



Converse Consultants

Over 50 Years of Dedication in Geotechnical Engineering and Environmental Sciences

September 12, 2003

00-43367-06

Ms. Chris Andres
Nevada Division of Environmental Protection
Bureau of Corrective Actions
1771 East Flamingo Road, Suite 121-A
Las Vegas, NV 89119

Subject: **Work Plan - Additional Site Activities**

Maryland Square Shopping Center
3661 South Maryland Parkway
Las Vegas, Nevada
Facility ID# H-000086

2003 SEP 15 PM 12: 02

Dear Ms. Andres:

Converse Consultants (Converse) is pleased to submit this work plan for the subject site (Site). The Nevada Division of Environmental Protection (NDEP), as set forth in your letter dated September 2, 2003 and at the August 26, 2003 meeting, has directed Converse to submit a workplan to address certain additional activities related to the Preliminary Corrective Action Plan (CAP) dated June 27, 2003. The additional activities include (1) installing two monitoring wells to the north and northwest of the Boulevard Mall parking garage, (2) characterizing of the tetrachloroethene (PCE) impacted groundwater to the east of the Boulevard Mall, (3) conducting slug tests related to the proposed use of Hydrogen Release Compound (HRC) on the Boulevard Mall property, (4) commencing pilot testing to aid in designing the final CAP, and (5) conducting quarterly groundwater monitoring and sampling.

Site Description

The Site is located at 3661 South Maryland Parkway at the northwest corner of Maryland Parkway and Twain Avenue in Las Vegas, Nevada.

It is located in the Southeast $\frac{1}{4}$ of the Northeast $\frac{1}{4}$ of Section 15, Township 21 South, Range 61 East. The site is developed as a strip shopping center. Until recently, a dry cleaner facility was located in the shopping center on the Site. A *Site Vicinity Map* is enclosed as Drawing No. 1.

Background

On August 9, 2000, subsurface soil and water conditions were investigated along the eastern boundary of the Site by drilling one (1) soil boring and converting it into a monitoring well (MW-1). Water samples collected from MW-1 on August 14, 2000 revealed that PCE concentrations in the groundwater at the Site exceeded the established USEPA maximum contamination level (MCL) for PCE in drinking water. Currently the MCL for PCE in drinking water is 5 ug/l or parts per billion (ppb).

On October 2 and 3, 2000, downgradient subsurface soil and water conditions were investigated by drilling five (5) additional soil borings in the vicinity of the Boulevard Mall parking garage and converting the borings into monitoring wells (MW-2, MW-3, MW-4, MW-5, MW-6). Water samples collected from these wells on October 5, 2000 revealed concentrations of PCE and trichloroethene (TCE) in the groundwater, which exceeded their established MCLs.

On August 22, 2001, Converse completed an A-K Evaluation for the Site that revealed twenty (20) potential sources of potable water in the section (Section 15) where the Site is located. Thirty-four (34) potential sources of potable water exist in Section 14, which is downgradient of the Site.

On May 14, 2002 subsurface soil conditions beneath the premises previously leased by Al Phillips The Cleaners, in the subject building were explored by installing five (5) soil borings (B-1 through B-5). Soil samples collected from these borings revealed concentrations of PCE in the soil that exceeded the Preliminary Remediation Goal (PRG).

On September 19 and 20, 2002, subsurface soil and water conditions were investigated by drilling six (6) additional soil borings (three on-site and three off-site) and converting the borings into monitoring wells

(MW-7 through MW-12). Water samples collected from these wells on September 24, 2002 revealed concentrations of PCE in the groundwater that exceeded the MCL for PCE.

On May 6, 2003, subsurface soil and water conditions were investigated by drilling one (1) additional soil boring on the Boulevard Mall property and converting the boring into a monitoring well (MW-13). A water sample collected from this well, in addition to the existing twelve wells, revealed concentrations of PCE in the groundwater that exceeded the MCL for PCE.

Scope of Services

Installation of Additional Monitoring Wells

Converse will install two (2) soil borings in the vicinity of the Boulevard Mall parking garage to investigate groundwater contamination in the area. One boring will be located to the west of MW-13 near the north-west corner of the parking garage. The second boring will be located to the northwest of MW-13. See Drawing No. 2 for approximate locations of the proposed monitoring wells. The borings will be installed with a truck-mounted drill rig. These borings will be installed to an approximate depth of 30 feet. Two discrete soil samples will be collected during installation of each of the borings. One sample from the vadose zone will be submitted to a Nevada certified laboratory for analysis using EPA Method 8260 for volatile organic compounds (VOCs), while the other sample from below groundwater will be analyzed by Converse to determine particle size distribution per ASTM C136. The drill cuttings will be placed in labeled 55-gallon drums and stored on-site pending proper disposal.

After completion of the soil borings, we will install 2-inch PVC well casing that will be screened through the water table. The wells will be installed per standard industry practice and general EPA protocol. After installation, the wells will be developed to remove sediment and to establish equilibrium between the aquifer and the well materials.

The new wells will be surveyed for horizontal and vertical control to aid in establishing the local groundwater gradient and flow direction.



Groundwater Characterization

Converse will also characterize the groundwater to the east of the Boulevard Mall. Up to six (6) soil borings will be installed along the eastern side of the Boulevard Mall building northward from monitoring well MW-11. See Drawing No. 2 for approximate locations of these soil borings. These borings will be installed to an approximate depth of 32 feet. One discrete soil sample will be collected during installation of each of the borings. The samples will be submitted to a Nevada certified laboratory for analysis using EPA Method 8260 for VOCs. The drill cuttings will be placed in labeled 55-gallon drums and stored on the Site pending proper disposal.

After completion of the soil borings, a grab water sample will be collected from each of the open boreholes. The groundwater samples will be collected with disposable bailers, placed in sterilized 40-ml glass vials, capped with Teflon lined lids, labeled, and placed in an insulated container. Samples will be sent under chain-of-custody to a Nevada certified laboratory. The samples will be analyzed in accordance with EPA Method 8260 for VOCs under rush turnaround times. The boreholes will be left open and covered with a flush metal plate until laboratory results are received.

Once the laboratory results have been evaluated, Converse anticipates that some of the soil borings will be completed as monitoring wells. If it is necessary to complete such wells, Converse will install 2-inch PVC well casing that will be screened through the water table. The wells will be installed per standard industry practice and general EPA protocol. After installation, the wells will be developed to remove sediment and to establish equilibrium between the aquifer and the well materials. The unused soil borings will be properly abandoned.

The new wells will be surveyed for horizontal and vertical control to aid in establishing the local groundwater gradient and flow direction.

As part of the groundwater characterization, Converse will determine if dewatering is being conducted on the Boulevard Mall property.

lug Tests

Slug tests will be performed in three existing 2-inch monitoring wells (MW-2, MW-3 and MW-13) to determine an approximate range of field hydraulic conductivity (**K**). The hydraulic conductivity can be used as an estimate of the rate at which the saturated porous media will transmit shallow groundwater. Slug test data will be analyzed using the Hvorslev (1951) and Bouwer and Rice (1976) methods for falling (slug-in) and rising (slug-out) head tests.

Each slug test will be conducted by submerging a "slug" constructed of rigid, sealed PVC pipe of known dimensions and volume below the water table. Two types of slug tests will be performed at each well, slug-in and slug-out, each of which causes an instantaneous change in water level. The rate at which the disturbed water level recovers to static conditions is a function of the hydraulic conductivity of the aquifer material near the well screen. Changes in water level over time will be observed using a rapid-sample electronic pressure transducer with a self-contained data logger, which is programmed and connected to a hand-held computer at the surface. The slug-in test causes an increase in the water level, before recovering to static conditions, while the slug-out test produces a drop in the water level as the slug is removed. Each test (slug-in and slug-out) is repeated for multiple repetitions until test results show little variation in the rate of water level recovery. Slug-in test results are generally used only for comparison, as they are considered less reliable than slug-out results due to the partial saturation of unsaturated materials that occurs from increasing the elevated water level upon slug insertion. Therefore, Converse will only report slug-out test results.

It should be noted that values of (**K**) determined from the slug testing represent near bore (<1 foot radius) averages, and may not be representative of aquifer materials outside this effective well radius. This is especially true for nonhomogeneous and anisotropic aquifers such as the shallow aquifer, which encompasses most of the Las Vegas Valley and includes the Site. These aquifer conditions can often result in significant spatial variability of hydraulic conductivity. Therefore, values of (**K**) derived from the slug tests should be considered as order of magnitude ranges, rather than absolute values of aquifer properties.

HRC Implementation

Once the slug tests are completed, the actual number and density of the injection points can be determined. Converse will install HRC injection points on the Boulevard Mall property between the parking garage and the mall building as it was directed by the NDEP in your letter dated September 2, 2003. Prior to installing the HRC injection points, Converse will drill one (1) soil boring in the area of the proposed HRC injection points. Two (2) soil samples will be collected for analysis of particle size distribution and effective porosity. Once the soil sample has been collected, the boring will be properly abandoned. Converse will coordinate with Boulevard Mall personnel and Underground Services Alert (USA) in an attempt to locate on-site utilities prior to installing the injection points. The injection points will be drilled as a barrier wall to treat impacted groundwater that is moving further downgradient underneath the Boulevard Mall building. See Drawing No. 2 for the proposed area where the injection points will be located. The injection points will be drilled to approximately 30 feet deep with a truck mounted drill/direct push rig. The drill cuttings will be placed in labeled 55-gallon drums and stored on-site pending proper disposal.

Upon completion of each of the injection points, HRC will be injected into the ground. The HRC will be pressure injected into the groundwater aquifer. Once the HRC has been injected, the soil borings will be properly abandoned and the asphalt repaired.

Soil Vapor Extraction/C-Sparge Pilot Testing

Converse will perform a two-part pilot test in the source area of the Site to evaluate whether soil vapor extraction (SVE) is a viable alternative for treating the impacted soil beneath the strip shopping center building, which is located on the Site. The first part of the two-part test will be 24-hour SVE pilot test. After completion of the initial SVE pilot test, a C-sparge pilot test will be performed in the source area. After approximately one week to ten (10) days of C-sparge testing, the second part of the SVE pilot test will occur. At that point, the SVE system will be turned back on and both systems (C-sparge and SVE) will then be run simultaneously for up to one additional seven to ten days. Operating the SVE and C-sparge systems simultaneously may increase the efficiency of each technology.

An objective in pilot testing the SVE process is to ensure that the soil lithology at the Site is conducive to the SVE. Soil media with low permeability can be difficult to remediate. The pilot testing process will involve installation of up to four (4) vapor extraction wells in the vadose zone at selected locations. Portable equipment will be used to conduct the pilot test. The portable equipment will be used to measure vacuum pressure and flow rates. In addition, air samples will be collected in tedlar bags. The air samples will be sent under chain-of-custody to a certified laboratory in Nevada. The samples will be analyzed in accordance with EPA Method 8260 for VOCs.

Under certain circumstances, an *Authority to Construct* (ATC) permit issued by the Clark County Department of Air Quality Management is required to discharge regulated pollutants to air. The proposed SVE pilot test will treat and discharge vapors from the soil beneath the building on the Site. The untreated discharge for the pilot test will be de minimis (less than 2 tons/year) so a formal permit will not be required.

An objective in pilot testing the C-sparge process is to determine if it is a viable alternative for treating the impacted groundwater. A pilot test is necessary to determine whether the lithology at the Site is conducive to the C-sparge process and to evaluate the C-sparge process relative to other remedial approaches. Converse will perform two independent C-sparging pilot tests. The first test will be conducted near the source area and sequenced with the SVE test as explained above. The second C-sparge test will be conducted along the eastern border of Maryland Parkway in the vicinity of MW-6.

The C-sparge pilot testing process on the Site would involve installation of two (2) sparge points, or wells, at different depths, a single boring and two (2) additional monitoring wells at the Site near MW-1. The sparge points would be used to inject an ozone/air mixture into the groundwater and the monitoring wells would be used to monitor the zone of influence from the sparge points. Portable equipment would be used to conduct the pilot test.

The C-sparge pilot testing process on the Boulevard Mall property would involve installation of two (2) sparge points at different depths in a single boring and three (3) additional monitoring wells at the site, which will be used with existing well MW-6. The sparge well would be used to inject air into the groundwater and the monitoring wells would

be used to monitor the zone of influence from the sparge well. Portable equipment would be used to conduct the pilot test. The C-sparge pilot test on the Boulevard Mall property is anticipated to last for a maximum of 72 hours due to security, structural and traffic restrictions at that property.

Both sparge point borings will be drilled with a truck-mounted drilling rig. The sparge point borings will be drilled to approximately 10 to 20 feet below the groundwater surface (25-45 feet bgs).

Converse will also, as part of the C-sparge pilot test, conduct analytical tests of the aquifer matrix for total or fraction organic carbon, particle size distribution, saturated hydraulic conductivity, soil air permeability, and dry bulk density, in order to gather information to assess the appropriate remedial alternatives for the Site. It should be noted, however, that sediments in the Las Vegas Valley can change multiple times within five to ten feet bgs. The presence of changing sediments, thus, may reduce the reliability of the information obtained through this testing.

Groundwater Sampling

The monitoring wells (13 existing and up to 5 new) will be purged and sampled in accordance with EPA protocol. The groundwater samples will be collected with disposable bailers, placed in sterilized 40-ml glass vials, capped with Teflon lined lids, labeled, and placed in an insulated container. Samples will be sent under chain-of-custody to a certified laboratory in Nevada. The samples will be analyzed in accordance with EPA Method 8260 for VOCs. The purged groundwater will be placed in labeled 55-gallon drums and stored on-site pending proper disposal on a quarterly basis.

Quarterly groundwater monitoring reports will be prepared upon completion of each quarterly sampling event. The reports will include a discussion of the monitoring results and our conclusions and recommendations.

Certified Environmental Manager (CEM) Statement

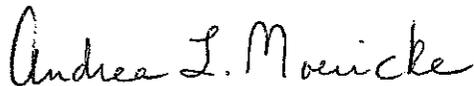
For the services provided and described in this document, the following language is from NAC 459.

I hereby certify that I am responsible for the services described in this document and for the preparation of this document. The services described in this document have been provided in a manner consistent with the current standards of the profession and to the best of my knowledge comply with all applicable federal, state, and local statutes, regulations, and ordinances.

We appreciate the opportunity to continue providing our environmental services for you. Should you have any questions regarding this report, please contact us at your earliest convenience.

Respectfully submitted,

CONVERSE CONSULTANTS



Andrea L. Moericke, CEM
Senior Project Manager
Nevada CEM 1754 (Exp. 3/1/05)
Dated 9/12/03

Reviewed by:

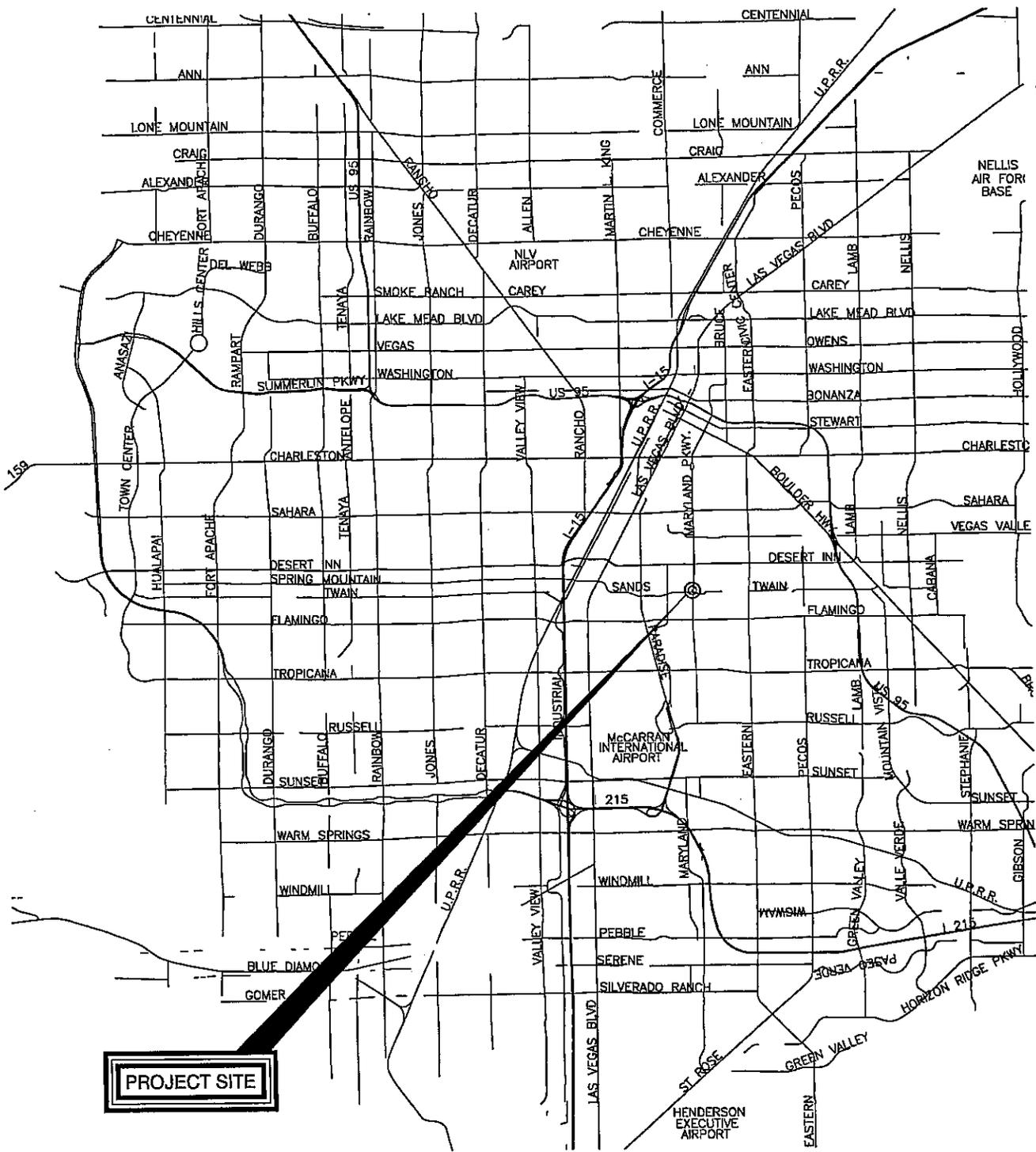


Kurt A. Goebel, CEM
Vice President
Environmental Division Manager

KAG:ALM:sc
30/46CS

Encl: Drawings No. 1 and 2

Dist: 1/Addressee
1/Dickerson, Dickerson, Consul & Pocker.
Attn: Mr. Paul Lal
2/Jenkins & Gilchirst, LLP
Attn: Ms. Sonja Inglin
1/Boulevard Mall
Attn: Mr. Timothy Biedinger



LAS VEGAS VICINITY

Maryland Square Shopping Center LLC/Herman Kishner Trust
 3661 South Maryland Parkway
 Las Vegas, Nevada

Scale	1" = 15,000'	File No.	36706V01
Date	09/12/03	Project No.	00-43367-06
Drafted By	REP	Drawing No.	1
Checked By	ALM		
Approved By			



Over 50 Years of Dedication
 in Engineering and
 Environmental Sciences