

SITE INSPECTION REPORT

2014 ANNUAL SITE INSPECTION REPORT GROUNDWATER TREATMENT FACILITIES NORTH INDIAN BEND WASH SUPERFUND SITE, SCOTTSDALE, ARIZONA

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Prepared for:



United States Environmental Protection Agency
Region 9
75 Hawthorne Street
San Francisco, California 94105

Prepared by:



Gilbane Federal
2355 E Camelback Road, Suite 850
Phoenix, Arizona 85016

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ACRONYMS AND ABBREVIATIONS

AAW	Arizona American Water
ADEQ	Arizona Department of Environmental Quality
ADHS	Arizona Department of Health Services
AED	automated external defibrillation
AZPDES	Arizona Pollutant Discharge Elimination System
bgs	below ground surface
CERP	contingency and emergency response plan
cfm	cubic feet per minute
CGTF	Central Groundwater Treatment Facility
COC	contaminant of concern
COS	City of Scottsdale
CPR	cardiopulmonary resuscitation
CPU	central processing unit
CWTP	COS Chaparral Water Treatment Plant
1,1-DCE	1,1-dichloroethene
EPA	U.S. Environmental Protection Agency
EPCOR	EPCOR Water
EQ	equalization
Gilbane	Gilbane Federal
GMEP	Groundwater Monitoring and Evaluation Plan
gpm	gallons per minute
GWETS	groundwater extraction and treatment system
HAZWOPER	Hazardous Waste Operations and Emergency Response Standard
HCl	hydrochloric acid
HMI	human/machine interface
ITSI Gilbane	ITSI Gilbane Company
LAU	lower alluvial unit
LFR	Levine-Fricke-Recon, Inc.
IGAC	liquid-phase granular activated carbon
MAU	middle alluvial unit
MCL	maximum contaminant level
mg/L	milligrams per liter
MRTF	Miller Road Treatment Facility
MSDS	material safety data sheet
N/A	not applicable
NGTF	NIBW Granular Activated Carbon Treatment Facility
NIBW	North Indian Bend Wash Superfund Site
O&M	operation and maintenance
OU	Operable Unit
P&ID	Process and Instrumentation Diagram
PCs	NIBW Participating Companies
PCE	tetrachloroethene
PE	professional engineer
PLC	programmable logic controller
RIO	remote input/output

RTU	remote terminal unit
ROD	Record of Decision
SCADA	supervisory control and data acquisition
SDS	safety data sheet
SRP	Salt River Project
SVE	soil vapor extraction
SVETS	soil vapor extraction and treatment system
1,1,1-TCA	1,1,1-trichloroethane
TCE	trichloroethene
UAU	upper alluvial unit
ug/L	micrograms per liter
UV/Ox	ultraviolet/chemical oxidation
VFD	variable-frequency drive
vGAC	vapor-phase granular activated carbon
VOC	volatile organic compound

1.0 INTRODUCTION

This report presents a record of the annual inspections of five active groundwater treatment facilities that are part of the remedy actions at the North Indian Bend Wash Superfund Site (NIBW) in Scottsdale, Arizona. The treatment facilities consist of the Area 7 groundwater extraction and treatment system (GWETS) and soil vapor extraction and treatment system (SVETS); the Area 12 GWETS; the Central Groundwater Treatment Facility (CGTF); the Miller Road Treatment Facility (MRTF); and the NIBW Granular Activated Carbon Treatment Facility (NGTF) (see Figure 1). The inspections were conducted on December 9-11, 2014, by Kent Baugh, PhD, PE, and Stephanie Archabal (Gilbane inspection team) of Gilbane Federal (Gilbane), on behalf of the U.S. Environmental Protection Agency (EPA), Region 9. Mr. James Lutton, PE, represented the NIBW Participating Companies (PCs) during the inspections. In addition, other responsible parties and/or operators were in attendance for their respective facilities.

The NIBW remedy is intended to restore groundwater in the upper alluvial unit (UAU), the middle alluvial unit (MAU), and the lower alluvial unit (LAU) to drinking water quality by decreasing the concentrations of the identified contaminants of concern (COCs): chloroform, 1,1-dichloroethene (1,1-DCE), tetrachloroethene (PCE), 1,1,1-trichloroethane (1,1,1-TCA), and trichloroethene (TCE). An inspection report documented that the NIBW treatment facilities, excluding the NGTF, were operating and functioning properly on February 28, 2003 (Table 2 of EPA, 2006). The construction completion date of the site-wide remedy for the Indian Bend Wash Superfund Site (including both the NIBW and South Indian Bend Wash Superfund Sites) was September 28, 2006 (EPA, 2006). The NGTF started operation in 2013 (NIBW PCs, 2014).

The 2014 inspection was the latest in a continuing series of annual site inspections of the treatment facilities for the NIBW Superfund Site conducted on behalf of the EPA. The focus of Gilbane's effort was on the operation and performance of the NIBW groundwater treatment plants and facilities with respect to remedial action objectives pertaining to groundwater treatment as established in the Record of Decision (ROD) Amendment (EPA, 2001). A primary objective is providing the City of Scottsdale (COS) with a water source that meets drinking water maximum contaminant levels (MCLs) for COCs. Certain remedial objectives and performance requirements of the NIBW remedy facilities are outside the purview of these site inspections, and are addressed only generally herein. Examples of the remedial objectives and performance requirements not covered by the annual inspections include COC mass flux in the UAU; hydraulic containment in the MAU and LAU; hydraulic capture in the northern LAU; and related groundwater modeling activities.

The focus of the Gilbane inspection team was directed toward areas of concern identified by EPA for the physical treatment plant inspections, including:

- Safe and efficient operation of the facilities;
- Site-specific health and safety procedures;
- Operator competence;
- Appropriateness of daily, weekly, and monthly maintenance and inspection activities;
- Maintenance of extraction well and conveyance system components (e.g., air relief valves);
- Continued implementation of lessons learned from the TCE exceedance incidents that occurred at the MRTF in October 2007 and January 2008;
- Confirmation of the plan by the NIBW PCs to update the operation and maintenance (O&M) plan and the contingency and emergency response plan (CERP) for each of the five groundwater treatment facilities;
- Authoritative procedures for changes to critical controls; and
- Recommendations for possible improvements.

The O&M plans and the CERPs for the five treatment facilities were not reviewed during the 2014 annual inspection. The NIBW PCs updated the O&M plans and related material for the treatment facilities based on EPA comments provided in 2012. Agency review input and comments on the updated content and details of the O&M manuals and related materials were provided to the NIBW PCs in separate deliverables in September and December 2014. Based on those comments, the NIBW PCs will provide further updates to the O&M plans and the CERPs for each of the five treatment facilities.

Prior to the start of inspection activities, the Gilbane inspection team reviewed the EPA *Recommended Annual O&M/Remedy Evaluation Checklist* (OSWER Form 9355.0-87; EPA, 2008) and the 2013 Annual Inspection Report (Gilbane, 2014) to provide a general framework for the inspections. A separate interview was conducted with Mr. Lutton on overall NIBW remedy components and EPA's evaluation checklist (EPA, 2008), while treatment facility inspections focused on the operational parameters bulleted above.

Overall, the remedy is functioning as intended and each treatment facility is meeting performance goals regarding mass removal and plume control. Short-term objectives and intermediate system goals include maintaining plume containment, maintaining operational uptime, treating groundwater to remove COC concentrations so that treated water can be reinjected or used for drinking water, and not releasing untreated groundwater. The final system goal is to treat all groundwater within the site boundaries to achieve COC concentrations below EPA MCLs. Based on the interview with Mr. Lutton, no new contaminant sources or contaminants have been identified within the last year and there is no reason to re-evaluate system goals (i.e., revised regulatory framework, better technology, unrealistic existing goals). Also, there is no need at this time to re-evaluate parameters including sampling methods,

sampling frequency, or monitoring locations used to evaluate remedy performance. A formal optimization study has not been conducted recently; however, the NIBW PCs have conducted system upgrades within the last year by installing new extraction wells in better locations or with larger pump capacities to provide better plume capture and containment. These optimizations are discussed in further detail by individual facility below.

Subsequent to the 2014 annual inspection, EPA was notified of 1,4-dioxane detections in influent and effluent treatment system samples after the COS conducted a five-year emerging contaminant sampling event. Further sampling is being conducted by the NIBW PCs. Results and future remedial actions with regard to 1,4-dioxane will be evaluated by EPA.

2.0 AREA 7 GWETS AND SVETS

The Gilbane inspection team visited the Area 7 GWETS and SVETS, located at the Scottsdale Civic Center near East 2nd Street and North 75th Street, on Tuesday, December 9, 2014. In addition to Mr. Lutton, Mr. Ryan O’Keefe of Arcadis (O&M subcontractor to the NIBW PCs), participated in the inspection. Mr. O’Keefe led a tour of the indoor and outdoor components of the treatment facility. The following subsections present brief descriptions of the remedy components for this facility, significant events since the previous site inspection, and observations made during the 2014 site inspection.

2.1 Area 7 Site Remedy Components

The Area 7 treatment system consists of both groundwater and vadose zone remedy components. The Area 7 GWETS was designed to extract and treat groundwater from the UAU and MAU to contain the contaminant plume and reduce the COC mass in groundwater. The Area 7 SVETS, which is the only remaining active source control system for the NIBW Superfund Site, was not in operation during the 2014 site inspection. The Area 7 SVETS had operated intermittently to extract volatile organic compounds (VOCs) from the vadose zone as a means of source control (i.e., limiting VOC mass flux into UAU groundwater). In December 2009, SVETS operation was discontinued, and a 3-year idle period followed to allow equilibrium conditions to establish in the vadose zone. A rebound evaluation was conducted in December 2012 involving soil vapor sampling of soil vapor monitoring and extraction wells at Area 7. Results from the soil vapor samples and leaching modeling were used to assess the treatment of vadose zone TCE concentrations on groundwater. The *2013 Groundwater Threat Analysis for Area 7* (Montgomery & Associates, 2013) concluded that, based on the low and declining TCE concentrations in downgradient UAU groundwater, soil vapor extraction (SVE) and UAU groundwater operations should be discontinued permanently and formally closed at Area 7.

Area 7 GWETS

The initial GWETS configuration included extraction of groundwater from one UAU well (7EX-1UA) at approximately 35 gallons per minute (gpm), treatment by a packed-column air stripper, and discharge to the COS sanitary sewer. Air stripper off-gas was merged with extracted soil vapor ahead of the vapor-phase granular activated carbon (vGAC) vessels.

In 1998, the Area 7 GWETS was upgraded to address VOC contamination in the MAU. Two MAU extraction wells (7EX-3MA, which was later replaced by 7EX-3aMA, and 7EX-4MA) were installed, and treatment capacity was increased by the addition of an ultraviolet/chemical oxidation (UV/Ox) system and replacement of the packed-column air stripper with a low-profile air stripper. The upgrades to the treatment system enable the GWETS to treat up to 500 gpm of groundwater with a maximum VOC concentration of 7,000 micrograms per liter (ug/L). Additionally, an injection well (7IN-1UA) was installed and used for injection to the UAU of treated effluent from the GWETS. The upgraded Area 7 GWETS was restarted in 1999. The Area 7 GWETS was further enhanced with the addition in 2001 of one new MAU extraction well (7EX-5MA) and one UAU injection well (7IN-2UA).

The treatment portion of the GWETS currently consists of the following major components:

- a 5,000-gallon equalization (EQ) tank to balance influent flows,
- a UV/Ox system to destroy VOCs in extracted groundwater,
- a low-profile air stripper to remove any remaining VOCs from the UV/Ox effluent stream, and
- a vapor-abatement system using two vGAC vessels operated in series configuration to remove VOCs from the air stripper off-gas.

Under normal conditions, effluent water is discharged from the GWETS to the UAU through injection (recharge) wells. However, discharge to the COS sanitary sewer is an option during non-routine maintenance or following major system modifications. Treated water injected to the UAU must meet the cleanup standards indicated in Table 1.

Table 1 – Area 7 GWETS Compliance Requirements for UAU Injection

Contaminant of Concern	Maximum Concentration (ug/L)
Chloroform	6
1,1-DCE	7
PCE	5
1,1,1-TCA	200
TCE	5

Note: Maximum concentration values are from the *Record of Decision (ROD) Amendment* (EPA, 2001).

During 2014, approximately 121,000,000 gallons of groundwater were extracted, treated, and injected and 762 pounds of TCE were removed by the Area 7 GWETS based on mass removal estimates derived from quarterly monitoring (NIBW PCs, 2015). Extraction wells 7EX-1UA and

7EX-5MA were not operational in 2014; plans are underway to replace 7EX-5MA (and no longer operate 7EX-4MA) with a new extraction well (7EX-6MA) at a proposed location west of extraction well 7EX-5MA near the corner of Monterey Way and 75th Street in Scottsdale (NIBW PCs, 2015). Based on final annual data provided by the NIBW PCs (NIBW PCs, 2015), approximately 85 million gallons were extracted by well 7EX-3aMA and 35 million gallons were extracted by well 7EX-4MA. October 2014 data indicated TCE concentrations of 500 ug/L at 7EX-3aMA and 1,200 ug/L at 7EX-4MA. Water-quality monitoring of the treatment system discharge indicated that treated effluent met all requirements listed in Table 1 for UAU injection.

Area 7 SVETS

The Area 7 SVETS was constructed in June 1994 and began operation in July 1994. The SVE system equipment, which applies vacuum to sets of nested wells screened at three separate depth intervals below ground surface, is contained on two separate extraction skids. The equipment extracts vapors from two distinct and independent layers or zones, with one skid dedicated to Zone A (approximately 0 to 50 feet below ground surface [bgs]) and the other to Zone B (approximately 50 to 125 feet bgs). Each SVE extraction skid consists of a vapor/water separator, an air filter, a blower, and appurtenant equipment such as valves, sample ports, and process sensors. The soil vapor streams discharged from the blowers on each extraction skid are combined in a common header and passed through a heat exchanger for temperature control. Following the heat exchanger, soil vapor is combined with off-gas from the GWETS low-profile air stripper and then treated by the two vGAC vessels described above for the Area 7 GWETS.

A brief operational history of the Area 7 SVETS was provided in the 2012 Site Monitoring Report (NIBW PCs, 2013a). The SVETS was idle for a planned 3-year period (December 2009 to December 2012) to allow equilibration and observe if soil vapor concentrations rebounded. Soil vapor monitoring was conducted in December 2012 (the end of the rebound period) in accordance with the *Startup Work Plan* (Levine-Fricke-Recon, Inc. [LFR], 2007). Anomalous results between primary and split samples from this event led to the collection of additional soil vapor samples in March 2013. Results from the soil vapor rebound sampling were reported in the technical memorandum, *Split Sampling, Area 7 Soil Vapor Extraction and Treatment System (SVETS), North Indian Bend Wash (NIBW) Superfund Site* (ITSI Gilbane, 2013), and were used as the basis for a groundwater threat analysis for Area 7. Based on the results of this analysis, Montgomery & Associates (2013) recommended that the SVE and UAU groundwater operations be discontinued and formally closed at Area 7. Because the SVE system was not in operation in 2014, routine monitoring of total VOC concentrations in extracted vapors was not performed. After the 2014 annual inspection, EPA sent the NIBW PCs a Letter of Determination for the Area 7 Soil Vapor Extraction System, dated April 22, 2015, approving the decommissioning of the SVE system for Area 7 (EPA, 2015).

2.2 Area 7 Site Events Since the Previous Annual Inspection

The previous annual site inspection occurred on December 3, 2013 (Gilbane Federal, 2014). Major events since the 2013 inspection that contributed to unplanned down-time included replacement of a variable frequency drive (VFD) communication card after a lightning storm in February 2014. Approximately six weeks of unplanned down-time were associated with replacing the communication card. In addition to this major event, a leak detection switch was replaced and a duct heater controller was repaired in 2014. Measures have been implemented to keep replacement parts in stock for these types of maintenance/repair issues. Extraction well 7EX-5MA currently is off line while the NIBW PCs continue to work through the logistics of replacing the well with extraction well 7EX-6MA. As reported during the 2014 site inspection, new extraction well 7EX-6MA is designed to have an influent flow rate of approximately 300 gpm in order to maintain or increase the plume capture provided by 7EX-4MA and 7EX-5MA combined. During the 2014 monsoon season (June to September), the leak detection switch shut off the well pumps, the system went into a recirculation mode, and then a complete power outage shut down the system. Beyond the monsoon storm events, which caused power failures for brief time periods, no other unplanned down-time was associated with Area 7.

2.3 Observations Made During the 2014 Site Inspection

The small (less than 0.25 acre) facility was found to be in good physical condition and appeared to be well maintained, as shown by the photographic documentation included in Appendix A. Good housekeeping practices were evident. The GWETS was operating during the site inspection. No water leaks from process equipment, instruments, or piping systems were evident. The operator reported that the low-profile tray air stripper is cleaned approximately every two to three years, with the last cleaning in July 2012 when the system was down for replacement of the UV/Ox central processing unit (CPU). No documentation of the air stripper cleaning procedures was provided. During the inspection, Mr. O'Keefe stated that the next cleaning would be scheduled for the beginning of 2015. In 2014, vGAC change-outs were reported to have occurred in January and July. Approximately 12 gallons of hydrogen peroxide per day are used by the UV/Ox system at Area 7. The typical dosage rate of the anti-scalant polyphosphate is 1-2 parts per million. Controls and interlock checks were conducted in July 2014 (NIBW PCs, 2015).

Maintenance notes are maintained in an Excel workbook on the site computer, and are recorded in the site logbook. The O&M Plan (NIBW, 2014f) was not reviewed in detail; O&M plans were reviewed and agency comments were provided to the NIBWs in September 2014; updates to the plan are forthcoming.

Authoritative procedures for changes to critical controls were discussed with the operator during the 2014 inspection. At Area 7, computers are password protected and only authorized personnel

responsible for the operation of the system can log into system operations. NIBW PCs management approval must be granted prior to changing any critical controls.

Health and safety procedures were reviewed and discussed with the operator during the 2014 inspection. An internal health and safety audit was conducted two years ago and updates to the site-specific health and safety plan were recommended. All material safety data sheets (MSDSs) will be converted to safety data sheets (SDSs) in 2015. If an incident occurs, the operator notifies the NIBW PCs immediately. Internal training on safety procedures is conducted by Arcadis.

Table 2 summarizes 2014 operational data for the Area 7 GWETS including routine O&M activities, 2014 operational parameters, and performance metrics as reported by Mr. Lutton and Mr. O’Keefe during the 2014 inspection.

Table 2 – Area 7 GWETS – Summary of Annual Operational History for 2014

Date of previous annual inspection (EPA)	3 December 2013
Frequency of wellhead inspections/routine O&M visits	Weekly/during system startup ¹
Frequency of treatment system O&M visits	Daily remote monitoring (logon via the Internet) and weekly O&M Site visits (weekly visits include lubricating parts, which occurs twice a month)
Reported system up-time	90%, including unplanned down-time
Reported air flow rate	Fixed flow rate (2,700 cubic feet per minute [cfm])
Has down-time associated with non-routine operations and maintenance exceeded expectations?	Yes. VFD communication card replacement took 6 weeks (to receive new part)
Major repairs since last site inspection	Replacement of a leak detection switch and duct heater controller.
Air emissions sampling frequency	Quarterly. Carbon change-out every 6 months
Has air emissions system met applicable requirements?	Yes ²
Water effluent sampling frequency	Monthly
Has effluent discharge (to injection wells) met applicable requirements?	Yes
Has optimization study been conducted?	In progress ³
Is system meeting performance goals regarding mass removal and plume control?	Yes
Do current operating parameters differ from design criteria?	Yes, Current TCE concentrations in extracted groundwater are much lower than the design concentration of 7,000 ug/L

Notes:

1. Extraction wellheads are inspected following startup of the Area 7 GWETS if the extraction well has been off line longer than 24 hours, according to the *7EX-5MA Incident Report* (Arcadis, 2010).
2. No air permit is required or maintained for the facility, because potential emissions are below ambient Maricopa County Air Quality Control District requirements.
3. At the time of the inspection, NIBW PCs were planning the installation of a new MAU extraction well (7EX-6MA).

2.4 Adequacy of the Contingency and Emergency Response Plan

Based on observations made during the site inspection, the practices and procedures described in the CERP (NIBW PCs, 2014b) should be adequate for addressing releases of untreated groundwater from pipelines and equipment. Review comments on the CERP have been provided to the NIBW PCs; incorporation of those comments is forthcoming.

2.5 Recommendations for the Area 7 GWETS

Two separate inspections were conducted based on the recommendations made following the 2013 site inspection. One inspection was held with the NIBW PCs' representative (Mr. Jim Lutton) to confirm that remedy goals are being met. A second inspection occurred with the operator of the system to discuss Area 7-specific system components and maintenance activities. As part of the second inspection, the operator was requested to provide printed screens of specific operations maintained on line.

The following recommendations are made based on the 2014 site inspection:

1. Provide documentation on the air stripper cleaning procedures in a chemical handling plan. This includes hazardous waste procedures and spill containment details.
2. Provide a maintenance plan for the upcoming year's activities. Action items developed during maintenance activities will be confirmed as completed or in progress during the following annual site inspection.
3. Provide written details of the major interlock alarm testing procedures, and include details as to how participating parties are incorporated in each step.
4. Update the emergency contact information listed on the fencing of the treatment facility.

The O&M plan will be updated based on agency comments provided in September 2014.

3.0 AREA 12 GWETS

The Gilbane inspection team visited the Area 12 GWETS, located at the General Dynamics Plant at 8201 East McDowell Road, Scottsdale, Arizona, on Tuesday, December 9, 2014. In addition to Mr. Lutton, Mr. Larry Lynch, P.E., of Ensolutions, Inc. (O&M subcontractor to the NIBW PCs), participated in the inspection. The Gilbane inspection team was given a tour of the treatment facility. The wellheads and treated water outlet at the Salt River Project (SRP) canal system were not visited. The following subsections present a brief description of the remedy components, events since the previous site inspection, and observations made during the 2014 site inspection.

3.1 Area 12 Site Remedy Components

The Area 12 GWETS was constructed by the NIBW PCs in 1998. The groundwater extraction system includes groundwater extraction from well MEX-1MA and the Granite Reef Well (also referred to as SRP Well 23.6E-6.0N), both screened in the MAU. The treatment portion of the GWETS includes an air stripper tower to remove VOCs from extracted groundwater and a vapor-abatement system (using two vGAC vessels operated in parallel) to remove VOCs from the air stream effluent from the air stripper. The Area 12 GWETS is designed to treat up to 1,850 gpm of groundwater with a maximum TCE concentration of 300 ug/L. Treated water from the GWETS is discharged to the SRP irrigation distribution system. The treated water discharged to the SRP canal must meet the cleanup standards indicated in Table 3, as well as the limited inorganic water quality requirements specified in the Area 12 Arizona Pollutant Discharge Elimination System (AZPDES) permit.

Table 3 – Area 12 GWETS Compliance Requirements for SRP Canal Discharge

Contaminant of Concern	Maximum Concentration (ug/L)
Chloroform	6
1,1-DCE	7
PCE	5
1,1,1-TCA	200
TCE	5

Note: Maximum concentration values are from the *ROD Amendment* (EPA, 2001).

During 2014, approximately 419 million gallons of groundwater were extracted and treated and 340 pounds of TCE were removed at the Area 12 GWETS based on mass removal estimates derived from quarterly monitoring (NIBW PCs, 2015). These quantities increased significantly from previous years due to operational changes in pumping of well MEX-1MA and the Granite Reef well. To increase mass removal, maintain plume control, and minimize migration of contaminant mass to the southwest margin, simultaneous pumping of well MEX-1MA and the Granite Reef well began in April 2014. Based on final annual data provided by the NIBW PCs (NIBW PCs, 2015), approximately 224 million gallons were extracted by well MEX-1MA and 195 million gallons were extracted by the Granite Reef well. The average concentrations of TCE in groundwater samples collected in 2014 from the two operating extraction wells were 53 ug/L from MEX-1MA and 131 ug/L from Granite Reef. TCE concentrations in the treatment system influent during 2014 ranged from 41 to 98 ug/L (NIBW PCs, 2015). Water-quality monitoring of the treatment system discharge indicated that treated effluent met all requirements specified in the AZPDES permit and Table 3. The AZPDES permit was renewed in May 2011, and metals, nitrate (as nitrogen), nitrite (as nitrogen), and dissolved oxygen were added to the list of monitored parameters; however, the review of these parameters is not included in this site inspection.

3.2 Area 12 Site Events since the Previous Annual Inspection

The previous annual site inspection occurred on December 3, 2013 (Gilbane Federal, 2014). Due to irrigation canal maintenance conducted by SRP, the treatment system was not in operation during the 2014 inspection. The Area 12 GWETS shutdown reportedly began on October 8, 2014, and at the time of the inspection the anticipated startup was February 8, 2015. No unplanned down-time occurred in 2014 due to storm event-induced power failures.

Maintenance notes are maintained on the Area 12 computer, as well as being recorded in the site logbook. The O&M Plan (NIBW, 2014g) was not reviewed in detail; O&M plans were reviewed and commented on in 2014, and updates are forthcoming.

3.3 Observations Made During the 2014 Site Inspection

The small (less than 0.25 acre) facility was found in good physical condition and appeared to be well maintained, as shown by the photographic documentation in Appendix B. Good housekeeping practices were evident. As shown in Appendix B, photograph 6, corroded parts of the emergency eyewash station should be replaced. Also on photograph 8, corrosion observed at the bottom of the vGAC vessel during the 2013 inspection will still allow condensation to leak from the unit. The system was not operating during the site inspection. No mechanical pump failures during 2014 were reported during the site inspection. The operator (Mr. Lynch of Ensolutions, Inc.) reported that the air stripper is cleaned annually and had been cleaned during February and October 2014. The next cleaning is scheduled for early 2016, during the annual dry-up of the SRP canal (scheduled by SRP). During the annual shutdown of the Area 12 GWETS that occurs concurrent with the SRP canal annual dry-up, program control logic checks are conducted. Air stripper cleaning procedures were discussed during the 2014 inspection and a non-hazardous waste manifest and a uniform waste profile from the last cleaning were provided. Mr. Lynch reported that thirty percent hydrochloric acid (HCl) is used for the air stripper cleaning operations, and that the spent acid waste stream from air stripper cleaning is neutralized with sodium hydroxide flakes before being shipped off site. During January 2014, a vGAC change-out was also conducted.

Authoritative procedures for changes to critical controls were discussed during the 2014 inspection. At Area 12, computers are password protected and only authorized personnel responsible for the operation of the system can log in to system operations. Approval from NIBW PCs management and SRP must be granted prior to changing any critical controls.

Health and safety procedures were reviewed and discussed with the operator during the 2014 inspection. All MSDSs will be converted to SDSs in 2015. If an incident occurs, the operator notifies the property owner (General Dynamics) immediately by an internal number. General Dynamics is responsible for calling 911 and will also dispatch their own safety personnel.

Hazardous Waste Operations and Emergency Response Standard (HAZWOPER) training documentation is kept electronically.

Table 4 summarizes 2014 operational data for the Area 12 GWETS, including routine O&M activities, 2014 operational parameters, and performance metrics as reported by Mr. Lutton and Mr. Lynch during the 2014 inspection.

Table 4 – Area 12 GWETS – Summary of Annual Operational History for 2014

Date of previous annual inspection (EPA)	3 December 2013
Frequency of wellhead inspections/routine O&M visits	Once per week
Frequency of treatment system O&M visits	Site visit once per week
Reported system uptime	90%, excluding SRP canal dry-up ¹
Reported air-to-water ratio for air stripper	30:1
Has down-time associated with non-routine operations and maintenance exceeded expectations?	No
Major repairs since last site inspection	None
Air emissions sampling frequency	Quarterly
Has air emissions system met applicable requirements?	Yes ²
Water effluent sampling frequency	Monthly
Has effluent discharge met applicable requirements?	Yes
Has optimization study been conducted?	No
Is system meeting performance goals regarding mass removal and plume control?	Yes
Do current operating parameters differ from design criteria?	Yes. The current average flow rate and concentration of TCE in extracted groundwater are much less than design parameters.

Notes:

1. SRP canal dry-up is scheduled to occur annually in January to facilitate maintenance activities. The Area 12 GWETS is taken off line during canal dry-up periods and planned maintenance is performed. In 2014, SRP canal maintenance began on October 8, 2014, and was scheduled to be completed in early 2015.
2. No air permit is required or maintained for the facility, because potential emissions are below ambient Maricopa County Air Quality Control District requirements.

3.4 Adequacy of the Contingency and Emergency Response Plan

According to statements by Mr. Larry Lynch, emergency response is administered by General Dynamics, which is the owner of the surrounding facility where the Area 12 GWETS is located. This is not discussed adequately in the current version of the CERP (NIBW PCs, 2014c). Additionally, the Area 12 GWETS is located within the secured General Dynamics facility. The CERP does not provide details for access to Area 12 by emergency responders in the event of an emergency. Agency comments were provided for the CERP in September 2014; incorporation of those comments is forthcoming.

3.5 Recommendations for Area 12 GWETS

The following list describes the actions taken in response to recommendations made based on the 2013 site inspection, and the results achieved as of the date of the 2014 inspection.

1. Corroded areas of the vGAC vessel still need to be repaired.
2. Tagging of instrumentation to correlate with detailed and accurate Process and Instrumentation Diagrams (P&IDs) was completed.
3. Documentation on the air stripper cleaning procedures still needs to be addressed in a chemical handling plan. This includes hazardous waste procedures and spill containment details.
4. A maintenance plan for activities during the upcoming year needs to be provided. Action items developed during maintenance activities will be confirmed as completed or in progress during the next annual site inspection.
5. Two separate inspections occurred. One inspection was held with the NIBW PCs' representative (Mr. Jim Lutton) to confirm that remedy goals are being met. A second inspection occurred with the operator of the system to discuss site-specific system components and maintenance activities. As part of the second inspection, the operator was requested to provide printed screens of specific operations maintained online.

The following recommendations are made based on the 2014 site inspection:

1. Repair corroded areas of the vGAC vessel.
2. Repair corroded parts of emergency eyewash station.
3. Provide documentation on the air stripper cleaning procedures in a chemical handling plan. This includes hazardous waste procedures and spill containment details.
4. Provide a maintenance plan for activities during the upcoming year. Action items developed during maintenance activities will be confirmed as completed or in progress during the next annual site inspection.
5. Provide written details of the major interlock alarm testing procedures, and include details as to how participating parties are incorporated in each step.
6. A hard copy of the Health and Safety Plan should be kept on site at all times.
7. Provide an updated O&M plan based on agency comments provided in September 2014.

4.0 CENTRAL GROUNDWATER TREATMENT FACILITY

The Gilbane inspection team visited the CGTF, also referred to as the Scottsdale Treatment Plant, located at Pima Park, 8650 East Thomas Road, Scottsdale, Arizona, on Wednesday, December 10, 2014. Present were Mr. Jim Lutton, consultant to the NIBW PCs; Mr. Chris Whitmer, COS Senior Water Treatment Plant Operator; and Mr. Craig Miller, COS Project Coordinator. The COS operates and maintains the CGTF. The Gilbane inspection team was given a tour of the treatment facility and extraction wellheads. The following subsections present a brief description of the remedy components, events since the previous site inspection, and observations made during the 2014 site inspection.

4.1 CGTF Site Remedy Components

The Operable Unit (OU) 1 (groundwater) Record of Decision (OU-1 ROD) for NIBW (EPA, 1988) stipulates that capture zones for COC plumes be established in the MAU and LAU by extracting groundwater. With regard to the CGTF, the groundwater extraction remedy includes extraction wells COS-31 (also called 23.3E-7.3N), COS-71 (abandoned and replaced with well COS-71A in 2014), COS-72, and COS-75A (which replaced well COS-75). The OU-1 ROD also establishes a flow rate goal of 75% of the historical extraction capacity for the existing wells (equating to a combined flow rate of 6,300 gpm). The OU1 ROD also stipulates that extracted groundwater be treated using a packed-column, counter-current-flow air stripper system to remove COCs, and that the air waste stream from the air strippers be abated using vGAC. The CGTF is designed with three air stripper towers operated in parallel to treat up to 9,450 gpm (13.6 million gallons per day) of groundwater with a maximum influent TCE concentration of 1,500 ug/L.

Construction of the CGTF was completed by the NIBW PCs in January 1994. A chlorine gas system, installed to disinfect the air stripper effluent water prior to delivery to the COS potable water system, is not part of the NIBW remedy and was not included in the 2014 site inspection.

Under normal conditions, water effluent from the CGTF is discharged to the COS potable water system and blended with other water to control scaling potential before delivery to customers. The treated water discharged from the CGTF must meet the cleanup standards indicated in Table 5 below.

Table 5 – CGTF Compliance Requirements for Treated Groundwater

Contaminant of Concern	Maximum Concentration (ug/L)
Chloroform	6
1,1-DCE	7
PCE	5
1,1,1-TCA	200
TCE	5

Notes:

1. Maximum concentration values are from the *Record of Decision Amendment* (EPA, 2001).
2. The requirement for chloroform is exclusive of byproducts from disinfection.

The ROD Amendment (EPA, 2001) reiterates the flow rate goal of 6,300 gpm. Additionally, the ROD Amendment identifies priority pumping from wells COS-71 and COS-75A (the most contaminated wells) and the purchase of spare pumps so that a replacement pump could be installed within 2 weeks in the event of a pump failure at COS-71 or COS-75A.

During 2014, approximately 1,559 million gallons of groundwater were extracted and treated and 626 pounds of TCE were removed by the CGTF (NIBW PCs, 2015). Pumping was primarily limited to COS-31 and COS-75A in 2014. Based on final annual data provided by the NIBW PCs (NIBW PCs, 2015), approximately 490 million gallons were extracted from COS-31; 12 million gallons were extracted from COS-71 before it was formally abandoned in April-May 2014; 53 million gallons were extracted from COS-71A which began operation in November 2014; 17 million gallons were extracted from COS-72; and 988 million gallons were extracted from COS-75A. At the time of the inspection, COS-75A was the only well operational, at approximately 2,400 gpm. Gilbane notes that the average annual flow rate of 2,666 gpm for 2014, as calculated based on the total gallons extracted and continuous operation, was below the minimum total annual average pumping rate goal of 6,300 gpm stated in the ROD Amendment. Water-quality monitoring of the treated effluent from CGTF indicated that water quality requirements listed in Table 5 and specified in the ROD Amendment were met.

4.2 CGTF Site Events Since the Previous Annual Inspection

The previous site inspection occurred on December 4, 2013. No major repairs occurred at the CGTF in 2014. Air stripper columns were cleaned in May-June 2014. Extraction well COS-71 was formally abandoned and replaced with COS-71A. The new extraction well COS-71A began operation in November 2014 at a flow rate of approximately 2,350 gpm and as reported by Mr. Lutton and Mr. Miller will be the primary extraction well along with COS-75A. The air stripper columns were cleaned in May-June 2014. The vGAC change-outs occur after 180 days of run-time for each column, resulting in change-outs occurring in January, February, and June of 2014.

4.3 Observations Made During the 2014 Site Inspection

The CGTF was found to be in very good physical condition and appeared to be well maintained. Good housekeeping practices were evident. Photos taken during the 2014 site inspection are presented in Appendix C. The groundwater extraction and treatment system was operating during the site inspection. There were no evident water leaks from treatment process equipment, instruments, or piping systems. The COS operator indicated that the next cleaning (i.e., descaling) of the air strippers is scheduled for the spring of 2015. The operator also stated that the control system interlocks would be tested when the system is off line for air stripper column cleaning. Testing also includes running the system through an alarm state with COS's citywide Supervisory Control and Data Acquisition (SCADA) system personnel. Operators described alarms that shut down the extraction wells and treatment plant operations; such as a high-high level in the air stripper column sump, low or high air to water ratios, low or high flow rate, duct

heater humidity out of range, high vibrations on the blowers, and high temperature in the air duct downstream of each air stripper off-gas heating unit.

The frequency of system checks and wellhead inspections was discussed in detail during the 2014 inspection. The CGTF is staffed from 6 a.m. to 4 p.m. every day. At the end of each day, a final walk-through is performed. Operators are on call 24 hours a day, 7 days a week, and the COS's citywide SCADA system for the CGTF (located in the main control room at the COS Water Campus) also is staffed 24 hours a day, 7 days a week. System checks are performed at the COS Water Campus during evening hours (at 10 p.m. and 2 a.m.) every day, while the CGTF is not staffed. Wellhead inspections are conducted monthly by COS in conjunction with groundwater sampling. In addition, COS production water and electrical personnel conduct wellhead inspections every one to two weeks.

Authoritative procedures for changes to critical controls were discussed during the 2014 inspection. At the CGTF, the control system software is locked and password protected, so that the possibility for unauthorized manipulation of the interlock/set-point is minimal. Prior to any change to a critical control, EPA, Arizona Department of Environmental Quality (ADEQ), and Maricopa County must all grant approval to the COS Executive Director. The Executive Director then relays the changes to the SCADA group, who then begin reprogramming process control set points. Once programming is complete, the information is sent to the mechanical and electrical operators to verify the changes at the CGTF. All parties must be in close communications in order for changes to occur properly.

Air stripper cleaning procedures were discussed and documentation was reviewed. On-site standard operating procedures, weigh tickets, the logbook, and lab data for acid levels after scale has been removed were available for review. Approximately 70,000 pounds of calcium and magnesium scale were reportedly removed during the last cleaning. About 20,000-25,000 gallons of 31% HCl is reportedly used during cleaning. A tanker truck brings in 25% sodium hydroxide to neutralize the acid. While CGTF is off line for the 4-5 week air column cleaning, COS's Chaparral Water Treatment Plant (CWTP), located at 7550 East McDonald Drive in Scottsdale, is on line to meet the potable water needs. A post-cleaning report is also produced.

Health and safety procedures were reviewed and discussed with the operator during the 2014 inspection. All MSDSs will be converted to SDSs in 2015. If an incident occurs, 911 is notified. All operators are cardiopulmonary resuscitation (CPR)/first aid/automated external defibrillation (AED) certified. HAZWOPER training documentation is kept electronically.

Table 6 summarizes 2014 operational data for the CGTF including routine O&M activities, 2014 operational parameters, and performance metrics as reported by the COS staff during the 2014 inspection.

Table 6 – CGTF – Summary of Annual Operational History for 2014

Date of previous annual inspection (EPA)	4 December 2013
Frequency of wellhead inspections/routine O&M visits	Monthly. CGTF is staffed 10 hours a day, 7 days a week. ¹
Reported system up-time	100%, excluding column cleaning
Reported air-to-water ratio	Minimum of 30:1
Has down-time associated with non-routine operations and maintenance exceeded expectations?	No
Major repairs since last site inspection	None at CGTF, installation of new extraction well COS-71A
Air emissions sampling frequency	Quarterly ²
Has air emissions system met applicable requirements?	Yes
Water effluent sampling frequency	Weekly on Monday (compliance) with analysis by TestAmerica; and 2 times per week (Wednesday, Friday) for process verification with analysis by an Arizona Department of Health Services (ADHS)-licensed lab ³
Has effluent discharge met applicable requirements?	Yes
Has optimization study been conducted?	Yes. Environ Corporation Evaluation was completed for the COS ⁴
Is system meeting performance goals regarding plume control?	Yes ⁵
Do current operating parameters differ from design criteria?	Yes. Current average operating flow rate and TCE concentrations in extracted groundwater are much lower than design parameters ⁴ .

Notes:

1. *Operation and Maintenance Plan Revision 3, Central Groundwater Treatment Facility, North Indian Bend Wash, 8650 East Thomas Road, Scottsdale, Arizona (COS, 2010).*
2. Influent and effluent air samples are collected during the week following the first 60 days of operation of new vGAC; samples are collected weekly thereafter until the vGAC is replaced.
3. Two of the three weekly water quality samples are analyzed by an ADHS-licensed lab for process verification as required by the COS, and are not part of compliance sampling.
4. *Engineering Evaluation, Central Groundwater Treatment Facility, Scottsdale, Arizona (Environ, 2009).*
5. Due to COS-71 being offline for much of 2014, future sampling events and updates to the groundwater model will determine whether the system is meeting performance goals regarding plume control.

4.4 Adequacy of Contingency and Emergency Response Plan

Based on observations made during the site inspection, practices described in the CERP (COS, 2014b) should be adequate for addressing releases of untreated groundwater from pipelines and equipment. Agency comments were provided in December 2014 for the CERP; incorporation of those comments is forthcoming.

4.5 Recommendations for the CGTF

The following are the results of the actions taken in response to recommendations made on the basis of the 2013 site inspection:

1. Air relief valve, AR07, located at extraction well COS72, was reconfigured to relieve pressure downward to minimize the potential for a pressure event to cause bodily harm.
2. Documentation on the air stripper cleaning procedures was provided in a chemical handling plan. This includes hazardous waste procedures and spill containment details.
3. A maintenance plan for activities during the upcoming year was not submitted. The COS operator staff participating in the 2014 inspection mentioned that 2015 is expected to be “status quo.”
4. Details of the major interlock alarm testing procedures and details as to how participating parties are notified in each step were discussed during the inspection. Written details have not been provided.
5. Gilbane conducted two separate inspections in 2014. One inspection was held with the NIBW PCs’ representative (Mr. Jim Lutton) to confirm that remedy goals are being met. A second inspection was held with the operators of the CGTF system to discuss site-specific system components and maintenance activities. As part of the second inspection, the operators were requested to provide printed copies of screens associated with specific operations maintained on line.

The following recommendations are made based on the 2014 site inspection:

1. Provide an update to EPA when the MSDS to SDS transition is complete.
2. Provide an update to the O&M Plan based on agency comments provided in December 2014.

5.0 NIBW GRANULAR ACTIVATED CARBON TREATMENT FACILITY

The Gilbane inspection team visited the NGTF, located at 5985 North Cattletrack Road, Scottsdale, Arizona, on December 10, 2014. Present were Mr. Jim Lutton (consultant to the NIBW PCs); Mr. Larry Lynch, of Ensolutions, Inc. (O&M subcontractor to the NIBW PCs); Mr. Chris Whitmer, COS Senior Water Treatment Plant Operator; and Mr. Craig Miller, COS Project Coordinator. The NGTF is a newly constructed facility that came online in 2013. The facility treats contaminated groundwater from extraction well PCX-1, which is screened in the LAU. Treated groundwater from the NGTF can be discharged to COS’s CWTP or the Arizona Canal. Functional testing began in early July 2013, and treatment of groundwater from PCX-1 at NGTF began on August 8, 2013 with treated water discharged to the Arizona Canal. NGTF was not operational for most of the first and second quarters of 2014 due to the replacement of the PCX-1 well pump. In August 2014, treated water was directed to the COS’s CWTP for the first time. The COS operates and maintains the NGTF.

The Gilbane inspection team was given a tour of the treatment facility, including the control room, liquid-phase granular activated carbon (IGAC) vessels, and extraction well PCX-1. The following subsections present brief descriptions of the remedy components and observations made during the 2014 site inspection.

5.1 NGTF Site Remedy Components

The NGTF was designed and constructed by the NIBW PCs to treat VOCs in groundwater extracted from well PCX-1 using IGAC. The NGTF was designed to provide treated groundwater that meets concentrations specified in Table 7. At the time of this inspection, treated groundwater was being delivered to the COS's CWTP.

Well PCX-1 was installed by the NIBW PCs and is owned, operated, and maintained by SRP. SRP also owns and maintains the PCX-1 pipeline from the well to a location on the Arizona Canal where the pipeline makes a 90-degree turn to the west, just outside the NGTF compound wall.

Water from well PCX-1 is pumped to the NGTF through a dedicated pipeline. Flow from well PCX-1 is controlled using a motorized flow-control valve and a magnetic flow meter to regulate influent flow to a rate not exceed the treatment capacity flow rate of 2,600 gpm. The PCX-1 well pump, previously having a capacity of 2,100 gpm, was replaced in summer 2014 with a new well pump having an increased capacity of 2,600 gpm. The facility has a current hydraulic capacity of 3,150 gpm. The facility is designed to allow for further expansion in the future, if necessary, to accept and treat groundwater from other extraction wells associated with the NIBW plumes, with a maximum hydraulic capacity of approximately 4,400 gpm. A pre-filter located upstream of the IGAC system removes entrained solids to prevent accumulation of sediment in the media bed of the IGAC vessels (i.e., contactors). Groundwater extracted from well PCX-1 is treated using three GAC treatment trains. Each train consists of two IGAC contactors in a series flow configuration. The target treatment flow for each treatment train is 1,050 gpm. Extracted groundwater enters through the lead contractor of each of the three operating IGAC trains, which provide the required NIBW COC treatment. From the lead contractor for each IGAC train, treated groundwater next flows through the lag contractor.

A valve "tree" consisting of eight butterfly valves controls the flow through the contactors of each train. The valve tree is configured such that each of the two GAC contactors in a treatment train can operate in either the lead position or the lag position. The tree also supports reverse flow through the contactors for backwashing the IGAC media. Valve position status is interlocked with the operation of well PCX-1 to ensure that the treatment system complies with the standard operating procedures developed for the facility. Sample taps are provided in the influent and effluent headers common to all trains, the effluent piping from each train, and the effluent and influent piping between the lead and lag contactors of each train (NIBW PCs, 2013c).

When treated water from the NGTF is discharged to the COS, the treated water is disinfected using sodium hypochlorite before being discharged from the facility. Chlorination, required by the COS to meet drinking water standards, is not part of the NIBW remedy and therefore not in the scope for this annual inspection of the NIBW treatment facilities.

The control building at the NGTF contains the control console with human/machine interface (HMI), appurtenant mechanical and electrical equipment, and the remote terminal unit (RTU) containing the main programmable logic controller (PLC). The system is linked with COS's citywide SCADA System. Remote input/output (RIO) panels are located near each treatment train. Indicator lights on each RIO panel locally indicate the operating mode (i.e., vessel lead and lag status, vessel backwash, or vessel rinse) for the treatment train. The NGTF and PX-1 operate only when the treatment train valve tree is configured appropriately and proper valve position status is confirmed by the PLC and indicated at the respective RIO panel.

In 2014, effluent from the NGTF was discharged primarily to the SRP Arizona Canal. NGTF effluent must meet the cleanup standards indicated in Table 7 below, as well as the AZPDES permit requirements.

Table 7 - NGTF Compliance Requirements for Treated Groundwater

Organic Contaminants of Concern ¹	Maximum Concentration (ug/L)
Chloroform ²	6
1,1-DCE	7
PCE	5
1,1,1-TCA	200
TCE	5

Notes:

1. Maximum concentration values from Table 3 of the *Record of Decision Amendment* (EPA, 2001).
2. The requirement for chloroform is exclusive of byproducts from disinfection.
3. Inorganic water quality requirements specified in the AZPDES permit are not listed in Table 7.

In August 2014, distribution of treated water from the NGTF to the CWTP began. During 2014, approximately 479,000,000 gallons of groundwater were extracted and treated and 240 pounds of TCE were removed at the NGTF. Approximately 80% of the total volume of treated water was discharged to the Arizona Canal and 20% was discharged to the CWTP. Based on samples collected during the fourth quarter, influent TCE concentrations ranged from 53 ug/L to 70 ug/L (NIBW PCs, 2015). Water-quality monitoring of the treatment system discharge indicated that treated effluent met the requirements specified in Table 7 and the 2001 ROD Amendment (NIBW PCs, 2015).

5.2 NGTF Site Events since the Previous Annual Inspection

The previous site inspection occurred on December 4, 2013. Major events during 2014 included replacement of the PCX-1 well pump and carbon change-out delays. From March through August 2014, the NGTF was not in operation due to the replacement of the PCX-1 well pump with a larger-capacity pump. In addition, the contractor supplying the carbon could not provide the 60,000 pounds of virgin carbon necessary for a carbon change-out in a reasonable time frame, even with the 3-4 week lead time provided. The NIBW PCs are looking into alternatives, as a carbon change-out is required every 30,000 bed volumes, or every 2-3 months. Other site events included general maintenance, with valve calibration occurring every 90, 180, and 365 days and air compressor maintenance every 30 days.

5.3 Observations Made During the 2014 Site Inspection

With construction completed in 2013, the physical condition of the NGTF was consistent with a new facility, and has been well maintained. Good housekeeping practices were evident. Appendix D presents the photographs taken during the 2014 site inspection. The system was operating during the site inspection. No water leaks were evident during the inspection from process equipment, instruments, or piping systems.

Authoritative procedures for changes to critical controls were discussed during the 2014 inspection. Mr. Miller stated that the control system software was locked and password protected, so that the possibility for unauthorized manipulation of the interlock/set-point is minimal (similar to the CGTF). Maintenance and calibration records were available on line and were reviewed during the site inspection. The frequency of system checks and wellhead inspections was discussed in detail during the 2014 inspection. The NGTF is staffed remotely from the CGTF; however, an in-person walk-through is performed each day. Operators are on call 24 hours a day, 7 days a week, and the COS's citywide SCADA system for the NGTF (located in the main control room at the CWTP and North Water Campus) also is staffed 24 hours a day, 7 days a week. During alarm events, two operators are notified automatically. During the 2014 inspection, operators described alarms that would shut down the PCX-1 and treatment plant operations, which include a large flow deviation between influent and effluent, high pressure at the wellhead, valve communication error, and high differential pressure between IGAC contactors for each train.

The air relief valves at the NGTF and those located near PCX-1 were visited during the 2014 site inspection. During daily inspections, the operators noted small leaks occurring at the air relief valves. All air relief valves were replaced with a model comparable to those used at all other COS facilities. The COS staff stated that if a new air relief valve needs replacement, PCX-1 does not need to be shut down because each air relief valve has an isolation valve enabling valve replacement while the NGTF continues operation.

Health and safety procedures were reviewed and discussed with the COS operators during the 2014 inspection. All MSDSs will be converted to SDSs in 2015. The SDSs will be available electronically, and will be maintained at a central location for the COS. If an incident occurs, the supervisor is notified immediately. All operators are certified annually for CPR and every two years for first aid and AED. CERP training, which also includes terrorism training, is provided annually. HAZWOPER training documentation is kept electronically.

Table 8 summarizes 2014 operational data for the NGTF including routine O&M activities, 2014 operational parameters, and performance metrics as reported by COS during the 2014 inspection.

Table 8 - NGTF – Summary of Annual Operational History for 2014

Date of previous annual inspection (EPA)	December 4, 2013
Frequency of wellhead inspections/routine O&M visits	SRP owns PCX-1 and conducts their own inspections ¹
Frequency of treatment system inspections/routine O&M visits	Daily on-site checks 7 days a week. Daily, 24-hour SCADA operation ¹
Reported system up-time	>90%, excluding March-August for PCX-1 pump replacement and IGAC change-out delays
Has down-time associated with non-routine operations and maintenance exceeded expectations?	Yes. Delays in subcontractor providing carbon for IGAC change-outs
Major repairs since last site inspection	Replacement of PCX-1 pump, replacement of air relief valves
Air emissions sampling frequency	N/A
Has air emissions system met applicable requirements?	N/A
Water effluent sampling frequency	3 times per week on lead vessel (only 1 for compliance on lead and lag vessels). ¹ Once TCE breakthrough occurs on the lead vessel, the lag vessel is sampled 3 times per week.
Has effluent discharge met applicable requirements?	Yes ¹
Has optimization study been conducted?	N/A. NGTF is a new facility.
Is system meeting performance goals regarding plume control?	Yes ¹
Do current operating parameters differ from design criteria?	No ¹

Notes:

1. Based on interviews conducted during the 2014 site inspection. Responses by Mr. James Lutton, et al.
2. No air permit is required or maintained for the facility, due to IGAC operations.

5.4 Adequacy of Contingency and Emergency Response Plan

Based on observations made during the site inspection, the practices described in the CERP (NIBW PCs, 2014) should be adequate for addressing releases of untreated groundwater from pipelines and equipment. Review comments were provided by Gilbane in 2014 for the CERP; incorporation of those comments is forthcoming.

5.5 Recommendations for NGTF

The following are the results of the actions taken pertaining to recommendations made on the basis of the 2013 site inspection:

1. The air relief valve at the PCX-1 wellhead was reconfigured to relieve pressure downward to minimize the potential for a pressure relief event to cause bodily harm.
2. A maintenance plan for activities during the upcoming year is to be provided as recommended during the last inspection.
3. Written details of the major interlock alarm testing procedures, including how participating parties are incorporated in each step, are to be provided as recommended during the last inspection.
4. Gilbane conducted two separate inspections. One inspection was held with the NIBW PCs' representative (Mr. Jim Lutton) to confirm that remedy goals are being met. A second inspection occurred with the operators of the NGTF system to discuss site-specific system components and maintenance activities. As part of the second inspection, the operators were requested to provide printed copies of screens associated with specific operations maintained on line.
5. The CERP was submitted and agency comments from were provided to the PCs and COS in December 2014.

The following recommendations are made based on the 2014 site inspection:

1. Present an update to the groundwater model based on the increased pumping rate at PCX-1.
2. Provide alternative contractor(s) for supplying IGAC to minimize down-time due to carbon change-outs (i.e. different vendors, alternative materials).
3. Maintain a hard copy of the Site-Specific Health and Safety Plan at the NGTF, as electronic versions are password protected and hard to retrieve.
4. Post a hospital route map at the NGTF.
5. Update the O&M Plan to include the specifications of the new PCX-1 well pump and resulting operational changes at NGTF for the IGAC trains.

6.0 MILLER ROAD TREATMENT FACILITY

The Gilbane inspection team visited the MRTF, located at 5975 North Cattletrack Road, Scottsdale, Arizona, on December 11, 2014. In addition to Mr. Lutton (consultant to the NIBW PCs), present were Mr. Ryan Guereña, Environmental Compliance Manager of EPCOR Water (EPCOR); Mr. Tim Williams, Operations Supervisor of EPCOR; Mr. Todd Farrell, Production Foreman of EPCOR; and Mr. Larry Lynch, of Ensolutions, Inc. (O&M subcontractor to the NIBW PCs).

EPCOR (formerly Arizona American Water [AAW]) currently operates the MRTF, which treats contaminated water from extraction wells PV-14 and PV-15. Prior to the NGTF beginning operation in 2013, EPCOR operated two of the three air stripper towers (Tower 1 and Tower 3) at the MRTF for the treatment of groundwater from wells PV-14 and PV-15, while EPCOR on behalf of the NIBW PCs operated the third tower (Tower 2) for the treatment of groundwater extracted from well PCX-1. Full details of the operation of the air stripper towers prior to 2014 can be found in previous annual inspection reports. The Gilbane inspection team was given a tour of the treatment facility, including the control room, air stripper towers, vGAC vessels, and extraction wells. The following subsections present a brief description of the remedy components, events since the previous site inspection, and observations made during the 2014 site inspection.

6.1 MRTF Site Remedy Components

The MRTF was constructed by the NIBW PCs in 1996-1997. Ownership of the MRTF was transferred from the NIBW PCs to AAW, now EPCOR, in December 1997. The plant was brought on line in March 1997, and is designed to remove VOCs from groundwater and prevent migration of the contaminated groundwater plume to EPCOR's potable water supply well field located to the north of the MRTF and associated extraction wells PV-14 and PV-15. The initial configuration of the MRTF included treatment components dedicated to (1) extracted groundwater from two existing wells (PV-14, screened in the LAU, and PV-15, screened in the MAU and the LAU) and (2) well PCX-1. As described in Section 5.0, extracted groundwater from PCX-1 is now treated at the NGTF.

The treatment configuration at MRTF includes three counter-current, forced-draft, packed-tower, air stripper towers to remove VOCs from groundwater. Each tower is equipped with a dedicated vGAC vessel to remove VOCs from the air waste stream. The MRTF was designed to treat up to 6,300 gpm (2,100 gpm at each air stripper) of groundwater with a maximum TCE influent concentration of 200 ug/L.

Effluent from the towers is discharged to the clearwell located below the MRTF and is then transported to the EPCOR arsenic-removal facility and subsequently to the water distribution

system for potable use. All MRTF effluent must meet the cleanup standards indicated in Table 9.

Table 9 - MRTF Compliance Requirements for Treated Groundwater

<i>Inorganic Constituents¹</i>	<i>Maximum Concentration (mg/L)</i>
Nitrate as nitrogen	10
Nitrite as nitrogen	1
<i>Organic Contaminants of Concern¹</i>	<i>Maximum Concentration (ug/L)</i>
Chloroform	6
1,1-DCE	7
PCE	5
1,1,1-TCA	200
TCE	5

Notes:

mg/L = milligrams per liter

1. Maximum concentration values are from the *Record of Decision Amendment* (EPA, 2001). Maximum Concentration values for inorganic constituents are not explicitly stated in the ROD Amendment; however, they are compared to their respective MCLs.
2. The requirement for chloroform is exclusive of by-products from disinfection.

A sodium hypochlorite system was installed upstream of the clearwell for disinfection of treated effluent water when the MRTF was constructed. This disinfection system, which is not part of the remedy, has been relocated to the EPCOR arsenic removal facility north of the MRTF.

The *ROD Amendment* (EPA, 2001) stipulates groundwater extraction at a flow rate goal of 5,480 gpm from existing wells PV-14, PV-15, and PCX-1 (or wells equivalent in location, depth, design, capacity, etc.), to “ensure that groundwater contamination in the Lower Aquifer (in the northern portion of NIBW) is not migrating further to the north.” The *ROD Amendment* also stipulates that extracted groundwater be treated using air-stripping technology, either at the existing MRTF or at alternate location(s). (Note: EPA issued an Explanation of Significant Differences in 2012 replacing air-stripping technology with liquid-phase granular activated carbon for treatment of extracted groundwater from well PCX-1 [EPA, 2012].)

The MRTF is configured so that Tower 1 can treat water from extraction wells PV-15 and Tower 3 can treat water from extraction well PV-14. Tower 2 is used as a standby and can treat water from either PV-14 or PV-15. Towers 2 and 3 were in operation during the 2014 site inspection. EPCOR personnel staff the MRTF 8 hours a day, 5 days a week (Monday through Friday) and are on call 24 hours a day, 7 days a week. The control system at the MRTF was upgraded and installed in late 2013. Testing and validation of the control system was performed in June 2014 for Tower 2 and in December 2014 for Towers 1 and 3.

In 2014, 2,110 million gallons of groundwater were extracted and treated at the MRTF. Of the total gallons, 1,032 million gallons were extracted at PV-14 and 1,078 million gallons at PV-15. An estimated 73 pounds of TCE were removed by the MRTF during 2014 (NIBW PCs, 2015).

Gilbane notes that the average annual flow rate of 4,000 gpm for 2014, as calculated based on the total gallons extracted and continuous operation, was below the minimum total annual average pumping rate goal of 5,480 gpm stated in the ROD Amendment, however groundwater from PXC-1 was not treated at MRTF. Fourth-quarter 2014 influent TCE concentrations ranged from 1.2 ug/L to 2.0 ug/L at PV-14 and from 6.7 ug/L to 7.9 ug/L at PV-15 (NIBW PCs, 2015). Water-quality monitoring of the treatment system discharge indicated that treated effluent met all requirements specified in Table 9, as mandated by the 2001 ROD Amendment (EPA, 2001).

6.2 MRTF Site Events Since the Previous Annual Inspection

The previous MRTF inspection occurred on December 4, 2013. A major event that occurred in 2014 was the realignment of Tower 2 piping to the clearwell and new influent piping to the column. This finalized the removal of PCX-1 from treatment at MRTF. During the inspection, Mr. Farrell stated that Tower 2 had been operating continuously treating groundwater from PV-15 since June 2014.

6.3 Observations Made During the 2014 Site Inspection

The facility was found to be in very good physical condition and appeared to be well maintained. Appendix E presents the photographs taken during the 2014 site inspection. Good housekeeping practices were evident. Both extraction wells and the treatment system were operating during the site inspection. No indication of water leaks from process equipment, instruments, or piping systems was observed during the inspection. The EPCOR operator stated that critical system controls and interlocks were tested routinely and that the control system software was locked and password protected to limit unauthorized tampering. Maintenance and calibration records were available in hard copy and electronically.

Critical controls/signals that would shut down the extraction well pumps and treatment system components in the event of an upset were reviewed. Critical controls/signals include the following:

- High-pressure and low-pressure switches are located on the air stripper tower process air inlet. In the event of a high- or low-pressure condition, the actuated valve at the process water influent will close and the blowers and extraction well pumps will be shut down.
- An air-flow switch is installed at the air stripper process air discharge. A low air-flow condition in the air stripper ducting actuates the switch, which causes the actuated valve at the process water influent to close and shuts down the blowers and extraction pumps.

Note: Operational updates include proposing to lower the air-to-water ratio in 2015.

The air relief valve at the PV-15 wellhead was visited during the 2014 site inspection (see photograph 14 in Appendix E). The air relief valve located at the PV-15 wellhead was reconfigured and is no longer a potential safety concern.

Air stripper cleaning procedures were discussed and documentation was reviewed. Ensolutions, Inc., conducts the acid cleaning with EPCOR oversight. Concentrated HCl (31%) is used during cleaning. Tanks store the spent acid until laboratory sample results allow for removal and disposal. After an acid cleaning, there is a minor discharge of treated water to the SRP canal before treated water is distributed to the EPCOR water system.

Health and safety procedures were reviewed and discussed with the operator during the 2014 inspection. All MSDSs will be converted to SDSs in 2015 and will be handled by EPCOR's safety department. If an incident occurs, the supervisor is notified immediately, and a near-miss report is generated if appropriate. All operators are CPR/first aid/AED certified. HAZWOPER training documentation is kept at the EPCOR safety office.

Table 10 summarizes 2014 operational data for the MRTF including routine O&M activities, 2014 operational parameters, and performance metrics.

Table 10 - MRTF – Summary of Annual Operational History for 2014

Date of previous annual inspection (EPA)	4 December 2013
Frequency of wellhead inspections/routine O&M visits	Daily ¹
Frequency of treatment system inspections/routine O&M visits	Hourly during staffed hours (MRTF is staffed from 6a.m. to 2:30p.m. Monday-Friday and for 2 hours on Saturday and Sunday). Operators are on call 24 hours per day ¹
Reported system up-time	100% ¹
Reported air-to-water ratio	54:1 for Tower 3 and 46:1 for Tower 2 ¹
Has down-time associated with non-routine operations and maintenance exceeded expectations?	No
Major repairs since last site inspection	Realignment of Tower 2 piping to the clearwell and influent piping to columns ¹
Air emissions sampling frequency	Not Applicable ²
Has air emissions system met applicable requirements?	Not Applicable ²
Water effluent sampling frequency	Weekly ³
Has effluent discharge met applicable requirements?	Yes ^{1,5}
Has optimization study been conducted?	Yes. Environ Corporation Engineering Evaluation, April 2008 ³
Is system meeting performance goals regarding plume control?	Yes. Groundwater Monitoring and Evaluation Plan (GMEP) contingency criteria have been triggered. ^{4,5}
Do current operating parameters differ from design criteria?	Yes. Current concentrations of TCE in the combined extracted groundwater (< 5 ug/L) are much lower than the design parameter (200 ug/L) ⁴ .

Notes:

1. Based on interviews conducted during the 2014 site inspection. Responses by Mr. James Lutton, et al. Responses were subsequently confirmed by reviewing O&M manuals, plans, and analytical reports.
2. No air permit is required or maintained for the facility, because potential emissions are below ambient Maricopa County Air Quality Control District requirements.
3. *2008 Interim Operating Plan, Miller Road Treatment Facility* (NIBW PCs, 2008).
4. *Groundwater Monitoring and Evaluation Plan* (NIBW PCs, 2002).
5. *2014 Site Monitoring Report* (NIBW PCs, 2015).

6.4 Adequacy of Contingency and Emergency Response Plan

Based on observations made during the site inspection, the practices described in the CERP (NIBW PCs, 2014e) should be adequate for addressing releases of untreated groundwater from pipelines and equipment. Review comments were provided by Gilbane in 2014 for the CERP; incorporation of those comments is forthcoming.

6.5 Recommendations for the MRTF

The following are the results of the actions taken in response to recommendations based on the 2013 site inspection:

1. The air relief valve at PV-15 was reconfigured to relieve pressure downward to minimize the potential for a pressure event to cause bodily harm.
2. During the 2014 inspection, Mr. Farrell noted that air stripper cleaning procedures are with the contractor, Ensolutions, Inc., that conducts the work. Documentation of air stripper cleaning activities should be located onsite.
3. A maintenance plan for activities in the upcoming year has not been provided. Action items developed during maintenance activities will be confirmed as completed or in progress during the next annual site inspection.
4. Operational plans and related documents, while revised in 2014, will need to be updated to reflect the air-to-water ratio change to be proposed and reportedly having a planned completion in 2015.
5. Gilbane conducted two separate inspections. One inspection was held with the NIBW PCs' representative (Mr. Jim Lutton) to confirm that remedy goals are being met. A second inspection occurred with the operators of the MRTF system to discuss site-specific system components and maintenance activities. As part of the second inspection, the operators were requested to provide printed copies of screens associated with specific operations maintained on line.

The following recommendations are made based on the 2014 site inspection:

1. Update the O&M Plan after system modifications are completed in 2015 and incorporate agency comments provided in December 2014.
2. Provide written documentation of acid cleaning activities.
3. Maintain a hard copy of the Health and Safety Plan on site at all times, with a hospital route map posted in a highly visible area.

7.0 REFERENCES

- Arcadis, 2010. *North Indian Bend Wash–Area 7 Groundwater Extraction Well 7EX-5MA Incident Report: Release of Untreated Water on July 6, 2010*. July.
- City of Scottsdale (COS), 2014a. *Operation and Maintenance Plan Revision 4, Central Groundwater Treatment Facility, North Indian Bend Wash, 8650 East Thomas Road, Scottsdale, Arizona*. April 24.
- COS, 2014b. *Contingency and Emergency Response Plan, for Accidental Release of Untreated Water, Including Waste Characterization*. May.
- Environ International Corporation, 2009. *Engineering Evaluation, Central Groundwater Treatment Facility, Scottsdale, Arizona*. January.
- ITSI Gilbane, 2013. *Split Sampling, Area 7 Soil Vapor Extraction and Treatment System (SVETS), North Indian Bend Wash (NIBW) Superfund Site, Scottsdale, Arizona*. July 8.
- Gilbane Federal (Gilbane), 2014. *2013 Annual Site Inspection Report, Groundwater Treatment Facilities, North Indian Bend Wash Superfund Site*. April.
- Levine-Fricke-Recon, Inc. (LFR), 2007. *North Indian Bend Wash Area 7 Soil Vapor Extraction and Treatment System Startup Work Plan*. November.
- Montgomery and Associates, 2013. *2013 Groundwater Threat Analysis for Area 7, North Indian Bend Wash Superfund Site, Maricopa County, Arizona*. August 29.
- NIBW Participating Companies (PCs), 2002. *Groundwater Monitoring and Evaluation Plan North Indian Bend Wash Superfund Site*. October 8.
- NIBW PCs, 2008. *2008 Interim Operating Plan, Miller Road Treatment Facility, North Indian Bend Wash Superfund Site*. April 25.
- NIBW PCs, 2013a. *2012 Site Monitoring Report, North Indian Bend Wash Superfund Site, Scottsdale, Arizona*. March 14.
- NIBW PCs, 2013b. *Operation and Maintenance Plan, NIBW Granular Activated Carbon Treatment Facility*. June 19.
- NIBW PCs, 2014a. *2013 Site Monitoring Report, North Indian Bend Wash Superfund Site, Scottsdale, Arizona*. February 28.
- NIBW PCs, 2014b. *Contingency and Emergency Response Plan, Area 7 Groundwater Extraction and Treatment System, North Indian Bend Wash Superfund Site*. May 30.
- NIBW PCs, 2014c. *Contingency and Emergency Response Plan, Area 12 Groundwater Extraction and Treatment System, North Indian Bend Wash Superfund Site*. May 30.

- NIBW PCs, 2014d. *Contingency and Emergency Response Plan, North Indian Bend Wash Granular Activated Carbon Treatment Facility, North Indian Bend Wash Superfund Site.* May 30.
- NIBW PCs, 2014e. *Contingency and Emergency Response Plan, Miller Road Treatment Facility, North Indian Bend Wash Superfund Site.* August 26.
- NIBW PCs, 2014f. *Operation and Maintenance Plan, Area 7 Groundwater Extraction and Treatment System.* April 7.
- NIBW PCs, 2014g. *Operation and Maintenance Plan, Area 12 Groundwater Extraction and Treatment System.* April 7.
- NIBW PCs, 2014h. *Operation and Maintenance Plan, Miller Road Treatment Facility, North Indian Bend Wash Superfund Site.* August 26.
- NIBW PCs, 2015. *2014 Site Monitoring Report, North Indian Bend Wash Superfund Site, Scottsdale, Arizona.* February 28.
- U.S. Environmental Protection Agency (EPA), 1988. *Final Record of Decision, Scottsdale Ground Water Operable Unit, Indian Bend Wash Superfund Site, Scottsdale, AZ.* September.
- EPA, 2001. *Record of Decision Amendment for the North Indian Bend Wash Superfund Site Final Operable Unit, Scottsdale, Arizona.* September.
- EPA, 2006. *Preliminary Close Out Report, Indian Bend Wash Superfund Site, Phoenix, Maricopa County, AZ.* September 28.
- EPA, 2008. *Recommended Annual O&M/Remedy Evaluation Checklist.* OSWVER 9355.0-87. April.
- EPA, 2012. *Explanation of Significant Differences, North Indian Bend Wash Superfund Site Remedy Well PXC-1, Scottsdale, Maricopa County, Arizona.* March.
- EPA, 2015. *EPA Letter of Determination for the Area 7 Soil Vapor Extraction System, North Indian Bend Wash Superfund Site, Scottsdale, Arizona.* April 22.

FIGURE 1

Location of NIBW Treatment Facilities, Extraction Wells, and Pipelines

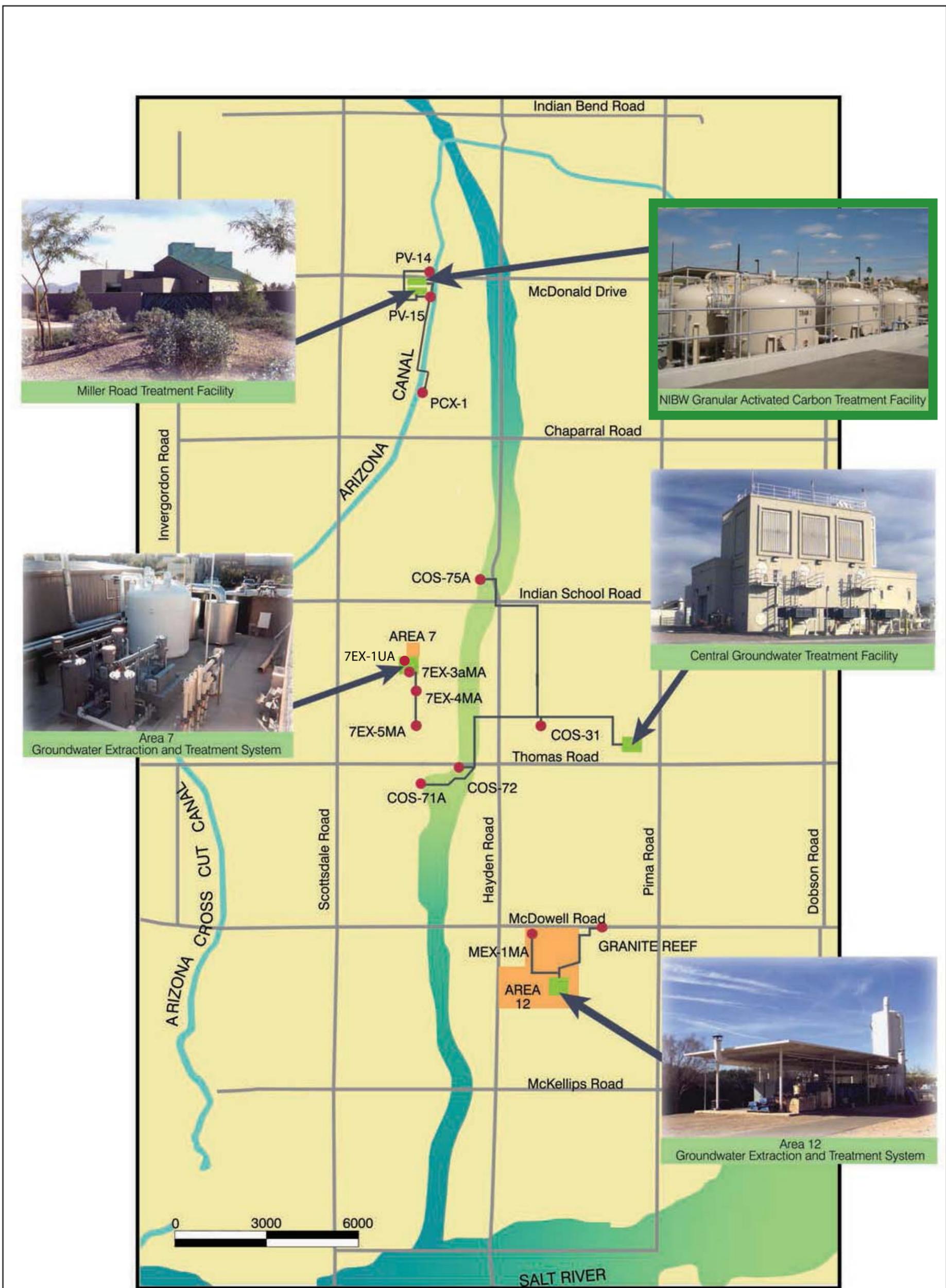


Image Source: Figure 17 from NIBW PCs, 2015. 2014 Site Monitoring Report, North Indian Bend Wash Superfund Site. February 27.

	<p>North Indian Bend Wash (NIBW) Superfund Site Scottsdale Arizona Annual Site Inspection Report</p>	<p>Figure 1 Locations of NIBW Treatment Facilities, Extraction Wells and Pipelines</p>
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APPENDIX A
Photographic Documentation - Area 7

Photographic Documentation – Area 7

North Indian Bend Wash Superfund Site, Scottsdale, Arizona

EPA Contract Number EP-S9-08-03, Task Order 0007

Gilbane Project Number 07163.0008

Photograph Date: 12/9/2014

Photograph No. 1

Direction: South

Description: Air compressor in good working condition.



Photograph No. 2

Direction: West

Description: Pump P-1 prior to ultraviolet/chemical oxidation (UV/Ox) treatment. Sample port SP-102-S is shown at the top center of the photo just below the yellow pipe label.



Photographic Documentation – Area 7

North Indian Bend Wash Superfund Site, Scottsdale, Arizona

EPA Contract Number EP-S9-08-03, Task Order 0007

Gilbane Project Number 07163.0008

Photograph Date: 12/9/2014

Photograph No. 3

Direction: East

Description: Tray air stripper that was in good working condition during the inspection. Next anticipated cleaning reported to be in early 2015.



Photograph No. 4

Direction: South

Description: Polyphosphate (anti-scalant) drum storage area with drums on secondary containment.



Photographic Documentation – Area 7

North Indian Bend Wash Superfund Site, Scottsdale, Arizona

EPA Contract Number EP-S9-08-03, Task Order 0007

Gilbane Project Number 07163.0008

Photograph Date: 12/9/2014

Photograph No. 5

Direction: South

Description: The hydrogen peroxide metering pump is at the left side of the photo. On the right in the photo is the polyphosphate metering pump.



Photograph No. 6

Direction: Northwest

Description: Air stripper blower and general storage.



Photographic Documentation – Area 7

North Indian Bend Wash Superfund Site, Scottsdale, Arizona

EPA Contract Number EP-S9-08-03, Task Order 0007

Gilbane Project Number 07163.0008

Photograph Date: 12/9/2014

Photograph No. 7

Direction: North

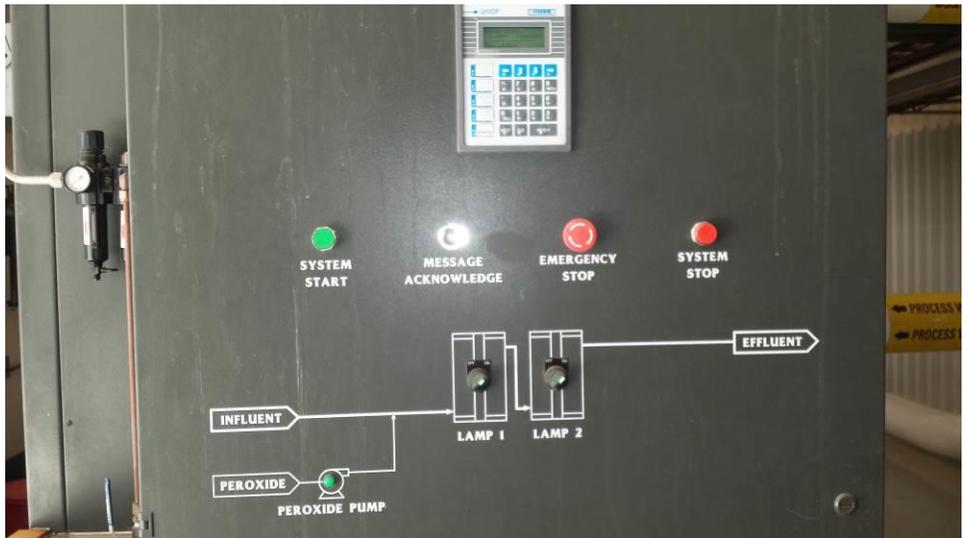
Description: Tray air stripper with polyphosphate drums in the foreground.



Photograph No. 8

Direction: South

Description: UV/Ox reactor system controls.



Photographic Documentation – Area 7

North Indian Bend Wash Superfund Site, Scottsdale, Arizona

EPA Contract Number EP-S9-08-03, Task Order 0007

Gilbane Project Number 07163.0008

Photograph Date: 12/9/2014

Photograph No. 9

Direction: North

Description: Eye-wash station located to the right of the office door and left of the garage door.



Photograph No. 10

Direction: Southwest

Description: Piping of treated water to Injection Wells 7IN-2UA and 7IN-1UA.



Photographic Documentation – Area 7

North Indian Bend Wash Superfund Site, Scottsdale, Arizona

EPA Contract Number EP-S9-08-03, Task Order 0007

Gilbane Project Number 07163.0008

Photograph Date: 12/9/2014

Photograph No. 11

Direction: West

Description: Sample ports on discharge pipe from extraction well 7EX-3MA (SP-603-S) and extraction well 7EX-4MA (SP-602-S).



Photograph No. 12

Direction: Southwest

Description: Equalization tank T-1.



Photographic Documentation – Area 7

North Indian Bend Wash Superfund Site, Scottsdale, Arizona

EPA Contract Number EP-S9-08-03, Task Order 0007

Gilbane Project Number 07163.0008

Photograph Date: 12/9/2014

Photograph No. 13

Direction: Southwest

Description: vGAC vessels:
VC-3B in foreground, VC-3A
in background.



Photograph No. 14

Direction: Northwest

Description: Idle soil vapor
extraction (SVE) system
equipment area.



APPENDIX B
Photographic Documentation - Area 12

Photographic Documentation – Area 12

North Indian Bend Wash Superfund Site, Scottsdale, Arizona

EPA Contract Number EP-S9-08-03, Task Order 0007

Gilbane Project Number 07163.0008

Photograph Date: 12/9/2014

Photograph No. 1

Direction: Southwest

Description: Area 12 compound area. vGAC vessels are in the center of the photo.



Photograph No. 2

Direction: South

Description: Containment sump pump discharge point. Level indicators on the drum secondary containment, which has a capacity of 170 gallons.)



Photographic Documentation – Area 12

North Indian Bend Wash Superfund Site, Scottsdale, Arizona

EPA Contract Number EP-S9-08-03, Task Order 0007

Gilbane Project Number 07163.0008

Photograph Date: 12/9/2014

Photograph No. 3

Direction: South

Description: Untreated groundwater conveyance piping.



Photograph No. 4

Direction: N/A

Description: View of packing within the air stripper. Packing is in good condition.



Photographic Documentation – Area 12

North Indian Bend Wash Superfund Site, Scottsdale, Arizona

EPA Contract Number EP-S9-08-03, Task Order 0007

Gilbane Project Number 07163.0008

Photograph Date: 12/9/2014

Photograph No. 5

Direction: North

Description: Air stripper
blower fan.



Photograph No. 6

Direction: South

Description: Emergency
eyewash station on the far left.
Note the corroded water
piping in need of replacement.



Photographic Documentation – Area 12

North Indian Bend Wash Superfund Site, Scottsdale, Arizona

EPA Contract Number EP-S9-08-03, Task Order 0007

Gilbane Project Number 07163.0008

Photograph Date: 12/9/2014

Photograph No. 7

Direction: Southwest

Description: vGAC vessels 1 (foreground) and 2 (background).



Photograph No. 8

Direction: N/A

Description: View of corroded vGAC vessel 2, still in need of repair.



Photographic Documentation – Area 12

North Indian Bend Wash Superfund Site, Scottsdale, Arizona

EPA Contract Number EP-S9-08-03, Task Order 0007

Gilbane Project Number 07163.0008

Photograph Date: 12/9/2014

Photograph No. 9

Direction: Northwest

Description: View of air stripper tower.



Photograph No. 10

Direction: Northwest

Description: Example of labeling completed at site. This high level switch is located near the bottom of the air stripper containment area.



APPENDIX C
Photographic Documentation - CGTF

Photographic Documentation – CGTF

North Indian Bend Wash Superfund Site, Scottsdale, Arizona

EPA Contract Number EP-S9-08-03, Task Order 0007

Gilbane Project Number 07163.0008

Photograph Date: 12/10/2014

Photograph No. 1

Direction: Northeast

Description: View of treatment building.



Photograph No. 2

Direction: Southeast

Description: Tower 1 treatment train air blower.



Photographic Documentation – CGTF

North Indian Bend Wash Superfund Site, Scottsdale, Arizona

EPA Contract Number EP-S9-08-03, Task Order 0007

Gilbane Project Number 07163.0008

Photograph Date: 12/10/2014

Photograph No. 3

Direction: South

Description: Tower 2 treatment train air duct with water conveyance piping in background.



Photograph No. 4

Direction: N/A

Description: Control panel for Tower 3 treatment train.



Photographic Documentation – CGTF

North Indian Bend Wash Superfund Site, Scottsdale, Arizona

EPA Contract Number EP-S9-08-03, Task Order 0007

Gilbane Project Number 07163.0008

Photograph Date: 12/10/2014

Photograph No. 5

Direction: South

Description: Cleaning pump
(bottom left of photo)
conveyance piping (yellow
piping).



Photograph No. 6

Direction: N/A

Description: Moderately
scaled packing within air
stripper column 2.



Photographic Documentation – CGTF

North Indian Bend Wash Superfund Site, Scottsdale, Arizona

EPA Contract Number EP-S9-08-03, Task Order 0007

Gilbane Project Number 07163.0008

Photograph Date: 12/10/2014

Photograph No. 7

Direction: East

Description: In-house laboratory room in good condition.



Photograph No. 8

Direction: Northeast

Description: Good general housekeeping on the east side of the treatment building.



Photographic Documentation – CGTF

North Indian Bend Wash Superfund Site, Scottsdale, Arizona

EPA Contract Number EP-S9-08-03, Task Order 0007

Gilbane Project Number 07163.0008

Photograph Date: 12/10/2014

Photograph No. 9

Direction: West

Description: Digital relative humidity and temperature gauges for vGAC Tower 1 treatment train.



Photograph No. 10

Direction: East

Description: vGAC vessel area.



Photographic Documentation – CGTF

North Indian Bend Wash Superfund Site, Scottsdale, Arizona

EPA Contract Number EP-S9-08-03, Task Order 0007

Gilbane Project Number 07163.0008

Photograph Date: 12/10/2014

Photograph No. 11

Direction: Northwest

Description: Differential pressure gauges for the vGAC vessel 3.



Photograph No. 12

Direction: East

Description: Air ducting and sample ports for vGAC vessels 2 and 3.



APPENDIX D
Photographic Documentation - NGTF

Photographic Documentation - NGTF

North Indian Bend Wash Superfund Site, Scottsdale, Arizona

EPA Contract Number EP-S9-08-03, Task Order 0007

Gilbane Project Number 07163.0008

Photograph Date: 12/10/2014

Photograph No. 1

Direction: N/A

Description: Daily inspection log used during the daily site walk of the treatment system.

City of Scottsdale Daily Operations Report for NGTF				
Operator	Date	Time	Recorded	
	12/10/14		10:00 10:00	
SCADA Online Data				
Train 1 Configuration	Circle one	RUN AB, RUN BA, RUN SA, RUN SW A, RUNSE A, RUNSE B, OFFLINE		
A Lag Bvs	100%	A Lag Bvs	100%	
B Lag Bvs	100%	B Lag Bvs	100%	
Train 2 Configuration	Circle one	RUN AB, RUN BA, RUN SA, RUN SW A, RUNSE A, RUNSE B, OFFLINE		
A Lag Bvs	100%	A Lag Bvs	100%	
B Lag Bvs	100%	B Lag Bvs	100%	
Train 3 Configuration	Circle one	RUN AB, RUN BA, RUN SA, RUN SW A, RUNSE A, RUNSE B, OFFLINE		
A Lag Bvs	100%	A Lag Bvs	100%	
B Lag Bvs	100%	B Lag Bvs	100%	
NGTF Inlet Flow	2583	gpm		
NGTF Inlet Valve % OPEN	100%			
Train 1 Flow	868	gpm	T1 Inlet Valve "A" % OPEN 100%	
Train 2 Flow	870	gpm	T2 Inlet Valve "A" % OPEN 100%	
Train 3 Flow	845	gpm	T3 Inlet Valve "A" % OPEN 100%	
NGTF Discharge Flow	2573	gpm		
To SRP Canal	2573	gpm	SRP Valve % OPEN 100%	
To CWTP Reservoir	0	gpm	CWTP Valve % OPEN 0%	
SRP PCX-1 Discharge Pressure	46.8	psi		
Bag Filter #1-51 Discharge Pressure	0	psi	Discharge to COS Sewer	
Backwash Tank Level	1.0	feet	BS FIT Total Flow, gal	
Sewer Lift Station Level	2.3	feet	LS FIT Total Flow, gal	
CWTP Reservoir Level	10.1	feet		
Field Instruments				
NGTF Inlet Pressure	3.0	psi	Gauge Upstream of Bag Filter	
NGTF Inlet Pressure	3.0	psi	Gauge Downstream of Bag Filter	
Train 1 A Inlet P	3.0	psi	Train 1 B Inlet P	3.0
Train 1 A Outlet P	3.0	psi	Train 1 B Outlet P	3.0
Train 1 A Diff P	4.5	psi	Train 1 B Diff P	4.5
Train 2 A Inlet P	3.0	psi	Train 2 B Inlet P	3.0
Train 2 A Outlet P	3.0	psi	Train 2 B Outlet P	3.0
Train 2 A Diff P	4.5	psi	Train 2 B Diff P	4.5
Train 3 A Inlet P	3.0	psi	Train 3 B Inlet P	3.0
Train 3 A Outlet P	3.0	psi	Train 3 B Outlet P	3.0
Train 3 A Diff P	4.5	psi	Train 3 B Diff P	4.5
Recordable Events or Faults				
SRP Well PCX-1 Panel Faults (record time of fault and type of fault RESET performed at SRP Side Panel)				
Observed abnormal operating conditions				

Photograph No. 2

Direction: Southwest

Description: View of the PCX-1 conveyance pipeline and influent flow meter at the NGTF. All untreated groundwater from PCX-1 is delivered to the NGTF for treatment.



Photographic Documentation - NGTF

North Indian Bend Wash Superfund Site, Scottsdale, Arizona

EPA Contract Number EP-S9-08-03, Task Order 0007

Gilbane Project Number 07163.0008

Photograph Date: 12/10/2014

Photograph No. 3

Direction: Northwest

Description: Treatment system bag-filter.



Photograph No. 4

Direction: Northeast

Description: Landscaping of facility grounds is in good condition.



Photographic Documentation - NGTF

North Indian Bend Wash Superfund Site, Scottsdale, Arizona

EPA Contract Number EP-S9-08-03, Task Order 0007

Gilbane Project Number 07163.0008

Photograph Date: 12/10/2014

Photograph No. 5

Direction: South

Description: Conveyance piping of treated water (including flow meter control panel) from the NGTF to the Chaparral Water Treatment Plant. The Train 1 IGAC vessels appear behind the conveyance piping. The MRTF is in background.



Photograph No. 6

Direction: South

Description: View of the carbon vessel for train 1A. The manhole is open for repairs inside the vessel. The control panel for train 1 is adjacent to the vessel.



Photographic Documentation - NGTF

North Indian Bend Wash Superfund Site, Scottsdale, Arizona

EPA Contract Number EP-S9-08-03, Task Order 0007

Gilbane Project Number 07163.0008

Photograph Date: 12/10/2014

Photograph No. 7

Direction: Southeast

Description: New air relief valves (black instruments in center and on the right side of photo) replaced old valves that would leak.



Photograph No. 8

Direction: North

Description: Emergency eye-wash and shower station located within the treatment train process area.



Photographic Documentation - NGTF

North Indian Bend Wash Superfund Site, Scottsdale, Arizona

EPA Contract Number EP-S9-08-03, Task Order 0007

Gilbane Project Number 07163.0008

Photograph Date: 12/10/2014

Photograph No. 9

Direction: East

Description: Typical valve tree at each IGAC treatment train that controls flow through the IGAC contactors.



Photograph No. 10

Direction: West

Description: Conveyance piping for groundwater, IGAC contractor backwash (rinse) water, and treated water.



Photographic Documentation - NGTF

North Indian Bend Wash Superfund Site, Scottsdale, Arizona

EPA Contract Number EP-S9-08-03, Task Order 0007

Gilbane Project Number 07163.0008

Photograph Date: 12/10/2014

Photograph No. 11

Direction: South

Description: Control panel for IGAC train 2.



Photograph No. 12

Direction: Southwest

Description: Open area ready for expansion if one more IGAC treatment train is necessary.



APPENDIX E
Photographic Documentation - MRTF

Photographic Documentation - MRTF

North Indian Bend Wash Superfund Site, Scottsdale, Arizona

EPA Contract Number EP-S9-08-03, Task Order 0007

Gilbane Project Number 07163.0008

Photograph Date: 12/11/2014

Photograph No. 1

Direction: Southeast

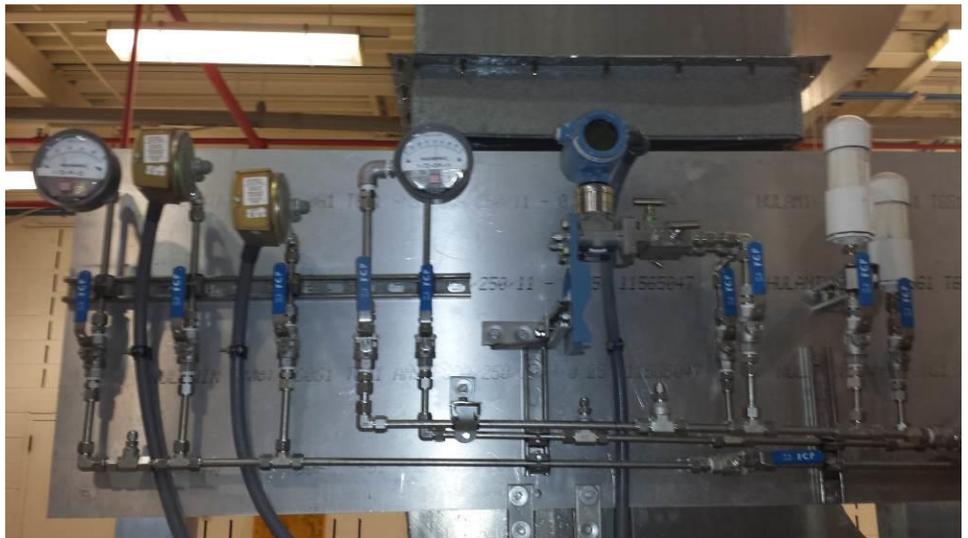
Description: View of the treatment plant. Tower 2 is in the center of the photo and Tower 3 is in the background. Good housekeeping was evident.



Photograph No. 2

Direction: North

Description: Labeled instrumentation panel for Tower 2.



Photographic Documentation - MRTF

North Indian Bend Wash Superfund Site, Scottsdale, Arizona

EPA Contract Number EP-S9-08-03, Task Order 0007

Gilbane Project Number 07163.0008

Photograph Date: 12/11/2014

Photograph No. 3

Direction: Southeast

Description: Tower 2 in operation. Packing is in good condition.



Photograph No. 4

Direction: Southeast

Description: Piping reconfiguration resulting from the disconnection of the pipeline from PCX-1 to the MRTF treatment system.



Photographic Documentation - MRTF

North Indian Bend Wash Superfund Site, Scottsdale, Arizona

EPA Contract Number EP-S9-08-03, Task Order 0007

Gilbane Project Number 07163.0008

Photograph Date: 12/11/2014

Photograph No. 5

Direction: South

Description: New influent piping at Tower 2.



Photograph No. 6

Direction: Southeast

Description: Tower 3 in operation. Packing is in good condition.



Photographic Documentation - MRTF

North Indian Bend Wash Superfund Site, Scottsdale, Arizona

EPA Contract Number EP-S9-08-03, Task Order 0007

Gilbane Project Number 07163.0008

Photograph Date: 12/11/2014

Photograph No. 7

Direction: South

Description: Distribution pumps and discharge piping area.



Photograph No. 8

Direction: South

Description: Blind flanges installed on the pipeline from PCX-1 and the connection to treatment system piping (disconnected section of piping having blind flanges in the center of the photo).



Photographic Documentation - MRTF

North Indian Bend Wash Superfund Site, Scottsdale, Arizona

EPA Contract Number EP-S9-08-03, Task Order 0007

Gilbane Project Number 07163.0008

Photograph Date: 12/11/2014

Photograph No. 9

Direction: Northeast

Description: Storage area within the treatment building.



Photograph No. 10

Direction: South

Description: Piping reconfiguration in background. Yellow piping in the center of the photo is the new influent piping at Tower 3.



Photographic Documentation - MRTF

North Indian Bend Wash Superfund Site, Scottsdale, Arizona

EPA Contract Number EP-S9-08-03, Task Order 0007

Gilbane Project Number 07163.0008

Photograph Date: 12/11/2014

Photograph No. 11

Direction: Southwest

Description: vGAC unit for Tower 1.



Photograph No. 12

Direction: Southwest

Description: Storage area with secondary containment for spent acid from air stripper cleaning operations.



Photographic Documentation - MRTF

North Indian Bend Wash Superfund Site, Scottsdale, Arizona

EPA Contract Number EP-S9-08-03, Task Order 0007

Gilbane Project Number 07163.0008

Photograph Date: 12/11/2014

Photograph No. 13

Direction: Northwest

Description: Emergency eye-wash station on the south side of the treatment building.



Photograph No. 14

Direction: Southwest

Description: The air relief valve at the PV-15 wellhead has been reconfigured to minimize the potential of bodily harm.



Photographic Documentation - MRTF

North Indian Bend Wash Superfund Site, Scottsdale, Arizona

EPA Contract Number EP-S9-08-03, Task Order 0007

Gilbane Project Number 07163.0008

Photograph Date: 12/11/2014

Photograph No. 15

Direction: Southwest

Description: Pipeline with valves and instrumentation from extraction well PV-15.



Photograph No. 16

Direction: Northwest

Description: General housekeeping to the south of the treatment building.

