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# Oversight News

Newsletter of the Commonwealth's Environmental Oversight of the Paducah Gaseous Diffusion Plant (PGDP)

Kentucky Department for Environmental Protection  
Division of Waste Management  
Hazardous Waste Branch  
Paducah Gaseous Diffusion Plant Section

## Progress Toward Reducing PGDP Continues with Demolition of C-340 Complex

The demolition of the C-340 Metals Plant was completed in February 2013. The demolition process took approximately 17 months to complete. This process included the stabilizing of internal process systems within the facility, removal of existing chemical hazards, including removal of polychlorinated biphenyls (PCBs), radioactive materials, and asbestos-containing materials as well as removal and disposal of equipment and infrastructure.

*This is a major accomplishment toward cleaning up the site," said Rob Seifert, Department of Energy (DOE) Paducah project manager. "Safe, compliant, timely and efficient removal of these types of facilities is a priority for DOE."*

The C-340 facility originally operated from 1953 until the mid-1980s, during which depleted uranium hexafluoride was converted to uranium metal or uranium tetrafluoride, also known as green salt. Accelerated cleanup under the [American Recovery and Reinvestment Act](#) previously allowed for removal of more than 100,000 cubic feet of systems waste, enough to fill roughly 200 dump trucks. The Metals



Plant was declared demolition-ready in early August 2011, avoiding \$2.5 million in inflationary costs by being cleaned up five years ahead of schedule.

While other structures and facilities at the PGDP will require future decontamination and decommissioning, the only remaining inactive facility currently undergoing Decontamination and Decommissioning (D&D) activities is the C-410/C-420 Feed Plant, which is scheduled for completion in 2015.

## PGDP Beginning Closure Activities

DOE announced in May 2013 that the PGDP would be closing, bringing to an end over six decades of uranium enrichment activities conducted at the site. The facility opened in 1952 to enrich uranium for military reactors and evolved into producing reactor-grade uranium for civilian reactors in the 1960s. The current operator, USEC Inc., announced in May 2013 that it would no longer be operating the facility

under a contract with the U.S. Department of Energy which had been in place since July 1993. The closing will lead to significant reductions in the 1,200-person PGDP work force.

The closure of the PGDP facility will not include the termination of current and future efforts to mitigate and remediate PGDP-related contamination and reduce the inventory of

existing uranium manufacturing structures at the site through the decontamination and decommissioning (D&D) process.

DOE is considering possible proposed future uses of portions of the PGDP facility and has received inquiries and proposals for future use of the PGDP site, but has not yet indicated any plans for the future use of the PGDP site.

## Plans Continue for a Possible Onsite Disposal Facility at PGDP

In early 2000, the U.S. Department of Energy (DOE) began considering the construction of an on-site CERCLA waste repository (*i.e.*, CERCLA landfill) to permanently dispose of remediation and decontamination and decommissioning (D&D) wastes generated at the Paducah Gaseous Diffusion Plant (PGDP). This approach to waste disposal is consistent with the approach utilized at several other DOE sites around the country, including the Oak Ridge Reservation in Tennessee and the Hanford site in Washington State. As much as 3.7 million cubic yards of waste are likely to be generated at the PGDP facility during the next several decades. Most of the waste generated will be when the large process buildings are demolished. An on-site repository located at PGDP would allow the site to safely dispose of non-hazardous, hazardous, TSCA, low level radioactive, and low level radioactive mixed wastes onsite. A second, potentially more expensive alternative to waste disposal would be to ship the waste offsite to a DOE owned or commercial waste facility.

DOE issued a first draft of a waste disposal alternatives feasibility study

in May 2012. The feasibility study details the various waste disposal options potentially available to the site. These options are grouped into the broad categories of onsite disposal versus offsite disposal. Since it is somewhat uncertain how much waste will actually require disposal, both the onsite and offsite alternatives are further broken



### Weldon Springs, Missouri Waste Disposal Facility

down into subcategories based upon certain assumptions.

For instance, the base case subcategory assumes that some of the waste generated will go to an existing onsite solid waste landfill — this assumes that the waste conforms to accepted contamination limits for the landfill. The high volume subcategory assumes that

this landfill will not be available for use and that all waste will require disposal in an onsite cell or transport and subsequent disposition in an offsite landfill. Kentucky and the U.S. Environmental Protection Agency are working with DOE to finalize the feasibility study under review. Following finalization of the feasibility study, DOE will issue a Proposed Plan that will include a description of the preferred alternative. The public will then be asked to provide input regarding this preferred alternative.

If the onsite option is selected as the preferred alternative and subsequently selected in a Record of Decision then a new landfill will be constructed at the PGDP. As currently envisioned, this landfill would likely be constructed in stages in order to accommodate waste as it is generated. In time, the landfill would receive a final cap that would serve to isolate the waste from infiltrating rainwater and from anyone that might otherwise inadvertently come into contact with the buried waste. The landfill would then need to be monitored to ensure that it maintains its integrity over time. A decision as to whether the onsite option is selected is expected sometime in 2014.

### William Turpin Ballard (1954-2013)

Turpin Ballard, of the Federal Facilities Branch of EPA Region IV Superfund Division, passed away on Thursday, April 25, 2013 after a brief illness.

Turpin was a valuable contributor to various environmental remediation projects at the PGDP and also frequently attended the Paducah



Citizens Activity Board (CAB) meetings. Mr. Ballard was a veteran, enjoyed Celtic and Scottish music and traditions, and was known for hand crafting fine leather sporrans (front pouch to kilts).

Turpin will be sorely missed. Our thoughts and best wishes are with his family.

## OREIS Results Update

Kentucky continues to collect soil and groundwater samples at the PGDP as part of the Agreement in Principal (AIP) grant program supported by DOE. From January to December 2012, 47 sets of environmental data associated with the Paducah Gaseous Diffusion Plant (PGDP) were sent to Los Alamos Technical Associates of Kentucky (LATAKY) to be added to the Oak Ridge Environmental Information System (OREIS) database.

All of the samples were collected by Kentucky Division of Waste Management (KDWM) personnel. Eight sample sets were split with the U.S. Department of Energy (DOE). The KDWM uses an independent laboratory for all analyses except Gross Alpha and Gross Beta which is analyzed for by the Cabinet for Health and Family Services (CHFS) of Frankfort, Kentucky.

Use the Acronyms/Key to “decipher” the OREIS Project Codes below.

### OREIS      Project Description

AIPSOSL1012-1	October 2012 Soil Sampling event 1
AIPSOSL1012-2	October 2012 Soil Sampling event 2
AIPTWNA0312	March 2012 DI water sample
AIPWGMW0112	January 2012 Monitoring Well Sampling Event
AIPWGMW0112-1	January 2012 Monitoring Well Sampling Event
AIPWGMW0112-2	January 2012 Monitoring Well Sampling Event
AIPWGMW0112-3	January 2012 Monitoring Well

	Sampling Event
AIPWGMW0212	February 2012 Monitoring Well Sampling Event
AIPWGMW0212-1	February 2012 Monitoring Well Sampling Event
AIPWGMW0212-3	February 2012 Monitoring Well Sampling Event
AIPWGMW0212-4	February 2012 Monitoring Well Sampling Event
AIPWGMW0312	March 2012 Monitoring Well Sampling Event
AIPWGMW0312-1	March 2012 Monitoring Well Sampling Event
AIPWGMW0312SPLIT	March 2012 Monitoring Well Sampling Event Split
AIPWGMW0312SPLIT-1	March 2012 Monitoring Well Sampling Event Split
AIPWGMW0412	April 2012 Monitoring Well Sampling Event
AIPWGMW0412-1	April 2012 Monitoring Well Sampling Event
AIPWGMW0412-2	April 2012 Monitoring Well Sampling Event
AIPWGMW0412SPLIT	April 2012 Monitoring Well Sampling Event Split
AIPWGMW0512	May 2012 Monitoring Well Sampling Event

### ACRONYMS/Key

AIP – Agreement in Principal
WG – Groundwater
MW – Monitoring Well
WS – Surface Water
CB – Catch Basin (sediment basin outlet)
CH – Channel/Ditch
SO – Soil
SL – Surface Location
NA – Not Available
RV – River/Stream
RW – Residential Well
TW – Treated Water
<u>Numbers</u> – 1 <sup>st</sup> – month, 2 <sup>nd</sup> year
01 – 1 <sup>st</sup> month (January)
02 – 2 <sup>nd</sup> month (February)
03 – 3 <sup>rd</sup> month (March)
04 – 4 <sup>th</sup> month (April)
05 – 5 <sup>th</sup> month (May)
06 – 6 <sup>th</sup> month (June)
07 – 7 <sup>th</sup> month (July)
10 – 10 <sup>th</sup> month (October)
11 – 11 <sup>th</sup> month (November)
12 – 12 <sup>th</sup> month (December)

## First Use of Passive Gas Samplers at SWMU 4

Passive gas sampling technology was used for the first time at the PGDP to guide subsequent intrusive sampling efforts for volatile organics at Solid Waste Management Unit (SWMU) 4, a burial ground facility that is currently undergoing site investigation and remediation as part of the PGDP’s CERCLA cleanup activities. Last September, a total of 65 Beacon Environmental passive gas samplers were deployed in the top foot of soil at both biased and unbiased locations across SWMU 4.

A total of 48 samplers were placed on a 75 foot grid across the SWMU. Seventeen additional samplers were placed in locations of particular interest in the SWMU.

These were generally locations where historical subsurface samples had shown high volatile organic compound (VOC) results. The samplers were retrieved and shipped to Beacon for analysis two weeks later.

Each sampler consists of a small borosilicate glass vial containing hydrophobic adsorbent cartridges, with a length of wire attached for vial retrieval. The sampler is placed 12 to 14 inches deep in a pre-drilled three foot deep hole. The reporting limit for all volatile organic compounds was 25 nanograms.

Most of the samplers returned results less than the reporting limit; however, two showed the presence of BTEX compounds, two showed the presence of TCE and one showed the presence of Freon 113.

The data gathered from this effort was used to direct the next phase of intrusive sampling at SWMU 4. Positive results guided where to concentrate the sampling effort and negative results helped to eliminate locations where sampling is not needed.

## Southwest Plume SWMU 1 Treatment Update

DOE, the Kentucky Division of Waste Management and the U.S. EPA are working to finalize the design for a remedial action to be implemented in an area where oils and other hazardous substances were once tilled into the ground. The area in question is known as the SWMU 1 C-747-C Oil Landfarm. From 1973 to 1979 this site was used for the disposal of waste oils and other such associated contaminants as trichloroethene (TCE), PCBs, and uranium. Under the right conditions, waste oils will readily degrade when

mixed in with the soil. Other contaminants such as TCE (a probable human carcinogen) can break down overtime but usually do so more slowly.

This is particularly true for TCE in the form of a Dense Non-Aqueous Phase (DNAPL) liquid, a concentrated form of the chemical. Deep Soil Mixing (DSM) is the technology that has been selected to remediate TCE DNAPL, which are believed to be present in the soils at SWMU 1. DSM is intended to remove TCE from the

subsurface within the more highly contaminated portions of the landfarm. The technology utilizes a large eight-foot diameter mixing paddle attached to the end of a long rod to actually mix the soil in place, sort of like mixing mashed potatoes. At SWMU 1 this mixing action will be combined with the injection of hot steam and iron fillings to ensure the most aggressive treatment possible. TCE in contact with hot steam will volatilize (turn into a vapor) and then rise to the surface with the steam where it can be captured and

later treated. DSM technology has been used at other locations around the U.S. with favorable results. Treatment at SWMU 1 is envisioned to be at least a two-step process. Treatment using DSM will be followed by another remedial action that will address those soil-based contaminants that cannot be removed using DSM.

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**The mission of the Kentucky Division of Waste Management is to protect human health and the environment by minimizing adverse impacts on all citizens of the Commonwealth through the development of fair, equitable, and effective waste management programs.**



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### Kentucky Department for Environmental Protection

Kentucky Environmental Oversight News is published quarterly by the Kentucky Department for Environmental Protection's Division of Waste Management. It features information regarding environmental cleanup activities at the Paducah Gaseous Diffusion Plant site and related topics. Additional information is available from:

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*Photographs courtesy of KDEP and DOE*