Dredge Disposal Site Monitoring Using IMS' .NET Link

Marie Crum, Contractor
Bowhead Information Technology, LLC for
US Army Corps of Engineers
109 St Joseph St, Room 7029
Mobile, AL
36602

marie.a.crum@sam.usace.army.mil

Abstract

The Silent Inspector (SI) application allows near-real time dredging data to be viewed alongside geospatial information stored in an enterprise geodatabase. Using this technology, the US Army Corps of Engineers can monitor the ocean dumping activities of our dredge operators, run initial quality control queries, and produce reports to inform the Environmental Protection Agency (EPA) of dredge disposal activities.

Accessing the Map

1. Using your web browser, go to http://opjdev/. The screen below appears. This application currently resides on a develop server in the Spatial Data Branch and accessible only through the intranet.

   Future deployment will be accessed from http://gis.sam.usace.army.mil.

2. Click "Map Room".

3. Select "SI Ocean Disposal GIS Basemap" from the drop-down list.

4. Click "Open Map" link.

Accessing the Application

1.Click “SI Monitor” button.

This will open a search form. This form allows a user to search for SI data by District, Date, Vessel, and Contract #.

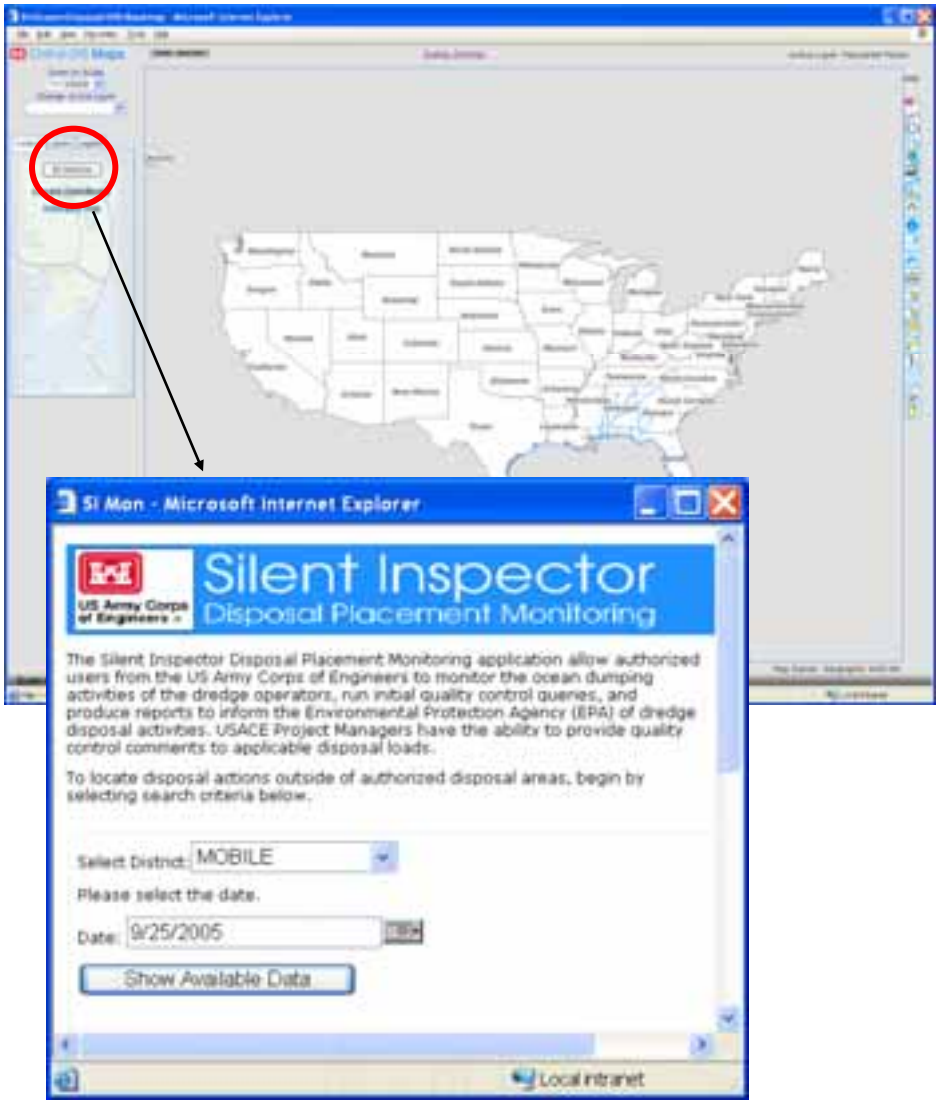
2.Select the district and a date for the search.

The district dropdown box is filled by querying a database in Vicksburg, MS.

3. Click “Show Available Data” button.

When the “Show Available Data” button is selected, the SI database is queried based on the user input. Disposal events that occurred on the selected date for the selected district, will be available for selection in the next step.

If no data exist for the selection, the most recent dredge date for the selected district will be displayed for the user.



Selection The Load

4. Select the desired Vessel/Contract/Load# from the drop-down list.

   The “Vessel/Contract/Load# /ALL” can be selected if no particular Load number is desired.

5. Click “Select Disposal Sites” button.

   When this button is selected, a request is sent to IMS using .Net Link.

   The “Disposal Sites” layer is spatially queried to determine which disposal sites exist based on the user-supplied inputs.

Using .NET Link to Query the Feature Class in IMS

```
Imports ESRI                    &     Reference      ESRI.ArcIMS.Server
-----------------------------------------------------------------------------------------------------------------------------------
'Get the disposal names from the disposal feature class in the IMS service
  Dim sAXL As String
  Dim axlResponse As New System.Xml.XmlDocument

  sAXL = "<?xml version=""1.0"" encoding=""UTF-8""?>"
  sAXL = "<ARCXML version=""1.1"">"
  sAXL &= "<REQUEST><GET_FEATURES envelope=""false"" beginrecord=""0"" geometry=""false""
  outputmode=""xml"" compact=""false"" >"
  sAXL &= "<LAYER id='" & strLayerID & "' />"
  sAXL &= "<SPATIALQUERY subfields=""#SHAPE# FEAT_NAME"" where=""DIST_NAME='" & strDisName &
  """"></SPATIALQUERY>"
  sAXL &= "</GET_FEATURES>"
  sAXL &= "</REQUEST></ARCXML>"

  Dim nameConn As New ESRI.arcims.server.ServerConnection("opjdev", 5300)
  nameConn.ServiceName = "D000"

  axlResponse.LoadXml(CleanXMLResponse(nameConn.Send(sAXL, "Query")))

  ' Get and display all the disposal site names.
  Dim root As System.Xml.XmlElement = axlResponse.DocumentElement
  Dim nodeList As System.Xml.XmlNodeList = root.GetElementsByTagName("FIELDS")
```

Using .Net Link to Fill the Array

```
Dim i, n, m, HoldIndex As Integer
Dim strName, temp As String
Dim arrName As New ArrayList
Dim index As Integer

'Fills an array with the disposal names as they are in the feature class
For i = 0 To nodeList.Count - 1
    strName =
nodeList.Item(i).Attributes("GCWGS84_VECTOR.GCWGS84.placement_area.FEAT_NAME").InnerXml.ToString
    arrName.Add(strName)
Next i
```

Selection the Disposal Area

6.Select the authorized disposal site from the drop-down list.

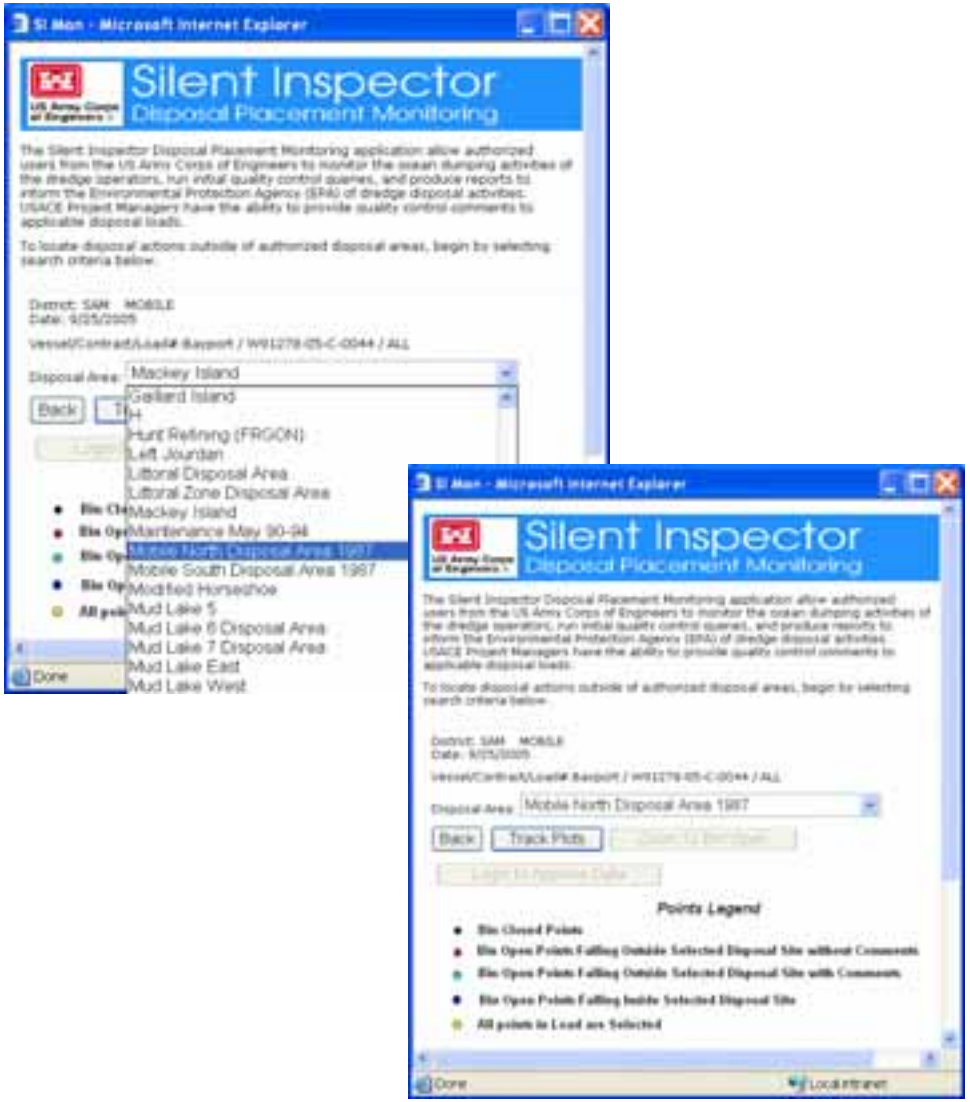
The names of the disposal sites, are extracted from the attribute in the disposal area feature class.

7.Click the “Track Plots” button to plot the points where the loads were dumped.

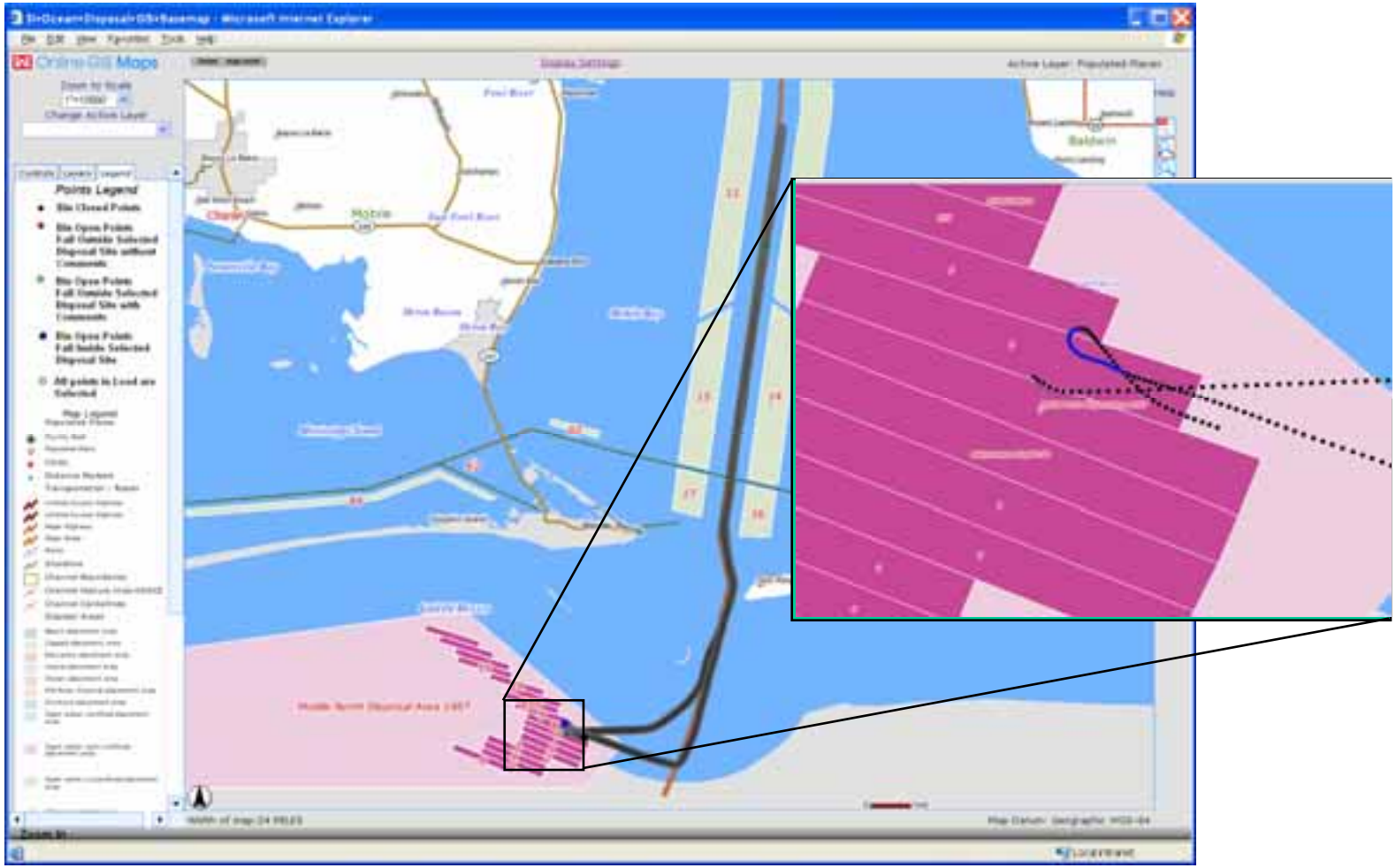
When the “Track Plots” button is selected, the SI database is queried once again to acquire the XY location of the vessel. These points are filtered by the user-defined queried and are plotted on the map.

8.Click the “Zoom to Bin Open” button to zoom to the open points outside the selected disposal site. This will zoom the user into the location on the map.

The points are drawn using the acetate layer for IMS. The user is not able to use the identify tool to retrieve information. This drawback was solved by displaying the information in a form.



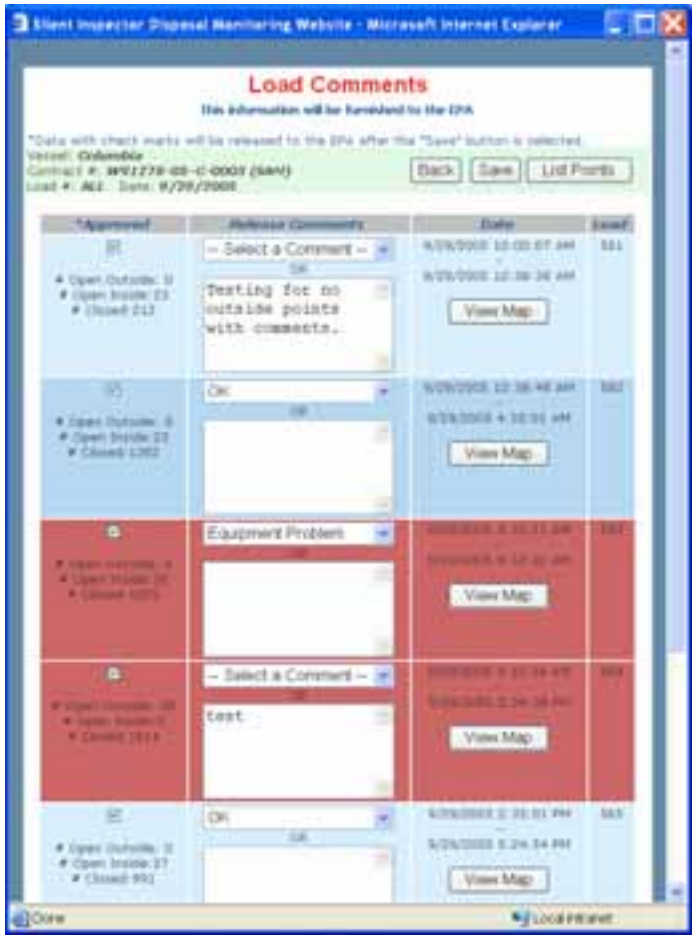
Plot Results

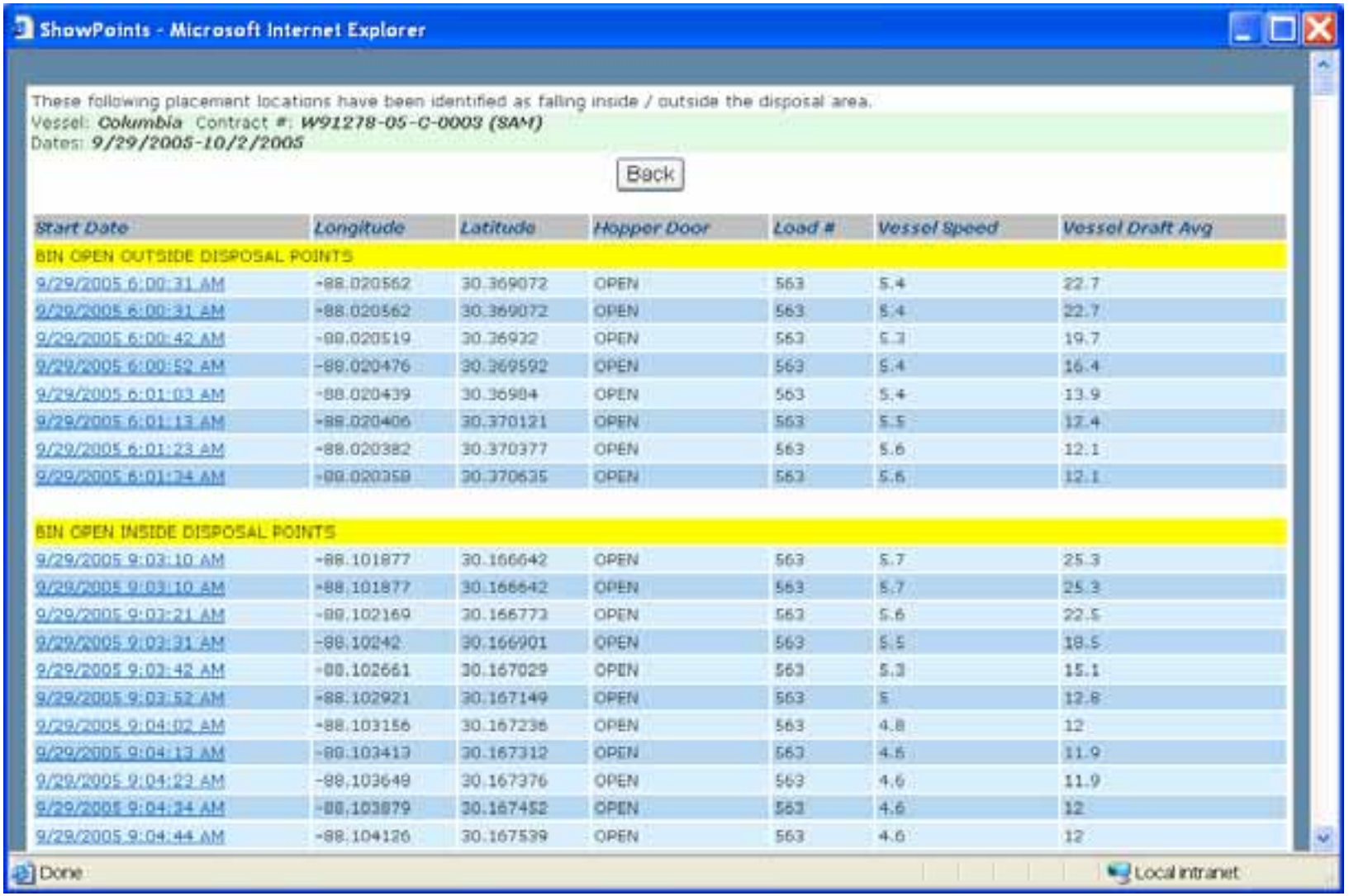


"Track Plot" Zooms To All Plotted Points

Authorized User Access

9. Once the authorized user is able to view the vessel points on the map, authorized users can log in to the site. The points are grouped by "Load" numbers.
10. All loads with open points falling outside the disposal site are shaded red.
11. By default, the "Release Comments" for all loads that have no open points outside are set to "OK". Once the user selects the release type
12. Clicking on the "View Map" button takes the users to the selected group of point and puts a green circle around it. The user can click the "List Points" button to view a list of all points. All points for the selected load are yellow.
13. Once all necessary changes are made, the user clicks the "Save" button to save the changes to the database. A report of the results is sent to the EPA.





ShowPoints - Microsoft Internet Explorer

These following placement locations have been identified as falling inside / outside the disposal area.
Vessel: *Columbia* Contract #: *W91278-05-C-0003 (SAM)*
Dates: *9/29/2005-10/2/2005*

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Start Date	Longitude	Latitude	Hopper Door	Load #	Vessel Speed	Vessel Draft Avg
BIN OPEN OUTSIDE DISPOSAL POINTS						
9/29/2005 6:00:31 AM	-88.020562	30.369072	OPEN	563	5.4	22.7
9/29/2005 6:00:31 AM	-88.020562	30.369072	OPEN	563	5.4	22.7
9/29/2005 6:00:42 AM	-88.020519	30.36932	OPEN	563	5.3	19.7
9/29/2005 6:00:52 AM	-88.020476	30.369592	OPEN	563	5.4	16.4
9/29/2005 6:01:03 AM	-88.020439	30.36984	OPEN	563	5.4	13.9
9/29/2005 6:01:13 AM	-88.020406	30.370121	OPEN	563	5.5	12.4
9/29/2005 6:01:23 AM	-88.020382	30.370377	OPEN	563	5.6	12.1
9/29/2005 6:01:34 AM	-88.020359	30.370635	OPEN	563	5.6	12.1
BIN OPEN INSIDE DISPOSAL POINTS						
9/29/2005 9:03:10 AM	-88.101877	30.166642	OPEN	563	5.7	25.3
9/29/2005 9:03:10 AM	-88.101877	30.166642	OPEN	563	5.7	25.3
9/29/2005 9:03:21 AM	-88.102169	30.166773	OPEN	563	5.6	22.5
9/29/2005 9:03:31 AM	-88.10242	30.166901	OPEN	563	5.5	18.5
9/29/2005 9:03:42 AM	-88.102661	30.167029	OPEN	563	5.3	15.1
9/29/2005 9:03:52 AM	-88.102921	30.167149	OPEN	563	5	12.8
9/29/2005 9:04:02 AM	-88.103156	30.167236	OPEN	563	4.8	12
9/29/2005 9:04:13 AM	-88.103413	30.167312	OPEN	563	4.6	11.9
9/29/2005 9:04:23 AM	-88.103649	30.167376	OPEN	563	4.6	11.9
9/29/2005 9:04:34 AM	-88.103879	30.167452	OPEN	563	4.6	12
9/29/2005 9:04:44 AM	-88.104126	30.167539	OPEN	563	4.6	12

Done | Local intranet

"List Points" Button Results

Acknowledgements

Thank you to Teresa Parks, Programmer (Bowhead Information Systems, LLC for US Army Corp of Engineers) for her assistance with writing this application. Without her skill and determination to solve problems this would not have been possible. Thank also goes to Mark Penton, GIS Lead (US Army Corp of Engineers) for the use of his Maddog dll and years of knowledge which he so freely gives to others.

Author's Information

Marie Crum

IMS Developer Contractor

Bowhead Information Technology, LLC in support of US Army of Engineers, Mobile District

109 St Joseph St, Rm 7029

251-694-3777

251-690-3464

Marie.a.crum@sam.usace.army.mil