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INTERIM REMEDIAL ACTION FOURTH QUARTER 1999 PERFORMANCE MONITORING  
AND GROUNDWATER QUALITY REPORT AT OPERABLE UNIT 4 (OU 4) NTC ORLANDO  
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4/13/2000  
CH2M HILL



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April 13, 2000

Ms. Barbara Nwokike  
Remedial Project Manager  
Southern Division  
Naval Facilities Engineering Command  
2155 Eagle Drive  
Charleston, SC 29406

Subject: Operable Unit 4 - Interim Remedial Action (IRA)  
Fourth Quarter 1999 Performance Monitoring and Ground Water Quality Report  
Naval Training Center, Orlando, Florida  
CTO 0017, Contract No. N62467-98-D-0995

Dear Ms. Nwokike:

CH2M HILL Constructors, Inc (CCI) is pleased to submit the results of the Fourth Quarter 1999 UVB system performance and ground water quality monitoring at Operable Unit 4 (OU-4) at Area C of the Naval Training Center (NTC) in Orlando, Florida. Quarterly activities were conducted by CCI in accordance with procedures described in the Performance Monitoring and Sampling Plan (PM&SP) found in Appendix B of the *Interim Remedial Action (IRA): Conceptual Design and Performance Specification, Operable Unit 4, ABB Environmental Services, Inc. (ABB-ES), May 1997*. A brief discussion on the site history and conditions at OU-4, including a technical description of the UVB recirculation system can also be found in that document.

The objective of the PM&SP is to evaluate and validate the performance, progress, and effectiveness of the recirculating/in situ well stripping ground water treatment system. The fourth quarter 1999 report covers the period from September 1, 1999 through January 7, 2000 and presents performance and analytical evaluations for

- System operation activities
- Hydraulic performance
- Ground water quality from the UVB influent/effluent streams
- Ground water quality in the study area
- Air emissions produced from the UVB influent/effluent streams

## SYSTEM OPERATION AND ACTIVITIES

The OU-4 IRA ground water treatment system consists of two UVB recirculation wells, designated UVB-1 and UVB-2, as illustrated in Figure-1. The UVB treatment system was initially started up on December 10, 1997. Details of subsequent system operation and monitoring have

been included in site quarterly monitoring reports prepared by Harding Lawson Associates (HLA).

Repairs to the UVB systems were made by Bechtel Environmental, Inc. and Roy F. Weston during a scheduled operation and maintenance (O&M) site visit during the week of August 9, 1999. This site visit coincided with the transition of system O&M from Bechtel/Roy F. Weston to CCI, and served as a training period for the transition. The following tasks were completed during this site visit:

- Disassembled both UVB wells for inspection of internal components.
- Removed accumulated sediment from the well casings.
- Clean and replace, if necessary, the submersible influent pumps.
- Installed new effluent flow meters to accurately measure the anticipated flow rates (1-4 gpm).
- Re-started and balanced both treatment systems.
- Trained CH2M HILL personnel on system servicing and operations.

The non-functioning UVB-2 system was repaired first. This well was found to be clean inside with little visible evidence of iron or mineral deposit buildup. The stripper plate, which was cleaned in late April 1999, was found to have no evidence of further scale buildup. The lower well casing was completely free of the fine sands that had previously penetrated through the outer well screen. The submersible pump did have some sediment accumulation and was replaced with a new pump. The original motor was used on the new pump housing. The paddle-type flow meter was removed and replaced with a nutating disc water meter capable of accurate flow measurement down to 0.5 gpm. Upon starting UVB-2 it was noted that the biocide chemical metering pump was performing in what appeared to be an erratic manner. It was speculated that the electronic control module for the pump may have been damaged by a lightning strike. Weston was able to locate a compatible metering pump in the Orlando area, and the pump was replaced.

UVB-1 was found to be in similar condition to UVB-2 except it was fully operational prior to the shutdown for maintenance. The well components were also clean and no fine sand was present in the well casing. The autodialer had been repaired and was re-installed. There were no detectable problems with the chemical metering pump at UVB-1. The submersible groundwater extraction pump was taken apart, cleaned, and re-installed. A new water meter was installed.

After final balancing of UVB-1, this well was pumping at 2.0 to 2.5 gpm with a pre-valve discharge pressure of 25 psi. The influent airflow rate was 123 cfm. There were 25.5 inches of biocide in the treatment drum. Flow rates at UVB-1 are limited by treated groundwater re-injection to the lower screen. The groundwater extraction pump is cycling on and off based on the level of water in the treated water effluent tank. The influent pumping has to be suspended periodically to allow the effluent discharge to "catch up" and gain some storage volume in the effluent storage tank. This results in cycling on and off of the influent submersible pump to achieve balanced flows.

UVB-2 was not balanced and re-started until the final day of the O&M site visit on August 13, 1999. This delay was due to the extra time required to locate and install a new chemical metering pump. Based on a short period of observation, the average pumping rate was just under 2.0 gpm. The pre-valve discharge pressure was 25.5 psi. The influent airflow rate was 128 cfm. There were 32 inches of biocide remaining in the treatment drum. Contrary to UVB-1, this well is limited in pumping rate by water yield from the well. The influent submersible pump is shutting off periodically due to water level in the well reaching the low-level switch. This shuts the pump off until the well can recharge.

Although the two UVB wells were disassembled by Bechtel and Roy F. Weston during the August 1999 O&M visit, the pre-pack screens were not removed or cleaned during this effort. In addition, neither of the two UVB wells were redeveloped during the August 1999 O&M visit as originally planned.

Prior to leaving the site, Bechtel replaced three of the Troll transducers with units containing new lithium batteries. These two transducers were installed in the two UVB wells and in observation well OW-9. There is also a still an active transducer in observation well OW-8. All remaining transducers were removed from their current locations and returned to In Situ Inc. to have new batteries installed. The transducers were returned by In-Situ to the site in mid-September 1999, and were installed and configured by CH2M HILL with assistance from HLA.

Since the last comprehensive O&M site visit in August of 1999, the performance of both UVB-1 and UVB-2 has fluctuated. The UVB wells, particularly UVB-2, have experienced both short and long term interruptions in service during this reporting period. During the sampling event completed in early January 2000, UVB-1 was pumping at less than 1.0 gpm which is down from the 2.0 to 2.5 gpm noted in August of 1999. The decrease in extraction/re-injection rates appear related to extraction pump problems and the injection capacity of the lower interval. Low water in the well does not appear to be a problem at UVB-1 since water levels have consistently been recorded above the appropriate shut off switches.

## **IRA MODIFICATIONS**

No system modifications have been made since the August 1999 O&M site visit.

## **HYDRAULIC PERFORMANCE**

As in previous quarterly reports prepared by others, the hydraulic head method was used to evaluate and summarize the effectiveness of the hydraulic influence from the UVB wells at OU-4 based on groundwater level data from surrounding monitoring wells.

In-Situ® pressure transducers were installed in the UVB wells and select monitoring wells to continuously monitor groundwater levels from the period of late September 1999 to early January 2000. The monitoring wells with groundwater level data are shallow interval wells 6A, 8A, 10A, and 12A; and deep interval wells 9C, 11C and 13C. The shallow interval monitoring wells are intended to monitor the withdrawal interval (UVB well screens set at approximately 3 to 13 feet

bgs), while the deep monitoring wells are intended to monitor the injection interval (UVB well screens set at approximately 39 to 49 feet bgs). Wells, screened intervals, and distances from the UVB wells are presented in Table 1.

**TABLE 1**  
 OU-4 — UVB and Monitoring Well Construction Data

Well	Approximate Screened Interval (feet, bgs)	Approximate Distance from UVB-1 (feet)	Approximate Distance from UVB-2 (feet)
UVB-1	3-13 (withdrawal) 39-49 (injection)	N/A	80
UVB-2	3-13 (withdrawal) 39-49 (injection)	80	N/A
6A	6-11	50	130
7C	39-44	50	130
8A	6-11	30	110
9C	39-44	30	110
10A	6-11	20	100
11C	40-45	20	100
12A	No information (6-11 assumed)	90	15
13C	No information (39-44 assumed)	10	10

All seven observation wells are being monitored using Troll Model SP4000 pressure transducers, manufactured by In-Situ Incorporated. Transducers are also installed in each UVB well to monitor drawdown at the pumping wells. The hydrographs presented in Appendix A are printouts of raw data from the data loggers showing water level elevations versus date. The hydrographs indicate a definitive head response to rainfall events and drawdown created by the treatment systems.

UVB-1 is extracting and injecting groundwater with an approximate average flow rate of 1.5 gpm over this reporting period with significant decreases in extraction and injection levels over the last two months. Operational water level fluctuations within the pumped interval are approximately 2 to 2.5 feet. The pumped water level (approximately 99 feet) does not approach the elevation of the low-level switch at 89.65 feet which is consistent with the idea that the operational capability of the well is limited by the ability to inject into the deep interval. The spacing between cycling peaks varies as noted on the attached hydrographs. The groundwater extraction pump cycles on and off based on the level of water in the treated water effluent tank. The influent pumping is therefore suspended periodically to allow the effluent discharge to gain

some storage volume in the effluent storage tank. This results in cycling on and off of the influent submersible pump for the system to achieve balanced flows and the reason for the varying spaces between cycling peaks as noted on the hydrographs. The amplitude of the cycling peaks do not change significantly over this reporting period.

Hydrographs for observation wells OLD-13-10A and OLD-13-11C exhibit the greatest response to pumping at UVB-1 as would be expected since these observation wells are situated only 15 feet from the treatment system. The head differential in OLD-13-10A/OLD-13-11C was approximately 1 foot at the beginning of this reporting period but has increased to approximately 3 feet over the last two months as the re-injection rates have deteriorated. The most recent hydrographs primarily depict water level responses to rainfall events since the treatment system at UVB-1 is not currently operating efficiently.

The current operational limitation at UVB-1 is believed to be both withdrawal fluctuations from air-entertainment and/or biological or geochemical fouling of the extraction pump and the injection capacity of the deep interval. These factors have led to subsequent reductions in the effective hydraulic conductivity of the aquifer as observed in the re-injection totals noted on the totalizer meter. Approximately 185,000 gallons of groundwater has been extracted, treated, and re-injected to the lower screen since start-up of UVB-1 in late August 1999.

Water level fluctuations in observation wells OLD-13-12A and OLD-13-13C respond primarily to rainfall events and not to the expected water table drawdown from system pumping. The hydrographs for UVB-2 were annotated with elevations of the top of casing flange, low level switch, transducer, and pump intake. Operational water level fluctuations within the pumped interval are approximately 6 feet to greater than approximately 10 feet over this reporting period. The pumped water level routinely fell below the low-level switch elevation, and the water level was below the pressure transducer for significant periods of time. The spacing between cycling peaks is small indicating that the withdrawal pump cycles frequently. Site observations indicate that the pump is on for approximately one-eighth of the time or less.

Daily rainfall data for this reporting period was obtained from the Orlando International Airport (OIA). Select data was also collected from the Executive Airport (OEA) located approximately 1.5 miles from the site. This data was not available for the entire reporting period as the OEA does not regularly document rainfall data. The data that was available was used to help distinguish between natural fluctuation of water levels due to rainfall events and the effects that the UVB treatment system has on the surficial water table. Available rainfall data is provided in Appendix B.

UVB-2 was initially extracting and injecting groundwater with an approximate average flow rate of 0.5 gpm but the system is currently not operational although the extraction pump motor continues to operate. The current operational limitation appears to be the withdrawal capacity from the shallow interval and potential problems from pump fouling or wearing of the pump impellers.

## **INFLUENT AND EFFLUENT DATA**

Groundwater samples were collected from the influent and effluent sampling ports of UVB-1 and UVB-2 on January 6 and 7, 2000, respectively, and submitted to Accutest Laboratories of Orlando, Florida for a full suite of laboratory analysis including volatile organic compounds (VOCs) by EPA Method 8260B. Laboratory results from the influent and effluent ports at UVB-1 and UVB-2 are summarized in tables provided in Appendix C. This data was collected to evaluate the efficiency of the treatment system and to compare it to the proper discharge criteria as defined in Table 1-1 from the *IRA: Conceptual Design and Performance Specification, OU-4*.

The treatment sphere discharge criteria from the IRA were based on Florida's Surface Water Quality Standards for chemicals with assigned standards. These values included 8 µg/L for tetrachloroethene (PCE), 80 µg/L for trichloroethene (TCE), and 70 µg/L for total 1,2-dichloroethene. These discharge criteria were established based on Florida's Surface Water Quality Standards for chemicals with an assigned standard. All other effluent contaminants of concern should meet Florida's maximum contaminant levels, where applicable.

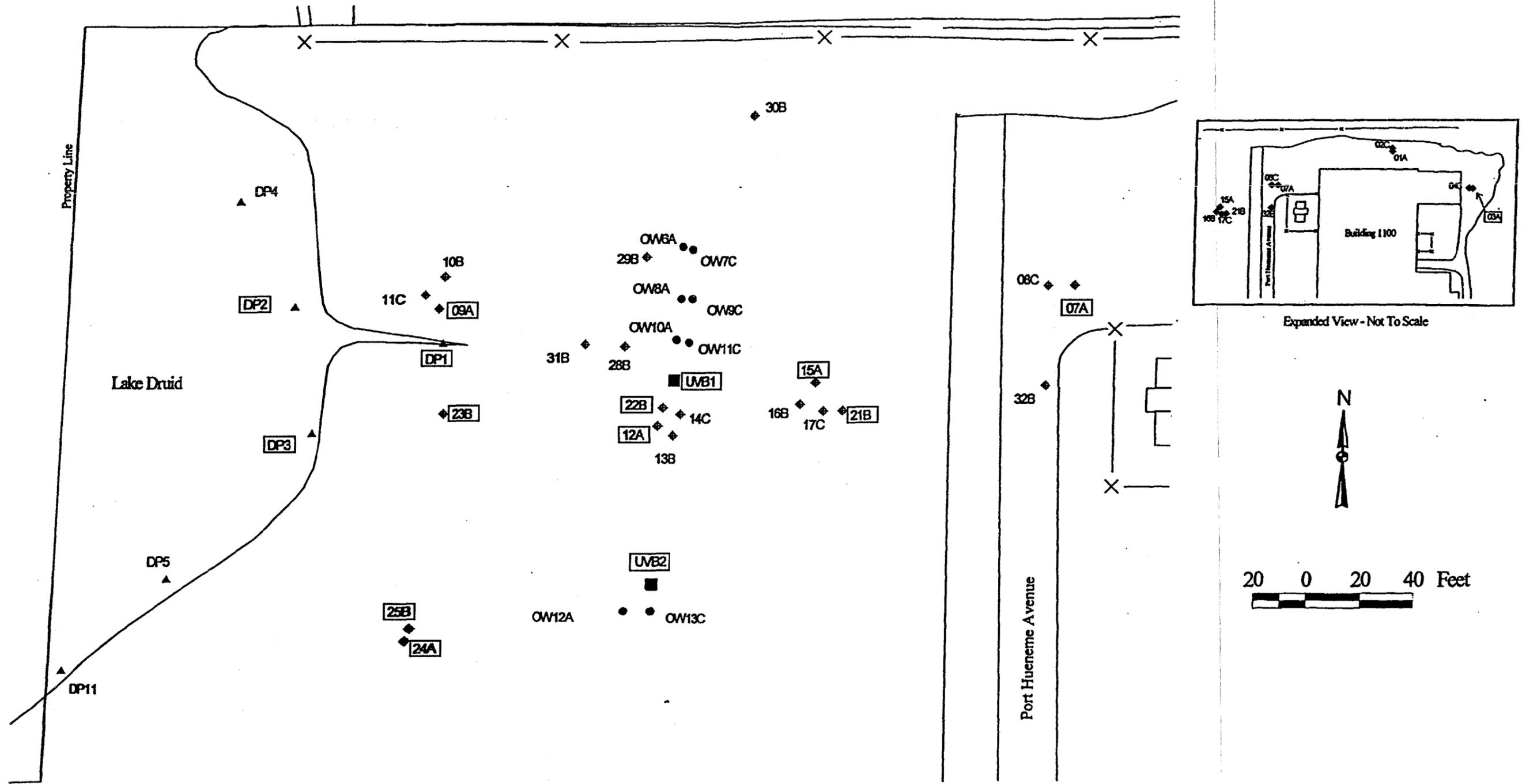
The PCE effluent discharge concentration for UVB-1 (576 µg/L) exceeded the discharge criterion during the January 2000 sampling. Both UVB-1 and UVB-2 met the effluent discharge criteria for TCE and cis-1,2 DCE, although there was little difference in concentration levels between the influent and effluent data indicating that the two treatment systems were not operating as designed during the sampling event in January 2000.

## **GROUNDWATER QUALITY IN MONITORING AND DRIVE POINT WELLS**

Nine monitoring wells (OLD-13-07A, 09A, 12A, 15A, 21B, 22B, 23B, 24A, and 25B) and three drive points (OLD-13-DP1, DP2, and DP3) were sampled during the week of January 3, 2000 to evaluate groundwater quality within the study area. Sampling locations are illustrated in Figure 1. Samples were collected for a full suite of laboratory analysis including VOCs using EPA Method 8260B. A summary of this data is provided in a table in Appendix C. Ground water sampling logs are provided in Appendix D.

Monitoring well OLD-13-07A is situated hydraulically upgradient of the UVB wells within the suspected source area and was sampled to evaluate groundwater quality migrating towards UVB-1. Laboratory analytical data indicates a total VOC concentration of 3,113 µg/L which is lower than the concentrations of 18,000 to 34,000 µg/L noted during sampling events in January, February, and March of 1998. The fluctuating trend in groundwater quality data observed at this source area well most recently appears on a downward trend as can be seen on the graph presented as a supplement to laboratory data tables in Appendix C.

Monitoring well OLD-13-09A is situated approximately 100 feet due west of UVB-1 near the edge of Lake Druid. Current laboratory analytical results at this sampling point indicates a total VOC concentration of 2,647 µg/L, a slight increase over the concentration of 2,450 µg/L identified during the last sampling event in January of 1999. The groundwater quality trend graph for this



**LEGEND**

- ◆ Monitoring Well Location and Designation
- Observation Well Location and Designation
- ▲ Drive Point Well Location and Designation
- Recirculation Well Location and Designation
- 24A Groundwater Sample Collected During January 2000 Sampling Event

**FIGURE 1**  
**OU-4 Site Map**

INTERIM REMEDIAL ACTION,  
 PERFORMANCE MONITORING  
 AND SAMPLING PLAN,  
 OPERABLE UNIT 4  
 NAVAL TRAINING CENTER  
 ORLANDO, FLORIDA



well in Appendix C indicates fluctuating total VOC concentrations over time with an approximate mean of 2500 µg/L.

Monitoring well OLD-13-22B is located approximately 20 feet south of UVB-1, and is screened within the recirculation cell from 27 to 32 feet Bls. The total VOC concentration in this well has increased from 208 µg/L in January 1999 to 1734 µg/L for the January 2000 sampling event. This concentration is similar to the concentrations observed at this sampling location during sampling events in 1998, and similar to other wells, provides no real distinctive upward or downward trend in groundwater quality.

Laboratory data from monitoring well OLD-13-15A identified an increase in total VOC concentrations from historical levels as shown on the attached graph. The concentration of 19,000 µg/L detected during the January 2000 sampling is significantly higher than concentrations detected during previous sampling events, and may be an anomaly.

Laboratory analytical results for Lake Druid drive point well DP-2 indicate a decrease in total VOC concentrations from 366 µg/L in January 1999 to 213 µg/L in January 2000. The graph of historical data for this sampling location indicates a downward trend in total VOC concentrations over time. Total VOC concentrations at drive point well DP-3 have decreased from 3,600 µg/L in March 1998 to 1633 µg/L in January 2000, the second consecutive decrease noted at this well. Total VOC concentrations at drive point well DP-1 have also decreased for two consecutive sampling events, but the overall trend as shown on the attached graph, indicates no clear upward or downward trend.

The overall fluctuating trend of total VOC groundwater quality at the site indicates that when the UVB wells are up and running at levels previously achieved for periods of time, they are capable of achieving the required remedial goals in the IRA. Potential changes in seasonal groundwater geochemistry and varying release rates of dissolved VOCs from the source area plume may also help explain the wide ranging fluctuations seen in groundwater quality at the site.

## **AIR EMISSIONS**

Off-gas samples from the UVB wells were collected on January 7, 2000 and submitted to the laboratory for VOC analysis using EPA Method TO14. Air sample analytical results and graphs illustrating historical trends are provided in Appendix C. The attached graphs appear to indicate decreasing VOC concentrations from the system effluent, but this may actually be a result of interruptions in system service particularly during the January sampling event.

The total mass of contaminants emitted from both UVB-1 and UVB-2 historically have combined to be less than 0.2 pounds per day, far below the FDEP maximum daily limit of 13.7 pounds per day. These values are not expected to be exceeded from the two UVB systems due to operational interruptions as discussed throughout this report.

## CONCLUSIONS AND RECOMMENDATIONS

Laboratory analytical data from the January 2000 sampling event indicates that VOC concentrations increased since the previous sampling event in monitoring wells downgradient of the UVB recirculation wells. These increases are likely a result of difficulties in maintaining the hydraulic performance of the systems.

Data from the source area well (OLD-13-07A) appears to indicate that the chlorinated solvent plume is exhibiting a downward trend in total VOC concentrations since startup of the IRA. This downward trend, although only noted over the last three sampling events, may indicate that the chlorinated solvent plume may be experiencing some level of natural degradation over time. This trend will continue to be monitored during future sampling rounds to better evaluate groundwater quality at the site.

The overall trend of groundwater quality at the three drive point wells sampled during this event indicates a continued decrease in total VOC concentrations. The downward trend observed at the drive point wells coupled with the fluctuating concentrations noted at the monitoring wells indicates that when operating at or near design specifications, the UVB wells are capable of reducing downgradient VOC concentrations and achieving surface water standards in groundwater entering Lake Druid. Based on the capture zone modeling conducted by the United States Geological Survey (USGS), an estimate of 3 to 6 months time was required for treated groundwater to reach these locations from UVB-1. Using this estimate, VOC concentrations can again be expected to fluctuate during the next sampling event scheduled for the first quarter of 2000 since UVB-2 has had numerous interruptions in service since mid September and UVB-1 similar interruptions since early January.

Continued efforts to re-balance and maintain the two UVB wells during this reporting period have failed. The current operational limitation at UVB-1 is believed to be both withdrawal fluctuations from air-entertainment and/or biological or geochemical fouling of the extraction pump and the injection capacity of the deep interval. In addition, power outages in late January and mid February interrupted service at both UVB wells. The operational limitation at UVB-2 appears to be the withdrawal capacity/recharge capabilities of the shallow interval and potential problems from pump fouling or wearing of the pump impellers. Several re-balancing efforts have been attempted at UVB-2 without success and the system is currently down.

Since the operation and maintenance of the two UVB wells historically has been extremely difficult and efforts to maintain hydraulic performance virtually impossible, a comprehensive O&M site visit to disassemble the two UVB wells appears warranted at this time. It is our opinion that this effort should include a thorough evaluation of the current operating condition of the system, including dismantling, cleaning, and redeveloping the two UVB wells. In addition, the possible replacement of internal components may also be necessary to achieve the extraction and reinjection design criteria of the IRA.

CCI and HLA are evaluating other remedial alternatives should the UVB system evaluation conclude that the costs to rehabilitate the current system are much greater than installation of a different remedial system.

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Naval Facilities Engineering Command  
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As of this writing, HLA is conducting a potassium permanganate pilot study within the limits the OU-4 chlorinated solvent source area. Laboratory analytical data from the next sampling event scheduled for early April, 2000 will evaluate the impact, if any, the pilot study has on groundwater quality emanating from the suspect source area plume.

The next round of quarterly sampling will be completed during the week of April 17, 2000; the results of the sampling will be included in the next quarterly report to be submitted in June 2000.

CCI appreciates the opportunity to be of continued service to the Southern Division Naval Facilities Engineering Command and looks forward to discussing this report with you at your convenience. Please feel free to call Steve Tsangaris at (813) 874-0777 if you have any questions or comments.

Sincerely,

CH2M HILL CONSTRUCTORS, Inc.



*for* Denis Ewing  
Senior Project Manager

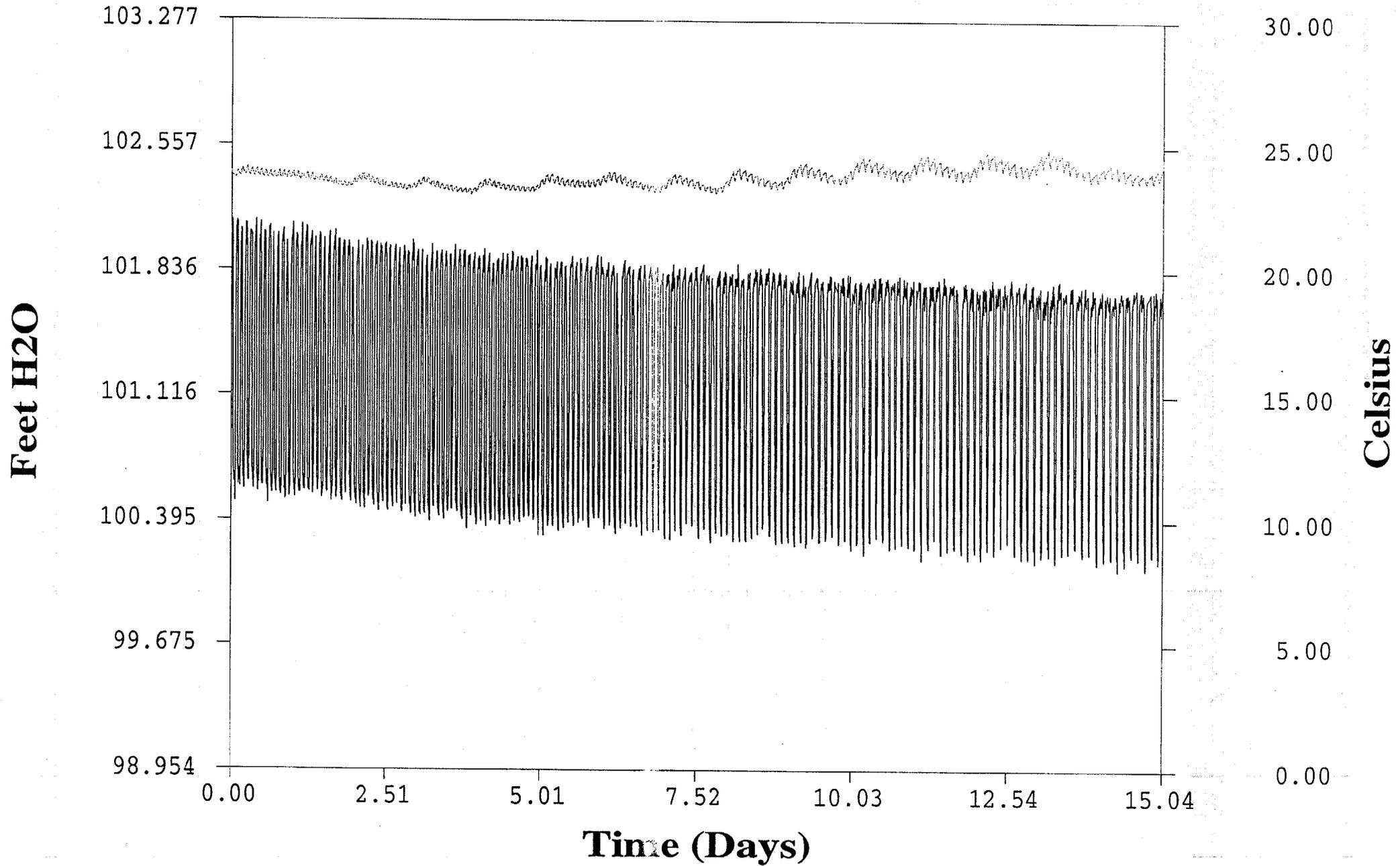
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c: Wayne Hansel, Southern Division  
Cliff Casey, Southern Division  
Nancy Rodriguez, USEPA Region IV  
David Grabka, FDEP  
Steve Tsangaris, CH2M HILL  
Fernando Ferreira, CH2M HILL

APPENDIX A

# Hydrographs

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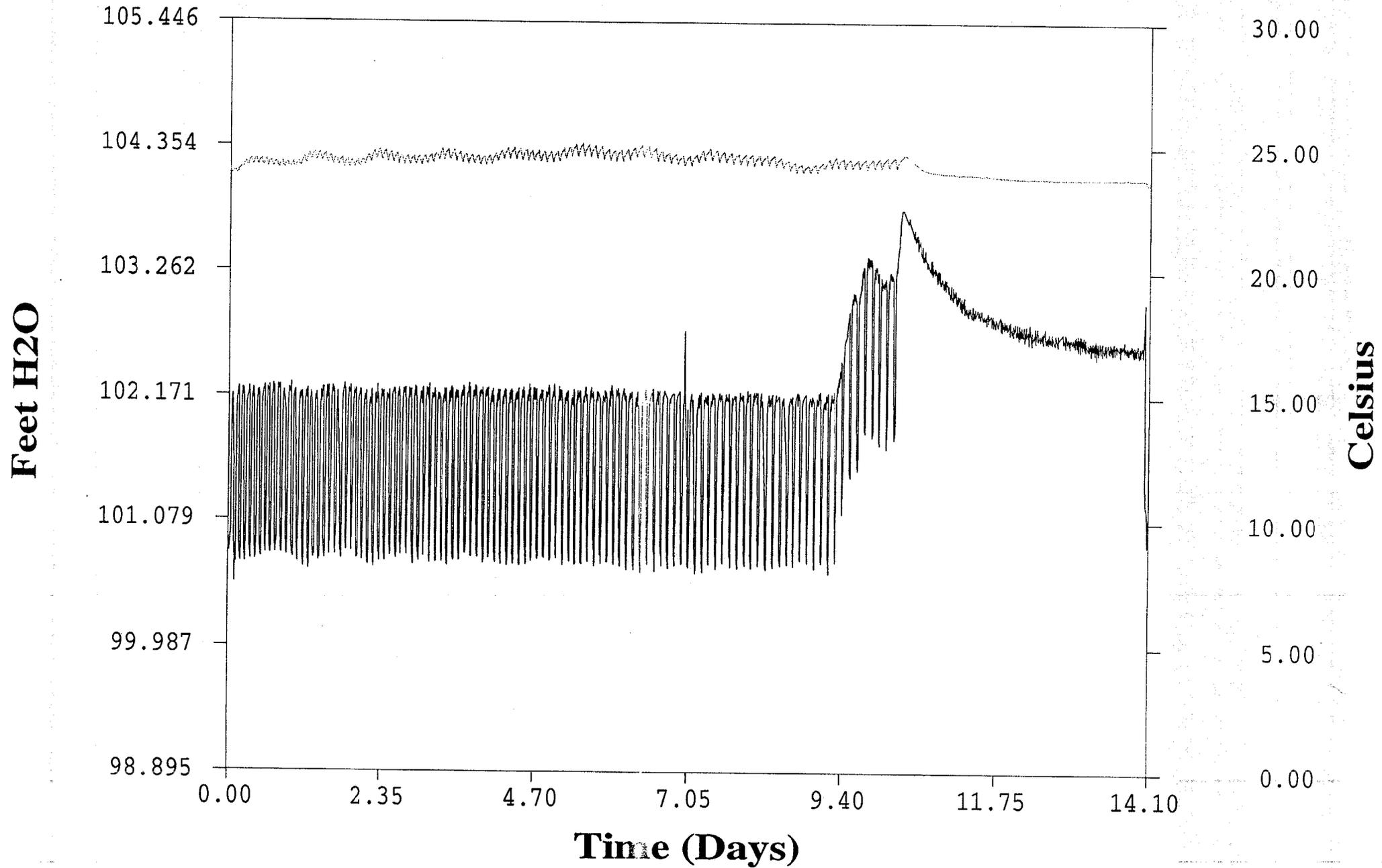
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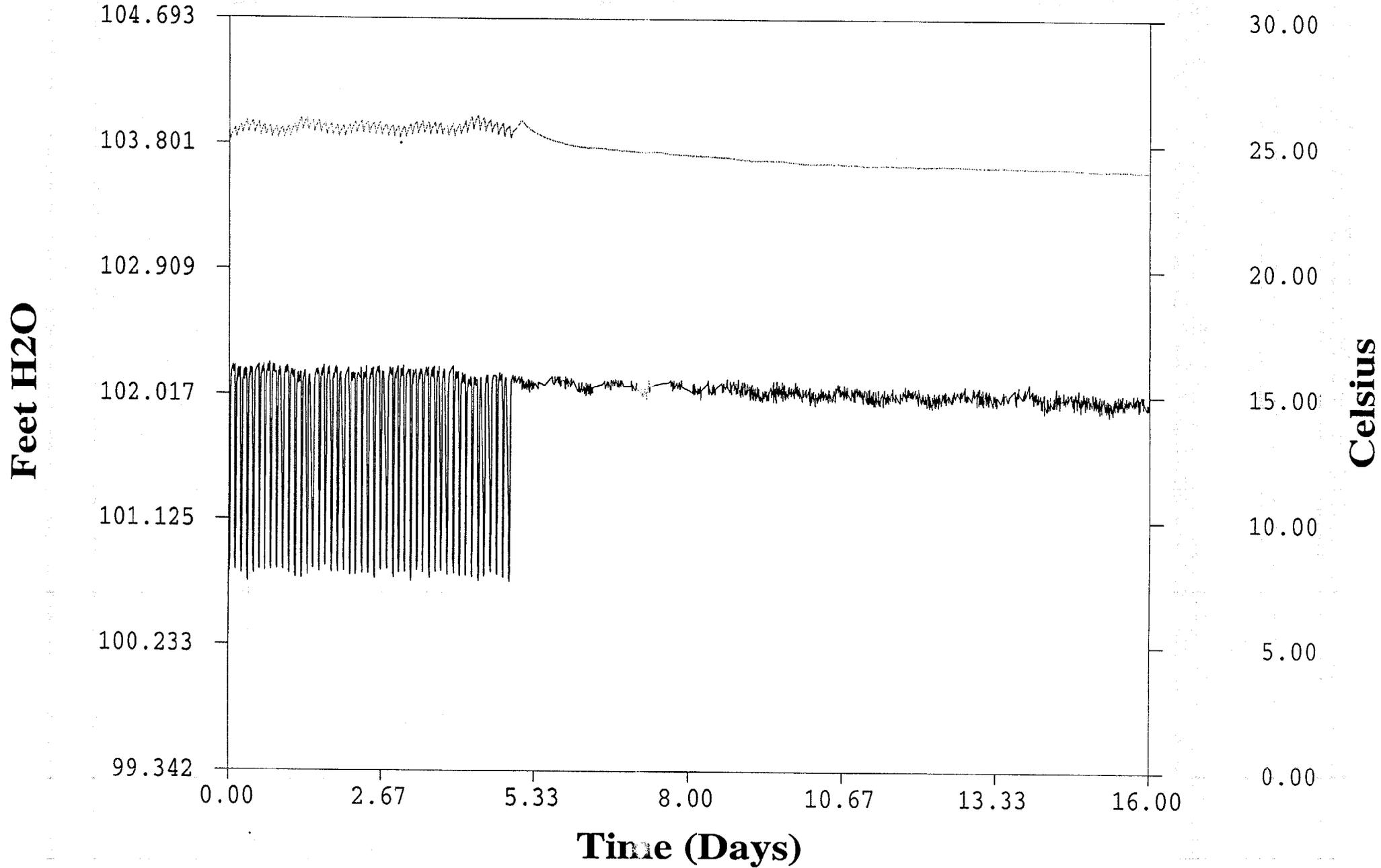
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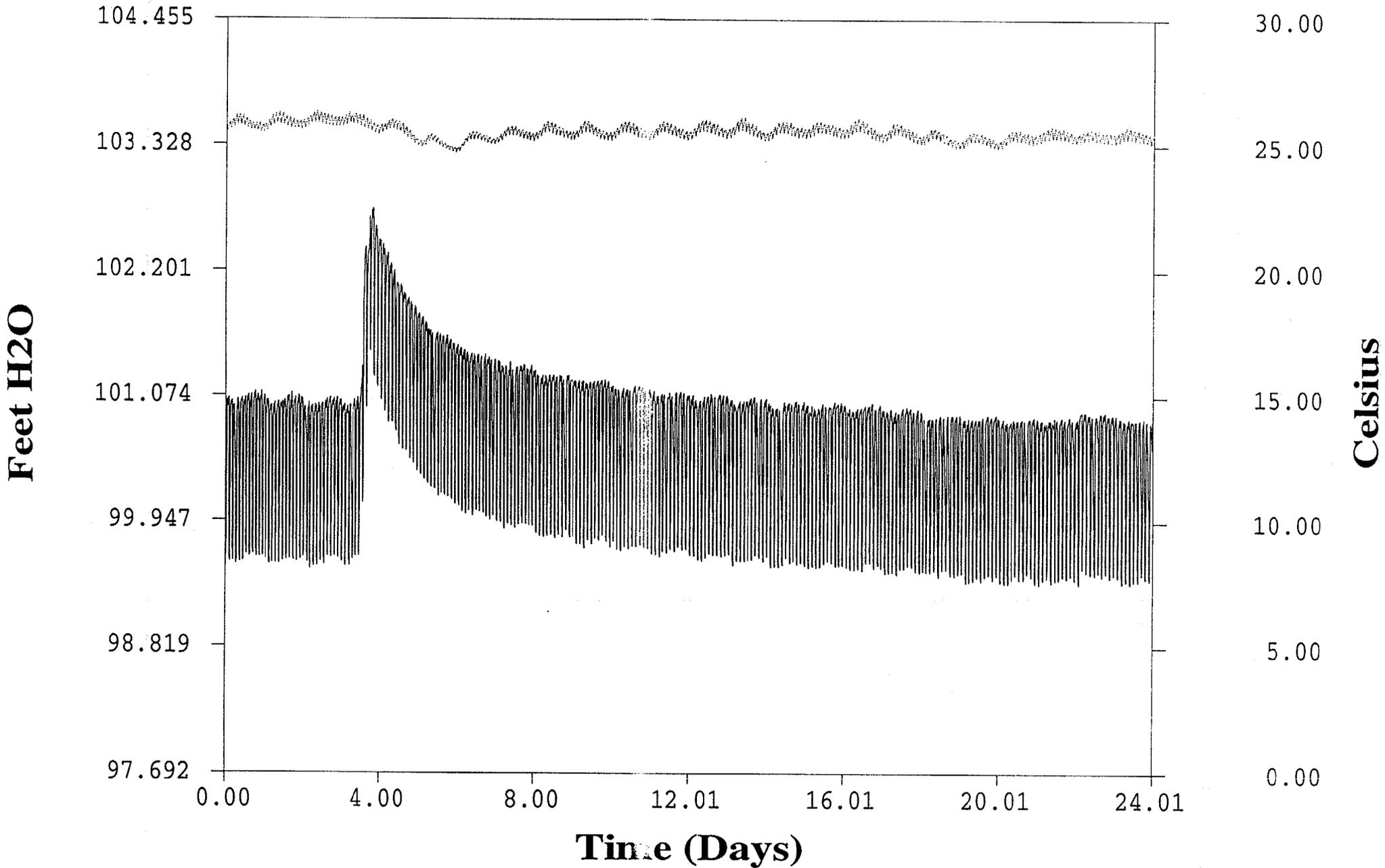
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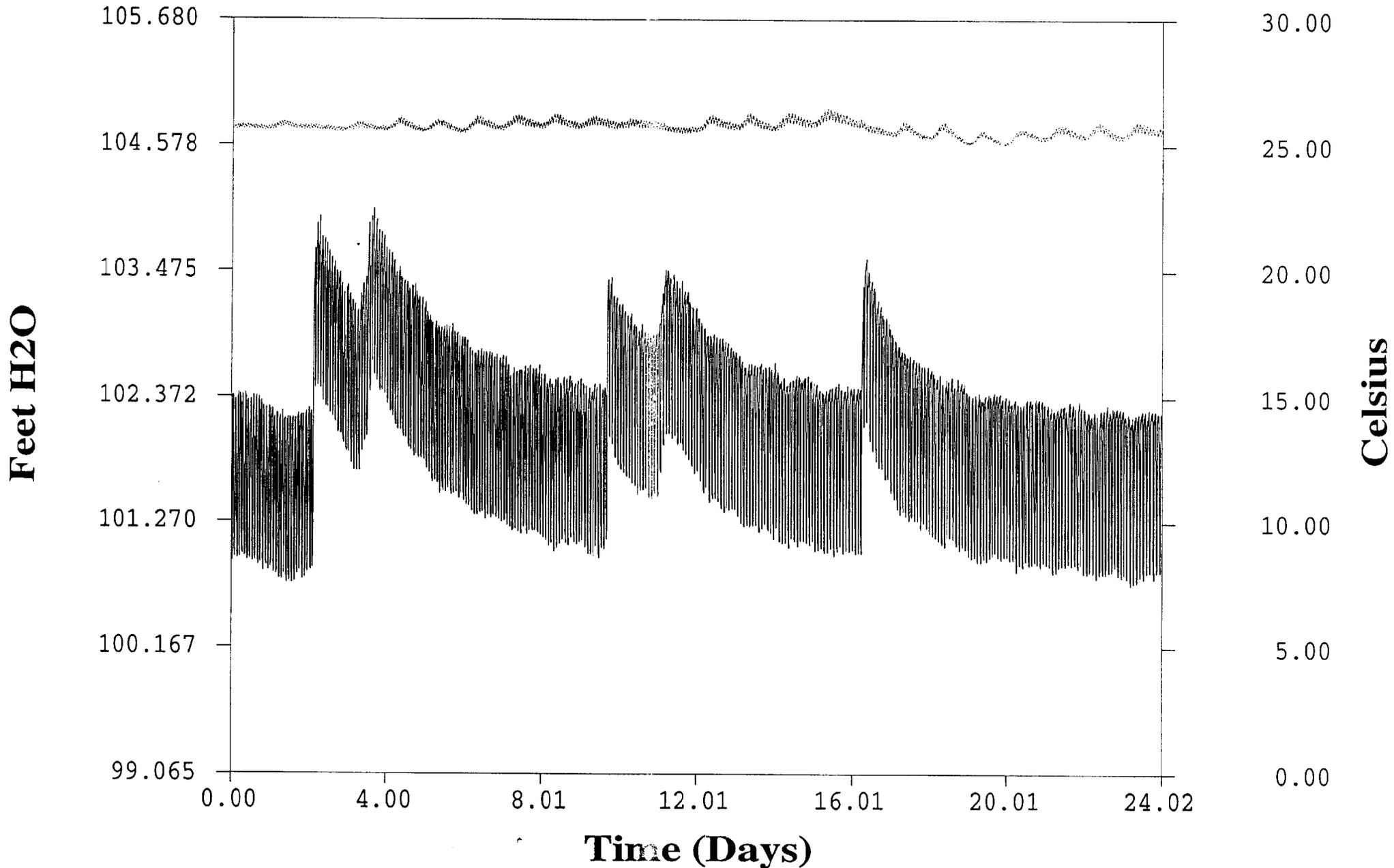
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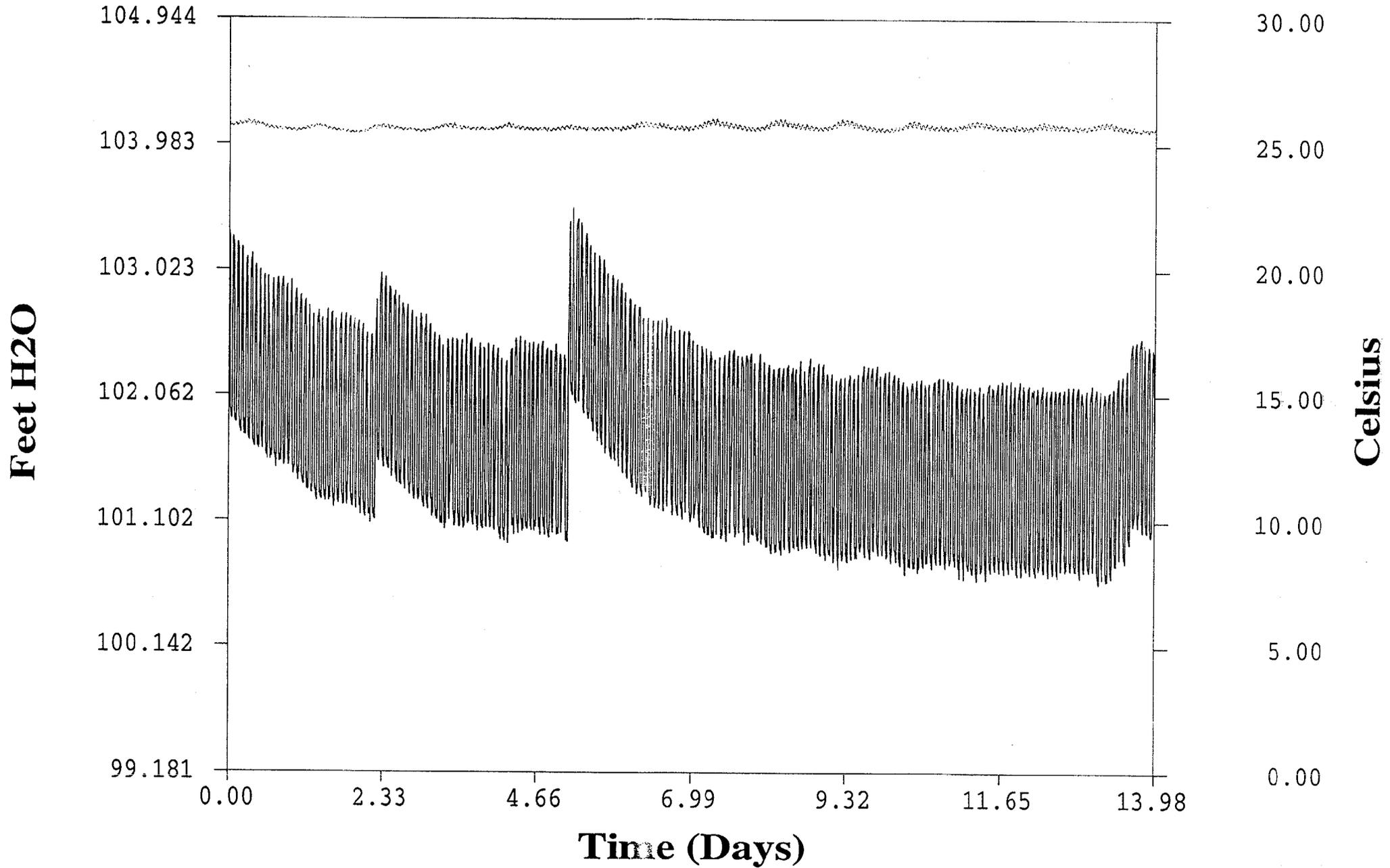
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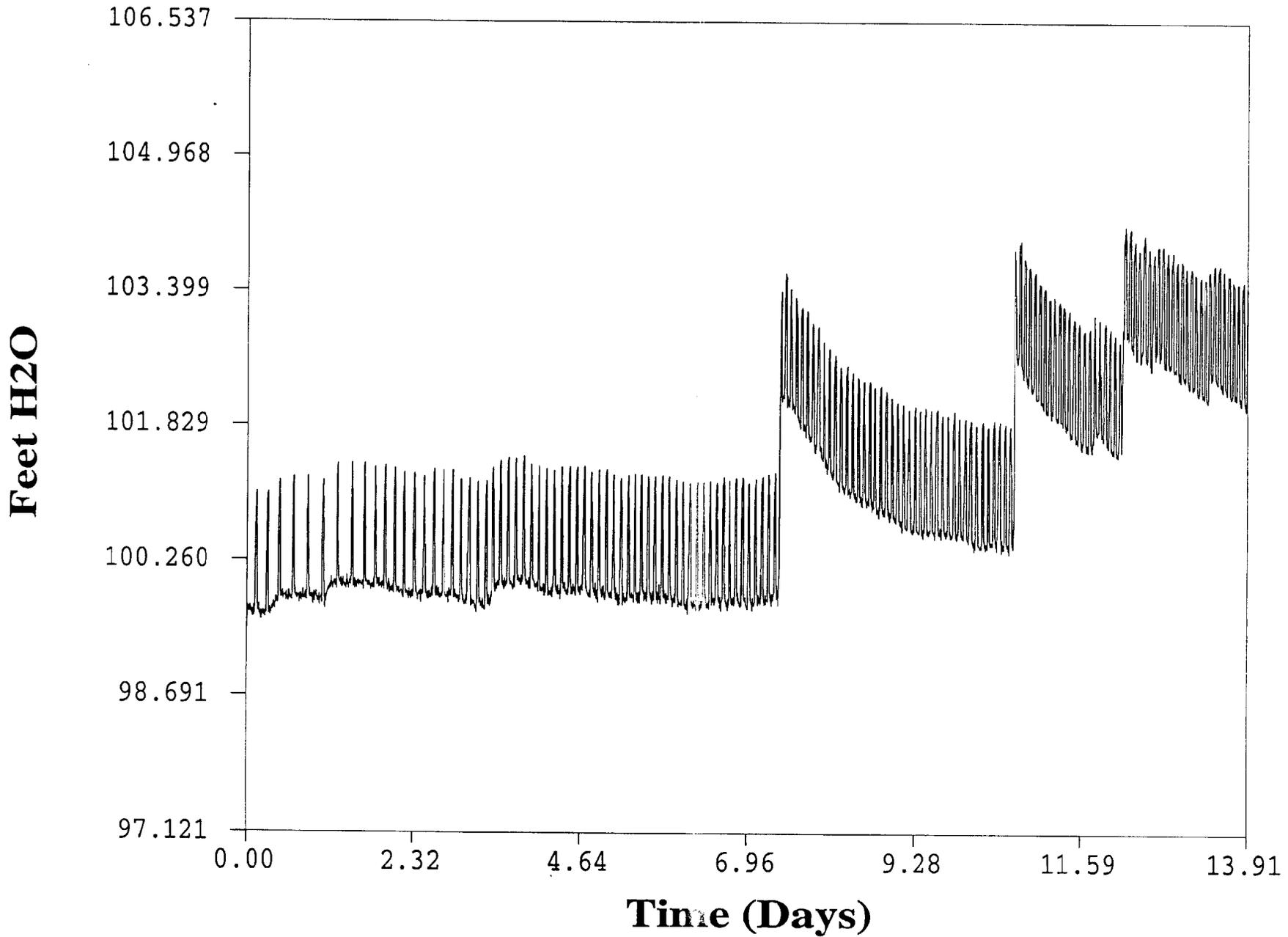
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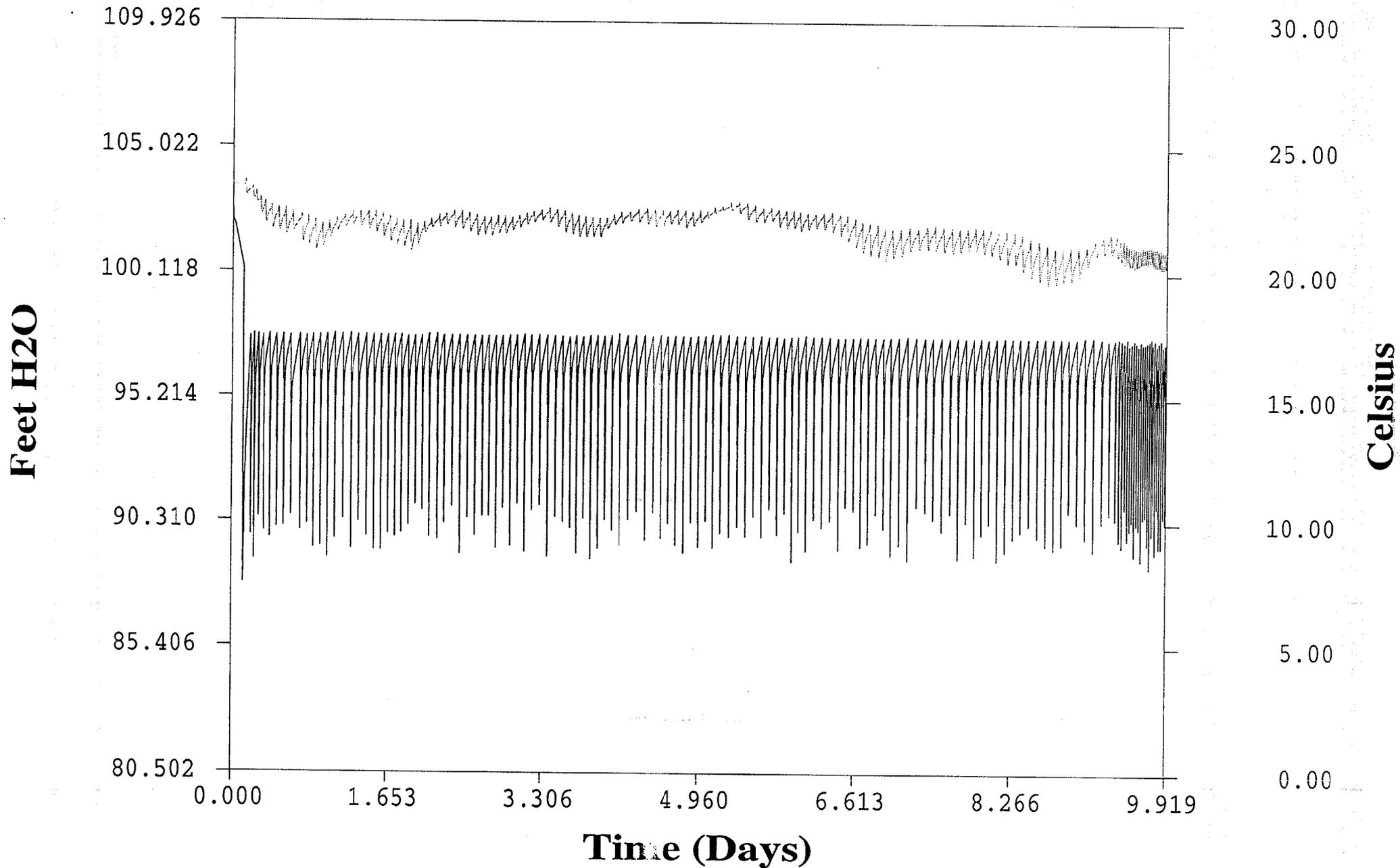
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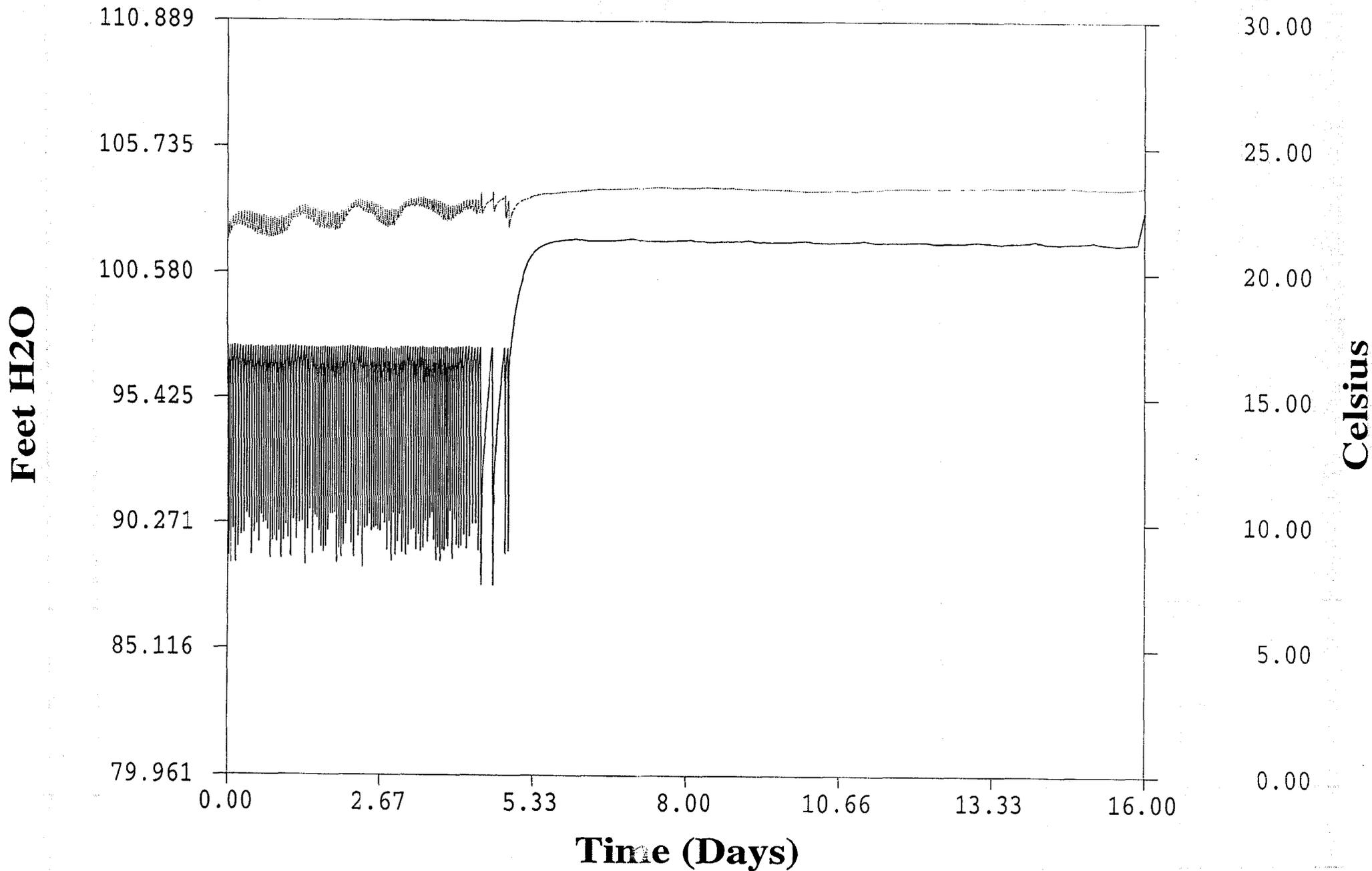
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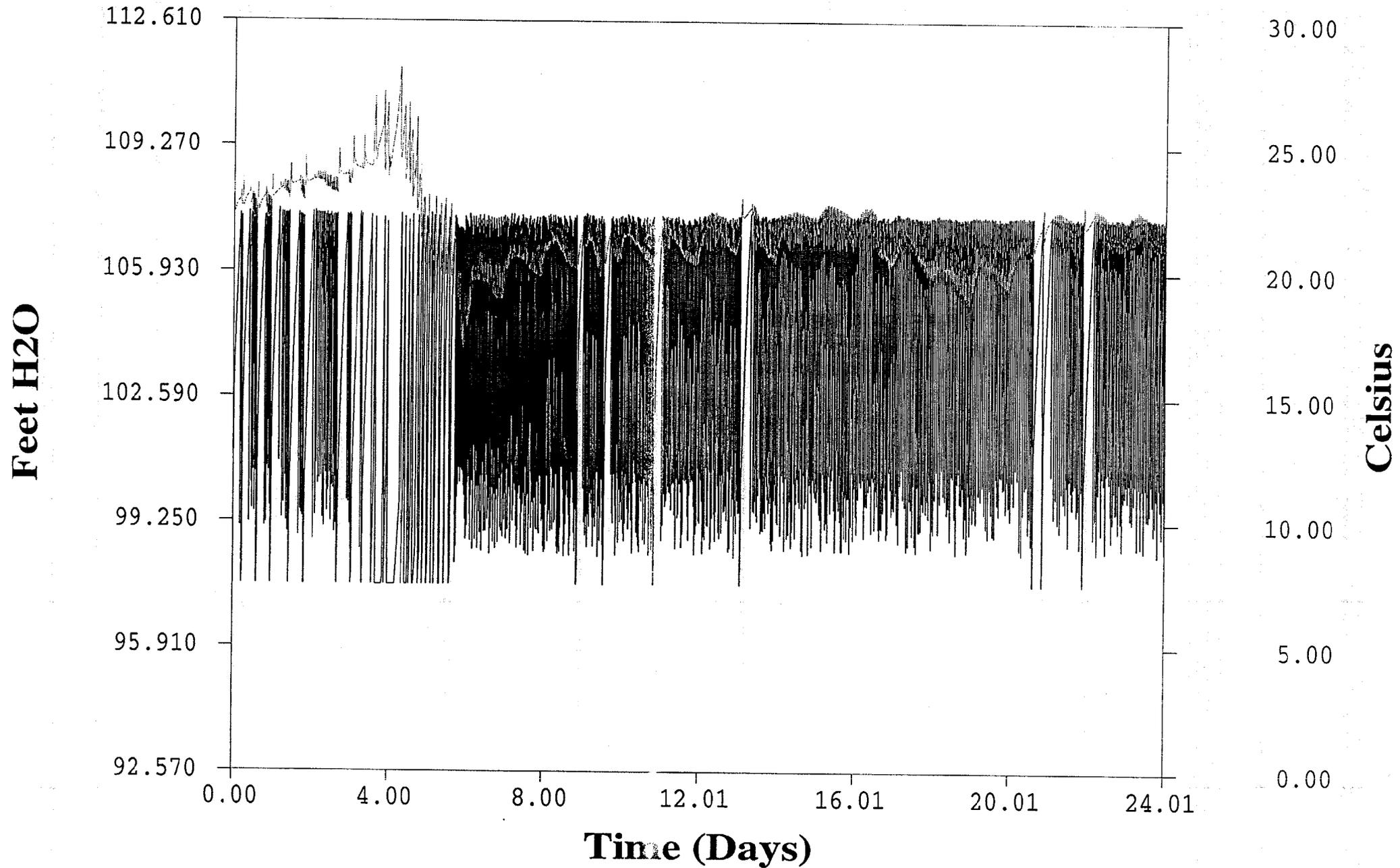
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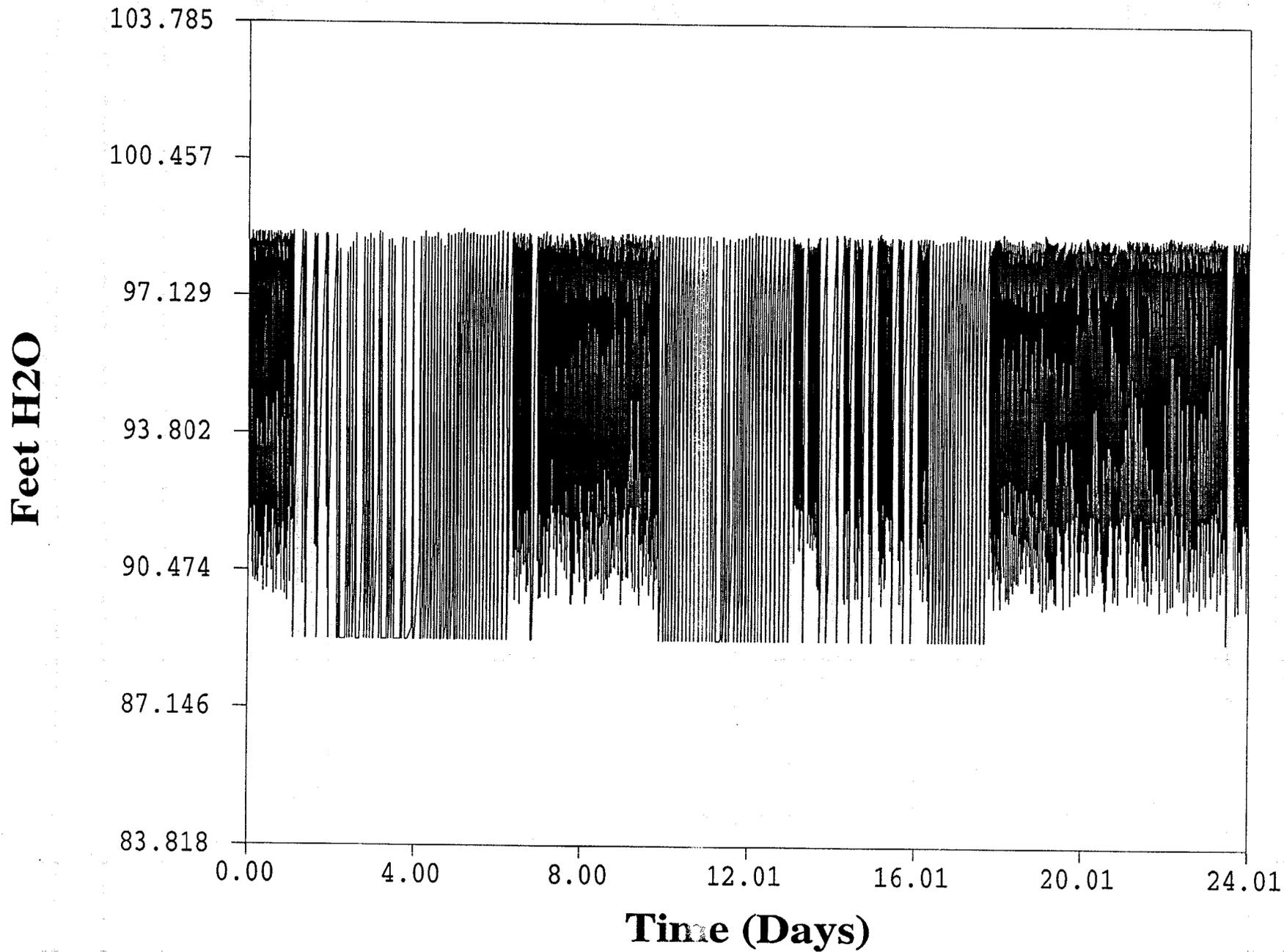
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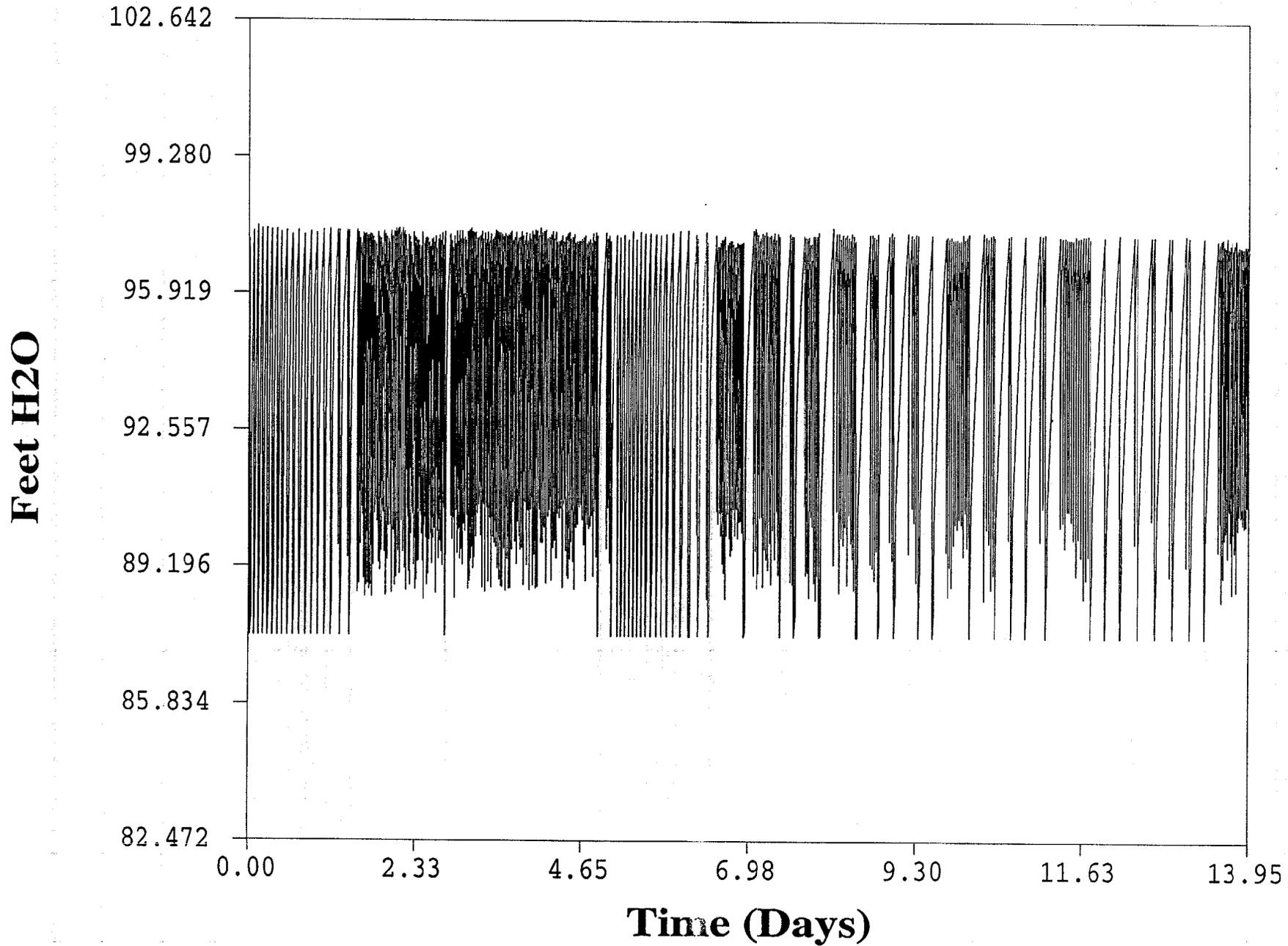
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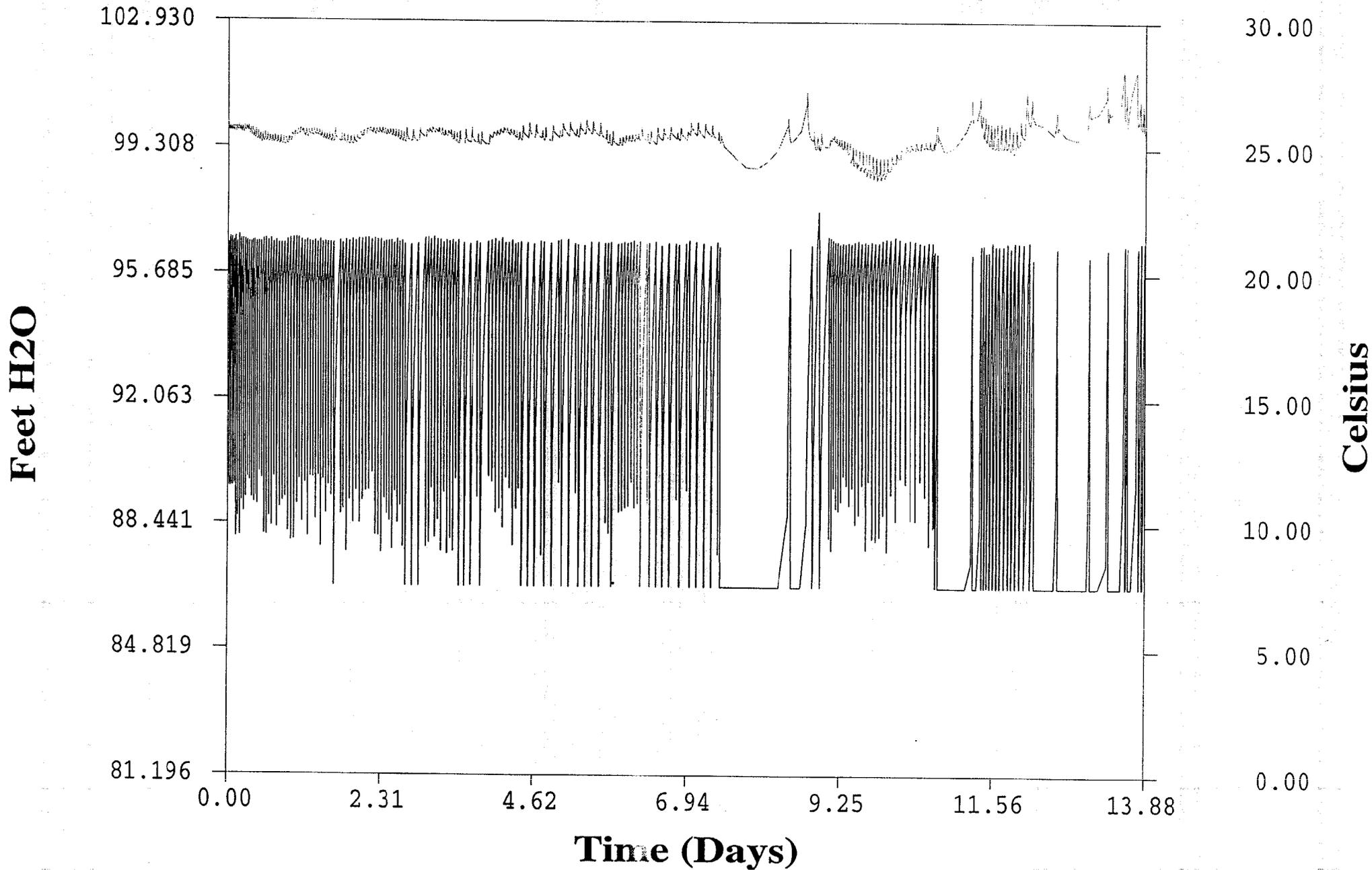
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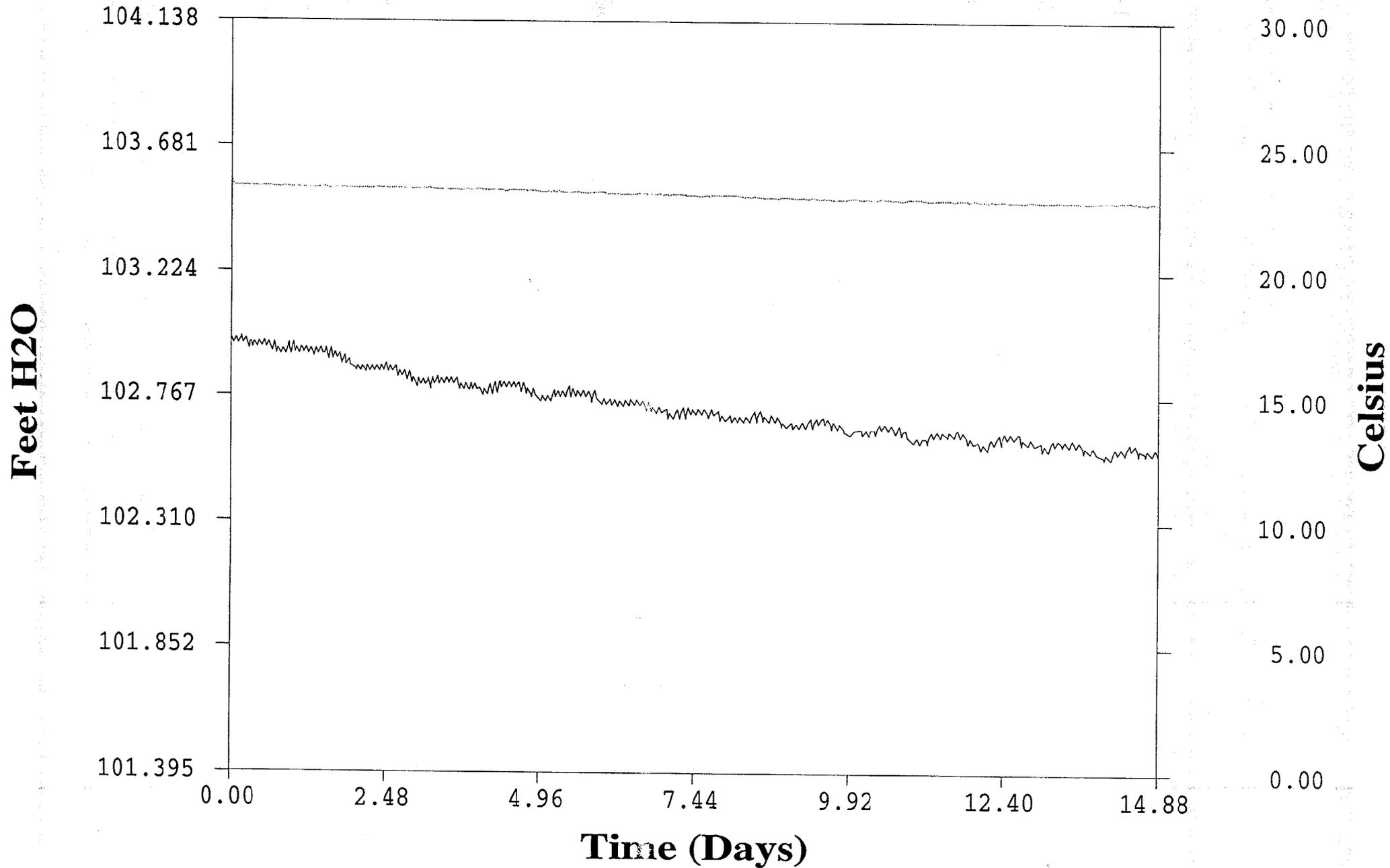
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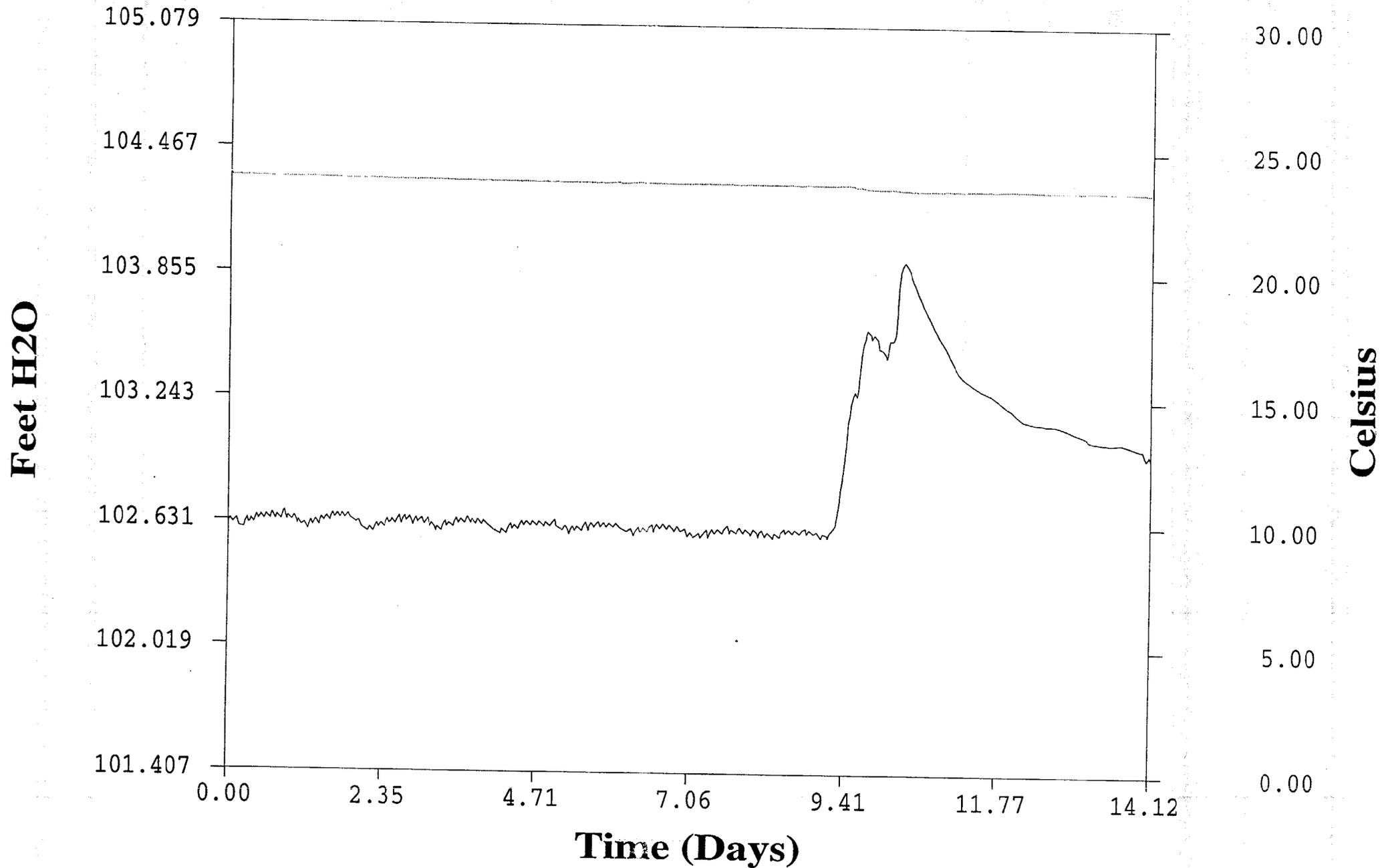
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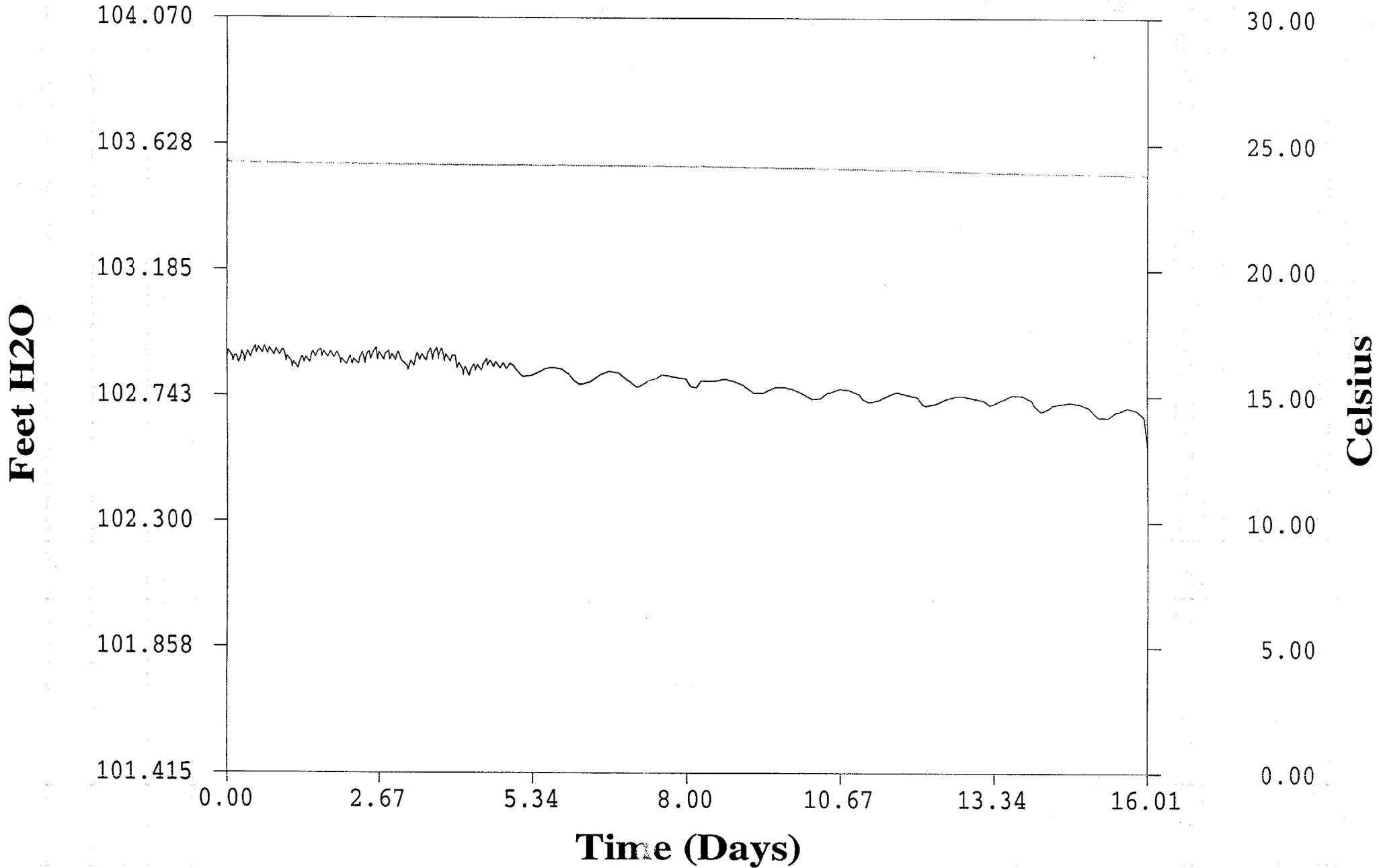
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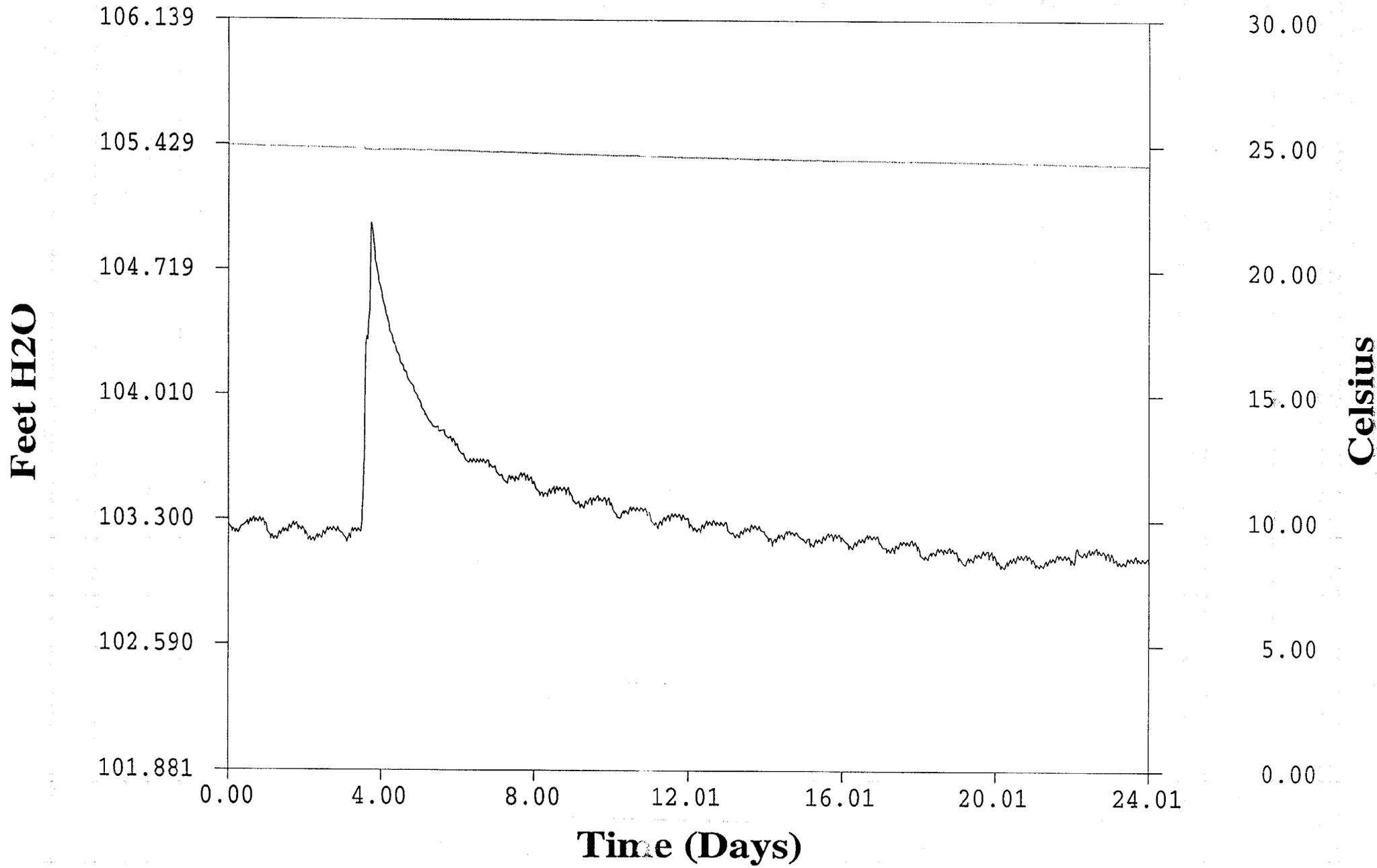
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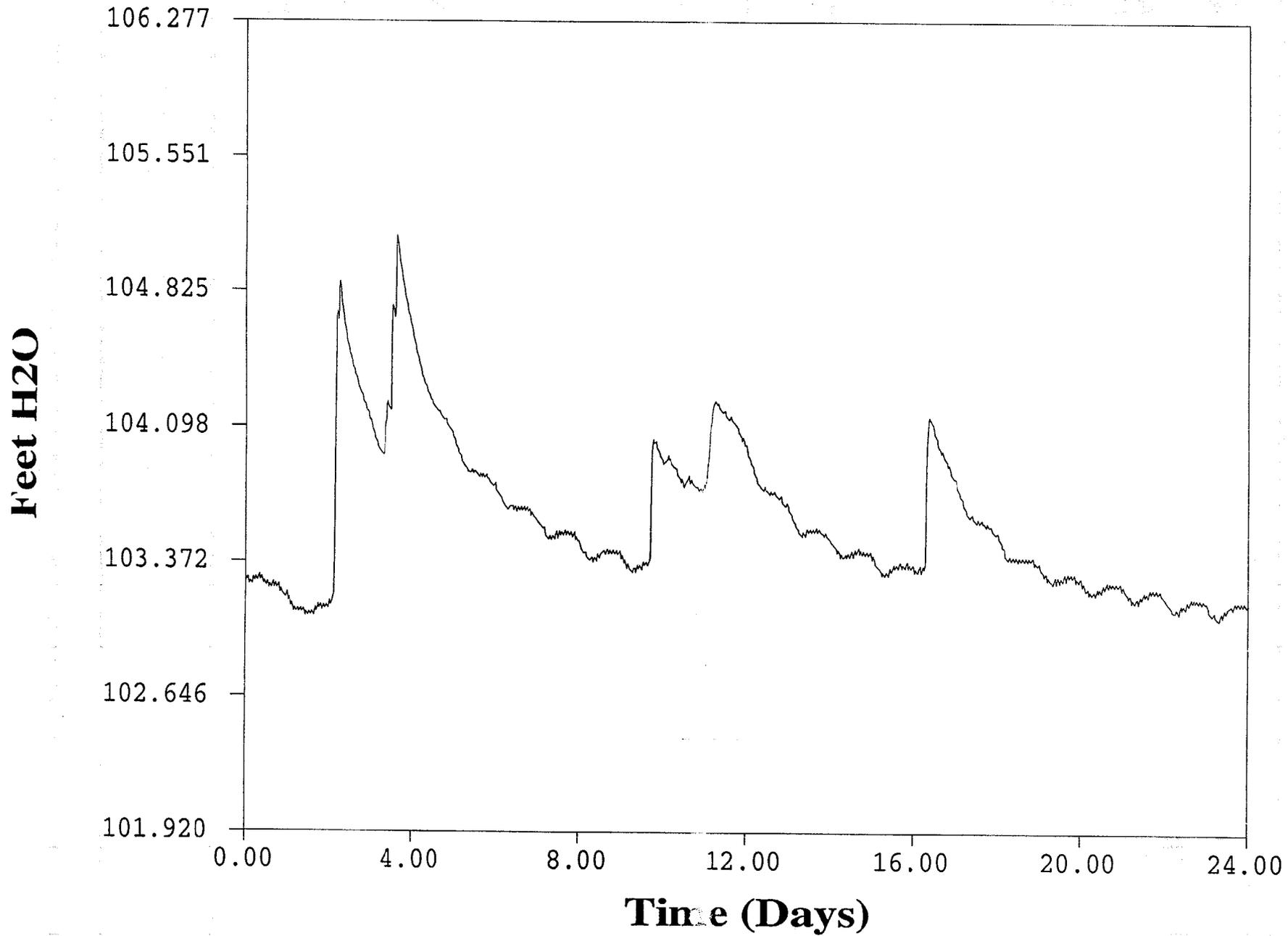


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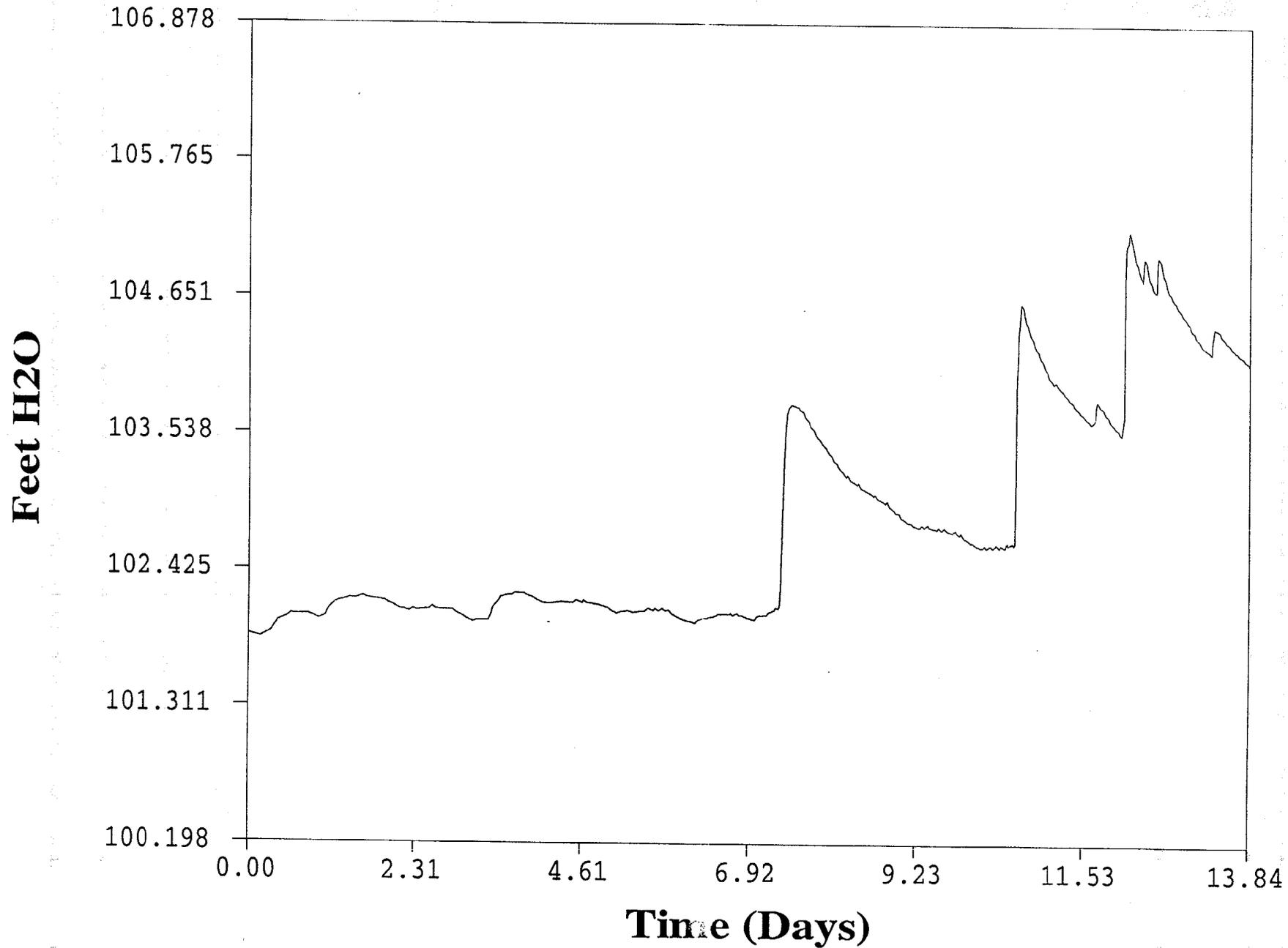
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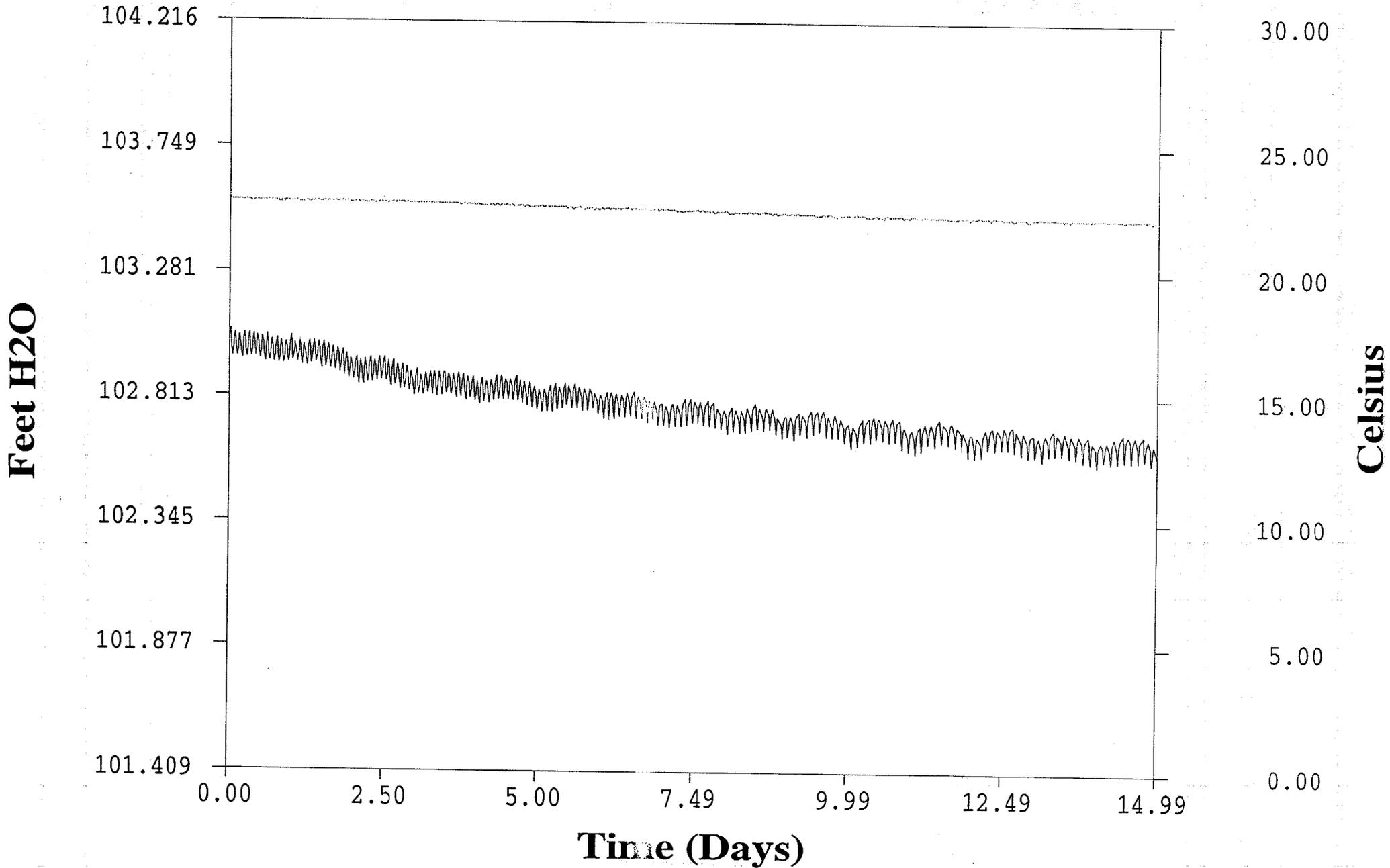
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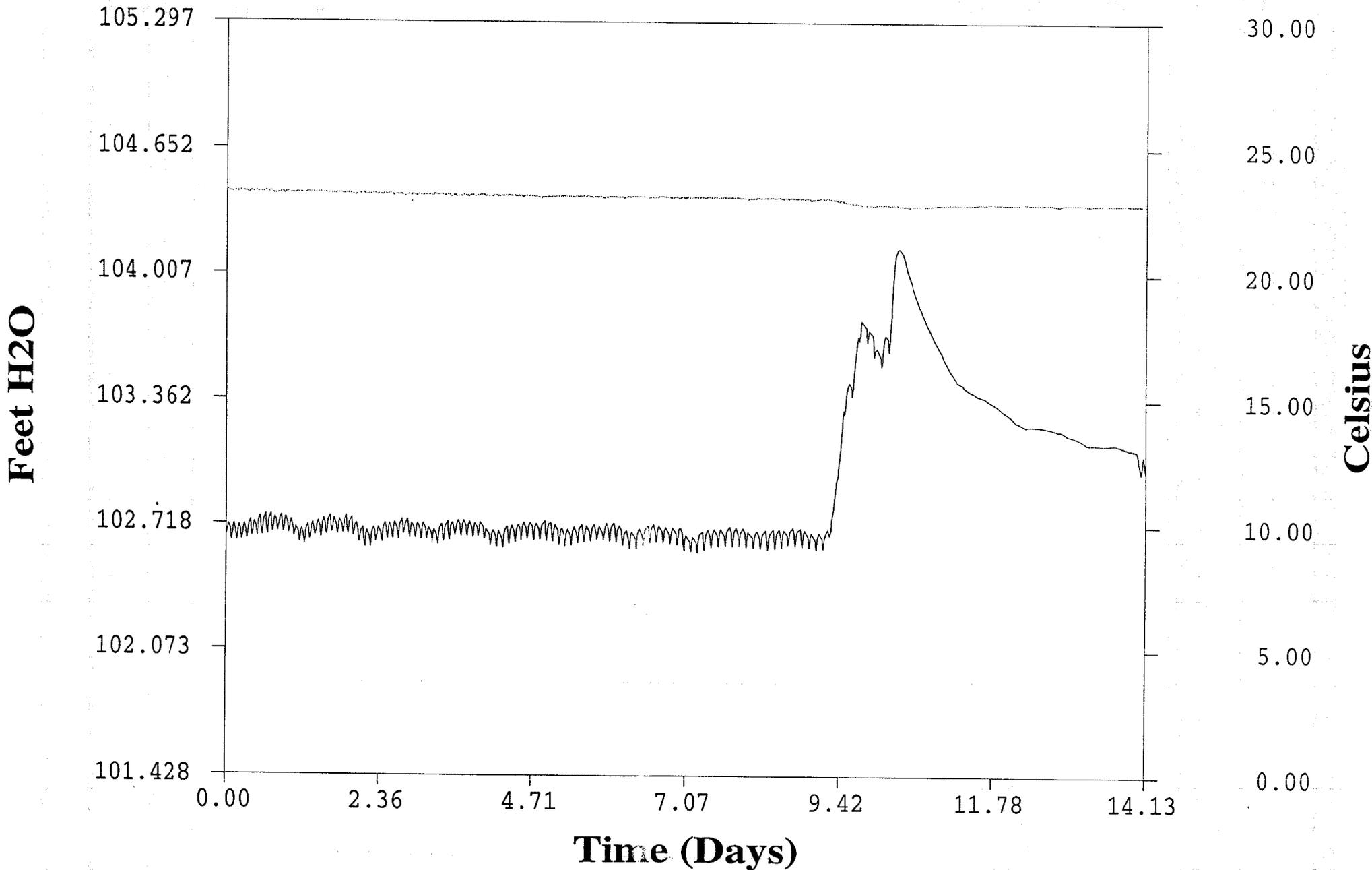
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[1] - OnBoard Temp

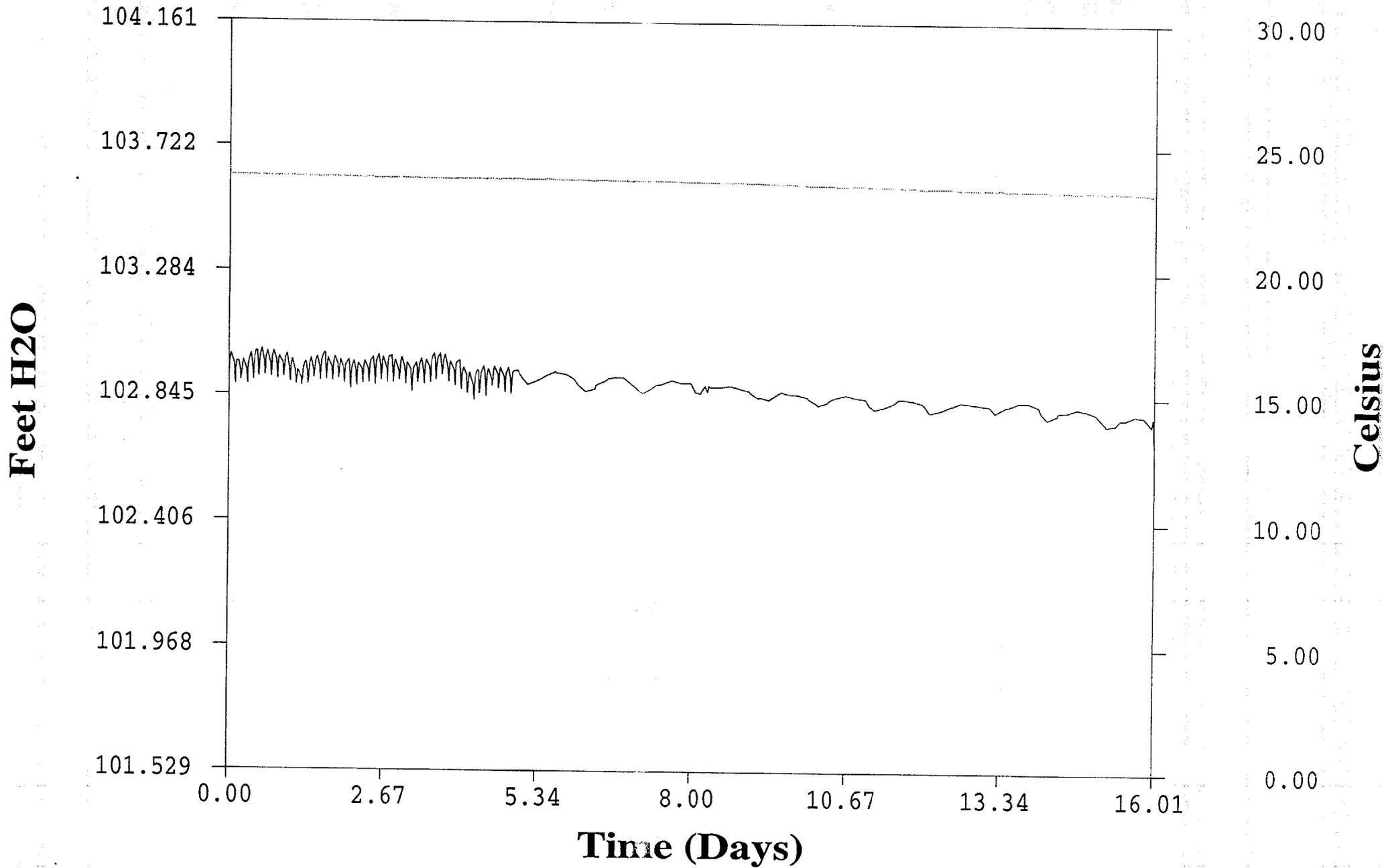
# 08A 12/8-12/22



[2] - OnBoard Pressure

[1] - OnBoard Temp

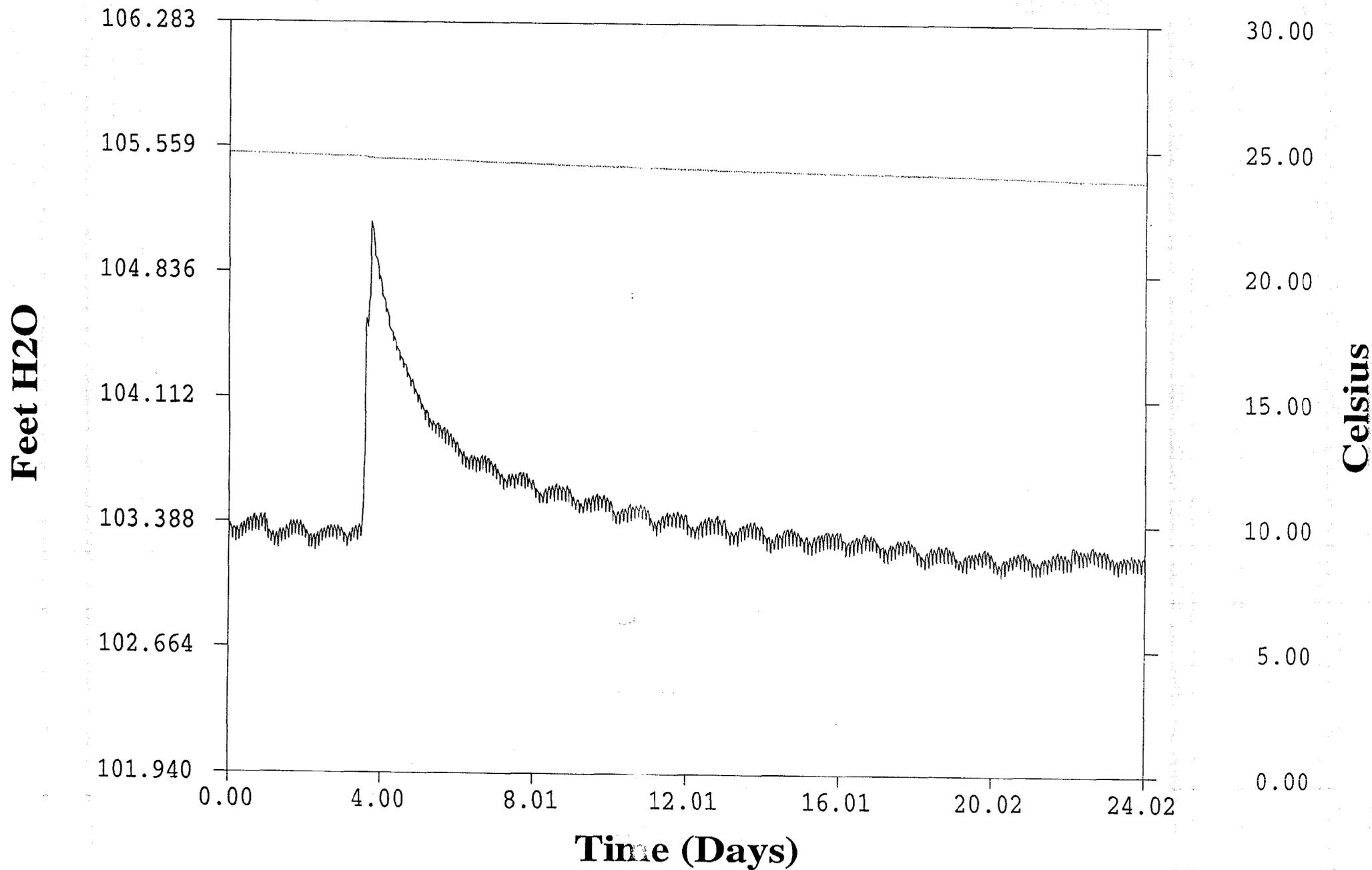
# 08A 11/22-12/08



[2] - OnBoard Pressure

[1] - OnBoard Temp

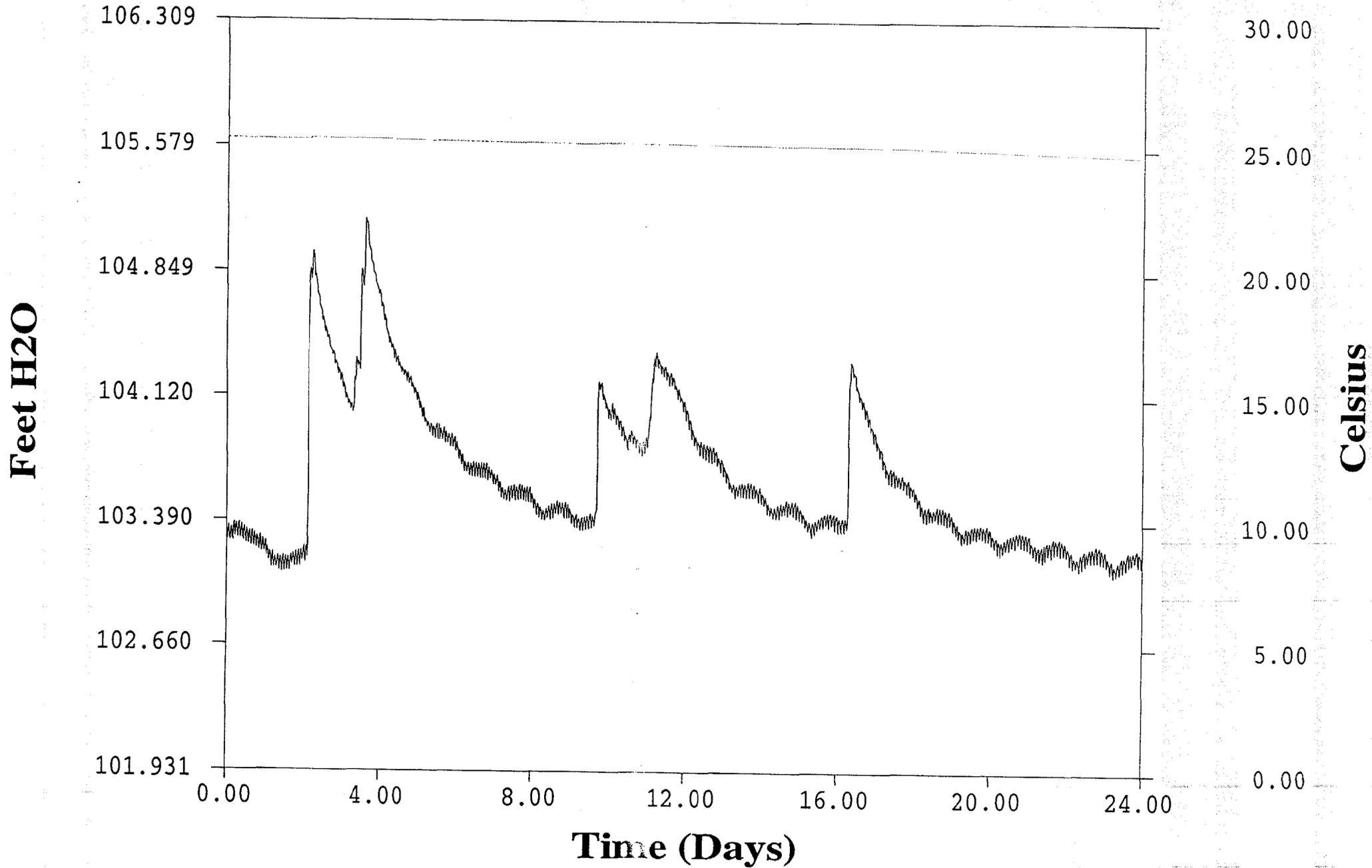
# 08A 10/26-11/22



[2] - OnBoard Pressure

[1] - OnBoard Temp

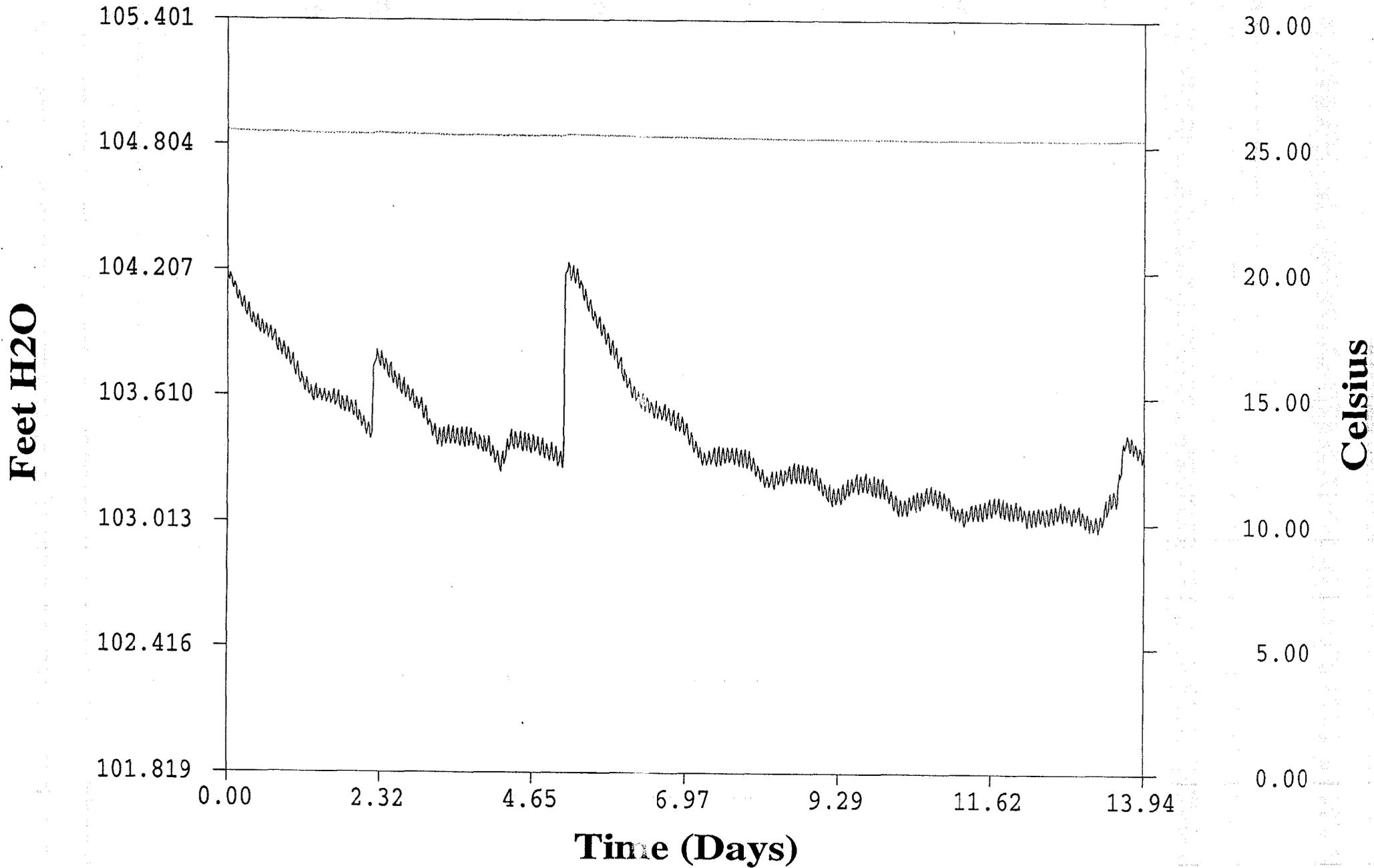
# 08A 10/5-10/29



[2] - OnBoard Pressure

[1] - OnBoard Temp

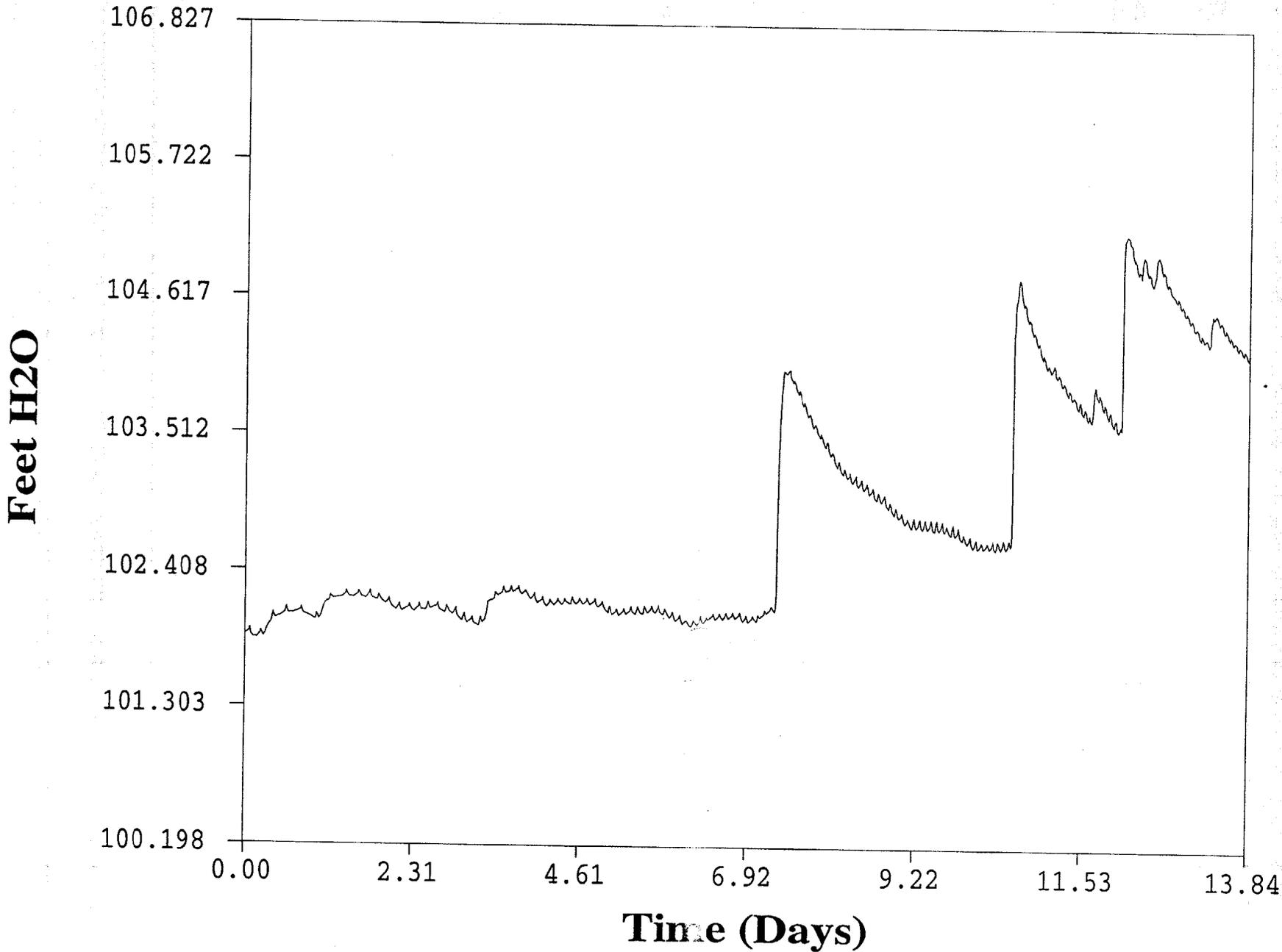
# 08A 9/21-10/5



[2] - OnBoard Pressure

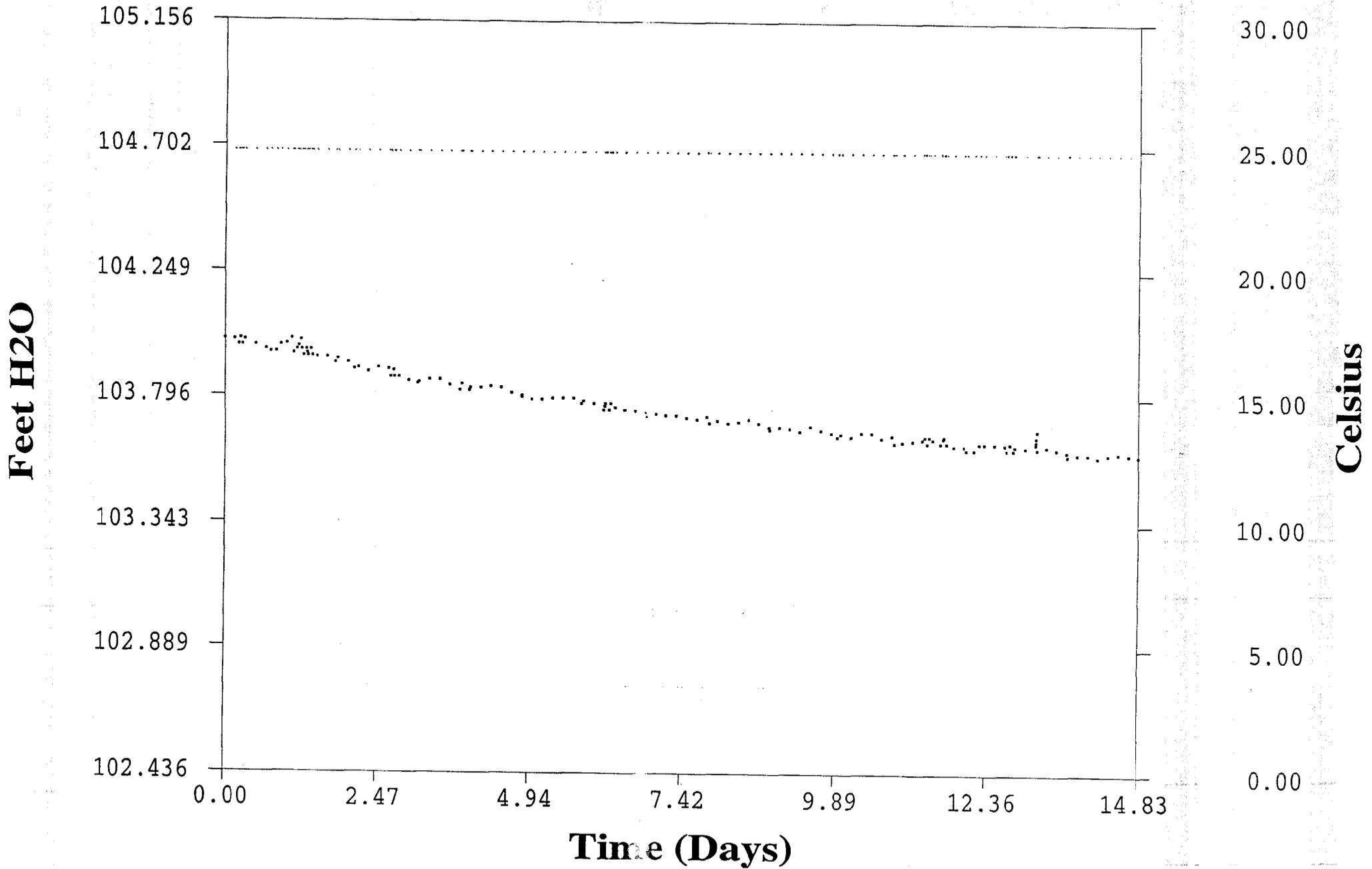
[1] - OnBoard Temp

08A 9/7-9/21



[2] - OnBoard Pressure

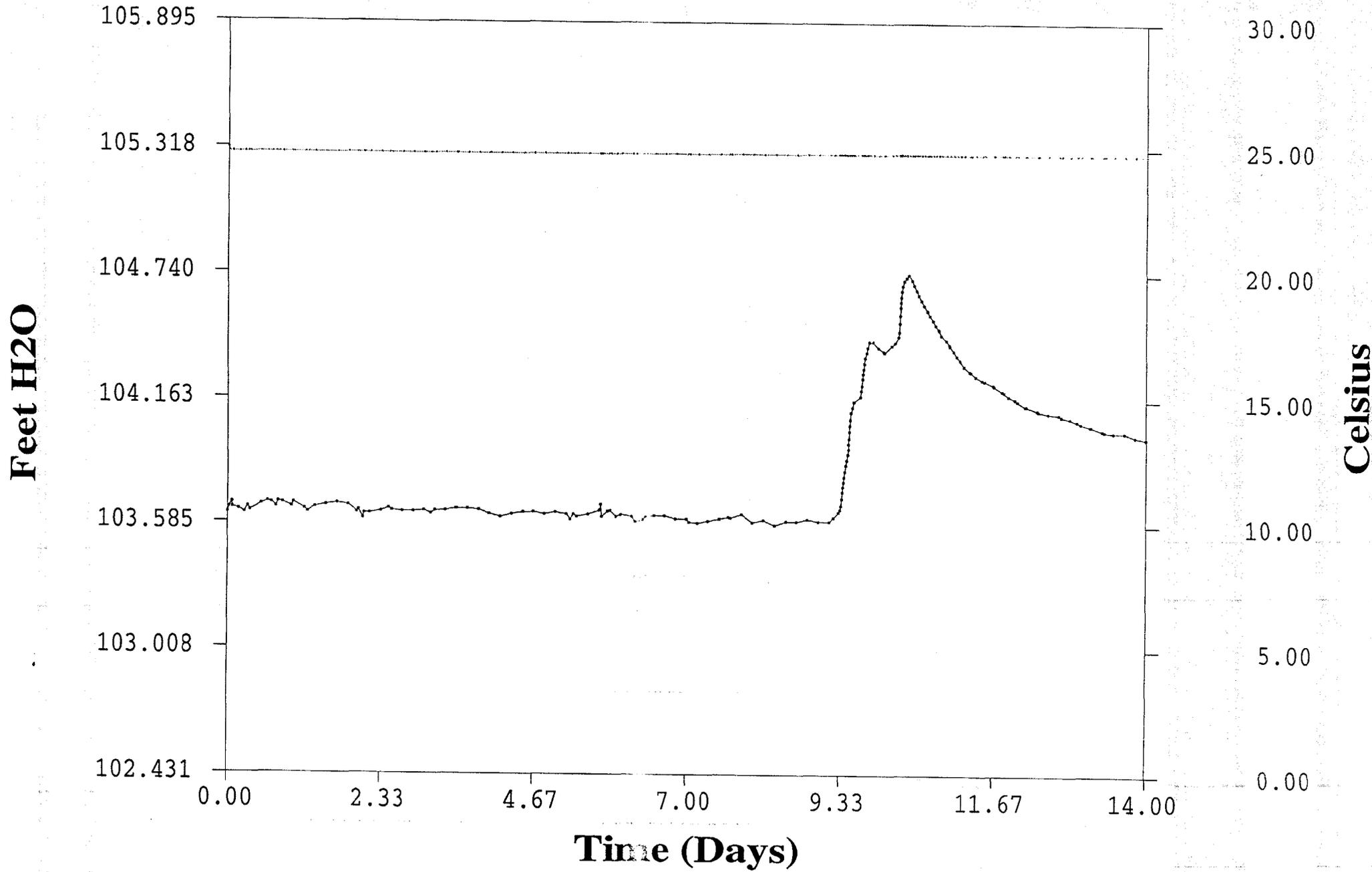
09C 12/22-1/6



[2] - OnBoard Pressure

[1] - OnBoard Temp

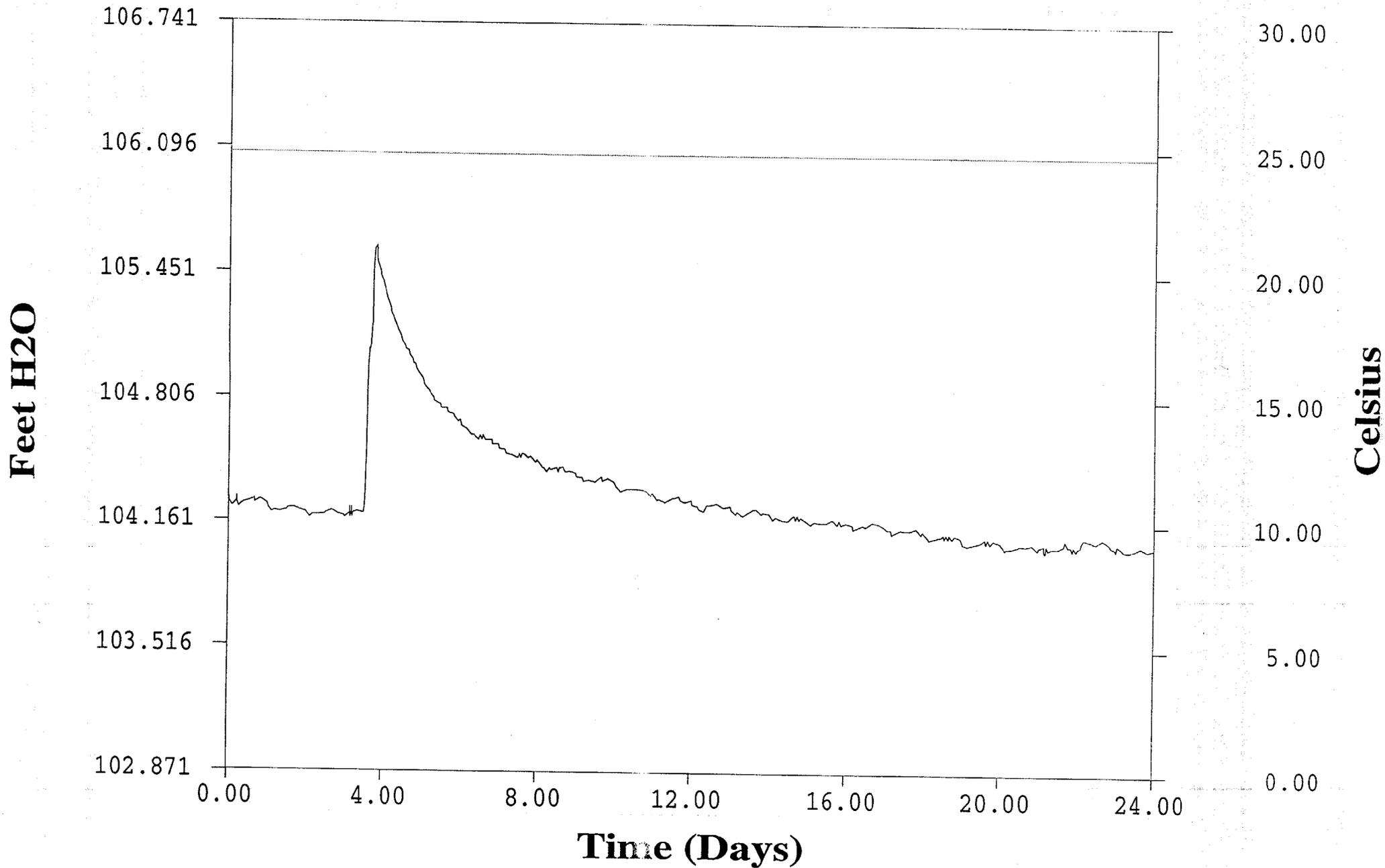
# 09C 12/2-12/28



[2] - OnBoard Pressure

[1] - OnBoard Temp

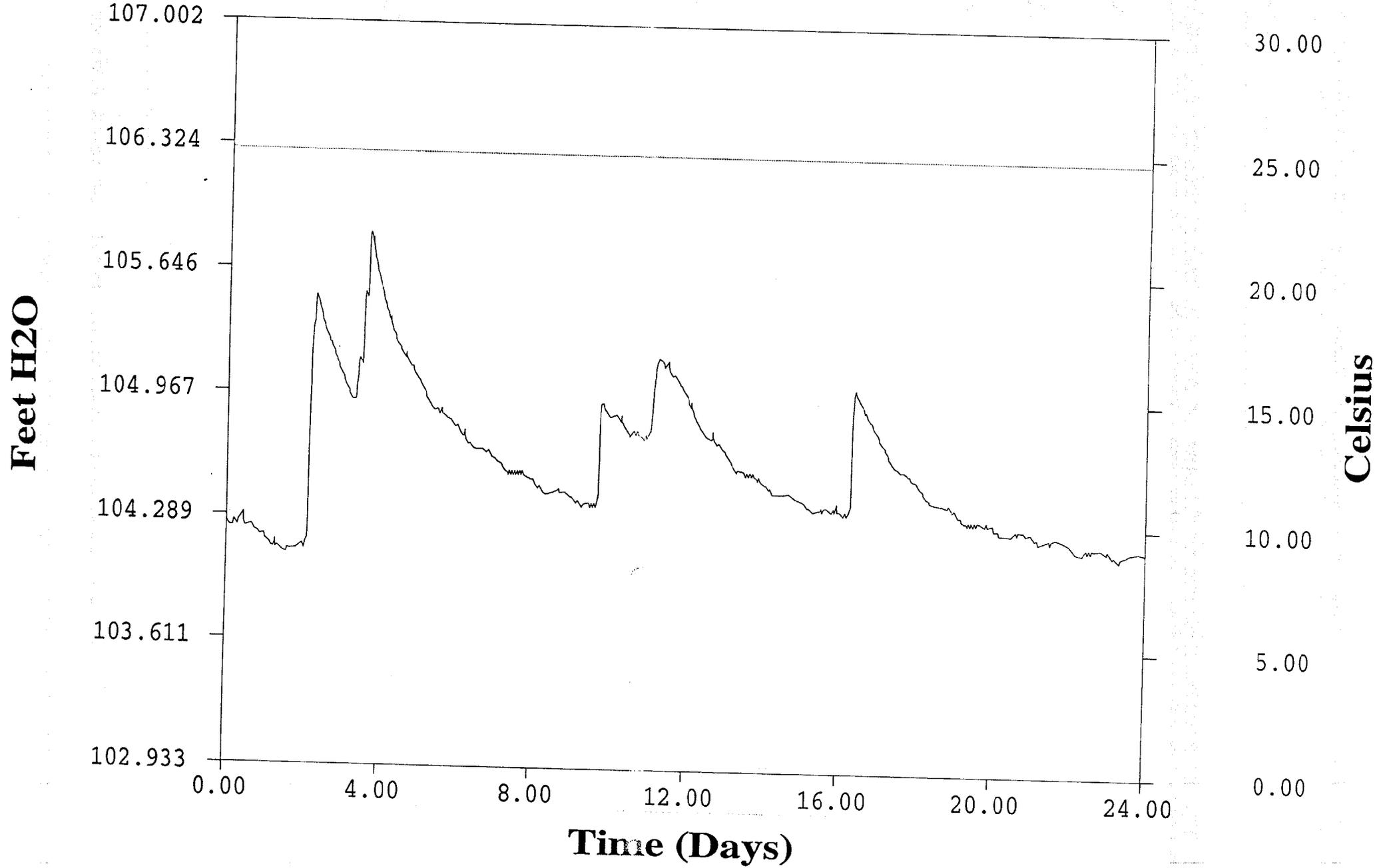
09C 10/29-11/22



[2] - OnBoard Pressure

[1] - OnBoard Temp

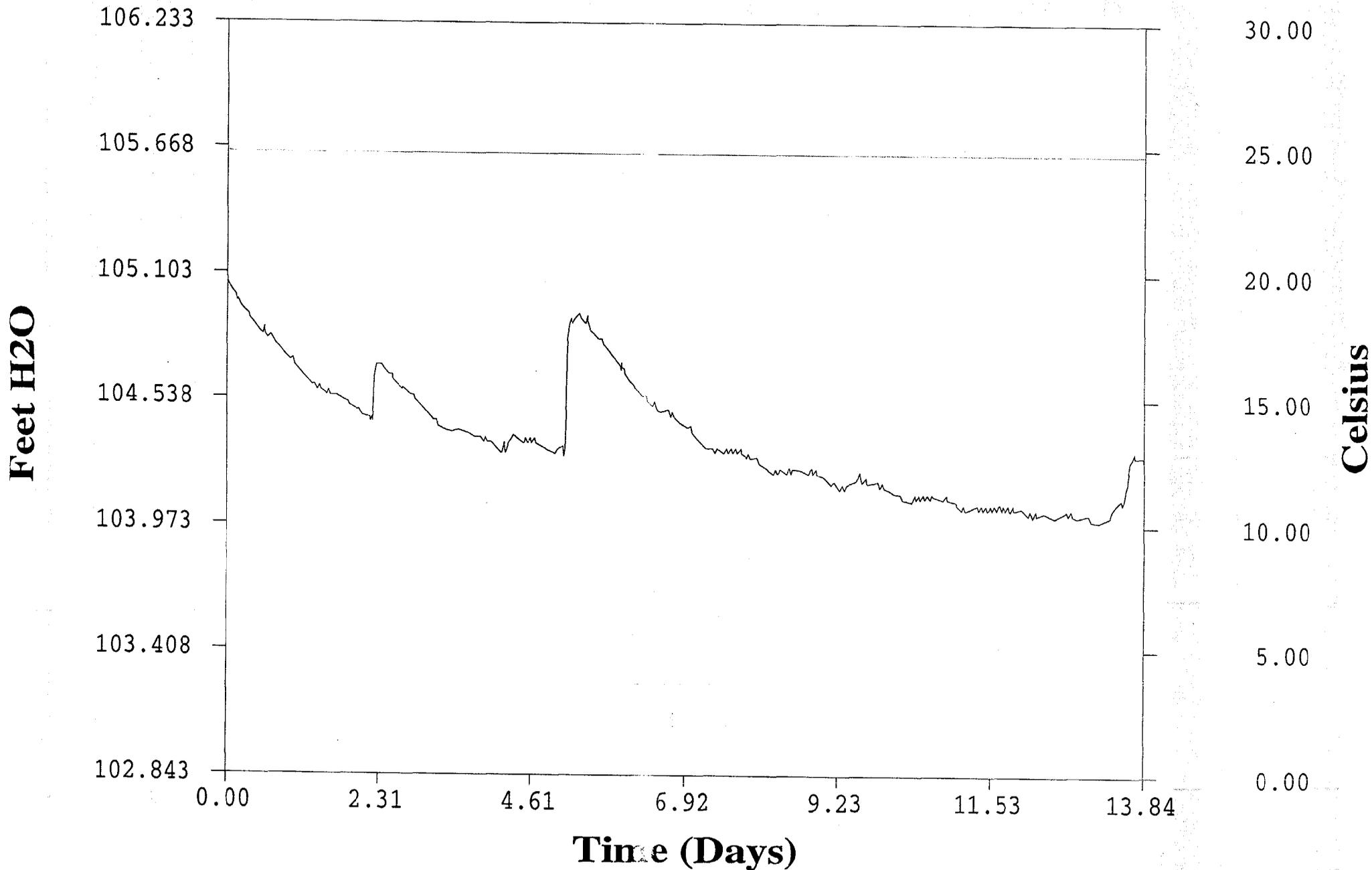
09C 10/5-10/29



[2] - OnBoard Pressure

[1] - OnBoard Temp

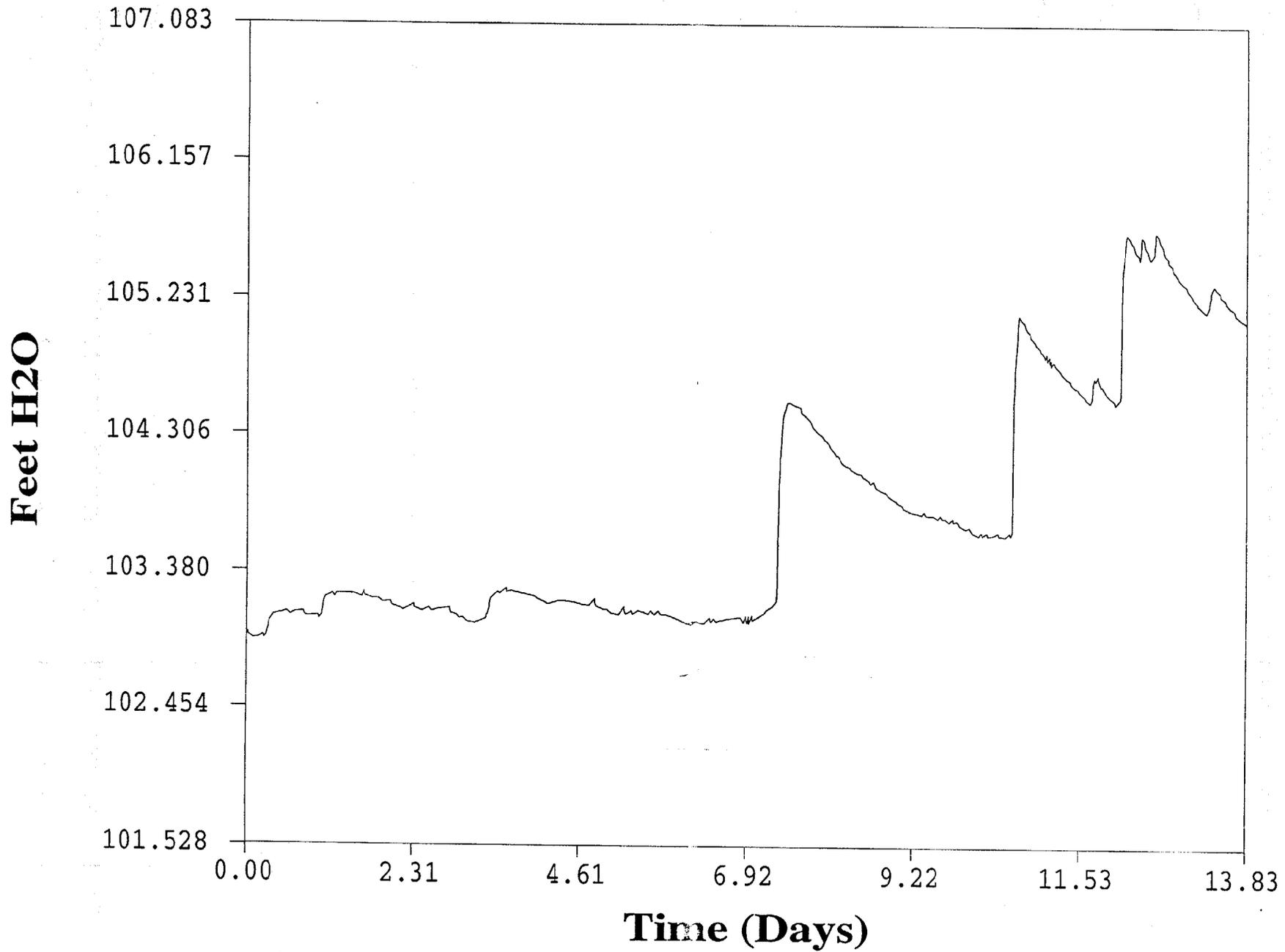
# 09C 9/21-10/5



[2] - OnBoard Pressure

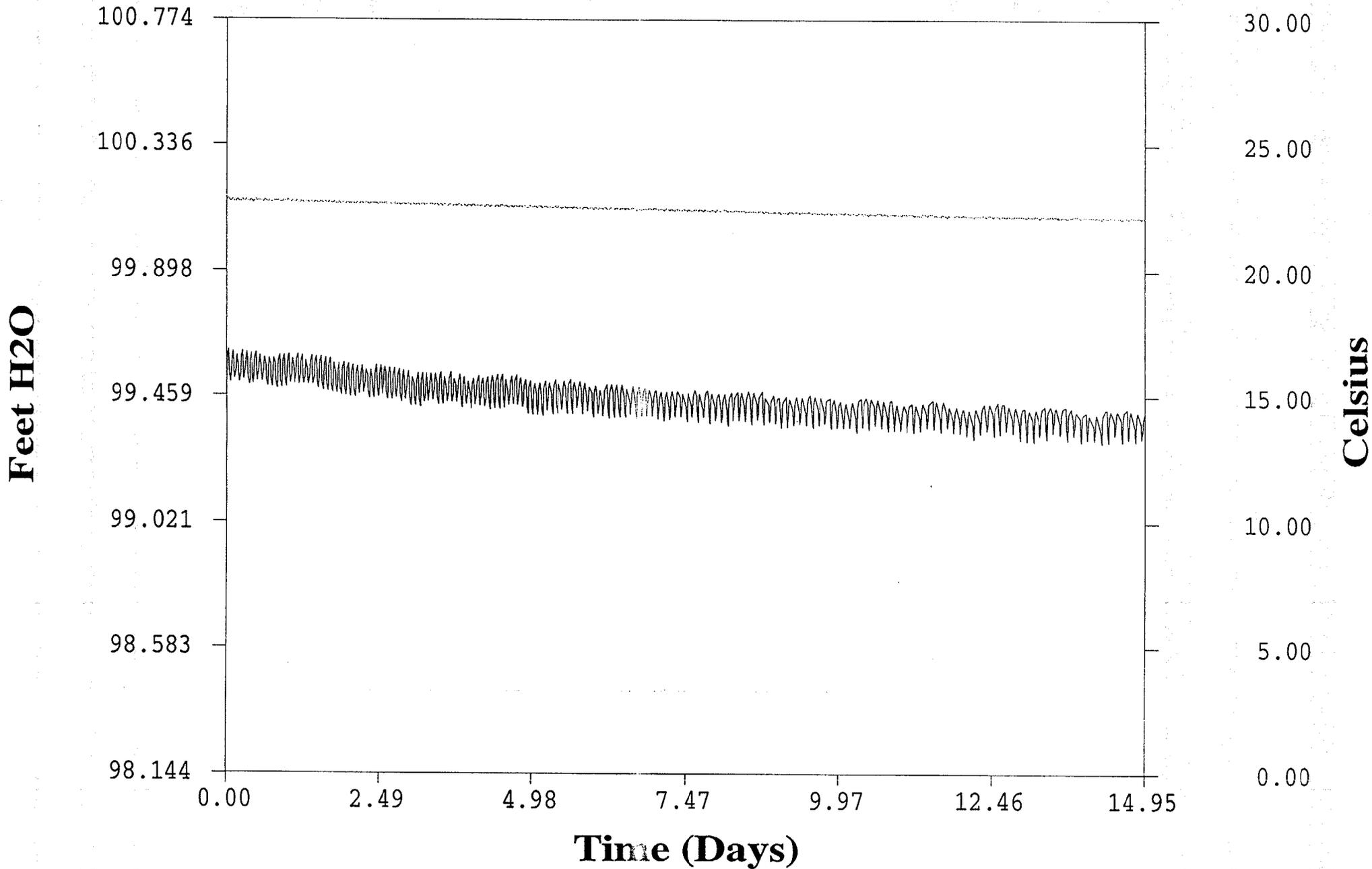
[1] - OnBoard Temp

09C 9/7-9/21



[2] - OnBoard Pressure

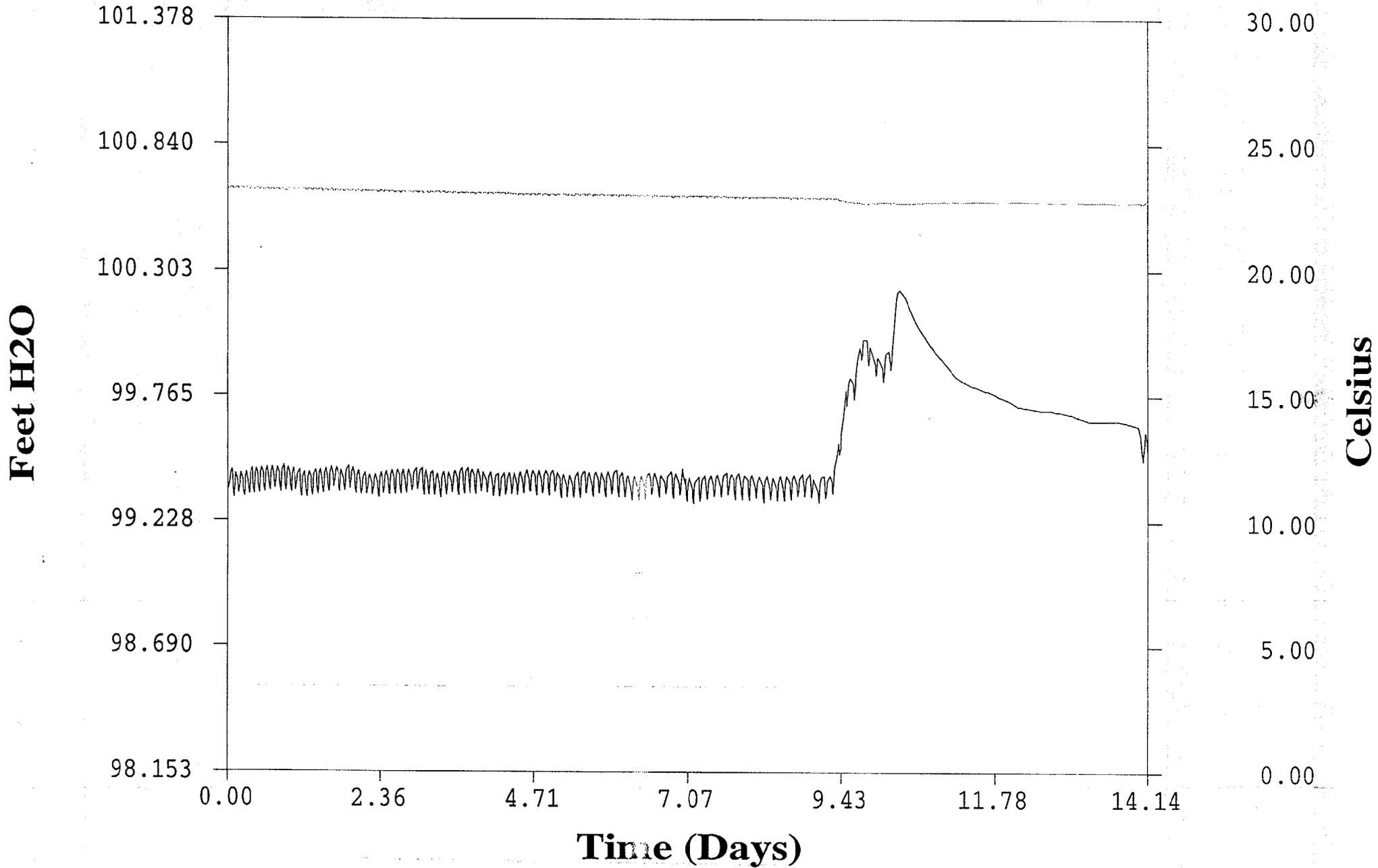
# 10A 12/22-1/6



[2] - OnBoard Pressure

[1] - OnBoard Temp

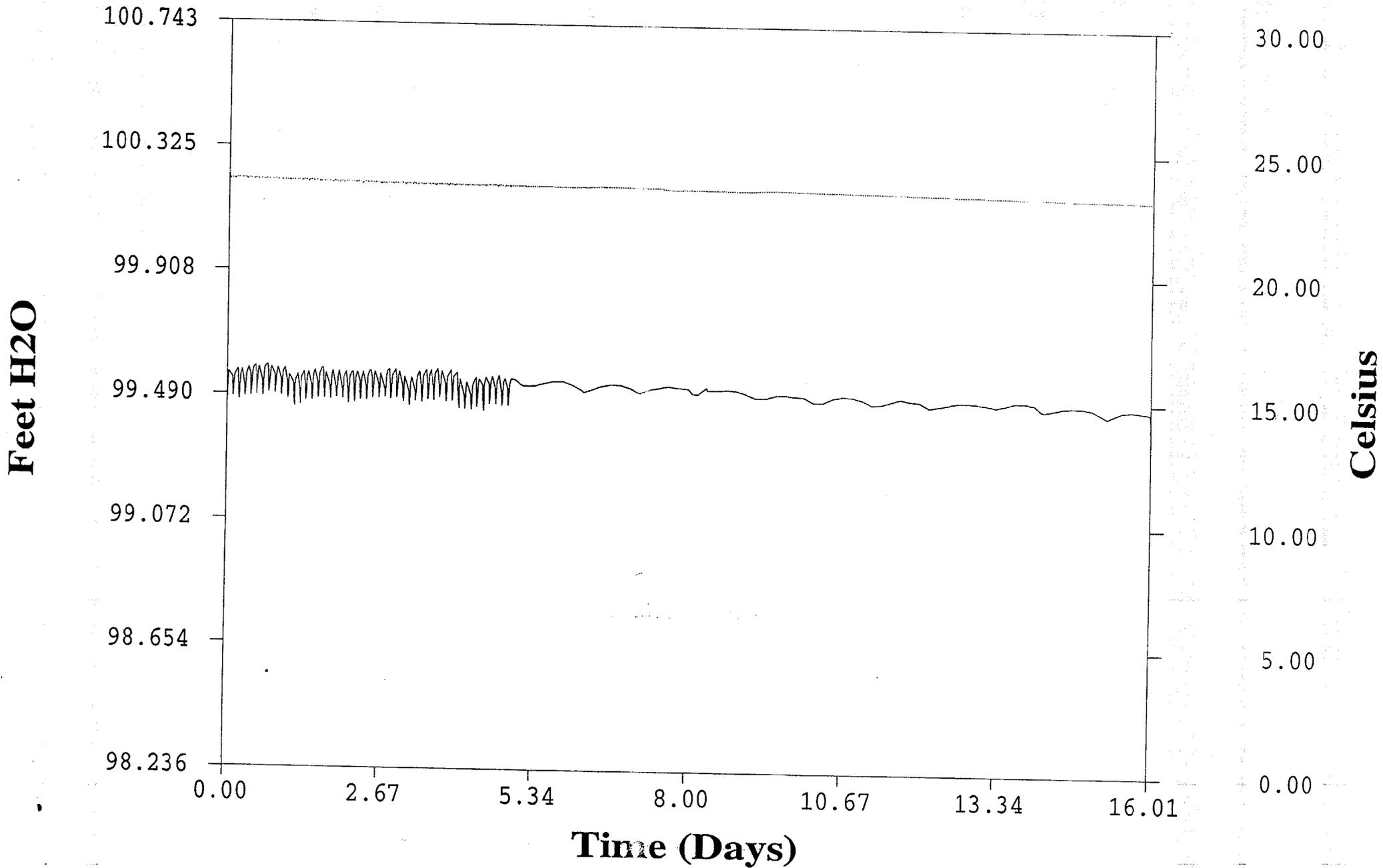
# 10A 12/8-12/22



[2] - OnBoard Pressure

[1] - OnBoard Temp

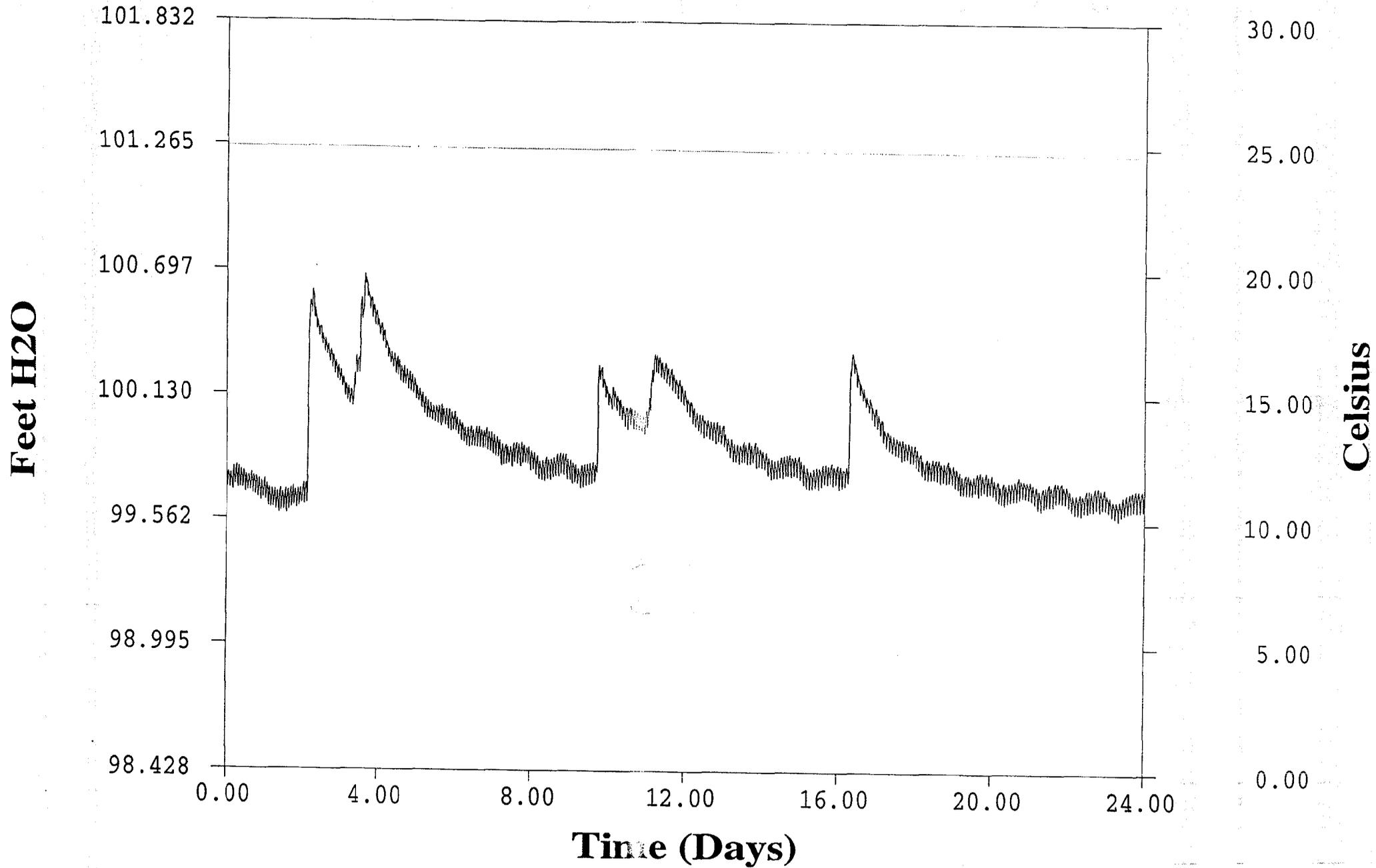
# 10A 11/22-12/8



[2] - OnBoard Pressure

[1] - OnBoard Temp

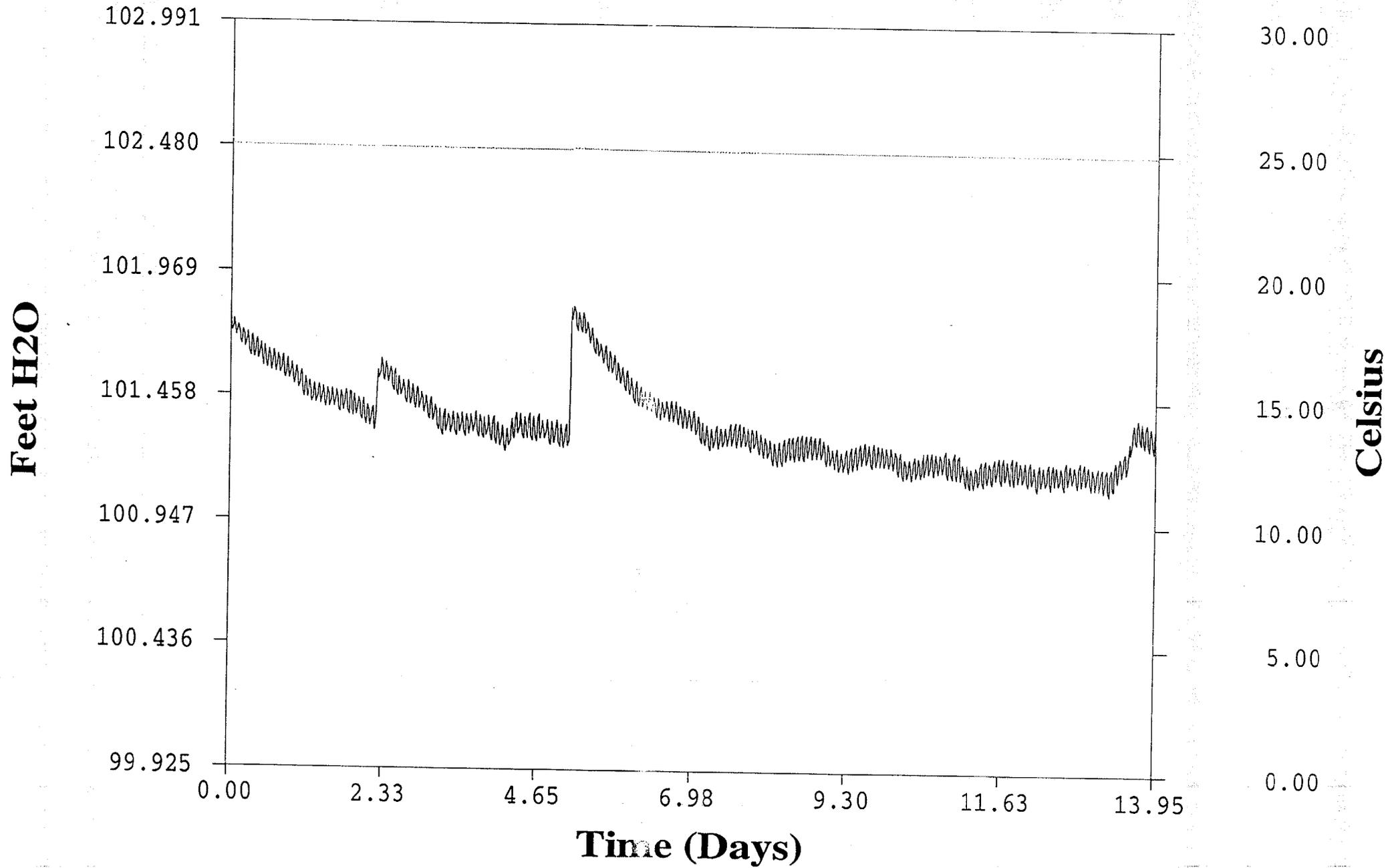
# 10A 10/5-10/29



[2] - OnBoard Pressure

[1] - OnBoard Temp

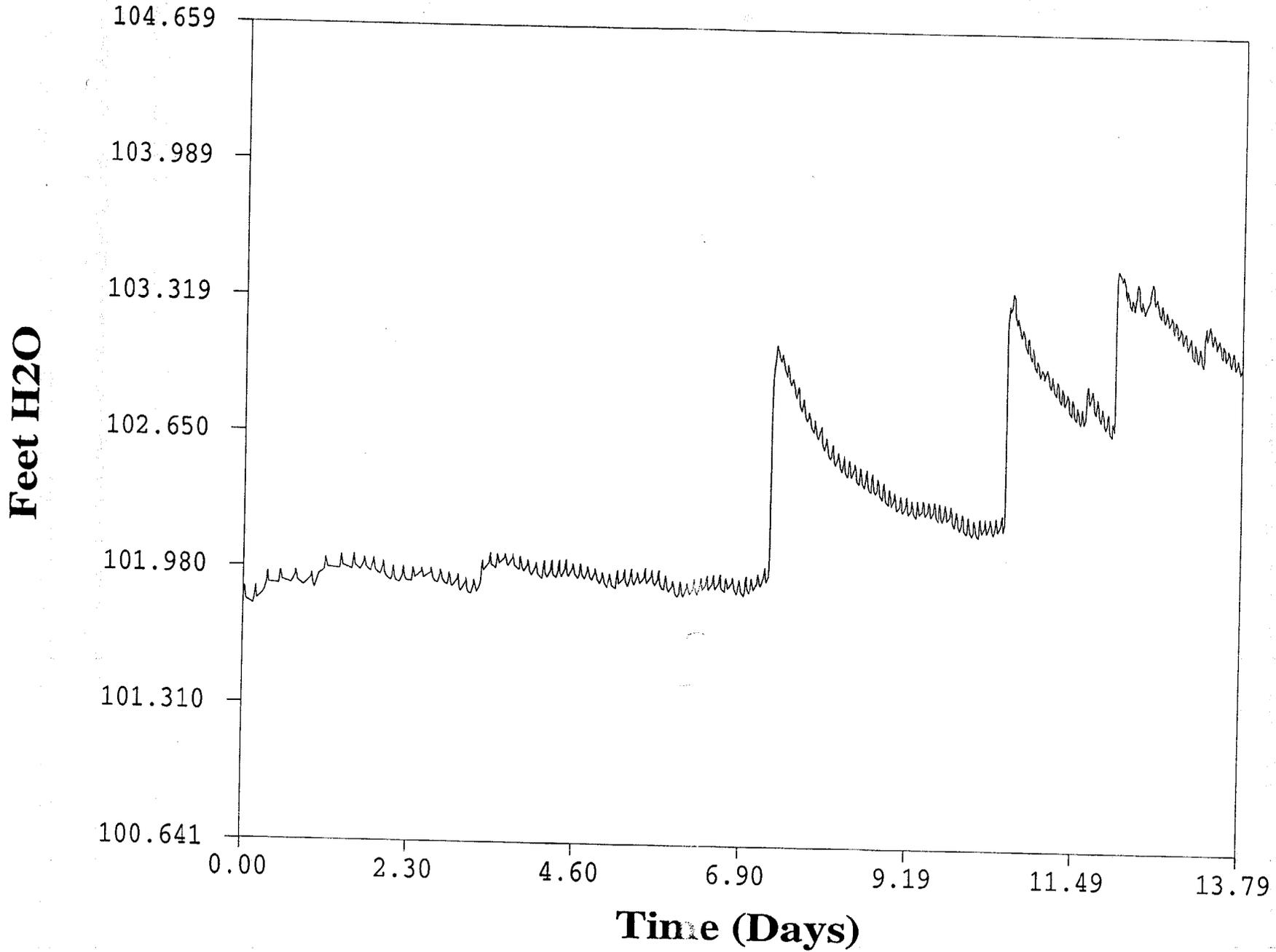
# 10A 9/21-10/5



[2] - OnBoard Pressure

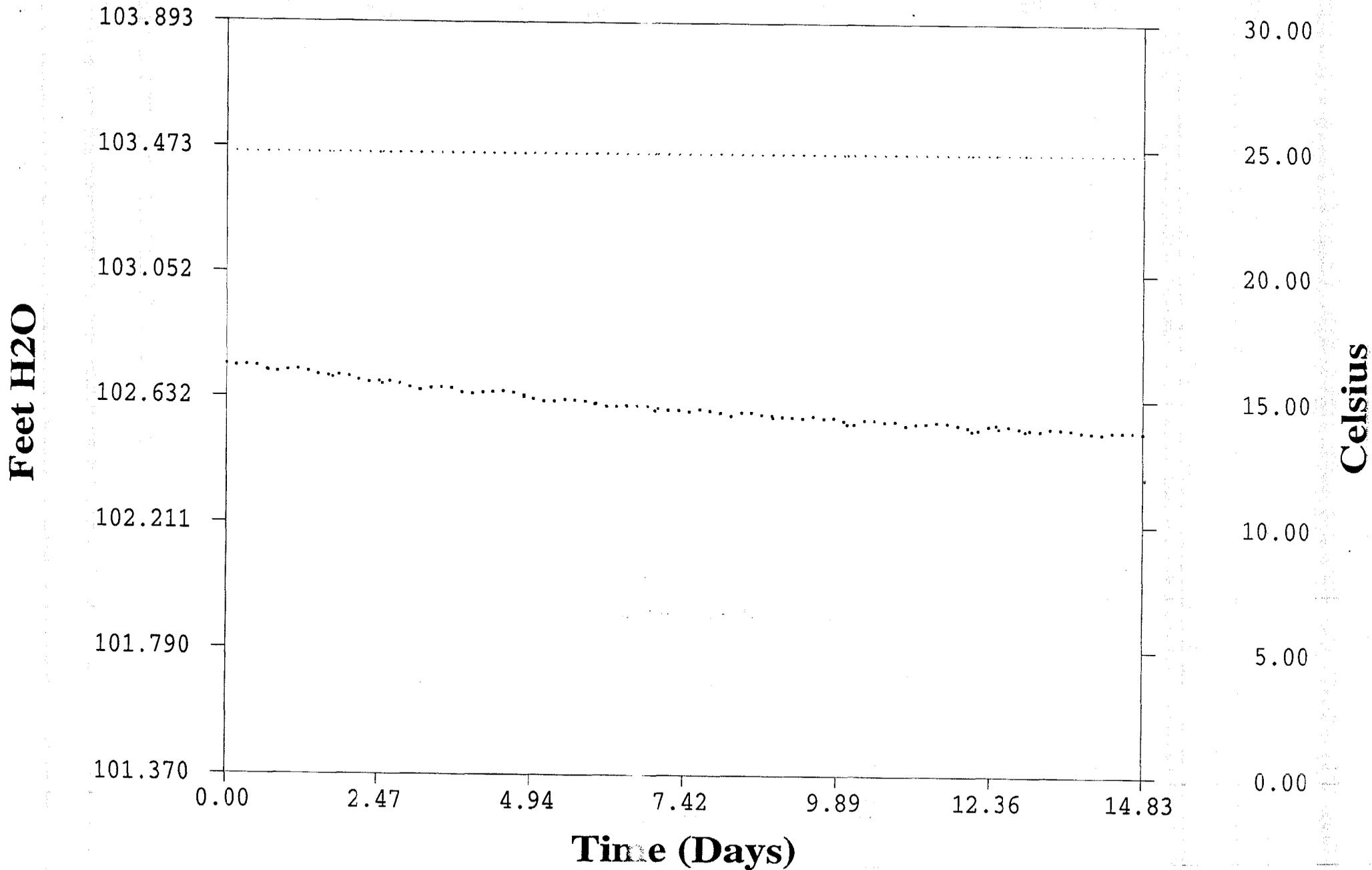
[1] - OnBoard Temp

# 10A 9/7-9/21



[2] - OnBoard Pressure

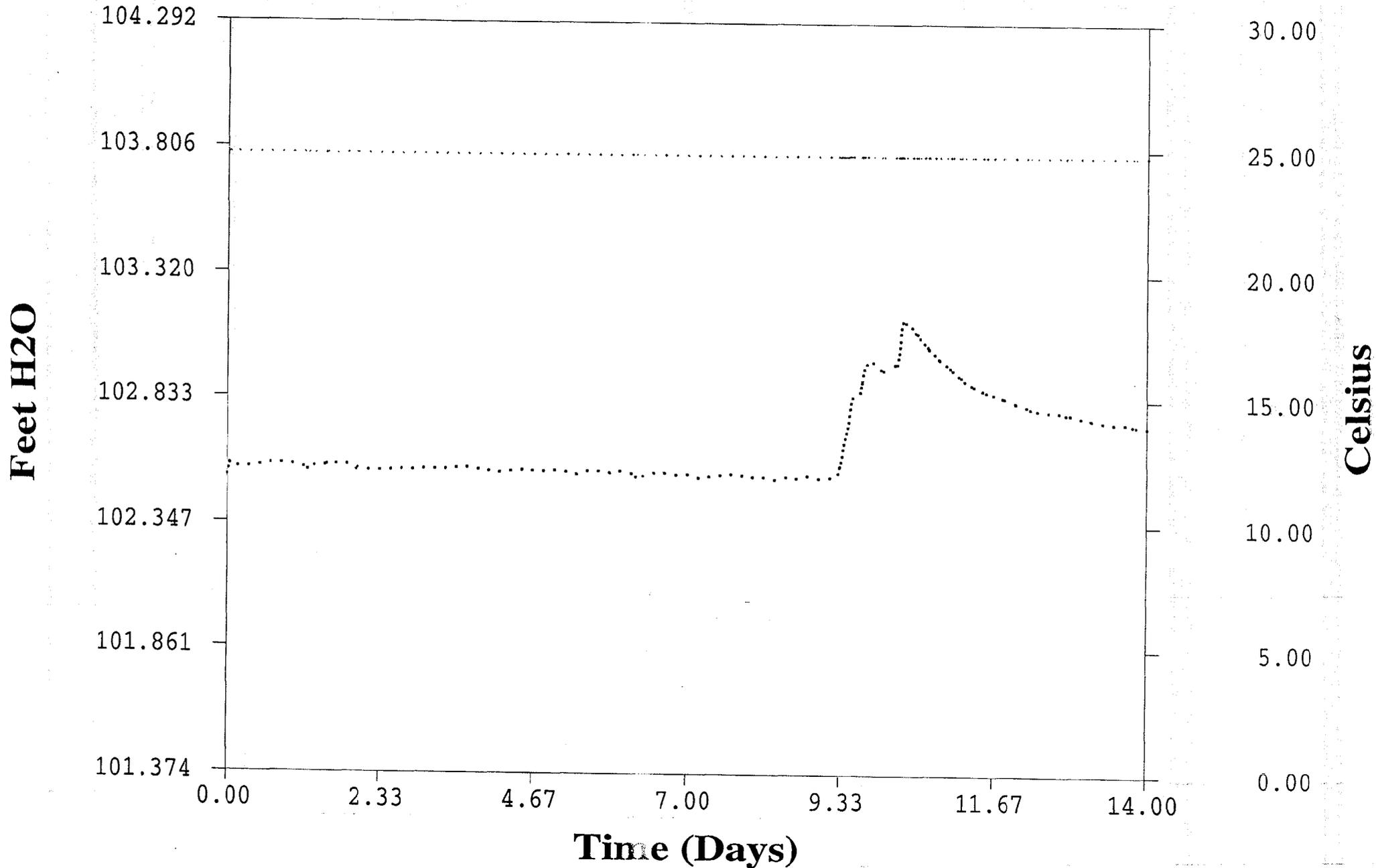
# 11C 12/22-1/6



[2] - OnBoard Pressure

[1] - OnBoard Temp

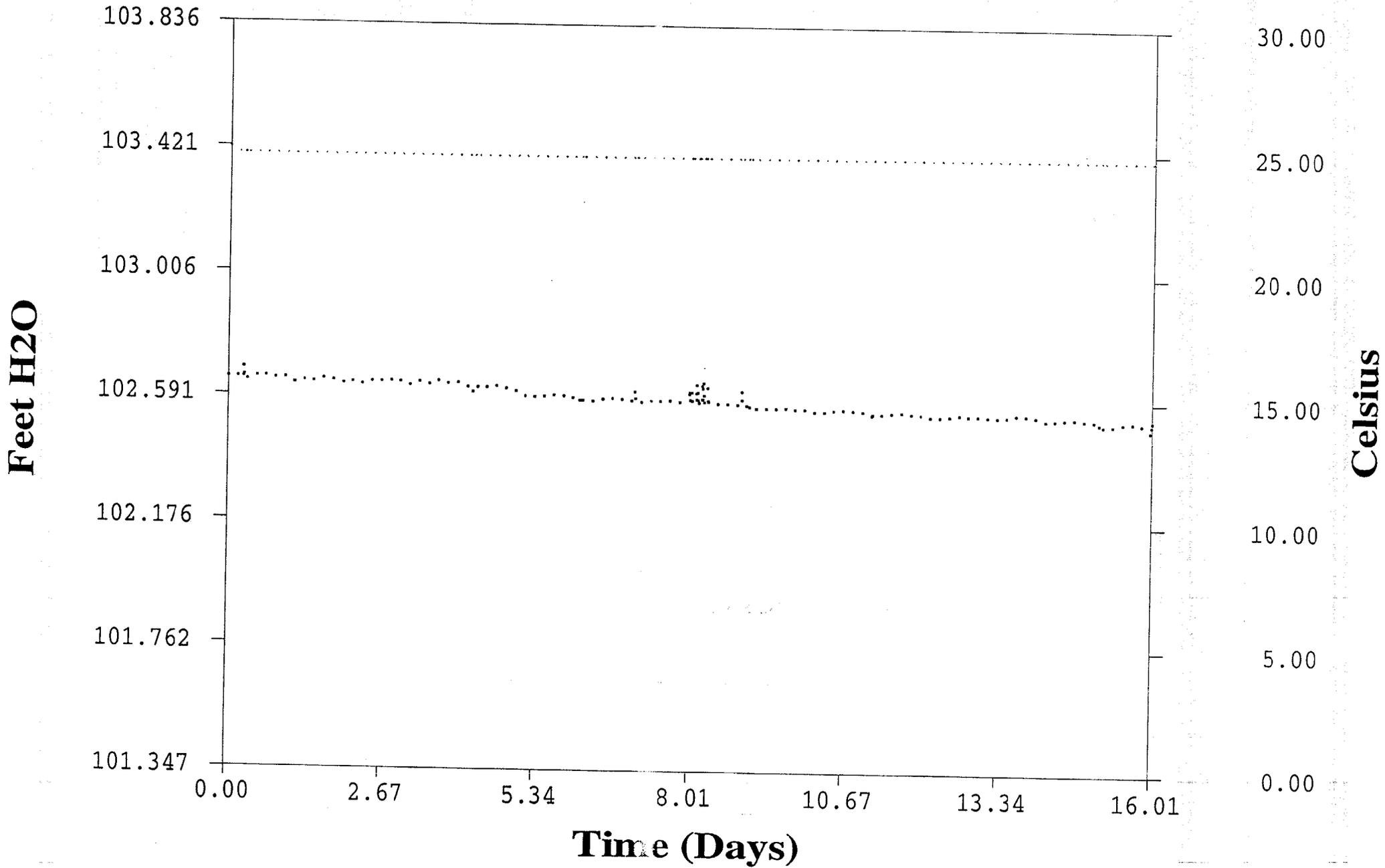
# 11C 12/8-12/22



[2] - OnBoard Pressure

[1] - OnBoard Temp

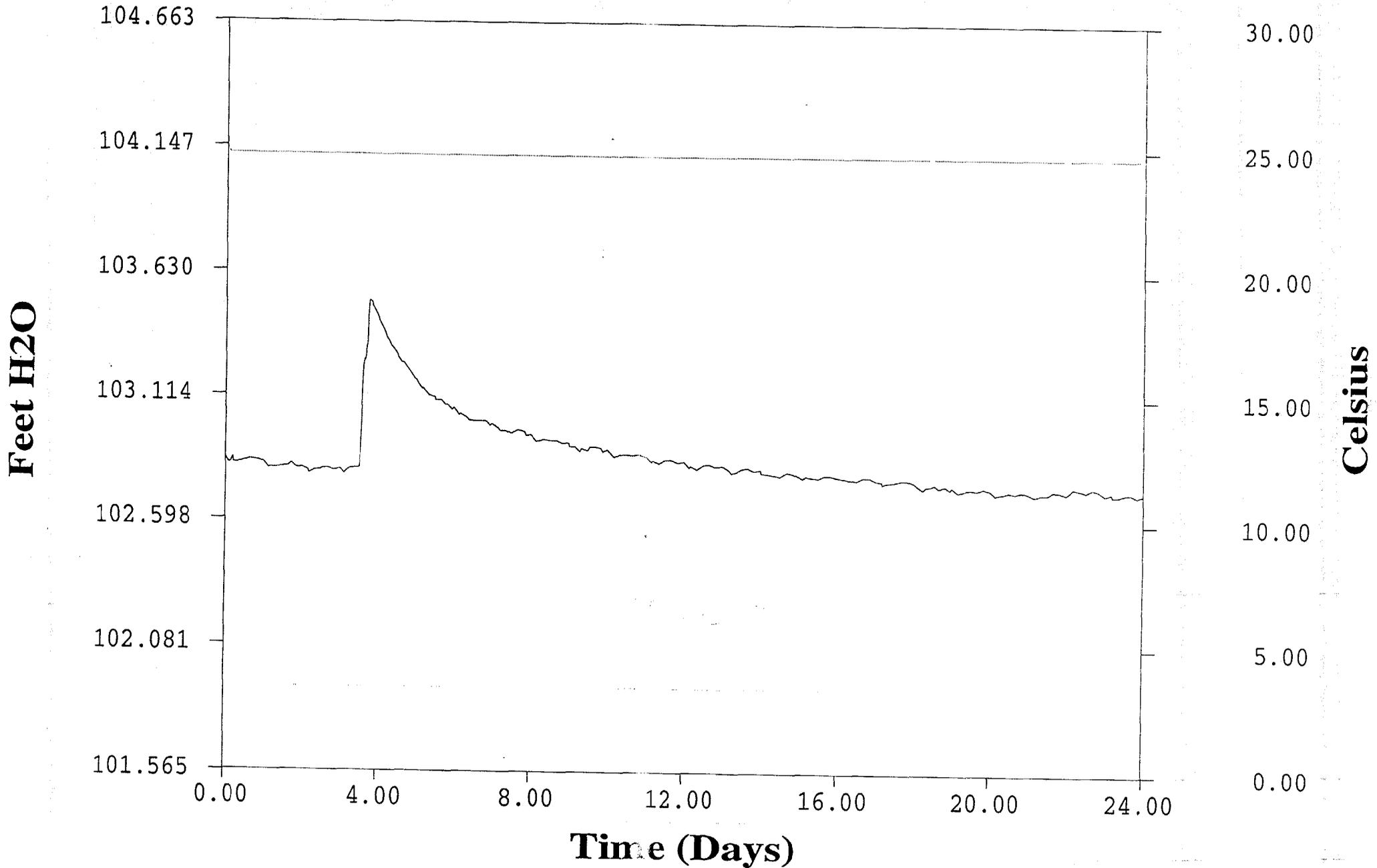
# 11C 11/22-12/8



[2] - OnBoard Pressure

[1] - OnBoard Temp

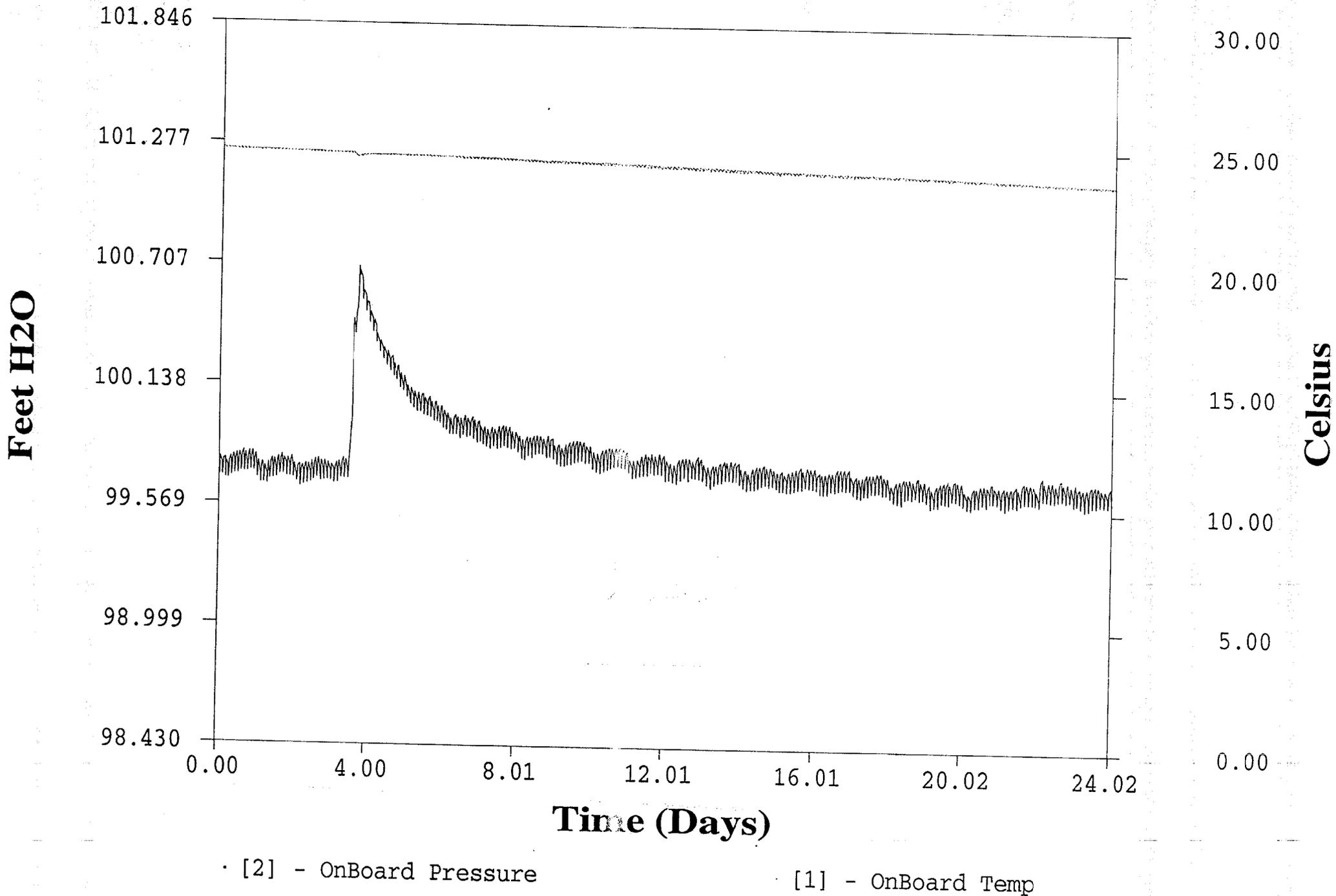
# 11C 10/29-11/22



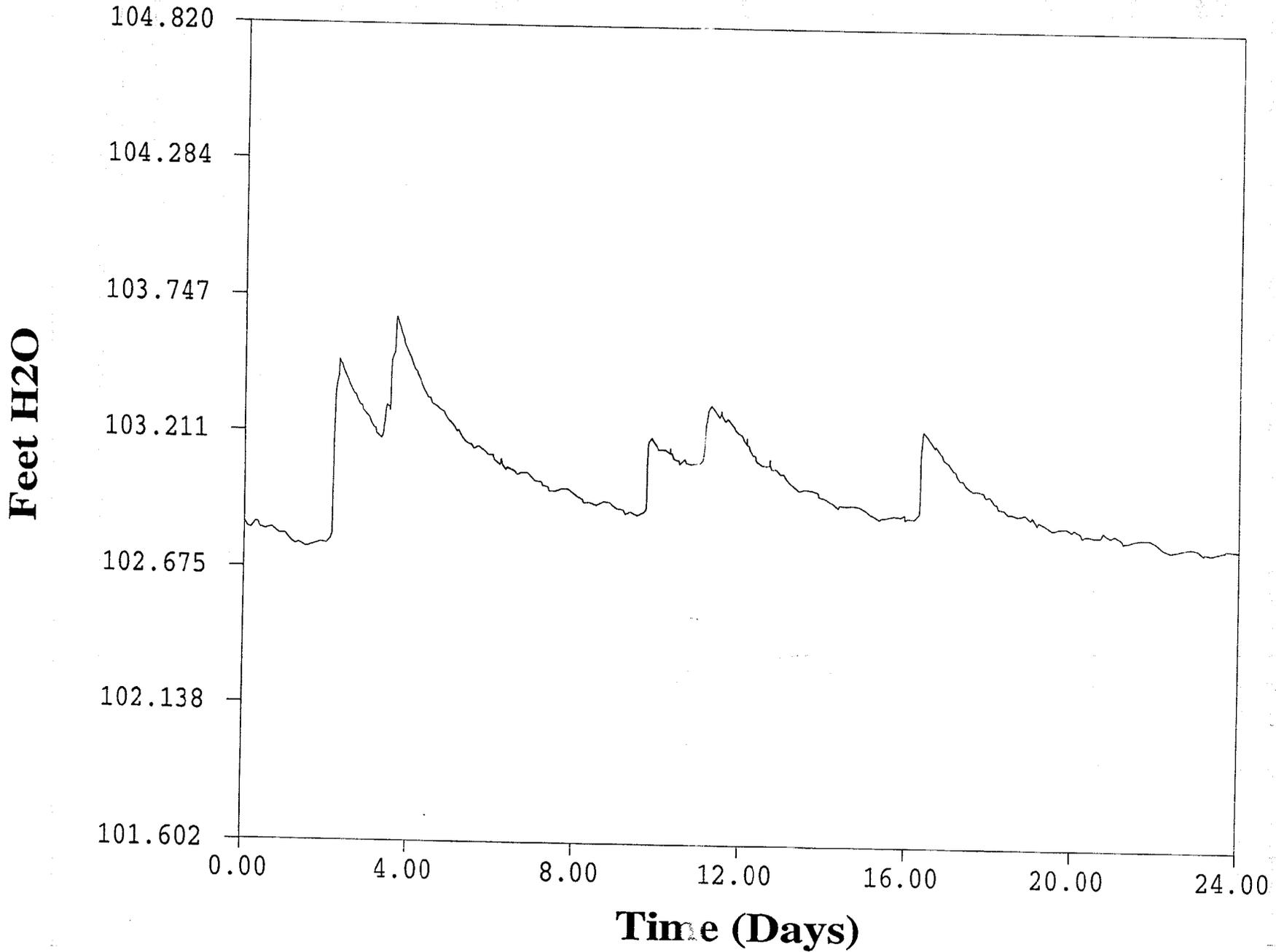
[2] - OnBoard Pressure

[1] - OnBoard Temp

# 10A 10/29-11/22

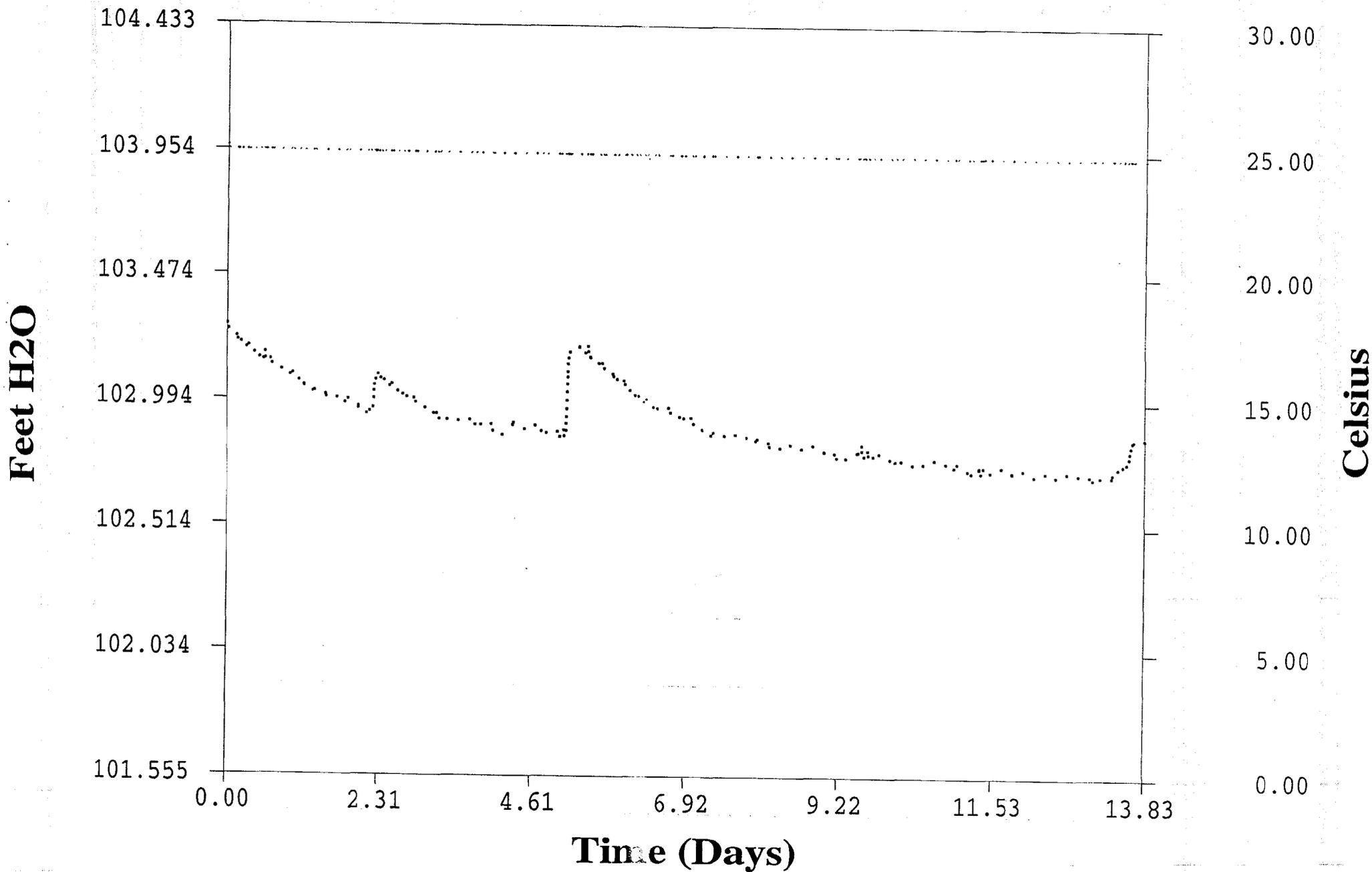


# 11C 10/5-10/29



[2] - OnBoard Pressure

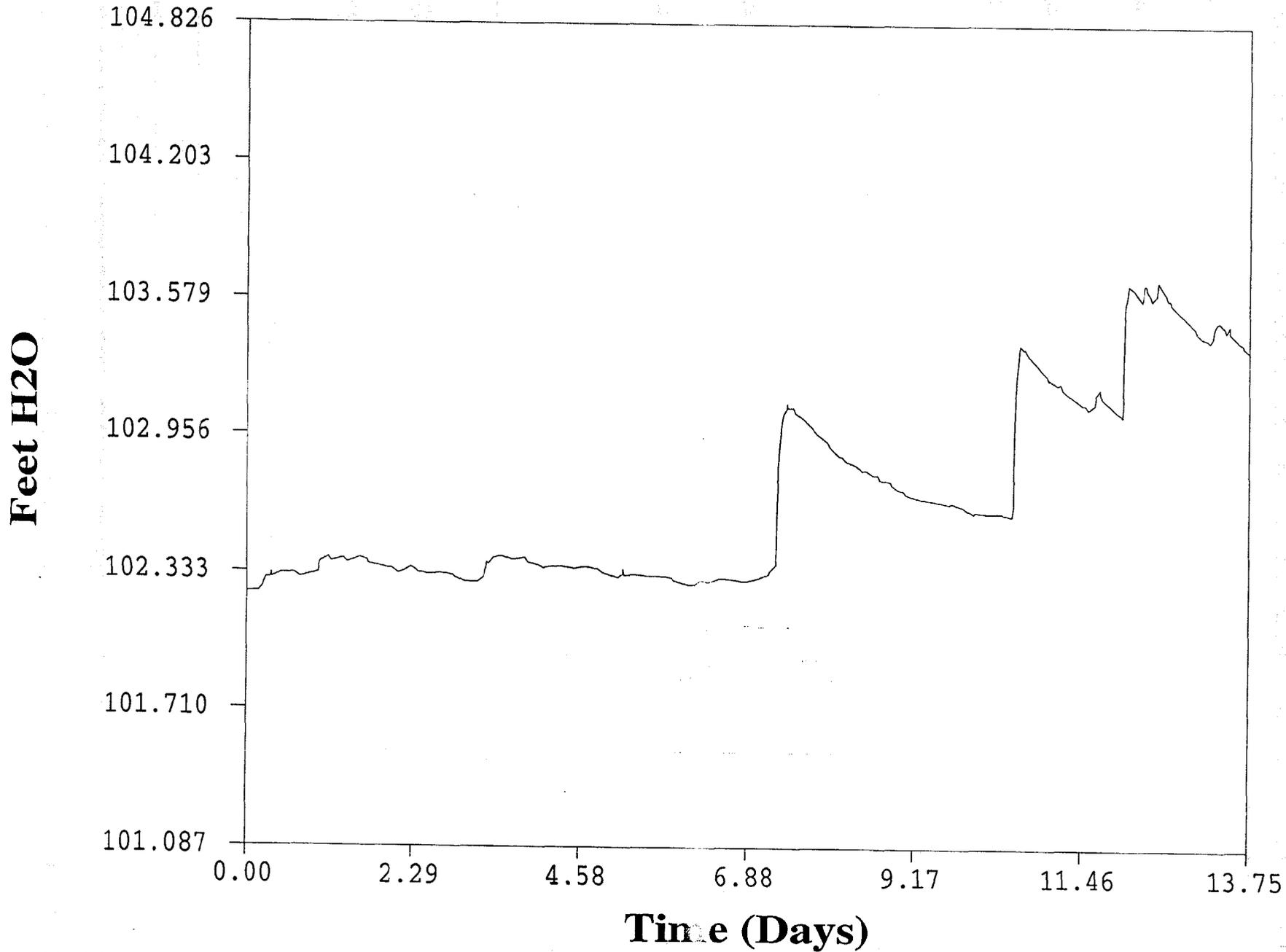
# 11C 9/21-10/5



[2] - OnBoard Pressure

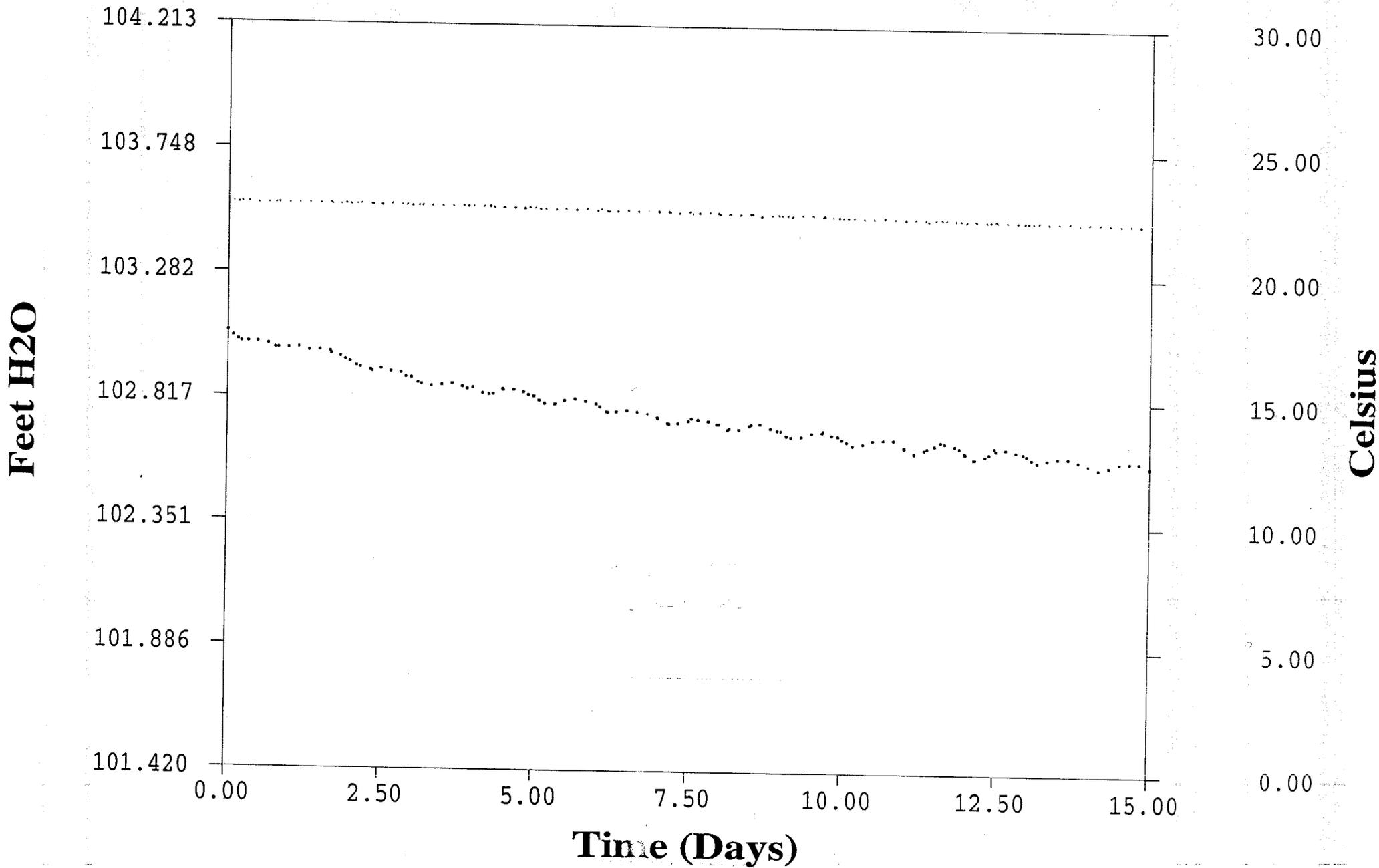
[1] - OnBoard Temp

# 11C 9,7-9/21



· [2] - OnBoard Pressure

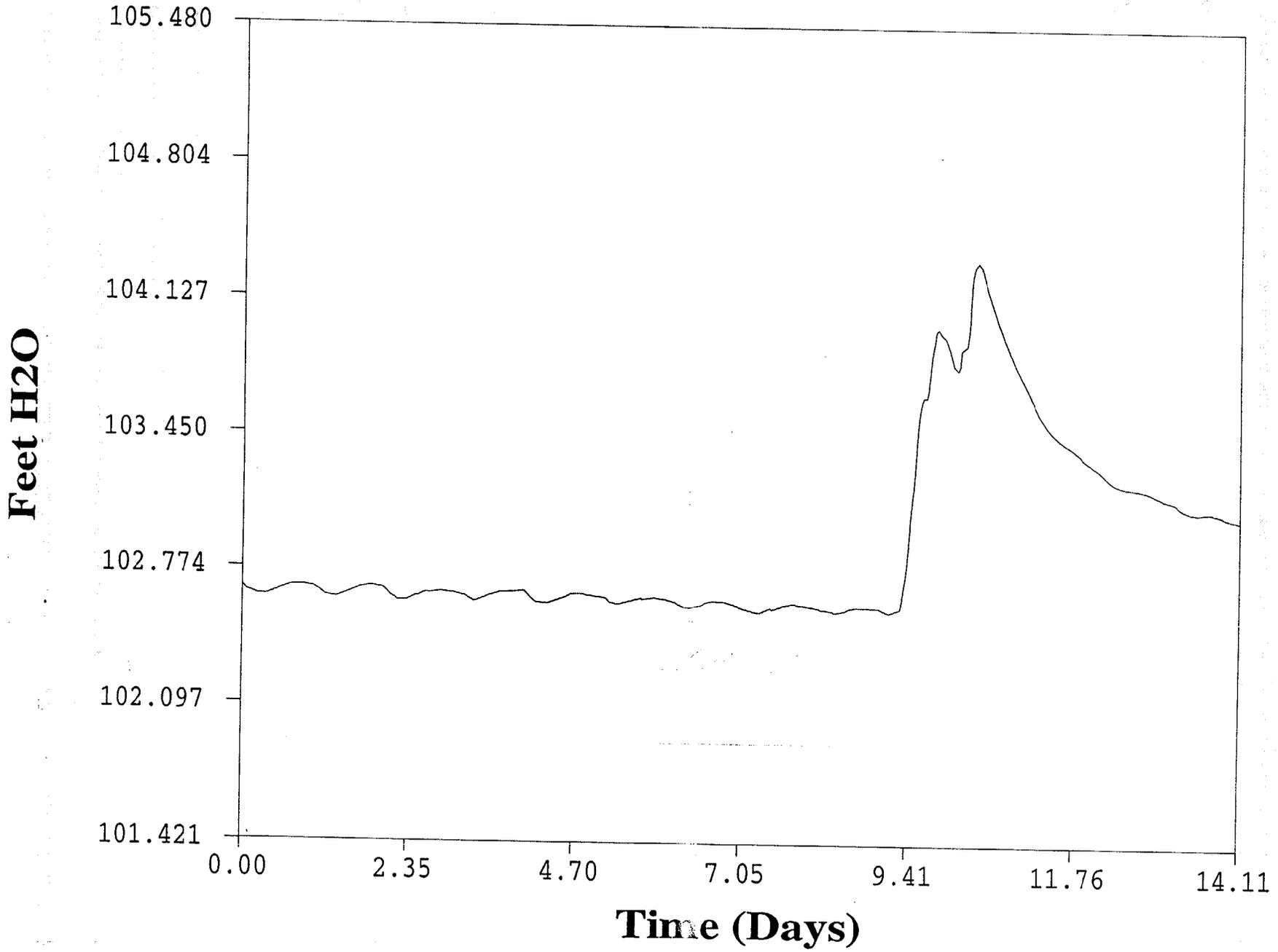
# 12A 12/22-1/6



[2] - OnBoard Pressure

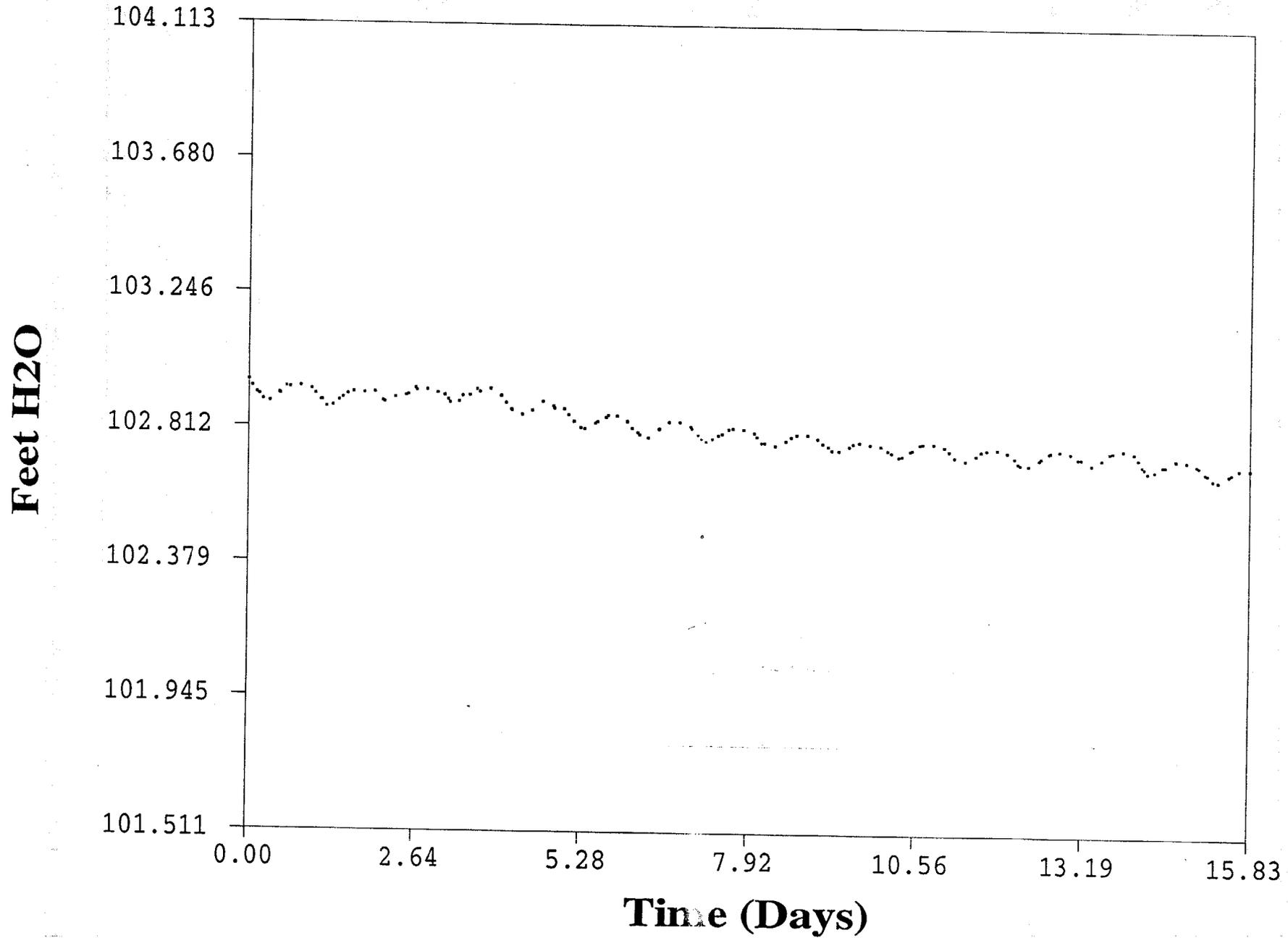
[1] - OnBoard Temp

# 12A 12/8-12/22



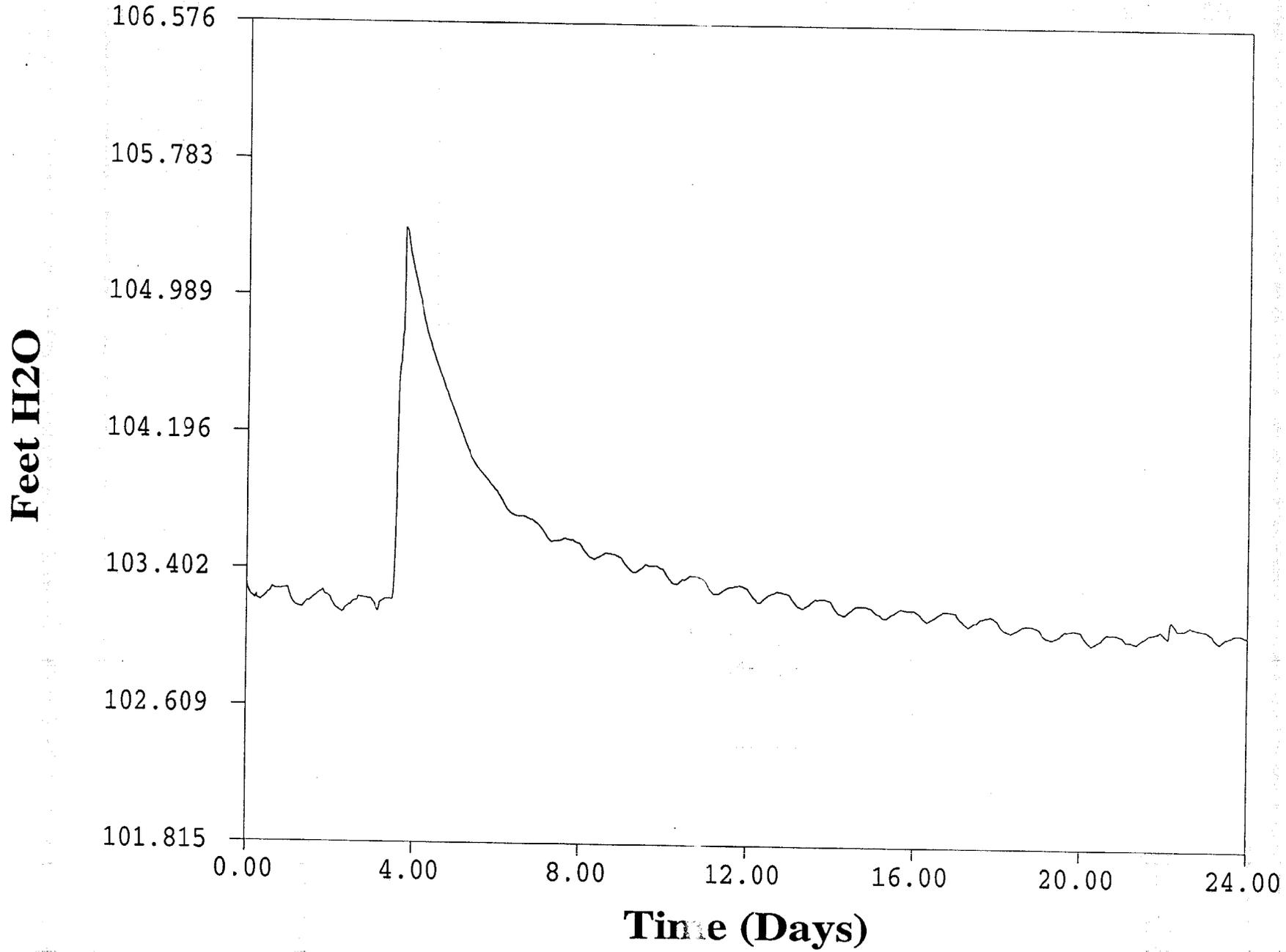
· [2] - OnBoard Pressure

# 12A 11/22-12/8



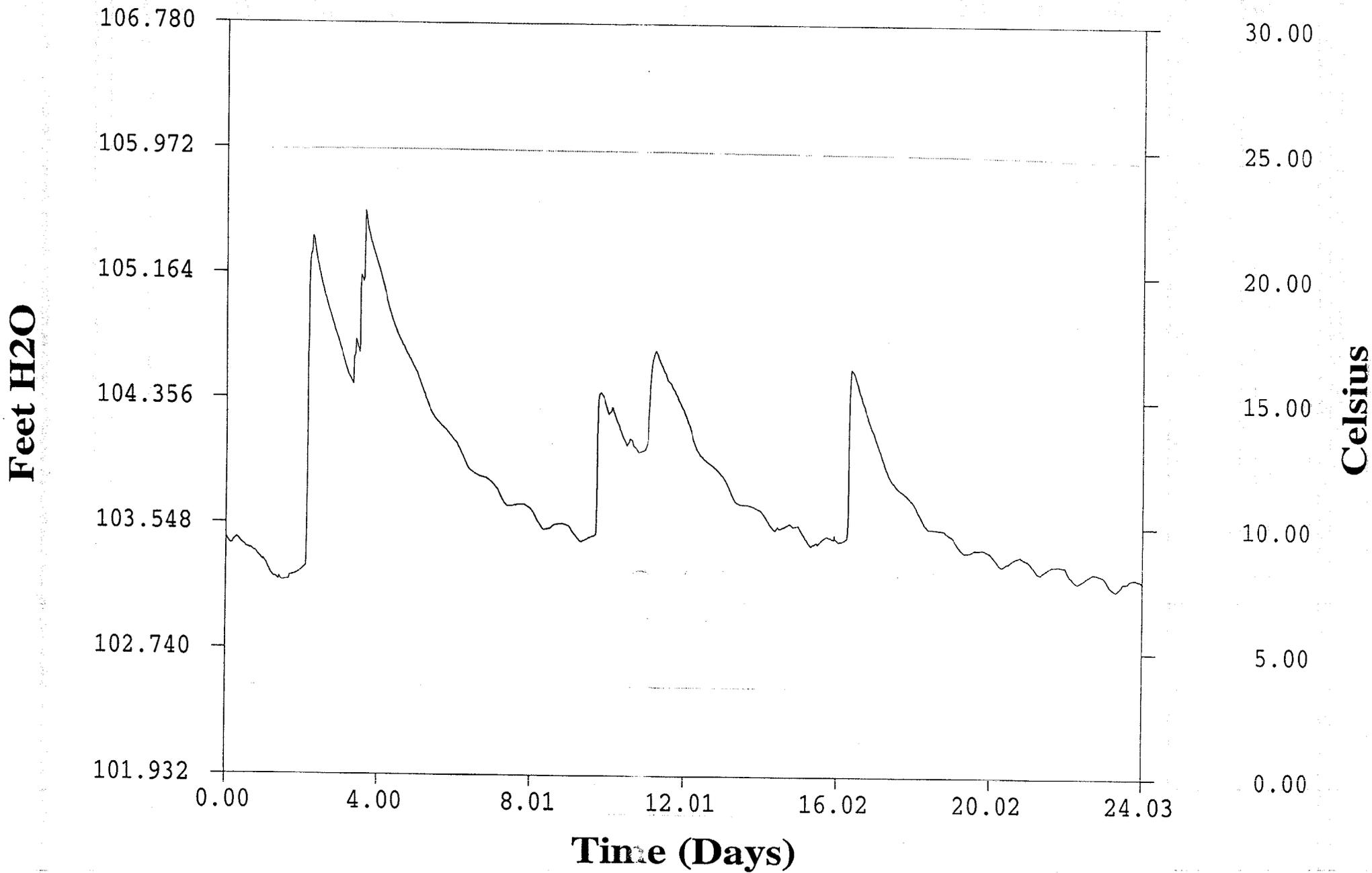
· [2] - OnBoard Pressure

# 12A 10/29-11/22



[2] - OnBoard Pressure

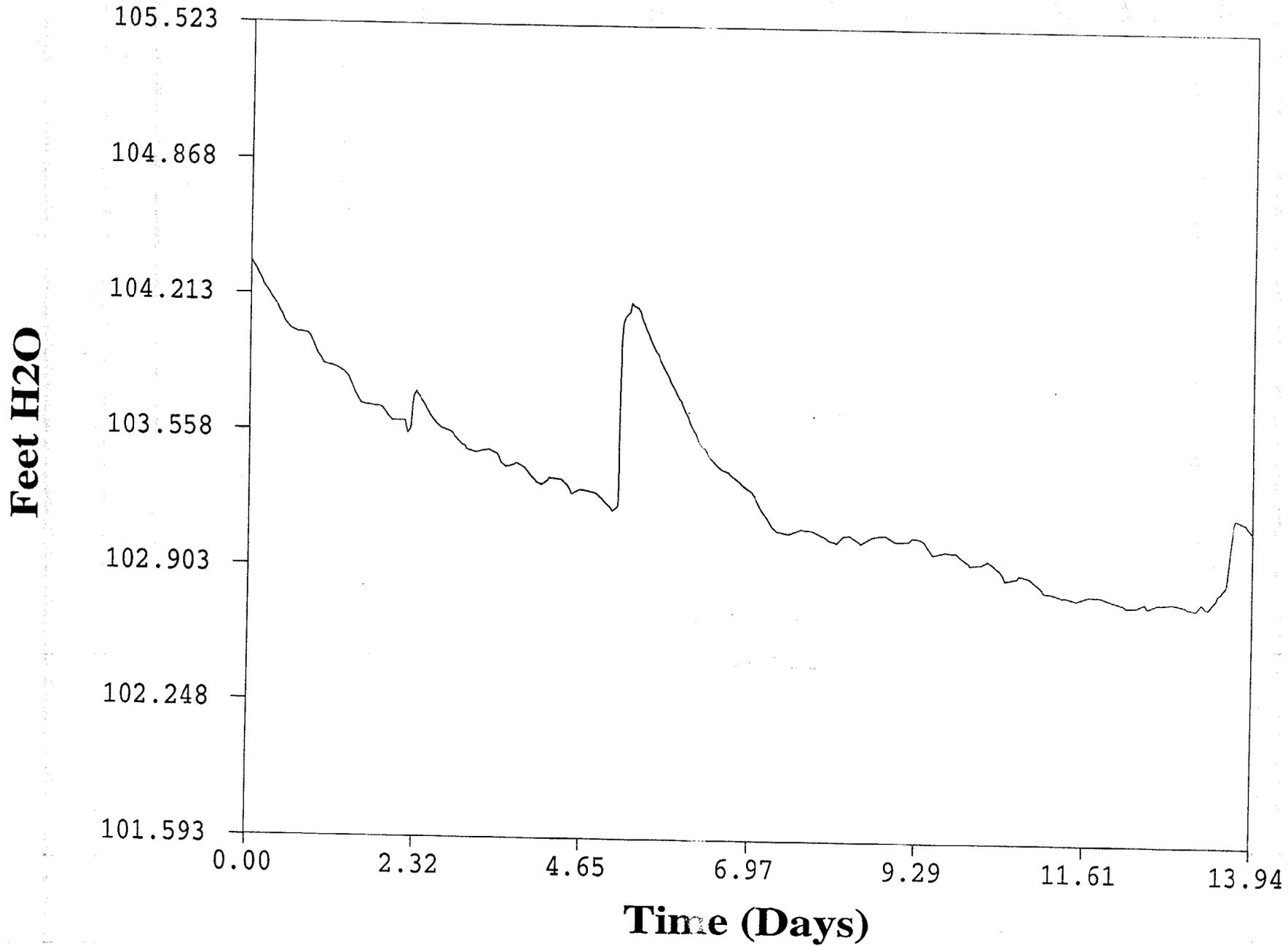
# 12A 10/5-10/29



[2] - OnBoard Pressure

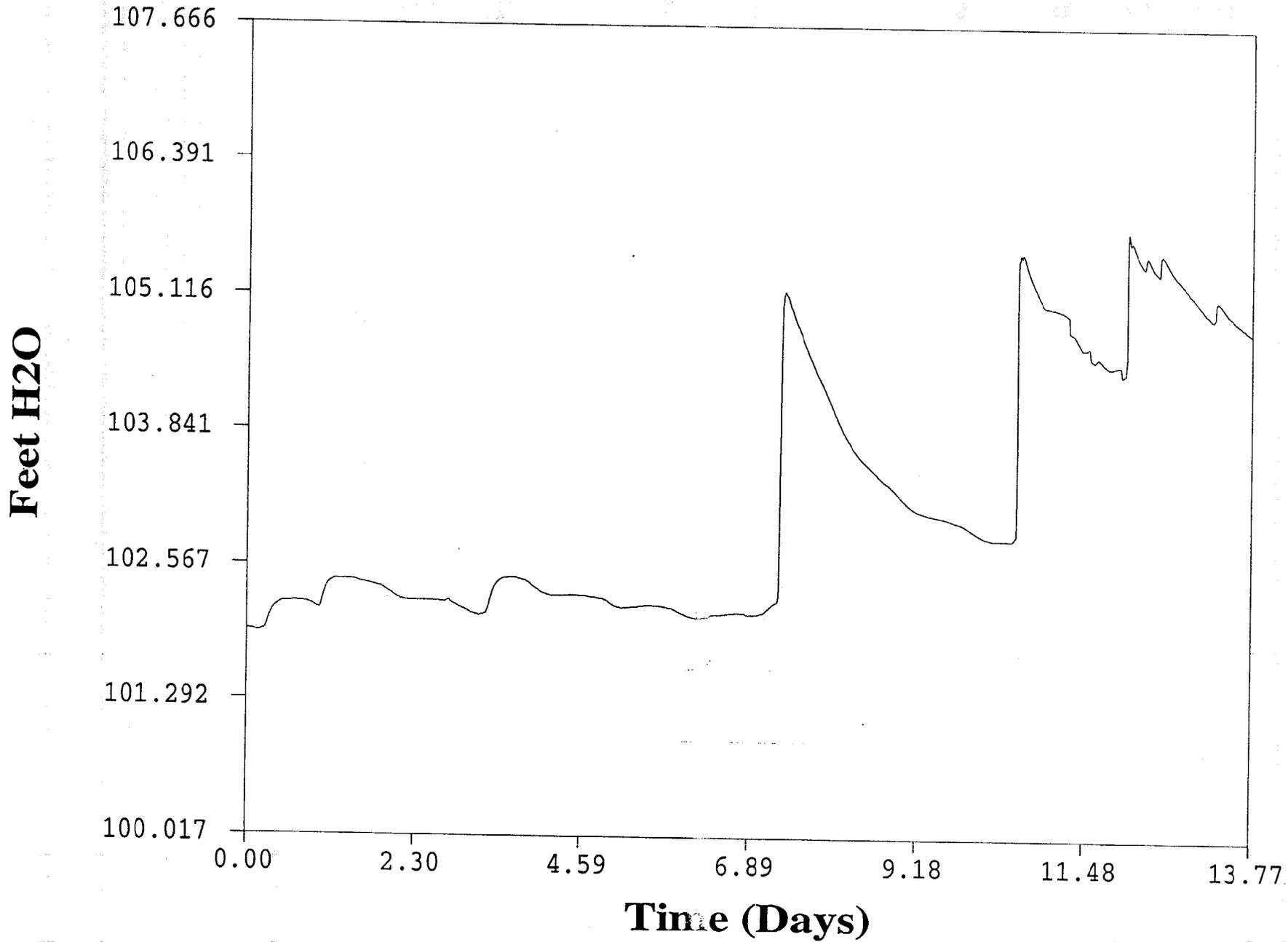
[1] - OnBoard Temp

# 12A 9/21-10/5



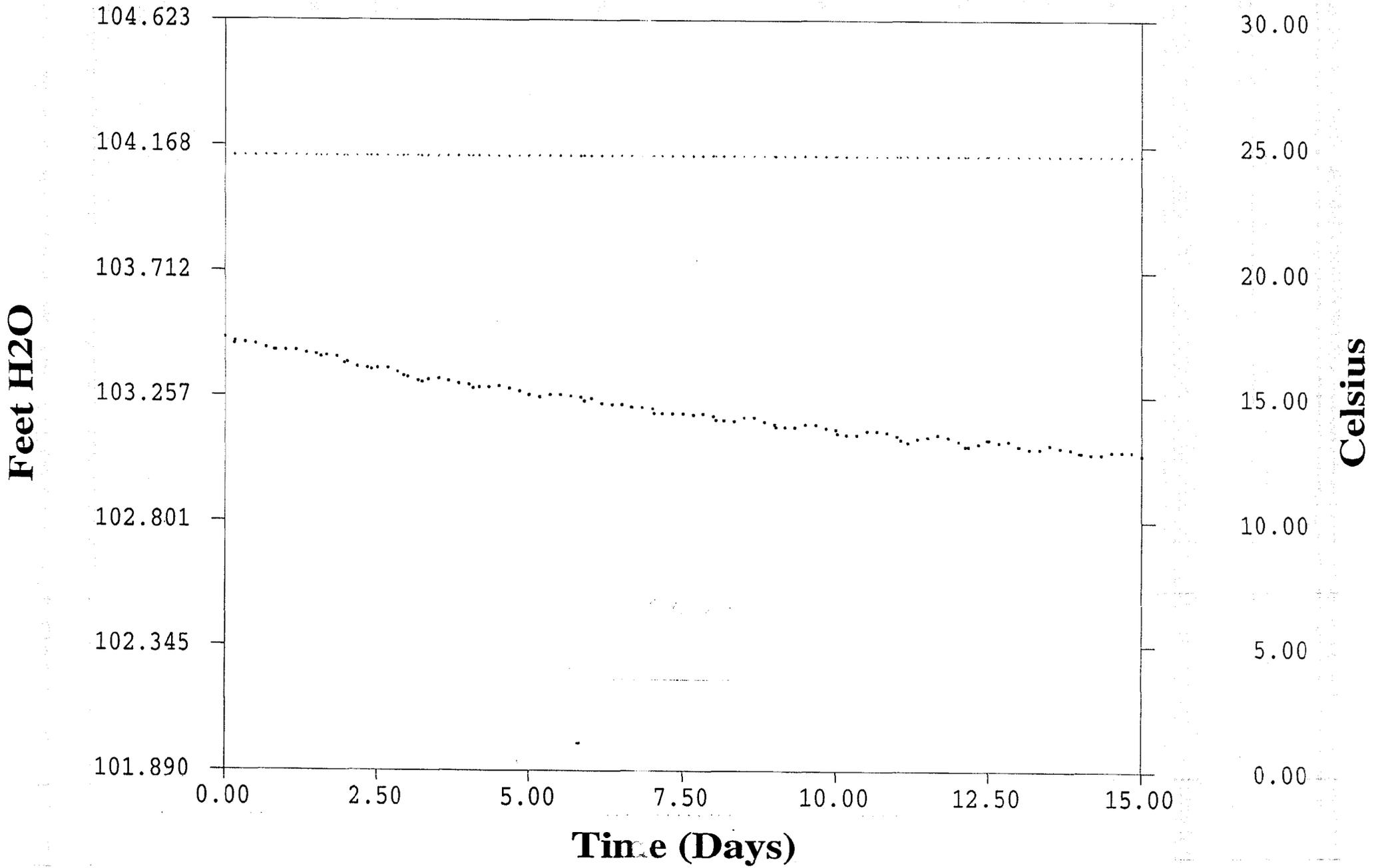
[2] - OnBoard Pressure

# 12A 9/7-9/21



· [2] - OnBoard Pressure

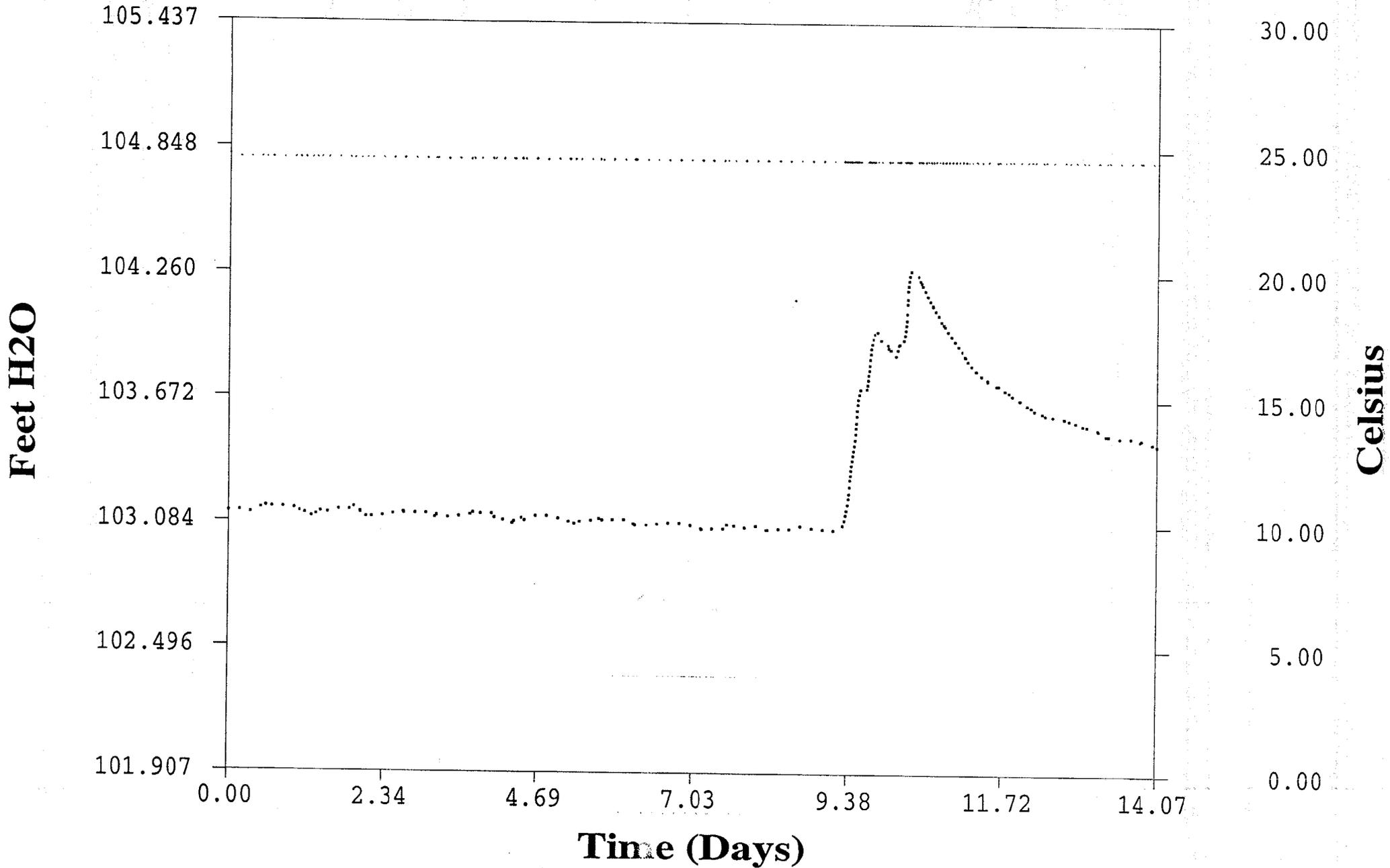
# 13C 12/22-1/6



[2] - onboardpressure

[1] - OnBoard Temp

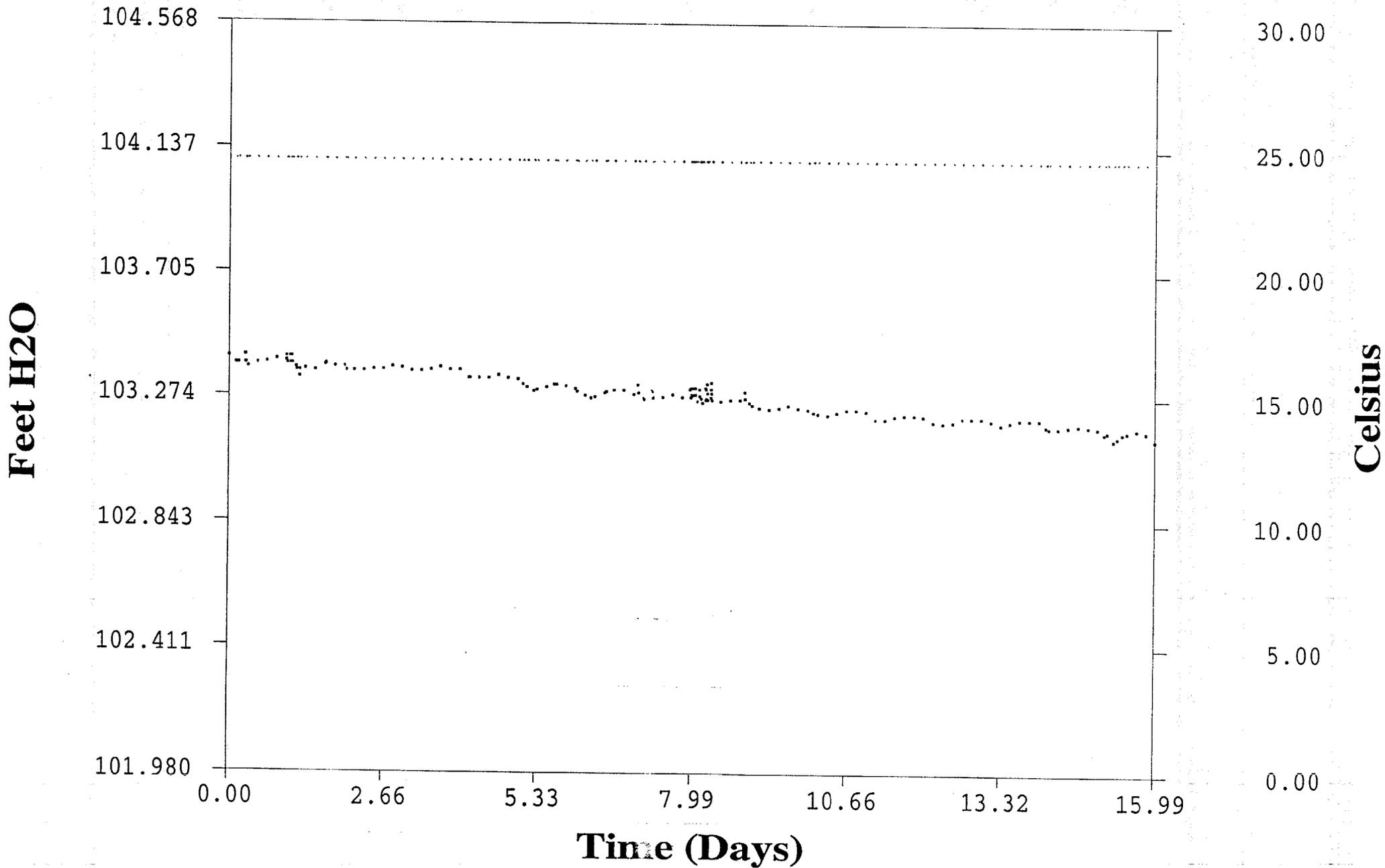
# 13C 12/8-12/22



[2] - onboardpressure

[1] - OnBoard Temp

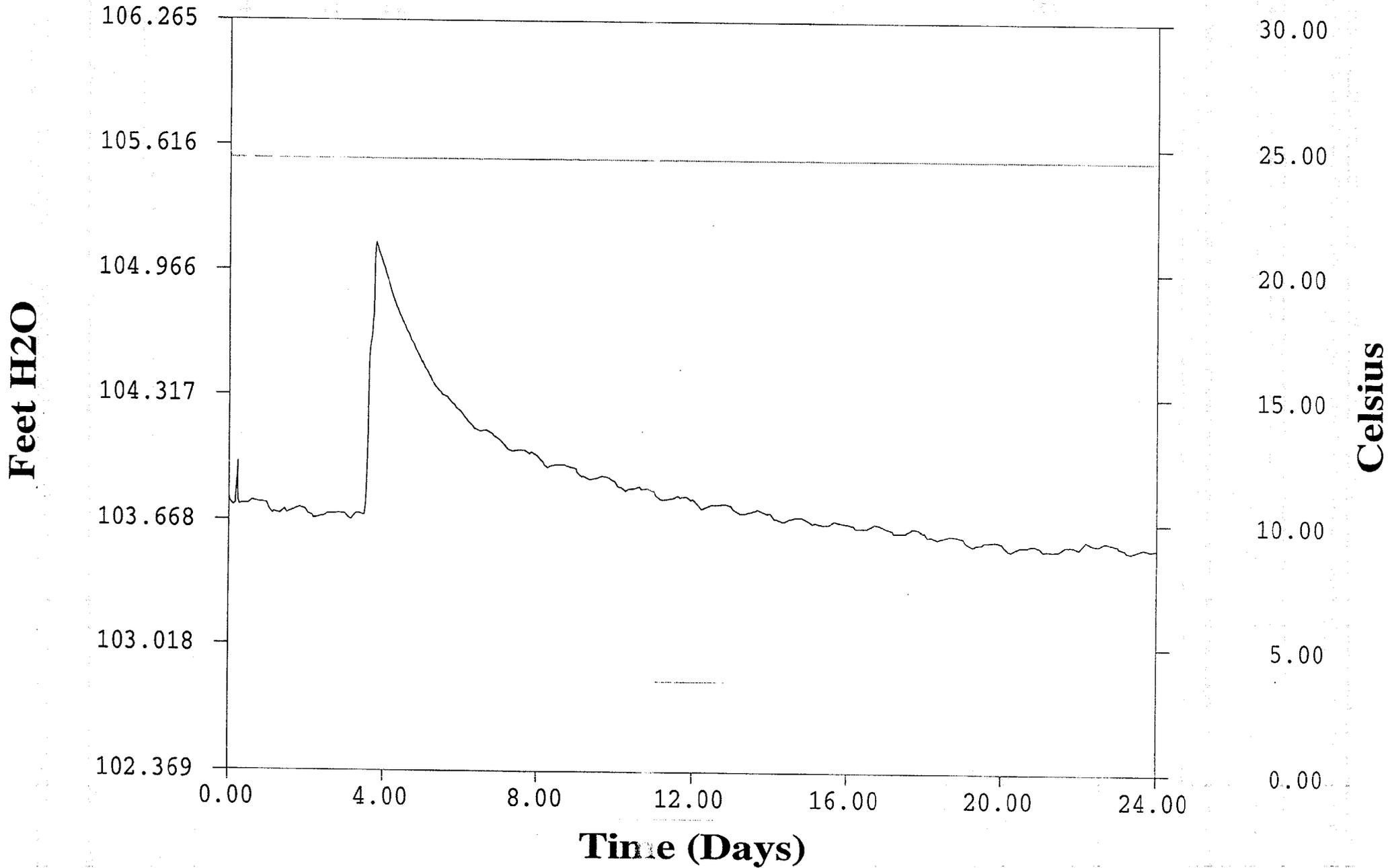
# 13C 11/22-12/8



[2] - onboardpressure

[1] - OnBoard Temp

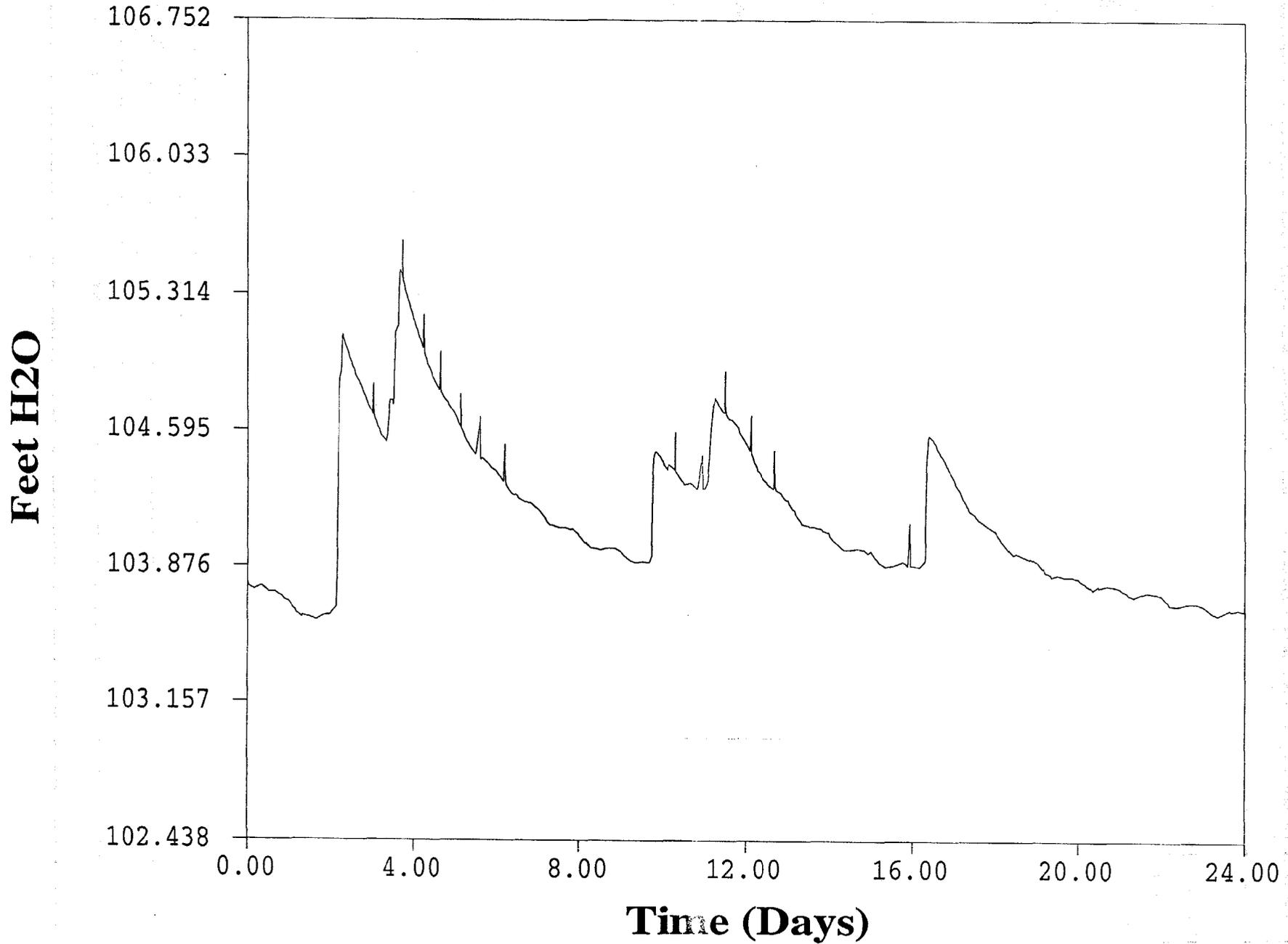
# 13C 10/29-11/22



[2] - OnBoard Pressure

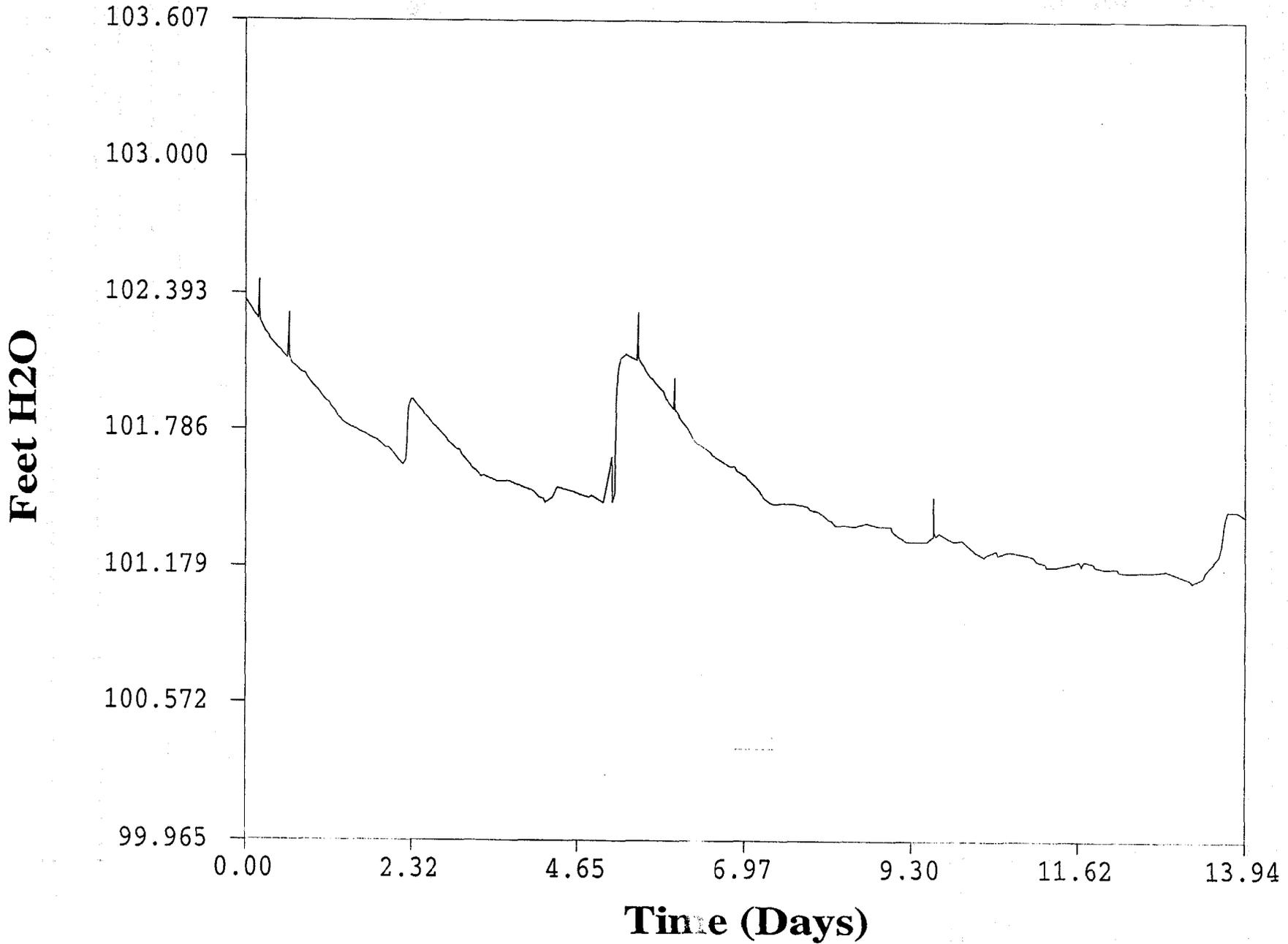
[1] - OnBoard Temp

# 13C 10/5-10/29



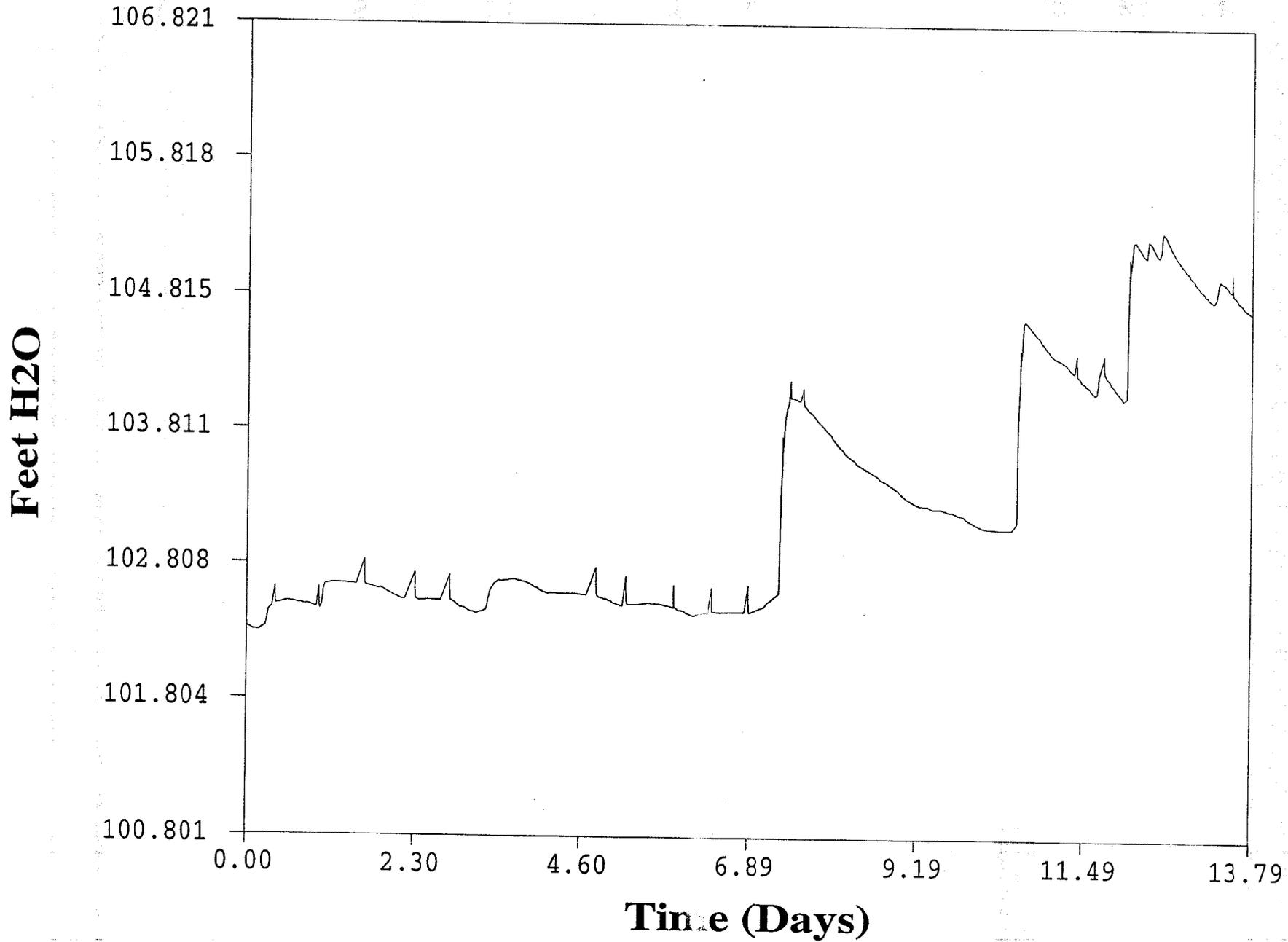
· [2] - OnBoard Pressure

# 13C 9/21-10/5



[2] - OnBoard Pressure

# 13C 9/7-9/21



[2] - OnBoard Pressure

APPENDIX B

# Rainfall Data

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## ORLANDO PRELIMINARY CLIMATE DATA SHEET FOR SEPTEMBER 1999

FOR OFFICIAL/CERTIFIED DATA CONTACT THE NATIONAL CLIMATIC DATA CENTER.  
1-828-271-4800 or <http://www.ncdc.noaa.gov>

	TEMPERATURES			DEGREE DAYS		MEASURABLE RAINFALL		
	HIGH	LOW	MEAN	CDD	HDD	DAY	MONTH	YEAR
1	90	73	82	17	00	0.00	0.00	35.22
2	92	70	81	16	00	0.00	0.00	35.22
3	95	65	80	15	00	0.00	0.00	35.22
4	95	70	83	18	00	0.00	0.00	35.22
5	94	70	82	17	00	0.00	0.00	35.22
6	90	74	82	17	00	0.12	0.12	35.34
7	91	73	82	17	00	0.01	0.13	35.35
8	88	73	81	16	00	0.00	0.13	35.35
9	91	73	82	17	00	0.00	0.13	35.35
10	93	72	83	18	00	1.87	2.00	37.22
11	91	73	82	17	00	0.00	2.00	37.22
12	88	75	82	17	00	0.01	2.01	37.23
13	90	75	83	18	00	0.00	2.01	37.23
14	89	74	82	17	00	1.10	3.11	38.33
15	85	74	80	15	00	0.13	3.24	38.46
16	93	68	81	16	00	0.00	3.24	38.46
17	93	66	80	15	00	0.00	3.24	38.46
18	82	74	78	13	00	0.76	4.00	39.22
19	87	73	80	15	00	0.82	4.82	40.04
20	84	74	79	14	00	0.29	5.11	40.33
21	85	72	79	14	00	0.00	5.11	40.33
22	82	70	76	11	00	0.00	5.11	40.33
23	85	66	76	11	00	0.30	5.41	40.63
24	86	70	78	13	00	0.00	5.41	40.63
25	86	72	79	14	00	0.71	6.12	41.34
26	84	74	79	14	00	0.26	6.38	41.60
27	88	75	82	17	00	0.02	6.40	41.62
28	90	75	83	18	00	0.00	6.40	41.62
29	91	73	82	17	00	0.00	6.40	41.62
30	90	73	82	17	00	0.00	6.40	41.62

## -TEMPERATURE DATA-

AVERAGE DAILY TEMPERATURE WAS 80.5, WHICH IS -0.5 DEGREES FROM NORMAL.  
AVERAGE DAILY HIGH TEMPERATURE WAS 88.9, WHICH IS -0.8 DEGREES FROM NORMAL.  
AVERAGE DAILY LOW TEMPERATURE WAS 72, WHICH IS -0.4 DEGREES FROM NORMAL.  
HIGHEST TEMPERATURE FOR THE MONTH WAS 95, OCCURRED LAST ON Sep 04.  
LOWEST TEMPERATURE FOR THE MONTH WAS 65, OCCURRED LAST ON Sep 03.

## -RAINFALL DATA-

TOTAL MONTHLY RAINFALL WAS 6.4, WHICH IS 0.39 INCHES FROM NORMAL.  
GREATEST CALENDAR DAY RAINFALL WAS 1.87, AND OCCURRED ON Sep 10.  
RAINFALL YEAR TO DATE WAS 41.62, WHICH IS 0.38 INCHES FROM NORMAL.

## -COOLING AND HEATING DEGREE DAYS-

COOLING DEGREE DAYS FOR THE MONTH WERE 471, WHICH IS -9 FROM NORMAL.  
COOLING DEGREE DAYS FOR THE SEASON WERE 2907, WHICH IS 60 FROM NORMAL.  
HEATING DEGREE DAYS FOR THE MONTH WERE 0, WHICH IS 0 FROM NORMAL.  
HEATING DEGREE DAYS FOR THE SEASON WERE 0, WHICH IS 0 FROM NORMAL.

## -REMARKS-

NEW RECORD LOW TEMPERATURE 2, 3, 16, 17

TRACE ON 11, 13, 21

END OF FILE

## ORLANDO PRELIMINARY CLIMATE DATA SHEET FOR OCTOBER 1999

FOR OFFICIAL/CERTIFIED DATA CONTACT THE NATIONAL CLIMATIC DATA CENTER.  
1-828-271-4800 or <http://www.ncdc.noaa.gov>

	TEMPERATURES			DEGREE DAYS		MEASURABLE RAINFALL		
	HIGH	LOW	MEAN	CDD	HDD	DAY	MONTH	YEAR
1	88	74	81	16	00	0.00	0.00	41.62
2	89	75	82	17	00	0.00	0.00	41.62
3	84	74	79	14	00	0.09	0.09	41.71
4	85	70	78	13	00	2.74	2.83	44.45
5	76	72	74	09	00	0.14	2.97	44.59
6	86	72	79	14	00	0.00	2.97	44.59
7	78	72	75	10	00	2.36	5.33	46.95
8	81	73	77	12	00	0.96	6.29	47.91
9	86	72	79	14	00	0.06	6.35	47.97
10	87	68	78	13	00	0.00	6.35	47.97
11	89	69	79	14	00	0.08	6.43	48.05
12	89	71	80	15	00	0.00	6.43	48.05
13	88	72	80	15	00	0.00	6.43	48.05
14	85	71	78	13	00	0.00	6.43	48.05
15	80	73	77	12	00	0.56	6.99	48.61
16	78	71	75	10	00	1.14	8.13	49.75
17	85	71	78	13	00	0.00	8.13	49.75
18	87	66	77	12	00	0.00	8.13	49.75
19	87	67	77	12	00	0.00	8.13	49.75
20	89	70	80	15	00	0.01	8.14	49.76
21	76	67	72	07	00	0.25	8.39	50.01
22	76	60	68	03	00	0.00	8.39	50.01
23	80	54	67	02	00	0.00	8.39	50.01
24	71	53	62	00	03	0.00	8.39	50.01
25	78	53	66	01	00	0.00	8.39	50.01
26	79	59	69	04	00	0.00	8.39	50.01
27	79	60	70	05	00	0.00	8.39	50.01
28	81	60	71	06	00	0.00	8.39	50.01
29	83	64	74	09	00	0.01	8.40	50.02
30	84	74	79	14	00	0.00	8.40	50.02
31	85	69	77	12	00	0.00	8.40	50.02

## -TEMPERATURE DATA-

AVERAGE DAILY TEMPERATURE WAS 75.3, WHICH IS 0.1 DEGREES FROM NORMAL.  
AVERAGE DAILY HIGH TEMPERATURE WAS 82.9, WHICH IS -1.7 DEGREES FROM NORMAL.  
AVERAGE DAILY LOW TEMPERATURE WAS 67.6, WHICH IS 1.8 DEGREES FROM NORMAL.  
HIGHEST TEMPERATURE FOR THE MONTH WAS 89, OCCURRED LAST ON Oct 20.  
LOWEST TEMPERATURE FOR THE MONTH WAS 53, OCCURRED LAST ON Oct 25.

## -RAINFALL DATA-

TOTAL MONTHLY RAINFALL WAS 8.4, WHICH IS 5.98 INCHES FROM NORMAL.  
GREATEST CALENDAR DAY RAINFALL WAS 2.74, AND OCCURRED ON Oct 04.  
RAINFALL YEAR TO DATE WAS 50.02, WHICH IS 6.36 INCHES FROM NORMAL.

## -COOLING AND HEATING DEGREE DAYS-

COOLING DEGREE DAYS FOR THE MONTH WERE 326, WHICH IS 10 FROM NORMAL.  
COOLING DEGREE DAYS FOR THE SEASON WERE 3233, WHICH IS 70 FROM NORMAL.  
HEATING DEGREE DAYS FOR THE MONTH WERE 3, WHICH IS 3 FROM NORMAL.  
HEATING DEGREE DAYS FOR THE SEASON WERE 3, WHICH IS 3 FROM NORMAL.

## -REMARKS-

RECORD LOW TIED ON - 23, NEW RECORD LOW ON - 24  
NEW RECORD RAINFALL ON - 4  
TRACE RAINFALL ON - 2, 14, 17  
END OF FILE

## ORLANDO PRELIMINARY CLIMATE DATA SHEET FOR NOVEMBER 1999

FOR OFFICIAL/CERTIFIED DATA CONTACT THE NATIONAL CLIMATIC DATA CENTER.  
1-828-271-4800 or <http://www.ncdc.noaa.gov>

	TEMPERATURES			DEGREE DAYS		MEASURABLE RAINFALL		
	HIGH	LOW	MEAN	CDD	HDD	DAY	MONTH	YEAR
1	84	71	78	13	00	0.53	0.53	50.55
2	78	64	71	06	00	0.99	1.52	51.54
3	65	48	57	00	08	0.00	1.52	51.54
4	75	47	61	00	04	0.00	1.52	51.54
5	78	56	67	02	00	0.00	1.52	51.54
6	80	60	70	05	00	0.00	1.52	51.54
7	80	61	71	06	00	0.00	1.52	51.54
8	81	59	70	05	00	0.00	1.52	51.54
9	80	59	70	05	00	0.00	1.52	51.54
10	81	60	71	06	00	0.00	1.52	51.54
11	81	62	72	07	00	0.00	1.52	51.54
12	81	60	71	06	00	0.00	1.52	51.54
13	79	66	73	08	00	0.09	1.61	51.63
14	80	61	71	06	00	0.00	1.61	51.63
15	80	57	69	04	00	0.00	1.61	51.63
16	72	56	64	00	01	0.00	1.61	51.63
17	75	54	65	00	00	0.00	1.61	51.63
18	77	54	66	01	00	0.00	1.61	51.63
19	77	59	68	03	00	0.18	1.79	51.81
20	77	61	69	04	00	0.00	1.79	51.81
21	79	62	71	06	00	0.00	1.79	51.81
22	80	61	71	06	00	0.00	1.79	51.81
23	80	64	72	07	00	0.00	1.79	51.81
24	78	65	72	07	00	0.24	2.03	52.05
25	79	65	72	07	00	0.10	2.13	52.15
26	82	64	73	08	00	0.00	2.13	52.15
27	74	54	64	00	01	0.00	2.13	52.15
28	77	53	65	00	00	0.00	2.13	52.15
29	78	55	67	02	00	0.00	2.13	52.15
30	69	48	59	00	06	0.00	2.13	52.15

## -TEMPERATURE DATA-

AVERAGE DAILY TEMPERATURE WAS 68.4, WHICH IS 0.4 DEGREES FROM NORMAL.  
AVERAGE DAILY HIGH TEMPERATURE WAS 77.9, WHICH IS -0.6 DEGREES FROM NORMAL.  
AVERAGE DAILY LOW TEMPERATURE WAS 58.9, WHICH IS 1.4 DEGREES FROM NORMAL.  
HIGHEST TEMPERATURE FOR THE MONTH WAS 84, OCCURRED LAST ON Nov 01.  
LOWEST TEMPERATURE FOR THE MONTH WAS 47, OCCURRED LAST ON Nov 04.

## -RAINFALL DATA-

TOTAL MONTHLY RAINFALL WAS 2.13, WHICH IS -0.17 INCHES FROM NORMAL.  
GREATEST CALENDAR DAY RAINFALL WAS 0.99, AND OCCURRED ON Nov 02.  
RAINFALL YEAR TO DATE WAS 52.15, WHICH IS 6.19 INCHES FROM NORMAL.

## -COOLING AND HEATING DEGREE DAYS-

COOLING DEGREE DAYS FOR THE MONTH WERE 130, WHICH IS -14 FROM NORMAL.  
COOLING DEGREE DAYS FOR THE SEASON WERE 3363, WHICH IS 56 FROM NORMAL.  
HEATING DEGREE DAYS FOR THE MONTH WERE 20, WHICH IS -34 FROM NORMAL.  
HEATING DEGREE DAYS FOR THE SEASON WERE 23, WHICH IS -31 FROM NORMAL.

## -REMARKS-

NEW RAINFALL RECORD - 2,

TRACE RAINFALL ON - 14, 21, 22, 23  
END OF FILE

## ORLANDO PRELIMINARY CLIMATE DATA SHEET FOR DECEMBER 1999

FOR OFFICIAL/CERTIFIED DATA CONTACT THE NATIONAL CLIMATIC DATA CENTER.  
1-828-271-4800 or <http://www.ncdc.noaa.gov>

	TEMPERATURES			DEGREE DAYS		MEASURABLE RAINFALL		
	HIGH	LOW	MEAN	CDD	HDD	DAY	MONTH	YEAR
1	61	43	52	00	13	0.00	0.00	52.15
2	67	39	53	00	12	0.00	0.00	52.15
3	71	47	59	00	06	0.00	0.00	52.15
4	77	58	68	03	00	0.00	0.00	52.15
5	76	57	67	02	00	0.01	0.01	52.16
6	80	54	67	02	00	0.00	0.01	52.16
7	73	47	60	00	05	0.00	0.01	52.16
8	76	56	66	01	00	0.00	0.01	52.16
9	79	55	67	02	00	0.00	0.01	52.16
10	80	55	68	03	00	0.00	0.01	52.16
11	76	56	66	01	00	0.00	0.01	52.16
12	80	60	70	05	00	0.00	0.01	52.16
13	81	62	72	07	00	0.00	0.01	52.16
14	74	60	67	02	00	0.11	0.12	52.27
15	72	58	65	00	00	0.01	0.13	52.28
16	64	52	58	00	07	0.04	0.17	52.32
17	70	53	62	00	03	1.21	1.38	53.53
18	65	61	63	00	02	1.26	2.64	54.79
19	77	53	65	00	00	0.00	2.64	54.79
20	74	50	62	00	03	0.00	2.64	54.79
21	81	59	70	05	00	0.00	2.64	54.79
22	79	60	70	05	00	0.00	2.64	54.79
23	64	57	61	00	04	0.01	2.65	54.80
24	63	47	55	00	10	0.00	2.65	54.80
25	58	41	50	00	15	0.00	2.65	54.80
26	59	38	49	00	16	0.00	2.65	54.80
27	69	39	54	00	11	0.00	2.65	54.80
28	67	48	58	00	07	0.00	2.65	54.80
29	65	42	54	00	11	0.00	2.65	54.80
30	71	39	55	00	10	0.00	2.65	54.80
31	74	45	60	00	05	0.00	2.65	54.80

## -TEMPERATURE DATA-

AVERAGE DAILY TEMPERATURE WAS 61.5, WHICH IS -0.6 DEGREES FROM NORMAL.  
AVERAGE DAILY HIGH TEMPERATURE WAS 71.7, WHICH IS -1.2 DEGREES FROM NORMAL.  
AVERAGE DAILY LOW TEMPERATURE WAS 51.3, WHICH IS 0 DEGREES FROM NORMAL.  
HIGHEST TEMPERATURE FOR THE MONTH WAS 81, OCCURRED LAST ON Dec 21.  
LOWEST TEMPERATURE FOR THE MONTH WAS 38, OCCURRED LAST ON Dec 26.

## -RAINFALL DATA-

TOTAL MONTHLY RAINFALL WAS 2.65, WHICH IS 0.5 INCHES FROM NORMAL.  
GREATEST CALENDAR DAY RAINFALL WAS 1.26, AND OCCURRED ON Dec 18.  
RAINFALL YEAR TO DATE WAS 54.8, WHICH IS 6.69 INCHES FROM NORMAL.

## -COOLING AND HEATING DEGREE DAYS-

COOLING DEGREE DAYS FOR THE MONTH WERE 38, WHICH IS -36 FROM NORMAL.  
COOLING DEGREE DAYS FOR THE SEASON WERE 3401, WHICH IS 20 FROM NORMAL.  
HEATING DEGREE DAYS FOR THE MONTH WERE 140, WHICH IS -24 FROM NORMAL.  
HEATING DEGREE DAYS FOR THE SEASON WERE 163, WHICH IS -55 FROM NORMAL.

## -REMARKS-

RECORD RAINFALL 18TH

TRACE RAINFALL ON - 6, 12, 13, 28  
END OF FILE

## ORLANDO PRELIMINARY CLIMATE DATA SHEET FOR JANUARY 2000

FOR OFFICIAL/CERTIFIED DATA CONTACT THE NATIONAL CLIMATIC DATA CENTER.  
1-828-271-4800 or <http://www.ncdc.noaa.gov>

	TEMPERATURES			DEGREE DAYS		MEASURABLE RAINFALL		
	HIGH	LOW	MEAN	CDD	HDD	DAY	MONTH	YEAR
1	77	52	65	00	00	0.00	0.00	0.00
2	79	57	68	03	00	0.00	0.00	0.00
3	81	55	68	03	00	0.00	0.00	0.00
4	82	58	70	05	00	0.00	0.00	0.00
5	65	54	60	00	05	0.00	0.00	0.00
6	77	57	67	02	00	0.00	0.00	0.00
7	78	62	70	05	00	0.00	0.00	0.00
8	78	61	70	05	00	0.00	0.00	0.00
9	81	55	68	03	00	0.00	0.00	0.00
10	82	59	71	06	00	0.01	0.01	0.01
11	77	53	65	00	00	0.00	0.01	0.01
12	78	48	63	00	02	0.00	0.01	0.01
13	80	49	65	00	00	0.00	0.01	0.01
14	65	46	56	00	09	0.00	0.01	0.01
15	67	44	56	00	09	0.00	0.01	0.01
16	71	45	58	00	07	0.00	0.01	0.01
17	70	43	57	00	08	0.00	0.01	0.01
18	75	49	62	00	03	0.00	0.01	0.01
19	69	59	64	00	01	0.03	0.04	0.04
20	76	53	65	00	00	0.00	0.04	0.04
21	58	41	50	00	15	0.00	0.04	0.04
22	69	37	53	00	12	0.00	0.04	0.04
23	77	48	63	00	02	0.00	0.04	0.04
24	68	46	57	00	08	0.59	0.63	0.63
25	57	40	49	00	16	0.00	0.63	0.63
26	50	36	43	00	22	0.00	0.63	0.63
27	57	32	45	00	20	0.00	0.63	0.63
28	64	41	53	00	12	0.09	0.72	0.72
29	75	53	64	00	01	0.00	0.72	0.72
30	80	56	68	03	00	0.00	0.72	0.72
31	61	45	53	00	12	0.51	1.23	1.23

## -TEMPERATURE DATA-

AVERAGE DAILY TEMPERATURE WAS 60.6, WHICH IS 0.9 DEGREES FROM NORMAL.  
AVERAGE DAILY HIGH TEMPERATURE WAS 71.7, WHICH IS 0.9 DEGREES FROM NORMAL.  
AVERAGE DAILY LOW TEMPERATURE WAS 49.5, WHICH IS 0.9 DEGREES FROM NORMAL.  
HIGHEST TEMPERATURE FOR THE MONTH WAS 82, OCCURRED LAST ON Jan 10.  
LOWEST TEMPERATURE FOR THE MONTH WAS 32, OCCURRED LAST ON Jan 27.

## -RAINFALL DATA-

TOTAL MONTHLY RAINFALL WAS 1.23, WHICH IS -1.07 INCHES FROM NORMAL.  
GREATEST CALENDAR DAY RAINFALL WAS 0.59, AND OCCURRED ON Jan 24.  
RAINFALL YEAR TO DATE WAS 1.23, WHICH IS -1.07 INCHES FROM NORMAL.

## -COOLING AND HEATING DEGREE DAYS-

COOLING DEGREE DAYS FOR THE MONTH WERE 35, WHICH IS -35 FROM NORMAL.  
COOLING DEGREE DAYS FOR THE SEASON WERE 35, WHICH IS -35 FROM NORMAL.  
HEATING DEGREE DAYS FOR THE MONTH WERE 164, WHICH IS -70 FROM NORMAL.  
HEATING DEGREE DAYS FOR THE SEASON WERE 327, WHICH IS -125 FROM NORMAL.

## -REMARKS-

NEW RECORD DAILY RAINFALL ON THE 31

TRACE RAINFALL ON - 7

END OF FILE

**Ferreira, Fernando/TPA**

**From:** parkers@bellsouth.net  
**Sent:** January 18, 2000 8:59 AM  
**To:** Ferreira, Fernando/TPA  
**Subject:** Re: Rainfall

Here is what I have.

*Rainfall data from Orlando Executive Airport*

12/1	0	12/2	0	
12/3	0			
12/4	0	12/5	.01	
12/6	.01			
12/7	0	12/8	0	
12/9	0			
12/10	.01	12/11	.01	
12/12	0			
12/13	0	12/14, 15, 16	- no data	
12/17	.93			
12/18	1.05	12/19	.01	
12/20	.01			
12/21	0	12/22	Trace	
12/23	.07			
12/24	0	12/25		
0		12/26	0	
12/27	.01	12/28	Trace	
12/29	0			
12/30	trace	12/31	.01	
1/1	0	1/2		
Trace		1/3	.01	
1/4	.04		1/5	
0		1/6	Trace	
1/7	Trace		1/8	
0		1/9	.01	
1/10	.01		1/11	
0		1/12	Trace	
1/13	.01		1/14	
0		1/15	0	
1/16	0		1/17	0

**Ferreira, Fernando/TPA**

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**From:** parkers@bellsouth.net  
**Sent:** December 13, 1999 11:38 PM  
**To:** Ferreira, Fernando/TPA  
**Subject:** Re: Rainfall

Fernando,

Sorry, but I got busy (or lazy) and missed the first 2 weeks of November. Our equipment only goes back 30 days. If you need the info I don't have, you may be able to get it from the National Weather Service in Orlando - unfortunately, I don't have an E-mail address or phone number for them.

Anyhow, here's what I do have for November:

12	0
13	Trace
14	0
15	0
16	0
17	0
18	0
19	.14
20	.05
21	.07
22	Trace
23	Trace
24	.23
25	.07
26	.01
27	0
28	0
29	0
30	0

Todd Parker

Ferreira, Fernando/TPA wrote:

## Ferreira, Fernando/TPA

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**From:** parkers@bellsouth.net  
**Sent:** October 05, 1999 12:21 AM  
**To:** fferreir@ch2m.com  
**Subject:** Rainfall

Fernando,

Our equipment only tracks daily statistics back 30 days. Anything more you would probably have to get through the National Weather Service. Anyhow, here is the last 30 days numbers:

Sept	30	Trace
	29	0
	28	0
	27	.02
	26	.66
	25	.16
	24	0
	23	.91
	22	0
	21	Trace
	20	.49
	19	2.40
	18	2.69
	17	0
	16	0
	15	.18
	14	1.84
	13	.8
	12	.7
	11	0
	10	.24
	9	.01
	8	.36
	7	.44
	6	Trace
	5	0
	4	0
	3	0

This equipment we use is not the best in the world, I can't vouch for the accuracy, but it should be close. Good luck

Todd Parker  
Orlando Executive Tower

APPENDIX C

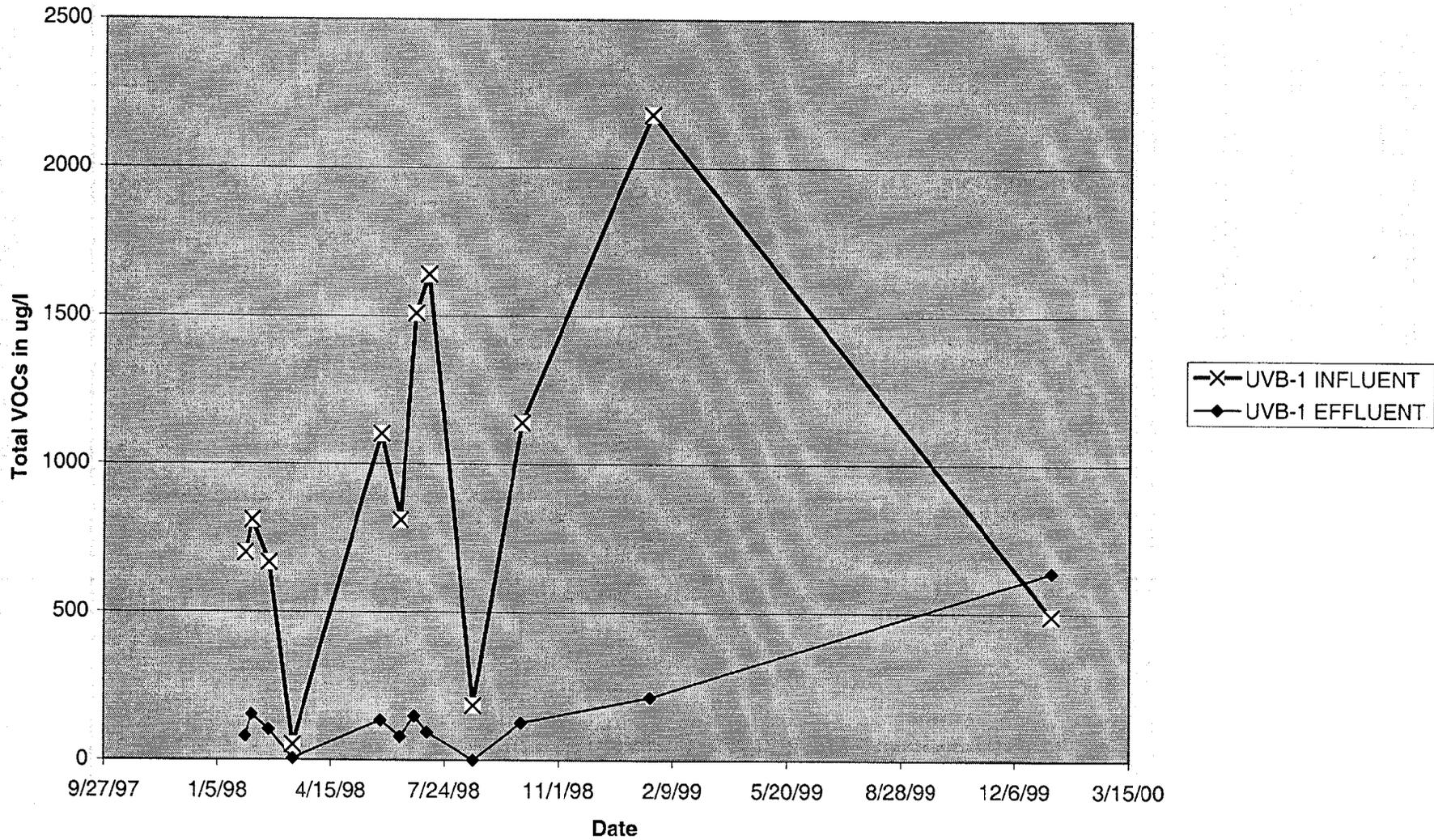
# Analytical Data and Graphs

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**PERFORMANCE MONITORING AND SAMPLING PLAN - ANALYTICAL RESULTS  
GROUNDWATER RESULTS - UVB-1**

Sample ID	UNITS	Week 1	Week 1	Week 2	Week 2	Week 4	Week 4	Week 7	Week 7	Week 18	Week 18	Week 20	Week 20	Week 22	Week 22	Week 24	Week 24	Week 30	Week 30	Week 36	Week 36	Week 52	Week 52				
		INFLUENT	EFFLUENT																								
Date Sampled		1/29/98	1/29/98	2/4/98	2/4/98	2/19/98	2/19/98	3/12/98	3/12/98	5/29/98	5/29/98	6/15/98	6/15/98	6/28/98	6/28/98	7/9/98	7/9/98	8/18/98	8/18/98	9/29/98	9/29/98	1/20/99	1/20/99	1/7/00	1/7/00		
Source		offsite																									
PCE	ug/l	<10	<2	<25	<5	17.0	<2.5	<1	<1	82.0	7.6	120.0	7.9	250.0	20.0	280.0	9.9	< 10	< 1	<50	<5	430	28	ND	ND		
TCE	ug/l	160.0	16.0	230.0	33.0	150.0	20.0	12.0	1.3	290.0	29.0	200.0	16.0	340.0	30.0	360.0	16.0	15.0	< 1	200.0	17.0	550	45	ND	61.5		
C-1,2-DCE	ug/l	540.0	64.0	580.0	120.0	500.0	83.0	40.0	4.1	730.0	98.0	490.0	55.0	920.0	99.0	1000.0	68.0	170.0	< 1	940.0	110.0	1200	140	490	576		
T-1,2-DCE	ug/l	<10	<2	<25	<5	<17	<2.5	<1	<1	<25	<2.5	<20	<1	<50	<5	< 50	< 2	< 10	< 1	<50	<5	<20	<5	ND	ND		
1,1-DCE	ug/l	<10	<2	<25	<5	<17	<2.5	<1	<1	<25	<2.5	<20	<1	<50	<5	< 50	< 2	< 10	< 1	<50	<5	<20	<5	ND	ND		
VC	ug/l	<10	<2	<50	<10	<33	<5	<1	<1	<25	<2.5	<20	<1	<50	<5	< 50	< 2	< 10	< 1	<50	<5	<20	<5	ND	ND		
BENZENE	ug/l	<10	<2	<25	<5	<17	<2.5	<1	<1	<25	<2.5	<20	<1	<50	<5	< 50	< 2	< 10	< 1	<50	<5	<20	<5	ND	ND		
TOLUENE	ug/l	<10	<2	<25	<5	<17	<2.5	<1	<1	<25	<2.5	<20	<1	<50	<5	< 50	< 2	< 10	< 1	<50	<5	<20	<5	ND	ND		
ETHYLBENZ.	ug/l	<10	<2	<25	<5	<17	<2.5	<1	<1	<25	<2.5	<20	<1	<50	<5	< 50	< 2	< 10	< 1	<50	<5	<20	<5	ND	ND		
m/p XYLENE	ug/l	<10	<2	<25	<5	<17	<2.5	<1	<1	<25	<2.5	<20	<1	<50	<5	< 50	< 2	< 10	< 1	<50	<5	<20	<5	ND	ND		
O XYLENE	ug/l	<10	<2	<25	<5	<17	<2.5	<1	<1	<25	<2.5	<20	<1	<50	<5	< 50	< 2	< 10	< 1	<50	<5	<20	<5	ND	ND		
total VOCs	ug/l	700.0	80.0	810.0	153.0	667.0	103.0	52.0	5.4	1102.0	134.6	810.0	78.9	1510.0	149.0	1640.0	93.9	185.0	< 1	1140.0	127.0	2180.0	213.0	490	637.5		

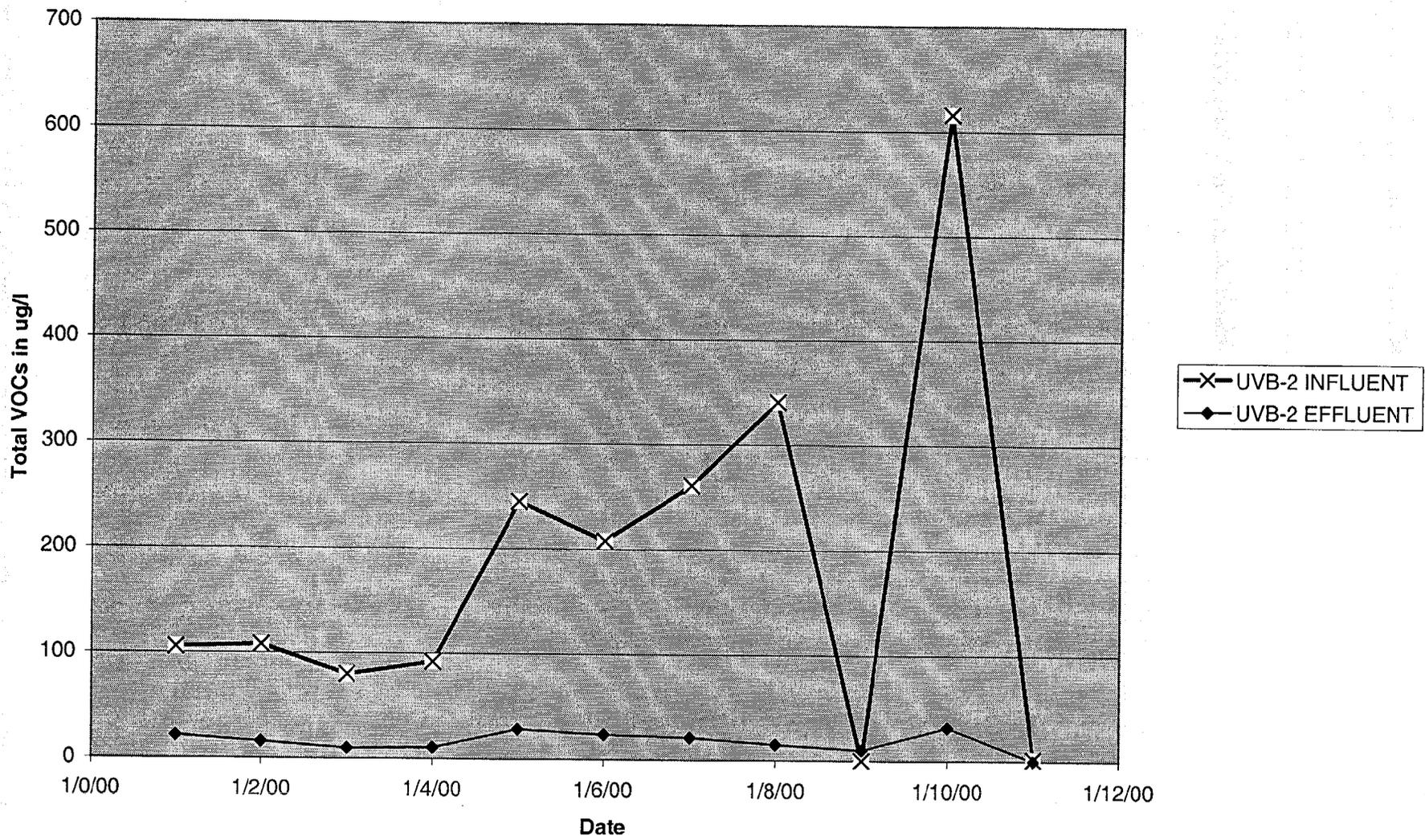
Total VOCs (ug/l) Well OLD-13-UVB1  
System Groundwater Results



**PERFORMANCE MONITORING AND SAMPLING PLAN - ANALYTICAL RESULTS  
GROUNDWATER RESULTS - UVB-2**

Sample ID	UNITS	Week 1	Week 1	Week 2	Week 2	Week 4	Week 4	Week 7	Week 7	Week 18	Week 18	Week 20	Week 20	Week 22	Week 22	Week 24	Week 24	Week 30	Week 30	Week 52	Week 52				
		INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT	INFLUENT	EFFLUENT														
Date Sampled		1/29/98	1/29/98	2/4/98	2/4/98	2/19/98	2/19/98	3/12/98	3/12/98	5/29/98	5/29/98	6/15/98	6/15/98	6/28/98	6/28/98	7/9/98	7/9/98	8/18/98	8/18/98	1/20/99	1/20/99	1/7/00	1/7/00		
Source		offsite	offsite	offsite	offsite	offsite	offsite	offsite	offsite																
PCE	ug/l	3.4	<1	<2.5	<1	<1.7	<2.5	1.1	<1	<5	<1	<5	<1	<10	<1	<10	<1	Not Collected	<1	<20	<1		ND	ND	
TCE	ug/l	23.0	5.4	29.0	3.8	24.0	2.4	20.0	2.1	65.0	6.3	38.0	3.7	31.0	2.1	31.0	<1	Not Collected	<1	46	1.7		ND	ND	
C-1,2-DCE	ug/l	79.0	16.0	79.0	12.0	56.0	7.3	71.0	8.5	180.0	22.0	170.0	20.0	230.0	19.0	310.0	15.0	Not Collected	10.0	570	30	1.5		ND	
T-1,2-DCE	ug/l	<2	<1	<2.5	<1	<1.7	<1	<1	<1	<5	<1	<5	<1	<10	<1	<10	<1	Not Collected	<1	<20	<1		ND	ND	
1,1-DCE	ug/l	<2	<1	<2.5	<1	<1.7	<1	<1	<1	<5	<1	<5	<1	<10	<1	<10	<1	Not Collected	<1	<20	<1		ND	ND	
VC	ug/l	<2	<1	<5	<2	<3.3	<2	<1	<1	<5	<1	<5	<1	<10	<1	<10	<1	Not Collected	<1	<20	<1		ND	ND	
BENZENE	ug/l	<2	<1	<2.5	<1	<1.7	<1	<1	<1	<5	<1	<5	<1	<10	<1	<10	<1	Not Collected	<1	<20	<1		ND	ND	
TOLUENE	ug/l	<2	<1	<2.5	<1	<1.7	<1	<1	<1	<5	<1	<5	<1	<10	<1	<10	<1	Not Collected	<1	<20	<1		ND	ND	
ETHYLBENZ	ug/l	<2	<1	<2.5	<1	<1.7	<1	<1	<1	<5	<1	<5	<1	<10	<1	<10	<1	Not Collected	<1	<20	<1		ND	ND	
m/p XYLENE	ug/l	<2	<1	<2.5	<1	<1.7	<1	<1	<1	<5	<1	<5	<1	<10	<1	<10	<1	Not Collected	<1	<20	<1		ND	ND	
O XYLENE	ug/l	<2	<1	<2.5	<1	<1.7	<1	<1	<1	<5	<1	<5	<1	<10	<1	<10	<1	Not Collected	<1	<20	<1		ND	ND	
total VOCs	ug/l	105.4	21.4	108.0	15.8	80.0	9.7	92.1	10.6	245.0	28.3	208.0	23.7	261.0	21.1	341.0	15.0	Not Collected	10.0	616.0	31.7	1.5		ND	

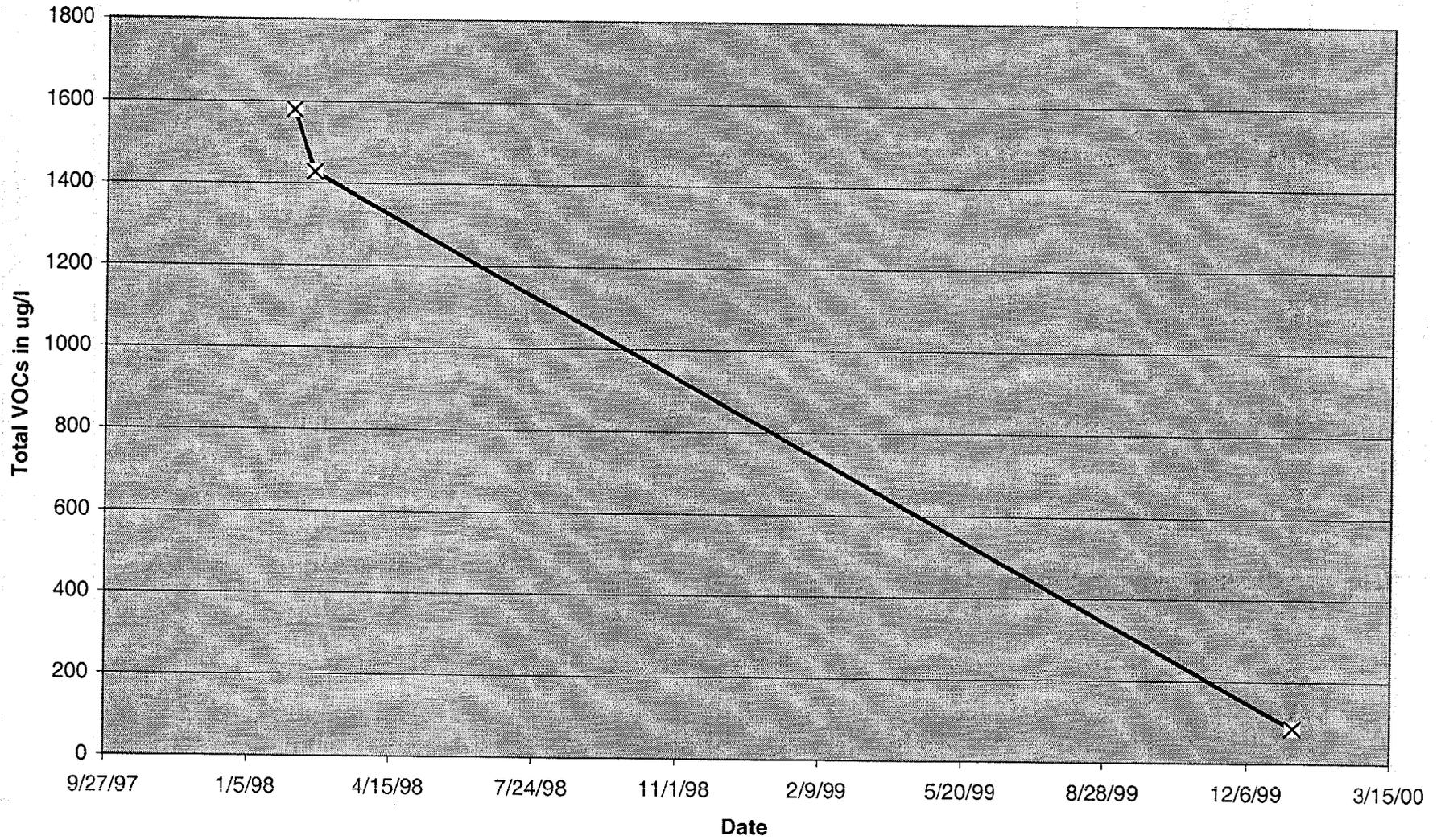
Total VOCs (ug/l) Well OLD-13-UVB2  
System Groundwater Results



**PERFORMANCE MONITORING AND SAMPLING PLAN - ANALYTICAL RESULTS**  
**SYSTEM OFF-GASES RESULTS - UVB-1**

	UNITS	Week 2	Week 4	Week 7	Week 11	Week 16	Week 28	Week 40	Week 52
Sample ID		U4VB1A01	U4VB1A02						
Date Sampled		2/4/98	2/19/98	1/7/00					
Source		offsite	offsite	offsite					
PCE	ppb	<12	38.0	0.2					
TCE	ppb	380.0	290.0	2.3					
C-1,2-DCE	ppb	1200.0	1100.0	40.8					
T-1,2-DCE	ppb	<12	<12	0.6					
1,1-DCE	ppb	<12	<12	0.1					
VC	ppb	<12	<12	0.5					
BENZENE	ppb	<12	<12	1.8					
TOLUENE	ppb	<12	<12	17.2					
ETHYLBENZ.	ppb	<12	<12	3.2					
m/p XYLENE	ppb	<12	<12						
O XYLENE	ppb	<12	<12	18.7 (tot)					
total VOCs	ppb	1580.0	1428.0	85.5					

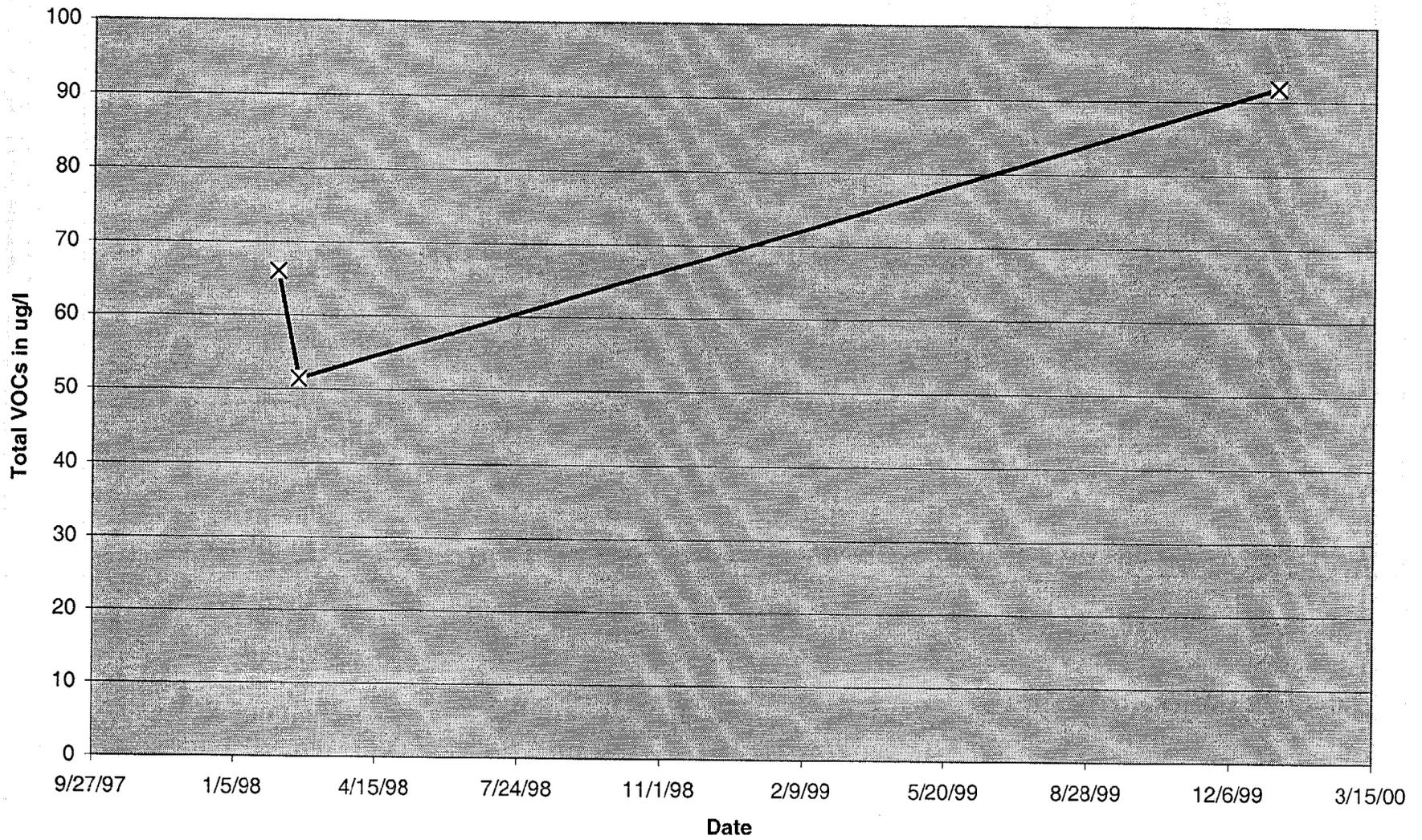
Total VOCs (ug/l) Well OLD-13-UVB1  
System Off-Gas Results



**PERFORMANCE MONITORING AND SAMPLING PLAN - ANALYTICAL RESULTS  
SYSTEM OFF-GASES RESULTS - UVB-2**

	UNITS	Week 2	Week 4	Week 7	Week 11	Week 16	Week 28	Week 40	Week 52
<b>Sample ID</b>		U4VB2A01	U4VB2A02						
<b>Date Sampled</b>		2/4/98	2/19/98	1/7/00					
<b>Source</b>		offsite	offsite	offsite					
PCE	ppb	<1.1	<1.3	2.8					
TCE	ppb	13.0	13.0	ND					
C-1,2-DCE	ppb	48.0	37.0	0.1					
T-1,2-DCE	ppb	<1.1	<1.3	ND					
1,1-DCE	ppb	<1.1	<1.3	ND					
VC	ppb	<1.1	<1.3	ND					
BENZENE	ppb	<1.1	<1.3	1.9					
TOLUENE	ppb	2.8	1.4	28.9					
ETHYLBENZ.	ppb	<1.1	<1.3	9.1					
m/p XYLENE	ppb	2.2	<1.3						
O XYLENE	ppb	<1.1	<1.3	49 (tot)					
total VOCs	ppb	66.0	51.4	91.8					

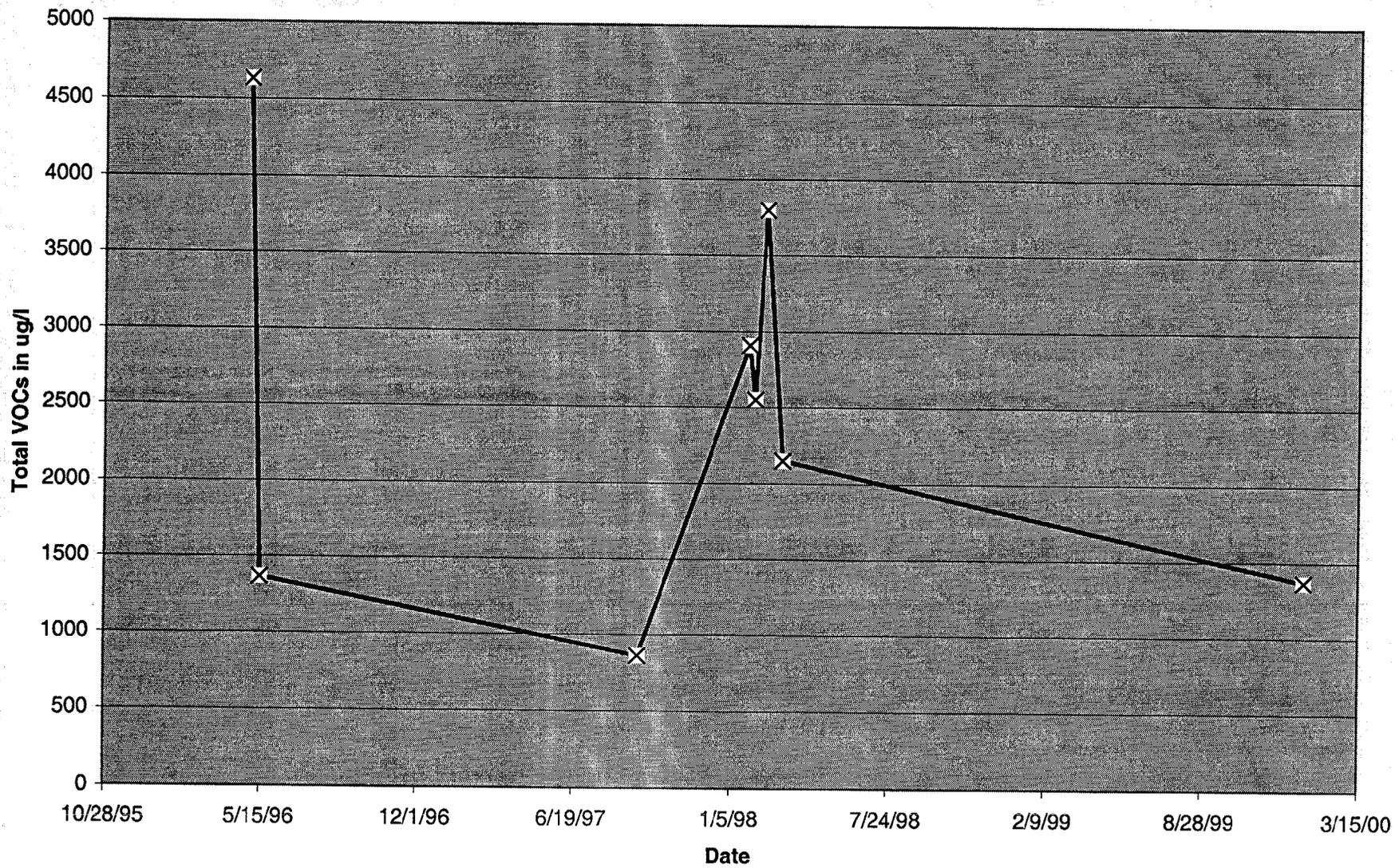
Total VOCs (ug/l) Well OLD-13-UVB2  
System Off-Gas Results



**PERFORMANCE MONITORING AND SAMPLING PLAN - ANALYTICAL RESULTS  
GROUNDWATER RESULTS - DP-1**

	UNITS			Baseline	Week 1	Week 2	Week 4	Week 7						
Sample ID		U4G00101F	U4G00102F	U4G00103	U4G00104	U4G00105	U4G00106	U4G00107						
Date Sampled		5/96	5/96	9/10/97	1/28/98	2/4/98	2/19/98	3/12/98	1/6/00					
Source		onsite	onsite	offsite	offsite	offsite	offsite	offsite	offsite	offsite				
PCE	ug/l	6.4	1.5	<.5	<50	<50	<200	<20	ND					
TCE	ug/l	3000.0	450.0	69.6	310.0	150.0	<200	150.0	62.6					
C-1,2-DCE	ug/l	1600.0	880.0	776.0	2600.0	2400.0	3800.0	2000.0	1240.0					
T-1,2-DCE	ug/l	25.0	32.0	9.4	<50	<50	<200	<20	ND					
1,1-DCE	ug/l	N/D	N/D	0.7	<50	<50	<200	<20	ND					
VC	ug/l	N/D	1.0	7.8	<50	<50	<200	<20	62.3					
BENZENE	ug/l	N/D	N/D	<.5	<50	<50	<200	<20	ND					
TOLUENE	ug/l	N/D	N/D	<.5	<50	<50	<200	<20	ND					
ETHYLBENZ.	ug/l	N/D	N/D	<.5	<50	<50	<200	<20	ND					
m/p XYLENE	ug/l	N/D	N/D	<.5	<50	<50	<200	<20	ND					
O XYLENE	ug/l	N/D	N/D	<.5	<50	<50	<200	<20	ND					
total VOCs	ug/l	4631.4	1364.5	863.5	2910.0	2550.0	3800.0	2150.0	1365.0					

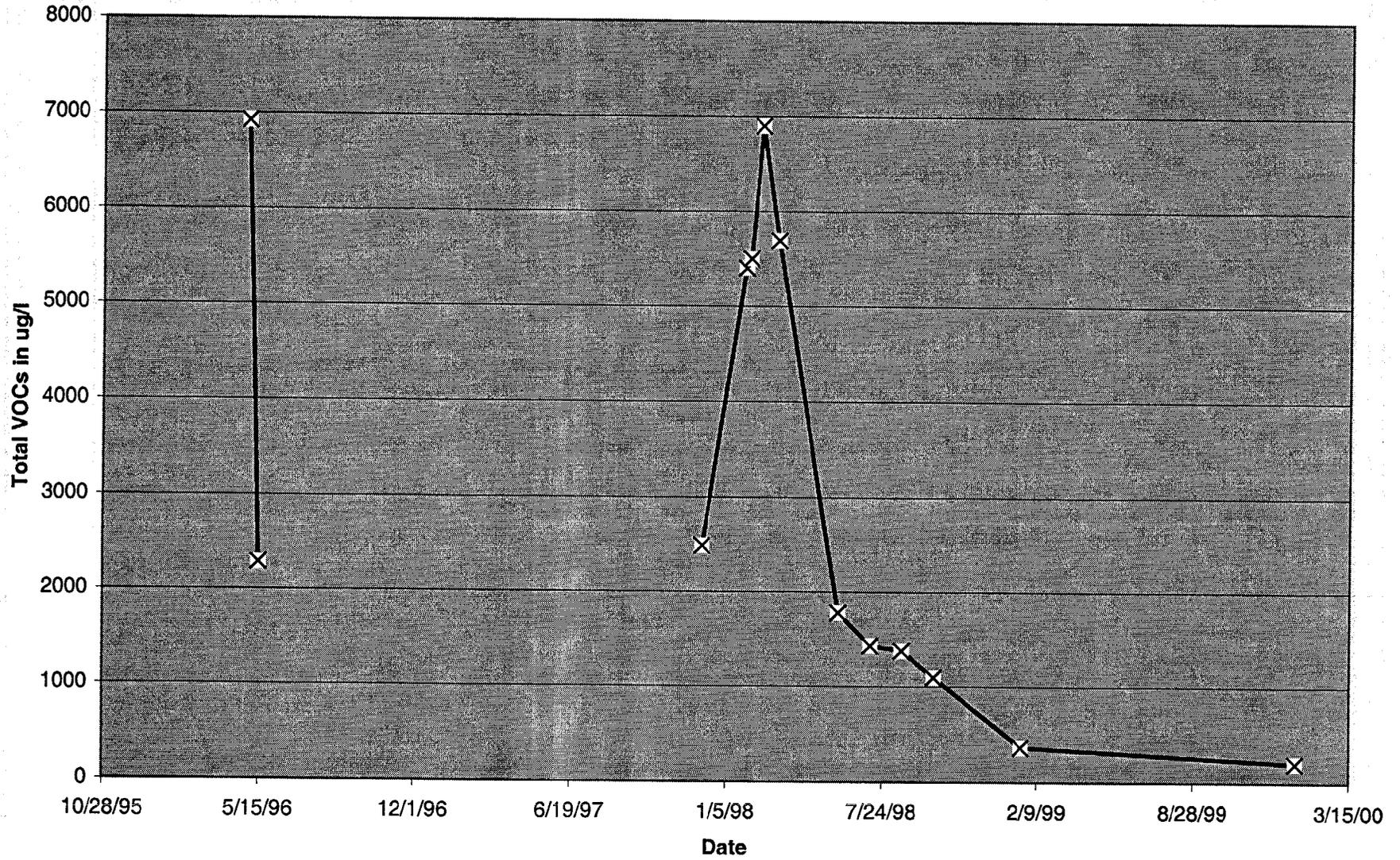
Total VOCs (ug/l) Well OLD-13-DP1



**PERFORMANCE MONITORING AND SAMPLING PLAN - ANALYTICAL RESULTS  
GROUNDWATER RESULTS - DP-2**

	UNITS					Baseline	Week 1	Week 2	Week 4	Week 7	Week 18	Week 24	Week 30	Week 36	Week 52	
Sample ID		U4G00201F	U4G00202F	U4G00203	U4G00204	U4G00205	U4G00206	U4G00207	U4G00208	U4G00209	U4G00210	U4G00211	U4G00212	U4G00213	U4G00214	
Date Sampled		5/96	5/96			12/5/97	1/29/98	2/4/98	2/19/98	3/12/98	5/29/98	7/9/98	8/18/98	9/29/98	1/20/99	1/6/00
Source		onsite	onsite			offsite	offsite									
PCE	ug/l	590.0	120.0			10.0	<100	<100	<200	<100	<100	< 50	< 50	<20	<10	4.3
TCE	ug/l	5800.0	1300.0			2400.0	1300.0	1300.0	1300.0	790.0	180.0	230.0	180.0	97.0	66	43.7
C-1,2-DCE	ug/l	530.0	840.0			<5	4100.0	4200.0	5600.0	4900.0	1600.0	1200.0	1200.0	1000.0	300	147
T-1,2-DCE	ug/l	5.0	25.0			75.0	<100	<100	<200	<100	<100	< 50	< 50	<20	<10	1.9
1,1-DCE	ug/l	N/D	1.1			<5	<100	<100	<200	<100	<100	< 50	< 50	<20	<10	ND
VC	ug/l	N/D	0.4			<5	<100	<100	<200	<100	<100	< 50	< 50	<20	<10	1.6
BENZENE	ug/l	N/D	N/D				<100	<100	<200	<100	<100	< 50	< 50	<20	<10	ND
TOLUENE	ug/l	N/D	N/D				<100	<100	<200	<100	<100	< 50	< 50	<20	<10	ND
ETHYLBENZ.	ug/l	N/D	N/D				<100	<100	<200	<100	<100	< 50	< 50	<20	<10	ND
m/p XYLENE	ug/l	N/D	N/D				<100	<100	<200	<100	<100	< 50	< 50	<20	<10	ND
O XYLENE	ug/l	N/D	N/D				<100	<100	<200	<100	<100	< 50	< 50	<20	<10	ND
total VOCs	ug/l	6925.0	2286.5			2485.0	5400.0	5500.0	6900.0	5690.0	1780.0	1430.0	1380.0	1097.0	366.0	198.5

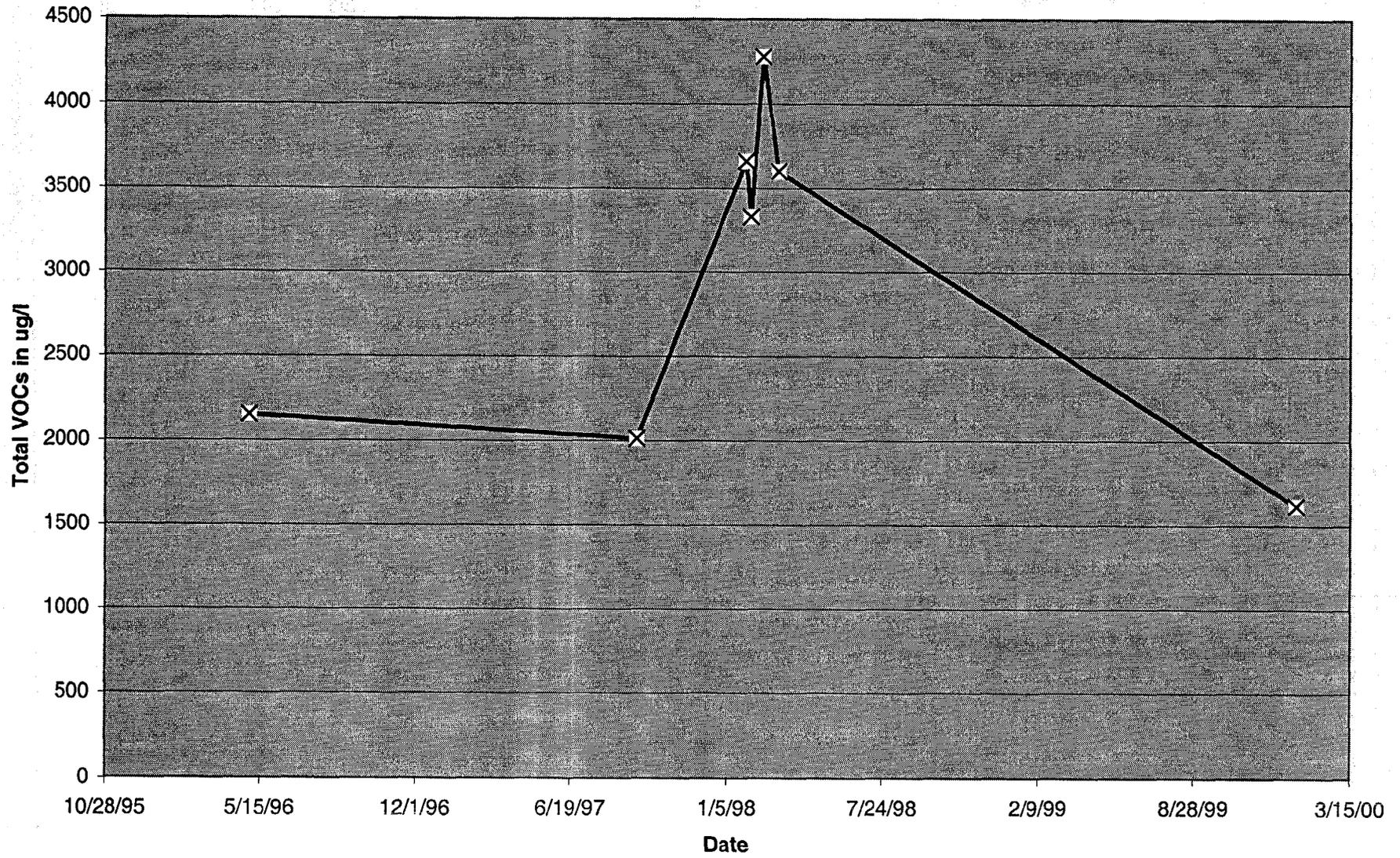
Total VOCs (ug/l) Well OLD-13-DP2



**PERFORMANCE MONITORING AND SAMPLING PLAN - ANALYTICAL RESULTS  
GROUNDWATER RESULTS - DP-3**

	UNITS		Baseline	Week 1	Week 2	Week 4	Week 7						
Sample ID		U4G00301F	U4G00302	U4G00303	U4G00304	U4G00305	U4G00306						
Date Sampled		5/96	9/12/97	1/29/98	2/4/98	2/19/98	3/12/98	1/6/00					
Source		onsite	offsite	offsite	offsite	offsite	offsite	offsite					
PCE	ug/l	22.0	<.5	<50	<50	<200	<50	ND					
TCE	ug/l	1400.0	110.0	360.0	330.0	680.0	700.0	98.0					
C-1,2-DCE	ug/l	710.0	1870.0	3300.0	3000.0	3700.0	2900.0	1500.0					
T-1,2-DCE	ug/l	19.0	30.7	<50	<50	<200	<50	18.0					
1,1-DCE	ug/l	N/D	1.5	<50	<50	<200	<50	ND					
VC	ug/l	N/D	1.3	<50	<50	<200	<50	ND					
BENZENE	ug/l	N/D	<.5	<50	<50	<200	<50	ND					
TOLUENE	ug/l	N/D	<.5	<50	<50	<200	<50	ND					
ETHYLBENZ.	ug/l	N/D	<.5	<50	<50	<200	<50	ND					
m/p XYLENE	ug/l	N/D	<.5	<50	<50	<200	<50	ND					
O XYLENE	ug/l	N/D	<.5	<50	<50	<200	<50	ND					
total VOCs	ug/l	2151.0	2013.5	3660.0	3330.0	4280.0	3600.0	1616.0					

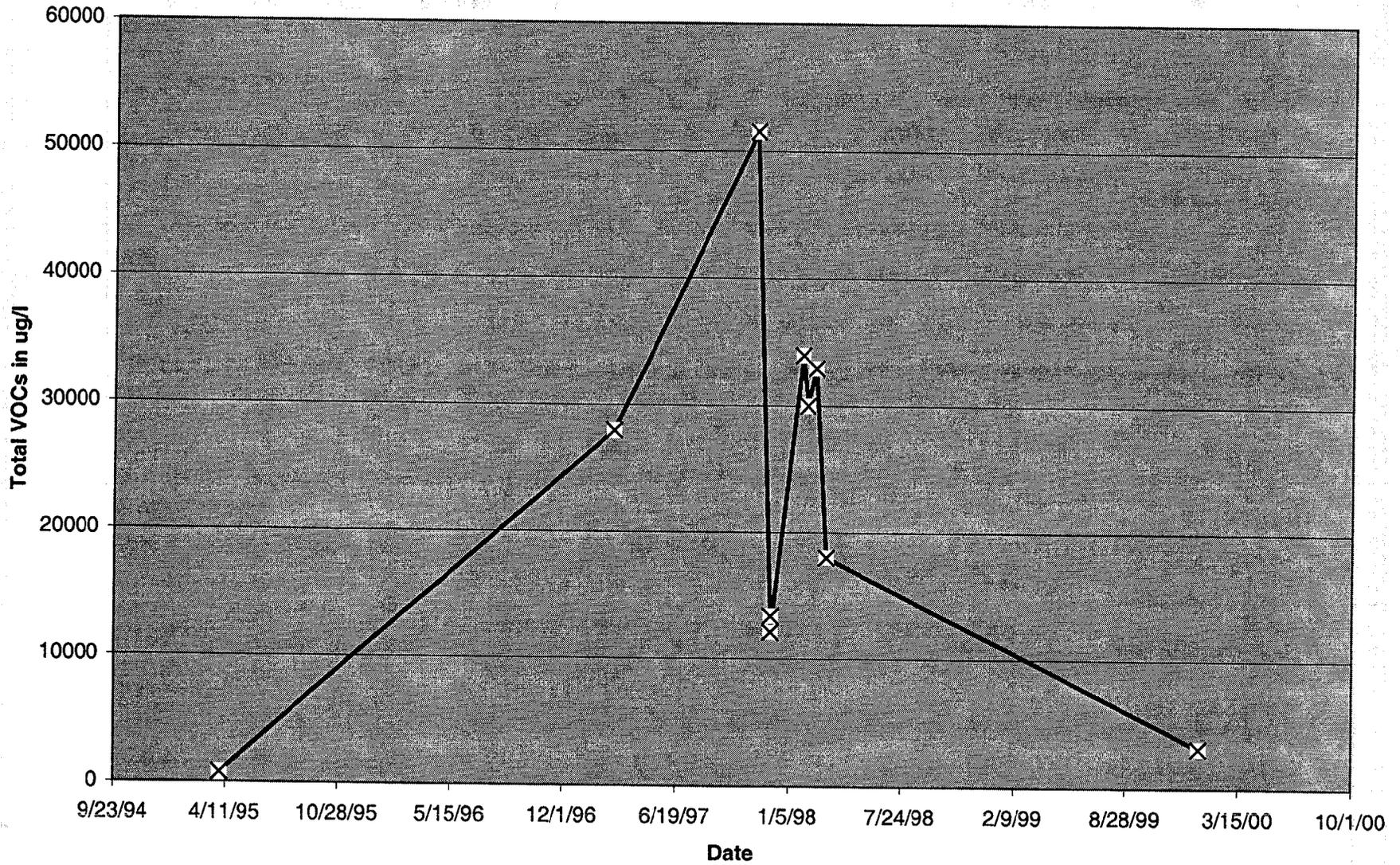
Total VOCs (ug/l) Well OLD-13-DP3



**PERFORMANCE MONITORING AND SAMPLING PLAN - ANALYTICAL RESULTS  
GROUNDWATER RESULTS - OLD-13-07A**

	UNITS				Baseline	Baseline	Week 1	Week 2	Week 4	Week 7						
Sample ID		13G00701	13G00702	13G00703F	13G00704	13G00705	13G00706	13G00707	13G00709	13G00710						
Date Sampled		4/95	3/97	11/6/97	12/4/97	12/4/97	1/27/98	2/5/98	2/20/98	3/12/98	1/5/00					
Source		offsite	offsite	onsite	offsite	offsite	offsite	offsite	offsite	offsite	offsite	offsite				
PCE	ug/l	680.0	28000.0	49000.0	12300.0	11000.0	34000.0	30000.0	33000.0	18000.0	114.0					
TCE	ug/l	52.0	N/D	1400.0	830.0	770.0	<1000	<500	<1000	<500	235.0					
C-1,2-DCE	ug/l	38.0	N/D	1100.0	260.0	330.0	<1000	<500	<1000	<500	2760.0					
T-1,2-DCE	ug/l	N/D	N/D	N/D	<5	<5	<1000	<500	<1000	<500	ND					
1,1-DCE	ug/l	N/D	N/D	N/D	<5	<5	<1000	<500	<1000	<500	ND					
VC	ug/l	N/D	N/D	N/D	<5	<5	<1000	<500	<1000	<500	ND					
BENZENE	ug/l	N/D	N/D	N/D			<1000	<500	<1000	<500	ND					
TOLUENE	ug/l	N/D	N/D	N/D			<1000	<500	<1000	<500	ND					
ETHYLBENZ.	ug/l	N/D	N/D	N/D			<1000	<500	<1000	<500	ND					
m/p XYLENE	ug/l	N/D	N/D	N/D			<1000	<500	<1000	<500	ND					
O XYLENE	ug/l	N/D	N/D	N/D			<1000	<500	<1000	<500	ND					
total VOCs	ug/l	770.0	28000.0	51500.0	13390.0	12100.0	34000.0	30000.0	33000.0	18000.0	3109.0					

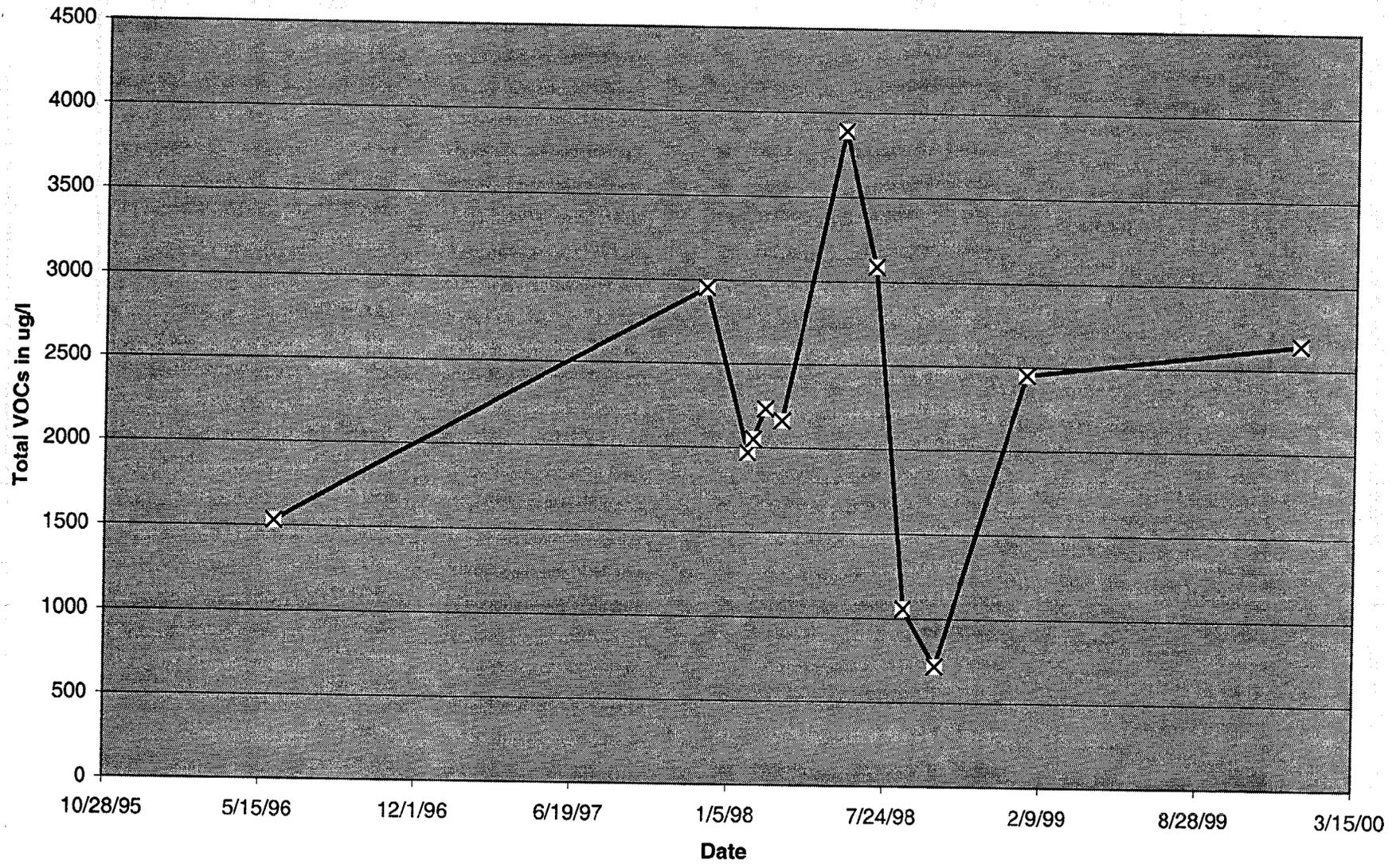
Total VOCs (ug/l) Well OLD-13-07A



**PERFORMANCE MONITORING AND SAMPLING PLAN - ANALYTICAL RESULTS  
GROUNDWATER RESULTS - OLD-13-09A**

	UNITS		Baseline	Week 1	Week 2	Week 4	Week 7	Week 18	Week 24	Week 30	Week 36	Week 52	Week 100
Sample ID		U4G00901	U4G00902	U4G00903	U4G00904	U4G00905	U4G00906	U4G00908	U4G00909	U4G00910	U4G00911	U4G00912	
Date Sampled		6/96	12/5/97	1/28/98	2/4/98	2/19/98	3/12/98	5/29/98	7/9/98	8/18/98	9/29/98	1/20/99	1/5/00
Source		offsite											
PCE	ug/l	N/D	<5	<50	<50	<50	270.0	<100	< 50	< 50	<20	<50	ND
TCE	ug/l	680.0	360.0	370.0	550.0	530.0	590.0	690.0	490.0	160.0	38.0	450.0	467
C-1,2-DCE	ug/l	850.0	2500.0	1600.0	1500.0	1700.0	1300.0	3200.0	2600.0	900.0	680.0	2000.0	2130
T-1,2-DCE	ug/l	N/D	26.0	<50	<50	<50	<20	<100	< 50	< 50	<20	<50	25.9
1,1-DCE	ug/l	N/D	<5	<50	<50	<50	<20	<100	< 50	< 50	<20	<50	ND
VC	ug/l	N/D	69.0	<50	<50	<50	<20	<100	< 50	< 50	<20	<50	ND
BENZENE	ug/l	N/D		<50	<50	<50	<20	<100	< 50	< 50	<20	<50	ND
TOLUENE	ug/l	N/D		<50	<50	<50	<20	<100	< 50	< 50	<20	<50	ND
ETHYLBENZ.	ug/l	N/D		<50	<50	<50	<20	<100	< 50	< 50	<20	<50	ND
m/p XYLENE	ug/l	N/D		<50	<50	<50	<20	<100	< 50	< 50	<20	<50	ND
O XYLENE	ug/l	N/D		<50	<50	<50	<20	<100	< 50	< 50	<20	<50	ND
total VOCs	ug/l	1530.0	2955.0	1970.0	2050.0	2230.0	2160.0	3890.0	3090.0	1060.0	718.0	2450.0	2647

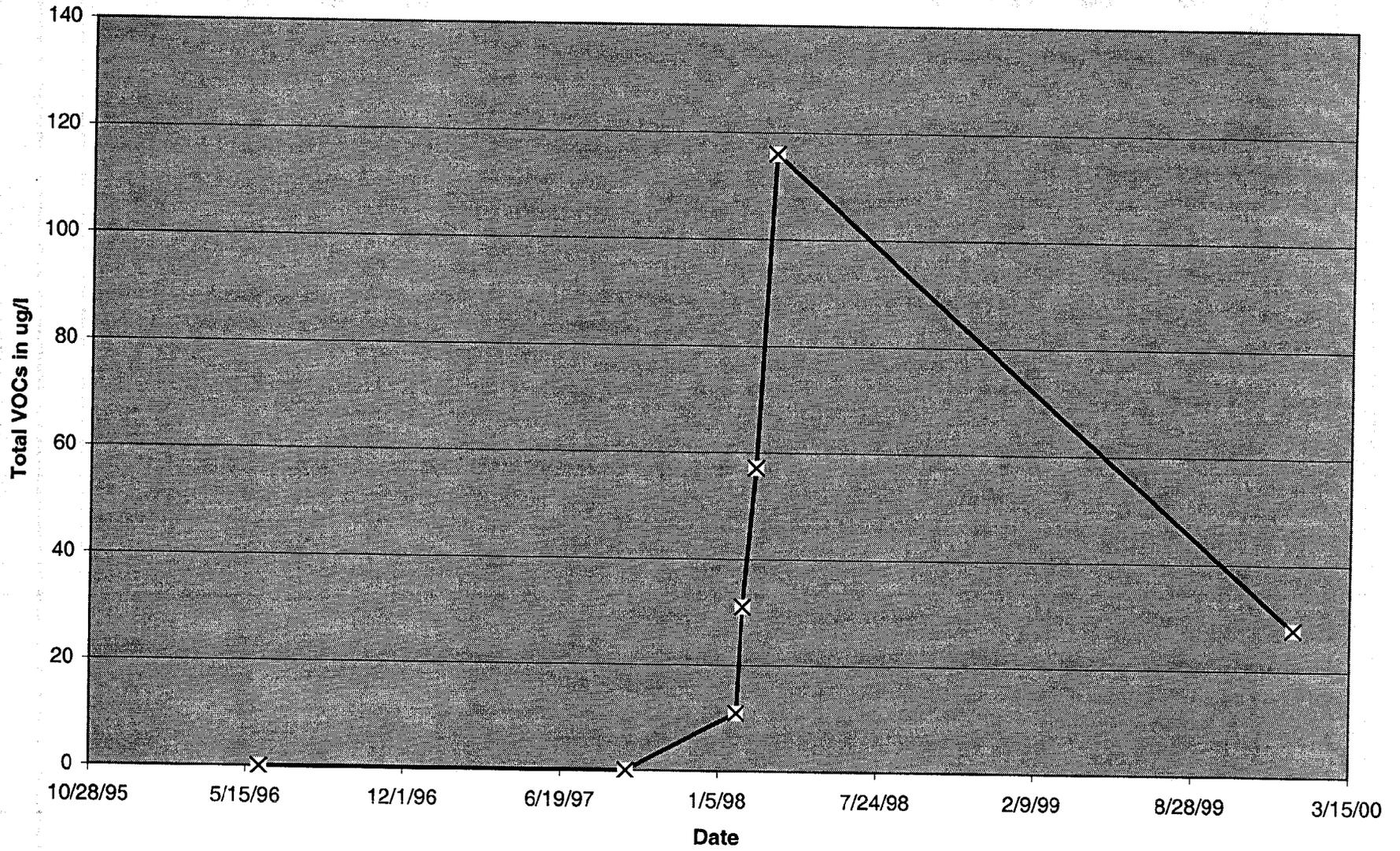
Total VOCs (ug/l) Well OLD-13-09A



**PERFORMANCE MONITORING AND SAMPLING PLAN - ANALYTICAL RESULTS  
GROUNDWATER RESULTS - OLD-13-12A**

	UNITS		Baseline	Week 1	Week 2	Week 4	Week 7						
Sample ID		U4G01201	U4G01202	U4G01203	U4G01204	U4G01205	U4G01206						
Date Sampled		6/96	9/10/97	1/28/98	2/4/98	2/19/98	3/12/98	1/4/00					
Source		offsite	offsite	offsite	offsite	offsite	offsite	offsite	offsite				
PCE	ug/l	N/D	<.5	<1	<1	<2.5	<2	ND					
TCE	ug/l	N/D	<.5	<1	<1	5.1	26.0	2.7					
C-1,2-DCE	ug/l	N/D	<.5	11.0	31.0	52.0	90.0	25.0					
T-1,2-DCE	ug/l	N/D	<.5	<1	<1	<2.5	<2	ND					
1,1-DCE	ug/l	N/D	<.5	<1	<1	<2.5	<2	ND					
VC	ug/l	N/D	<.5	<1	<1	<2.5	<2	ND					
BENZENE	ug/l	N/D	<.5	<1	<1	<2.5	<2	ND					
TOLUENE	ug/l	N/D	<.5	<1	<1	<2.5	<2	ND					
ETHYLBENZ.	ug/l	N/D	<.5	<1	<1	<2.5	<2	ND					
m/p XYLENE	ug/l	N/D	<.5	<1	<1	<2.5	<2	ND					
O XYLENE	ug/l	N/D	<.5	<1	<1	<2.5	<2	ND					
total VOCs	ug/l	0.0	0.0	11.0	31.0	57.1	116.0	27.7					

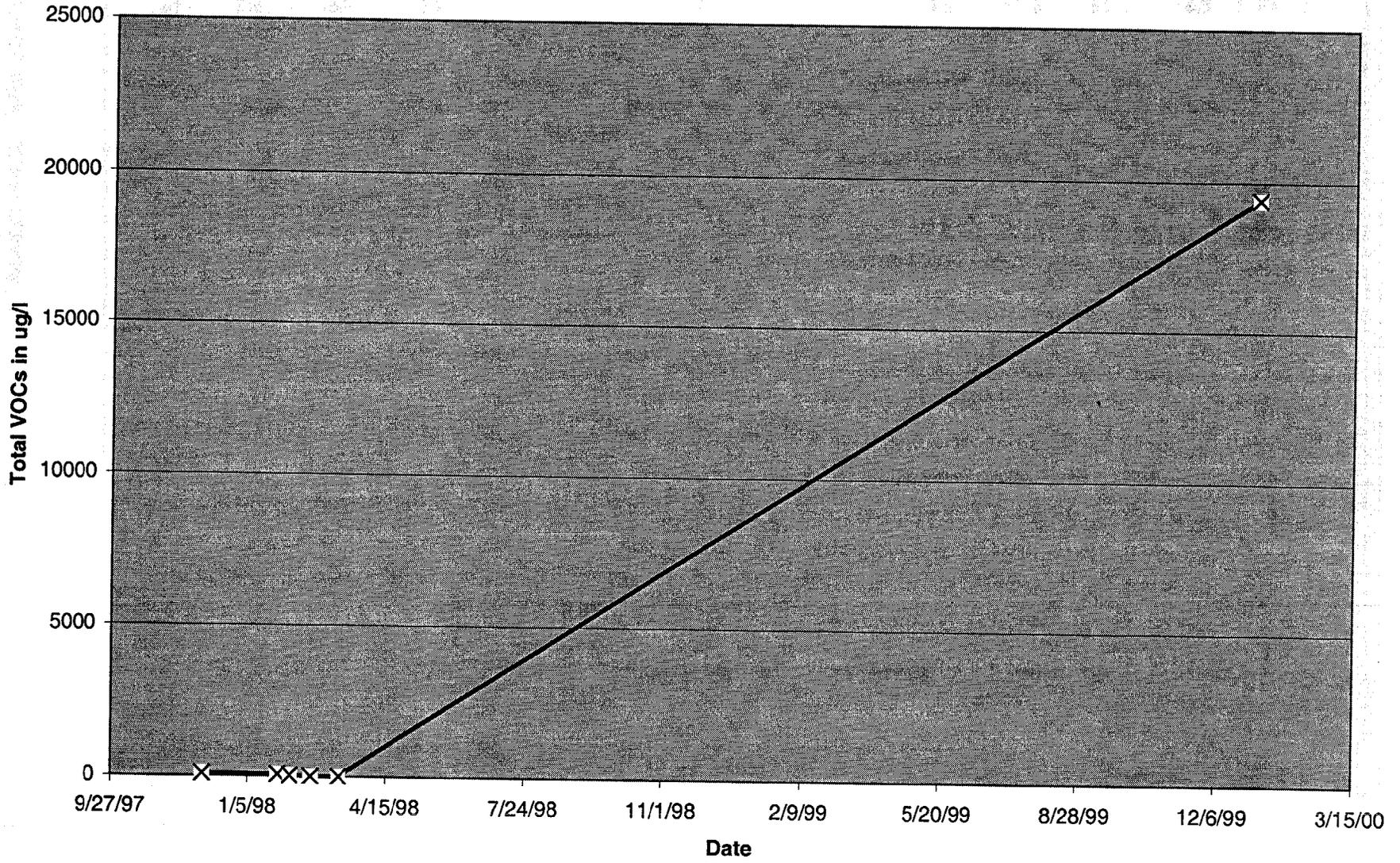
Total VOCs (ug/l) Well OLD-13-12A



**PERFORMANCE MONITORING AND SAMPLING PLAN - ANALYTICAL RESULTS  
GROUNDWATER RESULTS - OLD-13-15A**

	UNITS	Baseline	Week 1	Week 2	Week 4	Week 7					
Sample ID		U4G01501	U4G01502	U4G01503	U4G01504	U4G01505					
Date Sampled		12/3/97	1/27/98	2/5/98	2/20/98	3/12/98	1/5/00				
Source		offsite	offsite	offsite	offsite	offsite	ooffsite				
PCE	ug/l	7.0	65.0	35.0	<1	2.2	19000.0				
TCE	ug/l	35.0	<5	<2.5	<1	<1	332.0				
C-1,2-DCE	ug/l	42.0	<5	<2.5	<1	<1	67.8				
T-1,2-DCE	ug/l	<5	<5	<2.5	<1	<1	1.4				
1,1-DCE	ug/l	<5	<5	<2.5	<1	<1	ND				
VC	ug/l	<5	<5	<2.5	<1	<1	1.4				
BENZENE	ug/l		<5	<2.5	<1	<1	ND				
TOLUENE	ug/l		<5	<2.5	<1	<1	ND				
ETHYLBENZ.	ug/l		<5	<2.5	<1	<1	ND				
m/p XYLENE	ug/l		<5	<2.5	<1	<1	ND				
O XYLENE	ug/l		<5	<2.5	<1	<1	ND				
total VOCs	ug/l	84.0	65.0	35.0	<1	2.2	19403.0				

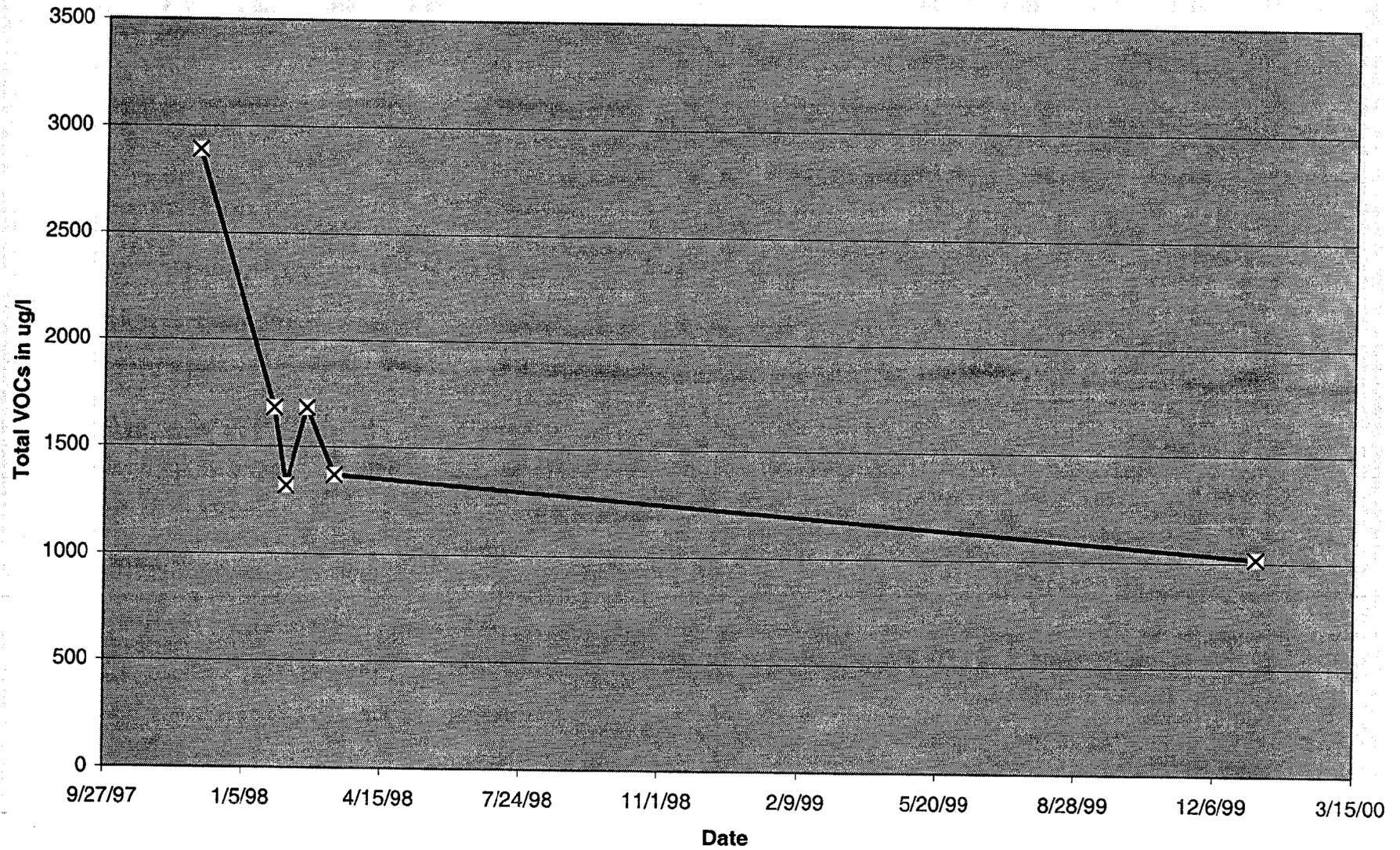
Total VOCs (ug/l) Well OLD-13-15A



**PERFORMANCE MONITORING AND SAMPLING PLAN - ANALYTICAL RESULTS  
GROUNDWATER RESULTS - OLD-13-21B**

	UNITS	Baseline	Week 1	Week 2	Week 4	Week 7					
Sample ID		U4G02101	U4G02102	U4G02103	U4G02104	U4G02105					
Date Sampled		12/3/97	1/27/98	2/5/98	2/20/98	3/12/98	1/5/00				
Source		offsite	offsite	offsite	offsite	offsite	offsite				
PCE	ug/l	20.0	<20	<20	<50	<20	10.4				
TCE	ug/l	1200.0	690.0	530.0	680.0	600.0	296.0				
C-1,2-DCE	ug/l	1640.0	990.0	790.0	1000.0	770.0	700.0				
T-1,2-DCE	ug/l	31.0	<20	<20	<50	<20	9.1				
1,1-DCE	ug/l	<5	<20	<20	<50	<20	ND				
VC	ug/l	<5	<20	<20	<50	<20	ND				
BENZENE	ug/l		<20	<20	<50	<20	ND				
TOLUENE	ug/l		<20	<20	<50	<20	ND				
ETHYLBENZ.	ug/l		<20	<20	<50	<20	ND				
m/p XYLENE	ug/l		<20	<20	<50	<20	ND				
O XYLENE	ug/l		<20	<20	<50	<20	ND				
total VOCs	ug/l	2891.0	1680.0	1320.0	1680.0	1370.0	1016.0				

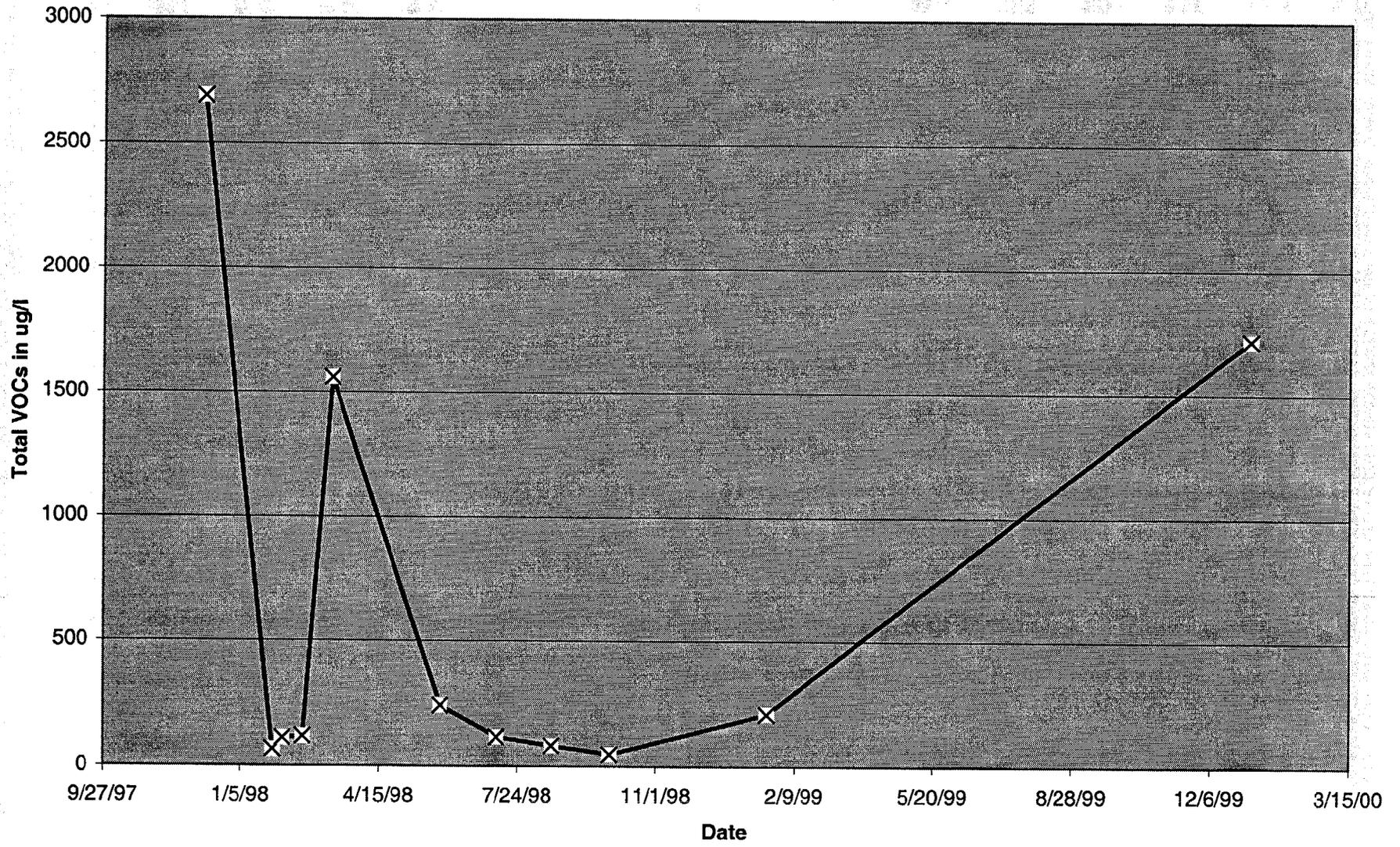
Total VOCs (ug/l) Well OLD-13-21B



**PERFORMANCE MONITORING AND SAMPLING PLAN - ANALYTICAL RESULTS  
GROUNDWATER RESULTS - OLD-13-22B**

	UNITS	Baseline	Week 1	Week 2	Week 4	Week 7	Week 18	Week 24	Week 30	Week 36	Week 52	
Sample ID		U4G02201	U4G02202	U4G02203	U4G02205	U4G02206	U4G02207	U4G02208	U4G02209	U4G02210	U4G02211	
Date Sampled		12/9/97	1/28/98	2/4/98	2/19/98	3/12/98	5/29/98	7/9/98	8/18/98	9/29/98	1/20/99	1/4/00
Source		offsite	offsite									
PCE	ug/l	<94	<2.5	<5	<2.5	<20	6.6	22.0	21	10	42	8.1
TCE	ug/l	690.0	11.0	21.0	24.0	360.0	56.0	22.0	54	26	36	226
C-1,2-DCE	ug/l	2000.0	55.0	90.0	94.0	1200.0	180.0	72.0	6.7	12	130	1470
T-1,2-DCE	ug/l	<94	<2.5	<5	<2.5	<20	<5	< 2	< 2.5	<1	<5	14.3
1,1-DCE	ug/l	<94	<2.5	<5	<2.5	<20	<5	< 2	< 2.5	<1	<5	1
VC	ug/l	<120	<2.5	<5	<2.5	<20	<5	< 2	< 2.5	<1	<5	ND
BENZENE	ug/l	<94	<2.5	<5	<2.5	<20	<5	< 2	< 2.5	<1	<5	ND
TOLUENE	ug/l	<94	<2.5	<5	<2.5	<20	<5	< 2	< 2.5	<1	<5	ND
ETHYLBENZ.	ug/l	<62	<2.5	<5	<2.5	<20	<5	< 2	< 2.5	<1	<5	ND
m/p XYLENE	ug/l	<62	<2.5	<5	<2.5	<20	<5	< 2	< 2.5	<1	<5	ND
O XYLENE	ug/l	<62	<2.5	<5	<2.5	<20	<5	< 2	< 2.5	<1	<5	ND
total VOCs	ug/l	2690.0	66.0	111.0	118.0	1560.0	242.6	116.0	81.7	48.0	208.0	1719

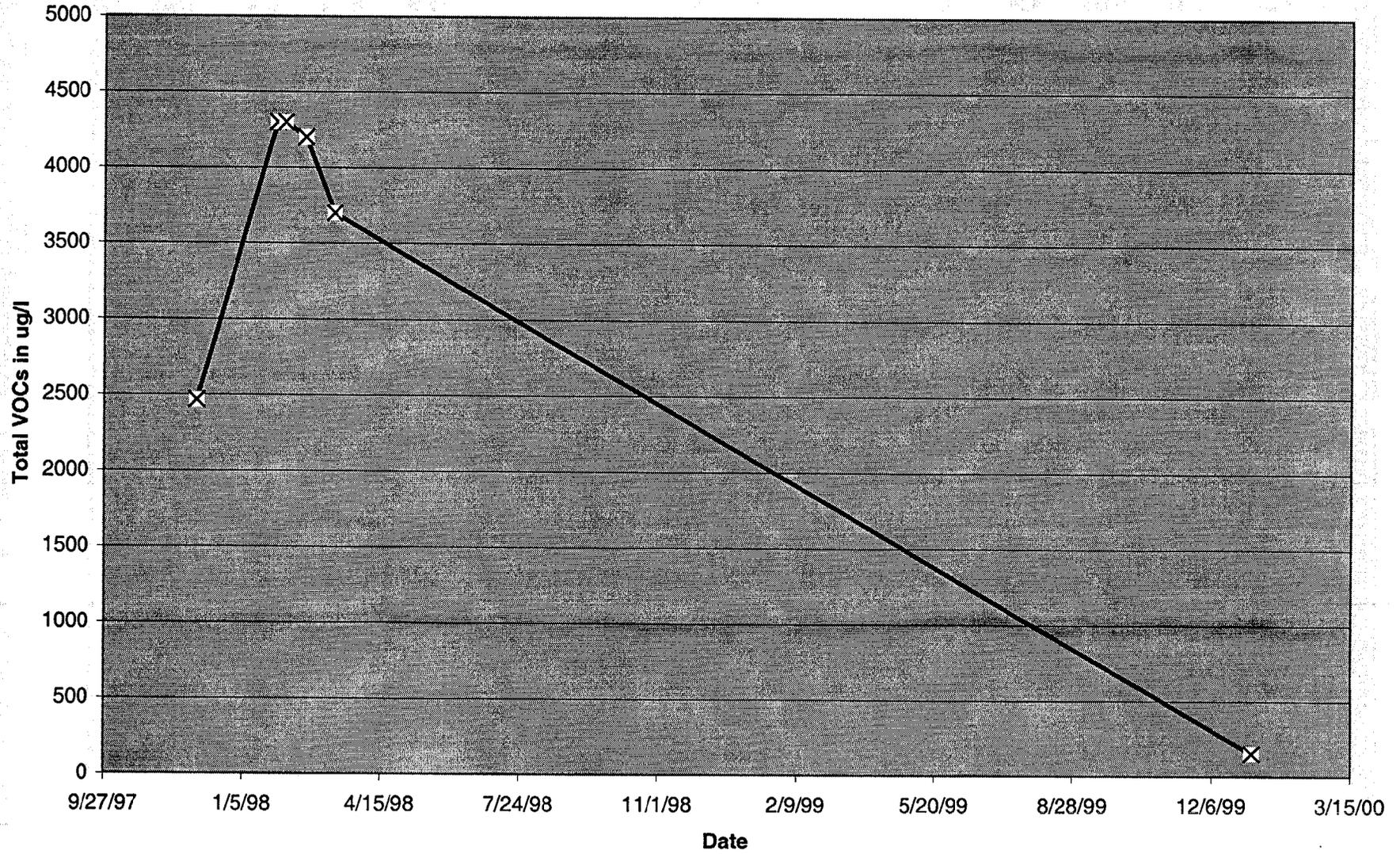
Total VOCs (ug/l) Well OLD-13-22B



**PERFORMANCE MONITORING AND SAMPLING PLAN - ANALYTICAL RESULTS  
GROUNDWATER RESULTS - OLD-13-23B**

	UNITS	Baseline	Week 1	Week 2	Week 4	Week 7					
Sample ID		U4G02301	U4G02302	U4G02303	U4G02304	U4G02305					
Date Sampled		12/3/97	1/29/98	2/4/98	2/19/98	3/12/98	1/4/00				
Source		offsite	offsite	offsite	offsite	offsite	offsite				
PCE	ug/l	23.0	<200	<50	<200	<50	9.0				
TCE	ug/l	1900.0	3000.0	2400.0	2500.0	2000.0	25.4				
C-1,2-DCE	ug/l	520.0	1300.0	1900.0	1700.0	1700.0	119.0				
T-1,2-DCE	ug/l	24.0	<200	<50	<200	<50	ND				
1,1-DCE	ug/l	<5	<200	<50	<200	<50	ND				
VC	ug/l	<5	<200	<50	<200	<50	ND				
BENZENE	ug/l		<200	<50	<200	<50	ND				
TOLUENE	ug/l		<200	<50	<200	<50	ND				
ETHYLBENZ.	ug/l		<200	<50	<200	<50	ND				
m/p XYLENE	ug/l		<200	<50	<200	<50	ND				
O XYLENE	ug/l		<200	<50	<200	<50	ND				
total VOCs	ug/l	2467.0	4300.0	4300.0	4200.0	3700.0	153.4				

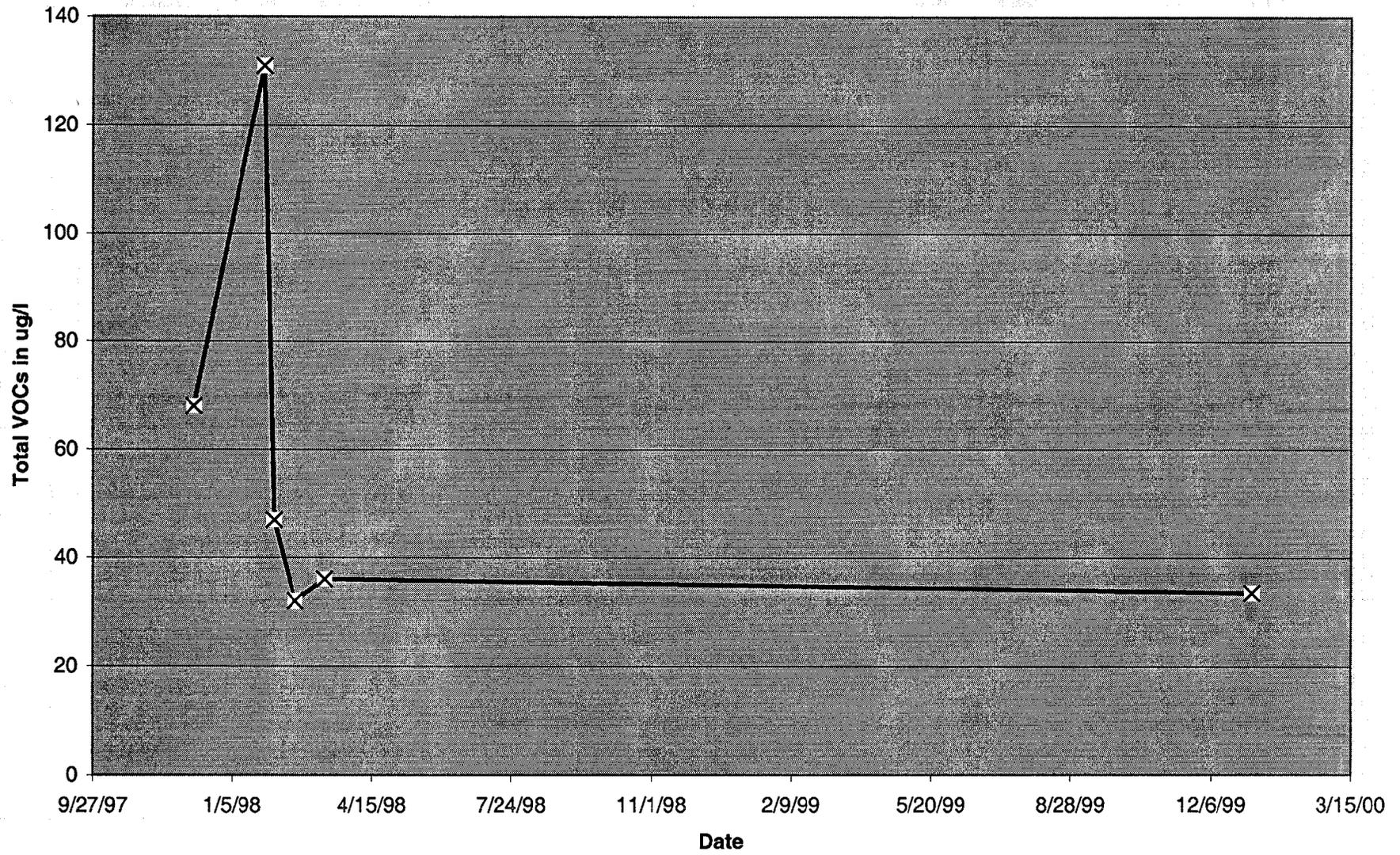
Total VOCs (ug/l) Well OLD-13-23B



**PERFORMANCE MONITORING AND SAMPLING PLAN - ANALYTICAL RESULTS  
GROUNDWATER RESULTS - OLD-13-24A**

	UNITS	Baseline	Week 1	Week 2	Week 4	Week 7					
Sample ID		U4G02401	U4G02402	U4G02403	U4G02404	U4G02405					
Date Sampled		12/9/97	1/28/98	2/4/98	2/19/98	3/12/98	1/4/00				
Source		offsite	offsite	offsite	offsite	offsite	offsite				
PCE	ug/l	<2	<10	<1	<1	<1	ND				
TCE	ug/l	22.0	35.0	14.0	11.0	14.0	13.4				
C-1,2-DCE	ug/l	46.0	96.0	33.0	21.0	22.0	20.1				
T-1,2-DCE	ug/l	<1	<10	<1	<1	<1	ND				
1,1-DCE	ug/l	<2	<10	<1	<1	<1	ND				
VC	ug/l	<2	<10	<1	<1	<1	ND				
BENZENE	ug/l	<2	<10	<1	<1	<1	ND				
TOLUENE	ug/l	<2	<10	<1	<1	<1	ND				
ETHYLBENZ.	ug/l	<1	<10	<1	<1	<1	ND				
m/p XYLENE	ug/l	<1	<10	<1	<1	<1	ND				
O XYLENE	ug/l	<1	<10	<1	<1	<1	ND				
total VOCs	ug/l	68.0	131.0	47.0	32.0	36.0	33.5				

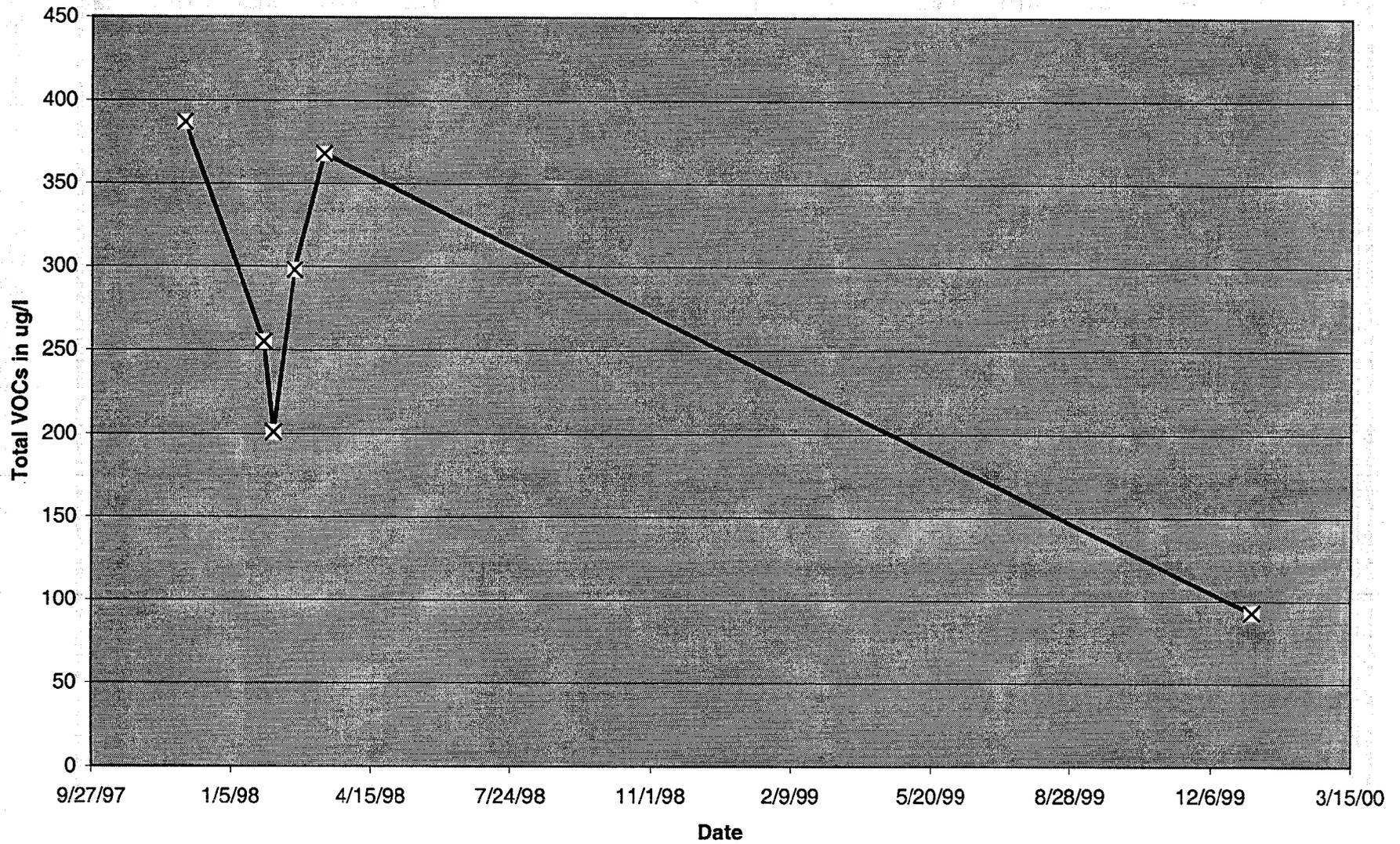
Total VOCs (ug/l) Well OLD-13-24A



**PERFORMANCE MONITORING AND SAMPLING PLAN - ANALYTICAL RESULTS  
GROUNDWATER RESULTS - OLD-13-25B**

	UNITS	Baseline	Week 1	Week 2	Week 4	Week 7					
Sample ID		U4G02501	U4G02502	U4G02503	U4G02504	U4G02505					
Date Sampled		12/3/97	1/28/98	2/4/98	2/19/98	3/12/98	1/4/00				
Source		offsite	offsite	offsite	offsite	offsite	offsite				
PCE	ug/l	280.0	240.0	180.0	270.0	320.0	69.4				
TCE	ug/l	71.0	15.0	21.0	28.0	32.0	17.3				
C-1,2-DCE	ug/l	36.0	<10	<10	<10	16.0	6.2				
T-1,2-DCE	ug/l	<5	<10	<10	<10	<5	ND				
1,1-DCE	ug/l	<5	<10	<10	<10	<5	ND				
VC	ug/l	<5	<10	<10	<10	<5	ND				
BENZENE	ug/l		<10	<10	<10	<5	ND				
TOLUENE	ug/l		<10	<10	<10	<5	ND				
ETHYLBENZ.	ug/l		<10	<10	<10	<5	ND				
m/p XYLENE	ug/l		<10	<10	<10	<5	ND				
O XYLENE	ug/l		<10	<10	<10	<5	ND				
total VOCs	ug/l	387.0	255.0	201.0	298.0	368.0	92.9				

Total VOCs (ug/l) Well OLD-13-25B



APPENDIX D

# Groundwater Sampling Logs

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## CH2M HILL WELL SAMPLING FIELD SHEET

PROJECT# 15244.35

<b>WELL NUMBER: OLD-13-12A</b>		<b>SITE: NTC Orlando, OU-4</b>				
<b>FIELD CREW: FJ Ferreira, E. Cabale</b>		(leave blank if on previous page)				
WELL DEPTH (FT):	14.14	CASING DIA.		GAL/FT OF CASING		
DEPTH TO WATER (FT):	4.5	2 IN.		0.1632		
WATER COLUMN (FT):	9.64	4 IN.		0.6528		
GAL/FT OF CASING	0.1632	6 IN.		1.4688		
CASING VOLUME (GAL)	1.6	8 IN.		2.611		
NO. OF VOLUMES min.(3)	4	10 IN.		4.0797		
PURGE VOLUME (GAL)	6.4	12 IN.		5.8748		
<b>METHOD OF PURGING (circle one)</b>						
PUMP: SUB. CENT. PERIST.		OTHER:		BAILER : TEFLON, SS ,OTHER:		
TIME ON: 0828 AM				BAILER VOL.. (gal) .25 / .33		
FLOW RATE (gpm): approx. 0.2/gpm				REQUIRED PULLS: _____		
PUMP TIME (min): 32				VOL. PURGED (gals): _____		
VOL. PURGED (gals): 6.5				OTHER: _____		
<b>FIELD PARAMETERS</b>	<b>FIELD MEASUREMENTS</b>					WITHIN10% Y / N
	1st	2nd	3rd	4th	5th	6th
TIME	836	844	852	900		
VOL. (gal)	1.6	3.2	4.8	6.4		
pH/Turbidity (NTUs)	5.35/95	5.36/67	4.77/66	4.83/65		
TEMP.(C)/ORP	22.09/23.6	21.92/36.4	21.69/39.3	21.67/36.5		
COND.(umhos/cm)/DO	74/-8.76	73/-15.21	70/-12.98	72/-10.95		
SAMPLE PARAMETERS ( GRAB OR COMPOSITE ): <u>Grab</u>						
FILTERED METALS COLLECTED: Y / N 1.0um,0.45um, OTHER: 1.0um						
<b>OBSERVATIONS</b>						
COLOR: CLEAR , AMBER , TAN , BROWN , GREY , MILKY WHITE , OTHER: <b>Clear</b>						
ODOR: NONE , LOW , MEDIUM , HIGH , VERY STRONG , H2S , FUEL LIKE , CHEMICAL ? , UNKNOWN						
TURBIDITY: NONE , LOW , MEDIUM , HIGH , VERY TURBID. HEAVY SILTS						
COMMENTS:						
OTHER: PLEASE USE BACK OF SHT.FOR SKETCHING MAPS ,WELL LOCATION NOTES ECT. SEE BACK OF SHT Y / N.						
Q.C. SAMPLE TYPE: DUPLICATE , EQUIPMENT BLANK , OTHER :						
Q.C. PARAMETERS:						
SAMPLE DATE/ TIME: 01/04/00 / @ 900						

SIGNED/SAMPLER: Ferreira / Cabale

## CH2M HILL WELL SAMPLING FIELD SHEET

PROJECT# 15244.35

<b>WELL NUMBER: OLD-13-22B</b>		<b>SITE: NTC Orlando, OU-4</b>				
<b>FIELD CREW: FJ Ferreira, E. Cabale</b>		(leave blank if on previous page)				
WELL DEPTH (FT):	34.75	CASING DIA.		GAL/FT OF CASING		
DEPTH TO WATER (FT):	4.28	2 IN.		0.1632		
WATER COLUMN (FT):	30.47	4 IN.		0.6528		
GAL/FT OF CASING	0.1632	6 IN.		1.4688		
CASING VOLUME (GAL)	5	8 IN.		2.611		
NO. OF VOLUMES min.(3)	3	10 IN.		4.0797		
PURGE VOLUME (GAL)	15	12 IN.		5.8748		
<b>METHOD OF PURGING (circle one)</b>						
PUMP: SUB. CENT. PERIST.		OTHER:		BAILER : TEFLON, SS , OTHER:		
TIME ON: 0800 AM				BAILER VOL.. (gal) .25 / .33		
FLOW RATE (gpm): approx. 0.2/gpm				REQUIRED PULLS: _____		
PUMP TIME (min): 75				VOL. PURGED (gals): _____		
VOL. PURGED (gals): 15				OTHER: _____		
<b>FIELD PARAMETERS</b>	<b>FIELD MEASUREMENTS</b>					WITHIN10% Y / N
	1st	2nd	3rd	4th	5th	6th
TIME	825	850	915			
VOL. (gal)	5	10	15			
pH/Turbidity (NTUs)	4.77/102	4.61/88	4.74/22			
TEMP.(C)/ORP	21.73/114.4	23.90/77.9	23.67/68.4			
COND.(umhos/cm)/DO	104/-4.55	108/-3.17	105/-5.01			
SAMPLE PARAMETERS ( GRAB OR COMPOSITE ): <b>Grab</b>						
FILTERED METALS COLLECTED: Y / N 1.0um,0.45um, OTHER: 1.0um						
<b>OBSERVATIONS</b>						
COLOR: CLEAR , AMBER , TAN , BROWN , GREY , MILKY WHITE , OTHER: <b>Clear</b>						
ODOR: NONE , LOW , MEDIUM , HIGH , VERY STRONG , H2S , FUEL LIKE , CHEMICAL ? , UNKNOWN						
TURBIDITY: NONE , LOW , MEDIUM , HIGH , VERY TURBID. HEAVY SILTS						
COMMENTS:						
OTHER: PLEASE USE BACK OF SHT.FOR SKETCHING MAPS ,WELL LOCATION NOTES ECT. SEE BACK OF SHT Y / N.						
Q.C. SAMPLE TYPE: <b>DUPLICATE</b> , EQUIPMENT BLANK , OTHER : <b>017-OLD-13-DUPI-Q4-99</b>						
Q.C. PARAMETERS:						
SAMPLE DATE/ TIME: <b>01/04/00</b> / @ <b>915</b>						

SIGNED/SAMPLER:                     Z                    Z

# CH2M HILL WELL SAMPLING FIELD SHEET

PROJECT# 15244.35

<b>WELL NUMBER: OLD-13-24A</b>		<b>SITE: NTC Orlando, OU-4</b>				
<b>FIELD CREW: FJ Ferreira, E. Cabale</b>		(leave blank if on previous page)				
WELL DEPTH (FT):	15.16	CASING DIA.		GAL/FT OF CASING		
DEPTH TO WATER (FT):	4.67	2 IN.		0.1632		
WATER COLUMN (FT):	10.49	4 IN.		0.6528		
GAL/FT OF CASING	0.1632	6 IN.		1.4688		
CASING VOLUME (GAL)	1.7	8 IN.		2.611		
NO. OF VOLUMES min.(3)	3	10 IN.		4.0797		
PURGE VOLUME (GAL)	5.1	12 IN.		5.8748		
<b>METHOD OF PURGING (circle one)</b>						
PUMP: SUB. CENT. PERIST.		OTHER:		BAILER : TEFLON, SS ,OTHER:		
TIME ON: 0915 AM				BAILER VOL.. (gal) .25 / .33		
FLOW RATE (gpm): approx. 0.2/gpm				REQUIRED PULLS:		
PUMP TIME (min): 25				VOL. PURGED (gals):		
VOL. PURGED (gals): 5.1				OTHER:		
<b>FIELD PARAMETERS</b>	<b>FIELD MEASUREMENTS</b>					WITHIN 10% Y / N
	1st	2nd	3rd	4th	5th	6th
<b>TIME</b>	923	931	940			
<b>VOL. (gal)</b>	1.7	3.4	5.1			
<b>pH/Turbidity (NTUs)</b>	4.81/56	4.32/40	4.42/28			
<b>TEMP.(C)/ORP</b>	23.40/12.0	22.81/18.1	23.11/20.2			
<b>COND.(umhos/cm)/DO</b>	112/-61.7	114/-63.3	119/-58.1			
<b>SAMPLE PARAMETERS ( GRAB OR COMPOSITE ) : Grab</b>						
FILTERED METALS COLLECTED: Y / N 1.0um, 0.45um, OTHER: 1.0um						
<b>OBSERVATIONS</b>						
<b>COLOR:</b> CLEAR , AMBER , TAN , BROWN , GREY , MILKY WHITE , OTHER: Clear						
<b>ODOR:</b> NONE , LOW , MEDIUM , HIGH , VERY STRONG , H2S , FUEL LIKE , CHEMICAL ? , UNKNOWN						
<b>TURBIDITY:</b> NONE , LOW , MEDIUM , HIGH , VERY TURBID. HEAVY SILTS						
<b>COMMENTS:</b>						
<b>OTHER:</b> PLEASE USE BACK OF SHT.FOR SKETCHING MAPS ,WELL LOCATION NOTES ECT. SEE BACK OF SHT Y / N.						
<b>Q.C. SAMPLE TYPE:</b> DUPLICATE , EQUIPMENT BLANK , OTHER : 017-OLD-13-24AMS/MSD-Q4-99						
<b>Q.C. PARAMETERS:</b>						
<b>SAMPLE DATE/ TIME: 01/04/00 / @ 940</b>						

**SIGNED/SAMPLER:** E. Ferreira

# CH2M HILL WELL SAMPLING FIELD SHEET

PROJECT# 15244.35

<b>WELL NUMBER: OLD-13-25B</b>		<b>SITE: NTC Orlando, OU-4</b>				
<b>FIELD CREW: FJ Ferreira, E. Cabale</b>					(leave blank if on previous page)	
WELL DEPTH (FT):	24.94	CASING DIA.		GAL/FT OF CASING		
DEPTH TO WATER (FT):	4.74	2 IN.		0.1632		
WATER COLUMN (FT):	20.2	4 IN.		0.6528		
GAL/FT OF CASING	0.1632	6 IN.		1.4688		
CASING VOLUME (GAL)	3.3	8 IN.		2.611		
NO. OF VOLUMES min.(3)	3	10 IN.		4.0797		
PURGE VOLUME (GAL)	10	12 IN.		5.8748		
<b>METHOD OF PURGING (circle one)</b>						
PUMP: SUB. CENT. PERIST.		OTHER:		BAILER : TEFLON, SS , OTHER:		
TIME ON: 0910 AM				BAILER VOL.. (gal) .25 / .33		
FLOW RATE (gpm): approx. 0.2/gpm				REQUIRED PULLS:		
PUMP TIME (min): 50				VOL. PURGED (gals):		
VOL. PURGED (gals): 10				OTHER:		
<b>FIELD PARAMETERS</b>	<b>FIELD MEASUREMENTS</b>					WITHIN 10% Y / N
	1st	2nd	3rd	4th	5th	6th
TIME	926	942	1000			
VOL. (gal)	3.3	6.6	10			
pH/Turbidity (NTUs)	4.67/88	4.54/64	4.45/50			
TEMP.(C)/ORP	24.10/21.5	24.29/39.7	24.72/38.0			
COND.(umhos/cm)/DO	233/-5.90	235/-37	231/-39.2			
SAMPLE PARAMETERS ( GRAB OR COMPOSITE ): <b>Grab</b>						
FILTERED METALS COLLECTED: Y / N 1.0um, 0.45um, OTHER: 1.0um						
<b>OBSERVATIONS</b>						
COLOR: CLEAR , AMBER , TAN , BROWN , GREY , MILKY WHITE , OTHER: <b>Clear</b>						
ODOR: NONE , LOW , MEDIUM , HIGH , VERY STRONG , H2S , FUEL LIKE , CHEMICAL ? , UNKNOWN						
TURBIDITY: NONE , LOW , MEDIUM , HIGH , VERY TURBID. HEAVY SILTS						
COMMENTS:						
OTHER: PLEASE USE BACK OF SHT.FOR SKETCHING MAPS ,WELL LOCATION NOTES ECT. SEE BACK OF SHT Y / N.						
Q.C. SAMPLE TYPE: DUPLICATE , EQUIPMENT BLANK , OTHER :						
Q.C. PARAMETERS:						
SAMPLE DATE/ TIME: 01/04/00 / @ 1000						

SIGNED/SAMPLER: Ferreira / Ferreira

# CH2M HILL WELL SAMPLING FIELD SHEET

PROJECT# 15244.35

<b>WELL NUMBER: OLD-13-23B</b>		<b>SITE: NTC Orlando, OU-4</b>				
<b>FIELD CREW: FJ Ferreira, E. Cabale</b>		(leave blank if on previous page)				
WELL DEPTH (FT):	33.62	CASING DIA.		GAL/FT OF CASING		
DEPTH TO WATER (FT):	4.14	2 IN.		0.1632		
WATER COLUMN (FT):	29.28	4 IN.		0.6528		
GAL/FT OF CASING	0.1632	6 IN.		1.4688		
CASING VOLUME (GAL)	4.8	8 IN.		2.611		
NO. OF VOLUMES min.(3)	3	10 IN.		4.0797		
PURGE VOLUME (GAL)	15	12 IN.		5.8748		
<b>METHOD OF PURGING (circle one)</b>						
PUMP: SUB. CENT. PERIST.		OTHER:		BAILER : TEFLON, SS ,OTHER:		
TIME ON: 0900 AM				BAILER VOL.. (gal) .25 / .33		
FLOW RATE (gpm): approx. 0.2/gpm				REQUIRED PULLS: _____		
PUMP TIME (min): 75				VOL. PURGED (gals): _____		
VOL. PURGED (gals): 15				OTHER: _____		
<b>FIELD PARAMETERS</b>	<b>FIELD MEASUREMENTS</b>					WITHIN 10% Y / N
	1st	2nd	3rd	4th	5th	6th
TIME	925	950	1015			
VOL. (gal)	5	10	15			
pH/Turbidity (NTUs)	4.95/58	4.25/66	4.41/50			
TEMP.(C)/ORP	22.55/23.6	23.98/26.5	23.97/26.4			
COND.(umhos/cm)/DO	117/-30.9	102/-56.4	102/-55.4			
SAMPLE PARAMETERS ( GRAB OR COMPOSITE ): <b>Grab</b>						
FILTERED METALS COLLECTED: Y / N 1.0um,0.45um, OTHER: 1.0um						
<b>OBSERVATIONS</b>						
COLOR: CLEAR , AMBER , TAN , BROWN , GREY , MILKY WHITE , OTHER: <b>Clear</b>						
ODOR: NONE , LOW , MEDIUM , HIGH , VERY STRONG , H2S , FUEL LIKE , CHEMICAL ? , UNKNOWN						
TURBIDITY: NONE , LOW , MEDIUM , HIGH , VERY TURBID. HEAVY SILTS						
COMMENTS:						
OTHER: PLEASE USE BACK OF SHT.FOR SKETCHING MAPS ,WELL LOCATION NOTES ECT. SEE BACK OF SHT Y / N.						
Q.C. SAMPLE TYPE: DUPLICATE , EQUIPMENT BLANK , OTHER :						
Q.C. PARAMETERS:						
SAMPLE DATE/ TIME: 01/04/00 / @ 1015						

SIGNED/SAMPLER:       Z / Z

## CH2M HILL WELL SAMPLING FIELD SHEET

PROJECT# 15244.35

**WELL NUMBER: OLD-13-09A**      **SITE: NTC Orlando, OU-4**

**FIELD CREW: FJ Ferreira, E. Cabale** (leave blank if on previous page)

		CASING DIA.	GAL/FT OF CASING	
WELL DEPTH (FT):	13.9			
DEPTH TO WATER (FT):	3.98	2 IN.	0.1632	
WATER COLUMN (FT):	9.92	4 IN.	0.6528	
GAL/FT OF CASING	0.1632	6 IN.	1.4688	
CASING VOLUME (GAL)	1.6	8 IN.	2.611	
NO. OF VOLUMES min.(3)	3	10 IN.	4.0797	
PURGE VOLUME (GAL)	5	12 IN.	5.8748	

**METHOD OF PURGING (circle one)**

PUMP: SUB. CENT. PERIST.	OTHER:	BAILER : TEFLON, SS , OTHER:
TIME ON: 1000 AM		BAILER VOL.. (gal) <span style="float: right;">.25 / .33</span>
FLOW RATE (gpm): approx. 0.2/gpm		REQUIRED PULLS:
PUMP TIME (min): 25		VOL. PURGED (gals):
VOL. PURGED (gals): 5		OTHER:

FIELD PARAMETERS	FIELD MEASUREMENTS					WITHIN 10% Y / N
	1st	2nd	3rd	4th	5th	
TIME	1008	1016	1025			
VOL. (gal)	1.6	3.2	5			
pH/Turbidity (NTUs)	4.31/55	4.47/48	4.78/35			
TEMP.(C)/ORP	23.74/54.6	23.91/19.8	22.84/13.9			
COND.(umhos/cm)/DO	105/-44.6	104/-60.1	114/-54.7			

SAMPLE PARAMETERS ( GRAB OR COMPOSITE ): **Grab**  
 FILTERED METALS COLLECTED: Y / N 1.0um, 0.45um, OTHER: 1.0um

**OBSERVATIONS**

**COLOR:** CLEAR , AMBER , TAN , BROWN , GREY , MILKY WHITE , OTHER: **Clear**

**ODOR:** NONE , LOW , MEDIUM , HIGH , VERY STRONG , H2S , FUEL LIKE , CHEMICAL ? , UNKNOWN

**TURBIDITY:** NONE , LOW , MEDIUM , HIGH , VERY TURBID. HEAVY SILTS

**COMMENTS:**

**OTHER:** PLEASE USE BACK OF SHT.FOR SKETCHING MAPS ,WELL LOCATION NOTES ECT. **SEE BACK OF SHT Y / N.**

**Q.C. SAMPLE TYPE:** DUPLICATE , EQUIPMENT BLANK , OTHER :

**Q.C. PARAMETERS:**

**SAMPLE DATE/ TIME: 01/04/00**      / @      1025

**SIGNED/SAMPLER:** *F. Ferreira*



## CH2M HILL WELL SAMPLING FIELD SHEET

PROJECT# 15244.35

**WELL NUMBER: OLD-13-21B**      **SITE: NTC Orlando, OU-4**

**FIELD CREW: FJ Ferreira, E. Cabale** (leave blank if on previous page)

	(FT):	CASING DIA.	GAL/FT OF CASING	
WELL DEPTH	35.28			
DEPTH TO WATER	5.48	2 IN.	0.1632	
WATER COLUMN (FT):	29.8	4 IN.	0.6528	
GAL/FT OF CASING	0.1632	6 IN.	1.4688	
CASING VOLUME (GAL)	4.8	8 IN.	2.611	
NO. OF VOLUMES min.(3)	3	10 IN.	4.0797	
PURGE VOLUME (GAL)	14.6	12 IN.	5.8748	

**METHOD OF PURGING (circle one)**

PUMP: SUB. CENT. PERIST.	OTHER:	BAILER: TEFLON, SS, OTHER:
TIME ON: 0715 AM		BAILER VOL. (gal) .25 / .33
FLOW RATE (gpm): approx. 0.2/gpm		REQUIRED PULLS: _____
PUMP TIME (min): 45		VOL. PURGED (gals): _____
VOL. PURGED (gals): 15		OTHER: _____

FIELD PARAMETERS	FIELD MEASUREMENTS					WITHIN 10% Y / N
	1st	2nd	3rd	4th	5th	
TIME	730	745	800			
VOL. (gal)	4.8	9.6	14.6			
pH/Turbidity (NTUs)	5.02/55	4.31/42	4.42/30			
TEMP.(C)/ORP	24.18/54.2	24.62/36.7	24.94/42.3			
COND.(umhos/cm)/DO	123/-25.5	121/-25.0	120/-18.9			

SAMPLE PARAMETERS ( GRAB OR COMPOSITE ): **Grab**  
 FILTERED METALS COLLECTED: Y / N 1.0um, 0.45um, OTHER: 1.0um

**OBSERVATIONS**

**COLOR:** CLEAR , AMBER , TAN , BROWN , GREY , MILKY WHITE , OTHER: **Clear**

**ODOR:** NONE , LOW , MEDIUM , HIGH , VERY STRONG , H2S , FUEL LIKE , CHEMICAL ? , UNKNOWN

**TURBIDITY:** NONE , LOW , MEDIUM , HIGH , VERY TURBID. HEAVY SILTS

**COMMENTS:**

**OTHER:** PLEASE USE BACK OF SHT. FOR SKETCHING MAPS , WELL LOCATION NOTES ECT. SEE BACK OF SHT Y / N.

**Q.C. SAMPLE TYPE:** DUPLICATE , EQUIPMENT BLANK , OTHER : 017-OLD-13-DUP2-Q4-99

**Q.C. PARAMETERS:**  
**SAMPLE DATE/ TIME:** 01/05/00 / @ 800

**SIGNED/SAMPLER:** F. J. Ferreira

# CH2M HILL WELL SAMPLING FIELD SHEET

PROJECT# 15244.35

<b>WELL NUMBER:</b> OLD-13-07A	<b>SITE:</b> NTC Orlando, OU-4
<b>FIELD CREW:</b> FJ Ferreira, E. Cabale <span style="float: right;">(leave blank if on previous page)</span>	

	(FT):	CASING DIA.	GAL/FT OF CASING	
WELL DEPTH	18.75			
DEPTH TO WATER	5.1	2 IN.	0.1632	
WATER COLUMN	13.65	4 IN.	0.6528	
GAL/FT OF CASING	0.1632	6 IN.	1.4688	
CASING VOLUME (GAL)	2.2	8 IN.	2.611	
NO. OF VOLUMES min.(3)	3	10 IN.	4.0797	
PURGE VOLUME (GAL)	6.6	12 IN.	5.8748	

METHOD OF PURGING (circle one)		
PUMP: SUB. CENT. PERIST.	OTHER:	BAILER : TEFLON, SS ,OTHER:
TIME ON: 0900 AM		BAILER VOL. (gal) .25 / .33
FLOW RATE (gpm): approx. 0.2/gpm		REQUIRED PULLS: _____
PUMP TIME (min): 30		VOL. PURGED (gals): _____
VOL. PURGED (gals): 6.6		OTHER: _____

FIELD PARAMETERS	FIELD MEASUREMENTS					WITHIN 10% Y / N
	1st	2nd	3rd	4th	5th	
TIME	910	920	930			
VOL. (gal)	2.2	4.4	6.6			
pH/Turbidity (NTUs)	5.77/45	6.17/56	6.17/44			
TEMP.(C)/ORP	21.98/119.4	23.06/180.2	22.95/174.4			
COND.(umhos/cm)/DO	184/-8.5	179/9.8	178/8.7			

SAMPLE PARAMETERS ( GRAB OR COMPOSITE ): Grab  
 FILTERED METALS COLLECTED: Y / N 1.0um,0.45um, OTHER: 1.0um

**OBSERVATIONS**

**COLOR:** CLEAR , AMBER , TAN , BROWN , GREY , MILKY WHITE , OTHER: Clear

**ODOR:** NONE , LOW , MEDIUM , HIGH , VERY STRONG , H2S , FUEL LIKE , CHEMICAL ? , UNKNOWN

**TURBIDITY:** NONE , LOW , MEDIUM , HIGH , VERY TURBID. HEAVY SILTS

**COMMENTS:** \_\_\_\_\_

**OTHER:** PLEASE USE BACK OF SHT.FOR SKETCHING MAPS ,WELL LOCATION NOTES ECT. SEE BACK OF SHT Y / N.

**Q.C. SAMPLE TYPE:** DUPLICATE , EQUIPMENT BLANK , OTHER :

**Q.C. PARAMETERS:**

**SAMPLE DATE/ TIME:** 01/05/00 / @ 930

**SIGNED/SAMPLER:** F. Ferreira



## CH2M HILL WELL SAMPLING FIELD SHEET

PROJECT# 15244.35

<b>WELL NUMBER:</b> OLD-13-DP1	<b>SITE:</b> NTC Orlando, OU-4
<b>FIELD CREW:</b> FJ Ferreira, E. Cabale <span style="float: right;">(leave blank if on previous page)</span>	

	(FT):	CASING DIA.	GAL/FT OF CASING	
WELL DEPTH	5.85			
DEPTH TO WATER	2.02	2 IN.	0.1632	
WATER COLUMN	3.83	4 IN.	0.6528	
GAL/FT OF CASING	NA	6 IN.	1.4688	
CASING VOLUME (GAL)	NA	8 IN.	2.611	
NO. OF VOLUMES min.(3)	NA	10 IN.	4.0797	
PURGE VOLUME (GAL)	NA	12 IN.	5.8748	

**METHOD OF PURGING (circle one)**

PUMP: SUB. CENT. PERIST.	OTHER:	BAILER: TEFLON, SS, OTHER:
TIME ON: NA		BAILER VOL. (gal) .25 / .33
FLOW RATE (gpm): approx. NA		REQUIRED PULLS:
PUMP TIME (min): NA		VOL. PURGED (gals):
VOL. PURGED (gals): NA		OTHER:

FIELD PARAMETERS	FIELD MEASUREMENTS					WITHIN 10% Y / N
	1st	2nd	3rd	4th	5th	6th
TIME	1015					
VOL. (gal)	3					
pH/Turbidity (NTUs)	4.91/185					
TEMP.(C)/ORP	23.79/89					
COND.(umhos/cm)/DO	107/-14.3					

SAMPLE PARAMETERS ( GRAB OR COMPOSITE ): **Grab**

FILTERED METALS COLLECTED: Y / N 1.0um, 0.45um, OTHER: 1.0um

**OBSERVATIONS**

**COLOR:** CLEAR , AMBER , TAN , BROWN , GREY , MILKY WHITE , OTHER: **Clear**

**ODOR:** NONE , LOW , MEDIUM , HIGH , VERY STRONG , H2S , FUEL LIKE , CHEMICAL ? , UNKNOWN

**TURBIDITY:** NONE , LOW , MEDIUM , HIGH , VERY TURBID. HEAVY SILTS

**COMMENTS:**

**OTHER:** PLEASE USE BACK OF SHT.FOR SKETCHING MAPS ,WELL LOCATION NOTES ECT. SEE BACK OF SHT Y / N.

**Q.C. SAMPLE TYPE:** DUPLICATE , EQUIPMENT BLANK , OTHER :

**Q.C. PARAMETERS:**

**SAMPLE DATE/ TIME:** 01/06/00 / @ 1030

**SIGNED/SAMPLER:**       Z / Z

