United States Environmental Protection Agency
Region V
POLLUTION REPORT

Date: Thursday, July 30, 2015
From: Kevin Turner

To: Brian Schlieger, U.S. EPA
Jason El-Zein, U.S. EPA
Kevin McCormack, U. S. Coast Guard

Subject: Final
Hartford Area Hydrocarbon Plume Site
N. Olive Street, Hartford, IL
Latitude: 38.8361210
Longitude: -90.0951620

POLREP No.:	18	**Site #:**	
Reporting Period:		**D.O. #:**	
Start Date:	10/20/2003	**Response Authority:**	CERCLA/OPA
Mob Date:		**Response Type:**	Non-Time-Critical
Demob Date:		**NPL Status:**	Non NPL
Completion Date:	6/15/2015	**Incident Category:**	Removal Assessment
CERCLIS ID #:		**Contract #**	
RCRIS ID #:		**Reimbursable Account #**	
FPN#	E04503		

Site Description
Incident Category:

Removal Assessment/Investigation and Removal Action of a large subsurface petroleum plume created by releases from several pipelines and refineries in the area.

Location:

The Hartford Area Hydrocarbon Plume Site is located within the northern most half of the Village of Hartford, Illinois just east of Illinois Route 3 and the Mississippi River. The site boundary is defined by Olive Street to the east; Rand Avenue to the north; Old St. Louis Road to the west and Donna Drive to the south. Investigations have demonstrated that the free product plume footprint extends beyond the site boundary to the north and east. Furthermore, the western most edge of the plume is less than 0.41 miles from the eastern bank of the Mississippi River and may fluctuate closer depending on river levels. The site is 3.65 miles to the northeast of the confluence of the Missouri and Mississippi Rivers.

Description of threat:

Through the years, the Illinois Environmental Protection Agency (Illinois EPA), has documented dozens of releases of hydrocarbons to the environment. This has resulted in several million gallons of petroleum hydrocarbons including leaded gasoline, diesel fuel, jet fuel, and unrefined petroleum products released over a 30+ year period to form an extensive below ground plume. Those documented releases were from petroleum pipelines and adjacent site refinery operations.
Larger spills or those releases from pipelines are likely to follow established corridors toward the Mississippi River. These corridors may have been sewers, utilities, other pipelines or abandoned pipelines. Each refinery had Mississippi River docks with the associated pipeline facilities. Each pipeline is an easy corridor to the river. In addition, until the late 1970's, the city sewer system and the Valero [(former Premcor) (former Clark refinery)] industrial waste water sewer were one system. During heavy rain events (>2 inches) the entire system would be over loaded, bi-pass any treatment and discharge directly to the Mississippi River. Such an event could have resulted in a sudden flood of product to the river.
During sewer replacement projects on Watkins Street, Village of Hartford personnel found hydrocarbon vapors and residual oil product in the sewer. Based on this and conversations with Village Public Works personnel, it is known that liquid petroleum products are routinely in and around the sewers and that more recently recorded releases to the sewers occurred on 4/28/2000, 11/8/2000, 10/15/2001, 6/6/2002 and on 4/8/2003. Also, the Watkins Street sewer replacement project demonstrated the desecrated state of

the entire village sewer system. Much of the system is in a bad state of disrepair. A camera survey commissioned by the Village confirms this. When a pipeline break occurred, product can (and has) flowed directly into the sewer system. In addition, if the clean-up of a spill is not complete, than the product can (and has) seeped into the sewer at a slower rate.
The current subsurface gradient maps showed that depending on depth, groundwater (w/ product) flows in different directions during the various seasons. For example, one depth (or one sand layer) shows groundwater flowing more northeast. At another depth groundwater flows more northwest. Regionally, groundwater flows more northwest. In addition, depending on the time of year, the Mississippi River can either be a localized recharge of groundwater or a localized discharge of groundwater. With the proximity of the oil products to the Mississippi River and the known groundwater flow patterns, the potential for direct discharge through groundwater to the river has been great.
During heavy rainfall events and in conjunction with rising Mississippi River stages, petroleum vapors continue to accumulate under basements of those residential homes on top the below ground plume. Hydrocarbon odor complaints have been documented by the Illinois EPA since the mid-1960s. It has been further documented that house fires resulting from petroleum vapor intrusion have occurred in the past since the early 1970's.

Site background:

The adjacent refinery operations were constructed in 1941 by Wood River Oil and Refining Company. Since that time, the refinery has been owned and operated by Sinclair Oil Company, Clark Oil and Refining Company, Apex Oil Corporation, AOC Holdings, Inc., Clark Refining and Marketing, Premcor and Valero. Starting in 1953, additional buried pipelines were installed to facilitate the movement of products between the river terminal and the refinery. Since the 1960s, over 3 million plus gallons have been released from the various refineries and adjacent buried pipeline systems.
On November 20th, 1984, Apex Oil had an oil pipeline release which entered the Village of Hartford storm water sewer system creating a release of oil to the Mississippi River. U.S. Coast Guard, MSO St. Louis and Illinois EPA responded to the 1984 release.
In 1991, Clark Oil Company installed a soil vapor extraction (SVE) and free phase hydrocarbon recovery system. Until recently, the SVE system attempted to controlled vapor intrusion into residential homes in Hartford, Illinois. The free phase hydrocarbon recovery system is currently not operating to design performance standards. U.S. EPA has oversee project activities including operation and maintenance of the existing dual phase treatment system for hydrocarbon removed by the oil companies identified in the Administrative Order of Consent, (Docket No. V-W-03-C-XXX) and the ultimate final remedy.

State and local actions to date:

The Hartford Area Hydrocarbon Plume Site came to U.S. EPA, Removal Branch attention through the Illinois EPA. Illinois EPA had performed RCRA inspections and spill response support activities in the area since the 1970's. In June, 2003, Illinois EPA referred the Hartford Area Hydrocarbon Plume Site to U. S. EPA. Illinois EPA will continue to oversee clean-up activities within the established RCRA Corrective Action program for the adjacent refineries.

Current Activities
Response activities to date:

After a series of meetings with the Hartford Work Group respondents in the Summer/Fall of 2003, the U.S. EPA requested that Work Plans be submitted and site activities commence in advance of a final AOC.
To date, a total of approximately 2.33 million gallons of liquid equivalent petroleum have been recovered within the village. As documented in prior reports to the Hartford site approximately 1.20 million gallons of LNAPL via skimming operations and 1.16 million gallons via the expanded SVE system have been collected.

Vapor Related Activities:

Determined the status of current operations and maintenance activities regarding the existing soil vapor extraction (SVE) system including a series of vacuum tests to determine the vacuum influence exerted upon the vapor control boring's and corresponding vapor probes.

Provided control of vapors into selected residential living spaces by interim protection measures.

To date, a total of 173 homes have been inspected for "needs assessment" purposes. Of the 173 homes, 141 homes having some form of interim measures performed. It is important to note that homeowners

continue to “opt in” to the needs assessment program, albeit in limited numbers.

The Effectiveness Monitoring Plan has been approved for residential sampling with the exception of the Event-Based Monitoring section. A time series analysis completed in 2006 is being used to define an “event” for the Event-Based Monitoring section.

The HWG submitted the Phase 3 SVE Expansion Technical Memorandum outlining the expansion of the Area Wide Vapor Extraction System in North Hartford. Phase 3A field work began on October 3, 2006. The HWG completed Phase 3B SVE system expansion on June 25, 2007. Restoration of damage to asphalt and concrete roads was completed on July 3, 2007.

Due to seasonal changes of Mississippi River along with winter snow melt and rainfall events, sub-surface petroleum vapors can make it past the area-wide vapor control system (SVE) and have been detected under slab in as many as 17 residential properties. These vulnerable homes can require daily testing to verify that petroleum vapors are not affecting indoor air quality. U.S. EPA has tasked the Apex Oil Technical Team perform additional testing and sheltering of residents at a nearby hotel if it is determined that vapors are impacting indoor air quality.

Daily vapor control system operations and maintenance, SVE effective monitoring along with O & M of the in-home protective measures is performed by the Apex Technical Team.

SVE wells along West Forest and East Watkins have been shut-down due to the apparent removal of vapor mass from the southernmost portion (buffer zone) of vapors that resided in soil gas. The agency has requested ongoing testing through the various seasons to continually prove soil gas is devoid of petroleum vapors. Because of this decrease in mass hydrocarbon removal, HWG is currently only operating 2 thermal oxidizers units used for vapor destruction purposes.

In late October, 2011, the Hartford Community Center experienced a vapor intrusion event that was not forecasted by Mississippi River stage nor expected due to the current maintenance approach by the Apex Technical Team contractors. Several homes near the center of the plume also demonstrate vapor migration from deeper geologic zones to shallower zones. Further updates and evaluation of the Conceptual Site Model and the emphasis of the forthcoming remedy design are warranted.

Determine the status of current operations and maintenance activities regarding the existing SVE system including a series of vacuum tests to determine the vacuum influence exerted upon the vapor control boring’s and corresponding vapor probes.

The installation of a newly constructed vapor extraction well and a removal well for pilot testing purposes.

Control of vapors into selected residential living spaces by interim protection measures.

Investigation for petroleum pipelines and utility lines contaminant migration pathways.

Due to vapor intrusion into the Village of Hartford Community Center, an investigation to determine the cause and a series of vapor probes was installed adjacent to the Community Center was commissioned by the Hartford Working Group.

The U.S. EPA stipulated that elevated levels related to lower explosive limits were to be ventilated to mitigate the potential of explosive vapor concentrations invading into the Village sanitary sewer system.

Portions of a deteriorated sanitary sewer line along Watkins Street was replaced in April, 2004. This street has previously experienced a high frequency of residential vapor complaints. START observed and recorded oil impacted residuals that remained in the deteriorated municipal sewer line. The Village of Hartford has and will continue to reline the sanitary sewer mains in order to prevent the introduction of petroleum vapors into residential and community owned buildings.

Groundwater Related Activities:

Installed 5 sentinel wells for Village of Hartford wellhead protection purposes. These wells have been and will continue to be sampled with no impact discovered at this time. Data collection for the on-going and ever evolving conceptual site groundwater modeling purposes continues at this time. Investigation into the lateral extent of free product hydrocarbons with the HWG and Apex Oil companies has occurred and completed in various stages.

Investigated the lateral extent of free product hydrocarbons with the HWG recommended random optical

screening tool (ROST™) (2004/2005).

The HWG presented a conceptual site model (CSM) information. The CSM will be updated as data is collected and will help determine and measure the impacts to the area wide regional groundwater and Mississippi River (2006).

The pilot tests for free-phase product hydrocarbon removal using the H2A mobile high vacuum removal technologies were complete (2005/2006).

Dissolved phase well installations were completed in September, 2005. The Dissolved Phase Ground Water Investigation Report was submitted to U.S. EPA in January of 2006.

On July 31, 2006, the HWG submitted the LNAPL Active Recovery 90% Design Report for construction installation of a LNAPL removal system using "high vacuum extraction" technologies.

Initial installation of the manifold piping network started in the fall of 2006 with the construction installation of MPE pilot test wells to follow in the future.

Five Multi-Phase Extraction (MPE) wells were installed as part of the Area "A" Pilot Systems for removal of free-phase floating oil was completed in late 2008.

The Apex Technical Team has installed a petroleum product recovery well and 3 observation wells near there intersection of North Olive Street and East Forest Street.

The HWG received approval from three railroad rights-of-way operators to install a 2-inch HPDE plastic and 2-inch braided stainless steel flex-hose into an existing 10-inch petroleum pipeline used to transfer total produced fluids to the pilot system fluids treatment and storage compound were successfully installed in March of 2011.

On November 7, 2011, The Area A Pilot Study was initiated. This pilot study will compare a variety of product removal technologies to support the forthcoming remedy selection. Pilot testing of a multi-phase hydrocarbon pumping system utilizing "bio-slurping" technology is expected to start-up in May, 2004.

Review ROST™ data and evaluate the lateral extent of the free phase hydrocarbon plume. Oversee dissolved phase investigation activities.

USEPA and START oversaw the pilot testing for free product hydrocarbon removal using bio-slurping, dual-phase removal and focused groundwater cone-of-depression pumping techniques

General Project Activities:

A public availability session and U.S. EPA sponsored public meeting including presentation was held on March 19, 2004. Residents provided comments to a court reporter.

The U. S. EPA has participated in the development of a formal program with the local fire department to prepare for and respond to vapor intrusions through the 911 emergency notification system.

Daily Mississippi River gauge data is collected and compared with site groundwater monitoring wells and pressure transducers to better understand the hydraulic connection of impacted waters of the State with the River, and, to better understand the potential threats to the Mississippi River via active and abandoned sewers and pipeline corridors leading to the Mississippi River and surrounding surface water bodies. Furthermore, water gauge data is used to better understand the groundwater flow and migration towards the Mississippi River in comparison to the influences upon the regional groundwater pumping/consumption usage.

IEPA has issued a permit modification to the HWG existing air permit as related to the 4 high temperature thermal oxidizers used to destroy the extracted gasoline vapors. This approach will allow HWG to operate the SVE system at higher vacuum pressures to aid in the removal of groundwater from occluded wells; to better separate and manage groundwater being introduced into the SVE system with a new vapor liquid separator; and to utilize the current SVE manifold piping as the means to convey vapors and liquids from the "Area A" MPE pilot study area.

All IEPA permits have been transferred to Apex Oil as part of the transition.

The RCRA Corrective Action Branch has taken over the management of this project and is leading all

technical matters such as in-home sheltering of Hartford residents, gasoline vapor mitigation measures, residential and SVE system effectiveness monitoring, LNAPL removal and long-term dissolved phase concerns.

Community Relations Activities:

During the week of May 23, 2005, U. S. EPA went door-to-door to meet with homeowners who have yet to opt into the needs assessment program. U.S. EPA is confident that all new participants were identified by that effort and that little more can be done to increase homeowner participation beyond what is already being conducted by HWG agents.

A U. S. EPA sponsored press release was conducted on May 25, 2005, in cooperation with the HWG community relations spokesperson. Future press releases are anticipated.

U. S. EPA developed and mailed an "August, 2006 Fact Sheet" that was mailed to all residents in the Village of Hartford on August 2, 2006.

The agencies will continue to disseminate information to the public as required and address any questions that may arise. Development of new "Fact Sheets" and the dissemination of such to members of the public are anticipated for every phase of clean-up.

Documents maintained by the U.S. EPA in the official Administrative Record were up dated in January 2007 and April 2010. The Information Repository at the Village of Hartford Public Library was updated in January of 2007 and June of 2010. Adobe (PDF) versions of the project documents are available for public review during normal visiting hours at the Village of Hartford Library located on Hawthorne Street.

In August 2014 the U.S. EPA, Illinois EPA and Apex Oil held a public availability session to give residents an up-date of the clean-up activities.

In May 2015 the U.S. EPA, Illinois EPA and Apex Oil attended a Hartford Village board meeting as part of the transfer of responsibilities from HWG to Apex. At this meeting it was also announced that oversight of clean-up activities will now be through the U.S. EPA Region 5 RCRA Corrective Action Branch.

Regional Metrics

This is an Integrated River Assessment.

Miles of river systems cleaned and/or restored: None impacted. However, the Mississippi River is threatened due to the existence of a large subsurface plume in close proximity to Village of Hartford storm sewers which ultimately discharge into the river.
Cubic yards of contaminated sediments removed and/or capped: None impacted but threatened.
Gallons of oil/water recovered: 1,173,285 gallons equivalent This is from all recovery operations including SVE system operations
Acres of soil/sediment cleaned up in floodplains and riverbanks: None impacted.

Stand Alone Assessment
Number of contaminated residential yards cleaned up None.
Number of workers on site 24
Contaminant(s) of Concern: Petroleum Hydrocarbons

Oil Response Tracking
Estimated volume: Initial amount released 3 to 8 million gallons estimate
Final amount collected: 2,335,285 total gallons This total incorporates the total gallons recovered including prior to USEPA AOC managed site actions.
CANAPS Info:
FPN Ceiling Amount:

Body of Water affected: Mississippi River is threatened

Precedent-Setting HQ Consultations: NO
More than one PRP: YES
AOC: YES
UAO: YES

DOJ involved:	YES
Criminal Investigation Division involved:	NO
Tribal consultation or coordination or other issues:	NO
Statutory Exemption for $2 Million	NO
Hazmat Entry Conducted – Level A, B or C	NO
Community challenges or high involvement:	YES
Endangered Species Act / Essential Fish Habitat issues:	NO
Historic preservation issues:	NO
NPL site:	NO
Remote location:	NO
Extreme weather or abnormal field season:	YES
Congressional involvement:	NO
Statutory Exemption for 1 Year:	NO
Incident or Unified Command established:	NO
Radiological:	NO
Explosives:	NO
Residential impacts:	YES
Relocation (Temporary):	YES
Drinking water impacted:	YES
Environmental justice:	NO
High media interest:	YES
Active fire present:	NO
Actual air release (not threatened):	NO

Planned Removal Actions

Vapor Related Activities:

Future actions will include continued vapor removal utilizing the expanded SVE system will be conducted by Apex Oil Company and overseen by U.S. EPA, Region 5, RCRA Corrective Action Branch.

Groundwater Related Activities:

Groundwater related activities including monitoring and eventual clean-up will be overseen by U.S. EPA, Region 5, RCRA Corrective Action Branch.

Next Steps

U.S. EPA, Region 5, RCRA Corrective Action Branch has taken over the management of this project and is leading all technical and administrative matters for the continuation of this site clean-up.

Key Issues

Enforcement:

The U. S. EPA and the Hartford Working Group (HWG) negotiated an Administrative Order on Consent (AOC) which was signed on March 17, 2004. Initially, HWG consisted of Shell Oil, PREMCOR, and ARCO with Sinclair Oil joining later. Apex Oil Company declined offers to sign the AOC. The AOC required HWG to investigate the scope and nature of the contamination, implement interim measures, and to propose final remedies. The U. S. EPA prepared a response to public comments obtained during and after the public meetings along with the development of Fact Sheets that were disseminated to the public.

In April 2005, the U.S. Department of Justice filed a law suit against Apex Oil Company seeking to compel Apex to cooperate and participate in the Hartford cleanup. On July 6, 2006, the United States District Court for the Southern District of Illinois granted the United States motion for partial summary judgment against the Apex Oil Company. The remaining issues were tried before the bench beginning January 7, 2008, with testimony completed on February 6, 2008. Ultimately, the U.S. DOJ/U.S. EPA received a favorable decision on July 28, 2008, which was confirmed by the 7th Circuit Court of Appeals on August 25, 2009. The Supreme Court denied Apex Oil's Petition for a Writ of Certiorari on October 4, 2010. The result is that Apex Oil is now legally bound to complete the Hartford cleanup under U.S. EPA oversight.

U.S. EPA, HWG, the State of Illinois, and Apex Oil spent significant time during and after final resolution of the Apex Oil litigation trying to negotiate a Consent Decree which would require all the parties to cooperate and participate in the final cleanup of Hartford. Ultimately, those negotiations were

unsuccessful. Since the work required under the AOC with HWG is nearly completed, in the fall of 2014 U.S. EPA directed the parties to start transitioning all work at the site to Apex Oil as the only party under an order requiring complete cleanup of the site. As a result, as of June 1, 2015, Apex Oil now implements all work at the site.

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