

2008
Interim Operating Plan
Miller Road Treatment Facility



Prepared for:
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Region IX**

Prepared by:
NIBW Participating Companies

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Interim Operating Plan Miller Road Treatment Facility

1.0 INTRODUCTION

On behalf of the North Indian Bend Wash Participating Companies (NIBW PCs), this Interim Operating Plan (IOP) is submitted to describe the proposed short term measures and plan for operation and maintenance of the Miller Road Treatment Facility (MRTF) in order to reinstate pumping of PCX-1 for plume containment associated with the NIBW Superfund Site groundwater remedy. This IOP is based on the NIBW PCs' Work Plan, Proposed Interim Actions, submitted to EPA in a letter regarding Interim Containment Measures, dated February 15, 2008 and EPA's letter regarding EPA Comments and Conditional Approval of MRTF Documents, dated March 5, 2008. Comments included in EPA's March 5, 2008 letter have been addressed in this IOP.

Since the original Work Plan was submitted, several changes to the Interim Containment Measures have been made based on subsequent requirements from Maricopa County Environmental Services Department (MCESD), agreements between the NIBW PCs and Arizona American Water Company (AAW), and discussions between the NIBW PCs and EPA. Specifically, the NIBW PCs and AAW have bifurcated operation of the MRTF such that treatment and end use of extraction well PCX-1 is separate and independent of treatment and end use of AAW wells.

This IOP focuses exclusively on operations associated with PCX-1 and Treatment Train 2. AAW is responsible for and will provide operation and maintenance of wells PV-15 and PV-14, if necessary, and associated treatment trains at MRTF in accordance with state and county requirements. Therefore, the operation, treatment, and end use of PV-15 and PV-14 is not discussed herein.

The NIBW PCs will extract and treat water from well PCX-1 through Treatment Train 2 and discharge the treated water to the Arizona Canal. In accordance with requirements from MCESD, water from PCX-1 and Treatment Train 2 has been physically separated from other treatment trains and the clearwell at MRTF. This bifurcation includes a completely separate control system for operation of well PCX-1 and Treatment Train 2.

Treatment of water extracted from well PCX-1 will be conducted by the NIBW PCs using a qualified operations contractor. Furthermore,



additional safeguards and operational enhancements will be implemented to ensure that all water discharged into the Arizona Canal is fully treated. These safeguards include 24-hour manned operation. Treatment will be verified through an aggressive sampling schedule.

This IOP is provided to augment the MRTF Operation and Maintenance (O&M) Plan, dated June 5, 2006, with detailed and specific information for MRTF start-up and interim operation. The information in Section 3 of this IOP provides a description of the changes that have been made to Treatment Train piping and instrumentation and controls since the January 2008 incident to update information that is included in Section 3 (System Description) of the MRTF O&M Plan. Section 5 of this IOP provides detailed procedures for start-up and operation of PCX-1 through Treatment Train 2 along with a monitoring plan and the permit basis for discharge of treated water to the Arizona Canal. These procedures supplement relevant portions of Section 4 (Operation and Maintenance) and Section 5 (Discharge Requirements) of the MRTF O&M Plan.

This IOP does not modify or otherwise replace requirements specified in Section 6 (Compliance Monitoring), Section 7 (Incident Identification and Control), Section 8 (Reporting), Section 9 (Key Roles), or Section 10 (Health and Safety, Training, and Emergency Response) of the MRTF O&M Plan. An updated NIBW Superfund Site organizational chart is attached to this IOP to identify designated MRTF roles and responsibilities and contact information.

The IOP applies only to this interim operating period until long term options for the northern plume and MRTF are evaluated and approved. The MRTF O&M Plan will be modified as necessary based on the selection and approval of the final long term options for MRTF.

2.0 OBJECTIVE

The MRTF has not operated since January 16, 2008, when AAW, the NIBW PCs and EPA learned of a malfunction of the Tower 3 treatment train. An investigation as to the cause of this malfunction has been completed and has been submitted under separate cover. Meanwhile, concerns regarding plume containment require that interim measures be implemented. This will provide for reinstatement of groundwater pumping to achieve plume containment and will not adversely affect public drinking water.



3.0 MILLER ROAD TREATMENT FACILITY

The MRTF was designed and constructed by the NIBW PCs to remove the five NIBW contaminants of concern (COCs) which include TCE, tetrachloroethene (PCE), 1,1-dichloroethene (1,1-DCE), 1,1,1-trichloroethane (1,1,1-TCA), and chloroform (inclusive as NIBW COCs). MRTF was designed to treat groundwater that meets designated treatment standards for the NIBW COCs.

MRTF is capable of treating water extracted from two AAW wells (PV-14 and PV-15) and one Salt River Project (SRP) well PCX-1.

3.1 Treatment System Description

The MRTF is located at 5975 Miller Road, at the southeast corner of the intersection of Miller Road and McDonald Drive in Scottsdale, Arizona. Construction of MRTF commenced in 1996 and the system was commissioned in March 1997. Completion of start-up and transfer of MRTF ownership to AAW was made in December 1997. The treatment plant had been operating on a continuous basis until November 20, 2007.

The primary components of MRTF include:

- three groundwater extraction wells (PV-14, PV-15, and PCX-1);
- conveyance piping from the wells to the treatment plant;
- an air-stripping system for each well; and
- treated water discharge systems.

The plant consists of an individual treatment train for each of the three MRTF groundwater extraction wells. Each treatment train includes a counter-current, forced-draft air stripper with appurtenant equipment such as air blower and instrumentation. Each air stripper column was designed to remove the NIBW target COCs to below treatment standards at flow rates up to 2,100 gpm. The facility has been modified so that all connections to/from the pipeline associated with PCX-1 have been removed so that water extracted from PCX-1 will be treated only through Treatment Train 2 and discharged only to the Arizona Canal. No water from PCX-1 can be mixed with or processed through any other equipment, treatment trains, or the clearwell at MRTF.



3.2 Interim MRTF Rehabilitation

The MRTF was scheduled to undergo a non-routine preventative maintenance program including removal and replacement of the packing in each air stripper, instrument upgrades, and facilities maintenance last in early 2008. MRTF has been shutdown since the January incident, however, so returning the system to service and containing the plume has been a priority. Only critical items associated with the planned rehabilitation program were recently completed to expedite the restart of wells PCX-1. Those items include replacement and relocation of measurement devices for blower monitoring on each air stripper, relocation of measurement device for inlet water flow rate monitoring on each air stripper, and the addition of two air flow monitoring switches on the outlet duct of each tower. Other modifications to MRTF include piping changes to segregate well PCX-1 and Treatment Train 2 from other systems and equipment at MRTF and installation of a separate control system for well PCX-1 and Treatment Train 2. Plans for the interim rehabilitation items and upgrades have been provided, at EPA's request, to EPA's contractor, CH₂MHill.

3.2.1 Relocation of Blower Monitoring Devices

Air pressure monitoring instrumentation will be re-located to above the connection point or element to minimize collection of moisture or condensate in the pressure response tubing. The flow rate element is a pitot-tube type device which measures differential pressure. The instruments associated with the blower pressure and flow rate will be mounted on a rack at a location near the blower and higher than the connections for pressure and flow rate. The tubing between the connections and the instruments will be ½-inch diameter tubing arranged without dips or low points so that any moisture is allowed to drain out of the response tubing.

3.2.2 Relocation of Water Flow Rate Monitoring Device

The water measurement instruments will be re-installed at a point below the connections on the pipe to minimize air accumulation in the response tubing. The influent water flow rate element is a venturi-type device which measures differential pressure. The location of the flow rate element has not changed. The instrument associated with the water influent flow rate, however, has been relocated and mounted near the existing element and at a point lower than the element. The pressure response tubing between the element and the instrument will be ½-inch diameter tubing arranged



without peaks or high points to minimize trapping air between the element and the instrument.

3.2.3 Installation of Outlet Air Flow Monitoring

Two air flow switches have been installed on the outlet air ducting from each air stripping tower. One switch has been wired into the control system. In the event of loss of air flow in the outlet ducting, the switch will send a discrete signal to the control system which will initiate an alarm condition and shut down the treatment train. The second air flow switch has been connected to alarm light to visually alert the operator of a loss of air flow in the outlet ducting.

3.2.4 Piping Modifications

Since the original Work Plan was submitted, the configurations of which well assigned to which tower have changed. Well PCX-1 has been physically separated from all other systems at MRTF and can now be treated only through Tower 2. The discharge piping has been modified so that no treated water from Tower 2 can be discharged into the clearwell. Treated water from Tower 2 will be discharged only to the Arizona Canal.

3.2.5 New Control System for Treatment Train 2

A dedicated instrumentation control system has been designed for Treatment Train 2. The control system uses the existing instrumentation and remote input/output rack (RIO-2) with a new programmable logic controller (PLC). The PLC will allow automatic operation of the equipment during continued operation. This control system is separate from the existing Bristol Babcock remote terminal unit (RTU) and control system. The existing control system will continue to control operation of Treatment Trains 1 and 3 and other associated systems including the clearwell and discharge system.

The PLC for Treatment Train 2 will control automatic operation of the pump in well PCX-1, the inlet water trimmer valve, and the blower.

The primary interlocks associated with operation of Treatment Train 2 include the following.

- Blower high/low pressure
- Blower low flow rate
- Blower high vibration
- Blower status
- Air flow status in tower outlet ducting



- Water low flow rate at the tower inlet
- High water pressure at the well head

Manual override of the control system will not be used for continuous operation of Treatment Train 2. Part of the operating procedures will be to check that the control system is in automatic mode.

The control system also features a call-out device for alerts in the event a control device fails. An operator will respond to shutdown the system in the event of a system malfunction to minimize discharge of untreated groundwater.

3.3 MRTF Long Term Rehabilitation

The scope of the long term rehabilitation included other work items such as removal and replacement of the packing, upgrades to the acid cleaning system, upgrades to the air handling system, facility maintenance, and installation of new motor-operated valves. The scope of the full MRTF rehabilitation was submitted to EPA in the February 15, 2008 letter. This work requires significant downtime for each of the treatment trains at MRTF while the work is performed. Many of those items have been postponed until long term options for the northern plume and MRTF have been evaluated and approved.

Finally, an investigation as to the cause of the October 2007 and January 2008 incidents has been completed and has been submitted to EPA under separate cover. System modifications recommended as a result of this investigation will be proposed to EPA for review and approval prior to implementation.

4.0 TREATMENT STANDARDS

The minimum standard for water quality for each of the NIBW COCs is shown in the following table.



NIBW COC Compliance Requirements

NIBW COCs	(µg/l)
Trichloroethene	5.0
Tetrachloroethene	5.0
1,1-Dichloroethene	7.0
1,1,1-Trichloroethane	200
Chloroform	6.0*

* chloroform produced as a byproduct of municipal water supply disinfection is exempt from the treatment standard for chloroform identified in Table 3 of the AROD.

µg/l = micrograms per liter

Treated water from Treatment Train 2 will be discharged to the Arizona Canal in accordance with the National (Arizona) Pollution Discharge Elimination System (NPDES) permit requirements.

5.0 APPROACH

The general approach to the Interim Containment Measures is to restart operation of well PCX-1. The NIBW PCs will retain a qualified contractor to operate Treatment Train 2 and the operator will be on-site around-the-clock to ensure the treatment system functions as designed. Qualifications of the operator will be submitted to EPA under separate cover. System monitoring will be performed to verify treated water quality.

The following sections describe the activities associated with implementation of the interim short term measures.

5.1 Pre-Start-Up

Prior to starting MRTF, all control instruments associated with each treatment train will be inspected and tested and all appropriate connections and settings will be verified. Once the instruments have been installed, reviewed and tested, a test of all of the control system alarms and interlocks will be performed. The purpose of the control system test is to validate that the control system is operating properly.



Verbal notification of planned discharge start and stop times and expected discharge volume will be provided to the SRP Northside Transmission Watermaster at 602-236-5836 (24 hours per day call number). Notification to SRP should be made as soon as possible when the schedule for start-up is known.

5.2 Start-Up

Initially and after each extended shutdown for maintenance, Treatment Train 2 will be started-up in two phases. Start-up procedures will be reviewed with EPA prior to restart when the system has been shutdown for short periods for maintenance or alarms. At all times, during the interim period, the water extracted from well PCX-1 and treated at MRTF will be discharged to the Arizona Canal.

The first phase of start-up will involve operating the tower for approximately four hours until the packing is wetted and the system has reached steady state. Since Treatment Train 2 has been physically separated from other systems at MRTF, groundwater extracted from well PCX-1 will be used to wet the packing in Tower 2. Once the system has reached steady state, a sample of the tower influent and effluent will be collected to demonstrate that the water meets treatment standards. The samples will be analyzed for TCE on a twenty-four hour turn-around-time (TAT) basis. In the first phase, once the samples have been collected, the tower will be shutdown pending receipt of the laboratory results.

If the laboratory results indicate that the treated groundwater meets the treatment standard for TCE, the second phase of start-up will commence. The NIBW PCs will provide preliminary data from the initial start-up sampling to EPA, ADEQ, and SRP prior to commencing further start-up testing.

In Phase 2, the packing wetting and achievement of system steady state will be accomplished similarly to Phase 1. Upon reaching steady state, an influent and effluent sample will be collected from Tower 2 and submitted to the laboratory for analysis of TCE on a twenty-four hour TAT basis. Unlike in Phase 1, after completion of the sampling, Treatment Train 2 will continue to operate and discharge to the Arizona Canal.

A summary of the laboratory results will be submitted to EPA, ADEQ, and SRP electronically within one day of receipt of laboratory results by the NIBW PCs and hard copies of the full laboratory results will be submitted as soon as practical.



5.3 Routine Operation

An operator will be at MRTF twenty-four hours per day seven days per week during all times Treatment Train 2 is in operation. The operator will use checklists to verify condition of the equipment and operation of the system on a frequent basis. The operator will inspect all equipment and instruments at a minimum once per shift, approximately two to three times per day during operation. Checklists will be developed with the contractor selected to operate Treatment Train 2. The checklists will be provided to EPA under separate cover. In summary, the checklists will include spaces for recording information such as system status, well pump status, blower outlet pressure, blower flow rate differential pressure, air flow rate, and water flow rate. Operating parameters such as air flow rate and water flow rate will be logged by the control system.

5.4 Monitoring

Following start-up, enhanced monitoring will be conducted according to the following schedule to verify that the treatment system is functioning as designed.

SUMMARY OF MONITORING REQUIREMENTS MILLER ROAD TREATMENT FACILITY INTERIM OPERATING PERIOD				
Sample	Location	Frequency	Reporting Timeframe	Governing Requirement
Treated Water (verification)	Tower 2 Effluent	Daily ¹	24 hours ²	IOP
Treated Water (compliance)	Tower 2 Effluent	Weekly	5 days	O&M Plan
PCX-1 Groundwater	Tower 2 Influent	Weekly	5 days	IOP
Discharge to Arizona Canal	Arizona Canal Outfall	Monthly	Routine ³	NPDES
Arizona Canal	Upstream of MRTF	Monthly	Routine ³	SRP ⁴
Arizona Canal	Downstream of MRTF	Monthly	Routine ³	SRP ⁴

- Notes:
- 1) After 30 days, the schedule may be adjusted to 3x per week
 - 2) Preliminary data will be reported by noon on the business day following sample collection
 - 3) Normal laboratory data reporting is 20 business days
 - 4) Salt River Project policy for receiving remediated water to canal system

Samples of PCX-1 treated water will be collected on a daily basis for a minimum period of 30 days and submitted to EPA-approved laboratory for analysis of TCE. Additionally, an influent sample of PCX-1 groundwater



will be collected every week. The laboratory will be directed to provide results of TCE analysis with 24-hour TAT for reporting of preliminary results.

After a period of 30 days following the initial MRTF start-up, verification data will be compiled and summarized by NIBW PCs to determine future sampling frequency. Upon approval by EPA, ADEQ, and SRP, sampling of PCX-1 treated groundwater will be adjusted to three times per week (Monday/Wednesday/Friday) with 48-hour TAT for reporting of preliminary results.

Verification samples will be analyzed for TCE in treated water by EPA Method 524.2. In the event of any instrumentation problems that may prevent analysis by EPA Method 524.2, the analytical laboratory will analyze TCE by EPA Method 8260B to meet the necessary expedited reporting of results. In this contingency, the sample will be rerun by EPA Method 524.2 within the sample hold time for confirmation of results. Both test methods have similar reporting limits for TCE.

A summary of the preliminary laboratory results for all verification samples will be submitted to EPA, ADEQ, and SRP electronically within one day of receipt of laboratory results by the NIBW PCs and hard copies of the full laboratory results will be submitted as soon as practical. Hard copies of the laboratory reports will be retained at the MRTF.

The NIBW PCs will continue to collect samples of PCX-1 treated water every Monday consistent with the MRTF O&M Plan for analysis of NIBW COCs with lab data reported in Level IV data package. Additionally, monthly samples of treated PCX-1 water discharged at the outfall to the Arizona Canal will be collected and analyzed for TCE and trace substances required by the NPDES Permit. Lastly, monthly samples of the water in the Arizona Canal upstream and downstream of the MRTF outfall will be collected and analyzed for the NIBW COCs.

5.5 Permitting

The NIBW PCs and AAW submitted a written agreement and permit transfer form to ADEQ on April 14, 2008 for transfer of AAW's existing NPDES permit (Permit No. AZ0024139) to Motorola. ADEQ has completed the transfer and specified April 21, 2008 as the effective date for the permit transfer.



5.6 Contact Information

The following are the technical and management contacts for issues associated with operation of Treatment Train 2.

<i>Technical Contact</i>	<i>Management Contact</i>
<p><i>James Lutton</i> (916) 452-5352 office (916) 698-2726 mobile james.lutton@rcip.com</p>	<p><i>Terry Lockwood</i> (602) 438-5696 office (602) 617-8563 mobile terry.lockwood@motorola.com</p>

5.7 Emergency Response Procedures

The Arizona Canal serves as a water source for six water providers downstream of the MRTF. In the unlikely event of receipt of sample results or other operational indications that water above a treatment standard has been discharged to the Arizona Canal, the following steps will be taken:

- 1) Immediately shut down well PCX-1 and Treatment Train 2.
- 2) Immediately notify the SRP Northside Transmission Watermaster at 602-236-5836 (24 hour per day call number). The Watermaster can provide the current flow in the canal measured at the Indian Bend Siphon measurement station 1-1.9, located upstream of the MRTF outfall.
- 3) Determine blended TCE concentration in the canal using sampling results and known flow rate. If TCE concentration is not known, assume a TCE concentration of 70 ug/l in the MRTF outfall. If the calculated concentration for TCE is above 5 ug/L, inform SRP Watermaster who will provide notification to downstream water providers.
- 4) Contact EPA (Jamey Watt, 415-972-3175) and ADEQ (Robert Peeples, 602-771-4196) Superfund Remedial Project Mangers by phone call or voice mail within 1 hour of initial notification to SRP Watermaster and verbally report the receipt of results above a treatment standard and discuss the steps being taken in response.



- 5) Collect a canal sample at the appropriate downstream location based on available data (considering canal travel times) within 1 hour (to the extent possible) of notification to SRP Watermaster and deliver this sample to the laboratory for 24 hour turn-around-time for report of preliminary data.
- 6) Contact the laboratory to request validation of initial sample result that was reported above a treatment standard.
- 7) Evaluate the treatment equipment and control records to determine potential cause of the event.
- 8) Contact ADEQ 24-hour hotline at 602-771-2330 within 24 hours of receipt of a sample result above an AZPDES permit limit to verbally report the result and the steps being taken in response.
- 9) Contact the ADEQ Water Quality Compliance Section Manager at 602-771-2209 by phone call or voice mail by 9:00 a.m. on the first business day following receipt of results above AZPDES Permit limits and provide follow-up written report of the incident within 5 days of the event, with a copy provided to SRP.
- 10) Provide written report to EPA, ADEQ, and SRP within 7 days describing the incident as required by water quality response notification in the MRTF O&M Plan.

6.0 SCHEDULE

The NIBW PCs are prepared to begin operation of well PCX-1 and Treatment Train 2 at MRTF as soon as approval of this IOP is received.

Pre-start-up activities will require approximately one to two days to complete. If instrument verification and control system testing activities do not reveal major shortcomings in the system, then restart of well PCX-1 can commence as early as April 24, 2008. EPA, ADEQ, and SRP will be kept apprised of the schedule as the interim actions move forward.