October 2013

Dealing with Unexpected Petroleum in Excavations
Case Studies from the Village of Heyworth

SHIVEHATTERY
ARCHITECTURE + ENGINEERING
2103 Eastland Drive | Bloomington, IL 61704 | 309.662.8992 | 800.798.8992

YOUR PRESENTER:
DAVID SHAFER - SHIVE-HATTERY

Shive-Hattery – Full service firm

- Land Surveying
- Architectural
- Engineering
  - Civil
  - Structural
  - Electrical
  - Mechanical
  - Environmental

Nine design offices

- Bloomington, Illinois
- Moline, Illinois
- Downers Grove, Illinois
- Chicago, Illinois
- St. Louis, Missouri
- Cedar Rapids, Iowa
- Iowa City, Iowa
- West Des Moines, Iowa
- Valparaiso, Indiana

Employee-owned

Rankings

- 25th among Giants 300 List of A/E firms by *Building Design and Construction Magazine*
- 208th among the 500 largest U.S.-based design firms by Engineering-News Record Magazine

David Shafer

- Licensed Engineer - 9 States
  - IL, IN, IA, WI, MO, KY, GA, MT, OH
- Licensed Land Surveyor – 3 States
  - IL, MO, WI
- Engineering Focus - Utilities
  - Water
  - Waste Water
  - Storm Water
  - Broadband and E911 communications
  - General Municipal
  - Transmission utilities and Rights-of-Way

Memberships

- AWWA
- APWA
- ASCE
- NSPE
- IRWA and IRWA
- IPLSA and MSPS

SHIVEHATTERY
ARCHITECTURE + ENGINEERING

About the Village of Heyworth

- Population of 2850
  - Village President – Larry Mowery
- Water System – Average Consumption of 330,000 Gallons
  - Water Plant replaced in 2002
  - 500,000 gallons in elevated storage
- Waste Water System – Rated for 400,000 GPD
- Roughly 15 Miles of Street Centerline
- Located 7 Miles South of Bloomington on US-51

SHIVEHATTERY
ARCHITECTURE + ENGINEERING

Abbreviations Used

- REC – Recognized Environmental Condition
- UST – Underground Storage Tank
- LUST – Leaking Underground Storage Tank
- AST – Above Ground Storage Tank
- PCS – Petroleum Contaminated Soil
- IEMA – Illinois Emergency Management Agency
- OSFM – Office of the State Fire Marshall

SHIVEHATTERY
ARCHITECTURE + ENGINEERING

Purpose of the Presentation

- 3 Case Studies on Petroleum in Utility Excavations
  - Buchanan Street
  - Vine Street (North)
  - Vine Street (South)
- How to Prepare and Respond when it happens to you.
- Lessons Learned

SHIVEHATTERY
ARCHITECTURE + ENGINEERING

Case Study #1 – Buchanan Street Reconstruction

The Buchanan Street Reconstruction project was a 3 block complete reconstruction.

- Construct new Storm Sewer
- Correct Pavement Grades, Widen Pavement, Add on-street Parking
- Water main was replaced on 2 blocks of the section a few years ago.
- A simple project…….

Until this manhole was found…… and opened……

SHIVEHATTERY
ARCHITECTURE + ENGINEERING

Case Study #1 – Buchanan Street Reconstruction

Opening the manhole revealed sludge and a strong odor of petroleum.

- Now what to do…..
- Lets dig around in and see what we have…….

SHIVEHATTERY
ARCHITECTURE + ENGINEERING

Case Study #1 – Buchanan Street Reconstruction

Now we have a hole, ground water, petroleum odor, oil slicks, and a PVC water main nearby.

- Need to replace PVC Water main with Ductile Iron Pipe and Petroleum Resistant Gaskets – why?
- Title 35 – Subpart F - 653.119 - f) Water mains and water service lines shall be protected against entrance of hydrocarbons through diffusion through any material used in construction of the line.
  - Permit from IEPA
  - $$$$$$ (Special Gaskets cost almost as much as a stick of pipe.)
  - Village self-constructed this portion - roughly 300' of 10 year old water main replaced – raises the question – why wasn't this found when the water main was installed.

SHIVEHATTERY
ARCHITECTURE + ENGINEERING

Case Study #1 – Buchanan Street Reconstruction

OK – Water main is replaced, what do we do with the Dirt? Oh and we have a storm sewer to install.

- Excavated material – tested and landfilled
  - Around storm sewer and we probably could have left it in place, but for public perception
- Because of uncertainty air testers were used in the trenches to test levels to make sure they were safe for entry
- Ground Water pumped and removed

SHIVEHATTERY
ARCHITECTURE + ENGINEERING

Case Study #1 – Buchanan Street Reconstruction

Hey wait – where did this all come from

- Before the project started databases were reviewed – No documented tanks for 2 blocks
- No suspect land uses
- Hey look – A tank!!!!!

SHIVEHATTERY
ARCHITECTURE + ENGINEERING

Case Study #1 – Buchanan Street Reconstruction

The End Result

- Additional Project Costs of Almost $100,000
- Project Delays of 3-4 Weeks
- Village obtained “Election Not to Proceed as Operator Letter” – No Obligation to clean up due to voluntary removal / cleanup.

SHIVEHATTERY
ARCHITECTURE + ENGINEERING

Case Study #2 – Vine Street (North)

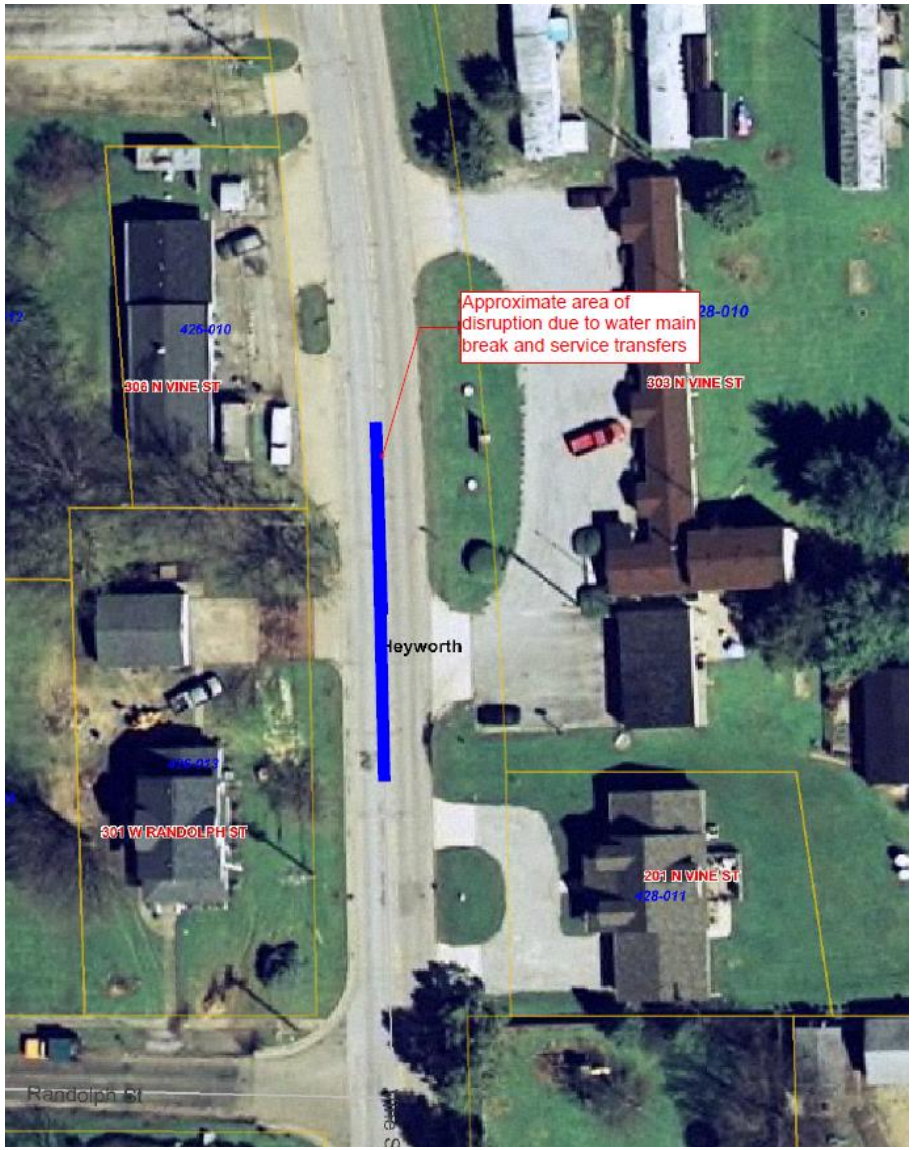
What Happened?

- Water Main Break on State Highway.
- Replacement Main had been installed several years ago, but services were never transferred.
- Simple task – Kill the main and transfer services.
- Except – what is that smell, Dang here we go again.

Case Study #2 – Vine Street (North)

What Next

- This was next to an old gas station
- Call IEPA – request files, what are we dealing with.
- Suspect Soil was set aside for Testing
- Material later hauled offsite so the highway could be opened.

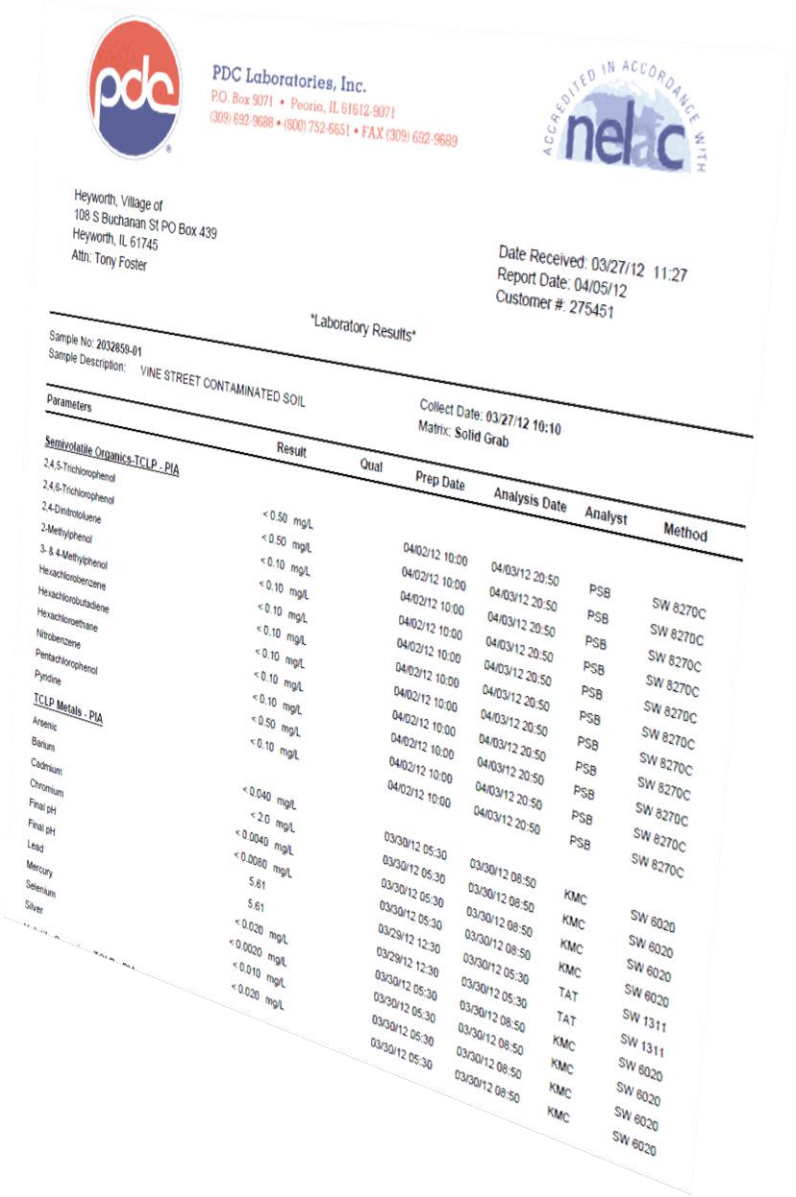


SHIVEHATTERY
ARCHITECTURE + ENGINEERING

Case Study #2 – Vine Street (North)

Test results

- Levels were safe for residential re-use
  - Odor strength is not a good indicator
- Public perception problems
- Liabilities????
  - Site was previously given a 4(y) closure letter
  - IDOT jurisdiction
  - Ongoing concerns IDOT storm sewer has petroleum Odor after rain events



PDC Laboratories, Inc.
P.O. Box 9071 • Peoria, IL 61612-9071
(309) 692-9688 • (800) 752-6651 • FAX (309) 692-9689

ACCREDITED IN ACCORDANCE WITH nelac

Heyworth, Village of
108 S Buchanan St PO Box 439
Heyworth, IL 61745
Attn: Tony Foster

Date Received: 03/27/12 11:27
Report Date: 04/05/12
Customer #: 275451

"Laboratory Results"

Sample No: 2032859-01
Sample Description: VINE STREET CONTAMINATED SOIL
Collect Date: 03/27/12 10:10
Matrix: Solid Grab

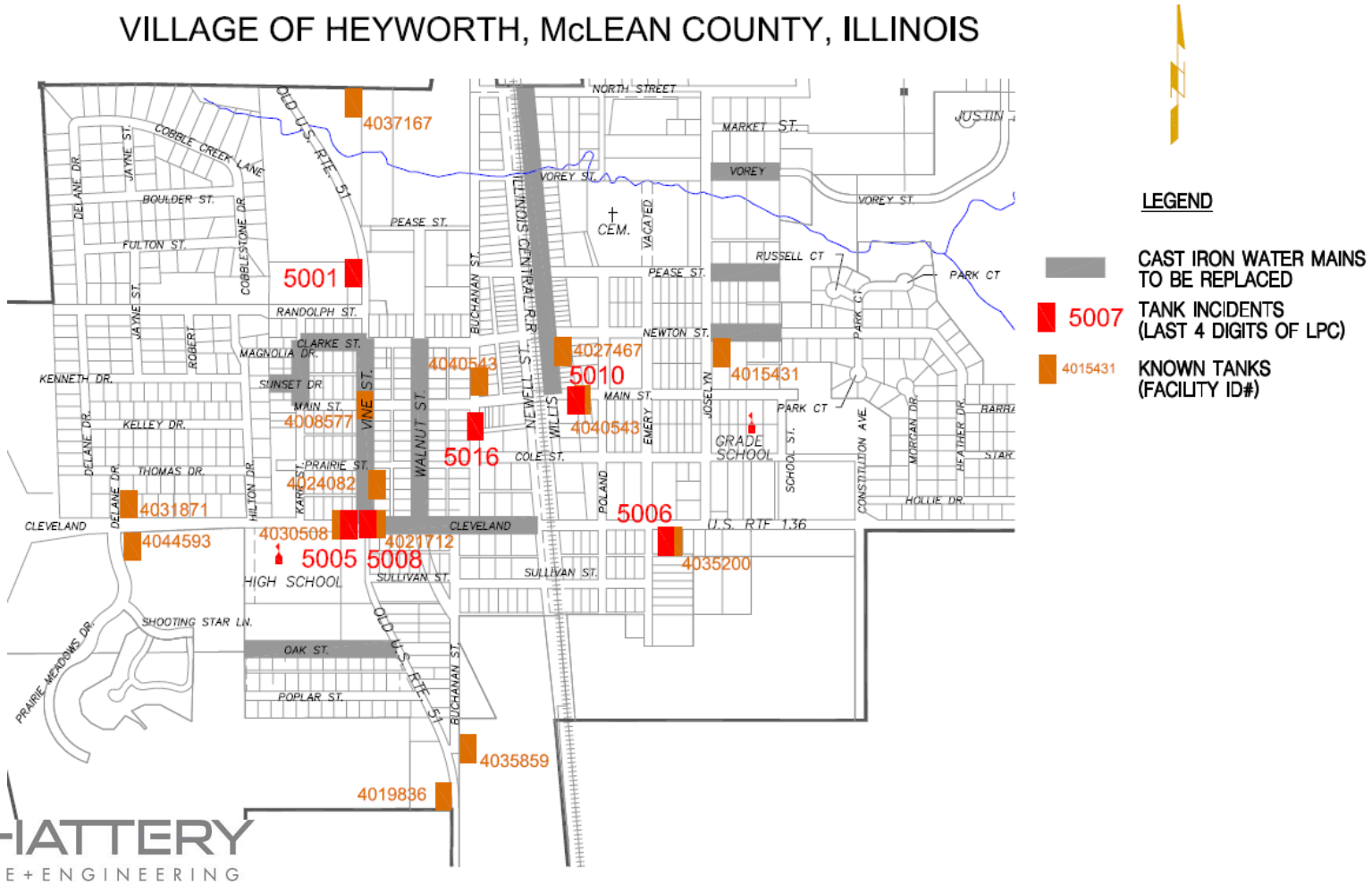
Parameters	Result	Qual	Prep Date	Analysis Date	Analyst	Method
Semivolatile Organics-TCLP - PIA						
2,4,5-Trichlorophenol	< 0.50 mg/L		04/02/12 10:00	04/03/12 20:50	PSB	SW 8270C
2,4,6-Trichlorophenol	< 0.50 mg/L		04/02/12 10:00	04/03/12 20:50	PSB	SW 8270C
2,4-Dinitrotoluene	< 0.10 mg/L		04/02/12 10:00	04/03/12 20:50	PSB	SW 8270C
2-Methylphenol	< 0.10 mg/L		04/02/12 10:00	04/03/12 20:50	PSB	SW 8270C
3- & 4-Methylphenol	< 0.10 mg/L		04/02/12 10:00	04/03/12 20:50	PSB	SW 8270C
Hexachlorobenzene	< 0.10 mg/L		04/02/12 10:00	04/03/12 20:50	PSB	SW 8270C
Hexachlorobutadiene	< 0.10 mg/L		04/02/12 10:00	04/03/12 20:50	PSB	SW 8270C
Hexachloroethane	< 0.10 mg/L		04/02/12 10:00	04/03/12 20:50	PSB	SW 8270C
Nitrobenzene	< 0.10 mg/L		04/02/12 10:00	04/03/12 20:50	PSB	SW 8270C
Pentachlorophenol	< 0.50 mg/L		04/02/12 10:00	04/03/12 20:50	PSB	SW 8270C
Pyridine	< 0.10 mg/L		04/02/12 10:00	04/03/12 20:50	PSB	SW 8270C
TCLP Metals - PIA						
Arsenic	< 0.040 mg/L		03/30/12 05:30	03/30/12 08:50	KMC	SW 6020
Barium	< 2.0 mg/L		03/30/12 05:30	03/30/12 08:50	KMC	SW 6020
Cadmium	< 0.0040 mg/L		03/30/12 05:30	03/30/12 08:50	KMC	SW 6020
Chromium	< 0.0060 mg/L		03/30/12 05:30	03/30/12 08:50	KMC	SW 6020
Final pH	5.61		03/29/12 12:30	03/30/12 05:30	TAT	SW 1311
Final pH	5.61		03/29/12 12:30	03/30/12 05:30	TAT	SW 1311
Lead	< 0.020 mg/L		03/30/12 05:30	03/30/12 08:50	KMC	SW 6020
Mercury	< 0.0020 mg/L		03/30/12 05:30	03/30/12 08:50	KMC	SW 6020
Selenium	< 0.010 mg/L		03/30/12 05:30	03/30/12 08:50	KMC	SW 6020
Silver	< 0.020 mg/L		03/30/12 05:30	03/30/12 08:50	KMC	SW 6020

SHIVEHATTERY
ARCHITECTURE + ENGINEERING

Case Study #2 – Vine Street (North)

Wow – two events in short order what should we do?

- Map of all known UST's and Incidents against planned future work



SHIVEHATTERY
ARCHITECTURE + ENGINEERING

Case Study #3 – Vine Street (South)

- Trying to correct a problem of a water main not in an easement.
- Need to abandon the water main and relocate a service into an easement to allow for business expansion.
- Location of water service was also the location of AST's
- Guess what we found…..

SHIVEHATTERY
ARCHITECTURE + ENGINEERING

Case Study #3 – Vine Street (South)

- Tests Run on Materials found
- Change in Water Service Materials
- Material Placed back in the hole, owner was notified of the problem.

SHIVEHATTERY
ARCHITECTURE + ENGINEERING

PCS Discovery

- Call IEMA – 217-782-7860
- Special Requirements for Being in the Trench (OSHA)
  - Work Safety and Comfort should be first concern
  - YOU are responsible for your safety and that of your co-workers!
  - PCS causes Headaches and Nausea
  - If short term get a high velocity fan, blow air into trench/work area
  - If you are going to use a respirator:
    - 40 Hr Trained
    - Fit Test for Respirator
  - Air Testing for O2, Explosive Vapors, Organic Vapors (Fan can solve this need)

SHIVEHATTERY
ARCHITECTURE + ENGINEERING

PCS Disposal

- Place back in the Trench
- Testing requirements based on landfill and disposal method.
  - Landfill
    - Quick
    - Effective
    - Moderate to High Priced $25 - $150 Ton
    - Works best for Low Volumes of Soil
  - Landfarm
    - Soil must stay on site
    - Best choice if you have space
    - Basically wait for contaminates to evaporate
  - If you are within 100 miles of IA – check prices might be cheaper to haul it out of state

SHIVEHATTERY
ARCHITECTURE + ENGINEERING

PCS Disposal – Groundwater Disposal

- Vacuum Truck – haul offsite
- Send to Sanitary Sewer Plant
  - Depends on Community
  - Depends on their NPDES Permit
- Onsite Treatment system
- NPDES Permit and direct discharge
- Benzene is usually the target chemical
  - 5ppb is the target level
  - 5ppb = ½ tsp of benzene in a swimming pool

SHIVEHATTERY
ARCHITECTURE + ENGINEERING

UST Discovery

- Call IEMA 217-782-7860
- Call OFSM 217-785-1020

- If it is an Orphan (Unregistered Tank) you can leave it, may be liability issues.
  Or
- Get it registered
- Get a removal permit (OSFM)
- Get a certified removal assessor and the OSFM to witness
- Tank must be cleaned and rendered unusable

SHIVEHATTERY
ARCHITECTURE + ENGINEERING

Cost Recovery

- IL LUST Program – Brian Bower 217-782-3335
- Orphan Tanks in IL – No Money Available
- Must have a LUST Incident Number to even get Consideration
  - Reimbursement can take a long time
  - Reimbursement may only cover 1/4 to 1/3 of the total costs
- Timelines don't typically fit a project that have been delayed due to discovery
- Sorry no Superfund money

SHIVEHATTERY
ARCHITECTURE + ENGINEERING

Lessons Learned

- Do your homework – run an EDR report, or have a Phase I ESA done on the project area - know what is in your area – if its not documented you wont find it this way.
- Have an action plan for handling a petroleum
  - Who makes calls?
  - What do you do with the soil?
  - What do you do with any ground water?
- Contact IEMA ASAP
  - You won't have all the answers, you may not have many answers.
  - Have IEMA connect you with IEPA Emergency Response if needed.
  - If other state agencies need to be notified make sure you tell the IEMA operator
- Contact OSFM once a tank is found.
  - do not touch the tank without the OSFM present and a certified removal specialist.
- Paperwork
  - When a tank is found – you have certain timelines to make reports to IEPA
  - If you are not the owner – you can ignore (maybe) or elect not to proceed as an operator, you can remove without incurring liability for contamination.
- Keep good records – you will get FOIA's on this stuff.
- Have a Plan

THANK YOU – ANY QUESTIONS?

David Shafer, P.E., P.L.S.
Project Manager, Civil-Survey Team Leader
2103 Eastland Drive
Bloomington, IL 61704
309.662.8892 (office)
309.531.1217 (cell)
dshafer@shive-hattery.com

SHIVEHATTERY
ARCHITECTURE + ENGINEERING