

**Meeting of the Decommissioning Project Community Workgroup (#28)
Tuesday, August 8, 2006
Huron Public Library**

The meeting began at 7 p.m. Present were Workgroup members John Blakeman, Anne Hinton, Rick Myosky, Ralph Roshong, Bob Speers and Dave Stein. NASA representatives attending were: Keith Peecook, Acting Decommissioning Project Manager; Peter Kolb, Project Environmental Manager and Sally Harrington, Glenn Public Affairs Specialist. Also present were Bob and Ruth Haag, and Ben Patterson, of Haag Environmental; and Susan Santos and Michael Morgan of FOCUS GROUP. There were seven members of the public in attendance, including Sandusky City Commissioner Dave Waddington and NASA retirees Jack Crooks and Len Homyak.

Keith Peecook provided welcoming remarks, then Susan Santos of FOCUS GROUP asked the group for, and received, acceptance of the minutes from the April meeting before briefly reviewing the August meeting agenda.

Project Update

Keith gave a presentation on current site work taking place on the Decommissioning Project. He said work has focused mainly on four areas, which he described as “risk reduction activities.” They include: the decontamination and subsequent surveying of the Hot Cells; the cleaning and surveying of embedded piping; site-wide characterization of radiation throughout the Reactor Facility and off-site sampling in and around Plum Brook and other area bodies of water. He noted that all of these activities are ongoing and are all “helping to supply information necessary” to support the Statement of Work that must be prepared in order to bid out what he termed “the completion contract,” which he expects to have issued in 2007 and will focus on completing all project work by the end of 2010.

Hot Cells

The Hot Cells are seven rooms located in the Hot Lab Building (adjacent to the Reactor Building), once used to analyze the results of experiments conducted when the reactor was operational. Keith reported that Hot Cell, #1 the largest (containing 40% of the total Hot Cell area) and the most contaminated, is being successfully decontaminated, and that work was going to continue there through the end of the month. He noted that workers in Hot Cell #1 had removed all its fixed equipment, including four 20-ton concrete slabs that comprised its roof. The roof slabs were cleaned and then sent to a Plum Brook Station subcontractor, which broke up the slabs into small pieces and took them to a licensed landfill for disposal.

Workers also removed from the cell a stainless steel liner that had covered the walls and floor of the room, as well as two leaded-glass, protective windows, each four feet thick and weighing more than 500 pounds. They removed the glass, “size-reducing” it with mallets, and temporarily storing it in 55-gallon containers. The workers also removed all the seven other windows in the Hot Cells, as well as one from the Hot Lab and one from

a below ground area formerly known as Hot Dry Storage (HDS). Highly irradiated equipment and tools once used for reactor experiments were removed from the HDS last year. Eventually, NASA will ship the window glass to a licensed disposal facility as mixed waste, a combination of low-level radioactive waste and lead. In addition to the glass, each window contained about 1,000 pounds of lead and wool that had provided additional shielding when the reactor was operational.

Keith said work in Hot Cell #1 was an indicator as to what approach NASA would take in terms of contamination in the other Hot Cells, and NASA has been analyzing the cost for decontamination versus demolishing the rooms and packaging the various material as low-level radioactive waste (LLRW), for disposal at a licensed facility, an approach known as “rip and ship.” He said the latter approach would increase disposal costs, but result in lower decontamination costs, and also shorten the project work schedule.

Keith stated that the Decommissioning Team members had to ask themselves “can we decontaminate this cell and pass the Final Status Survey?” The latter is a comprehensive sampling and analysis process that serves as the test that will demonstrate that NASA has achieved its project cleanup goals, successfully removing all residual radioactivity – on an isotope by isotope basis – across the 27-acre Reactor Facility site. As part of this process, decontamination workers are “scabbling” the walls of Hot Cell #1, using a jackhammer-like device to scrape away the concrete, a quarter inch at a time, and then surveying the concrete underneath to make sure it meets cleanup levels. Other Hot Cell decontamination work has included cleaning both 1,000 feet of piping and electrical conduits. Based on what he has seen so far, Keith said he is confident that NASA can continue to successfully decontaminate the Hot Cells, observing, “It looks like we’ll be successful in reaching our DCGL’s,” referencing the Derived Concentration Guideline Levels. These estimate what each individual isotope’s level needs to be, so when they are all added together at the end of the project, the total will not exceed the project cleanup goal of 25 millirem per year.

Embedded Piping

Keith reported that the decontamination and surveying of embedded piping – pipes encased in concrete and as much as 25 feet below ground in Reactor Facility buildings – “has gone very well.” But he said NASA had determined that “there were pipes (in the buildings) that were more not in the original (engineering) drawings of the facility” – such that “we found 20% additional piping” to be cleaned, making the total that must be completed closer to 2.5 miles than the originally estimated 2.2 miles. To date, he said, nearly 9,000 feet (closing in on 2 miles) has been successfully cleaned and surveyed. Keith added that most of the residual contamination is in the form of rust inside the pipes and that NASA had been successful in cleaning nearly all of it by mechanical means, using a “chain flail that rotated through the piping...knocking the dust off” for vacuuming. The piping is then surveyed to ensure that it meets cleanup levels. He said that just about 300 feet to date would need additional cleaning to meet the DCGL’s, using the hydrolaze, a high-power (20,000 pounds per square inch) pressure washer. He also noted that in the process of the cleaning, NASA has engaged in some “engineering on the

fly,” developing a special cleaning device mounted on wheels to clean inside the largest pipes, which are 24 inches in diameter.

Keith said that regardless of the cleaning methods employed, all cleaned piping is again surveyed, and then filled with grout to immobilize it. He reported that, to date, workers had completed cleaning and surveying embedded piping in three buildings – the Reactor, Reactor Office and Laboratory and Service Equipment Buildings – with work now progressing in the Fan House and Waste Handling Buildings. Keith estimated that all of this would be completed this October or November.

Characterization Activity

Keith reported that NASA was continuing its progress on ongoing characterization throughout the Reactor Facility, especially in the walls of the former quadrants and canals in the Reactor Building. He explained that characterization is a matter of “going out and seeing what you have” in terms of existing radiation and “knowing what isotopes are there.” He noted that, within the Reactor Facility fence line, there had once been two chemical spills, occurring between the Primary Pump House and the Waste Handling Building, adding that these “spill areas have been scoped” and found to be clean. Other outdoor areas monitored included roadways, driveways and parking areas, some located within the Reactor Facility and some located outside the facility but within the Plum Brook Station (PBS) fence line. Here NASA conducted 85 of what he termed “core borings,” samples of the pavement, and all “came back clean.”

He also said that in the Reactor Building, the walls in the former quadrants and canals had been covered with a fiberglass matting, coated with an epoxy paint, which served to protect the concrete in the walls. But the bonding material (“mastic”) used to fasten the fiberglass to the walls contained asbestos, which had to be removed before NASA could conduct core borings into the walls to determine how much contamination there was in the concrete. Keith said there had been 365 “targeted spots” on the walls, where there had been slightly elevated readings, and that removal of the asbestos had to take place before core borings could be taken. But he added that there was good news in that “There were only 20 spots with any contamination” and these were cleaned “with one pass” of the scabbling tool. He added that in one location, the Hot Pipe Tunnel, workers had also conducted core borings and “found a corner” of the structure that had a crack containing some contamination. He said NASA is continuing to “chase the crack” to determine the extent of the contamination, but did not believe it goes very deep. He also pointed out that “All our data shows that cleaning toward (the goal of) decontamination being effective.”

Cadmium Control Rods

Keith next addressed the status of some steel control rods that were once employed in regulating the reactor, and had been found in the Hot Dry Storage Area. The rods had radiation levels above the so-called Class A waste (which contains the lowest levels; most waste from the Decommissioning is Class A) sent to the Energy Solutions (formerly Envirocare) disposal facility in Utah. However, because these rods also contained cadmium, they could not be accepted at the disposal facility at Barnwell, South Carolina,

where the project's higher-level waste (Class B & C) had been sent, since Barnwell does not accept so-called "mixed waste." Thus, NASA has been storing the rods in steel liners, placed inside an 80,000 pound concrete cask on PBS land.

Keith reported that because the PBS Reactor Facility had originally been regulated by the former Atomic Energy Commission, now the Department of Energy (DOE), NASA expects to be able to move the rods for storage at the DOE's Nevada Test Site. He said he is developing a Statement of Work that will lead to a contract to move the rods, with the work expected to take place some time this fall.

Future Activity

Keith discussed what he expected to take place on the Decommissioning Project, over the next six months, saying again that he expects the embedded piping work to be completed by November. He also said that his "inclination is to clean up" Hot Cells 2-7, terming this work "our biggest technical challenge" but anticipating that decontamination efforts will continue to be successful. He added that sampling (the last bits of characterization) in the Containment Vessel and surveying work regarding the off-site Plum Brook levels would also take place. This work, he said, would be done to "support the RFP (Request for Proposals)" that would lead to the issuance of a Completion Contract for the remaining major decommissioning work. He expected that it will be issued early in Contract Year 2007, with work expected to start next October.

Keith added that a Statement of Work would be developed for the cleanup of Pentolite Ditch, anticipating that this work would begin in the fall of 2007. Finally, he said he expected that the cadmium containing control rods, and the other mixed waste (the leaded glass) would be shipped to disposal facilities this fall. He expected that all decommissioning work will be completed by the end of 2010.

Plum Brook Off-site Sampling

Keith said NASA had submitted a Final Status Survey (FSS) Plan to the US Nuclear Regulatory Commission (NRC) in December 2004, explaining that the FSS says "These are our cleanup levels, how we derived them and how we will clean and survey to reach the 25 millrem" per year level. He added that NASA sent the NRC a Revised Plan in May and that "The NRC is just starting to look at it." In the plan, he explained, "We wrote that we would apply the same cleanup levels we use onsite to the cleanup of off-site sediment adjacent to Plum Brook, terming it "a very conservative cleanup level."

Last November, NASA began work on an extensive off-site sampling program, taking 1,223 samples of Plum Brook sediment, completing the sampling and subsequent analysis in early April. The average reading per sample was below 3 picocuries per gram. There were a few areas with elevated readings of one specific isotope – Cesium 137 – above the range of 12-14 picocuries per gram, the proposed cleanup level for Cesium on the Decommissioning Project. Two types of samples were taken: 747 random and 367 targeted, along with another group of 109 samples "split" for analysis at outside labs

contracted by NASA, to perform independent quality control. Split samples were also taken for analysis by NRC and ODH labs. NASA used very sensitive instruments to identify the presence of any radioactivity above 300 counts per minute, equivalent to 6 picocuries per gram. The results of all samples – those analyzed by NASA and those “split” with other agencies – were consistent and there was no health risk to the public, including children in any of the levels found; and over 60 percent of all the samples were below background levels. Only 20 of the 1,223 total samples exceeded the 12-14.7 picocuries range. NASA subsequently undertook additional sampling in a fifth area, between U.S. 250 and Ohio Route 2; and in late spring, began working with a Sandusky hydrogeologist, Bob Haag (of Haag Environmental), to help identify if there are any other specific areas where contamination may have moved downstream.

At the August Workgroup meeting, Keith said the NRC and the Ohio Department of Health were still analyzing the sampling results, and reiterated that NASA would work with these agencies on any cleanup steps. He anticipated, however, that NASA would undertake spot cleanup of the elevated levels in isolated areas, using shovels and buckets. He added that NASA must clean up the on-site Pentolite Ditch (next summer) before undertaking any Plum Brook off-site cleanup. Keith then observed that NASA was happy to have found “people with the talents we needed, locally” and introduced Bob Haag for an off-site sampling presentation.

Bob discussed the “first step” he had taken with NASA, addressing the question of “where we should be looking,” then adding that his company and NASA had reviewed all the available hydrogeological information, and the period in which the Reactor Facility operated (1962-73). After the review, “we formulated a plan that we will execute,” and came to “conclusions on how and where to sample.” He noted that Cesium-137 “sticks to clay (sediment), so wherever the clay goes, we follow the clay.” He also pointed out that since the pinhole leak in a Plum Brook reactor fuel rod, which resulted in the off-site Cesium levels, took place in October 1968, a number of floods have occurred and have carried the Cesium “a long way...to East Sandusky Bay.” Haag said the new sampling program would examine “seven different environments,” where the sediment has been carried, including:

- Dredged Pentolite Ditch Sediment
- Backwaters (such as culverts where there had been flooding)
- Streams
- Open Water
- East Sandusky Bay
- Wetlands
- Groundwater

Bob noted that the sampling would entail surface scanning with sodium iodide monitors (which had been used in the previous sampling), and the testing of core samples. He said the sample that “contributes the highest reading” would be taken to NASA’s on-site laboratory, to be tested both quantitatively and qualitatively, explaining that “NASA needs quantitative results – how much Cesium is there.” He added that the uses for the expected testing results would be to:

- Define the limits of the current Cesium extent
- Define where the Cesium is moving
- Define where the Cesium is coming to rest
- Help decide where remediation is appropriate

Bob explained that the sampling and analysis would show “how clays are transported. He also explained how the drainage system at the Plum Brook Reactor Facility (PBRF) worked, with water from the Emergency Retention Basin, passing through Pentolite Ditch and exiting through the Waste Effluent Monitoring System (WEMS) and said that on 150 occasions when the reactor was operational, it was necessary to stop the reactor and “drain some water down and process it through the WEMS.” He said he was working with NASA retiree Jack Crooks to track how much water was discharged over the course of time, which would “give us a total amount of Cesium to look for.” Then, he said that over the years, most sediment transport had occurred as the result of floods, such as the 1969 Huron River flood, adding that there had been flooding in culverts on Galloway and Bogart Roads and that “Cesium dissolves in water.” Thus, the coarsest sediment would be found at the bottom of streams in the form of “varves” and each quarter inch of thickness would represent “a whole year of deposition.” Keith asked if the varve would be thicker for the year 1969, “since it was a flood year,” with Bob responding affirmatively, noting “the coarser the material, the bigger the flood events.”

Bob talked about other areas that will be sampled, including East Sandusky Bay, observing that there had been “open water changes” in the bay over the past 102 years, and showing area maps from 1904, 1941 and 1969. He noted that the Bay had far less standing water in 1904 than there is today and that, back then, water from Plum Brook would have discharged “into a land-based marsh,” while in 1941, the water would have flowed from pond to pond.” He also examined Lake Erie water levels from a number of years and said it was particularly low during the early years of PBRF operation (when Plum Brook water would have discharged into marshes), and higher in the later years (when Plum Brook water would have discharged into standing water). He pointed out that “wetlands can capture and release sediment, while marshes tend to hold contaminants for a while, then let them go.”

Bob discussed a number of the area’s “protected lands” under the control of the Ohio Department of Natural Resources (ODNR) and Erie MetroParks, and “sediment patterns” to East Sandusky Bay – and how the patterns have changed over the years. NASA retiree Len Homyak asked if the low-level Cesium contamination was “very close to background” levels. Keith confirmed this, adding, “We still have some questions. ODH says it does not see (contamination) interaction with groundwater, but they want us to prove it to the public.” He also pointed out that, while some material has migrated to East Sandusky Bay and Haag Environmental will sample groundwater for this reason, “the good news is that (Cesium) is so diffuse that we don’t expect to see any high levels.” Bob added, “We have to continue to look at groundwater, but groundwater does not carry a lot of clay and we do not expect to find” any Cesium there.

Bob further discussed groundwater, noting that the US Army Corps of Engineers had analyzed groundwater in limestone on the Ordnance Works cleanup project at Plum Brook Station (note: this project is separate from the PBRF Decommissioning and other NASA projects) – and that limestone fractures are a normal pattern in bedrock, with water following normal fractures. He mentioned the possibility of finding karst (sinkholes) in some bodies of water, such as the Blue Hole of Castalia, explaining that in these cases, “fractures have become cavities.” Bob said if karst is found, it may mean that water flow in the fractures would flow north to the Wagner Quarries. If this occurs, he said, “We’d have to look at clays in the groundwater.” He added that he also does not expect this to be the case, “but it could have happened.”

Bob then talked about the various environments that would be examined under the new sampling program, with work expected to begin later in August. They included:

Meandering Streams – He said that Plum Brook runs “from left to right” and that there may be “random spots with slightly elevated (Cesium) concentration.” He added that these were likely to be found “at the water’s edge,” explaining that “This does not mean the water has radiation, but that the soil has some outcropping.”

Backwater Areas – Bob said some sediment buildup would be found at culverts and the testing would show “how big an area would back up” in a flood. He said “We will scan at right angles to the brook, where floodwaters deposit sediment on the edges.” He added that the sampling would look for Cesium in excess of “300 counts per minute” (the equivalent of 6 picocuries per gram, less than half the proposed cleanup level) and that he did not expect to take any surface water samples. There has been no contamination in Plum Brook surface water, only some of the sediment.

Bob also touched upon sampling strategies, which will include “scan profiles, surface composites and culvert-front samples.” Testing equipment used will include a “gamma logger,” a steel tube device that will be inserted into a “bore hole” in the shale (similar to what oil field workers use). He noted that “Plum Brook shale has high naturally-occurring radiation.” Haag will also conduct layer sampling, to find the layer of clay that developed during the years of PBRF operation (1962-73). Out in East Sandusky Bay, he said the team would “try to find a pattern” of sediment deposits, “looking for delta type deposits” in shallow water and “out deeper, for varves.” In groundwater, Haag Environmental will also be “looking for clays.” He noted that there are still two groundwater wells at the PBRF and that when the latter was operational, workers had to “raise the pump every year because of sediment,” and thus, the “sediment in the wells represents the operating period of the Reactor Facility.” Bob added that in the groundwater, he expects to find “black, oily sediment, but not radiation.”

Keith said the sampling protocol Haag Environmental expects to employ will be the same as that for the previous Plum Brook sampling, and will include obtaining written permission from all property owners for access to sample. Bob added that the sampling project would take between four and six months.

Community Relations Update

Sally Harrington reported that the most recent edition of the Decommissioning Newsletter had been sent to 2,300 NASA mailing list members in mid-June and that the next will be published in early October. As has been true in recent years, this edition will be larger sized, containing a pictorial centerfold depicting project accomplishments during 2006. She also noted that the US Army has been conducting some parachute testing at the PBS Space Power Facility, with Keith adding that tests were intended to simulate altitude conditions at 60,000 feet. Sally also pointed out that NASA would be conducting new testing at the PBS active facilities as part of the new Constellation Program for space exploration.

The next Workgroup meeting will take place on Wednesday, October 18 at 5:30 p.m. (with a light supper available, starting at 5:15 p.m.), immediately preceding the annual Decommissioning Community Information Session (CIS), which starts at 7 p.m. It will be held at the Engineering Building at NASA Plum Brook Station (PBS). Sally emphasized that the event will not be an Open House in the manner of what took place in 1999; but she noted that, in addition to Decommissioning Project displays and a presentation by Keith, there would be a display on upcoming NASA PBS testing work and a presentation by PBS Chief of Operations Rich Kunath. Sally also pointed out that all attendees at the CIS must be US citizens and all people age 18 or over must show PBS Security a driver's license or other valid photo identification, in order to be admitted to PBS. In addition, all visitors' cars are subject to random search by PBS Security.

Workgroup Issues

Susan Santos noted that Workgroup member John Blakeman has been hired by the NASA Plum Brook Station Operations Support Group as a landscape and vegetation consultant. He had offered to resign from the Workgroup if his work presented a conflict of interest, but Keith and Sally agreed with FOCUS GROUP that his new duties did not conflict with his Workgroup participation. Thus, John, NASA and his fellow members were happy that he would be remaining with the Workgroup. Susan added that NASA was always looking for good potential Workgroup members as openings develop.

Susan, Keith, Sally and the Workgroup agreed that the topics for the next meeting would include a Project Update and an Off-site Sampling Update. Susan invited Workgroup members to contact FOCUS GROUP if they had any questions or suggestions on topics.

The meeting adjourned at 8:30 p.m.