



Mapping Institutional and Engineering Controls

- Every remedy that includes engineering or institutional controls should pursue obtaining an Environmental Covenant (in States where available)
- The remedy (and the covenant) should define use and activity limitation area(s)
- Each use and activity limitation area should be surveyed, and the following should be provided in the covenant (or other enforceable document):
 - Survey description (metes & bounds) of each area
 - Longitude/latitude of polygon vertices (for each area)
 - decimal degrees to at least seven decimal places
 - west longitude as negative number
 - datum of WGS1984
- Using longitude/latitude, make KML file, validate in Google Earth
- Post on EPA and State website in Google Earth/Maps using KMLs
- Store validated geographic data in database (RCRAInfo GIS module)
- Develop & implement oversight plan
- Link to One-Call if possible

Generally required by model covenants

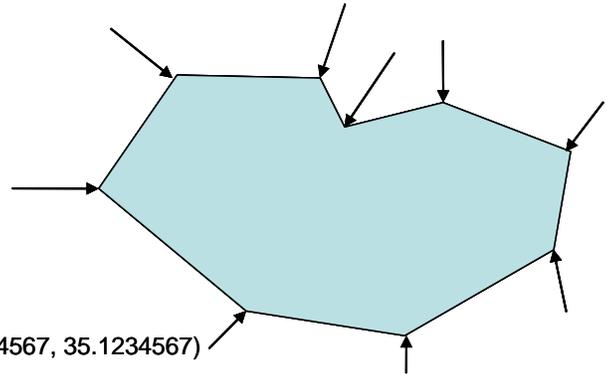
Periodic Oversight

- Identify:
 - What are the restrictions
 - Where do they apply
 - Where should they be recorded
 - Who should know
- Upload mapped controls to GPS
 - Load polygons as tracks
 - Load monitoring wells as points
 - DNR Garmin is a useful conversion/gps interface program
- Verify compliance (restricted area) in the field
- Verify other requirements (e.g., deed actually recorded, annual reports submitted, monitoring wells functional, etc.)



Use & Activity Limitation Area

- Geographic area is a polygon
- Define polygon vertices by geographic coordinates
- Longitude & Latitude of each vertex
 - Decimal degrees
 - Seven decimal places
 - Negative sign for west longitude
 - WGS 1984 datum



Example KML File

```
<?xml version="1.0" encoding="UTF-8"?>
<kml xmlns="http://earth.google.com/kml/2.1">
  <Document>
    <Placemark>
      <name>1</name>
      <description></description>
      <Polygon>
        <outerBoundaryIs>
          <LinearRing>
            <coordinates>
              -74.75259347899822,40.16361903968762,0
              -74.75658379160309,40.16258879706341,0
              -74.75607813718325,40.16040450401132,0
              -74.75596830359727,40.16020067160201,0
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              -74.75259347899822,40.16361903968762,0
            </coordinates>
          </LinearRing>
        </outerBoundaryIs>
      </Polygon>
    </Placemark>
  </Document>
</kml>
```

Point of Beginning

Point of Beginning

Save file as: filename.kml
Open in Google Earth to validate