

**GROUNDWATER RESOURCES CONSULTANTS, INC.**

CONSULTING HYDROGEOLOGISTS • ENVIRONMENTAL SPECIALISTS

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ALAN S. CUDDY, P.G.

**RESULTS OF ENHANCED DEWATERING  
BUILDING 059  
BOEING NORTH AMERICAN, INC.  
ROCKETDYNE PROPULSION & POWER  
VENTURA COUNTY, CALIFORNIA**

**SEPTEMBER 10, 1999**

**8640M-409**

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• WATER SUPPLY DEVELOPMENT • GROUNDWATER CONTAMINATION INVESTIGATIONS •

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September 10, 1999

Mr. Satish Shah  
Boeing North American, Inc.  
Rocketdyne Propulsion & Power - ETEC  
6633 Canoga Avenue, D/022 MS/T-038  
Canoga Park, California 91303

RE: *Results of Enhanced Dewatering at Building 059, Area IV*

Dear Mr. Shah:

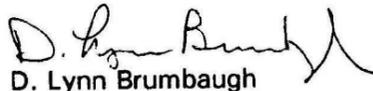
This report has been prepared to summarize results of enhanced dewatering at Building 059. Work outlined in this report concerns the implementation of additional dewatering wells in an attempt to further lower groundwater levels beneath the building, to allow for excavation of basement foundations and reclamation activities. GWRC proposed retrofitting nearby existing monitor wells RD-25 and RD-28, which commenced pumping on July 7, 1999.

This report concludes the latter of two tasks currently authorized for enhanced dewatering of Building 059. The first task involved draining the B/056 pit located adjacent to Building 059, which was completed in May 1999. Results of the B/056 pit draining were previously presented in our report number 8640M-408 dated July 23, 1999.

Please contact us if you have any questions or wish further discussion of this report.

Respectfully submitted,

GROUNDWATER RESOURCES CONSULTANTS, INC.

  
D. Lynn Brumbaugh  
Project Environmental Engineer/Hydrologist

  
Chuck M. Dickens  
Principal Hydrogeologist  
California Registered Geologist No. 3647

8640M-408 GWRC

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• WATER SUPPLY DEVELOPMENT • GROUNDWATER CONTAMINATION INVESTIGATIONS •

HDMS00143328

**RESULTS OF ENHANCED DEWATERING  
BUILDING 059  
BOEING NORTH AMERICAN, INC.  
ROCKETDYNE PROPULSION & POWER  
VENTURA COUNTY, CALIFORNIA**

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**RESULTS OF ENHANCED DEWATERING  
BUILDING 059  
BOEING NORTH AMERICAN, INC.  
ROCKETDYNE PROPULSION & POWER  
VENTURA COUNTY, CALIFORNIA**

**EXECUTIVE SUMMARY**

This report summarizes dewatering activities in the vicinity of Building 059 in Area IV of the Santa Susana Field Laboratory. Historically, groundwater seepage into the lower basement of the building was managed through use of the French-drain dewatering system (S-2 Sump). Current dewatering efforts have been conducted to further lower groundwater levels beneath the building to allow for excavation of the basement foundations and reclamation activities by utilizing monitor wells RD-25 and RD-28 as pumping-dewatering wells, which are located adjacent to the building.

This report concludes the latter of two tasks authorized for enhanced dewatering of Building 059. A preliminary task involved draining the B/056 pit, located about 250 feet west of the building. Draining of the pit was completed in May 1999 to eliminate potential recharge from the pit to the groundwater system in the vicinity of Building 059. Results of draining the pit B/056 were previously presented in Groundwater Resources Consultants, Inc. (GWRC) report number 8640M-408, dated July 23, 1999.

Based on data compiled since pumping of wells RD-25 and RD-28 commenced and from previous observations, the following pertinent facts and opinions are herewith presented.

- Foundation boring data in 1961 suggests that the water table was below the basement level of Building 059 when it was initially constructed.
- A review of data and reports archived in GWRC files did not reveal when groundwater seepage into Building 059 was initially recognized.
- It appears that degraded groundwater was initially confirmed in Building 059 in 1978.

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average daily pumping rates at the end of the eight week period for wells RD-25 and RD-28 were about 530 and 465 gpd, respectively.

- Prior to activation of wells RD-25 and RD-28, water levels routinely monitored at monitor wells in the vicinity of Building 059 and at the B/056 pit declined steadily, due mostly to conditions of low seasonal precipitation. After pumping of wells RD-25 and RD-28 commenced, water levels at most monitor wells continued the moderate, steady declining trend with the exception of monitor well RD-7, where the water level began to decline sharply. Following eight weeks of pumping wells RD-25 and RD-28, the total water level decline at well RD-7 was about 7.8 feet compared to wells RD-20 and RD-74, where water level declines totaled 1.3 and 2.9 feet, respectively.

Data collected during this project suggests that continued pumping of wells RD-25, RD-28 and RD-24 and maintaining a drained pit B/056 should eventually lower the water table to below the excavated foundation for Building 059.

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Historic water level data at nearby water supply well WS-7 provides evidence that groundwater levels in at least portions of Area IV have risen since the 1950s. When well WS-7 was initially constructed the static depth to water was 105 feet (GWRC, 1991). In 1984, when Hargis & Associates initially measured water levels in well WS-7, the depth to groundwater was 44 feet, indicating a rise of 61 feet. Well WS-7 is located northeast of Building 059 in the northeast corner of Area IV. GWRC has always suspected that when the pit B/056 and the foundation for Building 059 were initially excavated, that no groundwater was encountered. At some time, probably in the late 1960s, groundwater levels in the vicinity of Building 059 and much of Area IV commenced rising. It has been our opinion that historic water imports to Area IV in conjunction with a lack of water supply pumping in Area IV has resulted in a net historic rise in groundwater levels of approximately 50 feet in portions of Area IV, as evidenced at well WS-7.

**DESCRIPTION OF BUILDING 059 DEWATERING SYSTEM**

Four dewatering sources are currently utilized at Building 059; the original S-2 Sump French-drain, well RD-24 which was added in early 1995, and wells RD-25 and RD-28 which recently became operational. Well construction data for dewatering wells are summarized in Table 1. Historically, analytical results for groundwater samples collected from wells RD-24, RD-25 and RD-28 have indicated low concentrations of volatile organic compounds (VOCs). For this reason, groundwater discharged from these sources is conveyed to an activated carbon treatment system located on the site to remove potential concentrations of VOCs. Treated water is released to a nearby storm drain leading to the SSFL #2 NPDES compliance point. Treatment system performance is monitored and reported on a monthly basis (GWRC, 1999b).

**S-2 Sump:** The S-2 sump, which facilitates the French-drain system of building 059, is located on the western end of the building (Figure 2). The sump was originally equipped with a sump-pump that maintained water levels within three feet of the bottom of the sump. Water entering the sump gravitates from the French-drain which is located above the sump bottom at an invert elevation of 1,761.76 feet. The bottom of the sump is at an elevation of 1,756.6 feet. In February 1998, the sump pump was exchanged for a 1/3 horsepower submersible well pump, the pumping rate was restricted to 1 gpm utilizing a Dole valve, and the discharge re-routed from a holding tank to the carbon treatment system. The water level control probes were maintained at their original locations to maintain the water level within about three feet of the sump bottom, and below the invert of the French-drain system.

Historically, the daily pumping rate from the S-2 Sump has occasionally averaged as much as 300 gpd during periods of high seasonal precipitation. Since pumping commenced at wells RD-25 and RD-28, the daily pumping rate of the S-2 Sump has decreased to less than 10 gpd.

**Well RD-24:** In early 1995, nearby Chatsworth Formation monitor well RD-24 was retrofitted and utilized in combination with the S-2 Sump for additional dewatering capacity at Building 059. Well RD-24 was completed in August 1989 as a monitor well to a total depth of 150 feet. The wellhead is situated in a below grade vault located about 70 feet east of Building 059 (Figure 2). The groundwater production capacity of the well is generally about one gallon per minute (gpm). Water level controls were installed with a 1/2 horsepower submersible pump to maintain the water level between

3/4-inch diameter industrial grade hose.

**CHRONOLOGY AND RESULTS OF DEWATERING**

Pumping of wells RD-25 and RD-28 commenced on July 7, 1999 following completion of draining the B/056 pit in May 1999. Individual groundwater production capacities for these wells were about 1 gpm or less, which is typical of most wells in Area IV. The wells were equipped to maintain water levels at least 120 feet below land surface. Pumping rates were restricted to 1 gpm to allow longer and less frequent pumping durations, and to maintain combined flow from all dewatering sources to the treatment system to less than 10 gpm. A summary of pumpage for eight weeks of monitoring is presented on Table 3.

**B/059 Dewatering Pumpage:** Approximately three weeks after pumping of wells RD-25 and RD-28 commenced, the water level measured below the lower basement floor of B/059 was reported to have declined a total of about 3 inches. The daily pumping rate from the S-2 Sump had decreased from more than 100 gpd before activation of the additional wells to less than 10 gpd (Table 3). Pumping of wells RD-25 and RD-28 have had no discernible effect on the daily pumping rate of well RD-24.

Well RD-28 ceased pumping for a period of about two weeks on July 28, 1999 due to equipment malfunction. During this period the water level below the lower basement floor was reported to rise about one inch and daily pumping from the S-2 Sump increased. No rainfall was reported for the period. After pumping at well RD-28 resumed, the basement water level again began to decline and pumping from the S-2 Sump began to decrease.

Prior to activation of wells RD-25 and RD-28, the S-2 Sump and well RD-24 were operating on a normal basis and their combined average daily pumping rate was about 1,760 gpd. After approximately eight weeks of pumping at wells RD-25 and RD-28, the daily combined pumping rate for all B/059 groundwater dewatering sources was about 2,200 gpd. Individual average daily pumping rates at the end of the eight week period for wells RD-25 and RD-28 were about 530 and 465 gpd, respectively (Table 3).

The discharge of well RD-25 periodically contained fine sand produced from the Chatsworth Formation. The sand occasionally jammed the positive displacement type flow meter for this well until it was cleared. Therefore, daily pumping for well RD-25 was estimated for the periods when this occurred. The original flow meter was replaced with a paddle type meter on August 18, 1999 to alleviate this problem.

**RECOMMENDATIONS**

Data collected during this project suggests that the current dewatering strategy of pumping wells RD-24, RD-25 and RD-28 in conjunction with draining of the pit B/056 should effectively lower the water table to below the foundation excavation for Building 059. Water levels below the floor slab of the Building basement have dropped more than one foot and daily inflow to the French-drain system (S-2 sump) has decreased from 100 gpd to less than 10 gpd.

GWRC recommends that operation of the current dewatering system be continued as configured. Monitoring of pumpage and water levels should be continued, and a monthly letter prepared summarizing the monitoring data and results.

Now that all the wells in close proximity to Building 059 are operated as pumping-dewatering wells, it is our recommendation that one piezometer well be drilled near Building 059 to provide a means for monitoring water table changes.

TABLE 1												
WELL CONSTRUCTION DATA												
Well Identifier	Effective Borehole Depth (Feet)	Borehole		Casing		Sealed Interval (Feet)	Perforated Interval (Feet)	Pump Type	Depth to Pump Intake (Feet)	Depth to Water Level Controls (Feet)	Well Head M.P. Elevation (Ft Msl)	Date Drilled
		Diameter (inches)	Interval (feet)	I.D. (in)	Interval (feet)							
<b>B/059 DEWATERING WELLS AND VICINITY MONITOR WELLS</b>												
RD-7	300.0	15 8-5/8	0 - 25.0 25.0 - 300.0	10-1/8 ---	0 - 25.0 ---	0 - 25.0	OPEN HOLE	N/A	N/A	not equipped	1812.82	01-08-86
RD-20	127.0	12 6-1/2	0 - 30.0 30.0 - 127.0	8-1/4 ---	0 - 30.0 ---	0 - 30.0	OPEN HOLE	N/A	N/A	not equipped	1819.72	07-27-89
RD-24*	150.0	12 6-1/2	0 - 30.0 30.0 - 150.0	8-1/4 ---	0 - 30.0 ---	0 - 30.0	OPEN HOLE	Grundfos 1/2 hp 230 volt	137	upper 115 lower 136	1809.93 (V)	08-09-89
RD-25*	175.0	12 6-1/2	0 - 30.0 30.0 - 175.0	8-1/4 ---	0 - 30.0 ---	0 - 30.0	OPEN HOLE	Grundfos 1/3 hp 230 volt	167	upper 136 lower 166	1810.76 (V)	08-07-89
RD-28*	150.0	12 6-1/2	0 - 30.0 30.0 - 150.0	8-1/4 ---	0 - 30.0 ---	0 - 30.0	OPEN HOLE	Grundfos 1/3 hp 230 volt	132	upper 121 lower 131	1810.92 (V)	08-10-89
RD-29	100.0	12 6-1/2	0 - 30.0 30.0 - 100.0	8-1/4 ---	0 - 30.0 ---	0 - 30.0	OPEN HOLE	N/A	96	not equipped	1806.29	08-10-89
RD-74	101	17-1/2 6-1/2	0 - 30.0 30 - 101	12 ---	0 - 30.0 ---	0 - 30.0	OPEN HOLE	N/A	N/A	not equipped	1810.90	01-21-99
S-2 Sump* French Drain	N/A	N/A	N/A	16	58.75	Bottom at 1756.6	French Drain Elev. 1761.76	Grundfos 1/3 hp 230 volt	58	upper 56 lower 58	1815.35	early 1960s

Well Construction Depth/intervals are measured in feet below approximate land surface.

(\*) B/059 Dewatering Discharge Source.

(---) No casing installed over the borehole interval specified; open hole.

(v) Top of well below land surface, installed inside zero-grade vault.

N/A Not Applicable.

**TABLE 3  
EIGHT WEEKS SUMMARY OF PUMPAGE  
BUILDING 059 DEWATERING**

Meter Date	Period (Days)	RD-24		RD-25		RD-28		S-2		Comments
		Gallons per Period	Average GPD	Gallons per Period	Average GPD	Gallons per Period	Average GPD	Gallons per Period	Average GPD	
07/07/99	0	---	1509	210	start	251	start	---	101	RD-25 and RD-28 pumping started.
07/15/99	7.6	10735	1413	4278	563	5314	699	322	42	
07/21/99	6.1	9660	1584	3,434**	563	3375	553	24	4	RD-25 meter stuck (fine sand)
07/27/99	6.1	8215	1347	3,434**	563	1170	192	51	8	RD-25 meter changed
08/06/99	9.9	11729	1185	5554	561	360	36	285	29	RD-28 pump quit about 7/28
08/11/99	5.1	8488	1664	2875	564	13	3	199	39	RD-28 restarted
08/18/99	7.2	9957	1389	3,600**	502	3121	435	46	6	RD-25 meter replaced
08/24/99	5.8	8170	1409	3045	525	2,897**	465	0	0	RD-28 meter stuck
09/01/99	8.3	9985	1203	4395	530	3,860**	465	10	1	RD-28 meter replaced
<b>Total*</b>	<b>56.1</b>	<b>76,939 gallons</b>		<b>30,825 gallons</b>		<b>20,161 gallons</b>		<b>937 gallons</b>		<b>Ending eight weeks of operation</b>

(\*) Total pumpage volume from dewatering system since pumping of wells RD-25 and RD-28 commenced.  
 (\*\*) Flow meter changed - estimated pumpage volume for period.  
 (—) Not included for summary totals.

**APPENDIX A**

**LABORATORY REPORTS**

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Groundwater Resources Consultants, Inc.  
 Project: Boeing-Rocketdyne/SFL/8640 QGM  
 Sample Matrix: Water  
 Sample Name: RD-25  
 Lab Code: D1285005  
 Test Notes:

Service Request: D9901547  
 Date Collected: 08/19/99  
 Date Received: 08/27/99

Volatile Organic Compounds

Units: ug/L (ppb)  
 Basis: Wet

Analyte	Prep Method	Analysis Method	PQL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Chloromethane	EPA 5030	8260B	0.5	0.4	1	NA	08/30/99	ND	
Vinyl Chloride	EPA 5030	8260B	0.5	0.4	1	NA	08/30/99	ND	
Bromomethane	EPA 5030	8260B	0.5	0.3	1	NA	08/30/99	ND	
Chloroethane	EPA 5030	8260B	0.5	0.4	1	NA	08/30/99	ND	
Trichlorofluoromethane (CFC 11)	EPA 5030	8260B	0.5	0.3	1	NA	08/30/99	ND	
1,1-Dichloroethene (1,1-DCE)	EPA 5030	8260B	0.5	0.3	1	NA	08/30/99	ND	
Acetone	EPA 5030	8260B	20	3	1	NA	08/30/99	ND	
Carbon Disulfide	EPA 5030	8260B	2	0.9	1	NA	08/30/99	ND	
Methylene Chloride	EPA 5030	8260B	2	0.3	1	NA	08/30/99	ND	
trans-1,2-Dichloroethene	EPA 5030	8260B	0.5	0.2	1	NA	08/30/99	ND	
cis-1,2-Dichloroethene	EPA 5030	8260B	0.5	0.3	1	NA	08/30/99	0.5	
2-Butanone (MEK)	EPA 5030	8260B	10	2	1	NA	08/30/99	ND	
1,1-Dichloroethane	EPA 5030	8260B	0.5	0.4	1	NA	08/30/99	ND	
Chloroform	EPA 5030	8260B	0.5	0.3	1	NA	08/30/99	ND	
1,1,1-Trichloroethane (TCA)	EPA 5030	8260B	0.5	0.2	1	NA	08/30/99	ND	
Carbon Tetrachloride	EPA 5030	8260B	0.5	0.4	1	NA	08/30/99	ND	
Benzene	EPA 5030	8260B	0.5	0.2	1	NA	08/30/99	ND	
1,2-Dichloroethane	EPA 5030	8260B	0.5	0.3	1	NA	08/30/99	ND	
Vinyl Acetate	EPA 5030	8260B	25	2	1	NA	08/30/99	ND	
Trichloroethene (TCE)	EPA 5030	8260B	0.5	0.3	1	NA	08/30/99	1.0	
1,2-Dichloropropane	EPA 5030	8260B	0.5	0.2	1	NA	08/30/99	ND	
Bromodichloromethane	EPA 5030	8260B	0.5	0.2	1	NA	08/30/99	ND	
2-Chloroethyl Vinyl Ether	EPA 5030	8260B	5	2	1	NA	08/30/99	ND	
trans-1,3-Dichloropropene	EPA 5030	8260B	0.5	0.2	1	NA	08/30/99	ND	
2-Hexanone	EPA 5030	8260B	10	2	1	NA	08/30/99	ND	
4-Methyl-2-pentanone (MIBK)	EPA 5030	8260B	10	2	1	NA	08/30/99	ND	
Toluene	EPA 5030	8260B	0.5	0.2	1	NA	08/30/99	0.9	
cis-1,3-Dichloropropene	EPA 5030	8260B	0.5	0.3	1	NA	08/30/99	ND	
1,1,2-Trichloroethane	EPA 5030	8260B	0.5	0.3	1	NA	08/30/99	ND	
Tetrachloroethene (PCE)	EPA 5030	8260B	0.5	0.4	1	NA	08/30/99	10	
Dibromochloromethane	EPA 5030	8260B	0.5	0.3	1	NA	08/30/99	ND	
Chlorobenzene	EPA 5030	8260B	0.5	0.3	1	NA	08/30/99	ND	
Ethylbenzene	EPA 5030	8260B	0.5	0.3	1	NA	08/30/99	ND	
Styrene	EPA 5030	8260B	0.5	0.2	1	NA	08/30/99	ND	
Bromoform	EPA 5030	8260B	0.5	0.3	1	NA	08/30/99	ND	
1,1,2,2-Tetrachloroethane	EPA 5030	8260B	0.5	0.3	1	NA	08/30/99	ND	
1,3-Dichlorobenzene	EPA 5030	8260B	0.5	0.1	1	NA	08/30/99	ND	
1,4-Dichlorobenzene	EPA 5030	8260B	0.5	0.1	1	NA	08/30/99	ND	
1,2-Dichlorobenzene	EPA 5030	8260B	0.5	0.3	1	NA	08/30/99	ND	
Acrolein	EPA 5030	8260B	100	8	1	NA	08/30/99	ND	
Acrylonitrile	EPA 5030	8260B	100	8	1	NA	08/30/99	ND	
1,1,2-Trichlorotrifluoroethane (CFC 113)	EPA 5030	8260B	2	*	1	NA	08/30/99	ND	*
m- & p-Xylenes	EPA 5030	8260B	1	0.5	1	NA	08/30/99	ND	
o-Xylene	EPA 5030	8260B	0.5	0.4	1	NA	08/30/99	ND	
1,4-Dioxane	EPA 5030	8260B	1000	*	1	NA	08/30/99	ND	*

\* Searched for as a Tentatively Identified Compound.

Approved By:

*RM*

Date:

9/14/99

0009

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Groundwater Resources Consultants, Inc.  
 Project: Boeing-Rocketdyne/SFL/8640 QGM  
 Sample Matrix: Water  
 Sample Name: RD-28  
 Lab Code: D1285006  
 Test Notes:

Service Request: D9901547  
 Date Collected: 08/19/99  
 Date Received: 08/27/99  
 Units: ug/L (ppb)  
 Basis: Wet

Volatile Organic Compounds

Analyte	Prep Method	Analysis Method	PQL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Chloromethane	EPA 5030	8260B	0.5	0.4	1	NA	08/30/99	ND	
Vinyl Chloride	EPA 5030	8260B	0.5	0.4	1	NA	08/30/99	ND	
Bromomethane	EPA 5030	8260B	0.5	0.3	1	NA	08/30/99	ND	
Chloroethane	EPA 5030	8260B	0.5	0.4	1	NA	08/30/99	ND	
Trichlorofluoromethane (CFC 11)	EPA 5030	8260B	0.5	0.3	1	NA	08/30/99	ND	
1,1-Dichloroethene (1,1-DCE)	EPA 5030	8260B	0.5	0.3	1	NA	08/30/99	ND	
Acetone	EPA 5030	8260B	20	3	1	NA	08/30/99	ND	
Carbon Disulfide	EPA 5030	8260B	2	0.9	1	NA	08/30/99	ND	
Methylene Chloride	EPA 5030	8260B	2	0.3	1	NA	08/30/99	ND	
trans-1,2-Dichloroethene	EPA 5030	8260B	0.5	0.2	1	NA	08/30/99	ND	
cis-1,2-Dichloroethene	EPA 5030	8260B	0.5	0.3	1	NA	08/30/99	ND	
2-Butanone (MEK)	EPA 5030	8260B	10	2	1	NA	08/30/99	ND	
1,1-Dichloroethane	EPA 5030	8260B	0.5	0.4	1	NA	08/30/99	ND	
Chloroform	EPA 5030	8260B	0.5	0.3	1	NA	08/30/99	ND	
1,1,1-Trichloroethane (TCA)	EPA 5030	8260B	0.5	0.2	1	NA	08/30/99	ND	
Carbon Tetrachloride	EPA 5030	8260B	0.5	0.4	1	NA	08/30/99	ND	
Benzene	EPA 5030	8260B	0.5	0.2	1	NA	08/30/99	ND	
1,2-Dichloroethane	EPA 5030	8260B	0.5	0.3	1	NA	08/30/99	ND	
Vinyl Acetate	EPA 5030	8260B	25	2	1	NA	08/30/99	ND	
Trichloroethene (TCE)	EPA 5030	8260B	0.5	0.3	1	NA	08/30/99	ND	
1,2-Dichloropropane	EPA 5030	8260B	0.5	0.2	1	NA	08/30/99	ND	
Bromodichloromethane	EPA 5030	8260B	0.5	0.2	1	NA	08/30/99	ND	
2-Chloroethyl Vinyl Ether	EPA 5030	8260B	5	2	1	NA	08/30/99	ND	
trans-1,3-Dichloropropene	EPA 5030	8260B	0.5	0.2	1	NA	08/30/99	ND	
2-Hexanone	EPA 5030	8260B	10	2	1	NA	08/30/99	ND	
4-Methyl-2-pentanone (MIBK)	EPA 5030	8260B	10	2	1	NA	08/30/99	ND	
Toluene	EPA 5030	8260B	0.5	0.2	1	NA	08/30/99	5	
cis-1,3-Dichloropropene	EPA 5030	8260B	0.5	0.3	1	NA	08/30/99	ND	
1,1,2-Trichloroethane	EPA 5030	8260B	0.5	0.3	1	NA	08/30/99	ND	
Tetrachloroethene (PCE)	EPA 5030	8260B	0.5	0.4	1	NA	08/30/99	ND	
Dibromochloromethane	EPA 5030	8260B	0.5	0.3	1	NA	08/30/99	ND	
Chlorobenzene	EPA 5030	8260B	0.5	0.3	1	NA	08/30/99	ND	
Ethylbenzene	EPA 5030	8260B	0.5	0.3	1	NA	08/30/99	ND	
Styrene	EPA 5030	8260B	0.5	0.2	1	NA	08/30/99	ND	
Bromoform	EPA 5030	8260B	0.5	0.3	1	NA	08/30/99	ND	
1,1,2,2-Tetrachloroethane	EPA 5030	8260B	0.5	0.3	1	NA	08/30/99	ND	
1,3-Dichlorobenzene	EPA 5030	8260B	0.5	0.1	1	NA	08/30/99	ND	
1,4-Dichlorobenzene	EPA 5030	8260B	0.5	0.1	1	NA	08/30/99	ND	
1,2-Dichlorobenzene	EPA 5030	8260B	0.5	0.3	1	NA	08/30/99	ND	
Acrolein	EPA 5030	8260B	100	8	1	NA	08/30/99	ND	
Acrylonitrile	EPA 5030	8260B	100	8	1	NA	08/30/99	ND	
1,1,2-Trichlorotrifluoroethane (CFC 113)	EPA 5030	8260B	2	*	1	NA	08/30/99	ND	*
m- & p-Xylenes	EPA 5030	8260B	1	0.5	1	NA	08/30/99	ND	
o-Xylene	EPA 5030	8260B	0.5	0.4	1	NA	08/30/99	ND	
1,4-Dioxane	EPA 5030	8260B	1000	*	1	NA	08/30/99	ND	*

Searched for as a Tentatively Identified Compound.

Approved By:

*Rm*

Date:

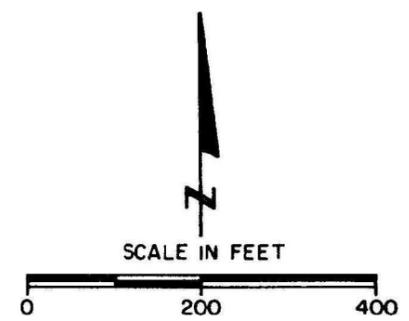
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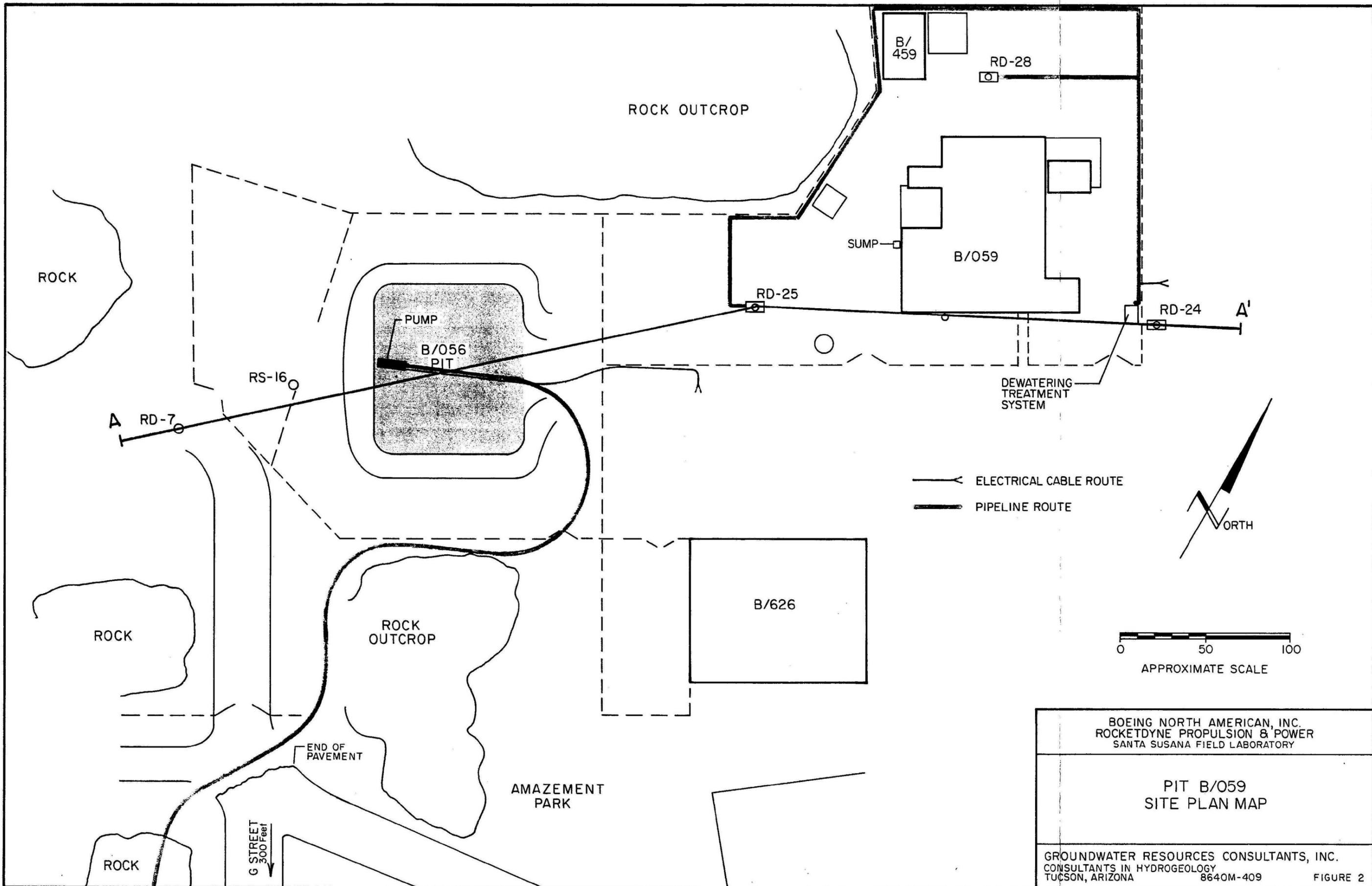


E X P L A N A T I O N

- RD-25 WELL IDENTIFIER
- CHATSWORTH FORMATION MONITOR WELL



BOEING NORTH AMERICAN, INC. ROCKETDYNE PROPULSION & POWER SANTA SUSANA FIELD LABORATORY	
<h2 style="margin: 0;">PROJECT SITE LOCATION MAP</h2>	
GROUNDWATER RESOURCES CONSULTANTS, INC. CONSULTANTS IN HYDROGEOLOGY TUCSON, ARIZONA	8640M-409 FIGURE 1

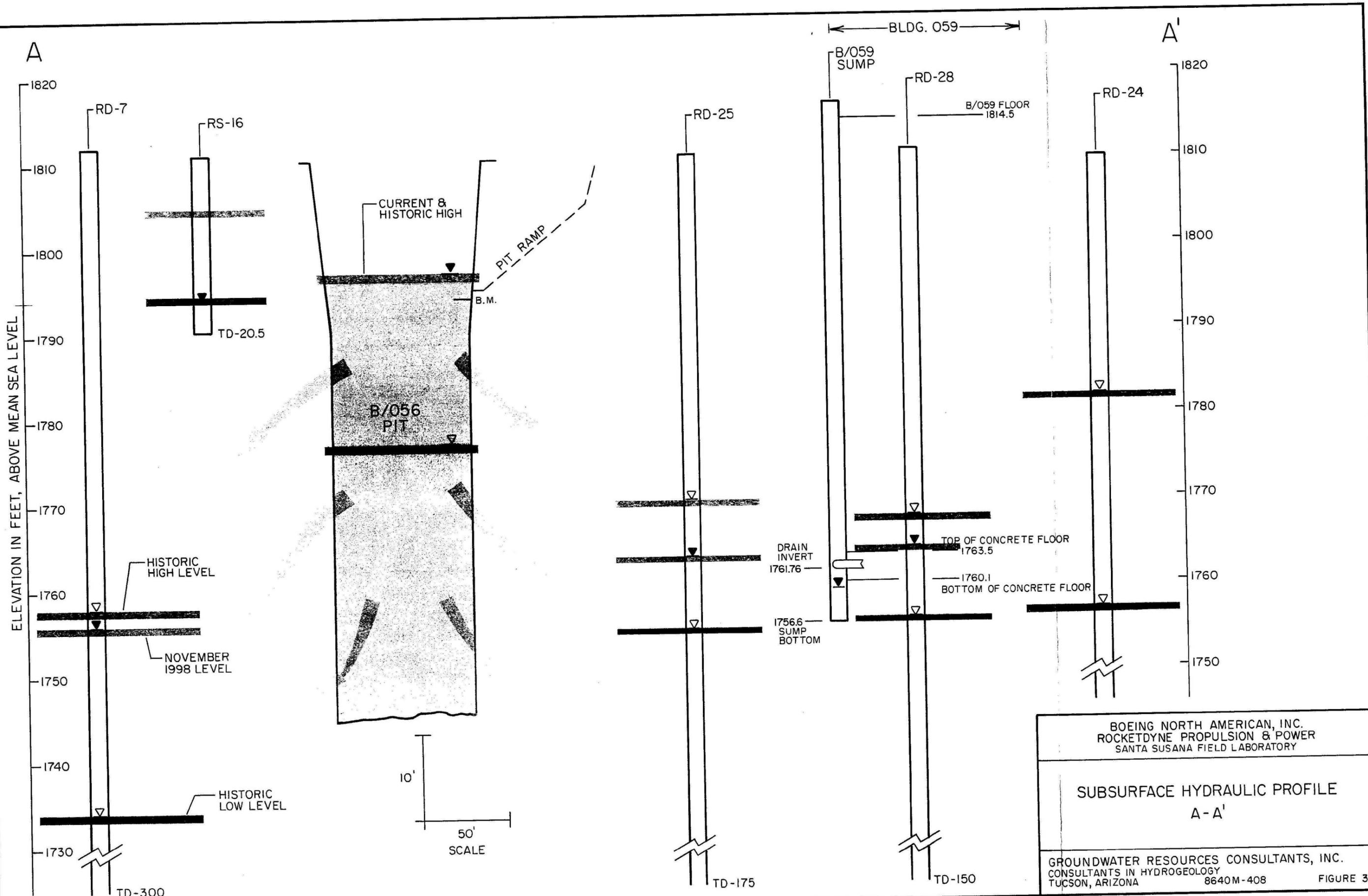


BOEING NORTH AMERICAN, INC.  
 ROCKETDYNE PROPULSION & POWER  
 SANTA SUSANA FIELD LABORATORY

PIT B/059  
 SITE PLAN MAP

GROUNDWATER RESOURCES CONSULTANTS, INC.  
 CONSULTANTS IN HYDROGEOLOGY  
 TUCSON, ARIZONA 8640M-409

FIGURE 2

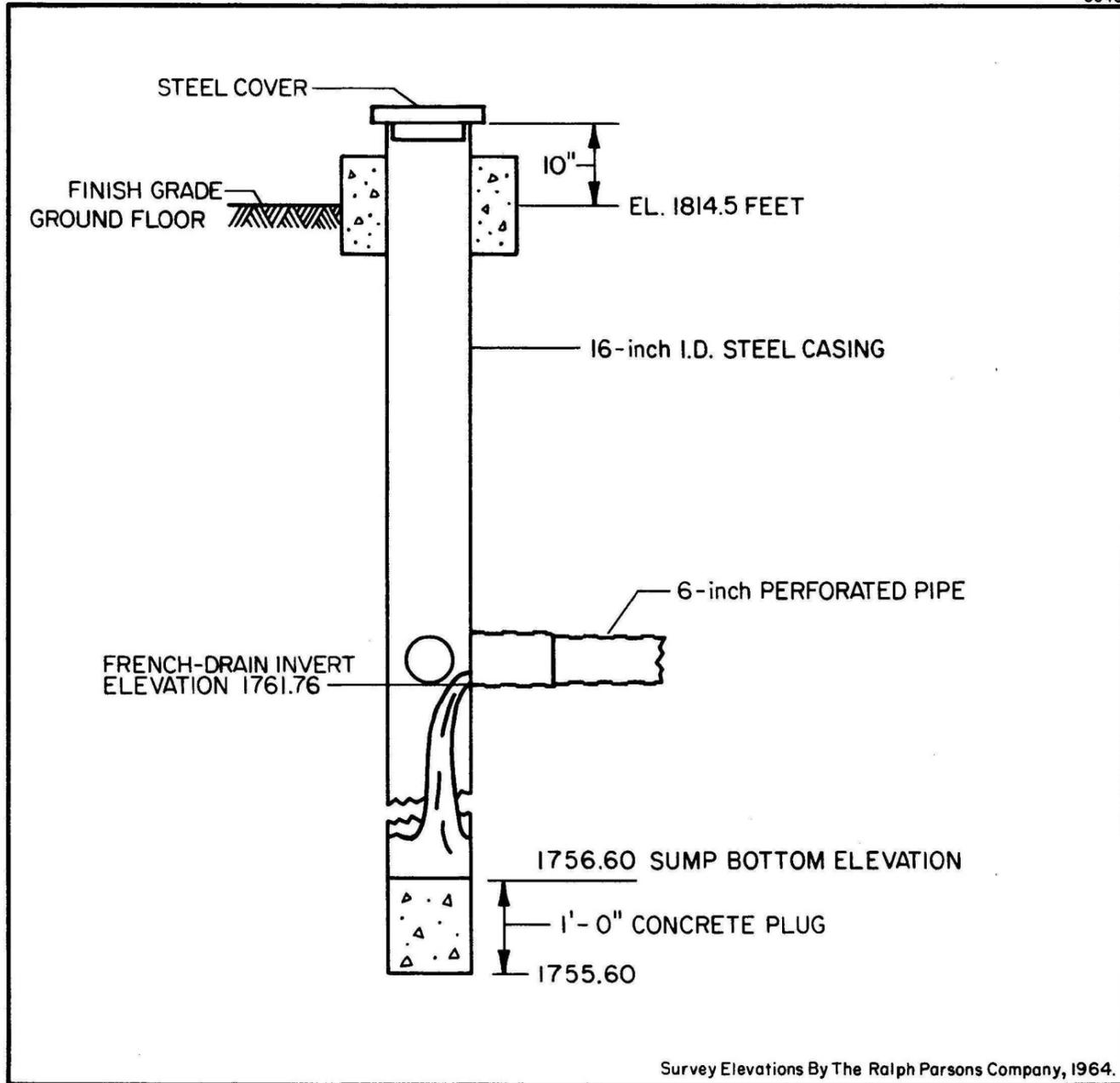


BOEING NORTH AMERICAN, INC.  
 ROCKETDYNE PROPULSION & POWER  
 SANTA SUSANA FIELD LABORATORY

SUBSURFACE HYDRAULIC PROFILE  
 A - A'

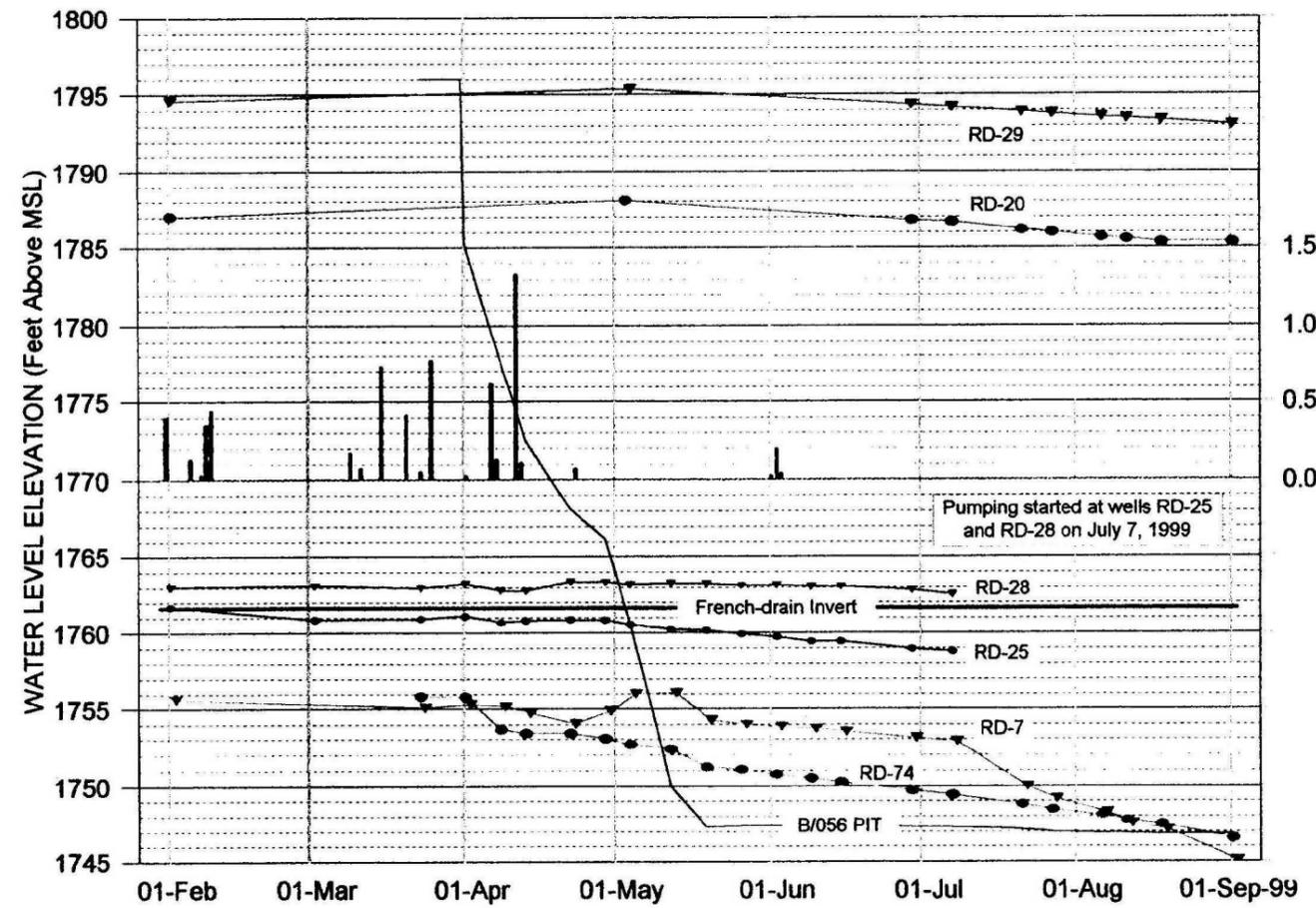
GROUNDWATER RESOURCES CONSULTANTS, INC.  
 CONSULTANTS IN HYDROGEOLOGY  
 TUCSON, ARIZONA 8640M-408

FIGURE 3



Survey Elevations By The Ralph Parsons Company, 1964.

FIGURE 4. SCHEMATIC OF BUILDING 059 S-2 SUMP AND FRENCH-DRAIN



**Figure 5. WATER LEVEL ELEVATIONS and RAINFALL  
VICINITY OF BUILDING 059**