DRAFT

TECHNICAL MEMORANDUM 1

Data Compilation
Volume 2 - Appendices

ROCKY FLATS PLANT
700 Area
(Operable Unit No. 8)

U. S. Department of Energy
Rocky Flats Plant
Golden, Colorado

ENVIRONMENTAL RESTORATION PROGRAM

April 1994

(wpf) 04/07/94

100% Recycled

TABLE OF CONTENTS
VOLUME 2 - APPENDICES
TECHNICAL MEMORANDUM NUMBER 1
OPERABLE UNIT 8

APPENDIX A

List of Engineering Drawings Reviewed For Foundation Drain Data Compilation

Appendix A
Rocky Flats Plant
Operable Unit 8 Data Compilation

Building No. 111			
Drawing No.	**Original Date**	**Latest Rev. Date**	**Title**
RF-11-F-1-C	1-6-51	N/R	Foundation and Basement Plan - Schedule and Details
RF-11-S-1-C	1-6-51	N/R	First Floor Plan (South) and Foundation Plan
1-1664-11	10-8-51	1-8-65	Basement Floor Plan (South)
1-1665-11	10-8-51	2-27-61	Basement Floor Plan (North)
14140-1	5-18-66	4-9-68	Meeting Room Addition - Foundation and First Floor Plan and Foundation Details
25581-8	12-9-75	N/R	Foundation Drain Plan
15501-026-M	7-20-83	7-20-90	Site Utility Plans
15501-027-M	7-20-83	7-20-90	Site Utility Plans
11508-11, 21, and 22	N/L	N/L	Grading Plan

Building No. 122			
Drawing No.	**Original Date**	**Latest Rev. Date**	**Title**
1-13122-21, 22	11-6-51	N/L	Foundation Plan and Details
21641-11	8-18-69	10-28-71	Building 122 Addition and Renovations Foundation Plan
15501-040-M	7-20-83	7-20-90	Utility Layout

N/R = Not Recorded N/L = Not Legible * = No Drawings Found h:\home\wait\drawings.out

Building No. 123			
Drawing No.	**Original Date**	**Latest Rev. Date**	**Title**
1-11588-23	10-31-51	2-7-52	Foundation Plan
1-11589-23	10-31-51	2-7-52	Foundation Details
1-11571-23	11-6-51	2-7-52	Toilet Room Layout and Source Vault Details
RF-23-101	11-30-51	9-11-53	Plumbing and Service Piping - Drains
20712-02	5-17-68	12-21-70	Plot and Drainage Plan
15501-040-M	7-20-83	7-20-90	Utility Layout

Building No. 124			
Drawing No.	**Original Date**	**Latest Rev. Date**	**Title**
RF-24-F1-C	3-24-52	3-19-53	Foundation Plan
RF-24-Y1-B	3-26-52	3-19-53	Plot Plan - Grading
RF-24-109-B	3-26-52	3-19-53	Outfall Sewer
27006-4	5-15-74	6-18-75	Backwash Storage Tanks Layout
25581-3	6-13-75	12-9-75	Foundation Drain Plan
15501-051-M	7-20-83	7-20-90	Site Utility Plans

Building No. 125			
Drawing No.	**Original Date**	**Latest Rev. Date**	**Title**
14482-1	1-8-64	7-27-65	Foundation and Floor Plan and Details
14482-2	1-8-64	3-17-65	Foundation and Slab Details
20712-16	5-15-68	12-21-70	Plot and Drainage Plan
15501-040-M	7-20-83	7-20-90	Utility Layout
28540-004	6-29-84	6-5-86	Site Plan - Drainage - Addition
28540-008	6-29-84	N/R	Foundation Plan - Addition
28540-010	6-29-84	6-5-86	Foundation Sections and Details

N/R = Not Recorded N/L = Not Legible * = No Drawings Found

Building No. 331			
Drawing No.	**Original Date**	**Latest Rev. Date**	**Title**
RF-31-F1-C	8-30-51	2-25-53	Ground Floor and Foundation Plan
RF-31-S2-C	9-27-51	2-25-53	Footings and Details
15972-3	6-21-67	3-5-69	Addition - Foundation and Second Floor Framing Plans
15501-028-M	7-20-83	7-20-90	Site Utility Plans

Building No. 371/374			
Drawing No.	**Original Date**	**Latest Rev. Date**	**Title**
25042-049	12-13-72	9-10-73	Subdrain Plan and Profile
25042-050	12-13-72	9-10-73	Subdrain Details
25032-023	5-23-73	2-3-76	Plutonium Recovery Plan Subdrains
25032-029	5-24-73	2-3-76	Subdrain and Earth Fill Sections
25032-030	5-23-73	2-3-76	Subdrain and Earth Fill Sections
25032-031	5-24-73	2-3-76	Subdrain and Earth Fill Sections
25032-032	5-18-73	1-5-76	Subdrain and Earth Fill Sections
25032-033	5-15-73	1-5-76	Subdrain and Earth Fill Sections and Details
25032-035	7-2-73	2-3-76	Waste Treatment Details
25025-015	3-4-76	N/R	Subbasement Floor Plan, Plumbing Drawing Index
25022-004	2-2-77	8-19-80	Area Plot Plan, Foundation and Storm Drains
15501-011-M	7-20-83	7-20-90	Site Utility Plans
15501-019-M	7-20-83	7-20-90	Site Utility Plans
37487-200	7-11-86	12-4-87	Cemented Salt Storage - Foundation Plan
30371-001-1E	7-4-87	12-11-90	Subbasement Floor Plan
30371-002-1H	7-27-87	8-7-90	Basement Floor Plan

N/R = Not Recorded N/L = Not Legible * = No Drawings Found

Building No. 439			
Drawing No.	**Original Date**	**Latest Rev. Date**	**Title**
21341-11	9-4-68	N/R	Foundation and Floor Slab Plan
21341-12	9-5-68	N/R	Foundation and Floor Slab Sections and Details
15501-052-M	7-20-83	7-20-90	Site Utility Plans

Building No. 440			
Drawing No.	**Original Date**	**Latest Rev. Date**	**Title**
21341-01	8-22-68	N/R	Foundation and Floor Slab Plan
21341-02	9-4-68	N/R	Foundation Wall Elevations
21341-03	9-5-68	N/R	Foundation and Floor Slab Sections and Details
21341-04	9-18-68	N/R	Foundation Sections
21341-05	9-20-68	N/R	Miscellaneous Sections and Details
15501-051-M	7-20-83	7-20-90	Site Utility Plans
15501-052-M	7-20-83	7-20-90	Site Utility Plans

Building No. 441			
Drawing No.	**Original Date**	**Latest Rev. Date**	**Title**
RF-41-F1-B	1-28-51	4-10-53	Foundation Plan and Details
RF-41-F2-B	1-28-51	4-10-53	Foundation Details and Sections
RF-41-Y1-B	2-10-52	4-10-53	Plot Plan
21641-31	8-18-69	10-28-71	Addition and Renovation Foundation Plan
21641-32	8-18-69	10-28-71	Addition and Renovation Foundation Sections and Details
15501-040-M	7-20-83	7-20-90	Utility Layout

N/R = Not Recorded N/L = Not Legible * = No Drawings Found

Building No. 442			
Drawing No.	**Original Date**	**Latest Rev. Date**	**Title**
RF-42-F1-B	1-11-52	3-5-53	Columns and Foundation Plan
RF-42-Y1-B	2-8-52	3-5-53	Plot Plan
15501-041-M	7-20-83	7-20-90	Site Utility Plans
26693-005	5-15-84	11-14-85	HEPA Building Plan and Foundation

Building No. 444			
Drawing No.	**Original Date**	**Latest Rev. Date**	**Title**
RF-44-F1	3-7-52	N/L	Foundation Plans and Details
(13608-44)*		3-3-53	Foundation Plans and Details
RF-44-F2	3-7-52	3-3-53	Foundation Schedule and Details
RF-44-F3	3-7-52	3-3-53	Foundation Details
RF-44-Y1	3-7-52	N/L	Plot Plan
RF-44-109-F	5-28-52	N/L	Sump Pumps - Details and Sections
RF-44-126-G	9-?-52	7-22-53	Process and Service Piping - Rooms 1 & 2
RF-44-127	1-18-52	N/L	Process Waste Details - Basement Level
RF-44-127-E	9-7-52	4-?-53	Process and Service Piping
(1-6540-44)*			Process and Serving Piping
1-3184-44	7-11-55	N/R	Process Waste and Filtration System
25581-4	6-13-75	12-9-75	Foundation Drain Plan
15501-052-M	7-20-83	7-20-90	Site Utility Plans
15501-041-M	7-20-85	7-20-90	Site Utility Plans
RF-44-107*			Process Waste Details, Basement Bldg 444

Building No. 447			
Drawing No.	**Original Date**	**Latest Rev. Date**	**Title**
RF-47-F1	6-1-55	N/L	Foundation and Mezzanine Plans and Details
1-3326-47	6-1-55	6-26-64	Floor Trenches and Underground Piping
15501-052-M	7-20-83	7-20-90	Site Utility Plans

N/R = Not Recorded N/L = Not Legible * = No Drawings Found

h:\home\tswa\drawings.out

Building No. 460			
Drawing No.	**Original Date**	**Latest Rev. Date**	**Title**
36001-304	4-22-83	7-22-83	Foundation Layout
36001-305	4-28-83	7-22-83	Foundations, Sections
15501-040-M	7-20-83	7-20-90	Area Layout
15501-051-M	7-20-83	7-20-90	Site Utility Plans
28646-3	10-14-83	10-21-83	Area Utilities Location
36010-100	11-18-83	10-9-84	Storm Drain Layout
36010-300	10-30-83	1-12-84	Foundation Layout
36010-301	10-28-83	1-12-84	Foundation Layout (continued)
36010-302	10-28-83	1-12-84	Foundation Schedule and Details
36010-304	12-1-83	1-12-84	Vault Plans
36010-452	3-23-84	3-5-85	Underground Piping
36010-453	3-23-84	3-5-85	Mechanical Piping
36010-459	3-23-84	3-5-85	Mechanical Piping

Building No. 559			
Drawing No.	**Original Date**	**Latest Rev. Date**	**Title**
RF-AY-14027-3	8-17-65	5-8-68	Site Details - Sheet No 1
RF-AY-14027-6	8-17-65	5-8-68	Site Details - Sheet No 4
RF-AY-14028-1	8-17-65	5-8-68	Foundation Plan
RF-AY-14028-3	8-17-65	5-8-68	Foundation and Roof Details
RF-AY-14028-4	8-17-65	5-8-68	Tunnel Plan and Details
RF-AY-14028-7	8-17-65	5-8-68	Schedules
21412-01	12-?-68	10-4-71	Plot and Drainage Plan
15501-020-M	7-20-83	7-20-90	Site Utility Plans
23452-102*		1-5-73	
23452-203*		9-?-74	

N/R = Not Recorded N/L = Not Legible * = No Drawings Found

h:\home\swa\drawings.cu8

Building No. 701			
Drawing No.	**Original Date**	**Latest Rev. Date**	**Title**
17940-1	3-13-68	6-26-69	Maintenance Shops - Plan and Details
17940-3	4-4-68	6-26-69	Maintenance Shops - Miscellaneous Details
15501-013-M	7-20-83	7-20-90	Site Utility Plans

Building No. 707			
Drawing No.	**Original Date**	**Latest Rev. Date**	**Title**
20220-06	3-21-67	8-4-71	Utility Plans
20220-08	9-21-67	2-19-75	Utility Plans
20220-12	9-21-67	1-5-75	Utility Plans
RF-BZ-20451-05	2-16-68	11-4-70	Plumbing Plan - Underground - Part A
RF-BZ-20451-06	2-19-68	11-4-70	Plumbing Plan - Underground - Part B
RF-BZ-20451-07	2-23-68	11-4-70	Plumbing Plan - Underground - Part C
RF-BZ-20451-08	2-13-68	11-4-70	Plumbing Plan - Underground - Part D
RF-BZ-20451-09	3-15-68	11-4-70	Plumbing Plan Details
15501-021-M	7-20-83	5-14-90	Site Utility Plans
15501-030-M	7-20-83	7-20-90	Site Utility Plans
15501-030-01L	12-20-89	N/R	Shelters for Pondcrete/Saltcrete T904A Trailer Site Plan

Building No. 731			
Drawing No.	**Original Date**	**Latest Rev. Date**	**Title**
50095-101	2-19-92	3-3-92	Details Building 731 Waste Pit

Building No. 770			
Drawing No.	**Original Date**	**Latest Rev. Date**	**Title**
13554-1	10-9-64	12-7-64	Modifications to Building Structural Details

N/R = Not Recorded N/L = Not Legible * = No Drawings Found h:\home\twall\drawings.out

Building No. 771			
Drawing No.	**Original Date**	**Latest Rev. Date**	**Title**
7387-2	12-10-51	5-12-70	Underground Plumbing
RF-71-103	12-10-51	N/L	Southwest Area First Floor Underground Plumbing
RF-71-104-G	12-19-51	5-11-53	Southeast Area First Floor Underground Plumbing
RF-71-F1	N/L	5-11-53	Foundation Plan
RF-71-S7	1-17-52	5-11-53	Foundation Plan Details
RF-71-101	1-14-52	11-6-65	Northwest Area First Floor Underground Plumbing
RF-71-102-E	1-14-52	5-11-53	Northeast Area First Floor Underground Plumbing
RF-71-113-D	2-8-52	5-11-53	Sewer and Drainage Lines
2-4185	3-31-59	N/R	Underground Utilities Layout - Zones G-6, G-7, H-6, and H-7
RF-V71-10008	8-6-62	N/R	Foundation Plan Sections and Details - Addition
15754-1	11-15-66	6-25-69	West Dock Extension - Foundation Plan and Details
19604-1	11-8-70	2-5-72	Floor Plan
RF-71-111-C	3-12-75	5-11-53	Sanitary, Process, and Storm Drains - Profiles
25581-5	6-13-75	12-9-75	Foundation Drain Plan
15501-012-M	7-20-83	11-20-90	Site Utility Plans
15501-013-M	7-20-83	7-20-90	Site Utility Plans
RF-71-100*		5-11-53	Underground Plumbing Plans
RF-71-116-C*			Arrangement of Holding Tanks

N/R = Not Recorded N/L = Not Legible * = No Drawings Found

h:\home\tswa\drawings.out

Building No. 774			
Drawing No.	**Original Date**	**Latest Rev. Date**	**Title**
RF-74-1-G	5-29-52	11-?-53	Plans and Elevations
RF-74-S1-D	6-6-52	11-?-53	Foundation - Floor-Roof Plan - Beam and Girder Details
2-4185	3-31-59	N/R	Underground Utilities Layout - Zones G-6, G-7, H-6, and H-7
RF-V74-10012	8-6-62	N/R	Bldg 74 Addition - Foundation Plan
14773-2	12-3-65	3-15-67	Waste Disposal Facility Plot Plan
23542-103	3-29-72	9-?-74	Excavation and Grading Plan
23542-202	1-28-72	5-24-72	Grading and Utility Plan
25581-6	6-13-75	12-9-75	Foundation Drain Plan, Bldg. 774
15501-013-M	7-20-83	7-20-90	Site Utility Plans
37728-002	9-17-86	3-9-90	Waste Treatment Addition - Bldg 774
37728-014	9-17-86	3-4-90	Waste Treatment Addition Foundation and Wall Sections
29655-470	10-30-89	5-11-90	Bldg 774 Subgrade Drain Pump Casing Details
38544-X10*			Utility Demolition Plan

Building No. 776			
Drawing No.	**Original Date**	**Latest Rev. Date**	**Title**
1-13324	12-2-55	6-4-66	Foundation Plan
RF-76-17202	12-9-55	9-19-57	Footing Schedule and Details
12571-2	1-19-56	3-18-70	Basement Plan and Sections
15232-1	4-9-64	4-2-66	Additions and Alterations Foundation Plan
15232-2	4-15-64	N/R	Additions and Alterations Foundation Sect and Details
15501-013-M	7-20-83	7-20-90	Site Utility Plans
15501-021-M	7-20-83	5-14-90	Site Utility Plans
2545-1*			

N/R = Not Recorded N/L = Not Legible * = No Drawings Found

Building No. 777			
Drawing No.	**Original Date**	**Latest Rev. Date**	**Title**
1-11142-77	12-30-55	7-16-63	Miscellaneous Foundation Details - Sheet 1
1-11143-77	1-3-56	N/L	Miscellaneous Foundation Details - Sheet 2
RF-77-17305-4	2-20-56	3-10-62	Concrete First Floor Plan
RF-AP-77-B1	7-9-64	5-27-65	East Addition Foundation and First Floor Plan
(14504-1)	7-9-64	5-27-65	East Addition Foundation and First Floor Plan
RF-AP-77-B4	7-9-64	4-27-65	Foundation and Floor Plan Sections, Remodel and Addition
(14505-1)	7-9-64	4-29-65	Foundation and Floor Plan Sections, Remodel and Addition
15501-013-M	7-20-83	7-20-90	Site Utility Plans
15501-021-M	7-20-83	5-14-65	Site Utility Plans

Building No. 778			
Drawing No.	**Original Date**	**Latest Rev. Date**	**Title**
11324-8	12-15-61	N/R	Office and Cafeteen Building - Foundation Plan
11324-9	12-15-61	N/R	Office and Cafeteen Building - Foundation Plan (cont)
14991-1	4-23-64	4-15-65	Addition - Site Plan, Foundation Plan and Details
15501-021-M	7-20-83	5-14-90	Site Utility Plans
2545-1*			

N/R = Not Recorded N/L = Not Legible * = No Drawings Found

Building No. 779			
Drawing No.	**Original Date**	**Latest Rev. Date**	**Title**
14607-2	N/L	12-14-64	Foundation and First Floor Plan
14608-1	N/L	12-14-64	Column and Footing Schedules
14608-2	N/L	12-14-64	Basement Slabs, Sections and Details
20112-01	6-19-67	9-12-68	Grading and Drainage Plan - Addition
20142-01	6-19-67	9-12-68	Foundation and First Floor Plan - Addition
20143-01	6-13-67	9-12-68	Footing Schedule and Details
20143-02	6-19-67	9-12-68	Foundation Details - Addition
20143-03	6-19-67	9-12-68	Foundation Details - Addition
25581-7	6-13-75	12-9-75	Foundation Drain Plan
15501-021-M	7-20-83	5-14-90	Site Utility Plans
15501-013-M	7-20-83	7-20-90	Site Utility Plans
20112-04*			Grading and Drainage Plan

Building No. 788			
Drawing No.	**Original Date**	**Latest Rev. Date**	**Title**
28883-003			Site Grading Plan
28883-007			Plan and Foundations
28883-008			Elevations and Sections
28883-009			Sectional Elevations
28883-020			Foundation Plan and Details
28883-021			Foundation Plan and Details
28883-051-01D			General Piping Arrangement
37665-040			Foundation Plan - Bldg 788 Expansion
37665-041			Foundation Sections and Details - Bldg 788 Expansion
37665-101			Architectural Elevations - Bldg. 788 Expansion
39041-107			Roof Framing/Foundation Plan - Mustang Pumper Shelter

N/R = Not Recorded N/L = Not Legible * = No Drawings Found

Building No. 850			
Drawing No.	Original Date	Latest Rev. Date	Title
28234-103	2-15-82	12-16-85	Site Plan
28234-106	2-15-82	12-16-85	First Floor Plan
28234-309	3-20-82	12-16-85	Plumbing Site Plan
15501-053-M	7-20-83	7-20-90	Site Utility Plans

Building No. 865			
Drawing No.	Original Date	Latest Rev. Date	Title
21112-01	8-?-68	6-12-72	Plot and Drainage Plan
21112-02	8-?-68	6-12-72	Plot and Drainage Plan
21112-03	8-?-68	6-12-72	Plot and Drainage Plan
21141-01	6-21-68	6-15-72	Cast-in-Place Pile Plan
21141-03	8-1-68	6-15-72	Foundation and Floor Slab Plan - Part A
21141-04	8-1-68	8-2-72	Foundation and Floor Slab Plan - Part B
21141-05	8-2-68	6-15-72	Foundation and Floor Slab Plan - Part C
21141-06	8-2-68	6-15-72	Foundation and Floor Slab Plan - Part D
21141-07	8-2-68	6-15-72	Foundation and Floor Slab Plan - Part E
21141-08	8-3-68	6-15-72	Foundation and Floor Slab Plan - Part F
21143-07-A	11-2-68	6-14-72	Process Waste Pit Plan and Sections
21151-03-C	11-22-68	9-11-75	Office Above Ground Plumbing Plan
21151-04-A	11-22-68	6-14-72	General Shop Area Underground Plan
21151-05-B	2-28-69	7-10-72	General Shop Area Above Ground Plumbing Plan
15501-043-M	7-20-83	7-20-90	Site Utility Plans

Building No. 881			
Drawing No.	**Original Date**	**Latest Rev. Date**	**Title**
RF-81-Y2-B	12-14-51	7-23-53	Excavation Plan
1-11609-81	1-24-52	5-23-63	Plot Plan
RF-81-F1	1-24-52	10-8-53	Foundation Plan, Bldg 81
RF-81-F2-C	1-24-52	7-23-53	Foundation Schedule and Details
RF-81-100	3-12-52	7-23-53	Storm and Sanitary Drains
RF-81-F7-K	4-4-52	7-23-53	Foundation Details, Bldg. 81
RF-81-109-B	5-16-52	7-23-53	Mezzanine Equipment Drains and Water Supply
RF-FS-21951*	3-9-56		Foundation Drain Lines for 883 and 881
25581-2	6-13-75	12-9-75	Foundation Drain Plan
15501-054-M	7-20-83	7-20-90	Site Utility Plans
38548-128	1-18-91	1-18-91	Collection Gallery and Pipeline Location Plan
38548-137	1-14-91	1-18-91	Civil Details
50026-100	10-28-91	N/L	Drainage Ditch Improvements

Building No. 883			
Drawing No.	**Original Date**	**Latest Rev. Date**	**Title**
1-5373-83	12-9-55	1-20-65	Foundation Plan
RF-FS-21951	3-9-56	N/R	Foundation Drain Lines for 883 and 881
1-5162-83	5-28-58	6-5-58	Foundations Floor Plan and Details - Addition
1-5169-83	5-22-58	6-5-58	Electric, Sprinklers, Lightning Prot and Details - Addition
RF-14250-2	8-10-65	6-30-67	Area Drainage Plan
20612-41-A	11-?-68	10-19-71	Plot and Drainage Plan
25581-9	6-13-75	12-9-75	Foundation Drain Plan
15501-043-M	7-20-83	7-20-90	Site Utility Plans
28483-204	11-21-83	4-6-86	Foundation Sections - Addition
28483-022	7-6-84	2-6-86	Sump Discharge Line

N/R = Not Recorded N/L = Not Legible * = No Drawings Found

Building No. 886			
Drawing No.	**Original Date**	**Latest Rev. Date**	**Title**
14825-4	11-12-63	5-19-63	Miscellaneous Sections and Details
14825-1	3-12-64	5-19-65	Foundation Plan and Sections
17242	9-27-65	N/R	Sump Pump Installation
18497-2	1-17-68	3-5-69	Foundation Plan and Details
23482-302	8-28-72	3-?-75	Grading Plan
23482-304	8-28-72	3-?-75	Drainage Plan and Details
25925-1	7-15-77	8-30-77	Subsurface Drainage Control (Underground Drains)
25925-2	7-15-77	8-30-77	Subsurface Drainage Control (Profile and Sections)
25925-3	5-11-77	8-30-77	Subsurface Drainage Control (Grading and Drainage Plan)
25925-X01	8-2-77	8-30-77	Subsurface Drainage Control (Title Sheet)
25925-X02	8-2-77	8-30-77	Subsurface Drainage Control (Area Plot Plan)
15501-043-M	7-20-83	7-20-90	Site Utility Plans
15501-044-M	7-20-83	7-20-90	Site Utility Plans

Building No. 887			
Drawing No.	**Original Date**	**Latest Rev. Date**	**Title**
RF-81-F9-E	5-29-52	7-?-78	Foundation Plan - Sections and Details Bldg 81
RF-81-F10-G	5-29-52	7-?-79	Sections and Details Bldg 81
15501-054-M	7-20-83	7-20-90	Site Utility Plans
50026-100	10-28-91	N/L	Drainage Ditch Improvements
50498-401	11-25-92	3-31-93	Sewage Life Pump Piping Plans and Details

Building No. 889			
Drawing No.	**Original Date**	**Latest Rev. Date**	**Title**
RF-BP-14286-2	5-7-66	9-15-67	Foundation and Framing Plans

N/R = Not Recorded N/L = Not Legible * = No Drawings Found

Building No. 910			
Drawing No.	**Original Date**	**Latest Rev. Date**	**Title**
15501-022-M	7-20-83	7-20-90	Site Utility Plans
39365-X011	5-15-93	5-20-93	Basement Floor Piping Plan Demolition

Building No. 991			
Drawing No.	**Original Date**	**Latest Rev. Date**	**Title**
1-3354-91	7-31-51	8-29-52	Plumbing and Service Pipeline - Utility Tunnel Plan
RF-91-F1-C	7-27-51	9-24-51	Footing and Foundation Plan
RF-91-F2-C	7-23-51	N/L	Column and Footing Schedule and Details
RF-91-S9-C	8-8-51	9-24-51	Wall Sections
15708-1	8-15-51	2-24-67	Plot Plan
1-7084-91A	6-15-59	7-10-59	Access Door Details
RF-BY-15928-2-B	8-21-67	3-6-68	Grading and Location Plan
15928-8-B	10-31-67	3-6-68	Repave Dock Area, Bldg 91 Subdrainage System
25581-10	6-13-75	12-9-75	Foundation Drain Plan
15501-023-M	7-20-83	6-14-90	Site Utility Plans
15501-032-M	7-20-83	7-20-90	Site Utility Plans

Building No. 995			
Drawing No.	**Original Date**	**Latest Rev. Date**	**Title**
20741-30	6-21-68	9-2-70	Sludge Drying Bed Plan and Sections
20741-31	5-17-68	9-2-70	Sewage Plant Addition Clarifier and Digester Plans
20741-32	5-17-68	9-2-70	Sewage Plant Addition Sections
20741-33	8-29-68	9-2-70	Sewage Plant Addition - Sections and Details
20712-61	7-?-68	9-11-70	Plot and Grading
20722-61	9-?-68	9-2-70	Piping Plan
15501-024-M	7-20-83	6-14-90	Site Utility Plans
38922-101	10-19-89	10-25-89	Foundation Plan

N/R = Not Recorded N/L = Not Legible * = No Drawings Found

Building No. 996/997/999			
Drawing No.	**Original Date**	**Latest Rev. Date**	**Title**
RF-99-17701	1-13-56	6-6-56	Concrete - Plans and Sections
RF-99-17702	1-13-56	6-6-56	Concrete - Sections and Details
13812-1	N/R	3-11-68	Floor Plan - Floor Slab - Roof Slab and Wall Sections
13812-3	N/R	3-11-68	Tunnel Plan - Elevations and Sections Bldg. 96 and 97
13812-5	N/R	3-11-68	Floor Plan - Sections Bldg 96 and 97
25581-12	6-13-75	12-9-75	Foundation Drain Plan
15501-022-M	7-20-83	7-20-90	Site Utility Plans
15501-023-M	7-20-83	6-14-90	Site Utility Plans

Building No. 998			
Drawing No.	**Original Date**	**Latest Rev. Date**	**Title**
RF-98-A1	7-30-51	9-28-52	Plan and Details
RF-98-S2	9-13-51	9-28-52	Concrete Tunnel Details to Bldg 98
15708-1	8-15-51	2-24-67	Plot Plan
25581-11	6-13-75	12-9-75	Foundation Drain Plan
15501-023-M	7-20-83	6-14-90	Site Utility Plans

Miscellaneous Drawings			
Drawing No.	**Original Date**	**Latest Rev. Date**	**Title**
25581-1	12-9-75	12-9-75	Foundation Drain Plan - Drain Terminating Points
27550-002	8-25-80	5-4-82	Perimeter Security Zone
27550-024	9-18-80	5-6-82	Perimeter Security Zone
27550-033	9-18-80	4-30-82	Perimeter Security Zone
27550-040	9-18-80	5-10-82	Perimeter Security Zone
27550-050	8-25-80	5-10-82	Perimeter Security Zone
27550-098	8-25-80	5-10-82	Perimeter Security Zone
27550-112	9-18-80	5-11-82	Perimeter Security Zone

N/R = Not Recorded N/L = Not Legible * = No Drawings Found h:\home\swaldrawings.out

APPENDIX B

Conversation Confirmers

JACOBS ENGINEERING GROUP INC.
DENVER OPERATIONS

CONVERSATION CONFIRMER

BY DAVID LANDES TIME 1020 AM ____ PM DATE 2-15-94

PROJECT 018 DRAIN IDENTIFICATION PROJECT NO 2-HECK

☒ TELEPHONE CALL
☐ OFFICE MEETING
☐ OTHER ____

CONVERSATION WITH STELE BARRES
COMPANY EG&G SWD
TEL NO 966 5288

SUBJECT Building 779 Sampling Location

The catch which has been sampled in the past may not be the correct catch. The catch which may be the true catch is located just to the east of FD 779.1 and has a surface water sampling location until about 1 year (or year) ago. The site is SW89 and data should exist in REEDS.

The sampling program is still not required for regulatory compliance but is driven by DOE Order 5400.1

FD 559/561 IS NOT BEING SAMPLED BECAUSE THE WATER IS BEING ROUTED TO THE SANITARY SEWER.

ACTION ____

DISTRIBUTION ____

JACOBS ENGINEERING GROUP INC
DENVER OPERATIONS

CONVERSATION CONFIRMER

BY David Landes TIME 10:00 AM ____ PM DATE 2-10-94

PROJECT 048 Drain Identification PROJECT NO 05H60020

☒ TELEPHONE CALL
☐ OFFICE MEETING
☐ OTHER ____

CONVERSATION WITH Jerry Bentzinger
COMPANY E666 (Bldg 776 Utilities)
TEL NO 966-4000 x1493 (Page)

SUBJECT Existence of Drains on Buildings 776/777

He is not aware of any foundation drains on the buildings. The only flooding problems he is aware of is in the tunnel which leads to Bldg. 771.
He is going to ask around to other building personnel about drains and groundwater infiltration.
He recommended calling Jeff Higley at x3561 for questions about Bldg. 771

ACTION ____

DISTRIBUTION ____

JACOBS ENGINEERING GROUP INC
DENVER OPERATIONS

CONVERSATION CONFIRMER

BY T. CA — TIME 8 O (AM) PM DATE 12-2-93

PROJECT RFCA FACTS U 2 PROJECT NO. 05H60300

☒ TELEPHONE CALL
☐ OFFICE MEETING
☐ OTHER

CONVERSATION WITH MARK BURMEISTER
COMPANY EG&G
TEL NO 966-5801

SUBJECT BUILDING 881

(1) IF OUTFALL OF FOOTING DRAINS ROUTED TO OU1?
yes, this

(2) ARE THERE ANY FLOW MEASUREMENTS OF 881 OUTFALL?
recent data from 881 outfall on 1-10 data from earlier years.

ACTION

Mark to fax outfall data to TC today.

DISTRIBUTION

JE JACOBS ENGINEERING GROUP INC
DENVER OPERATIONS

CONVERSATION CONFIRMER

BY I C Wait TIME ____ AM 1:28 (PM) DATE 12-2-93

PROJECT Rocky Flats IM/IRA PROJECT NO 05H60300

☒ TELEPHONE CALL
☐ OFFICE MEETING
☐ OTHER ____

CONVERSATION WITH Russ Cirillo
COMPANY EG&G
TEL NO 9666-5876

SUBJECT ____

881 Flow readings - flowmeter data is bad because instruments have de-calibrated over time.

Russ gave approximate flow measurements as follows:

Jan, Feb. ≈ 4.0 → 4.25 GPM
March, April, May ≈ 7 0 GPM
June, July, Sept., Oct. ≈ 2.3 GPM (DRY SEASON)
Nov, Dec. ≈ 3 5 GPM

ACTION ____

DISTRIBUTION BJ
MV.
DL.

JACOBS ENGINEERING GROUP INC.
DENVER OPERATIONS

CONVERSATION CONFIRMER

BY DAVID LANDES TIME 8 40 AM ____ PM DATE. 12/21/93

PROJECT CU8 IM/IRA PROJECT NO. 05H60020/05H6030

☒ TELEPHONE CALL
☐ OFFICE MEETING
☐ OTHER ____

CONVERSATION WITH LESLIE DUNSTAN
COMPANY EG&G SURFACE WATER DIVISION
TEL. NO 966-2002

SUBJECT SAMPLING PROGRAM FOR FOUNDATION DRAINS AND BUILDING SUMPS

LESLIE MANAGES THE DATA FOR THE SAMPLING PROGRAM. SHE JOINED THE SURFACE WATER PROGRAM IN 1988. PROGRAM (FD AND BS) BEGAN IN THE 1970's BUT ONLY HAS ANALYTICAL DATA FROM 1988 TO PRESENT. SHE HAS NEVER SEEN DATA FROM PRIOR TO 1988 AND DOESN'T KNOW IF ANY EXISTS. SHE WAS UNDER THE IMPRESION THAT THE DRAINS WERE SAMPLED QUARTERLY SINCE THE PROGRAM BEGAN. SHE SAID IF THE DATA EXISTS IT WOULD BE IN THE "ENVIRONMENTAL MASTER FILE."

SHE STATED THAT THE PROGRAM WAS INITIATED AS AN INTERNAL MONITORING PROGRAM AND WAS NOT REQUIRED BY REGULATORY AGENCIES CONSEQUENTLY IT WAS A LOW PRIORITY PROGRAM AND MAY HAVE BEEN PUT ON HOLD "WHEN THINGS GOT HECTIC".

LESLIE RECOMMENDED CONTACTING NANCY KIRK (HOFFMAN) FOR INFORMATION ABOUT THE PROGRAM WHEN IT BEGAN.

ACTION LEFT A MESSAGE FOR NANCY TO CALL. 273-6167 DENVER WEST

DISTRIBUTION. ____

JACOBS ENGINEERING GROUP INC
DENVER OPERATIONS

CONVERSATION CONFIRMER

BY Karen Hancock TIME ____ AM 3 10 PM DATE 3/30/94

PROJECT ____ PROJECT NO 05H60208

☒ TELEPHONE CALL
☐ OFFICE MEETING
☐ OTHER ____

CONVERSATION WITH Bob Fiore

COMPANY EG&G Technical Support for PU operations at Bldg 707

TEL NO 966-8142/966-4000 x1672

SUBJECT Aboveground tank associated with IHSS 118.2 (OU8)

Asked Bob whether the 5,000 gallon aboveground carbon tetrachloride tank located between the north side of Building 707 and the alleyway South of Building 778 has been removed:

Bob said the tank has not been removed and currently contains approximately 3500 gallons of liquid. He knows of no plans for removal

ACTION ____

DISTRIBUTION ____

JACOBS ENGINEERING GROUP INC.
DENVER OPERATIONS

CONVERSATION CONFIRMER

BY TC Wait, Theresa Jehn-Dellwort, Mike Jocky, Dave Landes TIME 10 45 (AM) PM DATE: 12/6/93

PROJECT ~~Rocky Flats IM/IRA~~ PROJECT NO OSH60300

☐ TELEPHONE CALL
☐ OFFICE MEETING
☒ OTHER Site walk #2 Conversation

CONVERSATION WITH Frank Gibbs
COMPANY EG&G
TEL. NO. N/A

SUBJECT 559 Footing Drain

Mr Gibbs approached us on our site walk while we were trying to trace the green hose from the manhole by 559/561 to building 560.

Mr Gibbs said the hose pumps water from FD 559/561 to the Sewer System at about 300 gal/day.

The water is sampled quarterly and reads about 200 ppb of Carbon Tetra Chloride.

We were advised to check with building personnel before field checking, especially in the P.A.

ACTION

DISTRIBUTION

JACOBS ENGINEERING GROUP INC
DENVER OPERATIONS

CONVERSATION CONFIRMER

BY David Landes TIME 1005 AM ____ PM DATE 2-03-94

PROJECT 018 Drain Identification PROJECT NO ____

☒ TELEPHONE CALL
☐ OFFICE MEETING
☐ OTHER ____

CONVERSATION WITH Carl Gibson
COMPANY EG&G 779 Utils. Manager.
TEL NO Page x 1062

SUBJECT Foundation Drains on Building 779

Carl is not aware of any drains or groundwater collection system around the basement structure. He says that there is a problem with groundwater infiltration during the high water table months. There are some concrete tanks beneath the basement floor which extend down approximately 30' below the floor. Groundwater does infiltrate through cracks in the tanks. The tanks are checked daily and pumped out when needed. The water is pumped to Bldg 776 and then to Bldg. 374 for treatment. There is a sump located east of Bldg 779 which discharges to sanitary sewer. He is uncertain of the source of water in the sump but is going to check his drawings for me.
He is unaware of any drains on Bldg. 776 but knows that there is a problem with groundwater infiltration there also. He recommended that I contact Mr Jerry Benzinger about utilities in that building. (Page x 1493)
Carl records the quantity of water pumped out of the tanks below the basement in a log book. and has been doing so for ~ 4 years.

ACTION ____

DISTRIBUTION Theresa Jehn-Dellaport
Dave Beehler
Mike Visocky
T.C. Wait
Farrel Hobbs

PRINTED ON RECYCLED PAPER

JE JACOBS ENGINEERING GROUP INC
DENVER OPERATIONS

CONVERSATION CONFIRMER

BY DAVID LANDES TIME. 9:00 AM ____ PM DATE 2-16-90

PROJECT 648 PROJECT NO · 6THCCCC

☒ TELEPHONE CALL
☐ OFFICE MEETING
☐ OTHER ____

CONVERSATION WITH CARL GIESEN
COMPANY EG&G 559, 779 UTILITIES
TEL. NO 966-4000 (1662 (GIESEN))

SUBJECT DRAINS ON BLDGS 779 AND 559

TANK 2A UNDERNEATH THE BASEMENT (3000 GALLON) IS THE TANK WHICH GROUNDWATER INFILTRATES INTO. THE TANK HAS FEED DRY SAND FILTER. GROUNDWATER ONLY INFILTRATES DURING THE HIGH WATER TABLE MONTHS.

THE ONLY FOUNDATION DRAINS FOR BUILDING 559 ARE AROUND THE PIT AND TUNNEL TO 561. THE OTHER TUNNEL DOES NOT HAVE DRAINS AND THE SUMP IS DRY. IF THE SUMP OUTSIDE THE BUILDING (BETWEEN 559/561) FILLS TO A DEPTH OF 6" THEN THE TUNNEL WILL FLOOD. THIS HAS ONLY HAPPENED ONCE.

ACTION ____

DISTRIBUTION ____

JACOBS ENGINEERING GROUP INC
DENVER OPERATIONS

CONVERSATION CONFIRMER

BY DAVID LANDES TIME 10 20 AM ____ PM DATE 1/4/94

PROJECT OU 8 / IM/IRA ROCKY FLATS PROJECT NO 05H60020

☒ TELEPHONE CALL
☐ OFFICE MEETING
☐ OTHER ____

CONVERSATION WITH PAUL GRABOWSKI
COMPANY E6+G
TEL NO 966-6389

SUBJECT INVERT ELEVATIONS OF DRAINS

I ASKED MR GRABOWSKI IF THE INVERT ELEVATIONS SHOWN ON THE ENGINEERING DRAWINGS CORRESPONDS TO "MEAN SEA LEVEL" ELEVATION. HE STATED THAT IN MOST CASES THE ELEVATIONS SHOWN ON THE DRAWINGS ARE TAKEN FROM A KNOWN BENCH MARK ELEVATION, WHICH DOES CORRESPOND TO MEAN SEA LEVEL ELEVATION. HOWEVER, IT HAS BEEN HIS EXPERIENCE THAT MOST OF THE ELEVATIONS GIVEN ON DRAWINGS ARE NOT ACCURATE AND HE WOULD NOT USE THEM FOR DESIGN CRITERIA. HE RECOMMENDED SURVEYING THE BUILDINGS OF INTEREST TO DETERMINE THE ACTUAL ELEVATIONS.

HE ALSO STATED THAT HE HAS WORKED WITH SEVERAL SUB-CONTRACTORS AND HAS ALREADY SURVEYED MANY OF THE CULVERTS AND OUTFALLS AROUND THE PLANT SITE. HE SAID THAT HE MAY HAVE THE ELEVATIONS FOR MANY OF THE OUTFALLS AND CULVERTS OF INTEREST FOR THIS STUDY. HE WOULD NEED A BILLING CODE TO CHECK THIS.

ACTION ____

DISTRIBUTION.
M VISOCKY
T C WALT
THERESA JEAN-DELLIPORT
BRUCE JONES
ART HIRSCH

JE JACOBS ENGINEERING GROUP INC
DENVER OPERATIONS

CONVERSATION CONFIRMER

BY: DAVID LANDES TIME 11:30 AM ____ PM DATE. 1/10/94

PROJECT OU8 - IM/IRA PROJECT NO. 0EH60020

☒ TELEPHONE CALL
☐ OFFICE MEETING
☐ OTHER ____

CONVERSATION WITH ZEKE HOUK
COMPANY EG&G OU1 MANAGER
TEL NO 966-8714

SUBJECT ZEKE STATED THAT VIDEO INSPECTION OF THE FD 444/460 OUTFALL SHOWED DOWNSPOUTS FROM ~~#~~ BUILDING 460 ROOF DRAINS TYING IN TO THE STORM DRAIN SYSTEM. HE DID NOT RECALL IF THE VIDEO SHOWED ANY FOUNDATION DRAINS FOR THE BUILDING TYING IN.

I ASKED IS HE KNEW HOW I COULD VIEW THE VIDEO TAPE AND HE STATED THAT IT MAY BE CLASSIFIED INFORMATION. HE RECOMMENDED CONTACTING ED MAST FOR INFORMATION ABOUT THE VIDEO.

ACTION ____

DISTRIBUTION. ____

JE JACOBS ENGINEERING GROUP INC
DENVER OPERATIONS

CONVERSATION CONFIRMER

BY David Landes TIME ____ AM 2 15 PM DATE 2-17-94

PROJECT Cut Fill Identification PROJECT NO C-746CC-C

☒ TELEPHONE CALL
☐ OFFICE MEETING
☐ OTHER ____

CONVERSATION WITH: Nancy Kirk
COMPANY EC+C
TEL NO 275-6167 D 4525

SUBJECT Foundation Drain Cutfalls

Nancy was involved with the program from April 1980 → July 1984
She said that the cutfalls were sampled 3 times per year or quarterly (she didn't recall for certain) during that time so there should be data somewhere.
She does recall a time period when the cutfalls were not sampled (maybe a 2 year time period) but she doesn't recall when or why they weren't sampled.
She had little recollection of the cutfalls locations and was not able to answer any specific questions.

ACTION ____

DISTRIBUTION ____

JE JACOBS ENGINEERING GROUP INC.
DENVER OPERATIONS

CONVERSATION CONFIRMER

BY DAVID LANDES TIME ~~AM~~ PM DATE 12/06/93

PROJECT IHSS 104 PROJECT NO.

☒ TELEPHONE CALL
☐ OFFICE MEETING
☐ OTHER

CONVERSATION WITH JIM KOELMEL
COMPANY EG&G 460 AREA CES
TEL NO 966-7457

SUBJECT MR KOELMEL HAD LITTLE KNOWLEDGE ABOUT THE LAYOUT OF THE STORM SEWER SYSTEM IN THE 460 AREA. HE REFERRED ME TO TOM TRUJILLO (EG&G) WHO WAS THE PROJECT ENGINEER FOR THE RE ROUTING OF THE SYSTEM.

I INQUIRED ABOUT THE BUILDING SUMP IN THE BASEMENT OF BUILDING 444 AND THE DESTINATION OF THE "WATER" IN THE SUMP HE STATED THAT HE KNOWS THAT THE FOUNDATION DRAINS DISCHARGE TO THE SUMP AND WAS NOT AWARE OF ANY OTHER DISCHARGE POINTS FOR THE DRAINS HE STATED THAT THE SUMP DISCHARGE ENTERS THE PROCESS WASTE SYSTEM AND IS TREATED AT

HE ALSO STATED THAT FOLLOWING THE CHROMIC ACID SPILL MODIFICATIONS TO THE PIPING SYSTEM WERE DONE SUCH AS RE ROUTING ONE SMALL SECTION OF PIPE HE REFERRED ME TO MISS MICKEY JOHNSON FOR INFORMATION REGARDING CHROMIC ACID INCIDENT

ACTION I WAS UNABLE TO CONTACT TOM TRUJILLO ON 12/6 HE WAS OUT OF HIS OFFICE (I WAS TOLD)
I MADE NO EFFORT TO CONTACT MS MICKEY JOHNSON

DISTRIBUTION: MIKE VISOCKY
TC WALT
DAVE BEEHLER

JACOBS ENGINEERING GROUP INC.
DENVER OPERATIONS

CONVERSATION CONFIRMER

BY David Landes TIME 10:20 AM ____ PM DATE 2-9-94

PROJECT Clay Foundation Tech. PROJECT NO C-4666-C

☒ TELEPHONE CALL
☐ OFFICE MEETING
☐ OTHER ____

CONVERSATION WITH John Lyons
COMPANY ECH SCC Area Utilities
TEL NO 966-2137

SUBJECT Foundation Drains and Sumps Bldgs 881, 865, 883

- John stated that the floor drain in the [illegible] discharge to the sump. The sump is pumped to the sanitary sewer. The sump is accessible for sampling.
- The storm drain system is for the roof drains. He is not aware of any other connections to this system.
- He is not sure of the discharge location for Bldg. 883 sump. He recalls something being done with the collect lines to discharge pipe from the sump is supposed to go. He said it may have been buried.
- He doesn't know anything about the vault on the west side of Bldg. 865. He said that it is contaminated in the vault but is not knowledgeable about the piping in that vault.

ACTION ____

DISTRIBUTION ____

JE JACOBS ENGINEERING GROUP INC.
DENVER OPERATIONS

CONVERSATION CONFIRMER

BY DAVID LAIDES TIME 9 00 AM ____ PM DATE 1-12-94

PROJECT OU8 RFP DRAIN IDENTIFICATION PROJECT NO 05H60020

☒ TELEPHONE CALL
☐ OFFICE MEETING
☐ OTHER ____

CONVERSATION WITH ED MAST
COMPANY. EG+G
TEL NO 966-8589

SUBJECT I ASKED ED IF I COULD VIEW THE VIDEOTAPE OF THE INSPECTION OF THE FD 444/460 OUTFALL. HE SAID THAT THE VIDEO IS NOT CLASSIFIED INFORMATION AND THAT I COULD VIEW IT. HE SAID THAT HE WOULD CALL MR. DOUG DENNISON AT A.S.I. AND ARRANGE FOR ME TO GET A COPY OF THE TAPE.

ACTION I PHONED DOUG DENNISON AND ARRANGED TO PICK UP A COPY OF THE VIDEO AND THE DOCUMENTATION WHICH GOES ALONG WITH IT. DOUG SAID THAT I COULD MAKE A COPY OF THE VIDEO IF JACOBS DESIRES. I WILL PICK ~~THE~~ UP THE INFORMATION ON 1/15/94

DISTRIBUTION THERESA JEHN-DELLAPORT
FARREL HOBBS

37d160

JACOBS ENGINEERING GROUP INC.
DENVER OPERATIONS

CONVERSATION CONFIRMER

BY DAVID LANDES TIME ____ AM ____ PM DATE 12/02/93
PROJECT IM IEA IOU PROJECT NO ____

☒ TELEPHONE CALL
☐ OFFICE MEETING
☐ OTHER ____

CONVERSATION WITH LEON McGOVERN
COMPANY EG&G CIVIL ENGINEERING
TEL. NO 966-4874

SUBJECT I ASKED MR McGOVERN FOR ASSISTANCE IN LOCATING "AS-BUILT" DRAWINGS FOR THE RE-ROUTING OF THE STORM SEWER SYSTEM IN THE 400 AREA AND HE STATED THAT DOCUMENT CONTROL SHOULD HAVE THE DRAWINGS AND SUGGESTED PERFORMING A DATABASE SEARCH USING THE KEYWORD 'OUTFALL' HE SAID IF JACOBS NEEDED FURTHER ASSISTANCE FROM THE ENGINEERING DEPARTMENT THAT MARK BUDDY WOULD HAVE TO CONTACT HIM AND GIVE AUTHORIZATION AND A BILLING CODE.

I INQUIRED ABOUT THE BUILDING 371/374 FOUNDATION DRAIN CUT... AND HE STATED THAT HE HAD NO KNOWLEDGE OF THAT I.E.I. BE ROUTED. HE SAID THAT OUTFALL #2 SHOULD NOT BE SEA... IT SHOULD STILL BE FUNCTIONING PROPERLY. HE SAID THAT THE ... WAS CLEANED OUT APPROX. ONE WEEK AGO

MR McGOVERN ALSO STATED THAT AN EXTENSIVE SURVEY ... STORM DRAIN SYSTEM FOR ALL OF PLANT SITE WAS RECENTLY ... AND THE VIDEO TAPE IS AVAILABLE (APPROX 24 HRS ...

ACTION I WAS UNABLE TO LOCATE THE DRAWINGS FOR THE RE... OF THE 400 AREA STORM SEWER SYSTEM. THE DATA... SEARCH USING THE KEYWORD "OUTFALL" REVEALED NO DRAWINGS. I DISCONTINUED MY SEARCH FOR THESE DRAWINGS.

DISTRIBUTION
MIKE VISOCKY
T C WAIT
ART HIRSCH
FARREL HEBES
DALE BEEHLER

JE JACOBS ENGINEERING GROUP INC
DENVER OPERATIONS

CONVERSATION CONFIRMER

BY DAVID LANDES TIME ____ AM 2:30 PM DATE 2-17-94

PROJECT CO.X Drain Identification PROJECT NO 0THCCCZC

☒ TELEPHONE CALL
☐ OFFICE MEETING
☐ OTHER ____

CONVERSATION WITH Ron Steckline
COMPANY EC&C 460 AREA UTILITIES
TEL. NO 966 4000 D C46C

SUBJECT FOUNDATION DRAINS IN THE 460 AREA

- Building 46C does not have any foundation drains

- The pipe which I suspected to be the inlet to the sump is the inlet. He is not aware of any other discharge locations for the drain. There are no other inlets to the sumps. He wasn't sure what Area Bldg E is but thinks he knows what I was referring to. He said he was told that there is a process waste vault located there but is not aware of any connection to the ED

- The cooling tower west of 46C has a gravity drain to the Sanitary Sewer. ~~He has~~ Ron has no idea what the 6" ID pipe entering the manhole is connected to

ACTION ____

DISTRIBUTION ____

JACOBS ENGINEERING GROUP INC.
DENVER OPERATIONS

CONVERSATION CONFIRMER

BY: DAVID CARDES TIME 11 30' AM PM DATE 1/24/94

PROJECT CW8 DRAIN IDENTIFICATION STUDY PROJECT NO 65H6CC3C

☒ TELEPHONE CALL
☐ OFFICE MEETING
☐ OTHER

CONVERSATION WITH TYLER SMART
COMPANY ADVANCED SCIENCES INC (ASI)
TEL NO 980-CC36

SUBJECT 400 AREA STORM SEWER & DEC INSPECTION

Tyler said that the figure which shows the layout of sewer system was generated before the work began in order to get the IWCF permit. The figure was not revised after the work was completed. The segment of pipe between MH 6 and MH 21 does not exist. A 6" pipe does enter MH 6, which had a continuous flow, but that pipe comes from building 440 (Roger Wisehart told him this)

- He said that the downspout entering the pipe on the west side of 400 are from roof drains based on visual observation. The scope of their work was not to verify pipes entering the system and they did not attempt to determine the origins.
- Manhole 4.6 (on figure) are such that he does not recall a connection from the 124 FD discharge
- The 6" pipe entering MH 5 is connected to a pump of some kind. During the work the pump turned on and water flowed from the pipe at a high velocity. He said it may be associated with an air conditioning unit which is located nearby because he was told the discharge from that unit was pumped.

ACTION

DISTRIBUTION

JACOBS ENGINEERING GROUP INC.
DENVER OPERATIONS

CONVERSATION CONFIRMER

BY Mike Visocky TIME 2:45 ~~AM~~ PM DATE 12/1/93

PROJECT OU-9 OPWL PROJECT NO: CSH60020

☒ TELEPHONE CALL
☐ OFFICE MEETING
☐ OTHER

CONVERSATION WITH Bldg 774 Rick WAGNER
COMPANY EG&G RFP
TEL NO 966-3102

SUBJECT IM/IRA Footing drains, & OU-9 TANKS & SUMPS

Rick Wagner says that when the new construction of Bldg 774 occured, the Footings & walls diverted the groundwater flow path into the Bldg. The 774 Foundation drain that flows to the north is not plugged up. Engineering has tested the line to prove this. ground water is presently seeping into the Basement of 774. There is a sump in Room 103 that collects inflow water. water is then treated (Precipitation with $FeSO_4$) and then sent to Bldg 374. sludge is made into cocic Bldg 774 also treats process water from Bldg 771 & what is known a Bottled Water Treatment Flow is as described as above 774 did treat organics at one time, early system was known as the Jelly Plant and the latter as OASIS 774 will accept water up to 100,000 pC/L.

ACTION

DISTRIBUTION:

JACOBS ENGINEERING GROUP INC
DENVER OPERATIONS

CONVERSATION CONFIRMER

BY DAVID LARDES TIME _____ AM 4:45 PM DATE 5-16-94

PROJECT CUS DRAL IDENTIFICATION PROJECT NO C5H6C2C3

☒ TELEPHONE CALL
☐ OFFICE MEETING
☐ OTHER _____

CONVERSATION WITH TOM TRUJILLO
COMPANY EG&G CIVIL ENGINEERING
TEL NO 966-5428

SUBJECT REROUTING / CONSTRUCTION OF OUTFALL FD 444/460

TOM SAID THAT THE OUTFALL WAS CONSTRUCTED IN 1987
THE PROJECT WAS COMPLETED IN AUGUST OR SEPTEMBER.

ACTION

DISTRIBUTION

JE JACOBS ENGINEERING GROUP INC.
DENVER OPERATIONS

CONVERSATION CONFIRMER

BY DAVID LANDES TIME 9 25 AM PM DATE 1/28/94

PROJECT CUS DRAIN IDENTIFICATION PROJECT NO 05H6022

☒ TELEPHONE CALL
☐ OFFICE MEETING
☐ OTHER

CONVERSATION WITH RICK WAGNER
COMPANY EG+G
TEL NO 966-3102

SUBJECT BUILDING 774 SUB DRAIN SYSTEM

Because of the flooding of the basement following the construction of the WASTE TREATMENT ADDITION (NORTH SIDE) a groundwater accumulation system (well sump) was installed in Room 103 (Details of sump shown on Dwg 24655-47C). The sump is about 3 feet below the finished floor. The discharge from the sump is to the 200 series tanks and is eventually treated in Building 374.

Rick thinks the system was installed in 1987 or 1988 very shortly after the addition was constructed.

He said that to his knowledge, all of the foundation drainage discharges to the small pond north of the building.

ACTION

DISTRIBUTION

JACOBS ENGINEERING GROUP INC
DENVER OPERATIONS

CONVERSATION CONFIRMER

BY David Landes TIME 0930 AM ____ PM DATE 2-03-94

PROJECT ____ PROJECT NO ____

☐ TELEPHONE CALL
☒ OFFICE MEETING
☐ OTHER ____

CONVERSATION WITH Dave Webb
COMPANY E606 Bldg. 124 Manager
TEL NO ____

SUBJECT Foundation Drains on Building 124

The manhole on the East side of the Bldg. is dry and there is no discharge into it. A sump is located next to the manhole and all drains discharge to this sump. The sump discharges to the basins east of the Buildiak which are part of the backwash treatment system. All wastewater from the backwash system is pumped to the cooling towers in the 400 area. From there the water is distributed around plant site for process needs.

The only chemicals stored in the building are those that are used for the water treatment (potable)

A 25 gallon diesel fuel tank is located in the ~~basement~~ D/2 Basement of the Bldg. If this tank leaked the fuel could enter the sump. There are two areas within the backwash treatment system where the fuel could be contained in the event of a spill.

ACTION ____

DISTRIBUTION Theresa Jehn-Dellaport
Dave Beehler
T. C Wait

PRINTED ON RECYCLED PAPER

JACOBS ENGINEERING GROUP INC
DENVER OPERATIONS

CONVERSATION CONFIRMER

BY DAVID LANDES TIME 950 AM ____ PM DATE 2-9-94

PROJECT CU8 PROJECT NO. 05HCLC-2C

☒ TELEPHONE CALL
☐ OFFICE MEETING
☐ OTHER ____

CONVERSATION WITH RICK WAGNER
COMPANY EG+G BLDG 774
TEL NO 966-3102

SUBJECT GROUNDWATER ACCUMULATION SYSTEM IN BLDG 774

RICK STATED THAT THE QUANTITY OF WATER PUMPED BY THE GROUNDWATER ACCUMULATION SYSTEM VARIES FROM 3,500 - 6,000 GALLONS PER MONTH

ACTION ____

DISTRIBUTION. ____

JACOBS ENGINEERING GROUP INC.
DENVER OPERATIONS

CONVERSATION CONFIRMER

BY TC WAIT TIME 8 20 (AM) PM DATE 12-2-93

PROJECT ROCKY FLATS IN/12- PROJECT NO 0546003CC

☒ TELEPHONE CALL
☐ OFFICE MEETING
☐ OTHER

CONVERSATION WITH SHARON WILSON
COMPANY EG&G
TEL NO 966-4193

SUBJECT BLDG 991 FOUNDATION DRAIN

① VERIFY THAT FD-991-1 HAS BEEN REROUTED TO THE BUILDING SUMP.

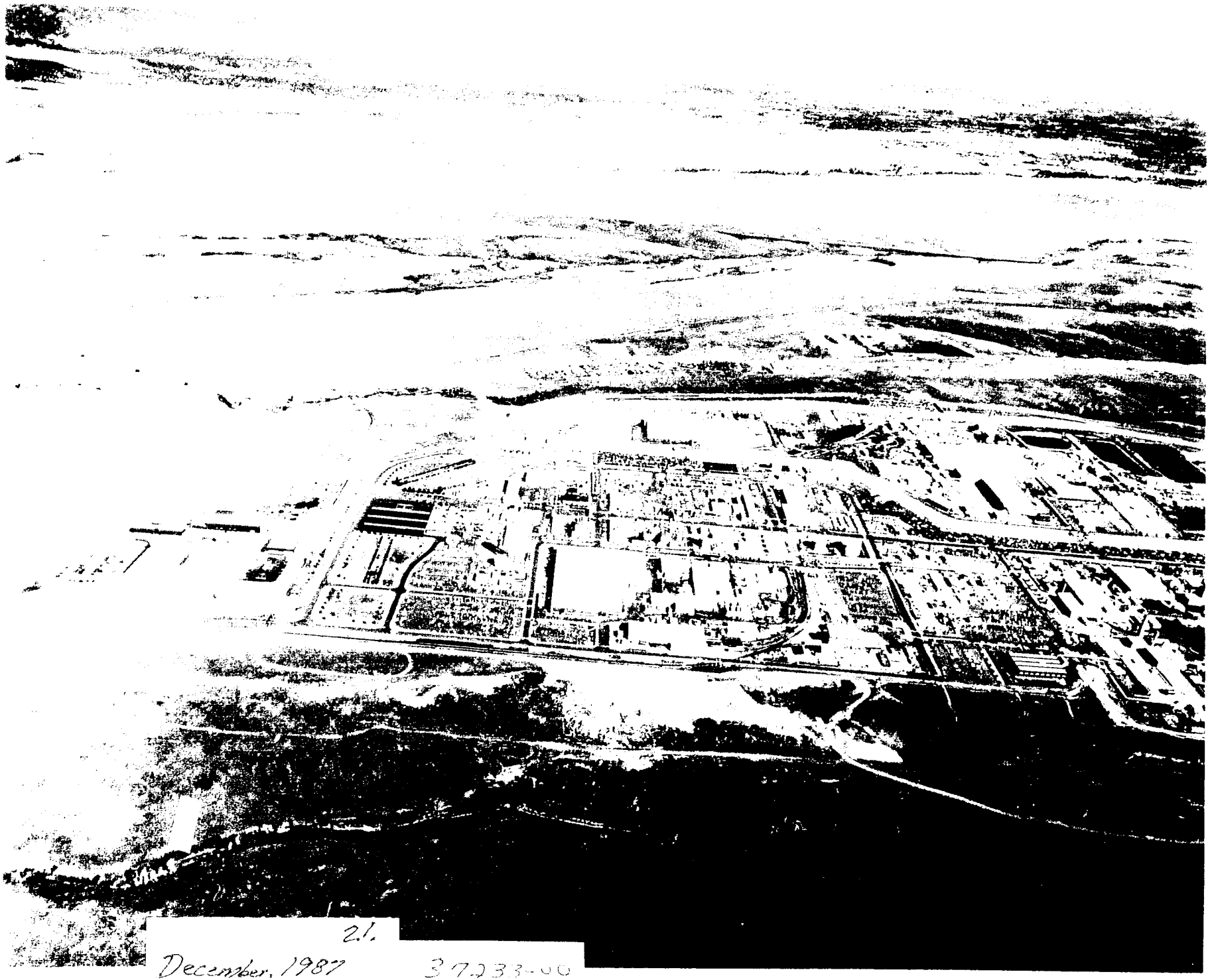
ACCORDING TO SHARON, WHO'S BEEN BUILDING MANAGER FOR 10 YRS, THIS IS NOT DOCUMENTED AND SHE DOES NOT RECALL ANY REROUTING. SHE BELIEVES THAT PART, IF NOT ALL, THE FD-991-1 IS GOING TO BLDG 990(?) AS PART OF THE SEWER SYSTEM.

ACTION

DISTRIBUTION

20

051-27-34 August 6, 1986



2.1.

December, 1987 37233-00

APPENDIX D

Water Table Measurements in Industrial Area Monitoring Wells
Spring and Fall 1992

APPENDIX D – Water-Level Measurements in Industrial Area Monitoring Wells, Spring and Fall 1992

WELL	DTW	DATE	STATE NORTH	STATE EAST	COMPLETION UNIT/LITH	SURFACE ELEV.	TOP OF CASING	TD CSG	TOP SCRN	BOT SCRN	TOP BEDROCK	WLE
1386	4 38	02-APR-92	751857	2086051	Qc	5840 47	5842 59	9 50	3 09	9 50	9 00	5838.2
1486	11 69	02-APR-92	751856	2085838	Kas & Kaclst	5844 71	5846 71	55.36	39 42	55 36	11 00	5835 0
1586	5 62	02-APR-92	751852	2085812	Qc	5848 43	5850 63	14 44	4 09	14 44	12 50	5845 0
1686	5 46	02-APR-92	751747	2085260	Kstss	5867.92	5869 55	45 06	39 06	45 06	7 00	5864 1
1786	5 37	02-APR-92	751740	2085242	Qc	5868 43	5869 57	13 96	3 73	13 96	12 50	5864.2
1886	8 83	02-APR-92	751522	2085831	Qc	5885 75	5887 97	7 50	3 74	7 50	8 00	5879 1
1986	2 34	02-APR-92	750894	2083296	Kclst	5943 06	5943 86	12.25	3 00	12.25	11 50	5941 5
2186	32 67	02-APR-92	750855	2082501	Kas & Kaltclst	6004 76	6005 96	67.25	35 00	67.24	15 00	5973 3
2286	7 12	02-APR-92	750718	2084411	Qrf	5978 77	5979 55	11.20	3.20	11.20	11 00	5972 4
2386	83 93	02-APR-92	750338	2084259	Kalt & Kaltclst	5982 46	5982 46	117.25	113 00	117.25	8 20	5898 5
2486	7 55	02-APR-92	750338	2084277	Qrf	5982 45	5983 56	7 45	2.95	7 45	7.20	5976 0
2586	30 43	03-APR-92	750412	2084831	Kaltclst & Kclst	5975.24	5977 14	82 00	59.90	82 00	8 00	5946 7
2686	9 96	03-APR-92	750411	2084841	Qrf	5975 42	5977 17	11 00	3 75	11 00	10 50	5967.2
2786	80 62	02-APR-92	750781	2085238	Kaslts & Kaclst	5982 89	5983 88	133 00	126.50	133 00	11 00	5883 3
2986	7 43	02-APR-92	750599	2085687	Qrf	5959 58	5960 68	8 77	2 83	8 77	8 50	5953 3
3086	3 93	02-APR-92	751078	2084921	Kclst	5957 42	5958 39	14 93	2 48	14 93	2 50	5954 5
3186	DRY	02-APR-92	751051	2084764	Kas & Kalt	5964.96	5967 05	17 32	2 46	17 32	0 50	5967 1
3286	59 09	02-APR-92	751050	2084743	Kas & Kstss	5966 06	5967 92	125 50	114.90	125 50	1 00	5908 8
3386	5 97	02-APR-92	749950	2085003	Qrf	5951 40	5952 42	7 34	2.99	7 34	6 80	5946 5
4486	6 25	06-APR-92	749254	2082234	Qrf	6019.93	6021 96	26.25	3.23	26.25	25 50	6015 7
6186	8 88	06-APR-92	749198	2083717	Qrf	5999 47	6000 60	12.25	5 00	12 00	11 50	5991 7
0187	7 92	03-APR-92	748127	2083653	fill	5992 49	5994 08	12 06	3.38	11 83	11 80	5986.2
0587	43 62	01-APR-92	748081	2084849	Kas & Kstss	5927.85	5929 99	51 50	42 00	51.25	11 00	5886 4
1287	5 58	03-APR-92	748581	2086066	Kcslt	5934 81	5936 30	10.24	4.91	10 01	3 50	5930 7
2187	10.24	02-APR-92	749969	2085799	Qc	5928 43	5929 69	10 56	3.26	10 41	8 00	5919 5
2287	80 46	02-APR-92	749924	2085822	Kas & Kalt	5931 18	5932 80	88 70	81 41	88 46	12 80	5852 3
3787	5 92	02-APR-92	750494	2085224	Qrf	5967 52	5968 99	9 00	3.50	8 77	8 00	5963 1
3887	8 47	03-APR-92	750396	2085094	Qrf	5972 15	5973 90	9 50	3.50	9.27	7 80	5965 4
3987	84 88	02-APR-92	751081	2085268	Kaslt & Kclst	5946 95	5948 42	117 39	109.99	117 14	3 50	5863 5
4387	7 9	01-APR-92	748030	2084786	Qc	5925 06	5926 41	12 50	3.50	12.25	12 00	5918 5
4487	3 92	03-APR-92	748306	2085435	Qc	5949 63	5951 10	3 70	1.50	3 50	3.20	5947.2
4587	91 15	03-APR-92	748313	2085451	Kas & Kalt & Kclst	5949.32	5950 91	101.30	89.50	97 05	4 00	5859.8
5687	7 08	02-APR-92	750638	2084423	Qrf	5978.39	5979 77	9.92	3.52	9 67	9 40	5972 7
1587	12 97	06-APR-92	749011	2086249	Qrf	5971.27	5972 79	22.53	5 80	22 06	21.90	5959 8
1687	86 46	06-APR-92	749130	2086249	Kalt	5969 49	5970 79	125.24	100 00	125 00	22.20	5884 3
1787	7 66	06-APR-92	749415	2086308	Qrf	5968 01	5969 56	25 75	3.50	25 50	25 00	5961.9
1887	129 46	06-APR-92	749404	2086339	Kas & Kaslt	5967.99	5969 49	133 70	127 00	133 45	25.20	5840 0
1987	6 94	06-APR-92	749623	2086171	Qrf	5968 44	5969 91	11 89	3.50	11 65	10 80	5963 0
2087	110 49	06-APR-92	749634	2086155	Kaltclst	5968 66	5970 14	116.36	107.26	116 11	11 80	5859 7
2387	11.25	06-APR-92	749404	2085910	Kstss & Kclst	5972 79	5974 49	37.85	17 19	37 61	15.20	5963.2
5087	DRY	03-APR-92	748123	2085334	Qc	5933 14	5934 78	13 70	3.50	13 50	12 50	5934 8
5187	15 47	06-APR-92	748103	2083850	fill?	5963.27	5965.22	14.00	3.58	13 84	12 50	5949 8

5391160

APPENDIX D – Water–Level Measurements in Industrial Area Monitoring Wells, Spring and Fall 1992

WELL	DTW	DATE	STATE NORTH	STATE EAST	COMPLETION UNIT/LITH	SURFACE ELEV.	TOP OF CASING	TD CSG	TOP SCRN	BOT SCRN	TOP BEDROCK	WLE
5287	9 47	06–APR–92	748145	2084067	fill?	5967 85	5969 57	20 50	3 50	20.25	20 00	5960 1
5387	4 61	06–APR–92	747985	2083912	Qc	5959 99	5961 81	9 30	3 50	9 05	10 00	5957.2
5487	3 2	06–APR–92	747985	2084032	Qc	5955 85	5957 62	4 68	1 33	4 53	4 00	5954 4
5687	6 93	06–APR–92	750638	2084423	Qrf	5978 39	5979 77	9 92	3 52	9 67	9 40	5972 8
B206089	11 57	02–APR–92	751143	2085876	Qc	5935 40	5937 07	14 16	3 40	12 90	12.20	5925 5
B206189	4 02	02–APR–92	751138	2085885	Kclst	5935 40	5937 46	27 58	16 90	26 34	11 00	5933 4
B206289	17 14	02–APR–92	751739	2086289	Kaltclst & Kclst	5850 70	5852 95	16 16	5 95	15 42	0 20	5835 8
B206389	DRY	02–APR–92	751687	2085584	Kaclst & Kclst	5876 80	5878 66	9 05	3 37	7 80	0 20	5878 7
B206489	DRY	02–APR–92	751683	2085636	Kclst	5876 30	5878 34	30 49	19 76	29.22	15 50	5878 3
B206589	3 39	02–APR–92	751804	2085477	Qc	5856 50	5858 35	5 07	3.23	3 99	3 60	5855 0
B206689	19 14	02–APR–92	751728	2085250	Kaltclst	5867.60	5869 60	23 07	12 32	21 80	7 30	5850 5
B206789	3 83	02–APR–92	751755	2084450	Qc	5907 10	5909 03	12 32	2 86	10 93	8 40	5905.2
B210489	3 37	02–APR–92	751802	2085513	Qc	5856 40	5858 71	8 67	2 96	7 41	7 00	5855 3
P114389	7 56	01–APR–92	750337	2081246	Qrf	6033 40	6035 43	50 10	44 40	48 80	48 30	6027 9
P114489	9.23	01–APR–92	750337	2081246	Qrf	6033 40	6035 43	50 10	44 40	48 80	48 30	6026.2
P114589	3 58	01–APR–92	750396	2081731	Qrf	6024 10	6025 90	37 60	32 54	36 50	27 50	6022 3
P114689	8.28	01–APR–92	749943	2083044	Qrf	6004 00	6005 76	23 50	17 83	22.24	22 00	5997 5
P114789	7 35	01–APR–92	749940	2082610	Qrf	6010 70	6012 40	27 60	21 81	26.23	26 00	6005 1
P114889	6 62	01–APR–92	749926	2082127	Qrf	6016 60	6018.26	15 55	9 89	14 30	13 80	6011 6
P114989	14 48	01–APR–92	749959	2081661	Qrf	6029 80	6031 84	39 30	33 59	38 00	37 50	6017 4
P115089	10 74	01–APR–92	749930	2081258	Qrf	6038 10	6040 10	42 01	36.27	40 70	40.20	6029 4
P115489	8 47	01–APR–92	749507	2082135	Qrf	6023 40	6025 10	27 75	22 09	26 50	26 00	6016 6
P115589	4 35	01–APR–92	749551	2082658	Qrf	6014 10	6015 77	30 70	25 05	29 48	29 00	6011 4
P115689	7 53	01–APR–92	749532	2083019	Qrf	6006.90	6008 71	21 31	16.23	20.20	19 70	6001.2
P119389	5 38	02–APR–92	750280	2081921	Qrf	6011 70	6013 18	18.21	12 50	16 90	16 40	6007 8
P207389	6 48	03–APR–92	750195	2084468	Kas & Kclst	5981 02	5982 77	16.22	10 53	15 18	7 00	5976 3
P207489	6 3	03–APR–92	750197	2084481	Qrf	5980 71	5982 64	8.23	2 39	7 00	6 50	5976 3
P207589	25 77	03–APR–92	750395	2084843	Kaltclst	5974 06	5975 96	25 10	14 40	23 86	9 40	5950.2
P207689	6 85	02–APR–92	750398	2085318	Qrf	5966 32	5967 88	14 36	3 64	13 10	12 60	5961 0
P207789	29 36	02–APR–92	750392	2085343	Kaltclst	5965 88	5967 75	28 63	17 90	27 34	12 90	5938 4
P207889	4.25	02–APR–92	750671	2085343	Qrf	5962 82	5964 90	8 95	3.26	7 70	8 50	5960 7
P207989	21 03	02–APR–92	750671	2085330	Kclst	5963 09	5965 17	21 73	11 00	20 48	5 80	5944 1
P208889	86 13	02–APR–92	751086	2085249	Kaltclst	5947 30	5949 25	99 16	87 76	96 94	5 50	5863 1
P208989	12 16	02–APR–92	751044	2084839	Kaltss & Kaltclst	5962 53	5964 56	26 12	15 40	24.84	3 50	5952 4
P209089	28 03	03–APR–92	750566	2084910	Kaltclst	5972 16	5974 25	27.21	16 50	25.96	11 50	5946.2
P209189	10 18	02–APR–92	750762	2084309	Kas & Kaltclst	5980 66	5982.21	36 08	13 30	35 01	10 30	5972 0
P209289	13 73	02–APR–92	750863	2084139	Qrf	5961 59	5963 42	13 40	8.20	12 66	12.20	5969 7
P209389	17 15	02–APR–92	750864	2084130	Kas & Kaltss & Kcss	5961 47	5963 39	30 05	16 82	28 80	13 80	5966.2
P209489	26 5	02–APR–92	750991	2084634	Kas & Kaltss	5977 98	5980 10	36.25	15 48	35 00	9 00	5953 6
P209589	18 36	02–APR–92	751071	2085286	Kaltclst & Kaclst	5948 17	5950 04	19 77	9 07	18 52	4 10	5931 7
P209689	26 45	02–APR–92	750533	2085514	Kaltclst	5962 63	5964 43	27 93	17.20	26 67	12 20	5936 0
P209789	4 7	02–APR–92	750579	2085481	Qrf	5962 82	5964 94	13 75	3 00	12.50	12 00	5960.2

54 of 160

APPENDIX D – Water–Level Measurements in Industrial Area Monitoring Wells, Spring and Fall 1992

WELL	DTW	DATE	STATE NORTH	STATE EAST	COMPLETION UNIT/LITH	SURFACE ELEV.	TOP OF CASING	TD CSG	TOP SCRN	BOT SCRN	TOP BEDROCK	WLE
P209689	4 49	02–APR–92	751194	2084984	Kslt|slst	5940 28	5942 40	19 63	8 89	18 33	3 90	5937.9
P209989	10.29	02–APR–92	751565	2084649	Qc	5898 10	5900 40	9 58	3 81	8 18	7 70	5890 1
P210089	19.21	02–APR–92	751564	2084639	Kslt|slst	5898 40	5900 40	22 93	12.20	21.50	7.20	5881.2
P213689	8 54	01–APR–92	749460	2083736	Qrf	5994 30	5996 04	14 80	9 08	13 50	13 00	5987 5
P213889	DRY	02–APR–92	750466	2086109	Kss & Kcss	5954 10	5955 94	22 03	11 30	20 83	8 00	5955.9
P213989	DRY	02–APR–92	750468	2086102	Qrf	5954 30	5956 38	7 20	3.29	6 92	6 70	5956 4
P215789	13 87	01–APR–92	749470	2083430	Qrf	6002 00	6003 66	19 59	14 53	18 50	18 00	5989 8
P218089	5 16	02–APR–92	749941	2084020	Qrf	5985 80	5987.55	8 89	3 00	7 43	6 00	5982 4
P218389	8 83	02–APR–92	750631	2085648	Qrf	5956.20	5958 45	13 77	8 08	12 50	12 00	5949 6
P219189	9 77	02–APR–92	751222	2084010	Qc	5941.20	5943 15	12 77	7 08	11 50	11 00	5933 4
P219489	14 48	02–APR–92	750415	2085651	Qrf	5959 50	5961 15	24.20	18 48	22 90	22.50	5946 7
P219589	23 94	02–APR–92	750268	2085536	Kclst & Kslst	5963 80	5965 70	26 99	21.27	25 70	17.20	5941 8
P313489	9 36	01–APR–92	748913	2083062	Qrf	6011 70	6013 58	22 37	16 71	21 10	20 60	6004.2
P313589	7 19	01–APR–92	748510	2083547	Qrf	6008 50	6010 11	13 76	8 08	12 50	11 00	6002.9
P314089	8 18	01–APR–92	749461	2083653	Qrf	5996 70	5998 49	11 06	5 37	9 79	9 30	5990.3
P314289	13 82	01–APR–92	748216	2083280	Qrf	6010 10	6011 77	14 80	9 11	13.51	13 00	5998 0
P414189	4 88	01–APR–92	749059	2082986	Qrf	6010 60	6012 18	19 78	14 09	18 50	18 00	6007.3
P415889	11.22	01–APR–92	749125	2080718	Qrf	6050 40	6052 60	44 50	38 75	43.20	49 50	6041 4
P415989	3 46	01–APR–92	749025	2081011	Qrf	6044 90	6046 71	28 00	22 30	26 73	34 00	6043 3
P416089	4 04	01–APR–92	748605	2080720	Qrf	6051 70	6053.95	35 39	29.24	34 00	33.50	6049.9
P416189	5 52	01–APR–92	748606	2081120	Qrf	6045 60	6047 95	30 94	25.23	29 66	29.20	6042 4
P416289	10 94	01–APR–92	748598	2081555	Qrf	6038 60	6040.22	24 77	19 07	23 50	23 00	6029.3
P416389	5 52	01–APR–92	748313	2080631	Qrf	6055 40	6057 14	31 40	25 69	30 10	30 00	6051.6
P416489	9 37	01–APR–92	748210	2081113	Qrf	6048 50	6050 15	26 98	21.27	25 70	25.20	6040 8
P416589	23 66	01–APR–92	748211	2081546	Qrf	6041.20	6042 81	32 10	27 04	31 00	30 50	6019.2
P416689	27 97	01–APR–92	748147	2081941	Qrf	6035 00	6036 55	33 76	28 09	32 50	32 00	6008 6
P416789	22 85	01–APR–92	748206	2082382	Qrf	6027 80	6029.27	28 20	22 48	26 90	26 40	6006 4
P416889	14 03	01–APR–92	748206	2082815	Qrf	6017 40	6018 79	21 52	15 86	20.27	20.20	6004 8
P207989	20 71	06–APR–92	750671	2085330	Kclst	5963 09	5965 17	21 73	11 00	20 48	5 80	5944 5
P317989	3 88	06–APR–92	748891	2084272	Qrf	5990 90	5992 84	8 73	3 00	7 49	6 40	5989 0
P320089	10 19	06–APR–92	748799	2083280	Qrf	6009 90	6011 87	20 08	14 38	18 81	18 80	6001 7
P418289	6 31	06–APR–92	748952	2082853	Qrf	6016 90	6018.20	26 70	9 60	23 50	23 00	6011.9
2391	DRY	03–APR–92	749853	2086600	Qrf	5956 82	5958 43	8 00	3 00	6 00	6 90	5958 4
07391	5 06	03–APR–92	748547	2085827	Qrf & Kclst	5949 14	5950 61	13 40	5 40	11 40	8 10	5945 6
09691	5.99	03–APR–92	748572	2086038	Kslts & Kclst	5935 64	5937 05	16 00	6 00	14 00	3 10	5931 1
33491	10 76	03–APR–92	748060	2084883	Qc & Kslst	5926 06	5928 59	11 10	6 68	8 69	8 00	5917.8
33691	10 93	03–APR–92	748112	2084994	Qc	5926 99	5929.24	10 80	6 19	8 11	7 80	5918.3
34591	12 8	03–APR–92	748462	2085621	Qc & Kclst	5952 19	5954 63	11 30	6 90	8.90	8.20	5941 8
34791	1 92	03–APR–92	748377	2085521	Qc	5951 39	5953 91	10 42	6 00	8 00	8 00	5952 0
36191	5 72	03–APR–92	748091	2084196	Qc	5962 89	5965 17	17 00	9.52	14 60	14 00	5959.5
36391	22 54	03–APR–92	748042	2084294	Qrf	5964 57	5967 01	29 80	17 43	27 41	26 40	5944 5
36691	26 68	03–APR–92	748027	2084421	Qc	5949 76	5951 52	27 83	15 83	25 83	25 00	5924 8

559 160

APPENDIX D – Water-Level Measurements in Industrial Area Monitoring Wells, Spring and Fall 1992

WELL	DTW	DATE	STATE NORTH	STATE EAST	COMPLETION UNIT/LITH	SURFACE ELEV.	TOP OF CASING	TD CSG	TOP SCRN	BOT SCRN	TOP BEDROCK	WLE
37191	5 61	03-APR-92	748036	2084533	Qc	5945 91	5948.29	23 07	11 12	21 07	20 50	5942 7
37591	5 73	03-APR-92	748580	2084610	Qrf	5991 42	5993 45	14 60	7 60	12 60	12 00	5987 7
37691	13 28	03-APR-92	748692	2085217	Qrf	5984 46	5985 24	18 50	6 51	16 50	16.20	5972 0
37891	38 94	03-APR-92	748075	2084915	Kcsltst & Ksltst	5925.22	5926.29	55.20	43.20	53.20	4 70	5887 4
37991	47 76	03-APR-92	748063	2084731	Kcsltst & Kssltst	5931 45	5933 55	57.20	45 20	55.20	6 90	5885 8
38191	7 68	03-APR-92	748014	2084765	Qc	5924 47	5926 40	17 00	10 00	15 00	14 70	5918 7
38291	DRY	03-APR-92	748032	2084801	Qc	5924 49	5926 71	10 70	6 70	8 70	8 40	5926 7
39691	8 25	03-APR-92	748357	2083634	Qrf & Kclst	6006 26	6006 37	11 00	7 00	9 00	8 00	6000 1
06591	10 32	06-APR-92	749064	2085535	Kscist & Kcltclst	5978 28	5979 78	50 00	33 00	48 00	15 40	5969 5
06891	6 24	06-APR-92	749258	2085883	Qrf	5974 14	5975 62	16 00	6 00	14 00	14 00	5969 4
06991	8 91	06-APR-92	749168	2085990	Qrf	5972 91	5974 57	31 00	14 00	29 00	28 60	5965 7
07191	14 57	06-APR-92	748850	2085908	Qrf	5974 79	5976 34	23 10	11 10	21 10	20 00	5961 8
07291	16 06	06-APR-92	748748	2085766	Qrf	5977.27	5978 80	22 60	10 60	20 60	20 00	5962 7
08891	12 77	06-APR-92	749128	2085866	Qrf	5976 36	5978 06	27 30	15 30	25 30	23 00	5965 3
09091	14 86	06-APR-92	748918	2085943	Qrf	5975 16	5976 79	26 70	14 70	24 70	24 00	5961 9
13191	11 6	06-APR-92	749071	2085530	Kscist	5978 25	5979 90	27 70	15 70	25 70	15 40	5968 3
13291	9 21	06-APR-92	749060	2085523	Qrf	5978 48	5979 97	17 70	5 70	15 70	15 40	5970 8
35391	11 09	06-APR-92	748011	2083907	Kclst	5960 73	5963 03	10 50	6 10	8 11	6 00	5951 9
37791	19 54	06-APR-92	748592	2083753	Qrf	6002 16	6004 18	22 60	10 60	20 60	20 00	5984 6
SUPPLEMENTAL SPRING 1992 DATA·												
0987	14 83	07-APR-92	749068	2085348	Kss	5980.22	5981 70	32 40	14 50	32 15	12 50	5966 9
1087	13 05	07-APR-92	748946	2085290	Qrf	5981 95	5983 52	12 00	3 50	12 00	11 30	5970 5
3486	20 9	07-APR-92	750162	2086193	Kcss & Kcslt	5912 00	5913 95	56.25	44.24	56.25	16 00	5893 1
3586	6 15	07-APR-92	750167	2086219	Qc	5910 75	5912 76	11 60	4 86	11 60	10 50	5906 6
P207889	4 74	07-APR-92	750671	2085343	Qrf	5962 82	5964 90	8.95	3 26	7 70	8 50	5960.2
P210089	19 09	07-APR-92	751564	2084639	Kcltclst	5898 40	5900 40	22 93	12 20	21 50	7.20	5881.3
01791	8 89	08-APR-92	749504	2086016	Kcltss & Kscist	5965 78	5967 41	20 00	10 00	18 00	8 00	5958 5
01891	9 1	08-APR-92	749438	2086023	Kcltss & Kcltclst	5971 76	5973 37	32 00	20 00	30 00	12 40	5964 3
02091	8 21	08-APR-92	749617	2086428	Kscist, Kcslt, Kcltclst	5965 19	5966 65	32 60	15 60	30 60	16 10	5958 4
02291	8 06	08-APR-92	749680	2086139	Kscist & Kcss	5936 66	5938.26	18 50	11 50	16 50	8 80	5930.2
02491	9 41	08-APR-92	749949	2086432	Kcltss, Kcslt	5944 54	5946.21	18 80	11 80	16 80	8 50	5936 8
02691	5 34	08-APR-92	750385	2086043	Kcltss & Kcltclst	5934 78	5936 38	18 00	6 00	16 00	1 10	5931 0
12091	9 77	08-APR-92	749436	2086009	Kcltss	5971 59	5973.27	24 00	14 00	22 00	13.20	5963 5
12291	14.29	08-APR-92	749429	2085441	Kcss & Kss	5970 98	5972 73	16 10	7 10	14 10	2 00	5958 4
1986	2 53	08-APR-92	750694	2083296	Kclst	5943 08	5943 86	12.25	3 00	12.25	11 50	5941 3
33891	11 38	08-APR-92	747961	2084641	Qc & Kclst	5927 54	5929 94	11 10	6 70	8 70	8 10	5918 6
35991	18 03	08-APR-92	748057	2083756	Qc	5973.25	5976 45	16 10	8 68	13 70	12.20	5958 4
4386	12 9	08-APR-92	749404	2085869	Qrf	5972 91	5974 46	16 75	3 99	16 75	17 00	5961.6
2486	8 3	09-APR-92	750338	2084277	Qrf	5982 45	5983 56	7 45	2.95	7 45	7.20	5975 3

APPENDIX D – Water–Level Measurements in Industrial Area Monitoring Wells, Spring and Fall 1992

WELL	DTW	DATE	STATE NORTH	STATE EAST	COMPLETION UNIT/LITH	SURFACE ELEV.	TOP OF CASING	TD CSG	TOP SCRN	BOT SCRN	TOP BEDROCK	WLE
3987	83 23	09–APR–92	751081	2085268	Kselt & Kclst	5946 95	5948 42	117 39	109 99	117 14	3 50	5865.2
B206089	11 83	09–APR–92	751143	2085876	Qc	5935 40	5937 07	14 16	3 40	12 90	12.20	5925 2
B206189	5 03	09–APR–92	751138	2085885	Kclst	5935 40	5937 46	27 58	16 90	26 34	11 00	5932 4
P206889	84 81	09–APR–92	751086	2085249	Kseltclst	5947 30	5949 25	99 16	87 76	96 94	5 50	5864 4
P209189	10 57	09–APR–92	750762	2084309	Kss & Kseltclst	5980 66	5982.21	36 08	13 30	35 01	10 30	5971 6
P209589	18 06	09–APR–92	751071	2085286	Kseltclst & Kscist	5948 17	5950 04	19 77	9 07	18 52	4.10	5932 0
P416989	16 37	09–APR–92	748780	2081034	Kselt & Kslt	6045 20	6047 55	157 95	151 16	155 61	30 00	6031 2
00191	9 32	13–APR–92	749237	2086244	Qrf	5968 86	5970 44	27 00	15 00	25 00	24.20	5961 1
01391	12 3	13–APR–92	749402	2085226	Qrf	5973 70	5975 30	16 00	6 00	14 00	14 50	5963 0
01491	14 34	13–APR–92	749430	2085474	Kss & Kcs	5970 37	5972 03	26 00	14 00	24 00	1 60	5957 7
02191	DRY	13–APR–92	749708	2086166	Qrf	5965 81	5967 51	15 00	8 00	13 00	13.50	5967 5
2286	7 72	13–APR–92	750718	2084411	Qrf	5978 77	5979 55	11.20	3.20	11.20	11 00	5971 8
2786	75 98	13–APR–92	750781	2085236	Kselts & Kscist	5962 89	5963 88	133 00	128 50	133 00	11 00	5887 9
3386	6 4	13–APR–92	749950	2085003	Qrf	5951 40	5952 42	7 34	2.99	7 34	6 80	5946 0
3787	6.29	13–APR–92	750494	2085224	Qrf	5967 52	5968 99	9 00	3 50	8 77	8 00	5962 7
2686	10 47	14–APR–92	750411	2084841	Qrf	5975 42	5977 17	11 00	3 75	11 00	10.50	5966 7
P207589	25 62	14–APR–92	750395	2084843	Kseltclst	5974 06	5975 96	25 10	14 40	23 86	9 40	5950 3
2187	9 57	15–APR–92	749969	2085799	Qc	5928 43	5929 69	10 56	3.26	10 41	8 00	5920 1
2287	80 44	15–APR–92	749924	2085822	Kss & Kslt	5931 18	5932 80	88 70	81 41	88 46	12 80	5852 4
P207689	7 15	15–APR–92	750398	2085318	Qrf	5966 32	5967 88	14 36	3 64	13 10	12 60	5960 7
P207789	29.23	15–APR–92	750392	2085343	Kseltclst	5965 88	5967 75	28 63	17.90	27 34	12.90	5938 5
2186	32 62	16–APR–92	750855	2082501	Kss & Kseltclst	6004 76	6005 96	67.25	35 00	67.24	15 00	5973 3
3186	DRY	20–APR–92	751051	2084764	Kss & Kslt	5964 98	5967 05	17 32	2 46	17 32	0 50	5967 1
3887	9 03	20–APR–92	750396	2085094	Qrf	5972 15	5973 90	9 50	3 50	9.27	7 80	5964 9
P206969	13 83	20–APR–92	751044	2084839	Kslss & Kseltclst	5962.53	5964 56	26 12	15 40	24 84	3 50	5950 7
P209689	4 62	20–APR–92	751194	2084984	Kseltclst	5940 28	5942 40	19 63	6 89	16 33	3 90	5937 8
P218089	5 44	20–APR–92	749941	2084020	Qrf	5965 80	5967 55	8 69	3 00	7 43	6 00	5962 1
5287	9 59	22–APR–92	748145	2084067	fill?	5967 85	5969 57	20 50	3 50	20.25	20 00	5960 0
6186	9 79	22–APR–92	749198	2083717	Qrf	5999 47	6000 60	12.25	5 00	12 00	11 50	5990 8
P209289	14 68	22–APR–92	750863	2084139	Qrf	5981 59	5983 42	13 40	8.20	12 66	12.20	5968 7
P317989	4 95	22–APR–92	748891	2084272	Qrf	5990 90	5992 84	8 73	3 00	7 49	6 40	5987 9
4486	6 9	23–APR–92	749254	2082234	Qrf	6019 93	6021 96	26.25	3.23	26.25	25 50	6015 1
P209389	18 53	23–APR–92	750864	2084130	Kss & Kslss & Kcss	5981 47	5983 39	30 05	16 82	28 80	13 80	5964 9
P209489	27 97	23–APR–92	750991	2084634	Kss & Kslss	5977 98	5980 10	36.25	15 48	35 00	9 00	5952 1
P209789	6 37	24–APR–92	750579	2085481	Qrf	5982 82	5984 94	13 75	3 00	12 50	12 00	5958 6
P418289	7 72	24–APR–92	748952	2082653	Qrf	6016 90	6018.20	26 70	9 60	23 50	23 00	6010 5
P209069	27 09	27–APR–92	750566	2084910	Kseltclst	5972 16	5974.25	27.21	16 50	25.96	11 50	5947.2
P209689	26 14	27–APR–92	750533	2085514	Kseltclst	5982 63	5984 43	27 93	17.20	26 67	12.20	5936 3
P320089	11 81	27–APR–92	748799	2083280	Qrf	6009 90	6011 87	20 06	14.36	18 81	18.80	6000 1
P207389	6 66	28–APR–92	750195	2084468	Kss & Kclst	5981 02	5982 77	16.22	10 53	15 18	7 00	5976 1
P207489	6 73	28–APR–92	750197	2084481	Qrf	5980 71	5982 64	8.23	2.39	7 00	6.50	5975 9
5387	6 12	29–APR–92	747965	2083912	Qc	5959 99	5961 81	9.30	3.50	9 05	10 00	5955 7

APPENDIX D – Water–Level Measurements in Industrial Area Monitoring Wells, Spring and Fall 1992

WELL	DTW	DATE	STATE NORTH	STATE EAST	COMPLETION UNIT/LITH	SURFACE ELEV.	TOP OF CASING	TD CSG	TOP SCRN	BOT SCRN	TOP BEDROCK	WLE
5487	4 28	29–APR–92	747985	2084032	Qc	5955 85	5957 62	4 68	1 33	4 53	4 00	5953 3
1787	10 86	30–APR–92	749415	2086308	Qrf	5968 01	5969 56	25 75	3 50	25 50	25 00	5958 7
2986	9 06	30–APR–92	750599	2085687	Qrf	5959 58	5960 68	8 77	2 83	8 77	8 50	5951 6
3086	5 02	30–APR–92	751078	2084921	Kclst	5957 42	5958 39	14 93	2 48	14 93	2 50	5953 4
P209989	10 43	30–APR–92	751565	2084649	Qc	5896 10	5900 40	9 58	3 81	8 18	7 70	5890 0
1386	5 02	14–APR–92	751857	2086051	Qc	5840 47	5842 59	9 50	3 09	9 50	9 00	5837 6
1486	11 52	14–APR–92	751856	2085838	Kss & Kcclst	5844 71	5846 71	55 36	39 42	55 36	11 00	5835.2
1586	6 32	13–APR–92	751852	2085812	Qc	5848 43	5850 63	14 44	4 09	14 44	12 50	5844.3
1686	5 5	07–APR–92	751747	2085260	Kslts	5867 92	5869 55	45 06	39 06	45 06	7 00	5864 1
1786	6 02	07–APR–92	751740	2085242	Qc	5868 43	5869 57	13 98	3 73	13 98	12 50	5863 6
1886	9	09–APR–92	751522	2085831	Qc	5885 75	5887 97	7 50	3 74	7 50	8 00	5879 0
37791	19 54	06–APR–92	748592	2083753	Qrf	6002 16	6004 18	22 60	10 60	20 60	20 00	5984 6
B208289	17 09	09–APR–92	751739	2086289	Kcltclst & Kclst	5850 70	5852 95	16 16	5 95	15 42	0.20	5835 9
B208589	3 95	09–APR–92	751804	2085477	Qc	5856 50	5858 35	5 07	3.23	3.99	3 60	5854 4
B208689	18 59	07–APR–92	751728	2085250	Kcltclst	5867 60	5869 60	23 07	12 32	21 80	7 30	5851 0
B208789	3 97	08–APR–92	751755	2084450	Qc	5907 10	5909 03	12 32	2 88	10 93	8 40	5905 1
B210489	4 16	10–APR–92	751802	2085513	Qc	5856 40	5858 71	8 67	2 98	7 41	7 00	5854 6
FALL 1992 WATER LEVEL DATA												
1386	8 11	02–OCT–92	751857	2086051	Qc	5840 47	5842 59	9 50	3 09	9 50	9 00	5834 5
1486	10 91	02–OCT–92	751856	2085838	Kss & Kcclst	5844 71	5846 71	55 36	39 42	55 36	11 00	5835 8
1586	7 16	02–OCT–92	751852	2085812	Qc	5848 43	5850 63	14 44	4 09	14 44	12 50	5843 5
1686	6 66	02–OCT–92	751747	2085260	Kslts	5867 92	5869 55	45 06	39 06	45 06	7 00	5862 9
1786	6 61	02–OCT–92	751740	2085242	Qc	5868 43	5869 57	13 98	3 73	13.98	12 50	5863 0
1886	DRY	02–OCT–92	751522	2085831	Qc	5885 75	5887 97	7 50	3 74	7 50	8 00	5888 0
1986	3 07	05–OCT–92	750894	2083296	Kclst	5943 08	5943 86	12 25	3 00	12.25	11 50	5940 8
2186	33 86	05–OCT–92	750855	2082501	Kss & Kcltclst	6004 76	6005 96	67 25	35 00	67.24	15 00	5972 1
2286	10 03	05–OCT–92	750718	2084411	Qrf	5978 77	5979 55	11 20	3 20	11.20	11 00	5969 5
2386	88 05	05–OCT–92	750338	2084259	Kslt & Kcltclst	5982 46	5982 46	117.25	113 00	117.25	8.20	5894 4
2486	DRY	05–OCT–92	750338	2084277	Qrf	5982 45	5983 56	7 45	2 95	7 45	7.20	5983 6
2586	30 16	05–OCT–92	750412	2084831	Kcltclst & Kclst	5975.24	5977 14	82 00	59 90	82 00	8 00	5947 0
2686	12	05–OCT–92	750411	2084841	Qrf	5975 42	5977 17	11 00	3 75	11 00	10 50	5965.2
2786	77	05–OCT–92	750781	2085236	Kslts & Kcclst	5962 89	5963 88	133 00	126 50	133 00	11 00	5886.9
2986	DRY	05–OCT–92	750599	2085687	Qrf	5959 58	5960 68	8 77	2 83	8 77	8.50	5960 7
3086	7 36	05–OCT–92	751078	2084921	Kclst	5957 42	5958 39	14 93	2 48	14 93	2 50	5951 0
3186	19 56	05–OCT–92	751051	2084764	Kss & Kslt	5964 98	5967 05	17 32	2 46	17 32	0 50	5947 5
3286	53 91	05–OCT–92	751050	2084743	Kss & Kslts	5966 06	5967 92	125 50	114 90	125 50	1 00	5914 0
3386	8 68	05–OCT–92	749950	2085003	Qrf	5951 40	5952 42	7 34	2 99	7.34	6 80	5943 7
3486	21.5	01–OCT–92	750162	2086193	Kcss & Kcslt	5912 00	5913 95	56.25	44.24	56.25	16 00	5892 5
3586	9 87	01–OCT–92	750167	2086219	Qc	5910 75	5912 76	11 60	4 86	11 60	10 50	5902 9

58 of 160

APPENDIX D – Water–Level Measurements in Industrial Area Monitoring Wells, Spring and Fall 1992

WELL	DTW	DATE	STATE NORTH	STATE EAST	COMPLETION UNIT/LITH	SURFACE ELEV.	TOP OF CASING	TD CSG	TOP SCRN	BOT SCRN	TOP BEDROCK	WLE
4386	DRY	01–OCT–92	749404	2085869	Qrf	5972 91	5974 46	16 75	3 99	16 75	17 00	5974 5
4486	8 14	01–OCT–92	749254	2082234	Qrf	6019 93	6021 96	26 25	3 23	26.25	25 50	6013 8
0187	10 41	01–OCT–92	748127	2083653	fill	5992 49	5994 06	12 08	3 38	11 83	11 80	5983 7
0587	44 59	01–OCT–92	748081	2084849	Kse & Kseltse	5927 85	5929 99	51 50	42 00	51.25	11 00	5885 4
0987	19 39	02–OCT–92	749068	2085348	Kse	5980 22	5981 70	32 40	14 50	32 15	12 50	5962 3
1087	DRY	01–OCT–92	748946	2085290	Qrf	5981 95	5983 52	12 00	3 50	12 00	11 30	5983 5
1087	13 77	02–OCT–92	748946	2085290	Qrf	5981 95	5983 52	12 00	3 50	12 00	11 30	5969 8
1287	10 87	02–OCT–92	748581	2086066	Kcslt	5934 81	5936 30	10 24	4 91	10 01	3 50	5925 4
1587	21 77	02–OCT–92	749011	2086249	Qrf	5971 27	5972 79	22 53	5 80	22 06	21 90	5951 0
1687	90 53	02–OCT–92	749130	2086249	Kslt	5969 49	5970 79	125 24	100 00	125 00	22.20	5880 3
1787	21.2	01–OCT–92	749415	2086308	Qrf	5968 01	5969 56	25 75	3 50	25 50	25 00	5948 4
1887	127 09	01–OCT–92	749404	2086339	Kse & Kselt	5967 99	5969 49	133 70	127 00	133 45	25.20	5842 4
1987	13 72	01–OCT–92	749623	2086171	Qrf	5968 44	5969 91	11 89	3 50	11 65	10 80	5956.2
2087	106 8	01–OCT–92	749634	2086155	Kseloist	5968 66	5970 14	116 36	107 26	116 11	11 80	5861 3
2187	7 84	05–OCT–92	749969	2085799	Qc	5928 43	5929 69	10 56	3.26	10 41	8 00	5921 9
2287	80 57	05–OCT–92	749924	2085822	Kse & Kslt	5931 18	5932 80	88 70	81 41	88 46	12 80	5852.2
2387	18 87	01–OCT–92	749404	2085910	Kseltse & Kcist	5972 79	5974 49	37 85	17 19	37 61	15 20	5955 6
3787	9 49	05–OCT–92	750494	2085224	Qrf	5967 52	5968 99	9 00	3 50	8 77	8 00	5959 5
3887	11 15	05–OCT–92	750396	2085094	Qrf	5972 15	5973 90	9 50	3 50	9 27	7 80	5962 8
3987	89 54	05–OCT–92	751081	2085268	Kselt & Kcist	5946 95	5948 42	117 39	109 99	117 14	3 50	5858 9
4387	9 73	01–OCT–92	748030	2084788	Qc	5925 06	5926 41	12 50	3 50	12.25	12 00	5916 7
4487	DRY	01–OCT–92	748306	2085435	Qc	5949 63	5951 10	3 70	1 50	3 50	3.20	5951 1
4587	90 74	01–OCT–92	748313	2085451	Kse & Kslt & Kcist	5949 32	5950 91	101 30	89 50	97 05	4 00	5860.2
5087	DRY	01–OCT–92	748123	2085334	Qc	5933 14	5934 78	13 70	3 50	13 50	12 50	5934 8
5387	10 94	01–OCT–92	747985	2083912	Qc	5959 99	5961 81	9 30	3 50	9 05	10 00	5950 9
5487	6	01–OCT–92	747985	2084032	Qc	5955 85	5957 62	4 68	1 33	4 53	4 00	5951 6
5687	8 48	05–OCT–92	750638	2084423	Qrf	5978 39	5979 77	9 92	3 52	9 67	9 40	5971 3
B208089	13 22	02–OCT–92	751143	2085876	Qc	5935 40	5937 07	14 16	3 40	12 90	12 20	5923 9
B208089	13.27	05–OCT–92	751143	2085876	Qc	5935 40	5937 07	14 16	3 40	12 90	12.20	5923 8
B208189	22 88	02–OCT–92	751138	2085885	Kcist	5935 40	5937 46	27 58	16 90	26 34	11 00	5914 6
B208189	22 72	05–OCT–92	751138	2085885	Kcist	5935 40	5937 46	27 58	16 90	26 34	11 00	5914 7
B208289	17 33	02–OCT–92	751739	2086289	Kseloist & Kcist	5850 70	5852 95	16 16	5 95	15 42	0.20	5835 6
B208389	DRY	02–OCT–92	751687	2085584	Kscist & Kcist	5876 80	5878 66	9 05	3 37	7 80	0.20	5878 7
B208489	DRY	02–OCT–92	751683	2085636	Kcist	5876 30	5878 34	30 49	19 76	29.22	15 50	5878.3
B208589	DRY	02–OCT–92	751804	2085477	Qc	5856 50	5858.35	5 07	3.23	3 99	3 60	5858 4
B208689	14 8	02–OCT–92	751728	2085250	Kseloist	5867 60	5869 60	23 07	12 32	21 80	7 30	5854 8
B208789	9 77	02–OCT–92	751755	2084450	Qc	5907 10	5909 03	12 32	2 88	10.93	8 40	5899 3
B210489	6 42	02–OCT–92	751802	2085513	Qc	5856 40	5858 71	8 67	2 98	7 41	7 00	5852 3
P114389	8 17	01–OCT–92	750337	2081246	Qrf	6033 40	6035 43	50 10	44 40	48 80	48 30	6027 3
P114489	14 58	01–OCT–92	750337	2081246	Qrf	6033 40	6035 43	50 10	44 40	48 80	48 30	6020 9
P114589	7 64	01–OCT–92	750396	2081731	Qrf	6024 10	6025.90	37 60	32 54	36 50	27 50	6018 3
P114689	12.24	01–OCT–92	749943	2083044	Qrf	6004 00	6005 76	23 50	17 83	22.24	22 00	5993 5

5946 108

APPENDIX D – Water-Level Measurements in Industrial Area Monitoring Wells, Spring and Fall 1992

WELL	DTW	DATE	STATE NORTH	STATE EAST	COMPLETION UNIT/LITH	SURFACE ELEV.	TOP OF CASING	TD CSG	TOP SCRN	BOT SCRN	TOP BEDROCK	WLE
P114789	8 04	01-OCT-92	749940	2082610	Qrf	6010 70	6012 40	27 60	21 81	26.23	26 00	6004 4
P114889	5 52	01-OCT-92	749926	2082127	Qrf	6016 60	6018 26	15 55	9 89	14 30	13 80	6012 7
P114989	12 77	01-OCT-92	749959	2081661	Qrf	6029 80	6031 84	39 30	33 59	38 00	37 50	6019 1
P115089	15 89	01-OCT-92	749930	2081258	Qrf	6038 10	6040 10	42 01	36 27	40 70	40 20	6024.2
P115489	11 28	01-OCT-92	749507	2082135	Qrf	6023 40	6025 10	27 75	22 09	26 50	26 00	6013 8
P115589	8 17	01-OCT-92	749551	2082658	Qrf	6014 10	6015 77	30 70	25 05	29 48	29 00	6007 6
P115689	13 02	01-OCT-92	749532	2083019	Qrf	6006 90	6008 71	21 31	16 23	20 20	19 70	5995 7
P119389	5 73	05-OCT-92	750280	2081921	Qrf	6011 70	6013 18	18.21	12 50	16 90	16 40	6007 5
P207389	8 69	05-OCT-92	750195	2084468	Kss & Kclst	5981 02	5982 77	16.22	10 53	15 18	7 00	5974 1
P207489	8 53	05-OCT-92	750197	2084481	Qrf	5980 71	5982 64	8.23	2 39	7 00	6 50	5974 1
P207589	25 58	05-OCT-92	750395	2084843	Kaltclst	5974 06	5975 96	25 10	14 40	23 86	9 40	5950 4
P207689	8 74	05-OCT-92	750398	2085318	Qrf	5966 32	5967 88	14 36	3 64	13 10	12 60	5959 1
P207789	29 17	05-OCT-92	750392	2085343	Kaltclst	5965 88	5967 75	28 63	17 90	27 34	12 90	5938 6
P207889	10 08	05-OCT-92	750671	2085343	Qrf	5962 82	5964 90	8 95	3 26	7 70	8 50	5954 8
P207989	18 45	05-OCT-92	750671	2085330	Kclst	5963 09	5965 17	21 73	11 00	20 48	5 80	5946 7
P208889	86 22	05-OCT-92	751086	2085249	Kaltclst	5947 30	5949 25	99 16	87 76	96 94	5 50	5863 0
P208989	17 55	05-OCT-92	751044	2084839	Kaltss & Kaltclst	5962 53	5964 56	26 12	15 40	24 84	3 50	5947 0
P209089	25 13	05-OCT-92	750566	2084910	Kaltclst	5972 16	5974 25	27.21	16 50	25 96	11 50	5949 1
P209189	13 5	05-OCT-92	750762	2084309	Kss & Kaltclst	5980 66	5982 21	36 08	13 30	35 01	10 30	5968 7
P209289	14 62	05-OCT-92	750863	2084139	Qrf	5981 59	5983 42	13 40	8 20	12 66	12 20	5968 8
P209389	18 42	05-OCT-92	750864	2084130	Kss & Kaltss & Kcss	5981 47	5983 39	30 05	16 82	28 80	13 80	5965 0
P209489	29 37	05-OCT-92	750991	2084634	Kss & Kaltss	5977 98	5980 10	36.25	15 48	35 00	9 00	5950 7
P209589	18 75	05-OCT-92	751071	2085286	Kaltclst & Kaclst	5948 17	5950 04	19 77	9 07	18 52	4 10	5931 3
P209689	28 37	05-OCT-92	750533	2085514	Kaltclst	5962 63	5964 43	27 93	17.20	26 67	12 20	5936 1
P209789	10 05	05-OCT-92	750579	2085481	Qrf	5962 82	5964 94	13 75	3 00	12 50	12 00	5954 9
P209889	5 34	05-OCT-92	751194	2084984	Kaltclst	5940 28	5942 40	19 63	8 89	18 33	3 90	5937 1
P209989	DRY	02-OCT-92	751565	2084649	Qc	5898 10	5900 40	9 58	3 81	8 18	7 70	5900 4
P210089	18 6	05-OCT-92	751564	2084639	Kaltclst	5898 40	5900 40	22.93	12.20	21 50	7.20	5881 8
P210089	18 72	02-OCT-92	751564	2084639	Kaltclst	5898 40	5900 40	22 93	12.20	21 50	7 20	5881 7
P213689	9 47	01-OCT-92	749460	2083736	Qrf	5994 30	5996 04	14 80	9 06	13 50	13 00	5986 6
P213889	DRY	01-OCT-92	750466	2086109	Kss & Kcss	5954 10	5955 94	22 03	11 30	20 83	8 00	5955.9
P213989	DRY	01-OCT-92	750468	2086102	Qrf	5954 30	5956 38	7.20	3 29	6 92	6 70	5956 4
P215789	15 79	01-OCT-92	749470	2083430	Qrf	6002 00	6003 66	19 59	14 53	18 50	18 00	5987.9
P218089	9 49	05-OCT-92	749941	2084020	Qrf	5985 80	5987 55	8 69	3 00	7 43	6 00	5978 1
P218389	14 53	05-OCT-92	750831	2085648	Qrf	5956.20	5958 45	13 77	8 06	12 50	12 00	5943 9
P219189	9 8	05-OCT-92	751222	2084010	Qc	5941.20	5943 15	12 77	7 06	11 50	11 00	5933 4
P219489	13 46	05-OCT-92	750415	2085651	Qrf	5959 50	5961 15	24.20	18 48	22 90	22 50	5947 7
P219589	22 52	05-OCT-92	750268	2085536	Kclst & Kaclst	5963 80	5965 70	26.99	21.27	25 70	17.20	5943.2
P313589	9 32	01-OCT-92	748510	2083547	Qrf	6006 50	6010 11	13 76	8 06	12 50	11 00	6000 8
P314089	10 05	01-OCT-92	749461	2083653	Qrf	5996 70	5998 49	11 06	5 37	9 79	9 30	5988 4
P314289	13 33	01-OCT-92	748216	2083280	Qrf	6010 10	6011 77	14 80	9 11	13 51	13 00	5998 4
P320089	15.23	02-OCT-92	748799	2083280	Qrf	6009 90	6011 87	20 06	14.38	18 81	18 80	5996 6

APPENDIX D – Water-Level Measurements in Industrial Area Monitoring Wells, Spring and Fall 1992

WELL	DTW	DATE	STATE NORTH	STATE EAST	COMPLETION UNIT/LITH	SURFACE ELEV.	TOP OF CASING	TD CSG	TOP SCRN	BOT SCRN	TOP BEDROCK	WLE
P414189	10 87	01-OCT-92	749059	2082986	Qrf	6010 60	6012 18	19 78	14 09	18 50	18 00	6001 3
P415889	16 53	01-OCT-92	749125	2080718	Qrf	6050 40	6052 60	44 50	38 75	43 20	49 50	6036 1
P415989	9 05	01-OCT-92	749025	2081011	Qrf	6044 90	6046 71	28 00	22 30	26 73	34 00	6037 7
P416089	11 36	01-OCT-92	748605	2080720	Qrf	6051 70	6053 95	35 39	29.24	34 00	33 50	6042 6
P416189	11 54	01-OCT-92	748606	2081120	Qrf	6045 60	6047 95	30 94	25.23	29 66	29 20	6036 4
P416289	14 08	01-OCT-92	748598	2081555	Qrf	6038 60	6040 22	24 77	19 07	23 50	23 00	6026 1
P416389	16 48	01-OCT-92	748313	2080631	Qrf	6055 40	6057 14	31 40	25 69	30 10	30 00	6040 7
P416489	19.28	01-OCT-92	748210	2081113	Qrf	6048 50	6050 15	26 98	21.27	25 70	25 20	6030 9
P416589	27 73	01-OCT-92	748211	2081546	Qrf	6041.20	6042 81	32 10	27 04	31 00	30 50	6015 1
P416689	29 73	01-OCT-92	748147	2081941	Qrf	6035 00	6036 55	33 76	28 09	32 50	32 00	6006 8
P416789	27 53	01-OCT-92	748206	2082382	Qrf	6027 80	6029.27	28.20	22 48	26 90	26 40	6001 7
P416889	18 37	01-OCT-92	748206	2082815	Qrf	6017 40	6018 79	21 52	15 86	20.27	20.20	6000 4
P418289	10 42	02-OCT-92	748952	2082653	Qrf	6016 90	6018.20	26 70	9 60	23 50	23 00	6007 8
00191	20.25	02-OCT-92	749237	2086244	Qrf	5968 86	5970 44	0 00	15 00	25 00	24 20	5950.2
01391	12 99	01-OCT-92	749402	2085226	Qrf	5973 70	5975 30	16 00	6 00	14 00	14 50	5962 3
01491	16.21	01-OCT-92	749430	2085474	Kse & Kcs	5970 37	5972 03	26 00	14 00	24 00	1 60	5955 8
01791	15.21	01-OCT-92	749504	2086018	Kslse & Kscist	5965 78	5967 41	20 00	10 00	18 00	8 00	5952 2
01891	19 42	01-OCT-92	749438	2086023	Kslse & Kslcist	5971 76	5973 37	32 00	20 00	30 00	12 40	5954 0
02091	22 11	01-OCT-92	749617	2086428	Kscist, Kslt, Kslcist	5965 19	5966 65	32 60	15 60	30 60	16 10	5944 5
02191	DRY	01-OCT-92	749708	2086166	Qrf	5965 81	5967 51	15 00	8 00	13 00	13 50	5967 5
02291	13 51	01-OCT-92	749680	2086139	Kscist & Kcse	5936 66	5938 26	18 50	11.50	16 50	8 80	5924 8
2391	DRY	02-OCT-92	749853	2086600	Qrf	5956 82	5958 43	8 00	3 00	6 00	6 90	5958 4
02491	16 9	01-OCT-92	749949	2086432	Kslse, Kslt	5944 54	5946.21	18 80	11 80	16 80	8 50	5929 3
02691	8 81	01-OCT-92	750385	2086043	Kslse & Kslcist	5934 78	5936 38	18 00	6 00	16 00	1 10	5927 6
06591	20 01	02-OCT-92	749064	2085535	Kscist & Kslcist	5978.28	5979 78	50 00	33 00	48 00	15 40	5959 8
06691	22 02	02-OCT-92	749068	2085714	Qrf	5978 34	5979 94	25 10	13 10	23 10	22 00	5957 9
06791	22 85	02-OCT-92	748855	2085646	Qrf	5978 87	5980 38	23 20	11.20	21.20	21.20	5957 5
06891	16 18	02-OCT-92	749258	2085883	Qrf	5974 14	5975 62	16 00	6 00	14 00	14 00	5959 4
06991	20 99	02-OCT-92	749168	2085990	Qrf	5972 91	5974 57	31 00	14 00	29 00	28 60	5953 6
07191	21.21	02-OCT-92	748850	2085908	Qrf	5974 79	5976 34	23 10	11 10	21 10	20 00	5955 1
07291	22 12	02-OCT-92	748748	2085766	Qrf	5977.27	5978 80	22 60	10 60	20 60	20 00	5956 7
07391	7 88	02-OCT-92	748547	2085827	Qrf & Kcist	5949 14	5950 61	13 40	5 40	11 40	8 10	5942 7
08891	23 55	02-OCT-92	749128	2085866	Qrf	5976 36	5978 06	27 30	15 30	25 30	23 00	5954 5
09091	23 4	02-OCT-92	748918	2085943	Qrf	5975 16	5976 79	26 70	14 70	24 70	24 00	5953 4
09691	11 3	02-OCT-92	748572	2086038	Kslse & Kcist	5935 64	5937 05	16 00	6 00	14 00	3 10	5925 8
12091	19 48	01-OCT-92	749436	2086009	Kslse	5971 59	5973.27	24 00	14 00	22 00	13.20	5953 8
12291	16 3	01-OCT-92	749429	2085441	Kcse & Kse	5970 96	5972 73	16 10	7 10	14 10	2 00	5956 4
13091	21 68	02-OCT-92	748960	2085992	Qrf	5973 68	5975.20	23 30	11.30	21 30	19 50	5953 5
13191	19 48	02-OCT-92	749071	2085530	Kscist	5978.25	5979 90	27 70	15 70	25 70	15 40	5960 4
13291	DRY	02-OCT-92	749060	2085523	Qrf	5978 48	5979 97	17 70	5 70	15 70	15 40	5960 0
13291	DRY	01-OCT-92	749060	2085523	Qrf	5978 48	5979 97	17 70	5 70	15 70	15 40	5960 0
33491	10 91	01-OCT-92	748060	2084883	Qc & Kscist	5926 06	5926 59	11 10	6 68	8 69	8 00	5917 7

APPENDIX D – Water–Level Measurements in Industrial Area Monitoring Wells, Spring and Fall 1992

WELL	DTW	DATE	STATE NORTH	STATE EAST	COMPLETION UNIT/LITH	SURFACE ELEV.	TOP OF CASING	TD CSG	TOP SCRN	BOT SCRN	TOP BEDROCK	WLE
33691	10 31	01–OCT–92	748112	2084994	Qc	5926 99	5929 24	10 60	6 19	8 11	7 80	5918 9
33891	10 6	01–OCT–92	747961	2084641	Qc & Kclst	5927 54	5929 94	11 10	6 70	8 70	8 10	5919 3
34591	13 61	02–OCT–92	748462	2085621	Qc & Kclst	5952 19	5954 63	11 30	6 90	8.90	8 20	5941 0
34791	6 41	02–OCT–92	748377	2085521	Qc	5951 39	5953 91	10 42	6 00	8 00	8 00	5947 5
35391	12 49	01–OCT–92	748011	2083907	Kclst	5960 73	5963 03	10 50	6 10	8 11	6 00	5950 5
35991	17 24	01–OCT–92	748057	2083756	Qc	5973 25	5976 45	16 10	8 68	13 70	12.20	5959.2
36191	10 37	01–OCT–92	748091	2084196	Qc	5962 89	5965 17	17 00	9 52	14 60	14 00	5954 8
36391	26 09	01–OCT–92	748042	2084294	Qrf	5964 57	5967 01	29 80	17 43	27 41	26 40	5940 9
36691	25 83	01–OCT–92	748027	2084421	Qc	5949 76	5951 52	27 83	15 83	25 83	25 00	5925 7
37191	9 59	01–OCT–92	748036	2084533	Qc	5945 91	5948 29	23 07	11 12	21 07	20 50	5938 7
37591	9 73	01–OCT–92	748580	2084610	Qrf	5991 42	5993 45	14 60	7 60	12 60	12 00	5983 7
37691	DRY	01–OCT–92	748692	2085217	Qrf	5964 46	5965 24	18 50	6 51	16 50	16.20	5965.2
37891	40 8	01–OCT–92	748075	2084915	Kcsltst & Kcltst	5925 22	5926 29	55 20	43 20	53.20	4 70	5885 5
37991	47 77	01–OCT–92	748063	2084731	Kcsltst & Kcsltst	5931 45	5933 55	57 20	45.20	55 20	6 90	5885 8
38191	11 19	01–OCT–92	748014	2084765	Qc	5924 47	5926 40	17 00	10 00	15 00	14 70	5915.2
38291	12 71	01–OCT–92	748032	2084801	Qc	5924 49	5926 71	10 70	6 70	8 70	8 40	5914 0
39691	12 88	01–OCT–92	748357	2083634	Qrf & Kclst	6006 26	6008 37	11 00	7 00	9 00	8 00	5995 5
SUPPLEMENTAL FALL 1992 DATA												
2186	33 86	06–OCT–92	750855	2082501	Kas & Kaltclst	6004 76	6005 96	67.25	35 00	67.24	15 00	5972 1
2286	10 03	06–OCT–92	750718	2084411	Qrf	5978 77	5979 55	11 20	3 20	11.20	11 00	5969 5
2386	87 75	06–OCT–92	750338	2084259	Kalt & Kaltclst	5982 46	5982 46	117 25	113 00	117.25	8.20	5894 7
5687	8 5	06–OCT–92	750638	2084423	Qrf	5978 39	5979 77	9 92	3 52	9 67	9 40	5971 3
B206189	22 72	06–OCT–92	751138	2085885	Kclst	5935 40	5937 46	27 58	16 90	26 34	11 00	5914 7
P218089	9 49	06–OCT–92	749941	2084020	Qrf	5985 80	5987 55	8 69	3 00	7 43	6 00	5978 1
P419689	20 04	06–OCT–92	748522	2082513	Qrf & Kas	6022 40	6023 42	24 77	19 06	23 50	22 00	6003 4
1986	3 07	07–OCT–92	750694	2083296	Kclst	5943 06	5943 86	12 25	3 00	12.25	11 50	5940.8
2486	DRY	07–OCT–92	750338	2084277	Qrf	5982 45	5983 56	7 45	2 95	7 45	7.20	5963 6
2986	DRY	07–OCT–92	750599	2085687	Qrf	5959 58	5960 68	8 77	2 83	8 77	8 50	5960 7
P207989	18 35	07–OCT–92	750671	2085330	Kclst	5963 09	5965 17	21 73	11 00	20 48	5 80	5946 8
P209289	14 58	07–OCT–92	750863	2084139	Qrf	5981 59	5983 42	13 40	8.20	12 66	12.20	5968 8
P209389	18 4	07–OCT–92	750864	2084130	Kas & Kaltas & Kcas	5981 47	5983 39	30 05	16 82	28 80	13 80	5965 0
3086	7 36	08–OCT–92	751078	2084921	Kclst	5957 42	5958 39	14 93	2 48	14.93	2 50	5951 0
3286	53.91	08–OCT–92	751050	2084743	Kas & Kaltas	5966 06	5967.92	125 50	114 90	125 50	1 00	5914 0
P207789	29 14	08–OCT–92	750392	2085343	Kaltclst	5965 88	5967 75	28 63	17 90	27.34	12.90	5938 6
P208989	17 55	08–OCT–92	751044	2084839	Kaltas & Kaltclst	5962 53	5964 56	26 12	15 40	24 84	3 50	5947 0
P209089	25	08–OCT–92	750566	2084910	Kaltclst	5972 16	5974.25	27.21	16 50	25.96	11 50	5949 3
P209889	5 34	08–OCT–92	751194	2084984	Kaltclst	5940 28	5942 40	19 63	8 89	18 33	3 90	5937 1
36991	DRY	09–OCT–92	748180	2084177	Qrf & Kclst	5969 48	5972 31	10 62	6 62	8 62	8 00	5972 3
37791	18 86	09–OCT–92	748592	2083753	Qrf	6002 16	6004 18	22 60	10 60	20 60	20 00	5985 3

APPENDIX D – Water–Level Measurements in Industrial Area Monitoring Wells, Spring and Fall 1992

WELL	DTW	DATE	STATE NORTH	STATE EAST	COMPLETION UNIT/LITH	SURFACE ELEV.	TOP OF CASING	TD CSG	TOP SCRN	BOT SCRN	TOP BEDROCK	WLE
5187	15 57	09–OCT–92	748103	2083850	fill?	5963.27	5965.22	14 00	3 58	13 84	12 50	5949 7
5287	10 42	09–OCT–92	748145	2084067	fill?	5967 85	5969 57	20 50	3 50	20.25	20 00	5959 2
6186	10 74	09–OCT–92	749198	2083717	Qrf	5999 47	6000 60	12.25	5 00	12 00	11 50	5989 9
P207689	8 77	09–OCT–92	750398	2085318	Qrf	5966 32	5967 88	14 36	3 64	13 10	12 60	5959 1
P317989	9 68	09–OCT–92	748891	2084272	Qrf	5990 90	5992 84	8 73	3 00	7 49	6 40	5983.2
2187	7 84	12–OCT–92	749969	2085799	Qc	5928 43	5929 69	10 56	3 26	10 41	8 00	5921 9
2287	80 57	12–OCT–92	749924	2085822	Kas & Kalt	5931 18	5932 80	88 70	81 41	88 46	12 80	5852.2
2586	28 66	12–OCT–92	750412	2084831	Kaltclst & Kclst	5975 24	5977 14	82 00	59 90	82 00	8 00	5948 5
2686	12 06	12–OCT–92	750411	2084841	Qrf	5975 42	5977 17	11 00	3 75	11 00	10 50	5965 1
37791	18 86	12–OCT–92	748592	2083753	Qrf	6002 16	6004 18	22 60	10 60	20 60	20 00	5985 3
5187	15 57	12–OCT–92	748103	2083850	fill?	5963 27	5965.22	14 00	3 58	13 84	12 50	5949 7
6186	10 74	12–OCT–92	749198	2083717	Qrf	5999 47	6000 60	12.25	5 00	12 00	11 50	5989 9
P207589	25 49	12–OCT–92	750395	2084843	Kaltclst	5974 06	5975 96	25 10	14 40	23 86	9 40	5950 5
P207889	10 09	12–OCT–92	750671	2085343	Qrf	5962 82	5964 90	8 95	3.26	7 70	8 50	5954 8
P209689	28 29	12–OCT–92	750533	2085514	Kaltclst	5962 63	5964 43	27 93	17 20	26 67	12.20	5936 1
P209189	13 78	13–OCT–92	750762	2084309	Kas & Kaltclst	5980 66	5982.21	36 08	13 30	35 01	10 30	5968 4
P317989	9 68	13–OCT–92	748891	2084272	Qrf	5990 90	5992 84	8 73	3 00	7 49	6 40	5983.2
5287	10 42	14–OCT–92	748145	2084067	fill?	5967 85	5969 57	20 50	3 50	20.25	20 00	5959.2
P209489	29 44	14–OCT–92	750991	2084634	Kas & Kaltss	5977 98	5980 10	36 25	15 48	35 00	9 00	5950 7
2786	73 33	15–OCT–92	750781	2085238	Kaslts & Kaclst	5962 89	5963 88	133 00	128 50	133 00	11.00	5890 6
P209789	10 27	16–OCT–92	750579	2085481	Qrf	5962 82	5964 94	13 75	3 00	12 50	12 00	5954 7
3787	9 8	19–OCT–92	750494	2085224	Qrf	5967 52	5968.99	9 00	3 50	8 77	8 00	5959.2
3887	11 37	19–OCT–92	750396	2085094	Qrf	5972 15	5973 90	9 50	3 50	9.27	7 80	5962 5
P416289	15 37	19–OCT–92	748598	2081555	Qrf	6038 60	6040.22	24 77	19 07	23 50	23 00	6024 9
P418289	11 23	19–OCT–92	748952	2082653	Qrf	6016 90	6018.20	26 70	9 60	23 50	23 00	6007 0
P419689	20 3	19–OCT–92	748522	2082513	Qrf & Kas	6022 40	6023 42	24 77	19 08	23 50	22 00	6003 1
0587	45 11	21–OCT–92	748081	2084849	Kas & Kaltss	5927 85	5929 99	51 50	42 00	51.25	11 00	5884 9
4486	8 68	21–OCT–92	749254	2082234	Qrf	6019 93	6021 96	26.25	3.23	26.25	25 50	6013 3
36391	26 17	23–OCT–92	748042	2084294	Qrf	5964 57	5967 01	29 80	17 43	27 41	26 40	5940 8
33491	10 75	26–OCT–92	748080	2084883	Qc & Kaclst	5926 06	5928 59	11 10	6 68	8 69	8 00	5917 8
33891	10 79	26–OCT–92	747961	2084641	Qc & Kclst	5927 54	5929.94	11 10	6 70	8 70	8 10	5919.2
35391	12 36	26–OCT–92	748011	2083907	Kclst	5960 73	5963 03	10 50	6 10	8 11	6 00	5950 7
36191	8 3	26–OCT–92	748091	2084198	Qc	5962 89	5965 17	17 00	9 52	14 60	14 00	5956 9
36691	25 04	26–OCT–92	748027	2084421	Qc	5949 76	5951 52	27 83	15 83	25 83	25 00	5926 5
37991	48 26	26–OCT–92	748063	2084731	Kcaltst & Kaaltst	5931 45	5933.55	57.20	45.20	55.20	6 90	5885 3
0187	10 27	27–OCT–92	748127	2083653	fill	5992 49	5994 06	12 06	3 38	11 83	11 80	5983 8
4387	9 31	27–OCT–92	748030	2084788	Qc	5925 06	5926 41	12 50	3 50	12 25	12 00	5917 1
37591	10 47	28–OCT–92	748580	2084610	Qrf	5991 42	5993 45	14 60	7 60	12 60	12 00	5983 0
P320089	15 71	28–OCT–92	748799	2083280	Qrf	6009 90	6011.87	20 08	14 38	18 81	18 80	5996.2
02291	14 15	29–OCT–92	749880	2086139	Kaclst & Kcas	5936 66	5938.26	18.50	11 50	16 50	8 80	5924 1
37891	41 61	29–OCT–92	748075	2084915	Kcaltst & Kaltst	5925 22	5926.29	55.20	43.20	53.20	4 70	5884 7
4587	90 68	29–OCT–92	748313	2085451	Kas & Kalt & Kclst	5949 32	5950.91	101 30	89 50	97 05	4 00	5860.2

639160

APPENDIX D – Water–Level Measurements in Industrial Area Monitoring Wells, Spring and Fall 1992

WELL	DTW	DATE	STATE NORTH	STATE EAST	COMPLETION UNIT/LITH	SURFACE ELEV.	TOP OF CASING	TD CSG	TOP SCRN	BOT SCRN	TOP BEDROCK	WLE
13591	DRY	02–OCT–92	749204	2086612	Qrf	5965 92	5967 55	18 00	6 00	16 00	16 00	5967 6
1386	8 67	12–OCT–92	751857	2086051	Qc	5840 47	5842 59	9 50	3 09	9 50	9 00	5833 9
1486	10 8	12–OCT–92	751856	2085838	Kss & Kclst	5844 71	5846 71	55 36	39 42	55 36	11 00	5835 9
1586	7 08	07–OCT–92	751852	2085812	Qc	5848 43	5850 63	14 44	4 09	14 44	12 50	5843 6
1686	6 54	12–OCT–92	751747	2085260	Kslts	5867 92	5869 55	45 06	39 06	45 06	7 00	5863 0
1786	8 54	07–OCT–92	751740	2085242	Qc	5868 43	5869 57	13 98	3 73	13 98	12 50	5861 0
37791	18 86	09–OCT–92	748592	2083753	Qrf	6002 16	6004 18	22 60	10 60	20 60	20 00	5985 3
37791	18 86	12–OCT–92	748592	2083753	Qrf	6002 16	6004 18	22 60	10 60	20 60	20 00	5985 3
B208689	13 74	12–OCT–92	751728	2085250	Kslt/clst	5867 60	5869 60	23 07	12 32	21 80	7 30	5855 9
B208789	9 79	05–OCT–92	751755	2084450	Qc	5907 10	5909 03	12 32	2 88	10 93	8 40	5899.2
B208289	17 32	05–OCT–92	751739	2086289	Kslt/clst & Kclst	5850 70	5852 95	16 16	5 95	15 42	0.20	5835 6
B210489	8.23	06–OCT–92	751802	2085513	Qc	5856 40	5858 71	8 67	2 98	7 41	7 00	5850 5

INDEX.

SURFACE ELEV = elevation of land surface at well head, in feet above mean sea level

STATE NORTH = State plane coordinates, northing

STATE EAST = State plane coordinates, easting

COMPLETION UNIT/LITH = rock type in which well is screened
- Kss = Cretaceous sandstone
- Kclst = Cretaceous claystone
- Kcslt = Cretaceous clayey siltstone
- Kcss = Cretaceous clayey sandstone
- Kscist = Cretaceous sandy claystone
- Kslt = Cretaceous siltstone
- Kslt/clst = Cretaceous silty claystone
- Kslts = Cretaceous silty sandstone
- Kssit = Cretaceous sandy siltstone
- Qa = Quaternary alluvium
- Qc = Quaternary colluvium
- Qrf = Quaternary Rocky Flats Alluvium

DTW = depth to water, measured in feet from top of casing

TD CSG = total depth of casing, in feet below top of casing

TOP SCRN = depth to top of well screen, in feet below top of casing

BOT SCRN = depth to bottom of well screen, in feet below top of casing

WLE = water–level elevation, in feet above mean sea level

64 of 160

APPENDIX E

Letters, Memoranda, and Meeting Notes

This is a retyped copy of a 1952 memo, the original is very difficult to read.

June 13, 1952

To: Mr. F.H. Langell

From: Mr. B. P. Shepherd

cc. Dr. Chapmen
Mr. Harrison
Dr. Matheson
Mr. Venable
Mr. Epp

Subject: Liquid Waste Disposal at Rocky Flats Plant.

Purpose: To outline the various methods of liquid waste collection and disposal at the Rocky Flats Plant, in order that the adequacy of treatment or the degree of radioactive contamination or chemical contamination can be shown.

Summary: Liquid waste from the Rocky Flats Plant consists in general of three types: sanitary, storm and process wastes.

Sanitary wastes from all building are collected through a sewage distribution system and flow to an activated sludge sewage treatment plant, Building 95. After treatment, which should remove form 90 to 95% of the B.O.D., the effluent is discharged in to the south tributary of Walnut Creek. The dried sludge can be spread over certain areas within the plant site, where it will act as a soil enriching substance, or it may be disposed of through any one of a number of means off the site, since it is a relatively inoffensive substance and has considerable value as a fertilizer. Samples will be taken regularly of the sewage in the sewage treatment tanks and will be analyzed for possible radioactive contamination. The design is such that it is practically impossible for any contamination to enter the sewage collection system except by actual sabotage or gross negligence or carelessness of some employee.

Storm wastes and rain and snow water run-off will be handled either by surface drainage or by storm sewers to the nearest water course. The ten air-sampling stations spotted at strategic points on the site should give sufficient indication as to whether or not contamination is sufficient as to be a hazard when picked up by normal run-off. Building air exhaust filtering systems have been designed in such a way as to reduce to a minimum any possibility of such contamination.

This is retyped copy of a 1952 memo, the original is very difficult to read.

Process wastes, as used in this report, include actual wastes from processing material as well as cooling water, laundry wastes and other liquids which might potentially carry contamination, but which normally should be entirely free from radioactive contamination. These process wastes also include in some cases purely chemical wastes which carry no contamination whatsoever, in no case are any liquids released, either on or into the ground, until they have been adequately processed and the degree of contamination positively determined as being within acceptable tolerance for such liquids. Provisions have been made in plant design and process equipment to treat any wastes which will develop, so that they can be rendered harmless and released without danger to animal or plant life on or off the site.

Discussions:

Building 71

The fundamental design philosophy which has guided the engineering of sewer and drain systems in this building may be stated as follows:

(a) Under no circumstances is a vessel carrying radioactive materials to be equipped for draining, nor will overflows or open type tanks be installed.

(b) No floor drains will be installed in the processing areas of the building, including production, development and analytical areas.

(c) No service tunnels of any variety, including ventilation ducts, will be constructed beneath processing areas.

(d) No dry boxes or hoods in which radioactive materials are processed will be equipped with drains.

(e) All process wastes, whether from production, analytical or development areas, will be vacuum transferred to Building 74 for treatment.

The following liquid waste systems will be provided for this building:

(a) Sanitary wastes. these wastes will be collected at a sewage lift station adjacent to the building, from which point the wastes will be pumped to the sanitary sewage treatment plant, Building 95 for treatment. These wastes should not contain any radioactivity.

This is retyped copy of a 1952 memo, the original is very difficult to read.

(b) Storm and footing drains. Waters collected in these drain systems should be free of radioactivity and will be discharged into Walnut Creek.

(c) Analytical Wastes. These wastes are collected in a separate drain system which will discharge into a 500-gallon sump north of and adjacent to the building. It is estimated that analytical waste will amount to approximately 300 gallons per day. The wastes in the sump will be held and sampled on a batch basis. If the wastes fall below acceptable limits, they will be pumped and discharged into Walnut Creek. If these wastes exceed the accepted limits, they will be pumped to Building 74 for further processing.

(d) Laundry wastes. These wastes will be collected in a separate drain system and will discharge, together with the cooling water, into one of two 25,000-gallon underground storage tanks located north of and adjacent to the building. At such time as one tank is filled, it will be sampled and the sample analyzed for radioactive isotope contamination. Should the level of activity fall below the accepted limits, the tankful of waste will be pumped to Walnut Creek. Should the level of activity exceed the accepted limits, the waste will be pumped to Building 74 for further processing. Laundry wastes should amount to approximately 3000 gallons per day.

(e) Cooling water. The cooling water referred to here is used entirely in heat exchange type of equipment, with adequate safeguards in design and operation to preclude any reasonable probability of radioactive contamination. This water will be collected in a separate drain system and will discharge, together with the laundry wastes, into one of two 25,000-gallon underground storage tanks located north of and adjacent to the building. Sampling and disposal will be as described in paragraph (d) above.

(f) All other liquid wastes. Other liquid wastes will be transferred by vacuum to Building 74 for further processing. These wastes will amount to approximately 1700 gallons per day

Building 81

(a) Storm and footing drains. Water from these drains will be discharged into Woman Creek.

(b) Sanitary Wastes. These wastes will be collected in a separate drain system and brought into a sewage lift station adjacent to the building, from which point they will be pumped into the main sewerage distribution system, from whence they will flow to the sanitary sewage treatment plant, Building 95, for necessary treatment.

This is retyped copy of a 1952 memo, the original is very difficult to read.

(c) Laundry Wastes. These wastes will be pumped through a suitable filter system into one of two 3000 gallon retention tanks. Each tankful of waste will be sampled and if the level of activity is within acceptable limits the wastes will be discharged into the sanitary drain system. Should the level of activity exceed the accepted limits, the wastes will be pumped to Building 74 for further treatment. Should the wastes by any chance exceed the level of activity which Building 74 can handle or be uneconomically high in accountable material, it will be necessary to process the wastes in Building 81, to reduce to an allowable level which Building 74 can handle or to a level below which accountability must be considered for economic reasons.

(d) Laboratory Wastes. These wastes will be collected in a single drain system from such laboratories as the analytical lab, spectroscopy lab, and radiography, and discharged into one of two 3000 gallon retention tanks. The waste in each tank will be sampled and if the level of activity is below the limit which Building 74 can handle, it will be pumped to that building for further processing. Should the level of activity exceed the limit which Building 74 can handle, it will be necessary to process these wastes further in Building 81.

(e) All other wastes. These other wastes will consist of various process wastes of a low level of activity which can be handled by Building 74, and will also include wastes coming from janitors' slop sinks, boiler blow-down water, cooling tower wash-down water, cooling water waste, which will be bled off occasionally to prevent excessive salt buildup, and miscellaneous other wastes. These wastes will be collected in suitable tanks and will be monitored before being transferred to Building 74.

It is estimated that the amount of waste which will be transferred from Building 81 to Building 74 will amount to approximately 6000 gallons per day. This figure may vary some what but will probably average this magnitude over a reasonable period of time.

Building 23 and 41

Wastes from these building will consist entirely of chemical laboratory wastes normally encountered in laboratory operation of the type which these buildings will be expected to carry on, with the exception of relatively small quantities of urinalysis samples which Building 23 will analyze. These urinalysis samples may contain very minute quantities of radioactive materials but the level of activity is so extremely low that no hazard from this standpoint should be expected. It is estimated that these buildings will discharge approximately 2000 gallons per day, of which 300 gallons per day will be discharged from Building 23 and 1700 gallons per day from Building 41. These wastes will be discharged into a lime pit to provide neutralization, thence to a holding tank of some 600 to 800 gallons capacity, from which tank it will be pumped

This is retyped copy of a 1952 memo, the original is very difficult to read.

to Building 74, where it will be processed even though the level of activity will be within acceptable limits.

Building 74

Total liquid waste flowing to this building will probably average about 9000 gallons per day. Treatment in this building will generally consist of removing the chemical and radioactive content to a point where it can be released and remain within the accepted limits of radioactivity, as well as chemical content. A detailed report covering the analysis of the liquid wastes entering the building for processing, the method of treatment employed within the building, and the analysis of the effluent leaving the building is contained in the Secret Document No. 00732. The treated effluent from the building will be pumped to the downstream side of the sanitary sewage treatment plant, Building 95, and discharged into the effluent from Building 95. This dilution will provide an additional factor of safety in reducing further any residual radioactivity or harmful chemicals.

In view of the relatively unproven process to be employed in Building 74 for the treatment of waste, a 200,000-gallon retention tank will be provided on the flat to the south of the building. This will provide approximately one month's normal operating hold-up of material. Wastes can be pumped from Building 74 to the retention tank and can be returned from the retention tank to Building 74

Building 44

(a) Storm Drains. Water from the roof drains will be discharged onto the ground along the outer walls of the building, and will then depend upon surface runoff.

(b) Footing Drains. Water from these drains should be very small in quantity and will be discharged into the 1200-gallon waste sump located in the basement of the building (see paragraph "d" below) Normally, water from the footing drains would be discharged to the nearest water course or to the sanitary sewer system, but the hydraulics of these systems with relation to each other is such as to make it impractical to discharge footing drain water in accordance with normal practices

(c) Sanitary Wastes. These wastes will be collected in a separate drain system and discharged in to the plant sewage system, through which the wastes will flow to the sanitary waste treatment plant, Building 95 for necessary treatment. Floor drains in the carbon shop will discharge into the sanitary sewer system, since no radioactivity should be present in this portion of the building.

This is retyped copy of a 1952 memo, the original is very difficult to read.

(d) All other wastes. The other wastes not mentioned above consist of a few floor drains in the basement of the foundry, drains from slop sinks, metallurgical laboratory sinks, a few drinking fountains and a few other miscellaneous sources. These wastes will be collected in a separate drain system and discharged into a 1200-gallon sump located in the basement. It is expected that approximately 800 gallons per day of these wastes will be collected in this sump. A float-operated pump will empty the sump by pumping the wastes through a suitable filter system. It is expected that one passage through the filters will reduce any radioactivity below the accepted limits. The wastes will pass from the filter into a second retention basin, at which point the wastes will be sampled. Should the level of activity be below accepted limits, the wastes will be discharged by gravity into the sanitary sewerage system. Should the wastes exceed the accepted limits, it will be necessary to pass them through the filter system again.

Building 95

This plant will treat sanitary sewage through the activated sludge process in equipment of conventional design and operation. It is anticipated that the effluent to be discharged from this plant will vary between 40,000 to 80,000 gallons per day. Samples will be taken regularly of the sewage treatment plants and will be analyzed for possible contamination. Further description of this process was outlined previously in the summary.

Conclusions No liquid wastes from the Rocky Flats Project will be released until the level of radioactivity, as well as the chemical content, has been reduced by positive processing methods to within acceptable limits. No dependance has been placed upon leaching fields or settling basins, inasmuch as these do not provide positive assurance against the release of liquids within safe limits. All liquids released from the project will fall within the requirements established by the AEC for level of activity, and within the generally accepted health requirements for biological and chemical wastes.

DOTY & ASSOCIATES
ENVIRONMENTAL, GROUND-WATER AND WASTE MANAGEMENT ENGINEERS

20011 GOLDEN GATE CANYON ROAD
SUITE 100
GOLDEN, COLORADO 80403-8125

TELEPHONE (303) 279-9181
FAX (303) 279-9186

6-5-92

June 5, 1992
1801-17

Mr. Jim Shaffer
Project Manager
Advanced Sciences, Inc.
405 Urban Street Suite 401
Lakewood, Colorado 80225

Subject. Foundation Drains which may impact OU8 IHSSs

Dear Mr Shaffer,

Foundation drains (or footing drains) around some buildings in the PA were studied by us to determine potential impacts on OU8 IHSSs Information was sought mainly to identify the location of current and historical foundation drains which has been doubted and contradicted in the past by various resources at the RFP An effort was made to determine which drains are still operational This letter summarizes information identified and sources reviewed for this information. An attempt was made to quantify the impact some of the drains may have on the water table in the vicinity of OU8 IHSSs Assumptions made for this effort are stated

The subject of foundation drains will be an evolving one since new sources of information on these drains are likely to be found in the future Any additional information we obtain will be evaluated and incorporated with the information in this letter This has not been an exhaustive study and in the interest of providing you this information as timely as possible, the summaries stated are to be considered in draft form, although they are true and complete to the best of our knowledge

Location

Several sources of information were used to determine the locations of foundation drains. These are stated below We have prepared a map (attached) showing the approximate locations of the drains relative to the OU8 IHSSs The following paragraphs describe the sources used

1 A set of Foundation Drain Plans identify the approximate locations of the foundation drains around many buildings at the RFP The twelve drawings are dated June 13, 1975 and are more schematic than design-oriented. We have the complete set obtained from

the RFP Engineering Drawing Room These are numbered 25581-1 through 25581-12. The set includes drawings of foundation drains specific to Buildings 771, 774, and 779 which indicate the location of the pipes and the direction of flow No other buildings in the OU8 Area are identified in these drawings. Therefore, it is assumed that the other production buildings that would be of concern to OU8 (e.g. 776/777, 707, 559) do not have foundation drains. Most individual drawings do not show termination points but reference the Area Plot Plan (25581-1) for the termination points. The Area Plot Plan is at a small scale and exact locations of termination points cannot be discerned.

2 An Internal Letter written in May 1977 by N.E. Moody of the RFP General Laboratory describes the locations of building sumps and foundation drains. The letter states the identification number and a brief description of its location with a notation indicating whether it would be expected to be wet or dry. In comparing the information in this letter to the 1975 maps, an additional foundation drain location is described. This foundation drain is FD707-1 and is described as being the storm drain outlet east of the Building 750 Parking Lot. The description of this sampling point includes a statement that it "should pick up water from Buildings 559, 750, 776, 777, 778, and 707." This is of significance because it is the only mention found that describe drainage from these buildings. Because the identification number is prefaced with FD, it was believed to be a foundation drain, but the description is of a storm drain and no other documentation was found which describes foundation drains associated with the mentioned buildings.

3 A sampling program was initiated sometime in the mid 1970s (based on the memory of Ralph Hawes, retired RFP Environmental Group employee) to monitor the quality of water discharging from drains. The results of this sampling program were summarized in a December 1981 report written by Nancy Hoffman (now Nancy Kirk with Procurement Control at the RFP) This report, entitled "Water Quality Data for Foundation Drains and Building Sumps from 1977 through 1981 (Draft)," reiterates and supplements N E. Moody's Internal Letter in the descriptions of the foundation drain and building sump locations In preparing the report, Ms. Hoffman traced down the sampling locations in the field using the 1975 maps. She went to the locations indicated to be termination points for the foundation drains and if a discharge pipe was found, it was concluded to be the discharge pipe indicated on the map. No additional analysis was performed, such as dye testing, to determine if the pipes found were truly foundation drain outlets.

4 Original construction drawings were found for portions of Buildings 771 and 774 or additions to them Foundation drains along the north side of Building 771 were verified from a 1962 (RF-V71-10008) drawing and the drain from the northwest corner of Building 771 to the outlet in a manhole were verified from a drawing from 1952 (RF-70-111-C) For these locations, exact (at the time of the drawing) invert elevations were

stated. Other than these, foundation drains were not identified in other construction drawings and were not able to be verified. A 1989 drawing (38544-102) for the replacement of Tanks 66, 67, and 68 at the southeast corner of Building 774 indicates a designed "perimeter foundation drain" which is a gravel pack over geosynthetic fabric directly adjacent to the foundation and is not representative of the type of foundation drain (pipe) that are the focus of this letter. Where not specifically found, foundation drain invert elevations were estimated based on the design elevations of the building foundations taken from construction drawings.

5 Current RFP Utility Drawings were studied for the existence and location of footing drains in the OU8 area. Several were found in the vicinity of Building 774 and a few near Building 771. In the case of Building 771, these were very close to the ones indicated on the 1975 map. The drains near Building 774 varied significantly. Building 774 has been modified many times since its construction in 1952. Small and large additions were built on to it in all directions from its original configuration.

It is supposed that the original building was constructed with the foundation drains around it and that subsequent construction activities probably left the drains in place but not serving their original intent. The drains may have been blocked off internally by these construction activities. It is believed that these original foundation drains are indicated on the 1975 map, superimposed over the new shape of the building. In comparing the building outline from the 1975 map with the current building outline on the 1990 Utility Drawings, it is clear that all of the drains indicated in the 1975 map are currently beneath some structure or pavement. The foundation drains indicated on the current utility drawings are noted only where they emerge from beneath the building and its path under the building is unknown. It is not believed that any foundation drains were added subsequent to the construction of the building (or additions) and that one or both of the maps are in error or are incomplete. The veracity of the 1975 map is doubted more than the utility drawing because is schematic in nature and the purpose of the 1975 maps is not currently known.

Working Condition

Foundation drains that are currently in existence are the ones of most concern to the OU8 workplan. For estimating the potential impact of the foundation drain on each IHSS in the OU, all of the foundation drains found from the sources above were included. This was considered to be a conservative approach and also as a direction for continuing investigations There is one exception to this The 1975 map indicates a foundation drain along the north side of Building 779 The map indicates a termination point between Solar Ponds 207C and 207A. It is believed that the pipeline between the solar ponds is a storm drain (based on the utility map and discussions with RFP employees) and that the foundation

drain portion was only north of the building. No other documentation or verification was found in support of the current existence of this foundation drain. The configuration of the building has changed since its original construction and construction activities occurred in the late 1980s which affected the foundation of Building 779 in retrofitting for seismic stability. The estimated elevation of this foundation drain is higher than the elevation of the closest OU8 IHSS and it was not considered for further analysis at this time.

The foundation drains are a subsurface network of pipes of various materials. There are no sampling ports, lamplights, or other access points other than the outlet. Therefore, the water quality identified from the outlet water samples are a composite of all waters entering the network and there is no direct and non-intrusive manner to isolate the source of potential contamination (assuming the water sample indicates contamination) and attribute it to one particular IHSS or PAC.

Some buildings in the OU8 Area do not have foundation drains. Buildings 771 and 774 are original production buildings at the RFP. Buildings 559, 707, 750, 776/777, 778, and other main buildings in the area were constructed in different phases after the initial construction. These buildings are equipped with interior building sumps. It is speculated that the buildings were designed without foundation drains, which would direct water away from the foundation, with the intent of allowing groundwater to seep into the building. Infiltrated groundwater would be contained within the building as a means of controlled monitoring and discharge of collected water

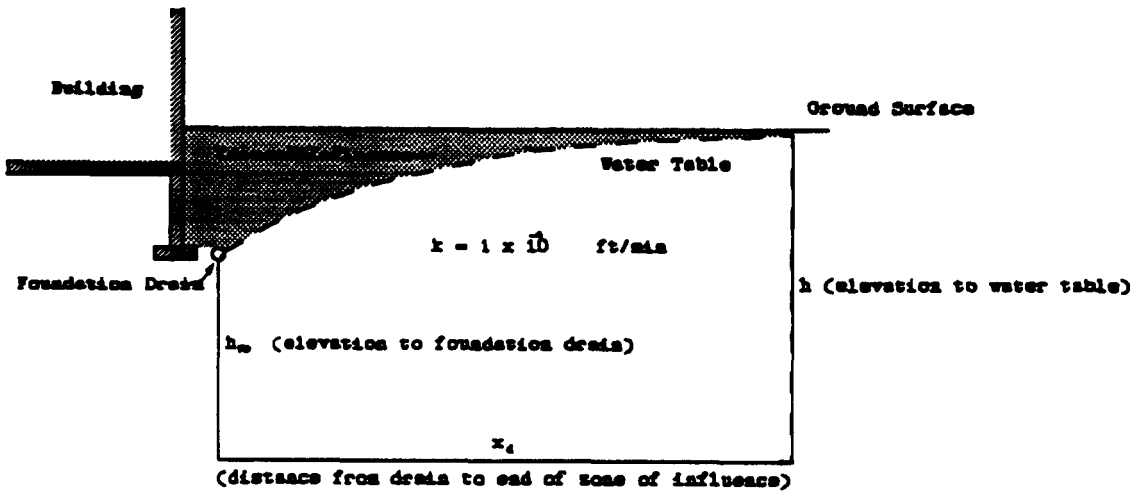
Impact on Groundwater

An evaluation was made in areas where the foundation drains were in close proximity to an OU8 IHSS to estimate if the foundation drain would impact the groundwater beneath the IHSS insofar as drawing down the water table toward the drain and allowing for potential contaminant migration Many assumptions were made for this evaluation. It was assumed that a foundation drain would collect the same amount of water along its length, that is, flow, Q, is constant and could be measured directly from the termination point of the pipe. All subsurface structures (pipelines, tunnels, tanks) were ignored in respect to effects on groundwater drawdown

The location of the OU8 IHSSs and the buildings and drains are considered constants. The water table elevation and the flowrate, Q, are variables. A table was prepared which summarized the flowrates and water table elevations necessary to have an impact on the OU8 IHSS. The flowrates can presumably be measured from the termination points and the water table elevations can be estimated from monitoring well control. If these variables are known, then it can be determined if the foundation drains actually impact the groundwater below the OU8 IHSSs The flowrate is zero if the water table elevation is below the level of the drain.

In this cases, the drains may not have any impact even if the IHSS is directly above the drain. However, there still could potentially be an impact if infiltration of surface water travels through the IHSS toward the drain, even if the water table elevation is below the drain elevation. If the drain loses water through its length, the drain could be impacting the groundwater beneath the IHSS, but this condition cannot be quantified accurately.

To estimate the relationship among flowrate, foundation drain elevation, water table elevation, and location of the IHSSs, an equation was derived to determine the zone of influence from the drain to the point where the water table is no longer impacted by the presence of the drain. This equation was derived from Darcy's Law:



$$Q = -kh\frac{dh}{dx}$$

(From Fetter, 1980, p 133 and McWhorter & Sunada, 1977, p 97)

Integrating both sides, with flow from right to left gives:

$$Qdx = khdh$$

$$Qx_d = \frac{k}{2}(h^2 - h_{FD}^2)$$

$$x_d = \frac{k(h^2 - h_{FD}^2)}{2Q}$$

or,

This equation is generally used to predict the water table profile. The actual water table is generally greater than the predicted profile because vertical components of flow are neglected (McWhorter & Sunada, 1977, p 147)

Other basic assumptions for this equation are as follows:

- flow is steady state;
- aquifer is homogeneous and isotropic; and
- the Dupuit-Forcheimer assumptions apply (Freeze and Cherry, 1979, p. 188):
  - flowlines are assumed to be horizontal and equipotential lines are assumed to be vertical,
  - the hydraulic gradient is assumed to be equal to the slope of the free surface and invariant with depth

Calculations were made, using the elevation of the foundation drain and the elevation of the ground surface of the IHSS, to find flowrates of the drains if the extent of the zone of influence was to the boundary of the IHSS The attached table summarizes these discharge calculations. The IHSS in question would potentially be affected if the actual discharge from the foundation drain was determined to be less than the flowrate calculated. For a given static water table elevation, a very low flowrate will have a relatively wide zone of influence; conversely, a high flowrate will have a relatively narrow zone of influence.

Flowrates were calculated for fully saturated and half saturated conditions. The fully saturated condition would apply if the water table elevation was just beneath the ground surface (a worst case scenario) The half saturated condition applies if the water table is half way between the ground surface and the foundation drain elevation. Although flowrates were calculated only for fully saturated and half-saturated conditions, it should be noted that the discharges calculated for fully-saturated conditions are twice the discharge rates calculated for half-saturated conditions, indicating a proportional relationship between the flowrate and the amount of saturation when the elevation differences are relatively small.

In cases in which IHSS boundaries and foundation drain boundaries overlap, it is assumed that the IHSS could be affected by the foundation drain regardless of the saturation and flowrate. Also, if the IHSS elevation is less than that of the drain, it is assumed that the foundation drain will not affect groundwater beneath the IHSS.

Conclusion

The information presented in the table should be used as guidance and measured values can be used in the derived equation to determine if there is a potential impact on the IHSS by the foundation drain. ASI has data for these variables that can be used in the equation.

I hope this information and effort are useful for your evaluation. If you need additional information or explanation, do not hesitate to call.

Sincerely,
DOTY & ASSOCIATES

Ann K. Sieben

Attachments 2

cc Frank J Blaha
File 1801-17

ATTACHMENT 2

IHSS #	LOCATION	FOOTING DRAIN ELEVATION (FT)	GROUND SURFACE ELEVATION (FT)	FULLY-SATURATED HEAD (FT)	HALF-SATURATED HEAD (FT)	FULLY-SATURATED DISCHARGE (GPM)	HALF-SATURATED DISCHARGE (GPM)
Footing drain - south side of Building 771 (runs E-W)							
139 1(S), 139 2	SE corner, Bldg 771	5943	5987	44	22	4 35	2 17
118 1	E side of Bldg 701	5943	5986	43	21 5	1 53	0 76
132, 144	E of Bldg 701	5943	5986	43	21 5	1 91	0 96
137	SE of Bldg 771	5943	5982	39	19 5	1 29	0 64
150 2	W of Bldgs 771 & 777	Overlaps footing drain - will be affected regardless of flow and saturation					
Footing Drain - East side of Building 771 (runs N-S)							
150 3	Between Bldgs 771 & 774	Overlaps footing drain - will be affected regardless of flow and saturation					
137	SE of Bldg 771	5943	5982	39	19 5	1 29	0 64
Footing Drain - West of Building 771 (runs N-S)							
150 2	W of Bldgs 771 & 777	Overlaps footing drain - will be affected regardless of flow and saturation					
172	NW and N of Bldg 771	5943	5946	3	1 5	1 33	0 67

IHSS #	LOCATION	FOOTING DRAIN ELEVATION (FT)	GROUND SURFACE ELEVATION (FT)	FULLY-SATURATED HEAD (FT)	HALF-SATURATED HEAD (FT)	FULLY-SATURATED DISCHARGE (GPM)	HALF-SATURATED DISCHARGE (GPM)
Footing drain - northernmost running E-W out of West side of Building 771							
150 2	W of Bldgs 771 & 777	5943	5961	18	9	1 33	0 67
172	NW and N of Bldg 771	Considered unaffected by footing drain due to pavement and opposite slopes					
Footing drain - southernmost running E-W out of West side of Building 771							
150 2	W of Bldgs 771 & 777	5943	5961	18	9	4 0	2 0
172	NW and N of Bldg 771	Considered unaffected by footing drain due to pavement and opposite slopes					
Footing Drain - North of Building 771 (runs E-W)							
172	NW and N of Bldg 771	5941	5944	3	1 5	1 33	0 67
150 1	N of Bldg 771	Overlaps footing drain (on west end) - will be affected regardless of flow and saturation					
163 2	N of Bldg 771	5941	5944	3	1 5	0 11	0 05
Footing Drain - South/Central Building 774 (runs E-W and N-S)							
137	S of Bldg 774	5949	5982	33	16 5	0 47	0 24
150 3	Between Bldgs 771 & 774	Overlaps footing drain - will be affected regardless of flow and saturation					

IHSS #	LOCATION	FOOTING DRAIN ELEVATION (FT)	GROUND SURFACE ELEVATION (FT)	FULLY-SATURATED HEAD (FT)	HALF-SATURATED HEAD (FT)	FULLY-SATURATED DISCHARGE (GPM)	HALF-SATURATED DISCHARGE (GPM)
Footing Drain - South/East side of Building 774 (runs E-W)							
137	S of Bldg 774	5948	5982	34	17	0 37	0 19
Footing Drain - northernmost North of Building 774 (runs E-W)							
150 1	N of Bldg 771	5946	5944	Footing drain won't affect IHSS - drain elevation greater than IHSS elevation			
northern portion - 139 1(N)	N of Bldg 774	5946	5936	Footing drain won't affect IHSS - drain elevation greater than IHSS elevation			
163 1	N of Bldg 774	5946	5940	Footing drain won't affect IHSS - drain elevation greater than IHSS elevation			
172	N of Bldg 771	Overlaps footing drain - will affect regardless of flow and saturation					
southern portion of 139 1(N)	N of Bldg 774	5946	5956	10	5	8 9	4 4
Footing Drain - southernmost North of Building 774 (runs E-W)							
southern portion of 139 1(N)	N of Bldg 774	Overlaps footing drain - will affect regardless of flow and saturation					
172	N of Bldg 771	5946	5947	1	0 5	0 89	0 44
163 1	N of Bldg 774	Footing drain won't affect IHSS - drain elevation greater than IHSS elevation					
northern portion of 139 1(N)	N of Bldg 774	Footing drain won't affect IHSS - drain elevation greater than IHSS elevation					

DOTY & ASSOCIATES
ENVIRONMENTAL, GROUND-WATER AND WASTE MANAGEMENT ENGINEERS

20011 GOLDEN GATE CANYON ROAD
SUITE 100
GOLDEN COLORADO 80403-8125

TELEPHONE (303) 279-9181
FAX (303) 279-9186

May 28, 1992
1801-17

Mr. Jim Shaffer
Advanced Sciences, Inc.
405 Urban Street
Suite 401
Lakewood, CO 80228

5-28-92

Subject: OU8 Information

Dear Mr. Shaffer:

This letter transmits information to you regarding various Operable Unit 8 (OU8) issues. The main issues addressed in this letter are listed below.

- Our comments on figures based on a review of the drawings for OU8 Individual Hazardous Substance Site (IHSS) locations.
- The status of photographs for the various OU8 IHSSs.
- A transmittal of currently available information on footing drains in OU8.

Review of Figures for IHSS Locations

With regard to our review of the OU8 IHSS drawings, we have identified a number of changes that are necessary in order to make the IHSSs locations better agree with currently available data. These changes are identified on the attached figures, and are briefly explained below. These changes, if made, will make the OU8 IHSS locations better agree with those locations presented in the Historical Release Report which has just been completed by my firm. The exception to this rule is your location for IHSS 150.3 which is more accurately presented in your drawings than in the final HRR.

The following comments are based on the colored figures that we obtained from you on May 14, 1992. The IHSSs are discussed in numerical order, references to figures are based on the ASI numbering system presented in the lower left-nand corners of the figures.

IHSS 118.1	Information obtained during HRR activities indicate that the boundaries of this IHSS should be modified to represent a rectangular area just south of the "notch" on the east side of Building 701 to better represent the former location of the tank. These comments are pertinent to Figures IHSS4 and IHSS9.
IHSS 118.2	Appropriate as presented.
IHSS 132	The boundaries for IHSS 132 are not presented on Figures IHSS9 or IHSS4. HRR information indicates that the boundaries for this site should be located east of Building 701 and IHSS 118.1, which is northeast of the IAG location.
IHSS 135	Appropriate as presented.
IHSS 137	Appropriate as presented.
IHSS 138	Information obtained during HRR activities indicate that the boundaries of this IHSS should be located a small distance east of the location presented in Figure IHSS6.
IHSS 139.1	Appropriate as presented.
IHSS 139.2	Appropriate as presented.
IHSS 144	Based on engineering drawings obtained during HRR activities, IHSS 144(N) should be located east of Building 701 and IHSS 132. Since the exact location of the sewer line break between Buildings 777 and 779 is unknown, the boundaries of 144(S) should include more of the alleyway. This comment pertains to Figures IHSS4, IHSS6, and IHSS9.
IHSS 150.1	Appropriate as presented.
IHSS 150.2	Appropriate as presented.
IHSS 150.3	Appropriate as presented.
IHSS 150.4	It was proposed in the HRR that this IHSS be moved to the west side of Building 750, since the IAG location is inaccurate. This comment pertains to Figure IHSS8.

IHSS 150.5 Information obtained during HRR activities indicates that this IHSS is really a duplicate of IHSS 123.2. Therefore, the boundaries have been deleted in the HRR. This comment pertains to Figure IHSS7.

IHSS 150.6 The boundaries of IHSS 150.6 have been modifies to agree with the IAG. However, it is possible that the IAG location is inaccurate. Since we found no hard information in the course of the HRR study contradicting the IAG boundaries, no changes were made to the boundaries of this IHSS. We have indicated to change the boundaries of this IHSS to the south of the boundaries shown on Figure IHSS6, including portions of Buildings 705 and 706. This comment pertains to Figures IHSS6 and IHSS8.

IHSS 150.7 The location of this IHSS is appropriate, however the west end should be modified to a rectangular shape. This comment pertains to Figures IHSS5 and IHSS9.

IHSS 150.8 The boundaries are appropriate as presented.

IHSS 151 The boundaries are appropriate as presented.

IHSS 163.1 Appropriate as presented.

IHSS 163.2 Appropriate as presented.

IHSS 172 Information obtained during HRR activities indicate that the boundaries of this IHSS be extended, since the roadway was contaminated to the west dock of Building 774. This comment pertains to Figure IHSS2.

IHSS 173 It was proposed in the HRR that this IHSS be reduced in size to include only the southwest corner of Building 991. Interviews and documentation indicate that activities which may have affected the site took place only at the south dock of Building 991. This comment pertains to Figure IHSS10.

IHSS 184 The boundaries of IHSS 184 appear to be too far north. The site location was not changed as a result of HRR activities, and should presumably

be the same as that presented in the IAG. This comment pertains to Figure IHSS10.

IHSS 188 Appropriate as presented.

The original colored figures are attached and are marked-up in pencil.

OU8 IHSS Photographs

Photographs were taken of OU8 IHSSs yesterday, May 27, 1992. These photographs were taken by the RFP Photography Department with my help, and will be ready for review approximately June 15, 1992. Two copies of each photograph will be made. A number of IHSS sites will be addressed through the use of low-level aerial photographs from recent years. Low-level aerial photographs at the RFP are done on an annual basis. Should any of the current aerial photographic coverage of OU8 prove inadequate, arrangements can be made for additional low-level aerial photographs to be taken in the month of June. Clearly these low-level aerial photographs will not be ready for a June 22, 1992 deliverable, but they can be ready for the fall deliverable. A number of OU8 IHSSs cannot be adequately covered by aerial photography, and for those we have taken ground-level shots.

Footing Drains

Footing drains in the OU8 area for which relatively complete information exists are located as described below. Also presented with these location descriptions is an evaluation of IHSSs potentially impacted by the footing drains, as well as a description of the locations at which these footing drains could be sampled.

- A footing drain is located along the tunnel that connects Buildings 771 and 776. This footing drain is not identified on any known engineering or utility drawings, but is expected to run along the north-south tunnel the full distance between Buildings 771 and 776. This footing drain is currently inoperative (the water collected by it must be pumped to the ground surface and the pump that does this is currently "locked out"). This footing drain, if operative, has the potential to impact groundwater flow near IHSSs 118.1, 132, 139.1(s), 139.2, 144, and 150.2 in OU8. This footing drain, if operative, would pump collected groundwater to the surface near the northwest corner of Building 701.

- A footing drain is located on the south side (and partially on the west and east sides) of Building 771. This footing drain discharged to South Walnut Creek to the northwest of Building 771 until sometime in the 1970's or 1980's. Drawings and records are available regarding these old discharge points. However, the current discharge from this footing drain is believed to be in the same general location of the Building 774 footing drain discharge to the north of Building 774. I have not yet identified any documentation of this change in discharge point for the Building 771 footing drains, but I have spoken to more than one person who has alluded to this change. The change in discharge point was made during the modification of drainage, roads and parking lots in the general Building 771 and 774 area. These changes have greatly modified this general area. This footing drain has the potential to impact groundwater flow near IHSSs 118.1, 132, 139.1(S), 139.2, 144, and 150.2.

- A footing drain is located on the south side (and partially on the west and east sides) of Building 774. This footing drain daylights on the hillside north of Building 774 near a small pond. This footing drain has the potential to impact groundwater flow near IHSSs 137 and 150.3.

- A footing drain is also located near the southeast corner of Building 559 along a tunnel that connects Building 559 and Building 528. This footing drain daylights a considerable distance northwest from Building 559 (and southwest from Building 771) on the hillside along a drainage that runs to the northeast. This footing drain has the potential to impact groundwater flow near IHSSs 150.5.

As a further step in evaluating the overall impact of these footing drains on the various IHSSs. I suggest that we run a quick paper calculation of the potential "zone of influence" of each of these footing drains. This evaluation will require some of the groundwater parameter information that should currently be available at ASI. The completion of these calculations will help increase the certainty of which IHSSs are potentially impacted by the footing drains, and will help in the identification of missing groundwater parameter information. This type of evaluation is a part of our current scope of work under Initial Evaluation.

I trust that the above is complete enough for your review and evaluation. If you have any questions or need additional clarification on any points, please call.

Sincerely,
DOTY & ASSOCIATES

Frank J. Blaha

Frank J. Blaha

DRAFT

MEMORANDUM

TO: Meeting Attendees

FROM: Frank J. Blaha

DATE: January 19, 1994

RE: Notes of meeting with EG&G personnel on footing drains and related information

In Attendance:
Steve Barros, EG&G
Leslie Dunstan, EG&G
Dan Wistrand, EG&G
Dean Yashan, EG&G (arrived about 11 AM)
Ferrel Hobbs, Jacobs
Dave Landes, Jacobs
Mike Visocky, Jacobs
Frank Blaha, Wright Water Engineers (WWE)

The above people attended a meeting on December 22, 1993 to discuss the information and findings of the Jacobs team regarding footing drains and to determine whether EG&G personnel had additional information of which the Jacobs team was unaware. The meeting focused upon those footing drains for which there seemed to be incomplete or conflicting information or for which there seemed that a better sampling point exists.

The EG&G personnel were interested in the footing drain invert elevations that Jacobs had developed from engineering drawings. This constitutes new information for the EG&G personnel and helps to determine the direction of flow within the footing drains. The direction of flow is useful in establishing a good monitoring point.

This memorandum consists of meeting minutes as well as a summary of all information this author knows of regarding Rocky Flats Plant (RFP) footing drains,

except for data. Data will be addressed in a separate memorandum to follow this one. Specific buildings and issues discussed are presented below.

Building 111. The Jacobs team was concerned about the fact that EG&G personnel have recently been sampling a building sump in the basement of Building 111. During a site walk, EG&G had indicated that the footing drains possibly flowed to this building sump. However, the Jacobs team did not believe that the building sump was connected to the footing drain system. Footing drain elevations generated by Jacobs indicated the low point in the footing drain system was on the opposite side of the building from the sump, making it unlikely that the footing drains flowed into the sump.

EG&G personnel concurred that there is uncertainty related to the footing drains at Building 111. EG&G personnel had been told by Building 111 Utilities personnel that the footing drains had been re-routed to the sanitary sewer system as a part of the construction of Building 115. However, a review of the drawings for construction of Building 115 found no evidence for the re-routing of the drains (all of the pipes were shown as truncated at the Building 115 wall). Further, a number of EG&G personnel have inspected the general area in which the Building 111 footing drain once daylighted and found no pipes or moist areas that could be indicative of the end of the footing drain. It was explained that one of the reasons the building sump in 111 has been sampled is to determine whether there is any connection between silver hits that have been identified in sanitary wastewater treatment plant sludge and a possible silver hit in a Building 111 sump sample. These two hits could indicate a tie-in of the building sump to

HOW? FLOOR DRAINS YES

footing drains and then to the sanitary wastewater treatment plant. However, EG&G personnel concurred that the building sump was probably not related in any way to the footing drains. After these discussions, it seemed that most reasonable routes of investigation had been pursued and that some questions still remained. However, the Rocky Flats Plant engineer responsible for construction of Building 115 had not yet been contacted, and it is possible that additional information could be available from that person. EG&G personnel indicated that dye testing of the building sump and footing drains at Building 111 will be conducted as a part of the Drain Identification Study (DIS) activities.

Building 124: Based upon engineering drawings obtained by Jacobs, Building 124 (the potable water treatment building) has a footing drain system that flows away from the building to the south. It was generally agreed that this footing drain once daylighted on the hillside south of Building 124 uphill from Woman Creek. However, Jacobs found drawings indicating that the footing drain had been connected to an 18"/24" southeast-running storm drain just southwest of Building 460. This storm drain connects with the other 444/460 storm drains that terminate above the South Interceptor Ditch (SID) just south of Building 664. Thus, flow from this footing drain would be sampled when samples are taken for the 444/447 footing drain.

SAW A PHOTO OF IT

POSSIBLE

NO - NOT - PIPE -V

POSSIBLE

The routing of Building 124 footing drain flows into this storm drain appeared to be new information to the EG&G personnel. EG&G personnel had spent some time trying to identify the point at which the Building 124 footing drain daylighted on the hillside south of Building

VERY LITTLE

124 but had been unsuccessful in locating the pipe and had found no wet areas on the hillside in the general area in which the pipe had once daylighted. WWE personnel have information on Pond 6 that could be useful in locating the point at which the Building 124 drain once daylighted. This information includes drawing 27006-4, sheet 4 of 12 (Rockwell International Corporation, 1975, Backwash Storage Tanks Layout. RFP Drawing No. 27006-4 sheet 4 of 12. As Built June 18). This drawing indicates that a drain leaving the general Building 124 area and draining to the south was plugged as a portion of the project for which these drawings were completed. This project was a backwash water recycle/management project intended to eliminate any discharge to Woman Creek from the water treatment plant due to NPDES permitting issues. It is WWE's opinion from interviews of personnel involved in this project that the drain from 124 to Woman Creek was plugged or removed, and Drawing 27006-4 supports the statements made by RFP personnel in those interviews. This drawing also indicates that this plug should be effective in preventing discharges from the footing drain to this outfall pipe.

It was also conjectured at the meeting that the tie-in of the footing drain to the storm drain should be visible in a stormwater catch basin. No one at the meeting was familiar with that particular catch basin. Further, it was also conjectured that Tom Trujillo, the RFP engineer that had recently been involved in many of the stormwater drainage problems and issues in the 444/460 area, might have additional information on the routing of this footing drain and stormwater drain. Jacobs' attempts to reach Mr. Trujillo had been unsuccessful. It was

also stated that dye testing of the Building 124 footing drain should be helpful in determining the true routing of the flow.

Building 444: Based on drawings recently accessed by Jacobs, the low point on the Building 444 footing drain occurs on the south side of Building 444 just east of Building 449. However, although this is the low point of the footing drain system (at an elevation of 6007.0'), there appears to be no pipe or other conveyance structure to remove the footing drain water from this area. Information obtained from building personnel has indicated that the footing drain flows are collected into a building sump and that the flow from that building sump goes into a second building sump and then the combined flow from that sump is pumped to the process waste treatment system. However, the elevations of the sumps are 6008.4', and thus these sumps are not capable of gravity draining flow from the footing drains on the south side of the building. According to elevations obtained by Jacobs, flow should actually be from the building sumps into the footing drain on the south side of the building, but again there is no conveyance structure related to footing drains shown from that point.

There was general agreement at the meeting that additional information needs to be obtained about the footing drains and building sumps at Building 444. Avenues of investigation that were discussed at the meeting included:

- talking to the Building 374 Process Waste Treatment operators (these people should know

what building sumps and other connections are made to the process waste collection system),

- talking to Tom Trujillo, an RFP engineer who has been involved in many drainage modifications in the 400-area of RFP,

- determining through utility drawing review and site inspections whether any current or original process waste treatment collection system valve vaults occur near the south side of Building 444, and

- inspecting the storm drain catch basins and drainage structures in the area to determine whether or not any pipes can be found daylighting to any of these structures.

A 1952 document sheds some light on the issue of footing drain flows from Building 444 This document (Shepherd, B.P., "Liquid Waste Disposal at Rocky Flats Plant," Dow Chemical Company, Internal Memorandum to F.H. Langell, June 13, 1952) gives some indication as to the original operation of both the footing drain system as well as the waste management system:

> (b) Footing Drains. Water from these drains should be very small in quantity and will be discharged into the 120-gallon waste sump located in the basement of the building (see paragraph "d" below). Normally, water from the footing drains would be discharged to the

> nearest water course or to the sanitary sewer system, but the hydraulics of these systems with relation to each other is such as to make it impractical to discharge footing drain water in accordance with normal practices.

and

> (d) All Other Wastes. The other wastes not mentioned above consist of a few floor drains in the basement of the foundry, drains from slop sinks, metallurgical laboratory sinks, a few drinking fountains and a few other miscellaneous sources. These wastes will be collected in a separate drain system and discharged into a 1,200-gallon sump located in the basement. It is expected that approximately 800 gallons per day of these wastes will be collected in this sump. A float-operated pump will empty the sump by pumping the wastes through a suitable filter system. It is expected that one passage through the filters will reduce any radioactivity below the accepted limits. The wastes will pass from the filter into a second retention basin, at which point the wastes will be sampled. Should the level of activity be below accepted limits, the wastes will be discharged by gravity into the sanitary sewerage system. Should the wastes exceed the accepted limits, it will be necessary to pass them through the filter system again.

The existence of the two sumps in the basement of 444 and the fact that the footing drains flowed to these sumps due to unfavorable hydraulics, appear to make more sense based on the above passages from the Shepherd document.

Building 707: Jacobs personnel have obtained engineering drawings indicating the existence and routing of footing drains associated with Building 707. EG&G Surface Water personnel have not previously accessed these engineering drawings.

The routing of the footing drains and the current sampling point employed by the EG&G Surface Water group to monitor the Building 707 footing drains were both discussed. There was general agreement that some modifications in sampling points may need to be made in order to monitor Building 707 footing drain flows. EG&G Surface Water personnel had been sampling water in a catch basin south of Building 707 and north of a cooling tower as potentially representative of footing drain flows. This sampling point was established based upon an interpretation of historical documentation related to the footing drains from the 1970s and 1980s. Engineering drawings accessed by Jacobs indicated that the footing drain flows pass north of the catch basin sampled by EG&G personnel and that the flows from the catch basin also enter this same pipe. It is conjectured that there may be some access points to the pipes identified by Jacobs as carrying footing drain flows, but additional research on this issue will be needed.

Building 771· The locations and sampling of Building 771 footing drains were discussed at the meeting. The footing drains from Building 771 historically flowed to the northwest from the Building. However, significant changes in drainage and drainage structures occurred to the northwest of Building 771 as a part of the Protected Area (PA) construction of the early 1980s. Footing drain drawings that address Building 771 footing drains prior to construction of the PA indicate three separate discharges of footing drain flows to North Walnut Creek.

The EG&G Surface Water Group is currently sampling a manhole just west of the Carpenter Shop of Building 771 as being indicative of some

of the Building 771 footing drain flows. Drawings indicate that some of the footing drains on the west and south sides of Building 771 flow to this manhole.

However, other footing drain flows from Building 771 existed prior to PA construction due north of this manhole. These flows entered a manhole (designated as manhole #3 on some drawings) just west of Building 778. An 18"-diameter vitrified clay pipe is indicated as flowing northwest from this manhole, and this constituted the original discharge of footing drains on the east, north, and portions of the west side of Building 771. However, drawings obtained by Jacobs related to PA construction indicate that the discharge pipe from this manhole has been plugged. These drawings do not indicate the current location of the footing drain discharge related to manhole #3.

Long-time employees of Building 771 or of RFP have told both EG&G Surface Water personnel and employees of WWE that at least some of the Building 771 footing drain flows have been routed to the east of their original discharge locations. In general, these personnel have indicated that the footing drains now flow into the small pond just north of Building 774. In the general vicinity of this pond, a number of pipes have been identified as daylighting, but the source of all of these pipes has never been successfully tracked down. This small pond is partly being addressed by Operable Unit 4 site characterization and remediation activities because the flows from this pond had been, until late 1992, collected by the french drain system located north of the solar ponds. Although attempts have been made by both EG&G Surface Water personnel and WWE employees, no drawings have yet

been located that corroborate the re-routing of footing drain flows to the small pond north of Building 774.

There was general agreement in the meeting that additional work is needed to obtain better information on the Building 771 footing drains.

Building 774 The footing drains associated with Building 774 were discussed. The author of this memo was not directly involved in this conversation, but there appeared to be general agreement at the meeting that most of the Building 774 footing drains flow to the small pond north of Building 774. At least some of the flows into this small pond are being monitored as footing drain flows, but there was some uncertainty as to the exact pipes currently carrying footing drain flows. There have been a number of additions to Building 774 and a number of construction projects in the general Building 774 area. Many of these projects could have encountered footing drains and required the rerouting of those drains. Drawings do indicate an additional footing drain outfall to the east of the small pond.

The following information on Building 774 is based entirely on this author's memory of events in 1987/1988. A construction project in approximately 1987/1988 involved the expansion/addition of a loading dock on the north side of Building 774. The construction activities for the foundation for this structure encountered a subsurface pipe which was cut and blocked by the foundation. Shortly thereafter the basement of Building 774 began to experience seepage of water through the floor/walls of the building. A small sump was constructed through the floor of the building to allow for sampling of the seepage

water and to allow for a more centralized management of the water. Sampling of the water collected in the sump indicated that the water was elevated in gross alpha activity. I believe that the water collected in the sump was being pumped into process waste tanks for appropriate treatment at that time, but the situation may have changed since my involvement with this project.

A 1989 drawing has been obtained by WWE (Rockwell International, 1989, Replace Tanks 66, 67, and 68, Phase I, Site Utility Plan, RFP Drawing No. 38544-101, Sheet 6, Original Issue June 12) that indicates that a buried footing drain manhole exists to the east of Building 774, apparently buried at a depth of approximately 10 feet, as well as the existence of a footing drain clean-out just east of Tank 68. The placement of the manhole is noted to be based on verbal information. Although most of the information on this drawing is related to the installation of new footing drains around the new construction described in the drawing, the references to existing footing drain structures could be of use in future investigations. The project described in this drawing was never built

Building 779: It was verified in the meeting that the EG&G personnel had been sampling the corrugated metal pipe (CMP) that daylights on the solar pond hillside in the general vicinity of the Building 779 footing drain. However, no known footing drain flows are conveyed in the CMP, only stormwater from the Building 779 area. EG&G personnel were unaware of the smaller pipe that daylights east of the CMP, and it was agreed that this smaller pipe is in the correct location for the footing drain outfall based on extant footing drain drawings

believed to have been created by Nancy Hoffman (now Nancy Kirk) of RFP. A seep typically present immediately down the hill from the small pipe outfall has been established as a surface water monitoring point Data from this surface water monitoring station should be present in the 1989 and 1990 "Surface Water and Sediment Geochemical Characterization" reports. (EG&G sampling personnel were shown the smaller pipe as part of a field trip the next morning. The pipe that day was dry, although a seep with a small quantity of flow was present just downhill from the pipe. Flow from the pipe had been noted during a storm event in the spring of 1993.)

Building 865: The footing drains associated with this building were discussed in some detail as well as their possible connection to the pumped discharge that daylights near the guard post (Building 888). The footing drains associated with Building 865 are shown to flow to a manhole near the main entrance to Building 865 on engineering drawings obtained by Jacobs personnel. This manhole is the same as the manhole that long-term building personnel had indicated as collecting footing drain flows. Water that reaches this manhole flows to the sanitary sewage treatment plant (Building 995). Based on the information presented at the meeting it seemed that many questions about the Building 865 footing drains will be adequately addressed by this project.

The pumped discharge that daylights near the guard post appears to be associated with a roof drain sump in the general area of the main door to Building 865 However, additional definition of the source of

the pumped discharge is necessary. It is possible that some footing drain or other flows could be associated with this pumped discharge.

Building 881: A number of issues were discussed related to Building 881 footing drains. It was first discussed that the main footing drain that flows directly to the south of the building was being separately collected and treated as a part of Operable Unit 1 IM/IRA activities. However, the possible connection of Building 883 footing drains to the Building 881 footing drains was brought up by Jacobs personnel. Some engineering drawings accessed by Jacobs allude to such a connection. EG&G Surface Water personnel were unaware of any possible connection between the Building 883 and Building 881 footing drains.

More recent information generated by Jacobs after the meeting with the Surface Water Division raises concerns about a possible second footing drain associated with Building 881. This information indicates a large drain that leaves the general 881 Building area and flows to the southeast. noted as a storm drain on RFP Utility Drawings, could possibly also serve as a footing drain. This pipe appears to have drained to old Pond 8 which previously existed southeast of Building 881. This large diameter pipe (18-inches) is also present beneath Building 881 - and is also labeled as a storm drain in those areas. This type of configuration (storm drains beneath a building) is unique in our experience. It is conjectured that this pipe may be serving as a footing or other drain where it is present under the building. Further research is needed on this issue.

Building 883: There was general agreement that the exact location and configuration of footing drains for this building requires additional investigation. Jacobs obtained engineering drawings not previously available to EG&G Surface Water personnel which indicated that the Building 883 footing drains once flowed to a sump off the southeast corner of the building. However, an addition was constructed on the southeast corner of Building 883 and this construction might have modified the footing drain configuration. Additional research needs to be done on Building 883 drains.

Building 991: At Building 991 EG&G has recently been sampling a sump located in southeast corner of the building. It had been indicated to EG&G personnel that the footing drain flowing to the east along the north side of Building 991 had been re-routed into this sump. However, this re-routing seems unlikely since new piping would have needed to have been laid under Building 991 or within Building 991.

It is ~~believed~~ known that prior to construction of the PA the footing drain north of Building 991 flowed directly to the east and daylighted in a drainage. Re-routing of this pipe, if it occurred, probably took place as a part of PA construction. The area east of Building 991 is currently poorly drained, and a considerable amount of standing water is typically present. Recent inspections by EG&G and WWE personnel have been unable to locate any pipes daylighting in the general area where these footing drains should be found, but standing water and general marshiness of the area could easily have prevented identification of the pipe. A likely scenario is, that during PA

construction, the footing drains were routed to the sanitary wastewater treatment plant. A sanitary wastewater pipeline passes northeast from Building 991, and connection of the footing drain to this system would have been easy. Another likely scenario is that the Building 991 footing drains were re-routed during PA construction into the pipes/culverts that carry South Walnut Creek flow past 991. Some of these piped flows do not daylight until immediately south of Building 995.

A roof drain near the northeast corner of Building 991, along with footing drain flows, has been conjectured to be tied into the sanitary wastewater collection system in that area. The roof drain is piped below ground approximately 20 feet from a sanitary wastewater system pipeline and very near a sanitary wastewater system manhole. Dean Yashan related the results of a dye test on this roof drain conducted to try to confirm that it was flowing to the sanitary wastewater treatment plant. A considerable amount of dye was dumped down the roof drain using a hose. Inspections of the STP influent and of the drainage east of Building 991 never detected dye in either of these locations. Thus, the routing of this roof drain, and any footing drains that might also be connected to it, is unknown at this time.

The people at the meeting agreed that additional work needs to be done to determine the fate of the Building 991 footing drain flows. but this is hampered by the fact that most Building 991 personnel, including the Building Manager, are relatively new to RFP. F.D. Hobbs suggested that Don Goetmen was a Building 991 Building Manager with a long-term history in the building and that Mr.

Goetman may have additional information on the fate of the footing drains.

A contract between WWE and EG&G is being negotiated for WWE to design changes in the drainage system east of Building 991. These activities have been prompted by the fact that Building 991 is in danger of being flooded during certain storm events. I believe that the intent is for these drainage changes to be constructed by the end of calendar year 1994. During the course of these activities additional information may be found on the Building 991 footing drain.

Solar Ponds: For completeness' sake I am including the following information on footing drain structures (drain tiles) near the solar ponds. This information was not discussed at the meeting of December 22, 1993, but I am including it so that personnel with footing drain responsibilities will be aware of it. The existence of these drain tiles (some personnel might consider these drain tiles to be footing drains, of a sort) is known to, and is being addressed by, the personnel working on Operable Unit 4 activities. The solar ponds constitute Operable Unit 4

Three drain tiles related to the solar ponds exist in the immediate vicinity of the solar ponds. These drain tiles are located immediately east of the 207B Solar Ponds, between Solar Ponds 207A and 207B, and immediately beneath the center, in an east-west direction, of Solar Pond 207C All of these drain tiles flow to the north where they discharge/daylight on the Solar Pond hillside. The drain tile beneath Solar Pond 207C was built as a leak detection pipe.

The drain tile east of the 207B Solar Ponds is indicated on some engineering drawings from the early 1960s related to re-design of the 207B Solar Ponds. Some discrepancies between the engineering drawings and actual field conditions do exist. This drain tile is shown as extending to the southern end of the 207B Solar Ponds.

The drain tile between Solar Ponds 207A and 207B was not indicated on any engineering drawings and was installed due to seepage problems encountered during original construction of the 207B Solar Ponds. This pipe is conjectured to extend to the southern end of Solar Ponds 207A and 207B, but this has never been verified.

In addition to the above drain tiles, there also exists a large and elaborate french drain system north of the Solar Ponds. This french drain system was installed to collect groundwater flows as well as some surface water seep flows. This system is indicated on engineering utility drawings.

This represents events of the meeting and related information to the best extent my memory allows. Please let me know if any changes are needed.

FJB/lal
B:\FOOTD MTG

1050/1160

APPENDIX F

Field Notes

OU-8

11/30/93

7:45 AM

Arrived AT Trailer.

Field People

Tracy	Wait	- JEG
Susan	Wyman	- JEG
Dave	Landes	- JEG
Dave	Boeler	- JEG
Ron	Holmes	- JEG
Mike	Visocky	- JEG
Steve	Barnes	- EG&G
Bob	Christiansen	- Weight Watcher

OU-8 Footing drain out Fall
Site walk

8:04 Left Trailer

8:10 Arrive at Portal to PA.

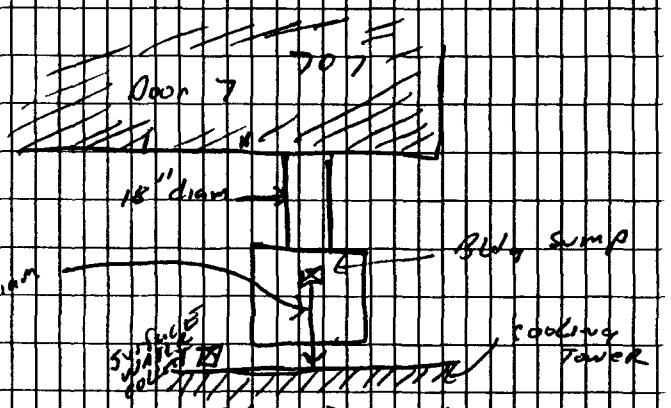
10801604

as it confirmed that the outfall is the sewer

B 27 BS-707-R

Building sump

Sump is in a concrete vault.



There is water in the sump. This is a confined space

8 valves on top of vault

Water from sump is pumped into cooling Tower Basin

109 of 160

* GAP 1) source AND destination of what STEVE is sampling on south side of 707

2) need to verify west side of 707 FD access point

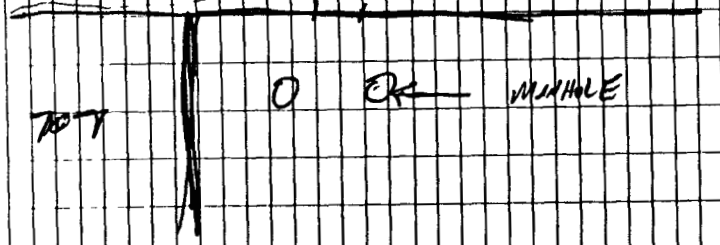
3) source of BS 707-3 Destination of BS-707-3. why did they sample

cooling tower A60-11481
Building 709

storm sewer on south side
water flows into collection
Basin on south side of 709
and then into storm sewer.?
pump system is bladder

man hole on south side of 707

8:45 BS-707-3
do not sample. no water.
previously did sample
Bldg 778 Door 3



Sample results will not show contaminants
Earlier date encountered coal tar?
Flow rate. 1½ yrs BS no water

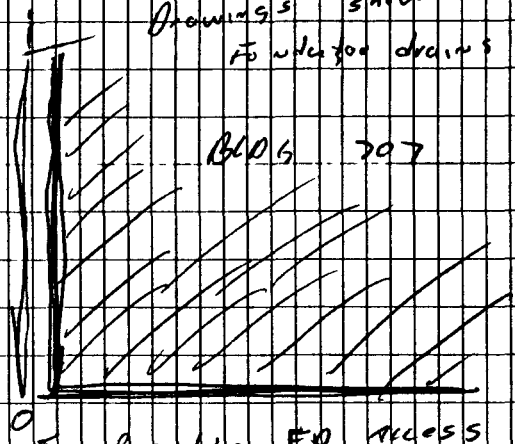
110 of 120

* 1) 559 / 561 MANHOLE
what are the sources
to MANHOLE.

2) what is the destination
of manhole water?

do not know
where the outfall
is.

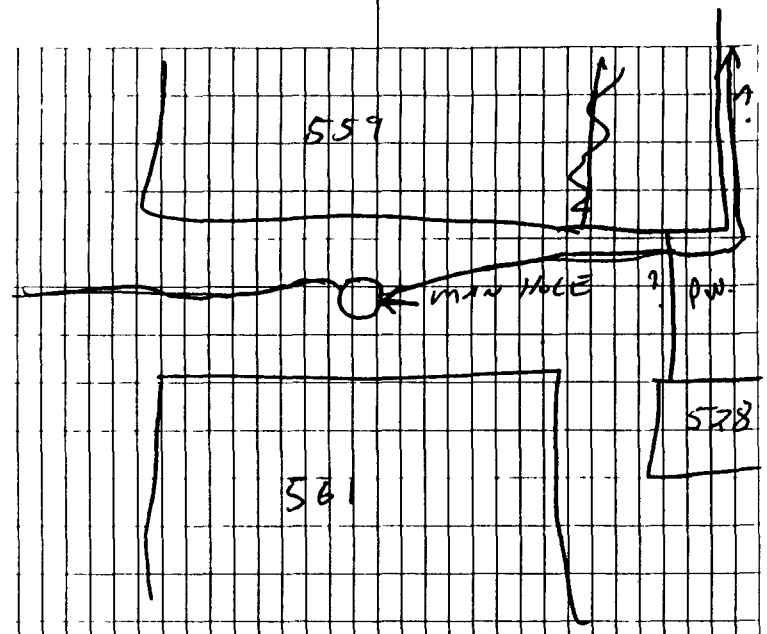
SW corner of 707



Possible FD access
concrete culvert
8" diam. Ties into storm
sewer

8:55 559-561 sample point

were sampling. HAD TCE
W.T. stopped sampling
Piping a culvert are
diverted into the pw
lines on the south side
of 559.?



The system is now used as the plenum drain system

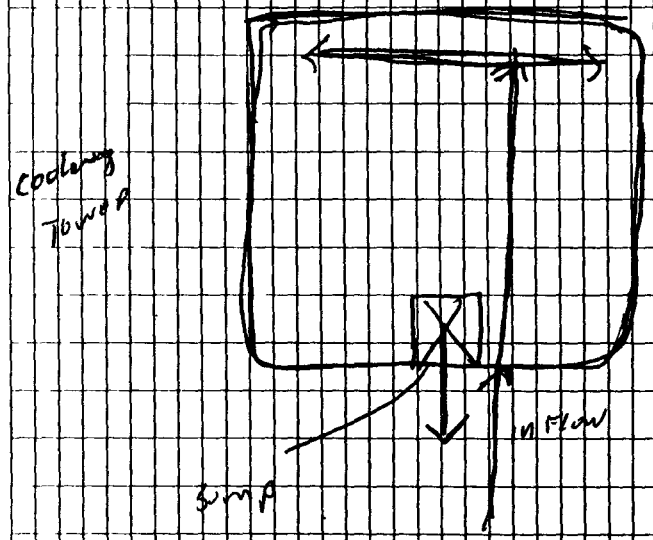
sump has water in it 20 FT down. very deep sump

WATER may go into sewer?

$ check.

water may flow into the
Evaporator Body 560
There appears to be no
discharge pipe into sump on
South side or Cooling
Tower?

need to determine
where the discharge
pipe goes



113 of 160

4/11/00

4/11 need to determine source

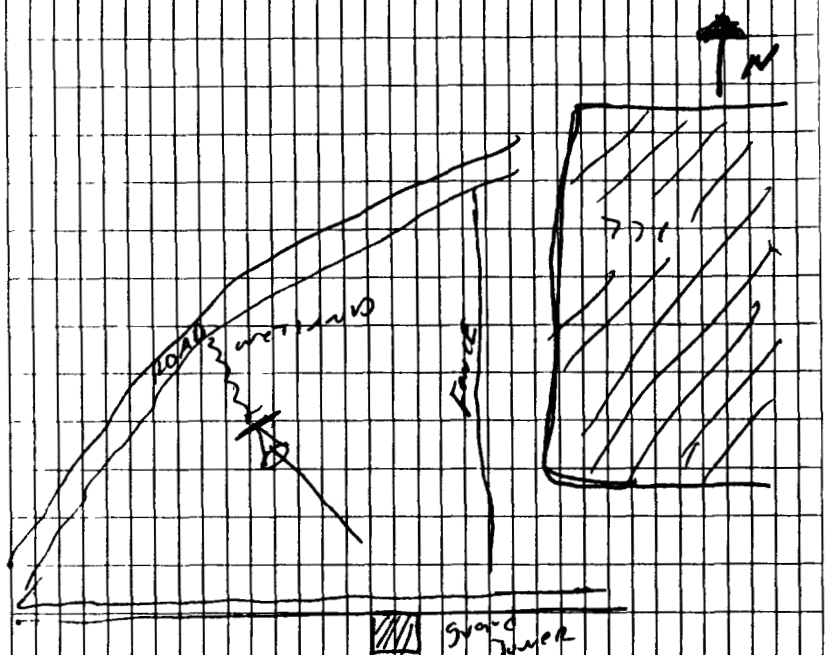
IF STEVE doesn't know where the 559 OUTFALL, How can they relocate ~~time~~ FD 516-1 with the 559 sample

9:15

FD-516-1

OUTFALL FOR 516

DRAINS ON TO HILL SIDE
FLOW RATE ½ gal/min



They are not sampling STEVE and moved location TO 559 MANHOLE

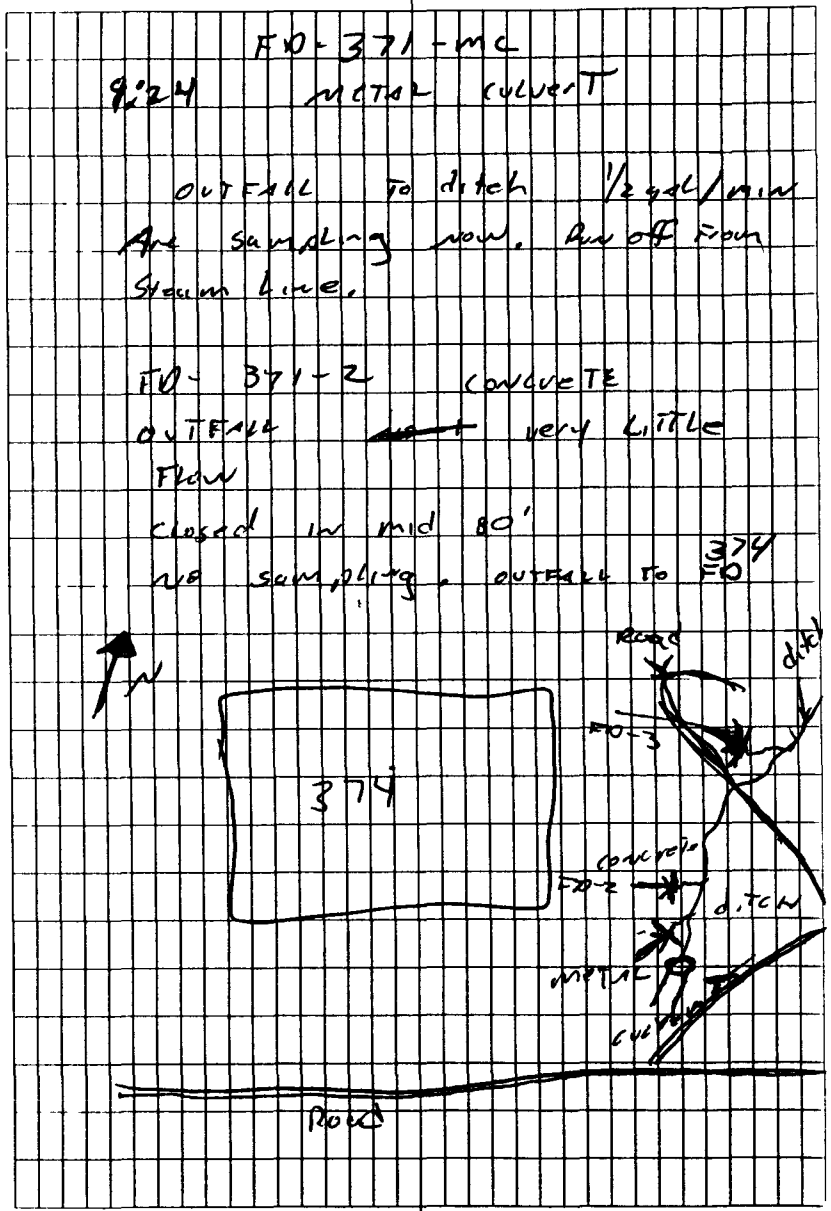
1) FD-371-1
need to verify if discharge is into concrete culvert

2) verify if FD-371-2 was rerouted to FD-371-3.

3) Find FD-371-5 & 6

4) Find source of FD-371-3

5) get Monitoring well Analytical Results for 1986



11509/160

FD-371-3

concrete and metal pipe
Flow is 1/2 gpd / more (est)

Area around outfall. Out of
cat tails. Pipe shows
great amount of Iron oxidation

FD-371-5+6 not
Found. They are
sampling the ditch
A composite sample
FD-371-4 not found.
may be buried

MW-F86 is down gradient
of outfalls in ditch.

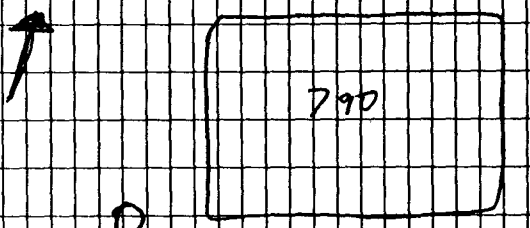
1160/160

9:50 Bldg 790

Analytical Lab

FD- 790

Sample from manhole, do not sample. Access problem in manhole



Built in the last 5 yrs

main source is GW.

during construction, encountered many springs.

1) Grate is in Roadway
Barried under ICE & mud
need to verify IF it is there

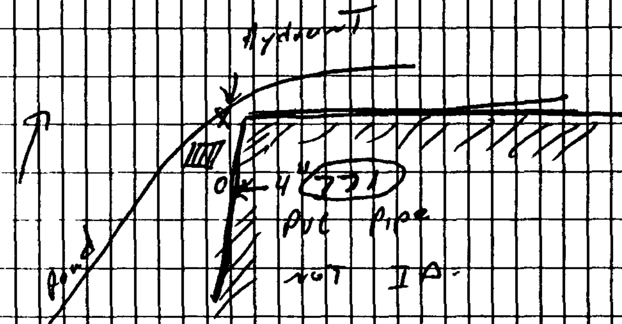
2) what is the white PVC
Pipe used FOR

3) Find MANHOLE 3, According
To drawings. FD OUTFALL
is to MH3

4) Find FD OUTFALLS For
other TWO

954 FD-771-1

drains into drain pipe
From NW corner of Bldg
Location is a grate in
Road



may go into
FD

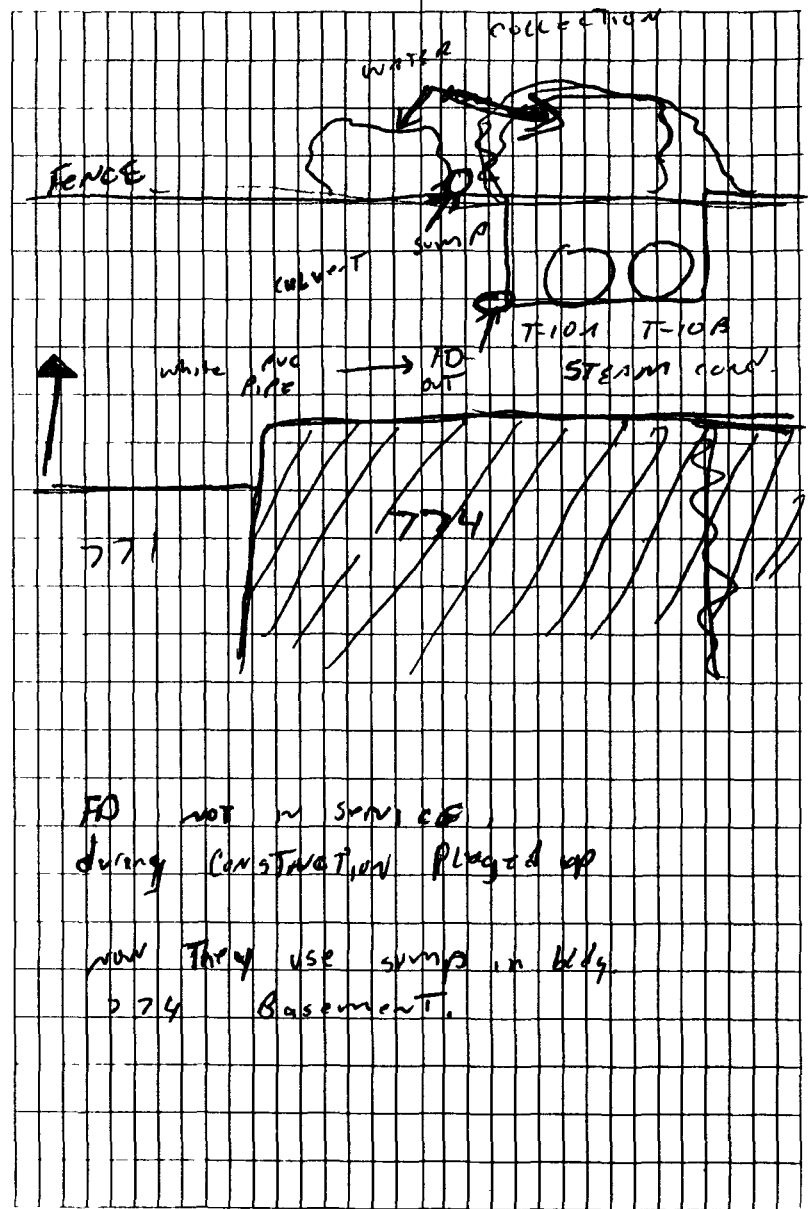
10:00 FD-774-1

on north side of Bldg
MW - P21 9189
SW - 174
SD - 124

1) Find P219189 INFO

2) Need to verify with Bldg Manager that FD are diverted To building sump

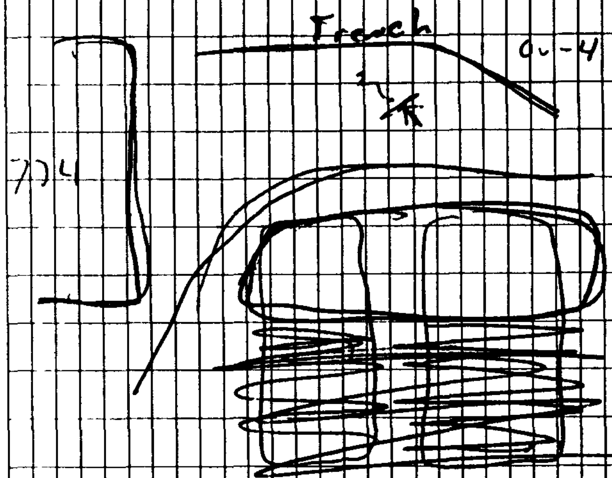
3) Verify Location of OUTFALL



FD not in service during construction Plugged up

now They use sump in bldg 774 Basement.

10:14 FD-774-1



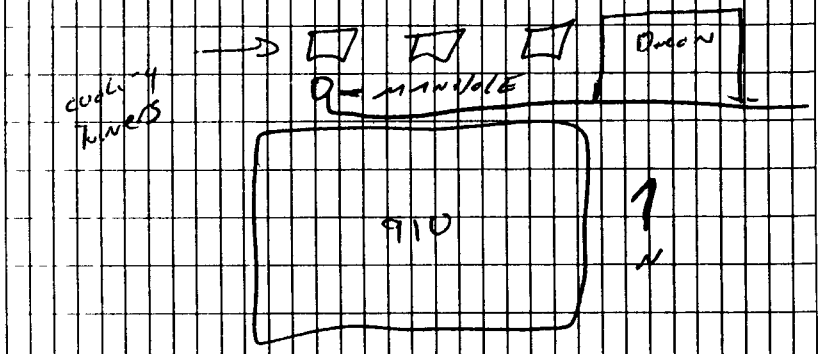
Sample when They end.

120101160

1) destination of 991 Building sump water

2) Verify that AD has been diverted to Bldg sump

10:30 BS- 910-1



910 treats the cut-H water (Trench) discharge the H2O, pumps the distillate to the 3 tanks. Recommended flow - distillate wastewater discharge into sewer.

10:40 Bldg 991

~~Foundation~~ drain is plumbed into the Building sump

12/9/1600

10:50 FD-707-1
of 750 culvert
All 700 - 500 storm
~~Est~~ Drainage
Has a good flow rate
5 gpm

NOT Sampling now

WATER Drains into W-Ponds

11:00 AT Portal to exit RA

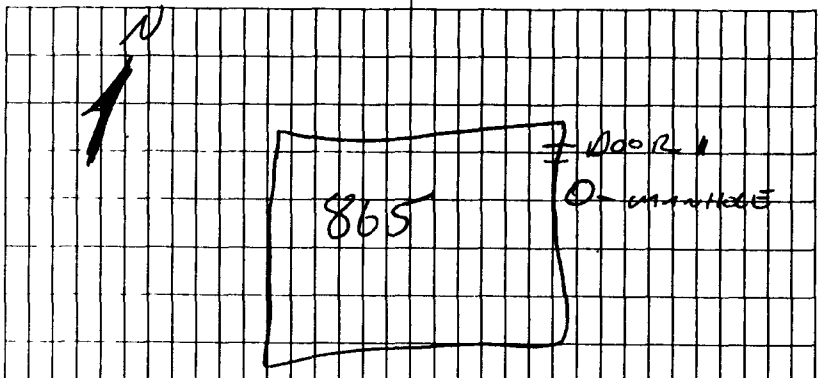
11:08 AT 800 Portal

11:15 FD-865-2
Building Sump
currently sampling

1220 1100

1) Re evaluate 886-2 & 886-1

FA- 886 - 2 Just East of
775



11'18 FA - 886 - 2
currently sampling

FA- 886 - 1

WATER IS pumped into
TANKER and shipped
TO 374
TANKER A week

11:20 STOPPED AT T-813A
TO MAKE Phone Call

1) Re Evaluate 865

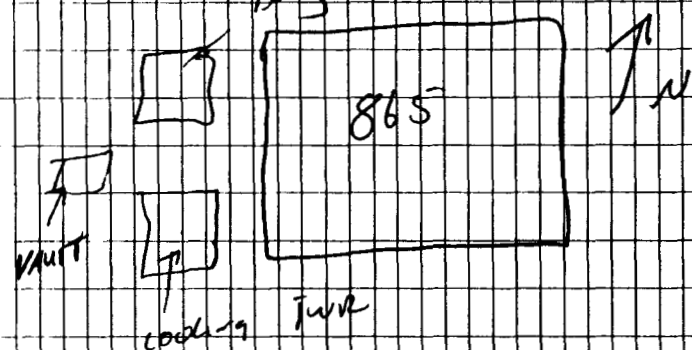
2) do not know destination
of source of water
in ~~manhole~~ sump
According
To steve, FD was rerouted
To new sump location

12/09/00

11:33 ~~FD~~

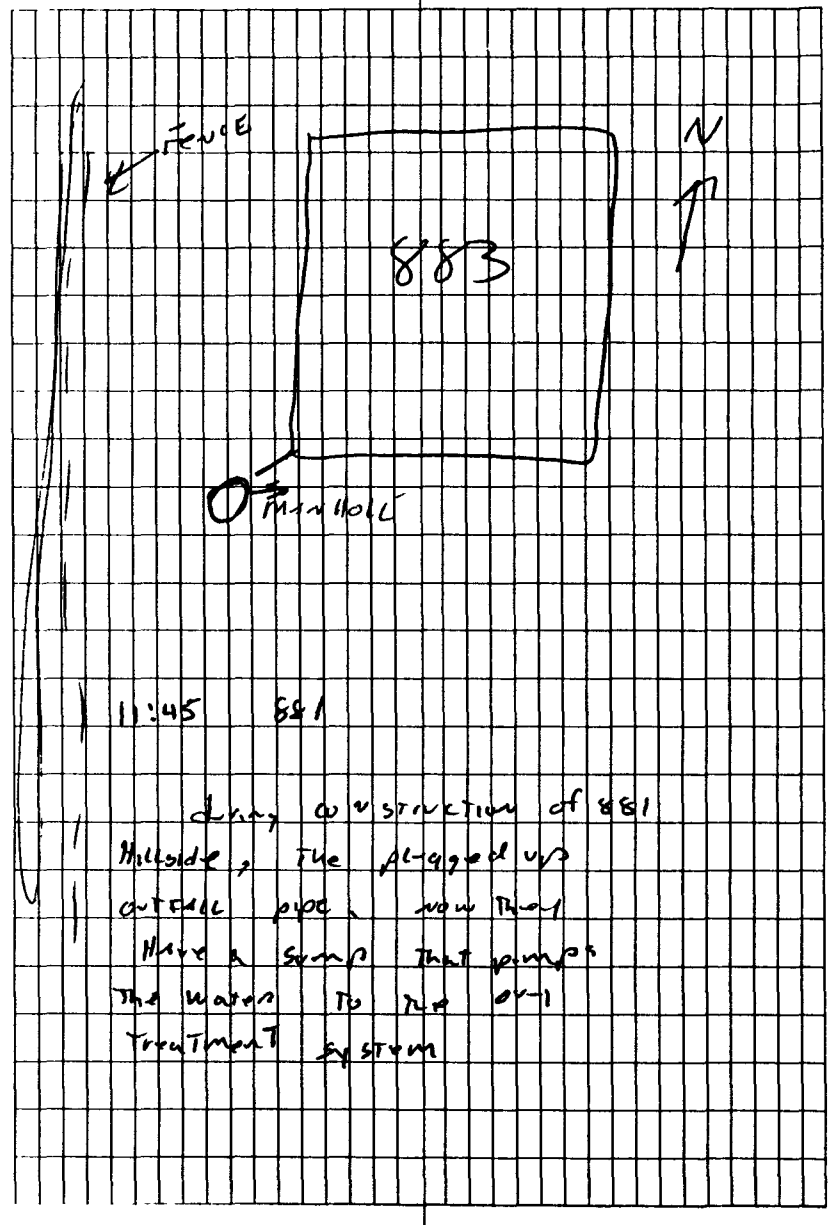
BS- 865-1

West side of Bldg
currently sampling
Quarterly ~ water outfall
to ditch.



11:37 BS- 883-1

Currently Sampling
unknown destination



11:45 881

during construction of 881
Hillside, The plugged up
outfall pipe, now that
Have a sump that pumps
the water to the oil
Treatment system

125 of 160

1) verify + Re Evaluate
OUTFALL PIPE From 400
Buildings need sources.

2) need to verify the
Bldg 111 Foundation outfall.

11:55 left The 800
Sackrete Area

12:00 8.50 OUTFALL
SE Corner of 850

12:06 Arrive back at Trailer

12:15 444 / 460 OUTFALL
Concrete drains into
ditch on south side
Talk with Ed Kent

12:25 Arrive back at Trailer

12 of 100

12/6/93

7:40 Arrived AT Trailer
East door combo
3425
Men shower 1, 2, 4
Women 1, 3, 2

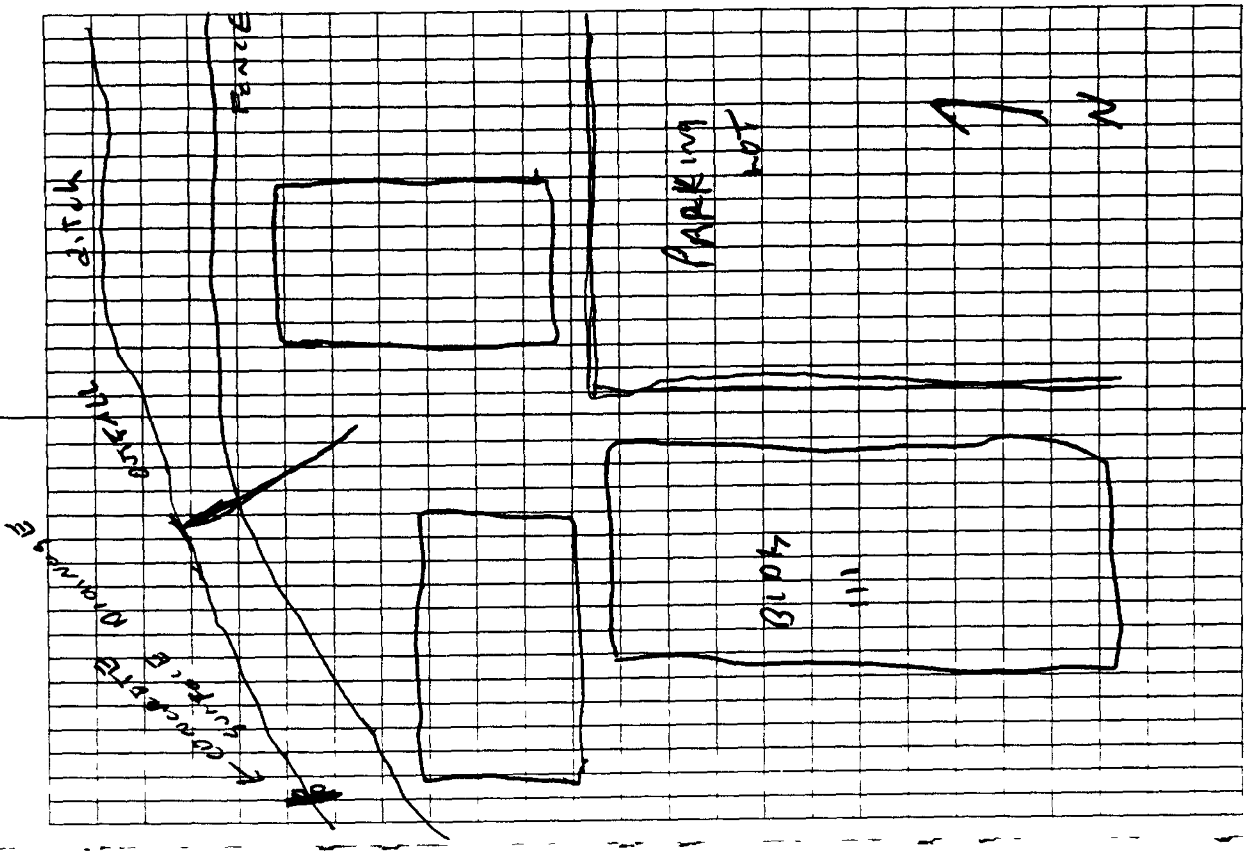
8:35 Arrived AT Bldg 111, Tried To Locate outfall To ditch North of Building. Never Found a physical Pipe outfall. Found an area where an outfall may be. Area is covered with Rock and a noticeable settling of the ground where a pipe may be buried. Water samples are currently being collected From The 111 sump. LEFT Area AT 9:55

Arrived AT Trailer 9:00

The 12/6 SITE Main Participants

Theresa JEN-Davenport - JEG
DAVE LANDES - JEG
T.C WAIT - JEG
Mike Vigoda - JEG
Ron Holms - JEG
ED BIANCO - JEG

TC WAIT Received a visitor Dosimeter. She Also went Through a Health & Safety Brief From Dave SPRUCE


FENCE
PARKING LOT
N
BLDG 111
ditch

Dec 6

Arrived at Brook Rd PA @ 9:25

Arrived at East side of 207 manholes. Sample location in the middle manhole. 3 manholes

Arrived at 207 SW corner temp hole to verify it was on process. could not verify that it was it's sunset, did not want to cut cover. (9:44)

9:50 arrived at 559 submersible pump in manhole. House goes to Bldg 560. Line runs to sump pit in Bldg

2891-160

AAD House going to Sewer
(sanitary) 300 gal/day
sump pump water started

Keith Mottl, previous
Sampler.

Frank Gibbs, SSG SHPT
Technical advisor

10:10 Arrived at the
314 outfalls to find
FD-314-5&6
Could not find outfalls,
water is flowing down the
ditch from hillside. This
water may be from FD
Ed Bianco says that FD
outfall may be located
near SW-18

10.30 Surveyed at FD1
FD outfall grate
is filled with mud.

need to determine
where the OU-4 Trench water
goes

Sam not see FD. Can not
Remove cap to AVE River.
Located new hole 3. NW
is north of 774 water
Propane Tank Appx 100' N
of Bldg. corner

10:45 Arrived at 774
FD. SW Flows to the
East to the French drains
The French drain system on the
north side of the solar
ponds. determine the
Final destination of the water
From the OU-4 manager.
The 774 SW ditch flows in
the ditch on the north
side of the solar ponds.
water flows to walnut
creek.

11:05 Secured at Portal to PA
to exit.

11:20 Arrived at Trailer.

Dave Sanders will verify
881 outfall and determine
883 outfall.

JACOBS ENGINEERING GROUP, INC.
DATA COMPILATION OPERABLE UNIT 8

FOOTING DRAIN SAMPLING EVENT MARCH 13, 1994

BY. DAVID LANDES

1. Building No: 707 2. Sample ID: BS 707-2

3 Description of Sample Location: VALVE VAULT ON NORTH SIDE OF COOLING TOWERS

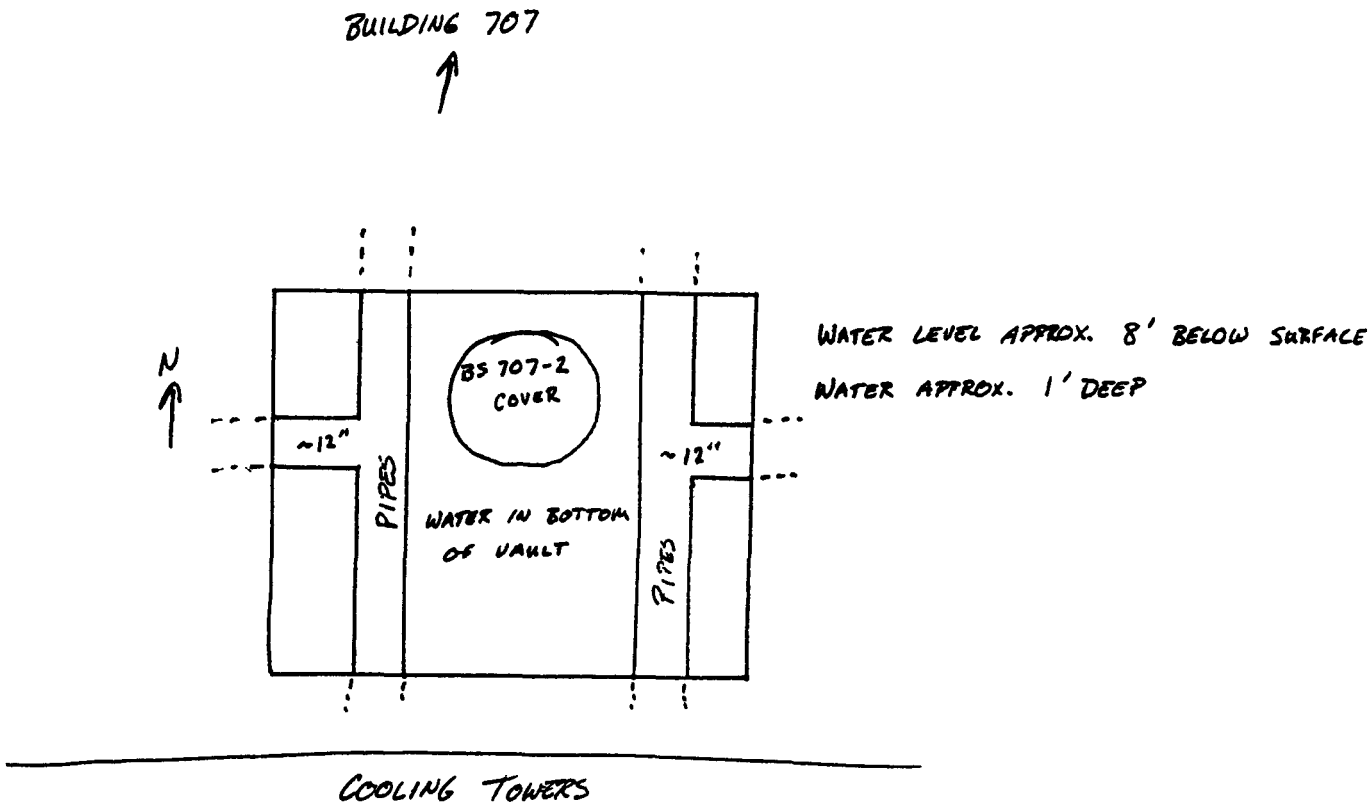
4. If sample location is a manhole:

Pipe	Size (ID)	Direction of flow	Depth (bls)	Pipe Material	Estimation of flow rate
A		N/A STAGNANT	8'		N/A G.W. INFILTRATION
B					
C					
D					

5 If sample location is an outfall.

Pipe Material	Size (ID)	Flow Rate/Stop Watch 5 gallon bucket

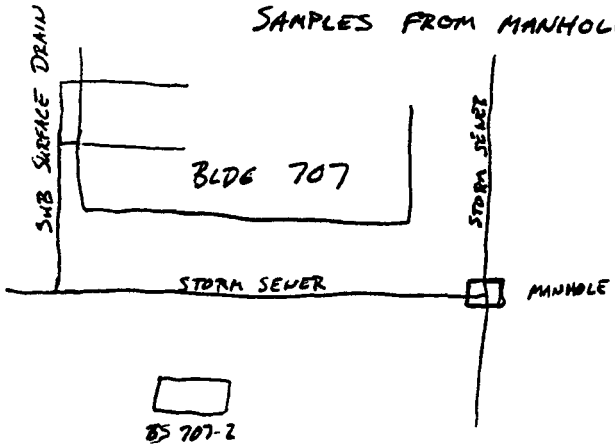
Prepare sketch on back of page



COULD COLLECT SAMPLES FROM MANHOLE NEAR SE CORNER OF BUILDING IN STORM SEWER. COULD NOT SEE PIPES IN MANHOLE.

SAMPLES FROM MANHOLE PROBABLY NOT REPRESENTATIVE OF FOOTING DRAINS.

DOESN'T APPEAR POSSIBLE TO COLLECT SAMPLES FROM JUST THE WEST ARM OF THE STORM SEWER SINCE THE PIPE WAS NOT VISIBLE.



JACOBS ENGINEERING GROUP, INC.
DATA COMPILATION OPERABLE UNIT 8

FOOTING DRAIN SAMPLING EVENT MARCH 13, 1994

BY. DAVID CANDES

1. Building No: 371 2. Sample ID: FD 371-2 / 371-3 / 371 MC

3 Description of Sample Location: 371-3 AT OUTFALL / 371 MC END OF PIPE / 371-2 NOT SAMPLED

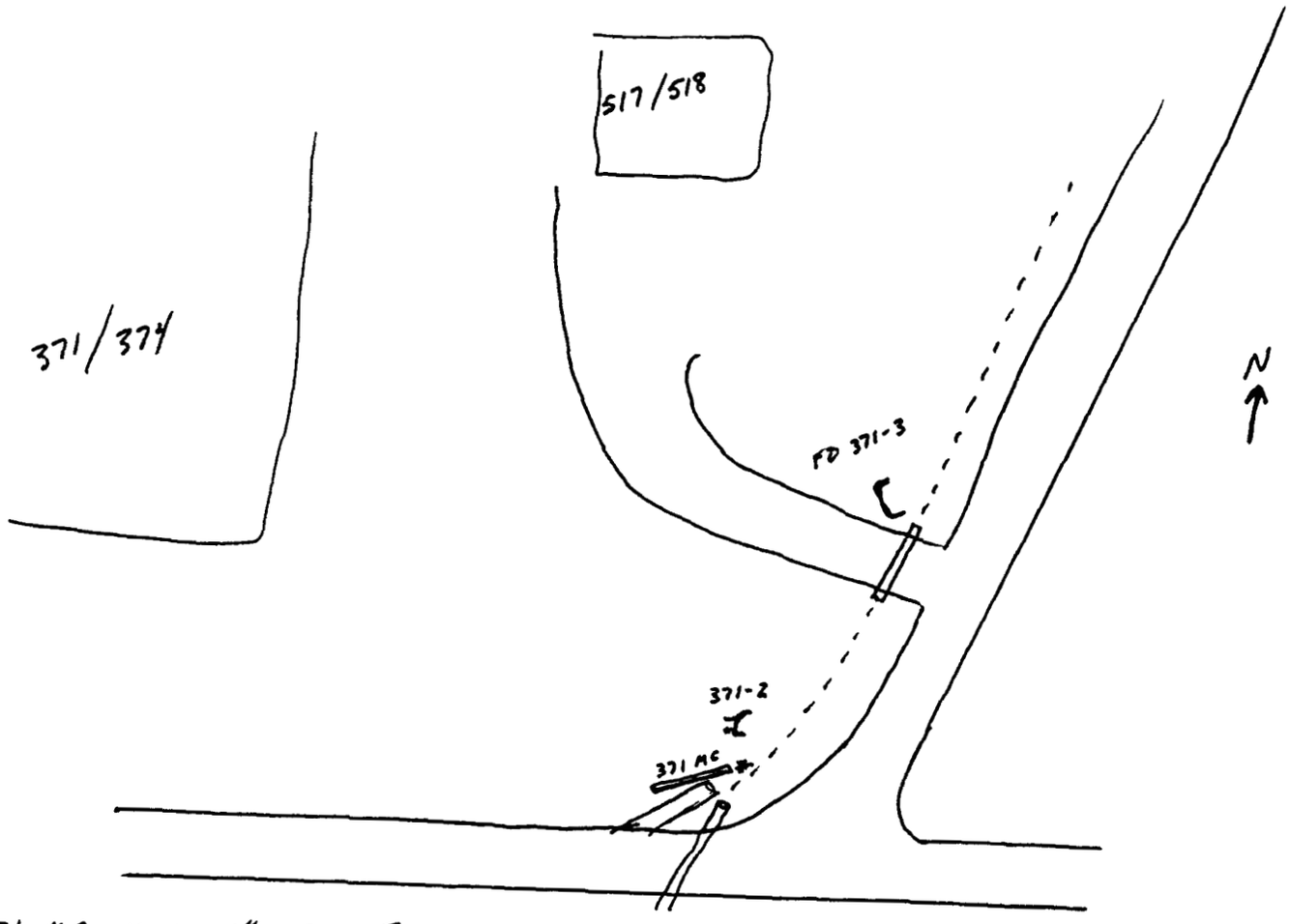
4. If sample location is a manhole:

Pipe	Size (ID)	Direction of flow	Depth (bls)	Pipe Material	Estimation of flow rate
A					
B					
C					
D					

5 If sample location is an outfall:

Pipe Material	Size (ID)	Flow Rate/Stop Watch 5 gallon bucket
371-2 NOT VISIBLE PVC ON DRAWING	10"	4 L/MIN. (EST.)
371-3 CAST IRON? UNABLE TO DETERMINE	10"	7 L/MIN
371-MC CORR. METAL PIPE	8"	4 L/MIN

Prepare sketch on back of page.



- 371 MC IS AN 8" CMP. FLOW FROM THE PIPE WAS MEASURED AT 4 L/MIN.
  TWO OTHER PIPES (CULVERTS) DISCHARGE AT THE SAME LOCATION. 1 - 48" CONCRETE
  1 - 24" CMP
- FD 371-2 APPEARS TO BE AT THE LOCATION SHOWN ON THE PS2 DRAWING.
  COULD NOT SEE ACTUAL PIPE BUT IS SHOWN AS 10" PVC ON DRAWING
  FLOW WAS OBSERVED ESTIMATED AT 4 L/MIN. COULD NOT MEASURE ACCURATELY
  BECAUSE UNABLE TO CAPTURE ALL FLOW IN THE BUCKET.
  THIS IS THE MOST FLOW THAT STEVE BARROS HAS EVER SEEN COMING OUT OF 371-2
  HE INDICATED THAT HE MAY NEED TO START SAMPLING HERE.
- FLOW RATE AT FD 371-3 MEASURED AT 7 L/MIN
  SAMPLES COLLECTED AT OUTFALL IN THE DRAINAGE DITCH
- FD 371-2 IS APPROXIMATELY 15' NORTH AND SLIGHTLY EAST OF 371-MC

JACOBS ENGINEERING GROUP, INC.
DATA COMPILATION OPERABLE UNIT 8

FOOTING DRAIN SAMPLING EVENT MARCH 13, 1994

BY: DAVID LANDES

1. Building No: 771 2. Sample ID: FD 771-1

3 Description of Sample Location: SURFACE GRATE TO STORM SEWER
NOT SAMPLED DURING THIS EVENT.

4. If sample location is a manhole:

Pipe	Size (ID)	Direction of flow	Depth (bls)	Pipe Material	Estimation of flow rate
A					
B					
C					
D					

5. If sample location is an outfall.

Pipe Material	Size (ID)	Flow Rate/Stop Watch 5 gallon bucket

Prepare sketch on back of page SURFACE GRATE WAS UNDER WATER
SAMPLES NOT COLLECTED PER STEVE BARROS

JACOBS ENGINEERING GROUP, INC.
DATA COMPILATION OPERABLE UNIT 8

FOOTING DRAIN SAMPLING EVENT MARCH 13, 1994

BY. DAVID LANDES

1. Building No: 790 2. Sample ID: FD 790

3. Description of Sample Location: MANHOLE NEAR SOUTHWEST CORNER OF BUILDING

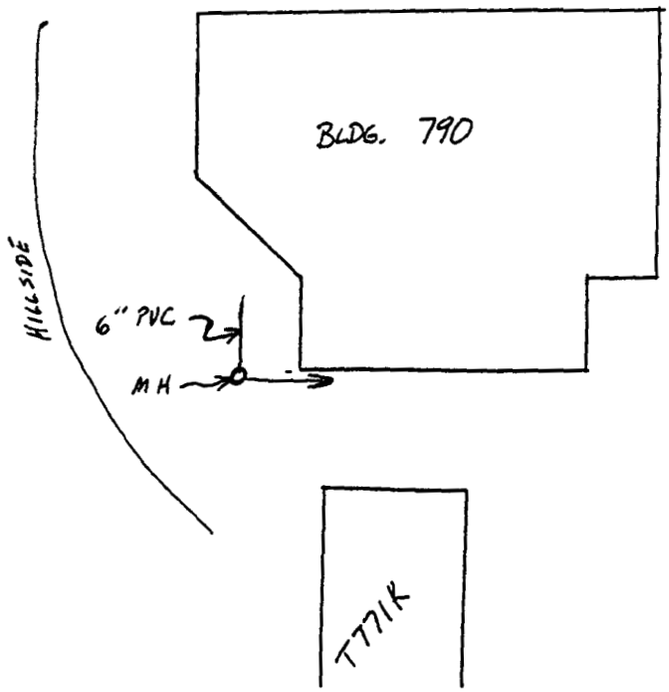
4 If sample location is a manhole:

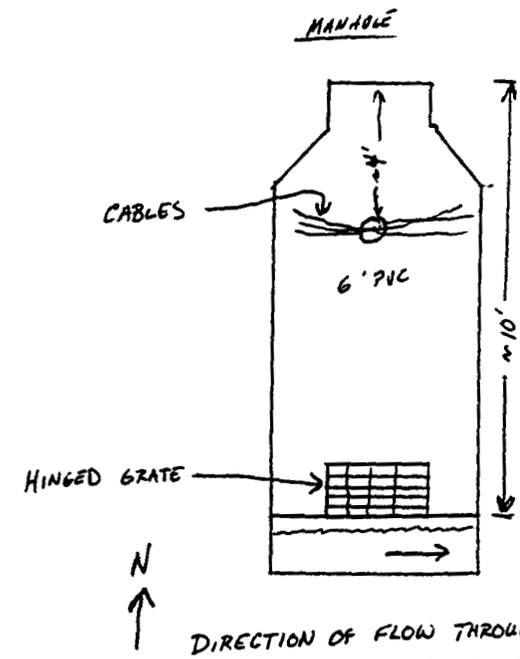
Pipe	Size (ID)	Direction of flow	Depth (bls)	Pipe Material	Estimation of flow rate
A	6"	SOUTH INTO MH	4' BELOW SURFACE	PVC	~4 L/MIN
B					
C					
D					

5. If sample location is an outfall·

Pipe Material	Size (ID)	Flow Rate/Stop Watch 5 gallon bucket

Prepare sketch on back of page.





DIRECTION OF FLOW THROUGH BOTTOM OF MANHOLE APPEARS TO BE TO THE EAST.

- THIS IS THE FIRST TIME THIS LOCATION HAS BEEN SAMPLED AND THE FIRST TIME THAT STEVE HAS SEEN FLOW FROM THE FOUNDATION DRAIN.
- 6" PVC PIPE (FD) ENTERS MANHOLE FROM THE NORTH APPROX. 4' BELOW THE SURFACE. SAMPLE WAS COLLECTED FROM WATER IN BOTTOM OF MANHOLE. OBSTRUCTIONS (CABLES) PREVENTED SAMPLES FROM BEING COLLECTED AT END OF PIPE.
- DEPTH OF MANHOLE APPROX. 10'
- FLOW RATE ESTIMATED AT 4 L/MIN. UNABLE TO COLLECT WATER FROM PIPE TO GET AN ACCURATE MEASUREMENT
- 6" PVC PIPE WAS THE ONLY PIPE VISIBLE IN THE MANHOLE
- THE HINGED GRATE WAS LIFTED BY USING A PRY BAR TIED TO A ROPE AND SAMPLES WERE COLLECTED FROM THE WATER UNDERNEATH THE GRATE.
- I WAS UNABLE TO LOCATE DRAWINGS FOR THIS BLDG DURING THE DRAWING SEARCH.

1390/160

JACOBS ENGINEERING GROUP, INC.
DATA COMPILATION OPERABLE UNIT 8

FOOTING DRAIN SAMPLING EVENT MARCH 13, 1994

BY: DAVID LANDES

1. Building No. 774 2. Sample ID: FD 774-1

3. Description of Sample Location. SAMPLES COLLECTED FROM POND AT INFLUENT

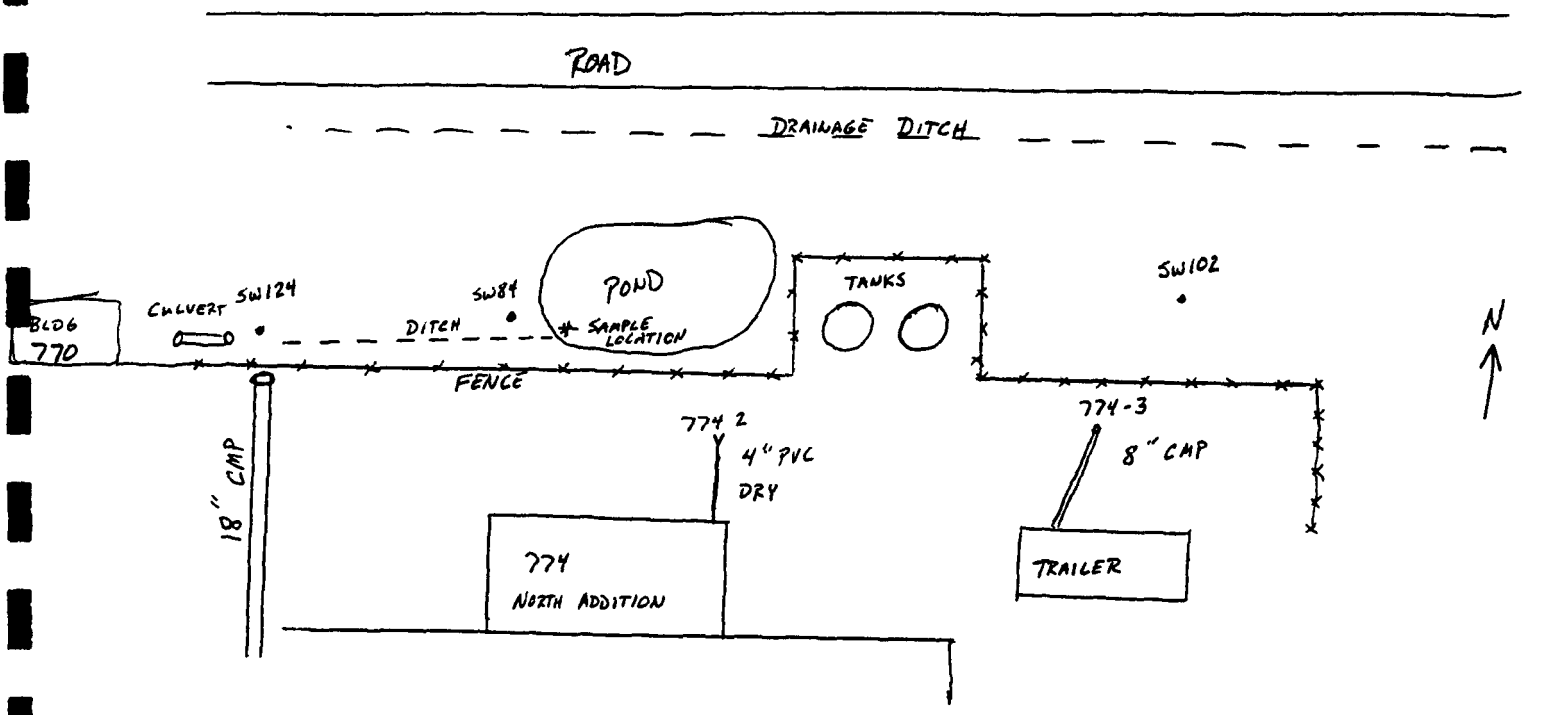
4. If sample location is a manhole:

Pipe	Size (ID)	Direction of flow	Depth (bls)	Pipe Material	Estimation of flow rate
A					
B					
C					
D					

5 If sample location is an outfall:

Pipe Material	Size (ID)	Flow Rate/Stop Watch 5 gallon bucket

Prepare sketch on back of page



- 18' CMP (FD 774-1) OUTFALLS JUST SOUTH OF FENCE UNABLE TO ESTIMATE FLOW AT OUTFALL DUE TO THE FENCE AND VEGETATION PARTIALLY BLOCKING END OF PIPE.
  ESTIMATED FLOW ENTERING POND FROM DITCH AT 2-3 GAL./MIN MOST OF THIS FLOW IS FROM THE 18" CMP BUT SOME OF IT IS FROM THE CULVERT TO THE WEST.
  SURFACE WATER AND SEDIMENT SAMPLING LOCATIONS AT THE OUTFALL (SW 124, SED 124)
  SURFACE WATER SAMPLING LOCATION (SW 84) NEAR INLET TO POND
- OUTFALL 774-2 (4" PVC) WAS DRY
- OUTFALL 774-3 (8" CMP) DAYLIGHTS APPROX 5' SOUTH OF FENCE TRICKLE (< 1 L/MIN) OBSERVED FLOWING FROM OUTFALL PIPE
  SURFACE WATER SAMPLING LOCATION (SW 102) LOCATED APPROX 20' N.E. OF OUTFALL
- STEVE IS UNSURE OF THE DESTINATION OF WATER FROM THE POND. PROBABLY WALNUT CREEK

FD 774-1 IS THE ONLY SAMPLE COLLECTED

JACOBS ENGINEERING GROUP, INC.
DATA COMPILATION OPERABLE UNIT 8

FOOTING DRAIN SAMPLING EVENT MARCH 13, 1994

BY: DAVID LANDES

1. Building No: 779 2. Sample ID: FD 779-1

3. Description of Sample Location. 18" CMP ON HILLSIDE NORTH OF SOLAR PONDS

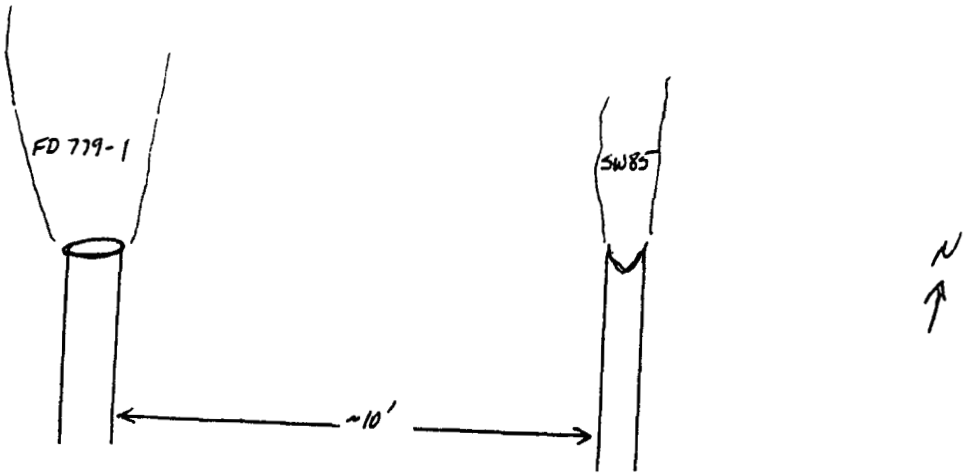
4 If sample location is a manhole:

Pipe	Size (ID)	Direction of flow	Depth (bls)	Pipe Material	Estimation of flow rate
A					
B					
C					
D					

5 If sample location is an outfall.

Pipe Material	Size (ID)	Flow Rate/Stop Watch 5 gallon bucket
FD 779-1 CORRUGATED METAL PIPE	18"	TRICKLE ~ 1 L/MIN
SW 85 VITRIFIED CLAY OR CONCRETE	10"	DRY

Prepare sketch on back of page.



FD 779-1

18" CMP OUTFALLS ONTO HILLSIDE NORTH OF SOLAR PONDS
SMALL TRICKLE OF WATER WAS OBSERVED, ESTIMATED AT 1 L/MIN
UNABLE TO GET AN ACCURATE MEASUREMENT DUE TO VEGETATION AND DEBRIS AT OUTFALL.
THIS LOCATION WAS NOT SAMPLED DUE TO THE LOW DISCHARGE RATE

SW 85

10" PIPE, EITHER VITRIFIED CLAY OR CONCRETE. NO FLOW WAS OBSERVED
OUTFALL PIPE IS PARTIALLY BURIED
STEVE BARROS THINKS THAT THIS IS THE OUTFALL FOR THE BLDG 779 F.D.
SW 85 IS APPROX 10' EAST OF FD 779-1

JACOBS ENGINEERING GROUP, INC.
DATA COMPILATION OPERABLE UNIT 8

FOOTING DRAIN SAMPLING EVENT MARCH 13, 1994

BY: DAVID LANDES

1. Building No: 910 2. Sample ID: FD 910

3 Description of Sample Location: SUMP/MANHOLE NEAR NW CORNER OF BUILDING (OUTSIDE)

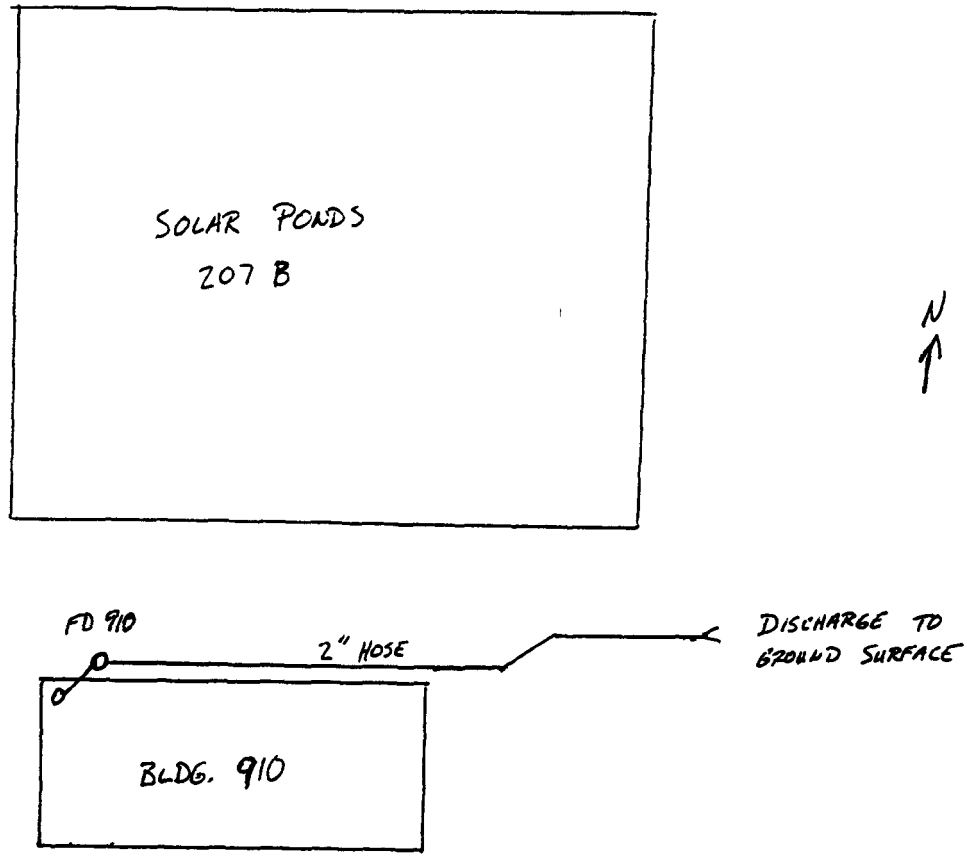
4. If sample location is a manhole.

Pipe	Size (ID)	Direction of flow	Depth (bls)	Pipe Material	Estimation of flow rate
A					
B					
C					
D					

5 If sample location is an outfall:

Pipe Material	Size (ID)	Flow Rate/Stop Watch 5 gallon bucket

Prepare sketch on back of page.



- SAMPLES COLLECTED FROM MANHOLE/SUMP NEAR NORTHWEST CORNER OF BUILDING DEPTH TO WATER IN MANHOLE IS APPROX 14' FROM SURFACE. NO PIPES WERE VISIBLE INSIDE MANHOLE. DISCHARGE FROM SUMP IS THROUGH A 2" HOSE. UNABLE TO ESTIMATE FLOW RATES
- ACCORDING TO STEVE BARROS A SUMP IS LOCATED IN THE NORTHWEST CORNER OF THE BUILDING AND THE SUMP DISCHARGES TO THE MANHOLE/SUMP OUTSIDE THE BUILDING THERE IS NO CONFIRMATION THAT DRAINS EXIST FOR THE BUILDING BUT THE WATER COLLECTED IN THE SUMPS IS BELIEVED TO BE GROUND WATER
- STEVE SAID THAT KATHY LONDON OR RAY BOYLE MAY HAVE DRAWINGS FOR THE BUILDING OR KNOW WHERE TO FIND THEM. (INTERLOCHEN)
- I WAS UNABLE TO LOCATE DRAWINGS WHICH SHOW THESE SUMPS

JACOBS ENGINEERING GROUP, INC.
DATA COMPILATION OPERABLE UNIT 8

FOOTING DRAIN SAMPLING EVENT MARCH 13, 1994

BY: DAVID LANDES

1. Building No: 991 2. Sample ID: BS 991-2

3. Description of Sample Location: SUMP IN SE CORNER OF BLDG (UTILITY TUNNEL)

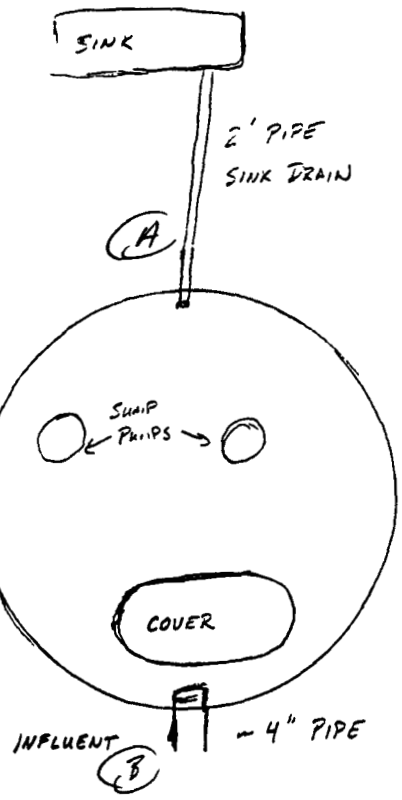
4. If sample location is a manhole·

Pipe	Size (ID)	Direction of flow	Depth (bls)	Pipe Material	Estimation of flow rate
A	2"	N TO S INTO SUMP	~ 1'	STEEL	NO FLOW OBSERVED SINK DRAIN
B	~4"		~3'	UNK.	2 L/MIN
C					
D					

5 If sample location is an outfall:

Pipe Material	Size (ID)	Flow Rate/Stop Watch 5 gallon bucket

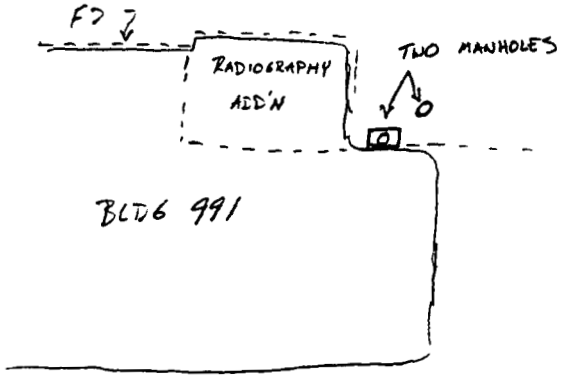
Prepare sketch on back of page



- SUMP LOCATED IN SOUTH EAST CORNER OF BLDG IN UTILITY TUNNELS
- SUMP DISCHARGES TO SANITARY SEWER
- ONLY 2 PIPES VISIBLE ENTERING SUMP. 2" PIPE ENTERS ON N SIDE, THIS IS THE SINK DRAIN, APPROX 1' BELOW THE SURFACE.
- APPROX 4' PIPE DISCHARGES TO SUMP (FROM S SIDE), APPROX 3' BELOW THE SURFACE FLOW WAS OBSERVED, ESTIMATED AT 2 L/MIN.

  I THOUGHT THIS PIPE WAS FOR THE FLOOR DRAINS IN THE TUNNEL BUT I HAVE MY DOUBTS BECAUSE OF THE FLOW, UNLESS G.W. IS INFILTRATING INTO THE PIPES. CHECK THE DRAWING TO DETERMINE THE SOURCE OF THE PIPE.
- WATER LEVEL IN SUMP WAS APPROX 4' BELOW SURF.
- THE SAMPLE I USED FOR THIS SAMPLE WAS FROM THE IR CODE SHOULD BE BS 991-2. I POINTED THIS OUT TO STEVE AND ASKED THAT HE WRITE A MEMO TO REEDS SO THE CORRECT I.D. IS ENTER

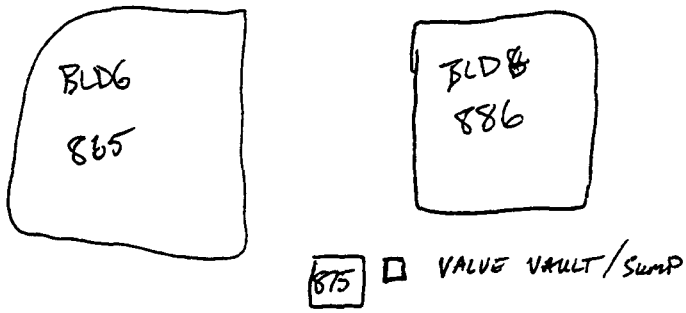
APPROX. 100 - 55 GAL DRUMS ARE STORED IN THE UTILITY TUNNELS. DRUMS ARE SOLID WASTE (BERYLLIUM SCRAPS)



NO ACCESS TO STORM SEWER IN THIS REGION.

- I WALKED THE AREA WHERE THE CATCH BASIN IS SHOWN ON THE DWGS. AND DID NOT LOCATE THE PIPE. IT MAY BE BURIED OR WAS HIDDEN FROM VIEW BY THE CAT TAILS.
- TWO MANHOLES LOCATED AT N.E. CORNER OF BLDG. FOOTING DRAIN MAY BE ROUTED TO THE ONE CLOSEST TO THE BUILDING, IT IS LOCATED IN LINE WITH THE F.D. AND COULD HAVE BEEN EASILY REROUTED
- THERE ARE NO MANHOLES OR SURFACE INLETS TO THE STORM SEWER ON THE SOUTH SIDE OF THE BUILDING. IF THE DRAIN FROM THE 996, 997, + 999 VAULTS DOES CONNECT TO THE SEWER, SAMPLING IS NOT POSSIBLE NEAR THE BLDG

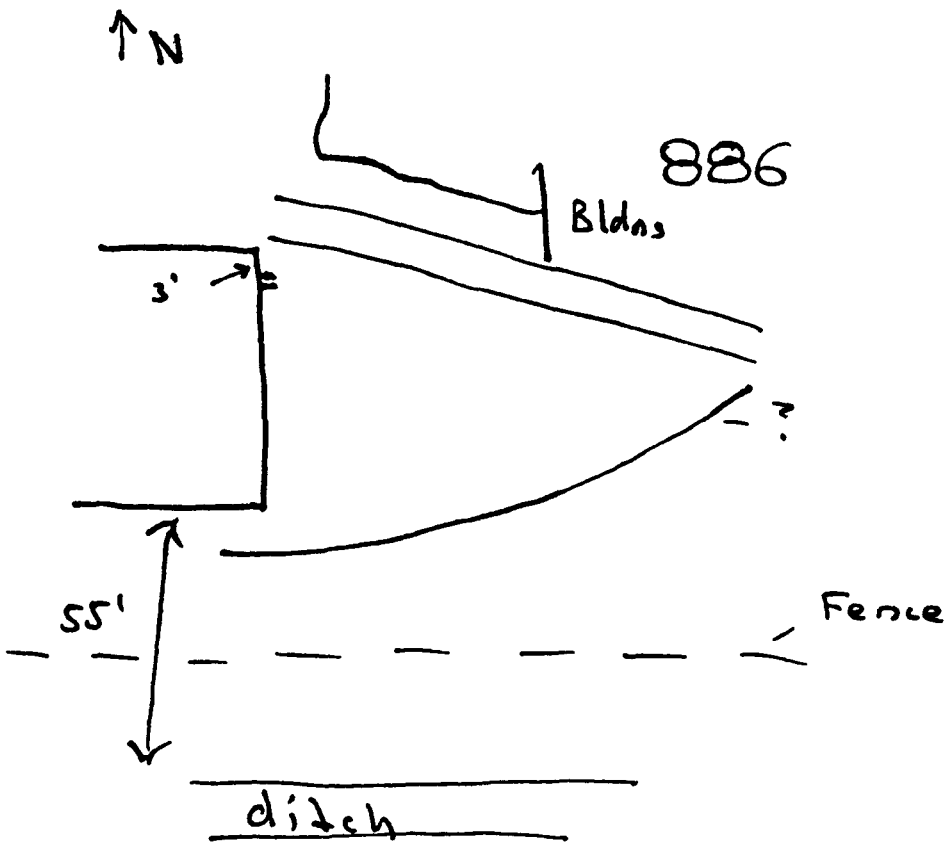
1470/160



- discharge to ditch ?

distance ?

bearing ?



JACOBS ENGINEERING GROUP, INC.
DATA COMPILATION OPERABLE UNIT 8

FOOTING DRAIN SAMPLING EVENT

MARCH ~~15~~ 20, 1994

BY DAVID LANDES

1. Building No: 447

2. Sample ID: FD 444-460

3 Description of Sample Location: OUTFALL ON HILLSIDE SOUTH OF BLDG 664
APPROX 200 FEET SOUTH OF SECURITY FENCE

4 If sample location is a manhole:

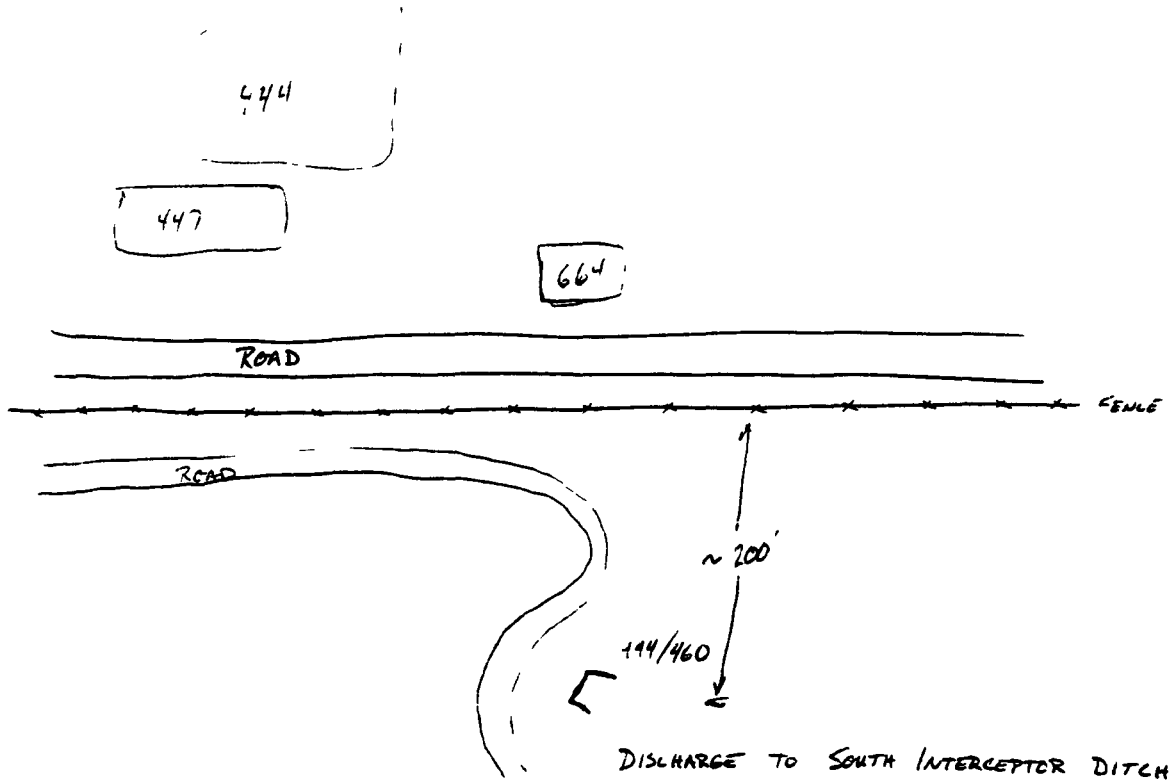
Pipe	Size (ID)	Direction of flow	Depth (bls)	Pipe Material	Estimation of flow rate
A					
B					
C					
D					

5 If sample location is an outfall:

Pipe Material	Size (ID)	Flow Rate/Stop Watch 5 gallon bucket
C MP	~ 36 DID NOT MEASURE	> 20 GAL/MIN UNABLE TO CAPTURE ALL FLOW IN BUCKET

* LIGHT RAIN AND SNOW DURING THE MORNING HOURS

Prepare sketch on back of page.



UNABLE TO CAPTURE ALL FLOW IN BUCKET TO GET AN ACCURATE FLOW MEASUREMENT BUT IS ESTIMATED AT > 20 GAL/MIN. LIGHT RAIN AND SNOW ALL MORNING IS LIKELY CONTRIBUTING TO FLOW.

THE OUTFALL PIPE IS APPROX 36 INCHES (I COULDN'T FIND A TAPE TO MEASURE) AT A CONCRETE HEADWALL

JACOBS ENGINEERING GROUP, INC.
DATA COMPILATION OPERABLE UNIT 8

FOOTING DRAIN SAMPLING EVENT

MARCH 20, 1994

BY: DAVID LANDES

1. Building No: 865

2. Sample ID: FD 865-1 BS

3 Description of Sample Location. VAULT ON WEST SIDE OF BUILDING

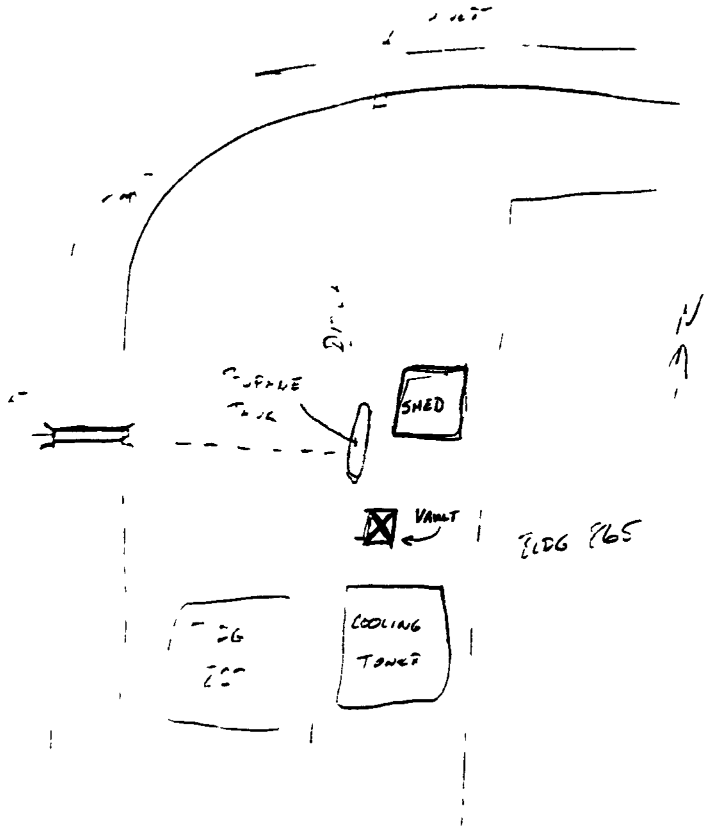
4 If sample location is a manhole: UTILITY MANHOLE, NO VISIBLE PIPES ENTERING VAULT

Pipe	Size (ID)	Direction of flow	Depth (bls)	Pipe Material	Estimation of flow rate
A					
B					
C					
D					

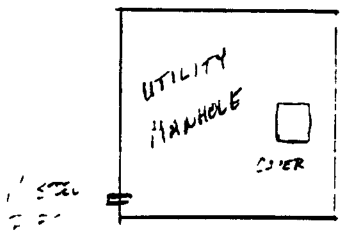
5 If sample location is an outfall:

Pipe Material	Size (ID)	Flow Rate/Stop Watch 5 gallon bucket

Prepare sketch on back of page



35 865-1



VAULT IS 5' DEEP APPROX 3" OF WATER IN BOTTOM OF VAULT

GROUND WATER INFILTRATION

SUMP [illegible] DISCHARGES [illegible] THE 1" PIPE TO THE [illegible]

[illegible] WOULD [illegible] TO THE NORTH DRY AT THIS TIME

[illegible] PIPE TEE TO THE DITCH

NO VISIBLE PIPES IN THE VAULT [illegible]

JACOBS ENGINEERING GROUP, INC.
DATA COMPILATION OPERABLE UNIT 8

FOOTING DRAIN SAMPLING EVENT

MARCH 20, 1994

BY: DAVID LANDES

1. Building No: 865

2. Sample ID: BS 865-2

3 Description of Sample Location: SUMP OUTSIDE DOOR #1 ON EAST SIDE OF BLDG

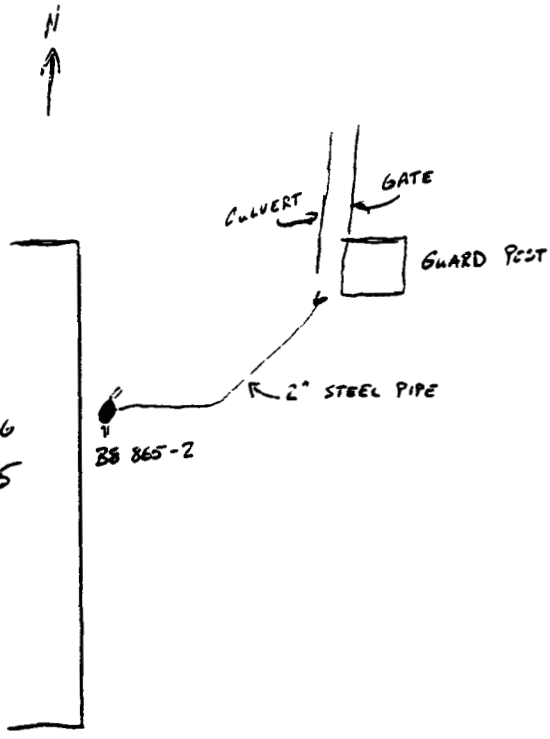
4 If sample location is a manhole:

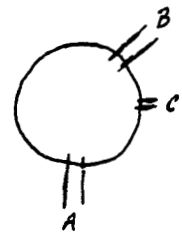
Pipe	Size (ID)	Direction of flow	Depth (bls)	Pipe Material	Estimation of flow rate
A	8"	N INTO SUMP	10'	VCP	3 L/MIN
B	8"	SW INTO SUMP	15'	VCP	3 L/MIN
C	2	EAST	~3'	STEEL	
D					

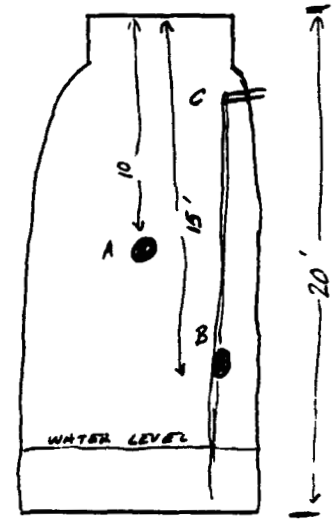
5 If sample location is an outfall.

Pipe Material	Size (ID)	Flow Rate/Stop Watch 5 gallon bucket

Prepare sketch on back of page







SUMP IS APPROX 20' DEEP

WATER LEVEL IN SUMP IS APPROX 18 BELOW SURFACE. SUMP WAS DISCHARGING DURING SAMPLING

DISCHARGE WAS OBSERVED FROM A 2' PIPE NEAR THE GUARD POST THIS IS BELIEVED TO BE FROM THE SUMP THE DISCHARGE ENTERED A CULVERT WHICH FLOWS TO THE DITCH ALONG CENTRAL AVE

STORM DRAIN LINE (FROM FOUNDATION DRAINS) ENTERS MANHOLE ~ 10' BELOW SURFACE (FROM SOUTH) THE PIPE IS EITHER 6" OR 8" (CHECK DRAWING) AND APPEARS TO BE VCP. THE FLOW FROM THE PIPE IS ESTIMATED AT 3 L/MIN

ANOTHER PIPE ENTERS THE SUMP FROM THE N W AT APPROX 15' BELOW SURFACE THIS PIPE IS THE SAME DIAMETER AND MATERIAL AS THE STORM DRAIN PIPE FLOW FROM THIS PIPE IS ALSO APPROX. 3 L/MIN. I DON T RECALL SEEING THIS PIPE ON THE DRAWINGS.

DISCHARGE THROUGH A 2" STEEL PIPE.

154 of 160

JACOBS ENGINEERING GROUP, INC.
DATA COMPILATION OPERABLE UNIT 8

FOOTING DRAIN SAMPLING EVENT MARCH ~~15~~ 20, 1994

BY. DAVID LANDES

1 Building No· 883 2. Sample ID· FD 883 - 1

3. Description of Sample Location: SUMP NEAR SW CORNER OF BLDG

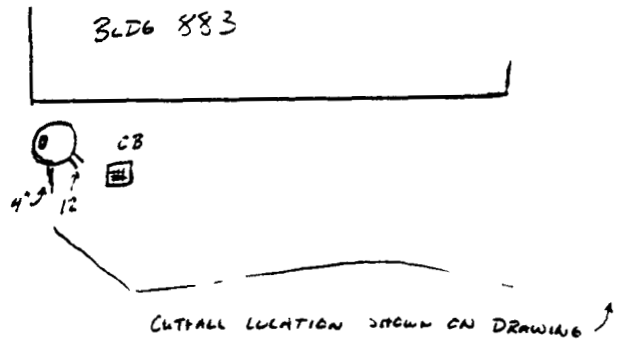
4 If sample location is a manhole:

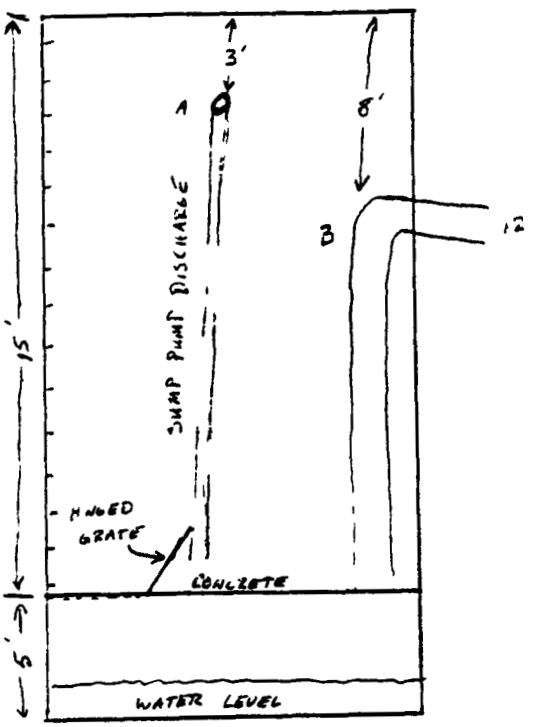
Pipe	Size (ID)	Direction of flow	Depth (bls)	Pipe Material	Estimation of flow rate
A	4"	SOUTH OUT OF SUMP	3'	PVC	SUMP PUMP DISCHARGE
B	12'	? NW ?	8	STEEL ?	UNK
C					
D					

5 If sample location is an outfall

Pipe Material	Size (ID)	Flow Rate/Stop Watch 5 gallon bucket

Prepare sketch on back of page.





SUMP IS 20 DEEP

ONLY 2 PIPES WERE OBSERVED IN THE SUMP

PIPE 'A' IS THE 4' DISCHARGE PIPE

PIPE "B IS A 12' PIPE (STEEL ?) WHICH ENTERS THE SUMP FROM THE S E SIDE APPROX 8' BELOW SURFACE

I THINK THIS IS THE 12" STORM SEWER SHOWN ON UTILITY DRAWINGS

THE END OF PIPE WAS NOT VISIBLE TO DETERMINE IF THERE WAS ANY FLOW

I DID NOT SEE THE FOUNDATION DRAIN PIPE INSIDE THE SUMP BUT I COULD HEAR WATER ENTERING THE SUMP BELOW THE HINGED GRATE

I DID NOT FIND THE OUTFALL AT THE LOCATION SHOWN ON THE DRAWINGS. IT IS APPARENTLY BURIED

I DO NOT KNOW IF THE 12' PIPE DISCHARGES TO THE SUMP IT MAY BE AN OVERFLOW PREVENTOR IN CASE THE SUMP PUMP FAILS

APPENDIX G

List of Engineering Drawings Reviewed for IHSS Data Compilation

Appendix G
Rocky Flats Plant
Operable Unit 8, Data Compilation
IHSS 150.6, 150.8 and 184, Stage 1

IHSSs 150.6 150.8

Drawing No.	Original Date	Latest Rev. Date	Title
RF-W/79-C	1-25-64	No revision	Plot and Grading Plan, Building 79
RF-W/79-C-3	1-25-64	No revision	Site and Paving Details, Building 79
RF-W/79-C-8	1-25-64	N/L	Miscellaneous Detail, Building 79
RF-BS-20111-01	7-3-67	12-14-67	Site Plan, Building 79-A
RF-BS-20112-01	7-3-67	12-14-67	Grading and Drainage Plan, Building 79-A
RF-BS-20112-02	7-3-67	9-12-68*	Miscellaneous Sections and Details, Building 79-A
25682 XC2	6-17-76	No revision	Roads and Paving Replacement, Area Plot Plan
27673-X02	4-14-71	N/L	Surface Drainage Improvements, Area Plot Plant
27673-X03	4-24-79	No revision	Surface Drainage Improvement, 776/779
27673-X04A	4-24-79	No revision	Surface Drainage Improvement Plan 776/779
D27673-X05A	4-20-79	N/L	Surface Drainage, 776/779
D27673-2	6-16-79	N/L	Surface Drainage Improvements, 776/779, Plan and Elevation

Notes:

N/L = Not Legible
* = As Built Date

IHSS 184

Drawing No.	Original Date	Latest Rev. Date	Title
RF-91-98-Y-1	8-15-51	N/L	Plot Plan
1-6516-91	4-5-60	No revision	"D" Plant Loading Dock Addition, Steel Details (Bldg 91)
1-6517-91	4-5-60	6-30-60	"D" Plant Loading Dock Additions, Concrete Details (Bldg 91)
RF-BY-15928-2	8-21-67	3-6-68*	Grading and Location Plan Buildings 86 and 91
15928-8	10-31-67	3-6-69*	Construction Group 703 Repave Dock Area, Bldg 91, Subdrainage System
28738-X03	4-27-84	2-21-86*	Site Removal Plan, Building 991
28738-X04	4-27-84	2-21-86*	Utilities Removal Plan, Building 991
28738-X05	4-27-84	2-21-86*	Mechanical Removal Plan, Building 991
28738-103	4-27-84	2-21-86*	Site Details

Notes·

N/L = Not Legible
* = As Built Date