



Building a County Wide Sanitation GIS

By
Tim Gahagan
Sonoma County Water Agency
GIS tech II

Presentation Overview



- **History of agency's sanitation atlas**
- **Options for converting CAD features to GIS**
- **Options for populating attribute information**
- **Benefits of GIS mapping for sanitation districts**

Overview of County System



The Sonoma County Water Agency is responsible for 8 different sanitation zones or districts county wide serving:

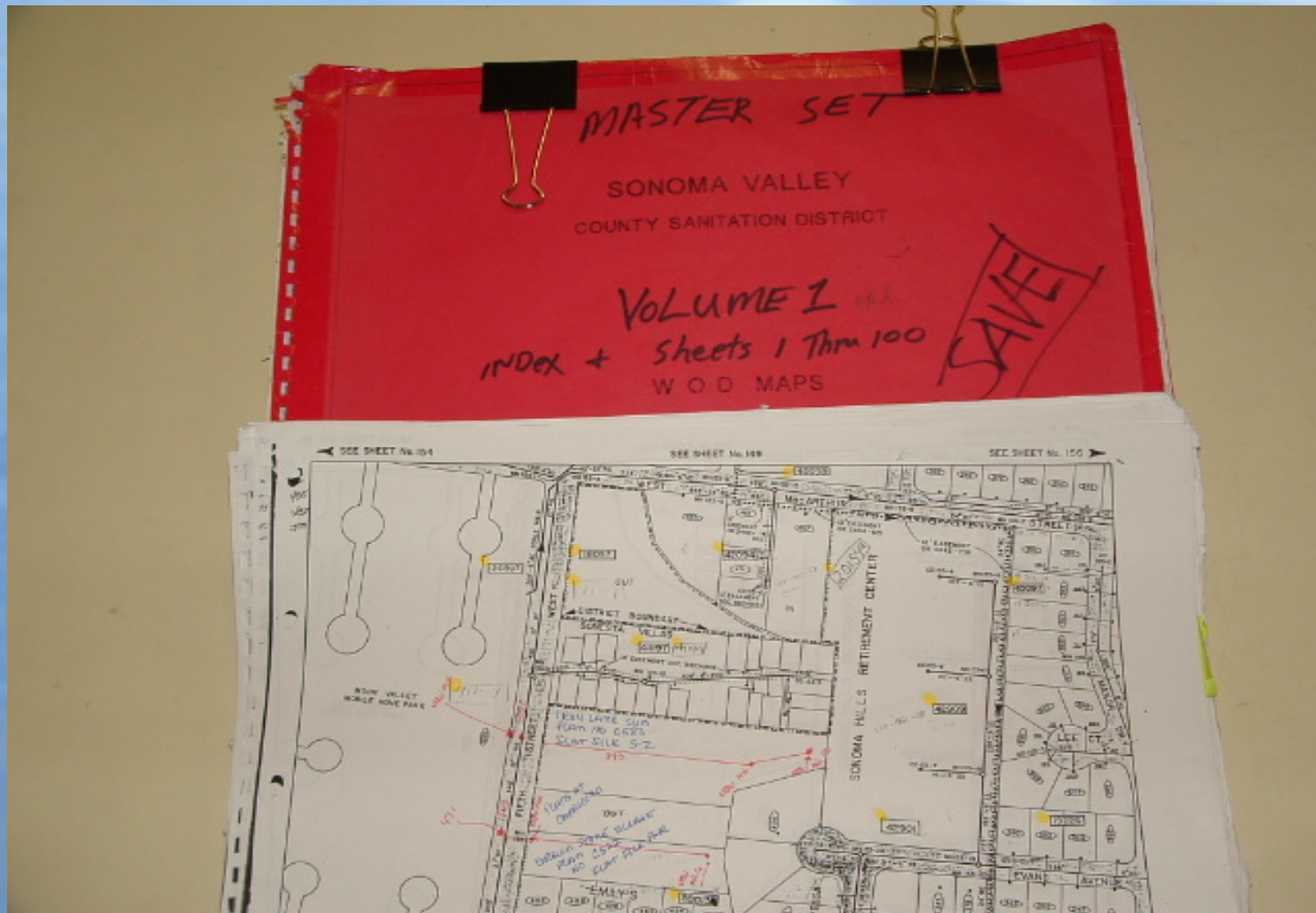
- **33,000 ESD's (equivalent single family dwelling)**
- **20,000 parcels**
- **250 miles of pipe**
- **6,000 manholes and cleanouts**

Pre GIS Atlas Mapping

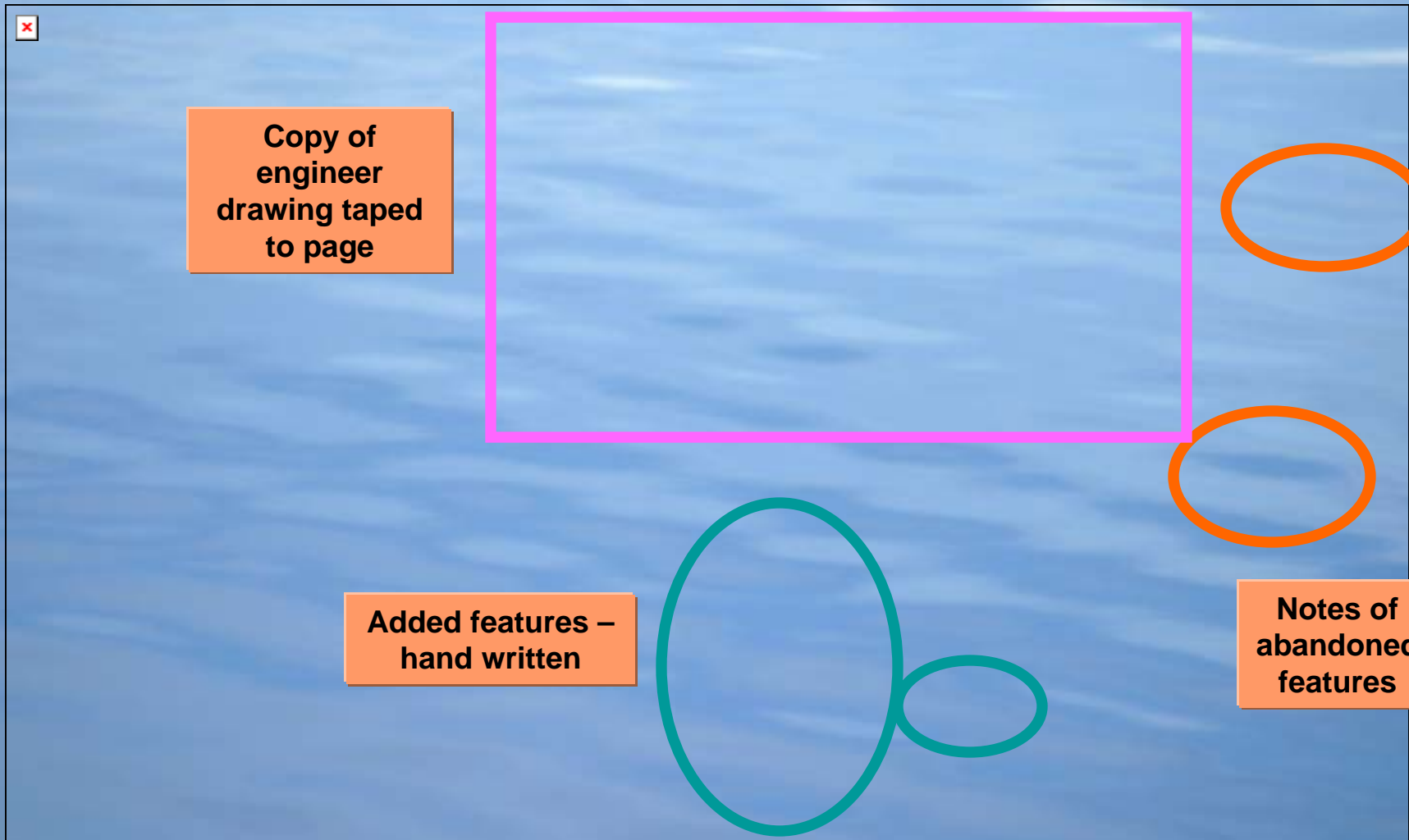


- **Hand drafted books - costly & poorly maintained, several "Master" copies**
- **Parcel base very difficult to manage**
- **Unable to view historic data**

Old Sanitation Map Book



Page Example from Old Sanitation Atlas Book with field notes



Conversion to GIS



Where to Start?

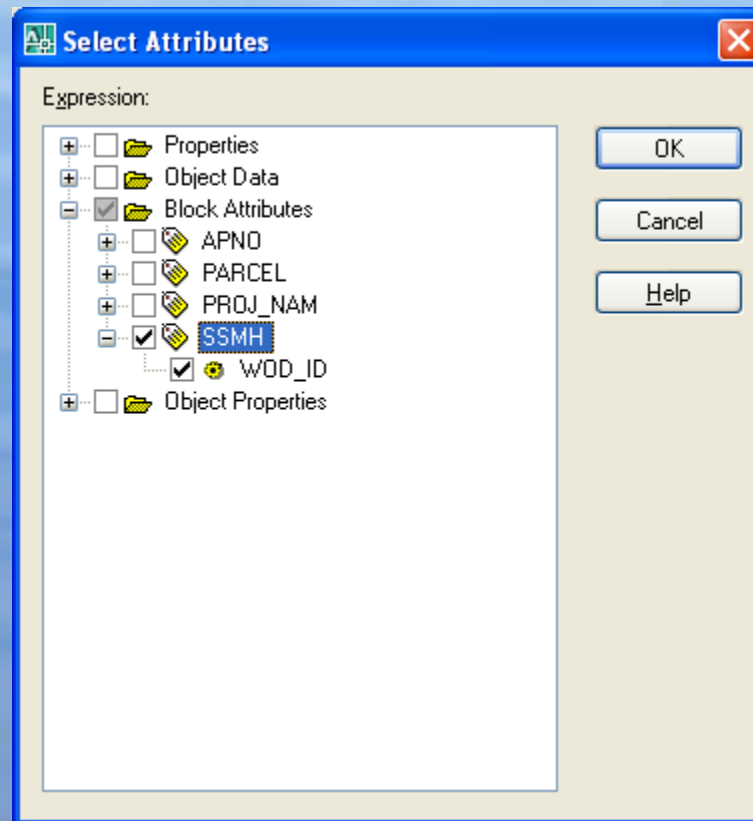
- **Presence of Block Attributes**
 - Export from CAD
- **Staging using Toolbox Conversion Tools**
 - Use Import CAD Annotation into FGD
- **Select CAD features by attributes**
 - Layer, Color, etc.

Export from CAD to Shapefile



Exporting Block Attributes from CAD

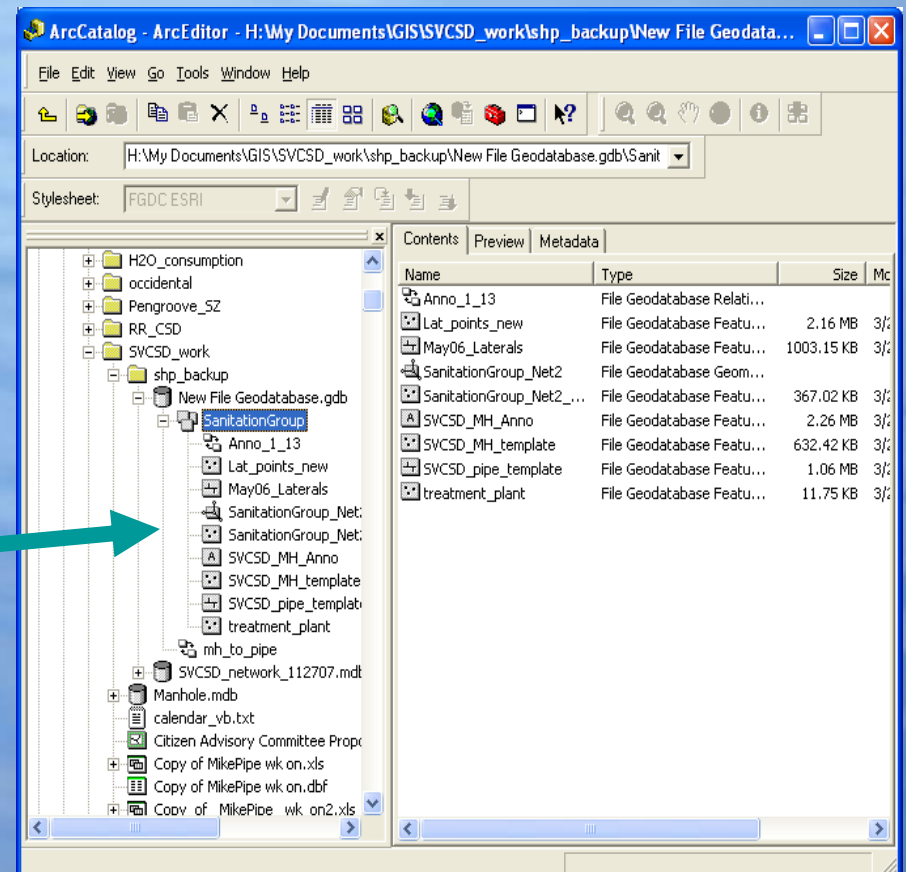
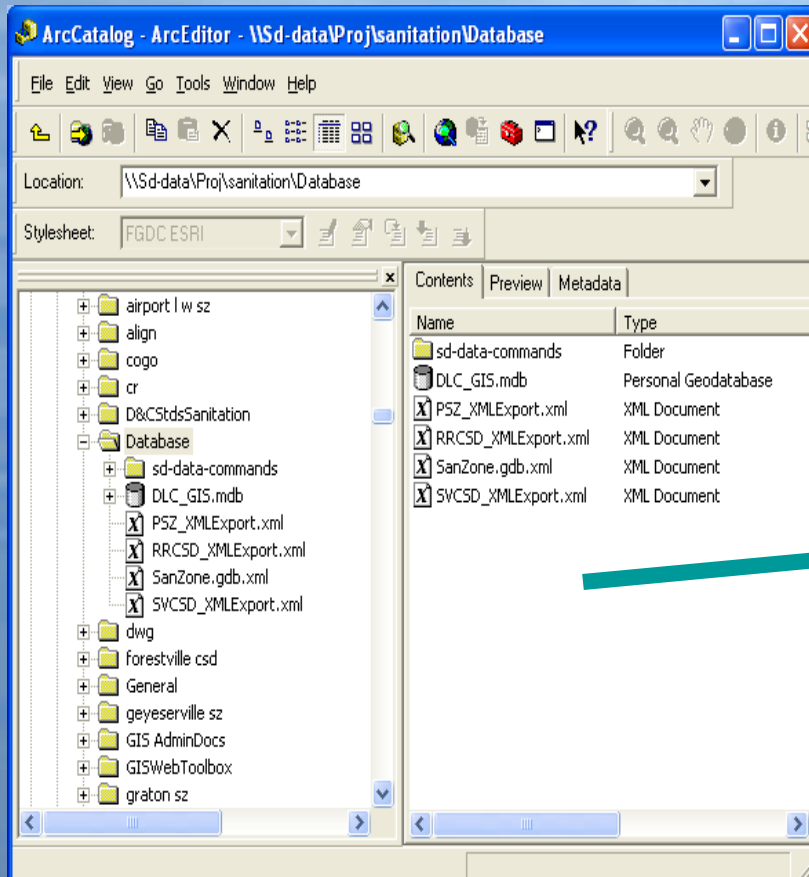
Map > Tools > Export > Data tab



Creation of File Geo Database



Import Existing Sanitation Schema



Once Shapefile/Feature Class is Available



Options for importing into Database Schema

- Data loader (simple feature class)
- Copy and paste (non simple feature class)

***Use join table to bring over other MH info stored in a dbf table**

Store Other Attributes in Excel Table for Importing



Microsoft Excel - WOD

File Edit View Insert Format Tools Data Window Help Adobe PDF

Type a question for help

SnagIt Window

	A	B	C	D	E	F	G	H	I	J	K	L	M
	WOD_ID	DOC_NO	DOC_ID	INV_IN_1	INV_IN_2	INV_IN_3	INV_SUMP	INV_OUT	RIM_ELEV	IN_STREET	DATE	STR_NAME	MH_ID
2	MH 10-1	40392	A-1	192.88	192.5		192.4			NO	04/06/81		
3	MH 10-2	40392	A-2		198.16		193.08			NO	04/06/81		DROF
4	MH 10-3	40392	A-3				194.14			NO	04/06/81		
5	MH 10-4	40392	A-4				195.17			NO	04/06/81		
6	MH 11-2	40392	A-5				196.35			NO	04/06/81		
7	MH 11-1	40393	B-1	200.25			200.15			YES	04/06/81	MAIN STREET	
8	MH 8-13	40394	C-1	193.27			193.17			NO	04/06/81		
9	MH 8-14	40394	C-10				196.72			YES	04/06/81	RIVER STREET	
10	MH 8-15	40404	C-11A		198.49		193			YES	04/06/81	RIVER STREET	
11	MH 7-2	40404	C-13				199.84			YES	04/06/81	RIVER STREET	
12	MH 7-1	40404	C-14	201.38			201.28			YES	04/06/81	RIVER STREET	
13	MH 8-12	40394	C-2	193.58			193.44			NO	04/06/81		
14	MH 8-11	40394	C-3		199.2	197	194.1			NO	04/06/81		DROF
15	MH 8-10	40394	C-4		199.61		194.58			NO	04/06/81		DROF
16	MH 8-9	40394	C-5		201.5		195.13			NO	04/06/81		DROF
17	MH 8-8	40394	C-6		201.75		195.39			NO	04/06/81		DROF
18	MH 8-7	40394	C-7		202.89		195.73			YES	04/06/81	DEPOT STREET	DROF
19	MH 8-6	40394	C-8	196	195.85		195.9			NO	04/06/81		
20	MH 8-5	40394	C-8A							YES/NO	04/06/81	RAILROAD AVENUE	
21	MH 8-4	40394	C-9	196.59	197.5		196.52			YES	04/06/81	RAILROAD AVENUE	
22	CO 11-2	40392	CO-A				197.4			NO	04/06/81		
23	CO 11-1	40393	CO-B				200.9			YES	04/06/81	MAIN STREET	
24	CO 7-1	40404	CO-C				201.56			YES	04/06/81	RIVER STREET	
25	CO 9-8	40393	CO-D				201.51			YES	04/06/81	MAIN STREET	
26	CO 9-7	40393	CO-E				201.5			YES	04/06/81	BOSCH	
27	CO 9-6	40393	CO-F				216.5			YES	04/06/81	MAIN STREET	
28	CO 9-9	40395	CO-G				201.66			NO	04/06/81		
29	CO 4-1	40398	CO-H				237.95			YES	04/06/81	MAIN STREET	
30	CO 9-1	40395	CO-I				209			NO	04/06/81		
31	CO 9-4	40395	CO-J				233.8			NO	04/06/81		
32	CO 6-5	40397	CO-K				245.3			YES	04/06/81	FELDMEYER AVENUE	
33	CO 6-4	40396	CO-M				226.72			YES	04/06/81	MAIN STREET	
34	CO 9-2	40396	CO-L				220.88			YES	04/06/81	MAIN STREET	

Sheet1

Ready NUM

More Tools for Building the GIS



ArcScripts downloads - ESRI Support - Windows Internet Explorer

http://arcscrip.../scripts.asp?eLang=&eProd=&perPage=10&eQuery=teamwat

ESRI Support Center Your online technical resource

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- Add software versions to the search string
- Add the author's name to the search string
- Consult our [search help](#)

Scripts for: All languages AND All ESRI software AND teamwater

scripts 1-10 of 16

Resort by	Title	Software	Language	Author	Modified	Downloads
	Add Points At Crossings	ArcGIS Desktop	Visual Basic	Michele Lundeen	Feb 27 2006	5931
	Auto Add Lines	ArcGIS Desktop	Visual Basic	Michele Lundeen	Jul 19 2005	4175
	Auto Sewer Laterals	ArcGIS Desktop	Visual Basic	Michele Lundeen	Aug 22 2007	2038
	Calculate Accumulation	ArcGIS - ArcEditor	Visual Basic	Michele Lundeen	Mar 7 2006	1062
	Custom Valve Isolation	ArcGIS Desktop	Visual Basic	Michele Lundeen	Jan 3 2008	2016
	Export to Excel	ArcGIS Desktop	Visual Basic	Michele Lundeen	Jul 19 2005	4819
	Flip Lines	ArcGIS Desktop	Visual Basic	Michele Lundeen	Jul 19 2005	2684
	Generate Manhole Ids	ArcGIS Desktop	Visual Basic	Michele Lundeen	Jul 19 2005	1345
	Get Polygon Info	ArcGIS Desktop	Visual Basic	Michele Lundeen	Jul 19 2005	1921
	Polygon Width	ArcGIS Desktop	Visual Basic	Michele Lundeen	Sep 11 2005	857

[next](#)

ESRI Teamwater Scripts



Examples of custom scripts available to assist in building a pipe network....

- **Transfer Invert Elevations from Manholes to Mains**
- **Generate Manhole ID's**
- **Calculate Accumulation**
- **Auto Sewer Laterals**

ESRI Knowledge base - ArcScripts search "Teamwater"

Once Data is Stored in GIS...

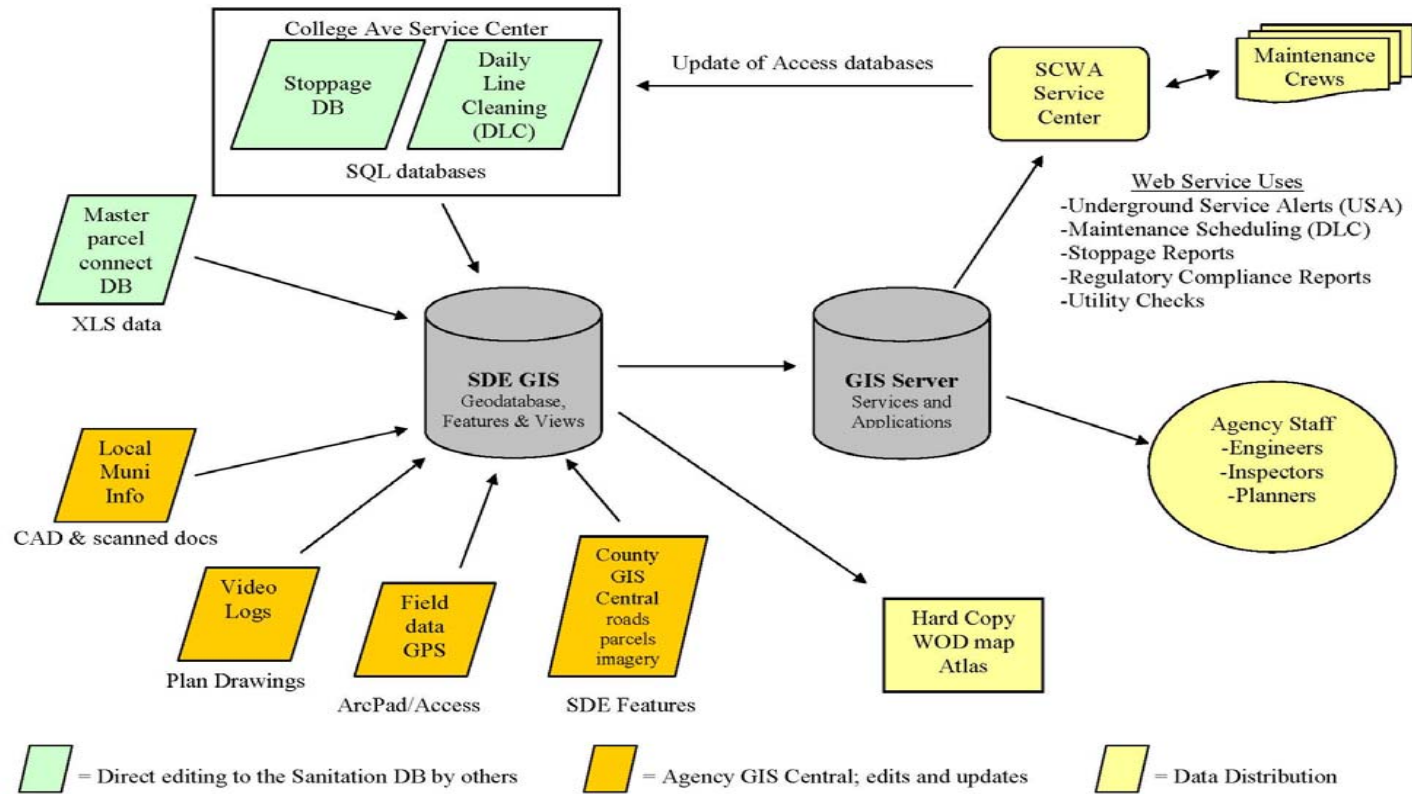


- **Link to base map information maintained by other departments**
 - Parcel and Address data
 - Road Centerlines
 - Right-of-Way, easements
- **Easily distribute updated maps**
 - Hard copy atlas
 - Intra-net service
- **Link to O & M line cleaning and stoppage reports**
- **System stored in SDE Geodatabase available for analysis**

Organizational Chart for SCWA Sanitation GIS Development

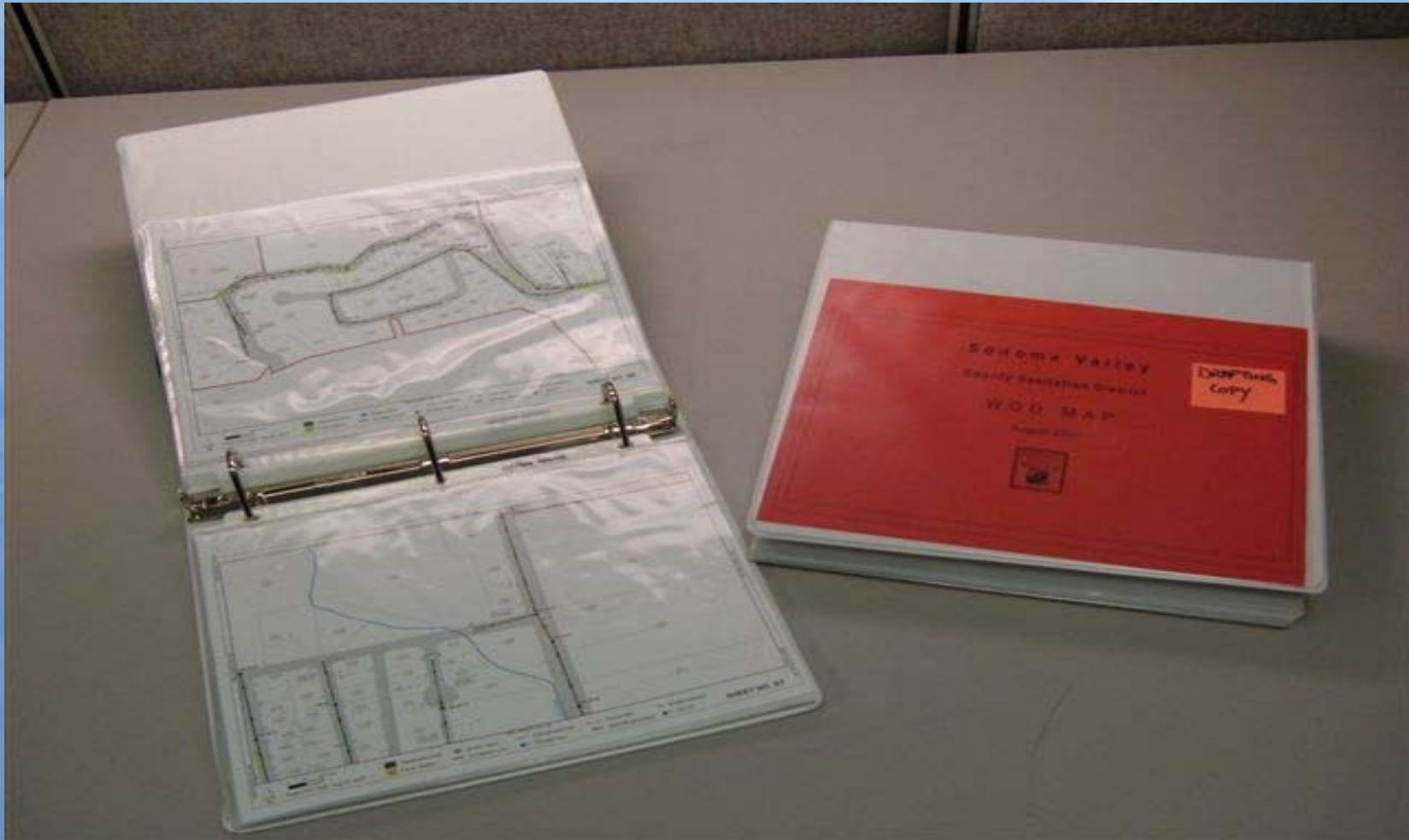


Sonoma County Water Agency (SCWA) – Sanitation GIS Update and Data Distribution Flowchart

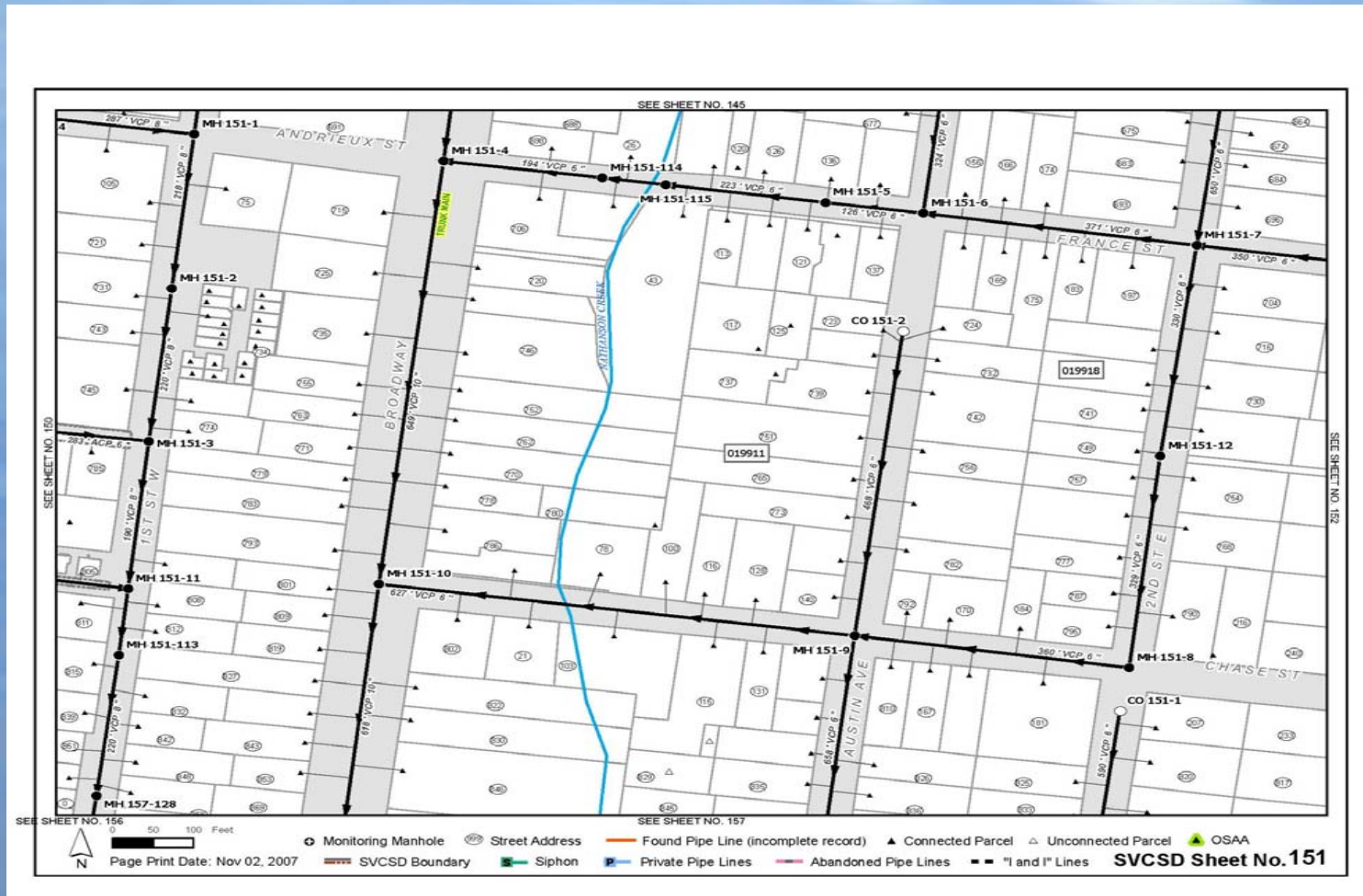


\\sd-data\proj\sanitation\GIS AdminDocs\Sanitation GIS Flow Chart.doc

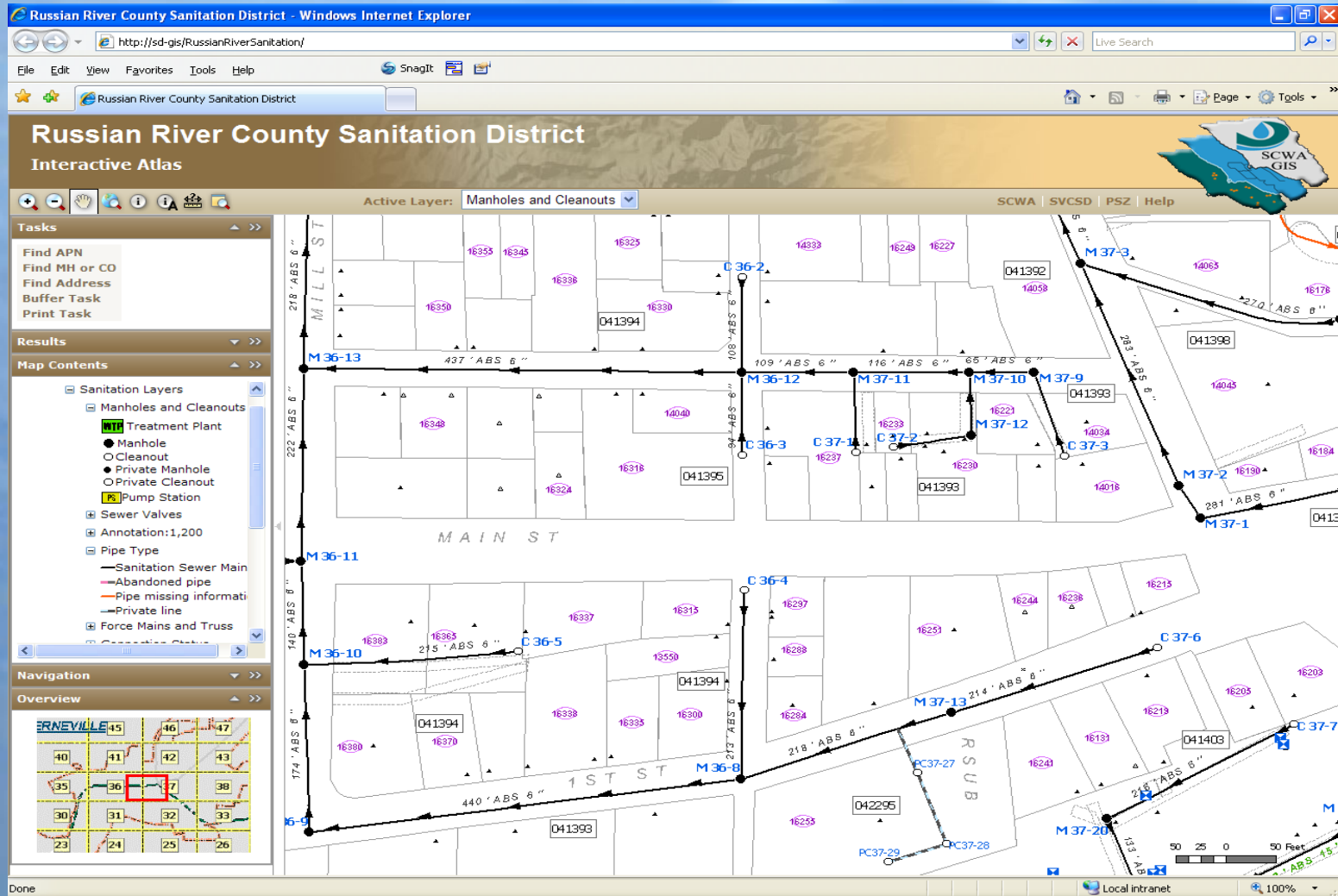
New Hard Copy Atlas for Each District



Page Example From New Sanitation Atlas Book



Water Agency Intra-net Web Application for Sanitation



Analysis on Web Applications



Sonoma Valley County Sanitation District - Windows Internet Explorer

http://sd-gis/SonomaValleySanitation/default.aspx

Sonoma Valley County Sanitation District

Sonoma Valley County Sanitation District Interactive Atlas

SCWA | RRCSO | PSZ | Help

Active Layer: Manholes, Cleanouts

Tasks: Find MH or CO, Find APN, Find Address, Buffer Results, Print, Export

Buffer Task

Select Clear

Buffer features in (Source Layer):
Manholes, Cleanouts

Select features in (Target Layer):
Parcel

Buffer Distance:
200 Feet

Execute Buffer

OBJECTID	APN	ASSR_SUF	LANDUSE1	CURRENTOWNER	NERN
58407	127-091-041	041	0010	HARRINGTON TIMOTHY J & JOA	
58408	127-091-042	042	0010	PENSABENE RICH TR	
58409	127-091-044	044	0010	GROTZ JOHN M JR & VIRGINIA I TR	18857
58410	127-091-045	045	0022	MARTIN BENNETT TR & SHEILA TR	18837
58411	127-091-009	009	0010	FERANDELL JAMES & MICHELE	18815
58758	127-440-009	009	0010	VALLERGA LAWRENCE V & VALLERGA FROSSANNA	781
58759	127-440-010	010	0010	DIVITA ANDREW J & STEPHANIE G	18796
58760	127-440-014	014	0010	FORD ROBERT M TR & FORD DARLENE C TR	18799
58761	127-440-020	020	0010	SIMMONS BARBARA J	775
58767	127-440-026	026	0010	EHRESMANN EILEEN A TR	179E1 756

Map showing parcel boundaries, manholes (MH 99-13, MH 99-4, MH 105-7, MH 105-8), and cleanouts (CO 99-3, CO 105-4). A 200-foot buffer is applied to the manholes, shown as a green shaded area.

Scale: 50 25 0 50 Feet

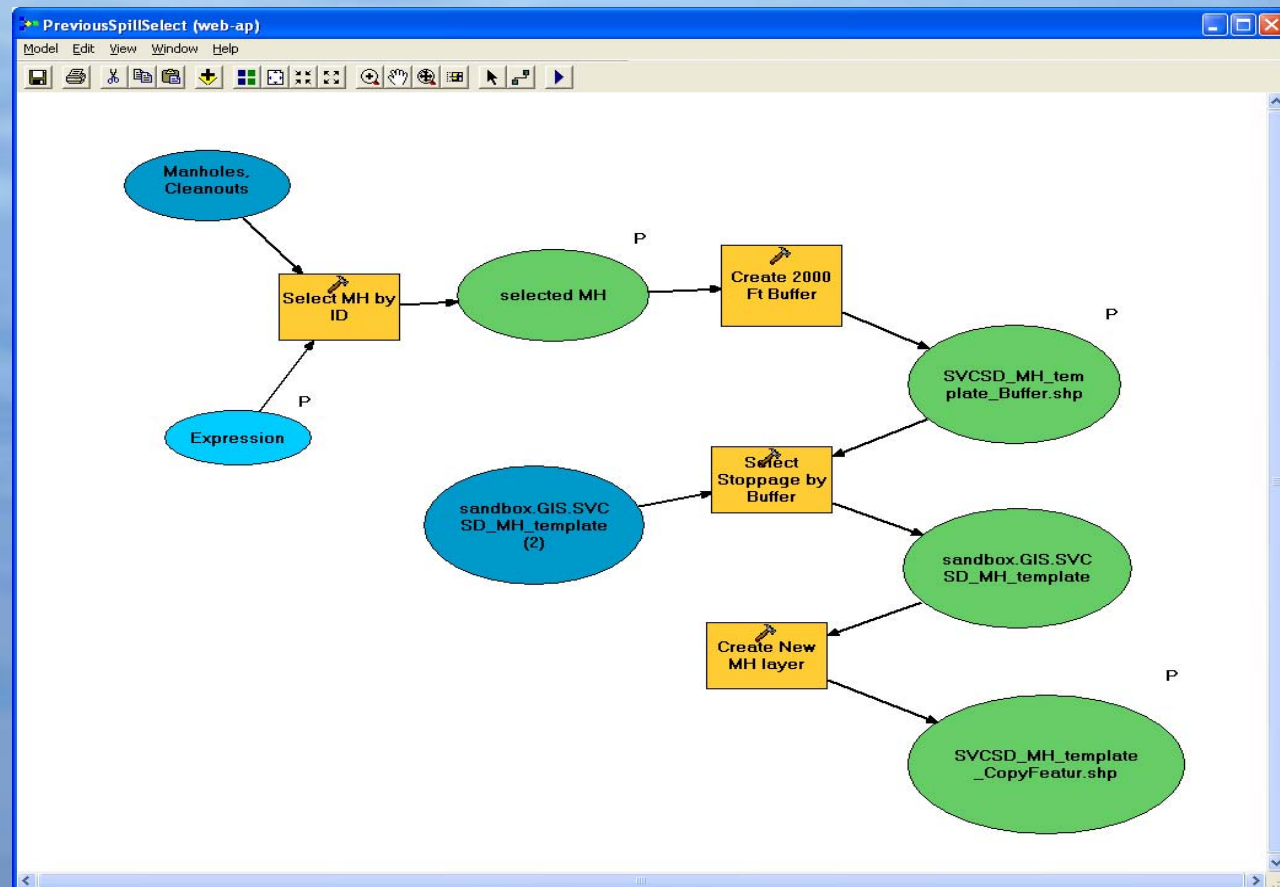
Local intranet 100%

Map and Analysis of Historical Data

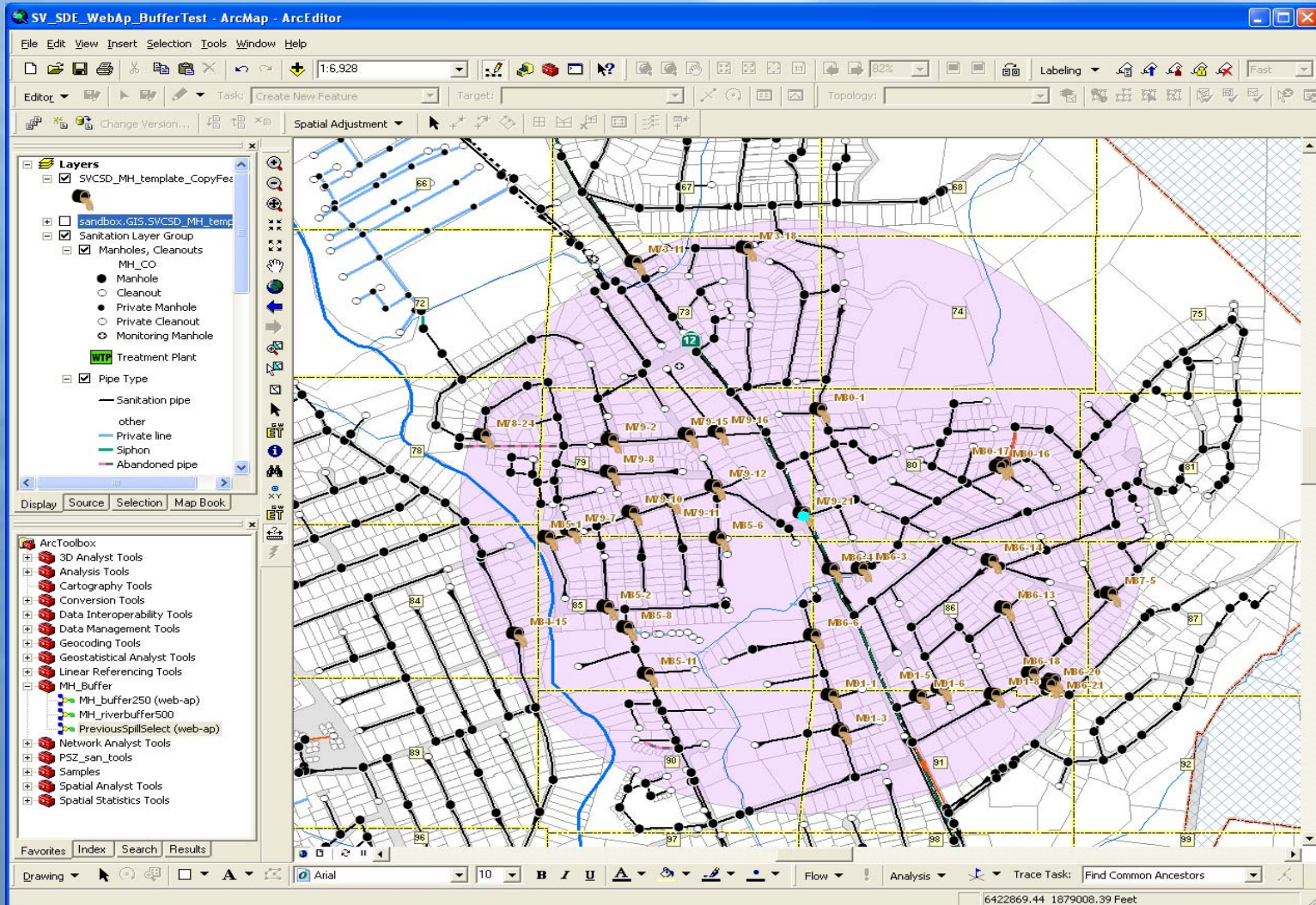


Incorporate Custom Models

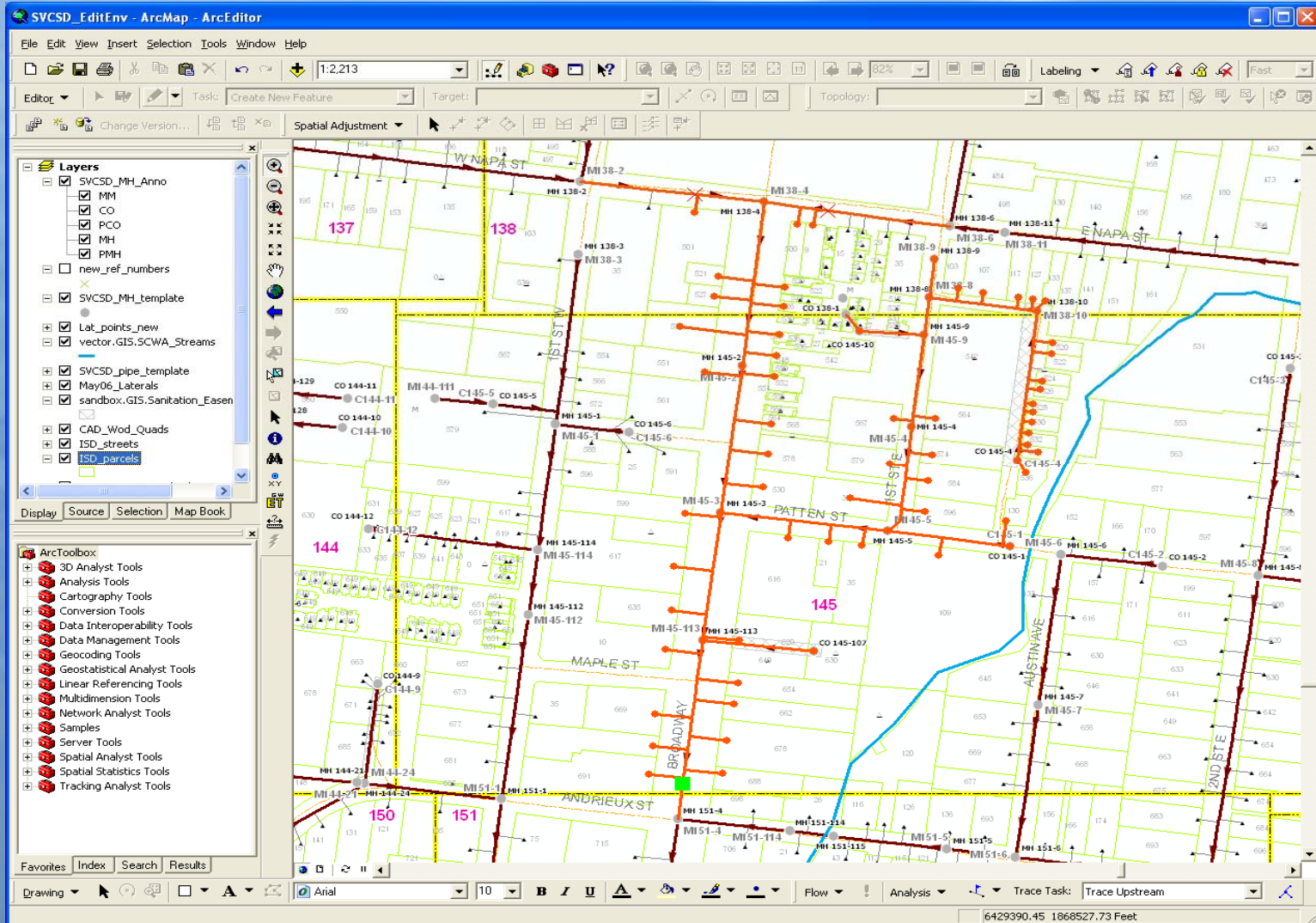
Search past overflows within 2,000 ft of current spill



Running Custom Tools from Desktop or Web Application



Network Tracing on Desktop



Future Enhancements to GIS



- **Addition of Storm Drain layer when available**
- **Addition of DEM for more precise spillage analysis**
- **Interface with Maximo and maintenance scheduling**

Conclusion



- **Several options to converting CAD features to GIS**
 - Which is best for you?
- **Options getting attributes into GIS**
 - Some manual entry might still be required
- **Benefits to mapping in GIS**
 - Custom Desktop and Web analysis



End of show!

Thank you for your interest!

Questions?

Please contact *Tim Gahagan* at the
Sonoma County Water Agency

tgahagan@scwa.ca.gov