

Mapping of Institutional and Engineering Controls in EPA Cleanup Programs
Land, Chemicals and Redevelopment Division - EPA Region 3
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EPA relies on institutional controls, such as land and water use restrictions, to protect the public at many EPA cleanup sites, such as RCRA Corrective Action, TSCA, and Superfund sites. Institutional controls are only effective if people know what the restrictions are and where they apply. EPA Region 3 has developed a strategy to increase the effectiveness of institutional controls, through website mapping, database integration, and field oversight.

The Land, Chemicals and Redevelopment Division in EPA Region 3 uses Geographic Information System (GIS) files for web-based mapping of the geographic extents of areas subject to institutional and engineering controls, with hyperlinks to supporting documents describing the controls. In order to do this mapping, EPA needs geographic data for the engineering and/or institutional controls. This information may already exist in many different forms, including ArcGIS shapefiles, Google Earth KML files, CAD drawings, property metes and bounds descriptions, and survey engineering drawings. These different file formats (or paper copies) must be converted to a GIS file format to be mapped on the Region 3 website. EPA Region 3 also intends to upload the geographic data into RCRAInfo, EPA's national RCRA database.

We are asking each facility to provide the following:

For each institutional or engineering control:

- Determine the geographic extent over which the control applies. For example, an environmental covenant requiring non-residential use of an entire facility would best be represented by the property boundary. An engineering control for a landfill would best be represented by the geographic extent of the landfill cap.
- Provide map files of the geographic extent of each control. As most controls are best represented as an area, the files should represent polygons. Other controls, such as a fence, could be provided as a polyline.
- Ideally, map files would be provided as ArcGIS shapefiles in a real-world coordinate system with a known datum. Google Earth KML files can also be used. Sometimes, CAD drawing files can also be used, or can be georeferenced to be used within a GIS system if at least two points mapped within the CAD drawing also have known real-world coordinates.
- If surveying is to be conducted to delineate a newly defined area, or to generate real world coordinates of an existing property defined by metes and bounds, the following should be considered:
 - Obtain geographic survey coordinates for each point (property corner) identified in the metes and bounds description (or each vertex of the polygon) as follows:
 - longitude and latitude in decimal degrees
 - to at least 7 decimal places
 - using the World Geodetic System (WGS) 1984 datum

- west longitude indicated as a negative number
 - The coordinates should be provided in a tabular format as follows:
 - The first and last coordinate values in the table should be the same, and should represent the coordinates of the Point of Beginning of the metes and bounds description (for property descriptions)
 - If a metes and bounds description includes arc segments (rather than straight line segments) defined by the beginning and ending of an arc of a specific radius, additional geographic control points should be calculated along the arc so that a straight line approximation from point to point does not deviate from the true arc by more than 0.1 foot.
 - The table of coordinate values should be provided separately as an electronic file, in a comma separated value (CSV) format, or provided as a KML file.
- If an environmental covenant is being developed for the site, a table of coordinate values should be provided for each control area described in the covenant in addition to the required metes and bounds description. The table of coordinate values (longitude/latitude of polygon vertices) should be incorporated into the map exhibit or provided as an attachment to the covenant.
- Map exhibits for environmental covenants should be developed to clearly indicate each restricted area (e.g., property boundary, capped area, no-dig area, etc.). Exhibits should label polygon vertices, provide geographic coordinates, include a bar scale, north arrow, and be simple line drawings with a light or no background so that the exhibit can be copied in black and white multiple times and still retain readable information (see example in Figure 1). The exhibit should be designed to be usable at 8.5 X 11 inch.

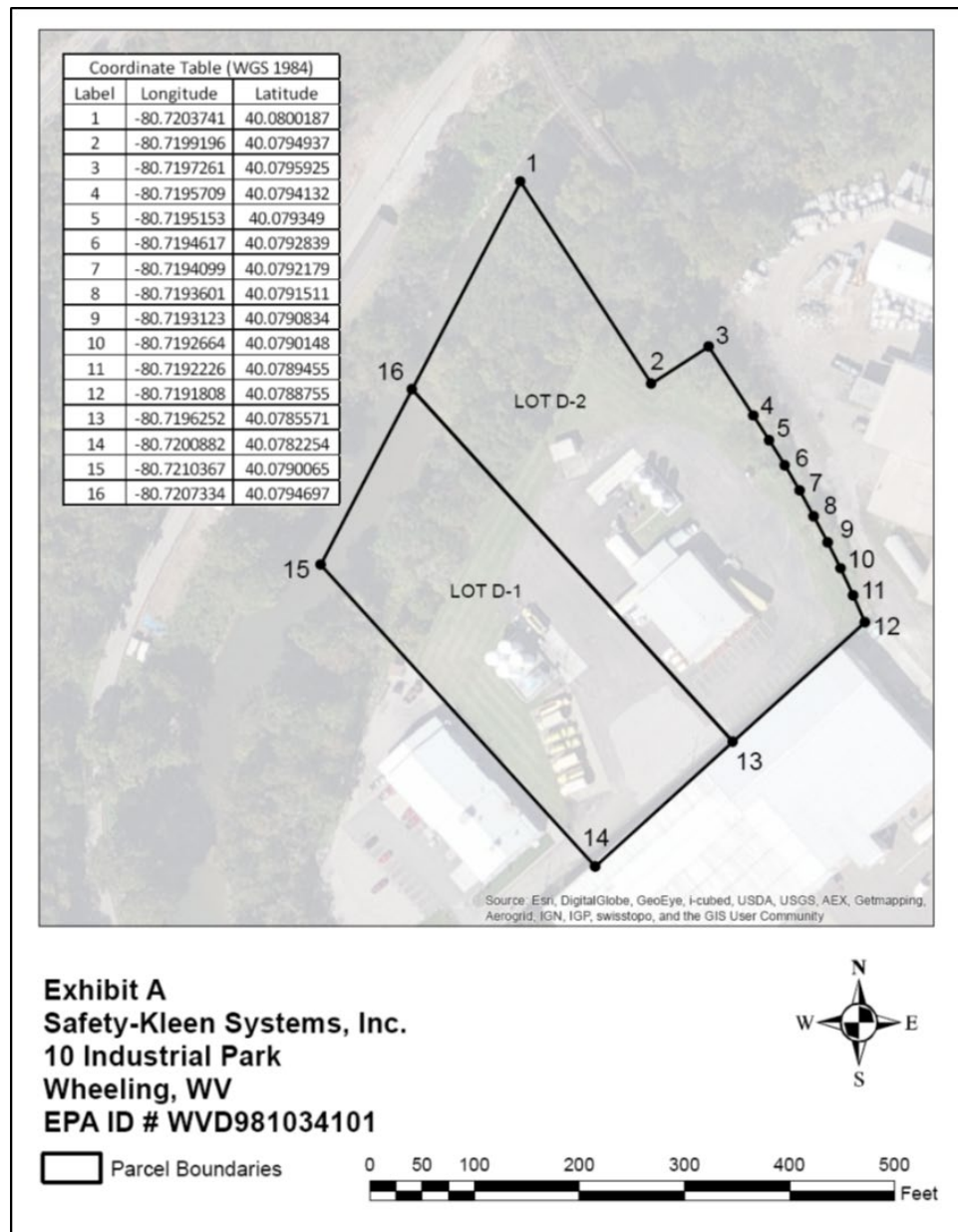


Figure 1: Example Covenant Exhibit