

Neu-Con Umbrella Wetland and **Stream** Mitigation Bank

Casey/King Wetland Mitigation Site  
First Annual Monitoring Report  
November 2002



**Environmental Banc & Exchange, LLC**  
Managers, Bankers, and Traders of Environmental Rights

---

*"Finding Environmental Solutions through Economic Incentives"*



## Environmental Banc & Exchange, LLC

Managers, Bankers and Traders of Environmental Rights

*"Finding Environmental Solutions through Economic Incentives"*

10055 Red Run Boulevard, Suite 130  
Owings Mills, MD 21117-4860  
410 356-5159 FAX 410 356-5822

2102 North Elm Street, Suite J  
Greensboro, North Carolina 27408  
336 274-9800 FAX 336 274-6655

[www.ebxusa.com](http://www.ebxusa.com)

November 26, 2002

Mr. Bill Biddlecome  
Department of the Army  
Wilmington District, Corps of Engineers  
Washington Regulatory Field Office  
PO Box 1000  
Washington, North Carolina 27889-1000

Re: Casey/King Annual Monitoring Report / Casey/King Site Specific Mitigation Plan/  
Neu-Con Umbrella Wetland and Stream Mitigation Banking Instrument ("MBI")

Dear Bill:

Enclosed for your consideration is a copy of the First Annual Monitoring Report for the Casey/King Site. This submittal is consistent with the Neu-Con MBI and the Site Specific Mitigation Plan for the Casey/King Site.

By copy of this letter, we are also circulating a copy of the Annual Report to members of the MBRT for the Casey/King Site.

Thank you for your assistance.

Sincerely,

George W. Kelly

Enclosure

cc: Mrs. Kathy Matthews (w/enclosure)  
Mr. Howard Hall (w/enclosure)  
Mr. Ron Sechler (w/enclosure)  
Mr. John Dorney (w/enclosure)  
Mr. Bennett Wynne (w/enclosure)

## TABLE OF CONTENTS

SUMMARY.....	2
1.0 INTRODUCTION.....	3
1.1 PROJECT DESCRIPTION.....	3
1.2 PURPOSE.....	3
1.3 PROJECT HISTORY.....	3
1.4 PROJECTED SCHEDULE.....	5
2.0 HYDROLOGY.....	5
2.1 SUCCESS CRITERIA.....	5
2.2 HYDROLOGIC DESCRIPTION.....	5
2.3 RESULTS OF HYDROLOGIC MONITORING.....	6
2.3.1 Site Data.....	6
2.3.2 Descriptions of Groundwater Gauging Stations.....	9
2.3.3 Climatic Data.....	9
2.4 CONCLUSIONS.....	11
3.0 VEGETATION.....	11
3.1 SUCCESS CRITERIA.....	11
3.2 DESCRIPTION OF SPECIES.....	11
3.3 RESULTS OF VEGETATIVE MONITORING.....	11
3.4 SUPPLEMENTAL VEGETATIVE MONITORING.....	12
3.5 CONCLUSIONS.....	13
4.0 REFERENCE SITE CONDITIONS.....	13
5.0 OVERALL CONCLUSIONS AND RECCOMENDATIONS.....	15
6.0 WILDLIFE OBSERVATIONS.....	15
7.0 VEGETATION OBSERVATIONS.....	15

## LIST OF FIGURES

Figure 1. Casey / King Mitigation Site Location Map.....	4
Figure 2. Casey / King Mitigation Site Gauge Location Map.....	7
Figure 3. 2002 Manual Data Graphical Figure.....	8
Figure 4. Lenoir WETS Data.....	10
Figure 5. Comparison of Reference Site Data to Station CK#1.....	14

## LIST OF TABLES

Table 1. 2002 Hydrologic Monitoring Results.....	6
Table 2. Comparison of Average Rainfall to Observed Rainfall.....	9
Table 3.A.1. Planted Tree Species.....	11
Table 3.A.2. 2002 Vegetation Monitoring Statistics, by plot.....	12
Table 3.B.1. Volunteer Tree Species.....	12
Table 3.B.2. 2002 Combined Planted and Volunteer Trees, by plot.....	12

## LIST OF APPENDICES

APPENDIX A DEPTH TO GROUNDWATER PLOTS	
APPENDIX B SITE PHOTOS	
APPENDIX C SUPPLEMENTAL STATISTICAL ANALYSIS FOR VEGETATION	

# **EBX-Neuse I, LLC.**

## **ANNUAL REPORT FOR 2002 Casey King Mitigation Site**

**November 28, 2002**

### **SUMMARY**

Construction of the Casey/King Mitigation Site started in December 2001 and was completed in March 2002, prior to the start of the 2002 growing season. In order to receive mitigation credit, the Site must meet the success criteria for both wetland hydrology and vegetation, as defined in the Mitigation Plan, for five consecutive years. This Annual Report details the monitoring activities during the 2002 growing season. The 2002 data represents results from the first year of hydrologic monitoring and the first year of vegetative monitoring.

This Annual Report reflects the findings from five manual groundwater stations, four automated groundwater stations and five vegetative monitoring plots on the 37.3 acre restoration site. Each of the five stations is equipped with a manual groundwater gauge and four stations are equipped with an automated gauge. Each station represents the corner of a 50 foot by 50 foot square vegetative monitoring plot. Additionally, the stations are points from which photographs are taken or are referenced. Automated gauges were installed in addition to the manual wells specified in the Mitigation Plan. Automated stations were installed adjacent to all manual stations except Station CK#2. Station CK#2 represents the lowest elevations on the Site at a location where ponding is anticipated.

The Mitigation Plan for the Casey/King Site calls for three manual groundwater monitoring gauges to be installed (Stations CK#1, CK#2 and CK#3). In addition, it calls for three vegetative monitoring stations; one for wetness zone 1, one for wetness zone 2, and one for wetness zones 3 and 4. The target wetland system for the Site is primarily a "nonriverine wet hardwood forest" with a small component of "Coastal Plain small stream swamp", as described by Schafale and Weakley, 1990. The initial plan was to restore a 28 acre wetland system. After construction, it was determined that up to 37.3 acres of wetland hydrology was restored. The additional 9.3 acres were planted as nonriverine forest. An additional manual well (CK#4) and vegetation plots were installed in the 9.3 acres (Stations CK#1 and CK#4).

Weather station data from the Kinston Weather Station is utilized in conjunction with a manual rain gauge located on the site. The manual gauge is used to validate observations made at the automated station. To date, both the gauges corroborate a rainfall total over eight inches below normal for the period between the first of March and the end of November.

In 2002, five of five wetland monitoring stations have met the hydrologic success criteria based on field observations. At various times during the growing season, three of four automated wells had some form of malfunction. However, collected data generally follows field observations. The minimum wetland hydrologic criteria was met within the first 12 consecutive days of the growing season as demonstrated by the results of the field observations. During this initial period there were significant, yet normal, rainfalls.

The vegetative monitoring resulted in total stem counts exceeding 320 trees per acre on four of five vegetative monitoring plots. One of the plots had less than 320 stems per acre, and therefore additional

vegetative sampling and analysis was performed at the site. The results of this additional monitoring suggest that supplemental

## 1.0 INTRODUCTION

### 1.1 PROJECT DESCRIPTION

Located in Lenoir County, the Casey/King Mitigation Site encompasses approximately 81 acres. It is situated off of British Road (SR 1803) and is bisected by Heath Branch (Figure 1). This project provides compensatory mitigation for wetland impacts associated with impacts within the resident hydrologic unit. The Casey/King Site is designed to restore nonriverine wet hardwood forest and Coastal Plain small stream swamp ecosystems. It was constructed between December 2001 and February 2002, with 37.3 acres of planting being completed on March 19, 2002. Groundwater, surface water, and rain gauges were functional on March 20, 2002. This is the first year of monitoring for the Site.

The Mitigation Plan predicted that approximately 28 acres of restoration were available on the Site. This prediction was based on evaluation of topographic gradients and modeling data. During construction, it was observed that the soil conditions (low chromas and high water table) outside the planned restoration boundary indicated that wetland hydrology could be restored to areas outside the original proposed restoration boundary. Therefore, the boundary of the restoration project was extended by scarifying these areas and planting trees. Monitoring gauges were installed such that these extended areas of restoration could be evaluated for hydrologic success criteria over the monitoring period. The total area where restoration practices were implemented was surveyed after the completion of construction and found to equal 37.3 acres.

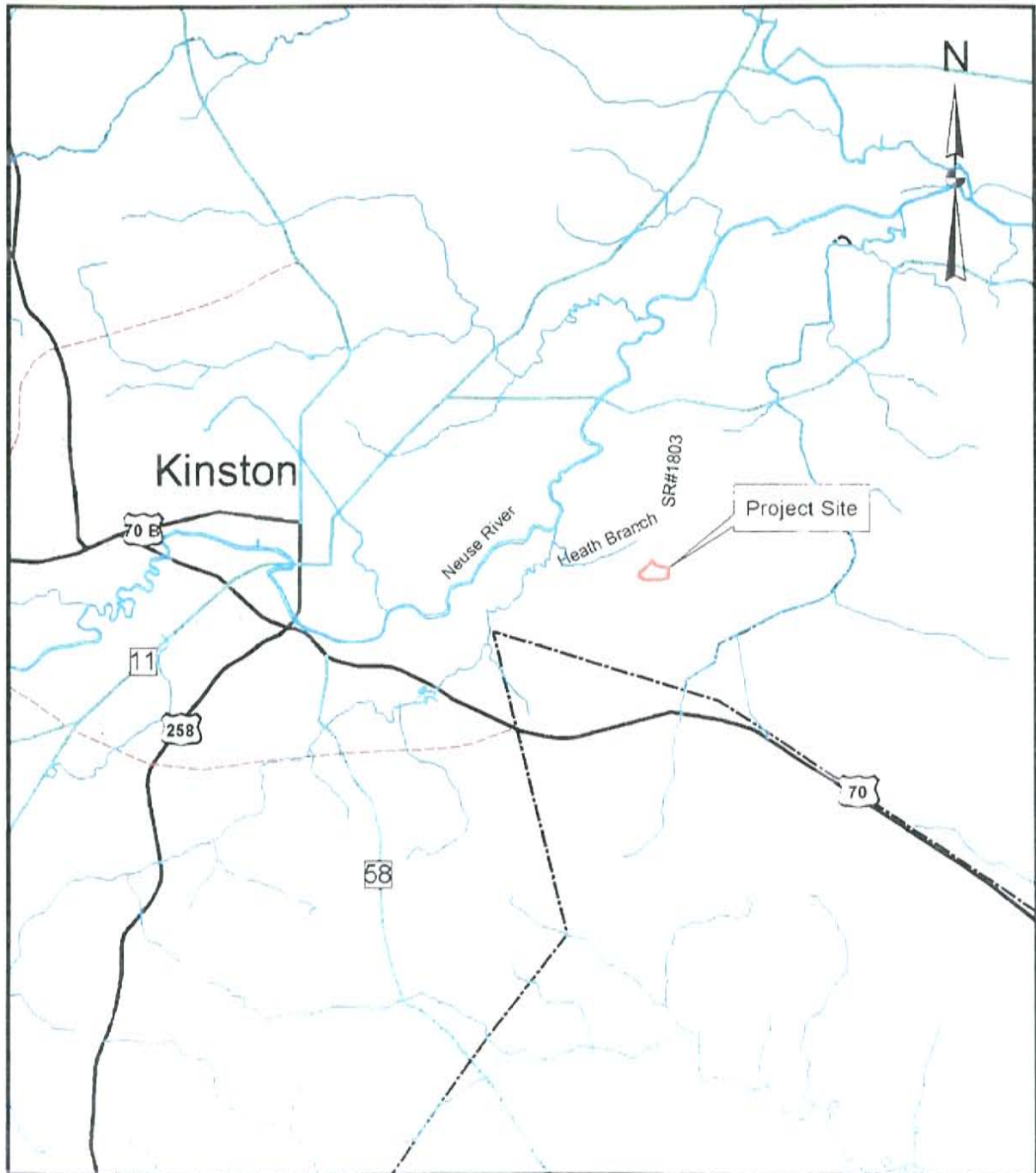
### 1.2 PURPOSE

Monitoring of the Casey/King Site is required to demonstrate successful mitigation based on the criteria specified in the Mitigation Plan, the Neu-Con Umbrella Stream and Wetland Mitigation Banking Instrument, and through a comparison to reference site conditions. Both hydrologic and vegetative monitoring is conducted throughout the growing season. Success criteria must be met for five consecutive years. This Annual Report details the results of the hydrologic and vegetative monitoring for 2002 at the Casey/King Mitigation Site.

### 1.3 PROJECT HISTORY

May 2000	Monitoring Gauges Installed
Fall 2001	Approved Mitigation Plan, Monitoring Gauges Installed
December 17, 2001	Construction Began
March 7, 2002	Construction Completed
March 19, 2002	Planting Completed
March 19, 2002	Post Construction Monitoring Gauges Installed
April 2002	As-Built Report Submitted
August 2002	Supplemental As-Built Report Submitted
October / November 2002	Supplemental Vegetative Monitoring
November 30, 2002	1 <sup>st</sup> Annual Monitoring Report

**Figure 1. Casey / King Mitigation Site Location Map**

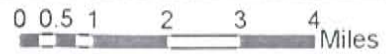


Environmental Banc and Exchange, LLC  
 10055 Red Run Boulevard, Suite 130  
 Owings Mills, MD 21117



518 Plaza Boulevard  
 Kinston, NC 28503

Location of Casey/King Wetland Mitigation Site



## 1.4 PROJECTED SCHEDULE

January 2003	Supplemental Planting in Selected Areas
November 2003	2 <sup>nd</sup> Annual Monitoring Report
November 2004	3 <sup>rd</sup> Annual Monitoring Report
November 2005	4 <sup>th</sup> Annual Monitoring Report
November 2006	5 <sup>th</sup> Annual Monitoring Report

## 2.0 HYDROLOGY

### 2.1 SUCCESS CRITERIA

As stated in the approved Mitigation Plan, the hydrologic success criteria for the Site is to restore the water table at the Site so that it will remain within 12 inches of the soil surface for at least 12.5% of the growing season cumulatively (approximately 30 days) or at least 5% of the growing season continuously (approximately 12 days). The day counts are based on the growing season for Lenoir County, which is 238 days long, beginning on March 20 and ending November 12, as calculated from National Weather Service Wetlands Determination Tables (WETS) for Kinston NNE, NC4689. The Plan specified that data would be collected from three manual groundwater gauges.

The Mitigation Plan further specifies that wetland conditions must be present in normal or dryer than normal conditions. Although the stated minimum success requirements for hydrology have been met, data from the reference system has also been presented to demonstrate the positive correlations between the restoration Site and the natural hydrology of the target system (Figure 5).

### 2.2 HYDROLOGIC DESCRIPTION

Five manual groundwater gauges, four automated WL 40 groundwater gauges, and one rain gauge were installed prior to the start of the first growing season (Figure 2). The monitoring protocol specified that manual station readings occur daily until defined success is attained and then throughout the remainder of the growing season after most rain events. The protocol further specified that the additional automated stations be accessed on a quarterly basis. The rainfall data used to analyze the Site's water level data are from both offsite and onsite rain gauges.

The Site was designed to function with rainfall as its primary hydrologic influence. Monitoring has thus far demonstrated that the influence of rainfall on site hydrology is as planned. During site visits in March, April, October and November 2002, evidence of surface inundation was observed throughout the monitored restoration area.

Immediately following the construction of the rock water control structure some weeping / piping through the structure was observed. The piping was immediately abated through the placement of filter fabric and crushed stone. No piping has since been observed.



## 2.3 RESULTS OF HYDROLOGIC MONITORING

### 2.3.1 Site Data

The maximum number of consecutive days that the groundwater was within twelve inches of the surface was determined for each gauge. This number was converted into a percentage of the 238-day growing season. The results are presented in Table 2. Appendix A contains charts of the water depth for each monitoring gauge. Precipitation is shown across the top of each graph. These graphs show the reaction at each monitoring location of the groundwater level to specific rainfall events.

Several of the automated gauge data sets were interrupted due to dead batteries and other unspecified software glitches; specifically stations CK#3, CK#4 and CK#5. Based on experience, data collection interruptions were expected and manual collection gauges and observations were utilized to ensure an accurate representation of the Site conditions. The sporadic data from wells CK#3, CK#4 and CK#5 do not entirely correlate with field observations and malfunctions are evident on the graphs. Early growing season data from CK#3 and CK#5 appear to reflect similar trends to field observations. The placement of the groundwater gauges and a graphical representation of the hydrologic monitoring results are provided in the Appendix A.

The monitoring protocol specified that manual gauges be field observed until the minimum wetland criteria was met. Additionally, the manual gauges were to be observed after rain events. Automated gauges were installed with the intention to cross reference the collected field data. Automated wells were accessed in the first days of the monitoring period with the protocol requiring accessing data on a quarterly basis thereafter. The automated and manual gauges appeared to show positive correlations the first few days of operation. It was not until after the first quarter that the significant malfunctions of the automated gauges were identified. The monitoring protocol has been amended to include monthly accessing of the automated gauges to reduce potential technical glitches.

**Table 1. 2002 Hydrologic Monitoring Results**

Manual Groundwater Gauges  
Percent of Growing Season – Consecutive Days

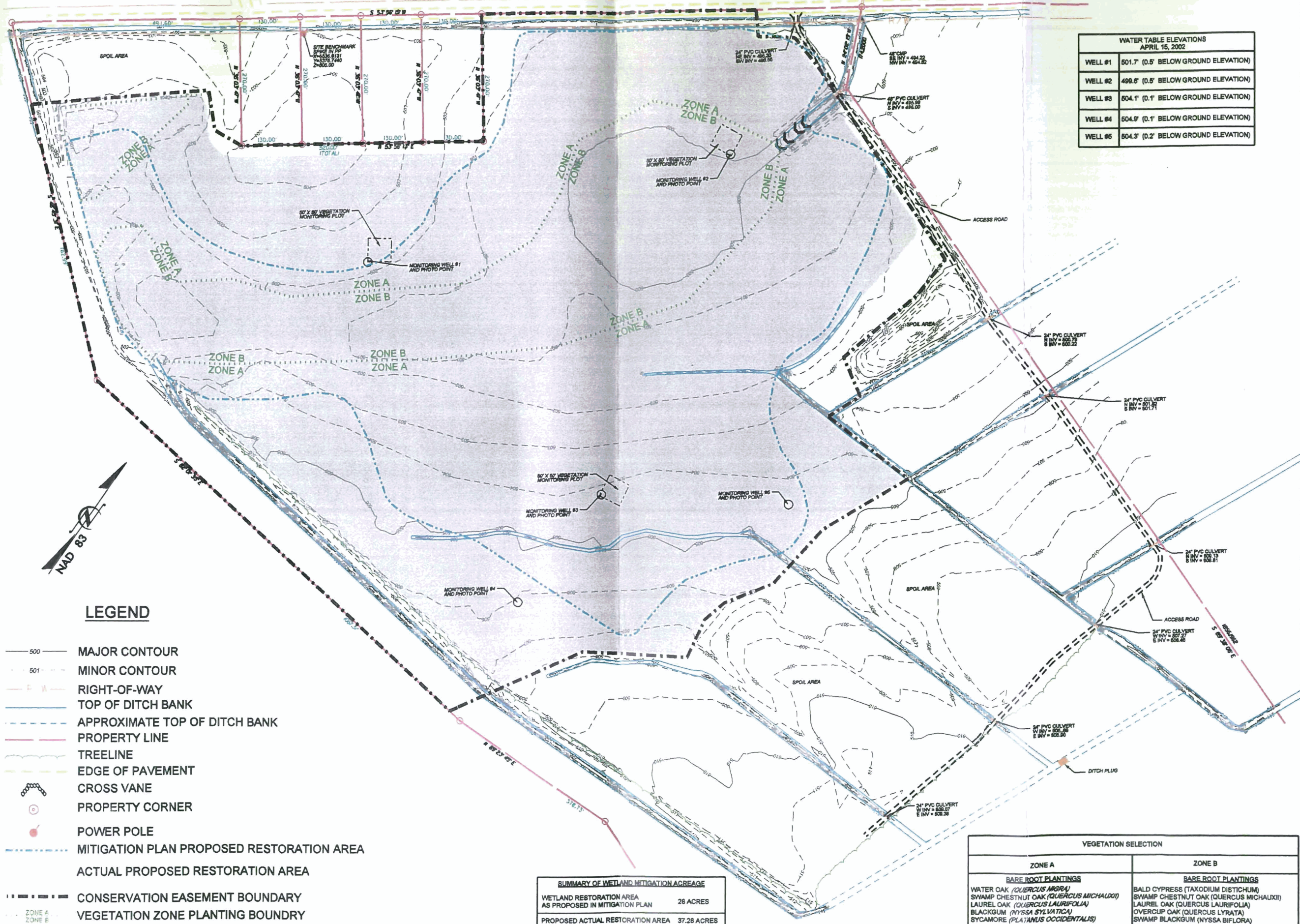
Monitoring Station	5% -8%	8%-12.5%	>12.5%
CK1	X		
CK2	X		
CK3	X		
CK4	X		
CK5	X		

**Figure 2. Casey / King Mitigation Site Gauge Location Map**

CAUSEY ROAD  
SR 1816

SR 1803 BRITISH ROAD 60' PUBLIC RIGHT-OF-WAY

WATER TABLE ELEVATIONS APRIL 15, 2002	
WELL #1	501.7' (0.5' BELOW GROUND ELEVATION)
WELL #2	498.8' (0.5' BELOW GROUND ELEVATION)
WELL #3	504.1' (0.1' BELOW GROUND ELEVATION)
WELL #4	504.9' (0.1' BELOW GROUND ELEVATION)
WELL #5	504.3' (0.2' BELOW GROUND ELEVATION)



**LEGEND**

- 500 — MAJOR CONTOUR
- 501 --- MINOR CONTOUR
- - - - - RIGHT-OF-WAY
- — — — — TOP OF DITCH BANK
- - - - - APPROXIMATE TOP OF DITCH BANK
- — — — — PROPERTY LINE
- — — — — TREELINE
- — — — — EDGE OF PAVEMENT
- — — — — CROSS VANE
- — — — — — PROPERTY CORNER
- — — — — — POWER POLE
- - - - - MITIGATION PLAN PROPOSED RESTORATION AREA
- — — — — ACTUAL PROPOSED RESTORATION AREA
- - - - - CONSERVATION EASEMENT BOUNDARY
- — — — — ZONE A
- — — — — ZONE B
- - - - - VEGETATION ZONE PLANTING BOUNDRY

SUMMARY OF WETLAND MITIGATION ACREAGE	
WETLAND RESTORATION AREA AS PROPOSED IN MITIGATION PLAN	26 ACRES
PROPOSED ACTUAL RESTORATION AREA	37.28 ACRES

VEGETATION SELECTION	
ZONE A	ZONE B
<b>BARE ROOT PLANTINGS</b>	<b>BARE ROOT PLANTINGS</b>
WATER OAK ( <i>QUERCUS MAGRA</i> )	BALD CYPRESS ( <i>TAXODIUM DISTICHUM</i> )
SWAMP CHESTNUT OAK ( <i>QUERCUS MICHAUXII</i> )	SWAMP CHESTNUT OAK ( <i>QUERCUS MICHAUXII</i> )
LAUREL OAK ( <i>QUERCUS LAURIFOLIA</i> )	LAUREL OAK ( <i>QUERCUS LAURIFOLIA</i> )
BLACKGUM ( <i>NYSSA SYLVATICA</i> )	OVERCUP OAK ( <i>QUERCUS LYRATA</i> )
SYCAMORE ( <i>PLATANUS OCCIDENTALIS</i> )	SWAMP BLACKGUM ( <i>NYSSA BIFLORA</i> )

NO	SUBMITTALS / REVISIONS	DES	DRN	CHK	DATE	
					R/L	R/L
1	DRAFT AS-BUILT DRAWING	R/L	DOV	R/L	R/L	04-23-2002
2	FINAL AS-BUILT PLANS	R/L	DOV	R/L	R/L	05-09-2002
3	REVISED FINAL PLANS	R/L	DOV	R/L	R/L	06-04-2002

NO	DATE	DESCRIPTION

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

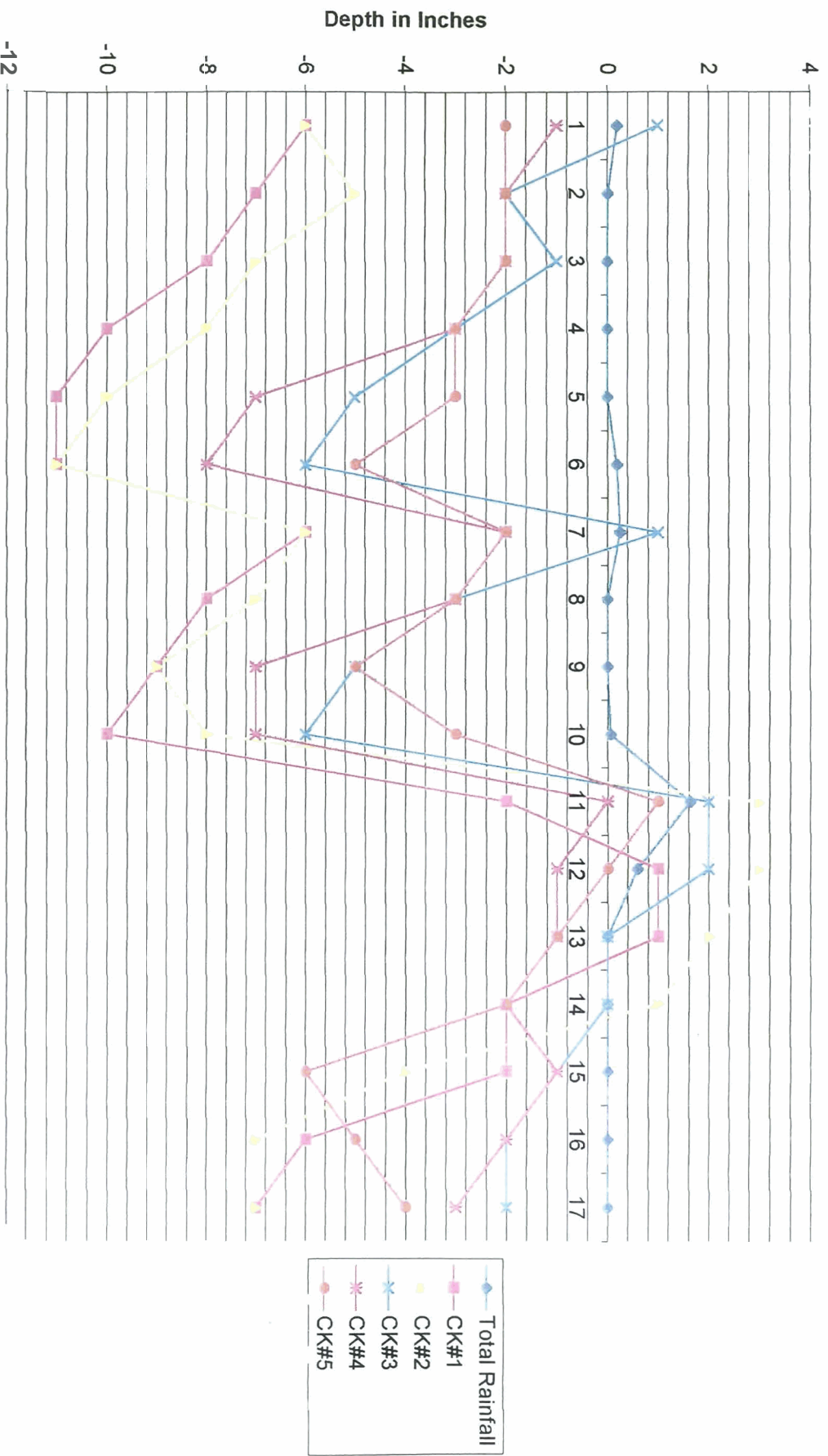
**BUCK**  
ENGINEERING

AS-BUILT DRAWING  
WETLAND RESTORATION PROJECT  
EBX CASEY / KING  
LENOIR COUNTY

DATE	6-6-2002
PROJECT NO	024
FILENAME	Design/AsBuilt/Casey_eab.esb
SCALE	FULL SIZE 1"=100' HALF SIZE 1"=200'
SHEET NO	2

**Figure 3. 2002 Manual Data Graphical Figure**

# Manual Groundwater Observations



Period between March 20, 2002 and April 5, 2002

- ◆ Total Rainfall
- CK#1
- CK#2
- × CK#3
- \* CK#4
- CK#5

### 2.3.2 Descriptions of Groundwater Gauging Stations

Each monitoring station was placed to analyze the success of a particular wetness zone within the restoration Site. The stations include gauges that collect readings for both surface water and groundwater.

Plots CK#1, CK#3, CK#4 and CK#5 are situated to determine the success of restoring a nonriverine wet hardwood forest on the site. Plot CK#2 was used to determine the success of the small stream swamp, with the success being determined by a single manual gauging station. Stations CK#4 and CK#5 are both represented by manual and automated gauging station that are calibrated at the ground surface. Automated gauges CK#1 and CK#3 were installed with screens above the surface; gauge CK#1 has since settled to be below the ground surface or minor erosion has cover the screen. Manual station CK#1 is located approximately four inches above the calibration point of the automated gauge. All other gauges are within a two inch vertical separation. All gauges within a plot are separated by no more than three feet.

### 2.3.3 Climatic Data

Table 2 is a comparison of the 2002 monthly rainfall to historical precipitation (collected between 1948 and 2002) for the Lenoir County area. Rainfall data presented in the figure represents a good correlation with the onsite gauge. It is assumed that, if the 2002 rainfall totals bars fall between the average precipitation total for each month, then the local climate was experiencing average conditions for that particular region. This comparison gives an indication of how 2002 relates to historical data in terms of average rainfall. The only months with above normal rainfall conditions were January, March, and November. Over half of the months had rainfalls that fell below the 30% average which indicates a far drier than normal year. December 2002 rainfall data was not available for this Report.

**Table 2. Comparison of Average Rainfall to Observed Rainfall**

Month	Average	30%	70%	2002 Precip.
January	4.05	3.08	4.71	5.05
February	3.73	2.41	4.49	1.53
March	3.97	2.71	4.74	5.77
April	3.16	1.95	3.82	2.08
May	4.26	2.79	5.12	2.37
June	4.04	2.76	4.82	2.43
July	5.29	3.78	6.26	4.38
August	5.48	3.73	6.55	2.56
September	4.29	2.30	5.24	1.27
October	2.96	1.77	3.66	2.88
November	2.83	1.86	3.40	4.65
December	3.54	2.11	4.29	N/A

Weather station data from the Kinston Weather Station is utilized in conjunction with a manual rain gauge located on the Site. The manual gauge is used to validate observations made at the automated station. To date, both the gauges corroborate that rainfall total was over eight inches below normal for the period between the first March and the end of November. Both March and November rainfalls were over an inch and a half above normal with significant rainfall events falling on the outer limits of the growing season; single events produce 1.27 inches on March 13, 2002 and 1.23 inches on November 12, 2002. These single events, if excluded from the averages, would indicate that the growing season was much drier than normal; possibly as much as ten inches below normal.

### Figure 4. Lenoir WETS Data

WETS Station : KINSTON 7 NNE, NC4689

Creation Date: 08/30/1999

Latitude: 3522 Longitude: 07733

Elevation: 60

State FIPS/County(FIPS): 37107 County Name: Lenoir

Start yr. - 1966 End yr. - 1990

Month	Temperature (Degrees F.)			Precipitation (Inches)					
	avg daily max	avg daily min	avg	avg	30% chance will have		avg # of days w/.1 or more	avg total snow fall	
					less than	more than			
January	53.6	31.7	42.7	4.05	3.08	4.71	7	0.3	
February	57.2	33.3	45.3	3.73	2.41	4.49	6	0.4	
March	65.8	40.2	53.0	3.97	2.71	4.74	6	0.3	
April	74.7	47.5	61.1	3.16	1.95	3.82	5	0.0	
May	81.3	56.4	68.8	4.26	2.79	5.12	7	0.0	
June	87.0	63.8	75.4	4.04	2.76	4.82	6	0.0	
July	89.7	68.5	79.1	5.29	3.78	6.26	8	0.0	
August	88.8	67.5	78.1	5.48	3.73	6.55	7	0.0	
September	84.2	61.3	72.7	4.29	2.30	5.24	5	0.0	
October	75.6	50.4	63.0	2.96	1.77	3.66	4	0.0	
November	67.3	42.3	54.8	2.83	1.86	3.40	4	0.0	
December	58.2	35.6	46.9	3.54	2.11	4.29	5	0.4	
Annual	-----	-----	-----	-----	41.65	50.00	--	----	
Average	73.6	49.9	61.7	-----	-----	-----	--	----	
Total	-----	-----	-----	47.61	-----	-----	70	1.4	

### GROWING SEASON DATES

Probability	Temperature		
	24 F or higher	28 F or higher	32 F or higher
	Beginning and Ending Dates Growing Season Length		
50 percent *	3/ 5 to 12/ 1 271 days	3/20 to 11/12 238 days	3/31 to 10/29 211 days
70 percent *	2/27 to 12/ 9 286 days	3/15 to 11/17 247 days	3/26 to 11/ 3 222 days

\* Percent chance of the growing season occurring between the Beginning and Ending dates.

## 2.4 CONCLUSIONS

Even though Lenoir County experienced dry climatic conditions all manual gauges met the continuous 5% saturation criteria specified in the approved Mitigation Plan. Several of the automated gauges experienced malfunctions during the 2002 growing season. Positive correlations were observed with the functioning automated gauge on the Site and the reference wetland. Normal rainfall is anticipated to increase the hydroperiod of all monitored stations.

## 3.0 VEGETATION

### 3.1 SUCCESS CRITERIA

The interim measure of vegetative success identified in the Mitigation Plan is the survival of at least 320 3-year old trees per acre at the end of year 3 of the monitoring period. The final vegetative success criteria is the survival of 260 5-year old trees per acre at the end of the monitoring period. In addition, for the five year monitoring period, the presence of volunteer facultative softwood species such as red maple, sweet gum, and loblolly pine is limited to less than 10% each of the total number of trees utilized to determine success. These trees may contribute more than 10% of the total trees on the site, but they will not constitute more than 10% each of the 260 trees per acre. The Plan specifies that the data would be collected from three vegetative plots.

Construction was completed on March 7, 2002. Planting of bare root trees and spreading of the permanent seed mixture was completed on March 19, 2002. Two distinct wetness zones were delineated after construction. Zone A makes up the majority of the site and included areas where high water table conditions would be common, but ponding of water would be minimal. Zone B is wetter than Zone A and includes areas where ponding of water is common. Species planted in each zone are given the table found below. Approximately 21,900 trees were planted over 37.3 acres for an average planted density of 587 stems per acre.

### 3.2 DESCRIPTION OF SPECIES

Table 3.A.1. Planted Tree Species

ID	Species	Common Name	Community Type	FAC Status
1	<i>Quercus phellos</i>	Willow Oak	NRWHW*	FACW-
2	<i>Quercus michauxii</i>	Swamp Chestnut Oak	NRWHW	FACW-
3	<i>Quercus nigra</i>	Water Oak	NRWHW	FAC
4	<i>Quercus shumardii</i>	Shumard Oak	NRWHW	FACW-
5	<i>Platanus occidentalis</i>	Sycamore	NRWHW	FACW-
6	<i>Nyssa sylvatica</i>	Blackgum	NRWHW	FAC
7	<i>Nyssa biflora</i>	Swampgum	CPSSS**	OBL
8	<i>Quercus lyrata</i>	Overcup Oak	CPSSS	OBL
9	<i>Taxodium distichum</i>	Bald Cypress	CPSSS	OBL

\* Non-riverine Wet Hardwood Forest

\*\* Coastal Plain Small Stream Swamp

### 3.3 RESULTS OF VEGETATIVE MONITORING

The following table (Table 3.A.2.) presents planted stem counts for each of the three specified and two additional monitoring plots which the sponsor elected to provide. Each planted tree species is identified across the top row and each plot is identified down the left column. The numbers on the top row correlate to the ID column of Table 3.A.1. Trees are flagged in the field on a quarterly basis before the flags degrade. Flags are utilized because they will not interfere with the growth of the tree. Volunteers are also flagged during this process.



One of the five plots had a low stem count (CK#3) and field observation identified isolated localities with low survival rates for swamp chestnut oak, gum and water oak. A check of subcontractor records indicates that some specimens may have been in poor condition when they were planted. In particular, some bundles of swamp chestnut oak had been harvested up to three months before planting and were somewhat dry because they were not packed in gel.

**Table 3.A.2. 2002 Vegetation Monitoring Statistics, by plot**

Plot	1	2	3	4	5	6	7	8	9	Total	Stem/acre
CK1	17		2		4	3				26	452
CK2	12			3	2		1	4	9	31	540
CK3					4	5				9	157
CK4		3		16						19	330
CK5					30					30	522

The following table (Table 3.B.2.) presents volunteer tree species and total stem counts for each of the monitoring stations. For Table 3.B.2. each volunteer tree species is identified across the top row and each plot is identified down the left column. The letters on the top row correlate to the ID column for the Table 3.B.1. First year volunteer species typically lack the distinguishing characteristics that allow positive identification.

**Table 3.B.1. Volunteer Tree Species**

ID	Species	Common Name	Community Type	FAC Status
A	<i>Liquidambar styr.</i>	Sweet Gum	NRWHW	FAC+
B	<i>Platanus occidentalis</i>	Sycamore	NRWHW	FACW-
C	<i>Caraya spp. (I)</i>	Hickory	NRWHW	
D	<i>Fraxinus spp. (I)</i>	Ash	CPSSS	

(I) First year sapling; positive ID not possible

The following table provides an accounting of the total stems per acre based on planted and observed volunteers. Volunteer stem counts increase the stem counts on three plots (CK#2, CK#3 and CK#5).

**Table 3.B.2. 2002 Combined Planted and Volunteer Trees, by plot**

Plot	A	B	C	D	Volunteer	Planted	Total Stems/Plot	Stem/acre
CK1						26	26	452
CK2				2	2	31	33	574
CK3						9	9	157
CK4	1	10			11	19	30	522
CK5			4		4	30	34	592

### 3.4 SUPPLEMENTAL VEGETATIVE MONITORING

Due to concern with the low stem count on plot CK#3, the sponsor evaluated the benefit of additional investigations and statistical analysis to determine if there was a need to augment the Site with additional trees for continued progress toward long-term success. Discussions with regional forestry professional indicated that the drought had an adverse effect on tree survival rates statewide. A concern about the possible continued drought conditions was the primary factor in the decision to conduct additional investigations.

Forestry Services, Inc. (Registered Forestry Consultants) and Dr. Bronson Bullock (NCSU, Department of Forestry) were retained to develop a sampling protocol that would provide a more detailed accounting of the survival rates of the planted trees. In order to further determine tree survival of this stand, Forestry Services developed a 2 chain (1 chain = 66 feet) by 4 chain grid over the tract with blue-painted steel fence posts set for plot centers. At each plot center, a 1/50 acre circular plot (radius of 16.6 feet) was inspected carefully for planted hardwoods and any other tree species. A total of 41 plots were evaluated. (Appendix C)

The statistical analysis of the data from these plots revealed the following: with a 90% Confidence Interval, there are 281.7 TPA (trees per acre) of planted trees surviving on this tract with a margin error of  $\pm 38.76$  TPA. In other words, there is a 90% chance of there being between 242.94 and 320.46 TPA of planted trees surviving on this tract. Forestry Services indicates that supplemental planting of an additional 120 trees per acre over the Site would provide additional assurance that five year goal of 260 trees per acre will be achieved.

Forestry Services also noted a few strips of Johnson grass growing on the Site. This grass, plus possibly other species of grass and/or weeds, might impact the establishment of the stand. Forestry Services recommended that OUST herbicide be broadcast at a 3 oz per acre rate over portions of the Site to inhibit germination of these weeds for the upcoming growing season.

The findings of the supplemental analysis by the forestry consultant have resulted in a decision to augment the Site with wetland hardwood planting at an average rate of 220 stems per acre. Species will be selected that ensure diversity is maintained at the Site, and planting density would be highest on those portions of the site requiring the most supplement based on the Forestry Services sampling. Herbicides will be selectively applied on the Site.

### **3.5 CONCLUSIONS**

Some 37 acres of this Site was planted in non-riverine hardwoods and coastal plain swamp in March 2002. Four of the monitored plots (CK#1, CK#2, CK#4, and CK#5) exceed 320 stems per acres and one plot (CK#3) achieved 157 stems per acre. In light of the low stem count on one plot, a more detailed analysis was performed to determine what level of supplemental planting was appropriate for the Site. To sustain the success rate and ensure target species survival in the event that drought conditions persist into next year, the augmentation is scheduled for this winter.

### **4.0 REFERENCE SITE CONDITIONS**

The approved Mitigation Plan provides that if the rainfall data for any given year during the monitoring period is not normal the reference wetland data can be accessed to determine if there is a positive correlation between the performance of the restoration site and the natural hydrology of the reference site.

Although suitable hydrology was observed at the Site during the below normal climatic conditions, data from the Reference Site was compiled to compare hydrographs. Data from the reference wetland groundwater gauge shows a positive correlation with the groundwater gauge located in monitoring plot CK#1 (Figure 5). The automated gauges from both CK#1 and the reference wetland show the similarity of the natural hydrology of the reference site and the restored hydrology of the Casey/King Mitigation Site. The sporadic data collected from CK#3, CK#4 and CK#5 do not correlate and no conclusion is possible because these gauges were not properly functioning.

**Figure 5. Comparison of Reference Site Data to Station CK#1**

# Automated Gauge CK#1 and Automated Gauge from Reference Site



Growing Season March 20, 2002 - November 12, 2002

◆ Total Rainfall (in)  
 ■ AUTO W1  
 ● AUTO Ref

## **5.0 OVERALL CONCLUSIONS AND RECCOMENDATIONS**

- First year hydrologic monitoring has shown the minimum wetland hydrology criteria has been achieved.
- The groundwater monitoring protocol will be amended to include monthly access of all automated gauges to ensure that there are no more technical glitches.
- First year vegetative monitoring has shown that four of the five plots exceed 320 stems per acre.
- Supplemental planting will occur in January – February 2003 to assure continued vegetative success in the event that the drought persists.
- A supplemental application of herbicides will be made in February 2003 to assure continued vegetative success.
- Monitoring of vegetation and groundwater and surface water levels will continue.

## **6.0 WILDLIFE OBSERVATIONS**

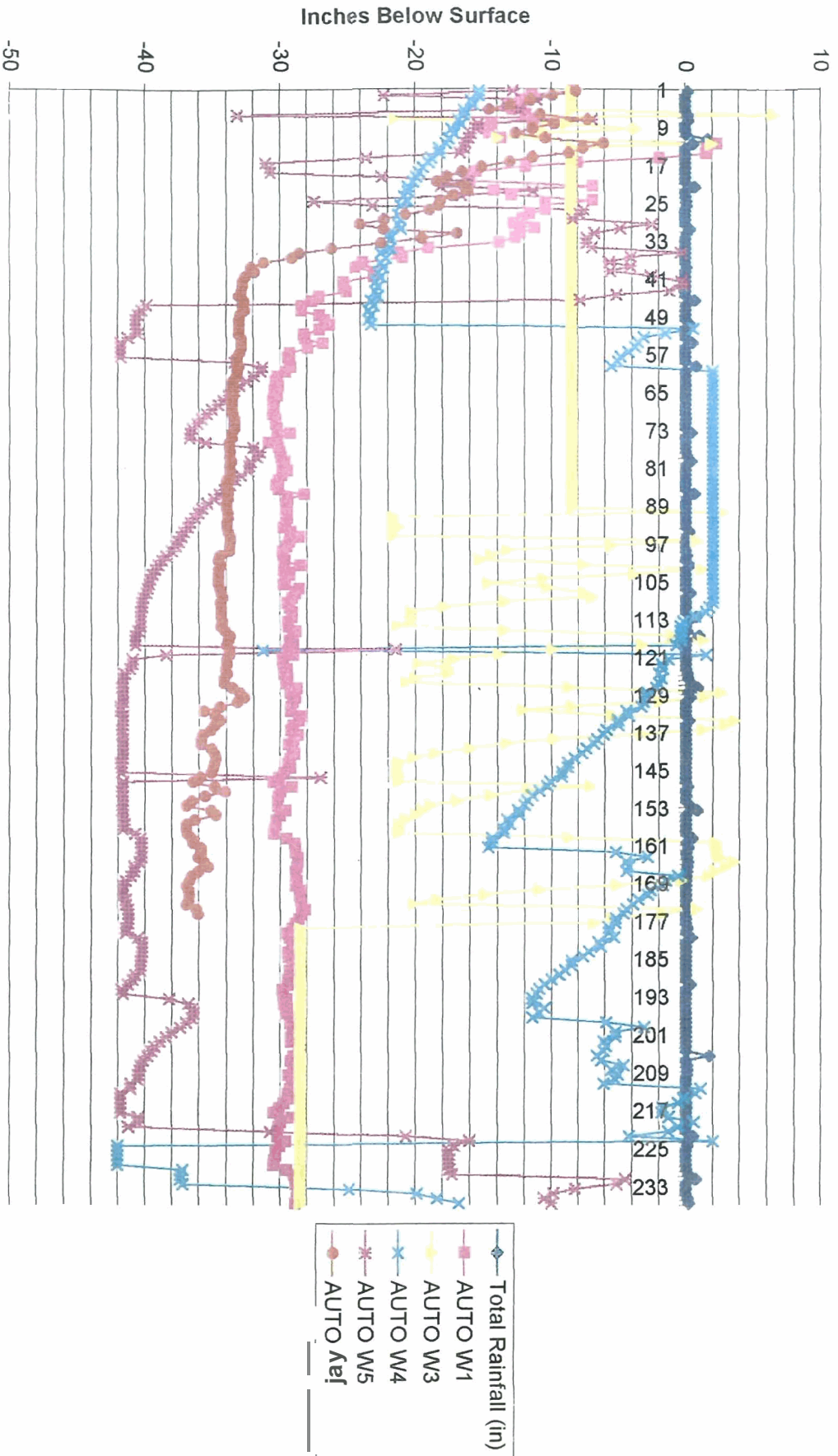
The most notable wildlife observation was made in October 2002 when we observed bear tracks on the Site. We noted deer tracks during all Site visits; no significant herbivory has been observed. Numerous shorebirds including Wilson's Plover and Solitary Sandpipers were encountered immediately following the construction. Canada geese took up residence in the ponded areas between April and June. Approximately 20 pair of Kildeer used the Site as a breeding ground. Numerous leopard frogs and mosquito fish were observed in all open water. Redwing Blackbird were possibly nesting on the Site during mid June. A Marsh Hawk was observed in November, 2002.

## **7.0 VEGETATION OBSERVATIONS**

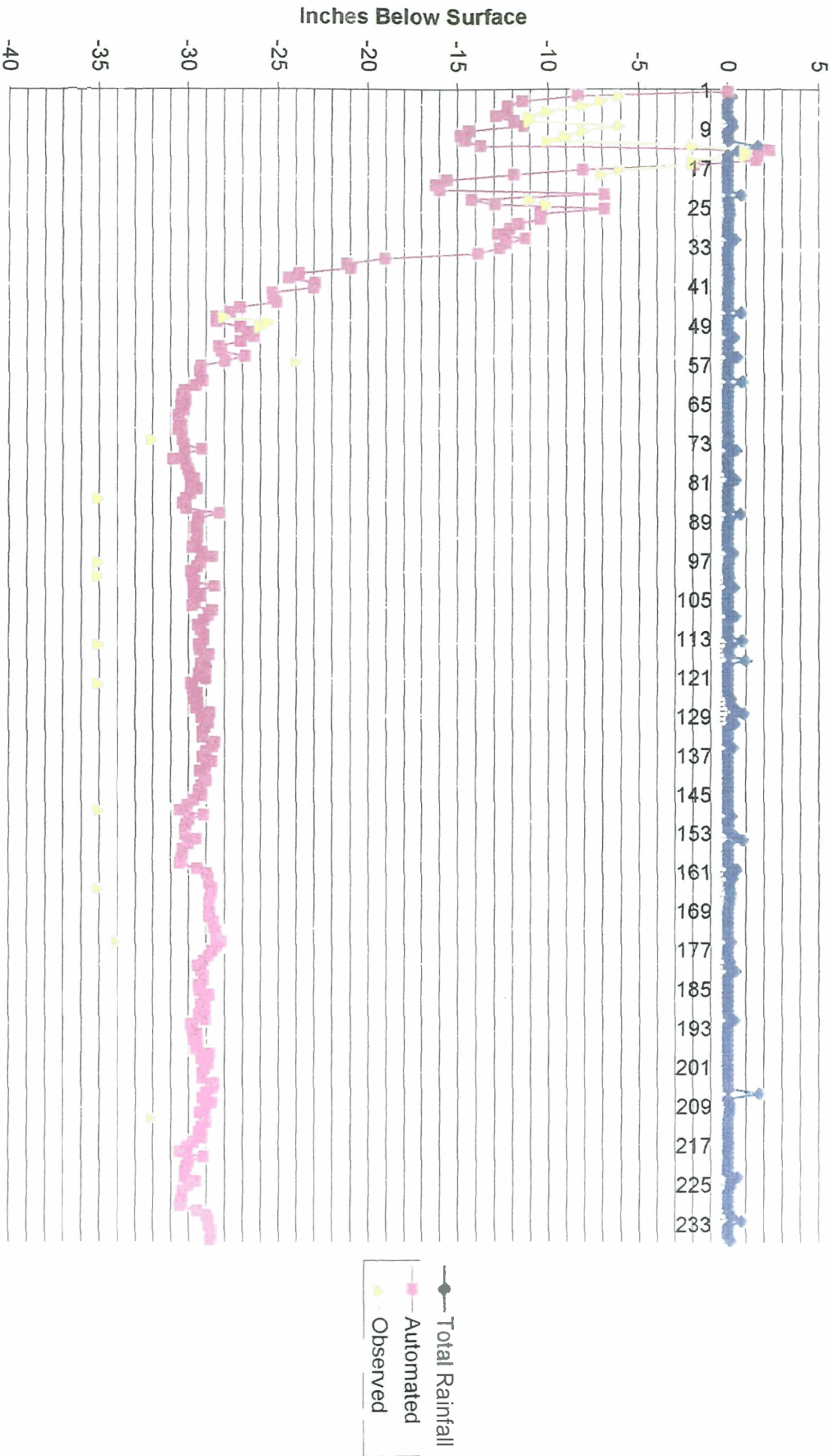
No invasive exotic species were observed in the monitoring plots. Juncus, carex and bent grass species were noted in all plots. Knot weeds, box seeds and false nettle were observed in many of the plots and cattails have become established in isolated pockets. Some rows of Johnson grass were noted in scattered portions of the Site particularly adjacent to ditches.

APPENDIX A  
DEPTH TO GROUNDWATER PLOTS

# Groundwater Gauges All Automated Gauges



# Groundwater Gauge 1 Automated and Observed



Growing Season March 20, 2002 - November 12, 2002



Julian Date	Total Rainfall (in)	Automated	Observed
80	0.2	-8.35	-6
81	0.01	-11.45	-7
82	0	-12.25	-8
83	0	-12.25	-10
84	0	-12.9	-11
85	0.19	-11.9	-11
86	0.25	-11.35	-6
87	0	-14.4	-8
88	0	-14.85	-9
89	0.06	-14.6	-10
90	1.64	-13.75	-2
91	0.59	2.3	1
92	0	1.6	1
93	0	1.5	-2
94	0	-1.95	-2
95	0	-8.1	-6
96	0	-11.9	-7
97	0	-15.6	
98	0	-16.25	
99	0	-16	
100	0.72	-6.9	
101	0	-14.25	-11
102	0.05	-12.95	-10
103	0.08	-6.9	
104	0.11	-10.45	
105	0.01	-10.45	
106	0	-11.65	
107	0	-12.15	
108	0	-12.8	
109	0.36	-11.25	
110	0.08	-12.35	
111	0	-12.7	
112	0	-13.9	
113	0	-19.05	
114	0	-21.2	
115	0.01	-20.95	
116	0	-23.85	
117	0.06	-24.45	
118	0.01	-22.95	
119	0	-23.05	
120	0	-25.35	
121	0.01	-25.3	
122	0	-25.1	
123	0	-27.15	
124	0.71	-27.7	
125	0.02	-28.45	-28

126	0	-28.45	-26
127	0	-27.1	-26
128	0	-26.7	
129	0.32	-26.35	
130	0	-27.1	
131	0	-28.3	
132	0	-28.15	
133	0.49	-26.85	
134	0.01	-27.95	-24
135	0	-29.3	
136	0	-29.4	
137	0	-29.3	
138	0.78	-29.2	
139	0.01	-29.6	
140	0	-30.25	
141	0	-30.4	
142	0	-30.15	
143	0	-30.45	
144	0	-30.25	
145	0	-30.6	
146	0	-30.55	
147	0	-30.45	
148	0	-30.6	
149	0.02	-30.35	
150	0	-30.35	-32
151	0	-30.25	
152	0.44	-29.25	
153	0	-30.25	
154	0	-30.9	
155	0	-30.15	
156	0	-30.05	
157	0.11	-29.95	
158	0.39	-29.7	
159	0.03	-29.9	
160	0	-29.5	
161	0	-29.9	
162	0	-30.15	-35
163	0	-30.35	
164	0	-30.15	
165	0.67	-28.25	
166	0.07	-29.45	
167	0	-29.5	
168	0	-29.6	
169	0	-29.5	
170	0	-29.5	
171	0	-29.6	
172	0	-29.8	
173	0.29	-29.25	
174	0.04	-28.65	

175	0.01	-29.35	-35
176	0	-29.55	
177	0	-29.9	
178	0.06	-29.8	-35
179	0.01	-29.7	
180	0.31	-28.55	
181	0	-29.75	
182	0	-29.35	
183	0	-29.65	
184	0	-29.8	
185	0	-28.65	
186	0.36	-28.9	
187	0	-29.15	
188	0	-29.5	
189	0	-29.35	
190	0	-29.15	
191	0.77	-29.15	
192	0.17	-29.45	-35
193	0	-29.4	
194	0.08	-28.85	
195	0.96	-29.1	
196	0	-29.35	
197	0	-29.05	
198	0	-29.45	
199	0	-29.05	
200	0	-29.9	-35
201	0	-29.8	
202	0	-29.55	
203	0.13	-29.75	
204	0.14	-29.5	
205	0.41	-29.6	
206	0.87	-28.8	
207	0.16	-29.3	
208	0.33	-28.9	
209	0	-29.1	
210	0	-29.25	
211	0	-29.25	
212	0	-28.55	
213	0.24	-28.65	
214	0	-29.05	
215	0	-29.25	
216	0	-28.7	
217	0	-29.05	
218	0	-29.4	
219	0	-29.1	
220	0	-29	
221	0	-29.3	
222	0	-29.45	
223	0	-29.25	

224	0	-29.75		
225	0	-30.1		
226	0	-30.55	-35	
227	0.17	-29.15		
228	0	-30		
229	0.03	-30.15		
230	0	-30.25		
231	0.33	-30.25		
232	0.82	-29.6		
233	0	-30.05		
234	0	-30.35		
235	0	-30.35		
236	0	-30.45		
237	0	-30.55		
238	0.46	-29.55		
239	0.03	-29		
240	0.21	-28.9		
241	0.04	-28.9		
242	0.08	-28.7	-35	
243	0.15	-28.7		
244	0.12	-28.8		
245	0.07	-28.9		
246	0.02	-28.9		
247	0	-28.8		
248	0	-28.9		
249	0	-28.6		
250	0	-28.6		
251	0	-28.5		
252	0	-28.45		
253	0.16	-28.15	-34	
254	0	-28.45		
255	0	-28.65		-28.65
256	0	-28.9		-28.9
257	0.1	-29.15		-29.15
258	0.04	-29.5		-29.5
259	0.41	-29.35		-29.35
260	0	-29.15		-29.15
261	0	-29.15		-29.15
262	0	-29.45		-29.45
263	0	-29.4		-29.4
264	0	-28.85		-28.85
265	0	-29.1		-29.1
266	0	-29.35		-29.35
267	0	-29.05		-29.05
268	0.01	-29.45		-29.45
269	0.34	-29.05		-29.05
270	0	-29.9		-29.9
271	0	-29.8		-29.8
272	0	-29.55		-29.55

273	0	-29.75	-29.75
274	0	-29.5	-29.5
275	0	-29.6	-29.6
276	0	-28.8	-28.8
277	0	-29.3	-29.3
278	0	-28.9	-28.9
279	0	-29.1	-29.1
280	0	-29.25	-29.25
281	0	-29.25	-29.25
282	0	-28.55	-28.55
283	0.01	-28.65	-28.65
284	1.73	-29.05	-29.05
285	0	-29.25	-29.25
286	0.07	-28.7	-28.7
287	0.1	-29.05	-29.05
288	0.08	-29.4	-29.4
289	0.01	-29.1	-29.1
290	0	-29	-29
291	0	-29.3	-29.3
292	0	-29.45	-29.45
293	0	-29.25	-29.25
294	0.02	-29.75	-29.75
295	0.02	-30.1	-30.1
296	0	-30.55	-30.55
297	0.02	-29.15	-29.15
298	0	-30	-30
299	0	-30.15	-30.15
300	0	-30.25	-30.25
301	0.53	-30.25	-30.25
302	0.16	-29.6	-29.6
303	0.13	-30.05	-30.05
304	0	-30.35	-30.35
305	0	-30.35	-30.35
306	0	-30.45	-30.45
307	0	-30.55	-30.55
308	0.05	-29.55	-29.55
309	0.2	-29	-29
310	0.74	-28.9	-28.9
311	0	-28.9	-28.9
312	0	-28.7	-28.7
313	0	-28.7	-28.7
314	0.14	-28.8	-28.8
315	0.22	-28.9	-28.9
316	1.23	-28.9	-28.9
317	0.7	-28.8	-28.8
318	0	-28.9	-28.9
319	0	-28.6	-28.6
320	0.71	-28.6	-28.6
321	0.55	-28.5	-28.5

322	0	-28.45	-28.45
323	0	-28.15	-28.15
324	0	-28.45	-28.45
325	0.1	-28.45	-28.45
326	0.01	-28.5	-28.5
327	0	-28.55	-28.55
328	0	-29.35	-29.35
329		-30.75	-30.75
330		-31.1	-31.1
		-31.1	-31.1
		-31.1	-31.1
		-10.8	-10.8
		-10.8	-10.8

Serial # - 0320409  
Data logged Fri Sep 13 08:31:01 2002

WELL 1  
CALIBRATION 10 INCHES  
ABOVE SURFACE

1	-25.1	20:00:00	01-Jan-02
2	-25.5	08:00:00	02-Jan-02
3	-25.7	20:00:00	02-Jan-02
4	-26.1	08:00:00	03-Jan-02
5	-26.2	20:00:00	03-Jan-02
6	-26.6	08:00:00	04-Jan-02
7	-27.1	20:00:00	04-Jan-02
8	-27.7	08:00:00	05-Jan-02
9	-28.4	20:00:00	05-Jan-02
10	-28.9	08:00:00	06-Jan-02
11	-29.1	20:00:00	06-Jan-02
12	-29.7	08:00:00	07-Jan-02
13	-30.2	20:00:00	07-Jan-02
14	-30.8	08:00:00	08-Jan-02
15	-30.9	20:00:00	08-Jan-02
16	-31.1	08:00:00	09-Jan-02
17	-31.8	20:00:00	09-Jan-02
18	-32	08:00:00	10-Jan-02
19	-32.2	20:00:00	10-Jan-02
20	-32.4	08:00:00	11-Jan-02
21	-33.1	20:00:00	11-Jan-02
22	-33.3	08:00:00	12-Jan-02
23	-33.3	20:00:00	12-Jan-02
24	-33.5	08:00:00	13-Jan-02
25	-34	20:00:00	13-Jan-02
26	-34.4	08:00:00	14-Jan-02
27	-34.6	20:00:00	14-Jan-02
28	-34.6	08:00:00	15-Jan-02
29	-34.9	20:00:00	15-Jan-02
30	-35.3	08:00:00	16-Jan-02
31	-35.5	20:00:00	16-Jan-02
32	-35.8	08:00:00	17-Jan-02
33	-35.8	20:00:00	17-Jan-02
34	-36	08:00:00	18-Jan-02
35	-36.2	20:00:00	18-Jan-02
36	-36.4	08:00:00	19-Jan-02
37	-36.7	20:00:00	19-Jan-02
38	-37.1	08:00:00	20-Jan-02
39	-37.1	20:00:00	20-Jan-02
40	-37.3	08:00:00	21-Jan-02
41	-37.6	20:00:00	21-Jan-02
42	-38	08:00:00	22-Jan-02
43	-38	20:00:00	22-Jan-02
44	-38.2	08:00:00	23-Jan-02
45	-38.5	20:00:00	23-Jan-02
46	-38.7	08:00:00	24-Jan-02
47	-38.9	20:00:00	24-Jan-02

48	-39.1	08:00:00	25-Jan-02
49	-39.4	20:00:00	25-Jan-02
50	-39.6	08:00:00	26-Jan-02
51	-39.6	20:00:00	26-Jan-02
52	-39.6	08:00:00	27-Jan-02
53	-39.6	20:00:00	27-Jan-02
54	-39.6	08:00:00	28-Jan-02
55	-39.6	20:00:00	28-Jan-02
56	-39.6	08:00:00	29-Jan-02
57	-39.8	20:00:00	29-Jan-02
58	-40	08:00:00	30-Jan-02
59	-40.3	20:00:00	30-Jan-02
60	-39.8	08:00:00	31-Jan-02
61	-39.8	20:00:00	31-Jan-02
62	-41.3	08:00:00	01-Feb-02
63	-41.4	20:00:00	01-Feb-02
64	-40	08:00:00	02-Feb-02
65	-40	20:00:00	02-Feb-02
66	-41.1	08:00:00	03-Feb-02
67	-41.4	20:00:00	03-Feb-02
68	-40.9	08:00:00	04-Feb-02
69	-40.3	20:00:00	04-Feb-02
70	-40.7	08:00:00	05-Feb-02
71	-40.7	20:00:00	05-Feb-02
72	-40.7	08:00:00	06-Feb-02
73	-40.5	20:00:00	06-Feb-02
74	-41.1	08:00:00	07-Feb-02
75	-41.3	20:00:00	07-Feb-02
76	-40.9	08:00:00	08-Feb-02
77	-40.7	20:00:00	08-Feb-02
78	-41.3	08:00:00	09-Feb-02
79	-41.4	20:00:00	09-Feb-02
80	-41.1	08:00:00	10-Feb-02
81	-40.9	20:00:00	10-Feb-02
82	-41.4	08:00:00	11-Feb-02
83	-41.4	20:00:00	11-Feb-02
84	-41.1	08:00:00	12-Feb-02
85	-40.7	20:00:00	12-Feb-02
86	-41.3	08:00:00	13-Feb-02
87	-41.3	20:00:00	13-Feb-02
88	-40.9	08:00:00	14-Feb-02
89	-40.7	20:00:00	14-Feb-02
90	-41.3	08:00:00	15-Feb-02
91	-41.4	20:00:00	15-Feb-02
92	-41.1	08:00:00	16-Feb-02
93	-41.1	20:00:00	16-Feb-02
94	-41.4	08:00:00	17-Feb-02
95	-41.4	20:00:00	17-Feb-02
96	-41.3	08:00:00	18-Feb-02
97	-40.9	20:00:00	18-Feb-02
98	-41.4	08:00:00	19-Feb-02



99	-41.3	20:00:00	19-Feb-02
100	-41.1	08:00:00	20-Feb-02
101	-41.1	20:00:00	20-Feb-02
102	-41.4	08:00:00	21-Feb-02
103	-41.4	20:00:00	21-Feb-02
104	-41.3	08:00:00	22-Feb-02
105	-41.1	20:00:00	22-Feb-02
106	-41.1	08:00:00	23-Feb-02
107	-41.3	20:00:00	23-Feb-02
108	-41.1	08:00:00	24-Feb-02
109	-40.9	20:00:00	24-Feb-02
110	-41.4	08:00:00	25-Feb-02
111	-41.4	20:00:00	25-Feb-02
112	-40.9	08:00:00	26-Feb-02
113	-40.7	20:00:00	26-Feb-02
114	-41.3	08:00:00	27-Feb-02
115	-41.3	20:00:00	27-Feb-02
116	-41.3	08:00:00	28-Feb-02
117	-41.3	20:00:00	28-Feb-02
118	-41.4	08:00:00	01-Mar-02
119	-41.4	20:00:00	01-Mar-02
120	-41.4	08:00:00	02-Mar-02
121	-41.3	20:00:00	02-Mar-02
122	-41.4	08:00:00	03-Mar-02
123	-41.4	20:00:00	03-Mar-02
124	-41.4	08:00:00	04-Mar-02
125	-41.3	20:00:00	04-Mar-02
126	-41.4	08:00:00	05-Mar-02
127	-41.4	20:00:00	05-Mar-02
128	-41.3	08:00:00	06-Mar-02
129	-41.4	20:00:00	06-Mar-02
130	-41.4	08:00:00	07-Mar-02
131	-41.4	20:00:00	07-Mar-02
132	-41.3	08:00:00	08-Mar-02
133	-41.4	20:00:00	08-Mar-02
134	-41.4	08:00:00	09-Mar-02
135	-41.3	20:00:00	09-Mar-02
136	-41.3	08:00:00	10-Mar-02
137	-41.3	20:00:00	10-Mar-02
138	-41.4	08:00:00	11-Mar-02
139	-41.4	20:00:00	11-Mar-02
140	-41.1	08:00:00	12-Mar-02
141	-41.3	20:00:00	12-Mar-02
142	-41.3	08:00:00	13-Mar-02
143	-41.3	20:00:00	13-Mar-02
144	-41.1	08:00:00	14-Mar-02
145	-41.4	20:00:00	14-Mar-02
146	-41.4	08:00:00	15-Mar-02
147	-41.1	20:00:00	15-Mar-02
148	-41.4	08:00:00	16-Mar-02
149	-41.4	20:00:00	16-Mar-02

150	-41.3	08:00:00	17-Mar-02
151	-41.3	20:00:00	17-Mar-02
152	-41.4	08:00:00	18-Mar-02
153	-37.1	20:00:00	18-Mar-02
154	-17.7	08:00:00	19-Mar-02
155	-26.6	20:00:00	19-Mar-02
156	-25.5	08:00:00	20-Mar-02
157	-23.7	20:00:00	20-Mar-02
158	-17.9	08:00:00	21-Mar-02
159	-18.8	20:00:00	21-Mar-02
160	-21.4	08:00:00	22-Mar-02
161	-21.5	20:00:00	22-Mar-02
162	-22.8	08:00:00	23-Mar-02
163	-21.7	20:00:00	23-Mar-02
164	-22.6	08:00:00	24-Mar-02
165	-21.9	20:00:00	24-Mar-02
166	-23	08:00:00	25-Mar-02
167	-22.8	20:00:00	25-Mar-02
168	-22.6	08:00:00	26-Mar-02
169	-21.2	20:00:00	26-Mar-02
170	-21	08:00:00	27-Mar-02
171	-21.7	20:00:00	27-Mar-02
172	-24.6	08:00:00	28-Mar-02
173	-24.2	20:00:00	28-Mar-02
174	-25.1	08:00:00	29-Mar-02
175	-24.6	20:00:00	29-Mar-02
176	-24.4	08:00:00	30-Mar-02
177	-24.8	20:00:00	30-Mar-02
178	-8.1	08:00:00	31-Mar-02
179	-39.4	20:00:00	31-Mar-02
180	-7.6	08:00:00	01-Apr-02
181	-7.8	20:00:00	01-Apr-02
182	-8.3	08:00:00	02-Apr-02
183	-8.5	20:00:00	02-Apr-02
184	-8.5	08:00:00	03-Apr-02
185	-8.5	20:00:00	03-Apr-02
186	-10.3	08:00:00	04-Apr-02
187	-13.6	20:00:00	04-Apr-02
188	-17.9	08:00:00	05-Apr-02
189	-18.3	20:00:00	05-Apr-02
190	-20.8	08:00:00	06-Apr-02
191	-23	20:00:00	06-Apr-02
192	-25.5	08:00:00	07-Apr-02
193	-25.7	20:00:00	07-Apr-02
194	-26.4	08:00:00	08-Apr-02
195	-26.1	20:00:00	08-Apr-02
196	-26.1	08:00:00	09-Apr-02
197	-25.9	20:00:00	09-Apr-02
198	-8.7	08:00:00	10-Apr-02
199	-25.1	20:00:00	10-Apr-02
200	-24.8	08:00:00	11-Apr-02

201	-23.7	20:00:00	11-Apr-02
202	-23.3	08:00:00	12-Apr-02
203	-22.6	20:00:00	12-Apr-02
204	-22.4	08:00:00	13-Apr-02
205	-11.4	20:00:00	13-Apr-02
206	-21	08:00:00	14-Apr-02
207	-19.9	20:00:00	14-Apr-02
208	-20.6	08:00:00	15-Apr-02
209	-20.3	20:00:00	15-Apr-02
210	-21.9	08:00:00	16-Apr-02
211	-21.4	20:00:00	16-Apr-02
212	-22.4	08:00:00	17-Apr-02
213	-21.9	20:00:00	17-Apr-02
214	-23	08:00:00	18-Apr-02
215	-22.6	20:00:00	18-Apr-02
216	-23.7	08:00:00	19-Apr-02
217	-18.8	20:00:00	19-Apr-02
218	-22.6	08:00:00	20-Apr-02
219	-22.1	20:00:00	20-Apr-02
220	-22.8	08:00:00	21-Apr-02
221	-22.6	20:00:00	21-Apr-02
222	-23	08:00:00	22-Apr-02
223	-24.8	20:00:00	22-Apr-02
224	-28.6	08:00:00	23-Apr-02
225	-29.5	20:00:00	23-Apr-02
226	-31.3	08:00:00	24-Apr-02
227	-31.1	20:00:00	24-Apr-02
228	-30.4	08:00:00	25-Apr-02
229	-31.5	20:00:00	25-Apr-02
230	-33.7	08:00:00	26-Apr-02
231	-34	20:00:00	26-Apr-02
232	-34.7	08:00:00	27-Apr-02
233	-34.2	20:00:00	27-Apr-02
234	-33.5	08:00:00	28-Apr-02
235	-32.4	20:00:00	28-Apr-02
236	-32.6	08:00:00	29-Apr-02
237	-33.5	20:00:00	29-Apr-02
238	-35.6	08:00:00	30-Apr-02
239	-35.1	20:00:00	30-Apr-02
240	-35.3	08:00:00	01-May-02
241	-35.3	20:00:00	01-May-02
242	-35.1	08:00:00	02-May-02
243	-35.1	20:00:00	02-May-02
244	-36.5	08:00:00	03-May-02
245	-37.8	20:00:00	03-May-02
246	-38.7	08:00:00	04-May-02
247	-36.7	20:00:00	04-May-02
248	-38.4	08:00:00	05-May-02
249	-38.5	20:00:00	05-May-02
250	-38.9	08:00:00	06-May-02
251	-38	20:00:00	06-May-02

252	-37.3	08:00:00	07-May-02
253	-36.9	20:00:00	07-May-02
254	-36.7	08:00:00	08-May-02
255	-36.7	20:00:00	08-May-02
256	-36.5	08:00:00	09-May-02
257	-36.2	20:00:00	09-May-02
258	-36.9	08:00:00	10-May-02
259	-37.3	20:00:00	10-May-02
260	-38.2	08:00:00	11-May-02
261	-38.4	20:00:00	11-May-02
262	-38.5	08:00:00	12-May-02
263	-37.8	20:00:00	12-May-02
264	-37.5	08:00:00	13-May-02
265	-36.2	20:00:00	13-May-02
266	-37.5	08:00:00	14-May-02
267	-38.4	20:00:00	14-May-02
268	-39.3	08:00:00	15-May-02
269	-39.3	20:00:00	15-May-02
270	-39.4	08:00:00	16-May-02
271	-39.4	20:00:00	16-May-02
272	-39.3	08:00:00	17-May-02
273	-39.3	20:00:00	17-May-02
274	-39.1	08:00:00	18-May-02
275	-39.3	20:00:00	18-May-02
276	-39.6	08:00:00	19-May-02
277	-39.6	20:00:00	19-May-02
278	-40.7	08:00:00	20-May-02
279	-39.8	20:00:00	20-May-02
280	-40.5	08:00:00	21-May-02
281	-40.3	20:00:00	21-May-02
282	-40.3	08:00:00	22-May-02
283	-40	20:00:00	22-May-02
284	-40.7	08:00:00	23-May-02
285	-40.2	20:00:00	23-May-02
286	-40.2	08:00:00	24-May-02
287	-40.3	20:00:00	24-May-02
288	-40.3	08:00:00	25-May-02
289	-40.9	20:00:00	25-May-02
290	-40.2	08:00:00	26-May-02
291	-40.9	20:00:00	26-May-02
292	-40	08:00:00	27-May-02
293	-40.9	20:00:00	27-May-02
294	-40.3	08:00:00	28-May-02
295	-40.9	20:00:00	28-May-02
296	-39.8	08:00:00	29-May-02
297	-40.9	20:00:00	29-May-02
298	-39.8	08:00:00	30-May-02
299	-40.9	20:00:00	30-May-02
300	-39.6	08:00:00	31-May-02
301	-40.9	20:00:00	31-May-02
302	-39.6	08:00:00	01-Jun-02

303	-38.9	20:00:00	01-Jun-02
304	-39.6	08:00:00	02-Jun-02
305	-40.9	20:00:00	02-Jun-02
306	-40.9	08:00:00	03-Jun-02
307	-40.9	20:00:00	03-Jun-02
308	-39.8	08:00:00	04-Jun-02
309	-40.5	20:00:00	04-Jun-02
310	-39.6	08:00:00	05-Jun-02
311	-40.5	20:00:00	05-Jun-02
312	-39.4	08:00:00	06-Jun-02
313	-40.5	20:00:00	06-Jun-02
314	-39.4	08:00:00	07-Jun-02
315	-40	20:00:00	07-Jun-02
316	-39.6	08:00:00	08-Jun-02
317	-40.2	20:00:00	08-Jun-02
318	-39.4	08:00:00	09-Jun-02
319	-39.6	20:00:00	09-Jun-02
320	-39.6	08:00:00	10-Jun-02
321	-40.2	20:00:00	10-Jun-02
322	-39.6	08:00:00	11-Jun-02
323	-40.7	20:00:00	11-Jun-02
324	-39.8	08:00:00	12-Jun-02
325	-40.9	20:00:00	12-Jun-02
326	-39.8	08:00:00	13-Jun-02
327	-40.5	20:00:00	13-Jun-02
328	-39.8	08:00:00	14-Jun-02
329	-36.7	20:00:00	14-Jun-02
330	-39.3	08:00:00	15-Jun-02
331	-39.6	20:00:00	15-Jun-02
332	-39.4	08:00:00	16-Jun-02
333	-39.6	20:00:00	16-Jun-02
334	-39.4	08:00:00	17-Jun-02
335	-39.8	20:00:00	17-Jun-02
336	-39.4	08:00:00	18-Jun-02
337	-39.6	20:00:00	18-Jun-02
338	-39.4	08:00:00	19-Jun-02
339	-39.6	20:00:00	19-Jun-02
340	-39.4	08:00:00	20-Jun-02
341	-39.8	20:00:00	20-Jun-02
342	-39.4	08:00:00	21-Jun-02
343	-40.2	20:00:00	21-Jun-02
344	-39.4	08:00:00	22-Jun-02
345	-39.1	20:00:00	22-Jun-02
346	-39.3	08:00:00	23-Jun-02
347	-38	20:00:00	23-Jun-02
348	-39.1	08:00:00	24-Jun-02
349	-39.6	20:00:00	24-Jun-02
350	-39.3	08:00:00	25-Jun-02
351	-39.8	20:00:00	25-Jun-02
352	-39.1	08:00:00	26-Jun-02
353	-40.7	20:00:00	26-Jun-02

354	-39.8	08:00:00	27-Jun-02
355	-39.8	20:00:00	27-Jun-02
356	-38.9	08:00:00	28-Jun-02
357	-40.5	20:00:00	28-Jun-02
358	-39.1	08:00:00	29-Jun-02
359	-38	20:00:00	29-Jun-02
360	-39.3	08:00:00	30-Jun-02
361	-40.2	20:00:00	30-Jun-02
362	-39.3	08:00:00	01-Jul-02
363	-39.4	20:00:00	01-Jul-02
364	-39.3	08:00:00	02-Jul-02
365	-40	20:00:00	02-Jul-02
366	-39.1	08:00:00	03-Jul-02
367	-40.5	20:00:00	03-Jul-02
368	-39.1	08:00:00	04-Jul-02
369	-38.2	20:00:00	04-Jul-02
370	-38.9	08:00:00	05-Jul-02
371	-38.9	20:00:00	05-Jul-02
372	-38.9	08:00:00	06-Jul-02
373	-39.4	20:00:00	06-Jul-02
374	-38.7	08:00:00	07-Jul-02
375	-40.3	20:00:00	07-Jul-02
376	-39.4	08:00:00	08-Jul-02
377	-39.3	20:00:00	08-Jul-02
378	-38.9	08:00:00	09-Jul-02
379	-39.4	20:00:00	09-Jul-02
380	-38.9	08:00:00	10-Jul-02
381	-39.4	20:00:00	10-Jul-02
382	-39.6	08:00:00	11-Jul-02
383	-39.3	20:00:00	11-Jul-02
384	-39.4	08:00:00	12-Jul-02
385	-39.4	20:00:00	12-Jul-02
386	-39.3	08:00:00	13-Jul-02
387	-38.4	20:00:00	13-Jul-02
388	-38.9	08:00:00	14-Jul-02
389	-39.3	20:00:00	14-Jul-02
390	-39.3	08:00:00	15-Jul-02
391	-39.4	20:00:00	15-Jul-02
392	-38.7	08:00:00	16-Jul-02
393	-39.4	20:00:00	16-Jul-02
394	-38.9	08:00:00	17-Jul-02
395	-40	20:00:00	17-Jul-02
396	-38.7	08:00:00	18-Jul-02
397	-39.4	20:00:00	18-Jul-02
398	-39.1	08:00:00	19-Jul-02
399	-40.7	20:00:00	19-Jul-02
400	-38.9	08:00:00	20-Jul-02
401	-40.7	20:00:00	20-Jul-02
402	-39.3	08:00:00	21-Jul-02
403	-39.8	20:00:00	21-Jul-02
404	-39.3	08:00:00	22-Jul-02

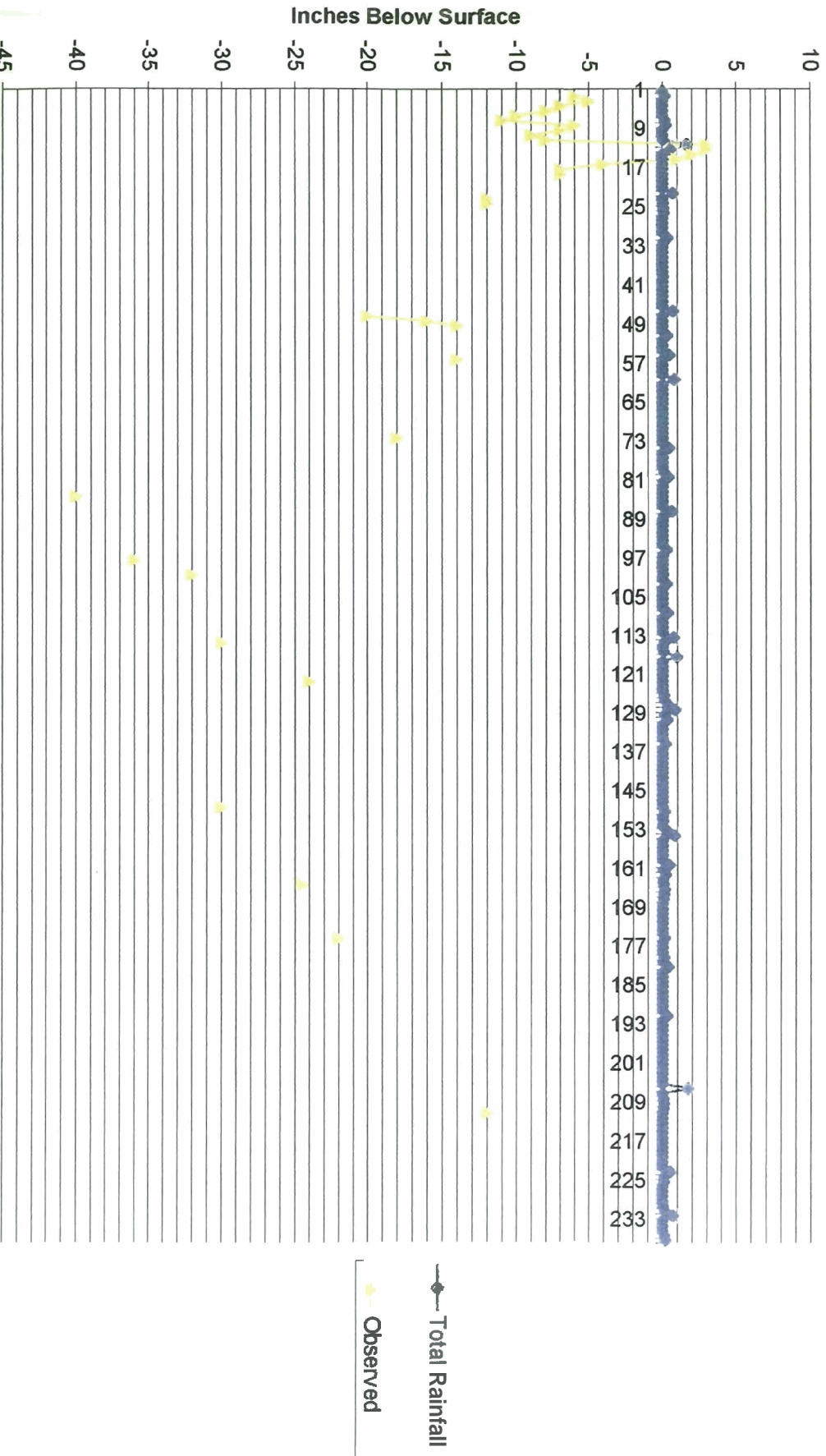
405	-40.2	20:00:00	22-Jul-02
406	-39.4	08:00:00	23-Jul-02
407	-39.6	20:00:00	23-Jul-02
408	-38.7	08:00:00	24-Jul-02
409	-40.5	20:00:00	24-Jul-02
410	-39.4	08:00:00	25-Jul-02
411	-38.2	20:00:00	25-Jul-02
412	-39.3	08:00:00	26-Jul-02
413	-39.3	20:00:00	26-Jul-02
414	-38.9	08:00:00	27-Jul-02
415	-38.9	20:00:00	27-Jul-02
416	-39.1	08:00:00	28-Jul-02
417	-39.1	20:00:00	28-Jul-02
418	-38.9	08:00:00	29-Jul-02
419	-39.6	20:00:00	29-Jul-02
420	-38.9	08:00:00	30-Jul-02
421	-39.6	20:00:00	30-Jul-02
422	-38.7	08:00:00	31-Jul-02
423	-38.4	20:00:00	31-Jul-02
424	-38.9	08:00:00	01-Aug-02
425	-38.4	20:00:00	01-Aug-02
426	-38.7	08:00:00	02-Aug-02
427	-39.4	20:00:00	02-Aug-02
428	-39.1	08:00:00	03-Aug-02
429	-39.4	20:00:00	03-Aug-02
430	-38.5	08:00:00	04-Aug-02
431	-38.9	20:00:00	04-Aug-02
432	-38.7	08:00:00	05-Aug-02
433	-39.4	20:00:00	05-Aug-02
434	-39.4	08:00:00	06-Aug-02
435	-39.4	20:00:00	06-Aug-02
436	-39.1	08:00:00	07-Aug-02
437	-39.1	20:00:00	07-Aug-02
438	-38.9	08:00:00	08-Aug-02
439	-39.1	20:00:00	08-Aug-02
440	-39.3	08:00:00	09-Aug-02
441	-39.3	20:00:00	09-Aug-02
442	-39.6	08:00:00	10-Aug-02
443	-39.3	20:00:00	10-Aug-02
444	-39.4	08:00:00	11-Aug-02
445	-39.1	20:00:00	11-Aug-02
446	-39.3	08:00:00	12-Aug-02
447	-40.2	20:00:00	12-Aug-02
448	-39.3	08:00:00	13-Aug-02
449	-40.9	20:00:00	13-Aug-02
450	-40.2	08:00:00	14-Aug-02
451	-40.9	20:00:00	14-Aug-02
452	-38.5	08:00:00	15-Aug-02
453	-39.8	20:00:00	15-Aug-02
454	-39.3	08:00:00	16-Aug-02
455	-40.7	20:00:00	16-Aug-02

456	-39.6	08:00:00	17-Aug-02
457	-40.7	20:00:00	17-Aug-02
458	-39.8	08:00:00	18-Aug-02
459	-40.7	20:00:00	18-Aug-02
460	-39.8	08:00:00	19-Aug-02
461	-40.7	20:00:00	19-Aug-02
462	-39.8	08:00:00	20-Aug-02
463	-39.4	20:00:00	20-Aug-02
464	-39.6	08:00:00	21-Aug-02
465	-40.5	20:00:00	21-Aug-02
466	-40.2	08:00:00	22-Aug-02
467	-40.5	20:00:00	22-Aug-02
468	-39.8	08:00:00	23-Aug-02
469	-40.9	20:00:00	23-Aug-02
470	-40	08:00:00	24-Aug-02
471	-40.9	20:00:00	24-Aug-02
472	-40.2	08:00:00	25-Aug-02
473	-40.9	20:00:00	25-Aug-02
474	-40.2	08:00:00	26-Aug-02
475	-38.9	20:00:00	26-Aug-02
476	-38.9	08:00:00	27-Aug-02
477	-39.1	20:00:00	27-Aug-02
478	-38.9	08:00:00	28-Aug-02
479	-38.9	20:00:00	28-Aug-02
480	-39.1	08:00:00	29-Aug-02
481	-38.7	20:00:00	29-Aug-02
482	-38.7	08:00:00	30-Aug-02
483	-38.7	20:00:00	30-Aug-02
484	-38.7	08:00:00	31-Aug-02
485	-38.7	20:00:00	31-Aug-02
486	-38.7	08:00:00	01-Sep-02
487	-38.9	20:00:00	01-Sep-02
488	-38.9	08:00:00	02-Sep-02
489	-38.9	20:00:00	02-Sep-02
490	-38.9	08:00:00	03-Sep-02
491	-38.9	20:00:00	03-Sep-02
492	-38.7	08:00:00	04-Sep-02
493	-38.9	20:00:00	04-Sep-02
494	-38.7	08:00:00	05-Sep-02
495	-39.1	20:00:00	05-Sep-02
496	-38.7	08:00:00	06-Sep-02
497	-38.5	20:00:00	06-Sep-02
498	-38.7	08:00:00	07-Sep-02
499	-38.5	20:00:00	07-Sep-02
500	-38.5	08:00:00	08-Sep-02
501	-38.5	20:00:00	08-Sep-02
502	-38.4	08:00:00	09-Sep-02
503	-38.5	20:00:00	09-Sep-02
504	-37.8	08:00:00	10-Sep-02
505	-38.5	20:00:00	10-Sep-02
506	-38.4	08:00:00	11-Sep-02



507	-38.5	20:00:00	11-Sep-02
508	-38.5	08:00:00	12-Sep-02
509	-38.4	20:00:00	12-Sep-02
510	-38.5	08:00:00	13-Sep-02

# Groundwater Gauge 2 Observed



Growing Season March 20, 2002 - November 12, 2002

◆ Total Rainfall  
■ Observed

Julian Date	Total Rainfall (in)	N/A	Observed
80	0.2		-6
81	0.01		-5
82	0		-7
83	0		-8
84	0		-10
85	0.19		-11
86	0.25		-6
87	0		-7
88	0		-9
89	0.06		-8
90	1.64		3
91	0.59		3
92	0		2
93	0		1
94	0		-4
95	0		-7
96	0		-7
97	0		
98	0		
99	0		
100	0.72		
101	0		-12
102	0.05		-12
103	0.08		
104	0.11		
105	0.01		
106	0		
107	0		
108	0		
109	0.36		
110	0.08		
111	0		
112	0		
113	0		
114	0		
115	0.01		
116	0		
117	0.06		
118	0.01		
119	0		
120	0		
121	0.01		
122	0		
123	0		
124	0.71		
125	0.02		-20

126	0	-16
127	0	-14
128	0	
129	0.32	
130	0	
131	0	
132	0	
133	0.49	
134	0.01	-14
135	0	
136	0	
137	0	
138	0.78	
139	0.01	
140	0	
141	0	
142	0	
143	0	
144	0	
145	0	
146	0	
147	0	
148	0	
149	0.02	
150	0	-18
151	0	
152	0.44	
153	0	
154	0	
155	0	
156	0	
157	0.11	
158	0.39	
159	0.03	
160	0	
161	0	
162	0	-40
163	0	
164	0	
165	0.67	
166	0.07	
167	0	
168	0	
169	0	
170	0	
171	0	
172	0	
173	0.29	
174	0.04	

175	0.01
176	0
177	0
178	0.06
179	0.01
180	0.31
181	0
182	0
183	0
184	0
185	0
186	0.36
187	0
188	0
189	0
190	0
191	0.77
192	0.17
193	0
194	0.08
195	0.96
196	0
197	0
198	0
199	0
200	0
201	0
202	0
203	0.13
204	0.14
205	0.41
206	0.87
207	0.16
208	0.33
209	0
210	0
211	0
212	0
213	0.24
214	0
215	0
216	0
217	0
218	0
219	0
220	0
221	0
222	0
223	0

-36

-32

-30

-24

224	0
225	0
226	0
227	0.17
228	0
229	0.03
230	0
231	0.33
232	0.82
233	0
234	0
235	0
236	0
237	0
238	0.46
239	0.03
240	0.21
241	0.04
242	0.08
243	0.15
244	0.12
245	0.07
246	0.02
247	0
248	0
249	0
250	0
251	0
252	0
253	0.16
254	0
255	0
256	0
257	0.1
258	0.04
259	0.41
260	0
261	0
262	0
263	0
264	0
265	0
266	0
267	0
268	0.01
269	0.34
270	0
271	0
272	0

-30

-24.5

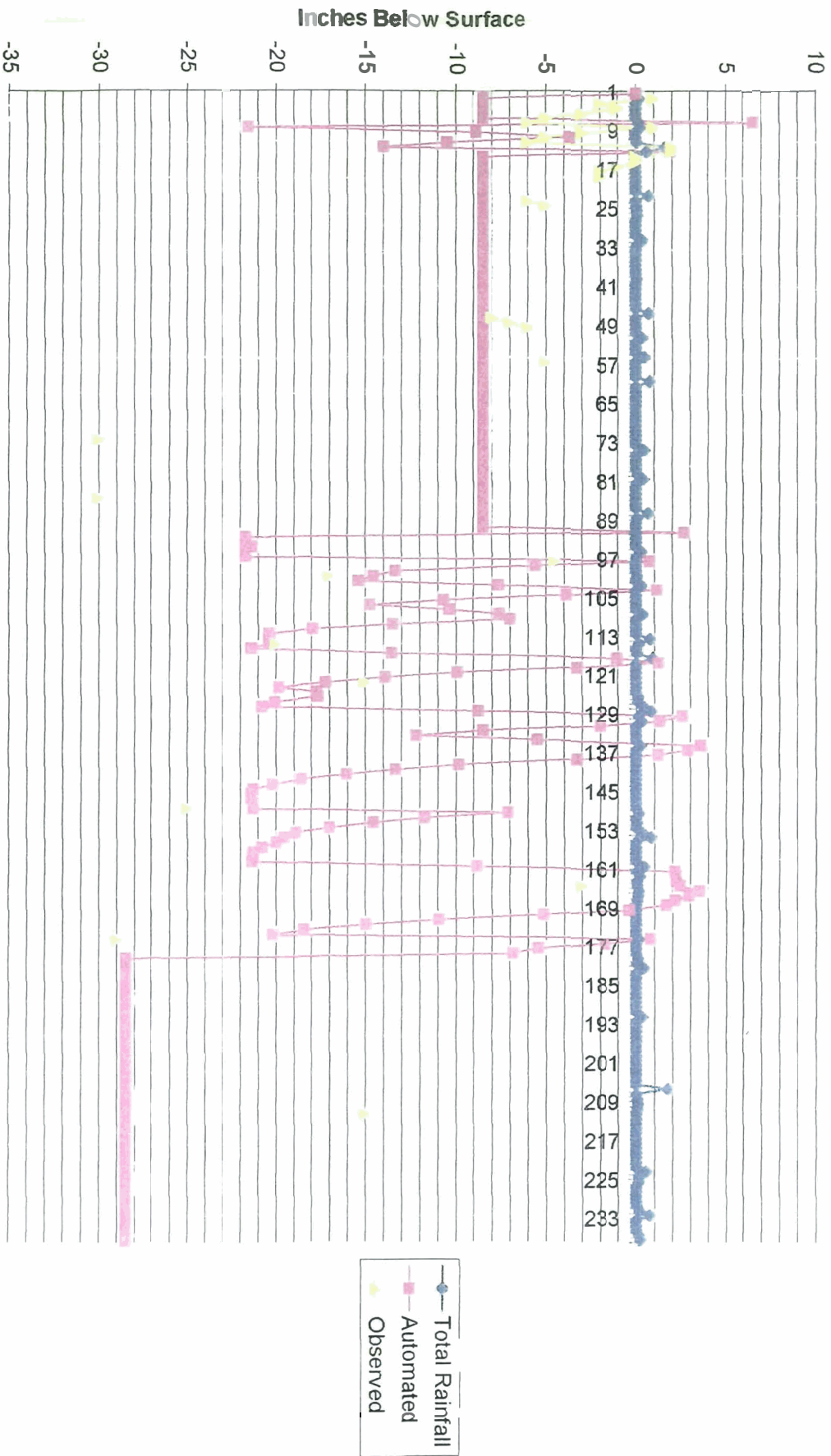
-22

273	0
274	0
275	0
276	0
277	0
278	0
279	0
280	0
281	0
282	0
283	0.01
284	1.73
285	0
286	0.07
287	0.1
288	0.08
289	0.01
290	0
291	0
292	0
293	0
294	0.02
295	0.02
296	0
297	0.02
298	0
299	0
300	0
301	0.53
302	0.16
303	0.13
304	0
305	0
306	0
307	0
308	0.05
309	0.2
310	0.74
311	0
312	0
313	0
314	0.14
315	0.22
316	1.23
317	0.7
318	0
319	0
320	0.71
321	0.55

322	0
323	0
324	0
325	0.1
326	0.01
327	0
328	0
329	
330	



# Groundwater Gauge 3 Automated and Observed



Growing Season March 20, 2002 - November 12, 2002

◆ Total Rainfall  
 ■ Automated  
 ▲ Observed

Julian Date	Total Rainfall (in)	Automated W3	Observed
80	0.2	-8.5	1
81	0.01	-8.5	-2
82	0	-8.5	-1
83	0	-8.5	-3
84	0	-8.5	-5
85	0.19	6.5	-6
86	0.25	-21.55	1
87	0	-8.9	-3
88	0	-3.7	-5
89	0.06	-10.5	-6
90	1.64	-14	2
91	0.59	1.9	2
92	0	-8.5	0
93	0	-8.5	0
94	0	-8.5	-1
95	0	-8.5	-2
96	0	-8.5	-2
97	0	-8.5	
98	0	-8.5	
99	0	-8.5	
100	0.72	-8.5	
101	0	-8.5	-6
102	0.05	-8.5	-5
103	0.08	-8.5	
104	0.11	-8.5	
105	0.01	-8.5	
106	0	-8.5	
107	0	-8.5	
108	0	-8.5	
109	0.36	-8.5	
110	0.08	-8.5	
111	0	-8.5	
112	0	-8.5	
113	0	-8.5	
114	0	-8.5	
115	0.01	-8.5	
116	0	-8.5	
117	0.06	-8.5	
118	0.01	-8.5	
119	0	-8.5	
120	0	-8.5	
121	0.01	-8.5	
122	0	-8.5	
123	0	-8.5	
124	0.71	-8.5	
125	0.02	-8.5	-8

126	0	-8.5	-7
127	0	-8.5	-6
128	0	-8.5	
129	0.32	-8.5	
130	0	-8.5	
131	0	-8.5	
132	0	-8.5	
133	0.49	-8.5	
134	0.01	-8.5	-5
135	0	-8.5	
136	0	-8.5	
137	0	-8.5	
138	0.78	-8.5	
139	0.01	-8.5	
140	0	-8.5	
141	0	-8.5	
142	0	-8.5	
143	0	-8.5	
144	0	-8.5	
145	0	-8.5	
146	0	-8.5	
147	0	-8.5	
148	0	-8.5	
149	0.02	-8.5	
150	0	-8.5	-30
151	0	-8.5	
152	0.44	-8.5	
153	0	-8.5	
154	0	-8.5	
155	0	-8.5	
156	0	-8.5	
157	0.11	-8.5	
158	0.39	-8.5	
159	0.03	-8.5	
160	0	-8.5	
161	0	-8.5	
162	0	-8.5	-30
163	0	-8.5	
164	0	-8.5	
165	0.67	-8.5	
166	0.07	-8.5	
167	0	-8.5	
168	0	-8.5	
169	0	2.65	
170	0	-21.7	
171	0	-21.7	
172	0	-21.35	
173	0.29	-21.7	
174	0.04	-21.7	

175	0.01	0.75	-4.5
176	0	-5.6	
177	0	-13.35	
178	0.06	-14.55	-17
179	0.01	-15.4	
180	0.31	-7.65	
181	0	1.15	
182	0	-3.9	
183	0	-10.7	
184	0	-14.75	
185	0	-10.4	
186	0.36	-7.6	
187	0	-7	
188	0	-13.5	
189	0	-17.95	
190	0	-20.4	
191	0.77	-20.35	
192	0.17	-20.4	-20
193	0	-21.4	
194	0.08	-13.55	
195	0.96	-1.05	
196	0	1.25	
197	0	-3.3	
198	0	-9.95	
199	0	-13.9	
200	0	-17.25	-15
201	0	-19.85	
202	0	-17.75	
203	0.13	-17.65	
204	0.14	-20.1	
205	0.41	-20.8	
206	0.87	-8.75	
207	0.16	2.55	
208	0.33	1.3	
209	0	-2	
210	0	-8.5	
211	0	-12.2	
212	0	-5.5	
213	0.24	3.55	
214	0	2.85	
215	0	1.2	
216	0	-3.3	
217	0	-9.85	
218	0	-13.35	
219	0	-16.05	
220	0	-18.6	
221	0	-20.2	
222	0	-21.3	
223	0	-21.4	

224	0	-21.4	
225	0	-21.3	
226	0	-21.3	-25
227	0.17	-7.1	
228	0	-11.75	
229	0.03	-14.55	
230	0	-17	
231	0.33	-18.9	
232	0.82	-19.55	
233	0	-20	
234	0	-20.8	
235	0	-21.3	
236	0	-21.3	
237	0	-21.35	
238	0.46	-8.8	
239	0.03	2.15	
240	0.21	2.2	
241	0.04	2.2	
242	0.08	2.4	-3
243	0.15	3.5	
244	0.12	2.9	
245	0.07	2.15	
246	0.02	1.65	
247	0	-0.4	
248	0	-5.15	
249	0	-10.95	
250	0	-14.95	
251	0	-18.45	
252	0	-20.2	
253	0.16	0.8	-29
254	0	-1.75	
255	0	-5.45	
256	0	-6.85	
257	0.1	-28.5	
258	0.04	-28.5	
259	0.41	-28.5	
260	0	-28.5	
261	0	-28.5	
262	0	-28.5	
263	0	-28.5	
264	0	-28.5	
265	0	-28.5	
266	0	-28.5	
267	0	-28.5	
268	0.01	-28.5	
269	0.34	-28.5	
270	0	-28.5	
271	0	-28.5	
272	0	-28.5	

273	0	-28.5
274	0	-28.5
275	0	-28.5
276	0	-28.5
277	0	-28.5
278	0	-28.5
279	0	-28.5
280	0	-28.5
281	0	-28.5
282	0	-28.5
283	0.01	-28.5
284	1.73	-28.5
285	0	-28.5
286	0.07	-28.5
287	0.1	-28.5
288	0.08	-28.5
289	0.01	-28.5
290	0	-28.5
291	0	-28.5
292	0	-28.5
293	0	-28.5
294	0.02	-28.5
295	0.02	-28.5
296	0	-28.5
297	0.02	-28.5
298	0	-28.5
299	0	-28.5
300	0	-28.5
301	0.53	-28.5
302	0.16	-28.5
303	0.13	-28.5
304	0	-28.5
305	0	-28.5
306	0	-28.5
307	0	-28.5
308	0.05	-28.5
309	0.2	-28.5
310	0.74	-28.5
311	0	-28.5
312	0	-28.5
313	0	-28.5
314	0.14	-28.5
315	0.22	-28.5
316	1.23	-28.5
317	0.7	-28.5
318	0	-28.5
319	0	-28.5
320	0.71	-28.5
321	0.55	-28.5

322	0	-28.5
323	0	-28.5
324	0	-28.5
325	0.1	-28.5
326	0.01	-24.2
327	0	-17.4
328	0	-17.3
329		-17.1
330		-17.45

Serial # - 0369711  
Data logged Mon Nov 25 21:50:29 2002

WELL 3  
CALIBRATION 20 INCHES  
ABOVE SURFACE

1	-41.7	20:00:00	15-Mar-02
2	-18.1	08:00:00	16-Mar-02
3	-20.4	20:00:00	16-Mar-02
4	-21.7	08:00:00	17-Mar-02
5	-29.5	20:00:00	17-Mar-02
6	-32.1	08:00:00	18-Mar-02
7	-34.6	20:00:00	18-Mar-02
8	-36.4	08:00:00	19-Mar-02
9	-32.7	20:00:00	19-Mar-02
10	-34.4	08:00:00	20-Mar-02
11	-36.4	20:00:00	20-Mar-02
12	-38.3	08:00:00	21-Mar-02
13	-17	20:00:00	21-Mar-02
14	-17.9	08:00:00	22-Mar-02
15	-19.8	20:00:00	22-Mar-02
16	-20.6	08:00:00	23-Mar-02
17	-27.2	20:00:00	23-Mar-02
18	-29.5	08:00:00	24-Mar-02
19	-31.9	20:00:00	24-Mar-02
20	-33.8	08:00:00	25-Mar-02
21	-35.7	20:00:00	25-Mar-02
22	-37	08:00:00	26-Mar-02
23	-23.8	20:00:00	26-Mar-02
24	-27.4	08:00:00	27-Mar-02
25	-27.8	20:00:00	27-Mar-02
26	-24.4	08:00:00	28-Mar-02
27	-29.6	20:00:00	28-Mar-02
28	-32.1	08:00:00	29-Mar-02
29	-34.9	20:00:00	29-Mar-02
30	-37	08:00:00	30-Mar-02
31	-38.9	20:00:00	30-Mar-02
32	-40.2	08:00:00	31-Mar-02
33	-40.6	20:00:00	31-Mar-02
34	-41.4	08:00:00	1-Apr-02
35	-39.3	20:00:00	1-Apr-02
36	-40.4	08:00:00	2-Apr-02
37	-40.4	20:00:00	2-Apr-02
38	-41.4	08:00:00	3-Apr-02
39	-41.4	20:00:00	3-Apr-02
40	-41.4	08:00:00	4-Apr-02
41	-25.7	20:00:00	4-Apr-02
42	-23.4	08:00:00	5-Apr-02
43	-18.7	20:00:00	5-Apr-02
44	-17.9	08:00:00	6-Apr-02
45	-19.6	20:00:00	6-Apr-02
46	-20	08:00:00	7-Apr-02
47	-26.6	20:00:00	7-Apr-02



48	-28.7	08:00:00	8-Apr-02
49	-31.2	20:00:00	8-Apr-02
50	-32.9	08:00:00	9-Apr-02
51	-34.9	20:00:00	9-Apr-02
52	-36.4	08:00:00	10-Apr-02
53	-38.1	20:00:00	10-Apr-02
54	-39.3	08:00:00	11-Apr-02
55	-40.4	20:00:00	11-Apr-02
56	-40.4	08:00:00	12-Apr-02
57	-35.1	20:00:00	12-Apr-02
58	-36.8	08:00:00	13-Apr-02
59	-38.5	20:00:00	13-Apr-02
60	-39.8	08:00:00	14-Apr-02
61	-40.4	20:00:00	14-Apr-02
62	-40.2	08:00:00	15-Apr-02
63	-41.4	20:00:00	15-Apr-02
64	-41.4	08:00:00	16-Apr-02
65	-16.1	20:00:00	16-Apr-02
66	-16.8	08:00:00	17-Apr-02
67	-18.1	20:00:00	17-Apr-02
68	-18.3	08:00:00	18-Apr-02
69	-19.1	20:00:00	18-Apr-02
70	-18.9	08:00:00	19-Apr-02
71	-25.1	20:00:00	19-Apr-02
72	-27.2	08:00:00	20-Apr-02
73	-29.8	20:00:00	20-Apr-02
74	-31.2	08:00:00	21-Apr-02
75	-33.2	20:00:00	21-Apr-02
76	-34.6	08:00:00	22-Apr-02
77	-16.4	20:00:00	22-Apr-02
78	-17	08:00:00	23-Apr-02
79	-15.9	20:00:00	23-Apr-02
80	-16.2	08:00:00	24-Apr-02
81	-18.1	20:00:00	24-Apr-02
82	-17.8	08:00:00	25-Apr-02
83	-19.8	20:00:00	25-Apr-02
84	-19.8	08:00:00	26-Apr-02
85	-26.8	20:00:00	26-Apr-02
86	-28.7	08:00:00	27-Apr-02
87	-31	20:00:00	27-Apr-02
88	-32.5	08:00:00	28-Apr-02
89	-34.2	20:00:00	28-Apr-02
90	-35.3	08:00:00	29-Apr-02
91	-36.8	20:00:00	29-Apr-02
92	-38.1	08:00:00	30-Apr-02
93	-39.1	20:00:00	30-Apr-02
94	-40	08:00:00	1-May-02
95	-40.4	20:00:00	1-May-02
96	-41.2	08:00:00	2-May-02
97	-41.4	20:00:00	2-May-02
98	-41.4	08:00:00	3-May-02

99	-41.4	20:00:00	3-May-02
100	-41.4	08:00:00	4-May-02
101	-41.4	20:00:00	4-May-02
102	-41.2	08:00:00	5-May-02
103	-41.4	20:00:00	5-May-02
104	-41.2	08:00:00	6-May-02
105	-41.4	20:00:00	6-May-02
106	-26.1	08:00:00	7-May-02
107	-28.1	20:00:00	7-May-02
108	-30.6	08:00:00	8-May-02
109	-32.9	20:00:00	8-May-02
110	-34.4	08:00:00	9-May-02
111	-34.7	20:00:00	9-May-02
112	-36.4	08:00:00	10-May-02
113	-37.6	20:00:00	10-May-02
114	-38.5	08:00:00	11-May-02
115	-39.3	20:00:00	11-May-02
116	-40.2	08:00:00	12-May-02
117	-38.9	20:00:00	12-May-02
118	-39.8	08:00:00	13-May-02
119	-40.2	20:00:00	13-May-02
120	-40.2	08:00:00	14-May-02
121	-41.4	20:00:00	14-May-02
122	-41.2	08:00:00	15-May-02
123	-41.4	20:00:00	15-May-02
124	-41.2	08:00:00	16-May-02
125	-41.4	20:00:00	16-May-02
126	-41.2	08:00:00	17-May-02
127	-41.5	20:00:00	17-May-02
128	-41.2	08:00:00	18-May-02
129	-16.4	20:00:00	18-May-02
130	-17.4	08:00:00	19-May-02
131	-18.3	20:00:00	19-May-02
132	-17.8	08:00:00	20-May-02
133	-17.8	20:00:00	20-May-02
134	-17.8	08:00:00	21-May-02
135	-17.8	20:00:00	21-May-02
136	-17.6	08:00:00	22-May-02
137	-17.6	20:00:00	22-May-02
138	-16.2	08:00:00	23-May-02
139	-16.8	20:00:00	23-May-02
140	-16.8	08:00:00	24-May-02
141	-17.4	20:00:00	24-May-02
142	-17.8	08:00:00	25-May-02
143	-17.9	20:00:00	25-May-02
144	-17.6	08:00:00	26-May-02
145	-19.1	20:00:00	26-May-02
146	-18.5	08:00:00	27-May-02
147	-22.3	20:00:00	27-May-02
148	-22.7	08:00:00	28-May-02
149	-27.6	20:00:00	28-May-02

150	-30	08:00:00	29-May-02
151	-31.9	20:00:00	29-May-02
152	-34	08:00:00	30-May-02
153	-35.9	20:00:00	30-May-02
154	-37.8	08:00:00	31-May-02
155	-39.1	20:00:00	31-May-02
156	-40.2	08:00:00	1-Jun-02
157	-40.2	20:00:00	1-Jun-02
158	-19.1	08:00:00	2-Jun-02
159	-19.3	20:00:00	2-Jun-02
160	-19.1	08:00:00	3-Jun-02
161	-24.4	20:00:00	3-Jun-02
162	-26.4	08:00:00	4-Jun-02
163	-28.9	20:00:00	4-Jun-02
164	-30.8	08:00:00	5-Jun-02
165	-32.5	20:00:00	5-Jun-02
166	-34	08:00:00	6-Jun-02
167	-34.9	20:00:00	6-Jun-02
168	-35.9	08:00:00	7-Jun-02
169	-36.6	20:00:00	7-Jun-02
170	-37.4	08:00:00	8-Jun-02
171	-16.6	20:00:00	8-Jun-02
172	-17	08:00:00	9-Jun-02
173	-17.9	20:00:00	9-Jun-02
174	-17.4	08:00:00	10-Jun-02
175	-18.9	20:00:00	10-Jun-02
176	-18.1	08:00:00	11-Jun-02
177	-20.6	20:00:00	11-Jun-02
178	-21	08:00:00	12-Jun-02
179	-25.3	20:00:00	12-Jun-02
180	-27	08:00:00	13-Jun-02
181	-28.7	20:00:00	13-Jun-02
182	-30.4	08:00:00	14-Jun-02
183	-31.3	20:00:00	14-Jun-02
184	-32.7	08:00:00	15-Jun-02
185	-33.6	20:00:00	15-Jun-02
186	-34.7	08:00:00	16-Jun-02
187	-35.7	20:00:00	16-Jun-02
188	-36.8	08:00:00	17-Jun-02
189	-37.6	20:00:00	17-Jun-02
190	-38	08:00:00	18-Jun-02
191	-38.3	20:00:00	18-Jun-02
192	-38.5	08:00:00	19-Jun-02
193	-38.9	20:00:00	19-Jun-02
194	-39.1	08:00:00	20-Jun-02
195	-39.7	20:00:00	20-Jun-02
196	-40.2	08:00:00	21-Jun-02
197	-40	20:00:00	21-Jun-02
198	-40	08:00:00	22-Jun-02
199	-40.2	20:00:00	22-Jun-02
200	-41.2	08:00:00	23-Jun-02

201	-41.2	20:00:00	23-Jun-02
202	-41.2	08:00:00	24-Jun-02
203	-41.2	20:00:00	24-Jun-02
204	-41.2	08:00:00	25-Jun-02
205	-41.2	20:00:00	25-Jun-02
206	-41.2	08:00:00	26-Jun-02
207	-41.4	20:00:00	26-Jun-02
208	-41	08:00:00	27-Jun-02
209	-41.2	20:00:00	27-Jun-02
210	-41.2	08:00:00	28-Jun-02
211	-41.4	20:00:00	28-Jun-02
212	-41.2	08:00:00	29-Jun-02
213	-41.2	20:00:00	29-Jun-02
214	-41.2	08:00:00	30-Jun-02
215	-41.2	20:00:00	30-Jun-02
216	-41.2	08:00:00	1-Jul-02
217	-41.2	20:00:00	1-Jul-02
218	-41.4	08:00:00	2-Jul-02
219	-41.2	20:00:00	2-Jul-02
220	-41.2	08:00:00	3-Jul-02
221	-17.4	20:00:00	3-Jul-02
222	-17.9	08:00:00	4-Jul-02
223	-18.3	20:00:00	4-Jul-02
224	-18.5	08:00:00	5-Jul-02
225	-18.3	20:00:00	5-Jul-02
226	-19.1	08:00:00	6-Jul-02
227	-19.1	20:00:00	6-Jul-02
228	-27.8	08:00:00	7-Jul-02
229	-39.8	20:00:00	7-Jul-02
230	-40	08:00:00	8-Jul-02
231	-28.5	20:00:00	8-Jul-02
232	-28.5	08:00:00	9-Jul-02
233	-28.5	20:00:00	9-Jul-02
234	-28.5	08:00:00	10-Jul-02
235	-28.5	20:00:00	10-Jul-02
236	-28.5	08:00:00	11-Jul-02
237	-28.5	20:00:00	11-Jul-02
238	-28.5	08:00:00	12-Jul-02
239	-28.5	20:00:00	12-Jul-02
240	-28.5	08:00:00	13-Jul-02
241	-28.5	20:00:00	13-Jul-02
242	-28.5	08:00:00	14-Jul-02
243	-28.5	20:00:00	14-Jul-02
244	-28.5	08:00:00	15-Jul-02
245	-28.5	20:00:00	15-Jul-02
246	-28.5	08:00:00	16-Jul-02
247	-28.5	20:00:00	16-Jul-02
248	-28.5	08:00:00	17-Jul-02
249	-28.5	20:00:00	17-Jul-02
250	-28.5	08:00:00	18-Jul-02
251	-28.5	20:00:00	18-Jul-02

252	-28.5	08:00:00	19-Jul-02
253	-28.5	20:00:00	19-Jul-02
254	-28.5	08:00:00	20-Jul-02
255	-28.5	20:00:00	20-Jul-02
256	-28.5	08:00:00	21-Jul-02
257	-28.5	20:00:00	21-Jul-02
258	-28.5	08:00:00	22-Jul-02
259	-28.5	20:00:00	22-Jul-02
260	-28.5	08:00:00	23-Jul-02
261	-28.5	20:00:00	23-Jul-02
262	-28.5	08:00:00	24-Jul-02
263	-28.5	20:00:00	24-Jul-02
264	-28.5	08:00:00	25-Jul-02
265	-28.5	20:00:00	25-Jul-02
266	-28.5	08:00:00	26-Jul-02
267	-28.5	20:00:00	26-Jul-02
268	-28.5	08:00:00	27-Jul-02
269	-28.5	20:00:00	27-Jul-02
270	-28.5	08:00:00	28-Jul-02
271	-28.5	20:00:00	28-Jul-02
272	-28.5	08:00:00	29-Jul-02
273	-28.5	20:00:00	29-Jul-02
274	-28.5	08:00:00	30-Jul-02
275	-28.5	20:00:00	30-Jul-02
276	-28.5	08:00:00	31-Jul-02
277	-28.5	20:00:00	31-Jul-02
278	-28.5	08:00:00	1-Aug-02
279	-28.5	20:00:00	1-Aug-02
280	-28.5	08:00:00	2-Aug-02
281	-28.5	20:00:00	2-Aug-02
282	-28.5	08:00:00	3-Aug-02
283	-28.5	20:00:00	3-Aug-02
284	-28.5	08:00:00	4-Aug-02
285	-28.5	20:00:00	4-Aug-02
286	-28.5	08:00:00	5-Aug-02
287	-28.5	20:00:00	5-Aug-02
288	-28.5	08:00:00	6-Aug-02
289	-28.5	20:00:00	6-Aug-02
290	-28.5	08:00:00	7-Aug-02
291	-28.5	20:00:00	7-Aug-02
292	-28.5	08:00:00	8-Aug-02
293	-28.5	20:00:00	8-Aug-02
294	-28.5	08:00:00	9-Aug-02
295	-28.5	20:00:00	9-Aug-02
296	-28.5	08:00:00	10-Aug-02
297	-28.5	20:00:00	10-Aug-02
298	-28.5	08:00:00	11-Aug-02
299	-28.5	20:00:00	11-Aug-02
300	-28.5	08:00:00	12-Aug-02
301	-28.5	20:00:00	12-Aug-02
302	-28.5	08:00:00	13-Aug-02

303	-28.5	20:00:00	13-Aug-02
304	-28.5	08:00:00	14-Aug-02
305	-28.5	20:00:00	14-Aug-02
306	-28.5	08:00:00	15-Aug-02
307	-28.5	20:00:00	15-Aug-02
308	-28.5	08:00:00	16-Aug-02
309	-28.5	20:00:00	16-Aug-02
310	-28.5	08:00:00	17-Aug-02
311	-28.5	20:00:00	17-Aug-02
312	-28.5	08:00:00	18-Aug-02
313	-28.5	20:00:00	18-Aug-02
314	-28.5	08:00:00	19-Aug-02
315	-28.5	20:00:00	19-Aug-02
316	-28.5	08:00:00	20-Aug-02
317	-28.5	20:00:00	20-Aug-02
318	-28.5	08:00:00	21-Aug-02
319	-28.5	20:00:00	21-Aug-02
320	-28.5	08:00:00	22-Aug-02
321	-28.5	20:00:00	22-Aug-02
322	-28.5	08:00:00	23-Aug-02
323	-28.5	20:00:00	23-Aug-02
324	-28.5	08:00:00	24-Aug-02
325	-28.5	20:00:00	24-Aug-02
326	-28.5	08:00:00	25-Aug-02
327	-28.5	20:00:00	25-Aug-02
328	-28.5	08:00:00	26-Aug-02
329	-28.5	20:00:00	26-Aug-02
330	-28.5	08:00:00	27-Aug-02
331	-28.5	20:00:00	27-Aug-02
332	-28.5	08:00:00	28-Aug-02
333	1.5	20:00:00	28-Aug-02
334	-41.9	08:00:00	29-Aug-02
335	-41.2	20:00:00	29-Aug-02
336	-41.2	08:00:00	30-Aug-02
337	-16.6	20:00:00	30-Aug-02
338	-16.4	08:00:00	31-Aug-02
339	-16.2	20:00:00	31-Aug-02
340	-12.5	08:00:00	1-Sep-02
341	-6.4	20:00:00	1-Sep-02
342	-4.5	08:00:00	2-Sep-02
343	-6	20:00:00	2-Sep-02
344	-7.7	08:00:00	3-Sep-02
345	-28.5	20:00:00	3-Sep-02
346	-28.5	08:00:00	4-Sep-02
347	-28.5	20:00:00	4-Sep-02
348	-28.5	08:00:00	5-Sep-02
349	-28.5	20:00:00	5-Sep-02
350	-28.5	08:00:00	6-Sep-02
351	-28.5	20:00:00	6-Sep-02
352	-28.5	08:00:00	7-Sep-02
353	-28.5	20:00:00	7-Sep-02

354	-28.5	08:00:00	8-Sep-02
355	-28.5	20:00:00	8-Sep-02
356	-28.5	08:00:00	9-Sep-02
357	-28.5	20:00:00	9-Sep-02
358	-28.5	08:00:00	10-Sep-02
359	-28.5	20:00:00	10-Sep-02
360	-28.5	08:00:00	11-Sep-02
361	-28.5	20:00:00	11-Sep-02
362	-28.5	08:00:00	12-Sep-02
363	-28.5	20:00:00	12-Sep-02
364	-28.5	08:00:00	13-Sep-02
365	-28.5	20:00:00	13-Sep-02
366	-28.5	08:00:00	14-Sep-02
367	-28.5	20:00:00	14-Sep-02
368	-28.5	08:00:00	15-Sep-02
369	-28.5	20:00:00	15-Sep-02
370	-28.5	08:00:00	16-Sep-02
371	-28.5	20:00:00	16-Sep-02
372	-28.5	08:00:00	17-Sep-02
373	-28.5	20:00:00	17-Sep-02
374	-28.5	08:00:00	18-Sep-02
375	-28.5	20:00:00	18-Sep-02
376	-28.5	08:00:00	19-Sep-02
377	-28.5	20:00:00	19-Sep-02
378	-28.5	08:00:00	20-Sep-02
379	-28.5	20:00:00	20-Sep-02
380	-28.5	08:00:00	21-Sep-02
381	-28.5	20:00:00	21-Sep-02
382	-28.5	08:00:00	22-Sep-02
383	-28.5	20:00:00	22-Sep-02
384	-28.5	08:00:00	23-Sep-02
385	-28.5	20:00:00	23-Sep-02
386	-28.5	08:00:00	24-Sep-02
387	-28.5	20:00:00	24-Sep-02
388	-28.5	08:00:00	25-Sep-02
389	-28.5	20:00:00	25-Sep-02
390	-28.5	08:00:00	26-Sep-02
391	-28.5	20:00:00	26-Sep-02
392	-28.5	08:00:00	27-Sep-02
393	-28.5	20:00:00	27-Sep-02
394	-28.5	08:00:00	28-Sep-02
395	-28.5	20:00:00	28-Sep-02
396	-28.5	08:00:00	29-Sep-02
397	-28.5	20:00:00	29-Sep-02
398	-28.5	08:00:00	30-Sep-02
399	-28.5	20:00:00	30-Sep-02
400	-28.5	08:00:00	1-Oct-02
401	-28.5	20:00:00	1-Oct-02
402	-28.5	08:00:00	2-Oct-02
403	-28.5	20:00:00	2-Oct-02
404	-28.5	08:00:00	3-Oct-02

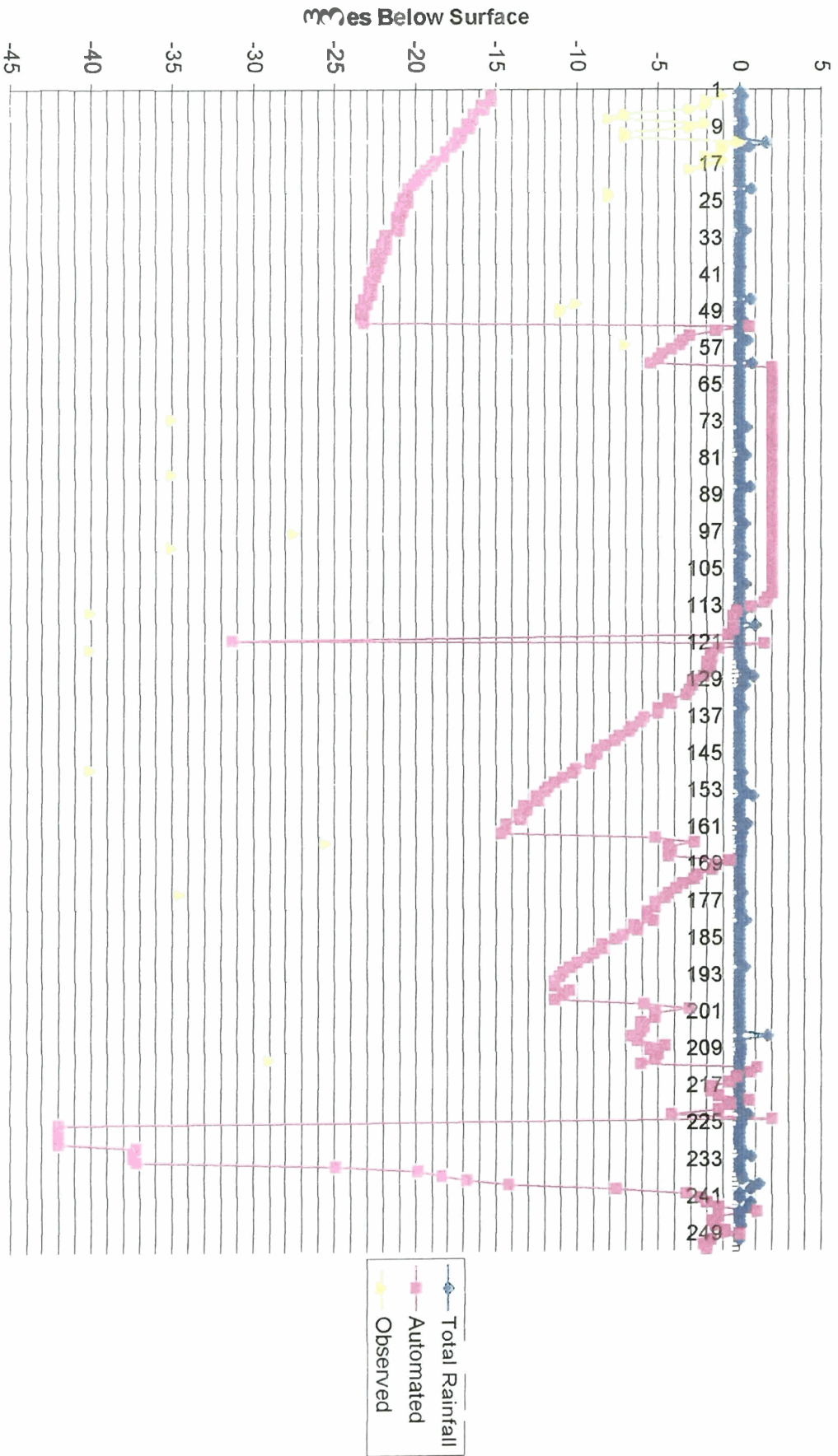
405	-28.5	20:00:00	3-Oct-02
406	-28.5	08:00:00	4-Oct-02
407	-28.5	20:00:00	4-Oct-02
408	-28.5	08:00:00	5-Oct-02
409	-28.5	20:00:00	5-Oct-02
410	-28.5	08:00:00	6-Oct-02
411	-28.5	20:00:00	6-Oct-02
412	-28.5	08:00:00	7-Oct-02
413	-28.5	20:00:00	7-Oct-02
414	-28.5	08:00:00	8-Oct-02
415	-28.5	20:00:00	8-Oct-02
416	-28.5	08:00:00	9-Oct-02
417	-28.5	20:00:00	9-Oct-02
418	-28.5	08:00:00	10-Oct-02
419	-28.5	20:00:00	10-Oct-02
420	-28.5	08:00:00	11-Oct-02
421	-28.5	20:00:00	11-Oct-02
422	-28.5	08:00:00	12-Oct-02
423	-28.5	20:00:00	12-Oct-02
424	-28.5	08:00:00	13-Oct-02
425	-28.5	20:00:00	13-Oct-02
426	-28.5	08:00:00	14-Oct-02
427	-28.5	20:00:00	14-Oct-02
428	-28.5	08:00:00	15-Oct-02
429	-28.5	20:00:00	15-Oct-02
430	-28.5	08:00:00	16-Oct-02
431	-28.5	20:00:00	16-Oct-02
432	-28.5	08:00:00	17-Oct-02
433	-28.5	20:00:00	17-Oct-02
434	-28.5	08:00:00	18-Oct-02
435	-28.5	20:00:00	18-Oct-02
436	-28.5	08:00:00	19-Oct-02
437	-28.5	20:00:00	19-Oct-02
438	-28.5	08:00:00	20-Oct-02
439	-28.5	20:00:00	20-Oct-02
440	-28.5	08:00:00	21-Oct-02
441	-28.5	20:00:00	21-Oct-02
442	-28.5	08:00:00	22-Oct-02
443	-28.5	20:00:00	22-Oct-02
444	-28.5	08:00:00	23-Oct-02
445	-28.5	20:00:00	23-Oct-02
446	-28.5	08:00:00	24-Oct-02
447	-28.5	20:00:00	24-Oct-02
448	-28.5	08:00:00	25-Oct-02
449	-28.5	20:00:00	25-Oct-02
450	-28.5	08:00:00	26-Oct-02
451	-28.5	20:00:00	26-Oct-02
452	-28.5	08:00:00	27-Oct-02
453	-28.5	20:00:00	27-Oct-02
454	-28.5	08:00:00	28-Oct-02
455	-28.5	20:00:00	28-Oct-02



456	-28.5	08:00:00	29-Oct-02
457	-28.5	20:00:00	29-Oct-02
458	-28.5	08:00:00	30-Oct-02
459	-28.5	20:00:00	30-Oct-02
460	-28.5	08:00:00	31-Oct-02
461	-28.5	20:00:00	31-Oct-02
462	-28.5	08:00:00	1-Nov-02
463	-28.5	20:00:00	1-Nov-02
464	-28.5	08:00:00	2-Nov-02
465	-28.5	20:00:00	2-Nov-02
466	-28.5	08:00:00	3-Nov-02
467	-28.5	20:00:00	3-Nov-02
468	-28.5	08:00:00	4-Nov-02
469	-28.5	20:00:00	4-Nov-02
470	-28.5	08:00:00	5-Nov-02
471	-28.5	20:00:00	5-Nov-02
472	-28.5	08:00:00	6-Nov-02
473	-28.5	20:00:00	6-Nov-02
474	-28.5	08:00:00	7-Nov-02
475	-28.5	20:00:00	7-Nov-02
476	-28.5	08:00:00	8-Nov-02
477	-28.5	20:00:00	8-Nov-02
478	-28.5	08:00:00	9-Nov-02
479	-28.5	20:00:00	9-Nov-02
480	-28.5	08:00:00	10-Nov-02
481	-28.5	20:00:00	10-Nov-02
482	-28.5	08:00:00	11-Nov-02
483	-28.5	20:00:00	11-Nov-02
484	-28.5	08:00:00	12-Nov-02
485	-28.5	20:00:00	12-Nov-02
486	-28.5	08:00:00	13-Nov-02
487	-28.5	20:00:00	13-Nov-02
488	-28.5	08:00:00	14-Nov-02
489	-28.5	20:00:00	14-Nov-02
490	-28.5	08:00:00	15-Nov-02
491	-28.5	20:00:00	15-Nov-02
492	-28.5	08:00:00	16-Nov-02
493	-28.5	20:00:00	16-Nov-02
494	-28.5	08:00:00	17-Nov-02
495	-28.5	20:00:00	17-Nov-02
496	-28.5	08:00:00	18-Nov-02
497	-28.5	20:00:00	18-Nov-02
498	-28.5	08:00:00	19-Nov-02
499	-28.5	20:00:00	19-Nov-02
500	-28.5	08:00:00	20-Nov-02
501	-30.8	20:00:00	20-Nov-02
502	-17.6	08:00:00	21-Nov-02
503	-17.8	20:00:00	21-Nov-02
504	-17	08:00:00	22-Nov-02
505	-17	20:00:00	22-Nov-02
506	-17.6	08:00:00	23-Nov-02

507	-17.2	20:00:00	23-Nov-02
508	-17	08:00:00	24-Nov-02
509	-18.1	20:00:00	24-Nov-02
510	-16.8	08:00:00	25-Nov-02

# Groundwater Gauge 4 Automated and Observed



Growing Season March 20, 2002 - November 12, 2002

- ◆ Total Rainfall
- Automated
- ▲ Observed

Julian Date	Total Rainfall (in)	Automated	Observed
80	0.2	-15.3	-1
81	0.01	-15.3	-2
82	0	-15.9	-2
83	0	-15.7	-3
84	0	-16.4	-7
85	0.19	-16.4	-8
86	0.25	-16.8	-2
87	0	-16.6	-3
88	0	-17.3	-7
89	0.06	-17.1	-7
90	1.64	-17.5	0
91	0.59	-17.7	-1
92	0	-18.2	-1
93	0	-18.2	-2
94	0	-18.8	-1
95	0	-19	-2
96	0	-19.4	-3
97	0	-19.7	
98	0	-19.9	
99	0	-20.1	
100	0.72	-20.5	
101	0	-20.5	-8
102	0.05	-20.8	-8
103	0.08	-20.5	
104	0.11	-21	
105	0.01	-20.8	
106	0	-21.2	
107	0	-21	
108	0	-21.2	
109	0.36	-21	
110	0.08	-21.9	
111	0	-21.8	
112	0	-22.1	
113	0	-21.8	
114	0	-22.5	
115	0.01	-22.1	
116	0	-22.5	
117	0.06	-22.3	
118	0.01	-22.7	
119	0	-22.5	
120	0	-22.9	
121	0.01	-22.7	
122	0	-22.9	
123	0	-22.7	
124	0.71	-23.2	
125	0.02	-23	-10

126	0	-23.4	-11
127	0	-23.2	-11
128	0	-23.4	
129	0.32	-23.2	
130	0	0.6	
131	0	-1.5	
132	0	-3.1	
133	0.49	-3.5	
134	0.01	-3.7	-7
135	0	-4.2	
136	0	-4.8	
137	0	-5	
138	0.78	-5.5	
139	0.01	2	
140	0	2	
141	0	2	
142	0	2	
143	0	2	
144	0	2	
145	0	2	
146	0	2	
147	0	2	
148	0	2	
149	0.02	2	
150	0	2	-35
151	0	2	
152	0.44	2	
153	0	2	
154	0	2	
155	0	2	
156	0	2	
157	0.11	2	
158	0.39	2	
159	0.03	2	
160	0	2	
161	0	2	
162	0	2	-35
163	0	2	
164	0	2	
165	0.67	2	
166	0.07	2	
167	0	2	
168	0	2	
169	0	2	
170	0	2	
171	0	2	
172	0	2	
173	0.29	2	
174	0.04	2	

175	0.01	2	-27.5
176	0	2	
177	0	2	
178	0.06	2	-35
179	0.01	2	
180	0.31	2	
181	0	2	
182	0	2	
183	0	2	
184	0	2	
185	0	2	
186	0.36	2	
187	0	2	
188	0	2	
189	0	1.7	
190	0	1.5	
191	0.77	0.7	
192	0.17	-0.2	-40
193	0	-0.4	
194	0.08	-0.4	
195	0.96	-0.4	
196	0	-0.4	
197	0	-0.7	
198	0	-31.3	
199	0	1.5	
200	0	-1.3	-40
201	0	-1.8	
202	0	-1.7	
203	0.13	-2	
204	0.14	-1.8	
205	0.41	-2	
206	0.87	-2.2	
207	0.16	-2.9	
208	0.33	-2.9	
209	0	-3.1	
210	0	-3.3	
211	0	-4.4	
212	0	-4.2	
213	0.24	-5	
214	0	-5	
215	0	-5.9	
216	0	-6.1	
217	0	-6.6	
218	0	-6.8	
219	0	-7.4	
220	0	-7.7	
221	0	-8.3	
222	0	-8.8	
223	0	-8.8	

224	0	-9.2	
225	0	-9.2	
226	0	-10.1	-40
227	0.17	-10.3	
228	0	-10.9	
229	0.03	-11.4	
230	0	-11.8	
231	0.33	-12	
232	0.82	-12.5	
233	0	-12.4	
234	0	-13.3	
235	0	-13.1	
236	0	-13.6	
237	0	-13.5	
238	0.46	-14.4	
239	0.03	-14.4	
240	0.21	-14.7	
241	0.04	-5.2	
242	0.08	-2.8	-25.5
243	0.15	-4.4	
244	0.12	-4.2	
245	0.07	-4.4	
246	0.02	-0.6	
247	0	-1.5	
248	0	-1.7	
249	0	-2.6	
250	0	-2.8	
251	0	-3.5	
252	0	-3.9	
253	0.16	-4.4	-34.5
254	0	-4.6	
255	0	-5.2	
256	0	-5.2	
257	0.1	-5.7	
258	0.04	-5.7	
259	0.41	-5.3	
260	0	-6.5	
261	0	-6.3	
262	0	-7.2	
263	0	-7.6	
264	0	-8.5	
265	0	-8.5	
266	0	-9	
267	0	-9.4	
268	0.01	-10	
269	0.34	-10.5	
270	0	-10.9	
271	0	-11.1	
272	0	-11.4	

273	0	-11.4
274	0	-10.5
275	0	-10.9
276	0	-11.4
277	0	-5.9
278	0	-3.1
279	0	-5.2
280	0	-5.2
281	0	-6.1
282	0	-5.9
283	0.01	-6.1
284	1.73	-6.6
285	0	-6.3
286	0.07	-4.6
287	0.1	-5.5
288	0.08	-5
289	0.01	-5.2
290	0	-6.1
291	0	1.1
292	0	0.7
293	0	-0.2
294	0.02	-0.6
295	0.02	-1.7
296	0	-1.8
297	0.02	-1.3
298	0	0.6
299	0	-0.6
300	0	-1.3
301	0.53	-4.2
302	0.16	2
303	0.13	-42
304	0	-42
305	0	-42
306	0	-42
307	0	-42
308	0.05	-37.2
309	0.2	-37.4
310	0.74	-37.4
311	0	-37.2
312	0	-24.9
313	0	-19.9
314	0.14	-18.4
315	0.22	-16.8
316	1.23	-14.2
317	0.7	-7.6
318	0	-3.3
319	0	-2.4
320	0.71	-2
321	0.55	-1.3



322	0	1.1
323	0	-1.3
324	0	-1.7
325	0.1	-1.5
326	0.01	-0.9
327	0	0
328	0	-1.8
329		-2.2
330		-2

Serial # - 03783E3

WELL A

Data logged Mon Nov 25 10:44:58 2002

1	-12.7	20:00:00	15-Mar-02
2	-13.1	08:00:00	16-Mar-02
3	-13.6	20:00:00	16-Mar-02
4	-13.6	08:00:00	17-Mar-02
5	-13.5	20:00:00	17-Mar-02
6	-13.8	08:00:00	18-Mar-02
7	-14	20:00:00	18-Mar-02
8	-14.6	08:00:00	19-Mar-02
9	-14.9	20:00:00	19-Mar-02
10	-14.7	08:00:00	20-Mar-02
11	-15.3	20:00:00	20-Mar-02
12	-15.3	08:00:00	21-Mar-02
13	-15.3	20:00:00	21-Mar-02
14	-15.5	08:00:00	22-Mar-02
15	-15.9	20:00:00	22-Mar-02
16	-15.7	08:00:00	23-Mar-02
17	-15.7	20:00:00	23-Mar-02
18	-16	08:00:00	24-Mar-02
19	-16.4	20:00:00	24-Mar-02
20	-16.2	08:00:00	25-Mar-02
21	-16.4	20:00:00	25-Mar-02
22	-16.6	08:00:00	26-Mar-02
23	-16.8	20:00:00	26-Mar-02
24	-16.6	08:00:00	27-Mar-02
25	-16.6	20:00:00	27-Mar-02
26	-17	08:00:00	28-Mar-02
27	-17.3	20:00:00	28-Mar-02
28	-17.1	08:00:00	29-Mar-02
29	-17.1	20:00:00	29-Mar-02
30	-17.5	08:00:00	30-Mar-02
31	-17.5	20:00:00	30-Mar-02
32	-17.5	08:00:00	31-Mar-02
33	-17.7	20:00:00	31-Mar-02
34	-17.9	08:00:00	1-Apr-02
35	-18.2	20:00:00	1-Apr-02
36	-18.1	08:00:00	2-Apr-02
37	-18.2	20:00:00	2-Apr-02
38	-18.6	08:00:00	3-Apr-02
39	-18.8	20:00:00	3-Apr-02
40	-18.8	08:00:00	4-Apr-02
41	-19	20:00:00	4-Apr-02
42	-19.2	08:00:00	5-Apr-02
43	-19.4	20:00:00	5-Apr-02
44	-19.5	08:00:00	6-Apr-02
45	-19.7	20:00:00	6-Apr-02
46	-19.9	08:00:00	7-Apr-02
47	-19.9	20:00:00	7-Apr-02

48	-19.9	08:00:00	8-Apr-02
49	-20.1	20:00:00	8-Apr-02
50	-20.3	08:00:00	9-Apr-02
51	-20.5	20:00:00	9-Apr-02
52	-20.3	08:00:00	10-Apr-02
53	-20.5	20:00:00	10-Apr-02
54	-20.8	08:00:00	11-Apr-02
55	-20.8	20:00:00	11-Apr-02
56	-20.6	08:00:00	12-Apr-02
57	-20.5	20:00:00	12-Apr-02
58	-20.8	08:00:00	13-Apr-02
59	-21	20:00:00	13-Apr-02
60	-20.8	08:00:00	14-Apr-02
61	-20.8	20:00:00	14-Apr-02
62	-21	08:00:00	15-Apr-02
63	-21.2	20:00:00	15-Apr-02
64	-21	08:00:00	16-Apr-02
65	-21	20:00:00	16-Apr-02
66	-21.2	08:00:00	17-Apr-02
67	-21.2	20:00:00	17-Apr-02
68	-21	08:00:00	18-Apr-02
69	-21	20:00:00	18-Apr-02
70	-21.6	08:00:00	19-Apr-02
71	-21.9	20:00:00	19-Apr-02
72	-21.8	08:00:00	20-Apr-02
73	-21.8	20:00:00	20-Apr-02
74	-21.8	08:00:00	21-Apr-02
75	-22.1	20:00:00	21-Apr-02
76	-21.9	08:00:00	22-Apr-02
77	-21.8	20:00:00	22-Apr-02
78	-22.1	08:00:00	23-Apr-02
79	-22.5	20:00:00	23-Apr-02
80	-22.1	08:00:00	24-Apr-02
81	-22.1	20:00:00	24-Apr-02
82	-22.5	08:00:00	25-Apr-02
83	-22.5	20:00:00	25-Apr-02
84	-22.3	08:00:00	26-Apr-02
85	-22.3	20:00:00	26-Apr-02
86	-22.5	08:00:00	27-Apr-02
87	-22.7	20:00:00	27-Apr-02
88	-22.7	08:00:00	28-Apr-02
89	-22.5	20:00:00	28-Apr-02
90	-22.9	08:00:00	29-Apr-02
91	-22.9	20:00:00	29-Apr-02
92	-22.9	08:00:00	30-Apr-02
93	-22.7	20:00:00	30-Apr-02
94	-22.7	08:00:00	1-May-02
95	-22.9	20:00:00	1-May-02
96	-22.9	08:00:00	2-May-02
97	-22.7	20:00:00	2-May-02
98	-23	08:00:00	3-May-02

99	-23.2	20:00:00	3-May-02
100	-23	08:00:00	4-May-02
101	-23	20:00:00	4-May-02
102	-23.4	08:00:00	5-May-02
103	-23.4	20:00:00	5-May-02
104	-23.2	08:00:00	6-May-02
105	-23.2	20:00:00	6-May-02
106	-23.4	08:00:00	7-May-02
107	-23.4	20:00:00	7-May-02
108	-23.4	08:00:00	8-May-02
109	-23.2	20:00:00	8-May-02
110	-23.4	08:00:00	9-May-02
111	0.6	20:00:00	9-May-02
112	-0.6	08:00:00	10-May-02
113	-1.5	20:00:00	10-May-02
114	-2.6	08:00:00	11-May-02
115	-3.1	20:00:00	11-May-02
116	-3.3	08:00:00	12-May-02
117	-3.5	20:00:00	12-May-02
118	-3.7	08:00:00	13-May-02
119	-3.7	20:00:00	13-May-02
120	-4.1	08:00:00	14-May-02
121	-4.2	20:00:00	14-May-02
122	-4.4	08:00:00	15-May-02
123	-4.8	20:00:00	15-May-02
124	-4.1	08:00:00	16-May-02
125	-5	20:00:00	16-May-02
126	-5.3	08:00:00	17-May-02
127	-5.5	20:00:00	17-May-02
128	2	08:00:00	18-May-02
129	2	20:00:00	18-May-02
130	2	08:00:00	19-May-02
131	2	20:00:00	19-May-02
132	2	08:00:00	20-May-02
133	2	20:00:00	20-May-02
134	2	08:00:00	21-May-02
135	2	20:00:00	21-May-02
136	2	08:00:00	22-May-02
137	2	20:00:00	22-May-02
138	2	08:00:00	23-May-02
139	2	20:00:00	23-May-02
140	2	08:00:00	24-May-02
141	2	20:00:00	24-May-02
142	2	08:00:00	25-May-02
143	2	20:00:00	25-May-02
144	2	08:00:00	26-May-02
145	2	20:00:00	26-May-02
146	2	08:00:00	27-May-02
147	2	20:00:00	27-May-02
148	2	08:00:00	28-May-02
149	2	20:00:00	28-May-02

150	2	08:00:00	29-May-02
151	2	20:00:00	29-May-02
152	2	08:00:00	30-May-02
153	2	20:00:00	30-May-02
154	2	08:00:00	31-May-02
155	2	20:00:00	31-May-02
156	2	08:00:00	1-Jun-02
157	2	20:00:00	1-Jun-02
158	2	08:00:00	2-Jun-02
159	2	20:00:00	2-Jun-02
160	2	08:00:00	3-Jun-02
161	2	20:00:00	3-Jun-02
162	2	08:00:00	4-Jun-02
163	2	20:00:00	4-Jun-02
164	2	08:00:00	5-Jun-02
165	2	20:00:00	5-Jun-02
166	2	08:00:00	6-Jun-02
167	2	20:00:00	6-Jun-02
168	2	08:00:00	7-Jun-02
169	2	20:00:00	7-Jun-02
170	2	08:00:00	8-Jun-02
171	2	20:00:00	8-Jun-02
172	2	08:00:00	9-Jun-02
173	2	20:00:00	9-Jun-02
174	2	08:00:00	10-Jun-02
175	2	20:00:00	10-Jun-02
176	2	08:00:00	11-Jun-02
177	2	20:00:00	11-Jun-02
178	2	08:00:00	12-Jun-02
179	2	20:00:00	12-Jun-02
180	2	08:00:00	13-Jun-02
181	2	20:00:00	13-Jun-02
182	2	08:00:00	14-Jun-02
183	2	20:00:00	14-Jun-02
184	2	08:00:00	15-Jun-02
185	2	20:00:00	15-Jun-02
186	2	08:00:00	16-Jun-02
187	2	20:00:00	16-Jun-02
188	2	08:00:00	17-Jun-02
189	2	20:00:00	17-Jun-02
190	2	08:00:00	18-Jun-02
191	2	20:00:00	18-Jun-02
192	2	08:00:00	19-Jun-02
193	2	20:00:00	19-Jun-02
194	2	08:00:00	20-Jun-02
195	2	20:00:00	20-Jun-02
196	2	08:00:00	21-Jun-02
197	2	20:00:00	21-Jun-02
198	2	08:00:00	22-Jun-02
199	2	20:00:00	22-Jun-02
200	2	08:00:00	23-Jun-02

201	2	20:00:00	23-Jun-02
202	2	08:00:00	24-Jun-02
203	2	20:00:00	24-Jun-02
204	2	08:00:00	25-Jun-02
205	2	20:00:00	25-Jun-02
206	2	08:00:00	26-Jun-02
207	2	20:00:00	26-Jun-02
208	2	08:00:00	27-Jun-02
209	2	20:00:00	27-Jun-02
210	2	08:00:00	28-Jun-02
211	2	20:00:00	28-Jun-02
212	2	08:00:00	29-Jun-02
213	2	20:00:00	29-Jun-02
214	2	08:00:00	30-Jun-02
215	2	20:00:00	30-Jun-02
216	2	08:00:00	1-Jul-02
217	2	20:00:00	1-Jul-02
218	2	08:00:00	2-Jul-02
219	2	20:00:00	2-Jul-02
220	2	08:00:00	3-Jul-02
221	2	20:00:00	3-Jul-02
222	2	08:00:00	4-Jul-02
223	2	20:00:00	4-Jul-02
224	2	08:00:00	5-Jul-02
225	2	20:00:00	5-Jul-02
226	2	08:00:00	6-Jul-02
227	2	20:00:00	6-Jul-02
228	1.8	08:00:00	7-Jul-02
229	1.7	20:00:00	7-Jul-02
230	1.8	08:00:00	8-Jul-02
231	1.5	20:00:00	8-Jul-02
232	0.9	08:00:00	9-Jul-02
233	0.7	20:00:00	9-Jul-02
234	0.2	08:00:00	10-Jul-02
235	-0.2	20:00:00	10-Jul-02
236	-0.4	08:00:00	11-Jul-02
237	-0.4	20:00:00	11-Jul-02
238	-0.4	08:00:00	12-Jul-02
239	-0.4	20:00:00	12-Jul-02
240	-0.2	08:00:00	13-Jul-02
241	-0.4	20:00:00	13-Jul-02
242	-0.7	08:00:00	14-Jul-02
243	-0.4	20:00:00	14-Jul-02
244	-0.6	08:00:00	15-Jul-02
245	-0.7	20:00:00	15-Jul-02
246	-0.9	08:00:00	16-Jul-02
247	-31.3	20:00:00	16-Jul-02
248	-2	08:00:00	17-Jul-02
249	1.5	20:00:00	17-Jul-02
250	-15.9	08:00:00	18-Jul-02
251	-1.3	20:00:00	18-Jul-02

252	-1.8	08:00:00	19-Jul-02
253	-1.8	20:00:00	19-Jul-02
254	-1.7	08:00:00	20-Jul-02
255	-1.7	20:00:00	20-Jul-02
256	-2	08:00:00	21-Jul-02
257	-2	20:00:00	21-Jul-02
258	-1.5	08:00:00	22-Jul-02
259	-1.8	20:00:00	22-Jul-02
260	-1.7	08:00:00	23-Jul-02
261	-2	20:00:00	23-Jul-02
262	-2.4	08:00:00	24-Jul-02
263	-2.2	20:00:00	24-Jul-02
264	-2.8	08:00:00	25-Jul-02
265	-2.9	20:00:00	25-Jul-02
266	-3.1	08:00:00	26-Jul-02
267	-2.9	20:00:00	26-Jul-02
268	-3.3	08:00:00	27-Jul-02
269	-3.1	20:00:00	27-Jul-02
270	-3.7	08:00:00	28-Jul-02
271	-3.3	20:00:00	28-Jul-02
272	-4.2	08:00:00	29-Jul-02
273	-4.4	20:00:00	29-Jul-02
274	-4.1	08:00:00	30-Jul-02
275	-4.2	20:00:00	30-Jul-02
276	-4.8	08:00:00	31-Jul-02
277	-5	20:00:00	31-Jul-02
278	-4.1	08:00:00	1-Aug-02
279	-5	20:00:00	1-Aug-02
280	-5.9	08:00:00	2-Aug-02
281	-5.9	20:00:00	2-Aug-02
282	-5.9	08:00:00	3-Aug-02
283	-6.1	20:00:00	3-Aug-02
284	-6.6	08:00:00	4-Aug-02
285	-6.6	20:00:00	4-Aug-02
286	-6.6	08:00:00	5-Aug-02
287	-6.8	20:00:00	5-Aug-02
288	-7.4	08:00:00	6-Aug-02
289	-7.4	20:00:00	6-Aug-02
290	-7.4	08:00:00	7-Aug-02
291	-7.7	20:00:00	7-Aug-02
292	-8.1	08:00:00	8-Aug-02
293	-8.3	20:00:00	8-Aug-02
294	-8.5	08:00:00	9-Aug-02
295	-8.8	20:00:00	9-Aug-02
296	-8.3	08:00:00	10-Aug-02
297	-8.8	20:00:00	10-Aug-02
298	-8.7	08:00:00	11-Aug-02
299	-9.2	20:00:00	11-Aug-02
300	-8.8	08:00:00	12-Aug-02
301	-9.2	20:00:00	12-Aug-02
302	-9.8	08:00:00	13-Aug-02

303	-10.1	20:00:00	13-Aug-02
304	-10.3	08:00:00	14-Aug-02
305	-10.3	20:00:00	14-Aug-02
306	-10.5	08:00:00	15-Aug-02
307	-10.9	20:00:00	15-Aug-02
308	-11.2	08:00:00	16-Aug-02
309	-11.4	20:00:00	16-Aug-02
310	-11.2	08:00:00	17-Aug-02
311	-11.8	20:00:00	17-Aug-02
312	-12	08:00:00	18-Aug-02
313	-12	20:00:00	18-Aug-02
314	-12.2	08:00:00	19-Aug-02
315	-12.5	20:00:00	19-Aug-02
316	-12.2	08:00:00	20-Aug-02
317	-12.4	20:00:00	20-Aug-02
318	-12.7	08:00:00	21-Aug-02
319	-13.3	20:00:00	21-Aug-02
320	-12.9	08:00:00	22-Aug-02
321	-13.1	20:00:00	22-Aug-02
322	-13.5	08:00:00	23-Aug-02
323	-13.6	20:00:00	23-Aug-02
324	-13.3	08:00:00	24-Aug-02
325	-13.5	20:00:00	24-Aug-02
326	-13.8	08:00:00	25-Aug-02
327	-14.4	20:00:00	25-Aug-02
328	-14.2	08:00:00	26-Aug-02
329	-14.4	20:00:00	26-Aug-02
330	-14.6	08:00:00	27-Aug-02
331	-14.7	20:00:00	27-Aug-02
332	-14	08:00:00	28-Aug-02
333	-5.2	20:00:00	28-Aug-02
334	-1.3	08:00:00	29-Aug-02
335	-2.8	20:00:00	29-Aug-02
336	-4.4	08:00:00	30-Aug-02
337	-4.4	20:00:00	30-Aug-02
338	-4.4	08:00:00	31-Aug-02
339	-4.2	20:00:00	31-Aug-02
340	-4.6	08:00:00	1-Sep-02
341	-4.4	20:00:00	1-Sep-02
342	-4.2	08:00:00	2-Sep-02
343	-0.6	20:00:00	2-Sep-02
344	-1.3	08:00:00	3-Sep-02
345	-1.5	20:00:00	3-Sep-02
346	-1.7	08:00:00	4-Sep-02
347	-1.7	20:00:00	4-Sep-02
348	-2.2	08:00:00	5-Sep-02
349	-2.6	20:00:00	5-Sep-02
350	-2.6	08:00:00	6-Sep-02
351	-2.8	20:00:00	6-Sep-02
352	-3.3	08:00:00	7-Sep-02
353	-3.5	20:00:00	7-Sep-02



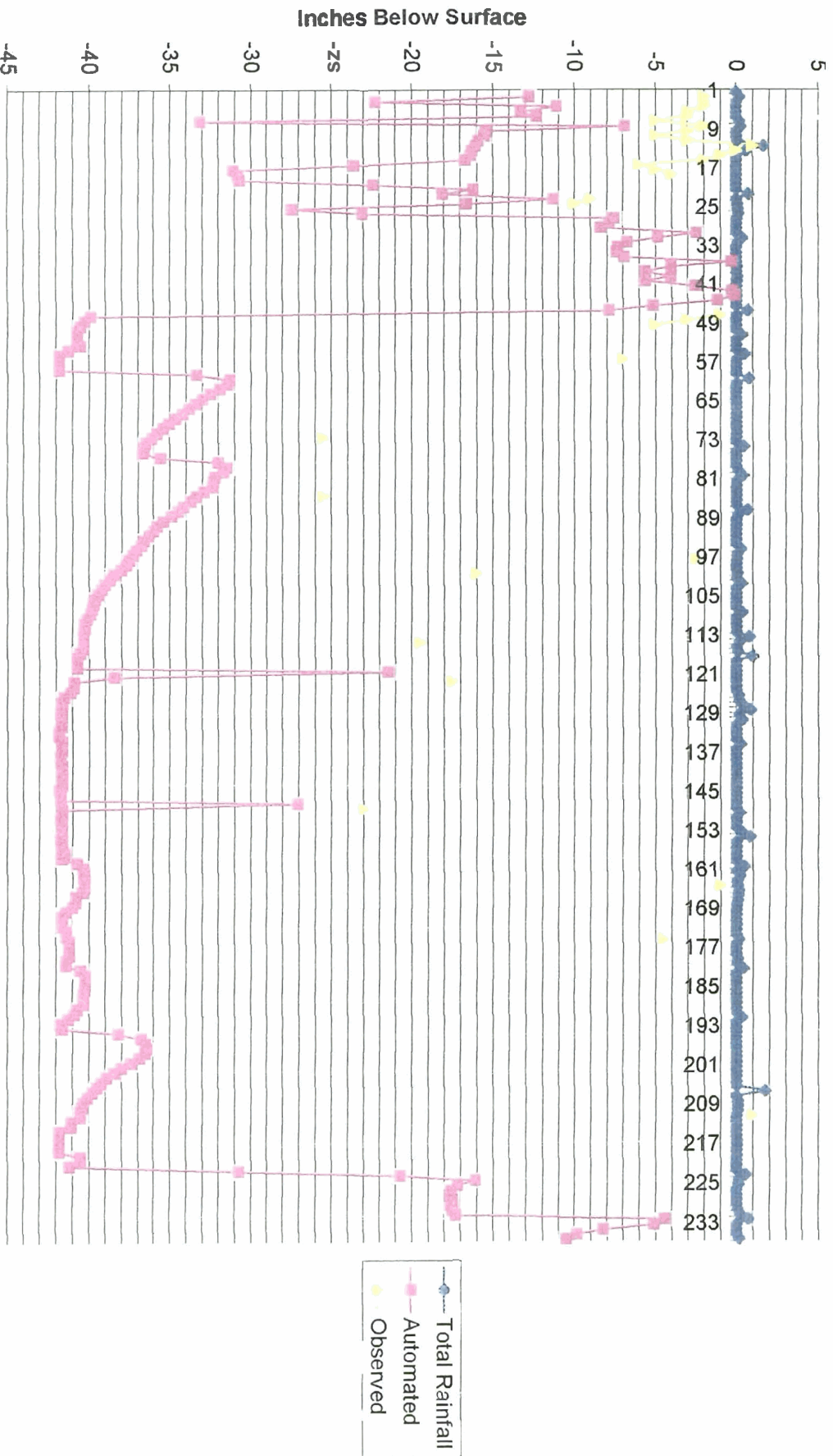
354	-3.7	08:00:00	8-Sep-02
355	-3.9	20:00:00	8-Sep-02
356	-4.6	08:00:00	9-Sep-02
357	-4.4	20:00:00	9-Sep-02
358	-4.6	08:00:00	10-Sep-02
359	-4.6	20:00:00	10-Sep-02
360	-5.2	08:00:00	11-Sep-02
361	-5.3	20:00:00	11-Sep-02
362	-5.2	08:00:00	12-Sep-02
363	-5.3	20:00:00	12-Sep-02
364	-5.7	08:00:00	13-Sep-02
365	-5.7	20:00:00	13-Sep-02
366	-5.7	08:00:00	14-Sep-02
367	-6.1	20:00:00	14-Sep-02
368	-5.3	08:00:00	15-Sep-02
369	-6.5	20:00:00	15-Sep-02
370	-6.5	08:00:00	16-Sep-02
371	-6.8	20:00:00	16-Sep-02
372	-6.3	08:00:00	17-Sep-02
373	-7	20:00:00	17-Sep-02
374	-7.2	08:00:00	18-Sep-02
375	-7.7	20:00:00	18-Sep-02
376	-7.6	08:00:00	19-Sep-02
377	-8.1	20:00:00	19-Sep-02
378	-8.5	08:00:00	20-Sep-02
379	-8.8	20:00:00	20-Sep-02
380	-8.5	08:00:00	21-Sep-02
381	-8.7	20:00:00	21-Sep-02
382	-9	08:00:00	22-Sep-02
383	-9.8	20:00:00	22-Sep-02
384	-9.4	08:00:00	23-Sep-02
385	-9.8	20:00:00	23-Sep-02
386	-10	08:00:00	24-Sep-02
387	-10.7	20:00:00	24-Sep-02
388	-10.5	08:00:00	25-Sep-02
389	-10.5	20:00:00	25-Sep-02
390	-10.9	08:00:00	26-Sep-02
391	-11.4	20:00:00	26-Sep-02
392	-11.1	08:00:00	27-Sep-02
393	-11.2	20:00:00	27-Sep-02
394	-11.4	08:00:00	28-Sep-02
395	-11.8	20:00:00	28-Sep-02
396	-11.4	08:00:00	29-Sep-02
397	-10.3	20:00:00	29-Sep-02
398	-10.5	08:00:00	30-Sep-02
399	-10.7	20:00:00	30-Sep-02
400	-10.9	08:00:00	1-Oct-02
401	-11.1	20:00:00	1-Oct-02
402	-11.4	08:00:00	2-Oct-02
403	-5.5	20:00:00	2-Oct-02
404	-5.9	08:00:00	3-Oct-02

405	-2.6	20:00:00	3-Oct-02
406	-3.1	08:00:00	4-Oct-02
407	-4.2	20:00:00	4-Oct-02
408	-5.2	08:00:00	5-Oct-02
409	-5.3	20:00:00	5-Oct-02
410	-5.2	08:00:00	6-Oct-02
411	-5.7	20:00:00	6-Oct-02
412	-6.1	08:00:00	7-Oct-02
413	-6.3	20:00:00	7-Oct-02
414	-5.9	08:00:00	8-Oct-02
415	-6.5	20:00:00	8-Oct-02
416	-6.1	08:00:00	9-Oct-02
417	-6.8	20:00:00	9-Oct-02
418	-6.6	08:00:00	10-Oct-02
419	-7	20:00:00	10-Oct-02
420	-6.3	08:00:00	11-Oct-02
421	-4.4	20:00:00	11-Oct-02
422	-4.6	08:00:00	12-Oct-02
423	-4.6	20:00:00	12-Oct-02
424	-5.5	08:00:00	13-Oct-02
425	-5.9	20:00:00	13-Oct-02
426	-5	08:00:00	14-Oct-02
427	-5.7	20:00:00	14-Oct-02
428	-5.2	08:00:00	15-Oct-02
429	-5.9	20:00:00	15-Oct-02
430	-6.1	08:00:00	16-Oct-02
431	2	20:00:00	16-Oct-02
432	1.1	08:00:00	17-Oct-02
433	0.7	20:00:00	17-Oct-02
434	0.7	08:00:00	18-Oct-02
435	0.4	20:00:00	18-Oct-02
436	-0.2	08:00:00	19-Oct-02
437	-0.6	20:00:00	19-Oct-02
438	-0.6	08:00:00	20-Oct-02
439	-1.1	20:00:00	20-Oct-02
440	-1.7	08:00:00	21-Oct-02
441	-1.8	20:00:00	21-Oct-02
442	-1.8	08:00:00	22-Oct-02
443	-2.2	20:00:00	22-Oct-02
444	-1.3	08:00:00	23-Oct-02
445	0.7	20:00:00	23-Oct-02
446	0.6	08:00:00	24-Oct-02
447	0.2	20:00:00	24-Oct-02
448	-0.6	08:00:00	25-Oct-02
449	-0.7	20:00:00	25-Oct-02
450	-1.3	08:00:00	26-Oct-02
451	-4.2	20:00:00	26-Oct-02
452	-4.2	08:00:00	27-Oct-02
453	-4.2	20:00:00	27-Oct-02
454	2	08:00:00	28-Oct-02
455	1.1	20:00:00	28-Oct-02

456	-42	08:00:00	29-Oct-02
457	-42	20:00:00	29-Oct-02
458	-42	08:00:00	30-Oct-02
459	-42	20:00:00	30-Oct-02
460	-42	08:00:00	31-Oct-02
461	-42	20:00:00	31-Oct-02
462	-42	08:00:00	1-Nov-02
463	-41.5	20:00:00	1-Nov-02
464	-42	08:00:00	2-Nov-02
465	-37.2	20:00:00	2-Nov-02
466	-37.2	08:00:00	3-Nov-02
467	-37.2	20:00:00	3-Nov-02
468	-37.4	08:00:00	4-Nov-02
469	-37.4	20:00:00	4-Nov-02
470	-37.4	08:00:00	5-Nov-02
471	-37.4	20:00:00	5-Nov-02
472	-37.2	08:00:00	6-Nov-02
473	-32.4	20:00:00	6-Nov-02
474	-24.9	08:00:00	7-Nov-02
475	-21	20:00:00	7-Nov-02
476	-19.9	08:00:00	8-Nov-02
477	-18.8	20:00:00	8-Nov-02
478	-18.4	08:00:00	9-Nov-02
479	-17.7	20:00:00	9-Nov-02
480	-16.8	08:00:00	10-Nov-02
481	-16	20:00:00	10-Nov-02
482	-14.2	08:00:00	11-Nov-02
483	-12.4	20:00:00	11-Nov-02
484	-7.6	08:00:00	12-Nov-02
485	-4.2	20:00:00	12-Nov-02
486	-3.3	08:00:00	13-Nov-02
487	-2.9	20:00:00	13-Nov-02
488	-2.4	08:00:00	14-Nov-02
489	-1.8	20:00:00	14-Nov-02
490	-2	08:00:00	15-Nov-02
491	-1.5	20:00:00	15-Nov-02
492	-1.3	08:00:00	16-Nov-02
493	0.6	20:00:00	16-Nov-02
494	1.1	08:00:00	17-Nov-02
495	0.7	20:00:00	17-Nov-02
496	-1.3	08:00:00	18-Nov-02
497	-1.5	20:00:00	18-Nov-02
498	-1.7	08:00:00	19-Nov-02
499	-1.3	20:00:00	19-Nov-02
500	-1.5	08:00:00	20-Nov-02
501	-1.1	20:00:00	20-Nov-02
502	-0.9	08:00:00	21-Nov-02
503	0	20:00:00	21-Nov-02
504	0	08:00:00	22-Nov-02
505	-0.6	20:00:00	22-Nov-02
506	-1.8	08:00:00	23-Nov-02

507	-2	20:00:00	23-Nov-02
508	-2.2	08:00:00	24-Nov-02
509	-1.8	20:00:00	24-Nov-02
510	-2	08:00:00	25-Nov-02

# Groundwater Gauge 5 Automated and Observed



Growing Season March 20, 2002 - November 12, 2002



Julian Date	Total Rainfall (in)	Automated	Observed
80	0.2	-12.8	-2
81	0.01	-22.25	-2
82	0	-11.1	-2
83	0	-13.3	-3
84	0	-12.35	-3
85	0.19	-33.15	-5
86	0.25	-6.9	-2
87	0	-15.4	-3
88	0	-15.5	-5
89	0.06	-15.9	-3
90	1.64	-16.05	1
91	0.59	-16.3	0
92	0	-16.4	-1
93	0	-16.7	-2
94	0	-23.6	-6
95	0	-31.1	-5
96	0	-30.8	-4
97	0	-30.7	
98	0	-22.4	
99	0	-16.2	
100	0.72	-18.1	
101	0	-11.35	-9
102	0.05	-16.6	-10
103	0.08	-27.45	
104	0.11	-23.1	
105	0.01	-7.55	
106	0	-7.85	
107	0	-8.4	
108	0	-2.5	
109	0.36	-4.85	
110	0.08	-6.75	
111	0	-7.35	
112	0	-7.4	
113	0	-6.95	
114	0	-0.35	
115	0.01	-4.05	
116	0	-5.65	
117	0.06	-4.05	
118	0.01	-5.6	
119	0	-2.55	
120	0	-0.3	
121	0.01	-0.1	
122	0	-1.2	
123	0	-5.15	
124	0.71	-7.85	
125	0.02	-39.9	-1

126	0	-40.25	-3
127	0	-40.5	-5
128	0	-40.7	
129	0.32	-40.7	
130	0	-40.7	
131	0	-40.5	
132	0	-41.25	
133	0.49	-41.8	
134	0.01	-41.8	-7
135	0	-41.8	
136	0	-41.8	
137	0	-33.35	
138	0.78	-31.3	
139	0.01	-31.45	
140	0	-31.9	
141	0	-32.5	
142	0	-33	
143	0	-33.4	
144	0	-33.8	
145	0	-34.2	
146	0	-34.6	
147	0	-35.05	
148	0	-35.4	
149	0.02	-35.8	
150	0	-36.1	-25.5
151	0	-36.5	
152	0.44	-36.65	
153	0	-36.7	
154	0	-35.55	
155	0	-32	
156	0	-31.5	
157	0.11	-31.7	
158	0.39	-32.2	
159	0.03	-32.3	
160	0	-32.35	
161	0	-32.9	
162	0	-33.35	-25.5
163	0	-33.7	
164	0	-34.15	
165	0.67	-34.5	
166	0.07	-34.9	
167	0	-35.4	
168	0	-35.8	
169	0	-36	
170	0	-36.3	
171	0	-36.65	
172	0	-36.8	
173	0.29	-37.1	
174	0.04	-37.3	

175	0.01	-37.5	-2.5
176	0	-37.7	
177	0	-38	
178	0.06	-38.45	-16
179	0.01	-38.7	
180	0.31	-39	
181	0	-39.2	
182	0	-39.4	
183	0	-39.6	
184	0	-39.7	
185	0	-39.8	
186	0.36	-39.9	
187	0	-40.1	
188	0	-40.25	
189	0	-40.2	
190	0	-40.3	
191	0.77	-40.3	
192	0.17	-40.3	-19.5
193	0	-40.3	
194	0.08	-40.5	
195	0.96	-40.7	
196	0	-40.7	
197	0	-40.7	
198	0	-21.45	
199	0	-38.45	
200	0	-40.9	-17.5
201	0	-40.9	
202	0	-41.1	
203	0.13	-41.5	
204	0.14	-41.6	
205	0.41	-41.6	
206	0.87	-41.7	
207	0.16	-41.6	
208	0.33	-41.6	
209	0	-41.6	
210	0	-41.8	
211	0	-41.8	
212	0	-41.6	
213	0.24	-41.6	
214	0	-41.6	
215	0	-41.7	
216	0	-41.7	
217	0	-41.6	
218	0	-41.6	
219	0	-41.6	
220	0	-41.6	
221	0	-41.6	
222	0	-41.8	
223	0	-41.7	



224	0	-41.7	
225	0	-27.05	
226	0	-41.6	-23
227	0.17	-41.6	
228	0	-41.7	
229	0.03	-41.6	
230	0	-41.6	
231	0.33	-41.6	
232	0.82	-41.7	
233	0	-41.6	
234	0	-41.6	
235	0	-41.5	
236	0	-41.6	
237	0	-40.7	
238	0.46	-40.3	
239	0.03	-40.25	
240	0.21	-40.3	
241	0.04	-40.25	
242	0.08	-40.25	-1
243	0.15	-40.4	
244	0.12	-40.8	
245	0.07	-40.8	
246	0.02	-41	
247	0	-41.4	
248	0	-41.6	
249	0	-41.6	
250	0	-41.6	
251	0	-41.4	
252	0	-41.4	
253	0.16	-41.2	-4.5
254	0	-41.2	
255	0	-41.2	
256	0	-41.2	
257	0.1	-41.4	
258	0.04	-41.4	
259	0.41	-40.5	
260	0	-40.2	
261	0	-40.2	
262	0	-40.2	
263	0	-40.25	
264	0	-40.3	
265	0	-40.3	
266	0	-40.3	
267	0	-40.7	
268	0.01	-40.9	
269	0.34	-41.25	
270	0	-41.7	
271	0	-41.6	
272	0	-38.2	

273	0	-36.8
274	0	-36.5
275	0	-36.4
276	0	-36.55
277	0	-36.9
278	0	-37.4
279	0	-38
280	0	-38.45
281	0	-38.9
282	0	-39.25
283	0.01	-39.5
284	1.73	-39.8
285	0	-40.1
286	0.07	-40.3
287	0.1	-40.4
288	0.08	-40.5
289	0.01	-40.5
290	0	-41.05
291	0	-41.05
292	0	-41.8
293	0	-41.8
294	0.02	-41.8
295	0.02	-41.8
296	0	-41.8
297	0.02	-40.5
298	0	-40.5
299	0	-41.2
300	0	-30.75
301	0.53	-20.7
302	0.16	-16.05
303	0.13	-17.2
304	0	-17.55
305	0	-17.65
306	0	-17.5
307	0	-17.6
308	0.05	-17.5
309	0.2	-17.3
310	0.74	-4.45
311	0	-5.1
312	0	-8.2
313	0	-9.85
314	0.14	-10.5
315	0.22	-10
316	1.23	-10.4
317	0.7	-9.85
318	0	-3.95
319	0	-2.6
320	0.71	-5.05
321	0.55	-5.75

322	0	-5.65
323	0	-6.2
324	0	-7.9
325	0.1	-8
326	0.01	-9.85
327	0	-6.9
328	0	-2.8
329		-23.5
330		-14.9

Serial # - 031F80D

Data logged Mon Nov 25 22:32:43 2002

WELL 5

1	-7.2	20:00:00	15-Mar-02
2	-1.6	08:00:00	16-Mar-02
3	-1.1	20:00:00	16-Mar-02
4	-3.2	08:00:00	17-Mar-02
5	-3.9	20:00:00	17-Mar-02
6	-5.4	08:00:00	18-Mar-02
7	-6.5	20:00:00	18-Mar-02
8	-33.2	08:00:00	19-Mar-02
9	-21.5	20:00:00	19-Mar-02
10	-4.1	08:00:00	20-Mar-02
11	-33.7	20:00:00	20-Mar-02
12	-10.8	08:00:00	21-Mar-02
13	-10.4	20:00:00	21-Mar-02
14	-11.8	08:00:00	22-Mar-02
15	-13.3	20:00:00	22-Mar-02
16	-13.3	08:00:00	23-Mar-02
17	-10.2	20:00:00	23-Mar-02
18	-14.5	08:00:00	24-Mar-02
19	-44.6	20:00:00	24-Mar-02
20	-21.7	08:00:00	25-Mar-02
21	1.1	20:00:00	25-Mar-02
22	-14.9	08:00:00	26-Mar-02
23	-15.4	20:00:00	26-Mar-02
24	-15.4	08:00:00	27-Mar-02
25	-15.4	20:00:00	27-Mar-02
26	-15.6	08:00:00	28-Mar-02
27	-15.8	20:00:00	28-Mar-02
28	-16	08:00:00	29-Mar-02
29	-16	20:00:00	29-Mar-02
30	-16.1	08:00:00	30-Mar-02
31	-16.3	20:00:00	30-Mar-02
32	-16.3	08:00:00	31-Mar-02
33	-16.3	20:00:00	31-Mar-02
34	-16.5	08:00:00	1-Apr-02
35	-16.7	20:00:00	1-Apr-02
36	-16.7	08:00:00	2-Apr-02
37	-16.7	20:00:00	2-Apr-02
38	-30.5	08:00:00	3-Apr-02
39	-31.2	20:00:00	3-Apr-02
40	-31	08:00:00	4-Apr-02
41	-30.8	20:00:00	4-Apr-02
42	-30.8	08:00:00	5-Apr-02
43	-30.7	20:00:00	5-Apr-02
44	-30.7	08:00:00	6-Apr-02
45	-29	20:00:00	6-Apr-02
46	-15.8	08:00:00	7-Apr-02
47	-16.1	20:00:00	7-Apr-02

48	-16.3	08:00:00	8-Apr-02
49	-18.3	20:00:00	8-Apr-02
50	-17.9	08:00:00	9-Apr-02
51	-10.9	20:00:00	9-Apr-02
52	-11.8	08:00:00	10-Apr-02
53	-16.5	20:00:00	10-Apr-02
54	-16.7	08:00:00	11-Apr-02
55	-29.4	20:00:00	11-Apr-02
56	-25.5	08:00:00	12-Apr-02
57	-23.1	20:00:00	12-Apr-02
58	-23.1	08:00:00	13-Apr-02
59	-7.9	20:00:00	13-Apr-02
60	-7.2	08:00:00	14-Apr-02
61	-7.5	20:00:00	14-Apr-02
62	-8.2	08:00:00	15-Apr-02
63	-8.4	20:00:00	15-Apr-02
64	-8.4	08:00:00	16-Apr-02
65	-2.5	20:00:00	16-Apr-02
66	-2.5	08:00:00	17-Apr-02
67	-4.3	20:00:00	17-Apr-02
68	-5.4	08:00:00	18-Apr-02
69	-6.3	20:00:00	18-Apr-02
70	-7.2	08:00:00	19-Apr-02
71	-7.2	20:00:00	19-Apr-02
72	-7.5	08:00:00	20-Apr-02
73	-7.3	20:00:00	20-Apr-02
74	-7.5	08:00:00	21-Apr-02
75	-7.3	20:00:00	21-Apr-02
76	-6.6	08:00:00	22-Apr-02
77	0.2	20:00:00	22-Apr-02
78	-0.9	08:00:00	23-Apr-02
79	-2.5	20:00:00	23-Apr-02
80	-5.6	08:00:00	24-Apr-02
81	-5	20:00:00	24-Apr-02
82	-6.3	08:00:00	25-Apr-02
83	-2.5	20:00:00	25-Apr-02
84	-5.6	08:00:00	26-Apr-02
85	-5.6	20:00:00	26-Apr-02
86	-5.6	08:00:00	27-Apr-02
87	-4.7	20:00:00	27-Apr-02
88	-0.4	08:00:00	28-Apr-02
89	-0.4	20:00:00	28-Apr-02
90	-0.2	08:00:00	29-Apr-02
91	0.7	20:00:00	29-Apr-02
92	-0.9	08:00:00	30-Apr-02
93	-0.2	20:00:00	30-Apr-02
94	-2.2	08:00:00	1-May-02
95	-3	20:00:00	1-May-02
96	-7.3	08:00:00	2-May-02
97	-7.5	20:00:00	2-May-02
98	-8.2	08:00:00	3-May-02

99	-39.8	20:00:00	3-May-02
100	-40	08:00:00	4-May-02
101	-40.2	20:00:00	4-May-02
102	-40.3	08:00:00	5-May-02
103	-40.5	20:00:00	5-May-02
104	-40.5	08:00:00	6-May-02
105	-40.7	20:00:00	6-May-02
106	-40.7	08:00:00	7-May-02
107	-40.7	20:00:00	7-May-02
108	-40.7	08:00:00	8-May-02
109	-40.7	20:00:00	8-May-02
110	-40.7	08:00:00	9-May-02
111	-40.5	20:00:00	9-May-02
112	-40.5	08:00:00	10-May-02
113	-40.7	20:00:00	10-May-02
114	-41.8	08:00:00	11-May-02
115	-41.8	20:00:00	11-May-02
116	-41.8	08:00:00	12-May-02
117	-41.8	20:00:00	12-May-02
118	-41.8	08:00:00	13-May-02
119	-41.8	20:00:00	13-May-02
120	-41.8	08:00:00	14-May-02
121	-41.8	20:00:00	14-May-02
122	-41.8	08:00:00	15-May-02
123	-34.8	20:00:00	15-May-02
124	-31.9	08:00:00	16-May-02
125	-31.4	20:00:00	16-May-02
126	-31.2	08:00:00	17-May-02
127	-31.4	20:00:00	17-May-02
128	-31.5	08:00:00	18-May-02
129	-31.7	20:00:00	18-May-02
130	-32.1	08:00:00	19-May-02
131	-32.4	20:00:00	19-May-02
132	-32.6	08:00:00	20-May-02
133	-32.8	20:00:00	20-May-02
134	-33.2	08:00:00	21-May-02
135	-33.3	20:00:00	21-May-02
136	-33.5	08:00:00	22-May-02
137	-33.7	20:00:00	22-May-02
138	-33.9	08:00:00	23-May-02
139	-34.2	20:00:00	23-May-02
140	-34.2	08:00:00	24-May-02
141	-34.4	20:00:00	24-May-02
142	-34.8	08:00:00	25-May-02
143	-35	20:00:00	25-May-02
144	-35.1	08:00:00	26-May-02
145	-35.3	20:00:00	26-May-02
146	-35.5	08:00:00	27-May-02
147	-35.7	20:00:00	27-May-02
148	-35.9	08:00:00	28-May-02
149	-36	20:00:00	28-May-02

150	-36.2	08:00:00	29-May-02
151	-36.4	20:00:00	29-May-02
152	-36.6	08:00:00	30-May-02
153	-36.6	20:00:00	30-May-02
154	-36.7	08:00:00	31-May-02
155	-36.7	20:00:00	31-May-02
156	-36.7	08:00:00	1-Jun-02
157	-36.7	20:00:00	1-Jun-02
158	-34.4	08:00:00	2-Jun-02
159	-32.3	20:00:00	2-Jun-02
160	-31.7	08:00:00	3-Jun-02
161	-31.5	20:00:00	3-Jun-02
162	-31.5	08:00:00	4-Jun-02
163	-31.5	20:00:00	4-Jun-02
164	-31.9	08:00:00	5-Jun-02
165	-32.1	20:00:00	5-Jun-02
166	-32.3	08:00:00	6-Jun-02
167	-32.3	20:00:00	6-Jun-02
168	-32.3	08:00:00	7-Jun-02
169	-32.3	20:00:00	7-Jun-02
170	-32.4	08:00:00	8-Jun-02
171	-32.8	20:00:00	8-Jun-02
172	-33	08:00:00	9-Jun-02
173	-33.2	20:00:00	9-Jun-02
174	-33.5	08:00:00	10-Jun-02
175	-33.5	20:00:00	10-Jun-02
176	-33.9	08:00:00	11-Jun-02
177	-34.1	20:00:00	11-Jun-02
178	-34.2	08:00:00	12-Jun-02
179	-34.4	20:00:00	12-Jun-02
180	-34.6	08:00:00	13-Jun-02
181	-34.8	20:00:00	13-Jun-02
182	-35	08:00:00	14-Jun-02
183	-35.3	20:00:00	14-Jun-02
184	-35.5	08:00:00	15-Jun-02
185	-35.7	20:00:00	15-Jun-02
186	-35.9	08:00:00	16-Jun-02
187	-36	20:00:00	16-Jun-02
188	-36	08:00:00	17-Jun-02
189	-36.2	20:00:00	17-Jun-02
190	-36.4	08:00:00	18-Jun-02
191	-36.6	20:00:00	18-Jun-02
192	-36.7	08:00:00	19-Jun-02
193	-36.7	20:00:00	19-Jun-02
194	-36.9	08:00:00	20-Jun-02
195	-37.1	20:00:00	20-Jun-02
196	-37.1	08:00:00	21-Jun-02
197	-37.3	20:00:00	21-Jun-02
198	-37.3	08:00:00	22-Jun-02
199	-37.5	20:00:00	22-Jun-02
200	-37.5	08:00:00	23-Jun-02

201	-37.6	20:00:00	23-Jun-02
202	-37.8	08:00:00	24-Jun-02
203	-37.8	20:00:00	24-Jun-02
204	-38.2	08:00:00	25-Jun-02
205	-38.4	20:00:00	25-Jun-02
206	-38.5	08:00:00	26-Jun-02
207	-38.7	20:00:00	26-Jun-02
208	-38.7	08:00:00	27-Jun-02
209	-38.9	20:00:00	27-Jun-02
210	-39.1	08:00:00	28-Jun-02
211	-39.1	20:00:00	28-Jun-02
212	-39.3	08:00:00	29-Jun-02
213	-39.4	20:00:00	29-Jun-02
214	-39.4	08:00:00	30-Jun-02
215	-39.6	20:00:00	30-Jun-02
216	-39.6	08:00:00	1-Jul-02
217	-39.6	20:00:00	1-Jul-02
218	-39.8	08:00:00	2-Jul-02
219	-39.8	20:00:00	2-Jul-02
220	-39.8	08:00:00	3-Jul-02
221	-39.8	20:00:00	3-Jul-02
222	-40	08:00:00	4-Jul-02
223	-40	20:00:00	4-Jul-02
224	-40.2	08:00:00	5-Jul-02
225	-40.2	20:00:00	5-Jul-02
226	-40.3	08:00:00	6-Jul-02
227	-40.2	20:00:00	6-Jul-02
228	-40.2	08:00:00	7-Jul-02
229	-40.3	20:00:00	7-Jul-02
230	-40.3	08:00:00	8-Jul-02
231	-40.3	20:00:00	8-Jul-02
232	-40.3	08:00:00	9-Jul-02
233	-40.3	20:00:00	9-Jul-02
234	-40.3	08:00:00	10-Jul-02
235	-40.3	20:00:00	10-Jul-02
236	-40.3	08:00:00	11-Jul-02
237	-40.3	20:00:00	11-Jul-02
238	-40.7	08:00:00	12-Jul-02
239	-40.7	20:00:00	12-Jul-02
240	-40.7	08:00:00	13-Jul-02
241	-40.7	20:00:00	13-Jul-02
242	-40.7	08:00:00	14-Jul-02
243	-40.7	20:00:00	14-Jul-02
244	-40.7	08:00:00	15-Jul-02
245	-2	20:00:00	15-Jul-02
246	-40.9	08:00:00	16-Jul-02
247	-36	20:00:00	16-Jul-02
248	-40.9	08:00:00	17-Jul-02
249	-40.9	20:00:00	17-Jul-02
250	-40.9	08:00:00	18-Jul-02
251	-40.9	20:00:00	18-Jul-02



252	-40.9	08:00:00	19-Jul-02
253	-41	20:00:00	19-Jul-02
254	-41.2	08:00:00	20-Jul-02
255	-41.4	20:00:00	20-Jul-02
256	-41.6	08:00:00	21-Jul-02
257	-41.6	20:00:00	21-Jul-02
258	-41.6	08:00:00	22-Jul-02
259	-41.6	20:00:00	22-Jul-02
260	-41.6	08:00:00	23-Jul-02
261	-41.6	20:00:00	23-Jul-02
262	-41.8	08:00:00	24-Jul-02
263	-41.6	20:00:00	24-Jul-02
264	-41.6	08:00:00	25-Jul-02
265	-41.6	20:00:00	25-Jul-02
266	-41.6	08:00:00	26-Jul-02
267	-41.6	20:00:00	26-Jul-02
268	-41.6	08:00:00	27-Jul-02
269	-41.8	20:00:00	27-Jul-02
270	-41.8	08:00:00	28-Jul-02
271	-41.8	20:00:00	28-Jul-02
272	-41.8	08:00:00	29-Jul-02
273	-41.6	20:00:00	29-Jul-02
274	-41.6	08:00:00	30-Jul-02
275	-41.6	20:00:00	30-Jul-02
276	-41.6	08:00:00	31-Jul-02
277	-41.6	20:00:00	31-Jul-02
278	-41.6	08:00:00	1-Aug-02
279	-41.8	20:00:00	1-Aug-02
280	-41.6	08:00:00	2-Aug-02
281	-41.6	20:00:00	2-Aug-02
282	-41.8	08:00:00	3-Aug-02
283	-41.6	20:00:00	3-Aug-02
284	-41.6	08:00:00	4-Aug-02
285	-41.6	20:00:00	4-Aug-02
286	-41.6	08:00:00	5-Aug-02
287	-41.6	20:00:00	5-Aug-02
288	-41.6	08:00:00	6-Aug-02
289	-41.6	20:00:00	6-Aug-02
290	-41.6	08:00:00	7-Aug-02
291	-41.6	20:00:00	7-Aug-02
292	-41.6	08:00:00	8-Aug-02
293	-41.8	20:00:00	8-Aug-02
294	-41.8	08:00:00	9-Aug-02
295	-41.6	20:00:00	9-Aug-02
296	-41.8	08:00:00	10-Aug-02
297	-41.8	20:00:00	10-Aug-02
298	-41.6	08:00:00	11-Aug-02
299	-12.5	20:00:00	11-Aug-02
300	-41.6	08:00:00	12-Aug-02
301	-41.6	20:00:00	12-Aug-02
302	-41.6	08:00:00	13-Aug-02

303	-41.6	20:00:00	13-Aug-02
304	-41.6	08:00:00	14-Aug-02
305	-41.6	20:00:00	14-Aug-02
306	-41.8	08:00:00	15-Aug-02
307	-41.6	20:00:00	15-Aug-02
308	-41.6	08:00:00	16-Aug-02
309	-41.6	20:00:00	16-Aug-02
310	-41.6	08:00:00	17-Aug-02
311	-41.6	20:00:00	17-Aug-02
312	-41.6	08:00:00	18-Aug-02
313	-41.6	20:00:00	18-Aug-02
314	-41.8	08:00:00	19-Aug-02
315	-41.6	20:00:00	19-Aug-02
316	-41.6	08:00:00	20-Aug-02
317	-41.6	20:00:00	20-Aug-02
318	-41.6	08:00:00	21-Aug-02
319	-41.6	20:00:00	21-Aug-02
320	-41.4	08:00:00	22-Aug-02
321	-41.6	20:00:00	22-Aug-02
322	-41.6	08:00:00	23-Aug-02
323	-41.2	20:00:00	23-Aug-02
324	-40.2	08:00:00	24-Aug-02
325	-40.3	20:00:00	24-Aug-02
326	-40.3	08:00:00	25-Aug-02
327	-40.2	20:00:00	25-Aug-02
328	-40.3	08:00:00	26-Aug-02
329	-40.3	20:00:00	26-Aug-02
330	-40.3	08:00:00	27-Aug-02
331	-40.2	20:00:00	27-Aug-02
332	-40.3	08:00:00	28-Aug-02
333	-40.3	20:00:00	28-Aug-02
334	-40.2	08:00:00	29-Aug-02
335	-40.3	20:00:00	29-Aug-02
336	-40.5	08:00:00	30-Aug-02
337	-40.7	20:00:00	30-Aug-02
338	-40.9	08:00:00	31-Aug-02
339	-40.7	20:00:00	31-Aug-02
340	-40.9	08:00:00	1-Sep-02
341	-41	20:00:00	1-Sep-02
342	-41	08:00:00	2-Sep-02
343	-41.2	20:00:00	2-Sep-02
344	-41.6	08:00:00	3-Sep-02
345	-41.6	20:00:00	3-Sep-02
346	-41.6	08:00:00	4-Sep-02
347	-41.6	20:00:00	4-Sep-02
348	-41.6	08:00:00	5-Sep-02
349	-41.6	20:00:00	5-Sep-02
350	-41.6	08:00:00	6-Sep-02
351	-41.4	20:00:00	6-Sep-02
352	-41.4	08:00:00	7-Sep-02
353	-41.4	20:00:00	7-Sep-02

354	-41.4	08:00:00	8-Sep-02
355	-41.2	20:00:00	8-Sep-02
356	-41.2	08:00:00	9-Sep-02
357	-41.2	20:00:00	9-Sep-02
358	-41.2	08:00:00	10-Sep-02
359	-41.2	20:00:00	10-Sep-02
360	-41.2	08:00:00	11-Sep-02
361	-41.2	20:00:00	11-Sep-02
362	-41.2	08:00:00	12-Sep-02
363	-41.2	20:00:00	12-Sep-02
364	-41.6	08:00:00	13-Sep-02
365	-41.6	20:00:00	13-Sep-02
366	-41.2	08:00:00	14-Sep-02
367	-40.7	20:00:00	14-Sep-02
368	-40.3	08:00:00	15-Sep-02
369	-40.2	20:00:00	15-Sep-02
370	-40.2	08:00:00	16-Sep-02
371	-40.2	20:00:00	16-Sep-02
372	-40.2	08:00:00	17-Sep-02
373	-40.2	20:00:00	17-Sep-02
374	-40.2	08:00:00	18-Sep-02
375	-40.2	20:00:00	18-Sep-02
376	-40.3	08:00:00	19-Sep-02
377	-40.3	20:00:00	19-Sep-02
378	-40.3	08:00:00	20-Sep-02
379	-40.3	20:00:00	20-Sep-02
380	-40.3	08:00:00	21-Sep-02
381	-40.3	20:00:00	21-Sep-02
382	-40.3	08:00:00	22-Sep-02
383	-40.7	20:00:00	22-Sep-02
384	-40.7	08:00:00	23-Sep-02
385	-40.9	20:00:00	23-Sep-02
386	-40.9	08:00:00	24-Sep-02
387	-40.9	20:00:00	24-Sep-02
388	-41.6	08:00:00	25-Sep-02
389	-41.8	20:00:00	25-Sep-02
390	-41.6	08:00:00	26-Sep-02
391	-41.6	20:00:00	26-Sep-02
392	-41.6	08:00:00	27-Sep-02
393	-38.9	20:00:00	27-Sep-02
394	-37.5	08:00:00	28-Sep-02
395	-36.9	20:00:00	28-Sep-02
396	-36.7	08:00:00	29-Sep-02
397	-36.6	20:00:00	29-Sep-02
398	-36.4	08:00:00	30-Sep-02
399	-36.4	20:00:00	30-Sep-02
400	-36.4	08:00:00	1-Oct-02
401	-36.4	20:00:00	1-Oct-02
402	-36.7	08:00:00	2-Oct-02
403	-36.7	20:00:00	2-Oct-02
404	-37.1	08:00:00	3-Oct-02

405	-37.3	20:00:00	3-Oct-02
406	-37.5	08:00:00	4-Oct-02
407	-37.8	20:00:00	4-Oct-02
408	-38.2	08:00:00	5-Oct-02
409	-38.4	20:00:00	5-Oct-02
410	-38.5	08:00:00	6-Oct-02
411	-38.7	20:00:00	6-Oct-02
412	-39.1	08:00:00	7-Oct-02
413	-39.1	20:00:00	7-Oct-02
414	-39.4	08:00:00	8-Oct-02
415	-39.4	20:00:00	8-Oct-02
416	-39.6	08:00:00	9-Oct-02
417	-39.8	20:00:00	9-Oct-02
418	-39.8	08:00:00	10-Oct-02
419	-40	20:00:00	10-Oct-02
420	-40.2	08:00:00	11-Oct-02
421	-40.3	20:00:00	11-Oct-02
422	-40.3	08:00:00	12-Oct-02
423	-40.3	20:00:00	12-Oct-02
424	-40.5	08:00:00	13-Oct-02
425	-40.5	20:00:00	13-Oct-02
426	-40.5	08:00:00	14-Oct-02
427	-40.5	20:00:00	14-Oct-02
428	-40.5	08:00:00	15-Oct-02
429	-40.5	20:00:00	15-Oct-02
430	-41.6	08:00:00	16-Oct-02
431	-40.5	20:00:00	16-Oct-02
432	-41.6	08:00:00	17-Oct-02
433	-41.8	20:00:00	17-Oct-02
434	-41.8	08:00:00	18-Oct-02
435	-41.8	20:00:00	18-Oct-02
436	-41.8	08:00:00	19-Oct-02
437	-41.8	20:00:00	19-Oct-02
438	-41.8	08:00:00	20-Oct-02
439	-41.8	20:00:00	20-Oct-02
440	-41.8	08:00:00	21-Oct-02
441	-41.8	20:00:00	21-Oct-02
442	-41.8	08:00:00	22-Oct-02
443	-40.5	20:00:00	22-Oct-02
444	-40.5	08:00:00	23-Oct-02
445	-40.5	20:00:00	23-Oct-02
446	-40.5	08:00:00	24-Oct-02
447	-41.9	20:00:00	24-Oct-02
448	-40.5	08:00:00	25-Oct-02
449	-33.5	20:00:00	25-Oct-02
450	-28	08:00:00	26-Oct-02
451	-23.8	20:00:00	26-Oct-02
452	-17.6	08:00:00	27-Oct-02
453	-15.6	20:00:00	27-Oct-02
454	-16.5	08:00:00	28-Oct-02
455	-17	20:00:00	28-Oct-02

456	-17.4	08:00:00	29-Oct-02
457	-17.4	20:00:00	29-Oct-02
458	-17.7	08:00:00	30-Oct-02
459	-17.7	20:00:00	30-Oct-02
460	-17.6	08:00:00	31-Oct-02
461	-17.4	20:00:00	31-Oct-02
462	-17.6	08:00:00	1-Nov-02
463	-17.6	20:00:00	1-Nov-02
464	-17.6	08:00:00	2-Nov-02
465	-17.4	20:00:00	2-Nov-02
466	-17.6	08:00:00	3-Nov-02
467	-17.4	20:00:00	3-Nov-02
468	-17.2	08:00:00	4-Nov-02
469	-5	20:00:00	4-Nov-02
470	-3.9	08:00:00	5-Nov-02
471	-4.3	20:00:00	5-Nov-02
472	-5.9	08:00:00	6-Nov-02
473	-7.3	20:00:00	6-Nov-02
474	-9.1	08:00:00	7-Nov-02
475	-9.7	20:00:00	7-Nov-02
476	-10	08:00:00	8-Nov-02
477	-10.4	20:00:00	8-Nov-02
478	-10.6	08:00:00	9-Nov-02
479	-10	20:00:00	9-Nov-02
480	-10	08:00:00	10-Nov-02
481	-10.4	20:00:00	10-Nov-02
482	-10.4	08:00:00	11-Nov-02
483	-9.7	20:00:00	11-Nov-02
484	-10	08:00:00	12-Nov-02
485	-4.3	20:00:00	12-Nov-02
486	-3.6	08:00:00	13-Nov-02
487	-1.6	20:00:00	13-Nov-02
488	-3.6	08:00:00	14-Nov-02
489	-4.7	20:00:00	14-Nov-02
490	-5.4	08:00:00	15-Nov-02
491	-5.6	20:00:00	15-Nov-02
492	-5.9	08:00:00	16-Nov-02
493	-5.6	20:00:00	16-Nov-02
494	-5.7	08:00:00	17-Nov-02
495	-5.9	20:00:00	17-Nov-02
496	-6.5	08:00:00	18-Nov-02
497	-7.9	20:00:00	18-Nov-02
498	-7.9	08:00:00	19-Nov-02
499	-7.9	20:00:00	19-Nov-02
500	-8.1	08:00:00	20-Nov-02
501	-9.3	20:00:00	20-Nov-02
502	-10.4	08:00:00	21-Nov-02
503	-10.4	20:00:00	21-Nov-02
504	-3.4	08:00:00	22-Nov-02
505	-6.1	20:00:00	22-Nov-02
506	0.5	08:00:00	23-Nov-02

507	-23.3	20:00:00	23-Nov-02
508	-23.7	08:00:00	24-Nov-02
509	-10.8	20:00:00	24-Nov-02
510	-19	08:00:00	25-Nov-02

10/11/02

APPENDIX B  
SITE PHOTOS



**Photo 1. Site grading with laser level equipped pan excavator.**



**Photo 2. Completed grading on the west side of the site.**





Photo 3. Breaking the plow pan and increasing surface storage.



Photo 4. Restoration area after grading and tillage operations were completed.



**Photo 5. Restored topography.**



**Photo 6. Same location as Photo 5 on August 24, 2002.**



**Photo 7. Cross-vane construction with footer rocks.**



**Photo 8. Sealing of cross-vane structure.**



**Photo 9. Completed cross-vanes with protective erosion control matting.**



**Photo 10. Same location as Photo 9 on August 24,2002.**



**Photo 11. Monitoring plot #1 on March 20, 2002 after a rainfall event.**



**Photo 12. Monitoring plot #1 on June 24, 2002.**



**Photo 13. Monitoring plot #1 on June 24,2002.**



**Photo 14. Monitoring plot #2 on March 20,2002 after a rainfall event.**



**Photo 15. Monitoring plot #2 on June 24, 2002.**



**Photo 16. Monitoring plot #2 on June 24, 2002.**



**Photo 17. Monitoring plot #3 on March 20,2002 after rainfall event.**



**Photo 18. Monitoring plot #3 on June 24, 2002.**





**Photo 19. Monitoring plot #3 on June 24, 2002.**



**Photo 20. Monitoring plot #4 on June 24, 2002.**



**Photo 21. Monitoring plot #4 on June 24,2002.**



**Photo 22. Monitoring plot #5 on June 24, 2002.**



Photo 22. Monitoring Plot #1 November 24, 2002



Photo 23. Monitoring Plot #1 November 24, 2002



**Photo 24. Monitoring Plot #2 November 24,2002**



**Photo 25. Monitoring Plot #2 November 24,2002**



Photo 26. Monitoring Plot #3 November 24,2002



Photo 27. Monitoring Plot #3 November 24,2002



Photo 28. Monitoring Plot #4 November 24,2002



Photo 29. Monitoring Plot #4 November 24,2002



Photo 30. Monitoring Plot #5 November 24,2002



Photo 31. Monitoring Plot #5 November 24,2002

APPENDIX C  
SUPPLEMENTAL STATISTICAL ANALYSIS FOR VEGETATION



## Casey/King Regeneration Study

**Statistical analysis of regeneration on the  
Casey / King tract in Lenoir County, NC**

Prepared for

**Environmental Banc & Exchange, LLC**

and

**Forestry Services Inc.**

November 27, 2002

To assess the amount of surviving regeneration on the 37.3-acre Casey/King tract in Lenoir County, NC, sample plots were installed to estimate the average number of trees per acre (TPA). One-fiftieth acre fixed radius plots (radius of 16.7 feet) were utilized to sample the tract. Using a systematic random sampling design, the plots were installed on a 2-by-4 chain grid, resulting in a cruising intensity of approximately 2.5%. A total of 41 plots were installed and measured on the Casey/King tract. The full 41-plot data set is listed in Table 1.

The surviving regeneration counts have a mean of 5.63 trees per plot with a minimum of 0 and a maximum of 12 trees per one-fiftieth acre plot. The plot level data was then expanded to a per acre basis with an overall mean of 281.71 TPA. A 90% confidence interval was placed on the mean number of TPA from the field data. The confidence interval was constructed from:

## Casey/King Regeneration Study

$$\bar{x} \pm (t_{df, 1-\alpha})(S_{\bar{x}})$$

where  $\bar{x}$  = The mean number of TPA derived from the sample

$t_{df, 1-\alpha}$  = The  $t$ -value

$S_{\bar{x}}$  = The standard error of the mean

The 90% confidence interval for the mean number of TPA on the 37.3-acre Casey/King tract is:

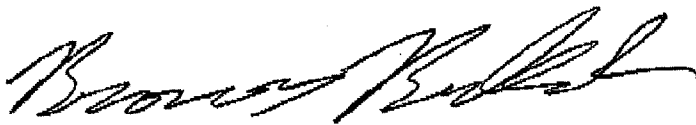
281.71  $\pm$  38.76 TPA

Hence, we are 90% confident that the *true population mean* number of trees per acre on the Casey/King tract in Lenoir County, NC is within the following bounds:

(242.95 , 320.47) TPA

Prepared by:

Bronson P. Bullock, Ph.D.



Campus Box 8008, 3102 Jordan Hall

Department of Forestry

North Carolina State University

Raleigh, NC 27695-8008

919-513-1248

## Casey/King Regeneration Study

**Table 1. Survival counts for the full 41-plot data set from the Casey/King tract in Lenoir County, NC**

Plot No.	Survival Count	Plot No.	Survival Count	Plot No.	Survival Count
CC1	5	6B	3	AA1	4
CC3	5	7B	4	AA5	5
CC4	4	1C	7	BB1	4
CC5	4	2C	9	BB2	7
CC7	5	3C	12	BB3	12
CC8	2	5C	6	BB4	6
CC9	4	6C	6	BB5	6
DD1	3	7C	1	BB6	5
DD2	3	8C	5	BB7	5
1B	11	9C	3	BB8	0
2B	5	A1	3	BB9	6
3B	4	A2	7	BB10	12
4B	12	A3	7	BB11	6
5B	9	A4	4		