



Activated Carbon - MGP Manufactured Gas Plants

A Presentation to the GTI Conference, TIGG, LLC.

Authored by: Michael Hasel Anthony Mazzoni Johyn Mahfood
PPL Service Corp. TIGG Corp. Corp. Env. Solution

From the early 1800's through the mid-1900's gas for lighting, heating and cooking was produced from coal or oil at manufactured gas plants (MGP). The MGP sites were built on the outskirts of towns that have since grown. Therefore the sites are often located in inner city areas.

The process which was used yielded residues that included tars, sludge, light oils, spent oxide waste, and other hydrocarbon products. Although many of these byproducts were recycled, excess residues remained at the site. The residues contain polyaromatic hydrocarbons (PAH) which are present in the base contaminant which is coal tar.

Approximately 1500 MGP sites have been designated to be cleaned up. The clean-up is triggered by regulatory pressure, mainly state agencies, property transfers and re-development as well as releases via ground water migration. Due to de-regulation, site clean-up may also be triggered by sale of a utility or of a specific utility site to other utilities.

When considering the remediation of a MGP site, the owner desires to have few or no problems, at the lowest cost, with the neighbors or government agencies, during the remediation operation. To achieve this goal there are many factors that need to be considered. These include, but are not limited to owner costs, public and government relations, present and future liabilities and type of remediation protocol to use.

The purpose of this paper is to discuss the pros and cons related to each of these factors when using one of three accepted options in conjunction with the "hog and haul" method of remediating a site. The options are the use of (1) minimal controls, (2) extensive onsite monitoring and (3) a fabric structure with limited air testing.

As we are all aware the government continues to react to public and media pressures relating to real or perceived environmentally caused health problems. So there is the possibility that new regulations will require more stringent guidelines for controlling emissions during the remediation operations and minimizing the need for further action in the future.

Regardless of the regulatory oversight and except for the most unusual of settings most MGP sites require a standard site investigation, risk evaluation and remediation often consisting of soils/materials excavation. At a minimum, the normal practice is to remove the extremely impacted (e.g., tar tanks, holders) soils for disposal/treatment. It is these soils that have the greatest impact to the environment and the neighborhood during a remedial action.

The complete remedial design is no longer limited to the evaluation of what technology, and their associated risks, to use for cleaning the site, but must also include the development of a comprehensive public relations campaign involving the neighbors, the media and the local government officials. Satisfying neighbor concerns is the center of the public relations effort. Their concerns are normally related to health, both during and after the clean-up, noise and property values.

The health concerns during remediation are usually related to odors and seeing personnel in moon suits. This is an indication to them that something is bad in the air. Both of these issues must be addressed or

the public will be upset. This then leads to more media coverage, more government scrutiny, an adverse impact on the company's image, and is likely to extend the time of the operation and increase costs.

Failure to manage risks for a single remediation could negatively impact the owner in many ways. This could lead to extensive regulatory review, negative P.R., and possible impacts on the stock value, applications for future permits, and future job siting (e.g., substation, power plants etc.). For regulated industries, it could even impact the rate case and reduce the ability to collect all or a portion of the costs from the ratepayer.

There are many technologies which are used to remediate MGP sites. Some of these are bio remediation, capping and slurry walls, stabilization, sheet piling and thermal treatment of the soil. However, the excavation and hauling technique, commonly referred to as "hog and haul", is an old idea but is still a core tool and is used alone or in conjunction with other technologies.

Whatever technology is used there are still factors which affect the success of the overall remedial operation. The weather, i.e. rain, snow, heat, wind and cold can cause delay in the operation if the site isn't covered. Also hours of operation could be limited by complaints about noise.

Following is a comparison of the three options which are used with the "hog and haul" technology:

1. Excavation with Limited Monitoring of Air

In this option there are minimal measurements of VOC emissions. Foam or plastic may be put down to help control vapor emissions and reduce complaints by residents. Monitoring may include the use of hand held PIDs.

Pros:

- This is the lowest cost approach
- Probably appropriate for rural areas and industrial complexes

Cons:

- Work delays due to weather or uncovering unexpected "hot spots"
- Variation in emissions could go undetected by monitor but detected by neighbors and thus complaints
- Lawsuits due to perceived health effects
- Regulatory control when done in suburban and urban areas
- Delays due to having to put down foam or plastic
- Extra costs due to change orders because of delays
- Public can be upset by odors and seeing moon suits

2. Excavation with Extensive Real Time Monitoring of Air Emissions

Real time VOC monitors are installed around the site. When the monitors detect a contaminant work activity is slowed or stopped. Monitors provide individual gas constituents.

Pros:

- Extensive monitoring can detect fugitive emissions
- Provides legally defensive monitoring data
- Can be used in suburban and urban settings

Cons:

- Work delays due to weather or uncovering unexpected "hot spots"
- Lawsuits due to perceived health effects

- Regulatory control when done in suburban and urban areas
- Delays due to having to put down foam or plastic
- Extra costs due to change orders because of delays
- Public can be upset by odors and seeing moon suits

3. Excavation under Fabric Structure and Limited Monitoring of Air

In this option a fabric structure is erected over the most contaminated area of the site. Garage doors, large enough to allow heavy equipment to enter the structure, along with mandos and lighting are installed in the structure.

The size and orientation of the structure is site specific and must take into account the work plan and truck traffic pattern. In addition to the structure, a well-designed air handling and purification system must be installed to capture VOC emissions generated within the structure and to allow workers to wear minimal personnel protection equipment. Generally the air purification system should be sized to provide 2-5 changes per hour.

Once erected and operational a fabric structure with a properly sized air purification system enables work to proceed in most weather conditions and prevents escape of contaminated air.



Fabric structures are built over contaminated areas at MGP sites.

Pros:

- Not affected by weather conditions
- Organics adsorbed on activated carbon so no odors released to atmosphere
- No visibility of operations
- Minimal visibility of personnel in moon suits
- Same cost as real time monitoring option
- Less noise
- Minimizes risk of lawsuits
- Structure can be moved to various locations on the site
- Better control of costs and schedule
- Much easier and more effective public relations

Cons:

- Presence of large visible structure
- A visible depiction of the foregoing discussion is presented in the accompanying table. The code for interpreting the presentation is as follows:
- Meets or exceeds objectives
- Meets objectives
- May not meet objective

As is obvious from the chart, the most solid black circles are shown under the structure option. The activities which are involved with this option are discussed below.

Evaluation of Concerns Associated with Site Operational Options

<u>Corporate</u>	<u>Execution of Limited Mandates of R/A</u>	<u>Execution of Limited Lead Time Mandates of R/A</u>	<u>Execution Under Structure of Limited Mandates of R/A</u>
• Liability Management			
○ Financial booking/cost	●	⊖	⊖
○ Minimizes current and future lawsuits	○	⊖	●
○ Defensible air data	⊖	●	⊖
• Image			
○ Stockholder interest	⊖	●	●
○ Customer/rate payer	○	⊖	●
○ Corporate Citizen	●	●	●
• Cost control			
○ Accurate budgets	⊖	⊖	●
○ Budget control	○	⊖	●
<u>Public/Local Government</u>			
• Public relations	⊖	●	●
• "Perceived risks" – odor, noise	○	⊖	●
• Potential future risks & toxicity standards	○	⊖	⊖
• Schedule	○	○	⊖
• Site security	⊖	⊖	●
<u>Regulators</u>			
• Compliance			
○ Air emissions	○	●	●
○ Soils management	⊖	⊖	⊖
○ Remedial objective	●	●	●

Objective:

Determine which and then select the operational option, when using the "hog and haul" technology, that would satisfy the Owner/Client, Regulators, and public to complete the R/A with minimal problems.

Conclusion:

The use of a fabric structure in a residential setting: allowed for the successful completion of the core goals and objectives of the remedial design.

Benefits of Using a Fabric Structure:

- A remedial plan to meet regulatory compliance
- Balances project cost with current and future liability controls
- Easier public and local buy-in for successful project completion
- Better control of costs and schedules versus other options
- No odors released to atmosphere
- Minimizes risk of lawsuits
- Not affected by weather conditions