

First Five-Year Review Report  
McColl Superfund Site  
City of Fullerton  
Orange County, California

September 2002

PREPARED BY:  
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Region 9  
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Approved by:



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Date:

9/30/02

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## List of Acronyms

ARARs	Applicable or Relevant and Appropriate Requirements
CA/DTSC	State of California Department of Toxic Substances Control
CalEPA	California Environmental Protection Agency
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COPC	Chemical of Potential Concern
Corps	U.S. Army Corps of Engineers
FS	Feasibility Study
MCL	Maximum Contaminant Level
mg/kg	Milligrams per kilogram
MSG	McColl Site Group
NCP	National Contingency Plan
NPL	National Priorities List
O&M	Operations and Maintenance
OU	Operable Unit
ppb	Parts per billion
ppb (v/v)	Parts per billion, volume to volume
ppm	Parts per million
PRG	Preliminary Remediation Goal
PRP	Potentially Responsible Party
RA	Remedial Action
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SDWA	Safe Drinking Water Act
THT	Tetrahydrothiophenes
ug/kg	Micrograms per kilogram
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Chemicals

## Executive Summary

The remedy for the McColl Superfund Site in Fullerton, California, included: (1) construction of a RCRA equivalent, multi layer cap over the untreated sumps (which contain petroleum refinery waste) for the purpose of isolating the waste, maximizing surface water runoff, and minimizing water infiltration into the sumps; (2) installation of a gas collection and treatment system beneath the cap to minimize pressure buildup from gases generated by the waste and to prevent potentially hazardous air emissions; (3) construction of subsurface cutoff walls around the sumps to prevent lateral migration of water into the waste and outward migration of water soluble and gaseous contaminants; (4) stabilization of steep slopes on the site with retaining walls; (5) long term groundwater monitoring as a safeguard should site related contaminants be detected migrating toward drinking water aquifers; and (6) institutional controls in the form of land use restrictions.

Operations and maintenance of the cap, cutoff walls, and gas collection and treatment system, and site security are necessary in perpetuity at the site.

The Site achieved construction completion with the signing of the Superfund Closeout Report on June 30, 1998. The trigger for the Five-Year Review was the beginning of onsite construction on March 31, 1997.

Through the assessment process of this Five-Year Review, EPA has determined that the remedy was constructed in accordance with the requirements of the two Records of Decision: the Source Record of Decision dated June 30, 1993; and the Groundwater Record of Decision dated May 15, 1996. EPA has further determined that the remedy is functioning as designed, and that the principal threats have been addressed. The remedy is expected to continue to be protective through the foreseeable future as the design life of the containment system is 100 years. The second five year review is scheduled for the year 2007.

## Five-Year Review Summary Form

### SITE IDENTIFICATION

**Site name (from WasteLAN):** McColl

**EPA ID (from WasteLAN):** CAD980498695

**Region:** 09    **State:** CA    **City/County:** Fullerton/Orange

### SITE STATUS

**NPL status:**  Final     Deleted     Other (specify) \_\_\_\_\_

**Remediation status (choose all that apply):**     Under Construction     Operating     Complete

**Multiple OUs?\***  YES     NO    **Construction completion date:** \_06 / 30/98\_\_\_\_\_

**Has site been put into reuse?**  YES     NO

### REVIEW STATUS

**Lead agency:**  EPA     State     Tribe     Other Federal Agency \_\_\_\_\_

**Author name:** David Seter

**Author title:** Remedial Project Manager    **Author affiliation:** EPA Region 9

**Review period:\*\*** \_03 /01/02\_\_\_\_\_ to \_08 /30/02\_\_\_\_\_

**Date(s) of site inspection:** \_05 /29/02\_\_\_\_\_

**Type of review:**

- Post-SARA     Pre-SARA     NPL-Removal only  
 Non-NPL Remedial Action Site     NPL State/Tribe-lead  
 Regional Discretion

**Review number:**  1 (first)     2 (second)     3 (third)     Other (specify) \_\_\_\_\_

**Triggering action:**

- Actual RA Onsite Construction at OU #02\_\_\_\_     Actual RA Start at OU# \_\_\_\_\_  
 Construction Completion     Previous Five-Year Review Report  
 Other (specify) \_\_\_\_\_

**Triggering action date (from WasteLAN):** \_05 /31 /97\_\_\_\_\_

**Due date (five years after triggering action date):** \_09 /30 /02\_\_\_\_\_

\* ["OU" refers to operable unit.]

\*\* [Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

## Five-Year Review Summary Form, cont'd.

**Issues:** *(for further detail see Section 8 of the Five Year Review Report)*

- 1) Since construction completion (6/98), O&M responsibilities have reverted from the oil companies to the federal government (2/00), back to the oil companies (9/02).
- 2) Tetrahydrothiophene compounds (THTs) have been detected in groundwater offsite at levels in excess of the benchmark set in the ROD of 3.6 ppb.
- 3) There is currently no consistent program to monitor emissions from the gas collection vapor treatment system.

**Recommendations and Follow-up Actions:** *(for further detail see Section 9 of the Five Year Review Report)*

- 1) EPA recommends continuing groundwater monitoring and using trends analysis to better determine whether groundwater institutional controls are warranted.
- 2) EPA recommends initiating a consistent program to monitor emissions from the gas collection vapor treatment system.

**Protectiveness Statement:** *(for further detail see Section 10 of the Five Year Review Report)*

All immediate threats at the site have been addressed, and the remedy is expected to continue to be protective of human health and the environment for the foreseeable future. The 100 year design life of the containment system continues to ensure the long-term protectiveness of the remedial action. No water supply wells are currently impacted by site-related contamination, nor are they likely to be impacted during the next review period.

**Other Comments:**

None.

McColl Superfund Site  
Fullerton, California  
First Five-Year Review Report

1. Introduction

The purpose of the Five-Year Review is to determine whether the remedy at a Superfund site continues to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in Five-Year Review reports. In addition, Five-Year Review reports identify issues found during the review, if any, and make recommendations to address the identified issues.

EPA has prepared this Five-Year Review report pursuant to CERCLA Section 121 and the National Contingency Plan. CERCLA Section 121 states:

*If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgement of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.*

The Agency interpreted this requirement further in the NCP; 40 CFR Section 300.430(f)(4)(ii):

*If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.*

The United States Environmental Protection Agency, Region 9, conducted the Five-Year Review of the remedy implemented at the McColl Superfund Site in Fullerton, California. This review was conducted by the Remedial Project Manager for the entire Site from March 2002 through August 2002, with input from: the United States Army Corps of Engineers; Montgomery Watson Harza, contractor to the Corps; the California Department of Toxic Substances Control; the oil companies; McAuley LCX Corporation; and AG Los Coyotes LLC. The Five Year Review site inspection was held on May 29, 2002.

This report documents the results of the review. This is the first Five-Year Review for the McColl Superfund Site. The triggering action for this statutory review is the start of onsite construction, which occurred on March 31, 1997. The Five-Year Review is required due to the fact that hazardous substances, pollutants, or contaminants, remain at the site above levels that allow for unlimited use and unrestricted exposure.

## 2. Site Chronology

Table 1/Chronology of Site Events

EVENT	DATE
Disposal of petroleum waste at the Site	1942-1946
Adjacent Los Coyotes Country Club constructed	late 1950s
Adjacent residential neighborhoods developed	1960s
First odor and health complaints from residents	1978
Public hearing on Site held by CA/DTSC	1980
Site listed on the federal Superfund NPL	1982
EPA and CA/DTSC proposal to excavate and dispose waste offsite is blocked in State court	1984
McColl Action Group (community organization) active	1985-1991
EPA concludes preparation of FS, proposes waste incineration, but field testing fails	1989
Fullerton Hills Community Association active	1991-1997
EPA concludes FS revisions, proposes waste solidification	1992
Source OU Record of Decision is signed, includes contingency remedy of RCRA equivalent cap	1993
When waste solidification pilot fails, EPA decides to implement contingency remedy	1995
The oil companies conduct the Site groundwater RI/FS	1993-1996
Groundwater OU Record of Decision is signed, includes further measures to reduce surface water infiltration and ground water monitoring	1996
On Site construction begins	3/31/97
Final inspection of remedial action	11/13/97
Issuance of Preliminary Close Out Report	6/30/98
New holes of Los Coyotes golf course open	1998

### 3. Background

#### Physical Characteristics:

The McColl Superfund Site is located on 22 acres in the City of Fullerton, Orange County, California. The Site is fenced and is located entirely within the boundaries of the Los Coyotes Country Club. Surface use consists of in-bounds and out-of-bounds areas of the Lake Nine portion of the country club's 27 hole golf course. The northeast corner of the Site is located at the intersection of Rosecrans Boulevard and Sunny Ridge Drive. The terrain at the site slopes gently from the northeast to southwest, with a maximum relief of approximately 70 feet. The golf course and surrounding residential areas have altered the natural topography; the Site generally lies at the lower southern face of the east-west trending Los Coyotes Hills. (See Attachment 1, Site Location Map.)

From 1942-1946 the 22 acres served as a disposal site, during which time twelve pits or sumps were dug and filled with a total estimated 72,600 cubic yards of petroleum refinery waste. At the time the waste pits were created, the local area was sparsely populated. Refinery operations took place on land located to the north/northwest of the Site. Subsequently, the golf course, then residences, were built on adjacent land. (See Attachment 2, Site Detail.)

The climate at the Site and surrounding area is Mediterranean, characterized by hot dry summers, and mild winters during which most of the year's rainfall occurs.

#### Air district::

The local air quality district is the State of California's South Coast Air Quality Management District. The air district regulates various emission sources throughout the south coast region, which incorporates the Los Angeles basin and surrounding areas. During the development of the Source Operable Unit remedy, EPA consulted with the district on the substantive requirements of regulations pertaining to air emissions. This information is pertinent to the operation of the Site gas collection vapor treatment system, which discharges collected landfill gases to the atmosphere following treatment with granular activated carbon. The pertinent emissions criteria for the Site treatment system is a limitation such that emissions do not create a nuisance or an excess cancer risk above ten in a million at the nearest Site boundary.

#### Surface water drainage:

Surface water drainage from the 22 acres is facilitated through engineered features, including the contoured vegetated multi-layer cover system, concrete v-ditches, and detention ponds. Since the waste materials are isolated beneath the cover system over which surface water drains, the surface water does not pick up any site related contaminants. Water which infiltrates the more-permeable upper portion of the cover system does not penetrate the impervious portion but is collected through a system of subsurface drains which channel back to the surface

at the low points in the cover system. There is one surface water drainage pathway originating offsite and traversing the northwest corner of the Site. This surface water drainage originates on land located directly to the north of the Site across Rosecrans Boulevard. Flow is routed into a geosynthetic-lined retention pond located on the "Lake Nine" portion of the golf course. The retention pond is designed to detain 100 year peak flows, and overflows through a culvert into a swale which traverses the course and enters another detention pond downstream.

#### Groundwater usage:

Consolidated Quaternary alluvial deposits underlie major portions of Orange County, California, including the McColl Superfund Site. Regional hydrology consists of three distinct formations, which are the La Habra Formation; the Coyote Hills Formation; and the San Pedro Formation. The La Habra formation is nearest to the surface at the Site, and is an Upper Pleistocene deposit of relatively fine-grained material laid in a non-marine and floodplain environment. It consists of semi-perched aquifers of limited extent. The coarser-grained Coyote Hills formation underlies the La Habra, and is a Lower Pleistocene deposit laid in a non-marine environment. The San Pedro Formation is the deepest of the three, and is an Older Lower Pleistocene deposit consisting of shallow to deep massive sands. The principal aquifer of the Orange County basin occurs at the base of the San Pedro Formation.

Four water bearing zones at the Site have been designated alphabetically from the shallowest to the deepest, A through D. Zones A, B, and C, are located within the La Habra Formation. Zone D is located in the Coyote Hills Formation. On-Site these zones are separated from one another by clay layers which serve as barriers to vertical flow, although the C zone does appear to intersect the regional aquifer at the southern Site boundary. Zones A, B, and C, produce little water. Zone D appears to be capable of producing more water.

Two municipal production wells have been identified within seven thousand feet of the Site. The closer of the two is the Coyote 12A Well, located three thousand feet from the Site. The "D" flow unit onsite may coincide with the shallowest screened interval of the Coyote 12A Well.

#### Land and Resource Use:

As described above, the Site comprises 22 acres, which includes two areas of approximately equal size: the Los Coyotes Sump area; and the Ramparts Sump area. Each of the two areas encompassed six sumps, for a total of twelve, into which a total estimated 72,600 cubic yards of petroleum refinery wastes was deposited.

The majority of the 22 acres has existed as open and undeveloped space since disposal operations ceased, with the exception of the southwest portion of the Los Coyotes area, over which a portion of the Los Coyotes golf course was constructed in 1960 (this portion of the course was closed in December 1995 pending cleanup of the sump areas under CERCLA).

Based on City of Fullerton land use planing, the area encompassing Site was originally zoned R-1 (single family residential). However, a 1996 consent decree between EPA and McAuley LCX Corporation (the property owner and then golf course operator) restricted future use of the Site, excluding excavation, construction, or development of any kind.

Surface use of the Site now includes fairway and out-of-bounds areas on the Lake Nine portion of the golf course. The twelves sumps which lie beneath the surface are now covered by a multi-layered cover system. The Site also includes perimeter areas which lie outside of the sumps, one portion of which contains a concrete pad and the Site gas collection vapor treatment system.

The area immediately west of the Site is zoned P-L (public land) and is occupied by the Ralph B. Clark Regional Park. To the north, the Site is bordered by Rosecrans Boulevard, across which mixed land use exists, ranging from zoning designations O-G (oil and gas), P-R-D (planned residential development), and R-3R (restricted multi family residential). Much of this land to the north is currently undeveloped, although recent signs of road building and land clearing suggest residential development is underway. The City of Fullerton has also reported that it is constructing a fire station in the same location along Rosecrans. To the east of the Site boundary is land zoned R-1, which is occupied by an existing development (constructed in 1968) of single family homes. The area to the south of the Site is taken up by the remainder of the Los Coyotes Country Club golf course, which consists of an additional 18 holes beyond the "Lake Nine".

#### History of Contamination:

From 1942 through 1946, approximately 72,600 cubic yards of petroleum waste sludge was disposed of into 12 sumps at a twenty-two acre disposal site owned by Ely McColl in Fullerton, California.

During the 1950s and early 1960s, in an attempt to control site odors, three sumps in the Ramparts area were covered with drilling mud. In the late 1950s, six sumps at the lower end of the property were covered with natural fill materials during the construction of the adjacent Los Coyotes Country Club golf course. Additional soil cover was placed over the upper Ramparts sumps in September 1983.

In the 1960s, residential neighborhoods were developed on property adjacent to the former landfill. The site initially was brought to the attention of regulatory agencies as a result of odor and health complaints received from residents beginning in July 1978.

#### Initial Response:

Community concern increased gradually through 1980, and California Department of Toxic Substances Control (DTSC) organized a public hearing in late 1980 chaired by the Governor's special assistant on Toxic Substances Control. A panel of state agency representatives also

participated.

The Site was included on the EPA National Priorities List in September 1982. Following investigations conducted by responsible parties, EPA proposed in 1984 to excavate and dispose of the waste. The State of California was designated the lead agency for the site but was later stopped from implementing the plan.

Following the court injunction blocking the state from implementing the excavation, some community members expressed increasing concern over perceived delays in the clean-up process. This concern led to the formation of the McColl Action Group. This neighborhood committee participated actively in decisions related to the site from 1985 through 1991, when the group disbanded. Another community group, the Fullerton Hills Community Association, was formed in 1991 and participated in site-related decisions through the final remedy construction.

EPA undertook additional feasibility studies at the site, and, having assumed the lead in 1989, proposed excavation of the waste and incineration. Following public comment and field testing on the proposed incineration, EPA reevaluated the alternatives.

In August 1992, EPA published its updated feasibility study, called the Supplemental Reevaluation of Alternatives II, and proposed to solidify the waste. The plan also identified installation of a Resource Conservation and Recovery Act (RCRA) equivalent closure system, or cap, as a contingency remedy in the event that solidifying the material was determined not to be feasible.

On September 28, 1995, following extensive testing of solidification, EPA concluded that the technology was not feasible for the site and decided to implement the contingency remedy. The contingency remedy included: (1) constructing a multi layer cap over the untreated sumps with a gas collection and treatment system to prevent infiltration of water and release of hazardous air emissions; (2) building subsurface walls around the sumps to prevent migration of water into the waste and outward migration of water soluble and gaseous contaminants; (3) stabilizing steep slopes on the site with retaining walls; (4) and monitoring groundwater. Operations and maintenance of the cap and slurry wall, gas collection and treatment system, and site security would be necessary in perpetuity at the site. These requirements are embodied in the Source Record of Decision executed on June 30, 1993.

From September 1993 to April 1996, the responsible parties, known as the McColl Site Group of Oil Companies (MSG), under EPA's oversight, conducted a groundwater investigation. EPA proposed a plan for the groundwater remedy on February 15, 1996. The groundwater remedy required that infiltration of water into the ground be reduced through: redirection of surface water off the site; grading of areas adjacent to the containment system, and lining of onsite drainage channels with low permeability materials. EPA's groundwater remedy is embodied in the Groundwater Record of Decision executed on May 15, 1996.

Basis for Taking Action:

EPA divided the McColl Superfund Site into two operable units: the Source OU; and the Groundwater OU. The Source OU addresses the threat posed by the petroleum waste itself. The Groundwater OU addresses the threat posed by releases of hazardous substances to groundwater from the petroleum waste. Separate Remedial Investigations and Feasibility Studies were undertaken for the two OUs. The Source OU ROD was signed in 1993 and the Groundwater OU ROD was signed in 1996.

Source OU:

The following organic and inorganic chemicals of potential concern (COPCs) were identified in samples of the petroleum waste and surrounding soil at the Site.

Source OU/Organic COPCs and Concentrations<sup>1</sup>

COPC	Waste Specific Sample Ave. (ug/kg)	Average, All Samples (ug/kg)
Methylene Chloride	15,814	5,233
Benzene	226,428	53,755
Ethylbenzene	57,404	16,724
Toluene	166,179	41,310
Xylenes	102,676	31,283
Acetone	36,333	11,876
2-Butanone	7,384	5,568
2-Methylnaphthalene	99,031	43,158
Napthalene	143,313	68,815
Phenanthrene	58,550	19,076
bis(2-ethylhexyl)phthalate	52,050	16,266
tetrahydrothiophenes	198,923	70,720
leachable sulfate	192,718	41,821
pH	1.73	5.5

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<sup>1</sup>Table excerpted from Source OU ROD/EPA 1993

### Source OU/Inorganic COPCs and Concentrations<sup>2</sup>

COPC	Average, All Samples (mg/kg)
Antimony	15.1
Arsenic	179.0
Beryllium	0.35
Cadmium	1.2
Chromium	134.2
Copper	4.2
Lead	14.6
Manganese	216.1
Mercury	0.05
Nickel	56.1
Tin	5.2
Vanadium	35.5
Zinc	50.1

The exposure pathways of concern evaluated for potential health risks were: 1) inhalation of VOCs emitted from the waste sumps; 2) inhalation of fugitive dust and inorganic compounds generated by wind erosion; 3) incidental ingestion of contaminated soil; 4) ingestion of contaminated garden vegetables; 5) dermal contact with contaminated soil.

Benzene and sulfur dioxide were judged to be the primary chemicals of concern. The possible toxic effects of benzene in humans include leukemia, central nervous system effects, hematological effects, and immune system depression. Benzene is a known human carcinogen. Sulfur dioxide is readily absorbed upon contact with the moist surfaces of the nose and upper respiratory passages. Once inhaled, most of the sulfur dioxide is then transferred into systemic circulation. The major toxic effects include increased airway resistance or other bronchioconstrictive effects.

#### Environmental Risks:

The Department of the Interior (DOI) prepared a preliminary natural resources survey in 1990, to determine whether any natural resources under the DOI trusteeship would be affected by hazardous substance releases at the Site. The conclusions of this survey indicated that wildlife exposure to contaminants from the pits was minimal, and it would be hard to demonstrate if wildlife were contaminated or impacted by wastes prior to capping. It was also determined that

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<sup>2</sup>Table excerpted from Source OU ROD/EPA 1993

a damage assessment to quantify injuries and damages to resources held in trust by the DOI was not needed.

Conclusions:

The adult exposure scenario resulted in carcinogenic risks that fell outside of the NCP's acceptable risk range of  $1 \times 10^{-4}$  and  $1 \times 10^{-6}$ , with an excess cancer risk of approximately 1:2000. The hazard index reading for noncancer risk was highest for adult exposure at a value of 1.8, which exceeds the benchmark level of 1. EPA noted a few limitations to its risk assessment, namely: airborne chemical concentrations resulting from sulfur dioxide and volatile organic chemicals (VOCs) were estimated without consideration of the probable contribution of emissions from active seeps; the potential noncarcinogenic effects of inhalation of fugitive dusts could not be evaluated quantitatively because of the lack of toxicity criteria for inhalation exposure to the COPCs; exposure to seeps via dermal contact and/or incidental ingestion could not be evaluated quantitatively; the surface soil data based was considered to be limited and potentially unrepresentative of the entire site; potential exposure to surface water runoff could not be evaluated quantitatively because surface runoff data representing then current site conditions were not available; and there were no EPA verified reference doses for sulfur dioxide and benzene. Based on the available data, taking the mentioned uncertainties into consideration, EPA concluded that the Site may present an imminent and substantial endangerment to public health, welfare, or the environment.

SOURCE OU/TOTAL CARCINOGENIC RISKS<sup>3</sup>

Child Resident	$8 \times 10^{-6}$
Adult Resident	$5 \times 10^{-4}$
Country Club Worker	$1 \times 10^{-7}$

SOURCE OU/TOTAL NONCARCINOGENIC RISKS<sup>4</sup>

Child Resident	0.02
Adult Resident	1.8
Country Club Worker	0.00001

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<sup>3</sup>Excerpted from Source OU ROD/EPA 1993

<sup>4</sup>Excerpted from Source OU ROD/EPA 1993

Groundwater Operable Unit:

The following organic and inorganic chemicals of potential concern (COPCs) were identified in groundwater at the Site.

Groundwater OU/COPCS<sup>5</sup>

THIOPHENES	VOCs	SVOCs	INORGANICS
Tetrahydrothiophene 2-methyltetrahydrothiophene 3-methyltetrahydrothiophene	Acetone Benzene 2-butanone Carbon Disulfide Chloroform 1,2-dichloroethane Ethylbenzene 2-hexanone Methylene Chloride Toluene Xylenes	Bis(2-ethylhexyl)phthalates Butylbenzylphthalate Dimethylphthalate Di-n-butylphthalate Isophorone 2-Methylphenol Nitrobenzene Phenol Pyrene	Aluminum Arsenic Barium Beryllium Cadmium Chromium Cobalt Copper Lead Manganese Mercury Nickel Selenium Thallium Vanadium Zinc

Most of the COPCS were detected only in the perched zones, and at levels below MCLs, with the exception of the following. Benzene and 1,2-dichloroethane were found at levels above their respective MCLs and were found in the C zone (which communicates with the regional aquifer system) as well as the perched A and B zones. THTs were also found in the C zone as well as the perched A and B zones. There is no MCL for THTs. Four inorganics exceeded MCLs in the perched zones: arsenic; beryllium; chromium; and manganese.

The Baseline Risk Assessment for the Groundwater Operable Unit was completed in November 1995 by ICF. For the purpose of performing risk calculations, single monitoring wells were selected to represent groundwater in the A zone (well P-3S); the C zone (well P-5L); and the D zone (well W-4). Two monitoring wells were selected to represent the B flow unit primarily because different chemical constituents were detected in those two wells (wells numbered P-2I and P-6S).

Of the chemicals identified as COPCs at the Site, 11 were considered to be known or suspected human carcinogens: arsenic; benzene; cadmium; beryllium; bid(2-ethylhexyl)phthalate; butylbenzylphthalate; chloroform; 1,2-dichloroethane; isophorone; methylene chloride; and lead.

The exposure assessment determined that groundwater is not currently used as a source of

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<sup>5</sup>Table Excerpted from Groundwater OU ROD/EPA 1996

potable water within the site. Water for adjacent communities is supplied by the local water district through a municipal distribution system. Therefore, no complete exposure pathways exist under current land use scenarios. Potential future use may result in the development of private or municipal supply wells, within the restrictions imposed by local ordinances. Future use scenarios were based on incidental ingestion and dermal absorption of chemicals in groundwater, and inhalation of chemicals released from the groundwater during domestic uses.

Carcinogenic risk associated with the perched zones was calculated at  $4 \times 10^{-3}$ . Carcinogenic risk associated with onsite groundwater zones in communication with the regional aquifer system was calculated at  $1 \times 10^{-4}$ . Noncancer risk associated with the perched zones was calculated at a hazard index of 300. Noncancer risk associated with the regional aquifer system onsite was calculated at a hazard index of 4.

The Baseline Risk Assessment recognized that, with the potential exception of D zone monitoring wells, groundwater onsite does not have sufficient yield to support domestic or commercial use, therefore the potential exposure is limited. However, the presence of THTs in the D zone suggest that transport of site related contamination to the regional aquifer system is possible, although the potential extent was unknown at the time, and is still somewhat unknown. The potential risks associated with THTs could not be assessed quantitatively because of the lack of EPA-verified toxicity criteria.

Based on this information, EPA concluded that the Site may present an imminent and substantial endangerment to public health, welfare, or the environment.

#### 4. Remedial Actions

##### A. Remedy Selection

Source Record of Decision was signed on June 30, 1993. Following extensive testing of solidification, EPA concluded that the technology was not feasible for the site and selected the contingency remedy a RCRA equivalent closure system. The contingency remedy included: (1) constructing a multi layer cap over the untreated sumps with a gas collection and treatment system to prevent infiltration of water and release of hazardous air emissions; (2) building subsurface walls around the sumps to prevent migration of water into the waste and outward migration of water soluble and gaseous contaminants; (3) stabilizing steep slopes on the site with retaining walls; (4) and monitoring groundwater. Operations and maintenance of the cap and slurry wall, gas collection and treatment system, and site security would be necessary in perpetuity at the site.

Groundwater Record of Decision was signed on May 15, 1996. The groundwater remedy required that infiltration of water into the ground be reduced through: redirection of surface water off the site; grading of areas adjacent to the containment system, and lining of onsite drainage channels with low permeability materials. The groundwater remedy stipulated continuing groundwater monitoring, with implementation of institutional controls should

certain criteria be exceeded.

#### Remedial Action Objectives:

Remedial action objectives for the Source OU and the Groundwater OU are closely linked at this Site. In fact, the Groundwater OU ROD refers to and incorporates Source OU selected response actions. The Site Remedial Action Objectives as summarized in the Superfund Closeout Report (EPA, 1998) include:

- 1) Long-term isolation of waste materials
- 2) Minimization of infiltration of rain water into waste
- 3) Control of any gases emitted from the waste
- 4) Provision of adequate bearing capacity for the end use of the site

Items 1 and 3 above are considered source control response objectives, as they are intended to physically contain waste materials and offgas in order to prevent human contact. Item 2 is considered a management of migration response objective as it is intended to minimize the potential for development of hydraulic gradients within the perched groundwater zones at the Site, which could result in migration to and contamination of the regional drinking water aquifer. Item 4 is also a management of migration response objective, as it is intended to prevent breaches of containment, either through direct penetration, or by alteration of the surface so as to increase surface water infiltration to the containment system.

The major components of source control for the two combined OUs (Source and Groundwater) are as follows:

- Installation of subsurface cut-off walls
- Installation of an impermeable multi-layer, RCRA-equivalent, cover
- Construction of erosion control and retaining structures
- Construction of a gas collection system and treatment plant

Components of migration management for the two combined OUs (Source and Groundwater) are as follows (the source control measures listed above also provide a degree of migration management):

- Installation of drainage structures and grading of surface elevations to minimize surface water infiltration

- Monitoring existing conditions to allow for the development of additional response measures in a timely manner should they be required

With respect to monitoring existing conditions, in the case of the gas collection system, a network of dedicated pressure probes at the Site is periodically tested to ensure that there is negative pressure within the sump containment structures relative to the surrounding area. In the case of the groundwater remedy, a network of monitoring wells is periodically tested to

assist in determining any trends, specifically whether Site related contaminants are decreasing, stable, or increasing, at points beyond the Site boundary.

## B. Remedy Implementation

Construction activities, performed by MSG with oversight from EPA, began on July 1996 (with an official onsite construction date of 3/31/1997) and were completed in November 1997. These activities included the following:

- Installation of Subsurface Cut-off Walls
- Installation of an Impermeable Cover
- Grading to Facilitate Surface Water Control
- Erosion Control Measures
- Building a Gas Collection & Treatment Plant, and
- Golf Course Restoration Activities.

The cover systems actually are two in number, one covering the Los Coyotes sump area, and the other covering the Ramparts sump area. These systems are identical except for their location, and differences in acreage and elevation. Design criteria for the two systems are identical: a barrier layer with maximum hydraulic conductivity of  $1 \times 10^{-7}$  cm/sec; a drainage layer with minimum hydraulic conductivity of  $1 \times 10^{-2}$  cm/sec; and a vegetative layer of 24 inch minimum thickness and 3 to 5 percent grade.<sup>6</sup>

Prior to cap construction, two vertical cutoff walls, which serve as subsurface barriers, were installed, one each encircling the Ramparts and Los Coyotes sump areas. Each barrier was constructed using a slurry mixture of soil and bentonite clay. The design criteria for the cutoff walls was a maximum hydraulic conductivity of  $1 \times 10^{-7}$  cm/sec.<sup>7</sup>

The gas collection systems installed beneath the Los Coyotes and Ramparts cover systems consist of a series of 8 inch mains and 4 inch laterals. Underground vaults allow access to individual laterals for inspection and flow measurement. The Los Coyotes and Ramparts networks are interconnected, and a single blower induces a vacuum to draw the subsurface gases through the above-ground vapor treatment system. The vapor treatment system is located on Site at a location due west of Sunny Ridge Drive, and consists of two granular activated carbon vessels operated in series. In addition to the coal-based coarse mesh granular activated carbon used to remove benzene and other organics, the vessels also include a top bed of sodium hydroxide impregnated carbon to remove sulfur compounds. The design flow rate for the system is 1,500 cubic feet per minute.<sup>8</sup>

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<sup>6</sup>From Five Year Review Report/MWH 2002

<sup>7</sup>From Five Year Review Report/MWH 2002

<sup>8</sup>From Five Year Review Report/MWH 2002

On November 13, 1997, EPA and the California DTSC conducted a final inspection of the McColl Superfund Site. EPA determined that construction had been completed according to specifications and the remediation had been successfully implemented. In April 1998, EPA approved the Final Remedial Action Report for the McColl site. On June 30, 1998, EPA signed the Superfund Closeout Report for the Site.

Additional components of the remedy beyond physical construction include institutional controls and long term monitoring. Institutional controls have been implemented as part of the Source OU remedy, and the Groundwater OU contains the option for groundwater institutional controls should certain criteria be met. The property owner, McAuley LCX Corporation, in a Consent Decree with the federal government, agreed to no further development of the Site property. McAuley LCX agreed to record a deed restriction on the Los Coyotes and Ramparts areas. This deed restriction runs with the land and is binding on any potential future owner of the Site. Long term monitoring at the Source OU includes observation of pressure probes to ensure a negative pressure exists within the sump containment systems, and surveying of settlement monuments for the purpose of identifying any areas of differential settlement which could affect the integrity of the containment systems. Long term monitoring at the Groundwater OU consists of sampling the existing network of monitoring wells to determine whether migration of Site related contaminants is occurring.

The Groundwater ROD specified continued groundwater monitoring to determine whether migration of site related contaminants is taking place offsite. For the purposes of monitoring groundwater, there is a network of 20 wells. All wells are located outside of the capped areas as perforations of the cap are to be avoided, and wells located immediately adjacent provide virtually equivalent information. The wells are nested, i.e. they can monitor several of the groundwater zones at one latitude/longitude. The P-2, P-3, P-4, and P-10 series wells are located onsite or on immediately adjacent areas within the boundaries of the Los Coyotes Country Club golf course. The W-9 series wells are located hydraulically upgradient of the Site on property owned by Chevron. The remaining wells are located within rights-of-way of the City of Fullerton. (See Attachment 2, Site Detail, for well locations; Attachment 3, Well Details.)

### C. System Operation and Maintenance

At the time of the Five Year Review O&M Activities, with the exception of site security and surface maintenance, were being performed by a team consisting of EPA, the U.S. Army Corps of Engineers, and the Corps' contractor Montgomery Watson Harza. A transition to O&M by the oil companies and their contractor C2REM is scheduled for late September 2002.

The site security and surface maintenance portions of Site O&M are the responsibility of the golf course operator, previously McAuley LCX Corporation, and currently AG Los Coyotes, LLC. When the oil companies drew up the plan for O&M, they negotiated with McAuley LCX, and signed a side agreement (one to which the federal government was not a party). Under that settlement agreement, in exchange for an annual payment from the oil companies, McAuley LCX would perform surface maintenance and site security. Surface maintenance obligations

included:<sup>9</sup>

- 1) Regular watering and fertilizing of the site sufficient to maintain green vegetation and to prevent over watering such that erosion occurs.
- 2) Routine site inspections of irrigation system components.
- 3) Repair of malfunctioning irrigation components.
- 4) Maintenance of surface drainage systems to allow normal drainage. Such maintenance shall not include removal of silt from the retention pond.
- 5) Routine maintenance to the site perimeter fencing to insure security.
- 6) Routine repair of surface conditions leading to erosion.
- 7) Routine removal of all surface vegetation not reflected in the Approved Design which could result in root growth that may impact the Containment System.
- 8) Routine control of burrowing animals from areas where the Containment System exists.

In 2001, EPA was approached by McAuley LCX Corporation and American Golf Corporation, stating McAuley's intention to lease golf course operations to American Golf. EPA considered the request, and agreed under certain conditions, one condition being that American Golf (through AG Los Coyotes LLC) would enter into an agreement with the federal government to perform the surface maintenance obligations previously agreed to between the oil companies and McAuley LCX (this is the Status Report and Stipulation referenced in footnote number nine).

Beyond surface maintenance, O&M procedures are documented in the O&M manual developed by the contractor to the MSG, Parsons Environmental Science, and entitled: Operations and Maintenance Plan at the McColl Superfund Site, Fullerton, California (October 1997).

O&M chiefly consists of three categories of tasks: operation and maintenance of the gas collection and treatment system; inspection of the cap and retaining walls, maintenance of ground cover, and site security; collection of groundwater monitoring data for use in evaluating the groundwater remedy.

From March 2000 through September 2002, O&M has been performed by the federal government using funds provided by an Interim Settlement Agreement between the federal government and the oil companies. The total cost of O&M during this 31 month period was

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<sup>9</sup>Excerpted from Surface Maintenance Agreement, Exhibit D to Status Report and Stipulation, Case No. CV 910589 RJK, filed August 9, 2001, U.S. District Court, Los Angeles, CA

\$695,000. This averages out to \$22,400 per month, or \$269,000 per year.

Annual System Operation and Maintenance Costs

O&M PERIOD	TOTAL COST
November 13, 1997 - March 8, 2000 <sup>10</sup>	data not available to EPA
March 8, 2000 - September 26, 2002 <sup>11</sup>	\$695,000

The ROD cost estimates for O&M were as follows:

SOURCE OU..... \$828,000 (1990 dollars)  
 GROUNDWATER OU..... \$146,000 (ROD date 1996)  
 TOTAL, BOTH OUs..... \$974,000 (not normalized or adjusted for inflation)

Comparing actual annualized O&M costs over the most recent 31 months (\$269,000/yr) to the ROD O&M cost estimate (\$974,000), it can be seen that significant cost savings have been achieved. In fact, actual cost are running at only 28% of estimated costs.

5. Progress Since the Last Five-Year Review

This was the first Five-Year Review for the Site, therefore all progress documented in this report has occurred during the first review period for the Site. Subsequent reviews will measure progress in comparison to this first Five Year Review.

6. Five-Year Review Process

Administrative Components:

EPA began this Five Year Review in March 2002 with a review of the two Site Records of Decision, the Closeout Report, recent Site inspection reports, and supporting documentation (see Attachment 6 for a complete list).

Upon initiating this review, EPA enlisted the support of the Corps of Engineers. The Corps has a long history at the Site, having provided oversight of the construction of the remedy by the oil companies from 1996-7, having overseen subsequent O&M undertaken by the oil companies,

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<sup>10</sup>MSG period of O&M

<sup>11</sup>Federal government period of O&M

and having organized on behalf of EPA assumption of federal O&M in March 2000.

EPA entered into an Interagency Agreement with the Corps in April 2002, through which EPA contracted for additional support. Montgomery Watson Harza was the contractor selected to provide support, particularly for the technical evaluation of the remedy's effectiveness.

The Five Year Review inspection was held on May 29, 2002, with representatives of EPA, the Corps, MWH, and the oil companies in attendance.

Montgomery Watson Harza released a draft of its evaluation of the remedy entitled Five Year Review Report (July 2002). EPA has incorporated many of MWH's findings in this report and has excerpted and summarized certain of these materials. The MWH draft evaluation is an excellent source of additional detailed information regarding the Site.

#### Community Involvement:

EPA released a fact sheet announcing the Five Year Review in June 2002 and requesting community input on the effectiveness of the remedy to date. This fact sheet was mailed out to the mailing list and was sent to the site information repositories (see Attachment 8).

To date of preparation of this report EPA has received a total of five inquiries in response to the fact sheet mailing. Most were requests for more information. One area where EPA specifically requested feedback was as to whether sulfur-like odors had been detected in the surrounding neighborhood (since thiophenes have a very low odor threshold, any failure of the gas collection and treatment system would result in noticeable odors in the adjacent community). No reports of such odors have been submitted, confirming the results of EPA's qualitative and quantitative analysis that the treatment system is operating effectively.

EPA will release a second fact sheet announcing the availability of this Five Year Review Report, and will continue to take comments from the public regarding the Site remedy.

#### Document Review:

EPA conducted a review of key reports, decision documents, and supporting materials, as summarized in the appendix. MWH reviewed additional materials in support of its review of risk assessment, remedy protectiveness, and other issues, as referenced in MWH/July 2002.

#### Data Review:

EPA relied upon MWH's review of site data, including data collected during their implementation of O&M responsibilities as contractor to EPA through the Corps of Engineers. EPA performed spot checks of this information and reviewed MWH's work product for accuracy and completeness. Conclusions drawn upon this data are presented in this report.

Again, comprehensive detail can be found at MWH/July 2002.

#### Site Inspection:

The Five Year Review inspection was held on May 29, 2002. This inspection supported the more detailed periodic inspections performed by the Corps and MWH. See Attachment 4, Five Year Review Site Inspection Checklist.

#### Interviews:

Given that its ongoing program of oversight of the remedy requires contact with the oil companies, state regulatory authorities, local authorities, and golf course maintenance authorities, EPA did not seek to conduct separate interviews. The public has been contacted through EPA's community involvement effort. As no significant deficiencies in remedy implementation have been detected during the course of this review, EPA did not see the need to interview additional experts in the field.

EPA would like to note that a draft version of this report was previously made available to the State of California, McAuley LCX, and the oil companies (including their consultant C2REM). EPA has received written comments from these parties, which are referenced in Attachment 6, List of Documents Reviewed. Some of these comments have resulted in changes to this report, and others will be considered during the implementation of follow-up actions, as described in Section 9 of this report.

#### 7. Technical Assessment

EPA contracted with the Corps and MWH to conduct the detailed evaluation of the effectiveness of the remedy. EPA has reviewed and is in agreement with the assessment, which is summarized below, and which can be found at MWH/July 2002.

Question A: Is the remedy functioning as intended by the decision documents?

Answer (A): Yes. The multilayer covers and cutoff walls have successfully contained the waste materials within the sumps, and the gas collection and treatment system has successfully controlled the off-gas. This has resulted in effective source control. With respect to migration control, although the target level set for thiophenes in the Groundwater OU ROD has been exceeded in four of the off-site, downgradient monitoring wells, more analysis is necessary to determine whether the changes observed are statistically significant. A qualitative analysis of the data suggests that implementation of groundwater institutional controls is not warranted at this time. See the Issues section (following) for further discussion.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy selection still valid?

Answer (B)/Part 1/Exposure Assumptions: The baseline risk assessment for groundwater was essentially based on future use scenarios for onsite groundwater. Application of this scenario was supported by uncertainties regarding the potential for offsite migration of site related contaminants in combination with the fact that the lower contaminated perched zones onsite communicate with the regional drinking water aquifer. Given the continued uncertainty with respect to offsite migration, this part of the exposure assumption still holds true. However, data collected since the Groundwater ROD (1996) suggest that the universe of contaminants present in downgradient monitoring wells is smaller than that used in the baseline risk assessment, and furthermore those contaminants which are currently present occur at lower concentrations than used in the baseline risk assessment.

The exposure assumptions made in the baseline risk assessment for refinery waste prepared for the Source OU ROD with respect to child resident, adult resident, and country club worker, continue to be appropriate. MWH has recommended the inclusion of a recreational exposure scenario, which was not previously considered, given the onsite discharge from the vapor treatment system.

Answer (B)/Part 2/Toxicity Data: The toxicity assessment performed by MWH in support of this Five Year Review determined that the only significant change with respect to potential groundwater exposures is that previous carcinogenic risk estimates for beryllium presented in the BRA are no longer applicable because beryllium is no longer classified by EPA as an oral carcinogen. Although changes to carcinogenic and noncarcinogenic toxicity criteria for several source area contaminants have occurred in the intervening years since the Source OU ROD (1993), MWH reports that in its opinion these changes would not have resulted in appreciable differences to the risk calculations in the baseline risk assessment.

Answer (B)/Part 3/Cleanup Levels: Although not designated as a cleanup level, the only numeric criteria specified in the Groundwater ROD was the action level set for THTs of 3.6 ug/l, which as originally envisioned would trigger institutional controls. Based on the discussion in the Groundwater ROD, it appears that the THT action level was set based on nuisance factors, not toxicity. THTs have a low odor threshold, in the part per trillion range. Currently available toxicological data for THTs suggest that concentrations substantially above the 3.6 ug/l level are not associated with adverse health effects. Further review of this benchmark is warranted.

Cleanup levels were not expressly designated in the Source OU ROD (1993). It was determined that the entire extent of the source area (i.e. the sumps) needed to be treated or capped (contingency remedy).

Answer (B)/Part 4/Remedial Action Objectives: This review confirms that the combined selected remedial action objectives for the Groundwater and Source OUs are still valid: 1) Long-term isolation of waste materials; 2) Minimization of infiltration of rain water into waste; 3) Control of any gases emitted from the wastes; 4) Provision of adequate bearing capacity for

the end use of the site. There have been no changes in site conditions or toxicity criteria to suggest that either existing response actions are no longer required or that additional actions need to be taken.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

Answer (C): No. Although improvements could be made to the program to verify vapor treatment plant emissions, based on the original modeling results and based on effluent sampling conducted in 2000, EPA concludes that the remedy remains protective. The issue of THTs in Groundwater is one that bears evaluation, however, no drinking water wells are considered endangered by site related contamination for the foreseeable future.

## 8. Issues

### A. No Consistent Off Gas Monitoring

Based upon modeling undertaken during the design phase, the conclusion was reached that air emissions from the off gas vapor treatment system would meet South Coast Air Quality Management District regulatory requirements. There is no quantitative compliance monitoring program in place to verify that the regulatory criteria are being met. The conclusion that the criteria would be consistently met was based on the expected concentrations of COPCs (obtained by analysis of data existing at the time) in off gas and the expected removal efficiency of the treatment system. An additional qualitative measure of the successful performance of the treatment system is that of successful control of thiophenes odors. Thiophenes, which are present in the off gas, are detectable by humans in the part per billion range, and the absence of such odors can be used as a qualitative measure of performance.

The one set of data in EPA's possession measuring concentrations of benzene (the risk driver for air emissions at the Site) influent and effluent to the treatment system, which was requested by the EPA RPM pursuant to a determination regarding whether to order a carbon change-out, is summarized as follows:<sup>12</sup>

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<sup>12</sup>Source: Laboratory Analysis Report dated 3/30/00 (sample date 3/15/00), Atmospheric Analysis and Consulting, Inc., Project No. 300-02-2091

CPOC	Influent (ppb v/v)	Effluent (ppb v/v)
benzene	23438	5.7
toluene	2968	14
ethylbenzene	473	6.6
m,p-xylenes	2065	17
o-xylene	699	6.1

The data suggest a few things. First, for this set of data, removal efficiency ranges from 98.6% for ethylbenzene to over 99.9% for benzene. Second, there do appear to be measurable levels of benzene, which is a risk driver, in the treatment system effluent. This is not unusual given the limitations of technology, which cannot achieve a true 100% removal efficiency.

#### B. Changes in Parties Conducting O&M

Since construction completion in June 1998, O&M responsibilities have reverted from the oil companies to the federal government (in February 2000), back to the oil companies (in September 2002). As of the date of this Five Year Review, litigation to address CERCLA liability is ongoing between the oil companies and the federal government. The final outcome of this litigation will to a substantial degree determine the party or parties responsible for future O&M. Although the O&M transitions to date at the Site have resulted in no interruption of the remedy and its protectiveness, each shift in O&M responsibility brings the potential for a disruption in O&M.

#### C. Potential Triggering of Groundwater Institutional Controls

Tetrahydrothiophene compounds (THTs) have been detected in Groundwater offsite at levels in excess of the benchmark set in the ROD of 3.6 ppb. The ROD states that an exceedence of this level in the regional aquifer beyond the current site boundary triggers the implementation of offsite institutional controls. The ROD does not specify what type of offsite institutional controls are to be implemented. The ROD further raises the possibility that the benchmark level for THTs may be revised. The Groundwater units that are monitored for the purpose of determining whether THTs are migrating offsite are the C and D units, which interconnect or lie within with the aquifer used regionally for water supply. Numerous COPCs were identified in the ROD, but THTs were selected as an indicator of potential migration of site related contaminants. EPA is not recommending an immediate triggering of institutional controls, but believes further analysis is required before a decision can be reached on whether to trigger those controls.

#### D. Surface Water Drainage Patterns with the Potential to Impact Water Quality

Surface water drainage from an offsite location to the north (across Rosecrans Boulevard from the site) enters one of the golf course surface impoundments on the Lake Nine portion of the course. Occasions of turbid water entering the impoundment have reportedly been noticed by golf course maintenance staff. It is not apparent from the site record that the quality or quantity of these surface water flows have been evaluated for possible impacts to the site remedy.

Additionally, MWH has noted an increase in groundwater levels in the B zone, accompanied by decreases in levels in the A and C zones. This situation creates a hydraulic gradient from the B zone toward the underlying C zone, which increases the potential for flow of site related contaminants into the C zone and from there into the regional aquifer system. MWH theorizes that the increased levels in the B zone may be a result of the introduction of additional flows into the above-mentioned retention pond. A recharge area to the B zone appears to exist immediately downslope of the retention pond. Introduction of additional flows to the pond may result in greater overflow and overland flow into the recharge zone.<sup>13</sup>

#### 9. Recommendations and Follow-up Actions

Given the pending change in O&M responsibility, EPA believes it is appropriate to assemble a technical review team of stakeholders to prepare a detailed plan of action on the issues identified above. EPA does not believe any of the issues raise any imminent threats to the protectiveness of the remedy. Nonetheless, several of the issues, if not addressed, have the potential to trigger additional response actions in the long term. Therefore, if consensus cannot be reached among stakeholders, EPA is prepared to develop and implement a corrective plan of action, should further detailed analysis of the issues support further response actions.

A range of possible actions for the issues identified above follows.

##### A. No Consistent Off Gas Monitoring

EPA recommends the drafting and implementation of a compliance monitoring program for treatment system off gas, which not only takes into account substantive requirements of South Coast Air Quality Management District regulations, but which also takes into account the most recent toxicity data for benzene, and which considers potential residential and recreational receptors.

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<sup>13</sup>Source: Five Year Review Report/MWH 2002

#### Recommended Follow-Up Actions, Issue A

ACTION	LEAD ENTITY	PROPOSED SCHEDULE
Review regulatory criteria	EPA/Oil companies	January 2003
Review toxicity data and exposure assumptions	EPA/Oil companies	January 2003
Review existing monitoring program for adequacy	EPA/Oil companies	January 2003
Make changes to monitoring program as appropriate	EPA/Oil companies	July 2003

#### B. Changes in Parties Conducting O&M

Per the discussion above, EPA recommends a more formal technical analysis and review process for the Site, and the assembly of a stakeholder team, with the goal of reaching consensus on technical issues.

#### Recommended Follow-Up Actions, Issue B

ACTION	LEAD ENTITY	PROPOSED SCHEDULE
Survey stakeholders	EPA	January 2003
Assemble stakeholder team	EPA	April 2003
Convene team and establish ground rules of operation	EPA	July 2004

#### C. Potential Triggering of Groundwater Institutional Controls

With respect to THTs in Groundwater, due to the inconclusiveness of the existing data (although the benchmark set in the Groundwater ROD has been exceeded in one or more wells, the benchmark value may warrant re-evaluation, and the levels detected do not suggest significant migration), EPA recommends that groundwater monitoring continue during the next five-year evaluation period. EPA further recommends use of trends analysis to better determine whether institutional controls or additional Groundwater cleanup measures are warranted. EPA further recommends a reassessment of the THT benchmark to determine whether this suite of compounds represents the best indicator, if so, whether the 3.6 ppb benchmark is defensible.

Recommended Follow-Up Actions, Issue C

ACTION	LEAD ENTITY	PROPOSED SCHEDULE
Refer issue to stakeholder team to develop work plan	EPA	September 2004
Work plan developed	Stakeholder Team Chair	November 2004
Work plan tasks assigned to staff and/or consultants	Stakeholder Team Chair	January 2005
Findings/recommendations issued	Staff of and/or consultants to stakeholder team	July 2005
Possible ESD or other decision document drafted	EPA	September 2005

D. Surface Water Drainage Patterns with the Potential to Impact Water Quality

With respect to surface water drainage onto the Site from offsite, EPA recommends that these flows be evaluated both for quantity and quality so that potential impacts, if any, on the site remedy may be identified and addressed. EPA recommends further technical analysis to determine means of further reducing recharge to the B zone.

Recommended Follow-Up Actions, Issue D

ACTION	LEAD ENTITY	PROPOSED SCHEDULE
Review existing monitoring plan for adequacy	EPA/Oil companies	January 2003
Make changes to monitoring plan as appropriate	EPA/Oil companies	July 2003

10. Protectiveness Statement

Protectiveness Statement:

All immediate threats at the site have been addressed, and the remedy is expected to continue to be protective of human health and the environment for the foreseeable future.

Long-term Protectiveness:

The 100 year design life of the containment system continues to ensure the long-term protectiveness of the remedial action. Within the intervening five years between this Review

and the next scheduled review, groundwater monitoring will continue as a safeguard to determine whether migration of site related contaminants toward drinking water aquifers is taking place. No water supply wells are currently impacted by site-related contamination, nor are they likely to be impacted during the next Review period, given the low concentrations of THTs detected in offsite monitoring wells, and given the inconclusiveness of the data with respect to their movement over the past five years.

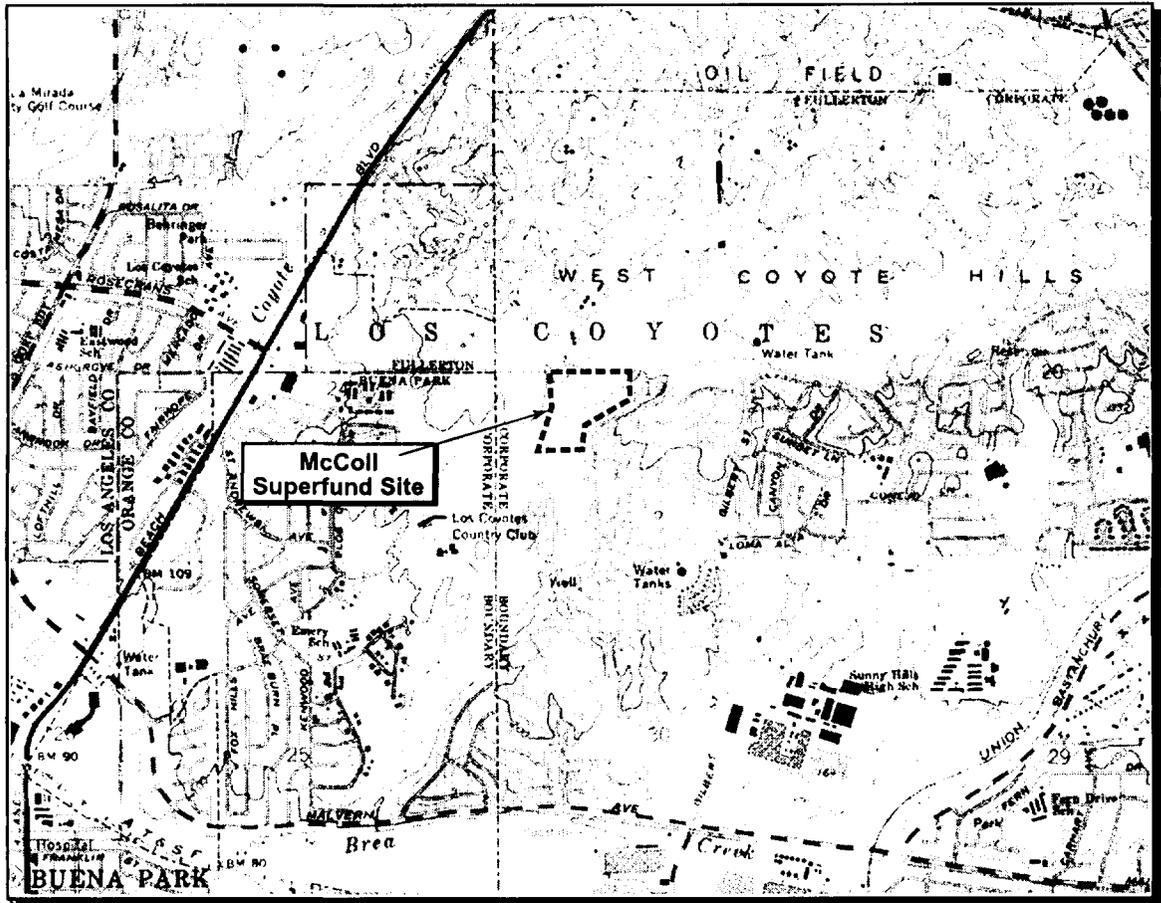
#### 11. Next Review

The next Five Year Review is scheduled to be conducted in the Year 2007.

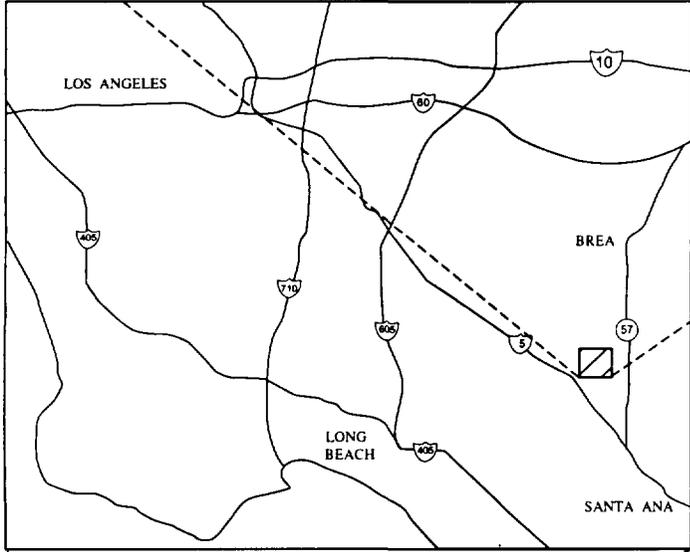
ATTACHMENT 1  
Site Location Map<sup>1</sup>

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<sup>1</sup>Excerpted from Montgomery Watson Harza, July 2002, McColl Superfund Site, Five Year Review Report



Source: USGS Topographic Map, La Habra CA Quad., 1964, Photorevised 1981




**MWH**  
 MONTGOMERY WATSON HARZA  
**McCOLL SUPERFUND SITE**  
**FULLERTON, CALIFORNIA**  
**SITE LOCATION MAP**  
 FIGURE 3-1

ATTACHMENT 2  
Site Plan<sup>2</sup>

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<sup>2</sup>Excerpted from Montgomery Watson Harza, July 2002, McColl Superfund Site, Five Year Review Report



**ATTACHMENT 3**  
**Table of Monitoring Wells<sup>3</sup>**

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<sup>3</sup>Excerpted from Montgomery Watson Harza, July 2002, McColl Superfund Site, Five Year Review Report

TABLE 3-1

FEATURES OF GROUNDWATER MONITORING WELLS  
McCOLL SUPERFUND SITE  
FULLERTON, CALIFORNIA

Well ID	Date of Construction	Intercepted Water-Bearing Zone	Casing Diameter (inches)	Total Casing Depth (ft bgs)	Elevation of Top of Casing (ft msl)	Elevation of Top of Screen (ft msl)	Elevation of Bottom of Screen (ft msl)	Depth of Top of Screen (ft btoc)	Length of Screen (ft)	Depth of Bottom of Screen (ft btoc)	Screen Slot Size/ Material	Dedicated Well Pump Present?	Depth of Pump Intake (ft btoc)	Pump Replacement Since June 1999	Sampling Status
P-2S	1994	A	4	27.3	266.46	245.7	240.7	20.8	5	25.8	0.01"/na	no	na		X
P-3S	1987	A	4	69.1	281.42	221.5	211.5	59.9	10	69.9	na/ss	no	na		X
P-2I	1994	B	4	139	266.39	139.8	129.8	126.6	10	136.6	na	yes	134	7/11/2001	X, Y
P-4I	1994	B	4	127.7	283.34	167.8	157.8	115.5	10	125.5	0.01"/na	no	na		X
P-5I	1994	B	4	97.5	259.77	177.8	167.8	82.0	10	92.0	0.01"/na	yes	91.0		X, Y
P-5S	1987	B	4	81	259.26	189.4	179.4	69.9	10	79.9	na/ss	no	na		X
P-10D	1994	B	4	200	248.42	62.4	52.4	186.0	10	196.0	0.01"/na	yes	195.0		X, Y
P-2DR	1994	C	4	230	266.15	52.4	42.4	213.8	10	223.8	0.01"/na	yes	222	Not replaced	X
P-3D	1987	C	4	250	282.40	42.5	32.5	239.9	10	249.9	na/ss	no	na		X
P-4D	1987	C	4	240	282.53	57.5	47.5	225.0	10	235.0	na/ss	no	na		X
P-5L	1994	C	4	210	258.13	62.6	52.6	195.5	10	205.5	0.01"/na	yes	204.5		X, Y
P-9D	1994	C	4	239	263.26	49.2	32.2	214.1	17	231.1	0.02"/na	yes	223.0		X, Y
P-10L	1994	C	4	259.5	248.63	0.3	-9.7	248.3	10	258.3	0.01"/na	yes	256.7	7/11/2001	X, Y
W-6A	1983	C	2	50	293.35	263.6	243.6	29.8	20	49.8	na/pvc	no	na		X
P-5D	1987	D	4	265	259.40	4.5	-5.5	254.9	10	264.9	na/ss	yes	266	12/14/2000	X, Y
W-8B	1983	D	2	310	247.12	-37.5	-47.5	284.6	10	294.6	na/pvc	yes	na	Not replaced	X
P-10XD	1996	D	4	298	266.44	6.9	-44.1	259.5	51	310.5	na	yes	312		X, Y
W-9B	1989	D	4	225	316.71	102.7	92.7	214.0	10	224.0	na	yes	225	12/14/2000	X, Y
W-9C	1989	D	4	320	316.09	7.4	-2.6	308.7	10	318.7	na	yes	na	6/16/2000	X, Y
W-10B	1989	D	4	216	314.55	110.3	100.3	204.3	10	214.3	na	yes	215	12/14/2000	X, Y

Abbreviations:

ft bgs - feet below ground surface  
ft btoc - feet below top of casing  
ft msl - feet above mean sea level  
na - not applicable, not available  
pvc - polyvinyl chloride  
ss - stainless steel  
X - Water level measurement  
Y - Sampling for constituents of concern

Notes:

1. USEPA has stipulated that all C-zone wells intercept the C portion of the regional aquifer, except for W-6A that intercepts the C perched zone (USEPA, 1996a).
2. All blank casings are pvc.
3. Pumps in wells P-2DR and W-8B did not function as of 3/29/00. These wells are not part of the sampling program and the pumps have not been replaced.

ATTACHMENT 4  
Site Inspection Checklist<sup>4</sup>

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<sup>4</sup>Excerpted from Montgomery Watson Harza, July 2002, McColl Superfund Site, Five Year Review Report

## 5-Year Review Site Inspection Checklist

I. SITE INFORMATION					
Site Name: McColl Superfund Site		Date of Inspection: 29 May 2002			
Location and Region: Fullerton, California		EPA ID:			
Agency, office, or company leading the five-year review: US EPA Region 9 / MWH Americas, Inc.		Weather/temperature: Sunny, Clear, 85 °F			
<b>Remedy Includes:</b> (Check all that apply) <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <input checked="" type="checkbox"/> Landfill cover/containment  <input checked="" type="checkbox"/> Access controls  <input checked="" type="checkbox"/> Institutional controls  <input type="checkbox"/> Groundwater pump and treatment  <input type="checkbox"/> Surface water collection and treatment                 </td> <td style="width: 50%; vertical-align: top;"> <input checked="" type="checkbox"/> Monitored natural attenuation  <input type="checkbox"/> Groundwater containment  <input checked="" type="checkbox"/> Vertical barrier walls                 </td> </tr> </table> <p>Other: Gas Collection and Treatment System <u>An air inlet valve for each cover system allows air to be pulled in. A network of buried perforated pipe in each cover system connects to a 30-hp blower through a common header. The vapor abatement system (on vacuum side of blower) consists of 2 steel upflow canisters each containing a bed of 3,200 lbs. coal-based coarse mesh granular activated carbon (GAC) and a top bed of 1,000 lbs. NaOH-impregnated carbon pellets</u></p>				<input checked="" type="checkbox"/> Landfill cover/containment <input checked="" type="checkbox"/> Access controls <input checked="" type="checkbox"/> Institutional controls <input type="checkbox"/> Groundwater pump and treatment <input type="checkbox"/> Surface water collection and treatment	<input checked="" type="checkbox"/> Monitored natural attenuation <input type="checkbox"/> Groundwater containment <input checked="" type="checkbox"/> Vertical barrier walls
<input checked="" type="checkbox"/> Landfill cover/containment <input checked="" type="checkbox"/> Access controls <input checked="" type="checkbox"/> Institutional controls <input type="checkbox"/> Groundwater pump and treatment <input type="checkbox"/> Surface water collection and treatment	<input checked="" type="checkbox"/> Monitored natural attenuation <input type="checkbox"/> Groundwater containment <input checked="" type="checkbox"/> Vertical barrier walls				
<b>Attachments:</b> <input checked="" type="checkbox"/> Inspection team roster attached <input checked="" type="checkbox"/> Site map attached					
II. INTERVIEWS (Check all that apply)					
1. O&M Site Manager:	<u>Robert Lindfors, P.E.</u> Name	<u>Project Manager</u> Title	<u>May 28, 2002</u> Date		
Interviewed <input checked="" type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone    Phone no. _____ Problems, suggestions; <input type="checkbox"/> Report attached _____ _____					
2. O&M Staff:	<u>Sam Grizzle</u> Name	<u>O&amp;M Supervisor</u> Title	<u>May 28, 2002</u> Date		
Interviewed <input checked="" type="checkbox"/> at site <input type="checkbox"/> at office <input checked="" type="checkbox"/> by phone    Phone no. <u>(626) 437-7326</u> Problems, suggestions; <input type="checkbox"/> Report attached _____ _____					

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency \_\_\_\_\_  
Contact \_\_\_\_\_  
Name Title Date Phone no.  
Problems; suggestions;  Report attached \_\_\_\_\_

Agency \_\_\_\_\_  
Contact \_\_\_\_\_  
Name Title Date Phone no.  
Problems; suggestions;  Report attached \_\_\_\_\_

Agency \_\_\_\_\_  
Contact \_\_\_\_\_  
Name Title Date Phone no.  
Problems; suggestions;  Report attached \_\_\_\_\_

Agency \_\_\_\_\_  
Contact \_\_\_\_\_  
Name Title Date Phone no.  
Problems; suggestions;  Report attached \_\_\_\_\_

4. **Other interviews** (optional)  Report attached.


III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1.	<b>O&amp;M Documents</b> <input checked="" type="checkbox"/> O&M manual <input type="checkbox"/> As-built drawings <input checked="" type="checkbox"/> Maintenance logs Remarks _____	<input checked="" type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> Up to date <input type="checkbox"/> N/A <input type="checkbox"/> N/A <input type="checkbox"/> N/A
2.	<b>Site-Specific Health and Safety Plan</b> <input checked="" type="checkbox"/> Contingency plan/emergency response plan Remarks _____	<input checked="" type="checkbox"/> Readily available <input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date <input checked="" type="checkbox"/> Up to date <input type="checkbox"/> N/A <input type="checkbox"/> N/A
3.	<b>O&amp;M and OSHA Training Records</b> Remarks _____	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date <input type="checkbox"/> N/A
4.	<b>Permits and Service Agreements</b> <input checked="" type="checkbox"/> Air discharge permit <input checked="" type="checkbox"/> Effluent discharge <input checked="" type="checkbox"/> Waste disposal, POTW <input type="checkbox"/> Other permits _____ Remarks _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A <input type="checkbox"/> N/A
5.	<b>Gas Generation Records</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
6.	<b>Settlement Monument Records</b> Remarks _____	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date <input type="checkbox"/> N/A
7.	<b>Groundwater Monitoring Records</b> Remarks _____	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date <input type="checkbox"/> N/A
8.	<b>Leachate Extraction Records</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
9.	<b>Discharge Compliance Records</b> <input checked="" type="checkbox"/> Air <input checked="" type="checkbox"/> Water (effluent) Remarks _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A
10.	<b>Daily Access/Security Logs</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A



<b>C. Institutional Controls (ICs)</b>			
1.	<b>Implementation and enforcement</b>		
	Site conditions imply ICs not properly implemented	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
	Site conditions imply ICs not being fully enforced	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
	Type of monitoring (e.g., self-reporting, drive by): <u>Walk through inspection of system and site. Gas Monitoring weekly.</u>		
	Frequency: <u>Daily by LCGC and Weekly by MWH.</u>		
	Responsible party/agency: <u>MWH and Los Coyotes County Club Management</u>		
	Contact: <u>Sam Grizzle</u>	<u>O&amp;M Supervisor</u>	<u>May 28, 2002</u> <u>(626) 437-7326</u>
	Name	Title	Date                      Phone no.
	Reporting is up-to-date	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A
	Reports are verified by the lead agency	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A
	Specific requirements in deed or decision documents have been met	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
	Violations have been reported	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
	Other problems or suggestions: <input type="checkbox"/> Report attached		
	_____		
	_____		
	_____		
2.	<b>Adequacy</b>	<input checked="" type="checkbox"/> ICs are adequate	<input type="checkbox"/> ICs are inadequate <input type="checkbox"/> N/A
	Remarks: _____		
	_____		
	_____		
<b>D. General</b>			
1.	<b>Vandalism/trespassing</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No vandalism evident
	Remarks: _____		
2.	<b>Land use changes on site</b>	<input checked="" type="checkbox"/> N/A	
	Remarks: _____		
3.	<b>Land use changes off site</b>	<input type="checkbox"/> N/A	
	Remarks: <u>Area north of site is apparently being developed for residential use. Five-year review technical report will address details on land use.</u>		
<b>VI. GENERAL SITE CONDITIONS</b>			
A.	<b>Roads</b>	<input checked="" type="checkbox"/> Applicable	<input type="checkbox"/> N/A
1.	<b>Roads damaged</b>	<input checked="" type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Roads adequate <input type="checkbox"/> N/A
	Remarks: _____		
	_____		

<b>B. Other Site Conditions</b>		
Remarks _____ _____ _____ _____		
<b>VII. LANDFILL COVERS</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A		
<b>A. Landfill Surface</b>		
1.	<b>Settlement (Low spots)</b> <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Settlement not evident Areal extent _____                      Depth _____ Remarks <u>See annual survey reports for data on settlement.</u>	
2.	<b>Cracks</b> <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Cracking not evident Lengths _____                      Widths _____                      Depths _____ Remarks _____	
3.	<b>Erosion</b> <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Erosion not evident Areal extent _____                      Depth _____ Remarks: <u>Slight erosion along reinforced earth structures (RESS). Need to maintain vegetative cover.</u>	
4.	<b>Holes</b> <input checked="" type="checkbox"/> Location shown on site map <input type="checkbox"/> Holes not evident Areal extent <u>4-inch diameter</u> Depth <u>6-inch depth</u> Remarks: <u>Minor rodent hole SE of Los Coyotes Cap.</u>	
5.	<b>Vegetative Cover</b> <input checked="" type="checkbox"/> Grass <input checked="" type="checkbox"/> Cover properly established <input type="checkbox"/> No signs of stress <input checked="" type="checkbox"/> Trees/Shrubs (indicate size and locations on a diagram) Remarks: <u>Landscaping throughout site. Grass on Sump Areas. There is slightly stressed vegetation along the SE slope of Los Coyotes Cap. This area has been re-seeded and needs continuous watering. Also slightly stressed vegetation along S slope of Lower Ramparts cap. May need to move sprinkler closer to effectively water.</u>	
6.	<b>Alternative Cover (armored rock, concrete, etc.)</b> <input type="checkbox"/> N/A Remarks: <u>Terraced retaining walls (RESS) constructed with geogrid between Upper and Lower Ramparts.</u>	
7.	<b>Bulges</b> <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Bulges not evident Areal extent _____                      Height _____ Remarks _____	
8.	<b>Wet Areas/Water Damage</b> <input checked="" type="checkbox"/> Wet areas/water damage not evident <input type="checkbox"/> Wet areas <input type="checkbox"/> Location shown on site map                      Areal extent _____ <input type="checkbox"/> Ponding <input type="checkbox"/> Location shown on site map                      Areal extent _____ <input type="checkbox"/> Seeps <input type="checkbox"/> Location shown on site map                      Areal extent _____ <input type="checkbox"/> Soft subgrade <input type="checkbox"/> Location shown on site map                      Areal extent _____ Remarks _____	

9.	<b>Slope Instability</b>	<input type="checkbox"/> Slides	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No evidence of slope instability
	Areal extent _____			
	Remarks _____			
<b>B. Benches</b>				
	<input checked="" type="checkbox"/> Applicable	<input type="checkbox"/> N/A		
	(Horizontally constructed mounds of earth placed across RESs to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)			
1.	<b>Flows Bypass Bench</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> N/A or okay	
	Remarks _____			
2.	<b>Bench Breached</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> N/A or okay	
	Remarks _____			
3.	<b>Bench Overtopped</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> N/A or okay	
	Remarks _____			
<b>C. Letdown Channels</b>				
	<input checked="" type="checkbox"/> Applicable	<input type="checkbox"/> N/A		
	(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)			
1.	<b>Settlement</b>	<input checked="" type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No evidence of settlement	
	Areal extent _____	Depth _____		
	Remarks: <u>Need to maintain joint sealant program at expansion joints of concrete v-ditches.</u>			
2.	<b>Material Degradation</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No evidence of degradation	
	Material type _____	Areal extent _____		
	Remarks: <u>Expansion joints need re-sealing as part of routine maintenance.</u>			
3.	<b>Erosion</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No evidence of erosion	
	Areal extent _____	Depth _____		
	Remarks _____			

4.	<b>Undercutting</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No evidence of undercutting
	Areal extent _____	Depth _____	
	Remarks _____		
5.	<b>Obstructions</b>	Type _____	<input checked="" type="checkbox"/> No obstructions
	<input type="checkbox"/> Location shown on site map	Areal extent _____	
	Size _____		
	Remarks _____		
6.	<b>Excessive Vegetative Growth</b>	Type _____	
	<input checked="" type="checkbox"/> No evidence of excessive growth		
	<input type="checkbox"/> Vegetation in channels does not obstruct flow		
	<input type="checkbox"/> Location shown on site map	Areal extent _____	
	Remarks _____		
<b>D. Cover Penetrations</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A			
1.	<b>Gas Vents</b>	<input type="checkbox"/> Active <input type="checkbox"/> Passive	
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration		<input type="checkbox"/> Needs Maintenance
	<input checked="" type="checkbox"/> N/A		
	Remarks _____		
2.	<b>Gas Monitoring Probes</b>	<input checked="" type="checkbox"/> Functioning	<input checked="" type="checkbox"/> Routinely sampled <input checked="" type="checkbox"/> Good condition
	<input type="checkbox"/> Properly secured/locked		<input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A
	<input type="checkbox"/> Evidence of leakage at penetration		
	Remarks: <u>All gas probes should be raised and locks replaced with brass locks for corrosion resistance.</u>		
3.	<b>Monitoring Wells (within surface area of landfill)</b>		
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration		<input checked="" type="checkbox"/> Needs Maintenance <input checked="" type="checkbox"/> N/A
	Remarks _____		
4.	<b>Leachate Extraction Wells</b>		
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration		<input type="checkbox"/> Needs Maintenance <input checked="" type="checkbox"/> N/A
	Remarks _____		
5.	<b>Settlement Monuments</b>	<input checked="" type="checkbox"/> Located	<input checked="" type="checkbox"/> Routinely surveyed <input type="checkbox"/> N/A
	Remarks: <u>Annual inspection and survey is conducted.</u>		
	Remarks _____		

<b>E. Gas Collection and Treatment</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A		
1.	<b>Gas Treatment Facilities</b> <input type="checkbox"/> Flaring <input type="checkbox"/> Thermal destruction <input type="checkbox"/> Collection for reuse <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks: <u>Carbon treatment and off-gas venting.</u>	
2.	<b>Gas Collection Wells, Manifolds and Piping</b> <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____	
3.	<b>Gas Monitoring Facilities</b> (e.g., gas monitoring of adjacent homes or buildings) <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance <input checked="" type="checkbox"/> N/A Remarks _____ _____	
<b>F. Cover Drainage Layer</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A		
1.	<b>Outlet Pipes Inspected</b> <input checked="" type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____	
2.	<b>Outlet Rock Inspected</b> <input type="checkbox"/> Functioning <input checked="" type="checkbox"/> N/A Remarks _____ _____	
<b>G. Detention/Sedimentation Ponds</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A		
1.	<b>Siltation</b> Areal extent _____      Depth _____ <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Siltation not evident Remarks _____ _____	
2.	<b>Erosion</b> Areal extent _____      Depth _____ <input checked="" type="checkbox"/> Erosion not evident Remarks _____ _____	
3.	<b>Outlet Works</b> <input checked="" type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____	
4.	<b>Dam</b> <input type="checkbox"/> Functioning <input checked="" type="checkbox"/> N/A Remarks _____ _____	

<b>H. Retaining Walls</b>		<input checked="" type="checkbox"/> Applicable	<input type="checkbox"/> N/A
1.	<b>Deformations</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Deformation not evident
	Horizontal displacement _____	Vertical displacement _____	
	Rotational displacement _____		
	Remarks <u>See annual reports for assessment of horizontal displacements.</u>		
2.	<b>Degradation</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Degradation not evident
	Remarks _____		
<b>I. Perimeter Ditches/Off-Site Discharge</b>		<input checked="" type="checkbox"/> Applicable	<input type="checkbox"/> N/A
1.	<b>Siltation</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Siltation not evident
	Areal extent _____	Depth _____	
	Remarks _____		
2.	<b>Vegetative Growth</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> N/A
	<input type="checkbox"/> Vegetation does not impede flow		
	Areal extent _____	Type _____	
	Remarks: <u>Concrete V-Ditches.</u>		
3.	<b>Erosion</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Erosion not evident
	Areal extent _____	Depth _____	
	Remarks _____		
4.	<b>Discharge Structure</b>	<input checked="" type="checkbox"/> Functioning	<input type="checkbox"/> N/A
	Remarks: <u>Drop inlet structure at northwest portion of site needs additional riprap (see attached site plan).</u>		
<b>VIII. VERTICAL BARRIER WALLS</b>		<input checked="" type="checkbox"/> Applicable	<input type="checkbox"/> N/A
1.	<b>Settlement</b>	<input checked="" type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Settlement not evident
	Areal extent _____	Depth _____	
	Remarks _____		
2.	<b>Performance Monitoring</b>	Type of monitoring _____	
	<input checked="" type="checkbox"/> Performance not monitored		
	Frequency _____	Evidence of breaching _____	
	Head differential _____		
	Remarks _____		

<b>IX. GROUNDWATER/SURFACE WATER REMEDIES</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A	
<b>A. Groundwater Extraction Wells, Pumps, and Pipelines</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A	
1.	<b>Pumps, Wellhead Plumbing, and Electrical</b> <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells properly operating <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks: _____ _____
2.	<b>Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances</b> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks: _____ _____
3.	<b>Spare Parts and Equipment</b> <input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided Remarks: _____ _____
<b>B. Surface Water Collection Structures, Pumps, and Pipelines</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A	
1.	<b>Collection Structures, Pumps, and Electrical</b> <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks: <u>Pond NW of Site.</u>
2.	<b>Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances</b> <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks: <u>Concrete V-ditches.</u>
3.	<b>Spare Parts and Equipment</b> <input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided Remarks: <u>NA</u>
<b>C. Treatment System</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A	
1.	<b>Treatment Train (Check components that apply)</b> <input type="checkbox"/> Metals removal <input type="checkbox"/> Oil/water separation <input type="checkbox"/> Bioremediation <input type="checkbox"/> Air stripping <input type="checkbox"/> Carbon adsorbers <input type="checkbox"/> Filters _____ <input type="checkbox"/> Additive (e.g., chelation agent, flocculent) _____ <input type="checkbox"/> Others _____ <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> Sampling ports properly marked and functional <input type="checkbox"/> Sampling/maintenance log displayed and up to date <input type="checkbox"/> Equipment properly identified <input type="checkbox"/> Quantity of groundwater treated annually _____ <input type="checkbox"/> Quantity of surface water treated annually _____ Remarks: _____ _____

2.	<b>Electrical Enclosures and Panels</b> (properly rated and functional) <input type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
3.	<b>Tanks, Vaults, Storage Vessels</b> <input type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Proper secondary containment <input type="checkbox"/> Needs Maintenance Remarks _____ _____
4.	<b>Discharge Structure and Appurtenances</b> <input type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
5.	<b>Treatment Building(s)</b> <input type="checkbox"/> N/A <input type="checkbox"/> Good condition (esp. roof and doorways) <input type="checkbox"/> Needs repair <input type="checkbox"/> Chemicals and equipment properly stored Remarks _____ _____
6.	<b>Monitoring Wells</b> (pump and treatment remedy) <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells located <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____ _____
<b>D. Monitoring Data</b>	
1.	Monitoring Data <input checked="" type="checkbox"/> Is routinely submitted on time <input checked="" type="checkbox"/> Is of acceptable quality
2.	Monitoring data suggests: <input checked="" type="checkbox"/> Groundwater plume is effectively contained <input checked="" type="checkbox"/> Contaminant concentrations are declining

<b>D. Monitored Natural Attenuation</b>			
1.	<b>Monitoring Wells</b> (natural attenuation remedy)		
	<input checked="" type="checkbox"/> Properly secured/locked	<input checked="" type="checkbox"/> Functioning	<input checked="" type="checkbox"/> Routinely sampled
	<input checked="" type="checkbox"/> All required wells located	<input type="checkbox"/> Needs Maintenance	<input checked="" type="checkbox"/> Good condition
	Remarks _____		
<b>X. OTHER REMEDIES</b>			
If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.			
<b>XI. OVERALL OBSERVATIONS</b>			
<b>A.</b>	<b>Implementation of the Remedy</b>		
Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).			
<u>Groundwater operable unit: surface water controls outside of waste sump areas appear adequate to significantly reduce infiltration of surface water and precipitation. Groundwater monitoring program appears adequate to assess whether infiltration controls are effective in preventing further migration of site contaminants to the regional aquifer.</u>			
<u>Source operable unit: multilayer caps and gas collection and treatment system appear to be adequate to prevent infiltration of water and release of hazardous air emissions. Vertical cutoff (slurry) walls appear to be adequate to prevent migration of water into the waste and outward migration of contaminants. Retaining walls (RESs) appear adequate to stabilize steep slopes. Groundwater monitoring is ongoing.</u>			
<b>B.</b>	<b>Adequacy of O&amp;M</b>		
Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.			
<u>O&amp;M procedures appear to be adequate for monitoring the remedies. Weekly site visit is necessary to monitor gas emissions from the vapor abatement portion of the gas collection and treatment system. Routine cover inspections, surveys of settlement monuments, measurements at gas flow indicator valves, measurements at gas pressure probes are conducted on an annual basis and appear to be adequate for maintaining the effectiveness and monitoring the status of the remedies.</u>			

**C. Early Indicators of Potential Remedy Problems**

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

None. \_\_\_\_\_  
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**D. Opportunities for Optimization**

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.  
It appears that the groundwater monitoring program could possibly be modified by reducing the number of wells, e.g., monitor C- and D-zone wells only, or by reducing the frequency of monitoring, e.g., semi-annual to annual. Possible opportunities for optimization will be addressed in detail in the 5-year review technical assessment report.

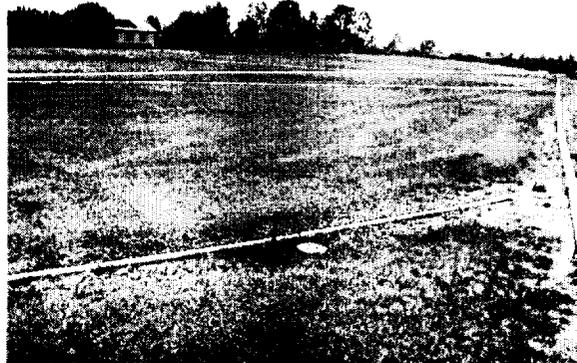
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**ATTACHMENT 5**  
**Site Inspection Photographs**

McColl Superfund Site  
Five-Year Review Inspection  
May 29, 2002

### PHOTOGRAPHS

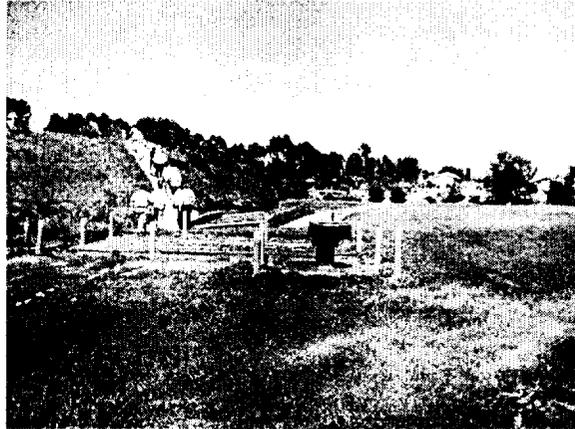
1) Lower Ramparts area cap and vegetative cover, looking southwest. Photo taken at a point approximately 100 feet southwest of the vapor treatment plant. Note above-ground irrigation system piping. One residence is visible, located on Tiffany Place. Extent of vegetative cover is estimated at greater than 95% coverage, an improvement over previous inspections. Original vegetative cover now comprises only an estimated 5-10% of cover material; the remainder is now weeds and drought tolerant grasses. There was an absence of snail shells, which had been abundant during previous inspections.



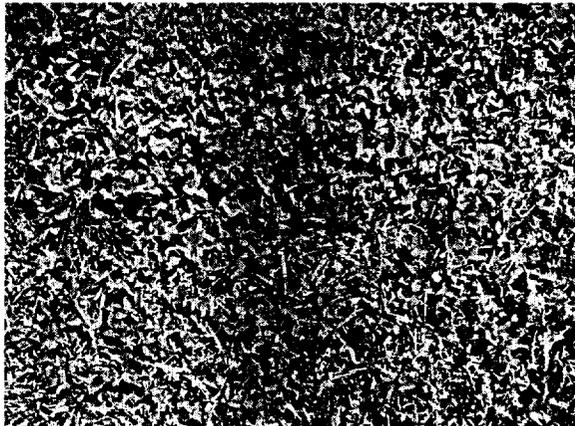
2) Closeup of retaining wall structure located between the Lower Ramparts and Upper Ramparts areas. Geogrid and wire basket are visible. Vegetation on retaining wall had been cut back in this area, but should be allowed to re-establish itself to maximize retaining wall performance. Most other sections of retaining wall are covered with vegetation. Photo taken from Lower Ramparts at a point approximately 200 feet west of the vapor treatment plant.



3) View of the Lower Ramparts vapor collection system vault and air inlet, looking northeast. In the far distance, barely visible at a point above the air inlet, is the vapor treatment plant to which the collected subsurface vapors are conveyed. Vault was not inspected during this visit as confined space entry protocol is required. The vault is inspected annually, and results of an inspection earlier this year will be incorporated into the Five Year Review findings. Photo taken from the approximate southerly boundary of the Lower Ramparts cap. Residences visible in the distance are located on Sunny Ridge Drive, the easternmost Site boundary. Inspection team can be seen ascending a concrete drainage channel connecting with Upper Ramparts.



4) Groundcover on Lower Ramparts, comprised of the original O'Connors (the clover-like plant in the center portion of the photo) now interspersed with drought tolerant weeds and grasses. Photo taken approximately ten feet due south of the Lower Ramparts vault (pictured in 3 above).



5) Upper Ramparts cap and vegetative cover (i.e. fairway, rough, and green) looking west. Photo taken at an elevation above and slightly to the northwest of the vapor treatment system, near the number six hole putting green. Note bunker in the foreground right. For reference, this area is the sixth hole of the "Lake Nine". The retaining wall pictured in 2 above is located to the left in this photo.



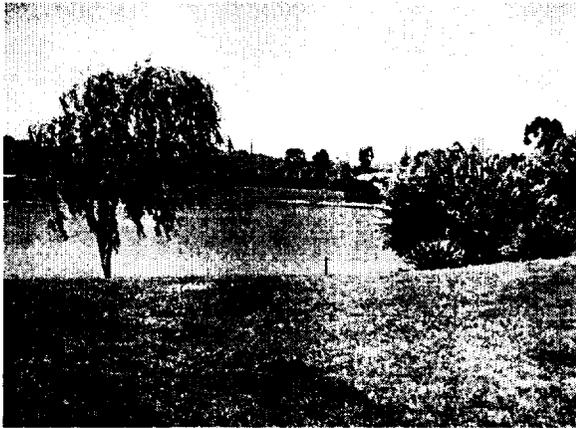
6) Lower Ramparts and the adjacent and downslope homes (located on Tiffany Place) as seen from Upper Ramparts looking southeast. Photo taken from the south side of the sixth fairway (of the Lake Nine) approximately 200 yards from the sixth tee, or at the approximate midpoint of the sixth fairway.



7) Signage. Photo taken at same location as 6 above, looking due south, or towards Lower Ramparts and Tiffany Place. Local rule mentioned on lower sign reads as follows on scorecard: "Environmentally Sensitive Areas - defined by red stakes with a green top. Proceed under Rule #26 as a lateral water hazard. Entering these areas for any reason, including looking for or playing a ball is strictly prohibited."



8) Pond at number 7 fairway of Lake Nine, located to the north of the number 6 hole and Upper Ramparts, looking to the northeast. Photo taken from the southwest corner of the pond, near and above the pond's outlet structure. Note this pond receives surface water drainage from offsite locations across Rosecrans Drive to the north. Rosecrans is the Site's northernmost boundary. Development is currently taking place across Rosecrans from the Site.



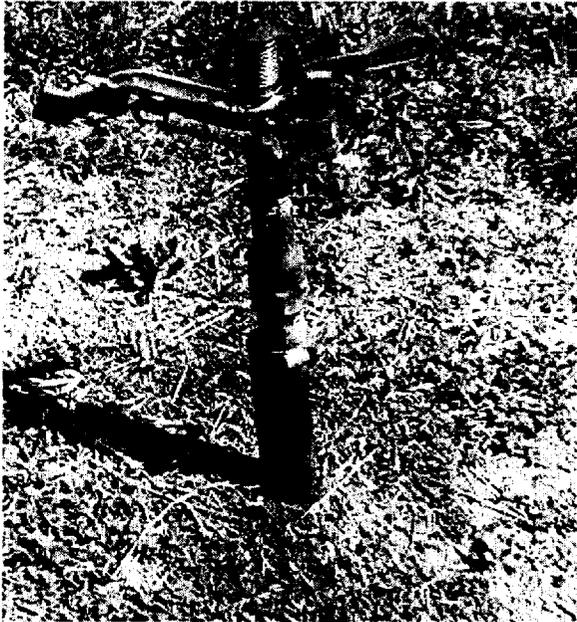
9) View of the Los Coyotes area of the Site, comprising portions of fairways 6 and 8 of the Lake Nine. Photo taken looking northeast from the westernmost edge of the Los Coyotes cap. Visible in the distance are two outlet structures, the one on the right serving as an overflow for the pond pictured in 8 above, the one on the left serving to convey surface water drainage from offsite, apparently from Ralph B. Clark Regional Park. The latter may represent a pre-existing seasonal drainage pathway.



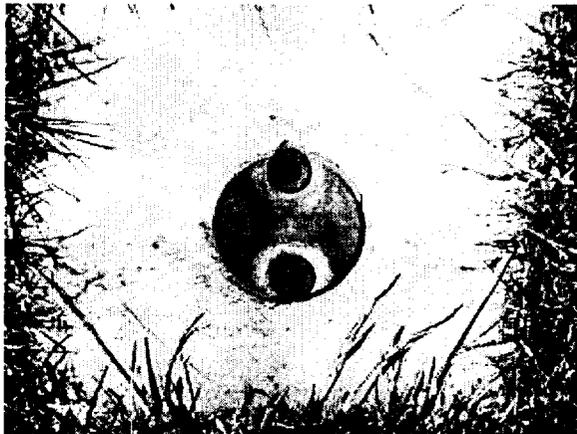
10) Piping material used in above-ground vegetative cover irrigation system, typical. Pipe is labeled as uv resistant. This section located on Los Coyotes cap.



11) Irrigation head, "rainbird" type, typical, used in vegetative cover irrigation system. This one located on Los Coyotes cap.



12) Settlement marker, typical, periodically surveyed to determine the extent of settlement of structures constructed as part of the Site remedy. This one located on Los Coyotes cap.



13) Vapor treatment system, looking east through the main gate. Photo taken directly in front of main gate at a distance of approximately 20 feet. Visible are the two GAC adsorbers, which are operated in series configuration. System has been operating successfully without odor complaints from local residents, the nearest of whom live along Sunny Ridge to the east, or Tiffany Place, to the south. Tetrahydrothiophenes, which are present in the collected vapors, would be readily detected by human sense of smell at part per billion levels.



ATTACHMENT 6  
List of Documents Reviewed

## LIST OF DOCUMENTS REVIEWED

C2REM, September 2002, 5-Year Review Comments, McColl Superfund Site

ICF Technology, Inc., May 1992, Baseline Public Health Evaluation, McColl Superfund Site

ICF Technology, Inc., August 1992, Final Letter Report on the RCRA-Equivalent Cap for the McColl Superfund Site

ICF Technology, Inc., November 1995, Baseline Public Risk Assessment for the McColl Superfund Site, Groundwater Operable Unit

McAuley LCX Corporation, September 2002, Re. McColl Five Year Review

Montgomery Watson Harza, April 2000, Vapor Analytical Results, O&M, McColl Superfund Site

Montgomery Watson Harza, May 2002, Groundwater Monitoring Report, Eleventh Semi-Annual Sampling Event

Montgomery Watson Harza, July 2002, McColl Superfund Site, Five Year Review Report

Montgomery Watson Harza, July 2002, McColl Superfund Site, Annual Reports, Years 2000 and 2001

Parsons Environmental Science, October 1997, Operations and Maintenance Plan at the McColl Superfund Site

Shell Oil Company, and McAuley LCX, November 1996, Settlement Agreement

State of California, Department of Toxic Substances Control, September 2002, Attachment A, DTSC Comments on the "Draft First Five Year Review Report", McColl Superfund Site

United States of America, and Shell Oil Company, June 2001, Status Report and Stipulation, United States District Court, Central District of California, Case No. CV 910589 RJK

United States Department of Justice, September 1999, Interim Settlement Agreement Regarding Refinery Acid Wastes at the McColl Superfund Site from Acid Treatment of Benzol

United States Environmental Protection Agency, June 1993, Record of Decision for the McColl Superfund Site, Source Operable Unit

United States Environmental Protection Agency, February 1996, Feasibility Study Report, Groundwater Operable Unit, McColl Site

United States Environmental Protection Agency, May 1996, Record of Decision, Groundwater Operable Unit, McColl Superfund Site

United States Environmental Protection Agency, June 1998, Superfund Closeout Report, McColl Superfund Site

United States Environmental Protection Agency, June 2002, U.S. EPA Announces Five-Year Milestone for the McColl Superfund Site Cleanup

ATTACHMENT 7A  
GROUNDWATER ARARs

The Groundwater OU Record of Decision (EPA, May 1996) identified chemical specific ARARs in the form of federal and state drinking water standards. The ROD did not identify any action specific or location specific ARARs. However, the Feasibility Study Report, Groundwater Operable Unit (EPA, February 1996), evaluated the full range of potential ARARs (see tables, attached).

The main performance criteria (as opposed to cleanup goal) selected in the ROD for evaluating the effectiveness of the remedy was not a state or federal drinking water standard, but a “PRG concentration of 3.6 ppb total THTs”.

The following crosswalk identifies changes to chemical specific ARARs that have taken place since the ROD was signed:

ARAR	STILL VALID?	CHANGES?
Federal Drinking Water Standards (MCLs) 40 CFR Part 141.60	Yes	Yes chloroform 80 ug/l <sup>1</sup> styrene 100 ug/l antimony 5 ug/l <sup>2</sup> arsenic 10 ug/l <sup>3</sup>
Federal Drinking Water Standards (MCLGs) 40 CFR Part 141.50	Yes	Yes styrene 100 ug/l antimony 0 ug/l <sup>4</sup>
State Drinking Water Standards 22 CCR §64431-64444.5	Yes	Yes chloroform 100 ug/l arsenic 10 ug/l

Since none of the above drinking water standards were selected as cleanup goals or performance criteria in the ROD, the new standards would not affect the outcome of the decision making process followed in the ROD.

Data collected since the signature of the ROD suggest that the THT performance criteria may not be optimal. Since federal and state drinking water standards were selected as chemical specific ARARs, it seems more appropriate that the effectiveness of the remedy be evaluated using these chemical specific standards. And although the ROD did not cite action specific ARARs, clearly there are a number of potentially applicable regulations which address the impact of continuing releases of hazardous waste with respect to the protection of drinking water source quality.

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<sup>1</sup>previously 100 ug/l

<sup>2</sup>previously 6 ug/l

<sup>3</sup>previously 50 ug/l

<sup>4</sup>previously 6 ug/l

**TABLE 2-1: SUMMARY OF POTENTIAL ARARs**  
**Feasibility Study**  
**McColl Site, Fullerton, California**

Type/Name of Potential ARAR	Citation	Description and Comments	Potentially Applicable or Relevant and Appropriate
<b>GROUND WATER CHEMICAL-SPECIFIC ARARs</b>			
Federal Drinking Water Standards  Maximum Contaminant Levels (MCLs)	40 CFR Part 141.60	Chemical-specific drinking water standards have been promulgated under the federal Safe Drinking Water Act (SDWA). These enforceable standards, which are termed Maximum Contaminant Levels (MCLs), are enforceable standards for public drinking water systems. In accordance with the National Contingency Plan (NCP), MCLs, or federal MCLGs above zero, generally will be the relevant and appropriate standards for ground water that is a current or potential source of drinking water, if these standards are relevant and appropriate to the circumstances of the release.	Potentially Relevant and Appropriate
Maximum Contaminant Level Goals (MCLGs)	40 CFR 141.50	Maximum Contaminant Level Goals (MCLGs) above zero are also considered chemical-specific ARARs under the NCP (40 CFR 300.430(e)(2)(i)(B)) for ground or surface waters that are current or potential sources of drinking water, where the MCLGs are relevant and appropriate under the circumstances of the release. When MCLGs are equal to zero (generally, for any chemical considered to be a carcinogen), the MCL is considered to be the chemical-specific ARAR, if the standard is relevant and appropriate under the circumstances of the release, instead of the MCLG (40 CFR 300.430(e)(2)(i)(C)).	Potentially Relevant and Appropriate

**TABLE 2-1. SUMMARY OF POTENTIAL ARARs**  
**Feasibility Study**  
**McColl Site, Fullerton, California**

Type/Name of Potential ARAR	Citation	Description and Comments	Potentially Applicable or Relevant and Appropriate
State Drinking Water Standards	22 CCR §64431-64444.5	California has under its Safe Drinking Water Act established enforceable primary drinking water standards. Although some of these California standards may not technically be ARARs, because they do not apply by law to ground water and are not specifically promulgated in implementation of the federal Safe Drinking Water Act, they are direct analogues of the federal MCLs and, as such, are considered chemical-specific ARARs for this Feasibility Study.	Potentially Relevant and Appropriate

**TABLE 2-1: SUMMARY OF POTENTIAL ARARs**  
**Feasibility Study**  
**McColl Site, Fullerton, California**

Type/Name of Potential ARAR	Citation	Description and Comments	Potentially Applicable or Relevant and Appropriate
<b>ACTION-SPECIFIC ARARs FOR MANAGEMENT OF EXTRACTED WATER</b>			
Discharge to Surface Water under NPDES Permit - Clean Water Act, WDRS	40 CFR Parts 122-125 23 CCR §§ 2200-2235.4	National Pollutant Discharge Elimination System (NPDES) substantive requirements (40 CFR Parts 122-125) and/or RWQCB Waste Discharge Requirements (WDRs) substantive requirements (23 CCR §§2200-2235.4) are ARARs for effluent discharge to surface waters. The effluent limitation requirements of an NPDES permit or a WDR are applicable to point source discharges from a treatment system with an outfall to surface waters or storm drains.	Potentially Applicable
Discharge to Publicly Owned Treatment Works	Section 307 of the Clean Water Act	Substantive requirements of the Federal Clean Water Act Pretreatment Standards (40 CFR Part 403) are ARARs for discharges of treated ground water to Publicly Owned Treatment Works (POTWs).	Potentially Applicable
Water Quality Control Plan for the Santa Ana Region, Santa Ana Forebay Sub-Basin	Water Code Sections 13140, 13240	The Basin Plan describes the water basins in the Region, establishes beneficial uses of ground and surface waters, establishes water quality objectives including narrative and numerical standards, establishes implementation plans to meet water quality objectives and protect beneficial uses, and incorporates statewide water quality control plans and policies.	Potentially Applicable

**TABLE 2-1. SUMMARY OF POTENTIAL ARARs**  
**Feasibility Study**  
**McColl Site, Fullerton, California**

Type/Name of Potential ARAR	Citation	Description and Comments	Potentially Applicable or Relevant and Appropriate
State Water Resources Control Board (SWRCB) Resolution 68-16 (Policy on Maintaining the High Quality of State Waters)	Water Code Section 13140, Clean Water Act regulations 40 CFR section 131.12.	<p>The resolution establish requirements for activities involving discharges of contamination directly into surface waters or groundwater (e.g., quality of pump and treat effluent into surface waters or groundwater).</p> <p>Substantive requirements established by the resolution include use of "best practicable treatment or control" for discharging the effluent.</p> <p>This regulation applies to remedial action activities that cause active discharges to surface waters or groundwater.</p>	Potentially Applicable

**TABLE 2-1. SUMMARY OF POTENTIAL ARARs**  
**Feasibility Study**  
**McColl Site, Fullerton, California**

Type/Name of Potential ARAR	Citation	Description and Comments	Potentially Applicable or Relevant and Appropriate
State Board Resolution No. 88-63 (Sources of Drinking Water Policy)	SWRCB Resolution No. 88-63	Resolution No. 88-63 has been incorporated into all Regional Board Basin Plans. The policy designates all ground and surface waters of the state as drinking water except where TDS is greater than 3000 ppm, the well yield is less than 200 gpd from a single well, the water is a geothermal resource or is a waste water conveyance facility, or the water cannot reasonably be treated for domestic use using either best management practices or best economically achievable treatment practice. SWRCB Resolution 88-63 applies in determining beneficial uses for waters that may be affected by discharges of waste. Further, Resolution No. 88-63 applies to all sites that may be affected by discharges of wastes to groundwater or surface water. As noted, the resolution specifies that, with certain exceptions, all groundwater and surface waters have beneficial use of municipal or domestic water supply. Consequently, California State primary MCLs are relevant and appropriate, however, the most stringent federal or state standard will be the ARAR for the remedial action.	Potentially Applicable

**TABLE 2-1. SUMMARY OF POTENTIAL ARARs**  
**Feasibility Study**  
**McColl Site, Fullerton, California**

Type/Name of Potential ARAR	Citation	Description and Comments	Potentially Applicable or Relevant and Appropriate
State Board Resolution No. 92-49 (Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 133040)	Water Code Section 13307, SWRCB Resolution 92-49	<p>Resolution 92-49 establishes policies and procedures for the oversight of investigations and cleanup and abatement activities resulting from discharges of waste which affect or threaten water quality.</p> <p>Section IIIG directs the Water Boards to ensure dischargers clean up and abate the "effects" of discharges in a manner promoting attainment of either background water quality or the best reasonable water quality if background quality is not feasible (feasibility determined by factors listed in Section IIIG and 23 CCR Chapter 15, Section 2550.4). Minimum water standards must be protective of beneficial use.</p> <p>Section IIIG directs the Water Board to apply 23 CCR Chapter 15, Section 2550.4 in approving any alternative cleanup levels less stringent than background quality.</p> <p>Subject to the limitations described above, this requirement is relevant and appropriate for establishing levels for effects to surface and groundwater quality caused by releases of hazardous substances.</p>	Potentially Relevant and Appropriate
Discharge through Injection/Reinjection - Federal Underground Injection Code	40 CFR 144	Regulations governing underground injection are applicable, if treated ground water is reinjected. The Federal Safe Drinking Water Act requires an Underground Injection Control (UIC) permit which, in California, is administered by the EPA for wells not related to oil and gas activities. The UIC regulations allow injection of ground water that has been treated and is being reinjected into the same formation from which it was withdrawn, subject to EPA approval of the reinjection as a CERCLA remedial action (40 CFR 144.13(c)).	Potentially Applicable

**TABLE 2-1: SUMMARY OF POTENTIAL ARARs**  
**Feasibility Study**  
**McColl Site, Fullerton, California**

Type/Name of Potential ARAR	Citation	Description and Comments	Potentially Applicable or Relevant and Appropriate
California Toxic Injection Well Control Act	Health and Safety Code, Division 20, Chapter 6.5, §25159.1-25159.25	The California Toxic Injection Well Control Act exempts from regulation reinjection into the same formation from which the water was drawn if the reinjection is conducted as an approved remedial action for the purpose of improving the quality of the ground water in the formation (California Health and Safety Code Section 25159.24(a)).	Potentially Applicable
Federal Ambient Water Quality Criteria	33 U.S.C. 1314(a)	Section 304(a)(1) of the federal Clean Water Act requires EPA to publish and periodically update ambient water quality criteria. These criteria present scientific knowledge on the identifiable effects of pollutants on public health and welfare, aquatic life, and recreation which can be useful to derive regulatory requirements based on water quality impacts. These criteria are not rules and they do not have federal regulatory impact. A water quality criterion has regulatory impact only if it has been adopted in a state water quality standard. The latest cumulative publication of these criteria is "Quality Criteria for Water, 1986." EPA notices the availability of water quality criteria in the Federal Register.	Potentially Applicable
<b>ACTION-SPECIFIC ARARS FOR HAZARDOUS WASTE GENERATION, IDENTIFICATION, TRANSPORTATION AND DISPOSAL</b>			
California Hazardous Waste Control Act	Health and Safety Code, Division 20, Chapter 65, §25100 et seq.	The State of California has been authorized by EPA to implement the hazardous waste program within California by implementing and enforcing the California hazardous waste regulations in lieu of the federal RCRA regulations. Therefore, the California hazardous waste regulations, and not the federal hazardous waste regulations, generally are potential ARARs. The statutory basis for California's hazardous waste program is at California Health & Safety Code §25100 et. seq.	Potentially Applicable

**TABLE 2 . . SUMMARY OF POTENTIAL ARARs**  
**Feasibility Study**  
**McColl Site, Fullerton, California**

Type/Name of Potential ARAR	Citation	Description and Comments	Potentially Applicable or Relevant and Appropriate
Hazardous Waste Identification	22 CCR 66261.10 et seq.	The hazardous waste toxicity characteristic leaching procedure (22 CCR 66261.24) and the California Soluble Threshold Limit Concentrations (STLCs) and Total Threshold Limit Concentrations (TTLCs) are applicable for determining whether treatment residuals (e.g., spent carbon) or drilling wastes, etc. are to be classified as a hazardous waste.	Potentially Applicable
Hazardous Waste Generation	22 CCR 66262.10 et seq.	The substantive provisions of California regulations relating to generators of hazardous waste are potential ARARs if hazardous wastes are generated during the remedial process.	Potentially Applicable
Hazardous Waste Transportation	40 CFR Part 263 49 CFR Part 171-79 Calif. Health and Safety Code §25167.1 Calif. Vehicle Code §32000; 13 CCR §1160	Both federal and state regulations govern transportation of hazardous wastes (see 40 CFR Part 263, 49 CFR Parts 171-179, California Hazardous Waste Haulers Act, California Health and Safety Code §§25167.1 et seq., California Vehicle Code §32000 et seq., 13 CCR §1160 et seq. and other code requirements cited therein). These requirements are applicable to off-site transportation of treatment residuals or drilling wastes, etc. that are classified as hazardous wastes.	Potentially Applicable

**TABLE 2-... SUMMARY OF POTENTIAL ARARs**  
**Feasibility Study**  
**McColl Site, Fullerton, California**

Type/Name of Potential ARAR	Citation	Description and Comments	Potentially Applicable or Relevant and Appropriate
Hazardous Waste Treatment, Storage and Disposal	22 CCR 66264.1 et seq.	The substantive provisions of the California hazardous waste regulations that relate to hazardous waste treatment, storage, and disposal (TSD) facilities would be potential ARARs if the remedial action involves the activities addressed by these regulations, such as the on-site treatment of hazardous wastes. Regulations relating to the off-site disposal or treatment of hazardous wastes are also potential ARARs. For example, hazardous waste regulations apply to the incineration of spent activated carbon in a hazardous waste incinerator. Land disposal restrictions may be applicable to the disposal of treatment residuals or drilling wastes, etc., that are classified as hazardous waste. If land disposal restrictions are applicable, the wastes must be treated using prescribed methods prior to land disposal or a treatability variance must be obtained.	Potentially Applicable
<b>ACTION-SPECIFIC ARARS FOR AIR EMISSIONS</b>			
South Coast Air Quality Management District (SCAQMD) Standards		District standards regulate the discharges of organic compounds to the atmosphere through air stripping operations during removal of organic compounds from groundwater.	Potentially Applicable
SCAQMD	Rule 401- Visible Emissions	This rule limits any visible emissions from any single source to less than Ringleman No. 1 or 20 percent opacity for 3 minutes in any hour.	Potentially Applicable

**TABLE 2-1: SUMMARY OF POTENTIAL ARARs**  
**Feasibility Study**  
**McColl Site, Fullerton, California**

Type/Name of Potential ARAR	Citation	Description and Comments	Potentially Applicable or Relevant and Appropriate
SCAQMD	Rule 402- Nuisance	This rule prohibits the discharge of any air contaminant or other material (including odorous compounds) that causes injury or annoyance to the public, endangers the comfort, repose, health or safety of the public or cause damage to business or property. In general, a notice of violation may be issued upon receipt of six verified complaints or for any property damage or personal injury.	Potentially Applicable
SCAQMD	Rule 403- Fugitive Dust	This rule limits on site activities so that the concentrations of fugitive dust at the property line shall not be visible. In addition, PM10 levels shall not exceed 50 micrograms per cubic meter as determined by the difference in upwind and downwind samples collected on high volume particulate matter samplers. These requirements do not apply if the wind gusts exceed 25 miles per hour. The rule also requires every reasonable precaution to minimize fugitive dust and the prevention and cleanup of any material accidentally deposited on paved streets. This rule shall not apply during life-threatening situations or during a declared disaster or state of emergency.	Potentially Applicable
SCAQMD	Rule 404- Particulate Matter	This rule limits equipment from discharging particulate emissions in excess of 0.01 to 0.195 grain per cubic foot based on a given volumetric (dry standard cubic feet per minute) exhaust gas flow rate averaged over one hour or one cycle of operation. It excludes steam generators or gas turbines.	Potentially Applicable
SCAQMD	Rule 407- Liquid and Gaseous Air Contaminants	This rule limits equipment for discharging carbon monoxide emissions in excess of 2000 ppm and sulfur dioxide emissions of 500 ppm or greater averaged over 15 minutes. It excludes stationary internal combustion engines, propulsion of mobile equipment or emergency venting.	Potentially Applicable

**TABLE 2-1: SUMMARY OF POTENTIAL ARARs**  
**Feasibility Study**  
**McColl Site, Fullerton, California**

Type/Name of Potential ARAR	Citation	Description and Comments	Potentially Applicable or Relevant and Appropriate
Other Potential Air Emission Standards Applicable to Treatment Units	40 CFR 61 40 CFR 51	<p>The National Emissions Standards for Hazardous Air Pollutants (NESHAPS codified at 40 CFR Part 61) have not been established for any activities associated with proposed remedial alternatives. The SCAQMD reviews toxic air contaminants as part of its permitting process.</p> <p>National Ambient Air Quality Standards (NAAQS) and state standards have been established for ozone. The SCAQMD has not attained the federal ozone standards and is subject to the nonattainment new source review standards set forth in 40 CFR Part 51. The SCAQMD has also not attained state ozone standards. Certain VOCs emitted by an air stripper are ozone precursors. Limits on VOC emissions consistent with the federal new source review requirements in ozone nonattainment areas and stricter local regulations are enforced as part of the SCAQMD permit review process under its air permit regulations.</p> <p>In addition, the SCAQMD regulates releases of certain identified or potential air toxics at levels determined to be "appropriate for review." In some cases, a risk assessment must be performed as part of a SCAQMD permit application.</p>	Potentially Applicable

**TABLE 2-2: SUMMARY OF TO BE CONSIDERED (TBC) CRITERIA**  
**Feasibility Study**  
**McColl Site, Fullerton, California**

Name of TBC Criterion	Citation	Description and Comments
California Department of Health Services (DHS) Action Levels (ALs) for Drinking Water	Published October 24, 1990 and updated by memorandum November 10, 1994	As interim guidance for "safe" levels of chemicals in drinking water, ALs serve as non-enforceable health-based guidance set by the California DHS.
Preliminary Remediation Goals (RPGs)		THT compounds have the potential to cause an aesthetic impact on water supply at very low concentrations due to their organoleptic properties (primarily taste and odor). For this reason, EPA has determined that THT compounds are "to be considered" in evaluating remedy selection and that site and concentration-specific PRGs will be determined, in conjunction with the State, when additional data relating to THT compounds become available.
Proposed MCLs		Proposed MCLs are drinking water criteria which have been proposed by federal EPA, but which have not been promulgated as MCLs.
EPA Health Advisories and Reference Doses (RFDs)		EPA health advisory levels are nonenforceable levels which present concentrations at which no adverse health effect is expected over a lifetime of consuming an assumed volume of 2 liters per day of drinking water. For carcinogens, the health advisory levels are typically set at a lifetime cancer risk level of $1 \times 10^{-6}$ due to the ingestion of the specific constituent in an environmental medium. Reference doses (RFDs) are daily exposure levels for noncarcinogens which, during the lifetime of a human, appear to be without appreciable risk. RFDs specific to water ingestion are also referred to as Drinking Water Equivalent Levels (DWELs).
Maximum Concentration of Constituents for Groundwater Protection Resulting from Solid Waste Management Units (SWMUs) under the Resource Conservation and Recovery Act	40 CFR 264.94	Maximum constituent concentrations identified by the Agency are the levels below which the EPA is unlikely to require active remediation of releases and provide a point of reference for suggesting and supporting alternative remedial levels.

**TABLE 2-2: SUMMARY OF TO BE CONSIDERED (TBC) CRITERIA**  
**Feasibility Study**  
**McColl Site, Fullerton, California**

**Privileged and Confidential**  
**Attorney Work Product**

Name of TBC Criterion	Citation	Description and Comments
Discharge of Extracted Ground Water from Ground Water Cleanup Projects	SWRCB Resolution 89-21	The SWRCB requires Regional Boards to consider reclamation options and POTW discharge before adopting an NPDES permit authorizing discharge of extracted ground water to surface water.
California Department of Water Resources Well Standards	Bulletin 74-90	Well standards of the California Department of Water Resources (Bulletin 74-90) are TBCs.
EPA's Office of Ground Water Protection (OGWP) Ground Water Classification System		Under the OGWP guidelines, ground water is classified as Class I, II, or III, based upon ecological importance, replaceability, and vulnerability considerations. Class I ground water is ground water that is irreplaceable, currently used by a substantial population, or supports an ecologically vital habitat. Class II ground water is currently or potentially a drinking water source. Class III ground water is ground water that is not potable due to poor quality or quantity. The interim guidance is not an ARAR, but is a statement of EPA policy to be considered when setting goals for ground water remediation.
Control of Air Emissions from Superfund Ground Water Air Strippers at Superfund Ground Water Sites	EPA Office of Solid Waste and Emergency Response (OSWER) Directive 9355.0-28 (June 15, 1989)	This memorandum establishes guidance on the control of air emissions from air strippers used at Superfund sites for ground water treatment and establishes procedures for implementation.
County of Orange, Health Care Agency Well Construction and Destruction Permit	County of Orange, Ordinance No. 2607	Well standards for the County of Orange are TBCs.

ATTACHMENT 7B  
SOURCE ARARs

Appendix C of the Source OU ROD (EPA, June 1993) lists numerous chemical specific, action specific, and location specific ARARs (see attached). Based upon EPA's review, these ARARs remain valid. Minor changes to some regulations and standards have taken place since the Source OU ROD was signed.

Under the State of California's Hazardous Waste Control Act (22 CCR 66261.1 - .126), STLCs and TTLCs (chemical specific ARARs) have been revised for chromium, a COPC at the Source OU, as follows (note that the ARAR used to apply to total chromium but now has been further divided to differentiate chromium VI):

COMPOUND	OLD STLC	NEW STLC	OLD TTLC	NEW TTLC
total chromium	560 mg/l	-----	2500 mg/l	-----
chromium VI	-----	5 mg/l	-----	500 mg/l
chromium and/or chromium III	-----	5 mg/l	-----	2500 mg/l

Changes in these values do not alter the decision making process in the ROD.

EPA's review does not call into question any of the ARARs selected in the ROD.

With respect to the action specific ARARs pertaining to environmental monitoring (under the State of California's Hazardous Waste Control Act, 22 CCR § 66264.700, and under the South Coast Air Quality Management District's rules and regulations), implementation of the remedy could be improved by the development of a compliance monitoring plan. There is currently no ongoing program to monitor emissions from the vapor treatment system, or to monitor the vapor ports exterior to the waste closure system. Since the remedy does comply with action specific design requirements, and since qualitative monitoring measures confirm that the wastes are being contained, this issue does not alter EPA's conclusion that the remedy remains protective.

# **APPENDIX C**

Tables of Applicable, Relevant, and Appropriate Requirements

FEDERAL ARARs																										
Requirement		Description		A	RA																					
CHEMICAL SPECIFIC	I. Resource Conservation and Recovery Act (RCRA) as amended by Hazardous and Solid Waste Amendments (HSWA) (42 USC 6901 et seq.)	<p>RCRA is the federal law providing requirements for hazardous waste management including criteria for the identification of hazardous waste and specific standards for the design, operation, and closure of hazardous waste treatment, storage, or disposal units and facilities. RCRA requirements are generally applicable to CERCLA actions when the following conditions are met:</p> <p>(1) the waste meets the RCRA criteria for a listed hazardous waste or a characteristic hazardous waste, and</p> <p>(2) the waste is treated, stored or disposed (as defined in 40 CFR 260.10) after the effective date of the RCRA requirement.</p>																								
	A. Characteristics of Hazardous Waste (40 CFR 261.24)	<p>RCRA identifies a solid waste as a hazardous waste if it exhibits the characteristic properties of ignitability, reactivity, toxicity, or for liquid or aqueous wastes, corrosivity. Based on available data, untreated McColl wastes are expected to exhibit characteristic corrosivity and toxicity. The RCRA toxicity characteristic is based upon the leachability of designated constituents as measured by the Toxicity Characteristic Leaching Procedure (TCLP). Specific chemicals present at McColl which are currently included in the toxicity criteria are:</p> <table border="1"> <thead> <tr> <th>Chemical</th> <th>EPA HW No.</th> <th>TCLP Maximum Concentration (mg/l)</th> </tr> </thead> <tbody> <tr> <td>Arsenic</td> <td>D004</td> <td>5.0</td> </tr> <tr> <td>Barium</td> <td>D005</td> <td>100.0</td> </tr> <tr> <td>Cadmium</td> <td>D006</td> <td>1.0</td> </tr> <tr> <td>Chromium</td> <td>D007</td> <td>5.0</td> </tr> <tr> <td>Lead</td> <td>D008</td> <td>5.0</td> </tr> <tr> <td>Benzene</td> <td>D018</td> <td>0.5</td> </tr> </tbody> </table>		Chemical	EPA HW No.	TCLP Maximum Concentration (mg/l)	Arsenic	D004	5.0	Barium	D005	100.0	Cadmium	D006	1.0	Chromium	D007	5.0	Lead	D008	5.0	Benzene	D018	0.5	X	
	Chemical	EPA HW No.	TCLP Maximum Concentration (mg/l)																							
Arsenic	D004	5.0																								
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Cadmium	D006	1.0																								
Chromium	D007	5.0																								
Lead	D008	5.0																								
Benzene	D018	0.5																								
B. Groundwater Maximum Concentration Limits (40 CFR 264.94)	<p>Groundwater in the upper-most aquifer underlying a hazardous waste management unit should not exceed the RCRA maximum contaminant levels (MCLs). Chemicals at McColl that have RCRA MCLs are listed below in mg/l.</p> <table border="1"> <thead> <tr> <th>Chemical</th> <th>MCL (mg/l)</th> </tr> </thead> <tbody> <tr> <td>Arsenic</td> <td>0.05</td> </tr> <tr> <td>Barium</td> <td>1.0</td> </tr> <tr> <td>Cadmium</td> <td>0.01</td> </tr> <tr> <td>Chromium</td> <td>0.05</td> </tr> <tr> <td>Lead</td> <td>0.05</td> </tr> </tbody> </table>		Chemical	MCL (mg/l)	Arsenic	0.05	Barium	1.0	Cadmium	0.01	Chromium	0.05	Lead	0.05		X										
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FEDERAL ARARs				
Requirement		Description	A	RA
CHEMICAL SPECIFIC	B. Groundwater Maximum Concentration Limits (40 CFR 264.94) (continued)	This requirement is included for use in the groundwater monitoring program to be maintained as part of the post-closure care. It is not intended to define an ARAR for groundwater remedial action because this analysis does not address the groundwater operable unit. The requirement is not applicable because they do not include hazardous waste management units; however, the requirement is considered well suited for use in monitoring the effectiveness of the closure actions and is therefore considered to be relevant and appropriate.		
	III. Clean Air Act (CAA) (42 USC 7401 et seq.)  National Emission Standards for Hazardous Air Pollutants (NESHAPs)  A. Fugitive Emissions Sources (40 CFR 61.240)	This regulation controls fugitive emissions of volatile hazardous air pollutants (VHAP) from equipment including: pumps, compressor pressure relief devices, sampling connection systems, open-ended valves or lines, valve, flanges and other connectors, product accumulator vessels and control devices or systems. Standards given in the regulation are for equipment that either contains or contact a liquid or gas that is at least 10% by weight VHAP, defined as regulated substances including benzene and vinyl chloride.		X
	B. Benzene Waste Operation Standards: Surface Impoundments (40 CFR 61.344)	Owners or operators of chemical manufacturing plants, coke by-product recovery plants, petroleum refineries, or RCRA-permitted 'hazardous waste facilities that treat, store, or dispose of hazardous waste (TSDFs) from these three types of facilities must comply with benzene emission standards if they manage a total quantity of benzene in excess of 10 megagrams per year (11 tons/year). These standards include general treatment and operation requirements and specific requirements for surface impoundments (defined as waste management units containing liquids wastes or wastes with free liquids), tanks, containers, and oil-water separators. The surface impoundment operation standard requires that the unit be equipped with a cover that does not release detectable emissions as indicated by an instrument reading less than 500 ppmv above background. These requirements are not applicable to McColl actions because the alternative does not use a surface impoundment as the disposal unit.		X

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FEDERAL ARARs					
		Requirement	Description	A	RA
CHEMICAL SPECIFIC		B. Benzene Waste Operation Standards: Surface Impoundments (40 CFR 61.344)	The requirements are considered relevant to actions at McColl because they regulate emissions of benzene (which is a significant contaminant at McColl), from surface impoundments covers which are similar to units proposed under the McColl alternative. Benzene is also derived from petroleum refinery waste. In addition, the requirements are considered appropriate because their objective is to limit benzene emissions to the level established as acceptable under the Clean Air Act regulations.		
	LOCATION SPECIFIC	I. RCRA Location Standards (40 CFR 264.18)	Portions of new facilities where treatment, storage, or disposal of hazardous waste will be conducted must not be located within 61 meters (200 feet) of a fault which has had displacement in Holocene time. Facilities located in a 100-year floodplain must be designed, constructed, operated and maintained to prevent washout of hazardous waste by a 100-year flood.  These RCRA requirements are a considered relevant and appropriate because their intent, controlling the release of hazardous constituents into the environment due to special environmental conditions, is well suited to the in situ treatment and closure activities.		X
ACTION SPECIFIC		I. RCRA  A. Permitted Hazardous Waste Facilities (40 CFR 264)	As previously discussed, RCRA Subtitle C requirements may be applicable to CERCLA actions if the CERCLA hazardous substance is also a RCRA hazardous waste, and the CERCLA action constitutes waste treatment, storage, or disposal as defined by RCRA. RCRA storage requirements are applicable to waste storage after the effective date of November 19, 1980. RCRA treatment requirements are applicable to any method, technique, or process, including neutralization to change the character or composition of hazardous waste to render it less hazardous. RCRA disposal includes placement of hazardous waste into a landfill, surface impoundment or other management unit. Capping waste in place or processing waste in situ to improve structural stability generally do not constitute treatment or disposal.  Requirements for permitted facilities are generally applicable to facilities that either treat, store, or dispose (TSD) of hazardous waste. The alternative includes some degree of waste handling. However, the specific TSD requirements are not uniformly applicable or relevant and appropriate to all CERCLA actions at McColl.		

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FEDERAL ARARs				
	Requirement	Description	A	RA
ACTION SPECIFIC	I. RCRA (continued)			
	A. Permitted Hazardous Waste Facilities (40 CFR 264) (continued)			
	1. Groundwater Protection (40 CFR 264.90-264.99)	<p>There are three types of groundwater monitoring required under Subpart F: detection monitoring, compliance monitoring and corrective action monitoring. The groundwater monitoring program must be designed and operated to verify that hazardous constituents have not migrated beyond the outer containment layer prior to the end of post-closure care. The regulations are applicable to "regulated units" which are surface impoundments, waste piles, landfills, and land treatments units that receive hazardous wastes after July 26, 1982.</p> <p>However, under RCRA, the Regional Administrator can exempt a facility under the conditions that the unit does not contain or receive waste containing free liquid, is designed to prevent infiltration of rainwater and groundwater, and is an engineered structure with inner and outer containment and leak detection. The alternative would include either leaving or disposing treated or untreated waste in the ground. Therefore groundwater monitoring requirements are well suited for assuring the effective protection of the alternatives and is therefore considered relevant and appropriate.</p>		X
2. Closure and Post-Closure (40 CFR 264.110 - 120)	<p>Closure requires minimization of need for further maintenance; control; minimization or elimination of post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products; and disposal or decontamination of equipment, structures, and soils. Closure and post-closure requirements are well-suited and thus relevant and appropriate.</p>		X	
3. Land Treatment Unsaturated Zone Monitoring (40 CFR 264.278)	<p>Where wastes are not removed from the regulated units, and are not eventually disposed in a RCRA-equivalent landfill, vadose zone (unsaturated zone) monitoring requirements, that require monitoring of soil and soil-pore liquids as feasible to determine whether hazardous constituents are migrating, are relevant. This requirement should be considered appropriate to the extent that a remedial design can feasibly incorporate vadose zone monitoring.</p>		X	

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FEDERAL ARARs				
	Requirement	Description	A	RA
ACTION SPECIFIC	4. Surface Impoundments (40 CFR 264.220-264.228)	Closure with waste in place (capping) uses Closure and Post Closure requirements, and elimination or solidification of free liquids; stabilization of remaining waste and waste residues to support cover installation of a final cover to provide long term minimization of infiltration and monitoring and maintenance for at least 30 years after closure. In addition, landfill closure and post closure requirements are used (see immediately above).		X
	II. Clean Water Act (CWA)  A. National Pollutant Discharge Elimination System (NPDES) (40 CFR 122-125)	Both on-site and off-site discharges from CERCLA sites to surface waters are required to meet the substantive CWA NPDES requirements, including discharge limitations, monitoring requirements, and best management practices. Only off-site CERCLA discharges to surface waters must be NPDES-permitted. Stormwater runoff from the site that is channeled to a receiving water body is included under this requirement.	X	

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STATE ARARs																															
	Requirement	Description	A	RA																											
CHEMICAL SPECIFIC	I. Hazardous Waste Control Act (HWCA) (Health and Safety Code Section 25100-25395)  A. Criteria for Identifying Hazardous Waste (22CCR, 66261.1-66261.126)	<p>HCWA provides the state law for the management of hazardous waste including the state criteria for the identification of hazardous waste and standards for the design, operation and closure of hazardous waste treatment, storage and disposal facilities. While this program closely parallels the federal RCRA program it contains some components with requirements in excess or more stringent than RCRA.</p> <p>The Cal-EPA Department of Toxic Substance Control (DTSC) defines hazardous waste according to any of the following criteria.</p> <p>Toxicity Criteria: Toxicity of hazardous waste is established by LD<sub>50</sub> or LC<sub>50</sub> criteria.</p> <p>Persistent and Bioaccumulative Toxic Substances: Total Threshold Limit Concentrations (TTLCs) and Soluble Threshold Limit Concentrations (STLCs) have been established to identify hazardous waste. STLCs and TTLCs are not identified for organics found on site. Those chemicals identified at McColl are listed below:</p> <table border="1"> <thead> <tr> <th>Chemical</th> <th>STLC (mg/l)</th> <th>TTLC (mg/kg)</th> </tr> </thead> <tbody> <tr> <td>Arsenic</td> <td>5</td> <td>500</td> </tr> <tr> <td>Barium</td> <td>100</td> <td>10,000 (excludes Ba SO<sub>4</sub>)</td> </tr> <tr> <td>Chromium (total)</td> <td>560</td> <td>2,500</td> </tr> <tr> <td>Copper</td> <td>25</td> <td>2,500</td> </tr> <tr> <td>Lead</td> <td>5</td> <td>1,000</td> </tr> <tr> <td>Nickel</td> <td>20</td> <td>2,000</td> </tr> <tr> <td>Vanadium</td> <td>24</td> <td>2,400</td> </tr> <tr> <td>Zinc</td> <td>250</td> <td>5,000</td> </tr> </tbody> </table> <p>Corrosivity Criteria: If, when mixed with an equivalent weight of water, a liquid is produced which corrodes steel according to EPA test method 1110 SW-846, it is a hazardous waste.</p> <p>Extremely Hazardous Wastes: TTLCs have been established for extremely hazardous persistent and bioaccumulative toxic substances. TTLCs for McColl waste constituents are limited to arsenic at 50,000 mg/kg.</p> <p>List of Special Wastes: These include bag house and scrubber waste such as from APCDs, and drilling muds from oil and gas wells.</p>	Chemical	STLC (mg/l)	TTLC (mg/kg)	Arsenic	5	500	Barium	100	10,000 (excludes Ba SO <sub>4</sub> )	Chromium (total)	560	2,500	Copper	25	2,500	Lead	5	1,000	Nickel	20	2,000	Vanadium	24	2,400	Zinc	250	5,000	X	
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	I. Porter-Cologne Water Quality Act (WC 13000-13806) as administered by the Water Resources Control Board (WRCB) and the Regional Water Quality Control Board (RWQCB) (23 CCR 2510-2836).	<p>New waste management units shall have a 61 meter (200-foot) setback from any known Holocene earthquake fault (23 CFR 2531). The location standards are relevant and appropriate because their intent is to prevent the release of hazardous waste through unusual environmental events.</p>		X																											

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**STATE ARARs**

Requirement		Description	A	RA
<b>LOCATION SPECIFIC</b>  1. Porter-Cologne Water Quality Act (continued)		New and existing hazardous waste management units shall be immediately underlain by natural geologic materials with a permeability of not more than 10 <sup>-7</sup> cm/sec and shall not be located where porous soil could impair the ability of natural geologic materials to act as a barrier to vertical fluid movement. New and existing Class I units (hazardous waste management units) shall also be located outside of floodplains subject to inundation by floods with a 100-yr return period (23 CFR 253.1). Alternatives to these standards may be considered under certain conditions if the standard is not feasible and the alternative is consistent with the performance goal and affords equal protection against water quality impairment. (See 23 CFR 2510 for specific conditions under which alternatives may be considered).	X	
<b>ACTION SPECIFIC</b>  1. Hazardous Waste Control Act (HWCA) (Health and Safety Code Section 25100-25395). A. General Facility Standards for Interim Status and Permitted Facilities (22CCR 66264.10) B. Environmental Monitoring for Interim Status and Permitted Facilities (22 CCR, 66264.700) C. Closure and Post-Closure for Interim Status and Permitted Facilities. (22 CCR, 66264.110-66264.120) 1. Closure		These general standards include requirements for waste analyses, facility security and inspection, training of personnel, requirements for handling ignitable, reactive or incompatible wastes, as well as seismic and precipitation design standards. These requirements are considered relevant and appropriate because waste is left at the site.  This article contains the requirements for the environmental monitoring of air, soil, and water for on-site facilities that treat, store, or dispose of hazardous waste. General requirements include a provision for groundwater monitoring. The requirement of environmental monitoring is considered relevant and appropriate because waste is left at the site.  A facility shall be closed in a manner that minimizes the need for further maintenance and controls, minimizes, or eliminates post-closure escape of hazardous waste, leachate, contaminated rainfall, or waste decomposition products to the ground or surface waters or the atmosphere. Closure shall be completed within 90 days after receiving the final volume of hazardous waste. When closure is completed, all facility equipment and structures shall be properly disposed of, or decontaminated by removing all hazardous waste and residues.		X

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STATE ARARs				
	Requirement	Description	A	RA
LOCATION SPECIFIC	C. Closure and Post-Closure for Interim Status and Permitted Facilities (continued)  2. Post Closure/Waste Left in Place	At facilities where hazardous waste will remain after closure, post-closure care shall continue for 30 years after the date of completing closure and shall consist of at least monitoring and reporting and maintenance, post-closure care and monitoring of waste containment systems. The requirement is relevant and appropriate for the monitoring and containments used for the untreated waste left in place and the wastes treated in situ.		X
	D. Surface Impoundments, Closure and Post Closure (22 CCR, 66264.220-66264.228)	If it can be demonstrated that nonliquid hazardous waste or contaminated subsoil can remain at a closed surface impoundment without posing a significant hazard to water quality, public health, or the environment, material can be left in place and closed. The soil and soil-pore liquid should be monitored to determine whether hazardous constituents migrate out of the treatment zone. Such monitoring would include use of soil cores and soil-pore liquid monitoring. Closure of a permitted surface impoundment is not directly applicable to the proposed CERCLA actions at McColl; however, the requirement for soil monitoring is well-suited because untreated or treated waste is left at the site.		X
ACTION SPECIFIC	II. Porter-Cologne Water Quality Act (WC 13000-13806) as administered by the State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Board (RWQCB) under CCR Title 23, Chapter 15, 1050-2836.	The Porter-Cologne Water Quality Act gives the state broad statutory authority to protect water quality by regulating waste disposal and requiring hazardous waste cleanup. Regulations implementing monitoring and corrective action are also applicable to "persons responsible for discharges at waste management units which are closed, abandoned, or inactive on the effective date of the regulations," meaning that the SWRCB and the RWQCB have jurisdiction over waste disposal sites abandoned prior to the enactment of requirements (§ 2510.(g)). Porter-Cologne delegates standard-setting authority to the RWQCBs. Santa Ana RWQCB will not dictate specific treatment alternatives but will require that the alternative meet minimum action levels and perform at a level near the Best Available Technology (BAT).		
	A. Water Quality Monitoring for Classified Waste Management Units (23 CCR 2550)	This regulation requires monitoring to detect leaks from waste management units and a corrective action program if leaks are detected. A waste management unit is broadly defined as an area of land where hazardous, designated, or nonhazardous waste is discharged. Owners and operators of new or existing landfills and surface impoundments shall monitor groundwater, surface water and the unsaturated zone as feasible. These requirements remain applicable through the post-closure period.	X	

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STATE ARARs				
	Requirement	Description	A	RA
ACTION SPECIFIC	B. Discharges of Waste to Land, Construction and Operation Requirements for Hazardous Waste Management Units (23 CCR 2510-2601).	<p>The Porter-Cologne Water Quality Act provides the SWRCB and the RWQCB with specific authority to regulate hazardous waste management units including the design, construction, operation and closure of landfills and surface impoundments. The regulations distinguish between new units and units in existence before the effective date of the regulations, but the act provides authority to regulate both new and existing units to protect the quality of state waters. Specific requirements for hazardous waste management units include the following:</p> <ul style="list-style-type: none"> <li>• New and existing landfills must be sited or operated to ensure that wastes will be a minimum of 5 feet above the highest anticipated elevation of groundwater.</li> <li>• New units must be designed to withstand the maximum credible earthquake.</li> <li>• Cutoff walls are required where there is a potential for lateral movement of fluid; the walls must be constructed a minimum of 5 feet into natural geologic material with a permeability of <math>10^{-7}</math> cm/s or less.</li> <li>• Landfills construction must include a clay liner at least 2 feet thick, of 90% relative compaction and maximum permeability of <math>1 \times 10^{-7}</math> cm/s.</li> <li>• Landfills construction must include a synthetic liner at least 40 millimeter thick.</li> <li>• A blanket type leachate collection and removal system must be constructed directly above underlying containment features for landfills and between liners for surface impoundments.</li> <li>• New and existing units must be closed with 2 feet of foundation material, 1 foot of compacted top soil (permeability equal to the bottom liner), and the final cover must be graded to prevent ponding or erosion.</li> <li>• Post-closure care including monitoring, leachate collection, and cover maintenance must continue for as long as wastes present a threat to water quality.</li> </ul> <p>These requirements are generally applicable. If treatment would render the McColl waste nonhazardous, less stringent design standards for Class II or Class III waste management units would be applicable.</p>	X	

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STATE ARARs				
Requirement		Description	A	RA
ACTION SPECIFIC	III. South Coast Air Quality Management District (SCAQMD) Rules and Regulations	The South Coast Air Quality Management District has authority to implement the federal and state air quality management programs through the State Implementation Plan and the Rules and Regulations to comply with the Nonattainment Area Plan for the South Coast Air Basin. In general, SCAQMD Rules and Regulation are applicable to all actions at McColl; however, specific emission control requirements may have limited application to specific source units.		
	A. Regulation IV--Prohibitory Rules			
	1. Rule 401 - Visible Emissions	Limits visible emissions from any point source to Ringelmann No. 1 or 20 percent opacity for 3 minutes in any hour.	X	
	2. Rule 402 - Nuisance	Prohibits the discharge of any material (including odorous compounds) that causes injury, or annoyance to the public, property, or businesses or endangers human health, comfort, repose, or safety.	X	
	3. Rule 403 - Fugitive Dust	This regulation limits on-site activities so that the concentrations of fugitive dust at the property line shall not be visible and the downwind particulate concentration shall not be more than 100 micrograms per cubic meter, averaged over 5 hours, above the upwind particulate concentration. These requirements do not apply if the wind speed, averaged over 15 minutes, is above 15 miles per hour. The rule also requires every reasonable precaution to minimize fugitive dust and the prevention and cleanup of any material accidentally deposited on paved streets.	X	
	4. Rule 404 - Particulate Matter (Concentration)	Rule 404(a) limits particulate emissions for given volumetric gas flow rates.	X	
	5. Rule 405 - Solid Particulate Matter (Weight)	This rule establishes allowable discharges for particulates at rates of 0.99 to 30 lb/hr.	X	
	6. Rule 407 - Liquid and Gaseous Air Contaminants	This rule limits carbon monoxide emissions to 2000 ppm and sulfur dioxide emissions to 500 ppm averaged over 15 minutes for any equipment other than that used for propulsion of mobile equipment stationary internal combustion engines.	X	
7. Rule 53 - Sulfur Compounds	This rule limits discharge of sulfur compounds into the atmosphere in excess at the point of discharge of 500 ppm by volume calculated as SO <sub>2</sub> .	X		

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STATE ARARs				
	Requirement	Description	A	RA
ACTION SPECIFIC	B. Regulation X--National Emission Standards for Hazardous Air Pollutants	Implements the provisions of Part 61, Chapter I, Title 40, of the CFR under the supervision of SCAQMD Executive Officer. The only NESHAP standard that would serve as an ARAR for the McColl site is "Benzene Waste Operation Standards for Surface Impoundments" (40 CFR 61.344). A cover for a surface impoundment should be designed to operate with no detectable emissions as indicated by an instrument reading of less than 500 ppm above background. The provisions apply to hazardous waste facilities that use surface impoundments to treat, store, or dispose of hazardous wastes from petroleum refineries.		X
	III. South Coast Air Quality Management District (SCAQMD) Rules and Regulations (continued)			
	C. Regulation XI--Source Specific Standards Rule 1150 Excavation of Landfill Sites	This rule states that no person shall initiate excavation of an active or inactive landfill without an Excavation Management Plan. The plan shall provide information regarding the quantity and characteristics of the material to be excavated and transported and shall identify mitigation measures including gas collection and disposal, baling, encapsulation, covering of the material, and chemical neutralizing.		X
	Rule 1150.2 Control of Gaseous Emissions	The rule limits gaseous emissions from inactive landfills. Within this rule, an inactive landfill is defined as a site where refuse had been disposed before 1982. Total Organic Carbon (TOC) emissions are limited to 500 ppm measured as methane (CH <sub>4</sub> ) at any point on the surface of the landfill and to 50 ppm measured as total organic compounds over a surface area of the landfill. This requirement is not strictly applicable to the McColl site because the McColl wastes do not fit the accepted definition of refuse. However, the requirement is relevant and appropriate because the intent is to protect air quality by limiting emissions of organic compounds from a disposal site.		X
	Rule 1166 Organic Gas Emissions from Decontamination of Soil	This rule limits the emissions of volatile organic compounds (VOCs) from contaminated soil. The rule prohibits any on-site or off-site spreading of VOC-contaminated soil which results in uncontrolled evaporation of VOC to the atmosphere. Rule 1166(c)(2)(B) requires that a person treating or handling VOC-contaminated soil implement BACT mitigation measures approved by the SCAQMD Executive Officer. There is an exemption for emergency soil excavation performed under the jurisdiction of an authorized health officer.	X	

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**STATE ARARs**

Requirement	Description	A	RA
<p align="center"><b>ACTION SPECIFIC</b></p> <p>D. Regulation XIII--New Source Review</p> <p>E. Regulation XIV-Toxics</p>	<p>This regulation sets forth preconstruction review requirements for new, modified, or relocated facilities to ensure that the operation of such stationary sources does not interfere with progress in attainment of the national and state ambient air quality standards without unnecessarily restricting the future economic growth within the district. These requirements apply to new or modified permit units, meaning articles, machinery, equipment, contrivances, or any combination of the above, which causes the issuance of nonattainment air contaminants or halogenated hydrocarbons at the site. Included in these permit units are emission control equipment.</p> <p>Rule 1303 requirements mandate Best Available Control technology (BACT) and requires modelling to demonstrate that any new or modified facility will not cause a violation of NAAQS standards. BACT guidelines are available for commonly processed permit units. BACT for other permit units is determined on a case-by-case basis. Modeling for sulfur oxides, as primary contaminants, and reactive organic gases is not presently required. The rule also states that accumulated emissions can be offset by reduction credits or credits from Community Bank.</p> <p>Rule 1306 provides that emissions calculations are to be used as the basis for calculating applicability of Regulation XIII. These requirements are considered applicable to all alternatives, except the "no action" alternative, to the extent that the alternatives employ equipment which either cause or control the issuance of nonattainment air contaminants.</p> <p>Rule 1401 - New Source Review of Carcinogenic Air Contaminants specifies limits for cancer risk and excess cancer cases from new, modified, and relocated permit units that emit carcinogenic air contaminants. The rule establishes allowable emission impacts for all such permit units requiring new permits pursuant to SCAQMD Rules 201 or 203. Best Available Control Technology for Toxics (T-BACT) will be required for any system where a lifetime (70 year) maximum individual cancer risk of one in one million or greater is estimated to occur. Limits are calculated using unit risk factors for specific contaminants. Contaminants identified at the McColl site (Table 1-3) that have identified unit risk factors include: arsenic, benzene, cadmium, chromium methylene chloride, and possibly phenols.</p>	<p align="center">X</p> <p align="center">X</p>	

A = Applicable  
 RA = Relevant and Appropriate  
 \* All ARARs and other requirements identified apply equally to the preferred remedy (SMS) and the contingent remedy (RCRA-equivalent closure).

ATTACHMENT 8  
Fact Sheet



# McColl Superfund Site

U.S. ENVIRONMENTAL PROTECTION AGENCY • REGION 9 • SAN FRANCISCO, CALIFORNIA • JUNE 2002

## U.S.EPA ANNOUNCES FIVE-YEAR MILESTONE FOR THE MCCOLL SUPERFUND SITE CLEANUP

November 2002 will mark five years since the cleanup of the McColl Superfund Site was completed. In November 1997, EPA conducted its final inspection and concluded that construction of the cleanup had been successfully completed.

To assure that the cleanup remains protective of human health and the environment, the Superfund law requires that a formal review of the cleanup be conducted every five years. This review is required at the McColl Site and all other Superfund sites where waste is left in place.

The purpose of the review is to investigate any changes in environmental conditions at the site and to make sure the cleanup is still effective. It provides EPA with a detailed scientific and engineering assessment of the cleanup effort.

### WHAT THE REVIEW INCLUDES

- EPA will thoroughly inspect the site to determine whether construction performed and equipment installed as part of the cleanup is still working;
- EPA will identify any physical conditions which may have changed at the site over the last five years;
- EPA will review the cleanup standards which were used to select the type of cleanup at the McColl Site to determine whether they are still valid.

The outcome of the review will be a Five Year Review Report, which will become part of the site record, and which EPA will make available for review and comment.

### EPA SEEKS PUBLIC COMMENT ON MCCOLL CLEANUP

EPA encourages members of the public to contact us with questions or comments about the McColl Site. Some of the issues about which EPA would like to hear from the public are:

- Have there been any sulfur-like odors in the surrounding neighborhoods that may be related to the site, such as the odors that initially alerted the public to a problem at the site?
- Have you noticed any runoff of water or soil from the site onto surrounding property or into the surrounding neighborhoods?
- Have there been any offensive noises or other disturbances from the gas treatment facility located at the site?

### PLEASE SEND YOUR COMMENTS TO EPA'S REMEDIAL PROJECT MANAGER

Dave Seter  
U.S. EPA (SFD-7-2)  
75 Hawthorne Street  
San Francisco, CA 94105

Phone: 415-972-3250  
or toll free at **1-800-231-3075**  
or email: [seter.david@epa.gov](mailto:seter.david@epa.gov)

OR, you may contact  
EPA's Community Involvement  
Coordinator:

Vicky Semones  
U.S. EPA (SFD-3),  
75 Hawthorne Street,  
San Francisco, CA 94105

Phone: 415-972-3238,  
toll free at 1-800-231-3075  
email: [semones.vicky@epa.gov](mailto:semones.vicky@epa.gov)

## EXISTING CLEANUP MEASURES

EPA constructed containment cells to isolate the petroleum waste found on site and installed an impermeable multi-layer cover. EPA also constructed an underground network of pipes beneath the cover to collect and

EPA began the five year review inspection of the McColl Superfund Site in late May 2002 and expects to release the Five Year Review report by September 2002.

treat any gas that may be released from the petroleum waste over time. This prevents any releases that would degrade local air quality.

A groundwater monitoring network was also put in place to provide an

early warning system in the unlikely event that contamination might move off-site toward regional drinking water aquifers.

As a result of the cleanup, a portion of the capped disposal area was made available for re-use as a golf course.

## CURRENT STATUS

EPA is currently operating and maintaining a gas collection and treatment plant at the site. As early as September 2002, this responsibility may revert back to the oil companies responsible for the waste. EPA and its agent at the site, the Corps of Engineers, perform routine inspections of the site a minimum of six times per year to ensure the cleanup is working as intended.

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**EPA is pleased to report that during the past four and a half years all indications are that the waste has been successfully contained on site.**

## SITE HISTORY

From 1942 through 1946, about 72,600 cubic yards of petroleum waste sludge was disposed of into 12 disposal cells at a 22-acre disposal site owned by Ely McColl in Fullerton, California. During the 1950s and early 1960s, three of the disposal cells were covered with drilling mud. In the late 1950s, six additional sumps were covered with fill during the construction of the adjacent Los Coyotes Country Club golf course.

In the 1960s, residential neighborhoods were developed on property adjacent to the disposal site. The site initially was brought to the attention of regulatory agencies in July 1978, as a result of odor and health complaints received from residents.

The Site was added to the EPA National Priority List of Superfund sites in September 1982.

## CLEANUP HISTORY

### On-Site Waste

In 1984, EPA proposed to excavate and dispose of waste at the site, following an investigation conducted by the oil companies identified by EPA as being responsible for the disposal of the petroleum wastes. The State of California was designated the lead agency. However, a court action later blocked the state from doing the excavation.

About this same time, a neighborhood committee, the McColl Action Group was formed. The group participated actively in decisions related to the site from 1985 through 1991, when the group disbanded. Another community group, the Fullerton Hills Community Association, was formed in 1991 and participated in site-related decisions through construction of the final remedy.

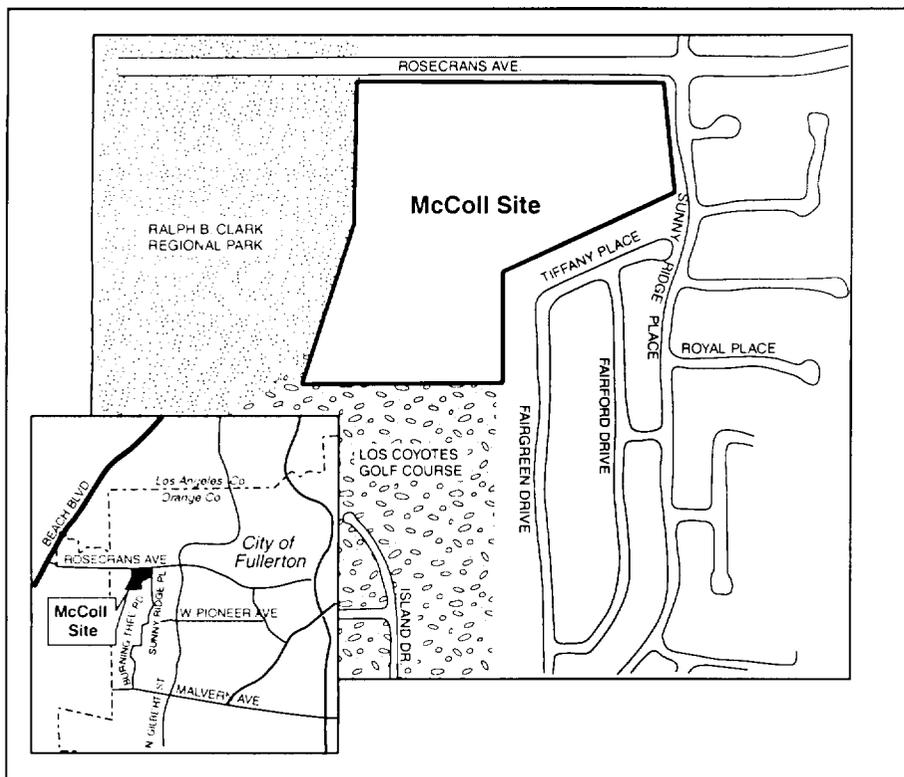


Figure 1: Location of McColl Superfund Site

EPA performed additional studies at the site and proposed incineration of the waste. Following public comment and field testing, EPA re-evaluated the alternatives and proposed solidification of the waste. When EPA concluded that solidification was not feasible at the site, it selected a Resource Conservation and Recovery Act (RCRA) equivalent closure system, or cap, as the means of isolating the petroleum waste. This remedy included:

- (1) constructing a multi-layer cap over the untreated sumps with a gas collection and treatment system to prevent infiltration of water and release of hazardous air emissions;
- (2) building subsurface walls around the sumps to prevent migration of water into the waste and migration of water and soluble and gaseous contaminants out of the sumps;
- (3) stabilizing of steep slopes on the site with retaining walls;
- (4) monitoring groundwater.

The cap and slurry wall, gas collection and treatment system, and site security will be operated and maintained over time at the site. The remedy is described in the *Source Record of Decision* signed on June 30, 1993.

### Groundwater

Under EPA's oversight, the oil companies conducted a groundwater investigation from September 1993 to April 1996. EPA proposed a plan for the groundwater remedy on February 15, 1996. The groundwater remedy required that infiltration of water into the ground be reduced through: (a) redirecting of surface water off the site; (b) grading of areas adjacent to the containment system, and (c) lining of onsite drainage channels with low permeability materials. EPA's groundwater remedy is also in the *Groundwater Record of Decision* signed on May 15, 1996.

Construction activities, performed by the oil companies with oversight from EPA, began on July 1996 and were completed in November 1997. These activities included the following:

- Installation of subsurface cut-off walls
- Installation of an impermeable cover
- Grading to facilitate surface water control
- Erosion control measures
- Building a gas collection and treatment plant, and
- Golf course restoration activities.

### Remedial Action Completed

On November 13, 1997, EPA and the California DTSC conducted a final inspection of the McColl Superfund Site. EPA determined that construction had been completed according to specifications and the remediation had been successfully executed. In April 1998, EPA approved the *Final Remedial Action Report* for the McColl site.

In August 1998, several new holes were opened at the Los Coyotes Country Club golf course on a portion of the capped disposal area made available for re-use.



## MAILING COUPON

If you did not receive this fact sheet in the mail and would like to be included on EPA's mailing list for the McColl site, please fill out this coupon and return it to Vicky Semones, U.S.EPA (SFD-3), 75 Hawthorne Street, San Francisco, CA 94105

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# EPA SEEKS YOUR INPUT

**As part of the Five Year Review  
at the McColl Superfund Site,  
EPA is seeking public comment  
on the effectiveness of the cleanup to date.**

**Please see the enclosed information for further details.**

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