/31/89	102.71	102.7	05/31/89	100.41	102.7	-2.29	31	0.882	
08/31/89		102.7	06/30/90	100.42	102.7	-2.28	31	0.871	
09/30/89		102.7	05/31/90	100.42	102.7	-2.28	30	0.859	
10/31/89	102.15	102.7	11/30/92	100.43	102.7	-2.27	31	0.847	
11/30/89		102.7	12/31/92	100.43	102.7	-2.27	30	0.835	
12/31/89	102.20	102.7	09/30/92	100.43	102.7	-2.27	31	0.823	
01/31/90	102.80	102.7	07/31/93	100.44	102.7	-2.26	31	0.811	
02/28/90	102.48	102.7	08/31/92	100.44	102.7	-2.26	28	0.801	
03/31/90	102.32	102.7	09/30/93	100.44	102.7	-2.26	31	0.789	
04/30/90	100.82	102.7	07/31/92	100.45	102.7	-2.25	30	0.777	
05/31/90	100.42	102.7	06/30/92	100.45	102.7	-2.25	31	0.765	
06/30/90	100.42	102.7	10/31/93	100.45	102.7	-2.25	30	0.753	
07/31/90	101.08	102.7	05/31/92	100.46	102.7	-2.24	31	0.741	
08/31/90	102.59	102.7	12/31/91	100.47	102.7	-2.23	31	0.729	
09/30/90	101.99	102.7	01/31/92	100.47	102.7	-2.23	30	0.718	
10/31/90	102.25	102.7	11/30/91	100.47	102.7	-2.23	31	0.706	
11/30/90	101.24	102.7	04/30/92	100.48	102.7	-2.22	30	0.694	
12/31/90	100.49	102.7	12/31/90	100.49	102.7	-2.21	31	0.682	
01/30/91	101.17	102.7	10/31/91	100.49	102.7	-2.21	30	0.671	
02/28/91	101.17	102.7	10/31/92	100.49	102.7	-2.21	29	0.669	
03/31/91	101.88	102.7	02/28/92	100.57	102.7	-2.13	31	0.647	
04/30/91	102.43	102.7	03/31/92	100.68	102.7	-2.02	30	0.636	
05/31/91	102.68	102.7	01/31/94	100.80	102.7	-1.90	31	0.624	
06/30/91	102.84	102.7	04/30/90	100.82	102.7	-1.88	30	0.612	
07/13/91	102.90	102.7	06/30/95	100.91	102.7	-1.79	13	0.607	
09/30/91	101.83	102.7	07/31/90	101.08	102.7	-1.82	79	0.677	
10/31/91	100.49	102.7	01/30/91	101.17	102.7	-1.53	31	0.585	
11/30/91	100.47	102.7	02/28/91	101.17	102.7	-1.53	30	0.553	
12/31/91	100.47	102.7	05/31/93	101.20	102.7	-1.50	31	0.541	
01/31/92	100.47	102.7	11/30/90	101.24	102.7	-1.48	31	0.529	
02/28/92	100.57	102.7	04/30/89	101.39	102.7	-1.31	29	0.518	
03/31/92	100.68	102.7	09/30/93	101.47	102.7	-1.23	31	0.506	
04/30/92	100.48	102.7	01/31/93	101.48	102.7	-1.22	30	0.494	
05/31/92	100.48	102.7	06/30/89	101.62	102.7	-1.08	31	0.482	-1.23
06/30/92	100.45	102.7	02/28/94	101.63	102.7	-1.07	30	0.471	
07/31/92	100.45	102.7	06/30/94	101.65	102.7	-1.05	31	0.459	
08/31/92	100.44	102.7	11/30/88	101.85	102.7	-1.05	31	0.447	
09/30/92	100.43	102.7	03/31/91	101.88	102.7	-1.02	30	0.435	
10/31/92	100.49	102.7	09/30/91	101.83	102.7	-0.87	31	0.423	
11/30/92	100.43	102.7	05/31/95	101.94	102.7	-0.78	30	0.412	
12/31/92	100.43	102.7	09/30/90	101.99	102.7	-0.71	31	0.400	
01/31/93	101.48	102.7	10/31/89	102.15	102.7	-0.55	31	0.388	
02/28/93	102.41	102.7	10/31/88	102.18	102.7	-0.52	28	0.377	
03/31/93	102.70	102.7	12/31/89	102.20	102.7	-0.50	31	0.365	
04/30/93	102.60	102.7	10/31/90	102.25	102.7	-0.45	30	0.353	
05/31/93	101.20	102.7	03/31/89	102.30	102.7	-0.40	31	0.341	
06/30/93	100.44	102.7	03/31/90	102.32	102.7	-0.38	30	0.330	
07/31/93	100.44	102.7	07/31/95	102.35	102.7	-0.35	31	0.318	
08/31/93	100.40	102.7	02/28/93	102.41	102.7	-0.29	31	0.306	
09/30/93	101.47	102.7	04/30/91	102.43	102.7	-0.27	30	0.294	
10/31/93	100.45	102.7	04/30/96	102.43	102.7	-0.27	31	0.282	
11/30/93	100.40	102.7	02/28/90	102.48	102.7	-0.22	30	0.271	
12/31/93	100.40	102.7	02/28/89	102.53	102.7	-0.17	31	0.259	
01/31/94	100.80	102.7	03/31/95	102.55	102.7	-0.15	31	0.247	
02/28/94	101.63	102.7	01/31/89	102.59	102.7	-0.11	28	0.236	
03/30/94		102.7	06/31/90	102.59	102.7	-0.11	30	0.224	
04/30/94		102.7	04/30/93	102.80	102.7	-0.10	31	0.212	
05/31/94	100.40	102.7	01/31/90	102.80	102.7	-0.10	31	0.200	
06/30/94	101.85	102.7	02/28/95	102.84	102.7	-0.06	30	0.189	
07/31/94	103.08	102.7	06/31/91	102.86	102.7	-0.04	31	0.177	
08/31/94	103.08	102.7	12/31/94	102.87	102.7	-0.03	31	0.165	
09/30/94	102.98	102.7	12/31/88	102.89	102.7	-0.01	30	0.153	
10/31/94	102.79	102.7	03/31/93	102.70	102.7	0.00	31	0.141	
11/30/94	102.71	102.7	07/31/89	102.71	102.7	0.01	30	0.129	
12/31/94	102.87	102.7	11/30/94	102.71	102.7	0.01	31	0.118	
01/31/95	102.73	102.7	01/31/95	102.73	102.7	0.03	31	0.106	
02/28/95	102.84	102.7	06/30/95	102.78	102.7	0.06	28	0.095	
03/31/95	102.55	102.7	08/31/95	102.79	102.7	0.09	31	0.083	
04/30/95	102.43	102.7	10/31/94	102.79	102.7	0.09	30	0.071	
05/31/95	101.94	102.7	06/30/91	102.84	102.7	0.14	31	0.059	
06/30/95	100.91	102.7	10/31/95	102.84	102.7	0.14	30	0.048	
07/31/95	102.35	102.7	07/13/91	102.90	102.7	0.20	31	0.036	
08/31/95	102.79	102.7	09/30/94	102.96	102.7	0.26	31	0.024	
09/30/95	102.78	102.7	05/31/94	103.08	102.7	0.38	30	0.012	
10/31/95	102.84	102.7	07/31/94	103.08	102.7	0.38	31	0.000	

... .. raw level corrected to a ground level datum:

Elevation of ground = 13.93 =

Elev. of pipe (15.83 ft) - sock up (1.90) Personal Comm. P. NeSmith

HYDROGRAPH DATA

P50 DATA

Date	Raw Level	Level Elev	HNP	Date	Level	Level Elev	Lev.-HNP	Time	Freq	Median
10/01/88	0.67	14.60	15.7	06/01/92	-2.90	11.03	-4.67	31		
11/01/88	0.40	14.33	15.7	07/01/91	-2.90	11.03	-4.67	30		
12/01/88	1.54	15.47	15.7	05/01/91	-2.90	11.03	-4.67	30		
01/01/89	1.33	15.26	15.7	05/01/92	-2.65	11.28	-4.42	30	0.952	
02/01/89	1.42	15.35	15.7	06/01/89	-2.50	11.43	-4.27	31	0.940	
03/01/89	1.25	15.18	15.7	05/01/94	-2.30	11.63	-4.07	30	0.926	
04/01/89	0.37	14.30	15.7	07/01/92	-2.30	11.63	-4.07	30	0.916	
05/01/89	-1.17	12.76	15.7	08/01/93	-1.50	12.43	-3.27	31	0.904	
06/01/89	-2.50	11.43	15.7	05/01/90	-1.50	12.43	-3.27	30	0.892	
07/01/89	0.50	14.43	15.7	06/01/90	-1.20	12.73	-2.97	31	0.880	
08/01/89	1.37	15.30	15.7	05/01/89	-1.17	12.78	-2.94	30	0.868	
09/01/89	1.60	15.53	15.7	06/01/95	-1.15	12.78	-2.92	31	0.856	
10/01/89	1.30	15.23	15.7	01/01/92	-1.10	12.63	-2.87	31	0.843	
11/01/89	0.50	14.43	15.7	11/01/91	-1.10	12.63	-2.87	31	0.831	
12/01/89	0.69	14.62	15.7	12/01/91	-1.00	12.93	-2.77	30	0.819	
01/01/90	1.33	15.26	15.7	08/01/92	-0.90	13.03	-2.67	31	0.807	
02/01/90	1.25	15.18	15.7	06/01/94	-0.80	13.13	-2.57	31	0.795	
03/01/90	1.34	15.27	15.7	10/01/90	-0.79	13.14	-2.56	30	0.783	
04/01/90	0.48	14.41	15.7	05/01/93	-0.75	13.18	-2.52	30	0.771	
05/01/90	-1.50	12.43	15.7	05/01/95	-0.75	13.18	-2.52	30	0.759	
06/01/90	-1.20	12.73	15.7	03/01/91	-0.70	13.23	-2.47	28	0.748	
07/01/90	1.71	15.64	15.7	02/01/94	-0.50	13.43	-2.27	31	0.736	
08/01/90	1.05	14.98	15.7	04/01/91	-0.45	13.48	-2.22	31	0.723	
09/01/90	0.90	14.83	15.7	04/01/92	-0.40	13.53	-2.17	31	0.711	
10/01/90	-0.78	13.14	15.7	03/01/94	-0.33	13.60	-2.10	28	0.700	
11/01/90	0.50	14.43	15.7	02/01/92	-0.25	13.68	-2.02	31	0.688	
12/01/90	-0.20	13.73	15.7	11/01/93	-0.20	13.73	-1.97	31	0.675	
01/01/91	0.35	14.28	15.7	12/01/90	-0.20	13.73	-1.97	30	0.664	
02/01/91	1.00	14.83	15.7	11/01/92	-0.15	13.78	-1.82	31	0.651	
03/01/91	-0.70	13.23	15.7	03/01/92	-0.10	13.83	-1.87	29	0.640	
04/01/91	-0.45	13.48	15.7	12/01/92	-0.10	13.83	-1.87	30	0.628	
05/01/91	-2.90	11.03	15.7	06/01/91	0.10	14.03	-1.87	31	0.616	
06/01/91	0.10	14.03	15.7	04/01/94	0.10	14.03	-1.87	31	0.603	
07/01/91	-2.90	11.03	15.7	10/01/93	0.20	14.13	-1.57	30	0.591	
08/01/91	1.50	15.43	15.7	09/01/92	0.25	14.18	-1.52	31	0.579	
09/01/91	1.40	15.33	15.7	01/01/93	0.30	14.23	-1.47	31	0.567	
10/01/91	0.50	14.43	15.7	01/01/91	0.35	14.28	-1.42	31	0.555	
11/01/91	-1.10	12.83	15.7	04/01/89	0.37	14.30	-1.40	31	0.542	
12/01/91	-1.00	12.93	15.7	11/01/88	0.40	14.33	-1.37	31	0.530	
01/01/92	-1.10	12.83	15.7	04/01/90	0.48	14.41	-1.29	31	0.518	
02/01/92	-0.25	13.68	15.7	07/01/89	0.50	14.43	-1.27	30	0.506	
03/01/92	-0.10	13.83	15.7	10/01/92	0.50	14.43	-1.27	30	0.494	
04/01/92	-0.40	13.53	15.7	11/01/89	0.50	14.43	-1.27	31	0.482	
05/01/92	-2.65	11.28	15.7	10/01/91	0.50	14.43	-1.27	30	0.470	
06/01/92	-2.90	11.03	15.7	11/01/90	0.50	14.43	-1.27	31	0.458	
07/01/92	-2.30	11.63	15.7	10/01/88	0.67	14.60	-1.10	30	0.446	
08/01/92	-0.90	13.03	15.7	12/01/89	0.69	14.62	-1.08	30	0.434	
09/01/92	0.25	14.18	15.7	09/01/93	0.70	14.63	-1.07	31	0.422	
10/01/92	0.50	14.43	15.7	01/01/94	0.70	14.63	-1.07	31	0.409	
11/01/92	-0.15	13.78	15.7	12/01/94	0.75	14.68	-1.02	30	0.397	
12/01/92	-0.10	13.83	15.7	06/01/93	0.80	14.73	-0.97	31	0.385	
01/01/93	0.30	14.23	15.7	02/01/93	0.83	14.76	-0.94	31	0.373	
02/01/93	0.83	14.78	15.7	12/01/93	0.90	14.83	-0.87	30	0.361	
03/01/93	1.57	15.60	15.7	07/01/93	0.90	14.83	-0.87	30	0.349	
04/01/93	1.50	15.43	15.7	04/01/95	0.90	14.83	-0.87	31	0.337	
05/01/93	-0.75	13.18	15.7	09/01/90	0.90	14.83	-0.87	31	0.325	
06/01/93	0.60	14.73	15.7	11/01/94	0.93	14.86	-0.84	31	0.312	
07/01/93	0.90	14.83	15.7	07/01/94	1.00	14.93	-0.77	30	0.300	
08/01/93	-1.50	12.43	15.7	02/01/91	1.00	14.93	-0.77	31	0.288	
09/01/93	0.70	14.63	15.7	08/01/90	1.05	14.98	-0.72	31	0.276	
10/01/93	0.20	14.13	15.7	01/01/95	1.18	15.11	-0.59	31	0.264	
11/01/93	-0.20	13.73	15.7	03/01/89	1.25	15.18	-0.52	28	0.252	
12/01/93	0.90	14.83	15.7	02/01/90	1.25	15.18	-0.52	31	0.240	
01/01/94	0.70	14.63	15.7	03/01/95	1.28	15.19	-0.52	28	0.229	
02/01/94	-0.50	13.43	15.7	02/01/96	1.30	15.23	-0.47	31	0.217	
03/01/94	-0.33	13.60	15.7	10/01/89	1.30	15.23	-0.47	30	0.205	
04/01/94	0.10	14.03	15.7	07/01/95	1.30	15.23	-0.47	30	0.193	
05/01/94	-2.30	11.63	15.7	01/01/90	1.33	15.26	-0.44	31	0.181	
06/01/94	-0.80	13.13	15.7	01/01/89	1.33	15.26	-0.44	31	0.169	
07/01/94	1.00	14.90	15.7	03/01/90	1.34	15.27	-0.43	28	0.157	
08/01/94	1.50	15.43	15.7	08/01/89	1.37	15.30	-0.40	31	0.145	
09/01/94	1.80	15.73	15.7	09/01/91	1.40	15.33	-0.37	31	0.133	
10/01/94	1.50	15.43	15.7	02/01/89	1.42	15.35	-0.35	31	0.121	
11/01/94	0.90	14.66	15.7	08/01/91	1.50	15.43	-0.27	31	0.108	
12/01/94	0.75	14.68	15.7	08/01/94	1.50	15.43	-0.27	31	0.096	
01/01/95	1.18	15.11	15.7	04/01/93	1.50	15.43	-0.27	31	0.084	
02/01/95	1.30	15.23	15.7	10/01/94	1.50	15.43	-0.27	30	0.072	
03/01/95	1.28	15.19	15.7	12/01/88	1.54	15.47	-0.23	30	0.060	
04/01/95	0.90	14.83	15.7	09/01/89	1.50	15.53	-0.17	31	0.048	
05/01/95	-0.75	13.18	15.7	03/01/93	1.67	15.60	-0.10	28	0.037	
06/01/95	-1.15	12.78	15.7	07/01/90	1.71	15.64	-0.08	30	0.025	
07/01/95	1.30	15.23	15.7	09/01/94	1.80	15.73	0.03	31	0.013	
08/01/95	1.90	15.83	15.7	08/01/95	1.90	15.83	0.13	31	0.000	

-1.27



## Hydrograph Data

Date	Level	HNP	Date	Level	HNP	Lev.-HNP	Time Step	Freq.	Median
10/31/88	99.66	100.5	05/31/90	98.58	100.5	-3.92	31		
11/30/88	99.73	100.5	06/30/90	98.58	100.5	-3.92	30	0.978	
12/31/88	100.29	100.5	07/31/90	98.78	100.5	-3.72	46	0.959	
01/31/89	100.18	100.5	08/15/90	98.79	100.5	-3.71	15	0.953	
02/28/89	100.10	100.5	05/31/92	98.80	100.5	-3.70	31	0.941	
03/31/89	99.88	100.5	01/31/92	98.81	100.5	-3.69	31	0.929	
04/30/89	99.31	100.5	12/31/91	98.82	100.5	-3.68	31	0.917	
05/30/89	97.18	100.5	11/30/91	98.82	100.5	-3.68	30	0.905	
07/31/89	98.70	100.5	05/31/94	98.91	100.5	-3.59	31	0.893	
08/31/89	99.88	100.5	12/31/93	98.92	100.5	-3.58	31	0.881	
09/30/89	98.38	100.5	11/30/93	98.92	100.5	-3.58	30	0.870	
10/31/89	99.03	100.5	04/30/94	98.93	100.5	-3.58	30	0.858	
11/30/89	98.17	100.5	08/31/93	98.93	100.5	-3.57	31	0.846	
12/31/89	99.03	100.5	04/30/92	97.05	100.5	-3.45	30	0.835	
01/31/90	99.54	100.5	06/30/89	97.18	100.5	-3.34	61	0.811	
02/28/90	99.40	100.5	04/30/90	97.35	100.5	-3.15	30	0.799	
03/31/90	99.18	100.5	02/28/92	97.38	100.5	-3.12	29	0.788	
04/30/90	97.35	100.5	10/31/91	97.39	100.5	-3.11	31	0.778	
05/31/90	98.58	100.5	10/31/93	97.41	100.5	-3.09	31	0.764	
06/30/90	98.58	100.5	06/30/95	97.42	100.5	-3.08	30	0.753	
07/31/90	98.43	100.5	06/30/93	97.97	100.5	-2.53	30	0.741	
08/31/90	100.14	100.5	03/31/92	98.05	100.5	-2.45	31	0.729	
09/30/90	99.71	100.5	11/30/89	98.17	100.5	-2.33	30	0.717	
10/31/90	99.79	100.5	01/31/94	98.19	100.5	-2.31	31	0.705	
11/30/90	99.42	100.5	05/31/92	98.21	100.5	-2.29	31	0.693	
12/31/90	98.43	100.5	07/31/93	98.29	100.5	-2.21	31	0.681	
01/30/91	98.40	100.5	08/30/94	98.39	100.5	-2.11	30	0.670	
02/28/91	98.82	100.5	01/30/91	98.40	100.5	-2.10	30	0.658	
03/31/91	99.14	100.5	12/31/90	98.43	100.5	-2.07	31	0.646	
04/30/91	99.82	100.5	07/31/90	98.43	100.5	-2.07	31	0.634	
05/31/91	100.24	100.5	03/31/94	98.49	100.5	-2.01	31	0.622	
06/30/91	100.33	100.5	09/30/92	98.50	100.5	-2.00	30	0.611	
07/31/91	100.42	100.5	06/30/93	98.57	100.5	-1.93	30	0.599	
08/31/91	100.10	100.5	02/28/91	98.62	100.5	-1.68	29	0.588	
09/30/91	99.40	100.5	05/31/95	98.95	100.5	-1.55	31	0.576	
10/31/91	97.39	100.5	02/28/94	98.95	100.5	-1.55	28	0.565	
11/30/91	98.62	100.5	12/31/92	98.01	100.5	-1.48	31	0.553	
12/31/91	98.82	100.5	12/31/89	99.03	100.5	-1.47	31	0.541	
01/31/92	98.81	100.5	10/31/89	99.03	100.5	-1.47	31	0.529	
02/29/92	97.38	100.5	07/31/95	99.11	100.5	-1.39	31	0.517	
03/31/92	98.05	100.5	03/31/91	99.14	100.5	-1.38	31	0.505	
04/30/92	97.05	100.5	03/31/90	99.18	100.5	-1.34	31	0.493	
05/31/92	98.80	100.5	11/30/92	99.25	100.5	-1.25	30	0.482	-1.36
06/15/92	95.79	100.5	01/31/93	99.25	100.5	-1.25	31	0.470	
07/31/92	98.78	100.5	04/30/89	99.31	100.5	-1.19	30	0.458	
08/31/92	98.21	100.5	10/31/92	99.31	100.5	-1.19	31	0.446	
09/30/92	98.50	100.5	05/31/93	99.34	100.5	-1.16	31	0.434	
10/31/92	99.31	100.5	09/30/89	99.38	100.5	-1.12	30	0.422	
11/30/92	99.25	100.5	02/28/90	99.40	100.5	-1.10	28	0.412	
12/31/92	99.01	100.5	09/30/91	99.40	100.5	-1.10	30	0.400	
01/31/93	99.25	100.5	11/30/90	99.42	100.5	-1.08	30	0.388	
02/28/93	98.91	100.5	01/31/90	99.54	100.5	-0.96	31	0.376	
03/31/93	100.31	100.5	04/30/95	99.68	100.5	-0.82	30	0.365	
04/30/93	100.20	100.5	07/31/89	99.70	100.5	-0.80	31	0.353	
05/31/93	99.34	100.5	09/30/90	99.71	100.5	-0.79	30	0.341	
06/30/93	97.97	100.5	11/30/88	99.73	100.5	-0.77	30	0.330	
07/31/93	98.29	100.5	10/31/90	99.79	100.5	-0.71	31	0.318	
08/31/93	98.93	100.5	04/30/91	99.82	100.5	-0.68	30	0.306	
09/30/93	98.57	100.5	10/31/88	99.88	100.5	-0.64	31	0.294	
10/31/93	97.41	100.5	03/31/89	99.88	100.5	-0.64	31	0.282	
11/30/93	96.92	100.5	08/31/89	99.88	100.5	-0.62	31	0.270	
12/31/93	96.92	100.5	02/28/93	99.91	100.5	-0.59	28	0.259	
01/31/94	98.19	100.5	03/31/95	99.94	100.5	-0.58	31	0.247	
02/28/94	98.95	100.5	02/28/89	100.10	100.5	-0.40	28	0.237	
03/31/94	98.49	100.5	08/31/91	100.10	100.5	-0.40	31	0.225	
04/30/94	98.93	100.5	02/28/95	100.13	100.5	-0.37	28	0.214	
05/31/94	98.91	100.5	08/31/90	100.14	100.5	-0.36	31	0.202	
06/30/94	98.39	100.5	12/31/94	100.17	100.5	-0.33	31	0.190	
07/31/94	100.38	100.5	01/31/89	100.18	100.5	-0.32	31	0.178	
08/31/94	100.51	100.5	08/31/85	100.20	100.5	-0.30	31	0.166	
09/30/94	100.47	100.5	04/30/93	100.20	100.5	-0.30	30	0.154	
10/31/94	100.36	100.5	11/30/94	100.21	100.5	-0.29	30	0.143	
11/30/94	100.21	100.5	05/31/91	100.24	100.5	-0.28	31	0.131	
12/31/94	100.17	100.5	01/31/95	100.24	100.5	-0.26	31	0.119	
01/31/95	100.24	100.5	12/31/88	100.29	100.5	-0.21	31	0.107	
02/28/95	100.13	100.5	03/31/93	100.31	100.5	-0.19	31	0.095	
03/31/95	99.94	100.5	06/30/91	100.33	100.5	-0.17	30	0.083	
04/30/95	99.68	100.5	10/31/94	100.36	100.5	-0.14	31	0.071	
05/31/95	98.95	100.5	08/30/95	100.37	100.5	-0.13	30	0.060	
06/30/95	97.42	100.5	07/31/94	100.38	100.5	-0.12	31	0.048	
07/31/95	99.11	100.5	10/31/95	100.42	100.5	-0.08	31	0.036	
08/31/95	100.20	100.5	07/31/91	100.42	100.5	-0.08	31	0.024	
09/30/95	100.37	100.5	09/30/94	100.47	100.5	-0.03	30	0.012	
10/31/95	100.42	100.5	08/31/94	100.51	100.5	0.01	31	0.000	

			F20 DATA						
Date	Level	HNP	Date	Level	HNP	Lev.-HNP	Time	Freq.	Median
09/30/88	98.40	98.9	12/31/91	95.01	98.9	-3.89	31		
10/31/88	98.05	98.9	11/30/89	95.03	98.9	-3.87	30	0.977	
11/30/88	97.51	98.9	11/30/91	95.07	98.9	-3.83	30	0.985	
12/31/88	97.87	98.9	01/31/92	95.09	98.9	-3.81	31	0.983	
01/31/89	98.58	98.9	05/31/94	95.14	98.9	-3.78	31	0.942	
02/28/89	98.51	98.9	04/30/94	95.19	98.9	-3.71	30	0.930	
03/31/89	98.28	98.9	12/31/93	95.20	98.9	-3.70	31	0.918	
04/30/89	97.51	98.9	08/31/93	95.27	98.9	-3.63	31	0.908	
05/31/89	95.50	98.9	09/30/89	95.40	98.9	-3.50	30	0.895	
06/30/89	95.40	98.9	08/31/90	95.42	98.9	-3.48	31	0.883	
07/31/89	96.85	98.9	05/31/89	95.50	98.9	-3.40	31	0.871	
08/31/89	97.08	98.9	08/30/90	95.52	98.9	-3.38	30	0.860	
09/30/89	98.04	98.9	10/31/89	95.57	98.9	-3.33	31	0.848	
10/31/89	95.57	98.9	11/30/90	95.58	98.9	-3.24	30	0.838	
11/30/89	95.03	98.9	08/30/96	95.72	98.9	-3.18	30	0.823	
12/31/89	96.32	98.9	07/31/92	95.86	98.9	-3.04	31	0.813	
01/31/90	97.21	98.9	02/29/92	95.88	98.9	-3.02	29	0.802	
02/28/90	98.88	98.9	04/30/90	95.94	98.9	-2.99	30	0.791	
03/31/90	96.93	98.9	05/31/92	96.01	98.9	-2.89	31	0.779	
04/30/90	95.94	98.9	09/30/89	96.04	98.9	-2.86	30	0.787	
05/31/90	95.42	98.9	08/30/92	96.05	98.9	-2.85	30	0.786	
06/30/90	95.52	98.9	05/30/93	96.15	98.9	-2.75	30	0.744	
07/31/90	97.00	98.9	12/31/89	96.32	98.9	-2.59	31	0.733	
08/31/90	98.48	98.9	04/30/92	96.40	98.9	-2.50	30	0.721	
09/30/90	98.48	98.9	10/31/91	96.42	98.9	-2.48	31	0.709	
10/31/90	98.42	98.9	09/30/93	96.43	98.9	-2.47	30	0.698	
11/30/90	97.92	98.9	03/31/92	96.47	98.9	-2.43	31	0.686	
12/31/90	96.90	98.9	08/30/94	96.59	98.9	-2.31	30	0.674	
01/30/91	98.83	98.9	05/31/95	96.68	98.9	-2.22	31	0.663	
02/28/91	97.18	98.9	10/31/93	96.88	98.9	-2.22	31	0.651	
03/25/91	97.70	98.9	01/31/94	96.72	98.9	-2.18	31	0.639	
04/30/91	98.49	98.9	03/31/94	96.78	98.9	-2.12	31	0.627	
05/31/91	98.78	98.9	01/30/91	96.83	98.9	-2.07	30	0.616	
06/30/91	98.77	98.9	07/31/89	96.85	98.9	-2.05	31	0.604	
07/31/91	98.85	98.9	02/28/90	96.88	98.9	-2.04	28	0.593	
08/31/91	98.59	98.9	12/31/90	96.90	98.9	-2.00	31	0.581	
09/30/91	97.74	98.9	03/31/90	96.93	98.9	-1.97	31	0.569	
10/31/91	98.42	98.9	07/31/90	97.00	98.9	-1.90	31	0.558	
11/30/91	95.07	98.9	07/31/93	97.08	98.9	-1.82	31	0.548	
12/31/91	95.01	98.9	08/31/89	97.08	98.9	-1.82	31	0.534	
01/31/92	95.09	98.9	02/28/91	97.16	98.9	-1.74	28	0.523	
02/29/92	95.88	98.9	01/31/90	97.21	98.9	-1.69	31	0.511	
03/31/92	96.47	98.9	07/31/95	97.23	98.9	-1.67	31	0.499	-1.57
04/30/92	96.40	98.9	02/28/94	97.37	98.9	-1.53	28	0.488	
05/31/92	96.01	98.9	08/31/92	97.47	98.9	-1.43	31	0.478	
06/30/92	96.05	98.9	11/30/88	97.51	98.9	-1.39	30	0.465	
07/31/92	95.86	98.9	04/30/89	97.51	98.9	-1.39	30	0.454	
08/31/92	97.47	98.9	05/31/93	97.59	98.9	-1.31	31	0.442	
09/30/92	98.39	98.9	03/25/91	97.70	98.9	-1.20	25	0.432	
10/31/92	98.83	98.9	09/30/91	97.74	98.9	-1.16	30	0.421	
11/30/92	98.31	98.9	12/31/88	97.87	98.9	-1.03	31	0.409	
12/31/92	98.11	98.9	11/30/90	97.92	98.9	-0.98	30	0.397	
01/31/93	98.15	98.9	10/31/88	98.05	98.9	-0.85	31	0.386	
02/28/93	98.83	98.9	12/31/92	98.11	98.9	-0.79	31	0.374	
03/31/93	98.85	98.9	01/31/93	98.16	98.9	-0.75	31	0.362	
04/30/93	98.82	98.9	04/30/95	98.16	98.9	-0.75	30	0.350	
05/31/93	97.59	98.9	03/31/89	98.26	98.9	-0.84	31	0.339	
06/30/93	98.18	98.9	11/30/92	98.31	98.9	-0.59	30	0.327	
07/31/93	97.08	98.9	09/30/92	98.39	98.9	-0.51	30	0.318	
08/31/93	95.27	98.9	03/31/95	98.39	98.9	-0.61	31	0.304	
09/30/93	98.43	98.9	09/30/88	98.40	98.9	-0.60	30	0.292	
10/31/93	98.88	98.9	10/31/90	98.42	98.9	-0.48	31	0.280	
11/30/93	95.86	98.9	08/31/90	98.48	98.9	-0.44	31	0.269	
12/31/93	95.20	98.9	09/30/90	98.48	98.9	-0.44	30	0.257	
01/31/94	98.72	98.9	04/30/91	98.49	98.9	-0.41	30	0.243	
02/28/94	97.37	98.9	02/28/89	98.51	98.9	-0.39	28	0.233	
03/31/94	98.78	98.9	01/31/89	98.56	98.9	-0.34	31	0.221	
04/30/94	95.19	98.9	02/28/95	98.57	98.9	-0.33	28	0.210	
05/31/94	95.14	98.9	08/31/91	98.59	98.9	-0.31	31	0.198	
06/30/94	96.59	98.9	08/31/95	98.60	98.9	-0.30	31	0.186	
07/31/94	98.82	98.9	04/30/93	98.62	98.9	-0.28	30	0.178	
08/31/94	98.93	98.9	02/28/93	98.63	98.9	-0.27	28	0.184	
09/30/94	98.93	98.9	10/31/92	98.63	98.9	-0.27	31	0.152	
10/31/94	98.81	98.9	11/30/94	98.64	98.9	-0.26	30	0.141	
11/30/94	98.84	98.9	12/31/94	98.68	98.9	-0.22	31	0.129	
12/31/94	98.88	98.9	01/31/95	98.73	98.9	-0.17	31	0.117	
01/31/95	98.73	98.9	05/31/91	98.76	98.9	-0.14	31	0.105	
02/28/95	98.57	98.9	09/30/95	98.77	98.9	-0.13	30	0.094	
03/31/95	98.39	98.9	06/30/91	98.77	98.9	-0.13	30	0.083	
04/30/95	98.15	98.9	10/31/94	98.81	98.9	-0.09	31	0.071	
05/31/95	98.68	98.9	07/31/94	98.82	98.9	-0.08	31	0.059	
06/30/95	95.72	98.9	03/31/93	98.85	98.9	-0.05	31	0.047	
07/31/95	97.23	98.9	10/31/95	98.85	98.9	-0.05	31	0.035	
08/31/95	98.50	98.9	07/31/91	98.85	98.9	-0.05	31	0.023	
09/30/95	98.77	98.9	09/30/94	98.93	98.9	0.03	30	0.012	
10/31/95	98.85	98.9	08/31/94	98.93	98.9	0.03	31	0.000	



... .. raw elev corrected to a ground level datum:

Elevation of ground per WCRWSA = 40.80 feet

HYDROGRAPH DATA

P50 DATA

Date	Raw Level	Level Elev	HNP	Date	Level	Level Elev	Lev.-HNP	Time	Freq	Median
10/01/88	1.75	43.74	44.21	06/01/94	-2.50	39.49	-4.72	31		
11/01/88	1.19	43.16	44.21	06/01/92	-2.50	39.49	-4.72	31		0.978
12/01/88	2.02	44.01	44.21	05/01/92	-2.50	39.49	-4.72	30		0.965
01/01/89	2.81	44.80	44.21	07/01/92	-2.45	39.54	-4.67	30		0.953
02/01/89	1.99	43.98	44.21	08/01/89	-2.43	39.56	-4.65	31		0.941
03/01/89	1.73	43.72	44.21	05/01/94	-2.40	39.59	-4.62	30		0.929
04/01/89	1.38	43.37	44.21	06/01/90	-2.30	39.69	-4.52	31		0.917
05/01/89	0.27	42.28	44.21	05/01/90	-1.50	40.48	-3.72	30		0.906
06/01/89	-0.73	41.28	44.21	04/01/92	-1.45	40.54	-3.67	31		0.894
07/01/89	-0.73	41.28	44.21	06/21/95	-1.33	40.87	-3.55	28		0.883
08/01/89	-2.43	39.56	44.21	08/01/93	-1.15	40.84	-3.37	31		0.871
09/01/89	0.47	42.46	44.21	05/24/95	-1.08	40.92	-3.30	29		0.860
10/01/89	0.84	42.83	44.21	06/01/89	-0.73	41.26	-2.95	31		0.848
11/01/89	-0.40	41.59	44.21	07/01/89	-0.73	41.26	-2.95	30		0.836
12/01/89	0.42	42.41	44.21	01/01/92	-0.58	41.41	-2.80	31		0.824
01/01/90	1.13	43.12	44.21	12/01/91	-0.40	41.59	-2.62	30		0.813
02/01/90	0.77	42.78	44.21	11/01/89	-0.40	41.59	-2.62	31		0.801
03/01/90	2.23	44.22	44.21	06/01/93	-0.35	41.64	-2.57	31		0.789
04/01/90	0.84	42.83	44.21	11/01/91	0.09	42.08	-2.13	31		0.777
05/01/90	-1.50	40.49	44.21	03/01/92	0.10	42.09	-2.12	29		0.765
06/01/90	-2.30	39.69	44.21	02/01/92	0.11	42.10	-2.11	31		0.753
07/01/90	0.74	42.73	44.21	07/01/94	0.28	42.25	-1.96	30		0.742
08/01/90	1.62	43.61	44.21	05/01/89	0.27	42.26	-1.95	30		0.730
09/01/90	1.47	43.46	44.21	04/01/94	0.28	42.27	-1.94	31		0.718
10/01/90	1.39	43.38	44.21	12/01/89	0.42	42.41	-1.80	30		0.707
11/01/90	0.69	42.68	44.21	09/01/89	0.47	42.46	-1.75	31		0.695
12/01/90	0.89	42.88	44.21	08/01/92	0.60	42.49	-1.72	31		0.683
01/01/91	0.81	42.80	44.21	10/01/89	0.64	42.63	-1.58	30		0.671
02/01/91	0.79	42.78	44.21	11/01/90	0.69	42.68	-1.53	31		0.659
03/01/91	1.60	43.49	44.21	07/01/90	0.74	42.73	-1.48	30		0.647
04/01/91	2.20	44.19	44.21	02/01/90	0.77	42.75	-1.45	31		0.635
05/01/91	1.61	43.60	44.21	02/01/91	0.79	42.78	-1.43	31		0.623
06/01/91	2.50	44.49	44.21	01/01/91	0.81	42.80	-1.41	31		0.611
07/01/91	2.60	44.59	44.21	04/01/90	0.84	42.83	-1.38	31		0.599
08/01/91	2.78	44.75	44.21	12/01/90	0.89	42.88	-1.33	30		0.588
09/01/91	2.64	44.63	44.21	04/26/95	0.98	42.97	-1.24	27		0.577
10/01/91	1.21	43.20	44.21	07/01/93	1.01	43.00	-1.21	30		0.566
11/01/91	0.09	42.08	44.21	12/01/93	1.10	43.09	-1.12	30		0.554
12/01/91	-0.40	41.59	44.21	01/01/90	1.13	43.12	-1.09	31		0.542
01/01/92	-0.58	41.41	44.21	11/21/94	1.15	43.14	-1.07	33		0.529
02/01/92	0.11	42.10	44.21	11/01/88	1.19	43.18	-1.03	31		0.517
03/01/92	0.10	42.09	44.21	10/01/91	1.21	43.20	-1.01	30		0.506
04/01/92	-1.45	40.54	44.21	01/01/94	1.24	43.23	-0.98	31		0.494
05/01/92	-2.50	39.49	44.21	06/01/93	1.33	43.32	-0.89	30		0.482
06/01/92	-2.50	39.49	44.21	07/19/95	1.36	43.35	-0.86	28		0.471
07/01/92	-2.45	39.54	44.21	04/01/89	1.38	43.37	-0.84	31		0.459
08/01/92	0.50	42.49	44.21	10/01/90	1.39	43.38	-0.83	30		0.448
09/01/92	2.00	43.89	44.21	09/01/90	1.47	43.46	-0.75	31		0.436
10/01/92	1.88	43.87	44.21	03/01/91	1.50	43.49	-0.72	28		0.425
11/01/92	1.78	43.77	44.21	12/21/94	1.54	43.53	-0.68	30		0.413
12/01/92	1.88	43.87	44.21	08/01/94	1.55	43.54	-0.67	31		0.401
01/01/93	1.71	43.70	44.21	03/30/95	1.57	43.56	-0.65	42		0.388
02/01/93	1.75	43.74	44.21	05/01/91	1.61	43.60	-0.61	30		0.373
03/01/93	1.82	43.81	44.21	08/01/90	1.62	43.61	-0.60	31		0.361
04/01/93	1.84	43.83	44.21	10/01/93	1.65	43.64	-0.57	30		0.350
05/01/93	1.33	43.32	44.21	03/01/94	1.70	43.69	-0.52	28		0.339
06/01/93	-0.35	41.64	44.21	01/01/93	1.71	43.70	-0.51	31		0.327
07/01/93	1.01	43.00	44.21	01/18/95	1.72	43.71	-0.50	28		0.316
08/01/93	-1.15	40.84	44.21	03/01/89	1.73	43.72	-0.49	28		0.306
09/01/93	1.91	43.90	44.21	11/01/93	1.74	43.73	-0.48	31		0.293
10/01/93	1.65	43.64	44.21	02/01/93	1.75	43.74	-0.47	31		0.281
11/01/93	1.74	43.73	44.21	10/01/88	1.75	43.74	-0.47	30		0.269
12/01/93	1.10	43.09	44.21	02/01/94	1.78	43.77	-0.44	31		0.257
01/01/94	1.24	43.23	44.21	11/01/92	1.78	43.77	-0.44	31		0.245
02/01/94	1.78	43.77	44.21	03/01/93	1.82	43.81	-0.40	28		0.235
03/01/94	1.70	43.69	44.21	04/01/93	1.84	43.83	-0.38	31		0.223
04/01/94	0.28	42.27	44.21	02/16/95	1.88	43.87	-0.34	29		0.211
05/01/94	-2.40	39.59	44.21	10/01/92	1.88	43.87	-0.34	30		0.200
06/01/94	-2.50	39.49	44.21	12/01/92	1.88	43.87	-0.34	30		0.188
07/01/94	0.25	42.25	44.21	09/01/93	1.91	43.90	-0.31	31		0.178
08/01/94	1.56	43.54	44.21	09/01/94	1.96	43.95	-0.26	31		0.164
09/01/94	1.96	43.95	44.21	02/01/89	1.98	43.98	-0.23	31		0.152
10/19/94	2.03	44.02	44.21	09/01/92	2.00	43.99	-0.22	31		0.140
11/21/94	1.15	43.14	44.21	09/27/95	2.01	44.00	-0.21	29		0.129
12/21/94	1.54	43.63	44.21	12/01/88	2.02	44.01	-0.20	30		0.117
01/18/95	1.72	43.71	44.21	10/19/94	2.03	44.02	-0.19	48		0.099
02/18/95	1.88	43.87	44.21	06/29/95	2.08	44.07	-0.14	41		0.083
03/30/95	1.57	43.56	44.21	04/01/91	2.20	44.19	-0.02	31		0.071
04/26/95	0.98	42.97	44.21	03/01/90	2.23	44.22	0.01	28		0.060
05/24/95	-1.08	40.82	44.21	06/01/91	2.50	44.49	0.28	31		0.048
06/21/95	-1.33	40.67	44.21	07/01/91	2.50	44.59	0.38	30		0.036
07/19/95	1.36	43.35	44.21	09/01/91	2.84	44.63	0.42	31		0.024
08/29/95	2.08	44.07	44.21	08/01/91	2.78	44.75	0.54	31		0.012
09/27/95	2.01	44.00	44.21	01/01/89	2.81	44.80	0.59	31		0.000

-1.00

... data were corrected to a ground level datum:

Elevation of ground = 20.19 = Elev. of pipe (21.54 ft) - sock up (1.35) Personal Comm. P. NeSmith  
 HYDROGRAPH DATA PISO DATA

Date	Raw Level	Level Elev	HNP	Date	Level Elev	Level Elev	Lev.-HNP	Time	Freq	Median
10/01/88	-1.00	19.19	21.13	05/01/91	-4.50	15.69	-5.44	30		
11/01/88	-1.00	19.19	21.13	06/01/92	-4.50	15.69	-5.44	31		
12/01/88	0.06	20.25	21.13	06/01/92	-4.50	15.69	-5.44	30		
01/01/89	-0.17	20.02	21.13	08/01/91	-4.50	15.69	-5.44	31		
02/01/89	-0.25	19.94	21.13	07/01/91	-4.50	15.69	-5.44	30		
03/01/89	0.29	20.48	21.13	06/01/91	-4.50	15.69	-5.44	31		
04/01/89	-2.12	18.07	21.13	08/01/89	-3.90	16.29	-4.84	31	0.915	
05/01/89	-3.33	16.86	21.13	07/01/92	-3.80	16.39	-4.74	30	0.904	
06/01/89	-3.90	16.29	21.13	08/01/93	-3.50	16.69	-4.44	31	0.891	
07/01/89	-0.67	19.52	21.13	02/01/92	-3.48	16.72	-4.42	31	0.879	
08/01/89	0.00	20.19	21.13	06/01/90	-3.44	16.75	-4.38	31	0.867	
09/01/89	0.00	20.19	21.13	05/01/94	-3.40	16.79	-4.34	30	0.858	
10/01/89	0.00	20.19	21.13	05/01/89	-3.33	16.86	-4.27	30	0.843	
11/01/89	-0.50	19.69	21.13	05/01/95	-3.30	16.89	-4.24	30	0.831	
12/01/89	-0.25	19.94	21.13	11/01/91	-3.20	16.99	-4.14	31	0.819	
01/01/90	0.12	20.31	21.13	12/01/91	-3.17	17.02	-4.11	30	0.807	
02/01/90	0.05	20.24	21.13	01/01/92	-3.10	17.09	-4.04	31	0.795	
03/01/90	-0.19	20.00	21.13	04/01/92	-3.01	17.18	-3.95	31	0.782	
04/01/90	-0.93	19.26	21.13	05/01/90	-3.00	17.19	-3.94	30	0.770	
05/01/90	-3.00	17.19	21.13	05/01/93	-3.00	17.19	-3.94	30	0.759	
06/01/90	-3.44	16.75	21.13	03/01/92	-2.98	17.21	-3.92	28	0.747	
07/01/90	0.00	20.19	21.13	04/01/91	-2.94	17.25	-3.88	31	0.735	
08/01/90	-0.47	19.72	21.13	12/01/93	-2.75	17.44	-3.69	30	0.723	
09/01/90	-0.90	19.29	21.13	08/01/95	-2.73	17.47	-3.66	31	0.711	
10/01/90	-0.78	19.41	21.13	08/01/92	-2.45	17.74	-3.39	31	0.698	
11/01/90	-1.91	18.26	21.13	03/01/94	-2.32	17.87	-3.26	28	0.687	
12/01/90	-0.10	20.09	21.13	04/01/89	-2.12	18.07	-3.06	31	0.675	
01/01/91	-1.60	18.59	21.13	03/01/91	-2.10	18.09	-3.04	28	0.664	
02/01/91	-2.09	18.10	21.13	11/01/92	-2.10	18.09	-3.04	31	0.652	
03/01/91	-2.10	18.09	21.13	12/01/92	-2.10	18.09	-3.04	30	0.640	
04/01/91	-2.94	17.25	21.13	02/01/91	-2.09	18.10	-3.03	31	0.628	
05/01/91	-4.30	15.89	21.13	11/01/93	-2.01	18.18	-2.95	31	0.615	
06/01/91	-4.50	15.69	21.13	11/01/90	-1.91	18.28	-2.85	31	0.603	
07/01/91	-4.50	15.69	21.13	01/01/93	-1.80	18.39	-2.74	31	0.591	
08/01/91	-4.30	15.89	21.13	10/01/91	-1.75	18.44	-2.69	30	0.579	
09/01/91	-0.20	19.99	21.13	07/01/93	-1.70	18.49	-2.64	30	0.567	
10/01/91	-1.75	18.44	21.13	06/01/94	-1.70	18.49	-2.64	31	0.555	
11/01/91	-3.20	16.99	21.13	10/01/93	-1.60	18.59	-2.54	30	0.543	
12/01/91	-3.17	17.02	21.13	01/01/91	-1.60	18.59	-2.54	31	0.530	
01/01/92	-3.10	17.09	21.13	04/01/94	-1.50	18.69	-2.44	31	0.518	
02/01/92	-3.48	16.72	21.13	02/01/93	-1.25	18.94	-2.19	31	0.506	
03/01/92	-2.98	17.21	21.13	02/01/94	-1.25	18.94	-2.19	31	0.494	-2.19
04/01/92	-3.01	17.18	21.13	10/01/88	-1.00	19.19	-1.94	30	0.482	
05/01/92	-4.50	15.69	21.13	09/01/93	-1.00	19.19	-1.94	31	0.470	
06/01/92	-4.50	15.69	21.13	11/01/89	-1.00	19.19	-1.94	31	0.457	
07/01/92	-3.90	16.39	21.13	04/01/95	-0.98	19.22	-1.91	31	0.445	
08/01/92	-2.45	17.74	21.13	04/01/90	-0.93	19.25	-1.87	31	0.433	
09/01/92	-0.50	19.69	21.13	09/01/90	-0.90	19.29	-1.84	31	0.420	
10/01/92	-0.55	19.64	21.13	10/01/90	-0.78	19.41	-1.72	30	0.409	
11/01/92	-2.10	18.09	21.13	06/01/93	-0.70	19.49	-1.64	31	0.396	
12/01/92	-2.10	18.09	21.13	07/01/89	-0.67	19.52	-1.61	30	0.384	
01/01/93	-1.80	18.39	21.13	01/01/94	-0.60	19.59	-1.54	31	0.372	
02/01/93	-1.25	18.94	21.13	10/01/92	-0.55	19.64	-1.49	30	0.360	
03/01/93	0.08	20.27	21.13	11/01/89	-0.50	19.69	-1.44	31	0.348	
04/01/93	0.00	20.19	21.13	08/01/92	-0.50	19.69	-1.44	31	0.336	
05/01/93	-3.00	17.19	21.13	06/01/90	-0.47	19.72	-1.41	31	0.323	
06/01/93	-0.70	19.49	21.13	08/01/94	-0.30	19.89	-1.24	31	0.311	
07/01/93	-1.70	18.49	21.13	12/01/94	-0.25	19.94	-1.19	30	0.299	
08/01/93	-3.50	16.69	21.13	12/01/89	-0.25	19.94	-1.19	30	0.287	
09/01/93	-1.00	19.19	21.13	02/01/89	-0.25	19.94	-1.19	31	0.275	
10/01/93	-1.60	18.59	21.13	09/01/91	-0.20	19.99	-1.14	31	0.263	
11/01/93	-2.01	18.18	21.13	03/01/90	-0.19	20.00	-1.13	28	0.252	
12/01/93	-2.75	17.44	21.13	01/01/95	-0.18	20.02	-1.11	31	0.239	
01/01/94	-0.60	19.59	21.13	01/01/89	-0.17	20.02	-1.11	31	0.227	
02/01/94	-1.25	18.94	21.13	03/01/95	-0.15	20.04	-1.09	28	0.216	
03/01/94	-2.32	17.87	21.13	12/01/90	-0.10	20.09	-1.04	30	0.204	
04/01/94	-1.50	18.69	21.13	11/01/94	-0.08	20.12	-1.01	31	0.192	
05/01/94	-3.40	16.79	21.13	07/01/94	0.00	20.19	-0.94	30	0.180	
06/01/94	-1.70	18.49	21.13	07/01/90	0.00	20.19	-0.94	30	0.168	
07/01/94	0.00	20.19	21.13	08/01/89	0.00	20.19	-0.94	31	0.156	
08/01/94	-0.30	19.89	21.13	04/01/93	0.00	20.19	-0.94	31	0.144	
09/01/94	0.10	20.29	21.13	10/01/89	0.00	20.19	-0.94	30	0.132	
10/01/94	0.10	20.29	21.13	09/01/89	0.00	20.19	-0.94	31	0.119	
11/01/94	-0.08	20.12	21.13	02/01/90	0.05	20.24	-0.89	31	0.107	
12/01/94	-0.25	19.94	21.13	12/01/88	0.06	20.25	-0.88	30	0.095	
01/01/95	-0.18	20.02	21.13	03/01/93	0.08	20.27	-0.86	28	0.084	
02/01/95	0.09	20.28	21.13	02/01/95	0.09	20.28	-0.85	31	0.072	
03/01/95	-0.16	20.04	21.13	07/01/95	0.10	20.29	-0.84	30	0.060	
04/01/95	-0.98	19.22	21.13	10/01/94	0.10	20.29	-0.84	30	0.048	
05/01/95	-3.30	16.89	21.13	09/01/94	0.10	20.29	-0.84	31	0.036	
06/01/95	-2.73	17.47	21.13	01/01/90	0.12	20.31	-0.82	31	0.024	
07/01/95	0.10	20.29	21.13	03/01/89	0.29	20.48	-0.86	28	0.013	
08/01/95	0.43	20.62	21.13	08/01/95	0.43	20.62	-0.51	31	0.000	

Hydrograph Data  
 Elevation of ground = 51.00 \*  
 Elev. of pipe (32.71 ft) - back up (2.05) Personal Contr. P. Nesmet

Date	Flow	Level	HNP	Flow	Level	Flow	Level
10/01/86	49.91	-1.75	50.96	45.91	-5.05	31	0.978
11/01/86	49.54	-2.12	50.96	45.91	-5.05	30	0.954
12/01/86	50.58	-1.00	50.96	45.91	-5.05	31	0.952
01/01/87	50.06	-1.80	50.96	45.91	-5.05	30	0.940
02/01/87	50.06	-1.58	50.96	45.91	-5.05	31	0.928
03/01/87	48.49	-2.17	50.96	45.91	-5.05	28	0.917
04/01/87	48.36	-2.30	50.96	45.91	-5.05	30	0.905
05/01/87	48.33	-3.33	50.96	45.91	-5.05	30	0.893
06/01/87	47.16	-4.50	50.96	45.91	-5.05	31	0.881
07/01/87	48.16	-2.50	50.96	45.91	-5.05	31	0.869
08/01/87	50.06	-1.80	50.96	45.91	-5.05	29	0.857
09/01/87	49.46	-2.20	50.96	45.91	-5.05	31	0.845
10/01/87	49.41	-2.25	50.96	45.91	-5.05	30	0.833
11/01/87	49.41	-2.25	50.96	45.91	-5.05	30	0.821
12/01/87	49.41	-2.25	50.96	45.91	-5.05	30	0.808
01/01/88	49.41	-2.25	50.96	45.91	-5.05	31	0.796
02/01/88	49.41	-2.25	50.96	45.91	-5.05	31	0.784
03/01/88	49.41	-2.25	50.96	45.91	-5.05	30	0.773
04/01/88	49.41	-2.25	50.96	45.91	-5.05	31	0.761
05/01/88	47.16	-4.50	50.96	45.91	-5.05	30	0.748
06/01/88	48.26	-3.40	50.96	45.91	-5.05	31	0.737
07/01/88	48.26	-3.40	50.96	45.91	-5.05	30	0.725
08/01/88	48.26	-3.40	50.96	45.91	-5.05	31	0.713
09/01/88	48.26	-3.40	50.96	45.91	-5.05	30	0.700
10/01/88	48.26	-3.40	50.96	45.91	-5.05	31	0.688
11/01/88	48.26	-3.40	50.96	45.91	-5.05	31	0.676
12/01/88	48.26	-3.40	50.96	45.91	-5.05	30	0.664
01/01/89	48.26	-3.40	50.96	45.91	-5.05	31	0.652
02/01/89	48.26	-3.40	50.96	45.91	-5.05	30	0.640
03/01/89	48.26	-3.40	50.96	45.91	-5.05	31	0.628
04/01/89	48.26	-3.40	50.96	45.91	-5.05	30	0.616
05/01/89	48.26	-3.40	50.96	45.91	-5.05	31	0.604
06/01/89	48.26	-3.40	50.96	45.91	-5.05	30	0.592
07/01/89	48.26	-3.40	50.96	45.91	-5.05	31	0.580
08/01/89	48.26	-3.40	50.96	45.91	-5.05	30	0.568
09/01/89	48.26	-3.40	50.96	45.91	-5.05	31	0.556
10/01/89	48.26	-3.40	50.96	45.91	-5.05	30	0.544
11/01/89	48.26	-3.40	50.96	45.91	-5.05	31	0.532
12/01/89	48.26	-3.40	50.96	45.91	-5.05	30	0.520
01/01/90	48.26	-3.40	50.96	45.91	-5.05	31	0.508
02/01/90	48.26	-3.40	50.96	45.91	-5.05	30	0.496
03/01/90	48.26	-3.40	50.96	45.91	-5.05	31	0.484
04/01/90	48.26	-3.40	50.96	45.91	-5.05	30	0.472
05/01/90	48.26	-3.40	50.96	45.91	-5.05	31	0.460
06/01/90	48.26	-3.40	50.96	45.91	-5.05	30	0.448
07/01/90	48.26	-3.40	50.96	45.91	-5.05	31	0.436
08/01/90	48.26	-3.40	50.96	45.91	-5.05	30	0.424
09/01/90	48.26	-3.40	50.96	45.91	-5.05	31	0.412
10/01/90	48.26	-3.40	50.96	45.91	-5.05	30	0.400
11/01/90	48.26	-3.40	50.96	45.91	-5.05	31	0.388
12/01/90	48.26	-3.40	50.96	45.91	-5.05	30	0.376
01/01/91	48.26	-3.40	50.96	45.91	-5.05	31	0.364
02/01/91	48.26	-3.40	50.96	45.91	-5.05	30	0.352
03/01/91	48.26	-3.40	50.96	45.91	-5.05	31	0.340
04/01/91	48.26	-3.40	50.96	45.91	-5.05	30	0.328
05/01/91	48.26	-3.40	50.96	45.91	-5.05	31	0.316
06/01/91	48.26	-3.40	50.96	45.91	-5.05	30	0.304
07/01/91	48.26	-3.40	50.96	45.91	-5.05	31	0.292
08/01/91	48.26	-3.40	50.96	45.91	-5.05	30	0.280
09/01/91	48.26	-3.40	50.96	45.91	-5.05	31	0.268
10/01/91	48.26	-3.40	50.96	45.91	-5.05	30	0.256
11/01/91	48.26	-3.40	50.96	45.91	-5.05	31	0.244
12/01/91	48.26	-3.40	50.96	45.91	-5.05	30	0.232
01/01/92	48.26	-3.40	50.96	45.91	-5.05	31	0.220
02/01/92	48.26	-3.40	50.96	45.91	-5.05	30	0.208
03/01/92	48.26	-3.40	50.96	45.91	-5.05	31	0.196
04/01/92	48.26	-3.40	50.96	45.91	-5.05	30	0.184
05/01/92	48.26	-3.40	50.96	45.91	-5.05	31	0.172
06/01/92	48.26	-3.40	50.96	45.91	-5.05	30	0.160
07/01/92	48.26	-3.40	50.96	45.91	-5.05	31	0.148
08/01/92	48.26	-3.40	50.96	45.91	-5.05	30	0.136
09/01/92	48.26	-3.40	50.96	45.91	-5.05	31	0.124
10/01/92	48.26	-3.40	50.96	45.91	-5.05	30	0.112
11/01/92	48.26	-3.40	50.96	45.91	-5.05	31	0.100
12/01/92	48.26	-3.40	50.96	45.91	-5.05	30	0.088
01/01/93	48.26	-3.40	50.96	45.91	-5.05	31	0.076
02/01/93	48.26	-3.40	50.96	45.91	-5.05	30	0.064
03/01/93	48.26	-3.40	50.96	45.91	-5.05	31	0.052
04/01/93	48.26	-3.40	50.96	45.91	-5.05	30	0.040
05/01/93	48.26	-3.40	50.96	45.91	-5.05	31	0.028
06/01/93	48.26	-3.40	50.96	45.91	-5.05	30	0.016
07/01/93	48.26	-3.40	50.96	45.91	-5.05	31	0.004

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Date	Level	HNP	Date	Level	HNP	Lev.-HNP	Time	Freq	Median
	Elev								
05/28/89	35.37	38.49	05/28/89	35.37	38.49	-3.12	28		
06/20/89	35.37	38.49	06/20/89	35.37	38.49	-3.12	25		
07/31/89	35.88	38.49	08/06/92	35.37	38.49	-3.12	14		
08/29/89	35.78	38.49	03/27/91	35.37	38.49	-3.12	27		
09/27/89	36.77	38.49	06/14/94	35.37	38.49	-3.12	41		
10/25/89	36.37	38.49	07/07/94	35.37	38.49	-3.12	23		
11/30/89	35.37	38.49	11/30/89	35.37	38.49	-3.12	36		
12/14/89	35.37	38.49	12/14/89	35.37	38.49	-3.12	14		
01/17/90	36.19	38.49	07/23/92	35.37	38.49	-3.12	49		
02/22/90	35.37	38.49	02/22/90	35.37	38.49	-3.12	36		
03/19/90	35.37	38.49	03/19/90	35.37	38.49	-3.12	25		
04/11/90	35.37	38.49	04/11/90	35.37	38.49	-3.12	23		
05/14/90	35.37	38.49	05/14/90	35.37	38.49	-3.12	33		
06/15/90	35.37	38.49	06/15/90	35.37	38.49	-3.12	32		
07/26/90	38.13	38.49	06/04/92	35.37	38.49	-3.12	36		
08/22/90	37.83	38.49	06/14/95	35.37	38.49	-3.12	41		
09/13/90	37.55	38.49	05/04/95	35.37	38.49	-3.12	21		
10/18/90	37.33	38.49	04/29/92	35.37	38.49	-3.12	50		
12/06/90	35.37	38.49	12/06/90	35.37	38.49	-3.12	49		
01/10/91	35.37	38.49	01/10/91	35.37	38.49	-3.12	35		
02/28/91	35.37	38.49	02/28/91	35.37	38.49	-3.12	49		
03/27/91	35.37	38.49	03/10/92	35.37	38.49	-3.12	21		
04/24/91	35.37	38.49	04/24/91	35.37	38.49	-3.12	28		
05/09/91	35.37	38.49	05/09/91	35.37	38.49	-3.12	15		
06/13/91	38.87	38.49	06/10/93	35.37	38.49	-3.12	37		
07/02/91	37.65	38.49	02/18/92	35.37	38.49	-3.12	34		
08/21/91	38.31	38.49	01/15/92	35.37	38.49	-3.12	41		
09/10/91	38.17	38.49	04/05/94	35.37	38.49	-3.12	33		
10/01/91	37.65	38.49	05/04/94	35.37	38.49	-3.12	29		
11/21/91	35.37	38.49	11/21/91	35.37	38.49	-3.12	51		
12/05/91	35.37	38.49	12/05/91	35.37	38.49	-3.12	14		
01/15/92	35.37	38.49	08/29/89	35.78	38.49	-2.71	29	0.567073	
02/18/92	35.37	38.49	07/31/89	35.88	38.49	-2.81	41	0.549612	
03/10/92	35.37	38.49	04/13/95	35.97	38.49	-2.52	30	0.536637	
04/29/92	35.37	38.49	03/03/94	36.05	38.49	-2.44	22	0.527488	
06/04/92	35.37	38.49	01/04/94	36.09	38.49	-2.40	27	0.51587	
07/23/92	35.37	38.49	01/17/90	36.19	38.49	-2.30	34	0.501491	
08/06/92	35.37	38.49	12/08/93	36.19	38.49	-2.30	22	0.492122	-2.30
09/03/92	36.93	38.49	07/01/93	36.21	38.49	-2.28	21	0.483179	
10/15/92	37.71	38.49	01/12/93	36.30	38.49	-2.19	40	0.468144	
11/17/92	37.05	38.49	01/10/95	36.31	38.49	-2.18	34	0.451685	
12/03/92	36.97	38.49	10/25/89	36.37	38.49	-2.12	28	0.439741	
01/12/93	36.30	38.49	10/05/93	36.41	38.49	-2.08	35	0.424836	
02/04/93	35.47	38.49	02/04/93	36.47	38.49	-2.02	23	0.415041	
03/02/93	36.61	38.49	07/27/95	36.47	38.49	-2.02	43	0.396729	
04/06/93	37.25	38.49	02/09/94	36.51	38.49	-1.98	36	0.381399	
05/04/93	37.01	38.49	03/14/95	36.55	38.49	-1.94	20	0.372881	
06/10/93	35.37	38.49	08/31/93	36.61	38.49	-1.88	61	0.348904	
07/01/93	36.21	38.49	03/02/93	36.61	38.49	-1.88	26	0.335832	
08/31/93	36.61	38.49	09/27/89	36.77	38.49	-1.72	29	0.323482	
10/05/93	36.41	38.49	08/09/94	36.81	38.49	-1.69	33	0.309428	
11/16/93	36.99	38.49	06/13/91	36.87	38.49	-1.62	35	0.294523	
12/08/93	36.19	38.49	02/22/95	36.93	38.49	-1.57	43	0.276212	
01/04/94	36.09	38.49	12/07/94	36.93	38.49	-1.56	23	0.268417	
02/09/94	36.51	38.49	09/03/92	36.93	38.49	-1.56	28	0.254493	
03/03/94	36.05	38.49	12/03/92	36.97	38.49	-1.52	16	0.247679	
04/05/94	35.37	38.49	11/16/93	36.99	38.49	-1.50	42	0.229793	
05/04/94	35.37	38.49	05/04/93	37.01	38.49	-1.48	26	0.217869	
06/14/94	35.37	38.49	11/17/92	37.05	38.49	-1.44	33	0.203816	
07/07/94	35.37	38.49	04/05/93	37.25	38.49	-1.24	35	0.188911	
08/09/94	36.81	38.49	10/18/90	37.33	38.49	-1.16	35	0.174006	
09/29/94	38.17	38.49	11/14/94	37.55	38.49	-0.94	32	0.160378	
10/13/94	38.13	38.49	09/13/90	37.55	38.49	-0.94	22	0.151009	
11/14/94	37.55	38.49	08/22/90	37.63	38.49	-0.86	27	0.139511	
12/07/94	36.93	38.49	10/01/91	37.65	38.49	-0.84	21	0.130568	
01/10/95	36.31	38.49	07/02/91	37.65	38.49	-0.84	19	0.122477	
02/22/95	36.93	38.49	10/15/92	37.71	38.49	-0.78	42	0.104591	
03/14/95	36.55	38.49	10/04/95	37.85	38.49	-0.64	27	0.093093	
04/13/95	35.97	38.49	09/07/95	38.07	38.49	-0.42	27	0.081594	
05/04/95	35.37	38.49	10/13/94	38.13	38.49	-0.36	14	0.075632	
06/14/95	35.37	38.49	07/26/90	38.13	38.49	-0.36	41	0.056172	
07/27/95	36.47	38.49	09/29/94	38.17	38.49	-0.32	51	0.036453	
08/11/95	38.41	38.49	09/10/91	38.17	38.49	-0.32	20	0.027936	
09/07/95	38.07	38.49	08/21/91	38.31	38.49	-0.18	50	0.006643	
10/04/95	37.65	38.49	06/11/95	38.41	38.49	-0.08	15	0.000256	

... to a ground level datum:

Elevation of ground per WCRWSA = 38.30 feet  
HYDROGRAPH DATA

Note: 0.08 feet discrepancy between WCRWSA and SWFWMD surveys  
PSO DATA

Date	Raw Level	Level Elev	HNP	Date	Level Elev	HNP	Level Elev	HNP	Lev.-HNP	Time	Freq	Median
10/01/88	0.53	38.83	39.72	06/21/95	-4.82	33.68	39.72	39.72	-6.04	31		
11/01/88	-0.02	38.28	39.72	04/01/91	-3.27	35.03	39.72	39.72	-4.89	31		
12/01/88	0.78	39.08	39.72	09/01/89	-3.27	35.03	39.72	39.72	-4.89	31		
01/01/89	0.45	38.75	39.72	07/01/89	-3.27	35.03	39.72	39.72	-4.89	30		
02/01/89	0.47	38.77	39.72	03/01/91	-3.27	35.03	39.72	39.72	-4.89	28		
03/01/89	0.14	38.44	39.72	04/01/94	-3.27	35.03	39.72	39.72	-4.89	31		
04/01/89	-0.27	38.03	39.72	01/01/91	-3.27	35.03	39.72	39.72	-4.89	31		
05/01/89	-1.57	36.73	39.72	02/01/91	-3.27	35.03	39.72	39.72	-4.89	31		
06/01/89	-2.77	35.53	39.72	08/01/92	-3.27	35.03	39.72	39.72	-4.89	31		
07/01/89	-3.27	35.03	39.72	07/01/94	-3.27	35.03	39.72	39.72	-4.89	30		
08/01/89	-3.07	35.23	39.72	05/01/95	-3.27	35.03	39.72	39.72	-4.89	20		
09/01/89	-3.27	35.03	39.72	06/01/92	-3.27	35.03	39.72	39.72	-4.89	30		
10/01/89	-2.37	35.93	39.72	06/01/94	-3.27	35.03	39.72	39.72	-4.89	31		
11/01/89	-2.77	35.53	39.72	05/01/94	-3.27	35.03	39.72	39.72	-4.89	30		
12/01/89	-3.17	35.13	39.72	07/01/92	-3.27	35.03	39.72	39.72	-4.89	30		
01/01/90	-2.27	36.03	39.72	12/01/89	-3.17	35.13	39.72	39.72	-4.59	30	0.808	
02/01/90	-3.02	35.28	39.72	08/01/89	-3.07	35.23	39.72	39.72	-4.49	31	0.796	
03/01/90	-1.62	36.68	39.72	02/01/90	-3.02	35.28	39.72	39.72	-4.44	31	0.784	
04/01/90	-2.52	35.78	39.72	06/01/90	-2.85	35.46	39.72	39.72	-4.27	31	0.772	
05/01/90	-2.75	35.55	39.72	08/01/89	-2.77	35.53	39.72	39.72	-4.19	31	0.760	
06/01/90	-2.86	35.45	39.72	11/01/89	-2.77	35.53	39.72	39.72	-4.19	31	0.748	
07/01/90	-1.70	36.60	39.72	05/01/90	-2.75	35.55	39.72	39.72	-4.17	30	0.736	
08/01/90	-0.14	38.18	39.72	12/01/90	-2.70	35.60	39.72	39.72	-4.12	30	0.725	
09/01/90	-0.75	37.55	39.72	04/01/90	-2.52	35.78	39.72	39.72	-3.94	31	0.713	
10/01/90	-1.15	37.15	39.72	04/01/92	-2.40	35.90	39.72	39.72	-3.82	31	0.701	
11/01/90	-2.07	36.23	39.72	10/01/89	-2.37	35.93	39.72	39.72	-3.79	30	0.689	
12/01/90	-2.70	35.60	39.72	05/01/91	-2.30	36.00	39.72	39.72	-3.72	30	0.678	
01/01/91	-3.27	35.03	39.72	08/01/92	-2.30	36.00	39.72	39.72	-3.72	31	0.666	
02/01/91	-3.27	35.03	39.72	08/01/94	-2.30	36.00	39.72	39.72	-3.72	31	0.654	
03/01/91	-3.27	35.03	39.72	01/01/90	-2.27	36.03	39.72	39.72	-3.69	31	0.642	
04/01/91	-3.27	35.03	39.72	11/01/90	-2.07	36.23	39.72	39.72	-3.49	31	0.630	
05/01/91	-2.30	36.00	39.72	08/01/93	-1.85	36.46	39.72	39.72	-3.27	31	0.618	
06/01/91	-1.20	37.10	39.72	12/01/93	-1.82	36.48	39.72	39.72	-3.24	30	0.606	
07/01/91	-0.20	38.10	39.72	07/01/90	-1.70	36.60	39.72	39.72	-3.12	30	0.594	
08/01/91	0.80	39.10	39.72	03/01/90	-1.62	36.68	39.72	39.72	-3.04	28	0.582	
09/01/91	0.80	39.10	39.72	05/01/89	-1.57	36.73	39.72	39.72	-2.99	30	0.572	
10/01/91	0.42	38.72	39.72	03/01/92	-1.50	36.80	39.72	39.72	-2.92	29	0.561	
11/01/91	0.00	38.30	39.72	09/01/94	-1.50	36.80	39.72	39.72	-2.92	31	0.549	
12/01/91	-0.38	37.95	39.72	01/01/94	-1.48	36.82	39.72	39.72	-2.90	31	0.537	
01/01/92	-0.98	37.32	39.72	04/11/95	-1.40	36.90	39.72	39.72	-2.82	12	0.532	
02/01/92	-1.12	37.18	39.72	06/01/90	-1.30	37.00	39.72	39.72	-2.72	31	0.520	
03/01/92	-1.50	36.80	39.72	03/01/94	-1.25	37.05	39.72	39.72	-2.67	28	0.509	
04/01/92	-2.40	35.90	39.72	08/01/91	-1.20	37.10	39.72	39.72	-2.62	31	0.497	
05/01/92	-3.27	35.03	39.72	03/30/95	-1.20	37.10	39.72	39.72	-2.62	42	0.481	-2.63
06/01/92	-3.27	35.03	39.72	12/21/94	-1.20	37.10	39.72	39.72	-2.62	30	0.469	
07/01/92	-3.27	35.03	39.72	10/01/90	-1.15	37.15	39.72	39.72	-2.57	30	0.458	
08/01/92	-2.30	36.00	39.72	02/01/92	-1.12	37.18	39.72	39.72	-2.54	31	0.448	
09/01/92	-0.65	37.65	39.72	07/19/95	-1.04	37.27	39.72	39.72	-2.45	28	0.435	
10/01/92	0.60	38.90	39.72	11/01/93	-0.98	37.32	39.72	39.72	-2.40	31	0.423	
11/01/92	0.40	38.70	39.72	01/01/92	-0.96	37.32	39.72	39.72	-2.40	31	0.411	
12/01/92	0.41	38.71	39.72	02/01/94	-0.95	37.35	39.72	39.72	-2.37	31	0.399	
01/01/93	0.10	38.40	39.72	10/01/93	-0.90	37.40	39.72	39.72	-2.32	30	0.387	
02/01/93	0.00	38.30	39.72	02/18/95	-0.80	37.50	39.72	39.72	-2.22	29	0.378	
03/01/93	0.08	38.35	39.72	09/01/90	-0.75	37.55	39.72	39.72	-2.17	31	0.364	
04/01/93	0.05	38.35	39.72	01/18/95	-0.75	37.55	39.72	39.72	-2.16	28	0.353	
05/01/93	-0.25	38.05	39.72	07/01/93	-0.73	37.57	39.72	39.72	-2.15	30	0.341	
06/01/93	-1.30	37.00	39.72	09/01/92	-0.65	37.65	39.72	39.72	-2.07	31	0.329	
07/01/93	-0.73	37.67	39.72	10/19/94	-0.41	37.89	39.72	39.72	-1.83	48	0.311	
08/01/93	-1.85	36.45	39.72	08/29/95	-0.41	37.89	39.72	39.72	-1.83	41	0.295	
09/01/93	-0.20	38.10	39.72	12/01/91	-0.35	37.95	39.72	39.72	-1.77	30	0.283	
10/01/93	-0.90	37.40	39.72	04/01/89	-0.27	38.03	39.72	39.72	-1.69	31	0.271	
11/01/93	-0.98	37.32	39.72	05/01/93	-0.25	38.05	39.72	39.72	-1.67	30	0.260	
12/01/93	-1.82	36.48	39.72	07/01/91	-0.20	38.10	39.72	39.72	-1.62	30	0.248	
01/01/94	-1.48	36.82	39.72	09/01/93	-0.20	38.10	39.72	39.72	-1.62	31	0.236	
02/01/94	-0.95	37.35	39.72	08/01/90	-0.14	38.18	39.72	39.72	-1.56	31	0.224	
03/01/94	-1.25	37.05	39.72	11/21/94	-0.12	38.18	39.72	39.72	-1.54	33	0.211	
04/01/94	-3.27	35.03	39.72	11/01/88	-0.02	38.28	39.72	39.72	-1.44	30	0.199	
05/01/94	-3.27	35.03	39.72	02/01/93	0.00	38.30	39.72	39.72	-1.42	31	0.187	
06/01/94	-3.27	35.03	39.72	11/01/91	0.00	38.30	39.72	39.72	-1.42	31	0.175	
07/01/94	-3.27	35.03	39.72	03/01/93	0.05	38.35	39.72	39.72	-1.37	29	0.164	
08/01/94	-2.30	36.00	39.72	04/01/93	0.05	38.35	39.72	39.72	-1.37	31	0.152	
09/01/94	-1.50	36.80	39.72	01/01/93	0.10	38.40	39.72	39.72	-1.32	31	0.140	
10/19/94	-0.41	37.89	39.72	03/01/89	0.14	38.44	39.72	39.72	-1.28	28	0.130	
11/21/94	-0.12	38.18	39.72	11/01/92	0.40	38.70	39.72	39.72	-1.02	31	0.118	
12/21/94	-1.20	37.10	39.72	12/01/92	0.41	38.71	39.72	39.72	-1.01	30	0.106	
01/18/95	-0.75	37.58	39.72	10/01/91	0.42	38.72	39.72	39.72	-1.00	30	0.094	
02/18/95	-0.80	37.50	39.72	01/01/89	0.45	38.75	39.72	39.72	-0.97	31	0.082	
03/30/95	-1.20	37.10	39.72	02/01/89	0.47	38.77	39.72	39.72	-0.95	31	0.070	
04/11/95	-1.40	36.90	39.72	10/01/88	0.53	38.83	39.72	39.72	-0.89	30	0.059	
05/01/95	-3.27	35.03	39.72	10/01/92	0.60	38.90	39.72	39.72	-0.82	30	0.047	
06/21/95	-4.82	33.68	39.72	09/27/95	0.65	38.95	39.72	39.72	-0.77	29	0.036	
07/19/95	-1.04	37.27	39.72	12/01/88	0.78	39.06	39.72	39.72	-0.66	30	0.024	
08/29/95	-0.41	37.89	39.72	09/01/91	0.80	39.10	39.72	39.72	-0.62	31	0.012	
09/27/95	0.65	38.95	39.72	08/01/91	0.80	39.10	39.72	39.72	-0.62	31	0.000	





HYDROGRAPH DATA				P50 DATA						
Date	Raw Level	Level Elev	HNP	Date	Raw Level	Level Elev	Lev.-HNP	Time	Freq	Median
10/01/88	1.20	28.30	29.17	04/01/92					31	
11/01/88	0.95	28.05	29.17	07/01/93					30	
12/01/88	-0.04	27.08	29.17	08/01/94					31	
01/01/89	1.04	28.14	29.17	05/01/92					30	
02/01/89	1.05	28.15	29.17	06/01/92					31	
03/01/89	0.72	27.82	29.17	05/01/90	-4.40	22.70	-8.47	30	0.920	
04/01/89	0.21	27.31	29.17	05/01/94	-4.00	23.10	-8.07	30	0.918	
05/01/89	-1.05	26.05	29.17	11/01/89	-3.65	23.45	-5.72	31	0.906	
06/01/89	-0.90	26.20	29.17	09/01/89	-3.50	23.60	-5.57	31	0.894	
07/01/89	-0.90	26.20	29.17	10/01/89	-3.50	23.60	-5.57	30	0.882	
08/01/89	-2.50	24.60	29.17	07/01/94	-3.20	23.90	-5.27	30	0.870	
09/01/89	-3.50	23.60	29.17	08/01/93	-3.00	24.10	-5.07	31	0.858	
10/01/89	-3.50	23.60	29.17	11/01/90	-2.90	24.20	-4.97	31	0.846	
11/01/89	-3.85	23.45	29.17	01/01/91	-2.50	24.60	-4.57	31	0.834	
12/01/89	-2.40	24.70	29.17	04/01/94	-2.50	24.60	-4.57	31	0.822	
01/01/90	-1.30	25.80	29.17	08/01/89	-2.50	24.60	-4.57	31	0.810	
02/01/90	-2.30	24.80	29.17	05/01/91	-2.40	24.70	-4.47	30	0.799	
03/01/90	-1.80	25.30	29.17	04/01/91	-2.40	24.70	-4.47	31	0.787	
04/01/90	-1.70	25.40	29.17	12/01/89	-2.40	24.70	-4.47	30	0.775	
05/01/90	-4.40	22.70	29.17	12/01/90	-2.40	24.70	-4.47	30	0.763	
06/01/90	-2.30	24.80	29.17	06/21/95	-2.36	24.74	-4.43	28	0.753	
07/01/90	-1.80	25.30	29.17	02/01/91	-2.30	24.80	-4.37	31	0.741	
08/01/90	-1.80	25.30	29.17	02/01/90	-2.30	24.80	-4.37	31	0.729	
09/01/90	-1.10	26.00	29.17	06/01/90	-2.30	24.80	-4.37	31	0.717	
10/01/90	-1.50	25.60	29.17	12/21/94	-1.95	25.15	-4.02	30	0.705	
11/01/90	-2.90	24.20	29.17	12/01/93	-1.84	25.26	-3.91	30	0.683	
12/01/90	-2.40	24.70	29.17	07/01/90	-1.80	25.30	-3.87	30	0.671	
01/01/91	-2.50	24.60	29.17	03/01/90	-1.80	25.30	-3.87	28	0.660	
02/01/91	-2.30	24.80	29.17	05/01/94	-1.80	25.30	-3.87	31	0.648	
03/01/91	-1.80	25.50	29.17	08/01/90	-1.80	25.30	-3.87	31	0.636	
04/01/91	-2.40	24.70	29.17	04/01/90	-1.70	25.40	-3.77	31	0.624	
05/01/91	-2.40	24.70	29.17	03/30/95	-1.68	25.42	-3.75	42	0.608	
06/01/91	-1.33	25.77	29.17	07/01/91	-1.65	25.48	-3.72	30	0.596	
07/01/91	-1.65	25.48	29.17	07/01/92	-1.62	25.48	-3.69	30	0.585	
08/01/91	1.20	28.30	29.17	06/01/93	-1.60	25.50	-3.87	31	0.573	
09/01/91	1.25	28.35	29.17	08/01/92	-1.60	25.50	-3.87	31	0.561	
10/01/91	0.60	27.60	29.17	03/01/91	-1.60	25.50	-3.87	28	0.550	
11/01/91	0.00	27.10	29.17	11/21/94	-1.54	25.56	-3.61	33	0.537	
12/01/91	-1.35	25.75	29.17	10/01/90	-1.50	25.60	-3.57	30	0.525	
01/01/92	-1.08	26.02	29.17	01/01/94	-1.45	25.65	-3.52	31	0.513	
02/01/92	-1.14	25.98	29.17	04/25/95	-1.45	25.65	-3.52	27	0.500	
03/01/92	-1.40	25.70	29.17	01/18/95	-1.40	25.70	-3.47	28	0.492	
04/01/92		27.10	29.17	10/01/93	-1.40	25.70	-3.47	30	0.480	
05/01/92		27.10	29.17	09/01/92	-1.40	25.70	-3.47	31	0.468	
06/01/92		27.10	29.17	03/01/92	-1.40	25.70	-3.47	29	0.457	
07/01/92	-1.52	25.48	29.17	12/01/91	-1.35	25.75	-3.42	30	0.446	
08/01/92	-1.60	25.50	29.17	08/01/91	-1.33	25.77	-3.40	31	0.433	
09/01/92	-1.40	25.70	29.17	01/01/90	-1.30	25.80	-3.37	31	0.421	
10/01/92	0.00	27.10	29.17	03/01/94	-1.24	25.86	-3.31	28	0.411	
11/01/92	0.00	27.10	29.17	09/01/94	-1.20	25.90	-3.27	31	0.399	
12/01/92	0.00	27.10	29.17	02/16/95	-1.15	25.95	-3.22	29	0.387	
01/01/93	-0.60	26.50	29.17	02/01/92	-1.14	25.96	-3.21	31	0.375	
02/01/93	-0.70	26.40	29.17	10/19/94	-1.10	26.00	-3.17	48	0.357	
03/01/93	-0.60	26.60	29.17	08/01/90	-1.10	26.00	-3.17	31	0.345	
04/01/93	-0.30	26.80	29.17	01/01/92	-1.08	26.02	-3.15	31	0.333	
05/01/93	-1.05	26.05	29.17	05/01/89	-1.06	26.05	-3.12	30	0.321	
06/01/93	-1.60	25.50	29.17	06/01/93	-1.06	26.05	-3.12	30	0.310	
07/01/93		27.10	29.17	06/01/89	-0.90	26.20	-2.97	31	0.298	
08/01/93	-3.00	24.10	29.17	07/01/89	-0.90	26.20	-2.97	30	0.286	
09/01/93	-0.90	26.20	29.17	08/01/93	-0.90	26.20	-2.97	31	0.274	
10/01/93	-1.40	25.70	29.17	11/01/93	-0.75	26.35	-2.82	31	0.262	
11/01/93	-0.75	26.35	29.17	02/01/93	-0.70	26.40	-2.77	31	0.250	
12/01/93	-1.84	25.26	29.17	07/19/95	-0.68	26.43	-2.75	28	0.239	
01/01/94	-1.45	25.65	29.17	01/01/93	-0.60	26.50	-2.67	31	0.227	
02/01/94	0.94	28.04	29.17	03/01/93	-0.50	26.60	-2.57	28	0.215	
03/01/94	-1.24	25.86	29.17	04/01/93	-0.30	26.80	-2.37	31	0.204	
04/01/94	-2.50	24.60	29.17	12/01/88	-0.04	27.06	-2.11	30	0.193	
05/01/94	-4.00	23.10	29.17	11/01/92	0.00	27.10	-2.07	31	0.181	
06/01/94		27.10	29.17	10/01/92	0.00	27.10	-2.07	30	0.169	
07/01/94	-3.20	23.90	29.17	12/01/92	0.00	27.10	-2.07	30	0.157	
08/01/94	-1.80	25.30	29.17	11/01/91	0.00	27.10	-2.07	31	0.145	
09/01/94	-1.20	25.90	29.17	04/01/89	0.21	27.31	-1.86	31	0.133	
10/19/94	-1.10	26.00	29.17	10/01/91	0.50	27.60	-1.57	30	0.122	
11/21/94	-1.54	25.58	29.17	03/01/89	0.72	27.82	-1.35	28	0.111	
12/21/94	-1.95	25.15	29.17	02/01/94	0.94	28.04	-1.13	31	0.099	
01/18/95	-1.40	25.70	29.17	11/01/88	0.95	28.05	-1.12	31	0.087	
02/16/95	-1.15	25.85	29.17	01/01/89	1.04	28.14	-1.03	31	0.075	
03/30/95	-1.88	25.42	29.17	02/01/89	1.05	28.15	-1.02	31	0.063	
04/26/95	-1.45	25.85	29.17	10/01/88	1.20	28.30	-0.87	30	0.051	
05/24/95	-1.88	25.23	29.17	08/01/91	1.20	28.30	-0.87	31	0.039	
06/21/95	-2.36	24.74	29.17	06/01/91	1.25	28.35	-0.82	31	0.027	
07/19/95	-0.66	26.43	29.17	08/29/95	1.27	28.37	-0.80	41	0.011	
08/29/95	1.27	28.37	29.17	09/27/95	1.35	28.45	-0.73	29	0.000	
09/27/95	1.35	28.45	29.17							

-3.47

raw data

Date	Level	HNP	Date	Level	HNP	Lev.-HNP	Time	Freq	Median
	Elev								
10/12/88	43.88	45.11	04/30/91					30	
11/09/88	43.30	45.11	08/31/92	40.78	45.11	-4.33	31	0.978	
12/14/88	44.08	45.11	05/31/92	40.85	45.11	-4.26	31	0.984	
01/11/89	43.65	45.11	04/30/92	40.86	45.11	-4.25	30	0.982	
02/07/89	43.71	45.11	06/30/92	40.87	45.11	-4.24	30	0.941	
03/15/89	43.37	45.11	03/31/92	40.87	45.11	-4.24	31	0.928	
04/30/89	42.88	45.11	11/30/89	40.87	45.11	-4.24	30	0.917	
05/31/89	41.18	45.11	02/28/92	40.87	45.11	-4.24	29	0.905	
06/30/89	40.92	45.11	08/31/89	40.87	45.11	-4.24	31	0.893	
07/31/89	40.82	45.11	01/31/92	40.88	45.11	-4.23	31	0.881	
08/31/89	40.87	45.11	07/31/92	40.89	45.11	-4.22	31	0.869	
09/30/89	41.03	45.11	08/30/89	40.92	45.11	-4.19	30	0.857	
10/31/89	40.97	45.11	07/31/89	40.92	45.11	-4.19	31	0.845	
11/30/89	40.87	45.11	06/30/94	40.93	45.11	-4.19	30	0.833	
12/31/89	41.01	45.11	05/31/94	40.93	45.11	-4.18	31	0.821	
01/31/90	41.15	45.11	07/31/94	40.93	45.11	-4.18	31	0.809	
02/28/90	41.23	45.11	04/30/94	40.93	45.11	-4.18	30	0.797	
03/31/90	41.21	45.11	05/31/95	40.93	45.11	-4.18	31	0.785	
04/30/90	41.06	45.11	08/31/93	40.98	45.11	-4.15	31	0.773	
05/31/90	41.08	45.11	12/31/93	40.97	45.11	-4.14	31	0.761	
06/30/90	41.04	45.11	10/31/89	40.97	45.11	-4.14	31	0.749	
07/31/90	41.82	45.11	12/31/89	41.01	45.11	-4.10	31	0.737	
08/31/90	42.27	45.11	09/30/89	41.03	45.11	-4.08	30	0.725	
09/30/90	41.46	45.11	06/30/90	41.04	45.11	-4.07	30	0.713	
10/31/90	41.39	45.11	01/31/91	41.04	45.11	-4.07	31	0.701	
11/30/90	41.05	45.11	02/28/91	41.04	45.11	-4.07	28	0.690	
12/31/90	41.05	45.11	06/30/95	41.05	45.11	-4.06	30	0.678	
01/31/91	41.04	45.11	03/31/91	41.05	45.11	-4.06	31	0.666	
02/28/91	41.04	45.11	12/31/90	41.05	45.11	-4.06	31	0.654	
03/31/91	41.05	45.11	05/31/90	41.08	45.11	-4.06	31	0.642	
04/30/91		45.11	11/30/90	41.05	45.11	-4.06	30	0.630	
05/31/91	41.22	45.11	04/30/90	41.08	45.11	-4.06	30	0.619	
06/30/91	41.35	45.11	01/31/90	41.15	45.11	-3.96	31	0.606	
07/31/91	41.74	45.11	03/31/94	41.18	45.11	-3.93	31	0.594	
08/31/91	43.05	45.11	05/31/89	41.18	45.11	-3.93	31	0.582	
09/30/91	43.48	45.11	08/30/93	41.18	45.11	-3.93	30	0.570	
10/31/91	43.08	45.11	03/31/90	41.21	45.11	-3.90	31	0.558	
11/30/91	42.07	45.11	05/31/91	41.22	45.11	-3.89	31	0.546	
12/31/91	41.28	45.11	02/28/90	41.23	45.11	-3.88	28	0.536	
01/31/92	40.88	45.11	04/30/95	41.25	45.11	-3.86	30	0.523	
02/29/92	40.87	45.11	12/31/91	41.28	45.11	-3.83	31	0.511	
03/31/92	40.87	45.11	06/30/91	41.35	45.11	-3.76	30	0.500	
04/30/92	40.86	45.11	10/31/90	41.39	45.11	-3.72	31	0.487	
05/31/92	40.85	45.11	07/31/95	41.46	45.11	-3.65	31	0.475	
06/30/92	40.87	45.11	08/30/90	41.46	45.11	-3.65	30	0.464	
07/31/92	40.89	45.11	06/31/94	41.46	45.11	-3.65	31	0.451	
08/31/92	40.78	45.11	01/31/94	41.48	45.11	-3.65	31	0.439	
09/30/92	42.14	45.11	07/31/93	41.50	45.11	-3.61	31	0.427	
10/31/92	42.91	45.11	11/30/93	41.62	45.11	-3.49	30	0.415	
11/30/92	43.09	45.11	03/31/98	41.64	45.11	-3.47	31	0.403	
12/31/92	42.97	45.11	12/31/94	41.70	45.11	-3.41	31	0.391	
01/31/93	42.71	45.11	02/28/94	41.72	45.11	-3.39	28	0.380	
02/28/93	42.50	45.11	07/31/91	41.74	45.11	-3.37	31	0.368	
03/31/93	42.80	45.11	07/31/90	41.82	45.11	-3.29	31	0.356	
04/30/93	42.77	45.11	10/31/93	41.83	45.11	-3.28	31	0.344	
05/31/93	41.84	45.11	05/31/93	41.84	45.11	-3.27	31	0.332	
06/30/93	41.18	45.11	01/31/95	41.98	45.11	-3.15	31	0.320	
07/31/93	41.50	45.11	09/30/94	42.02	45.11	-3.09	30	0.308	
08/31/93	40.98	45.11	11/30/91	42.07	45.11	-3.04	30	0.296	
09/30/93	42.27	45.11	02/28/95	42.08	45.11	-3.03	28	0.285	
10/31/93	41.83	45.11	09/30/92	42.14	45.11	-2.97	30	0.273	
11/30/93	41.82	45.11	11/30/94	42.14	45.11	-2.97	30	0.262	
12/31/93	40.97	45.11	08/31/90	42.27	45.11	-2.84	31	0.250	
01/31/94	41.48	45.11	09/30/93	42.27	45.11	-2.84	30	0.238	
02/28/94	41.72	45.11	10/31/94	42.41	45.11	-2.70	31	0.226	
03/31/94	41.18	45.11	02/28/93	42.50	45.11	-2.61	28	0.216	
04/30/94	40.93	45.11	03/31/93	42.60	45.11	-2.51	31	0.203	
05/31/94	40.93	45.11	04/30/89	42.68	45.11	-2.45	48	0.185	
06/30/94	40.93	45.11	01/31/93	42.71	45.11	-2.40	31	0.173	
07/31/94	40.93	45.11	04/30/93	42.77	45.11	-2.34	30	0.161	
08/31/94	41.46	45.11	08/31/95	42.90	45.11	-2.21	31	0.149	
09/30/94	42.02	45.11	10/31/92	42.91	45.11	-2.20	31	0.137	
10/31/94	42.41	45.11	12/31/92	42.97	45.11	-2.14	31	0.124	
11/30/94	42.14	45.11	08/31/91	43.05	45.11	-2.06	31	0.112	
12/31/94	41.70	45.11	10/31/91	43.08	45.11	-2.03	31	0.100	
01/31/95	41.98	45.11	11/30/92	43.09	45.11	-2.02	30	0.088	
02/28/95	42.08	45.11	11/09/88	43.30	45.11	-1.81	28	0.077	
03/31/95	41.84	45.11	03/18/89	43.37	45.11	-1.74	38	0.063	
04/30/95	41.25	45.11	09/30/95	43.48	45.11	-1.65	30	0.052	
05/31/95	40.93	45.11	09/30/91	43.48	45.11	-1.63	30	0.040	
06/30/95	41.05	45.11	01/11/89	43.88	45.11	-1.45	28	0.029	
07/31/95	41.48	45.11	02/07/89	43.71	45.11	-1.40	27	0.018	
08/31/95	42.90	45.11	10/12/88	43.88	45.11	-1.23	12	0.014	
09/30/95	43.48	45.11	12/14/88	44.08	45.11	-1.05	35	0.000	

-3.78



--- MEASURED WITH PALMETTO LINE AS DATUM:

Elevation of palmetto line calculated from: Table 3 of "Annual Report: Ecological Monitoring of the Morris Bridge Wellfield Water Ye

Upland well elevation given as 41.9 ft which is given as 0.2 feet above palmetto line

41.70 = palmetto elev

HYDROGRAPH DATA

P50 DATA

Date	Raw Level	Level Elev	HNP	Date	Level	Level Elev	HNP	Lev.-HNP	Time	Freq	Met
10/20/89	-3.03	38.67	41.56	06/29/90	-6.68	35.02	41.56	-6.54	42		
11/17/89	-3.58	38.12	41.56	05/20/92	-8.53	35.17	41.56	-6.39	23	0.964	
12/18/89	-4.33	37.37	41.56	01/24/91	-6.43	35.27	41.56	-6.29	41	0.942	
01/28/90	-2.91	38.79	41.56	03/22/91	-6.38	35.32	41.56	-6.24	30	0.925	
02/28/90	-3.23	38.47	41.56	02/20/91	-6.28	35.42	41.56	-6.14	27	0.910	
03/23/90	-3.63	37.77	41.56	02/24/92	-6.08	35.62	41.56	-5.94	38	0.889	
04/19/90	-4.43	37.27	41.56	04/19/91	-5.98	35.72	41.56	-5.84	28	0.874	
05/18/90	-5.78	35.92	41.56	04/27/92	-5.93	35.77	41.56	-5.79	33	0.856	
06/29/90	-6.68	35.02	41.56	01/17/92	-5.93	35.77	41.56	-5.79	28	0.840	
07/30/90	-5.43	36.27	41.56	05/18/90	-5.78	35.92	41.56	-5.64	29	0.824	
08/24/90	-4.53	37.17	41.56	08/29/92	-5.78	35.92	41.56	-5.64	40	0.802	
09/21/90	-4.38	37.32	41.56	12/14/90	-5.68	35.02	41.56	-5.54	14	0.794	
10/19/90	-4.13	37.57	41.56	05/31/91	-5.61	36.09	41.56	-5.47	42	0.771	
11/30/90	-4.91	36.79	41.56	03/25/92	-5.48	36.22	41.56	-5.34	30	0.755	
12/14/90	-5.68	36.02	41.56	07/30/90	-5.43	36.27	41.56	-5.29	31	0.737	
01/24/91	-6.43	35.27	41.56	08/30/93	-5.43	36.27	41.56	-5.29	33	0.719	
02/20/91	-6.28	35.42	41.56	12/20/91	-5.43	36.27	41.56	-5.29	28	0.704	
03/22/91	-6.38	35.32	41.56	07/29/92	-5.28	36.42	41.56	-5.14	30	0.687	
04/19/91	-5.98	35.72	41.56	11/30/90	-4.91	36.79	41.56	-4.77	42	0.664	
05/31/91	-5.81	36.09	41.56	06/18/93	-4.88	36.82	41.56	-4.74	21	0.652	
06/28/91	-4.08	37.62	41.56	04/15/94	-4.78	36.92	41.56	-4.64	15	0.644	
07/26/91	-0.73	40.97	41.56	08/21/92	-4.73	36.97	41.56	-4.59	23	0.631	
08/26/91	-0.93	40.77	41.56	07/28/93	-4.55	37.15	41.56	-4.41	40	0.609	
09/23/91	-2.38	39.32	41.56	08/24/90	-4.53	37.17	41.56	-4.39	25	0.596	
10/22/91	-3.23	38.47	41.56	05/28/93	-4.48	37.22	41.56	-4.34	31	0.578	
11/22/91	-4.43	37.27	41.56	04/19/90	-4.43	37.27	41.56	-4.29	27	0.563	
12/20/91	-5.43	36.27	41.56	11/22/91	-4.43	37.27	41.56	-4.29	31	0.546	
01/17/92	-5.93	35.77	41.56	09/21/90	-4.38	37.32	41.56	-4.24	28	0.531	
02/24/92	-6.08	35.62	41.56	12/18/89	-4.33	37.37	41.56	-4.19	31	0.514	
03/25/92	-5.48	36.22	41.56	10/19/90	-4.13	37.57	41.56	-3.99	28	0.498	
04/27/92	-5.93	35.77	41.56	06/28/91	-4.08	37.62	41.56	-3.94	28	0.483	
05/20/92	-6.53	35.17	41.56	03/23/90	-3.93	37.77	41.56	-3.79	25	0.469	
06/29/92	-5.78	35.92	41.56	05/31/94	-3.85	37.85	41.56	-3.71	46	0.444	
07/29/92	-5.28	36.42	41.56	11/17/89	-3.58	38.12	41.56	-3.44	28	0.428	
08/21/92	-4.73	36.97	41.56	03/31/94	-3.53	38.17	41.56	-3.39	31	0.411	
09/29/92	-2.13	39.57	41.56	01/22/93	-3.43	38.27	41.56	-3.29	24	0.398	
10/23/92	-2.38	39.32	41.56	11/24/92	-3.38	38.32	41.56	-3.24	32	0.380	
11/24/92	-3.38	38.32	41.56	12/29/92	-3.38	38.32	41.56	-3.24	35	0.361	
12/29/92	-3.38	38.32	41.56	02/26/90	-3.23	38.47	41.56	-3.09	31	0.344	
01/22/93	-3.43	38.27	41.56	10/22/91	-3.23	38.47	41.56	-3.09	29	0.328	
02/23/93	-1.93	39.77	41.56	06/15/94	-3.08	38.62	41.56	-2.94	15	0.319	
03/31/93	-1.68	40.02	41.56	10/20/89	-3.03	38.67	41.56	-2.89	20	0.308	
04/27/93	-2.73	38.97	41.56	01/26/90	-2.91	38.79	41.56	-2.77	39	0.287	
05/28/93	-4.48	37.22	41.56	12/29/93	-2.78	38.92	41.56	-2.64	30	0.270	
06/18/93	-4.88	36.82	41.56	04/27/93	-2.73	38.97	41.56	-2.59	27	0.255	
07/28/93	-4.55	37.15	41.56	10/23/92	-2.38	39.32	41.56	-2.24	24	0.242	
08/30/93	-5.43	36.27	41.56	09/23/91	-2.38	39.32	41.56	-2.24	28	0.227	
09/29/93	-1.33	40.37	41.56	02/28/94	-2.35	39.35	41.56	-2.21	41	0.204	
10/28/93	-0.83	40.87	41.56	07/14/94	-2.28	39.42	41.56	-2.14	29	0.188	
11/29/93	-2.08	39.62	41.56	09/29/92	-2.13	39.57	41.56	-1.99	38	0.167	
12/29/93	-2.78	38.92	41.56	11/29/93	-2.08	39.62	41.56	-1.94	32	0.149	
01/18/94	-0.68	41.02	41.56	02/23/93	-1.93	39.77	41.56	-1.79	32	0.131	
02/28/94	-2.35	39.35	41.56	03/31/93	-1.68	40.02	41.56	-1.54	36	0.111	
03/31/94	-3.53	38.17	41.56	08/30/94	-1.39	40.32	41.56	-1.24	47	0.085	
04/15/94	-4.78	36.92	41.56	09/29/93	-1.33	40.37	41.56	-1.19	30	0.069	
05/31/94	-3.85	37.85	41.56	08/26/91	-0.93	40.77	41.56	-0.79	31	0.052	
06/15/94	-3.08	38.62	41.56	10/28/93	-0.83	40.87	41.56	-0.69	29	0.036	
07/14/94	-2.28	39.42	41.56	07/26/91	-0.73	40.97	41.56	-0.59	28	0.020	
08/30/94	-1.38	40.32	41.56	01/18/94	-0.68	41.02	41.56	-0.54	20	0.009	
09/15/94	-0.58	41.12	41.56	09/15/94	-0.58	41.12	41.56	-0.44	16	0.000	

Elevation of palmetto line calculated from: Table 3 of "Annual Report: Ecological Monitoring of the Morris Bridge Wetfield Water Years 1994, 1995, and 1996 by B  
 Surface elevation of the well 167 is calculated as 38.6 feet  
 Data below has been corrected for existing datum being the palmetto edge and then for difference between the wells

HYDROGRAPH DATA					P50 DATA								
Date	Raw Level	Corrected Level	Level Elev	HNP	Date	Level	Corrected Level	Level Elev	HNP	Lev-HNP	Time	Freq	Median
12/18/89	-12.23	-12.03	24.57	35.51	06/28/92	-12.63	-12.83	23.07	35.51	-12.44	40		
01/26/90	-5.96	-5.66	30.94	35.51	05/20/92	-12.83	-12.83	23.07	35.51	-12.44	23		
02/26/90	-5.96	-5.76	30.82	35.51	04/27/92	-12.58	-12.38	23.32	35.51	-12.19	33	0.954	
03/23/90	-6.68	-6.48	30.12	35.51	06/29/90	-12.60	-12.30	23.40	35.51	-12.11	42	0.934	
04/18/90	-7.73	-7.53	28.07	35.51	06/15/94	-12.33	-12.13	23.57	35.51	-11.94	15	0.927	
05/18/90	-10.83	-10.73	25.87	35.51	07/29/92	-12.28	-12.08	23.62	35.51	-11.89	30	0.913	
06/29/90	-12.50	-12.30	24.30	35.51	12/18/89	-12.23	-12.03	23.87	35.51	-11.84	18	0.904	
07/30/90	-7.93	-7.73	28.87	35.51	03/22/91	-12.18	-11.98	23.72	35.51	-11.79	30	0.890	
08/24/90	-7.73	-7.53	29.07	35.51	02/24/92	-12.18	-11.98	23.72	35.51	-11.79	38	0.872	
09/21/90	-7.48	-7.28	29.32	35.51	04/15/94	-12.03	-11.83	23.87	35.51	-11.64	15	0.865	
10/19/90	-6.83	-6.73	29.87	35.51	05/31/94	-11.98	-11.78	23.94	35.51	-11.57	46	0.843	
11/30/90	-8.13	-7.93	28.87	35.51	02/20/91	-11.93	-11.73	23.97	35.51	-11.54	27	0.830	
12/14/90	-9.23	-9.03	27.57	35.51	01/24/91	-11.88	-11.68	24.22	35.51	-11.29	41	0.811	
01/24/91	-11.68	-11.48	25.12	35.51	05/18/90	-10.93	-10.73	24.07	35.51	-10.54	29	0.797	
02/20/91	-11.93	-11.73	24.87	35.51	08/30/93	-10.43	-10.23	25.47	35.51	-10.04	33	0.781	
03/22/91	-12.18	-11.98	24.62	35.51	07/28/90	-10.40	-10.20	25.50	35.51	-10.01	40	0.762	
04/18/91	-10.28	-10.08	26.52	35.51	04/18/91	-10.28	-10.08	25.62	35.51	-9.89	28	0.749	
05/31/91	-9.08	-8.88	27.72	35.51	06/21/92	-9.78	-9.58	26.12	35.51	-9.38	23	0.738	
06/28/91	-7.83	-7.63	28.97	35.51	01/17/92	-9.68	-9.48	26.22	35.51	-9.29	28	0.725	
07/18/91	-3.33	-3.13	33.47	35.51	12/20/91	-8.63	-8.43	28.27	35.51	-8.24	28	0.711	
08/09/91	-4.03	-3.83	32.77	35.51	12/14/90	-8.23	-8.03	26.67	35.51	-8.64	14	0.705	
09/23/91	-3.88	-3.68	32.82	35.51	07/14/94	-9.23	-9.03	26.67	35.51	-8.84	29	0.691	
10/22/91	-5.23	-5.03	31.57	35.51	05/31/91	-9.08	-8.88	26.82	35.51	-8.69	42	0.671	
11/22/91	-7.93	-7.73	28.87	35.51	12/29/93	-8.18	-7.98	27.72	35.51	-7.79	30	0.656	
12/20/91	-9.63	-9.43	27.17	35.51	11/30/90	-8.13	-7.93	27.77	35.51	-7.74	42	0.636	
01/17/92	-9.88	-9.68	27.12	35.51	01/18/94	-8.03	-7.83	27.87	35.51	-7.64	20	0.627	
02/24/92	-12.18	-11.98	24.62	35.51	07/30/90	-7.93	-7.73	27.97	35.51	-7.54	31	0.612	
03/26/92	-7.33	-7.13	29.47	35.51	11/22/91	-7.93	-7.73	27.97	35.51	-7.54	31	0.597	
04/27/92	-12.58	-12.38	24.22	35.51	06/28/91	-7.83	-7.63	28.07	35.51	-7.44	28	0.584	
05/20/92	-12.83	-12.63	23.97	35.51	08/24/90	-7.73	-7.53	28.17	35.51	-7.34	25	0.572	
06/29/92	-12.83	-12.63	23.97	35.51	04/18/90	-7.73	-7.53	28.17	35.51	-7.34	27	0.559	
07/29/92	-12.28	-12.08	24.62	35.51	09/21/90	-7.48	-7.28	28.42	35.51	-7.09	28	0.546	
08/21/92	-9.78	-9.58	27.02	35.51	03/25/92	-7.33	-7.13	28.57	35.51	-6.94	30	0.532	
09/29/92	-5.03	-4.83	31.77	35.51	03/31/94	-6.93	-6.73	28.97	35.51	-6.54	31	0.517	
10/23/92	-4.63	-4.43	32.17	35.51	10/19/90	-6.93	-6.73	28.97	35.51	-6.54	28	0.504	
11/24/92	-5.33	-5.13	31.47	35.51	02/26/94	-6.73	-6.53	29.17	35.51	-6.34	41	0.484	-6.50
12/29/92	-5.53	-5.33	31.27	35.51	03/23/90	-6.68	-6.48	29.22	35.51	-6.29	25	0.472	
01/22/93	-6.58	-6.38	31.22	35.51	05/26/93	-6.58	-6.38	29.32	35.51	-6.19	31	0.457	
02/23/93	-5.23	-5.03	31.57	35.51	02/26/90	-5.98	-5.78	29.92	35.51	-5.59	31	0.443	
03/31/93	-3.83	-3.63	32.97	35.51	01/26/90	-5.98	-5.78	30.04	35.51	-5.47	39	0.424	
04/27/93	-4.48	-4.28	32.32	35.51	01/22/93	-5.58	-5.38	30.32	35.51	-5.19	24	0.413	
05/28/93	-6.58	-6.38	30.22	35.51	12/29/92	-6.53	-6.33	30.37	35.51	-6.14	35	0.396	
06/18/93		0.20	36.80	35.51	11/26/93	-5.33	-5.13	30.57	35.51	-4.94	32	0.381	
07/28/93	-10.40	-10.20	28.40	35.51	11/24/92	-5.33	-5.13	30.57	35.51	-4.94	32	0.365	
08/30/93	-10.43	-10.23	28.37	35.51	10/22/91	-5.23	-5.03	30.67	35.51	-4.84	29	0.352	
09/29/93	-4.68	-4.48	31.92	35.51	02/23/93	-5.23	-5.03	30.67	35.51	-4.84	32	0.336	
10/28/93	-4.68	-4.48	31.92	35.51	08/29/92	-5.03	-4.83	30.87	35.51	-4.64	39	0.318	
11/29/93	-6.33	-6.13	31.47	35.51	09/29/93	-4.88	-4.68	31.02	35.51	-4.49	30	0.304	
12/29/93	-8.18	-7.98	28.82	35.51	10/28/93	-4.88	-4.68	31.02	35.51	-4.49	29	0.290	
01/18/94	-8.03	-7.83	28.77	35.51	10/23/92	-4.63	-4.43	31.27	35.51	-4.24	24	0.278	
02/26/94	-8.73	-8.53	30.07	35.51	08/30/94	-4.58	-4.38	31.34	35.51	-4.17	47	0.256	
03/31/94	-6.83	-6.73	29.87	35.51	04/27/93	-4.48	-4.28	31.42	35.51	-4.09	27	0.243	
04/15/94	-12.03	-11.83	24.77	35.51	01/31/96	-4.18	-3.98	31.72	35.51	-3.79	34	0.227	
05/31/94	-11.98	-11.78	24.84	35.51	08/09/91	-4.03	-3.83	31.87	35.51	-3.64	24	0.215	
06/18/94	-12.33	-12.13	24.47	35.51	06/23/91	-3.98	-3.78	32.02	35.51	-3.49	45	0.194	
07/14/94	-9.23	-9.03	27.57	35.51	03/31/93	-3.83	-3.63	32.07	35.51	-3.44	38	0.177	
08/30/94	-4.58	-4.38	32.24	35.51	07/16/91	-3.33	-3.13	32.57	35.51	-2.94	18	0.168	
09/15/94	-2.13	-1.93	34.67	35.51	10/27/94	-2.68	-2.48	33.24	35.51	-2.27	42	0.148	
10/27/94	-2.68	-2.48	34.14	35.51	07/19/95	-2.58	-2.38	33.52	35.51	-1.99	20	0.139	
11/29/94	-2.03	-1.83	34.77	35.51	06/26/95	-2.38	-2.18	33.52	35.51	-1.99	35	0.122	
12/28/94	-2.23	-2.03	34.67	35.51	12/28/94	-2.23	-2.03	33.67	35.51	-1.84	29	0.108	
01/31/95	-4.18	-3.98	32.62	35.51	09/15/94	-2.13	-1.93	33.77	35.51	-1.74	16	0.101	
02/15/95	-1.03	-0.83	35.77	35.51	11/29/94	-2.03	-1.83	33.87	35.51	-1.64	33	0.085	
03/31/95	-1.48	-1.28	35.32	35.51	05/25/95	-1.98	-1.78	33.92	35.51	-1.59	38	0.067	
04/17/95	-1.53	-1.33	35.27	35.51	04/17/95	-1.53	-1.33	34.37	35.51	-1.14	17	0.059	
05/25/95	-1.98	-1.78	34.82	35.51	03/31/95	-1.48	-1.28	34.42	35.51	-1.09	44	0.038	
06/29/95	-2.38	-2.18	34.42	35.51	02/15/95	-1.03	-0.83	34.87	35.51	-0.64	15	0.031	
07/19/95	-2.38	-2.18	34.42	35.51	08/31/95	-0.97	-0.77	34.93	35.51	-0.58	43	0.010	
08/31/95	-0.97	-0.77	35.83	35.51	06/18/93	-0.97	-0.77	34.93	35.51	-0.58	21	0.000	

... to datum of palmetto line: Calculated elevation of palmetto line = 35.8 feet NGVD  
 Upland well elevation given as 36.4 ft which is given as 0.6 feet above palmetto line

HYDROGRAPH DATA

P50 DATA

Date	Raw Level	Level Elev	HNP	Date	Level Elev	HNP	Lev.-HNP	Time	Freq	Median
08/25/89	-5.1	30.68	35.09	02/20/91	-8.7	27.08	35.09	-8.01	27	
09/22/89	-5.3	30.53	35.09	06/29/90	-8.6	27.18	35.09	-7.91	42	0.968
10/20/89	-6.4	28.38	35.09	05/31/91	-8.5	27.33	35.09	-7.76	42	0.951
11/17/89	-7.4	28.38	35.09	03/22/91	-8.5	27.33	35.09	-7.76	30	0.937
12/18/89	-5.1	30.68	35.09	12/14/90	-8.3	27.48	35.09	-7.61	14	0.931
01/26/90	-4.5	31.35	35.09	05/20/92	-8.3	27.48	35.09	-7.61	23	0.921
02/28/90	-3.2	32.58	35.09	05/18/90	-8.2	27.58	35.09	-7.51	29	0.908
03/23/90	-4.7	31.08	35.09	01/24/91	-8.2	27.58	35.09	-7.51	41	0.889
04/19/90	-6.3	29.48	35.09	04/18/91	-8.0	27.83	35.09	-7.28	28	0.877
05/18/90	-8.2	27.58	35.09	11/30/90	-7.5	28.35	35.09	-6.74	42	0.858
06/29/90	-8.6	27.18	35.09	11/17/89	-7.4	28.38	35.09	-6.71	28	0.846
07/30/90	-6.7	29.08	35.09	07/29/92	-7.1	28.68	35.09	-6.41	30	0.832
08/24/90	-8.6	29.23	35.09	10/19/90	-6.7	29.08	35.09	-6.01	28	0.820
09/21/90	-6.4	29.43	35.09	07/30/90	-6.7	29.08	35.09	-6.01	31	0.806
10/19/90	-6.7	29.08	35.09	08/24/90	-8.6	28.23	35.09	-5.86	25	0.795
11/30/90	-7.5	28.35	35.09	04/27/92	-6.5	29.33	35.09	-5.76	33	0.780
12/14/90	-8.3	27.48	35.09	06/29/92	-8.5	29.33	35.09	-5.76	40	0.762
01/24/91	-8.2	27.58	35.09	10/20/89	-6.4	29.38	35.09	-5.71	28	0.750
02/20/91	-8.7	27.08	35.09	05/31/94	-6.4	29.41	35.09	-5.68	46	0.729
03/22/91	-8.5	27.33	35.09	09/21/90	-6.4	29.43	35.09	-5.66	28	0.716
04/19/91	-6.0	27.83	35.09	04/19/90	-6.3	29.48	35.09	-5.61	27	0.704
05/31/91	-8.5	27.33	35.09	07/28/93	-6.2	29.65	35.09	-5.44	40	0.687
06/28/91	-3.0	32.78	35.09	03/25/92	-6.0	29.78	35.09	-5.31	30	0.673
07/26/91	-0.7	35.08	35.09	12/20/91	-5.9	29.88	35.09	-5.21	28	0.661
08/26/91	-0.8	34.88	35.09	01/17/92	-5.9	29.88	35.09	-5.21	28	0.648
09/23/91	-1.6	34.23	35.09	08/21/92	-5.7	30.08	35.09	-5.01	23	0.638
10/22/91	-3.1	32.68	35.09	05/28/93	-5.7	30.08	35.09	-5.01	31	0.624
11/22/91	-4.7	31.08	35.09	02/24/92	-5.6	30.23	35.09	-4.86	38	0.607
12/20/91	-5.9	29.88	35.09	08/18/93	-5.5	30.28	35.09	-4.81	21	0.598
01/17/92	-5.9	29.88	35.09	09/22/89	-5.3	30.53	35.09	-4.56	28	0.585
02/24/92	-5.6	30.23	35.09	06/15/94	-5.2	30.58	35.09	-4.51	15	0.578
03/25/92	-6.0	29.78	35.09	08/25/89	-5.1	30.68	35.09	-4.41	25	0.567
04/27/92	-6.5	29.33	35.09	12/18/89	-5.1	30.68	35.09	-4.41	31	0.553
05/29/92	-8.3	27.48	35.09	07/14/94	-5.0	30.83	35.09	-4.26	29	0.540
06/29/92	-6.5	29.33	35.09	09/29/92	-4.9	30.88	35.09	-4.21	39	0.523
07/29/92	-7.1	28.68	35.09	12/29/92	-4.9	30.88	35.09	-4.21	35	0.507
08/21/92	-5.7	30.08	35.09	08/30/93	-4.8	31.03	35.09	-4.06	33	0.493
09/29/92	-4.9	30.88	35.09	03/23/90	-4.7	31.08	35.09	-4.01	25	0.481
10/23/92	-4.0	31.83	35.09	11/22/91	-4.7	31.08	35.09	-4.01	31	0.468
11/24/92	-4.6	31.18	35.09	11/24/92	-4.6	31.18	35.09	-3.91	32	0.453
12/29/92	-4.9	30.88	35.09	03/31/94	-4.5	31.33	35.09	-3.76	31	0.438
01/22/93	-3.4	32.38	35.09	01/28/90	-4.5	31.35	35.09	-3.74	39	0.422
02/23/93	-1.6	34.23	35.09	10/23/92	-4.0	31.83	35.09	-3.26	24	0.411
03/31/93	-1.7	34.13	35.09	04/15/94	-3.8	31.98	35.09	-3.11	15	0.405
04/27/93	-2.8	33.03	35.09	01/22/93	-3.4	32.38	35.09	-2.71	24	0.394
05/28/93	-5.7	30.08	35.09	02/29/90	-3.2	32.58	35.09	-2.51	31	0.380
06/18/93	-5.5	30.28	35.09	05/25/95	-3.2	32.60	35.09	-2.49	38	0.363
07/28/93	-6.2	29.65	35.09	10/22/91	-3.1	32.68	35.09	-2.41	29	0.350
08/30/93	-4.8	31.03	35.09	06/28/91	-3.0	32.78	35.09	-2.31	28	0.338
09/29/93	-1.3	34.53	35.09	04/27/93	-2.8	33.03	35.09	-2.08	27	0.326
10/28/93	-1.8	34.03	35.09	02/28/94	-2.8	33.06	35.09	-2.04	41	0.307
11/29/93	-2.3	33.53	35.09	08/30/94	-2.6	33.18	35.09	-1.91	47	0.286
12/29/93	-2.4	33.38	35.09	12/29/93	-2.4	33.38	35.09	-1.71	30	0.273
01/18/94	-1.7	34.08	35.09	11/29/93	-2.3	33.53	35.09	-1.58	32	0.259
02/28/94	-2.8	33.05	35.09	10/28/93	-1.8	34.03	35.09	-1.06	29	0.246
03/31/94	-4.5	31.33	35.09	06/29/95	-1.7	34.08	35.09	-1.01	35	0.230
04/15/94	-3.8	31.98	35.09	04/17/95	-1.7	34.08	35.09	-1.01	17	0.222
05/31/94	-6.4	29.41	35.09	01/18/94	-1.7	34.08	35.09	-1.01	20	0.213
06/15/94	-5.2	30.58	35.09	03/31/93	-1.7	34.13	35.09	-0.96	36	0.197
07/14/94	-5.0	30.83	35.09	09/23/91	-1.6	34.23	35.09	-0.86	28	0.185
08/30/94	-2.6	33.18	35.09	02/23/93	-1.6	34.23	35.09	-0.86	32	0.170
09/15/94	-0.5	35.28	35.09	09/29/93	-1.3	34.53	35.09	-0.56	30	0.157
10/27/94	-0.5	35.28	35.09	03/31/95	-1.1	34.75	35.09	-0.34	44	0.137
11/29/94	-0.7	35.13	35.09	02/15/95	-0.8	34.98	35.09	-0.11	15	0.131
12/28/94	-0.6	35.23	35.09	08/26/91	-0.8	34.98	35.09	-0.11	31	0.117
01/31/95	-0.7	35.08	35.09	09/16/95	-0.8	35.03	35.09	-0.06	16	0.110
02/15/95	-0.8	34.98	35.09	07/26/91	-0.7	35.08	35.09	-0.01	28	0.097
03/31/95	-1.1	34.75	35.09	01/31/95	-0.7	35.08	35.09	-0.01	34	0.082
04/17/95	-1.7	34.08	35.09	11/29/94	-0.7	35.13	35.09	0.04	33	0.067
05/25/95	-3.2	32.60	35.09	07/19/95	-0.6	35.18	35.09	0.09	20	0.058
06/29/95	-1.7	34.08	35.09	12/28/94	-0.6	35.23	35.09	0.14	29	0.045
07/19/95	-0.6	35.18	35.09	09/15/94	-0.5	35.28	35.09	0.19	18	0.038
08/31/95	-0.5	35.28	35.09	08/31/95	-0.5	35.28	35.09	0.19	43	0.019
09/18/95	-0.8	35.03	35.09	10/27/94	-0.5	35.28	35.09	0.19	42	0.000

Datum per Slave Shear equal to ground level  
 Ground Elevation at Staff Gage (SWFAMD)  
 HYDROGRAPH DATA

Raw Level				P50 DATA						
Date	Level	Elev	HNP	Date	Level	Elev	Lev.-HNP	Time	Freq	Median
10/15/88	1.08	89.03	89.38	05/15/92	-4.32	81.85	-7.73	30		
11/15/88	1.12	89.09	89.38	06/15/92	-4.32	81.85	-7.73	31		
12/15/88	0.99	88.96	89.38	07/15/92	-4.32	81.85	-7.73	30		
01/15/89	1.06	89.05	89.38	12/15/90	-4.13	81.84	-7.54	30		
02/15/89	0.78	88.75	89.38	01/15/91	-4.13	81.84	-7.54	31		
03/15/89	0.80	88.77	89.38	01/15/92	-4.13	81.84	-7.54	31		
04/15/89	0.12	88.09	89.38	10/15/90	-4.13	81.84	-7.54	30		
05/15/89	-3.13	84.84	89.38	11/15/90	-4.13	81.84	-7.54	31		
06/15/89	-2.83	85.44	89.38	02/15/92	-4.13	81.84	-7.54	31		
07/15/89	-2.78	85.21	89.38	12/15/91	-4.13	81.84	-7.54	30		
08/15/89	-3.53	84.44	89.38	03/15/92	-4.13	81.84	-7.54	29		
09/15/89	-3.33	84.84	89.38	02/15/91	-4.13	81.84	-7.54	31		
10/15/89	-4.51	83.46	89.38	03/15/91	-4.13	81.84	-7.54	28		
11/15/89	-4.58	83.39	89.38	05/15/91	-4.13	81.84	-7.54	30		
12/15/89	-3.40	84.57	89.38	03/15/93	-4.13	81.84	-7.54	28		
01/15/90	-3.88	84.09	89.38	10/15/92	-4.13	81.84	-7.54	30		
02/15/90	0.12	88.09	89.38	05/15/93	-4.13	81.84	-7.54	30		
03/15/90	-3.53	84.44	89.38	06/15/93	-4.13	81.84	-7.54	31		
04/15/90	-4.58	83.41	89.38	09/15/93	-4.13	81.84	-7.54	31		
05/15/90	-4.68	83.31	89.38	08/15/93	-4.13	81.84	-7.54	31		
06/15/90	-4.28	83.71	89.38	07/15/93	-4.13	81.84	-7.54	30		
07/15/90	-4.85	83.32	89.38	08/28/95	-4.82	83.15	-6.23	27	0.746	
08/15/90	-4.68	83.31	89.38	03/15/94	-4.79	83.18	-6.20	28	0.735	
09/15/90	-4.11	83.86	89.38	01/15/94	-4.79	83.18	-6.20	31	0.723	
10/15/90	-4.13	81.84	89.38	02/15/94	-4.79	83.18	-6.20	31	0.712	
11/15/90	-4.13	81.84	89.38	08/15/94	-4.79	83.18	-6.20	31	0.700	
12/15/90	-4.13	81.84	89.38	05/15/94	-4.79	83.18	-6.20	30	0.688	
01/15/91	-4.13	81.84	89.38	04/15/94	-4.79	83.18	-6.20	31	0.678	
02/15/91	-4.13	81.84	89.38	10/15/93	-4.79	83.18	-6.20	30	0.665	
03/15/91	-4.13	81.84	89.38	11/15/93	-4.79	83.18	-6.20	31	0.653	
04/15/91	-3.98	83.98	89.38	12/15/93	-4.79	83.18	-6.20	30	0.641	
05/15/91	-4.13	81.84	89.38	05/15/90	-4.68	83.31	-6.07	30	0.630	
06/15/91	0.28	88.23	89.38	08/15/90	-4.68	83.31	-6.07	31	0.618	
07/15/91	0.84	88.81	89.38	07/15/90	-4.68	83.32	-6.06	30	0.606	
08/15/91	0.88	88.85	89.38	11/15/89	-4.58	83.39	-5.99	31	0.594	
09/15/91	0.19	88.16	89.38	04/15/90	-4.58	83.41	-5.97	31	0.582	
10/15/91	-2.05	85.82	89.38	05/30/95	-4.55	83.42	-5.96	43	0.568	
11/15/91	-3.38	84.59	89.38	04/15/92	-4.52	83.45	-5.93	31	0.554	
12/15/91	-4.13	81.84	89.38	10/15/89	-4.51	83.46	-5.92	30	0.542	
01/15/92	-4.13	81.84	89.38	06/15/90	-4.26	83.71	-5.87	31	0.531	
02/15/92	-4.13	81.84	89.38	09/15/90	-4.11	83.86	-5.82	31	0.519	
03/15/92	-4.13	81.84	89.38	04/15/91	-3.99	83.98	-5.60	31	0.507	
04/15/92	-4.52	83.45	89.38	07/15/94	-3.94	84.03	-5.35	30	0.495	-5.37
05/15/92	-4.32	81.85	89.38	01/15/90	-3.88	84.09	-5.28	31	0.483	
06/15/92	-4.32	81.85	89.38	08/15/92	-3.81	84.18	-5.22	31	0.471	
07/15/92	-4.32	81.85	89.38	09/15/92	-3.69	84.28	-5.10	31	0.459	
08/15/92	-3.81	84.18	89.38	03/15/90	-3.53	84.44	-4.94	28	0.449	
09/15/92	-3.88	84.28	89.38	08/15/89	-3.53	84.44	-4.94	31	0.437	
10/15/92	-4.13	81.84	89.38	12/15/92	-3.51	84.46	-4.92	30	0.425	
11/15/92	-2.35	85.62	89.38	12/15/89	-3.40	84.57	-4.81	30	0.414	
12/15/92	-3.51	84.46	89.38	11/15/91	-3.38	84.59	-4.79	31	0.402	
01/15/93	-2.48	85.49	89.38	02/15/93	-3.38	84.59	-4.79	31	0.390	
02/15/93	-3.38	84.59	89.38	04/17/95	-3.33	84.64	-4.74	27	0.380	
03/15/93	-4.13	81.84	89.38	06/15/89	-3.33	84.64	-4.74	31	0.368	
04/15/93	-2.48	85.51	89.38	05/15/94	-3.24	84.73	-4.65	31	0.356	
05/15/93	-4.13	81.84	89.38	05/15/89	-3.13	84.84	-4.54	30	0.344	
06/15/93	-4.13	81.84	89.38	12/23/94	-3.07	84.91	-4.47	25	0.335	
07/15/93	-4.13	81.84	89.38	03/21/95	-3.05	84.92	-4.46	27	0.324	
08/15/93	-4.13	81.84	89.38	07/15/89	-2.78	85.21	-4.17	30	0.313	
09/15/93	-4.13	81.84	89.38	01/23/95	-2.89	85.28	-4.10	31	0.301	
10/15/93	-4.79	83.18	89.38	02/22/95	-2.86	85.31	-4.07	30	0.289	
11/15/93	-4.79	83.18	89.38	08/15/89	-2.53	85.44	-3.94	31	0.277	
12/15/93	-4.79	83.18	89.38	01/15/93	-2.48	85.49	-3.89	31	0.265	
01/15/94	-4.79	83.18	89.38	04/15/93	-2.46	85.51	-3.87	31	0.253	
02/15/94	-4.79	83.18	89.38	11/15/92	-2.35	85.62	-3.76	31	0.242	
03/15/94	-4.79	83.18	89.38	11/28/94	-2.17	85.80	-3.58	46	0.224	
04/15/94	-4.79	83.18	89.38	10/15/91	-2.05	85.92	-3.48	30	0.212	
05/15/94	-4.79	83.18	89.38	07/23/95	-1.80	88.17	-3.21	27	0.202	
06/15/94	-4.79	83.18	89.38	10/13/94	-1.33	88.84	-2.74	18	0.195	
07/15/94	-3.94	84.03	89.38	02/15/90	0.12	88.09	-1.29	31	0.183	
08/15/94	-3.24	84.73	89.38	04/15/89	0.12	88.09	-1.29	31	0.171	
09/25/94	0.19	88.16	89.38	06/23/95	0.14	88.11	-1.27	31	0.159	
10/13/94	-1.33	88.84	89.38	08/15/91	0.19	88.16	-1.22	31	0.147	
11/28/94	-2.17	85.80	89.38	09/25/94	0.19	88.16	-1.22	41	0.132	
12/23/94	-3.07	84.91	89.38	08/15/91	0.26	88.23	-1.15	31	0.120	
01/23/95	-2.88	85.28	89.38	08/25/95	0.53	88.50	-0.88	33	0.107	
02/22/95	-2.68	85.31	89.38	07/15/91	0.84	88.81	-0.77	30	0.098	
03/21/95	-3.05	84.92	89.38	10/31/95	0.87	88.84	-0.74	36	0.082	
04/17/95	-3.33	84.64	89.38	02/15/89	0.78	88.75	-0.63	31	0.070	
05/30/95	-4.55	83.42	89.38	03/15/89	0.80	88.77	-0.61	28	0.059	
06/28/95	-4.82	83.15	89.38	08/15/91	0.88	88.85	-0.53	31	0.047	
07/23/95	-1.80	88.17	89.38	12/15/88	0.98	88.96	-0.42	30	0.038	
08/23/95	0.14	88.11	89.38	10/15/88	1.08	89.03	-0.35	30	0.024	
09/25/95	0.83	88.50	89.38	01/15/89	1.08	89.05	-0.33	31	0.012	
10/31/95	0.87	88.84	89.38	11/15/88	1.12	89.09	-0.28	31	0.006	

Data provided has been corrected to a ground level datum. Note: 0.08 feet discrepancy between WCRWSA and SWFWMD surveys.  
Elevation of ground per WCRWSA = 29.40 feet.

HYDROGRAPH DATA

P50 DATA

Date	Raw Level	Level Elev	HNP	Date	Level	Level Elev	Level - HNP	Time	Freq	Median
10/01/88	0.42	29.82	31.89	08/01/92	-4.99	24.41	31.89	-7.48	31	
11/01/88	-0.13	29.27	31.89	07/01/92	-4.99	24.41	31.89	-7.48	30	
12/01/88	-0.13	29.27	31.89	06/01/92	-4.99	24.41	31.89	-7.48	31	
01/01/89	0.22	29.62	31.89	09/01/92	-4.99	24.41	31.89	-7.48	31	
02/01/89	0.03	29.43	31.89	10/01/92	-4.99	24.41	31.89	-7.48	30	
03/01/89	0.43	29.83	31.89	08/01/93	-4.99	24.41	31.89	-7.48	31	
04/01/89	-1.53	27.87	31.89	06/01/93	-4.99	24.41	31.89	-7.48	31	
05/01/89			31.89	01/01/92	-4.99	24.41	31.89	-7.48	31	
06/01/89	-1.53	27.87	31.89	05/01/91	-4.99	24.41	31.89	-7.48	30	
07/01/89	-4.18	25.22	31.89	04/01/91	-4.99	24.41	31.89	-7.48	31	
08/01/89			31.89	02/01/92	-4.99	24.41	31.89	-7.48	31	
09/01/89			31.89	05/01/92	-4.99	24.41	31.89	-7.48	30	
10/01/89			31.89	04/01/92	-4.99	24.41	31.89	-7.48	31	
11/01/89	-1.83	27.57	31.89	03/01/92	-4.99	24.41	31.89	-7.48	29	
12/01/89	-3.03	26.37	31.89	12/01/93	-4.99	24.41	31.89	-7.48	30	
01/01/90	-3.53	25.87	31.89	11/01/94	-4.99	24.41	31.89	-7.48	31	
02/01/90	-3.53	25.87	31.89	10/01/94	-4.99	24.41	31.89	-7.48	30	
03/01/90	-4.03	25.37	31.89	09/01/94	-4.99	24.41	31.89	-7.48	31	
04/01/90			31.89	12/01/94	-4.99	24.41	31.89	-7.48	30	
05/01/90			31.89	03/01/95	-4.99	24.41	31.89	-7.48	28	
06/01/90			31.89	02/01/95	-4.99	24.41	31.89	-7.48	31	
07/01/90			31.89	01/01/95	-4.99	24.41	31.89	-7.48	31	
08/01/90	-2.00	27.40	31.89	03/01/94	-4.99	24.41	31.89	-7.48	28	
09/01/90	-3.00	26.40	31.89	02/01/94	-4.99	24.41	31.89	-7.48	31	
10/01/90	-2.00	27.40	31.89	01/01/94	-4.99	24.41	31.89	-7.48	31	
11/01/90	-4.33	25.07	31.89	04/01/94	-4.99	24.41	31.89	-7.48	31	
12/01/90	-4.99	24.41	31.89	07/01/94	-4.99	24.41	31.89	-7.48	30	
01/01/91	-4.99	24.41	31.89	06/01/94	-4.99	24.41	31.89	-7.48	31	
02/01/91	-4.99	24.41	31.89	05/01/94	-4.99	24.41	31.89	-7.48	30	
03/01/91	-4.99	24.41	31.89	03/01/91	-4.99	24.41	31.89	-7.48	29	
04/01/91	-4.99	24.41	31.89	12/01/90	-4.99	24.41	31.89	-7.48	30	
05/01/91	-4.99	24.41	31.89	01/01/91	-4.99	24.41	31.89	-7.48	31	
06/01/91	-3.03	26.37	31.89	02/01/91	-4.99	24.41	31.89	-7.48	31	
07/01/91	-2.08	27.32	31.89	06/21/95	-4.46	24.95	31.89	-6.95	43	0.595
08/01/91	-0.53	28.87	31.89	11/01/90	-4.30	25.07	31.89	-6.82	31	0.583
09/01/91	-0.30	29.10	31.89	07/01/89	-4.18	25.22	31.89	-6.67	30	0.572
10/01/91	-1.89	27.51	31.89	03/01/90	-4.03	25.37	31.89	-6.52	28	0.561
11/01/91	-2.71	26.89	31.89	07/01/93	-3.59	25.81	31.89	-6.08	30	0.549
12/01/91	-3.08	26.32	31.89	02/01/90	-3.53	25.87	31.89	-6.02	31	0.537
01/01/92	-4.99	24.41	31.89	01/01/90	-3.53	25.87	31.89	-6.02	31	0.525
02/01/92	-4.99	24.41	31.89	09/01/94	-3.52	25.88	31.89	-6.01	31	0.513
03/01/92	-4.99	24.41	31.89	11/01/93	-3.11	26.29	31.89	-5.60	31	0.501
04/01/92	-4.99	24.41	31.89	12/01/91	-3.08	26.32	31.89	-5.57	30	0.490
05/01/92	-4.99	24.41	31.89	12/01/89	-3.03	26.37	31.89	-5.52	30	0.478
06/01/92	-4.99	24.41	31.89	09/01/91	-3.03	26.37	31.89	-5.52	31	0.466
07/01/92	-4.99	24.41	31.89	05/01/93	-3.02	26.38	31.89	-5.51	30	0.454
08/01/92	-4.99	24.41	31.89	09/01/90	-3.00	26.40	31.89	-5.49	31	0.442
09/01/92	-4.99	24.41	31.89	01/01/93	-2.95	26.45	31.89	-5.44	31	0.430
10/01/92	-2.26	27.14	31.89	02/01/93	-2.92	26.48	31.89	-5.41	31	0.418
11/01/92	-2.71	26.89	31.89	11/01/91	-2.71	26.89	31.89	-5.20	31	0.406
12/01/92	-2.83	26.77	31.89	11/01/92	-2.71	26.89	31.89	-5.20	31	0.394
01/01/93	-2.95	26.45	31.89	05/09/95	-2.70	26.70	31.89	-5.19	13	0.389
02/01/93	-2.92	26.48	31.89	04/28/95	-2.70	26.70	31.89	-5.19	58	0.368
03/01/93	-2.46	26.94	31.89	12/01/92	-2.63	26.77	31.89	-5.12	30	0.356
04/01/93	-2.11	27.29	31.89	03/01/93	-2.46	26.94	31.89	-4.95	28	0.345
05/01/93	-3.02	26.38	31.89	09/01/93	-2.35	27.05	31.89	-4.84	31	0.333
06/01/93	-4.99	24.41	31.89	10/01/92	-2.26	27.14	31.89	-4.75	30	0.322
07/01/93	-3.59	25.81	31.89	04/01/93	-2.11	27.29	31.89	-4.60	31	0.310
08/01/93	-4.99	24.41	31.89	07/01/91	-2.08	27.32	31.89	-4.57	30	0.298
09/01/93	-2.35	27.05	31.89	10/01/90	-2.00	27.40	31.89	-4.49	30	0.286
10/01/93	-4.99	24.41	31.89	08/01/90	-2.00	27.40	31.89	-4.49	31	0.274
11/01/93	-3.11	26.29	31.89	10/01/91	-1.89	27.51	31.89	-4.38	30	0.263
12/01/93	-4.99	24.41	31.89	07/19/95	-1.87	27.54	31.89	-4.36	28	0.252
01/01/94	-4.99	24.41	31.89	11/01/89	-1.83	27.57	31.89	-4.32	31	0.240
02/01/94	-4.99	24.41	31.89	06/01/89	-1.53	27.87	31.89	-4.02	31	0.228
03/01/94	-4.99	24.41	31.89	04/01/89	-1.53	27.87	31.89	-4.02	31	0.218
04/01/94	-4.99	24.41	31.89	08/29/95	-0.54	28.88	31.89	-3.03	41	0.200
05/01/94	-4.99	24.41	31.89	09/01/91	-0.53	28.87	31.89	-3.02	31	0.188
06/01/94	-4.99	24.41	31.89	09/01/91	-0.30	29.10	31.89	-2.79	31	0.176
07/01/94	-4.99	24.41	31.89	11/01/88	-0.13	29.27	31.89	-2.62	31	0.164
08/01/94	-4.99	24.41	31.89	12/01/88	-0.13	29.27	31.89	-2.62	30	0.152
09/01/94	-3.52	25.88	31.89	10/01/89		29.40	31.89	-2.49	30	0.141
10/01/94	-4.99	24.41	31.89	06/01/90		29.40	31.89	-2.49	31	0.129
11/01/94	-4.99	24.41	31.89	07/01/90		29.40	31.89	-2.49	30	0.117
12/01/94	-4.99	24.41	31.89	05/01/90		29.40	31.89	-2.49	30	0.106
01/01/95	-4.99	24.41	31.89	04/01/90		29.40	31.89	-2.49	31	0.094
02/01/95	-4.99	24.41	31.89	09/01/89		29.40	31.89	-2.49	31	0.082
03/01/95	-4.99	24.41	31.89	05/01/89		29.40	31.89	-2.49	30	0.070
04/29/95	-2.70	26.70	31.89	08/01/89		29.40	31.89	-2.49	31	0.058
05/09/95	-2.70	26.70	31.89	02/01/89	0.03	29.43	31.89	-2.46	31	0.046
06/21/95	-4.46	24.95	31.89	09/27/95	0.08	29.48	31.89	-2.41	29	0.035
07/19/95	-1.87	27.54	31.89	01/01/89	0.22	29.82	31.89	-2.27	31	0.023
08/29/95	-0.64	28.88	31.89	10/01/88	0.42	29.82	31.89	-2.07	30	0.011
09/27/95	0.08	29.48	31.89	03/01/89	0.43	29.83	31.89	-2.08	28	0.000



HYDROGRAPH DATA

P50 DATA

HYDROGRAPH DATA				P50 DATA					
Date	Raw Level	Level Elev	HNP	Date	Level Elev	Lev.-HNP	Time	Freq	Median
10/15/88	0.80	63.92	64.88	03/15/92	-8.80	58.32	-8.56	29	
11/15/88	1.62	64.74	64.88	01/15/92	-8.80	58.32	-8.56	31	
12/15/88	1.16	64.28	64.88	06/15/92	-8.80	58.32	-8.56	31	
01/15/89	1.26	64.38	64.88	05/15/92	-8.80	58.32	-8.56	30	
02/15/89	0.82	63.94	64.88	12/15/90	-8.80	58.32	-8.56	30	
03/15/89	0.42	63.54	64.88	02/15/91	-8.80	58.32	-8.56	31	
04/15/89	-2.25	60.87	64.88	05/15/91	-8.80	58.32	-8.56	30	
05/15/89	-3.79	59.33	64.88	03/15/91	-8.80	58.32	-8.56	28	
06/15/89	-2.82	60.30	64.88	07/15/93	-8.80	58.32	-8.56	30	
07/15/89	-2.97	60.15	64.88	06/15/93	-8.80	58.32	-8.56	31	
08/15/89	-4.02	59.10	64.88	08/15/93	-8.80	58.32	-8.56	31	
09/15/89	-3.79	59.34	64.88	12/15/93	-4.98	58.14	-6.74	30	
10/15/89	-4.47	58.65	64.88	04/15/94	-4.98	58.14	-6.74	31	
11/15/89	-4.59	58.53	64.88	05/15/94	-4.98	58.14	-6.74	30	
12/15/89	-4.16	58.96	64.88	01/15/94	-4.98	58.14	-6.74	31	
01/15/90	-3.75	59.37	64.88	03/15/94	-4.98	58.14	-6.74	28	
02/15/90	-2.00	61.12	64.88	06/15/94	-4.98	58.14	-6.74	31	
03/15/90	-3.74	59.38	64.88	10/15/93	-4.98	58.14	-6.74	30	
04/15/90	-4.32	58.80	64.88	11/15/93	-4.98	58.14	-6.74	31	
05/15/90	-4.62	58.50	64.88	11/15/90	-4.67	58.45	-6.43	31	
06/15/90	-4.67	58.45	64.88	10/15/90	-4.67	58.45	-6.43	30	
07/15/90	-4.04	59.08	64.88	01/15/91	-4.67	58.45	-6.43	31	
08/15/90	-4.25	58.87	64.88	06/15/90	-4.67	58.45	-6.43	31	0.732
09/15/90	-4.12	59.00	64.88	05/15/90	-4.62	58.50	-6.38	30	0.721
10/15/90	-4.67	58.45	64.88	11/15/89	-4.59	58.53	-6.35	31	0.709
11/15/90	-4.67	58.45	64.88	10/15/89	-4.47	58.65	-6.23	30	0.697
12/15/90	-6.80	56.32	64.88	04/15/90	-4.32	58.80	-6.08	31	0.685
01/15/91	-4.67	58.45	64.88	09/15/93	-4.29	58.83	-6.05	31	0.674
02/15/91	-6.80	56.32	64.88	04/15/92	-4.25	58.87	-6.01	31	0.662
03/15/91	-6.80	56.32	64.88	08/15/90	-4.25	58.87	-6.01	31	0.650
04/15/91	-2.47	60.65	64.88	12/15/89	-4.16	58.96	-5.92	30	0.638
05/15/91	-6.80	56.32	64.88	09/15/90	-4.12	59.00	-5.88	31	0.626
06/15/91	-3.02	60.10	64.88	07/15/90	-4.04	59.08	-5.80	30	0.615
07/15/91	-0.13	62.99	64.88	02/15/94	-4.02	59.10	-5.78	31	0.603
08/15/91	1.28	64.40	64.88	08/15/89	-4.02	59.10	-5.78	31	0.591
09/15/91	-0.20	62.92	64.88	07/15/94	-3.96	59.16	-5.72	30	0.579
10/15/91	-1.95	61.17	64.88	05/30/95	-3.94	59.19	-5.70	40	0.563
11/15/91	-3.30	59.82	64.88	02/15/92	-3.90	59.22	-5.66	31	0.551
12/15/91	-3.73	59.39	64.88	07/15/92	-3.87	59.25	-5.63	30	0.539
01/15/92	-6.80	56.32	64.88	05/15/89	-3.79	59.33	-5.55	30	0.528
02/15/92	-3.90	59.22	64.88	09/15/89	-3.78	59.34	-5.54	31	0.515
03/15/92	-6.80	56.32	64.88	01/15/90	-3.75	59.37	-5.61	31	0.504
04/15/92	-4.25	58.87	64.88	03/15/90	-3.74	59.38	-5.60	28	0.493
05/15/92	-6.80	56.32	64.88	12/15/91	-3.73	59.39	-5.49	30	0.482
06/15/92	-6.80	56.32	64.88	03/15/93	-3.73	59.39	-5.49	28	0.471
07/15/92	-3.87	59.25	64.88	05/15/93	-3.72	59.40	-5.48	30	0.459
08/15/92	-2.59	60.53	64.88	02/15/93	-3.30	59.82	-5.06	31	0.448
09/15/92	-2.76	60.36	64.88	11/15/91	-3.30	59.82	-5.06	31	0.436
10/15/92	-2.51	60.61	64.88	09/15/94	-3.17	59.95	-4.93	31	0.424
11/15/92	-1.89	61.23	64.88	06/15/91	-3.02	60.10	-4.78	31	0.412
12/15/92	-1.84	61.28	64.88	07/15/89	-2.97	60.15	-4.73	30	0.400
01/15/93	-0.59	62.53	64.88	06/15/89	-2.82	60.30	-4.58	31	0.388
02/15/93	-3.30	59.82	64.88	12/23/94	-2.80	60.32	-4.56	25	0.379
03/15/93	-3.73	59.39	64.88	08/15/92	-2.76	60.38	-4.52	31	0.367
04/15/93	-1.79	61.33	64.88	06/15/92	-2.59	60.53	-4.35	31	0.355
05/15/93	-3.72	59.40	64.88	06/26/95	-2.59	60.54	-4.34	27	0.345
06/15/93	-6.80	56.32	64.88	10/15/92	-2.51	60.61	-4.27	30	0.333
07/15/93	-6.80	56.32	64.88	04/15/91	-2.47	60.65	-4.23	31	0.321
08/15/93	-6.80	56.32	64.88	01/23/95	-2.34	60.79	-4.09	31	0.308
09/15/93	-4.29	58.83	64.88	11/28/94	-2.26	60.86	-4.02	46	0.292
10/15/93	-4.98	58.14	64.88	04/15/89	-2.25	60.87	-4.01	31	0.280
11/15/93	-4.98	58.14	64.88	02/22/95	-2.25	60.88	-4.00	30	0.268
12/15/93	-4.98	58.14	64.88	04/17/95	-2.17	60.96	-3.92	27	0.258
01/15/94	-4.98	58.14	64.88	07/23/95	-2.16	60.97	-3.91	27	0.247
02/15/94	-4.02	59.10	64.88	02/15/90	-2.00	61.12	-3.78	31	0.235
03/15/94	-4.98	58.14	64.88	10/15/91	-1.96	61.17	-3.71	30	0.224
04/15/94	-4.98	58.14	64.88	03/21/95	-1.91	61.22	-3.66	27	0.214
05/15/94	-4.98	58.14	64.88	11/15/92	-1.89	61.23	-3.65	31	0.202
06/15/94	-4.98	58.14	64.88	12/15/92	-1.84	61.28	-3.60	30	0.190
07/15/94	-3.96	59.16	64.88	04/15/93	-1.79	61.33	-3.55	31	0.178
08/15/94	-3.17	59.95	64.88	10/15/94	-1.64	61.48	-3.40	18	0.171
09/25/94	-0.72	62.40	64.88	09/25/94	-0.72	62.40	-2.48	41	0.155
10/13/94	-1.84	61.48	64.88	01/15/93	-0.58	62.53	-2.35	31	0.144
11/28/94	-2.26	60.86	64.88	09/15/91	-0.20	62.92	-1.96	31	0.132
12/23/94	-2.80	60.32	64.88	07/15/91	-0.13	62.99	-1.89	30	0.120
01/23/95	-2.34	60.79	64.88	03/15/89	0.42	63.54	-1.34	28	0.109
02/22/95	-2.25	60.88	64.88	08/23/95	0.51	63.63	-1.25	31	0.097
03/21/95	-1.91	61.22	64.88	10/15/88	0.80	63.92	-0.96	30	0.086
04/17/95	-2.17	60.96	64.88	02/15/89	0.82	63.94	-0.94	31	0.074
05/30/95	-3.94	59.19	64.88	09/25/95	1.08	64.20	-0.68	33	0.061
06/26/95	-2.59	60.54	64.88	12/15/88	1.16	64.28	-0.60	30	0.050
07/23/95	-2.16	60.97	64.88	01/15/89	1.28	64.38	-0.50	31	0.038
08/23/95	0.51	63.63	64.88	09/15/91	1.28	64.40	-0.48	31	0.028
09/25/95	1.08	64.20	64.88	10/31/95	1.31	64.43	-0.45	36	0.012
10/31/95	1.31	64.43	64.88	11/15/88	1.62	64.74	-0.14	31	0.005

-5.51

WATER LEVELS PROVIDED WITH PALMETTO LINE AS DATUM:

Elevation of palmetto line calculated from: Table 3 of "Annual Report: Ecological Monitoring of the Morris Bridge Wetfield Water Years 1994, 1995, and 1996 by :

ground elev = 35.7 - 0.6 feet = 35.1

HYDROGRAPH DATA

P50 DATA

Date	Raw Level	Corrected Level	Level Elev	HNP	Date	Level	Corrected Level	Level Elev	HNP	Lev.-HNP	Time	Freq	Median
10/20/89	-3.55	-2.85	32.45	38.25	05/20/92	-10.25	-9.35	25.75	38.25	-10.50	23		
11/17/89	-5.85	-4.95	30.15	38.25	06/26/92	-9.70	-8.80	26.30	38.25	-9.95	40	0.965	
12/18/89	-5.90	-5.00	30.10	38.25	07/29/92	-9.30	-8.40	26.70	38.25	-9.55	30	0.949	
01/28/90	-2.33	-1.43	33.67	38.25	08/28/90	-8.10	-8.20	26.90	38.25	-9.35	42	0.926	
02/26/90	-2.40	-1.50	33.80	38.25	03/22/91	-9.05	-8.15	26.95	38.25	-9.30	30	0.909	
03/23/90	-4.10	-3.20	31.90	38.25	06/30/93	-9.05	-8.15	26.95	38.25	-9.30	33	0.891	
04/19/90	-6.30	-5.40	29.70	38.25	06/21/92	-8.95	-8.05	27.05	38.25	-9.20	23	0.878	
05/18/90	-6.80	-7.90	27.20	38.25	02/24/92	-8.95	-8.05	27.05	38.25	-9.20	38	0.857	
06/29/90	-8.10	-8.20	26.90	38.25	04/27/92	-8.90	-8.00	27.10	38.25	-9.15	33	0.839	
07/30/90	-8.00	-7.10	28.00	38.25	05/18/90	-8.80	-7.90	27.20	38.25	-9.05	29	0.823	
08/24/90	-5.85	-4.95	30.15	38.25	02/20/91	-8.80	-7.90	27.20	38.25	-9.05	27	0.808	
09/21/90	-4.85	-3.95	31.15	38.25	07/28/93	-8.70	-7.80	27.30	38.25	-8.95	40	0.786	
10/19/90	-5.10	-4.20	30.90	38.25	04/19/91	-8.70	-7.80	27.30	38.25	-8.95	28	0.771	
11/30/90	-6.57	-6.57	29.43	38.25	01/24/91	-8.50	-7.60	27.50	38.25	-8.75	41	0.748	
12/14/90	-7.80	-8.90	28.20	38.25	06/18/93	-8.30	-7.40	27.70	38.25	-8.55	21	0.736	
01/24/91	-8.50	-7.60	27.50	38.25	06/31/91	-8.20	-7.30	27.80	38.25	-8.45	42	0.713	
02/20/91	-8.80	-7.90	27.20	38.25	01/17/92	-8.10	-7.20	27.90	38.25	-8.35	28	0.698	
03/22/91	-9.05	-8.15	26.95	38.25	07/30/90	-8.00	-7.10	28.00	38.25	-8.25	31	0.681	
04/19/91	-8.70	-7.80	27.30	38.25	03/25/92	-7.95	-7.05	28.05	38.25	-8.20	30	0.664	
05/31/91	-8.20	-7.30	27.80	38.25	06/15/94	-7.90	-7.00	28.10	38.25	-8.15	15	0.658	
06/28/91	-4.30	-3.40	31.70	38.25	12/14/90	-7.80	-6.90	28.20	38.25	-8.05	14	0.648	
07/28/91	0.40	1.30	36.40	38.25	04/15/94	-7.50	-6.60	28.50	38.25	-7.75	15	0.640	
08/26/91	0.40	1.30	36.40	38.25	12/23/91	-7.40	-6.50	28.60	38.25	-7.65	28	0.624	
09/23/91	-0.15	0.75	36.85	38.25	11/30/90	-6.57	-5.67	29.43	38.25	-6.82	42	0.601	
10/22/91	-1.95	-1.05	34.05	38.25	06/31/94	-6.50	-5.60	29.50	38.25	-6.75	46	0.576	
11/22/91	-4.95	-4.05	31.05	38.25	04/19/90	-6.30	-5.40	29.70	38.25	-6.55	27	0.561	
12/29/91	-7.40	-6.50	28.60	38.25	07/14/94	-6.10	-5.20	29.90	38.25	-6.35	29	0.545	
01/17/92	-8.10	-7.20	27.90	38.25	12/18/89	-5.90	-5.00	30.10	38.25	-6.15	31	0.528	
02/24/92	-8.95	-8.05	27.05	38.25	08/24/90	-5.85	-4.95	30.15	38.25	-6.10	25	0.514	
03/25/92	-7.95	-7.05	28.05	38.25	11/17/89	-5.85	-4.95	30.15	38.25	-6.10	28	0.498	-6.10
04/27/92	-8.90	-8.00	27.10	38.25	12/29/93	-5.55	-4.65	30.45	38.25	-5.80	30	0.482	
05/29/92	-10.25	-9.35	25.75	38.25	10/19/90	-5.10	-4.20	30.90	38.25	-5.35	28	0.465	
06/29/92	-8.70	-8.80	26.30	38.25	01/22/93	-5.00	-4.10	31.00	38.25	-5.25	24	0.453	
07/29/92	-9.30	-8.40	26.70	38.25	11/23/91	-4.95	-4.05	31.05	38.25	-5.20	31	0.436	
08/21/92	-8.95	-8.05	27.05	38.25	03/31/94	-4.95	-4.05	31.05	38.25	-5.20	31	0.419	
09/29/92	-3.80	-2.90	32.50	38.25	12/29/92	-4.90	-4.00	31.10	38.25	-5.15	38	0.400	
10/23/92	-3.25	-2.35	32.75	38.25	09/21/90	-4.85	-3.95	31.15	38.25	-5.10	28	0.384	
11/24/92	-4.85	-3.95	31.15	38.25	11/24/92	-4.85	-3.95	31.15	38.25	-5.10	32	0.366	
12/29/92	-4.90	-4.00	31.10	38.25	06/29/91	-4.30	-3.40	31.70	38.25	-4.55	28	0.361	
01/22/93	-5.00	-4.10	31.00	38.25	03/23/90	-4.10	-3.20	31.90	38.25	-4.35	25	0.337	
02/23/93	-2.75	-1.85	33.25	38.25	11/29/93	-3.80	-2.90	32.20	38.25	-4.05	32	0.319	
03/31/93	-1.40	-0.50	34.60	38.25	10/20/89	-3.55	-2.65	32.45	38.25	-3.80	20	0.308	
04/27/93	-2.60	-1.70	33.40	38.25	09/29/92	-3.50	-2.60	32.50	38.25	-3.75	39	0.287	
05/28/93	-3.15	-2.25	32.85	38.25	02/28/94	-3.27	-2.37	32.73	38.25	-3.52	41	0.264	
06/18/93	-8.30	-7.40	27.70	38.25	10/23/92	-3.25	-2.35	32.75	38.25	-3.50	24	0.251	
07/28/93	-8.70	-7.80	27.30	38.25	05/28/93	-3.15	-2.25	32.85	38.25	-3.40	31	0.234	
08/30/93	-9.05	-8.15	26.95	38.25	08/30/94	-2.93	-2.03	33.07	38.25	-3.18	47	0.208	
09/29/93	-2.40	-1.50	33.80	38.25	02/23/93	-2.75	-1.85	33.25	38.25	-3.00	32	0.190	
10/28/93	-2.80	-1.70	33.40	38.25	04/27/93	-2.60	-1.70	33.40	38.25	-2.85	27	0.175	
11/29/93	-3.90	-2.90	32.20	38.25	10/29/93	-2.60	-1.70	33.40	38.25	-2.85	29	0.159	
12/29/93	-5.55	-4.65	30.45	38.25	02/28/90	-2.40	-1.50	33.60	38.25	-2.65	31	0.142	
01/18/94	-2.30	-1.40	33.70	38.25	09/29/93	-2.40	-1.50	33.60	38.25	-2.65	30	0.125	
02/28/94	-3.27	-2.37	32.73	38.25	01/29/90	-2.33	-1.43	33.67	38.25	-2.58	39	0.104	
03/31/94	-4.95	-4.05	31.05	38.25	01/18/94	-2.30	-1.40	33.70	38.25	-2.55	20	0.093	
04/15/94	-7.50	-6.60	28.50	38.25	10/22/91	-1.95	-1.05	34.05	38.25	-2.20	29	0.077	
05/31/94	-6.50	-5.60	29.50	38.25	03/31/93	-1.40	-0.50	34.60	38.25	-1.65	36	0.057	
06/18/94	-7.90	-7.00	28.10	38.25	09/23/91	-0.15	0.75	35.85	38.25	-0.40	28	0.042	
07/14/94	-6.10	-5.20	29.90	38.25	09/15/94	0.00	0.90	36.00	38.25	-0.25	18	0.033	
08/30/94	-2.93	-2.03	33.07	38.25	08/26/91	0.40	1.30	36.40	38.25	0.15	31	0.016	
09/15/94	0.00	0.90	36.00	38.25	07/28/91	0.40	1.30	36.40	38.25	0.15	28	0.000	

Drawn per State Show equal to ground level at the staff gage

73.65

Ground Elevation at Staff Gage (SWFMD)

P50 DATA

Hydrograph Data

Date	Flow	Level	Flow	Level	Date	Flow	Level
10/15/88	1.04	74.92	0.882	74.92	01/15/89	8.47	85.18
11/15/88	1.04	74.70	0.882	74.70	02/15/89	8.47	85.19
08/25/85	3.72	88.95	0.012	80.12	03/15/89	8.47	85.19
07/22/86	3.78	88.98	0.024	80.24	04/15/89	8.47	85.19
06/20/85	5.28	88.28	0.048	80.48	05/15/89	8.47	85.19
05/20/85	6.29	87.27	0.068	80.68	06/15/89	8.47	85.19
04/17/85	5.34	88.33	0.071	80.71	07/15/89	8.47	85.19
03/21/86	5.76	87.90	0.082	80.82	08/15/89	8.47	85.19
02/22/85	5.40	88.27	0.084	80.84	09/15/89	8.47	85.19
01/23/86	6.68	88.08	0.108	81.08	10/15/89	8.47	85.19
12/23/84	5.74	87.93	0.118	81.18	11/15/89	8.47	85.19
11/23/84	5.29	88.27	0.128	81.28	12/15/89	8.47	85.19
10/13/84	4.48	88.18	0.138	81.38	01/15/90	8.47	85.19
09/25/84	3.96	88.80	0.150	81.50	02/15/90	8.47	85.19
08/15/84	5.14	88.52	0.162	81.62	03/15/90	8.47	85.19
07/15/84	4.78	88.88	0.174	81.74	04/15/90	8.47	85.19
06/15/84	5.81	87.85	0.185	81.85	05/15/90	8.47	85.19
05/15/84	4.88	87.00	0.197	81.97	06/15/90	8.47	85.19
04/15/84	4.86	87.00	0.210	82.10	07/15/90	8.47	85.19
03/15/84	5.89	87.27	0.220	82.20	08/15/90	8.47	85.19
02/15/84	5.24	88.42	0.236	82.36	09/15/90	8.47	85.19
01/15/84	4.88	87.00	0.248	82.48	10/15/90	8.47	85.19
12/15/83	4.88	87.00	0.260	82.60	11/15/90	8.47	85.19
11/15/83	4.88	87.00	0.272	82.72	12/15/90	8.47	85.19
10/15/83	4.88	87.00	0.284	82.84	01/15/91	8.47	85.19
09/15/83	4.88	87.00	0.296	82.96	02/15/91	8.47	85.19
08/15/83	4.88	87.00	0.308	83.08	03/15/91	8.47	85.19
07/15/83	4.88	87.00	0.315	83.15	04/15/91	8.47	85.19
06/15/83	4.88	87.00	0.327	83.27	05/15/91	8.47	85.19
05/15/83	4.88	87.00	0.338	83.38	06/15/91	8.47	85.19
04/15/83	4.88	87.00	0.348	83.48	07/15/91	8.47	85.19
03/15/83	4.88	87.00	0.357	83.57	08/15/91	8.47	85.19
02/15/83	4.88	87.00	0.367	83.67	09/15/91	8.47	85.19
01/15/83	4.88	87.00	0.377	83.77	10/15/91	8.47	85.19
12/15/82	4.88	87.00	0.385	83.85	11/15/91	8.47	85.19
11/15/82	4.88	87.00	0.397	83.97	12/15/91	8.47	85.19
10/15/82	4.88	87.00	0.408	84.08	01/15/92	8.47	85.19
09/15/82	4.88	87.00	0.419	84.19	02/15/92	8.47	85.19
08/15/82	4.88	87.00	0.431	84.31	03/15/92	8.47	85.19
07/15/82	4.88	87.00	0.443	84.43	04/15/92	8.47	85.19
06/15/82	4.88	87.00	0.455	84.55	05/15/92	8.47	85.19
05/15/82	4.88	87.00	0.467	84.67	06/15/92	8.47	85.19
04/15/82	4.88	87.00	0.479	84.79	07/15/92	8.47	85.19
03/15/82	4.88	87.00	0.487	84.87	08/15/92	8.47	85.19
02/15/82	4.88	87.00	0.498	84.98	09/15/92	8.47	85.19
01/15/82	4.88	87.00	0.502	85.02	10/15/92	8.47	85.19
12/15/81	4.88	87.00	0.513	85.13	11/15/92	8.47	85.19
11/15/81	4.88	87.00	0.523	85.23	12/15/92	8.47	85.19
10/15/81	4.88	87.00	0.537	85.37	01/15/93	8.47	85.19
09/15/81	4.88	87.00	0.548	85.48	02/15/93	8.47	85.19
08/15/81	4.88	87.00	0.558	85.58	03/15/93	8.47	85.19
07/15/81	4.88	87.00	0.568	85.68	04/15/93	8.47	85.19
06/15/81	4.88	87.00	0.578	85.78	05/15/93	8.47	85.19
05/15/81	4.88	87.00	0.582	85.82	06/15/93	8.47	85.19
04/15/81	4.88	87.00	0.594	85.94	07/15/93	8.47	85.19
03/15/81	4.88	87.00	0.606	86.06	08/15/93	8.47	85.19
02/15/81	4.88	87.00	0.624	86.24	09/15/93	8.47	85.19
01/15/81	4.88	87.00	0.634	86.34	10/15/93	8.47	85.19
12/15/80	4.88	87.00	0.647	86.47	11/15/93	8.47	85.19
11/15/80	4.88	87.00	0.658	86.58	12/15/93	8.47	85.19
10/15/80	4.88	87.00	0.668	86.68	01/15/94	8.47	85.19
09/15/80	4.88	87.00	0.677	86.77	02/15/94	8.47	85.19
08/15/80	4.88	87.00	0.683	86.83	03/15/94	8.47	85.19
07/15/80	4.88	87.00	0.688	86.88	04/15/94	8.47	85.19
06/15/80	4.88	87.00	0.695	86.95	05/15/94	8.47	85.19
05/15/80	4.88	87.00	0.707	87.07	06/15/94	8.47	85.19
04/15/80	4.88	87.00	0.718	87.18	07/15/94	8.47	85.19
03/15/80	4.88	87.00	0.730	87.30	08/15/94	8.47	85.19
02/15/80	4.88	87.00	0.741	87.41	09/15/94	8.47	85.19
01/15/80	4.88	87.00	0.751	87.51	10/15/94	8.47	85.19
12/15/79	4.88	87.00	0.761	87.61	11/15/94	8.47	85.19
11/15/79	4.88	87.00	0.771	87.71	12/15/94	8.47	85.19
10/15/79	4.88	87.00	0.784	87.84	01/15/95	8.47	85.19
09/15/79	4.88	87.00	0.796	87.96	02/15/95	8.47	85.19
08/15/79	4.88	87.00	0.807	88.07	03/15/95	8.47	85.19
07/15/79	4.88	87.00	0.819	88.19	04/15/95	8.47	85.19
06/15/79	4.88	87.00	0.835	88.35	05/15/95	8.47	85.19
05/15/79	4.88	87.00	0.847	88.47	06/15/95	8.47	85.19
04/15/79	4.88	87.00	0.859	88.59	07/15/95	8.47	85.19
03/15/79	4.88	87.00	0.871	88.71	08/15/95	8.47	85.19
02/15/79	4.88	87.00	0.882	88.82	09/15/95	8.47	85.19
01/15/79	4.88	87.00	0.894	88.94	10/15/95	8.47	85.19
12/15/78	4.88	87.00	0.906	89.06	11/15/95	8.47	85.19
11/15/78	4.88	87.00	0.918	89.18	12/15/95	8.47	85.19
10/15/78	4.88	87.00	0.930	89.30	01/15/96	8.47	85.19
09/15/78	4.88	87.00	0.942	89.42	02/15/96	8.47	85.19
08/15/78	4.88	87.00	0.954	89.54	03/15/96	8.47	85.19
07/15/78	4.88	87.00	0.967	89.67	04/15/96	8.47	85.19
06/15/78	4.88	87.00	0.979	89.79	05/15/96	8.47	85.19
05/15/78	4.88	87.00	0.991	89.91	06/15/96	8.47	85.19
04/15/78	4.88	87.00	1.004	90.04	07/15/96	8.47	85.19
03/15/78	4.88	87.00	1.016	90.16	08/15/96	8.47	85.19
02/15/78	4.88	87.00	1.028	90.28	09/15/96	8.47	85.19
01/15/78	4.88	87.00	1.040	90.40	10/15/96	8.47	85.19
12/15/77	4.88	87.00	1.052	90.52	11/15/96	8.47	85.19
11/15/77	4.88	87.00	1.064	90.64	12/15/96	8.47	85.19
10/15/77	4.88	87.00	1.076	90.76	01/15/97	8.47	85.19
09/15/77	4.88	87.00	1.088	90.88	02/15/97	8.47	85.19
08/15/77	4.88	87.00	1.100	91.00	03/15/97	8.47	85.19
07/15/77	4.88	87.00	1.112	91.12	04/15/97	8.47	85.19
06/15/77	4.88	87.00	1.124	91.24	05/15/97	8.47	85.19
05/15/77	4.88	87.00	1.136	91.36	06/15/97	8.47	85.19
04/15/77	4.88	87.00	1.148	91.48	07/15/97	8.47	85.19
03/15/77	4.88	87.00	1.160	91.60	08/15/97	8.47	85.19
02/15/77	4.88	87.00	1.172	91.72	09/15/97	8.47	85.19
01/15/77	4.88	87.00	1.184	91.84	10/15/97	8.47	85.19
12/15/76	4.88	87.00	1.196	91.96	11/15/97	8.47	85.19
11/15/76	4.88	87.00	1.208	92.08	12/15/97	8.47	85.19
10/15/76	4.88	87.00	1.220	92.20	01/15/98	8.47	85.19
09/15/76	4.88	87.00	1.232	92.32	02/15/98	8.47	85.19
08/15/76	4.88	87.00	1.244	92.44	03/15/98	8.47	85.19
07/15/76	4.88	87.00	1.256	92.56	04/15/98	8.47	85.19
06/15/76	4.88	87.00	1.268	92.68	05/15/98	8.47	85.19
05/15/76	4.88	87.00	1.280	92.80	06/15/98	8.47	85.19
04/15/76	4.88	87.00	1.292	92.92	07/15/98	8.47	85.19
03/15/76	4.88	87.00	1.304	93.04	08/15/98	8.47	85.19
02/15/76	4.88	87.00	1.316	93.16	09/15/98	8.47	85.19
01/15/76	4.88	87.00	1.328	93.28	10/15/98	8.47	85.19
12/15/75	4.88	87.00	1.340	93.40	11/15/98	8.47	85.19
11/15/75	4.88	87.00	1.352	93.52	12/15/98	8.47	85.19
10/15/75	4.88	87.00	1.364	93.64	01/15/99	8.47	85.19
09/15/75	4.88	87.00	1.376	93.76	02/15/99	8.47	85.19
08/15/75	4.88	87.00	1.388	93.88	03/15/99	8.47	85.19
07/15/75	4.88	87.00	1.400	94.00	04/15/99	8.47	85.19
06/15/75	4.88	87.00	1.412	94.12	05/15/99	8.47	85.19
05/15/75	4.88	87.00	1.424	94.24	06/15/99	8.47	85.19
04/15/75	4.88	87.00	1.436	94.36	07/15/99	8.47	85.19
03/15/75	4.88	87.00	1.448	94.48	08/15/99	8.47	85.19
02/15/75	4.88	87.00	1.460	94.60	09/15/99	8.47	85.19
01/15/75	4.88	87.00	1.472	94.72	10/15/99	8.47	85.19
12/15/74	4.88	87.00	1.484	94.84	11/15/99	8.47	85.19
11/15/74	4.88	87.00	1.496	94.96	12/15/99	8.47	85.19
10/15/74	4.88	87.00	1.508	95.08	01/15/00	8.47	85.19
09/15/74	4.88	87.00	1.520	95.20	02/15/00	8.47	85.19
08/15/74	4.88	87.00	1.532	95.32	03/15/00	8.47	85.19
07/15/74							



## WATER LEVELS PROVIDED WITH PALMETTO LINE AS DATUM:

Elevation of palmetto line calculated from: Table 3 of "Annual Report: Ecological Monitoring of the Morris Bridge Wetfield Water Years 19

Upland well elevation given as 34.2 ft which is given as 0.6 feet above palmetto line

33.6 = palmetto line elev.

## HYDROGRAPH DATA

## P50 DATA

Date	Raw Level	Level Elev	HNP	Date	Level	Level Elev	HNP	Lev.-HNP	Time	Freq	Median
10/20/89	-2.18	31.42	34.1	08/08/92	-10.78	22.82	34.1	-11.28	19		
11/17/89	-3.88	29.72	34.1	02/24/92	-9.23	24.37	34.1	-9.73	38	0.968	
12/18/89	-3.28	30.32	34.1	05/20/92	-9.18	24.42	34.1	-9.68	23	0.956	
01/26/90	-1.28	32.32	34.1	07/29/92	-9.13	24.47	34.1	-9.63	51	0.927	
02/26/90	-1.88	31.72	34.1	04/19/91	-9.13	24.47	34.1	-9.63	28	0.912	
03/23/90	-2.58	31.02	34.1	02/20/91	-9.08	24.52	34.1	-9.58	27	0.897	
04/19/90	-3.88	29.72	34.1	03/22/91	-8.78	24.82	34.1	-9.28	30	0.880	
05/18/90	-7.73	25.87	34.1	08/21/92	-8.68	24.92	34.1	-9.18	23	0.867	
06/29/90	-8.65	24.95	34.1	06/29/90	-8.65	24.95	34.1	-9.15	42	0.844	
07/30/90	-6.88	26.72	34.1	04/27/92	-8.53	25.07	34.1	-9.03	33	0.825	
08/24/90	-5.68	27.92	34.1	08/30/93	-8.33	25.27	34.1	-8.83	33	0.807	
09/21/90	-5.18	28.42	34.1	06/15/94	-8.28	25.32	34.1	-8.78	15	0.799	
10/19/90	-4.83	28.77	34.1	05/31/91	-8.18	25.42	34.1	-8.68	42	0.775	
11/30/90	-5.95	27.65	34.1	01/24/91	-8.13	25.47	34.1	-8.63	41	0.752	
12/14/90	-7.48	26.12	34.1	07/28/93	-8.11	25.49	34.1	-8.61	40	0.730	
01/24/91	-8.13	25.47	34.1	01/17/92	-8.03	25.57	34.1	-8.53	28	0.714	
02/20/91	-9.08	24.52	34.1	03/25/92	-7.78	25.82	34.1	-8.28	30	0.698	
03/22/91	-8.78	24.82	34.1	06/18/93	-7.78	25.82	34.1	-8.28	21	0.686	
04/19/91	-8.13	24.47	34.1	05/18/90	-7.73	25.87	34.1	-8.23	29	0.670	
05/31/91	-8.18	25.42	34.1	12/20/91	-7.68	25.92	34.1	-8.18	28	0.654	
06/28/91	-7.33	26.27	34.1	05/31/94	-7.58	26.02	34.1	-8.08	46	0.629	
07/26/91	-0.43	33.17	34.1	04/15/94	-7.58	26.02	34.1	-8.08	15	0.620	
08/08/91	-1.48	32.12	34.1	12/14/90	-7.48	26.12	34.1	-7.98	14	0.613	
09/23/91	-2.13	31.47	34.1	06/28/91	-7.33	26.27	34.1	-7.83	28	0.597	
10/22/91	-4.33	29.27	34.1	07/14/94	-7.18	26.42	34.1	-7.68	29	0.581	
11/22/91	-6.23	27.37	34.1	07/30/90	-6.88	26.72	34.1	-7.38	31	0.564	
12/20/91	-7.68	25.92	34.1	11/22/91	-6.23	27.37	34.1	-6.73	31	0.546	
01/17/92	-8.03	25.57	34.1	12/29/93	-6.13	27.47	34.1	-6.63	30	0.530	
02/24/92	-9.23	24.37	34.1	11/30/90	-5.95	27.65	34.1	-6.45	42	0.506	
03/25/92	-7.78	25.82	34.1	08/24/90	-5.68	27.92	34.1	-6.18	25	0.492	
04/27/92	-8.53	25.07	34.1	05/28/93	-5.38	28.22	34.1	-5.88	31	0.475	
05/20/92	-9.18	24.42	34.1	03/31/94	-5.33	28.27	34.1	-5.83	31	0.458	
06/08/92	-10.78	22.82	34.1	09/21/90	-5.18	28.42	34.1	-5.68	28	0.442	
07/28/92	-8.13	24.47	34.1	01/22/93	-4.93	28.67	34.1	-5.43	24	0.429	
08/21/92	-8.68	24.92	34.1	09/29/92	-4.88	28.72	34.1	-5.38	39	0.407	
09/29/92	-4.68	28.72	34.1	12/29/92	-4.83	28.77	34.1	-5.33	35	0.387	
10/23/92	-3.48	30.12	34.1	10/19/90	-4.83	28.77	34.1	-5.33	28	0.372	
11/24/92	-4.78	28.82	34.1	11/24/92	-4.78	28.82	34.1	-5.28	32	0.354	
12/29/92	-4.83	28.77	34.1	10/22/91	-4.33	29.27	34.1	-4.83	29	0.338	
01/22/93	-4.93	28.67	34.1	02/28/94	-4.31	29.29	34.1	-4.81	41	0.315	
02/23/93	-2.33	31.27	34.1	01/18/94	-4.08	29.52	34.1	-4.58	20	0.304	
03/31/93	-1.18	32.42	34.1	04/19/90	-3.88	29.72	34.1	-4.38	27	0.289	
04/27/93	-2.13	31.47	34.1	11/17/89	-3.88	29.72	34.1	-4.38	28	0.273	
05/28/93	-5.38	28.22	34.1	11/29/93	-3.83	29.77	34.1	-4.33	32	0.255	
06/18/93	-7.78	25.82	34.1	10/23/92	-3.48	30.12	34.1	-3.98	24	0.242	
07/28/93	-8.11	25.49	34.1	12/18/89	-3.28	30.32	34.1	-3.78	31	0.225	
08/30/93	-8.33	25.27	34.1	08/30/94	-3.05	30.55	34.1	-3.55	47	0.199	
09/29/93	-2.43	31.17	34.1	10/28/93	-2.58	31.02	34.1	-3.08	29	0.182	
10/28/93	-2.58	31.02	34.1	03/23/90	-2.58	31.02	34.1	-3.08	25	0.169	
11/29/93	-3.83	29.77	34.1	09/29/93	-2.43	31.17	34.1	-2.93	30	0.152	
12/29/93	-6.13	27.47	34.1	02/23/93	-2.33	31.27	34.1	-2.83	32	0.134	
01/18/94	-4.08	29.52	34.1	10/20/89	-2.18	31.42	34.1	-2.68	20	0.123	
02/28/94	-4.31	29.29	34.1	09/23/91	-2.13	31.47	34.1	-2.63	45	0.098	
03/31/94	-5.33	28.27	34.1	04/27/93	-2.13	31.47	34.1	-2.63	27	0.083	
04/15/94	-7.58	26.02	34.1	02/26/90	-1.88	31.72	34.1	-2.38	31	0.066	
05/31/94	-7.58	26.02	34.1	08/09/91	-1.48	32.12	34.1	-1.98	14	0.058	
06/15/94	-8.28	25.32	34.1	01/26/90	-1.28	32.32	34.1	-1.78	39	0.036	
07/14/94	-7.18	26.42	34.1	03/31/93	-1.18	32.42	34.1	-1.68	36	0.016	
08/30/94	-3.05	30.55	34.1	07/28/91	-0.43	33.17	34.1	-0.93	28	0.000	

Data used is from the SWFWMD data base - Shallow Well 2C - Station 54 Site 10854  
 HYDROGRAPH DATA P50 DATA

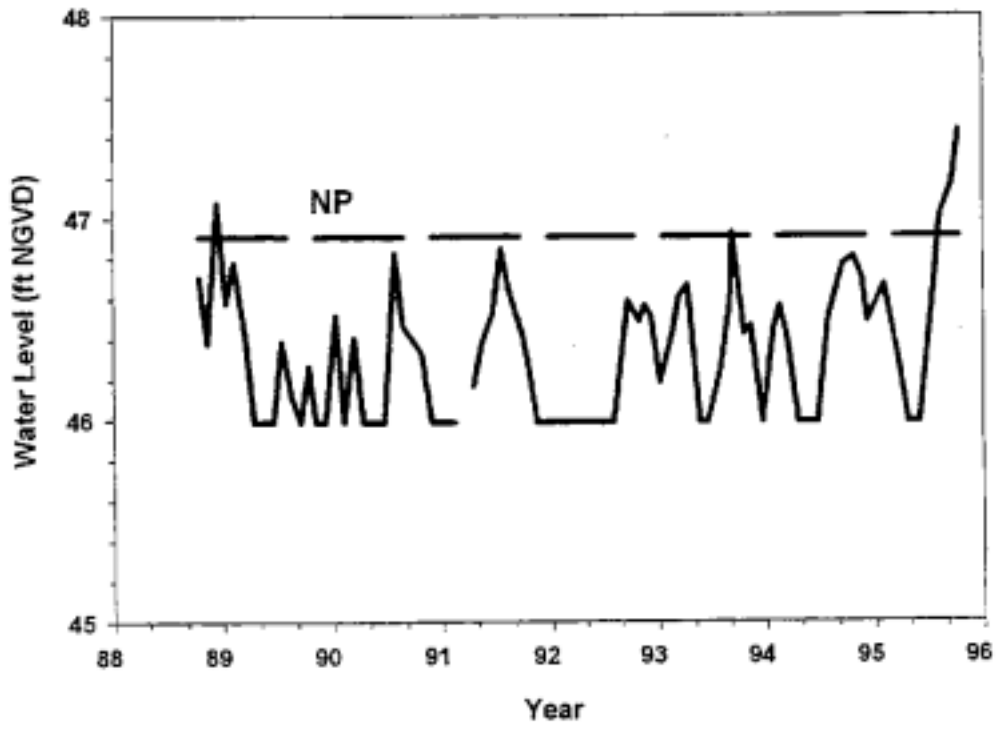
Date	Level Elev	HNP	Date	Level	HNP	Lev.-HNP	Time	Freq	Median
03/30/89	29.74	35.26	12/01/92		35.26			30	
04/26/89	28.92	35.26	01/01/93		35.26			27	
05/23/89	27.45	35.26	11/01/92		35.26			27	
06/29/89	26.30	35.26	09/01/92		35.26			37	
07/27/89	25.86	35.26	10/01/92		35.26			28	
08/24/89	25.70	35.26	02/01/93		35.26			28	
09/28/89	26.15	35.26	08/08/94		35.26			35	
10/26/89	26.44	35.26	02/10/95		35.26			28	
11/30/89	25.66	35.26	05/01/93		35.26			35	
12/19/89	25.58	35.26	03/01/93		35.26			19	
01/25/90	26.88	35.26	04/01/93		35.26			37	
02/22/90	26.53	35.26	08/04/92	22.72	35.26	-12.54		28	
03/29/90	26.41	35.26	06/18/92	23.09	35.26	-12.17		35	0.832
04/26/90	25.94	35.26	05/28/92	23.42	35.26	-11.84		28	0.820
05/31/90	24.47	35.26	07/23/92	23.71	35.26	-11.56		35	0.806
06/28/90	23.95	35.26	08/28/90	23.95	35.26	-11.31		28	0.794
07/26/90	25.72	35.26	04/23/92	24.27	35.26	-10.99		28	0.782
08/30/90	27.58	35.26	06/22/94	24.44	35.26	-10.83		35	0.787
09/27/90	27.58	35.26	05/31/90	24.47	35.26	-10.79		28	0.755
10/18/90	27.47	35.26	02/27/91	24.82	35.26	-10.44		21	0.746
11/28/90	26.57	35.26	03/27/91	24.88	35.26	-10.38		41	0.728
12/27/90	25.92	35.26	07/14/94	24.82	35.26	-10.34		29	0.716
01/30/91	25.26	35.26	05/30/91	24.97	35.26	-10.29		34	0.702
02/27/91	24.82	35.26	04/24/91	25.01	35.26	-10.25		28	0.690
03/27/91	24.88	35.26	01/30/91	25.26	35.26	-10.00		28	0.678
04/24/91	25.01	35.26	03/19/92	25.38	35.26	-9.88		28	0.666
05/30/91	24.97	35.26	05/12/94	25.42	35.26	-9.84		36	0.650
06/19/91	26.38	35.26	12/18/89	25.58	35.26	-9.68		20	0.842
07/25/91	26.77	35.26	11/30/89	25.66	35.26	-9.60		36	0.827
08/29/91	29.37	35.26	06/24/89	25.70	35.26	-9.56		35	0.812
09/25/91	30.77	35.26	07/26/90	25.72	35.26	-9.54		27	0.800
10/31/91	30.00	35.26	12/27/90	25.92	35.26	-9.35		36	0.585
11/21/91	28.86	35.26	06/14/95	25.92	35.26	-9.34		21	0.676
12/18/91	27.80	35.26	04/25/90	25.94	35.26	-9.33		27	0.564
01/23/92	26.77	35.26	07/27/89	25.96	35.26	-9.31		36	0.549
02/26/92	26.07	35.26	02/26/92	26.07	35.26	-9.19		34	0.535
03/19/92	25.38	35.26	09/28/89	26.15	35.26	-9.11		22	0.525
04/23/92	24.27	35.26	06/28/89	26.30	35.26	-8.96		35	0.510
05/28/92	23.42	35.26	06/19/91	26.38	35.26	-8.88		35	0.495
06/18/92	23.09	35.26	04/14/94	26.40	35.26	-8.86		21	0.486
07/23/92	23.71	35.26	03/29/90	26.41	35.26	-8.85		35	0.471
08/04/92	22.72	35.26	10/26/89	26.44	35.26	-8.82		12	0.466
09/01/92		35.26	05/11/95	26.52	35.26	-8.74		26	0.454
10/01/92		35.26	02/22/90	26.53	35.26	-8.73		30	0.442
11/01/92		35.26	11/28/90	26.57	35.26	-8.69		31	0.428
12/01/92		35.26	06/26/93	26.63	35.26	-8.63		30	0.416
01/01/93		35.26	07/25/91	26.77	35.26	-8.49		31	0.402
02/01/93		35.26	01/23/92	26.77	35.26	-8.49		31	0.389
03/01/93		35.26	01/25/90	26.88	35.26	-8.38		28	0.377
04/01/93		35.26	07/18/95	27.22	35.26	-8.04		31	0.364
05/01/93		35.26	04/18/95	27.30	35.26	-7.96		30	0.351
06/24/93	27.37	35.26	06/24/93	27.37	35.26	-7.89		54	0.328
07/29/93	27.45	35.26	12/14/93	27.39	35.26	-7.87		35	0.313
08/26/93	26.83	35.26	07/29/93	27.45	35.26	-7.81		26	0.301
09/16/93	27.90	35.26	05/23/89	27.45	35.26	-7.81		21	0.293
10/21/93	27.93	35.26	10/18/90	27.47	35.26	-7.79		35	0.278
11/10/93	26.12	35.26	01/19/94	27.54	35.26	-7.72		20	0.269
12/14/93	27.39	35.26	03/23/94	27.55	35.26	-7.71		34	0.255
01/19/94	27.54	35.26	06/27/90	27.58	35.26	-7.68		36	0.239
02/17/94	28.00	35.26	06/30/90	27.58	35.26	-7.68		29	0.227
03/23/94	27.55	35.26	03/21/95	27.73	35.26	-7.53		34	0.212
04/14/94	26.40	35.26	12/18/91	27.80	35.26	-7.46		22	0.203
05/12/94	25.42	35.26	09/16/93	27.90	35.26	-7.36		28	0.191
06/22/94	24.44	35.26	10/21/93	27.93	35.26	-7.33		41	0.174
07/14/94	24.92	35.26	01/10/95	28.00	35.26	-7.26		22	0.164
08/08/94		35.26	02/17/94	28.00	35.26	-7.26		25	0.154
09/07/94	28.12	35.26	09/07/94	28.12	35.26	-7.14		30	0.141
10/12/94	29.32	35.26	11/10/93	28.12	35.26	-7.14		35	0.126
11/03/94	29.18	35.26	12/13/94	28.30	35.26	-6.96		22	0.117
12/13/94	28.30	35.26	08/03/95	28.82	35.26	-6.44		40	0.100
01/10/95	28.00	35.26	11/21/91	28.86	35.26	-6.40		28	0.088
02/10/95		35.26	04/26/89	28.92	35.26	-6.34		31	0.074
03/21/95	27.73	35.26	11/03/94	29.18	35.26	-6.08		39	0.058
04/18/95	27.30	35.26	10/12/94	29.32	35.26	-5.94		28	0.046
05/11/95	26.52	35.26	08/29/91	29.37	35.26	-5.90		23	0.036
06/14/95	25.92	35.26	03/30/89	29.74	35.26	-5.52		34	0.022
07/18/95	27.22	35.26	10/31/91	30.00	35.26	-5.26		34	0.007
08/03/95	26.82	35.26	09/25/91	30.77	35.26	-4.49		16	0.000

-6.90

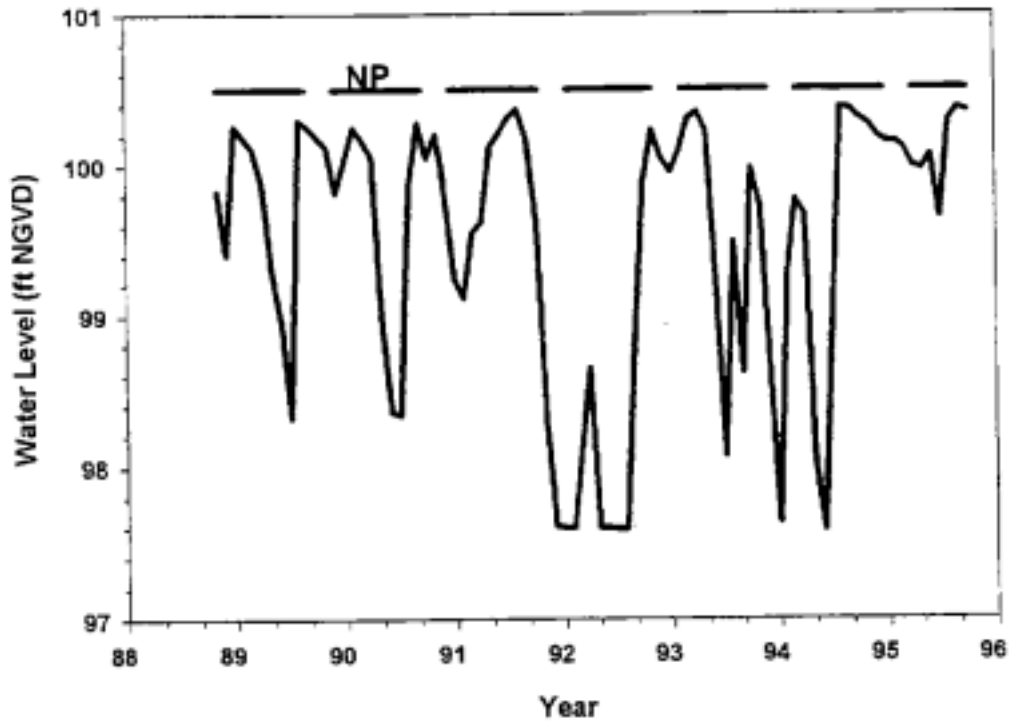
Appendix E. Hydrographs of reference wetlands.



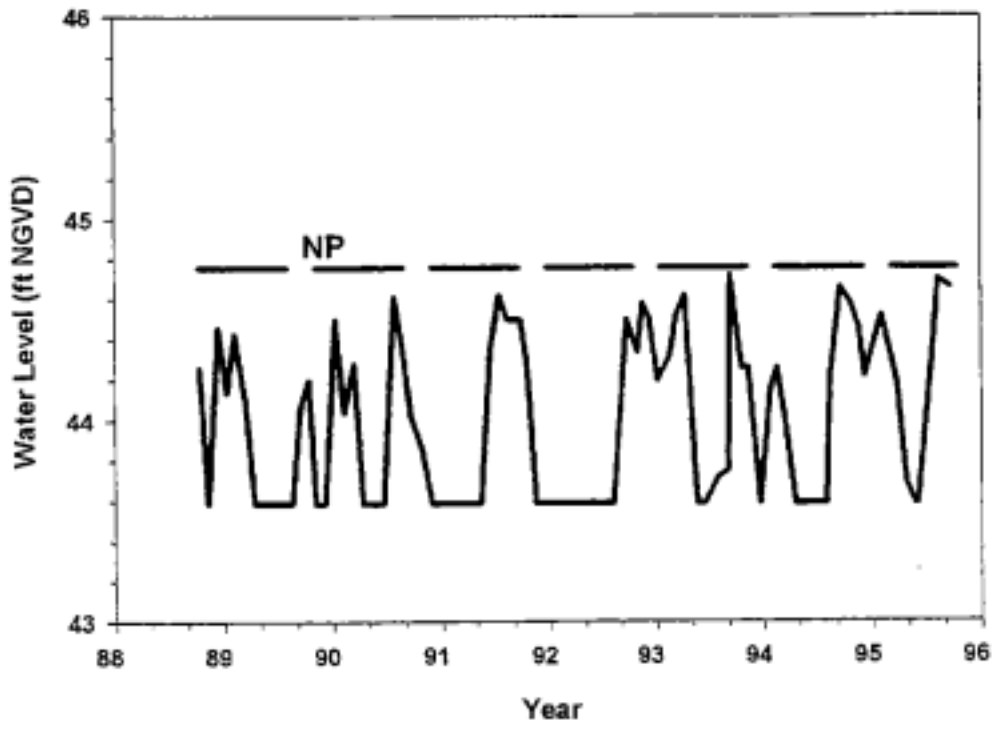
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Map Site 3



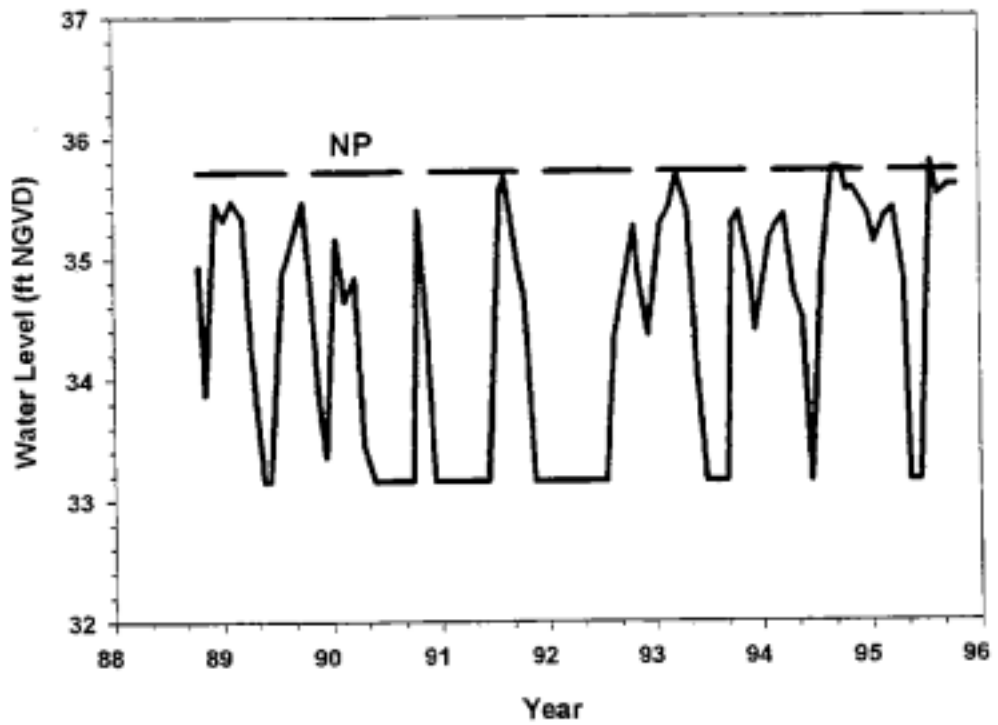
Green Swamp #1  
Map Site 4



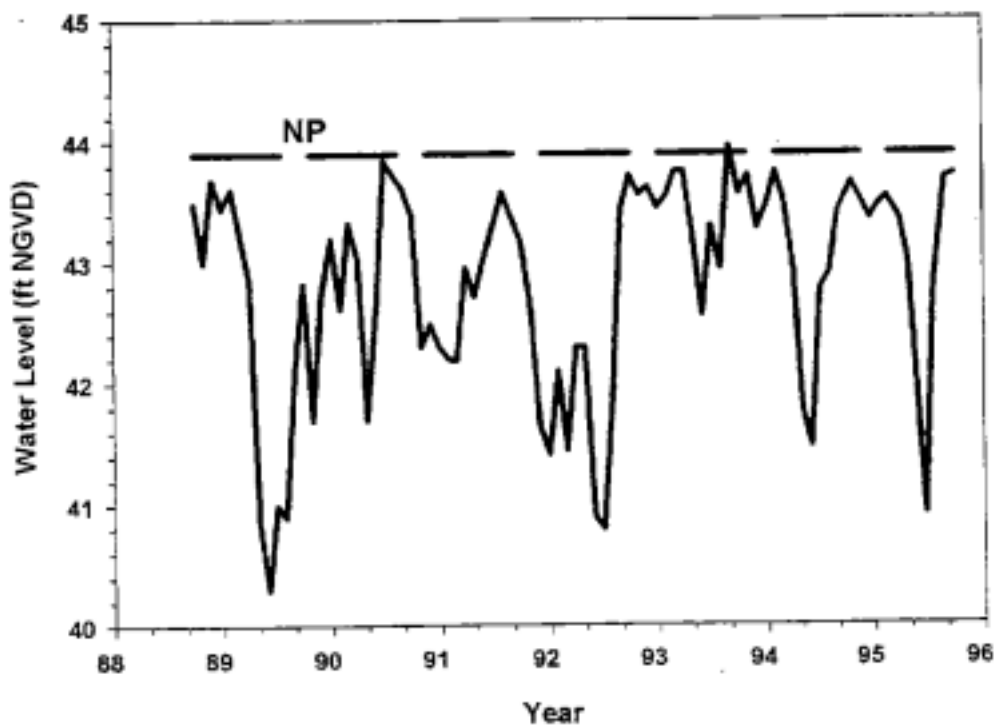
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Map Site 5



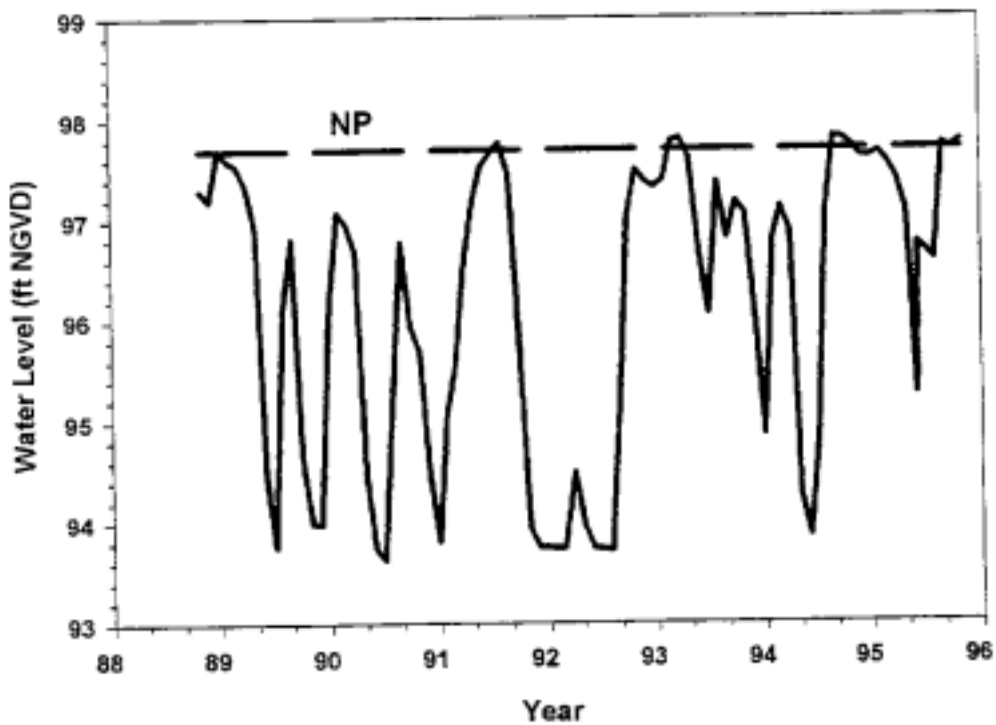
NW 125  
Map Site 6



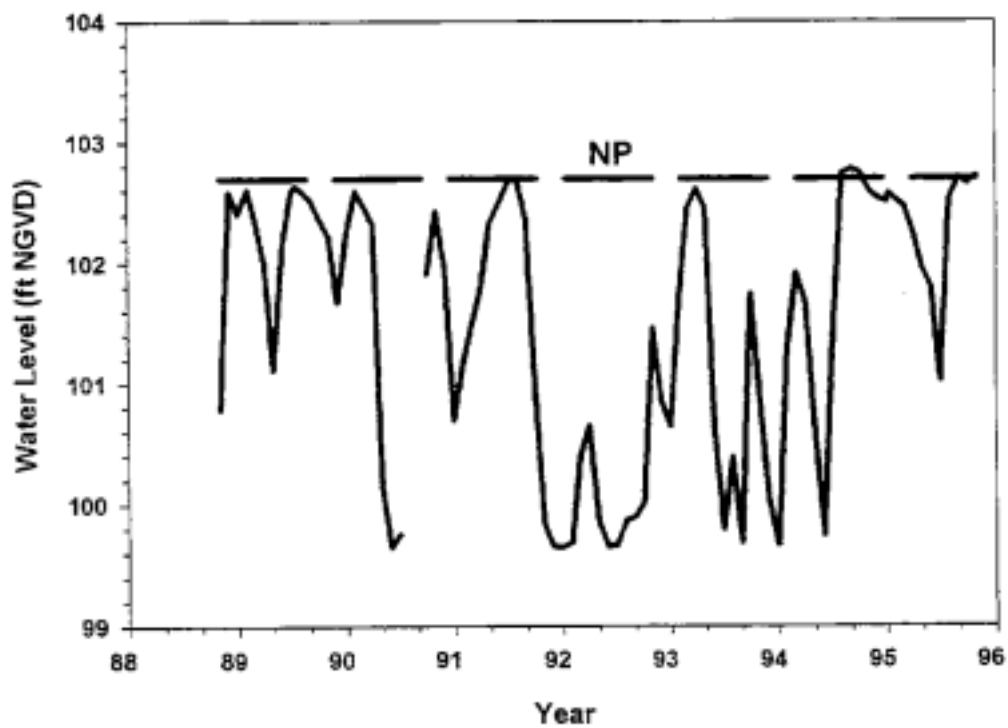
Starkey S 68  
Map Site 7



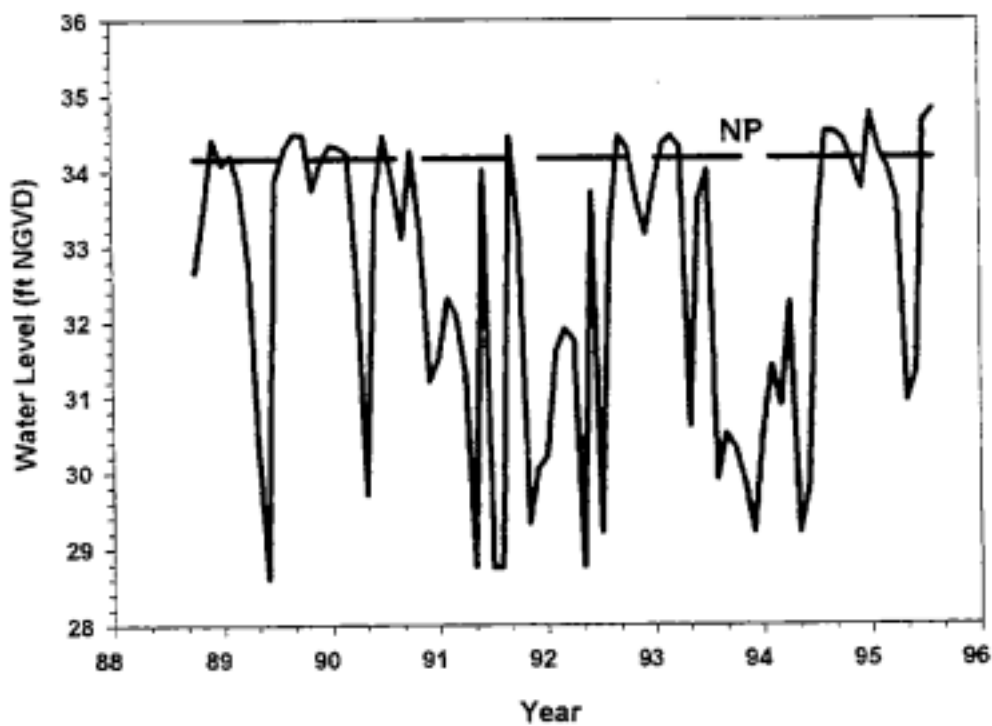
Green Swamp #6  
Map Site 8



Green Swamp # 3  
Map Site 9

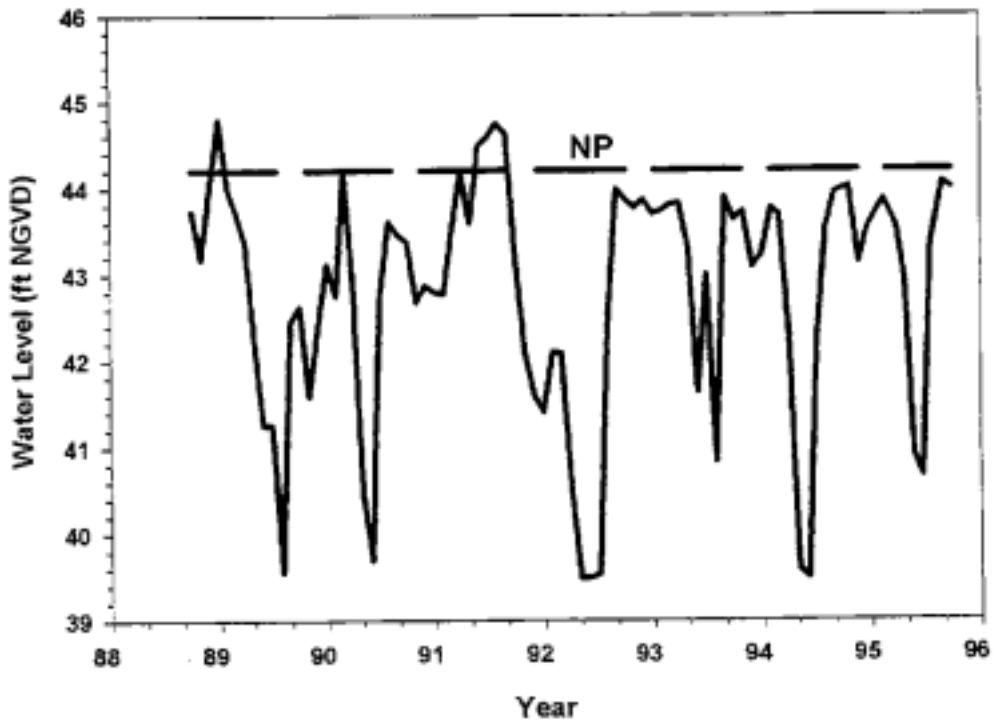


NW 61  
Map Site 10

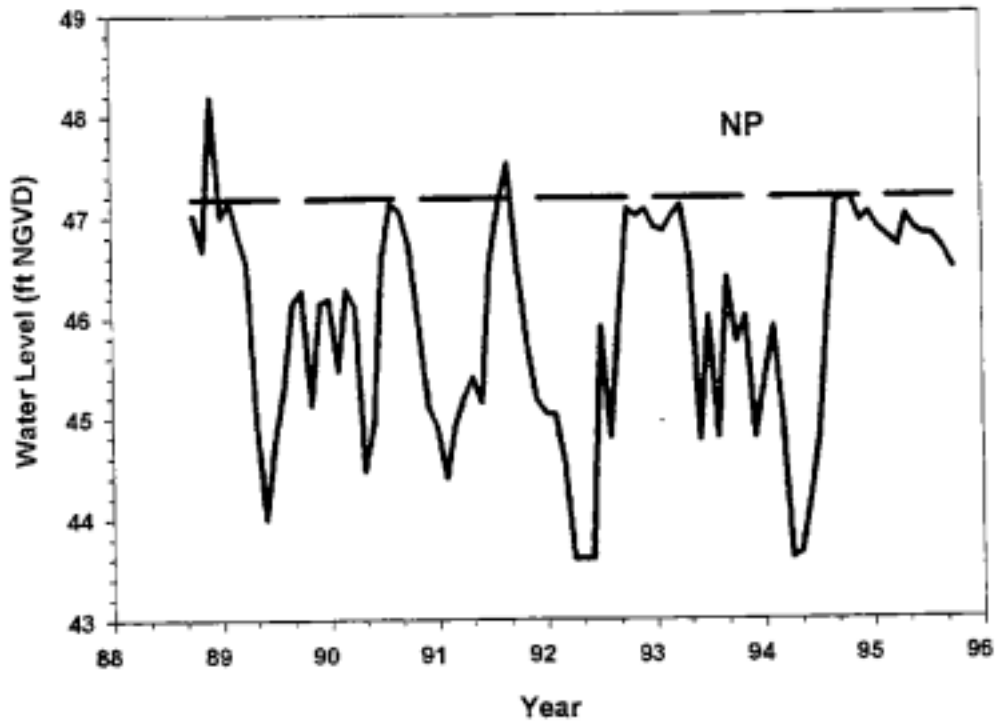




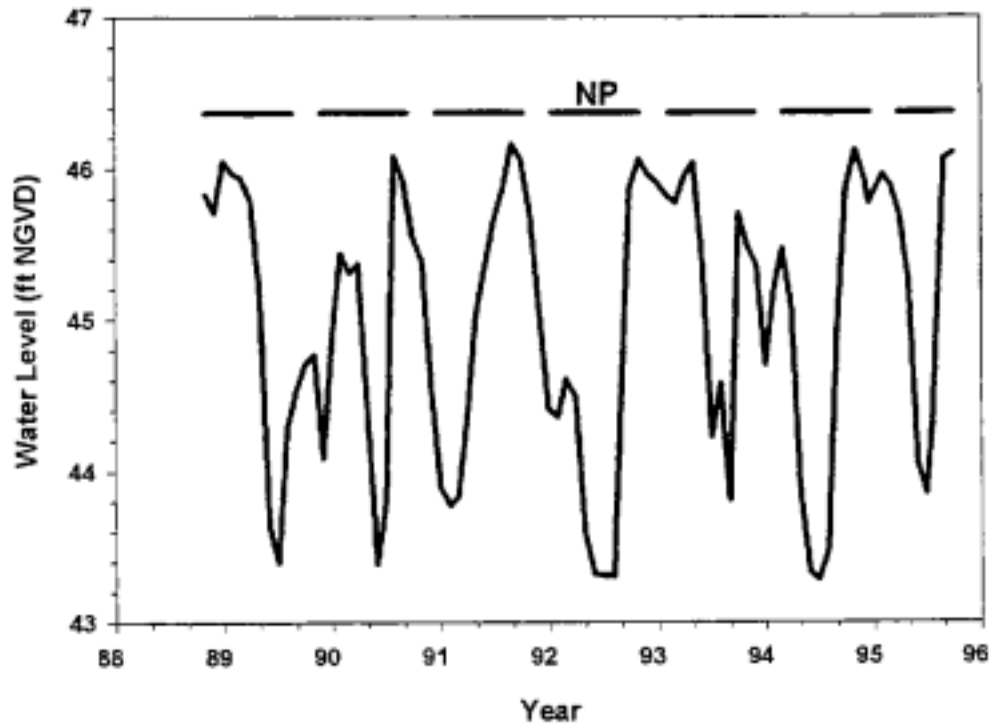
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Map Site 11**



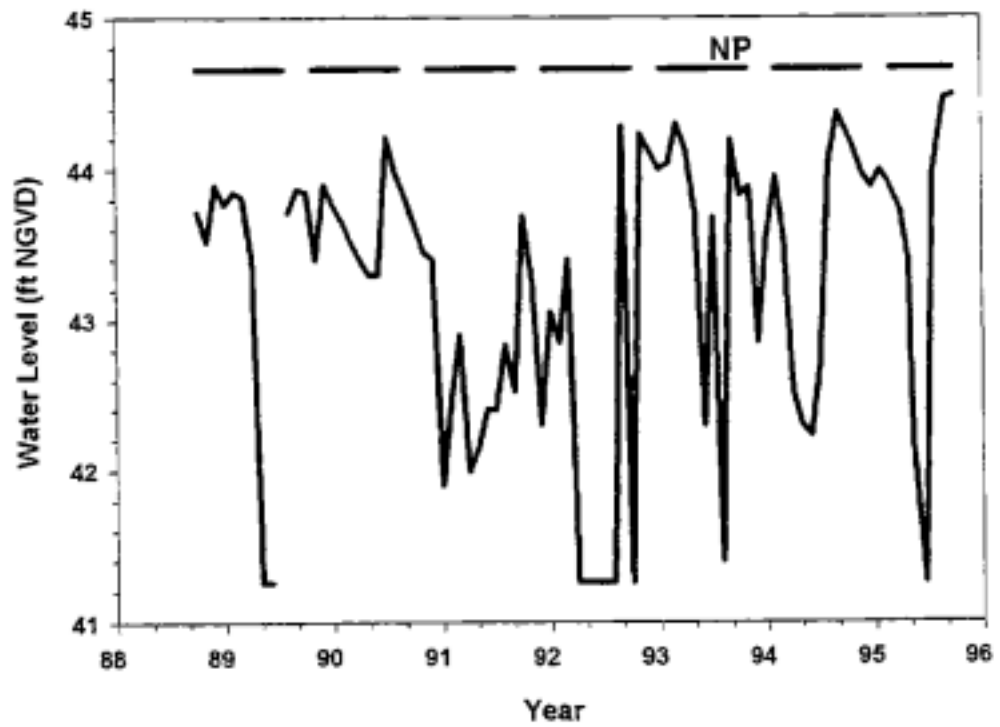
**Starkey S75  
Map Site 12**



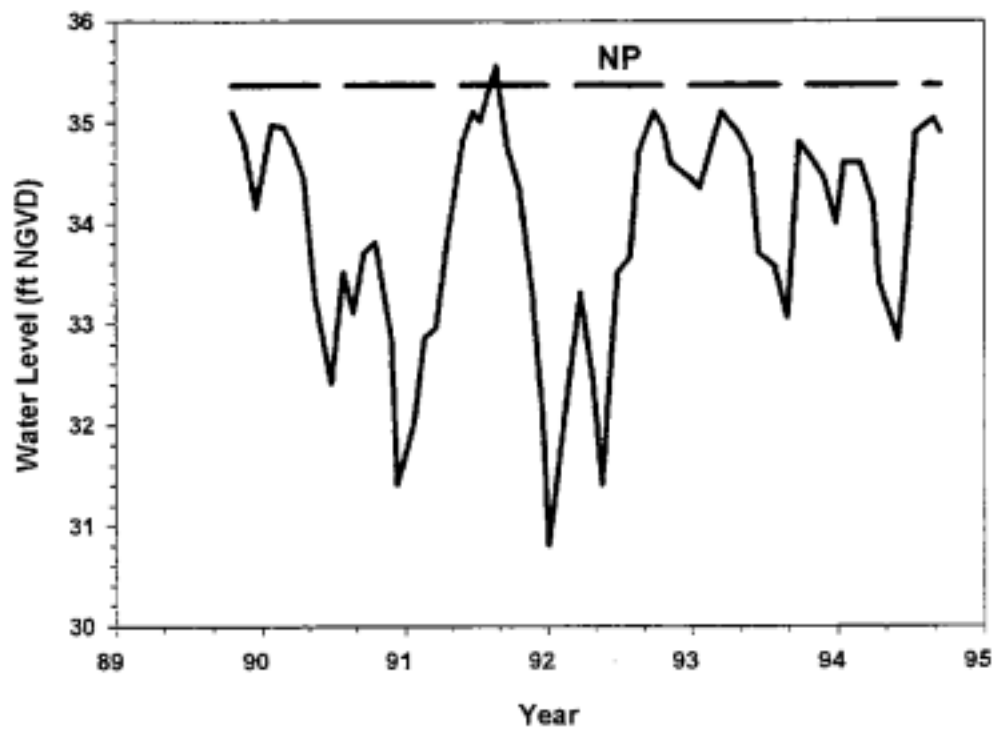
Starkey Eastern Recorder  
Map Site 13



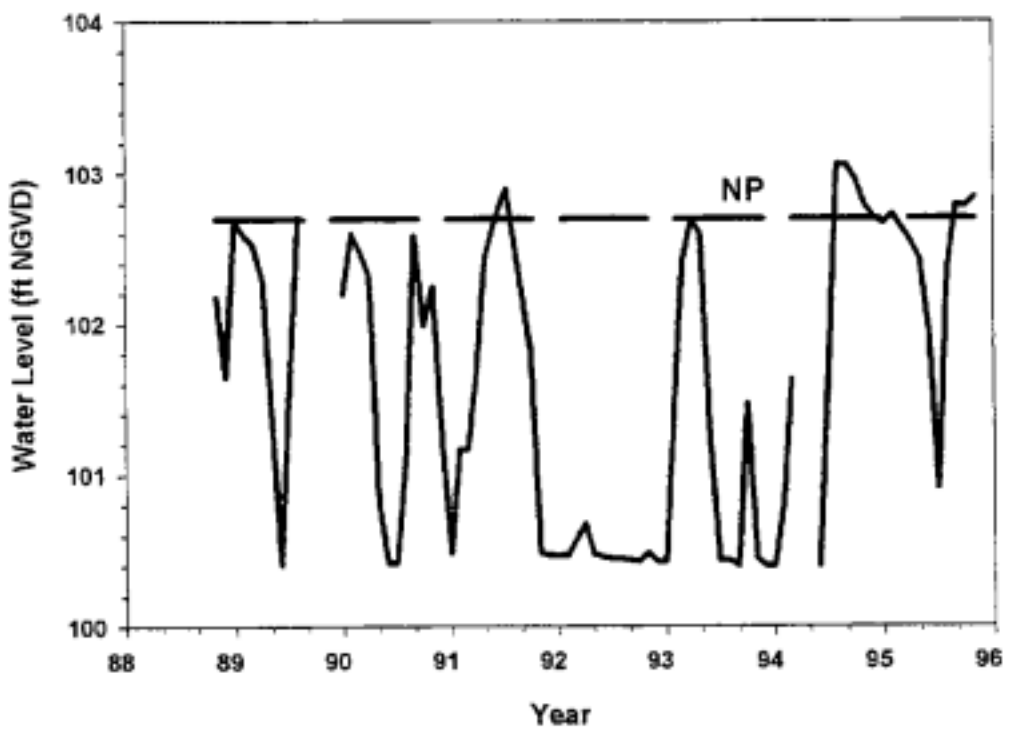
Starkey S70  
Map Site 14



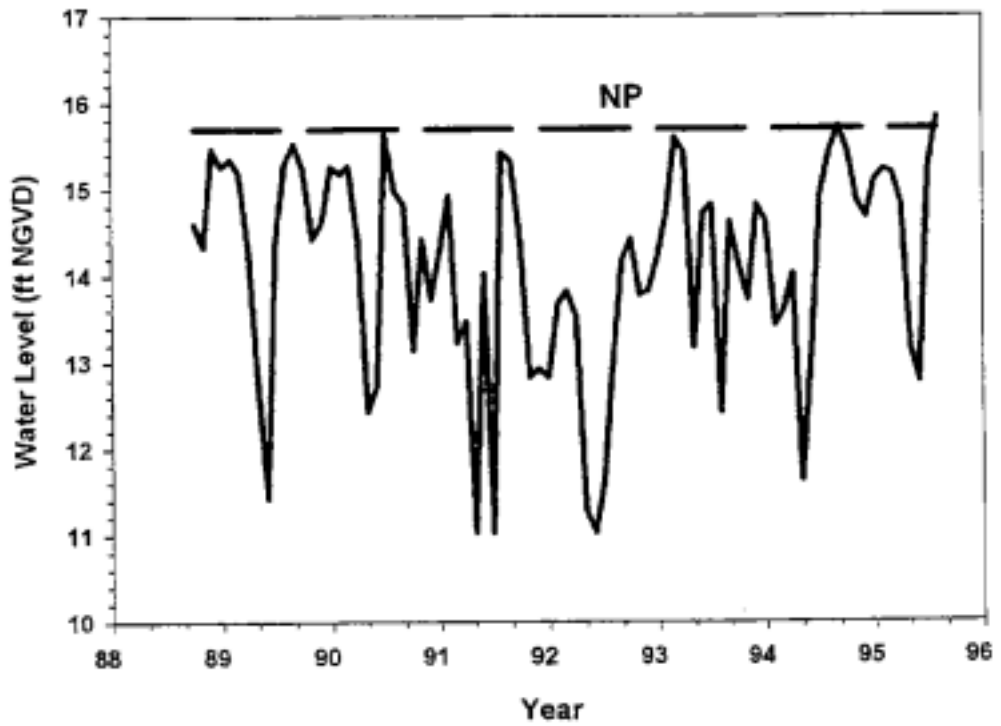
**MB 96  
Map Site 15**



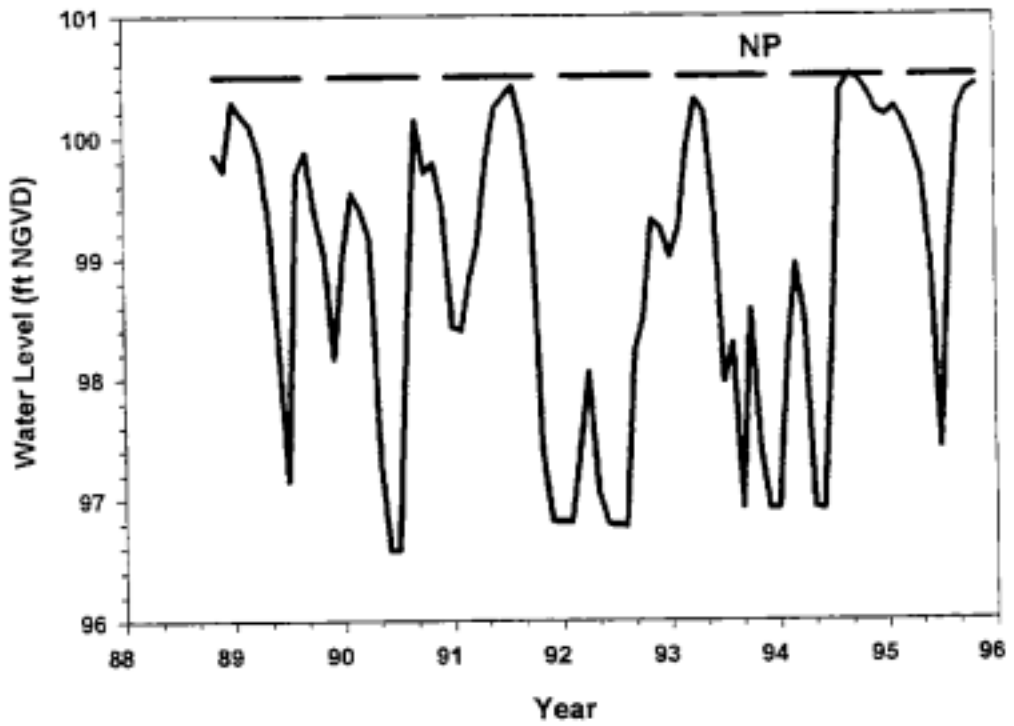
**Green Swamp #4  
Map Site 16**



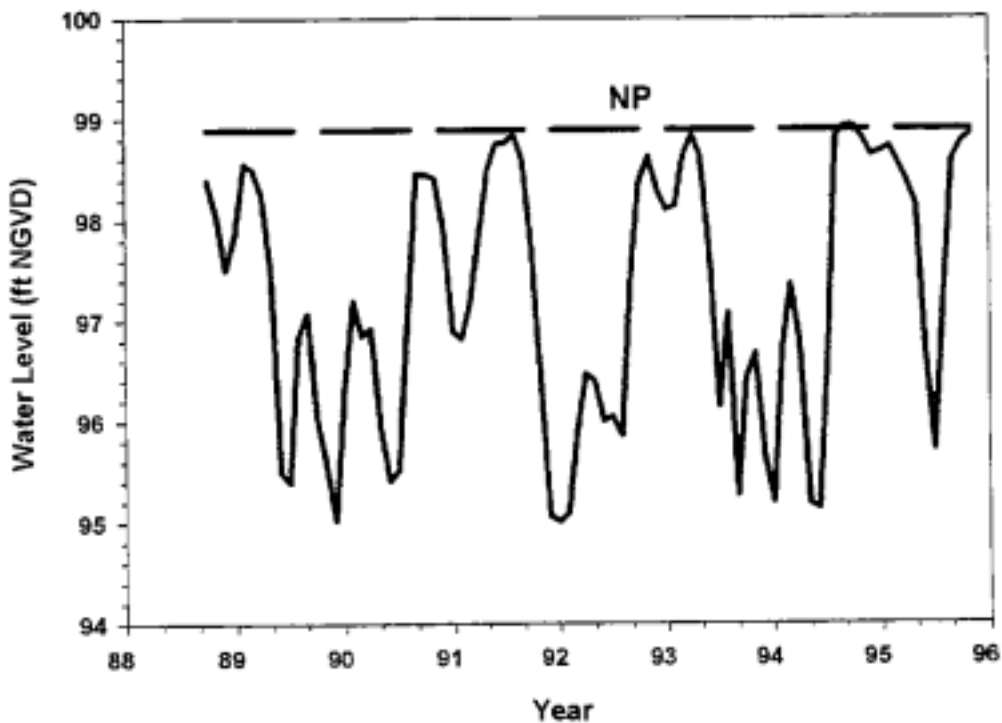
142817  
Map Site 17



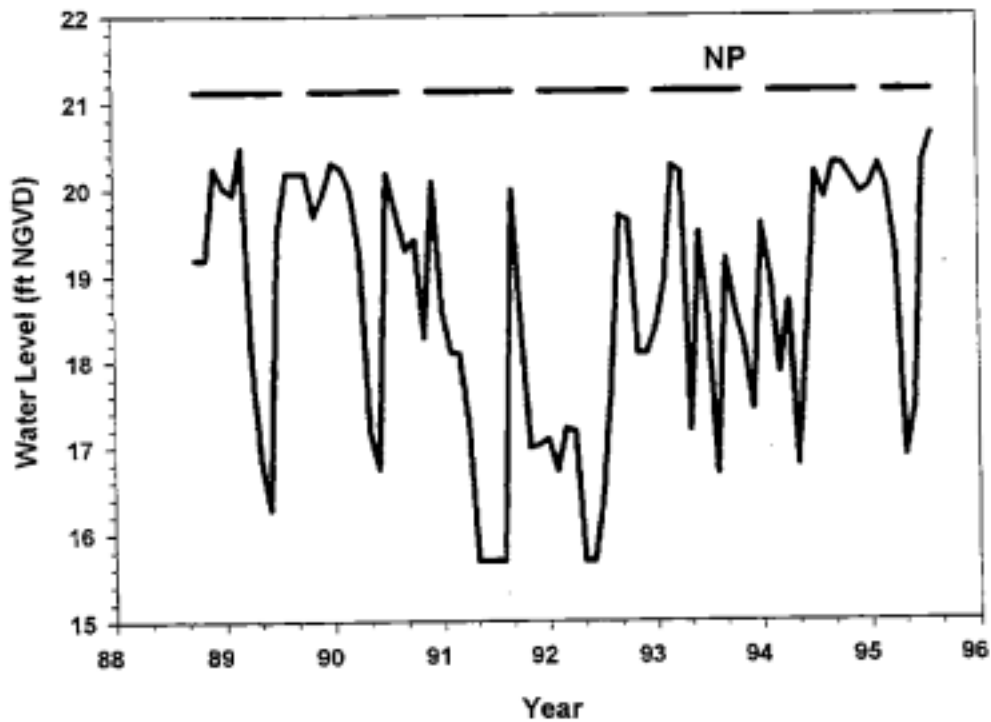
Green Swamp #2  
Map Site 18



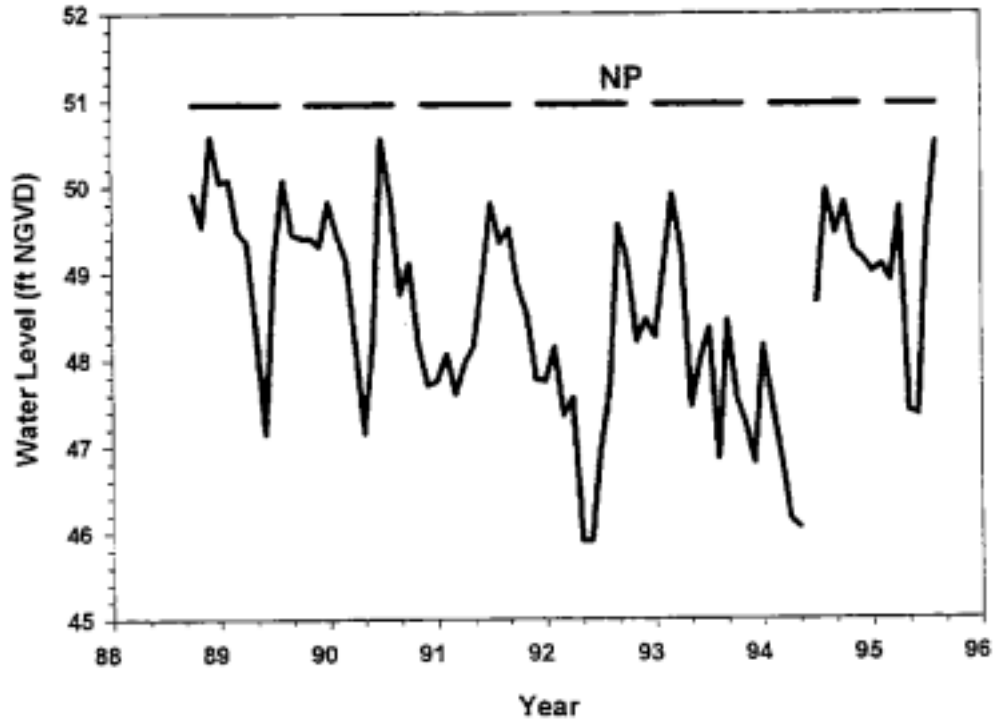
Green Swamp #5  
Map Site 19



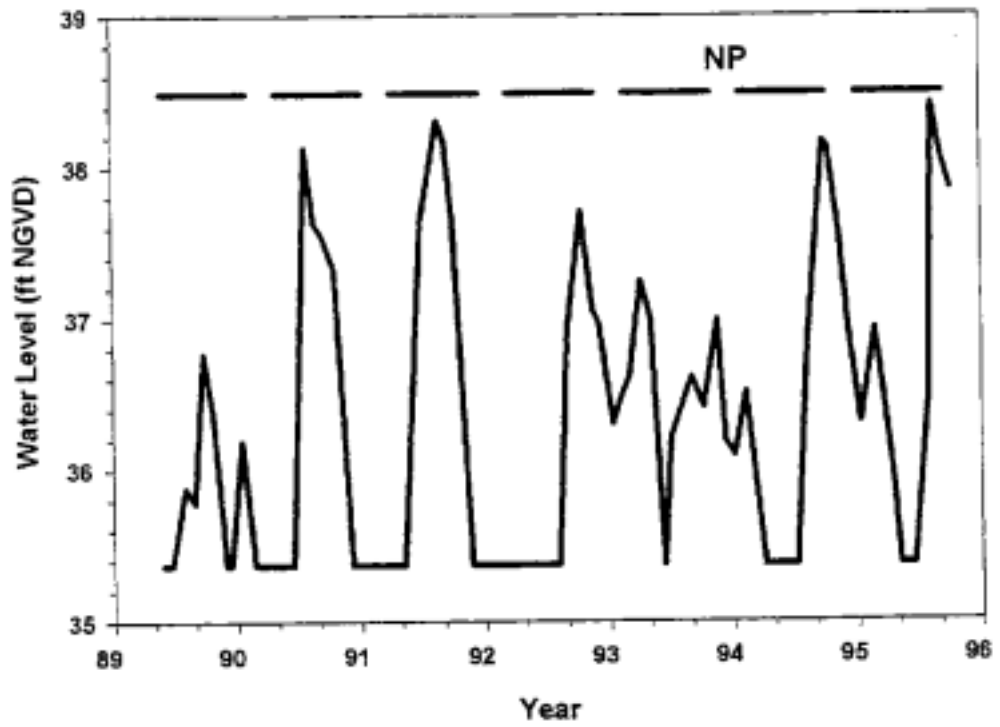
WC302818  
Map Site 20



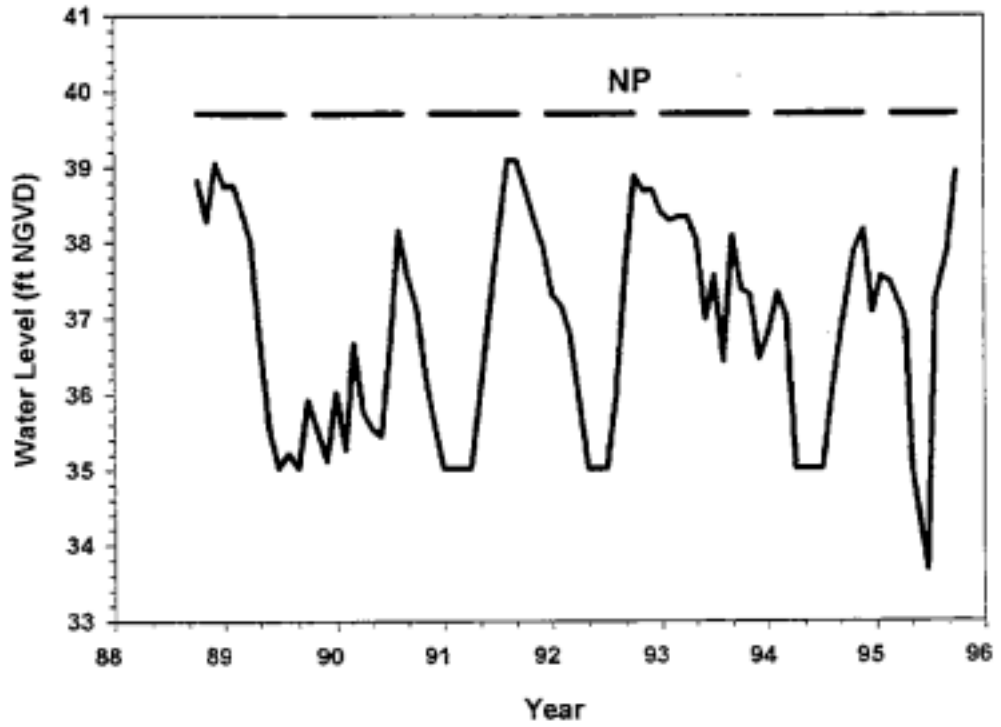
NC242717  
Map Site 21



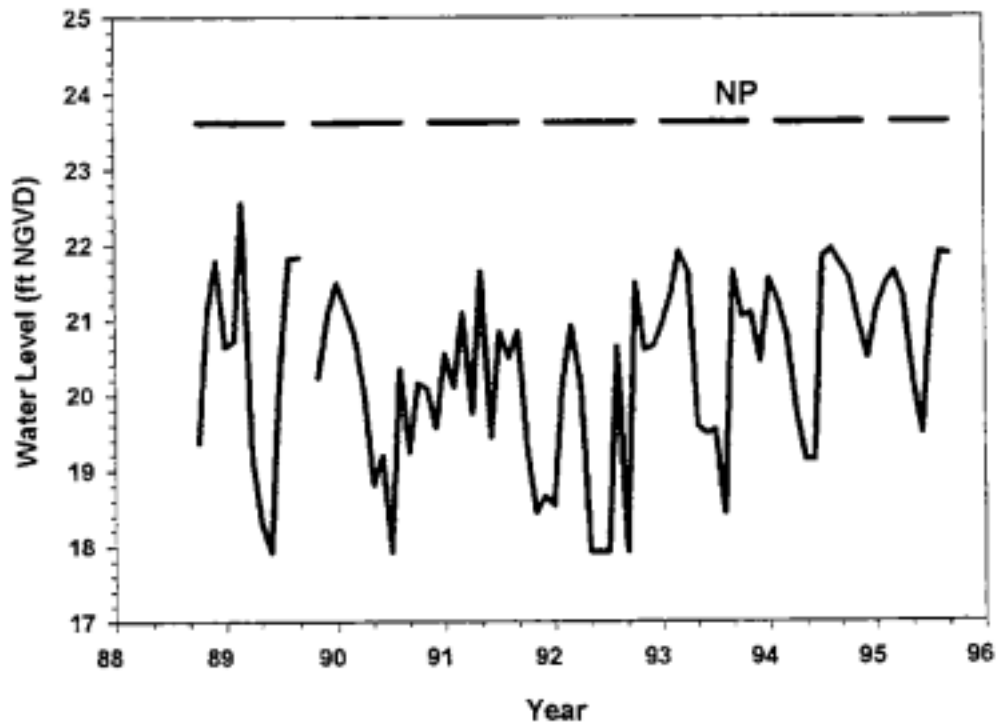
EW 11  
Map Site 22



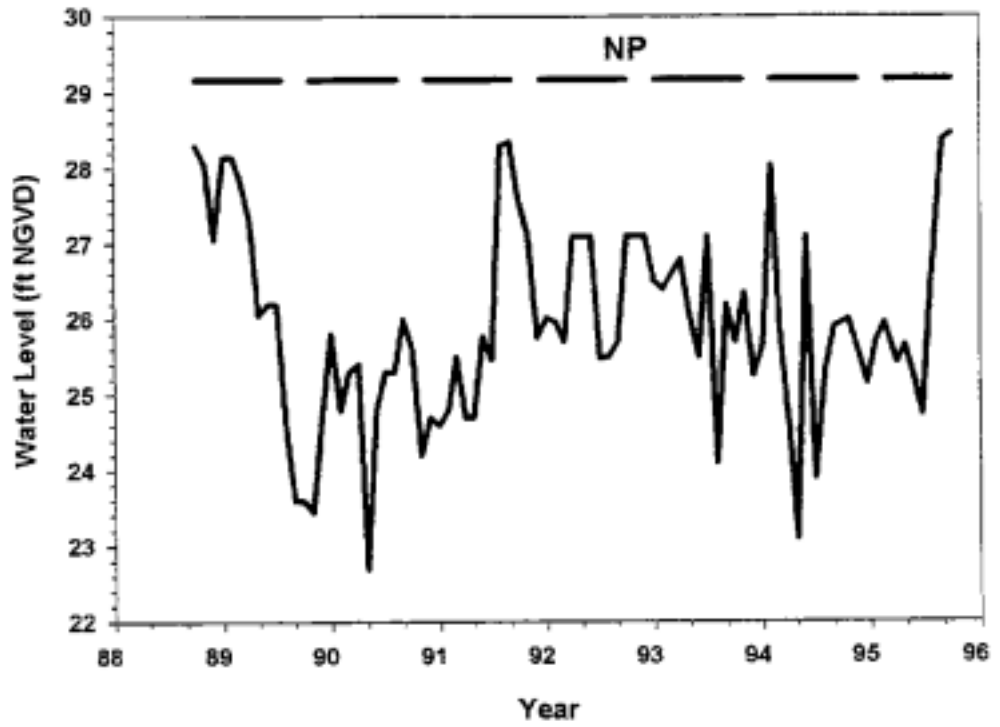
Starkey S94  
Map Site 23



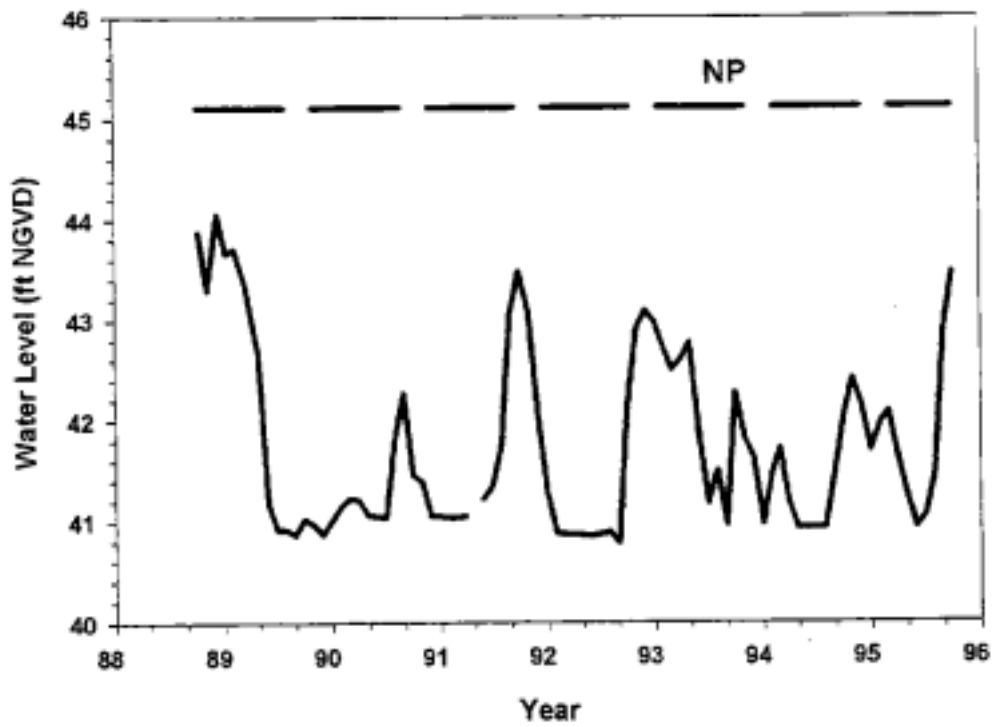
WC102817  
Map Site 24



Starkey S10  
Map Site 25

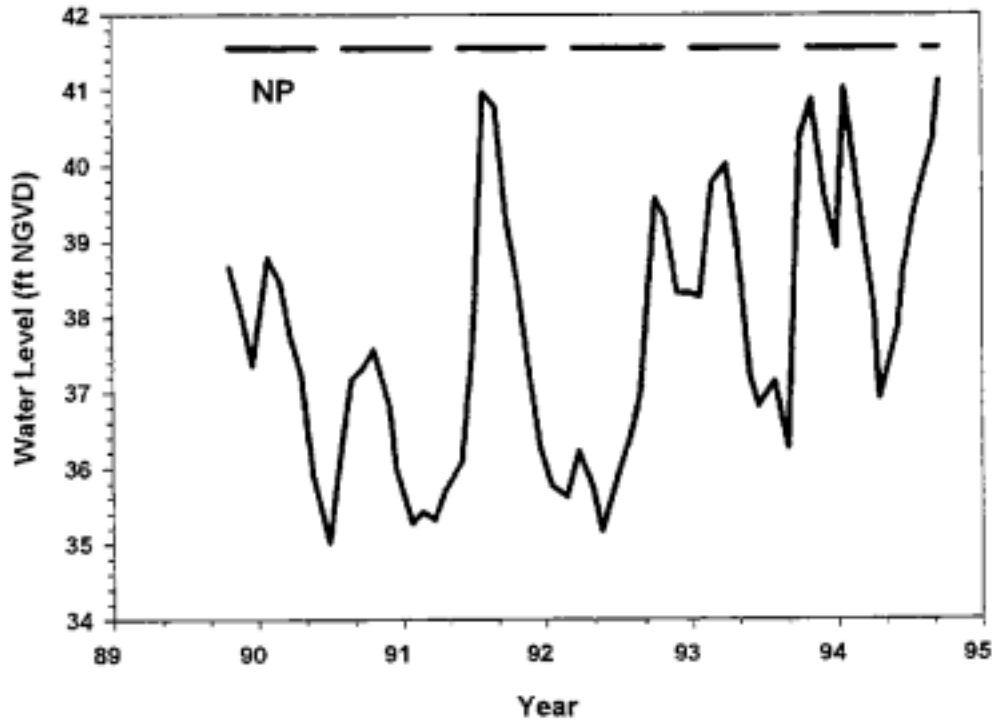


Starkey Central Recorder  
Map Site 26

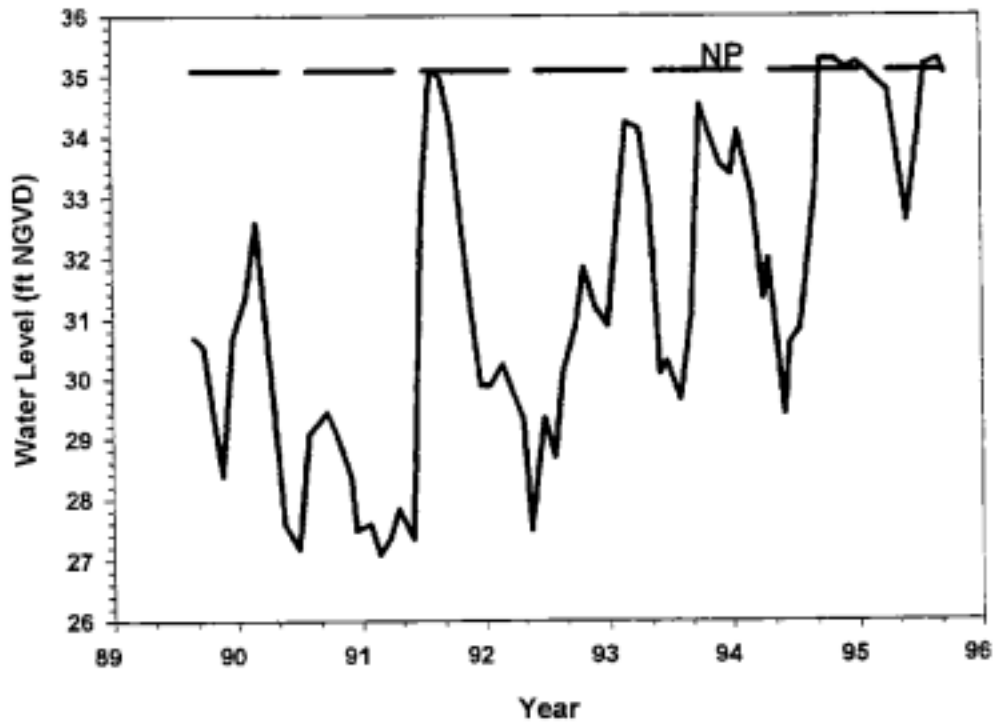




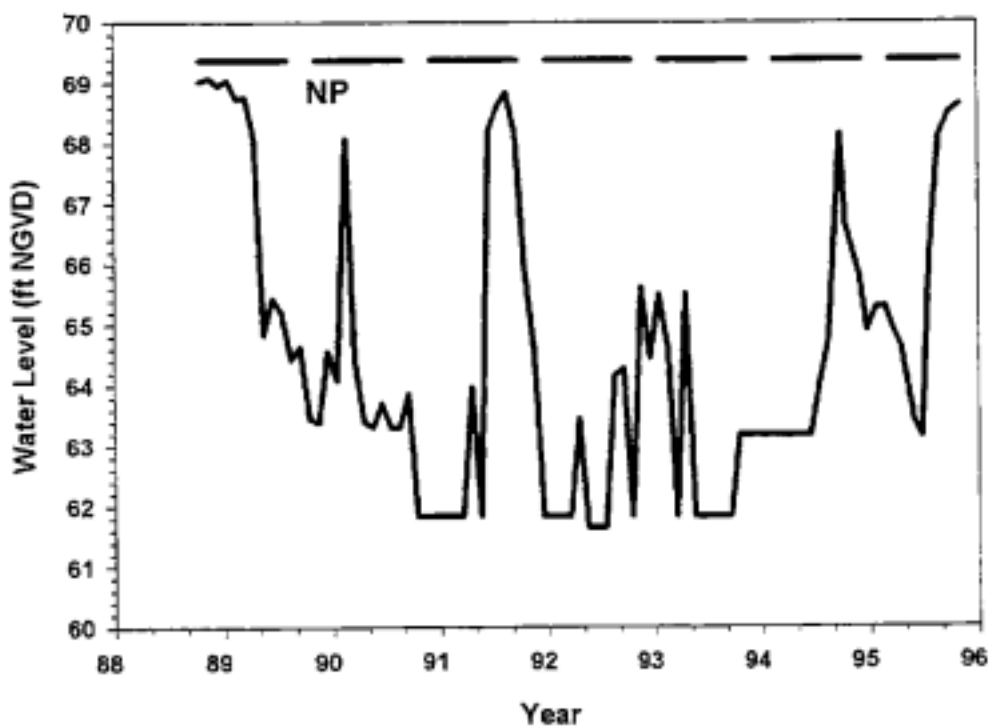
**MB 88  
Map Site 27**



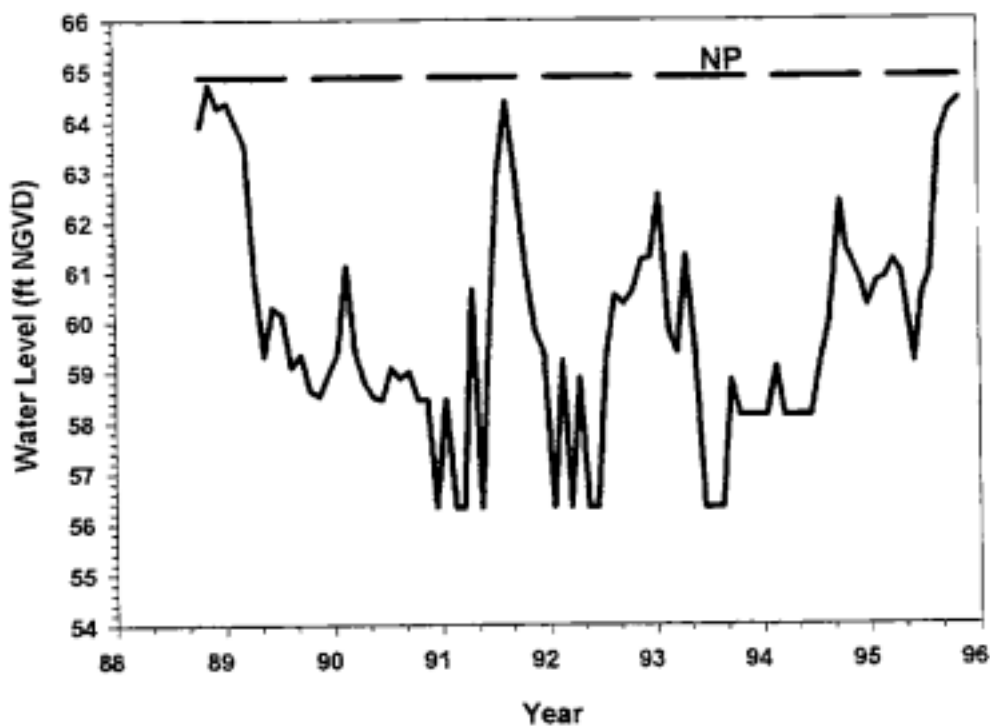
**MB 3C  
Map Site 28**



W 11  
Map Site 29

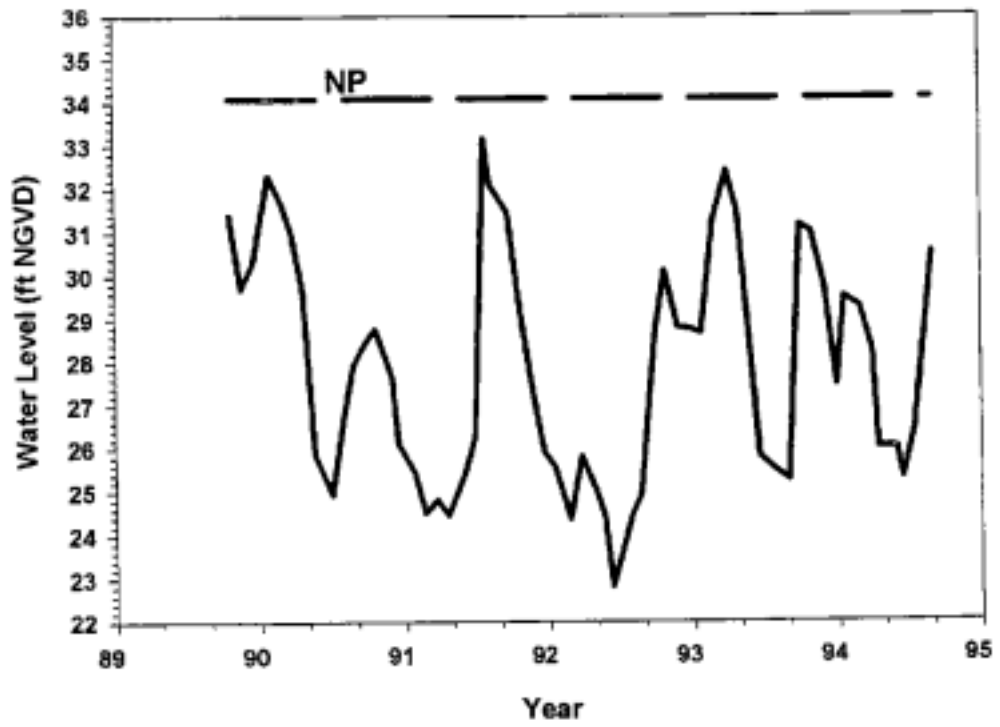


W 17  
Map Site 30

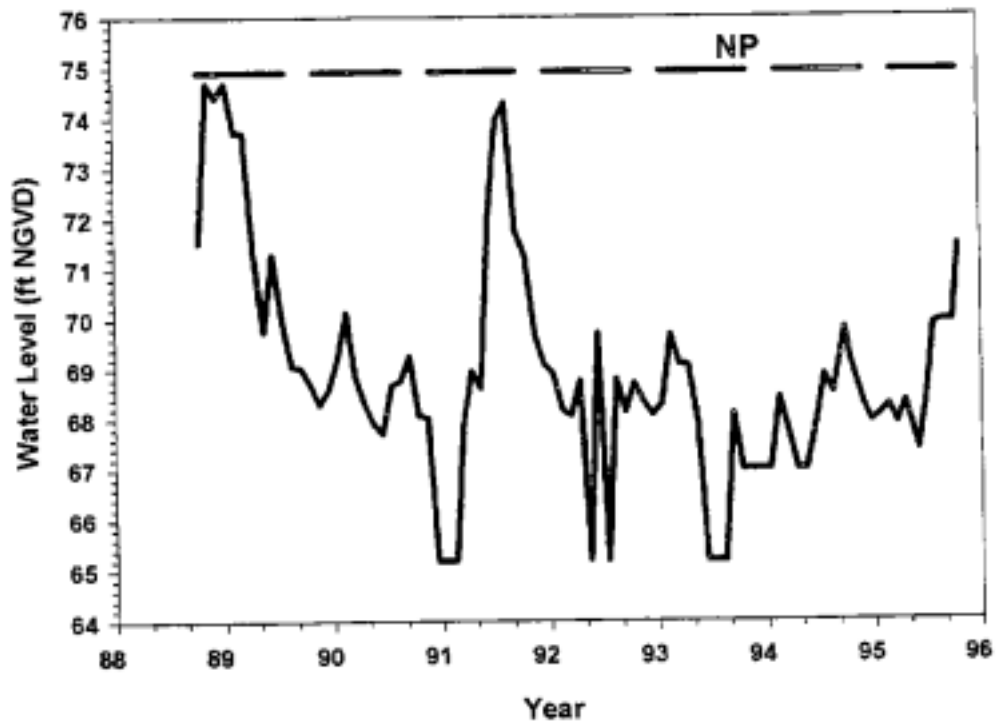




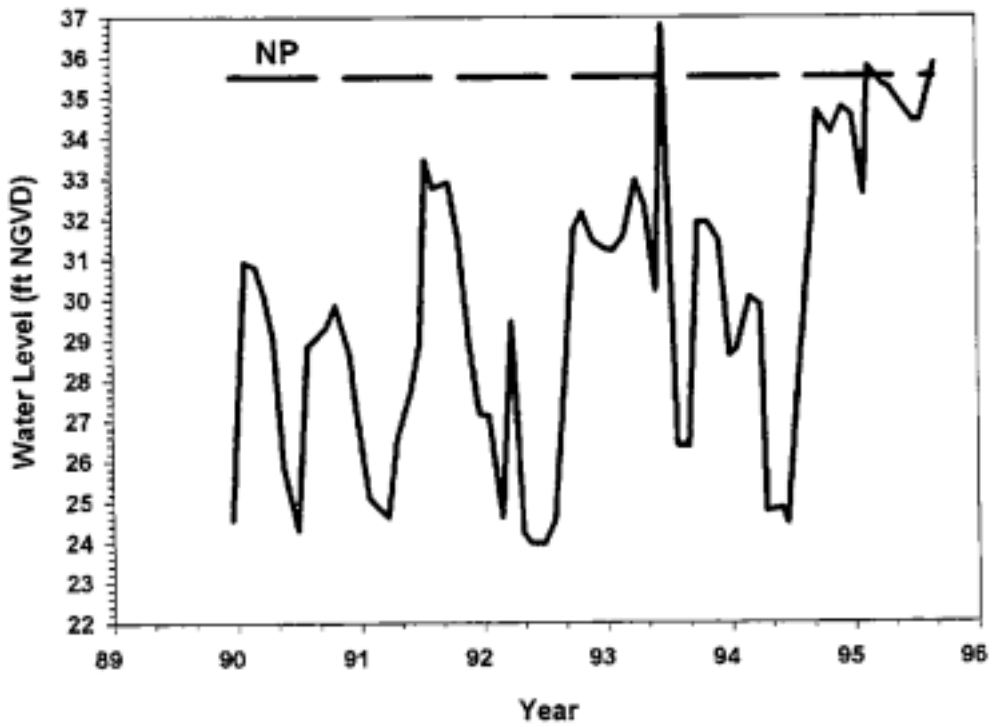
**MB 30**  
**Map Site 33**



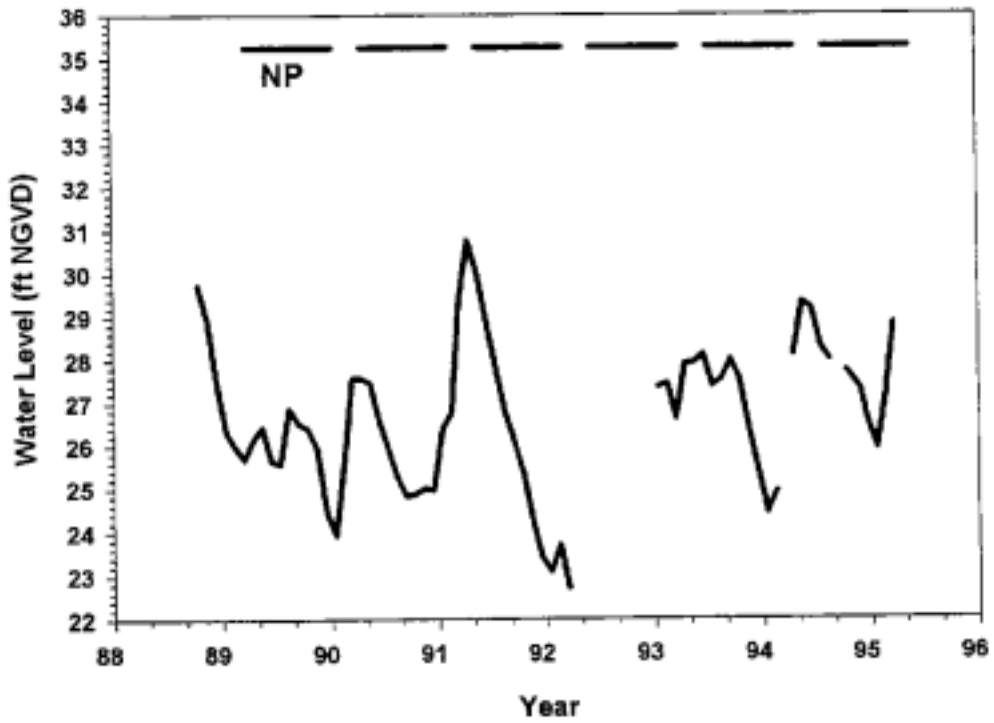
**W 41**  
**Map Site 34**



MB 35  
Map Site 35



Starkey S44  
Map Site 36



Appendix F. Results of Kolmogorov-Smirnov two sample test.

Cumulative Frequency Distributions

	Unimpacted Blue	Impacted Green	Severally Red	Composite Green-Red
0.42	0.02381	0	0	0
0.53	0.071429	0	0	0
0.61	0.119048	0	0	0
0.62	0.166667	0	0	0
0.83	0.214286	0	0	0
0.84	0.261905	0	0	0
0.86	0.309524	0	0	0
0.91	0.357143	0	0	0
0.94	0.404762	0	0	0
0.96	0.452381	0	0	0
1	0.5	0	0	0
1.04	0.547619	0	0	0
1.11	0.595238	0	0	0
1.12	0.642857	0	0	0
1.17	0.690476	0	0	0
1.23	0.738095	0	0	0
1.27	0.785714	0	0	0
1.36	0.833333	0	0	0
1.67	0.880952	0	0	0
2.19	0.928571	0	0	0
2.25	0.928571	0.045455	0	0.033333
2.3	0.928571	0.045455	0	0.033333
2.63	0.928571	0.136364	0	0.1
3.09	0.928571	0.227273	0	0.166667
3.47	0.928571	0.318182	0	0.233333
3.76	0.928571	0.409091	0	0.3
4.01	0.928571	0.5	0	0.366667
4.14	0.928571	0.590909	0	0.433333
5.37	0.928571	0.590909	0.125	0.5
5.51	0.928571	0.681818	0.125	0.566667
5.6	0.928571	0.681818	0.375	0.633333
6.1	0.928571	0.772727	0.375	0.7
6.33	0.928571	0.863636	0.625	0.833333
6.5	0.928571	0.954545	0.625	0.9
8.9	0.928571	0.954545	0.875	0.966667

DIFFERENCES

B-G	B-R	B-GR	G-R	G-GR	R-GR
0.0238095	0.02381	0.02381	0	0	0
0.0714286	0.071429	0.07143	0	0	0
0.1190476	0.119048	0.11905	0	0	0
0.1666667	0.166667	0.16667	0	0	0
0.2142857	0.214286	0.21429	0	0	0
0.2619048	0.261905	0.2619	0	0	0
0.3095238	0.309524	0.30952	0	0	0
0.3571429	0.357143	0.35714	0	0	0
0.4047619	0.404762	0.40476	0	0	0
0.452381	0.452381	0.45238	0	0	0
0.5	0.5	0.5	0.5	0	0
0.547619	0.547619	0.54762	0.04545455	0.0121	0.033
0.5952381	0.595238	0.59524	0.04545455	0.0121	0.033
0.6428571	0.642857	0.64286	0.13636364	0.0364	0.1
0.6904762	0.690476	0.69048	0.22727273	0.0606	0.167
0.7380952	0.738095	0.7381	0.31818182	0.0848	0.233
0.7857143	0.785714	0.78571	0.40909091	0.1091	0.3
0.8333333	0.833333	0.83333	0.5	0.1333	0.367
0.8809524	0.880952	0.88095	0.59090909	0.1576	0.433
0.9285714	0.928571	0.92857	0.46590909	0.0909	0.375
0.8831169	0.928571	0.89524	0.55681818	0.1152	0.442
0.8831169	0.928571	0.89524	0.30681818	0.0485	0.258
0.7922078	0.928571	0.82857	0.38772727	0.0727	0.325
0.7012987	0.928571	0.7619	0.23863636	0.0303	0.208
0.6103896	0.928571	0.69524	0.32954545	0.0545	0.275
0.5194905	0.928571	0.62857	0.025974	0.02857	0.0381
0.4285714	0.928571	0.5619	0.053571	0.0381	0.07954545
0.3376623	0.928571	0.49524	0.0381	0.07954545	0.0121
0.3376623	0.803571	0.42857	0.0381	0.07954545	0.0121
0.2467532	0.803571	0.3619	0.0381	0.07954545	0.0121
0.2467532	0.553571	0.29524	0.0381	0.07954545	0.0121
0.1558442	0.553571	0.22857	0.0381	0.07954545	0.0121
0.0649351	0.303571	0.09524	0.0381	0.07954545	0.0121
0.025974	0.303571	0.02857	0.0381	0.07954545	0.0121
0.025974	0.053571	0.0381	0.07954545	0.0121	0.092

SIZE → B 21 G 11 R 4 GR 15

1.22 KOLMOGOROV-SMIRNOV STATISTIC

	G	R	GR
BLUE vs	0.454076	0.665565	0.412435
GREEN vs	0.712327	0.484289	
RED vs		0.686532	

MAX DELTAS

B-G	B-R	B-GR	G-R	G-GR	R-GR
0.9285714	0.928571	0.92857	0.59090909	0.1576	0.442
Sign	Sign	Sign	Not Sig	Not Sig	Not Sig



Appendix G. Results of Kolmogorov-Smirnov one sample test.

Not Sign.  
Altered  
Water  
Levels

	Sample	Normal	Delta
	Distribution	Distribution	
0.42	0.02381	0.080361	0.056552
0.53	0.071429	0.120233	0.048804
0.61	0.119048	0.156869	0.037822
0.62	0.166667	0.161918	0.004749
0.83	0.214286	0.29124	0.076954
0.84	0.261905	0.298415	0.03651
0.86	0.309524	0.313002	0.003478
0.91	0.357143	0.35073	0.006413
0.94	0.404762	0.374126	0.030636
0.96	0.452381	0.389992	0.062389
1	0.5	0.422253	0.077747
1.04	0.547619	0.455045	0.092574
1.11	0.595238	0.513039	0.082199
1.12	0.642857	0.52133	0.121528
1.17	0.690476	0.562575	0.127901
1.23	0.738095	0.611148	0.126947
1.27	0.785714	0.642638	0.143076
1.36	0.833333	0.709778	0.123555
1.67	0.880952	0.884463	0.003511
2.19	0.928571	0.988675	0.060104
2.3	0.97619	0.993931	0.017741

Not Sign Altered  
1.094286 avg  
0.480724 std  
21 n

Statistic 0.143076  
KS max D 0.248768  
4.582576

Bootstrap  
1.0967 avg  
0.47365 std

Sign,  
Altered  
Water  
Levels

	Sample	Normal	Delta
	Distribution	Distribution	
2.25	0.086364	0.084494	0.00187
2.63	0.177273	0.130099	0.047174
3.09	0.268182	0.205013	0.063169
3.47	0.359091	0.282881	0.07621
3.76	0.45	0.350539	0.099461
4.01	0.540909	0.413055	0.127854
4.14	0.631818	0.446574	0.185245
5.51	0.722727	0.777966	0.055239
6.1	0.813636	0.875501	0.061865
6.33	0.904545	0.903854	0.000692
6.5	0.995455	0.921534	0.073921

4.344545 avg  
1.522789 std  
11 n

Statistic 0.185245  
KS Max D = 0.343723  
3.316625

90%

Bootstrap

3.9697 avg  
1.4118 std

Severely  
Altered

Water Level	Sample Distribution	Normal Distribution	Delta
5.37	0.2375	0.200041	0.037459
5.6	0.4875	0.249058	0.238442
6.33	0.7375	0.437668	0.299832
8.9	0.9875	0.953113	0.034387

6.55 avg	Statistic	0.299832	NS
1.402302 std	KS Max D =	0.57	90%
4 n	2		

Bootstrap

6.506 avg  
1.25734 std

Composite

Water Level	Sample Distribution	Normal Distribution	Delta
2.25	0.063333	0.067982	0.004649
2.63	0.13	0.10031	0.02969
3.09	0.196667	0.152888	0.043779
3.47	0.263333	0.208129	0.055204
3.76	0.33	0.257281	0.072719
4.01	0.396667	0.304044	0.092623
4.14	0.463333	0.329769	0.133565
5.37	0.53	0.596022	0.066022
5.51	0.596667	0.625847	0.02918
5.6	0.663333	0.644642	0.018692
6.1	0.73	0.741762	0.011762
6.33	0.796667	0.781308	0.015359
6.33	0.863333	0.781308	0.082026
6.5	0.93	0.808151	0.121849
8.9	0.996667	0.986273	0.010394

Composite

4.932667 avg	Statistic	0.133565	NS
1.799256 std	KS max D	0.294347	90%
15 n	3.872983		

Bootstrap

4.7628 avg  
1.7864 std