



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

September 8, 1995

RECEIVED

Reply to
Attn of: HW-114

SEP 13 1995

Charles Morey
S-16 Partnership
P.O. Box 27
Boise, Idaho 83702

Div. of Environmental Quality
Community Programs

Dear Mr. Morey:

The U.S. Environmental Protection Agency (EPA), through its contractor, Roy F. Weston, Inc., has completed the site investigation (SI) of the Capital Station, Boise site. A copy of the report is enclosed.

Based on this SI and other pertinent information, EPA currently finds it appropriate to refer to state authority for further consideration. EPA will be discussing with the state the best way to continue the ongoing investigation and remediation under state authority.

If you have any questions, I can be reached at (206) 553-2103.

Sincerely,

David Bennett

David Bennett
Site Assessment Manager
Site Evaluation Section

Enclosure

cc: Dean Nygard, IDHW
Mark Masarik/Fran Allans, EPA-IOO
Ron Lane, IDHW
Thomas Turco, IDHW



Site Inspection Report

Capital Station

Boise, Idaho

EPA REGION X

Contract No. 68-W9-0046
Work Assignment No. 46-23-0JZZ
Work Order No. 4000-019-025-4100
Document Control No. 4000-019-025-AAAA

August 1995



**SITE INSPECTION REPORT
CAPITAL STATION
BOISE, IDAHO**

Prepared for

**U.S. Environmental Protection Agency
Region X
1200 Sixth Avenue
Seattle, Washington 98101**

Contract No. 68-W9-0046
Work Assignment No. 46-23-0JZZ
Work Order No. 4000-019-025-4100
Document Control No. 4000-019-025-AAAA

August 1995

Prepared by

**Roy F. Weston, Inc.
700 Fifth Avenue
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ARCS QUALITY ASSURANCE CONCURRENCE

SITE INSPECTION REPORT Capital Station Boise, Idaho

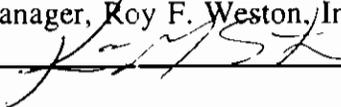
Project Name: Site Inspection Report
Capital Station

Contract Number: 68-W9-0046

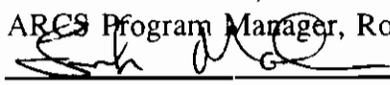
Work Assignment Number: 46-23-0JZZ

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Site Inspection Report
Capital Station
Boise, Idaho
EPA Site Identification Number: IDD9846674499

Site Name/Address

Capital Station
Boise, Idaho

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ABSTRACT

Pursuant to United States Environmental Protection Agency (EPA) Contract No. 68-W9-0046, Roy F. Weston, Inc. (WESTON®) conducted a nonsampling Site Inspection (SI) of the Capital Station site located in Boise, Idaho. The Capital Station site consists of four city blocks, three of which are vacant and one which has a warehouse and a city parking lot. Previously, the site consisted of a railroad station and yard, which was in operation from approximately 1900 until 1993. Groundwater contamination was identified on-site during a previous investigation and a remediation system has been in operation since the beginning of 1994.

The objective of this SI was to:

- Identify potential sources of contamination at Capital Station.
- Determine the existence of significant migrations pathways and human and/or environmental targets.
- Identify appropriate data to evaluate sources and migration pathways.

Site information and data reviewed for this report indicate that the activities at the Capital Station site are not the potential sources of contamination, however, a contaminated groundwater plume does exist under the site and migration to public and domestic drinking water wells is the primary pathway of concern.

SECTION 1

INTRODUCTION

Pursuant to United States Environmental Protection Agency (EPA) Contract No. 68-W9-0046, Roy F. Weston, Inc. (WESTON®) conducted a nonsampling Site Inspection (SI) of the Capital Station site in Boise, Idaho. This SI was conducted under the authority of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA). The SI is intended to document a threat or potential threat to public health or the environment as posed by a site, to identify whether a potential emergency situation exists that may require an immediate response, to document the presence or absence of contained or uncontrolled hazardous substances on a site, and to confirm site characteristics and area receptor information collected during the preliminary assessment. In addition, the SI process is intended to collect sufficient data to enable evaluation of the site's potential for inclusion on the National Priorities List (NPL) and, for those sites determined to be NPL candidates, establish priorities for additional action. The SI process does not include extensive or complete site characterization, contaminant fate determination, or quantitative risk assessment.

A Preliminary Assessment (PA), the first step in the CERCLA/SARA process, was conducted in 1994 to review existing information on the site and its environs to assess the threat, if any, posed by the site to public health, welfare, or the environment and to determine if further investigation (an SI) under CERCLA/SARA was warranted. After reviewing the PA, EPA decided that further investigation of Capital Station would be necessary to more completely evaluate the site using EPA's Revised Hazard Ranking System criteria (EPA, 1992). The HRS assesses the relative threat associated with the actual or potential releases of hazardous substances at a site.

This document presents a summary of the objectives, activities, and results of the Capital Station SI, which was performed as a nonsampling SI. Included are descriptions of site background information (Section 2), investigative/regulatory involvement (Section 3), summary of pathway considerations (Section 4), and conclusions (Section 5).

SECTION 2

BACKGROUND

2.1 SITE LOCATION

The Capital Station site is located on the southwestern edge of the downtown business district of Boise, Idaho, in Ada County. (Figure 2-1). The site consists of three vacant city blocks, which have been divided into four lots (A,B,C,D) (Figure 2-2). The site is bordered on the north by West Front Street, the south by West Myrtle Street, the east by North 9th Street, and on the west by North 15th Street. The site is located in Section 10 Township 3 North, Range 2 East. The geological coordinates are 43 degrees, 36 minutes, 57 seconds north latitude and 116 degrees, 12 minutes, 33 seconds west longitude.

2.2 SUMMARY OF SITE HISTORY

2.2.1 Ownership

The Capital Station site is currently owned by S-16 Partnership (S-16), an Idaho realty development partnership who has contracted Golden Development Corporation (Golden) to manage the property. The previous site owner was the Union Pacific Railroad Company (Union Pacific), who owned the property from approximately 1900 until 1 January 1993.

2.2.2 Summary of Historical Site Uses

Historically, the primary site operation was the main Boise railyard, operated by Union Pacific from 1900 until the 1980s. In addition to the railyard, Union Pacific leased out portions of the property to other business uses, which included: warehousing and the storage and sales of petroleum, coal, feed, and grain. Two former petroleum storage and sales operations, which were in operation during the 1980s have been identified as The Torrance Fuel and Ice Company which was located in the southern portion of Lot B and the Fuel West Company which was located in south corner of Lot A. In the late 1980s, after closure of the on-site businesses, the remaining site structures were demolished along with the railroad track and Union Pacific warehouses.

2.3 SUMMARY OF EXISTING SITE CONDITIONS

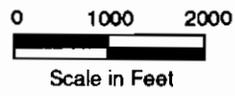
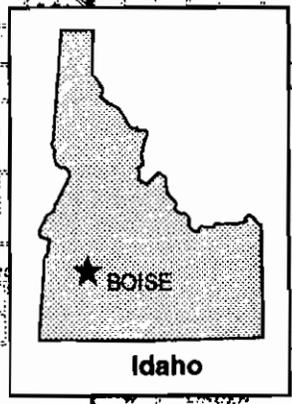
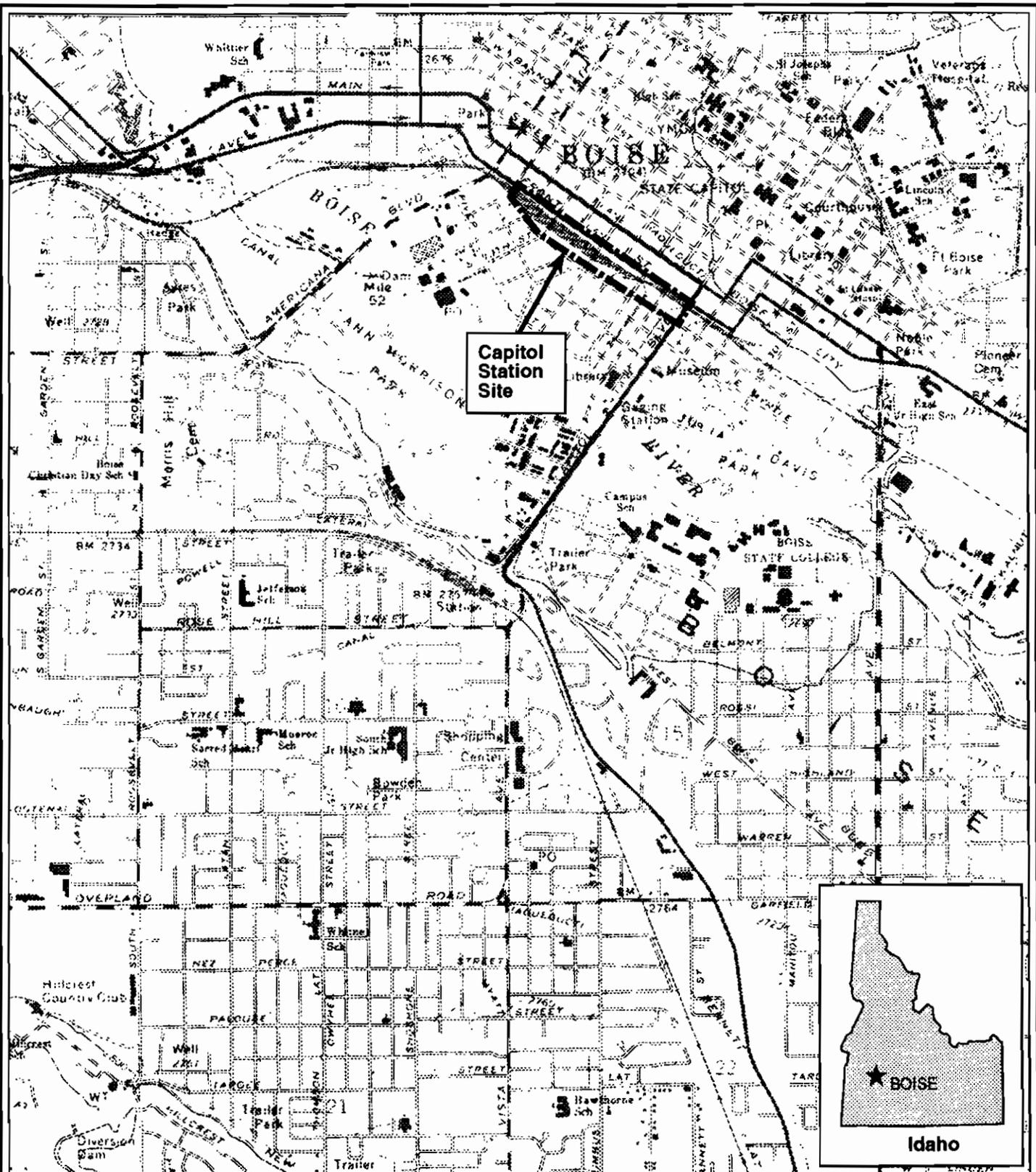
Presently, the majority of the Capital Station site is vacant and inactive. Two operations, Diamond Parking, a public parking area, and Michael's Furniture Warehouse are presently active on Lots C and D (Figure 2-2). The site encompasses approximately 15 acres or three

city blocks and is bordered to the north by West Front Street, the south by west Myrtle Street, the east by North 9th Street, and the west by North 15th Street. Michael's Furniture Warehouse, is the only structure on the site.

The vacant portion of the site consists of lots A and B (Figure 2-2). The majority of soil in the vacant portion of the site including the Diamond Public Parking area have become overgrown with weeds and grasses. The perimeter of the site has been enclosed in low earthen berms to reduce likelihood of unauthorized parking on the site and to minimize surface runoff reaching nearby storm drains. Storm drain catch basins are located adjacent to the site, on West Front Street and North 9th Street, which transport surface runoff from the site to the Boise River approximately 2,000 feet to the southwest.

There are 53 groundwater wells located throughout the site (Figure 2-3). Of these 53 wells, 28 comprise a groundwater sparging system coupled with an active vapor evaporator system which has been engineered to remediate on-site groundwater contamination (Figure 2-4).

Immediately surrounding the site are various businesses along West Front Street and North 9th Street, including a transmission repair shop, a tavern, hotels and furniture warehouses.



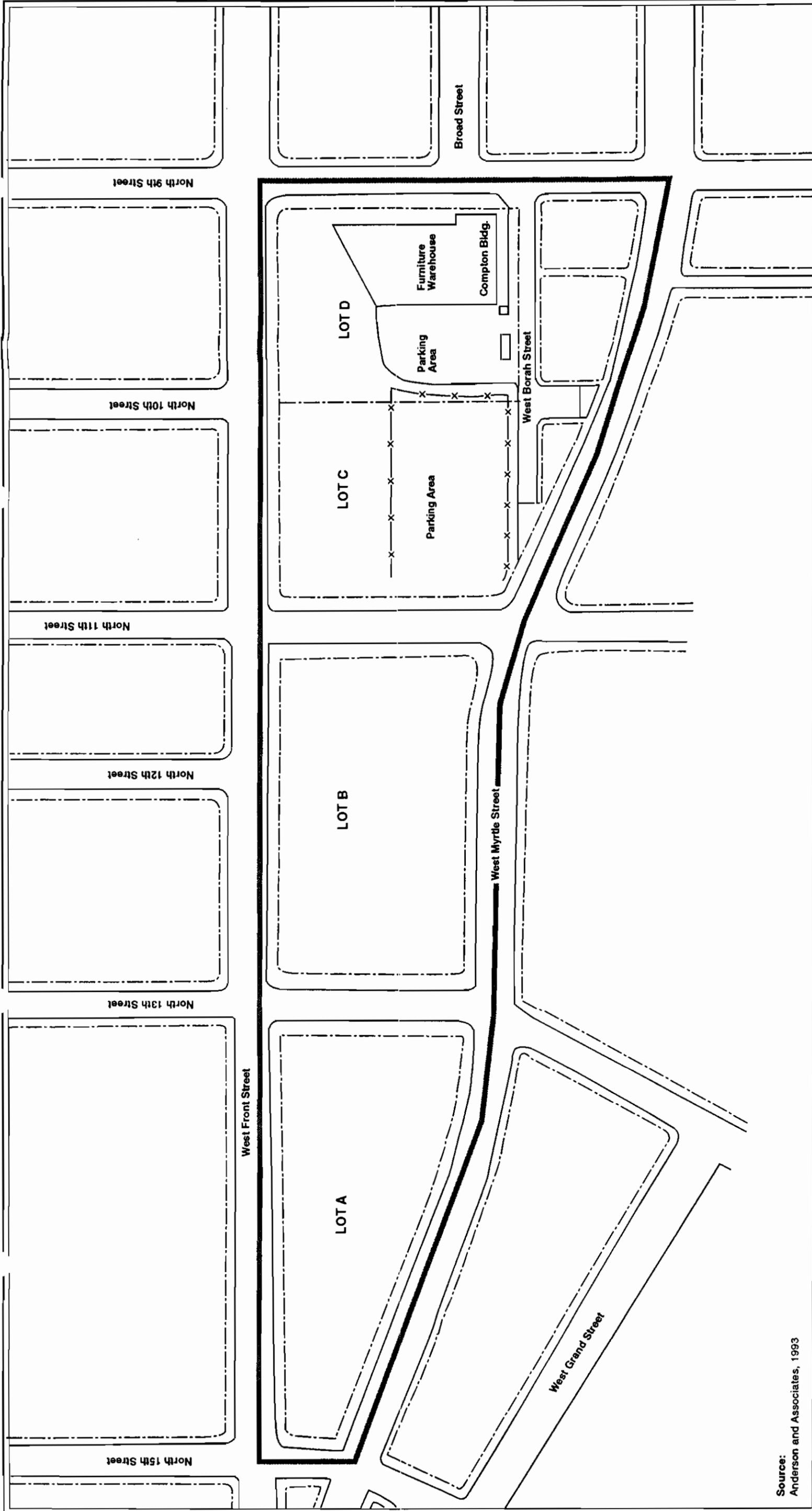
Source: USGS 7 1/2' Quadrangle Series - Boise South, Idaho(1972)

Capitol Station Vicinity Map Boise, Idaho



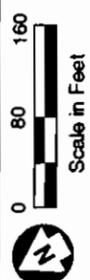
4000-19-25-4100
March 1995

FIGURE
2-1



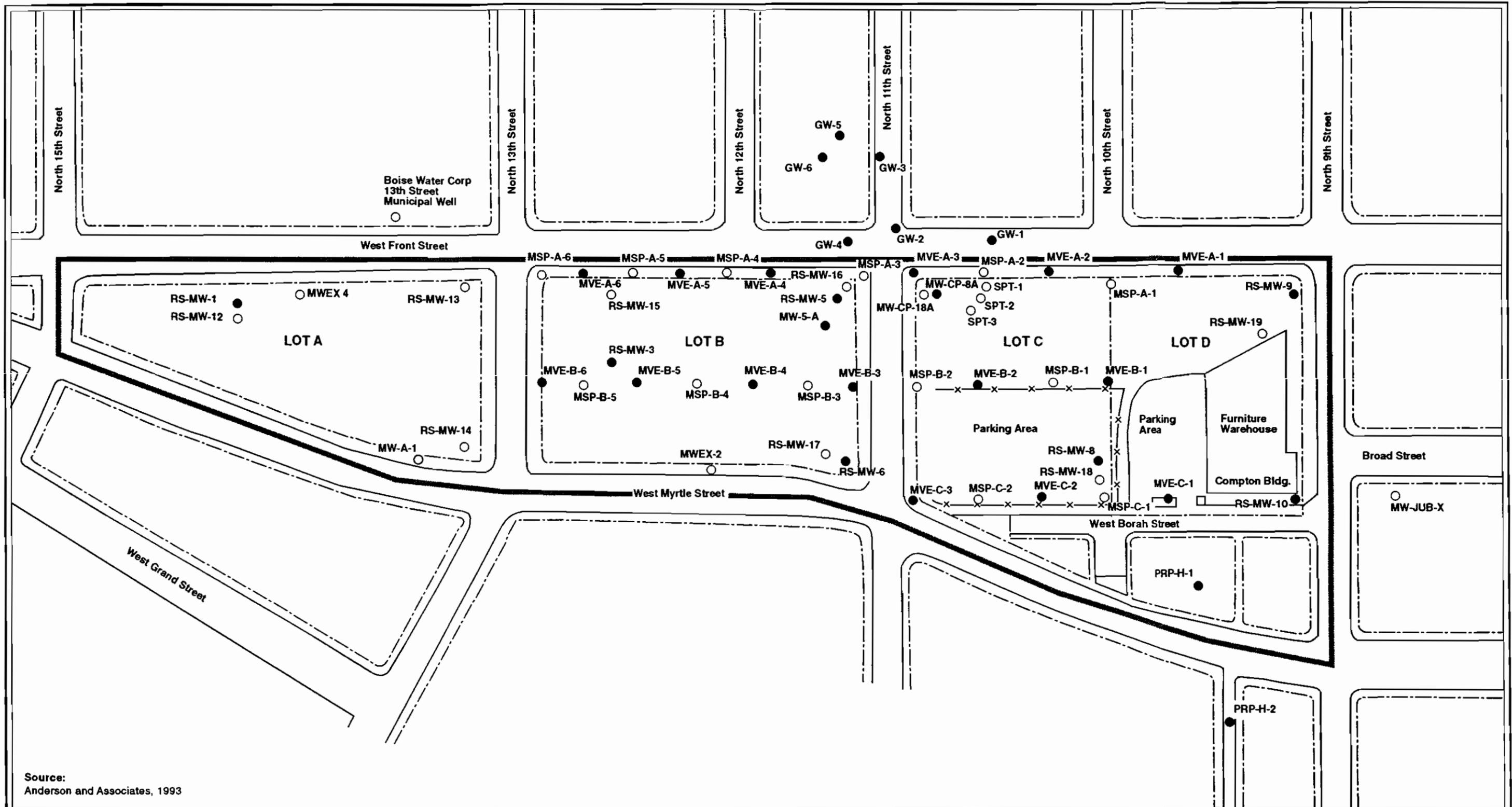
Source:
Anderson and Associates, 1993

EXPLANATION
 Site Boundary



4000-19-25-4100
April 1995

Capitol Station
Boise, Idaho
Site Map



Source:
Anderson and Associates, 1993



4000-19-25-4 100
May 1995

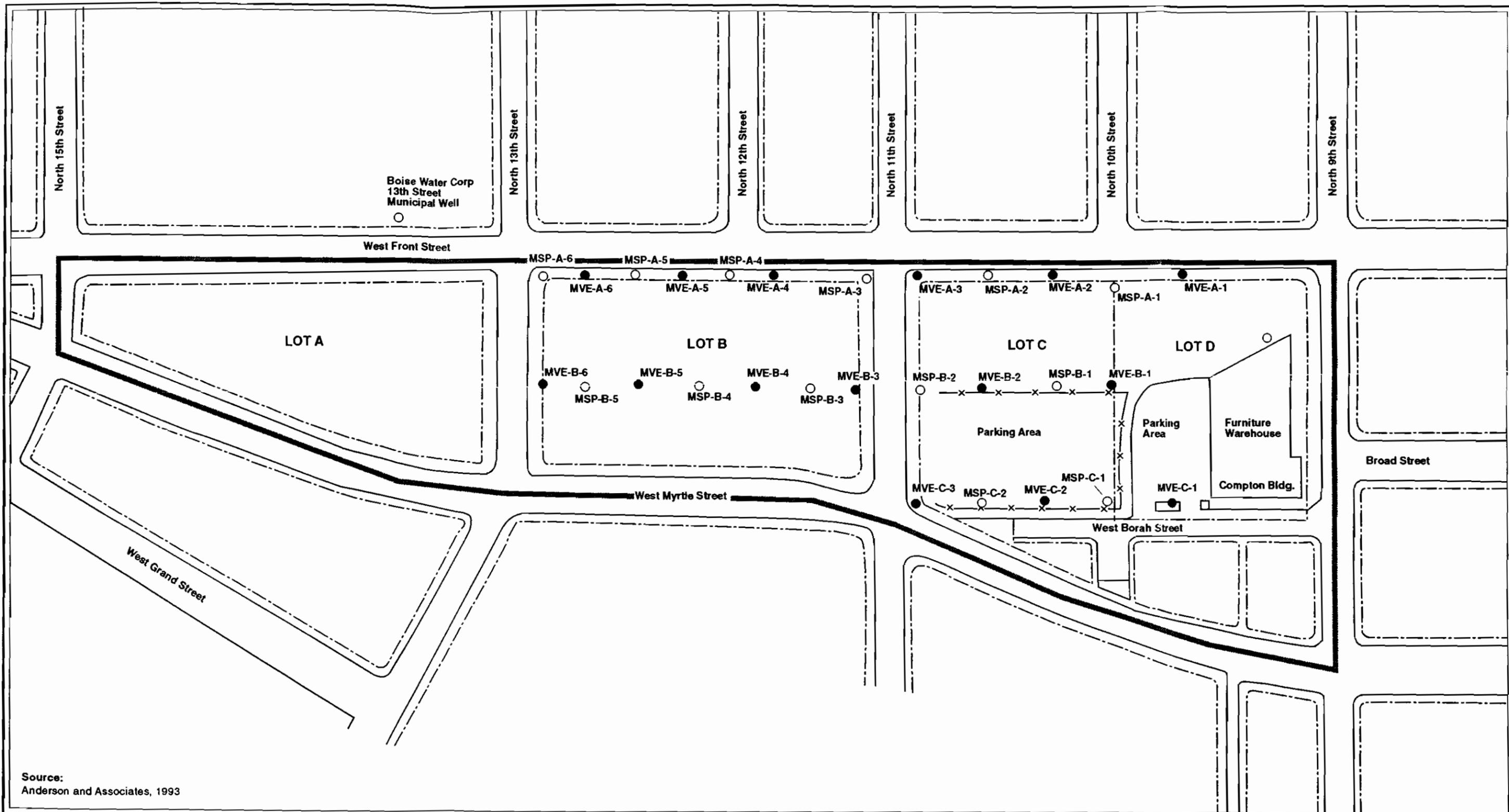
EXPLANATION

- Site Boundary
- Shallow Well
- Deep Well

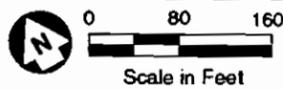
Capitol Station
Boise, Idaho
Monitoring Well Locations

FIGURE

2-3



Source:
Anderson and Associates, 1993



4000-19-25-4100
May 1995

EXPLANATION

- Site Boundary
- Shallow Well
- Deep Well
- MVE-X-N Vapor Extraction Well
- MSP-X-N Sparge Well

Capitol Station
Boise, Idaho
Sparge and Vapor Extraction Well Locations

SECTION 3

INVESTIGATIVE/REGULATORY INVOLVEMENT

In 1991, an Environmental Site Assessment was conducted, consisting of two phases (PRC, 1994). During Phase I, five underground storage tanks (USTs) were identified in the southern portion of the site with potential total petroleum hydrocarbon (TPH) contamination in the soil.

In August 1991, during Phase II of the Environmental Site Assessment, the five USTs were removed and samples were collected from the soil beneath the excavated tanks. Soil sampling confirmed the presence of TPH and chlorinated organic compounds in the soils associated with the five USTs in the southern portion of the site. TPH was detected at concentrations reaching 16,000 mg/kg and unnamed solvents were detected at concentrations greater than 20 mg/kg. In addition, soil gas and groundwater samples were collected at numerous locations throughout the site. Soil gas sampling identified tetrachloroethene at concentrations less than 100 ppb to depths of 3 feet in the site soil. Groundwater sampling identified tetrachloroethene and trichloroethene in the groundwater with the highest concentrations observed in deep wells along West Front Street between North 11th and 13th streets. Concentrations of tetrachloroethene ranged from 4 to 120 µg/L in the shallow wells and from 7 to 180 µg/L in the deep wells (PRC, 1994). Concentrations of tetrachloroethene are presented in Table 3-1.

Based on the findings from the Environmental Site Assessment, the Idaho Division of Environmental Quality (IDEQ) negotiated two consent orders with Union Pacific and Golden, respectively, for remediating the soil and groundwater contamination at the site.

In October 1992, the first consent order (the RCRA consent order pursuant to Idaho Code 39-4413, the Idaho Hazardous Waste Management Act) was signed with Union Pacific requiring Union Pacific to complete final clean closures of the five USTs identified on the site. The final closures included soil sampling to delineate the extent of contaminated soil and the appropriate disposal of the contaminated soil in a RCRA-approved disposal facility (PRC, 1994).

In December 1992, the second consent order was signed with Golden requiring further investigation of the source and areal extent of the contaminated groundwater plume detected in Phase II of the Environmental Site Assessment, and implementation of remedial actions to improve water quality to standards acceptable to IDEQ (PRC, 1994).

In 1993, Golden created and submitted a plan to remediate the groundwater contamination. The plan consisted of a sparge system coupled with an active vapor extraction treatment system (sparge/vapor extraction system) to aerate volatiles from the groundwater. In addition,

**Table 3-1—Concentrations of Tetrachloroethene
in On-Site Monitoring Wells, 1991 (µg/L)**

Monitoring Well ID	Concentration
Shallow Wells^a	
MW-A1	5.7
MW-A2	14
MW-A3	13
MW-B2	18
MW-B3	120
RS-MW1	4
RS-MW3	44
RS-MW5	96
RS-MW6	25
RS-MW8	28
RS-MW9	<1
RS-MW10	<1
Deep Wells^b	
RS-MW11	130
RS-MW12	32
RS-MW13	94
RS-MW14	8
RS-MW15	160
RS-MW16	180
RS-MW17	58
RS-MW18	110
RS-MW19	1.7

^a well depth between 15 and 30 feet bgs

^b well depth between 50 and 80 feet bgs

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Golden constructed low earthen berms around the perimeter of the site to discourage unauthorized parking and minimize surface water runoff. A pilot groundwater remediation system was tested in September 1993 (PRC, 1994).

In January 1994, the sparge/vapor extraction treatment system was put into operation for a one-year trial period. The system was to begin full operation in February 1995 for a five-year period. The system operates by pumping oxygen into the groundwater via the sparge wells volatilizing the tetrachloroethene, which is released via the vapor extraction wells. Quarterly groundwater sampling has been conducted to determine the effectiveness of the treatment system and the results have been compiled into quarterly reports for the IDEQ. The quarterly groundwater sampling results show slight improvements in groundwater quality, however, they are difficult to differentiate from the seasonal fluctuations of tetrachloroethene concentrations. Quarterly groundwater results are summarized in Appendix B.

In the fall of 1994, the sparge/vapor extraction system was shut down for semi-annual maintenance and for a determination of the effectiveness of this remediation system since its effectiveness could not be determined from the quarterly sampling results. The IDEQ requested that Golden develop a protocol to test the effectiveness of the system before the system was reactivated.

In the fall of 1994, additional research activities were conducted at the site through a cooperative effort of Anderson Associates, Inc., S-16, and Boise State University. These activities included surface geophysical testing (seismic, resistivity, radar), borehole testing (seismic and geo-sampling), and pump tests. The data from these tests, however, have not been interpreted or released to date (AAI, 1995).

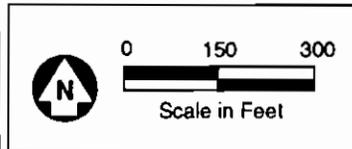
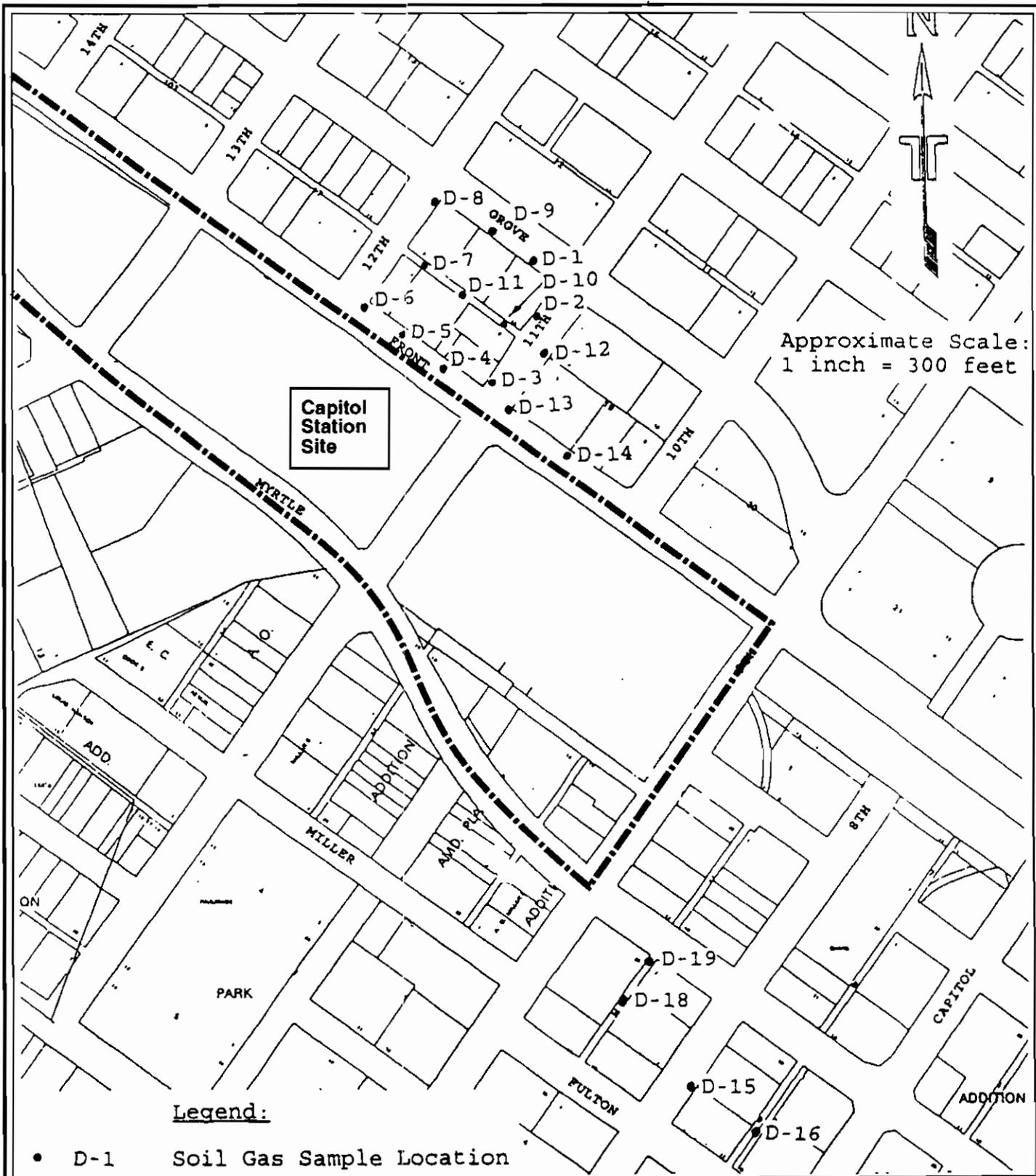
In February 1995, a protocol agreed to by IDEQ and AAI was implemented to test the radius of influence of the sparge wells. Based on results of the test, IDEQ claimed that the test was not conducted to the protocols initially accepted and that results did not indicate a decrease of tetrachloroethene in the tested wells. IDEQ further concluded that the sparge wells are located too far apart to be effective in the remediation of the groundwater contamination. AAI responded, saying that the system needed to be in operation for 18 months to demonstrate its effectiveness and decrease concentrations of tetrachloroethene. IDEQ agreed to operate the system for 18 months and presently, it is in full operation (Lane, 1995).

In May 1995, IDEQ conducted subsurface soil gas sampling off-site in an effort to identify a potential source of the groundwater contamination at the Capital Station site. Sampling took place in the vicinity of 11th and West Front Street and 8th and Fulton Street where historic uses of tetrachloroethene have been documented (Figure 3-1). Eighteen samples were collected and the results identified concentrations of tetrachloroethene ranging from less than 1 ppb to 13 ppb (which was detected at location D-16, in an alley southeast of the Idaho Linen Supply) (Terracon, 1995). Based on the results, two groundwater wells will be installed in these areas in August 1995 by Golden in an attempt to identify a source of the

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groundwater contamination at the Capital Station site. If sampling of the groundwater wells identifies another potential responsible party, IDEQ and Golden may renegotiate the original consent order (Lane, 1995).

Presently, a nonsampling site inspection of the Capital Station site is being conducted by WESTON for EPA.



Source: Terracon, 1995

Source Investigation Off-Site Soil Gas Sampling Locations



4000-19-25-4100
August 1995

FIGURE
3-1

SECTION 4

SUMMARY OF PATHWAY CONSIDERATIONS

This section presents a summary of the potential threats associated with each exposure pathway at the Capital Station site.

4.1 WASTE TYPE AND CHARACTERISTICS

A plume of groundwater contaminated with tetrachloroethene has been identified in the site groundwater. The groundwater plume has therefore been assumed to be a source at the site even though it cannot be directly attributed to the site. The highest concentration of tetrachloroethene (101 µg/L) identified in the last sampling event in the deep aquifer was observed in Well RS-MW-16. The concentrations of tetrachloroethene from on-site monitoring wells sampled in March, 1995 are in Table 4-1.

4.2 PATHWAYS OF CONCERN

4.2.1 Groundwater Pathway

Hydrogeology

The hydrogeology in the vicinity of the site is characterized by alluvial sediments overlying glacial outwash deposits and tertiary sediments. These upper layers consist of silt, sand, and coarse, well-sorted gravel. Below this unit of sediments, lies the Glens Ferry Formation which is approximately 2,000 feet thick. The Glens Ferry Formation consists of unconsolidated silt, clay, gravel, volcanic ash, and basalt. Shallow unconfined aquifers are present in the alluvial sediments which act as a single water-bearing unit. A deep aquifer is present in the Glens Ferry Formation.

The shallow aquifer which is associated with the surficial sediments is approximately 23 feet below ground surface (bgs). This aquifer is recharged by the Boise River, irrigation canals, runoff from the mountains to the north, in addition to rain and snowmelt. The hydraulic conductivity in the shallow aquifer is 2×10^{-5} cm/sec and groundwater flow is to the northwest. A semi-confining layer between the shallow and deep aquifer consists of dark colored silt, clay, and dense sand at approximately 60 feet bgs. This layer is often referred to as "blue clay."

The deep aquifer is associated with the Glens Ferry Formation and water drawn from this aquifer serves the Boise Valley. A hydraulic connection between the shallow and deep aquifer has been demonstrated by drawdown observed in the shallow aquifer wells

Table 4-1—Concentrations of Tetrachloroethene ($\mu\text{g/L}$) In On-Site Monitoring Wells, Sampled March, 1995

Well ID	Concentration
Shallow Wells	
RS-MW-1	2.0
RS-MW-3	13.1
RS-MW-5	33.5
RS-MW-6	5.1
RS-MW-8	3.0
RS-MW-9	ND
RS-MW-10	ND*
MVE-A-1	ND
MVE-A-2	1.1
MVE-A-3	4.2
MVE-A-4	-----
MVE-A-5	8.9*
Deep Wells	
RS-MW-12	1.1
RS-MW-13	49.6
RS-MW-14	4.0
RS-MW-15	60
RS-MW-16	101
RS-MW-17	27.2
RS-MW-18	50
RS-MW-19	2.4
MSP-A-1	3.2*

Well ID	Concentration
Shallow Wells	
MVE-A-6	NS
MVE-B-1	1.0
MVE-B-2	4.6
MVE-B-3	7.4*
MVE-B-4	NS
MVE-B-5	NS
MVE-B-6	NS
MVE-C-1	5.3
MVE-C-2	3.7
MVE-C-3	4.2
MW-CP-8A	3.9
MW-A-1	2.0
Deep Wells	
MSP-B-1	19.3*
MSP-B-2	NS
MSP-B-3	NS
MSP-B-4	28.2*
MSP-B-5	NS
MSP-C-1	5.1*
MSP-C-2	43.3*
MW-CP-18A	55.3
SPT-1	24.5

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Table 4-1—Concentrations of Tetrachloroethene ($\mu\text{g/L}$) In On-Site Monitoring Wells, Sampled March, 1995

Well ID	Concentration
MSP-A-2	NS
MSP-A-3	NS
MSP-A-4	NS
MSP-A-5	NS
MSP-A-6	NS

Well ID	Concentration
SPT-2	6.0
SPT-3	21.1
PRP-H-1	7.3
PRP-H-2	6.5

* Indicates concentration was taken from data collected in December 1994 because well was not sampled in this round.

▪ Indicates sample in this round was collected in February 1995.

NS - Not sampled.

ND - Not detected.

---- Indicates that the well has never been sampled.

on-site when the nearby deep Boise supply well (13th Street well) screened from 150 to 295 feet was pumped at 1,000 gallons per minute. The groundwater flow in the deep aquifer is to the northeast.

Observed Releases

For the purposes of this SI, detected concentrations of tetrachloroethene off-site have been used to identify an observed release of contamination. Tetrachloroethene is not a naturally occurring compound in groundwater or the earth's crust; therefore, any detected concentrations in the groundwater indicate a release of this compound. In addition, since the groundwater plume has been defined as a source, migration of the contamination to nearby off-site wells was determined to be an observed release.

Targets

The Boise area drinking water is drawn from the local aquifer system. A public groundwater system owned by the United Water Corporation (UWC) (formally known as the Boise Water Corporation), serves approximately 145,000 people from 62 public wells, 44 of which are within a 4-mile radius of the site. In addition to the UWC wells, there are selected other public wells within a 4-mile radius of the site. All the municipal wells draw groundwater from the local deep aquifer and are assumed to draw water from the shallow aquifer since screens have been found at various depths in the wells and drawdown tests have indicated interconnection between both aquifers. An approximate total of 128,287 people are served by

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public wells within 4 miles of the site. The numbers served by public wells are summarized in Table 4-2.

The closest off-site municipal well is a UWC well. The well is located approximately 200 feet from the site, north of Front Street, and downgradient of the groundwater contamination (Figure 2-4). The well has 6 perforated areas for drawing water and primarily draws water from the deep aquifer. The well is used regularly for drinking water in the downtown area during the summer months. It is not used regularly in the winter months. Based on samples collected by IDEQ in October 1994, tetrachloroethene at a concentration of 0.22 µg/L has been identified in the well (Lane, 1995).

In addition to the public wells, there are approximately 376 domestic wells within 4 miles of the site (USGS, 1995). Based on the average number of people per household in Boise (2.42) (USDC, 1990), approximately 910 people are served by these wells. The numbers served by domestic wells is summarized in Table 4-3.

The groundwater within 4 miles of the site is also used for irrigation and for watering stock. There are approximately 270 irrigation wells and five stock wells within a 4-mile radius of the site (USGS, 1995).

4.2.2 Surface Water Pathway

The surface water pathway consists of two migration components: the overland flow component and the groundwater to surface water component. There is no groundwater to surface water pathway since the groundwater is not flowing towards the Boise River or any other major surface water bodies.

Overland Flow

The closest water body is the Boise River located approximately 2,000 feet southwest of the site. The average flow of the River is 358 cubic feet per second (cfs) in the vicinity of the site where riverflow is controlled by dams. Approximately 5 miles downstream of the site, the average flow increases to 1,000 cfs as other streams enter the Boise River. In addition, the site is located in a 500 year flood plain of the Boise River.

The area receives relatively little precipitation and the net rainfall is 3 inches per year. Surface water runoff is transported to the Boise River via storm drains with catch basins located along West Front Street and along North 9th Street. There are no other exposed sources of soil contamination on the site and overland flow is minimized by the berm around the site.

**Table 4-2—Public Groundwater Wells Within a 4-mile Radius
of the Capital Station Site, Boise, Idaho**

Distance From the Site	Number of BWC Wells	Number Served	Number of Other Wells	Number Served	Total Number Served
0-1/8	1	2,338	0	0	2,338
1/8-1/4	0	0	0	0	0
1/4-1/2	0	0	0	0	0
1/2-1	1	2,338	0	0	2,338
1-2	14	32,732	3	1,921	34,653
2-3	16	37,408	8	5,812	43,220
3-4	18	42,084	7	3,654	45,738
Total	50	116,900	18	11,387	128,287

**Table 4-3—Domestic Groundwater Wells Within a 4-Mile Radius
of The Capital Station Site, Boise, Idaho**

Distance From Site	Number of Deep Wells	Number of People Served	Number of Shallow Wells	Number of People Served
0-1/8	0	0	0	0
1/8-1/4	0	0	0	0
1/4-1/2	3	7	0	0
1/2-1	4	10	1	2
1-2	35	85	6	15
2-3	77	186	34	82
3-4	155	375	61	148
Total	274	663	102	247
Total Number of Wells	376	Total Number of People Served	910	

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4.2.2.1 *Drinking Water*

There are no drinking water intakes in the Boise River within 15 miles downstream of the site.

4.2.2.2 *Food Chain*

The Boise River is open annually to sport fishing and approximately 54,000 trout are stocked in the river each year (Allen, 1995). Based on an approximate average weight of the fish (0.5 lb) and the number stocked, if all fish stocked were caught during the year, approximately 27,000 lbs of fish would be taken from the Boise River annually.

4.2.2.3 *Environmental*

Wetlands are found in patches along the banks of the Boise River and on small islands in the river for approximately 5 miles downstream of the site. There is approximately 5 linear miles of wetland frontage along the Boise River within the target distance limit. The Boise River in the vicinity of the site has a significant amount of its water diverted from the River for purposes of agricultural irrigation.

4.2.3 **Soil Exposure Pathway**

Capital Station is located in a predominantly commercial area on the edge of the downtown district of Boise. Most of the site is exposed soil with areas of gravel and weeds, however, no sources have been identified on site or in the site soil. The only area that is not vacant is the area occupied by Michael's Furniture Warehouse and a public parking lot in the southeastern corner of the site. Access to the site is unrestricted except for the perimeter berm which discourages unauthorized parking.

There are approximately 25 workers, on-site in Michael's Furniture Warehouse. There are several businesses that are located within 200 feet of the site on North 9th Street and along West Front Street. These businesses consist of transmission repair shops, taverns, hotels, and furniture warehouses. There are seven houses located within 200 feet of the site and approximately 17 people are assumed to be residing within 200 feet of the site, based on the average number of people per household in Boise (USDC, 1990).

4.2.4 **Air Pathway**

The Boise area is characterized by relatively hot summers and cold winters. Net precipitation in the vicinity of the site averages 3 inches per year. The 2-year 24 hour rainfall averages 1.5 inches. No contamination has been identified in or on the site soil.

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The closest person to the site is approximately 0.04 mile away. The total population within a 4-mile radius of the site is approximately 129,553 people. The population distribution is presented below in Table 4-4. No contamination has been identified in or on the site soil.

Table 4-4—Population Distribution Within a 4-Mile Radius of the Capital Station Site

Distance From Site (miles)	Number of People
0 to 1/8	115
1/8 to 1/4	263
1/4 to 1/2	662
1/2 to 1	8,033
1 to 2	32,094
2 to 3	39,414
3 to 4	27,590
Total Population	129,553

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SECTION 5

CONCLUSIONS

The following conclusions can be made from information from this SI:

A contaminated groundwater plume has been identified at the site and it is assumed to be a source even though it cannot be attributed to the site at this time. Presently, a search for an off-site source is being conducted.

An observed release of tetrachlorethene has been identified in a nearby off-site municipal well hydrogeologically downgradient of the site which provides drinking water for downtown businesses. The local groundwater serves as a drinking water source for greater than 100,000 people within 4 miles of the site. The groundwater pathway poses the greatest threat to human health.

The groundwater to surface water pathway poses minimal threat to human health because the groundwater flows away from the Boise River, which is the major surface water body in the area.

The surface water ultimately reaches the Boise River via storm drains; however, there is no source of soil contamination on site that could be transported via overland flow of surface water. The surface water pathway poses minimal threat to human health and the environment.

Soil and air exposures are minimal because no source on the surface has been identified on the site.

SECTION 6

REFERENCES

Allen, Dale. 1995. U.S. Department of Fish and Game. Personal Communication with Kata Ritenburg, Roy F. Weston, Inc. January, 1995.

Anderson Associates, Inc. (AAI). 1995. Capital Station Project Quarterly Report—October through December 1994. Prepared for S-Sixteen. 15 January 1995.

Lane, Ron. 1995. Idaho Department of Environmental Quality, Boise, Idaho. 1-208-334-0550. Personal Telecommunication with Louis Craig of Roy F. Weston, Inc.

PRC Environmental Management, Inc. (PRC). 1994. *Preliminary Assessment Report For Capital Station*. January 1994.

Terracon Consultants Western, Inc. 1995. Soil Gas Survey Vicinity of 11th St. and Front St. and 8th St. and Fulton, Boise, Idaho. Prepared for IDEQ.

U.S. Department of Commerce (USDC). Rainfall Frequency Atlas of the United States. Technical Paper No. 40.

U.S. Department of Commerce (USDC). 1990. The 1990 Census of Population and Housing, Summary of Population and Housing Characteristics, Idaho.

U.S. Department of the Interior (DOI). 1991. National Wetlands Inventory Map, Boise South, Idaho.

U.S. Environmental Protection Agency (EPA). 1992. *HRS Guidance Manual*.

U.S. Geological Society (USGS). 1972. Topographic map, 7.5 Minute Series. Boise South, Idaho. Photoinspected 1976.

U.S. Geological Survey (USGS). 1995. Water Resources Division, Well Inventory for 4-mile radius of Capital Station, Boise Idaho.

APPENDIX A
CONTACT LIST

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CONTACT LIST

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APPENDIX B

**SUMMARY OF GROUNDWATER SAMPLING RESULTS
FOR TETRACHLOROETHENE ($\mu\text{G/L}$) FROM QUARTERLY SAMPLING 1994**

Appendix B
Summary of Groundwater Sampling Results
for Tetrachloroethene (ug/L) from Quarterly Sampling 1994

Well ID	January	March	June	September	December
Shallow Monitoring Wells					
USPCI Wells					
RS-MW-1	3.2	3.5	4.1	2.1	2.2
RS-MW-3	24	20.9	13.7	16.2	14.7
RS-MW-5	82	50	12.1	15.6	40
RS-MW-6	15.7	12.3	8	5.1	5.4
RS-MW-8	17.5	15	11.3	5.7	5.3
RS-MW-9	ND	ND	ND	ND	ND
RS-MW-10	ND	ND	ND	NS	ND
Evaporation Wells					
MVE-A-1		1.6	0.7	1.9	1.1
MVE-A-2		1.1	1.8	5.7	NS
MVE-A-3		2	2.6	4.8	NS
MVE-A-4*					
MVE-A-5			13.2	NS	8.9
MVE-A-6			12.8	NS	NS
MVE-B-1		1.3	10.4	6	4
MVE-B-2		7.7	5.8	4.5	NS
MVE-B-3			4.4	6.7	7.4
MVE-B-4			14.1	NS	NS
MVE-B-5			13.9	NS	NS
MVE-B-6			9.1	3.6	NS
MVE-C-1			8.9	NS	NS
MVE-C-2			13.3	7.1	NS
MVE-C-3			6	NS	4.1
Other Wells					
MW-5-A			11.8	NS	NS
MW-A-1	3.6	4.6	2.6	NS	NS
MW-A-2	NS	NS	NS	NS	NS
GW-1					
GW-2					
GW-3					
GW-4					
GW-5					
GW-6					
MW-CP-8A				4.9	6.1
Deep Monitoring Wells					
USPCI Wells					
RS-MW-12	2.8	1.4	2.8	2.7	1.8
RS-MW-13	89.3	107	72.7	70	85
RS-MW-14	15	7.6	7.4	5.5	5.6
RS-MW-15	101	125	110	65	59
RS-MW-16	385	223	188	233	315
RS-MW-17	83	66.5	43.9	33.9	35
RS-MW-18	43	49.5	40.9	97.5	75
RS-MW-19	1.2	1.1	1.1	5.6	2.2
Sparge Wells					
MSP-A-1		2.1	3.9	2.2	3.2
MSP-A-2		4	6.7	10.6	NS
MSP-A-3			NS	NS	NS
MSP-A-4			8.5	NS	NS
MSP-A-5			12.8	NS	NS
MSP-A-6			7.3	NS	NS
MSP-B-1		5.1	4.6	9.9	19.3
MSP-B-2		34.5	10.7	17.3	NS
MSP-B-3			28.8	NS	NS