



# Spatial data collection at petroleum release sites

## Petroleum Remediation Program - Guidance document 1-03

This document describes the standards and procedures for collecting and submitting spatial data for the Minnesota Pollution Control Agency (MPCA) Petroleum Remediation Program (PRP). The requirements outlined below apply to both new and existing sites in the program.

### Requirements

#### Which locations need to be reported?

Spatial data, or coordinates, are required for all permanent monitoring wells. A permanent monitoring well is any well installed to capture groundwater information over a period of time.

#### How accurate do the coordinates need to be?

The aim for positional accuracy, or horizontal accuracy, is to obtain coordinates that are within a maximum of three meters of their actual location.

#### Which coordinate system should be used?

Spatial data may be collected and reported in Universal Transverse Mercator (UTM) projection (Projected Coordinate System) coordinates or as latitude and longitude (Geographic Coordinate System). In the Petroleum Remediation Program, UTM coordinates are preferred.

*Projected Coordinate System* - Data may be reported as projected coordinates (x and y) using the Universal Transverse Mercator projection (UTM). For UTM projected data, the datum used must be the North American Datum of 1983 (NAD83), and the measurement units must be in meters. Minnesota lies within three UTM zones, although most of the state lies within one zone, Zone 15 North (15N). It is common practice to extend Zone 15 to include areas of the state located in the other two zones, Zones 14 and 16. The standard coordinate system used by Minnesota state agencies is UTM Zone 15N, NAD83.

*Geographic Coordinate System* - Data may be reported in geographic coordinates (latitude and longitude). Geographic coordinates are most often obtained using a handheld GPS receiver. This system is based on the World Geodetic System of 1984 (WGS84). WGS84 is an earth-centered datum and geographic coordinate system. All devices receiving signals from GPS satellites receive data in WGS84 format.

#### How should data be reported?

Monitoring well coordinates are submitted in the tables section of the [Investigation Report](#) and [Monitoring Report](#). If providing projected coordinates in UTM, report values in meters using Zone 15N described above. If providing geographic coordinates, report values in decimal degrees (dd.dddddd) to at least six decimal places. If you are submitting GPS-collected data in UTM, please be aware of what zone you are in and what zone your GPS receiver is set for. You may need to adjust the receivers setting to obtain UTM coordinates in Zone 15N.

# Collection methods

## Global Positioning System (GPS)

Handheld, civilian-grade GPS receivers are capable of meeting the PRP's horizontal accuracy requirement of three meters without additional augmentation, although actual accuracy is affected by atmospheric degradation of GPS satellite signals, the number of satellites within view of the receiver, and the quality of the receiving device. Take note of the horizontal accuracy estimated by the receiver during the time of measurement. If it does not meet PRP requirements, an alternative collection method should be used. GPS receivers will usually allow data to be viewed in the representative geographic coordinates (latitude and longitude) as well projected coordinates (e.g., UTM).

## Map interpolation

An alternative method to GPS collection is to obtain coordinates from georeferenced, high resolution aerial and satellite imagery, either through use of a geographic information system (GIS) or in an internet-based mapping application. This desktop method can be quickly and easily implemented on a computer with internet access, often at no additional cost.

Internet-based mapping applications that can be used to obtain coordinates include:

MPCA *Petroleum Remediation Program Maps Online*

<http://pca-gis02.pca.state.mn.us/prp/index.html>

MPCA *What's in My Neighborhood?*

<http://pca-gis02.pca.state.mn.us/wimn2/index.html>

Minnesota Department of Natural Resources *Landview*

[http://www.dnr.state.mn.us/maps/landview/index.html?layers=lakes+roads+cent\\_popplpt1](http://www.dnr.state.mn.us/maps/landview/index.html?layers=lakes+roads+cent_popplpt1)

Google Earth

<http://www.google.com/earth/>

For Minnesota geographic data that can be used in GIS applications, browse the list of resources on the Minnesota Geospatial Information Office's Minnesota Geographic Data Clearinghouse. The Clearinghouse provides direct access to Minnesota data and links to additional data providers.

<http://www.mngeo.state.mn.us/chouse/index.html>