

BYRON OBSERVATION
WELL MONITORING PROGRAM
ANNUAL REPORT
FOR 1983
BYRON STATION
COMMONWEALTH EDISON COMPANY

I. PURPOSE

The purpose of this report is to present the groundwater and precipitation data collected as part of the well monitoring program and to provide an interpretation of the groundwater conditions present in Area of Concern 11 along the Essential Service Water (ESW) make-up pipeline. The purpose of the monitoring program is to provide for the collection of data necessary to close the requirements for a License Condition of the U.S. Nuclear Regulatory Commission's Safety Evaluation Report.

II. SCOPE

The monitoring program consists of the collection of field data from four observation wells and precipitation from the Byron Station meteorological tower.

During the FSAR review by the NRC staff, Commonwealth Edison Company (CECo) agreed to establish a groundwater monitoring program at the request of the NRC. Four observation wells were installed between ESW pipeline Stations 45+20N and 53+00N (see Figure 1 for approximate locations).

III. OBSERVATION WELL CONSTRUCTION

The four observation wells can be divided into two categories. Wells OW-1 and OW-2 were installed to detect and measure the presence of perched groundwater occurring in the soils above the bedrock surface. Wells OW-3 and OW-4 were installed to measure the groundwater level occurring in the upper portion of the dolomite bedrock.

Construction details for the wells are shown in Figure 2 and 3. Exact locations, elevation of the top of the well casing, elevation of the well tip, and depth to the well tip are presented in Table 1.

IV. DATA COLLECTION AND RESULTS

The four observation wells were installed between March 17, 1982, and March 25, 1982. Monitoring of the water levels in the four wells began on April 12, 1982, and has continued on a weekly basis for the last 20 months.

The four observation wells were dry during all of 1982 and 1983. The precipitation data for 1982 indicates that the total rainfall at the Byron site was 29.81 inches or 5.31 inches less than the 1931-1960 mean yearly rainfall. The first 6 months of 1982 were 5.85 inches less than the mean for the first 6 months. The second half of 1982 was 0.54 inches greater than the second half of year mean for this area. The precipitation data for 1983 indicates that the total rainfall to date at the Byron site was 27.42 inches or 6.83 inches less than the prorated 1931-1960 mean yearly rainfall.

V. INTERPRETATION AND CONCLUSIONS

The data collected during both 1982 and 1983 indicates the groundwater level in Area of Concern 11 is less than 809 feet MSL. As the two soil observation wells have been dry, there is no indication of the presence of perched groundwater occurring above the bedrock surface in Area of Concern 11. It is the applicant's position that the piezometric surface map (see FSAR Figure 2.4-24) shows an abnormally high groundwater level due to an extremely high level of precipitation. Precipitation data for the Byron site is presented in Table 3. This table presents the 1931-1960 mean precipitation and 1973, 1974, 1981, 1982 and 1983 precipitation levels. The piezometric surface map was based on July 1, 1974, well readings. The data presented in Table 3 indicate that all of 1973 and the first six months of 1974 were periods of exceptionally high precipitation. In addition to the period of exceptionally high precipitation, it is also possible that a certain amount of induced recharge was taking place from the grouting program being performed for the foundation of the main plant. Continuous grouting was taking place from May through November 1974. Large amounts of water was used in this operation with an unlined settling pond being located near the highest point of recharge shown on the July 1, 1974, piezometric surface map. This set of conditions caused an abnormally high groundwater level. An examination of water level data from 1974 indicates that the 1974 levels were an average of 14.3 feet, 11.3 feet, and 30.6 feet higher than the 1972, 1973 and 1975 levels, respectively. An examination of the piezometric surface map for the Galena-Platteville aquifer indicates that on July 1, 1974, the groundwater level in Area of Concern 11 was between 825 and 835 feet MSL. The bedrock surface in Area of Concern 11 is above elevation 832.8 feet MSL. Therefore, it is highly unlikely that the groundwater level will ever be high enough to saturate the soil above the bedrock surface.

The NRC Safety Evaluation Report (NUREG-0876, February 1982) required that the monitoring program consider the maximum rate of groundwater rise in the site vicinity so that the level at which notification given to the NRC would allow enough time to develop and implement contingency plans before groundwater elevation 850 feet MSL is exceeded in Area of Concern 11. The data base that has been developed from onsite groundwater measurements indicates that there is no zone of perched groundwater in the soil in Area of Concern 11 and that it is highly unlikely the groundwater level would ever reach elevation 850

feet MSL. Therefore, based upon lack of measured groundwater response the license condition should be closed and deleted from the NRC Safety Evaluation Report.

Table 1
BYRON OBSERVATION WELL DATA

Well	Location	El. of Top of PVC Casing (MSL)	Depth to Bottom of Well From Top of PVC Casing (Ft)	El. Well Tip (MSL)
OW-1	49+20N 32+91.75E	870.65	31.58	839.07
OW-2B	48+26N 32+91.25E	870.67	22.74	847.93
OW-3	49+25N 32+92.5E	870.42	61.15	809.27
OW-4	47+35N 32+91.25E	870.03	60.93	809.10

Table 2
SCHEDULE FOR DATA COLLECTION

Activity	Year 1 and 2				After 2 Years (If necessary)
	<u>Spring</u>	<u>Summer</u>	<u>Fall</u>	<u>Winter</u>	
Observation Well Readings (OW-1, 2, 3, & 4)	Weekly	Weekly	Bi-weekly	Monthly	Monthly
Collection of Daily Precipitation Records	Monthly				

Note: If the groundwater elevation rises above elevation 840 feet (MSL), regardless of season, monitoring of the wells shall be on a daily basis until such time that the water level falls below 840 feet (MSL). At such time, the normal monitoring frequency may be resumed.

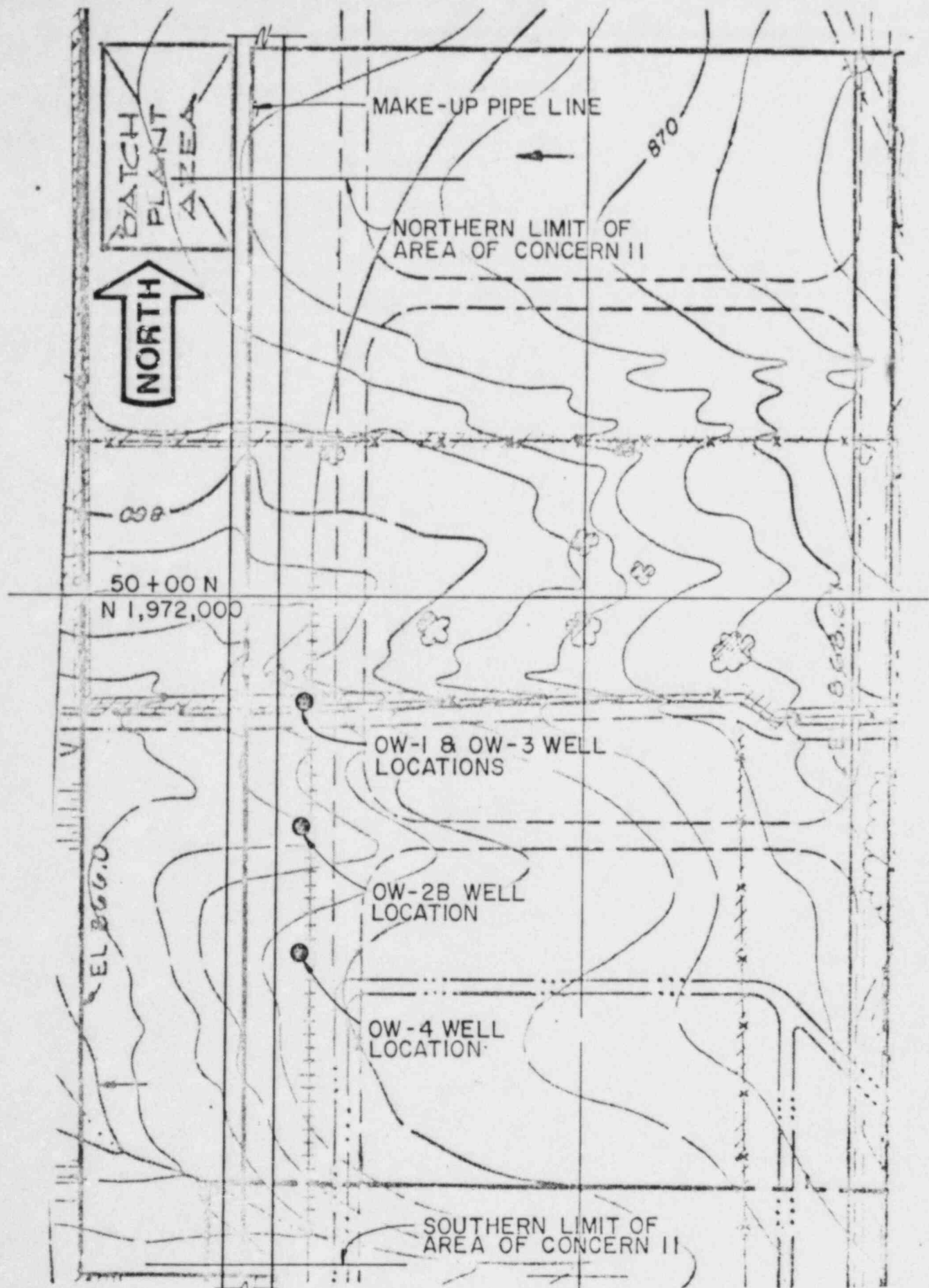
Table 3

INCHES OF PRECIPITATION AT THE BYRON STATION

Month	1931-1960 Mean	1973	1974	1981	1982	1983
Jan	1.98	1.67	3.55	0.22	1.58	0.32
Feb.	1.44	1.56	1.65	2.40	0.20	1.56
March	2.46	4.53	2.03	0.65	3.63	1.81
April	3.05	9.92	3.41	5.21	1.27 ¹	3.62
May	3.83	6.98	6.98	1.84	2.68	4.62
June	4.30	5.16	6.30	5.88	1.85	3.00
6-mth subtotal	17.06	29.82	23.92	16.20	11.21	14.93
Change from mean		+12.76	+6.86	-0.86	-5.85	-2.13
July	4.14	5.81	1.48	1.14	5.43	2.11
Aug.	4.14	1.89	2.21	9.18	1.24	2.33
Sep.	3.51	8.52	0.35	3.51	0.76	3.31
Oct.	2.70	5.15	2.41	2.47	4.07	1.35
Nov.	2.37	1.97	2.31	1.63	3.81	3.39
Dec.	1.70	3.32	1.63	0.77	3.29	
6-mth subtotal	18.06	26.66	10.39	18.70	18.60	
Yearly Total	35.12	56.48	34.31	34.90	29.81	
Change from mean		+21.36	-0.81	-0.22	-5.31	

Notes:

1. Precipitation data for April through December 1982 are from an on site recorder at the Byron Station. Data prior to April 1982 are from the Rockford Airport.



NOTES

1. BASE MAP FROM SARGENT & LUNDY DRAWING S-144-BY.
2. SCALE: 1" = 100'

FIGURE 1
LOCATIONS OF
OBSERVATION WELLS

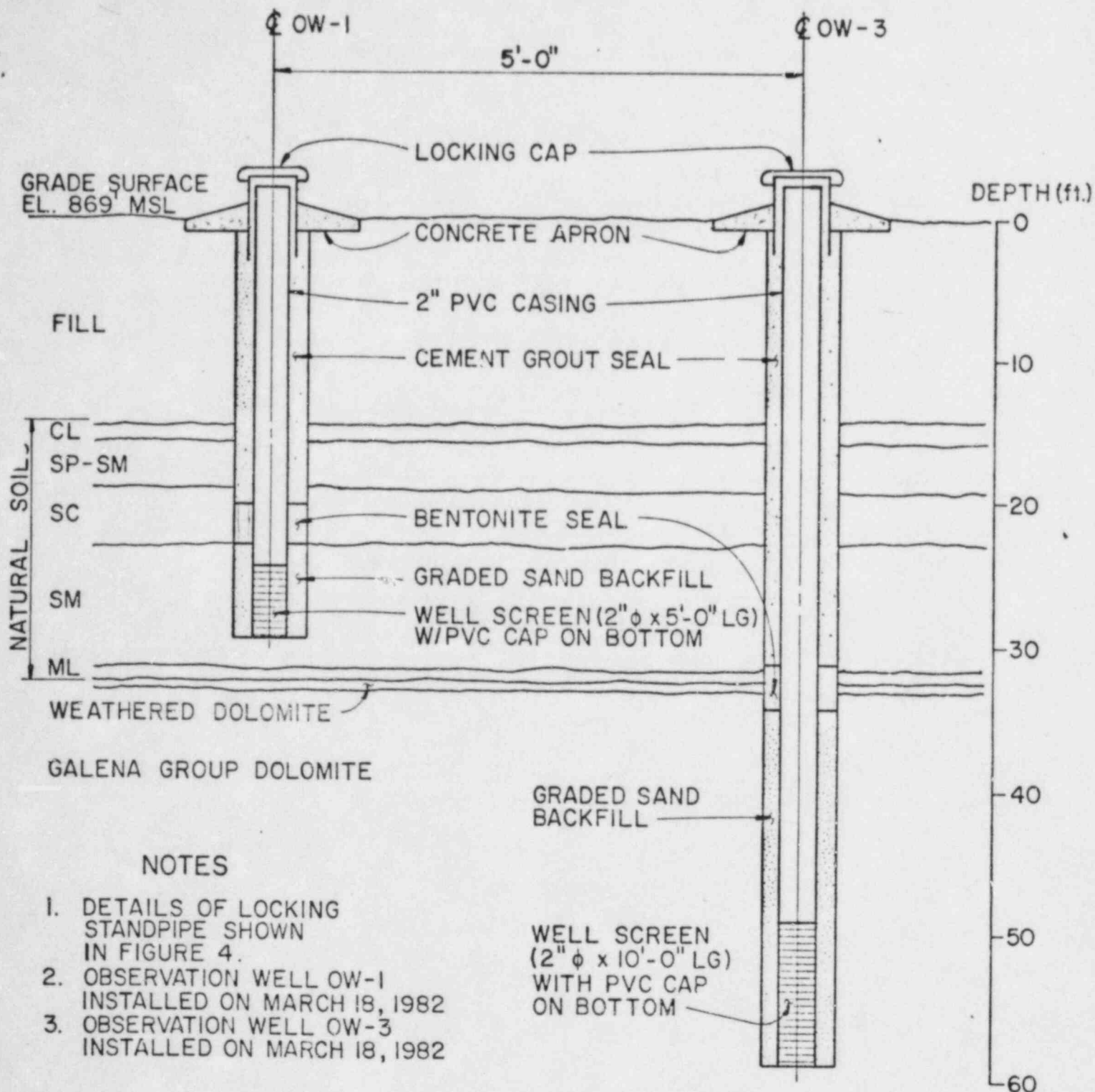
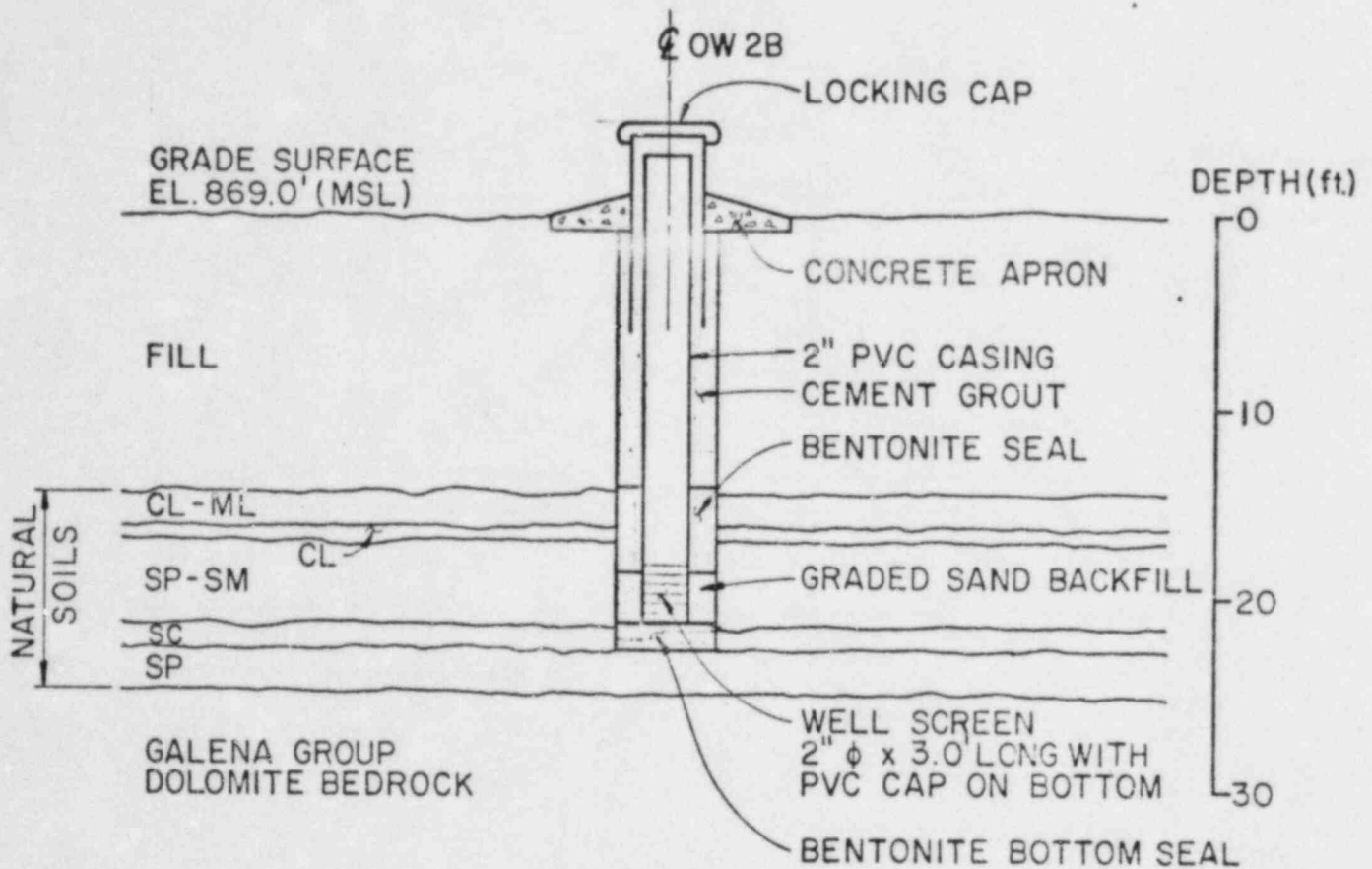


FIGURE 2

CONSTRUCTION DETAILS
FOR WELLS OW-1 & OW-3



NOTES

1. DETAILS OF LOCKING STANDPIPE SHOWN IN FIGURE 4.
2. GEOLOGY FROM BORING OW-2A PERFORMED 4' SOUTH ON MARCH 23, 1982.
3. OBSERVATION WELL INSTALLED ON MARCH 23, 1982

FIGURE 3A

CONSTRUCTION DETAILS
FOR WELL OW-2B

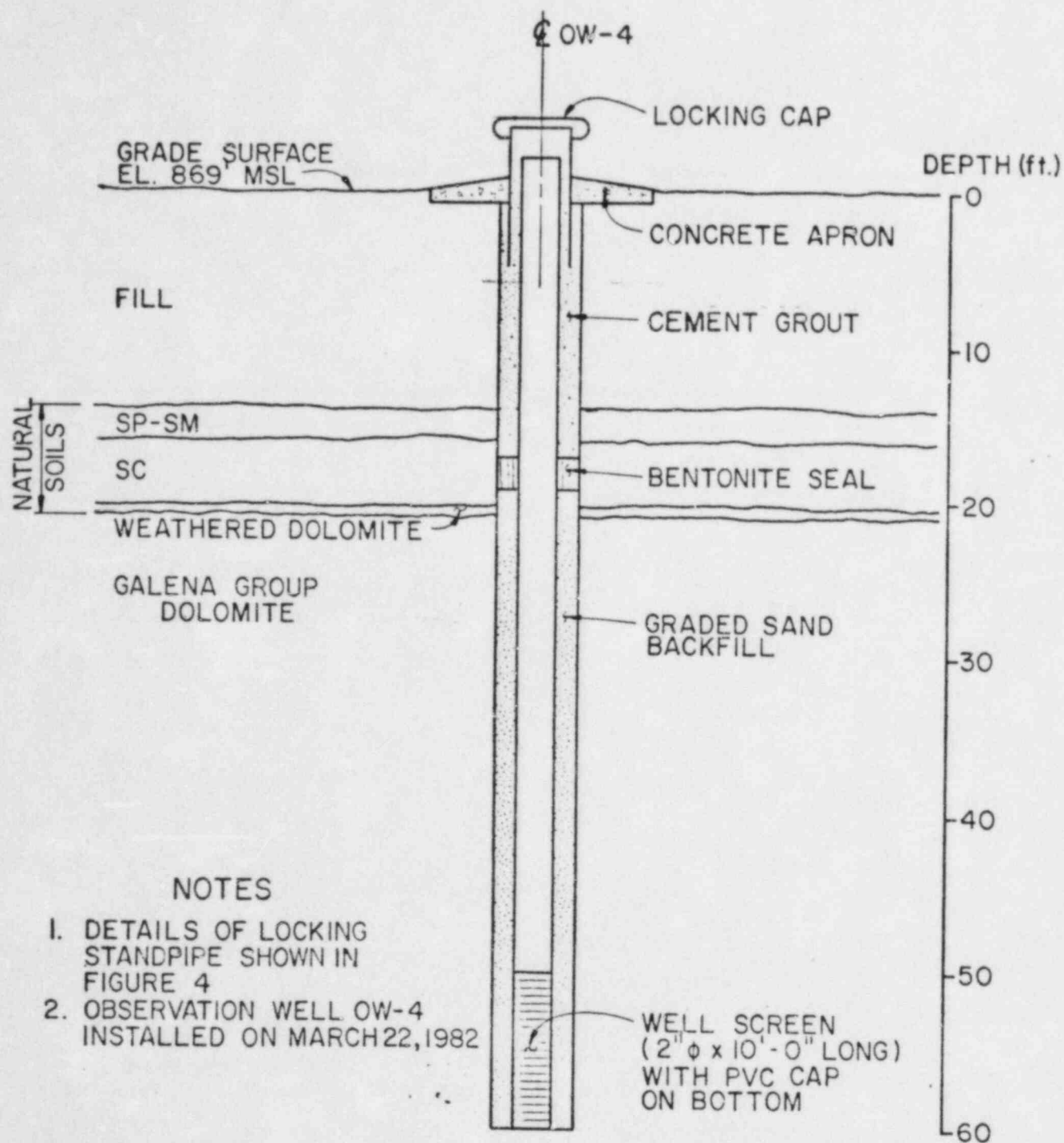


FIGURE 3B

CONSTRUCTION DETAILS
FOR WELL OW-4