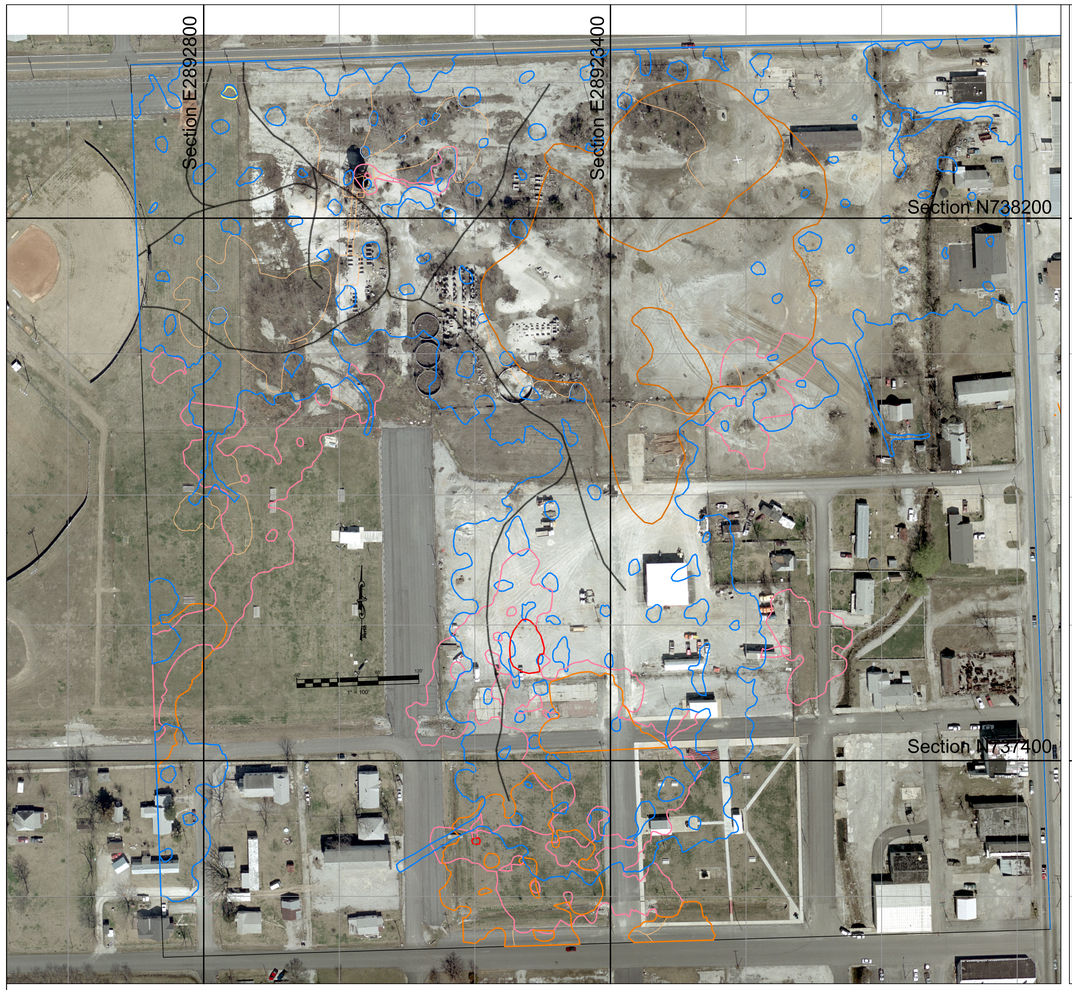

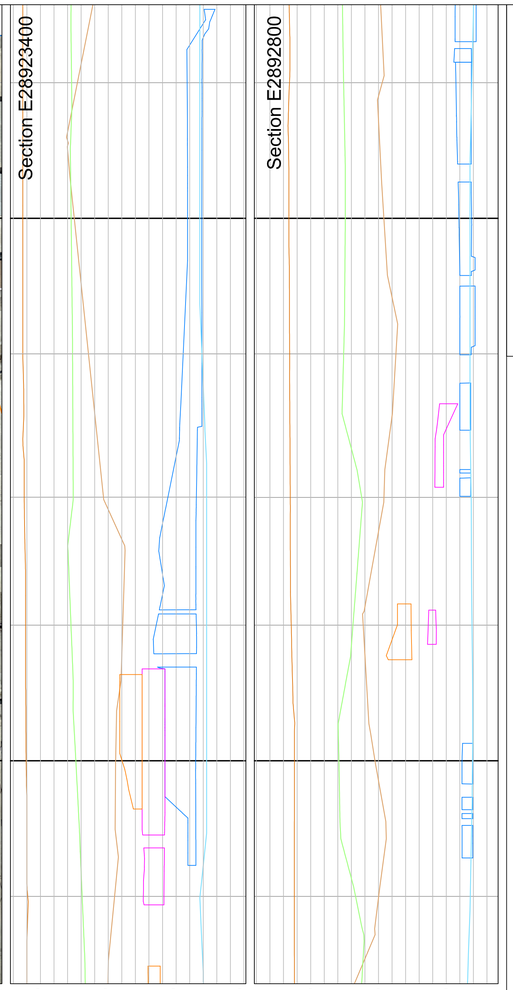

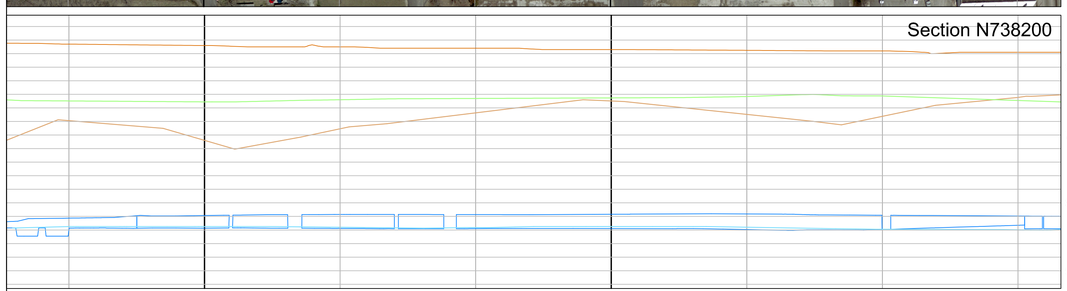

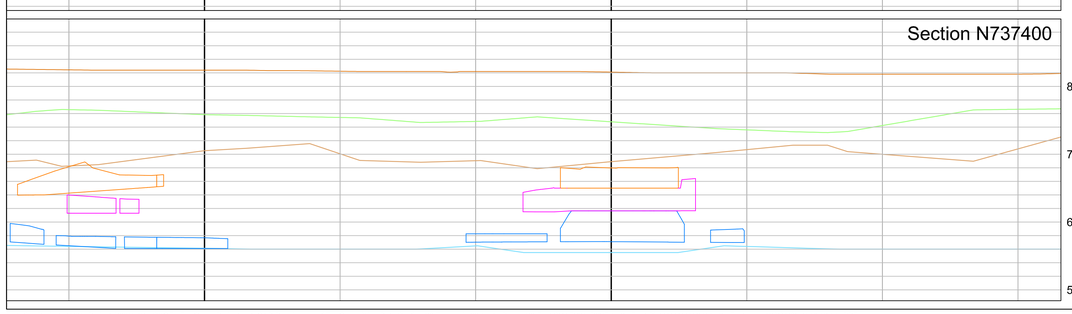

Legend

- 2004 Surface
- E - Bed
- G&H - Beds
- K - Bed
- M - Bed
- O - Bed
- Tracks
- Shafts
- Floor Breakline
- Top of Chester
- Top of Boone
- M - N Contact

Projection NAD83 OK state plane, north zone, US foot

Mine Specific Notes

TIN Method - Spoke and Ring

M roof near the bottom center of drawing reaches up through the K and E levels as one large open room. There is a concrete pillar in this room.

PROCESS DESCRIPTION: The production procedures, instrumentation, hardware, and software used in the collection of standard MVG (Mine Vector Graphic) products vary depending on systems used at the contract, co-operator production sites. The process step describes, in general, the process used in the production of standard MVG data sets.

1. Production of a MVG begins with the scanning of a paper 40-acre map on a high resolution scanner. Scanning resolutions range from 300 to 600 dpi with the output file running between 100 to 300 megabytes. Some were scanned bi-tonal and some true color.

2. Images not in a bi-tonal form were converted to index color then to bi-tonal. Cleanup of images occurs at this phase. Converting images to bi-tonal is necessary to allow our software (AutoCAD Land Development Desktop) to assist in the vectorization process.

3. A reference section grid was prepared by Mike Sharp in the Oklahoma State Plane North Nad 1983. Reference section lines were based off road intersections pulled from Aerial Photography. This was done in an effort to recreate the original section grid that predates the 1927 Datum.

4. Each map was then placed on this grid and scaled in the X and Y direction but not skewed or twisted (printed maps tend to shrink or expand across the grain of the medium). This created a continous coverage of images across the areas of risk. Most maps were fairly seamless on the overlaps. On some of the map overlaps there is a survey bust of up to 6ft (T29N R23E S17) and an average of 0 to 3ft. If two maps conflict on remaining pillars or excavation; maximun excavation is assumed.

5. The Main Image drawing was then split up into 40-acre maps for digitization by several employees using AutoCAD Raster Design. A set of closed polylines was produce for each 40-acre mine lease. In a separate drawing the elevations of the mine workings were created as 3D breaklines and points. Great attention was paid to the floor breaklines. However, in some cases they were assumed. These lines and points were added to a DTM (Digital Terrain Model). Due to the scale of the project the DTMs were created one section at a time.

6. The DTMs were exported as TINs (Triangle Irregular Network) in a DXF file format. These TINs and closed polyline sets for each 40-acre mine were sent to Montgomery Watson Harza for analysis in ArcGIS.

7. These TINs and Closed polyline sets for each 40-acre mine were then imported into GEMCOM. GEMCOM is a 3D mine planning and solids modeling program. This was done to give us the abblity to cut cross- sections and compute volumes. Process in GEMCOM was as follows:

a. TINs were imported into GEMCOM as surfaces one layer at a time.
b. Polyline sets were converted to ASC files. One file for each level in each mine.
c. One level of polylines for one mine was then imported into GEMCOM.
d. Polylines are set at zero elevation.
e. Polylines for that level are then extruded up 900ft and named
f. These new solids were then clipped on the top and the bottom with the TIN surfaces
g. Once complete cross - sections were cut every 200ft on the Northings and Eastings in a grid.
h. Sections were then exported back to AutoCAD for page setup and ploting.

HORIZONTAL SCALE 1"=100'	
VERTICAL SCALE Same	
DESIGNED	
DATE 12-08-2005 / BY SGJ	
DRAWN	
DATE 00-00-00 / BY XXX	

Picher Mining Field
Subsidence Evaluation

Figure 7.1
T29 - R23 - S20 nwNW
East Netta

F1

Z:\Active Projects\2004_Projects\2004-43 USACE - Tar Creek Project\AutoCAD Drawings\subf\Tar Creek Mine Data\Section 20 Township 29 North Range 23 East\S20 T29N R23E Netta East\Plot 20-29-23 2-2 Netta East.dwg 10/7/2005 9:47:47 AM PDT