CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

[TENTATIVE] MONITORING AND REPORTING PROGRAM NO. R5-2015-0012-XXXX

FOR

IN-SITU GROUNDWATER REMEDIATION
AND DISCHARGE OF TREATED GROUNDWATER TO LAND
REEDLEY/FORMER DRY CLEANER
1340 G STREET, REEDLEY
FRESNO COUNTY

This Monitoring and Reporting Program (MRP) describes requirements for monitoring a groundwater remediation system for former dry cleaner facility (Facility) at 1340 G Street in Reedley. This MRP is issued pursuant to Water Code Section 13267. The Discharger shall not implement any changes to this MRP unless and until a revised MRP is issued by the Executive Officer. As appropriate, California Regional Water Quality Control Board, Central Valley Region (Central Valley Water Board) staff shall approve specific sample station locations prior to implementation of sampling activities. All samples should be representative of the volume and nature of the discharge or matrix of material sampled. The time, date, and location of each grab sample shall be recorded on the sample chain of custody form.

GROUNDWATER MONITORING

As shown on Figure 1, there are monitoring wells currently at the site. Figure 2 shows the western portion of the Site, with existing monitoring wells, proposed additional monitoring wells, and the proposed direct push injection borings for in-situ groundwater remediation. Monitoring and sampling of these wells and any additional wells installed for the purposes of monitoring the groundwater remediation system subsequent to the issuance of this MRP shall follow the schedule in Table 1 and the samples shall be analyzed by the methods in Table 2. Sample collection and analysis shall follow standard EPA protocol. Currently, semi-annual groundwater monitoring is performed at the site, which should continue to be implemented in addition to the requirements herein. When concurrent sampling for both monitoring programs can meet requirements, a single report can satisfy both reporting objectives.

Table 1:Sampling Frequency

Well Number (1)	Constituent (2)	Frequency	Monitoring Objective
MW-11	See Table 2	Quarterly	Background (3)
IW-2 & IW-2	See Table 2	Quarterly	Treatment Zone (4)
MW-A, MW-B, MW-C	See Table 2	Quarterly	Treatment Zone (4)
MW-D & MW-15	See Table 2	Quarterly	Transition Zone (5)
MW-E	See Table 2	Quarterly	Compliance (6)

1.Well numbers as shown on Figure 2
2.Constuent suite components listed in Table 2
3.Well used to develop background concentrations
4.Wells sampled to evaluate in-situ remediation progress inside the treatment zone.
5.Wells Sampled to evaluate migration of pollutants within the treatment zone.
6.Wells used to determine compliance water groundwater limitations

Table 2: Analytical Methods

Constituent	Method	Maximum Practical Quantitation Limit)
Volatile Organic Compounds	EPA Method 8260B	0.5
Ferrous Iron	SM3500	100
Nitrate	EPA Method 300	300
Dissolved Methane, Ethane, and Ethene	RSK 175M	0.1
Sulfate	EPA Method 300	200
Chloride	EPA Method 300	300
Alkalinity	SM2320B	2000
Manganese	EPA Method 6010	0.93
Total or Dissolved Organic Carbon (TOC/DOC)	EPA Method 9060 or 415.1	300

1. Or an equivalent EPA or Standards Method that achieves the maximum Practical Quantitation Limit.
2 For constituents not detected. All concentrations between the Method Detection Limit and the Practical
Quantitation Limit shall be reported as an estimated value.

Field Sampling

In addition to the above sampling and laboratory analyses, field sampling and analysis shall be conducted each time a monitor well or extraction well is sampled. The sampling and analysis of field parameters shall be as specified in Table 3.

Table 3: Field Sampling

Parameters	Units	Practical Quantitation Limit	Method
pH	pH Units	0.1 units	Field Meter
Water Temperature	ºF/ºC	0.1ºF/ºC	Field Meter
Conductivity	µhmos/cm	50µS/cm^2	Field Meter
Dissolved Oxygen	mg/L	0.2mg/L	Field Meter
Oxidation Reduction Potential	Millivolts	10 millivolts	Field Meter

All wells that are purged shall be purged until pH, temperature, conductivity and dissolved oxygen are within approximately 10% of the previous value.

Field meter usage must include:

1. Operator training in proper use and maintenance of the instruments;
2. Instrument calibration in accordance with the manufacturers specifications prior to each monitoring event;
3. Instrument service and/or calibration by the manufacturer at the recommended frequency; and
4. Submittal of field calibration reports as described in item (b) of the “Reporting” section of this MRP.

IN-SITU DISCHARGE MONITORING

The Discharger shall monitor daily the discharge of water and amendments that are injected into the groundwater according to the requirements specified in Table 4 Each amendment addition shall be recorded individually, along with information regarding the time period over which the amendment was injected into the aquifer.

Table 4: Discharge Monitoring Requirements

Parameters	Units	Type of Sample
Injected Water Volume	Gallons per day/per injection area	Meter
Amendments(s) added	Pounds per day/per injection area	measured

AMENDMENT ANALYSIS

Prior to use, amendments shall be analyzed for the constituents listed in Table 6. The analysis should be done on a mixture of the amendment and deionized water at the estimated concentration that would be injected during the pilot project.

Table 5: Amendment Analytical Requirements

Constituents	Method(1)	Maximum Practical Quantitation Limit (µg/L)(2)
Volatile Organic Compounds	EPA 8020 or 8260B	0.5
General minerals(3)	Various	Various
Metals, Total and Dissolved(4)	EPA 200.7, 200.8	Various
Semi-Volatile Organic Compounds	EPA Method 8270	5
Total Dissolved Solids	EPA 160.1	10,000
pH	Meter	NA
Electrical Conductivity	Meter	NA

1. Or an equivalent EPA Method that achieves the maximum Practical Quantitation Limit.
2 .All concentrations between the Method Detection Limit and the Practical Quantitation Limit shall be reported as an estimated value.
3. General Minerals include: alkalinity, bicarbonate, potassium, chloride, sulfate, total hardness, nitrate, nitrite, ammonia.
4 .Metals include arsenic, barium, cadmium, calcium, total chromium, copper, iron, lead, manganese, magnesium, mercury, molybdenum, nickel, selenium and silica.

ESTABLISHMENT OF BACKGROUND CONCENTRATION VALUES

The Discharger shall develop background groundwater values for c all constituents listed in Table 1 and Table 3, following the procedures found in CCR Section 20415(e)(10). The Discharger shall conduct a baseline sampling event in which all groundwater monitoring wells are sampled prior to implementation of the groundwater remediation. Ongoing monitoring for changes in background concentrations shall be evaluated by conducting four quarters of groundwater monitoring followed by continuing semi-annual monitoring in the background wells.

REPORTING

When reporting the data, the Discharger shall arrange the information in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized in such a manner as to illustrate clearly the compliance with this Order. The results of any monitoring done more frequently than required at the locations specified in the Monitoring and Reporting Program shall also be reported to the Central Valley Water Board.
As required by the California Business and Professions Code Sections 6735, 7835, and 7835.1, all reports shall be prepared by a registered professional Civil Engineer or Geologist or their subordinate and signed by the registered professional.

The Discharger shall submit quarterly electronic data reports, which conform to the requirements of the California Code of Regulations, Title 23, Division 3, Chapter 30. The quarterly reports shall be submitted electronically over the internet to the Geotracker database system by the 1st day of the second month following the end of each calendar quarter by 1 February, 1 May, 1 August, and 1 November for the first four quarters. Following the first year of data collection, the frequency of data submittals becomes semi-annually until such time as the Executive Officer determines that the reports are no longer necessary.

Each quarterly and semi-annual report shall include the following minimum information:

(a) a description and discussion of the groundwater sampling event and results, including trends in the concentrations of pollutants and groundwater elevations in the wells, how and when samples were collected, and whether the pollutant plume(s) is delineated;
(b) field logs that contain, at a minimum, water quality parameters measured before, during, and after purging, method of purging, depth of water, volume of water purged, etc.;
(c) groundwater contour maps for all groundwater zones, if applicable;
(d) pollutant concentration maps for all groundwater zones, if applicable;
(e) a table showing well construction details such as well number, groundwater zone being monitored, coordinates (longitude and latitude), ground surface elevation, reference elevation, elevation of screen, elevation of bentonite, elevation of filter pack, and elevation of well bottom;
(f) a table showing historical lateral and vertical (if applicable) flow directions and gradients;
(g) cumulative data tables containing the water quality analytical results and depth to groundwater;
(h) a copy of the laboratory analytical data report;
(i) the status of any ongoing remediation, including an estimate of the cumulative mass of pollutant removed from the subsurface, system operating time, the

effectiveness of the remediation system, and any field notes pertaining to the operation and maintenance of the system; and

(j) if applicable, the reasons for and duration of all interruptions in the operation of any remediation system, and actions planned or taken to correct and prevent interruptions.

An Annual Report shall be submitted to the Central Valley Water Board by 1 February (1 November for semi-annual monitoring) of each year. This report shall contain an evaluation of the effectiveness and progress of the investigation and remediation. The Annual Report may be substituted for the fourth quarter (or second semi-annual) monitoring report as long as it contains all of the information required for that report plus that required for the Annual Report. The Annual Report shall contain the following minimum information:

(a) both tabular and graphical summaries of all data obtained during the year;
(b) groundwater contour maps and pollutant concentration maps containing all data obtained during the previous year;
(c) a discussion of the long-term trends in the concentrations of the pollutants in the groundwater monitoring wells;
(d) an analysis of whether the pollutant plume is being effectively treated;
(e) a description of all remedial activities conducted during the year, an analysis of their effectiveness in removing the pollutants, and plans to improve remediation system effectiveness; an identification of any data gaps and potential deficiencies/redundancies in the monitoring system or reporting program; and
(f) an identification of any data gaps and potential deficiencies/redundancies in the monitoring system or reporting program; and
(g) if desired, a proposal and rationale for any revisions to the groundwater sampling plan frequency and/or list of analytes.

A letter transmitting the monitoring reports shall accompany each report. Such a letter shall include a discussion of requirement violations found during the reporting period, and actions taken or planned for correcting noted violations, such as operation or facility modifications. If the Discharger has previously submitted a report describing corrective actions and/or a time schedule for implementing the corrective actions, reference to the previous correspondence will be satisfactory. The transmittal letter shall contain the penalty of perjury statement by the Discharger, or the Discharger's authorized agent, as described in the Standard Provisions General Reporting Requirements Section B.3 (Attached to the Notice of Applicability).

The Discharger shall implement the above monitoring program on the first day of the month following adoption of this Order.

Ordered by:

_____

PATRICK PULUPA
Executive Officer

_____

Date

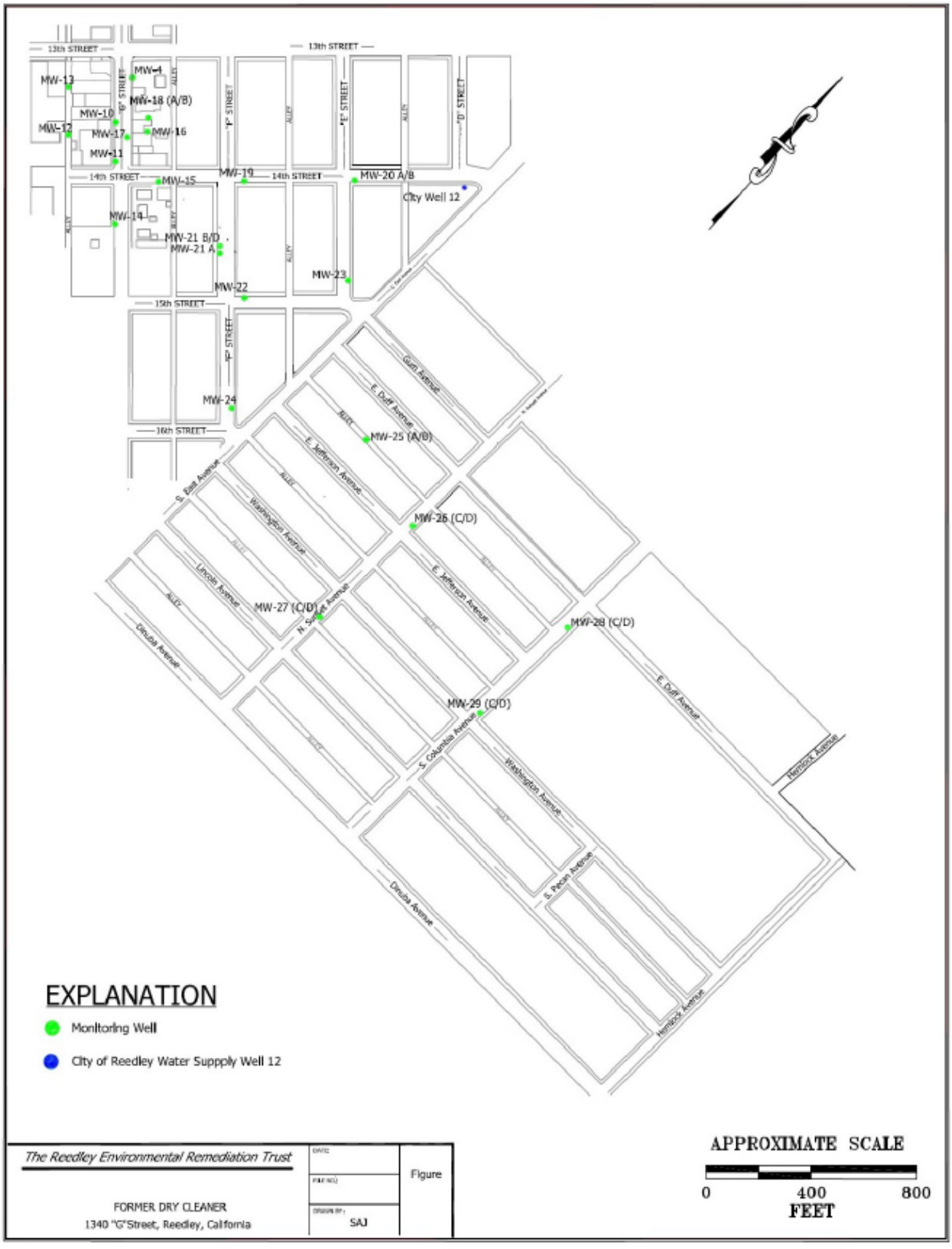

Figure 1:Site Location

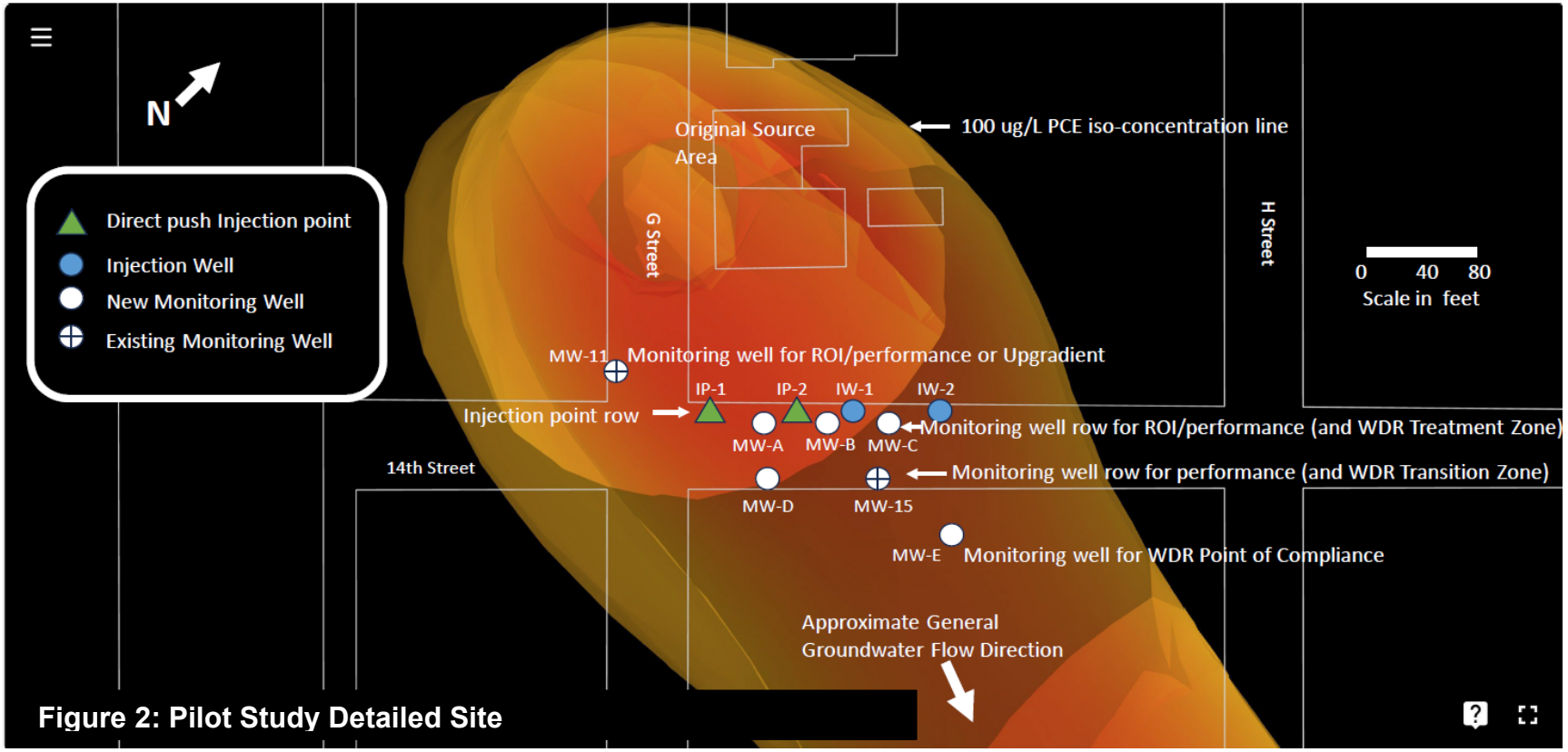

Figure 2: Pilot Study Detailed Site