

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF ENFORCEMENT

EPA-330/1-80-009

OMEGA-1 LIDAR: DATA ANALYSIS REPORT
PUBLIC SERVICE OF INDIANA
GIBSON GENERATING STATION

Princeton, Indiana

October 1980

NATIONAL ENFORCEMENT INVESTIGATIONS CENTER
Denver, Colorado



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- II. SUMMARY AND CONCLUSIONS
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I. INTRODUCTION

The National Enforcement Investigations Center (NEIC) conducted an investigation of visible emissions from two stationary sources at the Gibson Generating Station operated by Public Service of Indiana (PSI), in Princeton, Indiana, during the afternoon hours of June 16, 1980. Opacities of observed visible emissions were measured remotely with a new instrumentation method* using the NEIC Omega-1 Lidar. Figure 1 depicts the location of the Lidar during the observations.

The Gibson Station contains four coal-fired generating units (Units 1 through 4) with each being equipped with an electrostatic precipitator (ESP). Each of the units has a generating capacity of 650 megawatts. The emissions from Units 1 and 2 are discharged through Stack A while the emissions from Units 3 and 4 are discharged through Stack B. The height of each stack is 500 ft. Visible emissions from these sources are alleged to be in violation of the applicable opacity limits of the Indiana State Implementation Plan (SIP).

On April 21, 1980, the Enforcement Division of EPA, Region V, Chicago, Illinois, requested assistance from NEIC in documenting the opacity of emissions from the Gibson Station.

To provide the requested assistance to Region V, NEIC conducted the investigation with the following objectives:

1. Document the opacity of visible emissions from Stacks A and B.
2. Evaluate the compliance of the observed emissions with the Indiana SIP.

* This method has been proposed in the Federal Register, Vol. 45, No. 128, Tuesday, July 1, 1980, pages 44329 through 44351, as an alternate method to Reference Method 9.

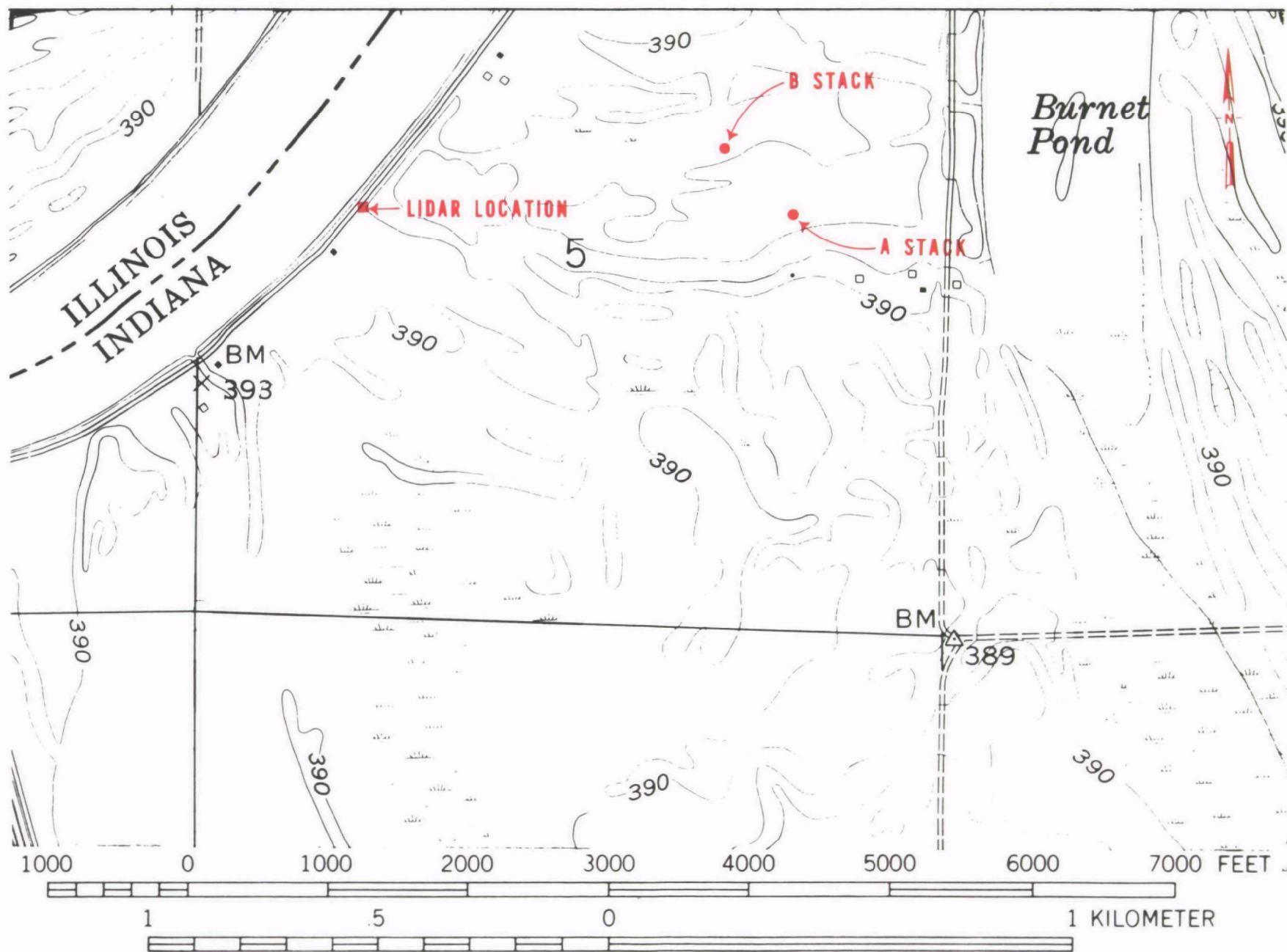


Figure 1. Location Map

II. SUMMARY AND CONCLUSIONS

SUMMARY OF INVESTIGATION

The opacity of visible emissions from the two stationary sources within the Gibson Generating Station, Public Service of Indiana (PSI), Princeton, Indiana, were measured during the afternoon hours of June 16, 1980. The sources investigated were Stacks A and B. All measurements were conducted remotely from off the plant site.

Opacities were measured remotely with the NEIC Omega-1 Lidar which is a new instrumentation method. The method has been proposed in the Federal Register as Alternate Method 1 to Reference Method 9.

Four sets of opacity measurements were made, the total of which was about 1 hour of observation and about 350 individual measurements. The sets of measurements were 15 minutes in length. Measurements were made at a temporal frequency range from once about every 8 to 9 seconds.

All opacity measurements were subsequently analyzed and reduced with the NEIC laboratory computer using the methods given in Alternate Method 1 (proposed).

The results of the lidar observations are summarized in Table 1 according to the official designation of each stationary source.

CONCLUSIONS

The visible emissions from Stacks A and B did not exceed the allowable limit of the Indiana State Implementation Plan (40% for a 6-minute average) at any time during the lidar observations.

Table 1
PSI, GIBSON GENERATING STATION
Princeton, Indiana

Source Designation	Applicable Opacity Limit (%)	Date June 1980	Time Interval (hr min sec)	Approx length of Observation (min)	Approx Time Exceeding Limit (min)	% of Time in Excess of limit	± Max Lidar Calibration	
							Peak Opacity (6-min avg)	Error Mag (%) [From 0% to 80%]
Stack B	40	16	14.38 58 14 53 39	15	0	0	13	-0.19, +0 42
Stack B	40	16	15 04.46 15.19 21	15	0	0	20	-0.19, +0 42
Stack A	40	16	15.32.27 15.47.00	15	0	0	29	-0.15, +0.38
Stack A	40	16	15.52 36 16 07 02	15	0	0	27	-0 15, +0 38

III. METHODS

LIDAR OPACITY MEASUREMENTS

Alternate Method 1 (proposed) employs a lidar (lasar radar) which is an optical system installed in a truck-mounted van enclosure. This mobile lidar is specifically designed and fabricated for measuring the opacity of visible emissions from a given stationary source during both day and nighttime ambient lighting conditions. The laser transmitter within the lidar emits a short pulse of light. The lidar receiver collects the laser light backscattered from the atmospheric aerosols before and beyond the visible plume as well as that from the aerosols (particulates) within the plume. The lidar receiver converts the backscattered optical signals to electronic signals or data. The Lidar has an inherent data processing capability that calculates the opacity values from the backscatter data from just before and beyond the plume. It subsequently records these opacity values in hard copy form, and also records the original lidar receiver data (signal amplitude vs range) on magnetic tape for future reference or use.

The nominal data gathering rate of the lidar is an opacity measurement or determination once every 10 seconds. This data rate can be maintained in continuous operation for minutes or even hours. The lidar method is intended for use during nighttime, as well as during the day.

The Omega-1 Lidar is internally calibrated in the field periodically over the opacity values of 0, 10, 20, 40, 60, and 80%.

DATA ANALYSIS AND REDUCTION

The lidar data were analyzed in accordance with Section 2 of Alternate Method 1 (proposed) using the NEIC PDP-11-70 laboratory computer. The

individual opacity values were calculated using the backscatter data recorded on magnetic tape, with the opacity equation given in Section 2.4.1. The associated statistics which includes the standard deviation, S_o , of each individual opacity value, were calculated using the appropriate equations in Section 2.4.1. The running- or sliding-average, \bar{O}_p , of the individual opacity values was calculated over the 6-minute averaging interval, given in the Indiana State Implementation Plan (SIP), according to the requirements of Section 2.4.2.

The number of opacity values included in the running-average is nominally 36 (six measurements/minute for 6 minutes according to the SIP). The 6-minute interval remains constant although the number of opacity values may vary above or below the nominal. In accordance with the Opacity Data Acceptance/Rejection Criterion in Section 2.4.3, if the standard deviation, S_o , for a given opacity value is greater than 8% (full scale) then that value is discarded from the running-average set decreasing the total number by one. The number of opacity values in the 6-minute interval may be greater than 36 which is caused by the lidar data rate being set faster than six opacity measurements/minute (one opacity measurement every 10 seconds).

DATA PRESENTATION

The opacity values are presented in two separate formats in Section IV of this data analysis report. For each data run the values are given in tabular form followed by graphic plots. An identification header is located across the top of the tabular form which provides the following information:

- EPA-NEIC identification block.
- EPA-NEIC Omega control number (evidentiary parameter).
- Official designation for the stationary source.
- Facility name.
- Facility location.
- Location of the lidar during tests.
- Length of the running average interval.

This tabular presentation provides the applicable data in columns identified as follows:

- Date of data run.
- Time of the opacity measurement (nearest second).
- Opacity values as calculated in %.
- Standard deviation SO (S_o in Alternate Method 1) in %.
- Individual violation flags, not applicable in Indiana.
- Average opacity (%) calculated over the running-average interval.
- Average standard deviation (%) calculated over the running-average interval.
- Average opacity violation flag, applicable in Indiana.
- Number of opacity values discarded due to the Opacity Data Acceptance/Rejection Criterion (§ 2.4.3 of the Alternate Method 1).

In the average opacity violation column, any violations that occurred over and above the 40% (SIP) average opacity limit are indicated with a flag of four asterisks.

The computer graphical plots, located in Section IV immediately after each respective tabular data set, show the individual opacity values (column 3 of the tabular data set) along with their respective standard deviations as error bars (column 4 of the tabular data set). The standard deviation gives an indication of the magnitude of the error associated with each opacity value due to atmospheric noise along the lidar line-of-sight. The magnitude of the average opacity established in the SIP is indicated on each plot by the dashed line at the 40% value. Each graphical plot is fixed in time along the horizontal axis, being 10 minutes in length.

The lidar internal calibration data are presented in Table 1 of Section II for each respective observation period as the extreme values that occurred throughout the opacity range given above. A negative value indicates that the lidar was determining opacity low or below the respective standard while a positive value indicates a high value with respect to the standard.

IV. DATA ANALYSIS PRESENTATION

OMEGA-0068

PUBLIC SERVICE OF INDIANA

GIBSON STATION

STACK B

June 16, 1980, 14:38:58 to 14:53:39

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ENFORCEMENT INVESTIGATIONS CENTER
DENVER, COLORADO 80225

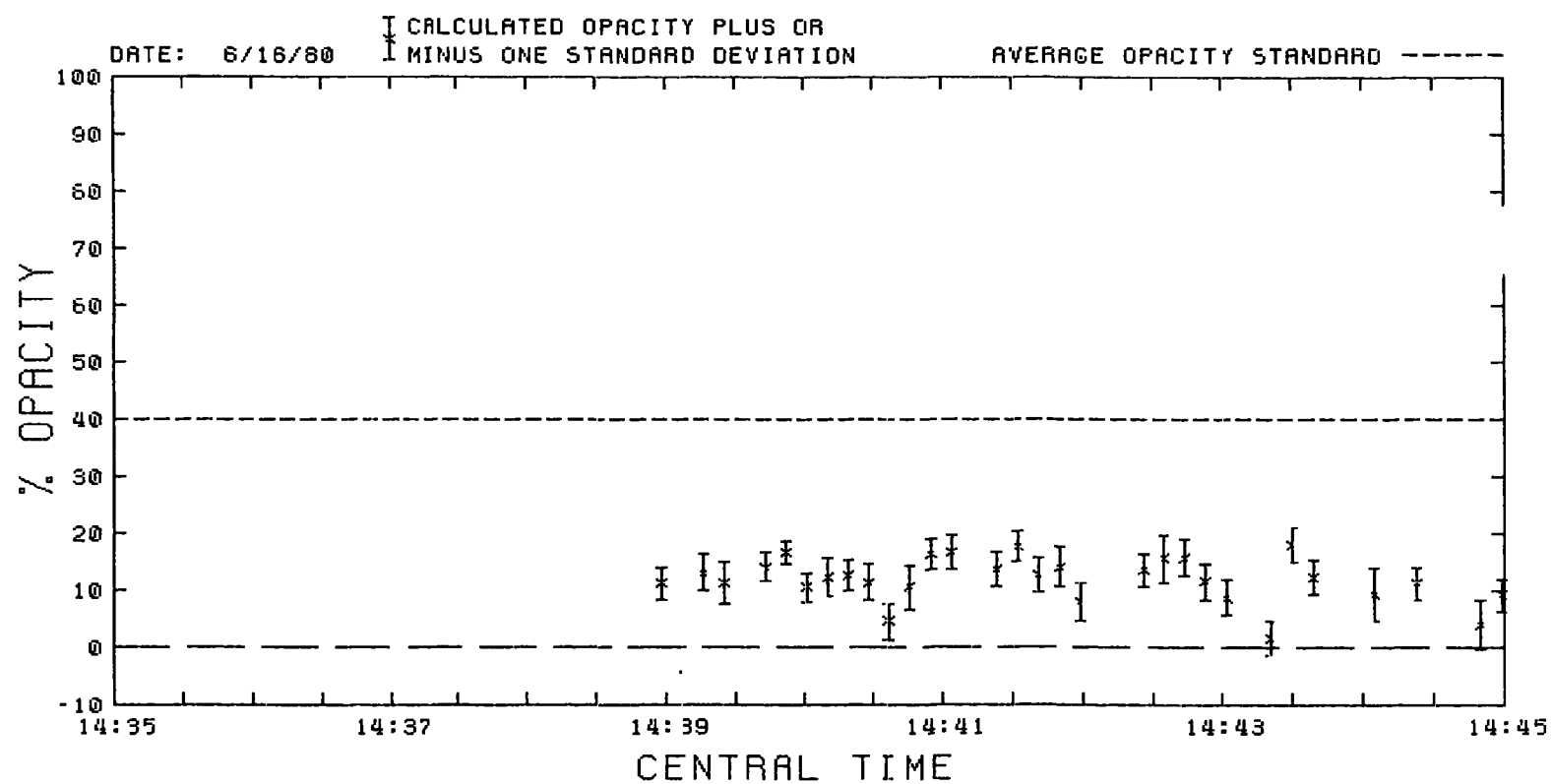
OMEGA-0068, STACK B, PSI GIBSON STATION, PRINCETON, INDIANA FROM WEST OF PLANT SIX MINUTE AVERAGES
DATE TIME OPACITY SO VIOLATION AVERAGE OPACITY AVERAGE SO VIOLATION NUMBER DISCARDED

6/16/80	14 38 58	11	3		0	0	0	OF	0
6/16/80	14 39 16	13	3		0	0	0	OF	0
6/16/80	14 39 25	11	4		0	0	0	OF	0
6/16/80	14 39 43	14	2		0	0	0	OF	0
6/16/80	14 39 52	17	2		0	0	0	OF	0
6/16/80	14 40 1	11	2		0	0	0	OF	0
6/16/80	14 40 10	12	3		0	0	0	OF	0
6/16/80	14 40 19	13	3		0	0	0	OF	0
6/16/80	14 40 28	11	3		0	0	0	OF	0
6/16/80	14 40 37	5	3		0	0	0	OF	0
6/16/80	14 40 46	11	4		0	0	0	OF	0
6/16/80	14 40 55	16	3		0	0	0	OF	0
6/16/80	14 41 4	17	3		0	0	0	OF	0
6/16/80	14 41 23	14	3		0	0	0	OF	0
6/16/80	14 41 32	18	3		0	0	0	OF	0
6/16/80	14 41 41	13	3		0	0	0	OF	0
6/16/80	14 41 50	14	3		0	0	0	OF	0
6/16/80	14 41 59	8	3		0	0	0	OF	0
6/16/80	14 42 26	14	3		0	0	0	OF	0
6/16/80	14 42 35	16	4		0	0	0	OF	0
6/16/80	14 42 44	16	3		0	0	0	OF	0
6/16/80	14 42 53	12	3		0	0	0	OF	0
6/16/80	14 43 2	9	3		0	0	0	OF	0
6/16/80	14 43 21	2	3		0	0	0	OF	0
6/16/80	14 43 30	18	3		0	0	0	OF	0
6/16/80	14 43 39	12	3		0	0	0	OF	0
6/16/80	14 44 5	9	5		0	0	0	OF	0
6/16/80	14 44 23	11	3		0	0	0	OF	0
6/16/80	14 44 50	4	4		12	3	0	OF	29
6/16/80	14 44 59	9	3		12	3	0	OF	29
6/16/80	14 45 8	10	3		12	3	0	OF	30
6/16/80	14 45 17	10	3		12	3	0	OF	30
6/16/80	14 45 35	14	3		12	3	0	OF	30
6/16/80	14 45 44	2	3		11	3	0	OF	30
6/16/80	14 45 53	6	3		11	3	0	OF	30
6/16/80	14 46 2	8	3		11	3	0	OF	30
6/16/80	14 46 11	6	3		11	3	0	OF	30
6/16/80	14 46 20	14	3		11	3	0	OF	30
6/16/80	14 46 29	17	3		11	3	0	OF	30
6/16/80	14 46 38	15	3		11	3	0	OF	30
6/16/80	14 46 47	7	5		11	3	0	OF	30
6/16/80	14 46 56	1	4		11	3	0	OF	30
6/16/80	14 47 5	12	3		11	3	0	OF	30
6/16/80	14 47 14	26	3		11	3	0	OF	31
6/16/80	14 47 23	21	3		11	3	0	OF	32
6/16/80	14 47 32	12	3		11	3	0	OF	32
6/16/80	14 47 41	16	4		11	3	0	OF	32
6/16/80	14 47 59	18	4		11	3	0	OF	31
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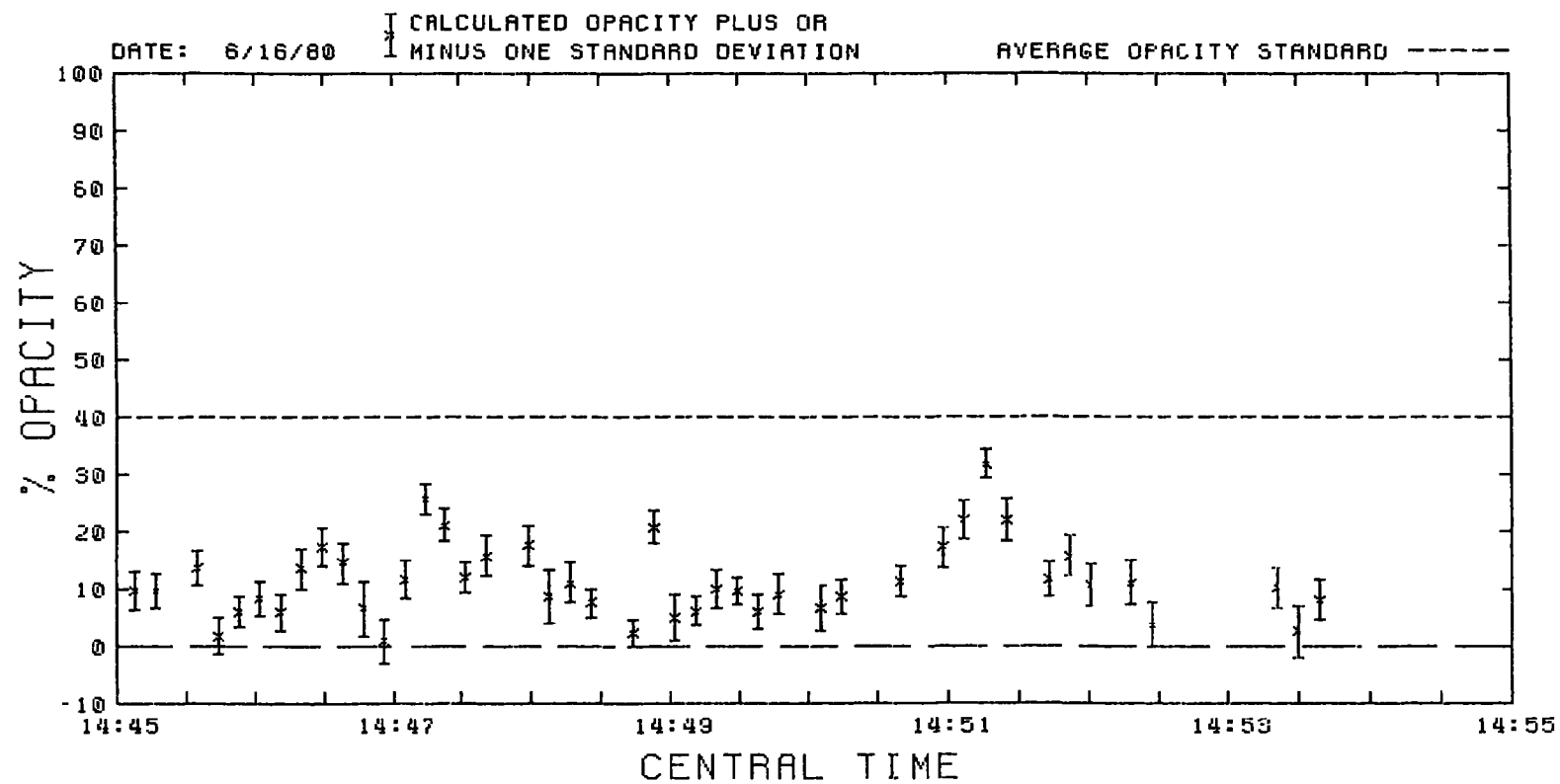
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OMEGA-0068, STACK B, PSI GIBSON STATION, PRINCETON, INDIANA FROM WEST OF PLANT SIX MINUTE AVERAGES

DATE	TIME	OPACITY	SO VIOLATION	AVERAGE OPACITY	AVERAGE SO VIOLATION	NUMBER DISCARDED
6/16/80	14 48 26	7	2	11	3	0 OF 33
6/16/80	14 48 44	2	2	11	3	0 OF 32
6/16/80	14 48 53	21	3	11	3	0 OF 32
6/16/80	14 49 2	5	4	11	3	0 OF 32
6/16/80	14 49 11	6	2	11	3	0 OF 32
6/16/80	14 49 20	10	3	11	3	0 OF 33
6/16/80	14 49 29	10	2	11	3	0 OF 33
6/16/80	14 49 38	6	3	10	3	0 OF 33
6/16/80	14 49 47	9	3	10	3	0 OF 33
6/16/80	14 50 5	7	4	10	3	0 OF 34
6/16/80	14 50 14	9	3	10	3	0 OF 34
6/16/80	14 50 40	11	3	10	3	0 OF 34
6/16/80	14 50 58	17	3	11	3	0 OF 34
6/16/80	14 51 7	22	3	11	3	0 OF 34
6/16/80	14 51 16	32	2	12	3	0 OF 34
6/16/80	14 51 25	22	4	12	3	0 OF 34
6/16/80	14 51 43	12	3	12	3	0 OF 34
6/16/80	14 51 52	16	3	12	3	0 OF 34
6/16/80	14 52 1	11	4	12	3	0 OF 34
6/16/80	14 52 18	11	4	13	3	0 OF 33
6/16/80	14 52 27	4	4	12	3	0 OF 33
6/16/80	14 53 21	10	4	12	3	0 OF 28
6/16/80	14 53 30	3	5	12	3	0 OF 28
6/16/80	14 53 39	8	3	12	3	0 OF 28



STACK B. PSI GIBSON STATION, PRINCETON, INDIANA



STACK B. PSI GIBSON STATION, PRINCETON, INDIANA

OMEGA-0068

PUBLIC SERVICE OF INDIANA

GIBSON STATION

STACK B

June 16, 1980, 15:04:46 to 15:19:21

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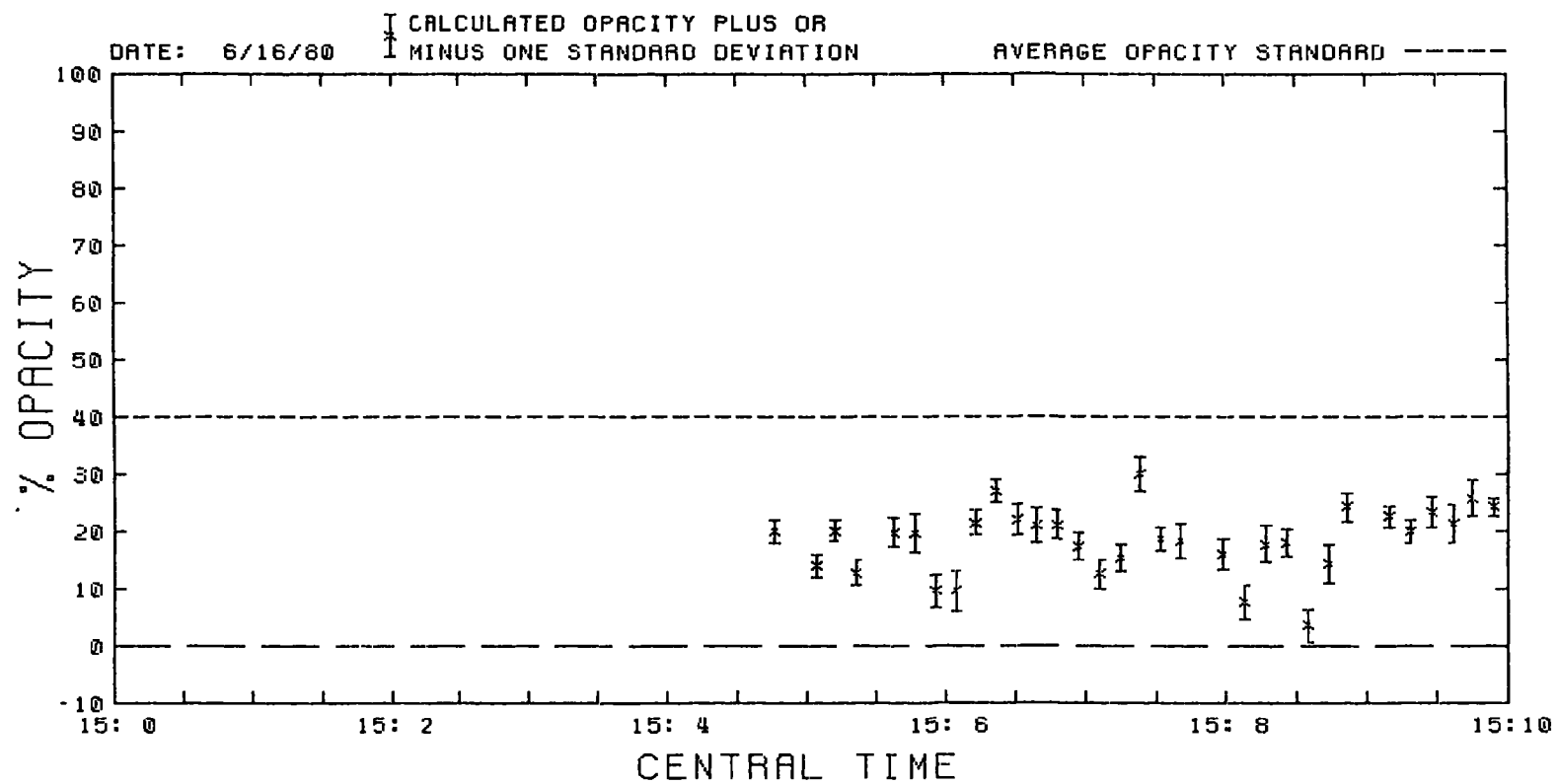
OMEGA-0068, STACK B, PSI GIBSON STATION, PRINCETON, INDIANA FROM WEST OF PLANT SIX MINUTE AVERAGES
DATE TIME OPACITY SO VIOLATION AVERAGE OPACITY AVERAGE SO VIOLATION NUMBER DISCARDED

6/16/80	15	4	46	20	2	0	0	0	OF	0
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6/16/80	15	5	12	20	2	0	0	0	OF	0
6/16/80	15	5	21	13	2	0	0	0	OF	0
6/16/80	15	5	38	20	2	0	0	0	OF	0
6/16/80	15	5	47	20	3	0	0	0	OF	0
6/16/80	15	5	56	10	3	0	0	0	OF	0
6/16/80	15	6	5	10	3	0	0	0	OF	0
6/16/80	15	6	13	21	2	0	0	0	OF	0
6/16/80	15	6	22	27	2	0	0	0	OF	0
6/16/80	15	6	31	22	3	0	0	0	OF	0
6/16/80	15	6	39	21	3	0	0	0	OF	0
6/16/80	15	6	48	21	3	0	0	0	OF	0
6/16/80	15	6	57	17	2	0	0	0	OF	0
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6/16/80	15	7	23	30	3	0	0	0	OF	0
6/16/80	15	7	32	19	2	0	0	0	OF	0
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6/16/80	15	9	10	23	2	0	0	0	OF	0
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6/16/80	15	10	12	25	4	0	0	0	OF	0
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6/16/80	15	10	47	23	2	19	3	0	OF	37
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6/16/80	15	11	31	21	2	19	3	0	OF	39
6/16/80	15	11	40	26	3	20	3	0	OF	39
6/16/80	15	11	49	12	3	19	3	0	OF	39
6/16/80	15	11	58	18	3	20	3	0	OF	39
6/16/80	15	12	7	20	3	20	3	0	OF	39
6/16/80	15	12	25	8	3	19	3	0	OF	38
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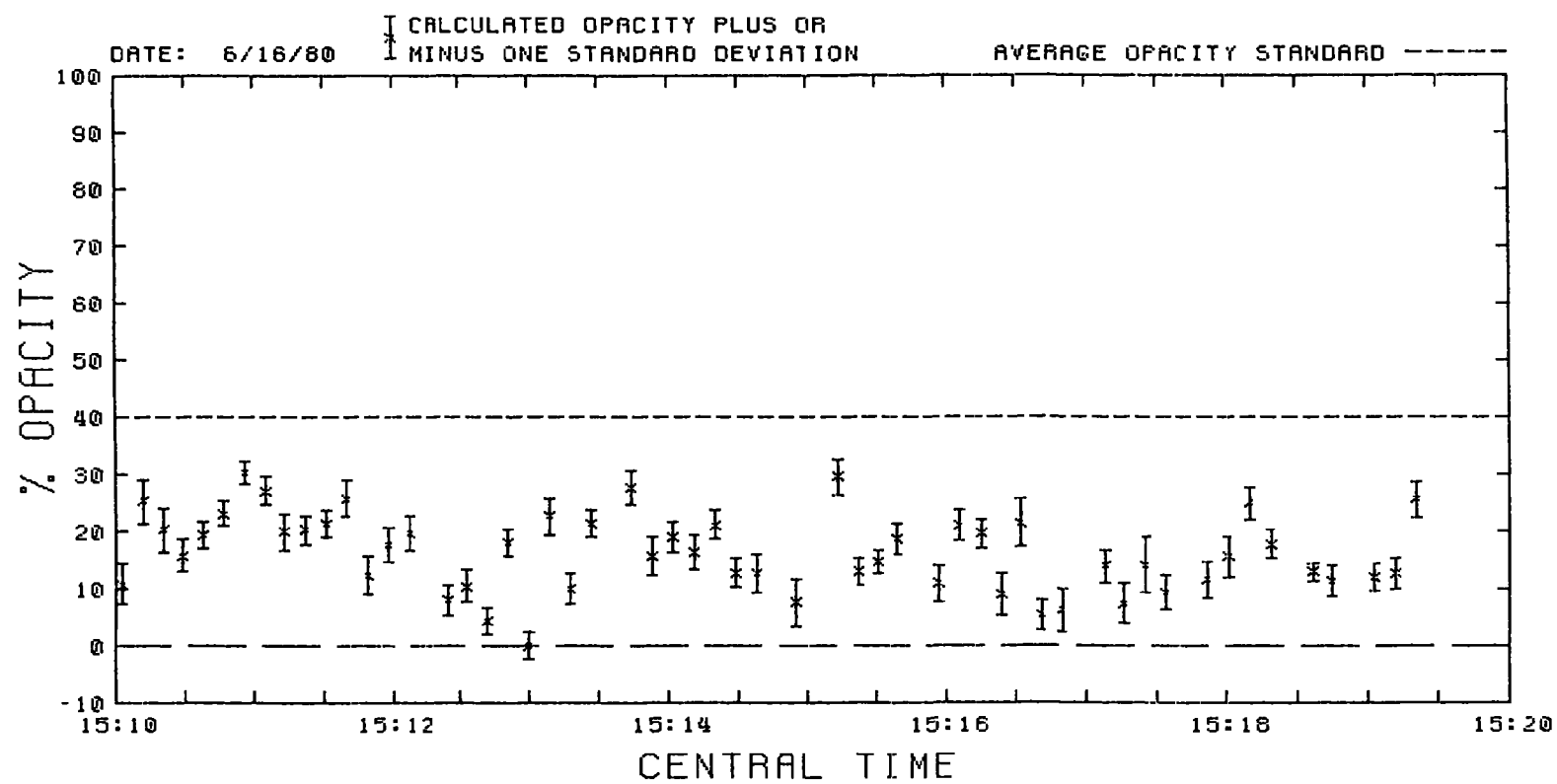
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OMEGA-0068, STACK B, PSI GIBSON STATION, PRINCETON, INDIANA FROM WEST OF PLANT SIX MINUTE AVERAGES
DATE TIME OPACITY SO VIOLATION AVERAGE OPACITY AVERAGE SO VIOLATION NUMBER DISCARDED

6/16/80	15 12 51	18	2		18	3	0 OF 38
6/16/80	15 13 0	0	2		18	3	0 OF 38
6/16/80	15 13 9	23	3		18	3	0 OF 38
6/16/80	15 13 18	10	3		18	3	0 OF 38
6/16/80	15 13 27	21	2		18	3	0 OF 38
6/16/80	15 13 44	28	3		18	3	0 OF 37
6/16/80	15 13 53	16	3		18	3	0 OF 38
6/16/80	15 14 2	19	3		18	3	0 OF 38
6/16/80	15 14 11	16	3		18	3	0 OF 38
6/16/80	15 14 20	21	2		18	3	0 OF 38
6/16/80	15 14 29	13	2		18	3	0 OF 38
6/16/80	15 14 38	13	3		19	3	0 OF 38
6/16/80	15 14 55	7	4		18	3	0 OF 37
6/16/80	15 15 13	30	3		18	3	0 OF 37
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6/16/80	15 15 39	19	3		18	3	0 OF 37
6/16/80	15 15 57	11	3		17	3	0 OF 36
6/16/80	15 16 6	21	3		18	3	0 OF 36
6/16/80	15 16 15	20	3		17	3	0 OF 36
6/16/80	15 16 24	9	4		17	3	0 OF 36
6/16/80	15 16 32	21	4		17	3	0 OF 36
6/16/80	15 16 41	5	3		17	3	0 OF 36
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6/16/80	15 17 16	7	4		15	3	0 OF 35
6/16/80	15 17 25	14	5		15	3	0 OF 35
6/16/80	15 17 34	9	3		15	3	0 OF 35
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6/16/80	15 18 10	25	3		15	3	0 OF 34
6/16/80	15 18 19	18	3		15	3	0 OF 35
6/16/80	15 18 37	13	2		15	3	0 OF 34
6/16/80	15 18 45	11	3		15	3	0 OF 34
6/16/80	15 19 3	12	2		15	3	0 OF 33
6/16/80	15 19 12	13	3		15	3	0 OF 33
6/16/80	15 19 21	26	3		16	3	0 OF 33



STACK B. PSI GIBSON STATION, PRINCETON, INDIANA



OMEGA-0069

PUBLIC SERVICE OF INDIANA

GIBSON STATION

STACK A

June 16, 1980, 15:32:27 to 15:47:00

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ENFORCEMENT INVESTIGATIONS CENTER
DENVER, COLORADO 80225

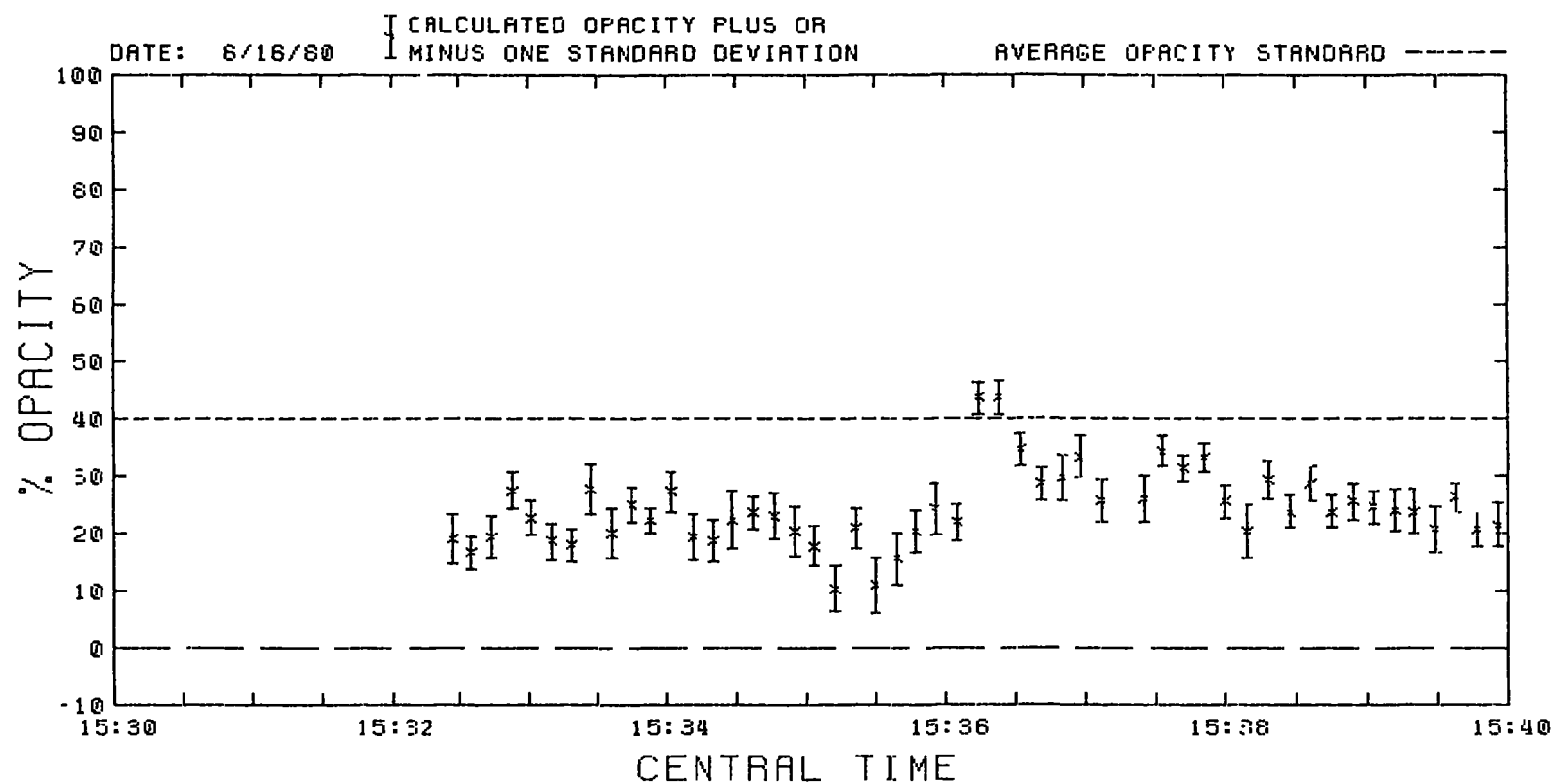
OMEGA-0069, STACK A, PSI GIBSON STATION, PRINCETON, INDIANA FROM WEST OF PLANT SIX MINUTE AVERAGES
DATE TIME OPACITY SO VIOLATION AVERAGE OPACITY AVERAGE SO VIOLATION NUMBER DISCARDED

6/16/80	15 32 27	19	4		0	0	0 OF	0
6/16/80	15 32 35	17	3		0	0	0 OF	0
6/16/80	15 32 44	19	4		0	0	0 OF	0
6/16/80	15 32 53	27	3		0	0	0 OF	0
6/16/80	15 33 1	23	3		0	0	0 OF	0
6/16/80	15 33 10	19	3		0	0	0 OF	0
6/16/80	15 33 19	18	3		0	0	0 OF	0
6/16/80	15 33 27	28	4		0	0	0 OF	0
6/16/80	15 33 36	20	4		0	0	0 OF	0
6/16/80	15 33 45	25	3		0	0	0 OF	0
6/16/80	15 33 53	22	2		0	0	0 OF	0
6/16/80	15 34 2	27	4		0	0	0 OF	0
6/16/80	15 34 11	19	4		0	0	0 OF	0
6/16/80	15 34 20	19	4		0	0	0 OF	0
6/16/80	15 34 28	22	5		0	0	0 OF	0
6/16/80	15 34 37	24	3		0	0	0 OF	0
6/16/80	15 34 46	23	4		0	0	0 OF	0
6/16/80	15 34 55	20	4		0	0	0 OF	0
6/16/80	15 35 3	18	3		0	0	0 OF	0
6/16/80	15 35 12	10	4		0	0	0 OF	0
6/16/80	15 35 21	21	4		0	0	0 OF	0
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6/16/80	15 35 39	16	5		0	0	0 OF	0
6/16/80	15 35 47	20	4		0	0	0 OF	0
6/16/80	15 35 56	24	5		0	0	0 OF	0
6/16/80	15 36 5	22	3		0	0	0 OF	0
6/16/80	15 36 14	44	3		0	0	0 OF	0
6/16/80	15 36 23	44	3		0	0	0 OF	0
6/16/80	15 36 32	35	3		0	0	0 OF	0
6/16/80	15 36 41	29	3		0	0	0 OF	0
6/16/80	15 36 50	30	4		0	0	0 OF	0
6/16/80	15 36 58	33	4		0	0	0 OF	0
6/16/80	15 37 7	26	4		0	0	0 OF	0
6/16/80	15 37 25	26	4		0	0	0 OF	0
6/16/80	15 37 33	34	3		0	0	0 OF	0
6/16/80	15 37 42	31	2		0	0	0 OF	0
6/16/80	15 37 51	33	3		0	0	0 OF	0
6/16/80	15 38 0	26	3		0	0	0 OF	0
6/16/80	15 38 9	20	5		24	4	0 OF	39
6/16/80	15 38 18	29	3		24	4	0 OF	40
6/16/80	15 38 27	24	3		24	4	0 OF	41
6/16/80	15 38 36	29	3		25	4	0 OF	40
6/16/80	15 38 45	24	3		25	3	0 OF	40
6/16/80	15 38 54	26	3		25	4	0 OF	40
6/16/80	15 39 3	25	3		25	3	0 OF	40
6/16/80	15 39 12	24	4		25	4	0 OF	40
6/16/80	15 39 20	24	4		25	4	0 OF	40
6/16/80	15 39 29	21	4		25	4	0 OF	40
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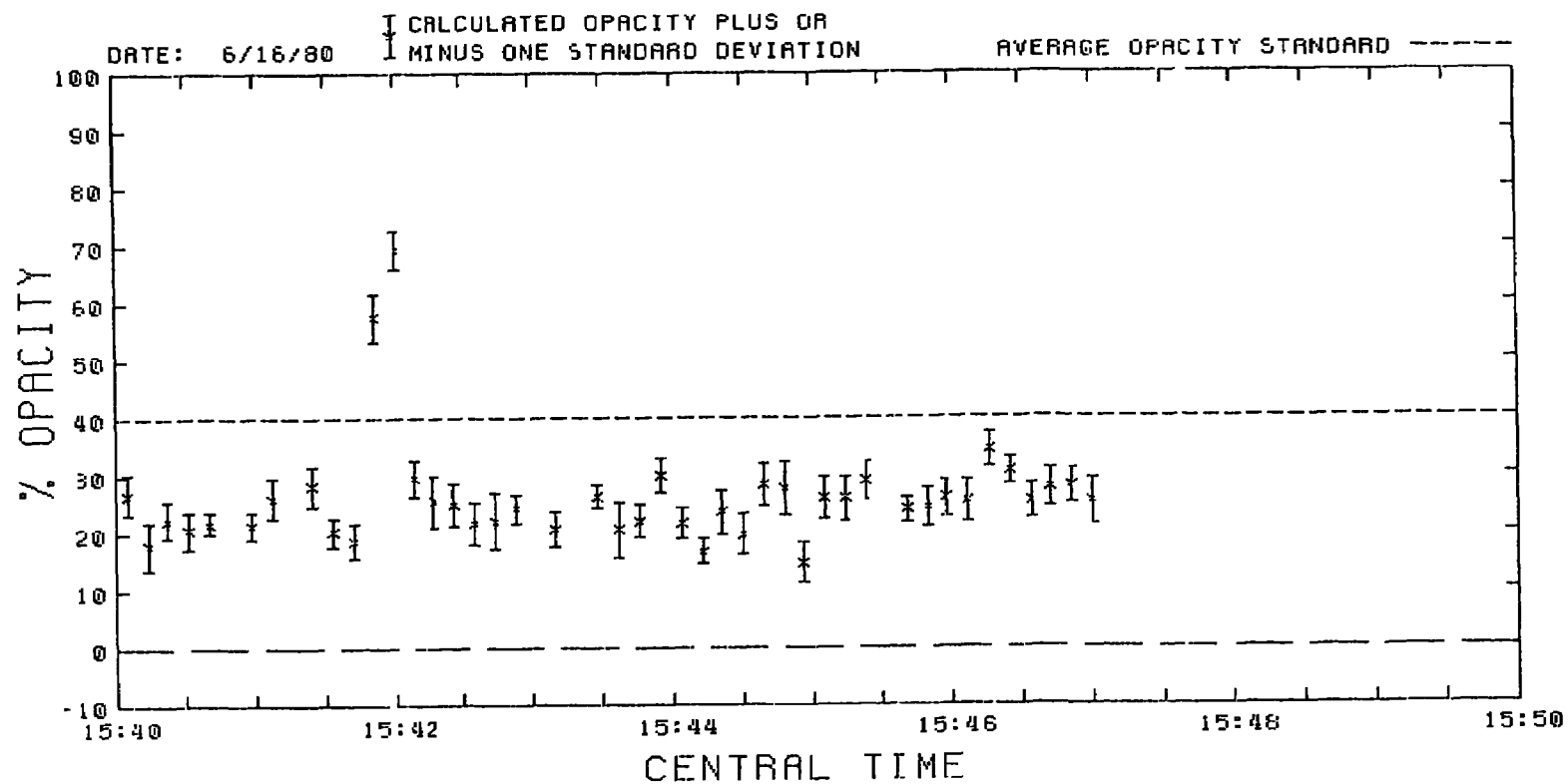
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NATIONAL ENFORCEMENT INVESTIGATIONS CENTER
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OMEGA-0069. STACK A. PSI GIBSON STATION, PRINCETON, INDIANA FROM WEST OF PLANT SIX MINUTE AVERAGES
DATE TIME OPACITY SO VIOLATION AVERAGE OPACITY AVERAGE SO VIOLATION NUMBER DISCARDED

6/16/80	15 39 56	21	4		25	4	0 OF 40
6/16/80	15 40 5	27	3		25	4	0 OF 40
6/16/80	15 40 14	18	4		25	4	0 OF 40
6/16/80	15 40 22	22	3		25	4	0 OF 40
6/16/80	15 40 31	21	3		25	3	0 OF 40
6/16/80	15 40 40	22	2		25	3	0 OF 40
6/16/80	15 40 58	21	2		25	3	0 OF 39
6/16/80	15 41 7	26	4		25	3	0 OF 39
6/16/80	15 41 24	28	4		26	3	0 OF 38
6/16/80	15 41 33	20	2		26	3	0 OF 38
6/16/80	15 41 42	19	3		26	3	0 OF 38
6/16/80	15 41 51	58	4		27	3	0 OF 38
6/16/80	15 42 0	69	3		28	3	0 OF 38
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6/16/80	15 42 26	25	4		28	3	0 OF 38
6/16/80	15 42 35	22	4		27	3	0 OF 38
6/16/80	15 42 44	22	5		27	3	0 OF 38
6/16/80	15 42 53	24	2		27	3	0 OF 38
6/16/80	15 43 10	21	3		27	3	0 OF 37
6/16/80	15 43 28	26	2		27	3	0 OF 37
6/16/80	15 43 37	21	5		26	3	0 OF 37
6/16/80	15 43 46	22	3		26	3	0 OF 37
6/16/80	15 43 55	30	3		26	3	0 OF 37
6/16/80	15 44 4	22	3		26	3	0 OF 37
6/16/80	15 44 13	17	2		26	3	0 OF 37
6/16/80	15 44 21	24	4		26	3	0 OF 37
6/16/80	15 44 30	20	4		25	3	0 OF 37
6/16/80	15 44 39	28	4		25	3	0 OF 37
6/16/80	15 44 48	28	5		26	3	0 OF 37
6/16/80	15 44 56	15	4		25	3	0 OF 37
6/16/80	15 45 5	26	4		25	3	0 OF 37
6/16/80	15 45 14	26	4		25	3	0 OF 37
6/16/80	15 45 23	29	3		25	3	0 OF 37
6/16/80	15 45 41	24	2		26	3	0 OF 36
6/16/80	15 45 50	24	3		26	3	0 OF 36
6/16/80	15 45 58	26	3		26	3	0 OF 36
6/16/80	15 46 7	25	4		26	3	0 OF 36
6/16/80	15 46 16	34	3		26	3	0 OF 36
6/16/80	15 46 25	31	2		26	3	0 OF 36
6/16/80	15 46 34	25	3		27	3	0 OF 36
6/16/80	15 46 42	28	3		27	3	0 OF 36
6/16/80	15 46 51	28	3		27	3	0 OF 37
6/16/80	15 47 0	25	4		27	3	0 OF 37



STACK A. PSI GIBSON STATION, PRINCETON, INDIANA



STACK A, PSI GIBSON STATION, PRINCETON, INDIANA

OMEGA-0069

PUBLIC SERVICE OF INDIANA

GIBSON STATION

STACK A

June 16, 1980, 15:52:36 to 16:07:02

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ENFORCEMENT INVESTIGATIONS CENTER
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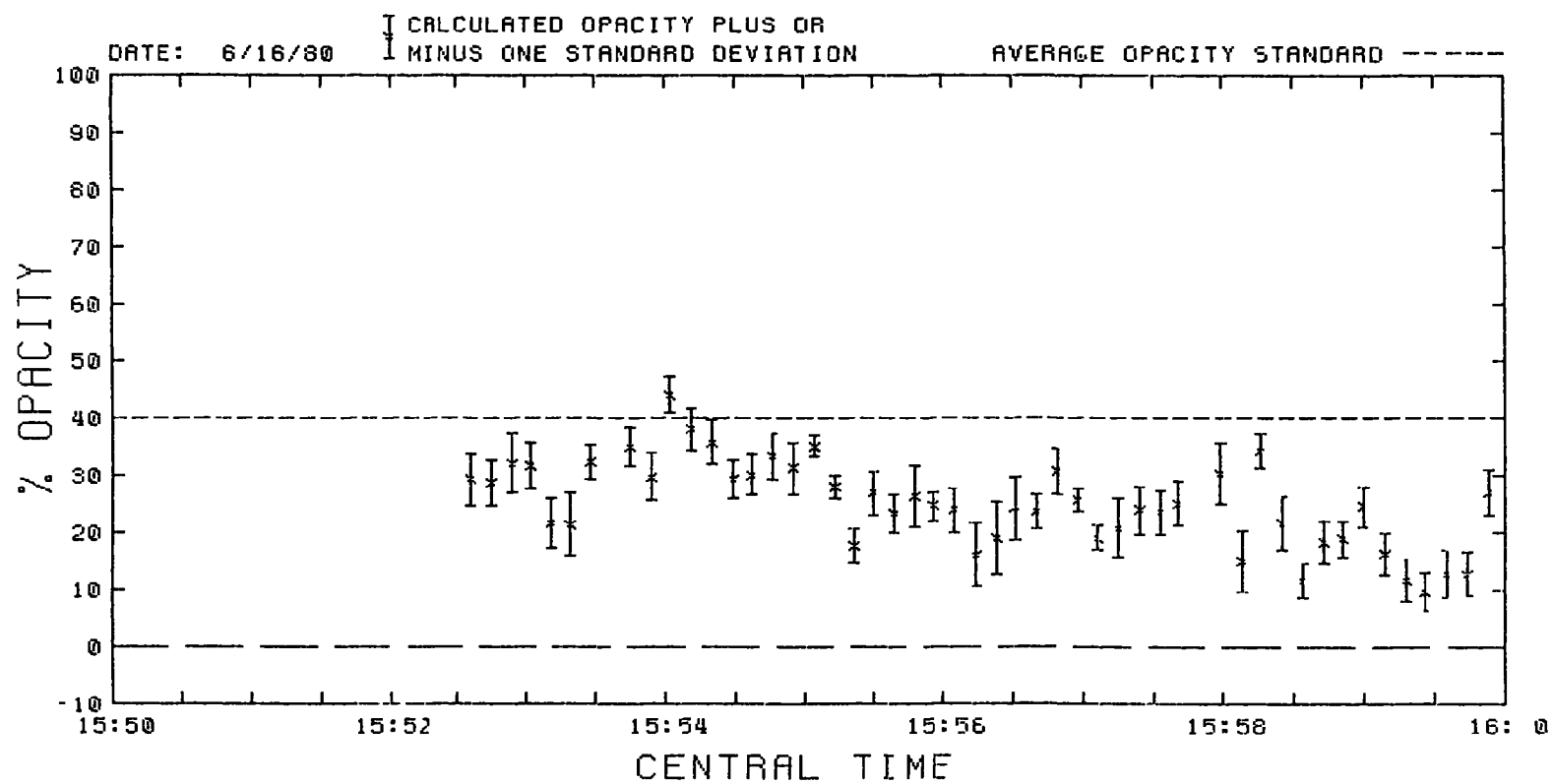
OMEGA-0069, STACK A, PSI GIBSON STATION, PRINCETON, INDIANA FROM WEST OF PLANT SIX MINUTE AVERAGES

DATE	TIME	OPACITY	SO	VIOLATION	AVERAGE OPACITY	AVERAGE SO	VIOLATION	NUMBER DISCARDED
6/16/80	15 52 36	29	4		0	0		0 OF 0
6/16/80	15 52 45	29	4		0	0		0 OF 0
6/16/80	15 52 54	32	5		0	0		0 OF 0
6/16/80	15 53 2	32	4		0	0		0 OF 0
6/16/80	15 53 11	22	4		0	0		0 OF 0
6/16/80	15 53 19	21	6		0	0		0 OF 0
6/16/80	15 53 28	32	3		0	0		0 OF 0
6/16/80	15 53 45	35	3		0	0		0 OF 0
6/16/80	15 53 54	30	4		0	0		0 OF 0
6/16/80	15 54 2	44	3		0	0		0 OF 0
6/16/80	15 54 11	38	4		0	0		0 OF 0
6/16/80	15 54 20	36	4		0	0		0 OF 0
6/16/80	15 54 29	29	3		0	0		0 OF 0
6/16/80	15 54 37	30	3		0	0		0 OF 0
6/16/80	15 54 46	33	4		0	0		0 OF 0
6/16/80	15 54 55	31	4		0	0		0 OF 0
6/16/80	15 55 4	35	2		0	0		0 OF 0
6/16/80	15 55 13	28	2		0	0		0 OF 0
6/16/80	15 55 21	18	3		0	0		0 OF 0
6/16/80	15 55 30	27	4		0	0		0 OF 0
6/16/80	15 55 39	23	3		0	0		0 OF 0
6/16/80	15 55 48	26	5		0	0		0 OF 0
6/16/80	15 55 56	25	3		0	0		0 OF 0
6/16/80	15 56 5	24	4		0	0		0 OF 0
6/16/80	15 56 14	16	6		0	0		0 OF 0
6/16/80	15 56 23	19	6		0	0		0 OF 0
6/16/80	15 56 31	24	6		0	0		0 OF 0
6/16/80	15 56 40	24	3		0	0		0 OF 0
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6/16/80	15 56 58	26	2		0	0		0 OF 0
6/16/80	15 57 6	19	2		0	0		0 OF 0
6/16/80	15 57 15	21	5		0	0		0 OF 0
6/16/80	15 57 24	24	4		0	0		0 OF 0
6/16/80	15 57 33	24	4		0	0		0 OF 0
6/16/80	15 57 41	25	4		0	0		0 OF 0
6/16/80	15 57 59	30	5		0	0		0 OF 0
6/16/80	15 58 8	15	5		0	0		0 OF 0
6/16/80	15 58 16	34	3		0	0		0 OF 0
6/16/80	15 58 25	22	5		27	4		0 OF 39
6/16/80	15 58 34	12	3		27	4		0 OF 40
6/16/80	15 58 43	18	4		27	4		0 OF 40
6/16/80	15 58 51	19	3		26	4		0 OF 40
6/16/80	15 59 0	25	3		26	4		0 OF 40
6/16/80	15 59 9	16	4		26	4		0 OF 40
6/16/80	15 59 18	12	4		26	4		0 OF 40
6/16/80	15 59 26	10	3		25	4		0 OF 40
6/16/80	15 59 35	13	4		25	4		0 OF 40
6/16/80	15 59 44	13	4		24	4		0 OF 41
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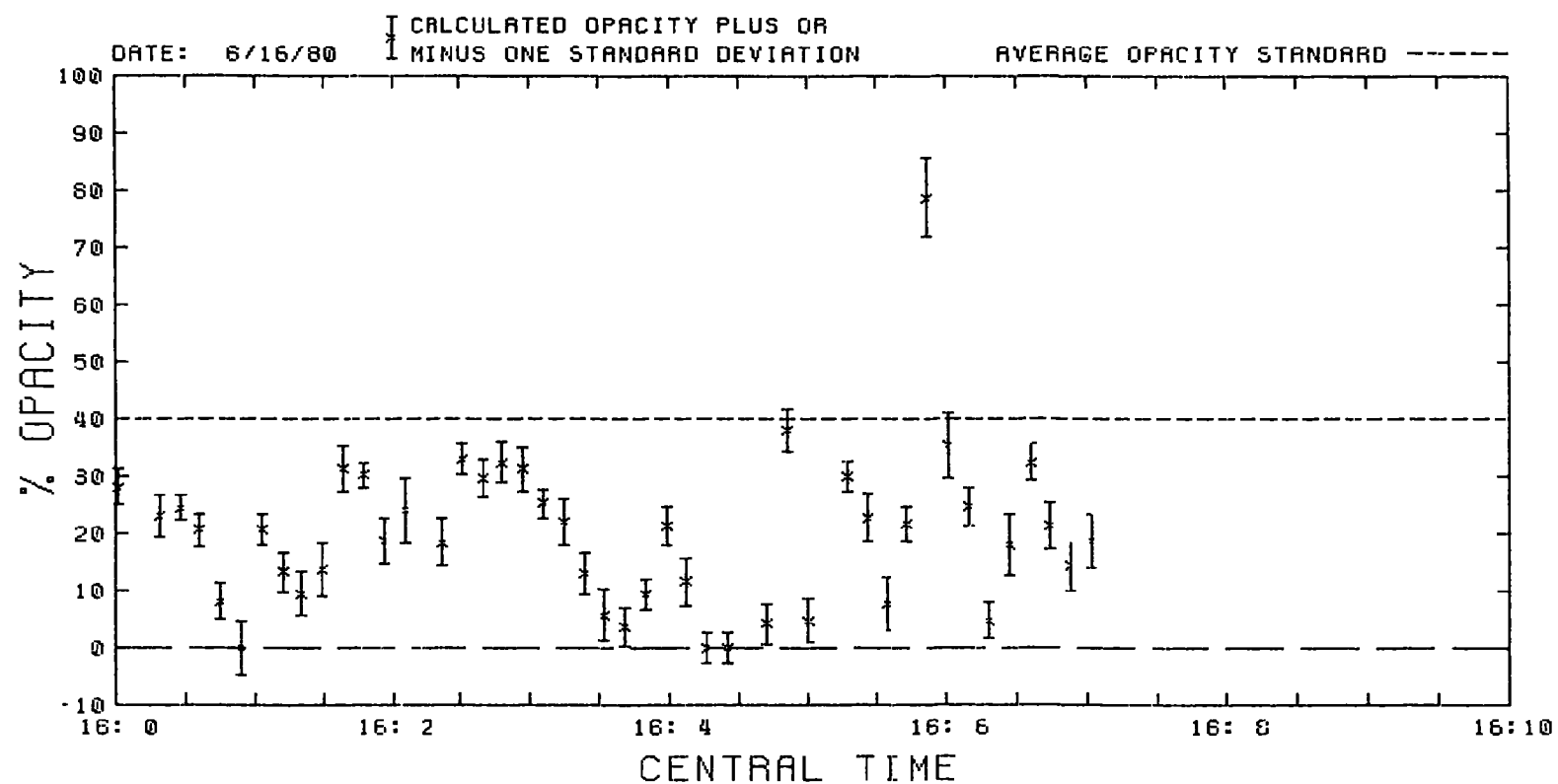
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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OMEGA-0069, STACK A, PSI GIBSON STATION, PRINCETON, INDIANA FROM WEST OF PLANT SIX MINUTE AVERAGES
DATE TIME OPACITY SO VIOLATION AVERAGE OPACITY AVERAGE SO VIOLATION NUMBER DISCARDED

6/16/80	16	0 19	23	4	23	4	0 OF	40
6/16/80	16	0 28	24	2	23	4	0 OF	40
6/16/80	16	0 36	21	3	23	4	0 OF	40
6/16/80	16	0 45	8	3	22	4	0 OF	40
6/16/80	16	0 54	0	5	21	4	0 OF	40
6/16/80	16	1 3	21	3	21	4	0 OF	40
6/16/80	16	1 12	13	4	21	4	0 OF	40
6/16/80	16	1 20	9	4	20	4	0 OF	40
6/16/80	16	1 29	14	5	20	4	0 OF	40
6/16/80	16	1 38	31	4	20	4	0 OF	40
6/16/80	16	1 47	30	2	20	4	0 OF	40
6/16/80	16	1 56	19	4	20	4	0 OF	40
6/16/80	16	2 5	24	6	20	4	0 OF	40
6/16/80	16	2 22	18	4	20	4	0 OF	39
6/16/80	16	2 31	33	3	20	4	0 OF	39
6/16/80	16	2 40	30	3	21	4	0 OF	39
6/16/80	16	2 48	32	4	21	4	0 OF	39
6/16/80	16	2 57	31	4	21	4	0 OF	39
6/16/80	16	3 6	25	2	21	4	0 OF	39
6/16/80	16	3 15	22	4	21	4	0 OF	39
6/16/80	16	3 24	13	4	21	4	0 OF	39
6/16/80	16	3 32	6	4	20	4	0 OF	39
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6/16/80	16	4 7	12	4	19	4	0 OF	40
6/16/80	16	4 16	0	3	19	4	0 OF	40
6/16/80	16	4 25	0	3	18	4	0 OF	40
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6/16/80	16	4 51	38	4	18	4	0 OF	39
6/16/80	16	5 0	5	4	17	4	0 OF	39
6/16/80	16	5 17	30	3	18	4	0 OF	38
6/16/80	16	5 26	23	4	18	4	0 OF	38
6/16/80	16	5 35	8	5	18	4	0 OF	38
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6/16/80	16	6 27	18	5	19	4	0 OF	39
6/16/80	16	6 36	32	3	20	4	0 OF	39
6/16/80	16	6 44	21	4	20	4	0 OF	39
6/16/80	16	6 53	14	4	20	4	0 OF	39
6/16/80	16	7 2	19	5	20	4	0 OF	39



STACK A. PSI GIBSON STATION, PRINCETON. INDIANA



STACK A. PSI GIBSON STATION, PRINCETON, INDIANA