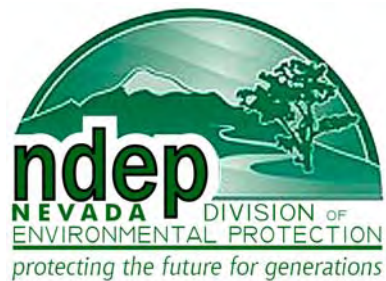


**Work Plan for Monitoring Well Installation
BMI Common Areas
Eastside Area**

March 4, 2009

Submitted to:



Prepared for:

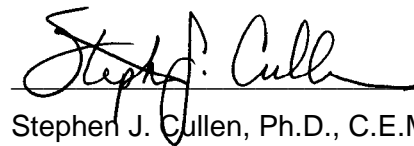


Daniel B. Stephens & Associates, Inc.

260 Newport Center Drive • Newport Beach, California 92660

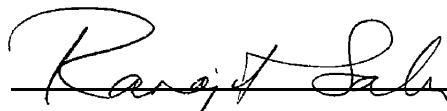
Responsible CEM for this Project

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.



March 4, 2009

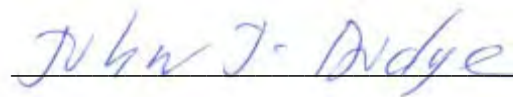
Stephen J. Cullen, Ph.D., C.E.M. (No. 1839)
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March 4, 2009

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1. Introduction

This work plan presents the scope of work for the installation of several Shallow, Middle, and Deep Zone wells at the Eastside Area of the Basic Management, Incorporated (BMI) Common Areas/Complex (the "Site") in Clark County, Nevada (Figure 1).

This scope of work has previously been discussed between Basic Remediation Company (BRC) and Nevada Division of Environmental Protection (NDEP) representatives, in a NDEP meeting on February 4, 2009 and in written correspondence to BRC dated February 23, 2009. The scope of work consists of:

- Monitoring well installation.
- Reporting.

1.1 Location and Setting

The Site is located in Clark County, Nevada, and is situated approximately 2 miles west of the River Mountains and 1 mile north of the McCullough Range. As shown in Figure 1, the area surface topography slopes in a westerly to northwesterly direction from the River Mountains and in a northerly to northeasterly direction from the McCullough Range. Near the Site, the surface topography slopes in a northerly direction toward the Las Vegas Wash.

The uppermost water-bearing zone is unconfined and present primarily in alluvium (referred to as the Shallow Zone). At some locations on portions of the Site, groundwater is first encountered in the Shallow Zone in the uppermost portion of the Tertiary Muddy Creek Formation (TMCf). This unconfined Shallow Zone groundwater generally flows in a northerly direction toward Las Vegas Wash. The Shallow Zone groundwater is generally continuous across the Site, but there are areas where Shallow Zone wells are dry. Below the Shallow Zone, deeper groundwater occurs in sporadically encountered lenses in the Middle Zone, designated between approximately 90 and 270 feet below grade. Deep Zone groundwater is generally continuous across the Site and is characterized with wells screened below 270 feet bgs to a maximum nominal depth of 400 ft bgs. Groundwater elevation data from the last several rounds of groundwater monitoring (2006, 2007, 2008) show that Deep Zone

groundwater is confined, and the potentiometric surface of Deep Zone groundwater is oriented generally north towards Las Vegas Wash (MWH, 2008).

Separate NDEP-approved project documents provide information regarding area geology and hydrogeology, soils, history, and investigations completed to-date (e.g., BRC, 2006).

1.2 Objectives

The existing wells at the site characterize Shallow, Middle, and Deep Zone groundwater in the Eastside Area. This work plan proposes the installation of additional wells in order to provide additional data to support groundwater characterization in this area. This work plan only addresses the installation and development of the proposed wells and sampling of the Eastside wells will be addressed separately. The objectives of this work plan are to:

- Install monitoring wells to assist in the characterization of the Shallow, Middle, and Deep Zone groundwater quality and flow direction in the Eastside Areas south and proximal to the Las Vegas Wash and in the area of the former Spray Wheel.
- Data collected from the proposed wells as well as from other existing wells will be used to refine the hydrogeologic conceptual site model (CSM) for the Eastside Area. The new monitoring wells will be installed in the Eastside Area at the proposed locations presented in Figure 2.

2. Proposed Scope of Work

This section identifies the proposed field procedures, well construction and quality assurance/quality control (QA/QC) procedures that will be used during the investigation of the Eastside Area.

2.1 Field Procedures

All proposed field procedures will be consistent with the NDEP-approved *BRC Field Sampling and Standard Operating Procedures* (FSSOP) (BRC, 2007b). The standard operating procedures (SOPs) referred to in this work plan are documented in FSSOP.

The rotary sonic drilling method will be used to allow for continuous core sampling (SOP-1). During drilling, an inner sample barrel (located at the end of the drill string) will be advanced for continuous soil core collection, and an outer, larger-diameter casing will be advanced as necessary to maintain the borehole in areas of unconsolidated sediments. The field geologist will prepare logs for each boring indicating the Unified Soil Classification System (USCS) soil classification (SOP-17), an estimate of field moisture content, sampling depths, progress of drilling (SOP-15), final completion depth, and the nature and resolution of any problems encountered. A representative sample from each sampled interval and/or change in lithology will be photographed to complete the documentation.

The deepest boring at each proposed well location will be drilled first to log soils encountered at the location, conduct soil sampling for laboratory analyses, and collect a full soil core to total depth. Subsequently, the more shallow boring(s) at the same location will be drilled next, without having to duplicate soil core collection, logging, and sampling.

Selected soil samples will be retained for laboratory analysis according to Table 1. These parameters were selected to evaluate potential sources and impacts at depth at the proposed drilling locations and further support conceptual model development at the Eastside area.

2.2 Well Construction

The proposed new wells are shown on Figure 2. The wells will be screened to be consistent with existing wells in each water-bearing zone at the Site. As requested, field boring logs and proposed screen intervals will be submitted to BRC and/or NDEP for review and concurrence before well construction commences. The proposed well locations may be adjusted in the field based on site access restrictions.

Field procedures for equipment decontamination (SOP-31), soil, water, and waste disposal (SOP-34), soil borings (SOP-1 and SOP-7), logging of soil borings (SOP-17), and well installation (SOP-2) protocol are set forth in the governing FSSOP (BRC, 2007b). Project SOPs are in accordance with Nevada Department of Water Resource (NDWR) drilling regulations.

General well design and construction methods are described in SOP-2. Individual well construction details will be designed and overseen by a Nevada Certified Environmental

Manager (CEM) such that the resulting wells are comparable in design to monitoring wells previously installed at the Site.

Well development will be performed using a combination of surging, bailing, and pumping (SOP-3). Field measurements of groundwater quality (pH, temperature, electrical conductivity, and turbidity) will be monitored using a portable water quality meter (SOP-5). Well development activities, including well identification, date constructed, date developed, volume of water purged, well recovery rates, and other relevant information, will be recorded by field personnel (SOP-15).

As noted earlier, this work plan addresses only monitoring well installation. Groundwater sampling in the new wells will be conducted under a separate task. BRC will consult with NDEP before finalizing the analyte list and before beginning sampling.

2.3 *Quality Assurance/Quality Control Procedures*

The QA/QC procedures that will be followed during this task are detailed in Section B of the BRC Quality Assurance Project Plan (QAPP) (BRC, 2007a).

3. Reporting

The data obtained during the tasks presented in this work plan will undergo a QA/QC review in accordance with the procedures described in the BRC QAPP (BRC, 2007a). These procedures will be followed to verify that the data are sufficient to meet the goals of this project. Only those data determined by the QA/QC review to be suitable for use will be considered for project use.

Boring log and well completion data will be presented in graphical and tabular format in the report. Boring log data to be presented will include:

- Drilling method
- The USCS of logged soils
- Soil color
- Qualitative evaluation of soil moisture content (USCS)
- Qualitative evaluation of particle size distribution

- Observation of mineralogical and/or other observed anomalies in the sampled soil material
- Depth to the contact between the Qa and TMCf
- Coarse- and fined-grained facies within the TMCf (if encountered)
- Total depth of boring
- Depth and location at which soil physical samples are collected
- Chain of custody for soil samples

Well completion and development data to be presented will include:

- Well identification and location (northing and easting)
- Well completion details
- Well development completion date
- Well screen interval
- Static water level after development completion
- Well screen swabbing data
- Sediment bailing data
- Purging date
- Purge method
- Purge volume
- Average purge rate
- Well recharge rate
- Notes of observations made during well installation and development

4. Schedule

Field activities will be initiated upon receipt of NDEP approval to proceed. Assuming a 6-week period for field work, it is anticipated that a well installation report will be submitted to NDEP within approximately 10 weeks of field work initiation.

References

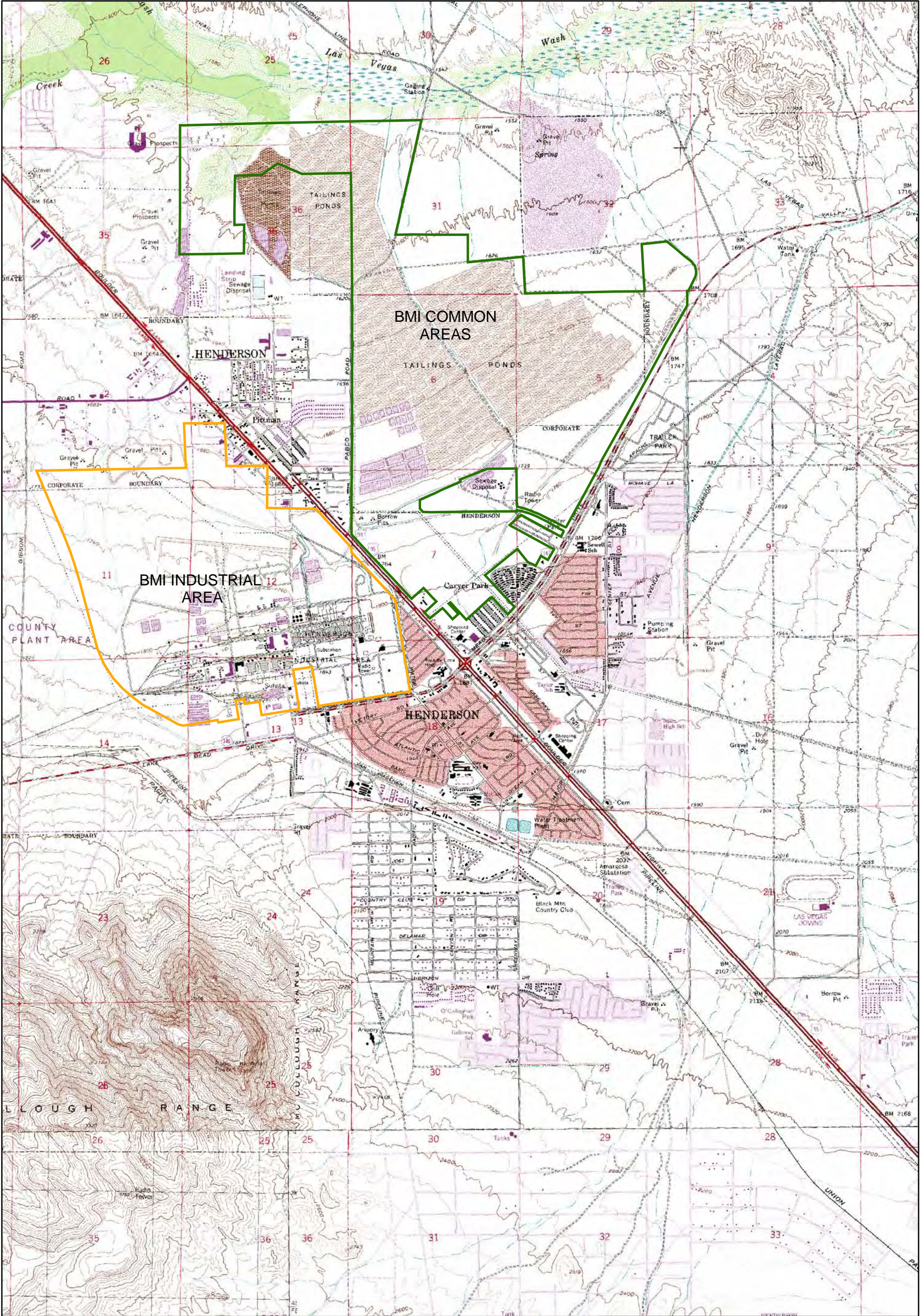
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MWH, 2008. *Fifth round groundwater monitoring report, April - July 2008, BMI Common Areas (Eastside), Clark County, Henderson, Nevada*. Prepared for Basic Remediation Company (BRC), Henderson, Nevada. December 2008.

Figures



2,000 1,000 0 2,000
Feet

BMI Site
Henderson, Nevada

FIGURE 1

SITE LOCATION AND
TOPOGRAPHIC MAP



Nevada-Clark Co. 7.5 Minute Series (Topographic)
Henderson, Nevada SE, Boulder City NW, and Sloan NE Quadrangles

Prepared by:
MKJ MWH

Date
09/28/06

JOB No. 1881262
FILE: GIS/BRC/BKGD_FIGURE1.MXD

Table

**Table 1. Proposed Soil Sampling
Monitoring Well Installation
BRC Eastside Area**

Wells	Depth (ft bgs)	Note	Parameter	Method	Objective
MCF-24B, MCF-28A, MCF-29A, MCF-30A, MCF-31A, MCF-32A	Qal samples at 10 ft bgs and 10-feet above Qal/TMC contact; TMC samples below Qal/TMC contact at 10, 25, 50, 100, 200, 300, and TD	Also collect soil samples from wet lenses to TD	EC	EPA 120.1	Evaluate TDS and ClO ₄ ⁻ impacts/sources and vertical migration
			anions/cations	EPA 300.0	
			perchlorate	EPA 314.0	
			bulk density	ASTM D2937	Evaluate vertical flow
			moisture content (initial volumetric and gravimetric)	ASTM D2216/D4643/D2974	
MCF-24B, MCF-31A	Qal samples at 10 ft bgs and 10-feet above Qal/TMC contact; TMC samples below Qal/TMC contact at 10, 25, 50, 100, 200, 300, and TD	Also collect soil samples from wet lenses to TD	Arsenic	EPA 6010/6020B	Evaluate soil and groundwater sources and impacts
MCF-28B	Qal samples at 10 ft bgs and 10-feet above Qal/TMC contact; TMC samples below Qal/TMC contact at 10, 25, 50, 100, 200, 300, and TD	Also collect soil samples from wet lenses to TD	Radium 226 + 228	EPA 903.0/904.0	Evaluate soil and groundwater sources and impacts

Note:
 EC - electrical conductivity of the saturated extract
 Qal - Quaternary alluvium
 TMC - Tertiary Muddy Creek formation
 TD - total depth