PG&E Class Location Determination Process

Performed by Willbros

1.0 PURPOSE

The purpose of this report is to describe in detail the setup and process used to determine class locations for PG&E's transmission pipeline system.

2.0 INTRODUCTION

Each operator is required to maintain accurate class locations on their pipeline system. The determination of this class location can be performed using many different methods, but each result must be repeatable and conform to the federal code outlining class.

3.0 SOURCE MATERIAL

On Feb. 11th 2011 Willbros Engineers was in Walnut Creek CA for a review of the Class Location Pilot work for Santa Clara County. At the conclusion of the review the following data was provided to Willbros on an external hard drive to perform the remainder of the work.

3.1 **PipelineCLSFeb11.shp** - polyline shapefile containing the transmission pipelines and attribute data for all 40 counties in PG&E's system

3.2 **ActiveCareFac.shp** – point shapefile containing all registered care facilities in the state of California

3.3 **Parcel Data** –40 geodatabases (one per county) containing all the parcels and attribute information in that county

3.4 **2009 National Agricultural Imagery Program (NAIP)** data was provided for the 40 counties used as the base photography.

Once in Kansas City this data was placed on the production server in the PGE project folder:

P:\Projects\PG&E\51877 PG&E CLASS LOCATION ANALYSIS\WK WORKING FILES\Source_Data

4.0 SET-UP

The following steps were performed to prepare the source data to be used for the remainder of the project.

4.1 An SDE database was created on KCEGISDEV01. This database will be used to host all project data. Inside the SDE database seven Feature Datasets were created"

- **CARE_FACILITY** - SDE Feature Dataset – contains all the care facility feature classes by county
- **CLASS_CALC** - SDE Feature Dataset – contains the results from the PG&E's CLASSLOCATIONCALCULATOR tool for all 40 counties

Fields Class_Calc feature dataset

- **CLASS_PROPOSED** - SDE Feature Dataset - contains Willbros proposed class results for all 40 counties. This contains the same fields as Class_Calc

- **CLASS_FINAL** - SDE Feature Dataset - contains the final PG&E approved class results for all 40 counties

Details for PGE.PGE.SAN_JOAQUIN__FINAL_CLASS

Type of object: Feature Class

Number of records: 0

Attributes

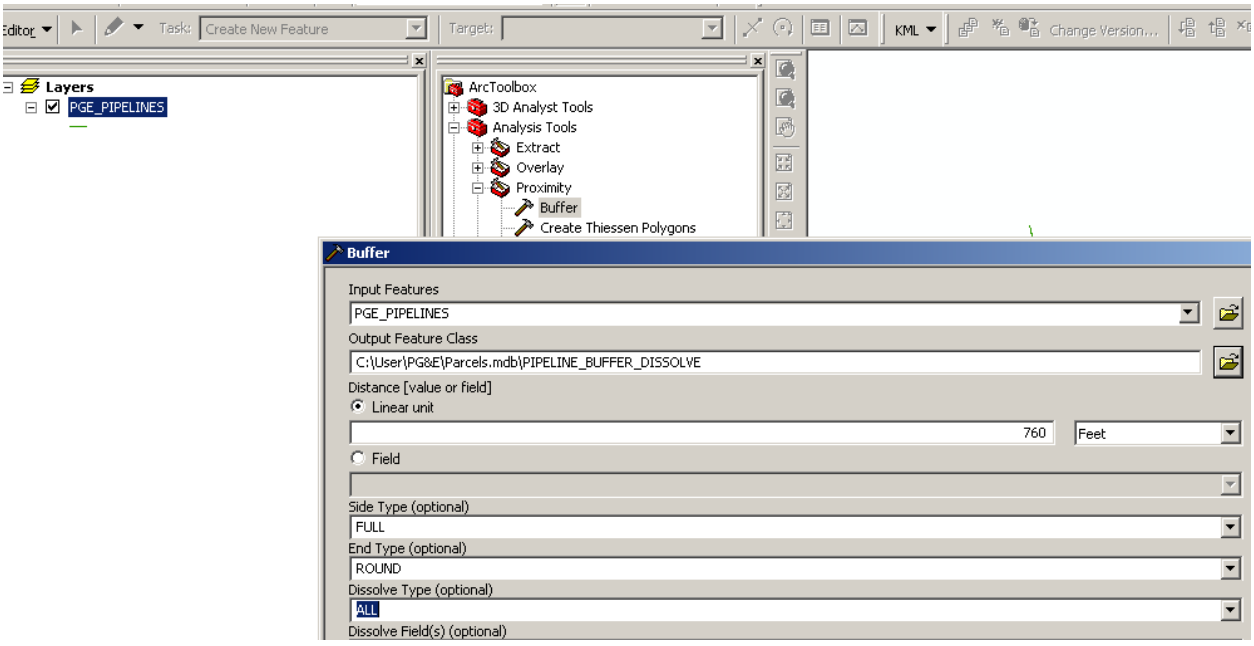
OBJECTID_1	TEST_JOB
MaintOrg	TEST_DATE
Route	TEST_PRESS
Segment_no	TEST_EDIUM
ClassPres	TEST_DUR
ClassCalc	trans_def
ClassProp	HCA_ID
FINALCLASS	gasmapid
ClassChng	Sheet_Name
PROP_COMM	Route_Join
cfootage	DateCreate
MP1	JNTEFF
MP2	TEST_REC
SmysMop	JOB_NO
MOP	ofootage
SMYS_MAOP	UPGRADEJOB
MAOP	Shape_Le_1
OD	Notes
W_THICK	FOOTAGE
GRADE	OBJECTID
SMYS	oshapelen
YR_INSTALL	Shape_Leng
GIRTH_WELD	Shape
LONG_SEAM	SMYS_ALLOW
JOINT_TYPE	Shape.len

- **PARCELS** - SDE Feature Dataset - contains the buffered parcel data sets for all 40 counties
- **BUFFERS** - SDE Feature Dataset – contains the four different pipeline buffers used for this project
- **PROXIMITY_MAINLINES** - SDE Feature Dataset – contains all the proximity circles per county used during the manual “walking” the pipeline looking for class breaks and cluster areas.
- **PROXIMITY_STUBS** - SDE Feature Dataset – used to store the proximity circles used in creating the STUB maps.
- **MAPBOOK_MAINLINES** - SDE Feature Dataset – used to store the ESRI map book sheet windows for the mainline maps with attributes.
- **MAPBOOKS_STUBS** - SDE Feature Dataset – used to store the ESRI map book sheet windows for the stub maps with attributes.
-

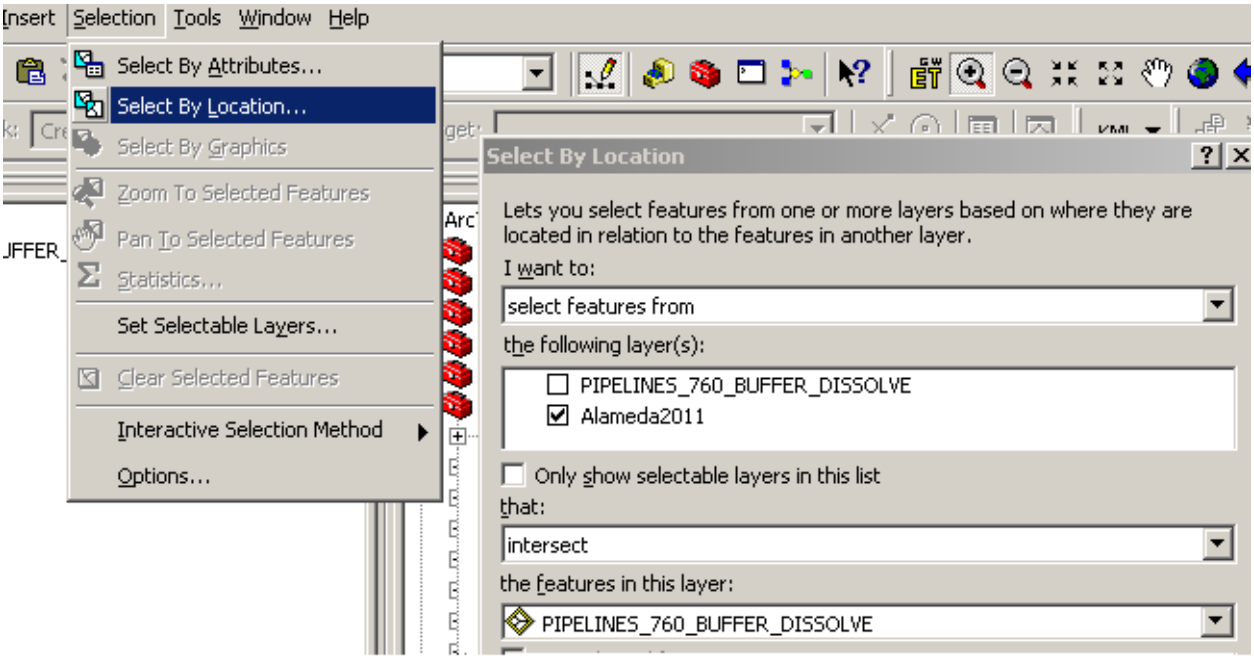
- ***Note: CLASS PRESENT/CURRENT was pulled from the original* PipelineCLSFeb11.shp. *CLASS PRESENT/CURRENT is what all class changes are compared against.***

4.2 **PipelineCLSFeb11.shp** was exported out as an SDE feature class called **PGE_PIPELINES.** This layer will be stored in the root directory of the SDE database.

4.3 Created a 760' buffer around **PGE_PIPELINES** created in step 4.2 using ARC Toolbox Buffer Tool. Output is named **PIPELINES_760_BUFFER_DISSOLVE** stored in a local geodatabase.



4.4 Selected all parcels which intersected the 760' buffer using the **Select By Location** tool in ArcGIS.



- The selected parcels were exported to an SDE feature class, stored in the PARCELS - SDE Feature Dataset. The output feature class was named **"County Name"_PARCELS**. This step was repeated for all 40 counties.

4.5 Two new data fields were added in **"County Name"_PARCELS**

- **SYMBOLOGY** – will be used later for displaying parcels in ARC Map
- **RECEIVED_DATE** – used to document the date Willbros received the data from PG&E.
- It was determined during the Pilot project that only certain data fields within the parcel dataset were of use; the un-used fields were deleted from the dataset to help manage the data more efficiently.

4.6 Four buffers were created from the **PGE_PIPELINES** feature class; the outputs were stored in the BUFFERS - SDE Feature Dataset. The buffers were created at 315', 400', 675' and 760' dissolving the buffer based on the Route field in the **PGE_PIPELINES** feature class.

- **PIPELINE_315_BUFFER**
- **PIPELINE_400_BUFFER**
- **PIPELINE_675_BUFFER**
- **PIPELINE_760_BUFFER**

4.7 Created a Care Facility dataset for all 40 counties.

4.7.1 The **ActiveCareFac.shp** was intersected with "County Name"_PARCELS datasets created in sect. 4.4 using the Select By Location tool. The selected data was exported to an SDE Feature Class in the **CARE_FACILITY** - SDE Feature Dataset with an output name: "County Name"_CARE_FACILITY.

4.7.2 The parcel data was then intersected with the newly created care facility data. Once selected, Field Calculate the CLS_CAREFAC fields to = YES

- Note: Five counties did not contain any Care Facilities.

4.8 Create a measured route to run Willbros' Sliding Mile tool

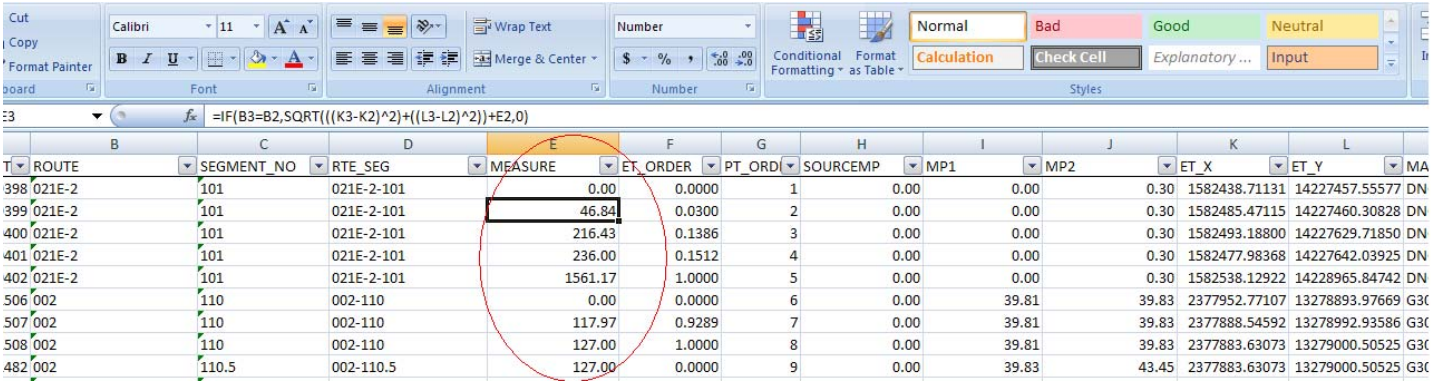
4.8.1 Use ET GeoWizards to create a point dataset out from the PGE_PIPELINES feature class using the Polyline to Point tool.

4.8.2 Open the newly created point dataset in excel and order the points by Route – Segment – MP1- ET Order fields.

4.8.2.1 Add a PT_ORDER Field, calculate all the points 1 - XXXXXX

4.8.2.2 Add a MEASURE Field

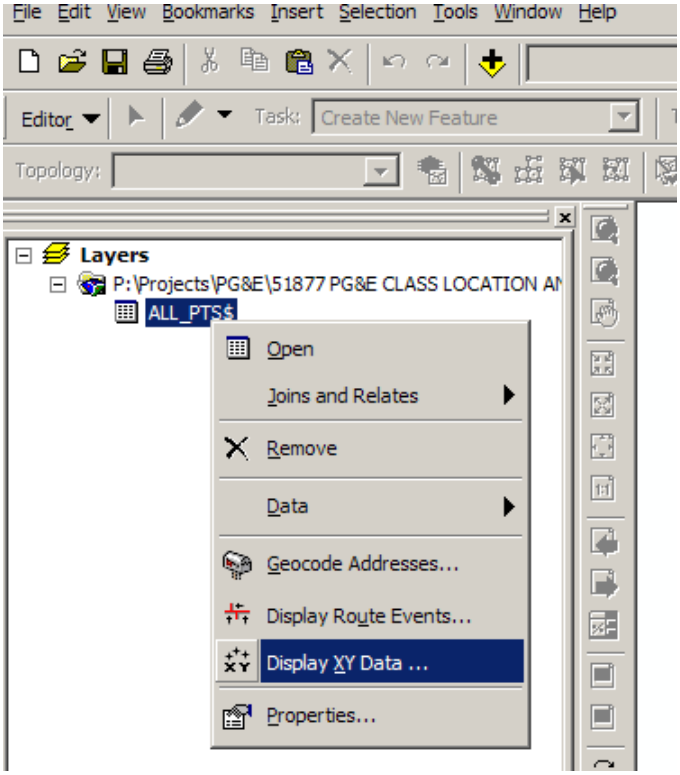
4.8.3 Assign a station/measure to each point based on the XY value using the formula: SQRT((X1-X2)^2)+((Y1-Y2)^2)) + previous station/measure.



=IF(B3=B2,SQRT(((K3-K2)^2)+((L3-L2)^2))+E2,0)

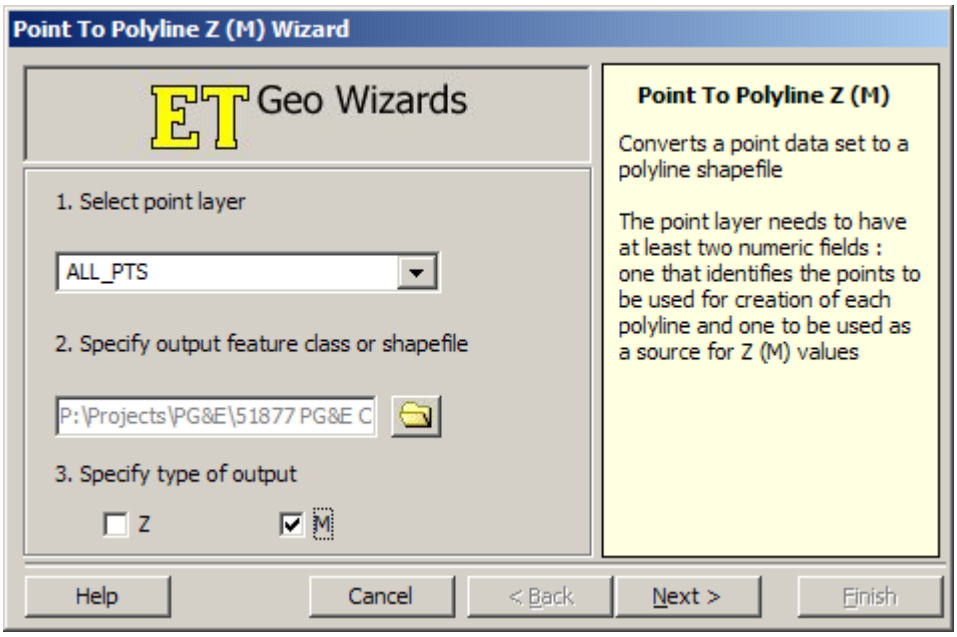
	B	C	D	E	F	G	H	I	J	K	L	
T	ROUTE	SEGMENT_NO	RTE_SEG	MEASURE	ET_ORDER	PT_ORD	SOURCEMP	MP1	MP2	ET_X	ET_Y	MA
398	021E-2	101	021E-2-101	0.00	0.0000	1	0.00	0.00	0.30	1582438.71131	14227457.55577	DN
399	021E-2	101	021E-2-101	46.84	0.0300	2	0.00	0.00	0.30	1582485.47115	14227460.30828	DN
400	021E-2	101	021E-2-101	216.43	0.1386	3	0.00	0.00	0.30	1582493.18800	14227629.71850	DN
401	021E-2	101	021E-2-101	236.00	0.1512	4	0.00	0.00	0.30	1582477.98368	14227642.03925	DN
402	021E-2	101	021E-2-101	1561.17	1.0000	5	0.00	0.00	0.30	1582538.12922	14228965.84742	DN
506	002	110	002-110	0.00	0.0000	6	0.00	39.81	39.83	2377952.77107	13278893.97669	G3
507	002	110	002-110	117.97	0.9289	7	0.00	39.81	39.83	2377888.54592	13278992.93586	G3
508	002	110	002-110	127.00	1.0000	8	0.00	39.81	39.83	2377883.63073	13279000.50525	G3
482	002	110.5	002-110.5	127.00	0.0000	9	0.00	39.83	43.45	2377883.63073	13279000.50525	G3

4.8.4 Add the point data into Arc and Display points based on XY Cordinates

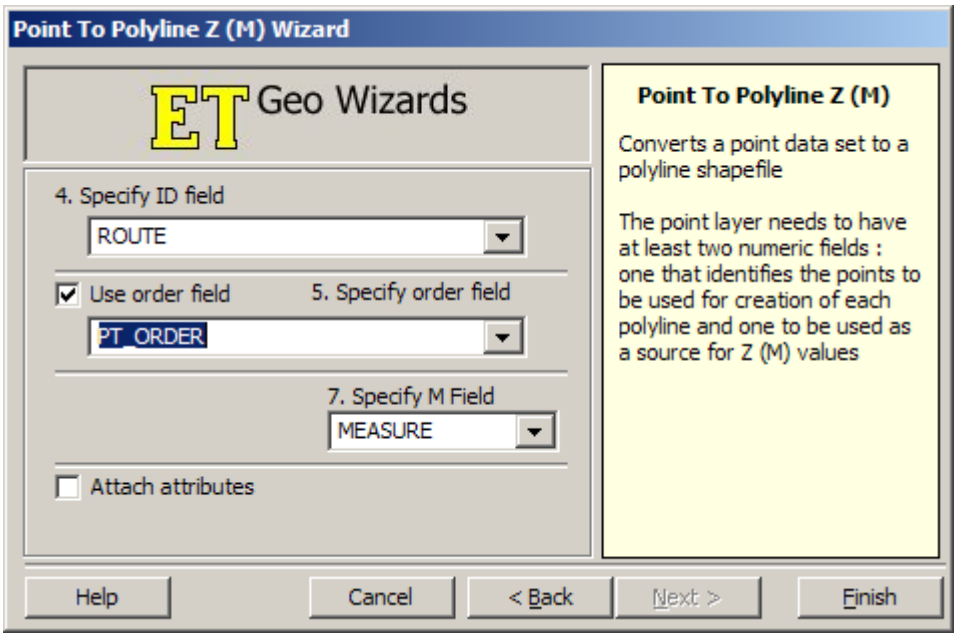


4.8.5 Using ET GeoWizards, create a new measured route using the Point to Polyline Z (M) tool.

GO

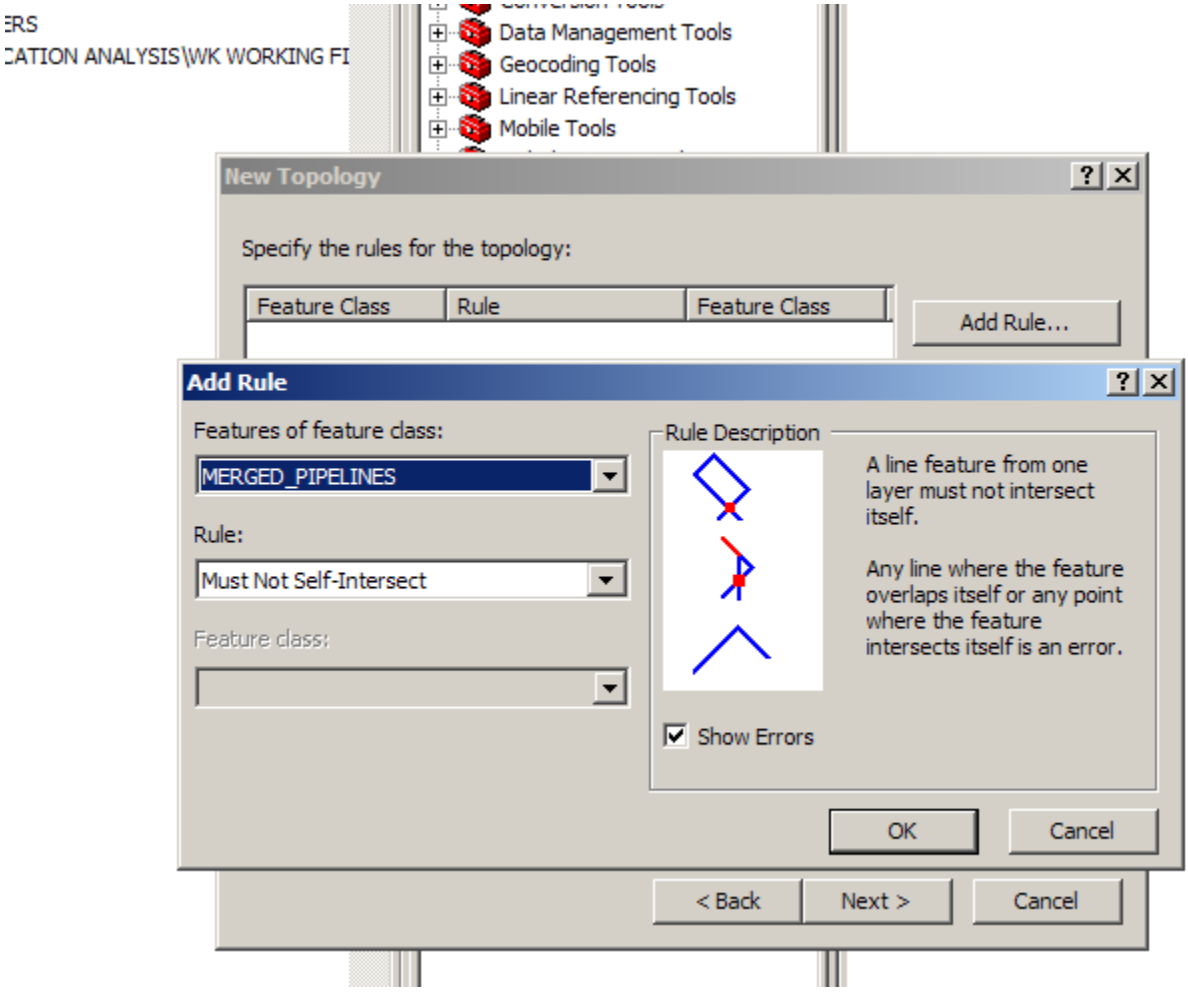

Point To Polyline Z (M) Wizard
ET Geo Wizards
1. Select point layer
ALL_PTS
2. Specify output feature class or shapefile
P:\Projects\PG&E\51877 PG&E C
3. Specify type of output
Z
M
Point To Polyline Z (M)
Converts a point data set to a polyline shapefile
The point layer needs to have at least two numeric fields : one that identifies the points to be used for creation of each polyline and one to be used as a source for Z (M) values
Help
Cancel
< Back
Next >
Finish

NEXT


Point To Polyline Z (M) Wizard
ET Geo Wizards
4. Specify ID field
ROUTE
Use order field
5. Specify order field
PT_ORDER
7. Specify M Field
MEASURE
Attach attributes
Point To Polyline Z (M)
Converts a point data set to a polyline shapefile
The point layer needs to have at least two numeric fields : one that identifies the points to be used for creation of each polyline and one to be used as a source for Z (M) values
Help
Cancel
< Back
Next >
Finish

FINISH

4.8.6 Run Topology looking for self intersecting lines. Fix Errors



4.9 Set up a project directory with folders for each step of the process.

4.9.1 **Class Calculator Folder:** stores an .mxd used for the Class Location Tool

4.9.2 **Parcel Review MXDs Folder:** contains an .mxd for every county to be used during parcel identification step of the project.

4.9.3 **Class Review MXDs Folder**: stores an .mxd for each county to be used during the class review step.

4.9.4 **MAPPING Folder:** contains an .mxd for every county to be used during mapping step of the project.

5.0 PROCESS – ATTRIBUTING THE PARCEL DATASETS

There are three primary fields within the Parcel Datatsets used during this step of the process:

- **P_STRUCT –** used to store the # of buildings, units or dwellings within the parcel boundary. According to Federal Regulations Section 192.5

  (1) A "class location unit" is an onshore area that extends 220 yards (200 meters) on either side of the centerline of any continuous 1- mile (1.6 kilometers) length of pipeline.

  (2) Each separate dwelling unit in a multiple dwelling unit building is counted as a separate building intended for human occupancy.

- **P_IDSITE –** used to represent Class 3 structures Well Defined Outside Areas. According to Federal Regulations Section 192.5

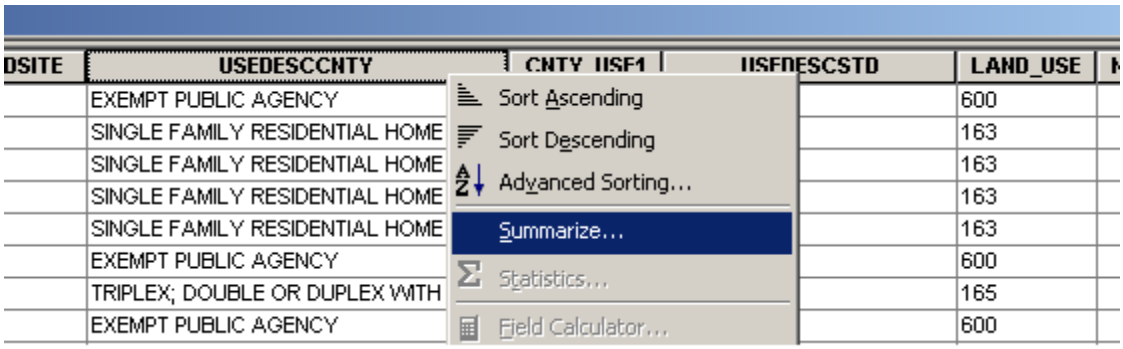
An area where the pipeline lies within 100 yards (91 meters) of either a building or a small, well-defined outside area (such as a playground, recreation area, outdoor theater, or other place of public assembly) that is occupied by 20 or more persons on at least 5 days a week for 10 weeks in any 12-month period. (The days and weeks need not be consecutive.)

- **SYMBOLOGY –** will be used for displaying parcels during the review process.

5.1 Pre-populate the P_STRUCT and P_IDSITE field in the PARCEL datasets

5.1.1 Add the Parcels to a blank ArcMap file and open the Attribute Table for the dataset.

5.1.2 Calculate all the unique values stored in the **USEDESCCNTY** field using the **Summarize** tool in ArcGIS



5.1.3 Output the data to a dBase Table, save the dBase Table out as an Excel file: "County Name"_Use_Code.xls. Repeat this process for all 40 counties. Combine all of the spreadsheets into one new spreadsheet; and add two new fields P_STRUCT and P_IDSITE. Save this new spreadsheet as ALL_County_Use_Codes.xls. Sort the spreadsheet on USEDESCCNTY field and eliminate all duplicate values. A senior designer will then populate the P_STRUCT and P_IDSITE fields based on the use code description. Once populated an SQL script was written to populate the data in the SDE database.

Ex. update pge.pge.county_name_parcels set **P_STRUCT** = 1,**P_IDSITE** = 20 where USEDESCCNTY = 'XXXXXXXXXX'

5.2 Populate the **SYMBOLOGY** field added in Sect. 4.5.

5.2.1 Select all parcels where STRIES_NBR field > = 400. Once selected, Field Calculate the **SYMBOLOGY** field to = 400.

5.2.2 Select all parcels where P_STRUCT = 46. Once selected, Field Calculate the **SYMBOLOGY** field to = 46 unless the record has already been populated to = 400.

5.2.3 Select all parcels where P_IDSITE = 20. Once selected, Field Calculate the **SYMBOLOGY** field to = 20 unless the record has already been populated to = 400 or = 46.

5.2.4 Select all parcels where CLS_CAREFAC = YES. Once selected, Field Calculate the **SYMBOLOGY** field to = 20 unless the record has already been populated to = 400 or = 46.

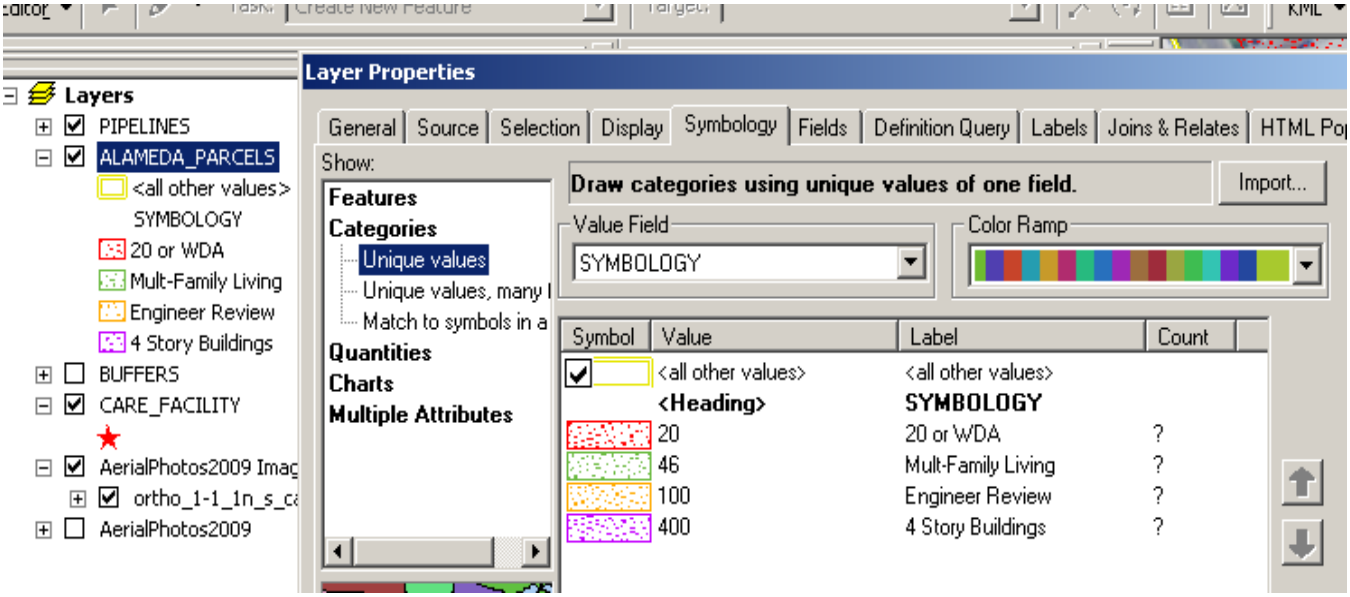
5.2.5 All remaining data in the **SYMBOLOGY** field will be null.

5.3 Compare data in **NBR_BLDN** field to the **P_STRUCT** field, if **NBR_BLDN > P_STRUCT,** field calculate **P_STRUCT = NBR_BLDN.**

5.4 Label the Parcels based on the **P_STRUCT** and **P_IDSITE** fields. Use the expression:
[P_STRUCT] & " " & "-" & " " & [P_IDSITE]
Examples:

- 1 – 0 - Represents 1 structure - not a class three building or area
- 46 – 0 - Represents parcels which may contain 46 or more units - not a class three building or area
- 1 – 20 - Represents 1 structure - and a Place of Public Assembly or a Well Defined Outside Area.
- Null – Null – Represents a need to verify area.

5.5 Symbolize the parcels based on **SYMBOLOGY** field attributed in Sect.5.2



5.6 Start visually reviewing the parcels. Add the NAIP photography, buffers created in Sect. 4.6, the care facility data created in Sect. 4.7 and the PGE_PIPELINES to the .mxd file. Starting at the edge of the county and start panning/"walking" the pipeline updating the NULL- NULL labeled parcels as you go with the correct attributes for the parcel based on the photography. Also pay attention to the pre-populated parcels looking for errors that may have occurred during pre-populate step in Sect. 5.1. In areas where the parcel information cannot be determined based on the Use Code or the NAIP photography, Google Earth Pro will be used to visually verify the parcel.

Sample of what you might see:

As you can see in the photo, there are many parcels the user must verify:

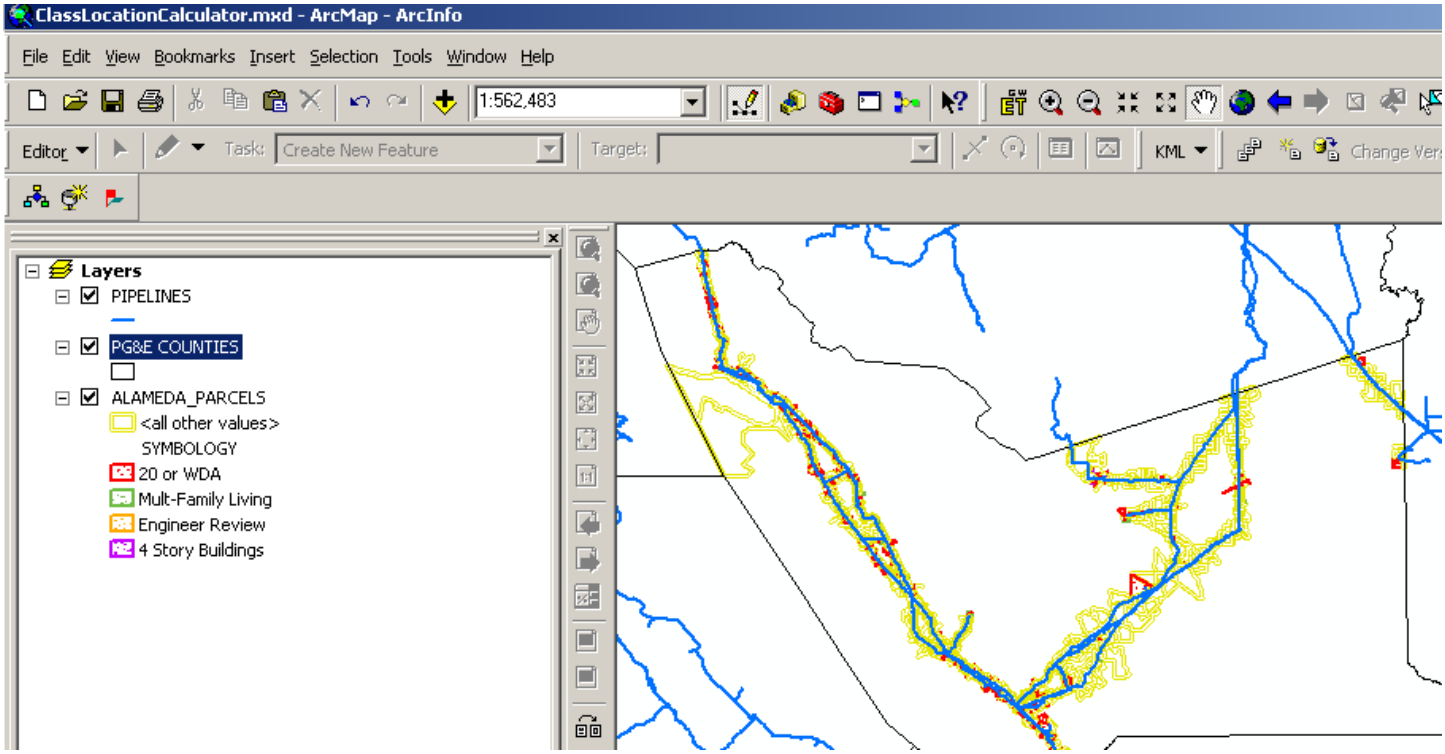
- There are quite a few parcels labeled null – null
- There is a parcel colored red with no label, notice the stars representing the care facility, this will need to be populated.
- Four story buildings that will need to be verified in Google Earth Pro.
- Parcels labeled 46 based on the county USE CODE, need to verify if these really need to be populated the way they are.

5.6.1 After all the parcels have been attributed, the user will once again “walk” the pipeline in Google Earth Pro looking for buildings four stories or more within the study area that may have not been attributed in the original data, and update the parcels accordingly

6.0 Process – Running PG&E's Class Calculator and Reviewing Results

6.1 Open up the **ClassLocationCalculator.mxd;** add your parcel dataset, pipeline layer and county polygon layer to the Table of Contents in the .mxd.

- The PGE_COUNITES feature class is stored in a geodatabase on the production server called PG&E_Reference_Files.mdb

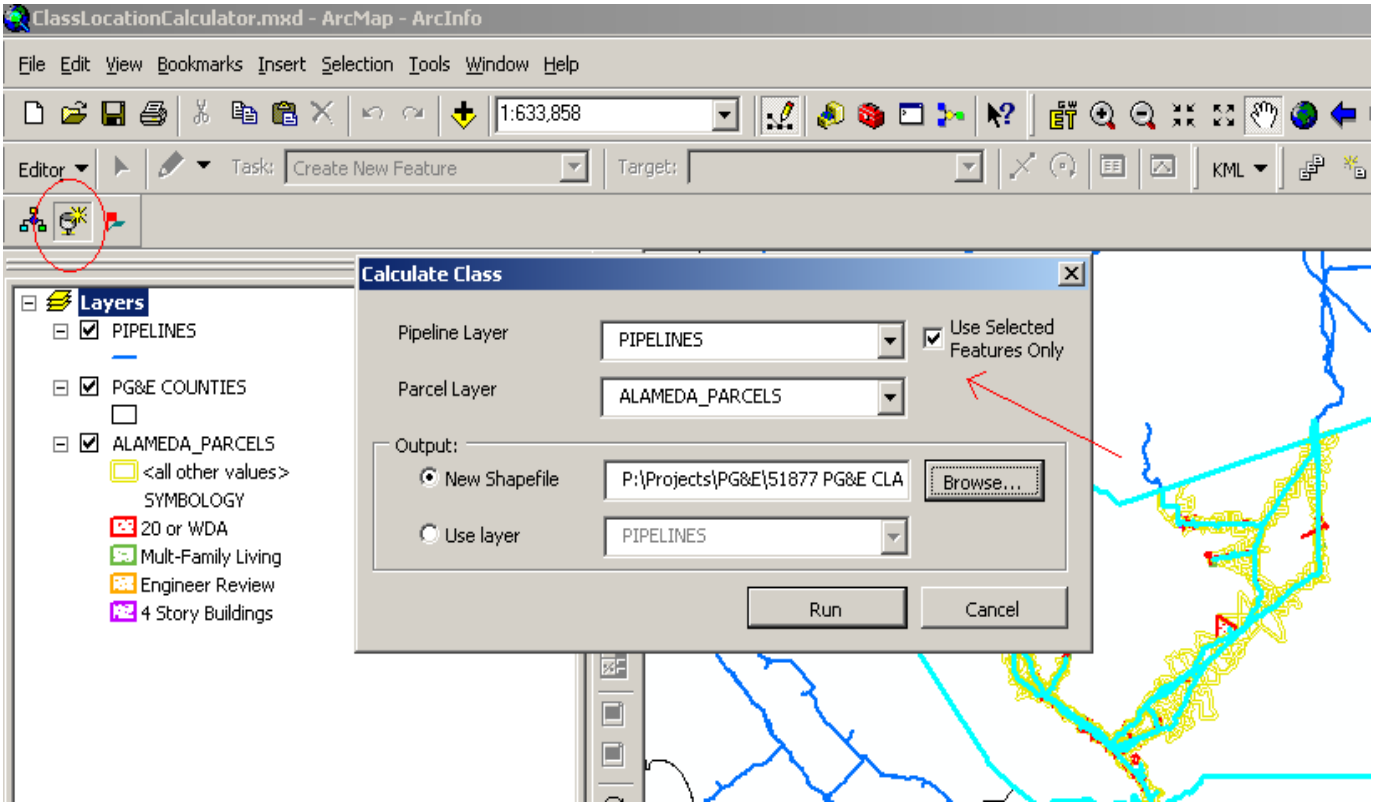


6.1.1 Open up the attribute data for the parcel dataset. In order for the class calculator tool to work, the CLS_STRUCT and CLS_IDSITE fields must be populated. Field Calculate these fields.

- CLS_STRUCT = P_STRUCT
- CLS_IDSITE = P_IDSITE

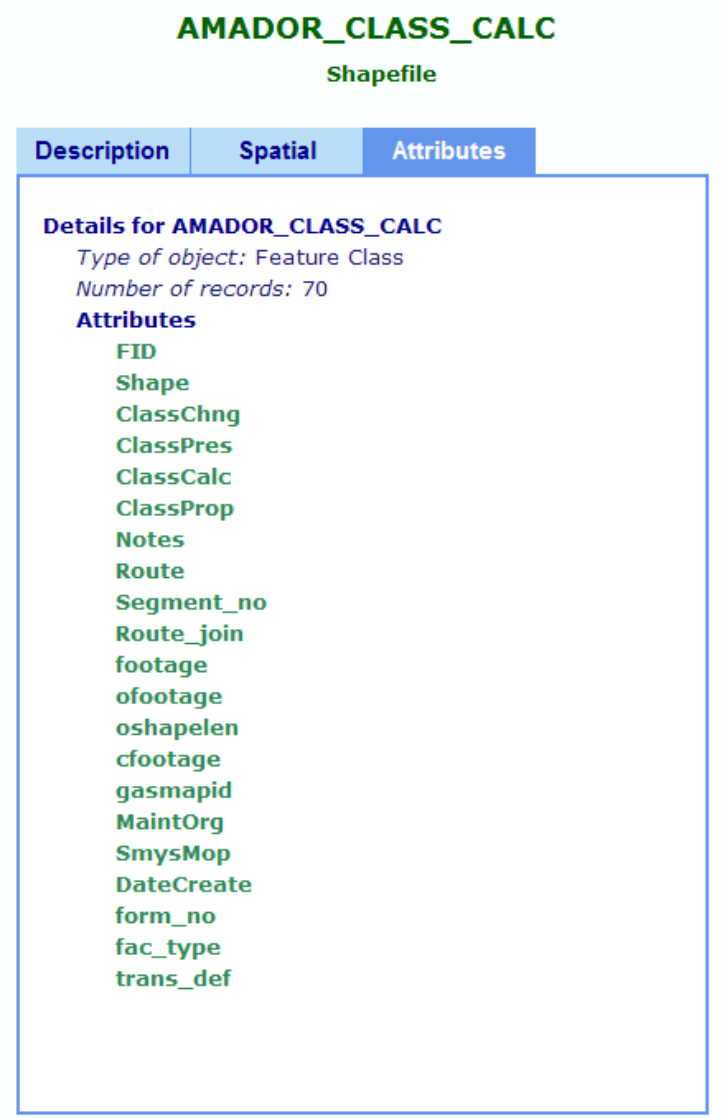
6.1.2 Select the county in the PGE_COUNTIES dataset you are working in. Next do a Select By Location, selecting the Pipelines that intersect the selected county.

6.1.3 Open PG&E's Class Calculator  and populate the drop down boxes, make sure you hit check the Use Selected Features Only box. Browse out to the Class Calculator folder on the production server and save the shapefile as "County Name"_CLASS_CALC



6.1.4 Run the Tool – Review the Results

Columns in Output



6.1.5 Import the newly generated CLASS_CALC shape to the SDE database in the **CLASS_CALC** - SDE Feature Dataset "COUNTY_NAME"_CLASS_CALC

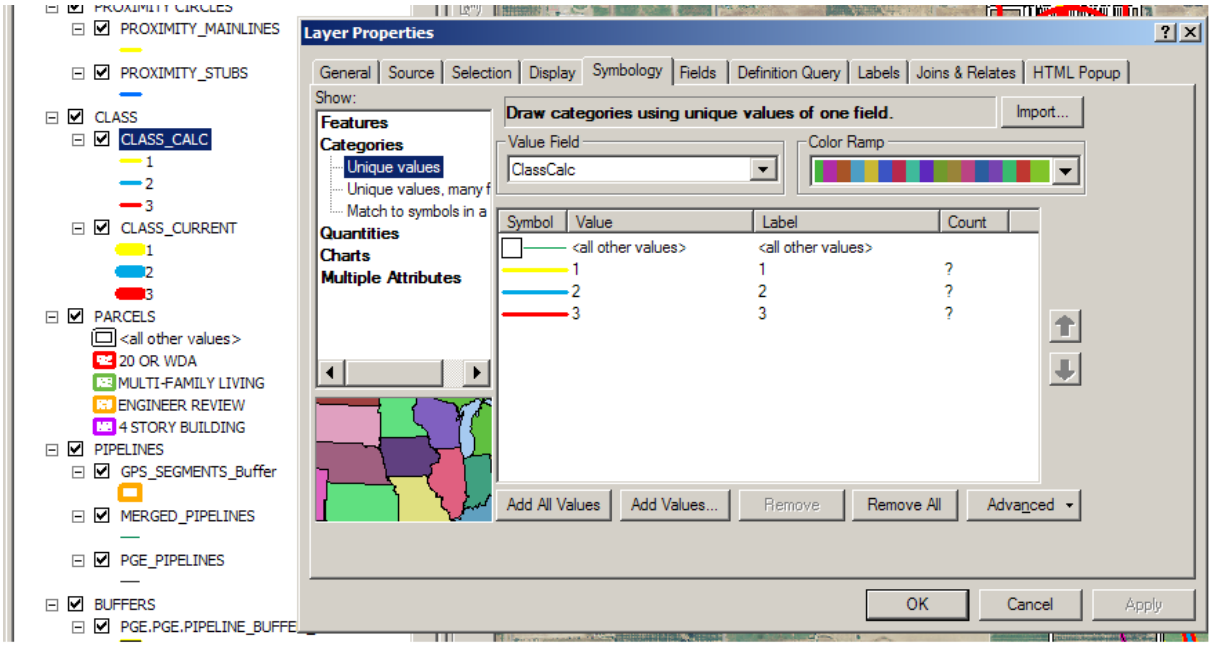
6.1.6 Trim the new dataset by snapping to the county borders of the PGE_COUNITES feature class. This output is the base data used for the remainder of the study.

7.0 PROCESS – Determining Class

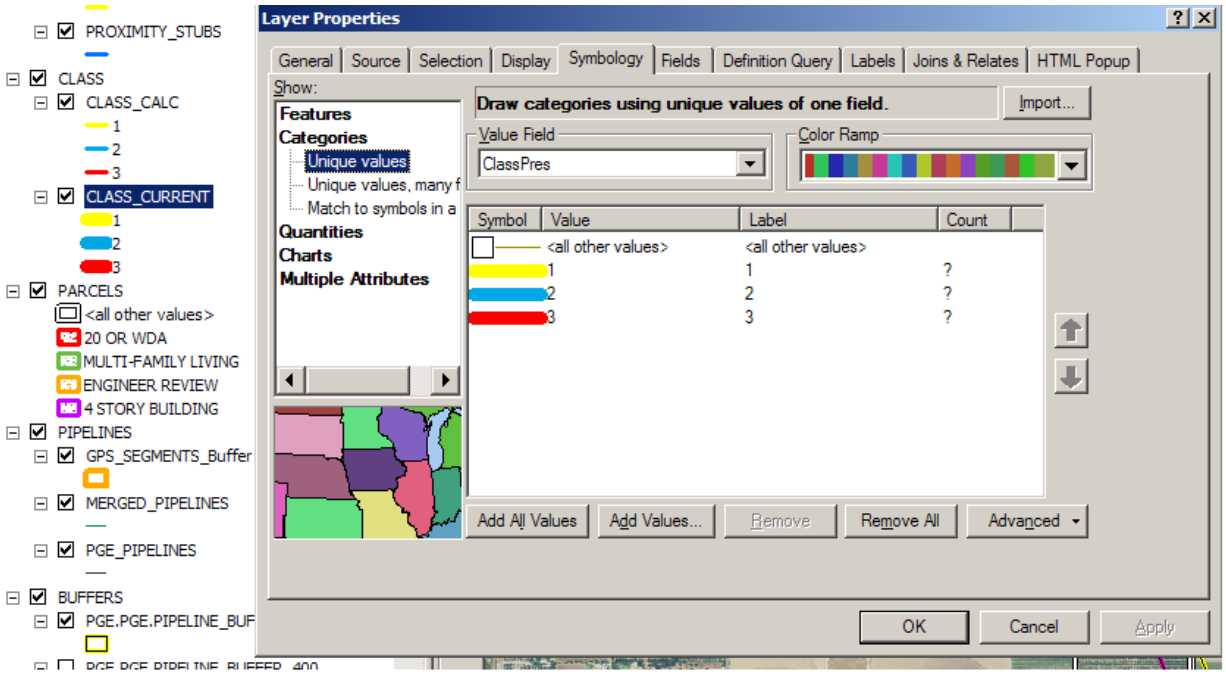
7.1 A designer up a class review mxd "COUNTY_NAME"_CLASS_REVIEW.mxd for each county. Add the populated/symbolized PARCEL DATA, the CLASS_CALC data twice, the MEASURED_ROUTE created in Sect 4.8, and the photography.

7.2 Symbolize the two CLASS_CALC datasets

7.2.1 Symbolize the first dataset based on the CLASS_CALC field



7.2.2 Symbolize the second dataset base on the CLASS_PRES field



7.3 Turn on the parcel labels with symbology and the buffers.

7.4 An engineer sits with the designer and begins the analysis for each county by determining a logical starting point and panning through all of the pipelines in each county with the buffers on and making the determination of class location areas. This determination is assisted by using the sliding mile tool which Willbros built. This tool follows the path of the pipeline and is exactly 5280 feet in length. By placing this tool, the number of structures can be counted within the mile and class location determination can be made. Once a class location area has been determined, the engineer will have the designer update the ClassProp Field within the CLASS_CALC feature class with the proposed class location area, either 1, 2, 3, or 4.

Example of Sliding Mile with Proximity Circles marking the end of the Proposed Class Area

7.5 Class location as defined by the criteria set forth in 49 CFR Part 192.5, which reads as follows:

"(a) This section classifies pipeline locations for the purposes of this part. The following criteria apply to classifications under this section.

(1) A "class location unit" is an onshore area that extends 220 yards on either side of the centerline of any continuous 1 mile length of pipeline.

(2) Each separate dwelling unit in a multiple dwelling unit building is counted as a separate building intended for human occupancy.

(b) Except as provided in paragraph (c) of this section, pipeline locations are classified as follows:

(1) A Class 1 location is:

(i) An offshore area: or

(ii) Any class location unit that has 10 or fewer buildings intended for human occupancy.

(2) A Class 2 location is:

Any class location unit that has more than 10 but fewer than 46 buildings intended for human occupancy.

(3) A Class 3 location is:

(i) Any class location unit that has 46 or more buildings intended for human occupancy; or

(ii) An area where the pipeline lies within 100 yards of either a building or a small, well-defined outside area (such as a playground, recreation area, outdoor theater, or other place of public assembly that is occupied by 20 or more persons on at least 5 days a week for 10 weeks in any 12 month period. (The days and weeks need not be consecutive.)

(4) A Class 4 location is:

Any class location unit where buildings with four or more stories above ground are prevalent.

(c) The length of class locations 2, 3, and 4 may be adjusted as follows:

(1) A class 4 location ends 220 yards from the nearest building with four or more stories above ground.

(2) When a cluster of buildings intended for human occupancy requires a class 2 or 3 location, the class location ends 220 yards from the nearest building in the cluster."

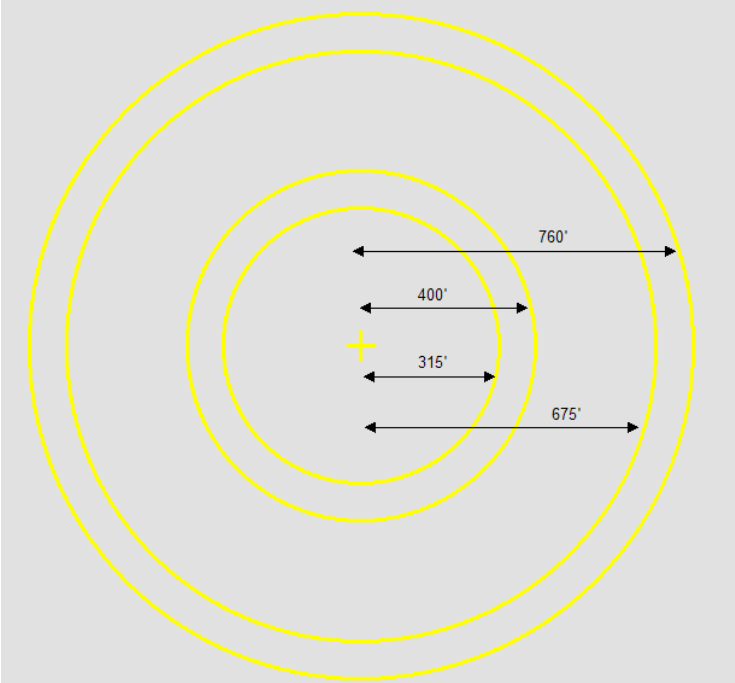
Further to the code as described above, the following other rules were applied in the class location determination process.

1. A class 4 location unit could not contain only one four or more story building.
2. Any class 4 location unit had to have more 4 or more story buildings than other inhabitable structures within the sliding mile.
3. Barns and outlying structures from an inhabitable structure were not counted in the class location determination.
4. All motels, hotels, and RV park had the number of individual units be determined if possible and these individual units were counted each as structures.
5. Apartment complexes and trailer parks were counted as individual dwellings.

6. For golf courses, only the clubhouse was defined as a structure and these were all listed as Class 3 type buildings. The driving range was classified as a well-defined outside area and treated as such. The golf course was not counted in any manner.
7. The class location determination process as defined by the slides prepared by ViaData and used in the PHMSA Pipeline Training classes was used in this analysis.
8. At the junction of various pipelines, the sliding mile was applied in all possible directions to obtain the corresponding class location unit.
9. Any short pipeline segment branching off the mainline was treated with the same class location as the line from which it branched.

7.6 The engineer will review the parcel label for questionable structures to determine if the parcel label should be changed. Using Google Earth Pro and local maps, often times the structure type may need to be adjusted. The engineer always uses a very conservative approach in making these types of decisions so any error is on the conservative side and no under classing can occur.

7.7 The engineer will determine the first and last structure within the sliding mile and have the designer place a proximity circle on these structures.



The proximity circle has a crosshair in the center of the circle and the circle is placed with this crosshair on the corner of the structure closest to the pipeline which results in the longest class area possible. This procedure is often called the arc method of determining the extents of the class location unit. The proximity circle is actually four circles of distances equal to 315', 400', 675', and 760'. The corresponding circle was used to determine the extent based on whether the line had been surveyed using GPS and whether it was a well-defined outside area or a Class 3 type building.

7.8 In areas where the class location being proposed differed from the current class location, the segment of pipeline was split using a ESRI ArcGIS "split" tool, 

which divided the segment at the location selected but retained the same attributes on both. The designer then changed the proposed class accordingly per the engineer's instructions.

7.9 At the conclusion of this determination process, a separate engineer than the one who performed the initial determination performed a quality control check by performing the same process as the initial engineer had performed and resolving any conflicting determinations

7.10 After the data went through the quality control check, it was imported into the CLASS_PROPOSED feature dataset

8.0 PROCESS – Mapping

8.1 Two mapping templates were designed: an 11" x 17" for branch/"stub" lines and a 24" x 36" for main pipeline maps. For each county an mxd was set up using these two templates. Using ESRI Map Books, a designer placed a new map book window around areas of proposed class change up or down. Each map book window was attributed according.

8.1.1 **Sheet Name**: This name was created using the following naming convention:
Maint. Org – A or B – County Abbreviation Year- Number
Ex. DMIS-A-ALA2011-1

8.1.2 **Scale**: The scales used on these maps were limited to 1" = 200', 300', 400', 500', 600', 800' and 1000'. This determination was made to provide for accurate scaling by hand if necessary.

8.1.3 **Route Names**: All routes which have a change in class shown on map.

8.1.4 **Rotation**: The angle relative to true north which the map is oriented.

8.2 After placing the map windows, the designer would populate the Sheet_Name field in the Class Proposed Table. Any segment that had a proposed change would have the corresponding sheet number tied to it.

8.3 After all the map windows were placed ESRI Map Books was used to generate the new sheets to be plotted off for review.

8.4 The maps were presented to the quality control team for inspection, review and modification. All changes were documented on the map in red and sent back to the designer to be changed.

8.5 Final maps were once again reviewed by quality control to ensure the requested redline changes had been made and then presented to the engineer for review and approval.

8.6 The engineer could request further changes and begin the quality control process again or accept the map as is and continue on.

8.7 If the map passed through the engineer, the engineer would then build a report describing the proposed class location change indicated on the map. The designer would provide the GIS data in tabular format for the affected pipe segments on the map. The engineer would review this data and the map and add in text describing all of the necessary details for the map to be reviewed by PG&E personnel and allow them to understand the details of the class location determination classification.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1	PG&E Class Location Analysis																										
2	DSAC-A-COL2011-2																										
3																											
4	Data associated with proposed class change																										
5	Maint Org	Route	Segment no	Class Pres	Class Calc	Class Prop	ClassChng	Footage	Miles	OD	WT	GRADE	SMYS	YR INSTALL	GIRTH WELD	LONG SEAM	JOINT TYPE	SmysMop	TEST_JOB	TEST_DATE	TEST PRESS	TEST MEDIUM	TEST DUR	TRANS DEF	HCA ID	gasmapid	Commensurate?
6	DSAC	0638-02	111	3	1	1	Change Down	5761.0	1.09	4.5	-0.141		-35000	1/1/1996				-36.4742		<Null>	0		0	TI	Z51	205138042	Yes with assumptions
7	DSAC	0638-02	111	3	1	1	Change Down	84.1	0.02	4.5	-0.141		-35000	1/1/1996				-36.4742		<Null>	0		0	TI	Z51	205138043	Yes with assumptions
8	DSAC	DREG7092	801	3	1	1	Change Down	400.0	0.076	4.5	-0.141		-35000	1/1/1996				-36.4742		<Null>	0		0	TI	Z85	205115441	Yes with assumptions
9																											
10	Description																										
11	A 300' proximity circle shown on the map was used on the west of a building that is considered occupied by 20 or more persons on at least 5 days a week for 10 weeks in any 12-month period.																										
12	All the pipeline west of the circle is proposed class change down from Class 3 to Class 1 due to there being less than 11 structures in the sliding mile.																										
13	The pipe is commensurate with the class change.																										
14																											

9.0 Deliverables

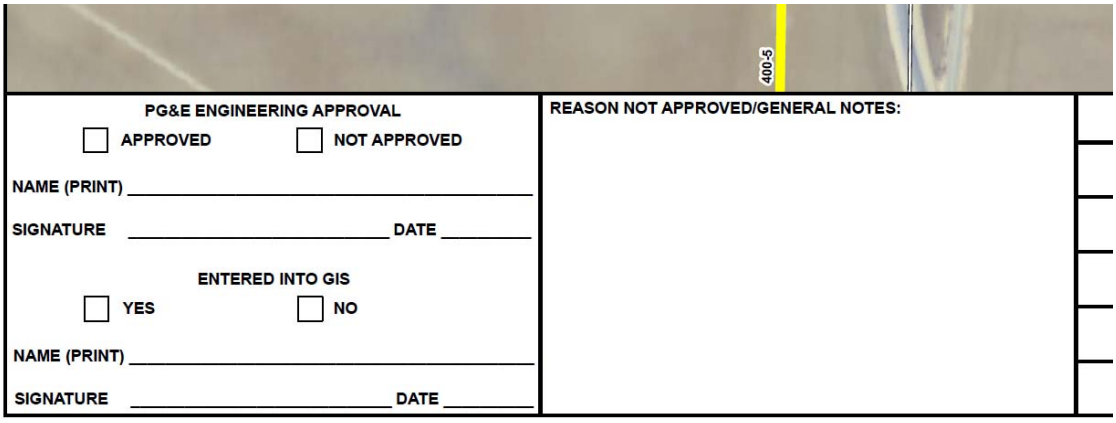
9.1 A final quality control step was to place all maps and corresponding reports into a deliverable product which is a three-ring binder and review all information contained in the book to ensure it was complete.

9.2 Prior to delivering the book, the designer would prepare a GIS extract of data on this county with the current class location in one column, the PG&E Class Calculator tool results in another column and the Willbros proposed class in the next column. The other data included on this spreadsheet was requested by PG&E to be included so determination of whether the pipe in the proposed class changes areas was commensurate with the proposed class. These other data fields were pulled from the PGE_Pipelines layer described above in Sect. 4.2.

9.3 Willbros engineers added a column to this spreadsheet and added to this column by indicating one of the following attributes to each pipe segment, “Yes w/assumptions”, “Yes”, “No w/assumptions”, “No”, and “Maybe”. Each of these attributes was added to show whether the pipe was commensurate with the proposed class change. The SMYS_MOP was used for this determination process. If the proposed class change was to class 1, then the value of the SMYS_MOP had to be below 72% for the pipe to be commensurate with the class change. The same thing applies for Class 2, where SMYS_MOP had to be below 60%, for class 3, SMYS_MOP had to be below 50%, and for class 4, SMYS_MOP had to be below 40%. PG&E’s database has negative values for fields which are assumed. If any values were negative the “w/assumptions”, either yes or no attribute was used. If the proposed class change was one class up and the value of SMYS_MOP was lower than the next class up, the attribute of “maybe” was used. Each pipe segment was reviewed and one of these five attributes was added under a column heading of “Proposed Commensurate”.

9.4 The deliverable by county of the maps, the reports for each map and the entire county pipe segments with proposed commensurate completed was delivered to the appropriate PG&E engineer for their review and approval.

9.5 If the PG&E engineer agreed with the proposed class changes on the map, the map was marked “approved” along with any comments in the provided check box area of the maps. If there was any disagreement, the map was marked “not approved” along with any comments the engineer felt necessary.



Any item which required field verification was noted on the map and a running list was kept for all of these issues. On any map marked as “not approved”, the PG&E engineer added comments to the map indicating the areas of disagreement and subsequently the areas which required further modification.

9.6 The maps and reports are then shipped back to Willbros for review, modification and finalization. Willbros makes these changes, updates the maps, reports and spreadsheet and resends the maps and reports with the modifications back to the PG&E engineer for final approval. Final approval is sent to Willbros via e-mail. These e-mails are saved by Willbros and the final books are saved by the appropriate PG&E engineer.

9.7 Willbros finalizes the spreadsheet and uploads this final information into a county by county summary report along with an overall PG&E system report indicating the amount of miles for each category of attribute and divided by Class Change Up, Class Change Down, and No Change.

9.8 Willbros makes final delivery of the final county shape files and PG&E keeps the completed and approved county books indicating all of the approved class changes.