JANUARY 15, 2009

FORMER TANK FARM

CONCEPTUAL SITE MODEL/SAMPLING AND ANALYSIS PLAN

HENDERSON, NEVADA

HARGIS + ASSOCIATES, INC.
HYDROGEOLOGY • ENGINEERING

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January 15, 2009

VIA FEDERAL EXPRESS

Mr. Brian Rakvica & Dr. Marysia Skorska
Special Projects Branch
Bureau of Corrective Actions
NEVADA DIVISION OF ENVIRONMENTAL PROTECTION
2030 E. Flamingo Road, Suite 230
Las Vegas, Nevada 89119

Re: Former Tank Farm Conceptual Site Model/Sampling and Analysis Plan, Henderson, Nevada

Dear Dr. Skorska and Mr. Rakvica:

Enclosed is the document titled:

Former Tank Farm
Conceptual Site Model/Sampling and Analysis Plan
Henderson, Nevada

If you have any questions, please contact me at the number listed above.

HARGIS + ASSOCIATES, INC.

Michael R. Long, RG, CEM
Principal Hydrogeologist
State of Nevada CEM No. 1891 (Exp 05/27/10)

MRL/erl

Enclosure

cc: Mr. Paul Sundberg, Independent Consultant
Mr. Curt Richards, Olin Corporation
Mr. Mike Bellotti, Olin Corporation
Mr. Lee Erickson, Stauffer Management Company
Mr. George Crouse, Syngenta Crop Protection, Inc.
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Other Offices:
San Diego, CA
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JURAT

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.

For the services provided and attested to with this Jurat including the preparation of this work plan.

HARGIS + ASSOCIATES, INC.

Michael R. Long, RG, CEM
Principal Hydrogeologist
Nevada Certified Environmental Manager
No. EM - 1891 (Expires 05/27/10)

Date Signed: January 15, 2009

HARGIS + ASSOCIATES, INC.

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ACRONYMS AND ABBREVIATIONS

1,2-DCB	1,2-dichlorobenzene
1,4-DCB	1,4-dichlorobenzene
atm-m^3/mole	atmospheres-cubic meters per mole
BCL	Nevada Division of Environmental Protection Basic Comparison Level
bgs	below ground surface
bls	below land surface
BMI	Black Mountain Industrial Complex
CPA	Closed Ponds Area
CSM	Conceptual Site Model
EPA	U.S. Environmental Protection Agency
ET	Earth Tech
FBT	Former Benzene Storage Tank
f_{oc}	fraction organic carbon
FPS	Former Plant Site
FTF	Former Tank Farm
H+A	Hargis + Associates, Inc.
K_H	Henry's Law Constant
LOU	Letter of Understanding
md	millidarcies
mg/kg	milligrams per kilogram
mg/l	milligrams per liter
Montrose	Montrose Chemical Corporation of California
msl	mean sea level
MSSL	Medium-specific soil screening levels
NAPL	non-aqueous phase liquid
NDEP	Nevada Division of Environmental Protection
NFA	no further action
PRG	Preliminary Remediation Goal
Qal	Quaternary alluvium
RAS	Remedial Alternatives Study

ACRONYMS AND ABBREVIATIONS (continued)

SAPs	sampling and analysis plans
SBR	Still Bottom Residue
SRCs	site-related chemicals
SSIWP	Supplemental Soil Investigation Workplan
SVOCs	semi-volatile organic compounds
UMCf	fine-grained Upper Muddy Creek Formation
USGS	U.S. Geological Survey
UST	underground storage tank
VOCs	volatile organic compounds
xMCf	transitional UMCf

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HENDERSON, NEVADA

1.0 INTRODUCTION

On behalf of the Montrose Chemical Corporation of California (Montrose), Hargis + Associates, Inc. (H+A) is submitting this source area-specific Conceptual Site Model (CSM) and Sampling and Analysis Plan (SAP) for the Montrose Former Tank Farm (FTF) Area, located on what is known as "Parcel B" of the former Montrose leased properties within the Black Mountain Industrial Complex (BMI) in Henderson, Nevada (Figure 1). Previously, Remedial Alternative Study (RAS) workplans for the Montrose site assessment areas including the FTF Area, the Montrose Former Benzene Tank (FBT), the Former Plant Site (FPS) and the Closed Ponds Area (CPA) were requested by the Nevada Division of Environmental Protection (NDEP) in a letter to Mr. Joe Kelly dated January 29, 2008 (NDEP, 2008a). The work plans were requested as deliverables under the existing Phase II Administrative Order on Consent (NDEP, 1996a and 1996b).

Subsequent to that letter, Draft RAS work plans for the FTF, FBT, and FPS were submitted by Hargis & Associates to NDEP on April 11, 2008 (H+A, 2008a, 2008b, and 2008c) and for the CPA by GeoSyntec also on April 11, 2008 (Geosyntec, 2008). NDEP provided comments to the April 11 FTF, FBT, and FPS submittals in a letter dated June 30, 2008 (NDEP, 2008b). Correspondence for the CPA was handled separately. Since the NDEP comments were issued, NDEP and the Companies have agreed to develop Site Specific RAS documents as outlined in the NDEP's RAS Process e-mail (NDEP, 2008c). As part of that process, NDEP requested that site-specific CSMs/sampling and analysis plans (SAPs) be prepared to meet the requirements of Deliverable Number 3 of the NDEP's RAS Process. This report follows the outline for Deliverable Number 3 (NDEP, 2008c). Many of the original components submitted in April 2008

have been replaced. The Response to Comments in Appendix A addresses those components that are still included in this report.

The FTF site assessment area is located between the FPS and the CPA (Figure 1). Potential sources in the FTF area include the former still bottom residue (SBR) drum storage area and the former tank farm. The former SBR drum storage area and the former tank farm are designated as Letter of Understanding (LOU) items 18 and 19 in the August 15, 1994 NDEP Phase II Letter of Understanding, respectively (NDEP, 1994).

1.1 OBJECTIVE

The objective of this report is to develop a preliminary source area-specific CSM and accompanying SAP from existing information to support development of the RAS document to fulfill Deliverable Number 3 of the RAS Process document (NDEP, 2008c). The source area-specific CSM will be used to:

- formulate remedial alternatives for each source area, and
- identify data gaps for preliminary screening of alternatives against the primary criteria of effectiveness, implementability, and cost.

A proposed path forward for the FTF area is discussed in Section 4.0 of this report.

2.0 SOURCE AREA-SPECIFIC CSM

2.1 SITE HISTORY

Montrose manufactured organic chemicals including chlorobenzene, polychlorinated benzenes, chloral, and 4,4'-dichlorobenzil at the facility from 1947 until 1983. Montrose ceased operations at the organic chemical plant in 1983 and subsequently demolished the plant in 1984 (Converse Consultants [Converse], 1993).

The former SBR drum storage area was used to store sealed drums containing SBR and other PCB-affected solids (H+A, 2008d). The sealed drums were stored on pallets that were stacked up to 3 layers (10 feet) high. The pallets were stored on a concrete floor that was surrounded by a 1.3 foot high concrete block curb. According to Montrose documents, the SBR drum storage area was removed from service in 1983 and dismantled between 1983 and 1984. Montrose submitted an amended closure plan to NDEP in September 1987, which reported that all tanks, drums and concrete had been decontaminated, removed and transported for offsite disposal (H+A, 2008d). There is no documentation of any leaks or releases from the drums in the historical Montrose records (Converse, 1993).

The FTF was used to store raw materials. There were 17 individual aboveground tanks in the area, ranging in capacity from 5,200 to 150,000 gallons. No underground storage tanks (USTs) were used in this area. The tanks contained a variety of materials including hydrochlororic acid (HCL), benzene, chlorobenzene, dichlorobenzenes and acetaldehyde. Additionally, two rail car loading/unloading stations for benzene and acetaldehyde were also present in this area (H+A, 2008d). The area currently exists as undeveloped land. Documentation of two HCL releases is included in the historical Montrose records (Converse, 1993). These include releases of HCL from a tank in or prior to 1975, and in 1980. The volume released in both incidents was not estimated.

2.2 PHYSICAL SETTING

The FTF area is located in Township 21 South (T21S), Range 62 East (R62E), approximately 12 miles southeast of Las Vegas within an unincorporated area of Clark County (Figure 1). The FTF area is approximately one acre in size.

The Las Vegas-Henderson area climate is arid (Malmberg, 1965). Daytime high temperatures in the summer are extreme and are often above 100 degree Fahrenheit (°F). Winters are considered mild. Average annual temperatures range from a high of approximately 80°F to a low of approximately 56°F (National Oceanic & Atmospheric Administration, 2007). Precipitation averages slightly less than 4.5 inches per year. In general, precipitation occurs during the winter months of December through March, and during the summer months of July through September. Winter storms are characterized as being sustained and of low intensity. Summer storms often occur as thunderstorms of high intensity and brief duration causing significant surface overland flow. Potential evapotranspiration is significantly greater than average precipitation, ranging from approximately 60 to 82 inches annually (Southern Nevada Water Authority, 1996).

The FTF area is located on alluvial fan deposits derived principally from the McCullough Range to the south. As such, natural land surface elevations in the area slope significantly from the south to the north. The land surface elevation in the vicinity of the FTF area is approximately 1,825 feet above mean sea level (msl) (U.S. Geological Survey [USGS], 1983). Land surface slopes at an average gradient of approximately 0.02. Land surfaces have been altered in the vicinity of the FTF area to accommodate historic operations and processes, provide secondary containment for the former tank farm and stormwater control.

There are no naturally occurring, perennial surface water bodies located in the vicinity of the FTF area. Surface water is occasionally present as stormwater runoff during and after precipitation events. The majority of the FTF area is unpaved and sparsely vegetated. Ground surface features that reduce the infiltration of surface water and divert water to natural and anthropogenic drainage features include paved areas and the FTF berms that remains at the

site. Surface water runoff in the immediate vicinity of the FTF is controlled by the current site drainage features.

2.2.1 Regional Geology and Hydrogeology

The FTF site assessment area is located in the Las Vegas Valley. The Las Vegas Valley is a northwest-southeast trending structural trough located within the Basin and Range physiographic province (Malmberg, 1965 and Plume, 1989). The Basin and Range province is characterized by uplifted fault-blocks forming the surrounding mountain ranges, alternating with down-dropped blocks forming sediment-filled valleys.

The mountain ranges bounding Las Vegas Valley in the study area include Frenchman Mountain to the northeast, which is comprised of Paleozoic and Mesozoic sedimentary rocks (limestone, dolomite, sandstone, and siltstone), and the McCullough Range to the south, which is comprised of Tertiary volcanic rocks (basaltic and andesitic lava flows, flow breccia, and ash-flow tuff). Further to the west and east, the Las Vegas Valley is bounded by the Spring Mountains and Sunrise Mountains, respectively. The Las Vegas Valley, which locally contains up to 13,000 feet of Tertiary and Quaternary basin-fill sediments and volcanic flows and deposits, is interpreted to have largely formed through right-lateral movement along the Las Vegas Shear zone (located approximately four miles north of the Site) (USGS, 2005).

The valley-fill sediments in Las Vegas Valley consist of Miocene to Pliocene Muddy Creek Formation and younger sediments (Plume, 1989). The valley fill is reported to be several thousand feet in thickness and comprise the primary water-bearing zones in Las Vegas Valley. In general, the primary source of potable water is within coarse-grained deposits which comprise the “deep aquifer” or “principal aquifer” generally from 300 to 2,000 feet below ground surface (bgs). However, in the central and eastern parts of Las Vegas Valley, clays and silts predominate in lieu of the transmissive coarse-grained deposits (Plume, 1989). Where present, the deep aquifer is overlain and confined by a regional aquitard which is several hundred feet thick. Groundwater which is often present within the upper portion of the regional aquitard or overlying alluvium (i.e., upper thirty feet of saturated sediments) comprises the “shallow aquifer”, and is not considered a source of potable water in Las Vegas Valley. In most areas of Las

Vegas Valley, water quality of the shallow aquifer exceeds standards for potable water due to elevated concentrations of total dissolved solids which exceed 1,000 milligrams per liter (mg/l) (Plume, 1989 and Las Vegas Valley Water District, 1991).

In general, the valley fill within the east and southeast parts of Las Vegas Valley (vicinity of the FTF assessment area) is comprised of predominantly fine-grained deposits interbedded with thin intervals of coarse-grained and heterogeneous deposits that are not laterally continuous (Plume, 1989); the exception being where near surface coarse-grained deposits are present along the Valley margins. The aggregate thickness of these fine-grained deposits is reported to be at least 500 feet in the vicinity of the study area (Plume, 1989).

2.2.2 Vadose Zone/Soil

Lithologic data from borings and monitor wells completed in the vicinity of the FTF assessment area indicate that the vadose zone consists predominantly of the coarse-grained Quaternary alluvium (Qal) sediments from land surface to approximately 30 to 60 feet bgs. This zone is underlain by a sequence of fine-grained sediments, which corresponds to either a transition zone between the Qal deposits or the Muddy Creek Formation (UMCf).

Based on physical samples analyzed as part of pilot testing activities for the Montrose Former Plant Site SVE system located just north of the FTF, significant differences in measured permeabilities exist between the coarse-grained and fine-grained sediments. Measured horizontal and vertical permeabilities for the coarse-grained, upper vadose zone materials are reported to be 862 and 432 millidarcies (md), respectively (Earth Tech [ET], 2005). Measured horizontal and vertical permeabilities for the underlying fine-grained materials are reported to be 30.6 and 5.89 md, respectively. These measurements illustrate the differences in permeability between the two vadose zone lithologies.

In the FTF area, the thickness of the vadose zone, based on water level measurements collected in alluvial aquifer monitor wells in the vicinity of the FTF area during the period 2006 through 2008, ranges from approximately 45 to 48 feet. Lithologic logs of soil borings

constructed in the FTF area indicate that the soils of the vadose zone are comprised of well graded sand and silty sand of the Qal to approximately 35 feet and clayey silt of the transitional UMCf (xMCf) or UMCf to 45 feet.

2.3 EXTENT OF SOIL CONTAMINATION

This section summarizes the nature and extent of Site Related Chemicals (SRCs) in soil in the FTF area. Data available from past investigations in the vicinity of this assessment area include soil investigation results from the mid 1990's Phase II ECI program as well as the 2006 field investigation conducted under Supplemental Soil Investigation Workplan (SSIWP) (H+A, 2005).

The details of the Phase II ECI investigation for the FTF area are presented in the Draft Phase II Environmental Investigation Report (SECOR, 1997). A series of six soil borings, FTF-1 through FTF-6, were drilled to a maximum depth of 10 feet bgs (Figure 1). Soil samples were collected from 2 and 10 feet bgs in boring FTF-1 and FTF-5, and from 6 and 10 feet bgs in borings FTF-2, FTF-3, FTF-4, and FTF-6. The samples were analyzed for volatile organic compounds (VOCs); semi-volatile organic compounds (SVOCs) plus dichlorobenzil and acetaldehyde; and chloride, sulfate, and pH (Table 3). Concentrations of chlorobenzene and other chlorinated benzenes were detected. With the exception of detectable concentrations of 1,2,4,5-tetrachlorobenzene, pentachlorobenzene, and hexachlorobenzene at 6 and 10 feet bgs in boring FTF-4, concentrations of SVOCs were generally not detected above the method detection limits. The concentration of hexachlorobenzene at 10 feet in boring FTF-4 was 2.3 milligrams per kilogram (mg/kg), above the U.S. Environmental Protection Agency (EPA) Preliminary Remediation Goal (PRG) of 1.1 mg/kg (EPA, 2004) and the NDEP Basic Comparison Level (BCL) of 1.2 mg/kg. Dichlorobenzil and acetaldehyde were also not detected but the analytical reports did not list a method detection level so the quality of the data is uncertain.

As part of the 2006 Supplemental Soil Investigation program, seven shallow (FTF-14S through FTF-20S) and eight deep (FTF-7D through FTF-13D and RB-5 and RB-7) soil borings were drilled to depths of 10 feet and 50 feet bgs, respectively. Soil samples were collected at 0.5 feet, 5 feet and 10 feet bgs in the shallow borings and at every 10 feet in the deep borings. In general, the shallow soils borings were for the purpose of future risk assessments and the

deeper borings were sited near specific tanks or tank containment areas to address data gaps. The results of this work are summarized here and are presented in the Site-Wide CSM (H+A, 2008d). The soil samples were analyzed for an extensive list of the SRCs most likely handled at the assessment area. The summary tables of the analytical results for the investigations completed to date from the CSM have been included for reference and completeness (Tables 1 through 3). However, these tables were prepared prior to NDEP's directive (NDEP letter of December 2, 2008) to use the NDEP BCLs so Table 5 has been provided for comparison of BCLs to PRGs. For this deliverable and all future deliverables, soil analytical results will be compared to BCLs and will be discussed with respect to the BCLs rather than PRGs. The following SRCs were detected at concentrations that exceed the BCLs in the FTF area:

- Benzene was detected in two soil samples in the central portion of the Montrose Former Tank Farm at concentrations as high as 29 mg/kg between the depths of 45 and 50 feet bgs. Benzene was detected at concentrations exceeding the BCL of 1.60 mg/kg at soil boring FTF-10D (1.9 mg/kg in the sample collected at 50 feet bgs) and at soil boring FTF- 11D (29 mg/kg in the sample collected at 45 feet bgs) (Figure 2). Soil boring FTF-10D is not located near a source of benzene and the benzene at this location may be associated with groundwater contamination. However, soil boring FTF-11D is located near former tank numbers B-1 and B-2 which reportedly stored benzene for the manufacturing processes.

- Chlorobenzene was detected in two borings (FTF-07D and FTF-09D) at concentrations exceeding the BCL of 494 mg/kg. The soil samples containing chlorobenzene at concentrations exceeding the BCL were collected at depths ranging from 20 to 50 feet bgs at concentrations ranging from 630 to 18,000 mg/kg (Figure 3). Soil boring FTF-7D is located near former tank number 12 which reportedly contained chlorobenzene and boring FTF-9D is located adjacent to former tank number 7 and in the vicinity of former tank numbers 22, 22A, and 23 which contained crude dichlorobenzene (Figure 1).

- 1,2-Dichlorobenzene (1,2-DCB) was also detected above the Industrial BCL of 373 mg/kg in vadose zone soil in soil boring FTF-9D in the central portion of the Montrose Former Tank Farm. 1,2-DCB was detected at concentrations as high as 4,700 mg/kg at

depths ranging from 10 to 30 feet bgs (Figure 4). Soil boring FTF-9D is located adjacent to former tank number 7 which reportedly stored dichlorobenzene (Figure 1).

- 1,4-Dichlorobenzene (1,4-DCB) was detected in three soil borings in the central portion of the Montrose Former Tank Farm including soil borings FTF-04, FTF-09D, and FTF-10D at concentrations exceeding the BCL of 8.07 mg/kg (Figure 5). These soil borings are located in the vicinity of former tank numbers 7, 22, 22A, and 23 which contained crude dichlorobenzene. 1,4-DCB was detected at these borings at concentrations as high as 5,400 mg/kg at depths ranging from 6 to 50 feet bgs. However, concentrations generally attenuate with depth.

- Chloroform was detected above the Industrial BCL of 0.580 mg/kg in vadose zone soil samples collected from seven of the 21 borings drilled in FTF area including borings FTF-07D through FTF-13D (Figure 6). Chloroform was detected in soil samples from the borings at concentrations as high as 34 mg/kg at depths of 30 feet bgs and greater. Chloroform was not reportedly used in the manufacturing process but chloroform was identified as a waste material from the former facility operations.

- Carbon tetrachloride was also detected at a concentration of 0.77 mg/kg, which is slightly above the Industrial BCL of 0.582 mg/kg, in one soil sample collected at 45 feet bgs from boring FTF-11D drilled in the Montrose Former Tank Farm.

- Arsenic was detected in 35 samples of 44 soil samples collected in the FTF area at concentrations greater than the Industrial BCL of 1.77 mg/kg. Arsenic concentrations in the soil in the FTF area ranged from less than 0.5 to 21 mg/kg. In general, the highest arsenic concentrations were detected at depths greater than 30 feet, where the vadose zone soil tends to be a finer-grained mixture of alluvial and UMCf sediments. Arsenic is a naturally occurring metal in soil at the Site and a maximum provisional background concentration of 7.2 mg/kg has been proposed by Timet and BRC based on a background study.

Benzene, chlorobenzene, 1,4-DCB and chloroform were detected at 50 feet bgs very near the water table. These detects may be related to groundwater contamination for these compounds at the site.

2.4 ESTIMATED VOLUME OF CONTAMINATED SOIL

The volume of contaminated soil for each boring, or group of borings, where soil samples contained SRCs at concentrations greater than their respective BCLs is assumed to be a cylinder or polygon. The horizontal extent of the cylinder or polygon is determined by measuring the distance between the isolated contaminated boring or borings and the nearest non-contaminated boring or borings and using half of this distance as the radius of contaminated soil.

The thickness, or height of the cylinder or polygon, is assumed to be equal to the thickness of the contaminated zone in the boring or group of borings. The thickness of the contaminated zone is assumed to extend from the shallowest contaminated soil sample to the deepest contaminated soil sample or the water table, plus half the distance to the next shallowest or deepest soil sample that contains concentrations less than BCLs (see example below).

Potential Remedial Areas

Based on the results of soil investigations (H+A, 2008d), there are potential source locations in the FTF area where soil samples contained benzene, chlorobenzene, 1,2-dichlorobenzene, 1,4-dichlorobenzene, carbon tetrachloride, and chloroform at concentrations that exceeded the BCLs. Arsenic was also detected in soil samples above the BCL; however, due to its widespread nature and possible connection with background levels a contaminated soil volume was not calculated for arsenic contamination. With the exception of the area of soil containing chloroform at concentrations greater than the BCL, contaminated areas are relatively small and are defined based on one to three closely spaced soil borings. The calculated volume of contaminated soil for these areas must be considered initial estimates. The calculations provided here are highly conservative (i.e., biased high) and assume that contamination exceeding the BCL exists over the entire volume of soil in the selected area. Although

additional data are required to refine these estimates, for this initial source area specific CSM, the volume of contaminated soil may be conservatively calculated as described below. The additional data required to refine the estimates have been identified as a data gap and are further addressed in Section 4.0.

Isolated SRC concentrations exceed BCLs in the vicinity of soil boring FTF-11D and FTF-07D.

FTF-11D Area

Based on the current data, soil in the immediate area around FTF-11D is contaminated with benzene from approximately 41 to 46 feet bgs and carbon tetrachloride from approximately 43 to 46 feet bgs (Figure 2). These SRCs are believed to be of limited areal extent. The area contaminated at FTF-11D is assumed to be a cylinder that extends vertically from 41 feet bgs to 46 feet bgs or approximately 5 feet, and areally a radial distance equal to half the distance from FTF-11D and the nearest deep soil boring where all soil samples contained benzene at concentrations less than the BCL (FTF-9D), approximately 40 feet. Thus, the volume of soil around FTF-11D is equal to the volume of a cylinder with a radius of 40 feet and a length of 5 feet. This calculates to approximately 25,130 cubic feet (3.141 X 1600 square feet times 5 feet) or about 930 cubic yards.

FTF-07D Area

Chlorobenzene at concentrations above the BCL was detected in the soil boring FTF-07D from approximately 15 feet bgs to the water table (52 feet bgs) and is of limited extent (Figure 3). The volume of contaminated soil in the vicinity of FTF-07D, using the same method, is a cylinder with a radius of 18 feet and a length of 37 feet, thus, the volume of chlorobenzene contaminated soil is estimated to be 37,660 cubic feet or 1,395 cubic yards (Table 5).

FTF-04, FTF-09D, and FTF-10D Area

In the vicinity of borings FTF-04, FTF-09D, and FTF-10D, benzene, chlorobenzene, 1,2-dichlorobenzene, and 1,4-dichlorobenzene have been detected at concentrations that exceed their respective BCL screening levels (Figures 2 through 5). In this situation a polygon

that includes all of these borings and the maximum thickness for any of the SRCs in this area is used to calculate the volume of contaminated soil. Based on the current data, soil in the immediate vicinity of these soil boring locations is contaminated with benzene, chlorobenzene, 1-2 dichlorobenzene, and 1-4 dichlorobenzene from 4 feet bgs to the water table (approximately 52 feet bgs) and is of an areal extent limited to the immediate vicinity of the three boring locations. The conservative polygonal surface area of contamination is approximately 8,010 square feet and the volume is approximately 384,480 cubic feet or 14,240 cubic yards (Table 5).

Soil Contaminated with Chloroform

Chloroform was detected above its BCL in 7 borings located within the FTF area (Figure 6). Because of its areal extent a conservative estimate of the potential volume of soil contaminated with chloroform in the FTF area is done by calculating a polygonal volume. The surface area is conservatively calculated to be approximately 40,070 square feet and the thickness is approximately 37 feet (from 15 feet bgs to the water table). The volume of soil contamination is conservatively calculated to be 1,482,630 cubic feet or 54,910 cubic yards (Table 5).

3.0 CONTAMINANT FATE AND TRANSPORT

Data collected to date at the FTF assessment area indicate that some soils do contain SRCs at concentrations greater than Nevada BCL. Therefore, a brief summary of contaminant fate and transport is provided. Contaminant fate and transport mechanism for the vadose zone soils in the FTF area include:

- Potential release mechanisms for each source;
- Environmental media (primary and secondary) that may have been impacted;
- Exposure points, and
- Potential receptors.

This information is a summary of the pertinent portions of the Fate and Transport sections of the Site-Wide CSM and focuses primarily on VOCs in soil, primarily deep soil (soil from 10 feet bgs to the water table) and secondarily on the potential for soil VOC contamination to impact air. Surface soils and groundwater as with other Site-Wide issues will be dealt with in detail in other RAS deliverables.

3.1 RELEASE MECHANISMS/TRANSPORT PATHWAYS

Potential release mechanisms at the FTF Area could include spills of raw material during deliveries or loading of the tanks or of spills of SBR when pallets were brought to the storage area. As indicated previously, documentation of two HCL releases from the former tank farm is included in the historical Montrose records (Converse, 1993). These include releases of HCL from a tank in or prior to 1975, and in 1980. The volume released in both incidents was not estimated. However, HCL spills would not contribute to the chemical concentrations found in soils above the BCL, hence those incidents are irrelevant to this discussion and there are no records of spills or leaks from the former SBR drum storage area.

Potential contaminant transport pathways within the FTF area include air, soil, surface water and groundwater. Each pathway and potential transport mechanism is discussed in the following sections except groundwater. While groundwater contamination is present at the FTF

assessment area, it is related to another source area and therefore the groundwater fate and transport will be addressed in the Site-Wide Groundwater RAS process to be submitted separately.

3.1.1 Air Pathway

Contaminant transport can occur through the air pathway via two mechanisms: 1) windborne particulates, and 2) volatilization of contaminants into ambient air. Windborne particulate transport can occur when contaminated surface soils are present and particulates are mobilized and carried by wind. This pathway and mechanism can also transport contaminants from subsurface soils if they are excavated or grading exposes them to the effects of wind. The second mechanism by which contaminants can be transported via the air pathway is the migration of volatile compounds through soil pore space.

Surface soil samples and shallow soil samples (less than approximately one foot bgs) have been collected from shallow soil borings at the FTF area. The samples have been analyzed for VOCs based on the facility location and date of sampling (H+A, 2008d).

The second mechanism via the air pathway is the migration of volatile compounds through soil pore space. These vapors can migrate into the atmosphere or can be transported deeper into the ground and potentially impact groundwater, depending primarily on volatility of the compound, and also on molecular weight, the carbon content (fraction organic carbon [f_{oc}]) and physical properties of the soil matrix (porosity, grain size distribution, and moisture content) and temperature gradients.

The volatility of a chemical compound increases as its vapor pressure increases. Vapor pressures greater than 1 mm of mercury are considered highly volatile, vapor pressures in the range of 0.001 to 0.1 mm of mercury are considered semi-volatile and vapor pressures less than 0.001 mm of mercury are non-volatile under normal conditions. Due to the high summer temperatures at the Site, the volatile and semi-volatile compounds in the surface or near surface are susceptible to being volatized and released to the atmosphere. This process of near surface volatilization is probably complete because the operations that may have resulted in the

release of SRCs to the subsurface ceased over 20 years ago and concentrations of the SRCs in soil in the FTF area are very low (generally less than 0.33 mg/kg [Table 1]).

VOCs dissolved in soil moisture and groundwater can also volatilize and be released to the atmosphere via soil gas respiration. The potential for these compounds to volatilize from the vadose zone soil moisture and groundwater is defined by the Henry's Law Constant (K_H) for that compound. K_H provides a measure of the extent of chemical partitioning between air and water at equilibrium. The higher the K_H the more likely a chemical is to volatilize than to remain in water. A K_H exceeding 10^{-3} atmospheres-cubic meters per mole (atm-m^3/mole) indicates a compound that is readily volatilized from a dilute aqueous solution. Compounds that have a K_H of less than 10^{-7} atm-m^3/mol are considered to have a low volatility.

The potential volatility of the SRCs range from volatile to highly volatile based on their vapor pressure and K_H (H+A, 2008d). These data indicate that the SRCs benzene, chlorobenzene, 1,2-DCB and 1,4-DCB, 1,2,4-trichlorobenzene, and chloroform are volatile and that there is a potential for these compounds to be transported as vapor to the atmosphere.

Soil sampling indicate that volatilization and transport of contaminants in air from the shallow soil and/or groundwater, although possible, is not likely a significant transport pathway at the site as shallow soil sampling results do not indicate significant concentrations of VOCs in the shallow soil (H+A, 2008d). In addition, air monitoring has been performed at the former Montrose and Stauffer facilities. Breathing space air monitoring during drilling activities and groundwater sampling activities conducted at the site have not detected significant concentrations of volatile compounds (H+A, 2006, Appendix B).

3.1.2 Soil Pathway

Contaminants may be transported in soil by several mechanisms including vapor transport, dissolved-phase transport in soil moisture, and non-aqueous phase liquid (NAPL) migration to groundwater. A detailed discussion of these transport mechanisms and the factors that effect the transport and fate of VOCs (the primary SRCs in the FTF assessment area) in soil are presented in the Site Wide CSM section 5.2. The information is not reiterated in this document.

In addition to vapor transport and migration via infiltration, contaminants can also be transported in soil via NAPL migration. A detailed discussion of NAPL transport is provided in the Site-Wide CSM (H+A, 2008d). However, the data collected to date in the FTF area indicate that concentrations of VOCs in soil are extremely low and no direct evidence of NAPL has been reported.

3.1.3 Surface Water and Sediment Pathway

Contaminants spilled during delivery of raw materials or SBR drums on pallets or from potential undocumented spills and leaks at the former tank farm or SBR drum storage area could also have been transported via surface water runoff during precipitation events. Contaminants can be transported as dissolved phase in the surface water runoff or adsorbed onto the sediment load in the runoff. Soluble contaminants can be dissolved and transported across the land surface and/or infiltrate into the subsurface, contaminating the vadose zone and potentially migrating to the groundwater. Surface water can also concentrate and deposit-dissolved contaminants through evaporation when runoff pools in topographic low areas after precipitation events.

3.1.4 Transport of Site-Related Chemicals with Surface Water Runoff

SRCs were conveyed off of the former facilities historically in a series of unlined ditches (Weston, 1993). Soil sampling indicates that detectable concentrations of pesticides and benzene compounds were found in the vicinity of the ditches as a result of historical wastewater disposal and stormwater management. In December 1976, the BMI Complex became a “zero discharge” industrial effluent facility under National Pollutant Discharge Elimination System resulting in the discontinuance of the use of the ditch conveyances. Stormwater originating upgradient of the Pioneer property is diverted around the former facilities and onsite stormwater is collected and conveyed to onsite ponds.

3.2 EXPOSURE PATHWAYS AND POTENTIAL RECEPTORS

Previous sections of this document have described the nature and extent of chemicals within the site area, along with potential transport mechanisms that could disperse chemicals to other media or locations. This section builds upon that analysis to provide a summary of the human and ecological receptors that could be exposed to the SRCs and the routes by which exposures could occur. The synthesis of this collective information is referred to as an exposure pathway.

EPA (1989) has defined the four elements that must exist for an exposure pathway to be considered complete:

- A source and mechanism of chemical release;
- A retention or transport media;
- A point of potential contact by receptors, and
- An exposure route at the contact point.

If any one of these elements is missing, then the exposure pathway is considered incomplete. For example, if human activity patterns and/or the location of potentially exposed individuals prevent contact with the impacted media, then no completed pathways can exist.

This section focuses on the potential contact points and related exposure routes that are relevant for the sources and transport mechanisms previously discussed. Site-specific soils in the FTF area contain SRCs and are considered here. Additionally, air, which can contain SRCs as a result of dust generation or volatilization, also is considered. Potentially complete exposure pathways associated with these media are discussed.

Surface water onsite is not considered a potential contact point or exposure route since no permanent surface water bodies exist onsite. Exposure to chemicals in downgradient groundwater has been described in the Site-Wide CSM and will be dealt with in the Site-Wide Groundwater RAS documents and is not discussed here.

In some cases, an exposure pathway may be complete but is not significant because: 1) the exposure may be less than that from another pathway involving the same medium at the same exposure point; 2) the magnitude of exposure has low toxicological significance, and/or 3) the probability of exposure is low and potential risks associated with the pathway are not high (EPA, 1989). Exposure pathways that are potentially complete but are considered insignificant will be discussed as "minor" routes to differentiate them from the "primary" exposures pathways identified for the Site.

The remainder of this section first describes the human receptor populations and their related exposure pathways, followed by a discussion of the ecological receptors and pathways.

3.2.1 Human Receptors and Exposure Pathways

The land use within the FTF area has historically been industrial/commercial. As such, worker populations were considered in the exposure pathway analysis. It was assumed that the current land use within the FTF area would remain the same in the future.

3.2.2 Worker Exposure Pathways

For the industrial/commercial workers at the FTF area and adjacent areas within the Site, a total of three exposure scenarios have been identified:

- Indoor workers who spend the majority of their work day indoors;
- Outdoor workers who spend the majority of their work day outside, and
- Construction workers who are assumed to contact shallow and subsurface soils.

For indoor workers, the primary exposure media is indoor air. The inhalation exposure route could result from release of volatile SRCs from soils. Volatile chemicals released from soil could be transported through ambient air and infiltrate into indoor air. Volatile chemicals in subsurface soils could migrate through the vadose zone and infiltrate indoor air through the building foundation. However, as indicated above, the concentrations of SRCs in soil in the FTF

assessment area are very low and there are no buildings on or within several hundred feet of the FTF assessment area. Thus exposure via the indoor air route is not likely. Fugitive dusts generated from wind erosion or soils handling activities could also be transported via ambient air and ultimately infiltrate indoor air. Exposure pathways associated with outdoor soil contact also could occur, though it is expected that contact with outdoor soils would be minor because workers in this scenario are assumed to spend the majority of their workday indoors.

The outdoor worker scenario is designed to represent employees of commercial or industrial facilities within the study area who spend the majority of their workday outdoors. Consequently, pathways related to indoor air exposures are considered incomplete for outdoor workers. The primary exposure media for outdoor workers are soils and ambient air. Two potentially complete exposure pathways from direct contact with soils are incidental ingestion, and dermal contact. These direct contact pathways are assumed to be limited to surface soils. Outdoor workers could potentially be indirectly exposed to SRCs in soils via the inhalation route through fugitive dusts or volatile chemicals released into ambient air.

The construction worker scenario reflects temporary activities that could occur within the study area. The construction worker is assumed to be exposed to surface soils. In addition, it is assumed that the worker will be exposed to deep subsurface soils that may be exposed as part of excavation activities occurring at the Site. For this receptor, potentially completed pathways resulting from direct contact with soils are incidental ingestion and dermal contact. In addition, construction workers could potentially be exposed to SRCs in soil via the inhalation route through volatilization and from fugitive dusts released to ambient air through wind erosion or soils handling.

3.2.3 Residential Exposure Pathways

Non-occupational exposures in the study area can occur onsite as a result of trespassing or off-site in the adjacent residential areas. The trespasser scenario is assumed to involve adolescent and teenage children from the nearby residential areas. The potential exposures associated with trespassing onsite would be infrequent and for a shorter duration than the assumed residential exposures. Potential direct contact with soil by trespassers could result in

exposures through the incidental ingestion and dermal contact pathways. Inhalation exposures to chemicals in soils could occur via releases from wind erosion and soils handling, and from volatilization.

All other residential scenarios are assumed to take place in the off-site portions of the CSM study area. Fugitive dusts and volatiles released from onsite soils and transported to off-site residential areas via ambient air could result in potentially completed inhalation exposure pathways. Impacted groundwater could also contribute to potential exposure for the residential scenario through the inhalation route.

Residents also could be exposed to chemicals in offsite soils that have been transported from the site, such as dust transport. Exposures could occur via incidental ingestion or dermal contact.

3.3 ECOLOGICAL RECEPTORS AND PATHWAYS

Ecological receptors and pathways are not considered relevant to the FTF assessment area. By agreement with NDEP, potential ecological receptors and exposure pathways can only occur in the downgradient area and through exposure to groundwater. Groundwater pathways have been described and discussed in the Site-Wide CSM (H+A, 2008d) and will be dealt with in the Site-Wide Groundwater RAS documents.

4.0 PATH FORWARD

In general, the progression of activities anticipated for the FTF site assessment area is to first conduct a Data Usability evaluation of the existing data set relevant to the FTF to determine if any key assessment data is unusable and would become a data gap, gather additional soil chemical concentration data, and perform a risk assessment to support the development of the RAS document. This path forward is based on discussions in a meeting with NDEP on September 4, 2008 where the future course of action for the FTF area was discussed and the NDEP indicated that risk assessment is needed for obtaining closure of the FTF area for industrial use and that a risk assessment would require additional information. The data gaps identified during the meeting and the additional information required to fill the data gaps include the following:

- Asbestos data;
- radionuclide data in the vicinity of the acid tanks, analytes would include U-234 through U-238; Th-230; Th-232; Ra-226 and Ra-228;
- soil gas or flux chamber data has not been collected and will be needed to address the vapor intrusion pathway, and
- soil physical parameters data has not been collected and would be needed to complete modeling to support the soil-to-groundwater leaching pathway.

The asbestos data gap is primarily related to surface soils and will be addressed in the Site-Wide Surface Soil RAS and the soil physical parameters is related to the groundwater pathway and will be dealt with in the Site-Wide Groundwater RAS. However, soil samples and soil gas samples will be collected as part of the area-specific FTF Soil RAS at the same time sub-surface soil sampling is conducted.

For the Soil RAS portion, Montrose will submit a letter work plan/SAP to collect surface and shallow sub-surface (less than 2 feet bls) soil samples, collect soil gas samples and construct 6 deep soil borings and collect sub-surface soil samples in the FTF area to collect data to address the data gaps identified above and to refine the estimates of volume of contaminated soil and fill the identified data gaps. All sample locations will be selected based on potential source locations and will be discussed with NDEP.

Shallow soil samples will be collected to support evaluation of the risk associated with surface soil contact pathway. For shallow soils, samples will be collected using surface sampling equipment, hand auger or hollow stem auger equipment. Soil samples will be collected using the same methods and at the same intervals as used during the Supplemental Soil Investigation conducted in 2006, approximately 0.25 and 2 feet bgs. Sampling methods are described in the Field Sampling and Standard Operating Procedures (FSSOP) (H+A, 2007). The soil samples will be analyzed for asbestos and the BHC compounds using the NDEP approved analytical methods.

Soil gas samples will be collected at selected locations to support risk evaluation for the vapor intrusion pathway. Soil gas samples will be collected at 5 feet bgs using the same methods used previously at the Site and described in the FSSOP (H+A, 2007). The soil gas samples will be analyzed for VOCs by EPA Method 8260B.

For deep soil borings, installation will use the rotosonic method of drilling to obtain core for inspection and sampling. Soil samples will be collected at the same intervals as used during the Supplemental Soil Investigation conducted in 2006, approximately 10, 20, 30, 40, and 50 feet bgs or immediately above the groundwater surface. Sampling protocols are described in the FSSOP (H+A, 2007). The soil samples will be analyzed for VOCs by EPA Method 8260B, for the radionuclides listed above using NDEP approved analytical methods. Selected soil samples will also be analyzed for soil physical parameters (based on one of the approved BMI SAPs) to support remedial alternative evaluations.

Once the analytical reports are completed for samples collected from the borings, the analytical results will be validated. The validated data from the surface sampling, soil gas sampling and proposed soil borings and the soil analytical data previously collected in the FTF area will be used to update the Data Usability study (to be conducted as Deliverable Number 2 of the RAS Process) (NDEP, 2008c) to be used in support of a risk assessment for the FTF area.

5.0 REFERENCES

Converse Consultants, Inc. [Converse], 1993. Phase I Environmental Conditions Assessment for Former Montrose Chemical Corporation Facility, Henderson, Nevada. April 15, 1993. [NDEP Acceptance status – Unknown].

Earth Tech (ET), 2005. Expedited Investigation Summary Report, Montrose Chemical Corporation, Henderson, Nevada. July, 2005. [NDEP acceptance status – Accepted; December 2, 2005].

Geosyntec Consultants, 2008. Focused Conceptual Site Model and Preliminary Screening of Remedial Alternatives, Montrose Closed Ponds Area, Henderson, Nevada. April 11, 2008. [NDEP acceptance status – Non-concurrence; May 22, 2008].

Hargis + Associates, Inc., 2005. Draft Supplemental Soil Investigation Workplan, Montrose Chemical Corporation of California, Henderson, Nevada. November 16, 2005. [NDEP acceptance status – Conditional approval; August 18, 2006].

_____, 2006. Supplemental Groundwater Investigation Workplan, Montrose Chemical Corporation of California, Henderson, Nevada. June 20, 2006. [NDEP acceptance status – Conditional approval; August 18, 2006].

_____, 2007. Field Sampling and Standard Operating Procedures, Site-Wide Soil and Groundwater Investigations, Former Montrose and Stauffer Sites, Henderson, Nevada, Revision 2.0. May 11, 2007. [NDEP acceptance status – Accepted; May 18, 2007].

_____, 2008a. Nevada Division of Environmental Protection Request for Remedial Alternatives Study Work Plan for Former Tank Farm Area. April 11, 2008. [NDEP acceptance status – Non-concurrence; June 30, 2008].

_____, 2008b. Nevada Division of Environmental Protection Request for Remedial Alternatives Study Work Plan for Former Benzene Storage Tank Area on Parcel C. April 11, 2008. [NDEP acceptance status –Non-concurrence; June 30, 2008].

_____, 2008c. Nevada Division of Environmental Protection Request for Remedial Alternatives Study Work Plan for Former Plant Site Area. April 11, 2008. [NDEP acceptance status – Non-concurrence; June 30, 2008].

_____, 2008d. Revision 1.0 Conceptual Site Model, Former Montrose and Stauffer Facilities and Downgradient Areas to Las Vegas Wash, Henderson, Clark County Nevada, Replacement Pages. July 25, 2008. [NDEP acceptance status – NDEP Comments provided October 22, 2008; Response to Comments provided November 5, 2008].

Las Vegas Valley Water District, 1991. The Shallow Aquifer System in Las Vegas Valley, Nevada. August, 1991.

Malmberg, G.T., 1965. Available Water Supply of the Las Vegas Groundwater Basin, Nevada. U.S. Geological Survey Water-Supply Paper 1780.

National Oceanic & Atmospheric Administration, 2007. Weather data online for Las Vegas-Henderson, Nevada area at www.noaa.org. July 3, 2007.

Nevada Division of Environmental Protection [NDEP], 1994. Phase II Letter of Understanding Between NDEP and Montrose Chemical Corporation of California, Regarding the Former Montrose Facility, Henderson, Nevada. August 15, 1994.

_____, 1996a. Final Phase II Consent Agreement Between NDEP and Montrose Chemical Corporation of California. June 28, 1996.

_____, 1996b. Final Phase II Consent Agreement Between NDEP and Stauffer Management Company, LLC and Pioneer Chlor Alkali Company, Inc. June 28, 1996.

_____, 2008a. Request for Remedial Alternatives Studies for Montrose Former Plant Site, Former Tank Farm, and Former Benzene Storage Tank, Letter to Joe Kelly, January 29, 2008.

_____, 2008b. Nevada Division of Environmental Protection Response to: Nevada Division of Environmental Protection Request for Remedial Alternatives Study Work Plan for Former Plant Site Area; Nevada Division of Environmental Protection Request for Remedial Alternatives Study Work Plan for Former Tank Farm Area; and Nevada Division of Environmental Protection Request for Remedial Alternatives Study Work Plan for Former Benzene Storage Tank Area on Parcel C., Letter to Joe Kelly, June 30, 2008.

_____, 2008c. Remedial Alternatives Study Process, via e-mail, October 7, 2008.

Plume, Russell W., 1989. Ground-Water Conditions in Las Vegas Valley, Nevada, part 1, Hydrogeologic Framework. U.S. Geological Survey Water-Supply Paper 2320-A.

SECOR International, Inc. [SECOR], 1997. Draft Phase II Environmental Conditions Investigation Report, Former Montrose Facility, Henderson, Nevada. August 21, 1997. [NDEP acceptance status – Unknown].

Southern Nevada Water Authority, 1996. Extent and Potential Use of the Shallow Aquifer and Wash Flow in Las Vegas Valley, Nevada. 1996

U.S. Environmental Protection Agency [EPA], 1989. Risk Assessment Guidance for Superfund, Volume 1: Human Health Evaluation Manual (Part A). Office of Emergency and Remedial Response, Washington, DC.

_____, 2004. Region IX Preliminary Remediation Goal Table. October 2004.

U.S. Geological Survey [USGS], 1983. Henderson, Nevada, 7.5 Minute Quadrangle, 1983.

_____, 2005. Geologic and Geophysical Maps of the Las Vegas 30' x 60' Quadrangle, Clark and Nye Counties, Nevada and Inyo County, California.

Weston, Roy. F. [Weston], 1993. Phase I Environmental Conditions Assessment, Pioneer Chlor Alkali Company, Inc., Stauffer Chemical Company Site. March 22, 1993. [NDEP acceptance status – Unknown].