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SUBJECT: Forwards "Rept on Exploration/Demobilization of Wells 4 & 5"
 by Woodward Clyde & "Rept on Deep Exploration Drilling
 Program, Dewatering Well 7" & "Rept on Exploration/Grouting
 Program, Dewatering Well 7" (2 vols), by Bechtel.

(see Encls rpts)
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	20 I & C SYS BR	1	1	21 POWER SYS BR	1	1	
	22 AD SITE TECH	1	0	26 ACCDNT ANLYS	1	1	
	27 EFFL TRT SYS	1	1	28 RAD ASMT BR	1	1	
	29 KIRKWOOD	1	1	AD FOR ENG	1	0	
	AD PLANT SYS	1	0	AD REAC SAFETY	1	0	
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REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

7907260666

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 RECIP. NAME RECIPIENT AFFILIATION
 BAER, R. Light Water Reactors Branch 2

SUBJECT: Forwards "Rept on Exploration/Grouting Program Dewatering
 Well Number 7," Vol 1-2 & "Rept of

Exploration/Demobilization of Wells 4 & 5," w/errata sheets. *Enwire*

+ "Rpt on Deep Exploration Drilling Program, Dewatering Well #7" (see reports)
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INTERNAL:	01 REG FILE	1	1	02 NRC PDR	1	1	
	06 I & E	2	2	08 OPERA LIC BR	1	1	
	09 GEOSCIEN BR	1	1	10 GAB	1	1	
	11 MECH ENG BR	1	1	12 STRUC ENG BR	1	1	
	13 MATL ENG BR	2	2	15 REAC SYS BR	1	1	
	16 ANALYSIS BR	1	1	17 CORE PERF BR	1	1	
	18 AUX SYS BR	1	1	19 CONTAIN SYS	1	1	
	20 I & C SYS BR	1	1	21 POWER SYS BR	1	1	
	22 AD SITE TECH	4	4	26 ACCDNT ANALYS	1	1	
	27 EFFL TRT SYS	1	1	28 RAD ASMT BR	1	1	
	29 KIRKWOOD	1	1	AD FOR ENG	1	0	
	AD PLANT SYS	1	0	AD REAC SAFETY	1	0	
	AD SITE ANALYSIS	1	0	DIRECTOR NRR	1	0	
	MPA	1	0	DELD	1	0	
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		30 ACRS	10	10			

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JUL 17 1979

Southern California Edison Company



P. O. BOX 800
2244 WALNUT GROVE AVENUE
ROSEMEAD, CALIFORNIA 91770

K. P. BASKIN
MANAGER, GENERATION ENGINEERING

TELEPHONE
213-572-1401

July 11, 1979

Director, Office of Nuclear Reactor Regulation
Attention: Mr. Robert Baer, Chief
LWR Branch 2, DPM
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

REGULATORY DOCKET FILE COPY

Gentlemen:

Subject: Docket Nos. 50-361 and 50-362
San Onofre Nuclear Generating Station
Units 2 and 3

As part of Southern California Edison's (SCE) commitment to keep the NRC staff informed of work performed in demobilizing the dewatering well system, fifty (50) copies of three (3) reports on work performed on Dewatering Wells 4, 5 and 7 are provided for your use. These reports document the final disposition of the subject wells. Also enclosed are fifty (50) copies of errata sheets for previously submitted reports on Dewatering Wells No. 6 and 8.

The first report, "Report on the Exploration/Demobilization of Wells 4 and 5," describes in detail the exploration of the area around Wells 4 and 5 using both drilling and crosshole seismic techniques. The result of this exploration was the discovery of a small, near surface cavity at Well No. 5. This cavity was subsequently stabilized by pressure grouting. No cavities existed at greater depths at Well No. 5 or at any depth around Well No. 4.

The second report, "Report on Deep Exploration Drilling Program, Dewatering Well No. 7," provides detailed information on the exploration at depth in the area around Well No. 7. The well was explored to its full 200 foot depth with the result that no disturbed material or cavities were detected below a depth of 120 feet (Elevation - 90).

The third report, in two (2) volumes is titled, "Report on Exploration/Grouting Program, Dewatering Well No. 7." This report provides detailed information on the exploration of the upper portions of Dewatering Well No. 7. This exploration, in conjunction with the deep exploration drilling data, defined the size and location of a near surface cavity. The program also included the filling and stabilizing of the cavity by both tremie and pressure grouting.

The errata sheet corrects or clarifies information presented in the final disposition reports on Wells No. 6 and 8.

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Mr. Robert Baer, Chief

-2-

July 11, 1979

The submittal of these reports completes the presentation of detailed information on the demobilization of the dewatering well system. However, it is SCE's intention to present a summary report, putting together under a single cover, a history of the system operation, exploration, and demobilization work. Completion and presentation of this summary report is scheduled for late July, 1979.

If you have any questions on information provided in these reports, please contact me.

Sincerely,

KP Bushin

cc: R. H. Engeken (NRC, Director I&E - Region V)

ERRATA FOR REPORT ON
DEEP EXPLORATION DRILLING PROGRAM DEWATERING WELL NO. 6
FEBRUARY 1979

The following have been identified as errors or omissions or are clarifications in the Report on Deep Exploration Drilling Program, Dewatering Well No. 6.

TABLE 2

Table of Grout Quantities, delete "(2)" from 6B-19.

FIGURE 6

This figure, Isometric of Drill Holes at Well, has been revised to show the ground surface location of Drill Hole 6B-17 which was inadvertently omitted from the drawing. For reference, the location is along S21+00 at its intersection with Drill Hole 6B-5A. In this representation, 6B-5A is immediately behind 6B-17 at the S21+00 grid line.

APPENDIX A - Geologic Drill Logs

Hole 6B-2

Sheet 3 of 3. Last paragraph, Description column, line 3 should read "...AW rods, 1:1 water:cement ratio mix plus 0.94 lbs..."

Hole 6B-4

Sheet 1 of 3. At 20 feet in the Drilling Notes column, a note should be added indicating the end of swing shift at 20 feet and the beginning of the day shift on 6/2/78.

Sheet 2 of 3. Clarification is herein provided regarding the nature of the disturbed sand zone between 110 feet and 128 feet. The AW rods settled under their own weight from 110 to 128 feet, and following the SPT, the NC rods went to 115 feet before stopping. Exploration/Grouting Hole M21A was drilled within 2 feet of 6B-4 and for the interval in question, 110 to 128 feet, undisturbed San Mateo Formation was encountered. Deep Exploration Drill Hole 6B-17 is also within 2 feet of 6B-4 in the interval in question and it too encountered only undisturbed San Mateo Formation. In addition, surrounding holes 6B-9, 6B-18 and 6B-21 indicate undisturbed San Mateo Formation from 110 feet to 130 feet. A note in the Drilling column of 6B-4 at 120 feet states that drilling fluid showed good return with little loss. One possible explanation for the change in density in this interval is intersection with Hole 6-4, drilled previously.

Sheet 3 of 3. In the Description column below "Bottom of Hole: 200'" and "Elevation: -170'," a note should be added as follows: "Ran Eastman gyroscopic survey of hole."

Hole 6B-5A

Sheet 3 of 3. In the Description column below "Bottom of Hole: 200'" and "Elevation -170'," a note should be added as follows: "Ran Eastman gyroscopic survey of hole."

Hole 6B-8A

Sheet 1 of 3. Notes column, beginning at eighth line, comment now reads "Hole advanced with tremie rock bit to 20'." It should read "Hole advanced with tricone rock bit to 20'."

Hole 6B-10A

Sheet 2 of 3. In the sample descriptions from 70 feet to 130 feet, the word wet is contained in the description. The samples are all saturated below about 25 feet in depth (Depth of Water Table), therefore the term wet is redundant. The Bechtel geologist logging this hole was new to the SONGS jobsite and was not familiar with the water table elevation at the time of drilling, thus the reference to wet in the description for the sake of completeness.

Hole 6B-18

Sheet 1 of 3. The completion date should be changed from 2/24/78 to 7/24/78.

Sheet 2 of 3. The site reference - Unit 2, Well 6 and the Hole No. - 6B-18 were inadvertently left off of the boxes at the bottom of the page.

Hole 6B-20

Sheet 1 of 3. Re lost circulation at 55': log states that 6B-20 wandered into old hole (possibly 6-5 or 6A-19), and that circulation loss was for a few minutes only. Graphic log does not reflect this since blow counts at 50 and 60 feet indicate very dense San Mateo Formation for this interval. Description column, last paragraph, Line 8 now reads "...by Gallerani using 1:1 cement..." It should read "...by Gallerani using 2:1 to 1:1 cement..."

Hole 6B-21

Sheet 3 of 3. Description column, last paragraph, Line 8 now reads "...10/13/78 using 1:1 grout:water..." It should read "...10/13/78 using 2:1 grout:water..."

Hole 6B-22

Sheet 1 of 3. A note should be added in the Drilling Notes column as follows: "No samples were obtained in the upper 50 feet due to the

influence of grout lenses on the SPT sampling." The present of the cavity in this area had already been defined by adjacent holes; the main purpose of this hole was to determine conditions at depths below 100 feet.

APPENDIX C

Hole 6B-18

The grouting log in some copies of the report is illegible and has been reprinted.

ERRATA FOR REPORT ON
EXPLORATION/GROUTING PROGRAM DEWATERING WELL NO. 6
FEBRUARY 1979

The following have been identified as errors or omissions or are clarifications in the Report on Exploration/Grouting Program, Dewatering Well No. 6.

Page 1, Section 2.0

Background, Line 7 now reads "A video scan of the 14-inch casing was also made. A total of 34 auger holes..." It should read "A video scan of 14-inch casing was also made. A total of 35 auger holes..."

Page 2, Section 2.0

Background, Line 2 now reads "...G-3) was placed by tremie method in nine auger holes to fill the open portion..." It should read "...G-3) was placed by tremie method in nine of the 35 auger holes to fill the open portion..."

Page 3, Section 5.0

Drilling and Grouting, Line 3 now reads "Stage 2 holes were drilled after most Stage 1 holes were completed." It should read "After completion of all Stage 1 holes in an area, Stage 2 holes were then drilled in that same area."

Page 5, Section 5.2

Sampling, Lines 3 and 4 now read "...at 5-foot intervals in all Stage 1 holes." It should read "..., generally at 5-foot intervals in all Stage 1 and 3 holes." Delete sentence, Line 4, beginning "In Stage 3 holes, sampling was done..."

Page 5, Section 5.2

Sampling, last sentence in section now reads "The histograms show an increase ..." It should read "The histograms suggest a trend toward an increase..."

Page 6, Section 5.3

Grouting Methods and Materials, last line of paragraph 4 now reads "(see Figure 6)." It should read "(see Figure 5)."

APPENDIX B

Graphic Logs, Stage 1

Sheet 8 of 11, Hole Lm24 shows high blow counts (30/6"-50/6") in disturbed material at 135 feet. Reason for high blow counts is that

sampler was being driven through well gravels, causing greater resistance to advancement than would normally be expected.

Graphic Logs, Stage 2

Sheet 2 of 4, Hole G32 was not sampled below 75 feet since previous drilling at F30 and H30 showed all native San Mateo in that area.

ERRATA FOR REPORT ON
DEEP EXPLORATION DRILLING PROGRAM DEWATERING WELL NO. 8
AUGUST 1978

The following have been identified as errors or omissions or are clarifications in the Report on Deep Exploration Drilling Program, Dewatering Well No. 8.

Page 8, Section 7.2

Cavity Description, Line 2 now reads "...feet in 8B-6 and to 110 feet in Hole 8B-7." It should read "...feet in 8B-19 and to 115 feet in Hole 8B-7."

FIGURE 1

In some copies of the report this figure (Location Map) was transposed with the Location Map for the companion report "Report on Shallow Exploration/Grouting Program, Dewatering Well No. 8, August 1978."

FIGURE 2

In some copies of the report this figure (Original Plan of Drill Holes) was transposed with Figure 2 - Preliminary Plan of Drill Holes for the companion report "Report on Shallow Exploration/Grouting Program, Dewatering Well No. 8, August 1978."

FIGURE 4

There is a reference on the figure to Exploratory holes 8A-1 through 8A-27 and 8A-8Y, 8AA-8DD and 8RR-8ZZ which were drilled prior to the initiation of the Deep Exploration Drilling Program. Stick Logs of these holes will be included in the summary report.

FIGURE 6

In some copies of the report this figure (Distribution of SPT Results) was transposed with Figure 6 - Generalized Exploration/Grout Hole for the companion report "Report on Shallow Exploration/Grouting Program, Dewatering Well No. 8, August 1978."

APPENDIX A, Geologic Drill Logs

Introductory Sheet

Line 2 now reads "...through 8B-17 prepared for the Deep Exploration Drilling Program." It should read "...through 8B-19 prepared for the Deep Exploration Drilling Program."

Hole 8B-2

Sheet 1 of 2. Note referenced in the Rock and Total Depth boxes of heading appears in the Description column at 29 feet, after "29.0-150' SAND, loose" and begins "hole advanced by washing only..."

Hole 8B-3

Sheet 3 of 3. Paragraph below "Bottom of Hole" in Description column, Line 3 reads "...cement, 1:1 by volume and..." It should read "...cement. Water/cement ratio 1:1 by volume with..."

Hole 8B-5

Sheet 3 of 3. Paragraph below "Bottom of Hole" in Description column, Line 3 reads "...with 94 lbs. of Intraplast..." It should read "...0.94 lbs..."

Hole 8B-6

Sheet 2 of 3. Description at 120 feet should read "Slightly coarser grained."

Hole 8B-7

Sheet 1 of 3. Add Unit 3 Well 8 to the Site box at the bottom of the page and 8B-7 to the Hole No. box at bottom of page.

Sheet 2 of 3. Description of hole at 90 feet should read "90' hole caved back to 75'."

Sheet 3 of 3. Last paragraph in Description column, Line 1 should read "Water/cement ratio 1:1." Line 3 should read "...Intraplast additive per sack of cement."

Hole 8B-8

Sheet 1 of 3. At 25 feet; core taken from 25-30 feet with 3.4 feet of recovery (68%). Core recovery box in heading should read "3.4'/68%," 5 feet of core run should be shown in Sample column, and the Sampler Type and Advance columns, etc. should read "NC, 5', 3.4', 68%." Delete sentence in Drilling Notes column at 20 feet which reads "No core recovery until 25.0'." (No core was taken until 25'.)

Hole 8B-9

Sheet 3 of 3. First paragraph below "Bottom of Hole" line, first sentence should read "Conducted Eastman gyroscopic..." Second paragraph, second line should read "...specification by tremie method. Water:cement..."

Hole 8B-10

Sheet 1 of 3. Should read "Logged by D. A. Cordell/P. Yen." The description from 1.0-180.0' should read "San Mateo Formation Fine-to coarse-grained clean quartzose sand, predominantly tan to white, occasional silty zones, weakly cemented.

Sheet 2 of 3. Description at 70 feet should read "Siltstone fragment in SPT sample."

Sheet 3 of 3. Last paragraph, Description column, last line should read "...Intraplast additive per sack of cement."

Hole 8B-11

Sheet 2 of 3. Description at 80 feet should read "Continues fine-grained, silty sand..." Comment in Drilling Notes column at 130', "About 3' of sand in hole" should appear immediately below shift change line at 140', and is followed by "Cleaned and took sample."

Hole 8B-12

Sheet 1 of 3. Description at 40-foot depth should read "Tan, fine-medium, scattered coarse, sand; angular to subangular, quartzitic, with mica grains.

Sheet 3 of 3. Last paragraph, Description column, fourth line should read "...plus 0.94 lbs. Intraplast..."

Hole 8B-13

Sheet 1 of 3. Should read "Logged by D. Cordell." The description at 10-foot depth should read "Poorly to moderately compacted, tan, slightly silty, fine- to medium-grained, glossy quartz, subrounded to angular, limonite stained sand." The description at 50-foot depth should read "Tan, fine-medium sand; some coarse; angular to subangular quartzitic."

Hole 8B-14

Sheet 3 of 3. A note should be added to the Drilling Notes column that reads "Due to hole caving, difficulty in sampling, poor circulation and danger of losing drilling tools, hole not advanced below 180 feet."

Drill hole in well as indicated by gravel in cuttings from 140 feet.

Hole 8B-16

Sheet 1 of 3. In heading, Overburden should read "3" feet and Rock should read "177" feet. Description at 40 feet should be included in the Sand and Grout interval (40-65'), and should appear immediately after the general description at 40 feet.

Sheet 3 of 3. Description column, following Elev. -172.5', add comment "Conducted Eastman Whipstock gyroscopic survey of hole." Also, add Unit 3 Well 8 to the Site box at the bottom of the page and 8B-16 to the Hole No. box at the bottom of the page.

Hole 8B-17

Sheet 3 of 3. The sample at 150 feet should indicate sampler advance of 6 inches in the Sampler Advance column. The sample at 180 feet should indicate 6 inches of recovery in the Sample Recovery column. Last paragraph, Description column, third line should read "...using 1:1 mix, water:cement ratio, with 0.94 lbs..."

Hole 8B-18

Sheet 1 of 3. Heading - Rock box should read "179" feet and Total Depth should read "180" feet.

Hole 8B-19

Sheet 1 of 3. Heading - Overburden should read "0" feet, Rock should read "180" feet, and Depth/El Top of Rock should read "0'/7.5'."

Sheet 2 of 3. Sampler advance at 90 feet now reads "4" inches. It should read "10" inches. Description at 130' now reads "Medium coarse sandstone with grout seepage and 3" Revert (black) staining present. Medium dense." It should read "Medium coarse sandstone with gray staining and 3" Revert (black) staining present. Medium dense." Description at 140' now reads "Lt. tan qtzose sand with much grout and grey Revert staining." It should read "Light tan quartzose sandstone with much lenticular gray silt and gray Revert staining."

Sheet 3 of 3. The sample at 180 feet should indicate 0 inches of recovery in the Sample Recovery column.

ERRATA FOR REPORT ON
SHALLOW EXPLORATION/GROUT PROGRAM DEWATERING WELL NO. 8
AUGUST 1978

The following have been identified as errors or omissions or are clarifications in the Report on Shallow Exploration/Grouting Program, Dewatering Well No. 8. August 1978.

Page 2, Section 2.0

Background, Line 1 now reads "Sixty-seven holes were drilled..." It should read "Sixty-five holes were drilled..."

Page 10, Section 9.0

Summary of Foundation Conditions, Line 2 now reads "...amount of disturbed sand is less than 208 cubic yards." It should read "...amount of disturbed sand is less than 208 cubic yards.*" The asterisk is added to refer to a note to be added to the bottom of the page as follows:

"*Note: To maintain consistency, the quantity of disturbed sand remaining in the cavity area (208 cubic yards) was determined by adding the total grout placed in the exploration/grouting program (19 cubic yards) with the amount of Lyman and G-3 grout placed as calculated from planimeter measurement of the isopach map (204 cubic yards) and subtracting this value (223 cubic yards) from the total volume of the cavity as determined from planimeter measurements of the contour map of the top of San Mateo Formation (431 cubic yards)."

FIGURE 1

In some copies of the report this figure (Location Map) was transposed with the Location Map for the companion report "Report on Deep Exploration Drilling Program, Dewatering Well No. 8, August 1978."

FIGURE 2

In some copies of the report this figure (Preliminary Plan of Drill Holes) was transposed with Figure 2 - Original Plan of Drill Holes for the companion report "Report on Deep Exploration Drilling Program, Dewatering Well No. 8, August 1978."

FIGURE 6

In some copies of the report this figure (Generalized Exploration/Grout Hole) was transposed with Figure 6 - Distribution of SPT results for the companion report "Report on Shallow Exploration/Grouting Program."

FIGURE 8

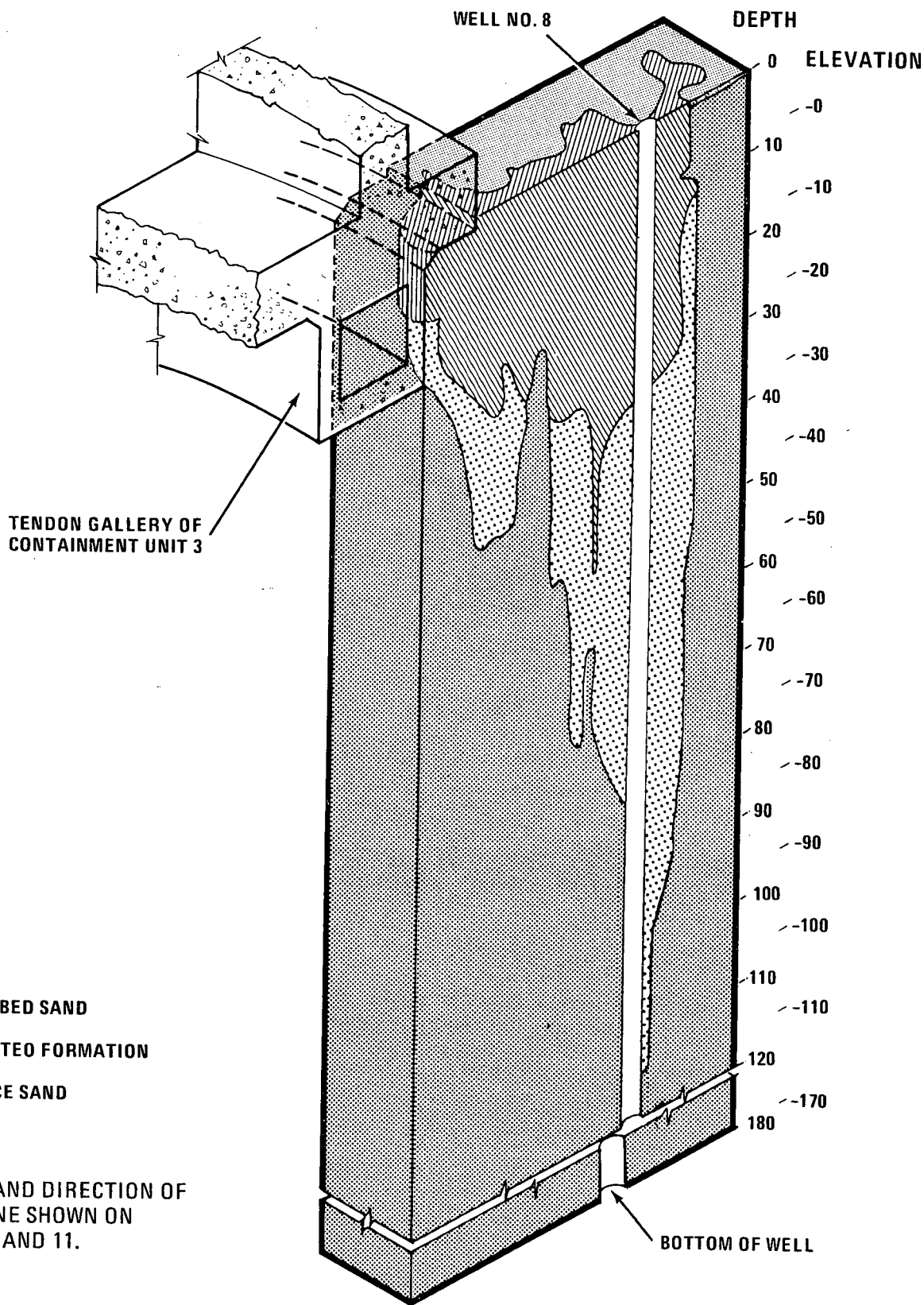
This figure, Isometric Drawing of Cavity, has been revised to show the lower extent of disturbed sand at a depth of 115 feet (Elevation -85 feet).

FIGURE 10

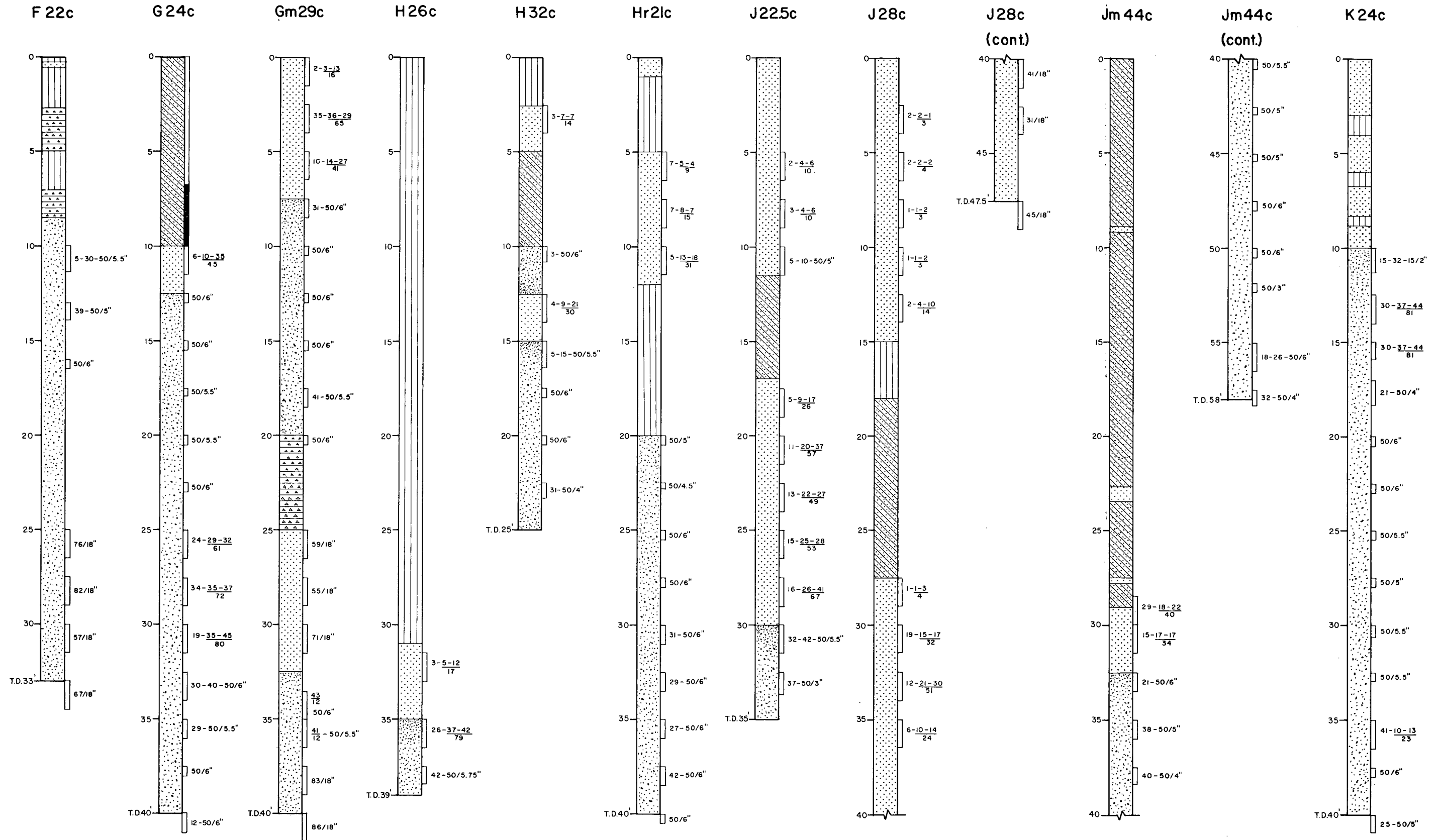
Section A-A' has been revised to indicate a SPT of 45/3" in hole G20.1 at 46 feet, and a total depth of 55.8 feet (from 55.9 feet). Section C-C' of the cross sections has been revised to reflect the maximum depth of disturbed material in 8B-19 and 115 feet in depth (Elevation -85 feet).

APPENDIX B

Sheet 11 of 12 Graphic Logs. The graphic log of drill hole G24c has been revised to show the blow counts of the Standard Penetration Test at 40 feet. The blow counts should read "12-50/6" for a 12-inch penetration.



BECHTEL POWER CORPORATION ENGINEERS & CONSTRUCTORS LOS ANGELES, CALIF.			J.O. NO.	SAN ONOFRE NUCLEAR GENERATING STATION
FIGURE 8				ISOMETRIC DRAWING OF CAVITY
JOB NO. 10079-003	DATE AUG. 1978	APPROVED <i>A. Arnold</i>		SOUTHERN CALIFORNIA EDISON COMPANY SCALE N.T.S. LOS ANGELES, CALIF.



For explanation of symbols and notes, see sheet No. 1

UNITS 2 & 3

BECHTEL CORPORATION		
ENGINEERS & CONSTRUCTORS		
LOS ANGELES, CALIF.		
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10079-003	AUG. 1978	<i>A. G. G. G.</i>

J.O. NO.	SAN ONOFRE NUCLEAR GENERATING STATION
FILE	SHALLOW EXPLORATION
SHEET No. 11	GROUTING PROGRAM - WELL No. 8
OF 12	APPENDIX B
	GRAPHIC LOGS
	SOUTHERN CALIFORNIA Edison COMPANY
	SCALE N.T.S. LOS ANGELES, CALIF.