

Integrating Mobile GIS into Municipal Services

November 26, 2002



Mobile GIS at the RDOS

- Mobile GIS Applications
 - ◆ Noxious Pest Control
 - ◆ Tree fruit pest control
 - ◆ Mosquito control
 - ◆ Water System Application
 - ◆ Water sampling
 - ◆ Valve and hydrant maintenance
 - ◆ Water connections
- Landfill modeling

Background

- Lower Okanagan and Similkameen Valleys
- Roughly 10,600 square km
- Population of 78,000 including 6 municipalities – largest being Penticton and Summerland
- Approximately 18,000 land parcels
- Using ESRI products for 1.5 years
 - ArcGIS 8.2/ArcIMS/ArcPAD
- Limited resources

Tree Fruit Pest Control

- Commercial fruit industry important in lower Okanagan and Similkameen valleys
- Noxious Insect Control Bylaw
 - ◆ Ensure better control of insect pests
 - ◆ Potential to cause considerable economic damage

Tree Fruit Pest Control

- PW required an application that would;
 - ◆ Record location of infestation
 - ◆ Track comments over time
 - ◆ Distribute information to staff in the office

Tree Fruit Pest Control

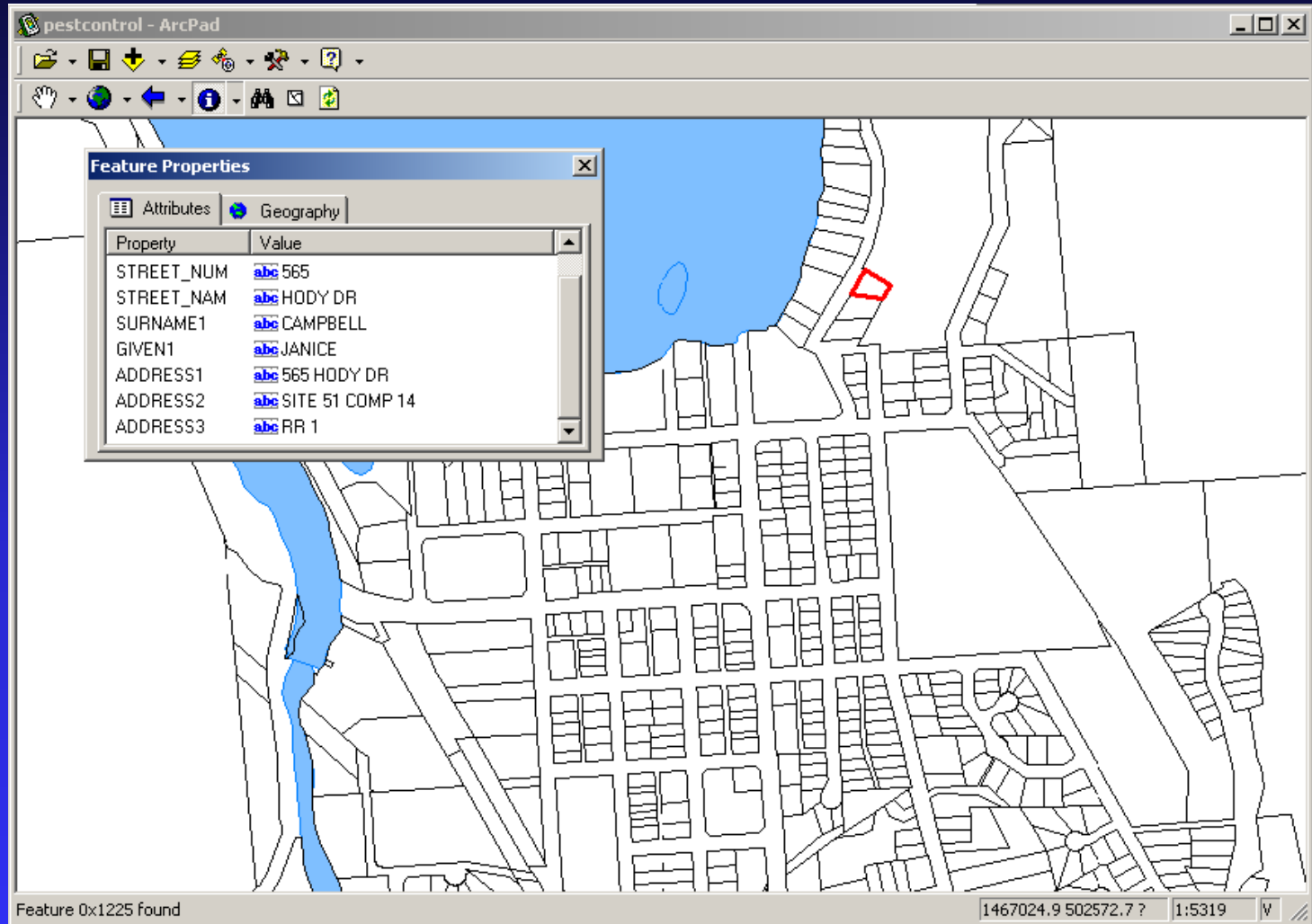
- Solution – ArcPAD application on iPAQ with 64 MB RAM



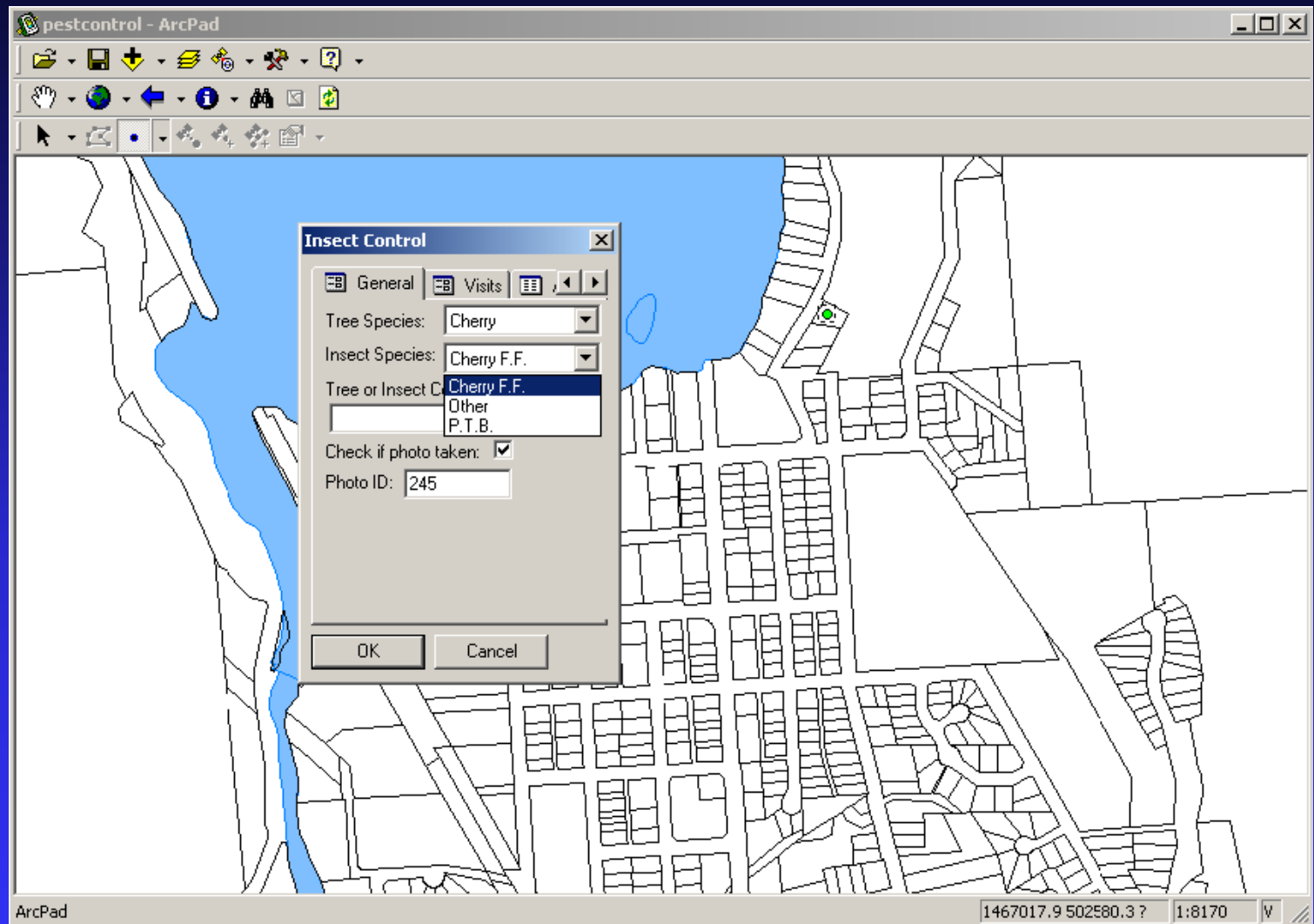
Tree Fruit Pest Control

- Application includes base features for valley bottom
 - ◆ TRIM roads and streams
 - ◆ Cadastral linework
 - ◆ Civic and owner information for 12,000 parcels
- Simple input form
 - ◆ Pull-down boxes
 - ◆ Calendars

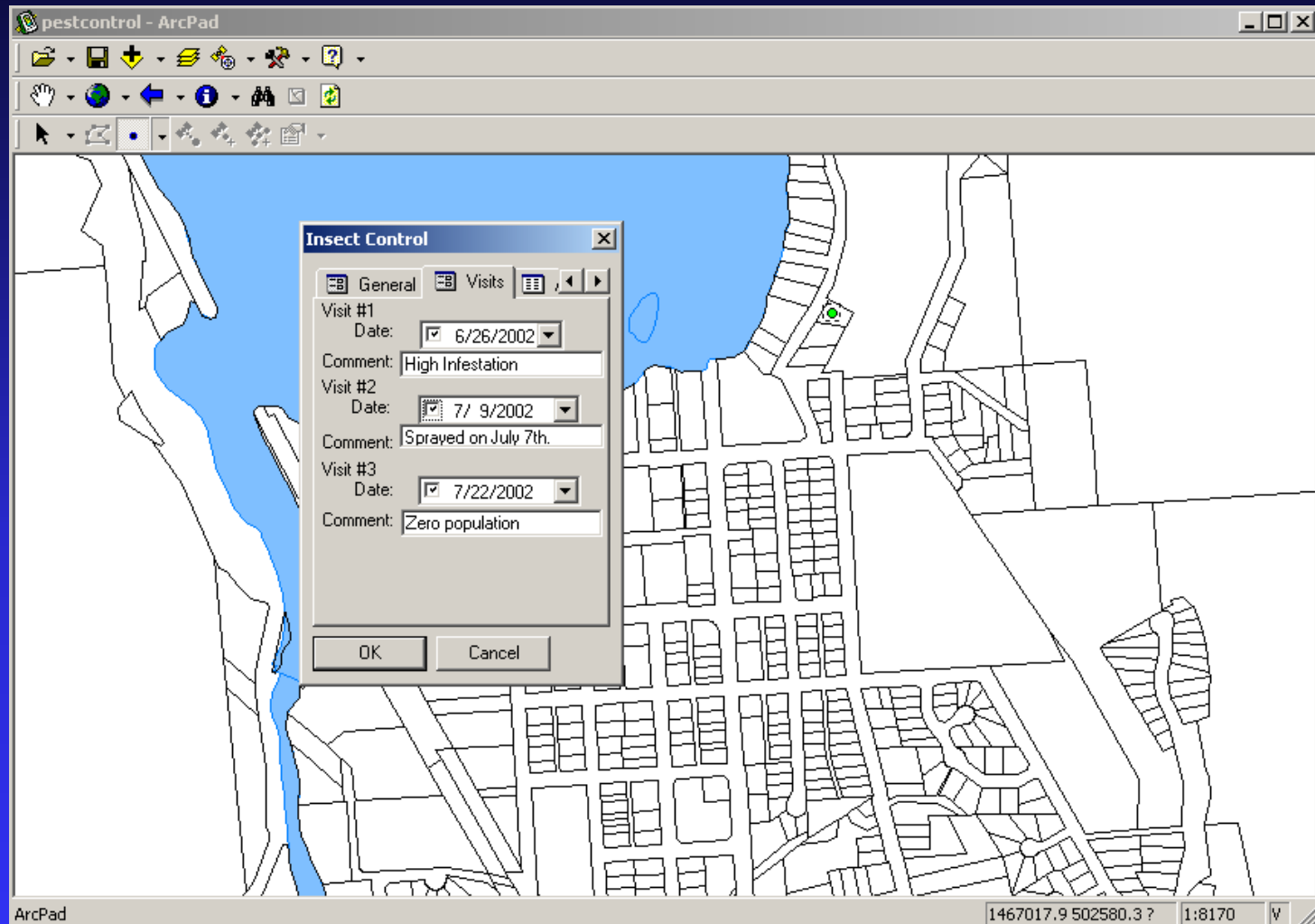
Tree Fruit Pest Control



Tree Fruit Pest Control



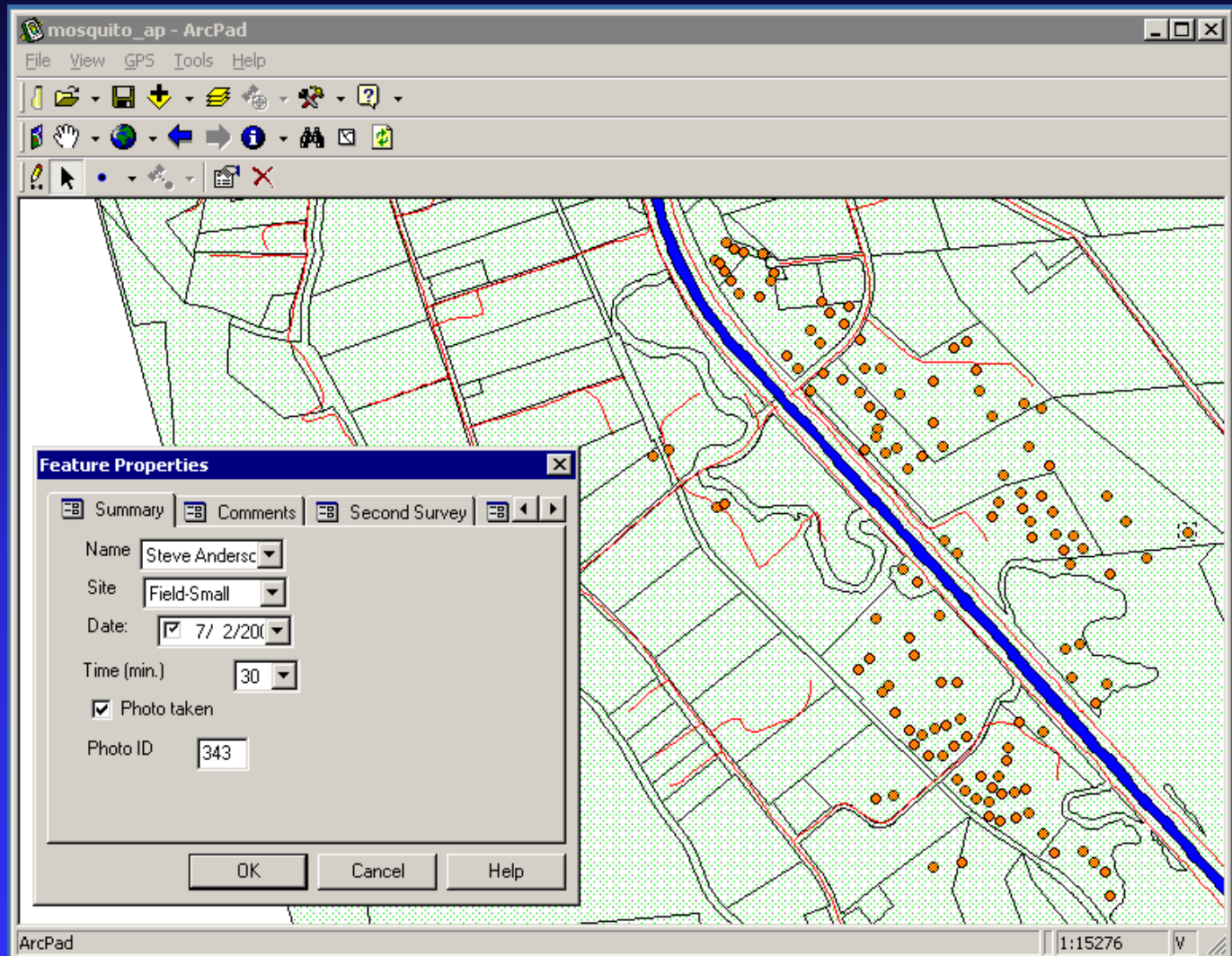
Tree Fruit Pest Control



Mosquito Control

- Control nuisance mosquito populations in a number of its Electoral Areas and municipalities
- PW Departments required an application that would;
 - ◆ Record location of control applications
 - ◆ Add comments

Mosquito Control



Distributing Information

- Internet mapping
- Hardcopy Maps
- PDF Files

Tree Fruit Pest Control

Regional District of Okanagan-Similkameen Map Site - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print Mail News RSS Feeds Links RDOS Website ASP test

Address http://www.rdosmaps.bc.ca/internal/rdos_base/ Go

Regional District of Okanagan-Similkameen Map Site

About Overview Map Layers Legend Search Options Search Refresh Map Help

Print Home Search Home Hand Full Screen Refresh

Search Results

Select Pest (1 records selected)

ID: 59

E_SPEC: Cherry

CT_SPC: Cherry F. F.

DATE1: 6/21/2002

MENTS1: Monitor. Near anonymous 'x'. Area C. Few cherries. Trap 38 up to replace 75.

DATE2: 6/27/2002

Visited 6/27, 7/5, 11, 19. Trapped a number of

MENTS2: Mrs. says she'll be mowing and picking right away.

DATE3: 8/9/2002

MENTS3: Trap 38 down, 13CFF. All cherries off.

OTO_ID: 1217

TO_URL: http://www.rdosmaps.bc.ca/pest_image/1217

Map Tool: **i** Identify

Map Coords (m): 1467929 , 478201

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Internet

Tree Fruit Pest Control

Regional District of Okanagan-Similkameen

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Address <http://www.rdosmaps.bc.ca/internal/>

Regional District of Okanagan-Similkameen

About Overview Map Layers Legend

Search Results

Insect Pest (1 records selected)

ID: 59

TREE_SPEC: Cherry

INSECT_SPC: Cherry F. F.

DATE1: 6/21/2002

COMMENTS1: Monitor. Near anonymous 'x'. A trees. Trap 38 up to replace 7/

DATE2: 6/27/2002

Visited 6/27, 7/5,11,19. Trapped

COMMENTS2: Mrs. says she'll be mowing ar away.

DATE3: 8/9/2002

COMMENTS3: Trap 38 down, 13CFF. All cher

PHOTO_ID: 1217

PHOTO_URL: http://www.rdosmaps.bc.ca/pest_image/1012.htm

Untitled Document - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address http://www.rdosmaps.bc.ca/pest_image/1012.htm

Done Internet

Map Tool: **Identify**

Map Coords (m): 1467924 , 477511

Internet

0 0.15km

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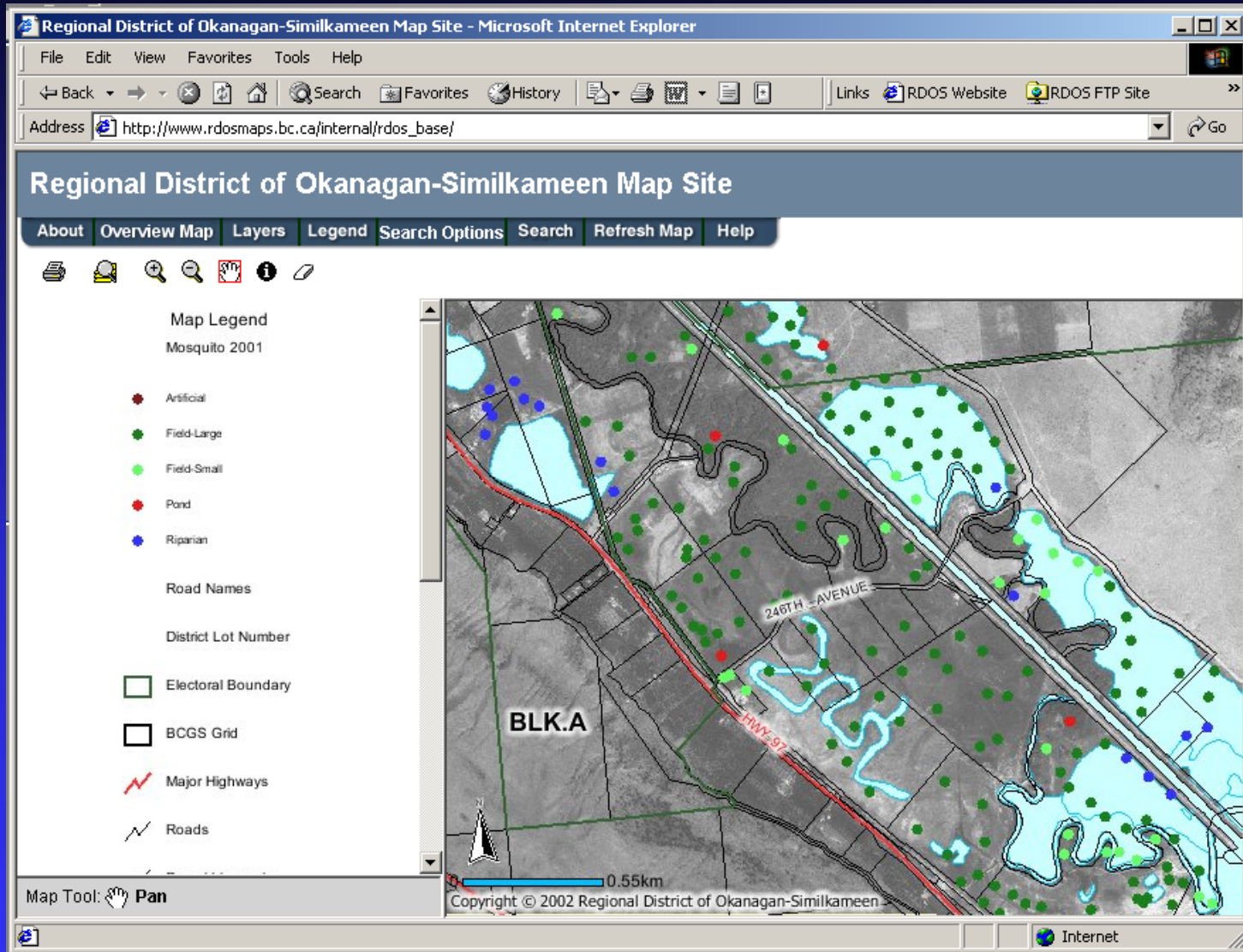
pl.1790

937

pl.26963

TESTALINDEN CREEK RD

Mosquito Control



New Applications for 2002

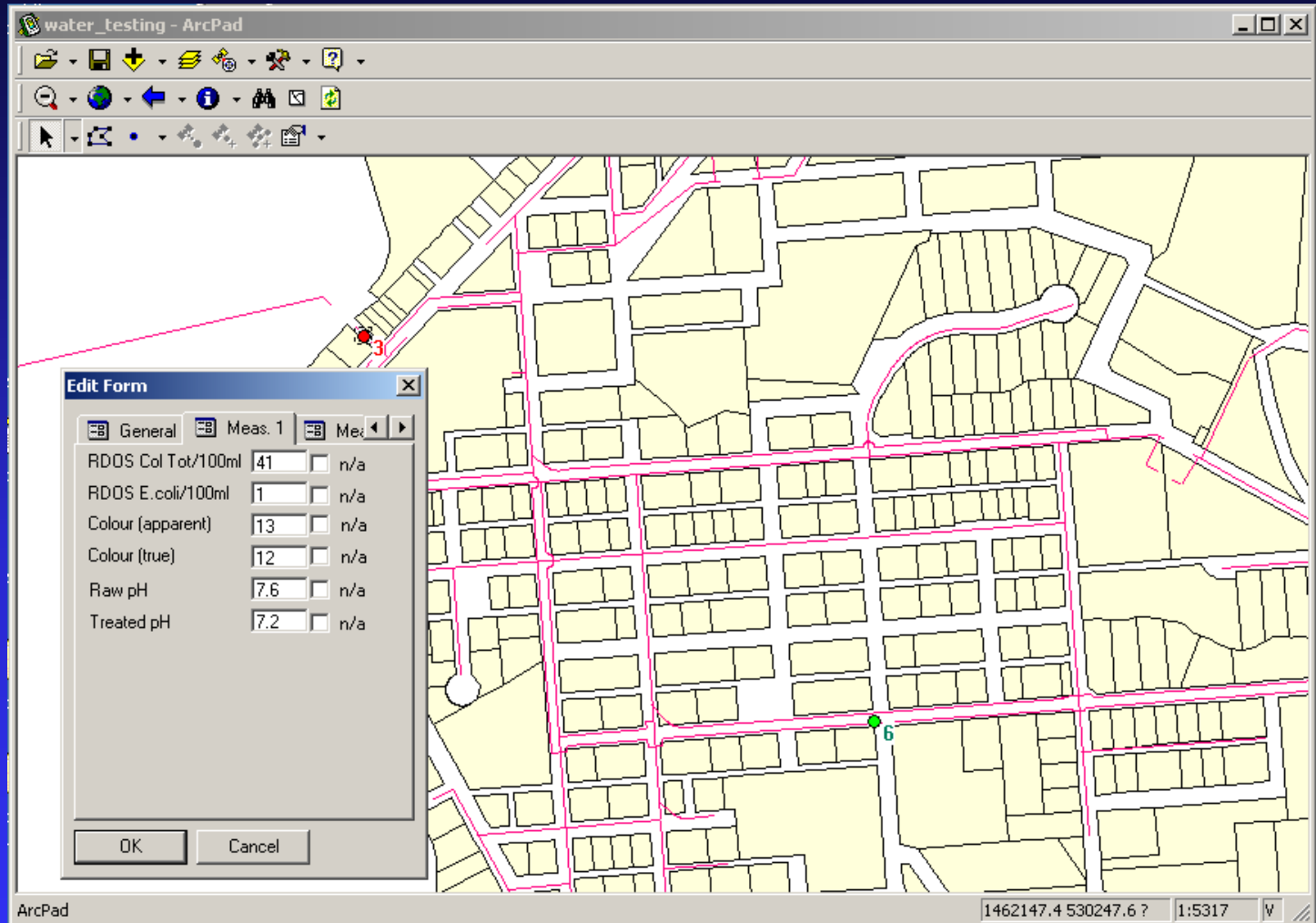
- Water sampling
- Valve and hydrant maintenance
- Water connections



Water Sampling

- 3 water service areas
- Weekly samples for large number of parameters
- ArcPAD application to enter field information
- MS Access VBA application allow field staff to;
 - ◆ Import ArcPAD data
 - ◆ Add lab data
 - ◆ Produce graphs

Water Sampling




Water Sampling

naramata_water_samples : Form

Naramata Water Samples

Add Data:

View/Modify Data: Pick Dataset: 

Display Graphs: Pick Dataset:

Choose location:

Choose Start Date: **May 2002**

Sun	Mon	Tue	Wed	Thu	Fri	Sat
28	29	30	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	1
2	3	4	5	6	7	8

Choose End Date: **June 2002**

Sun	Mon	Tue	Wed	Thu	Fri	Sat
26	27	28	29	30	31	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	1	2	3	4	5	6

Water Sampling

The screenshot shows a Microsoft Access window titled "Raw Intake : Form". The form is titled "Raw Intake" and contains several sections of data entry fields:

- Basic Information:** ID, LOCATION (NNI), DATE (4/3/2002), TIME (13:10), OPERATOR (Dan), WEATHER (Sunny), and COMMENTS (Giardia and crypto samples taken April 2/02).
- Coliert by RDOS:** Total Coliform (CFU/100ml, checked N/A) and E.coli (CFU/100ml, checked N/A).
- Membrane Filter by Accredited Lab:** Total Coliform (72 CFU/100ml, unchecked N/A), Total Coliform - NC (800 CFU/100ml, unchecked N/A), Fecal Coliform (0 CFU/100ml, unchecked N/A), and Fecal Coliform - NC (0 CFU/100ml, unchecked N/A).
- Other Measurements:** Colour (apparent) (38 colour units, unchecked N/A), Colour (true) (30 colour units, unchecked N/A), Raw pH (8.3, unchecked N/A), and Treated pH (7.8, unchecked N/A).
- Other Measurements (cont'd):** Temperature (4 degree), Alkalinity (mg/L C), Hardness (mg/L), Lab Turbidity (0.495 NTU), Field Turbidity (0.5 NTU), Total Dissolved Solids (8 mg/L), Suspended Solids (mg/L), Free CL2 Residual (1.48 ppm), CL2 Use (2.2 lb/day), Flow (110 Gallons), Giardia (cysts/1), and Crypto (oocyst).


At the bottom, there is a search section with dropdowns for ID and DATE, a "Find Record" button, and a record navigation bar showing "Record: 13 of 66". A "Produce Graphs" button is also present.

Water Sampling

naramata_water_samples : Form

Naramata Water Samples

Add Data:

View/Modify Data: Pick Dataset: 

Display Graphs: Pick Dataset:

Choose location:

Choose Start Date: **May 2002**

Sun	Mon	Tue	Wed	Thu	Fri	Sat
28	29	30	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	1
2	3	4	5	6	7	8

Choose End Date: **June 2002**

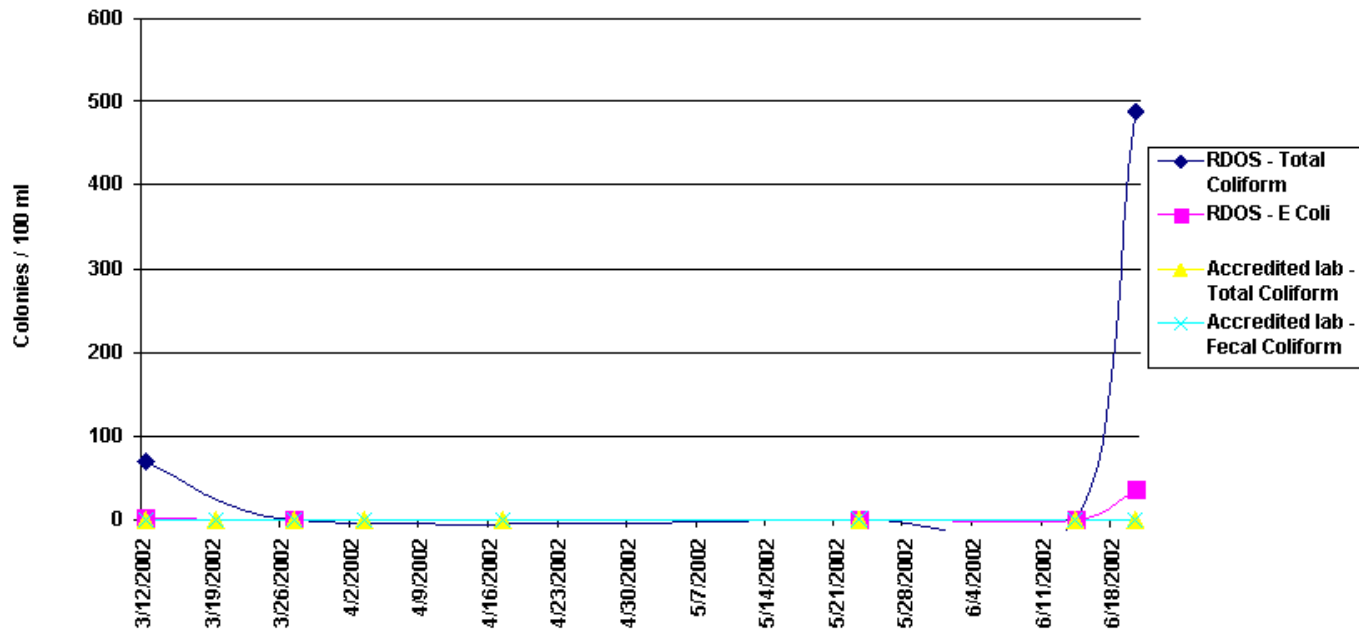
Sun	Mon	Tue	Wed	Thu	Fri	Sat
26	27	28	29	30	31	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	1	2	3	4	5	6

Water Sampling

Bacteriological Analysis

* Total And Fecal Coliform analysis was conducted using the Membrane filter method by one of the accredited laboratories Caro Environmental or MB Labs.

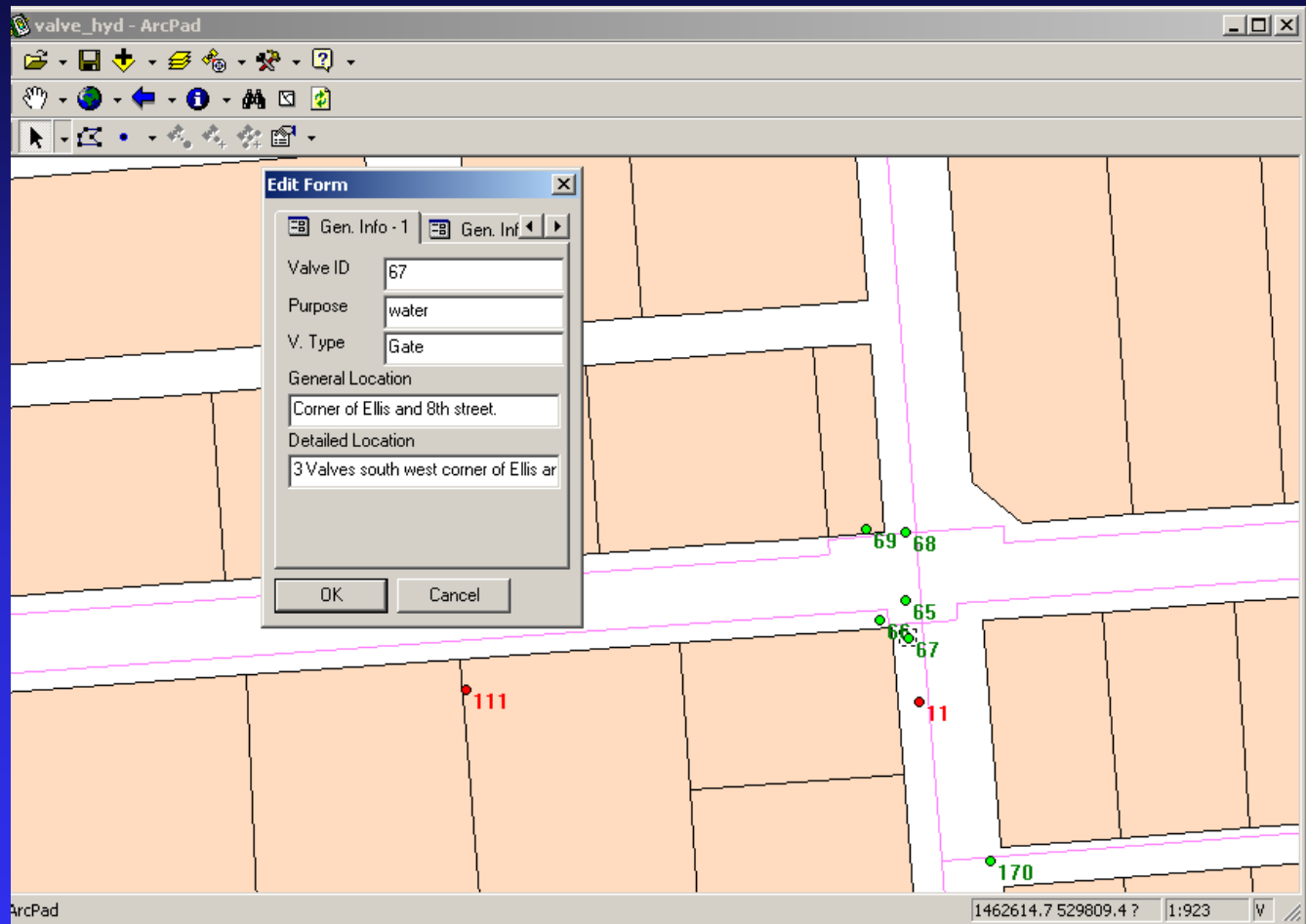
* The Total Coliform and E. coli analysis was conducted using the Colilert MPN method by RDOS Staff at the City of Perincton Water Treatment Plant



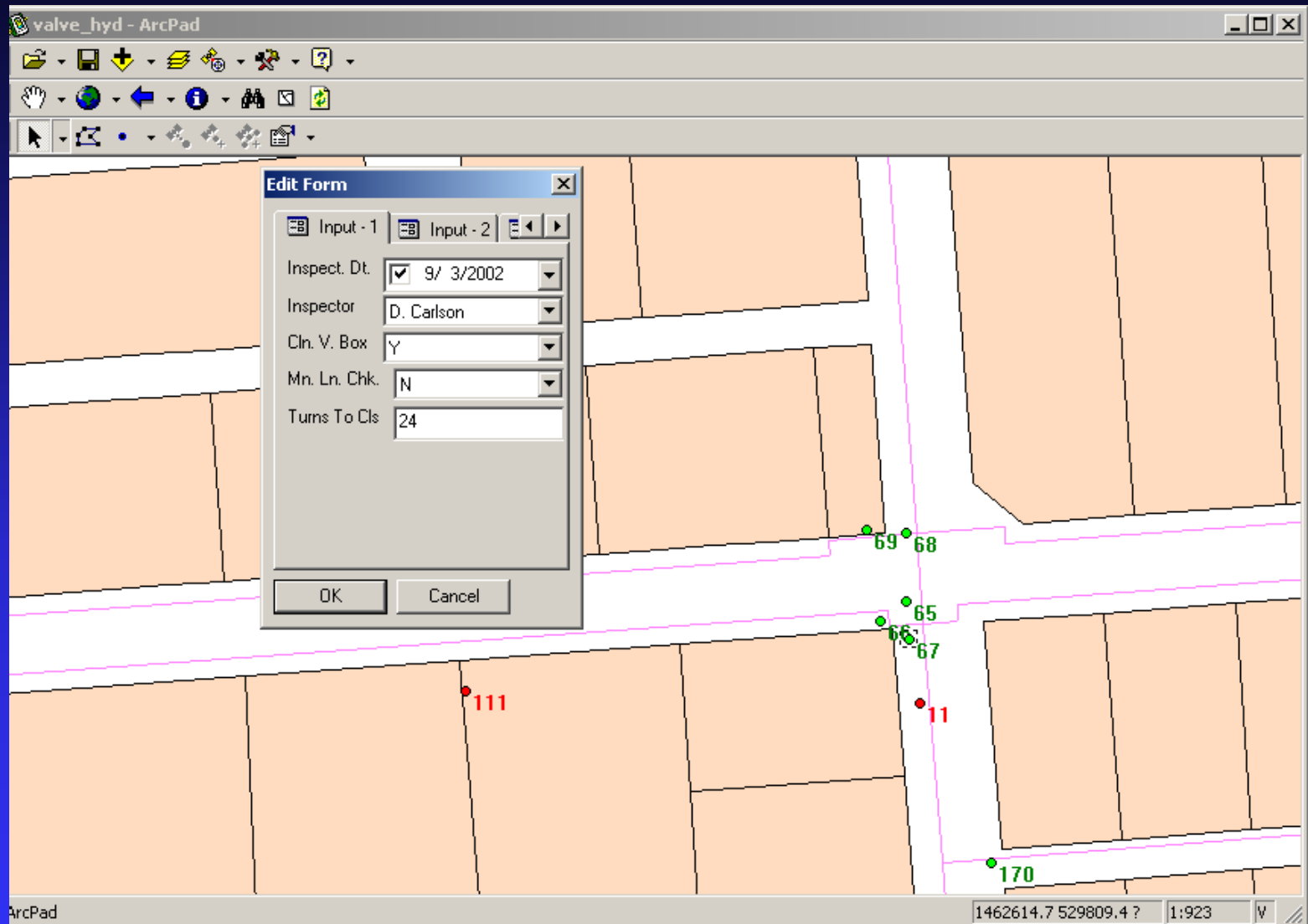
Valve and Hydrant Maintenance

- Maintenance check required every year
- Application allow user;
 - ◆ Identify valve/hydrant
 - ◆ Record service performed, parts replaced
- Application to query for all valves and hydrants not maintained in certain time period

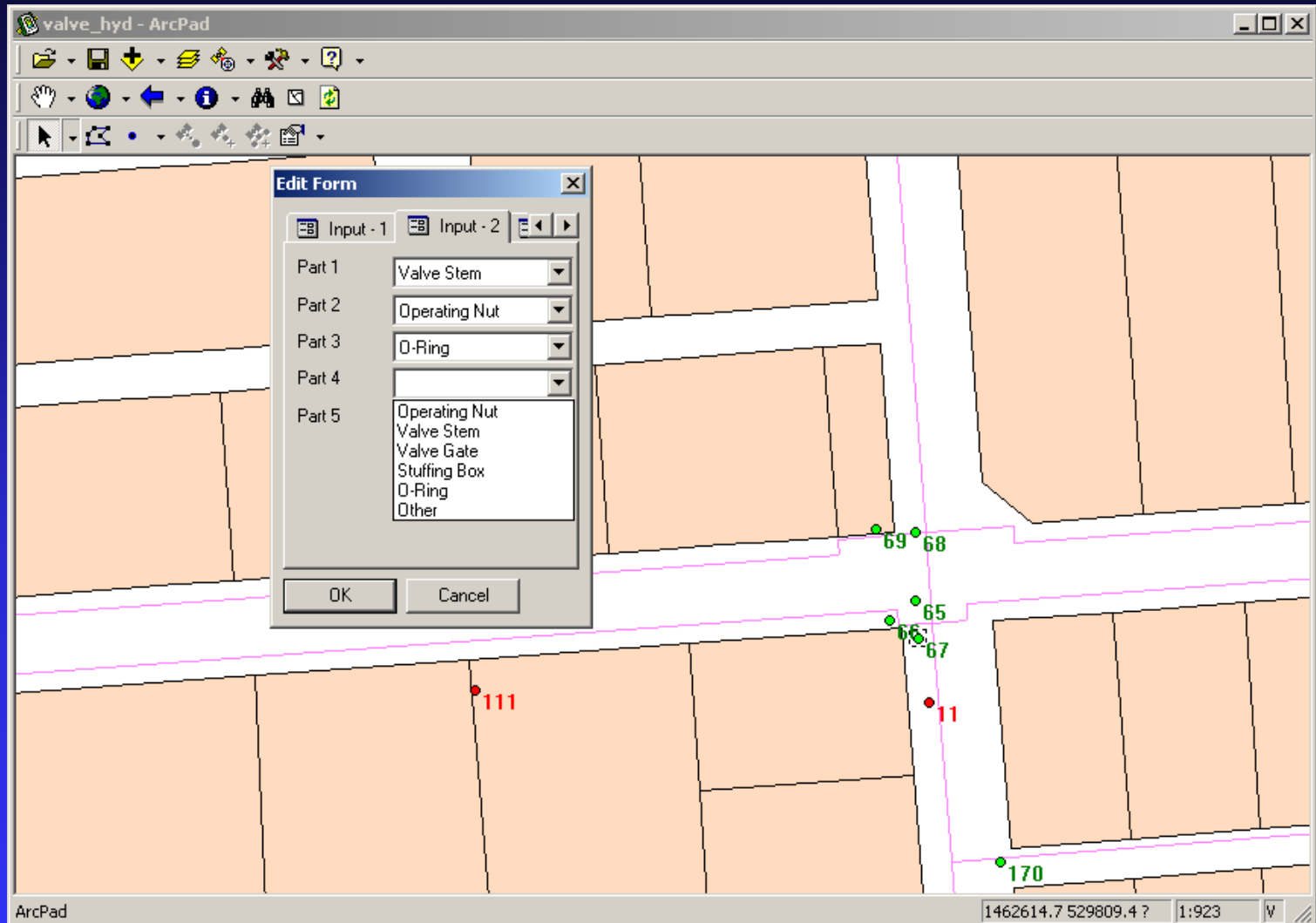
Valve and Hydrant Maintenance



Valve and Hydrant Maintenance



Valve and Hydrant Maintenance



Valve and Hydrant Maintenance

Regional District of Okanagan-Similkameen Map Site - Microsoft Internet Explorer

Address: http://imstest/internal/test_hydrant/

Regional District of Okanagan-Similkameen Map Site

About Overview Map Layers Legend Search Options Search Refresh Map Help

Search Map

Hydrant Information Search

Hydrant Id: ALL

Hydrant Date: 26 Nov 2001

Valve Id: ALL

Valve Date:

Go

Search Options

Information Categories

Hydrant Valve

Display Fields Horizontal

Map Tool: Pan

0 0.04km

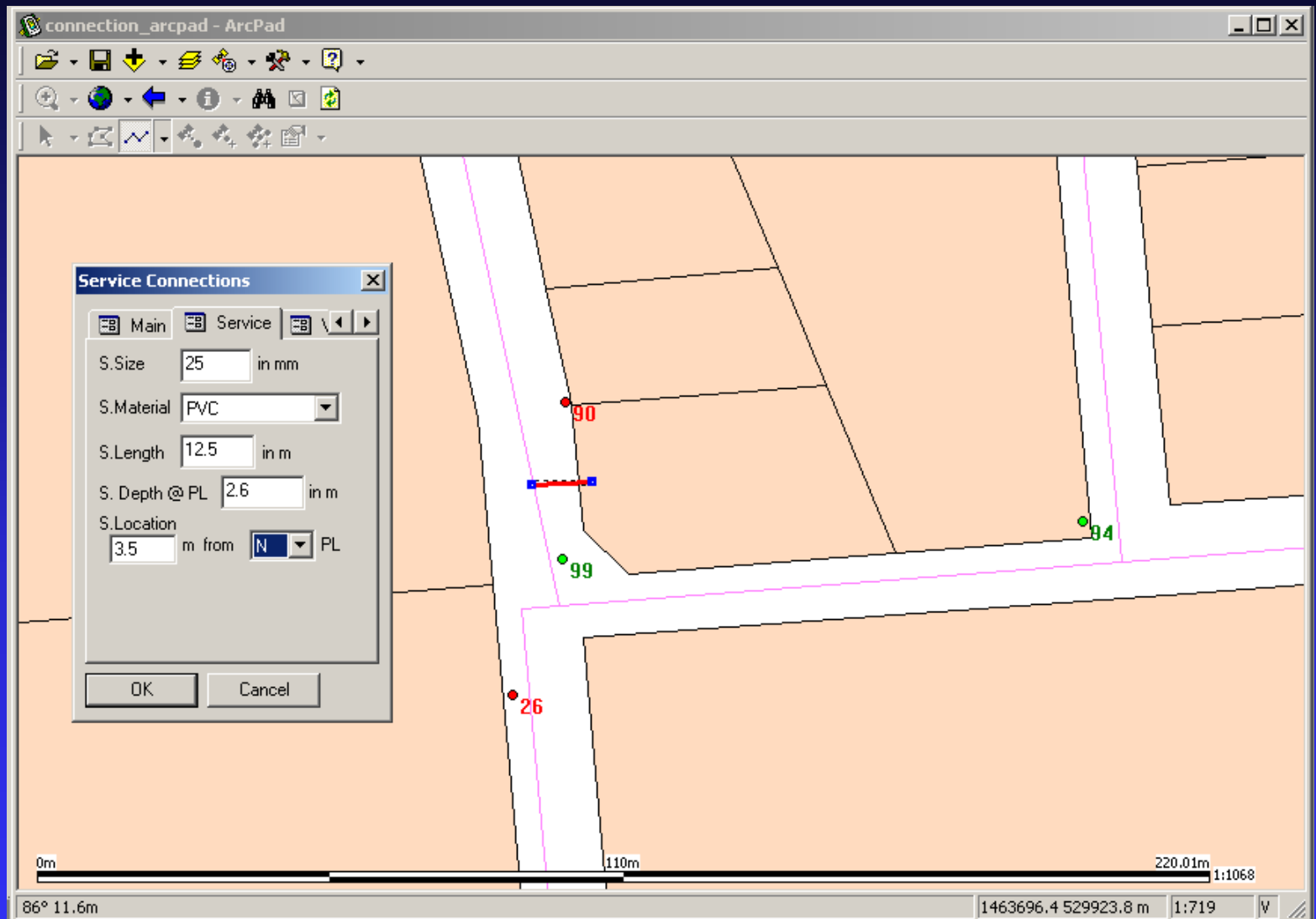
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Local intranet

Water Connection

- Have limited connection information from mains to parcels
- Application to record location and attributes
 - ◆ Type (domestic/irrigation)
 - ◆ Connection diameter
 - ◆ Pipe material

Water Connection



Future Projects

- 911 - Fire Departments – record hydrants
- Sewer system
- Building Inspection
- GPS

Limitations

- Annotation
- Snapping

Advantages

- With ArcIMS is an effective method of distributing information in a timely manner
- Attributes in a standard format – easy to update GIS dataset/internet mapping applications
- Fairly simple to set up
- Relatively low cost

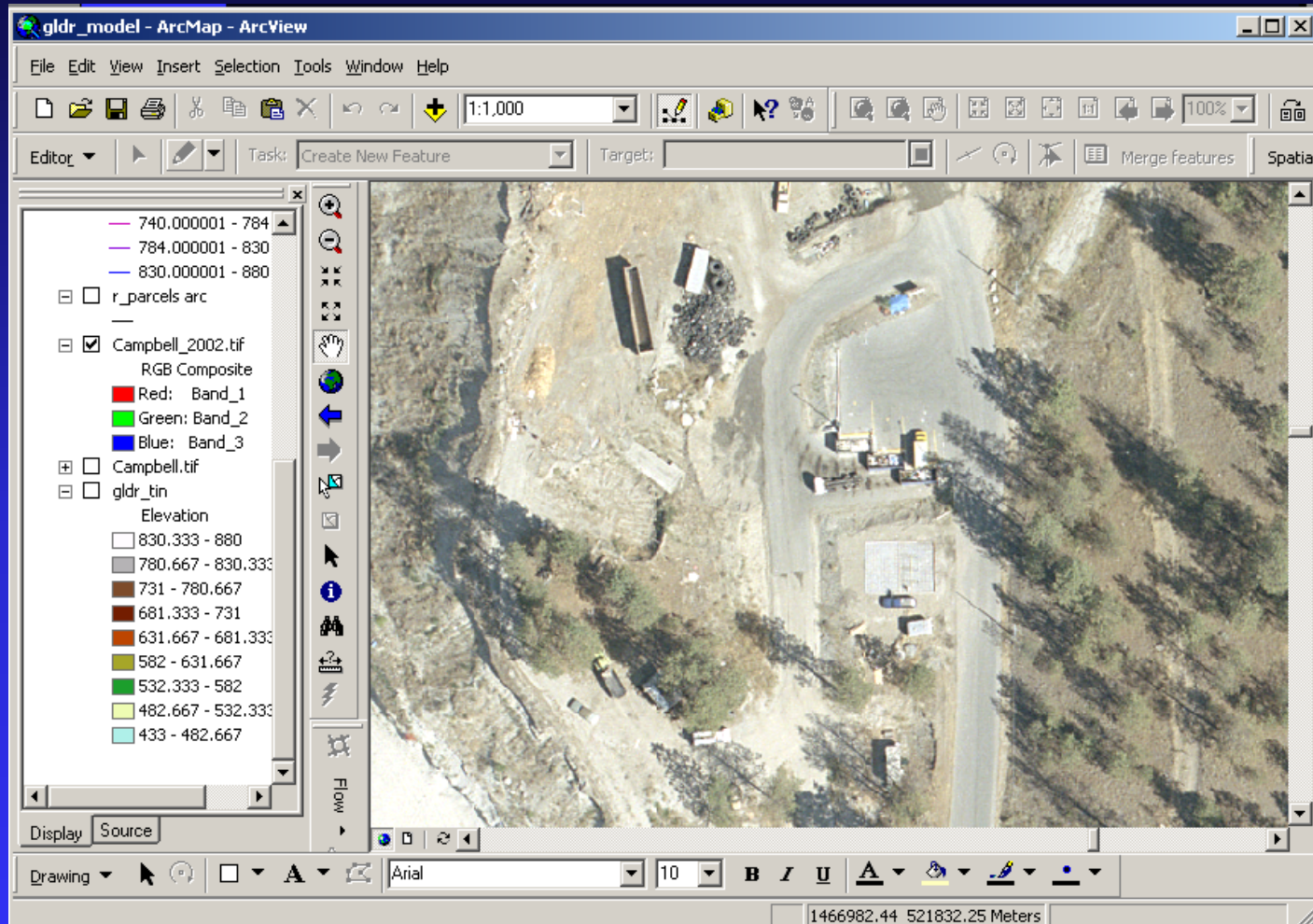


Landfill Analysis

- Currently maintaining 4 landfills
- Life expectancy of landfill – contentious issue
- High resolution Ortho's and DEM's in 2001 and 2002
- Contract to model maximum size of landfill
- Using ArcGIS 3D Analyst to model volumes – life expectancy

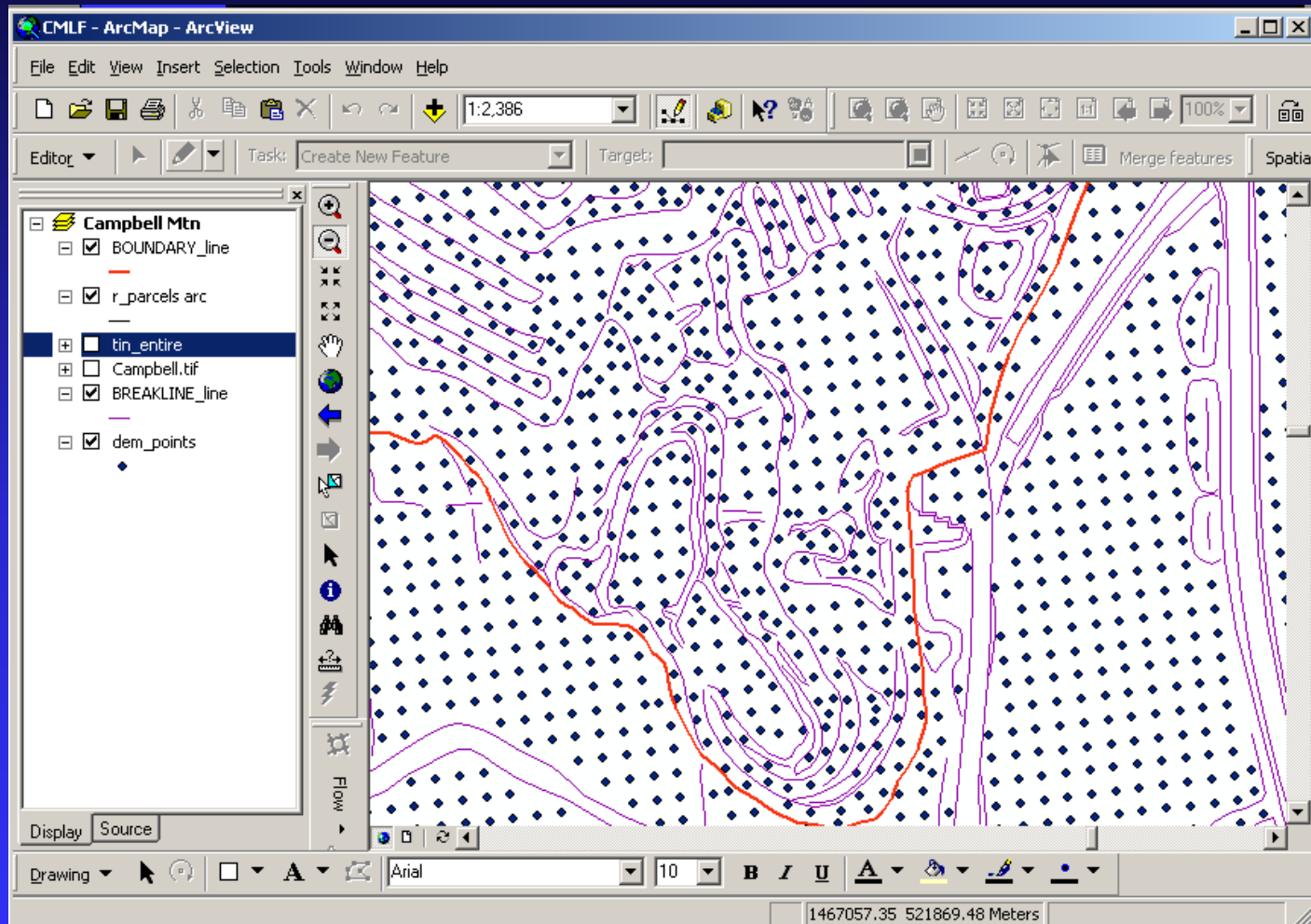
Landfill Analysis

2002 Ortho



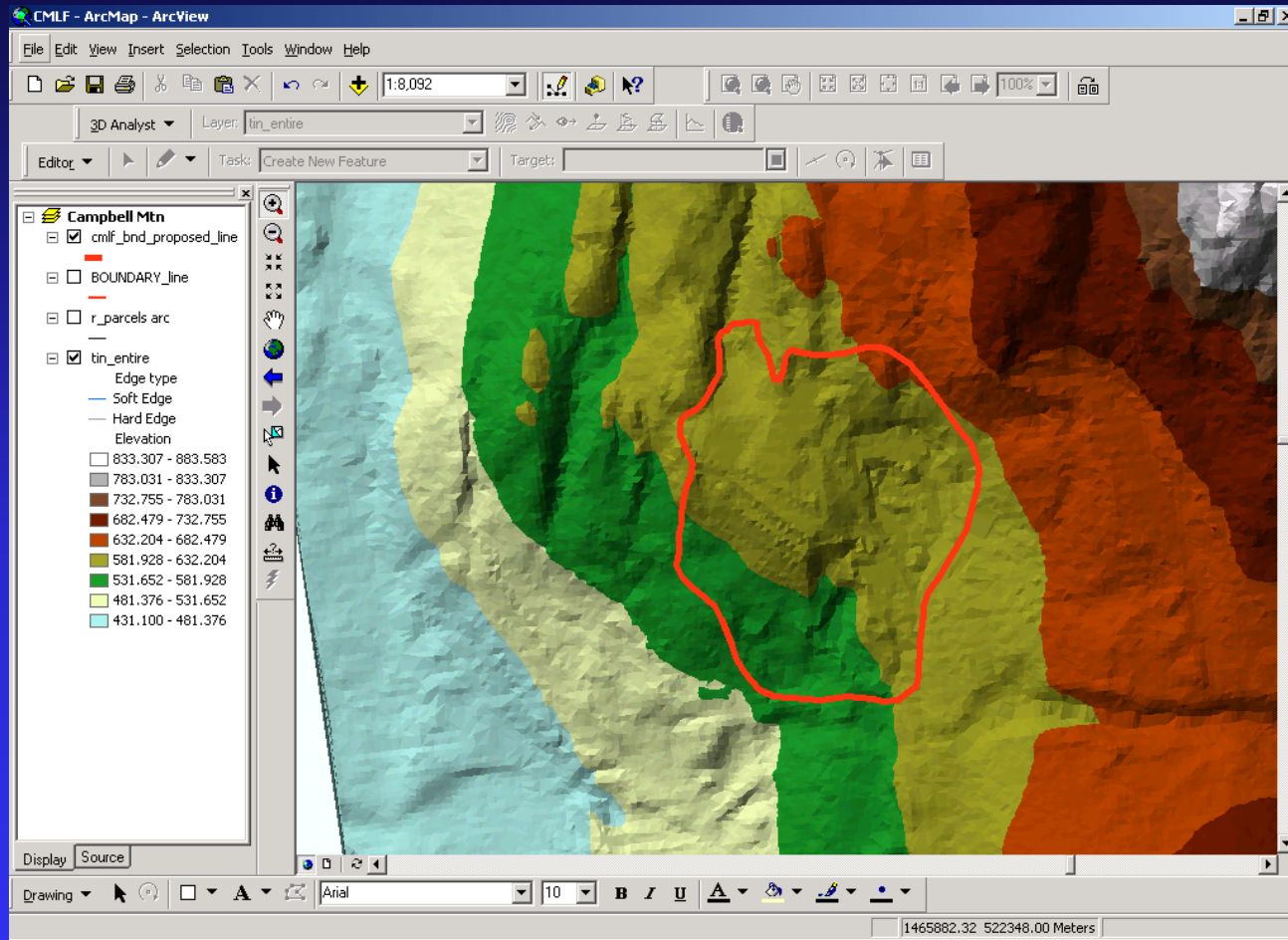
Landfill Analysis

2001 DEM



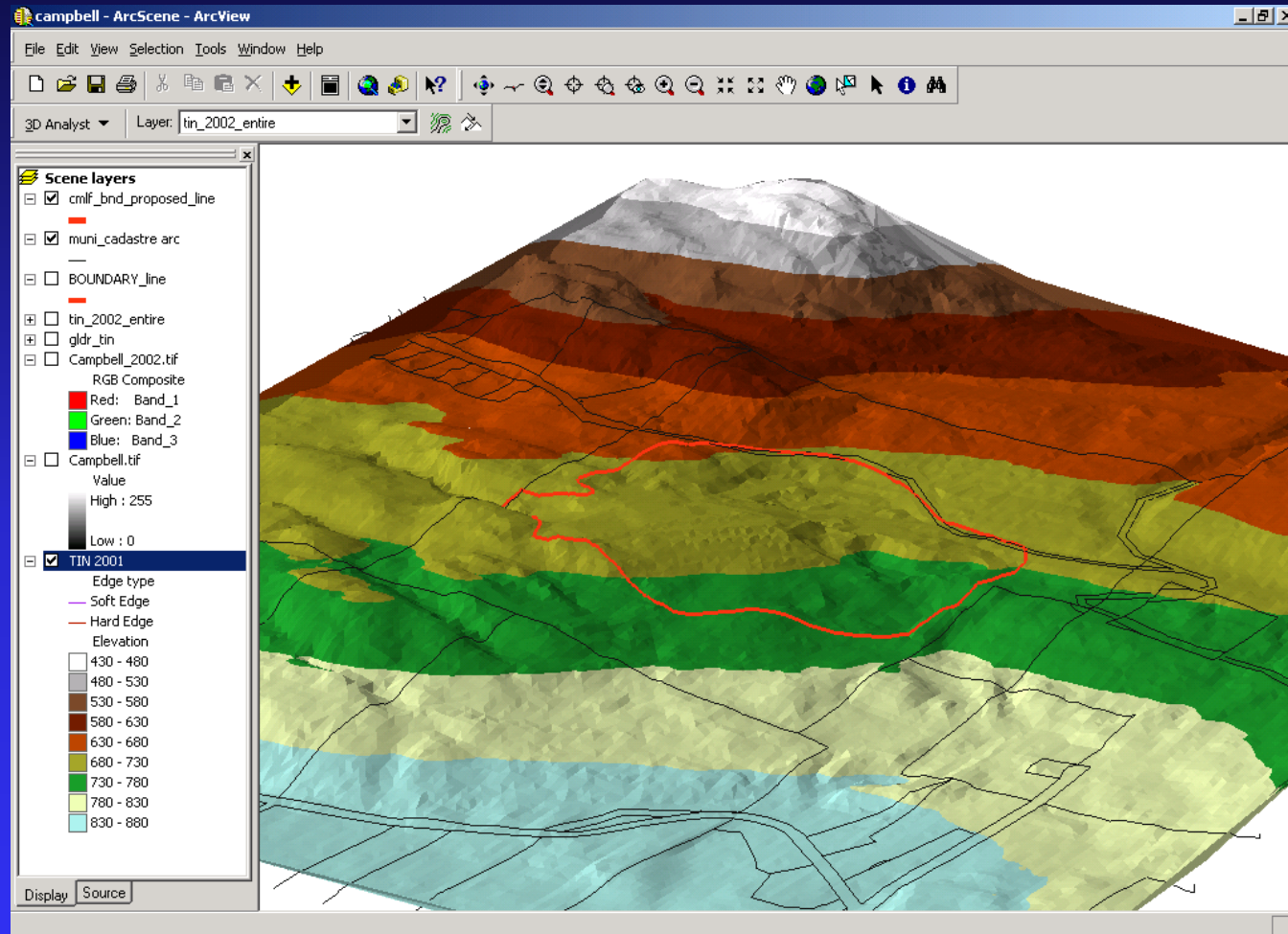
Landfill Analysis

2001 TIN



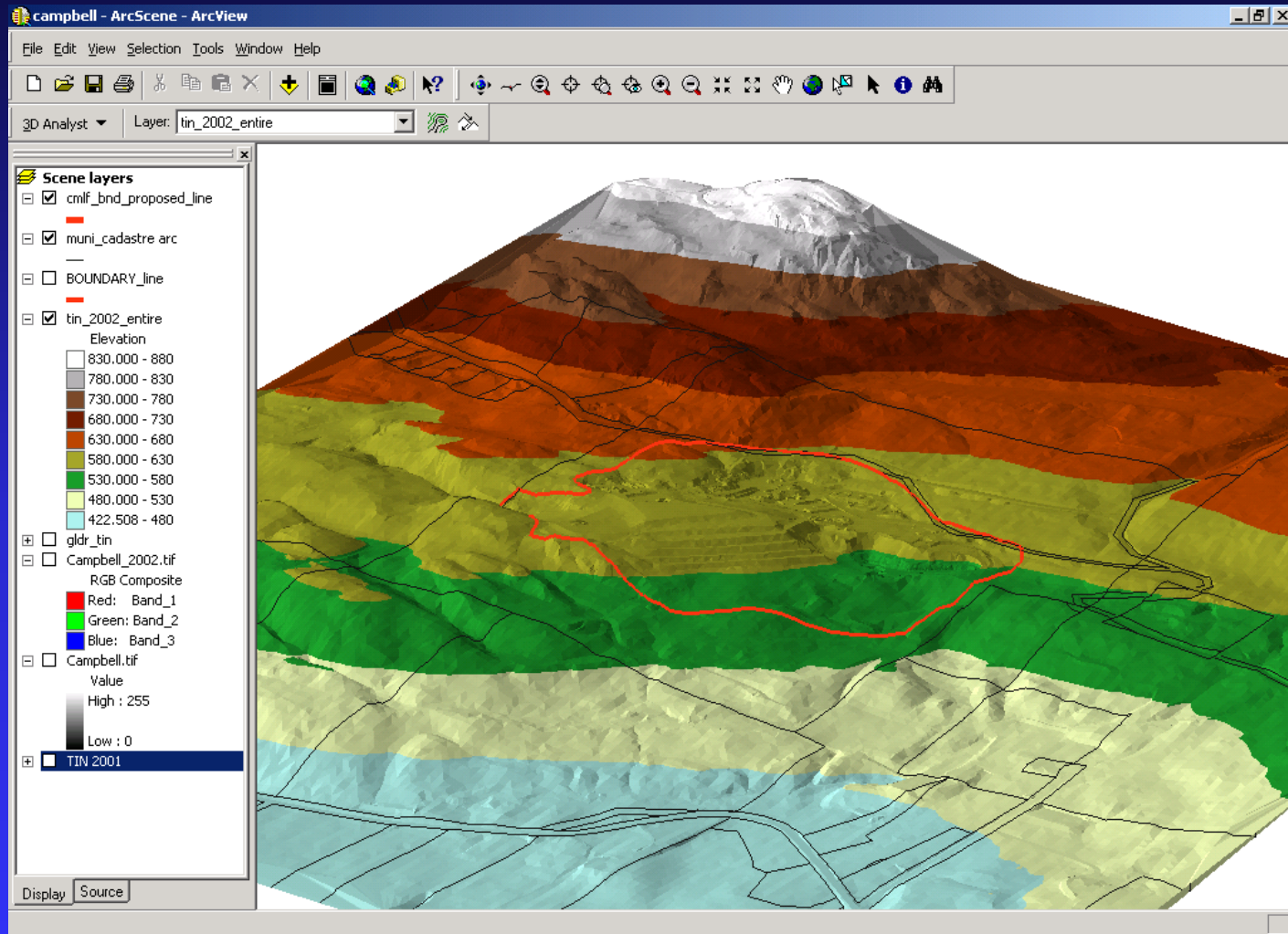
Landfill Analysis

2001 TIN



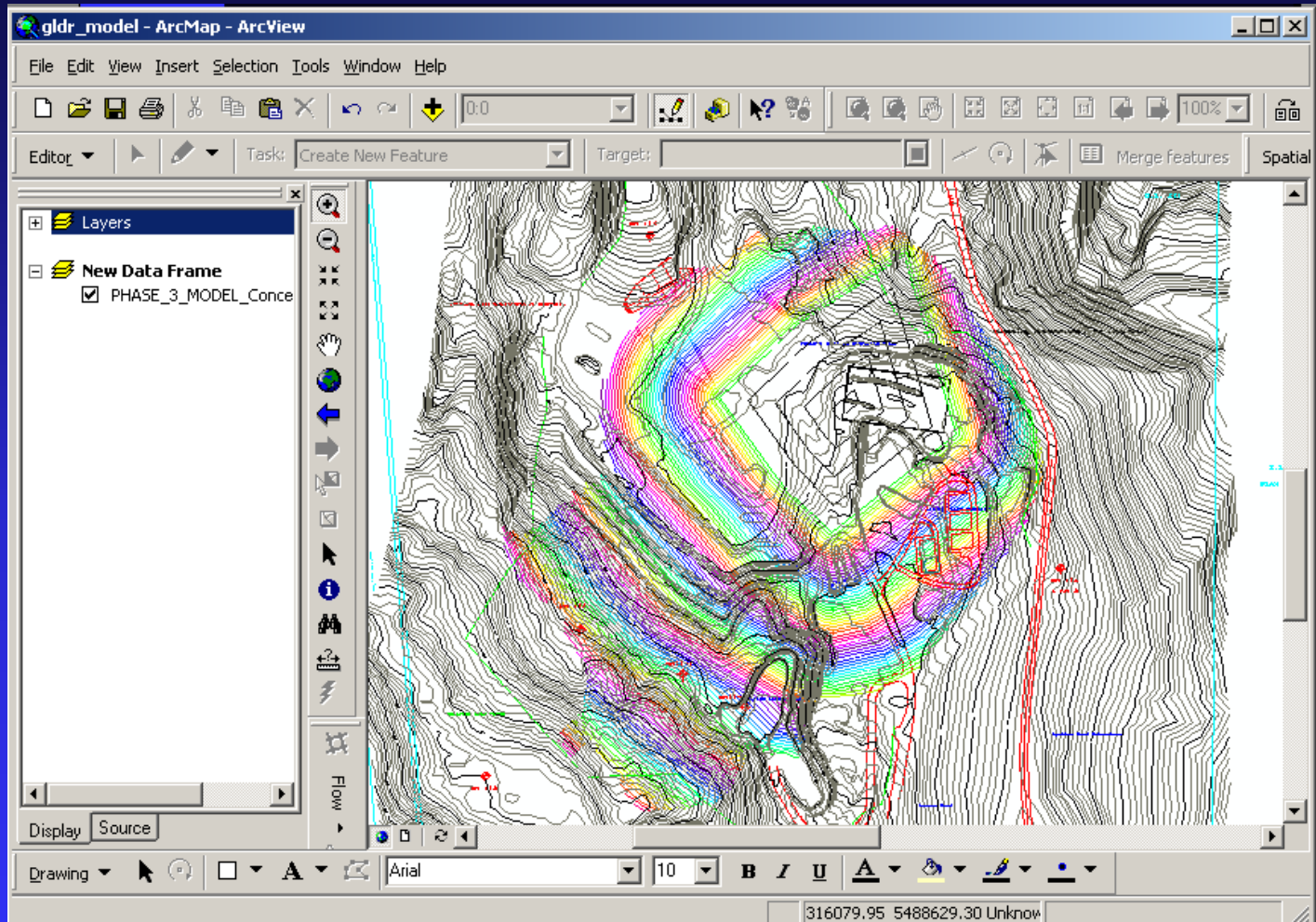
Landfill Analysis

2002 TIN



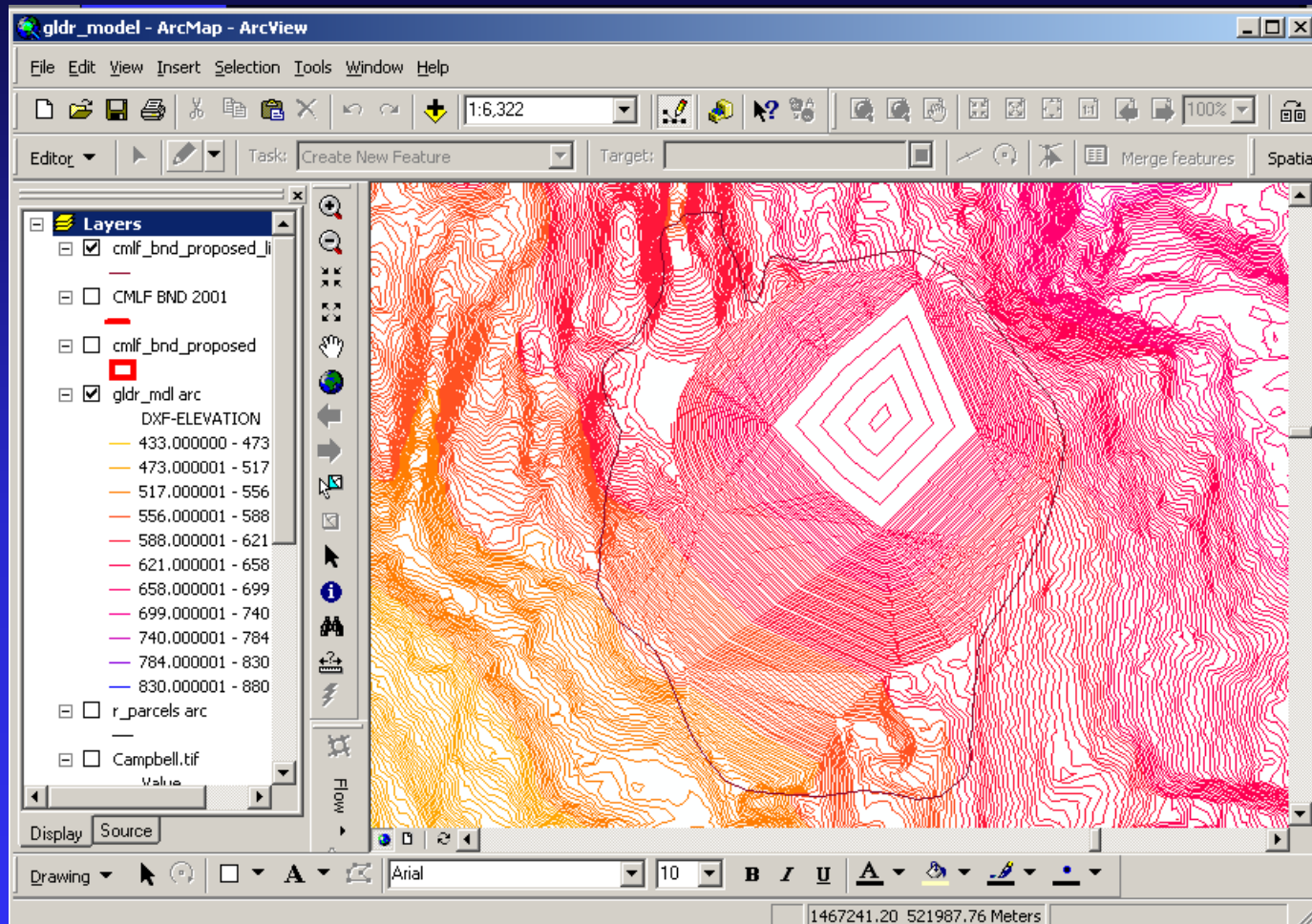
Landfill Analysis

AutoCAD model in DXF file format



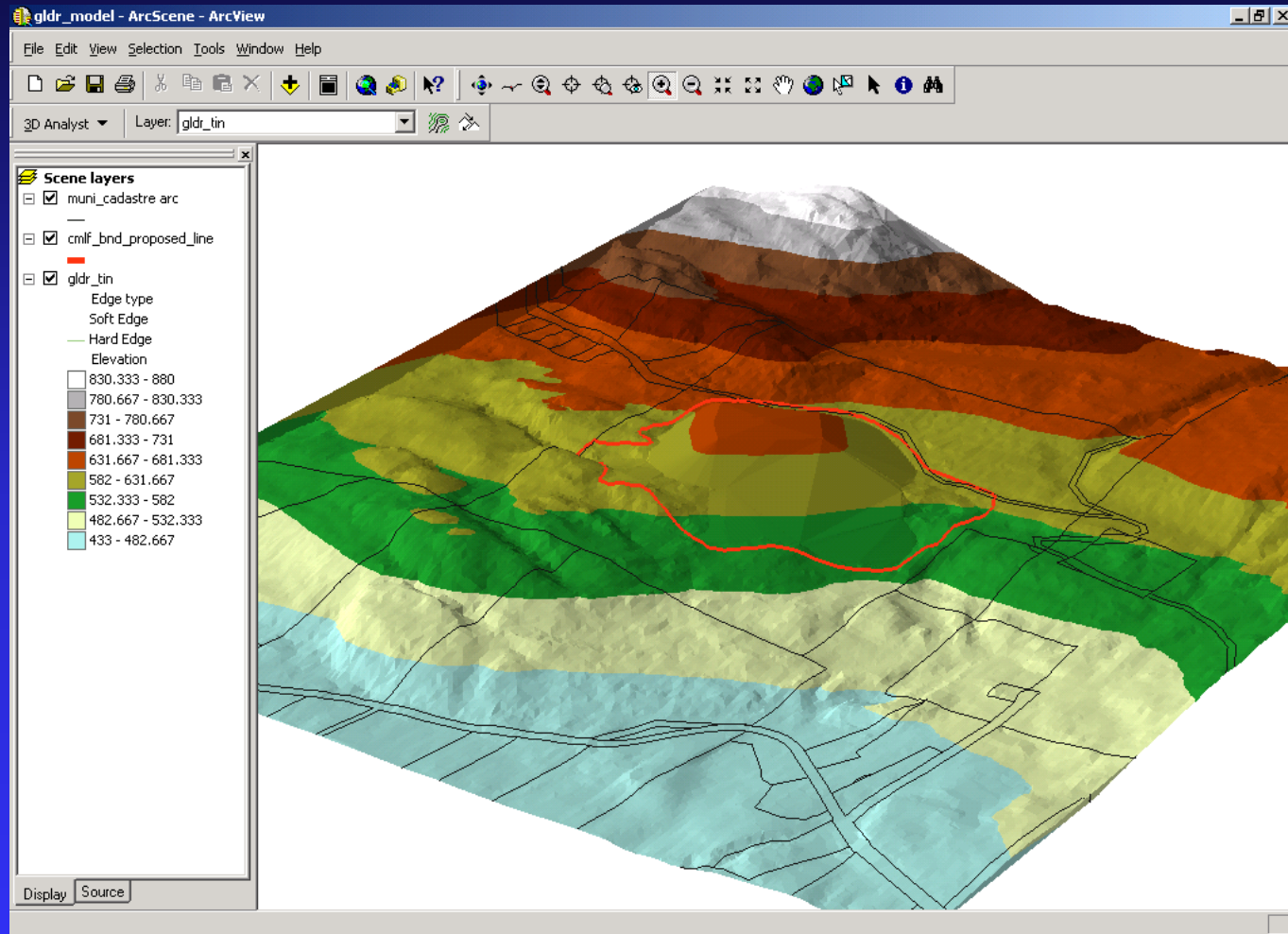
Landfill Analysis

Model in shape file format



Landfill Analysis

Model in ArcScene



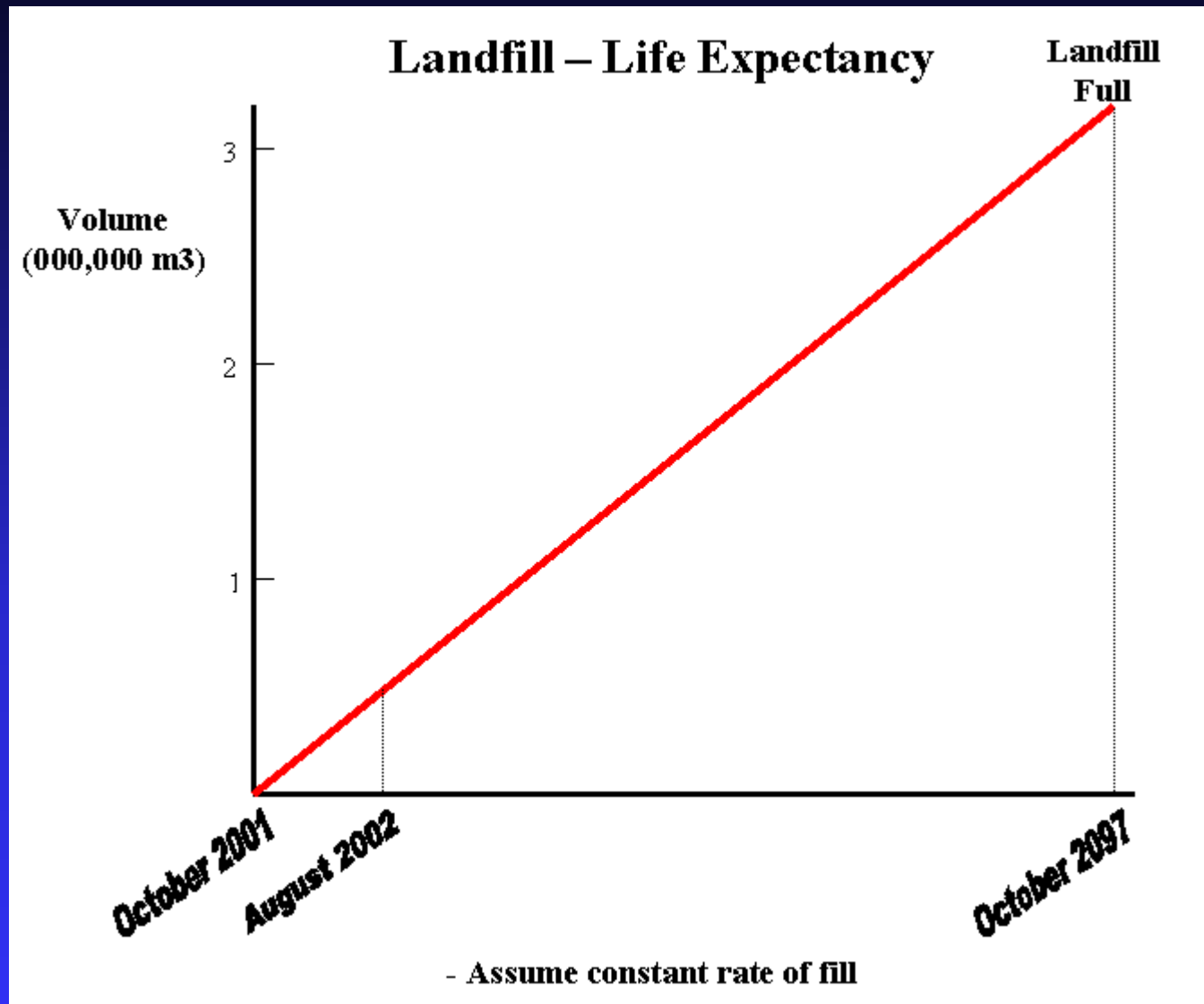
Landfill Analysis

Volume Calculations - Landfill Life Expectancy

Year	Change in Volume (m3)
October 9/2001	0
August 21/2002	28,452
Model – Maximum size of landfill	3,159,906

- Change in volume in one year
 - $28,452 \times 365 / 316 = 32,864 \text{ m}^3$
- Life expectancy of landfill
 - $3,159,906 / 32,864 = 96 \text{ years}$

Landfill Analysis



Landfill Analysis

■ Future Work

- ◆ Model population growth/recycling
- ◆ 3 year contract for high resolution ortho's and DEM's

Landfill Analysis

- What we have learned
 - ◆ A lot of speculation – important to make better, more informed decisions
 - ◆ Relatively low cost
 - ◆ Good WOW effect

- End of presentation
- Questions & Answers

