

From: Hunter, Jeffrey L

Sent: Friday, July 20, 2007 1:46 PM

Subject: ALARA Center Activities for Week of July 16, 2007

Attachments: INVITE 2008 all.doc; Vac filter for Hot Spot.JPG; HPS MON Talk 071207.pdf; CSU HPS 2007 THAM-C Presentation.pdf; DECON GEL 1101 MSDS V1 0 TS - 4-9-07.pdf; Decon Gel 1101 Order Form Pricing July 07.pdf; Decon Gel 1101 Product Data Sheet.pdf; DG1101 Nuclear DD Two Pager 070707.pdf

Visit the ALARA Center Website at www.hanford.gov/rl/?page=974&parent=973! We would also be happy to answer your ALARA or D&D questions via e-mail or directly over the phone.

1. Forwarded a copy of the PUREX Storage Tunnel Report to LANL Radcon. A SRS engineer contacted the Center inquiring about a product to bond stainless steel. The engineer was interested in securing barrier material between a sample assembly and glove box. That area could contact nitric acid, aluminum oxide or Pu 239. We recommended that he contact a 3-M sales representative. 3-M has adhesive experts on staff to answer questions. View 3-M's product index at http://www.3m.com/product/index.html?WT.mc_id=www.3m.com/product/index.jhtml
2. Ray Stevens, Fluor D&D Engineering, visited the ALARA Center inquiring about a glove bag that could be used to sniff and draw a liquid sample from waste drums. Their plan is to drill a 1/4" hole through the bung hole and sniff the contents. They will then remove the bung and draw a liquid sample. If contamination is spread, they will install a glovebag for all future sampling. Referred him to T. Haan, Fluor SWSR Radiological Engineer, to see what glovebags SWSD is using for venting drums.
3. PFP Operation personnel visited the Center to brain-storm methodologies for applying a fixative inside a pipe that penetrates a highly contaminated glovebox. PFP Operations liked three of the ideas and will test them on a 4' long piece of 2" diameter clear plastic piping donated to them by the Center. They intend to mockup the different ideas to see which method will provide 100% coverage inside the clear pipe.
4. The ALARA Center continues to provide support for both initial glove bag training and glove bag training for RCT continuing training. This week the Center trained two NCOs and one RCT on basic glove bag training (course number 020729), and 8 CH2MHill and 16 Fluor RCT received glove bag training as part of their continuing training program. Both courses have classroom lessons along with hands-on practical exercises for students to work with glove bags.
5. Jeff Marks, CH2MHill Radiological Engineering, visited the ALARA Center to look at equipment to prepare the tank farm evaporator's floor and walls for coating. The area is highly contaminated and general area dose rates are also high. The work is still in conceptual design.
6. Lisa Berneski, Fluor WM Operations, called with a problem concerning a 250 mr/hr hot spot on the bottom of a tank at the 200 LEF. Spot is about the size of a dime. Their plan is to reach down through the manway and remove it using a HEPA filtered vacuum cleaner. Depending on the radiation level, the vacuum cleaner will then be opened and the bag placed in a shielded container or the entire vacuum cleaner packaged in a shielded drum. The Center provided vendor websites that specialize in making shielded containers. The Center suggested an alternative idea utilizing a collecting device to pre-filter out the hot spot, keeping it out of the vacuum system. The Center also developed a prototype of the collection device (pictured above). The collection device consists of a one-pint plastic bottle, glove bag drain and filter media. A hole was drilled in the bottle and the drain installed. Blue filter media stuffed in the bottle and a tapered rubber vacuum hose nozzle would be pushed on the bottle cap threads and hose clamped. With the vacuum cleaner connected and operating, the highly radioactive debris would be drawn into the plastic bottle and only very small pieces would be able to get through several layers of the filter media. Experience at DOD facilities has shown this type of device will remove almost all debris from

the air stream and the vacuum cleaner will only show a small increase in radiation levels. The device could then be removed from the hose and packaged in a shielded container. The LEF Planner and Lead RCT were brief on the collection device. They like the concept and will probably "tweak" the design using better materials from their spare parts. They will photograph the final design and record radiation levels on the collector and vacuum cleaner during the job.

7. Toured the waste retrieval complex located in 200 East Area in Burial Ground 12B, near the sub trench. The large white weather enclosure over a portion of waste trench 17 where highly radioactive drums will be uncovered in the fall. Two 77,000 CFM vent units provide ventilation for the tent. Two low-emission vehicles are at the site and ready to uncover the drums. The containment, designed with mobility in mind, has the ability to move to other trenches in the burial ground using four tracked mini-vehicles that are part of the tent framework. The complex also includes a portable building equipped with three remote-operated venting stations.

8. A CH2MHill Radiological Control Engineer stopped by the Center to look at HEPA filtered vacuum cleaner units and collection devices (rock stoppers) for upcoming work at the 702-AZ building in tank farms. Additionally, we suggested they contact the fabrication shop to see if they could make a rock stopper suitable for their needs and contact Nilfisk (www.pa.nilfisk-advance.com) to order a vacuum unit.

Larry Waggoner / Jerry Eby / Jeff Hunter
Fluor Hanford ALARA Center
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FOR YOUR INFORMATION:

1. Dynasonics (800-535-3569, www.dynasonics.com) offers a portable or hand held line of non-intrusive ultrasonic clamp-on flow meters fitting pipe sizes from 0.5" to 100". Quick clamp-on installation will save dose and non-intrusive measurement methods minimizes contamination concerns because no system breach is necessary for installation.

2. Greg Gibbons, Fluor Hanford D&D Radiological Control, forwarded information regarding Cellular Bioengineering, Inc. product Decon Gel. Decon Gel is a one component, water-based, broad application, peelable decontamination hydrogel that lifts, binds and encapsulates contaminants into a rehydratable polymer matrix. Attached is additional information about Decon Gel, including test data and cost.

3. Plan on attending the Hanford ALARA Workshop on February 27 & 28, 2008, at the Tower Inn located in Richland, WA. The Workshop's theme is "ALARA... From the Beginning." Workshop questions can be direct to Owen Berglund of CH2MHill at (509) 376-9035. ALARA Workshop information is attached.

4. The Nuclear Energy Institute has an interesting press release about the Kashiwazaki-Kariwa nuclear power plant recently damaged by an earthquake that you may wish to check out. See the details at www.nei.org.

Decon Gel 1101

Peelable Decontamination Technology (Nuclear Industry D&D)

Decon Gel 1101 is a one component, water-based, broad application, peelable decontamination hydrogel that **lifts, binds and encapsulates** contaminants into a rehydratable polymer matrix.

Decon Gel 1101 is a safe, user and material friendly, neutral-pH, low odor polymer hydrogel for radiological decontamination of radioisotopes as well as particulates, heavy metals, water-soluble and insoluble organic compounds (including tritiated compounds). The product can be applied to horizontal, vertical and inverted surfaces and applied to most surfaces (see the *Decon Gel 1101 Product Data Sheet*).

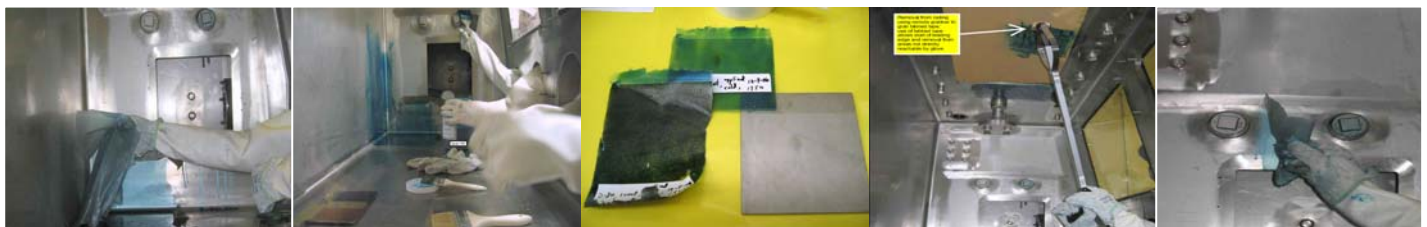
Decontamination Demonstration with Decon Gel



Chalk on a textured ceramic tile shows the lift, bind and encapsulation process of Decon Gel. A white glove test on the film underside came out clean – demonstrating that particulate matter is fully entrapped in the dry film.

Advantages of Decon Gel 1101 as a peelable, broad application decontamination agent include:

- Zero preparation
- Easy application (Apply → Dry → Peel → Dispose)
- Simple decontamination (Lifts → Binds → Encapsulates)
- Penetrates and removes contamination from cracks, pores, and voids
- Works on variety of surfaces (smooth, rough and painted) and complex geometries
- Minimal odor, respirators not required (unless mandated by other job safety concerns) therefore no resultant heat stress
- Dries into tough film that is easy to peel (non-sticky) and dispose
- Minimizes contaminated waste material for easy and safe disposal
- Ability to rehydrate for forensics (wet analysis, filtration of contaminants)
- To date, shown effective in field tests on the following radioisotopes:
 - Cs-137, Pa-233, Np-237, U-238, Pu-238, Pu-239, Am-241
 - I-131, I-125, Tc-99^m, F-18, C-14, [³H]-TdR, [³H] NaBH₄



WINNER 'BEST D&D POSTER' - 2007 Waste Management Symposium
“An Improved Polymer-based Hydrogel for Decontamination of Hard Assets”

Am-241 and Pu-239 Testing of Decon Gel 1101 at Sandia National Laboratories

- CBI commissioned tests at Sandia National Laboratories using Decon Gel 1101 on concrete, carbon steel, stainless steel and Plexiglas coupons contaminated with Am-241 and Pu-239
- The Am-241 solution was AmCl₃ dissolved in 1 N HCl; The Pu-239 solution was Pu(NO₃)₄ dissolved in 4 M HNO₃
- Decon Gel 1101 was spread onto coupons using a spatula; the excess was allowed to drip off
- The coupons were allowed to dry for 24 hours
- All coupons were easy to peel with concrete most difficult; all coatings peeled in a single sheet with none fractured
- The coupons were counted using a Ludlum 43-1 alpha scintillator connected to an Eberline E600

Coupon Name	Initial Counts (k cpm)	Initial Activity (uCi)	Counts after Decon (k cpm)	Activity after Decon (uCi)	% Decon
CAm-1	351	0.980	60.4	0.169	83 %
CAm-2	318	0.888	53.4	0.149	83 %
CPu-1	350	1.005	61.3	0.176	82 %
CPu-2	314	0.902	89.6	0.257	71 %
CSAm-1	333	0.994	3.99	0.012	99 %
CSAm-2	318	0.949	10.5	0.031	97 %
CSPu-1	288	0.983	2.63	0.009	99 %
CSPu-2	286	0.977	6.07	0.021	98 %
SSAm-1	351	0.961	76.5	0.210	78 %
SSAm-2	346	0.947	62.5	0.171	82 %
SSPu-1	326	1.045	56.6	0.181	83 %
SSPu-2	305	0.978	17.3	0.056	94 %
PAm-1	337	1.002	3.59	0.011	99 %
PAm-2	307	0.913	3.96	0.012	99 %
PPu-1	230	0.859	108	0.403	53 %
PPu-2	242	0.903	109	0.405	55 %

Notes:

CAM – concrete, americium; CPu – concrete, plutonium; CSAm – carbon steel, americium; CSPu – carbon steel, plutonium; SSAm – stainless steel, americium; SSPu – stainless steel, plutonium; PAm – plexiglas, americium; PPu – plexiglas, plutonium

$$\% \text{ Decon} = \frac{(\text{Initial Activity} - \text{Final Activity})}{\text{Initial Activity}} \times 100$$

Field testing at DoE D&D sites, ALARA Centers, National Laboratories and other locations continues to prove that Decon Gel 1101 can decontaminate a variety of surfaces and substrates. For more information on Decon Gel 1101 including this test, please contact:

Mike O'Neill, PhD 1-808-949-2208 x113 moneill@cellularbioengineering.com
Chris Helm 1-808-284-6502 chelm@cellularbioengineering.com

Or our Partner



Chesapeake Nuclear Services

Mike Davidson, CHP CHMM 1-410-421-5454 mdavidson@chesnuc.com

Product Data Sheet

Decon Gel 1101

Product Description

A one component, water-based, broad application, peelable decontamination hydrogel.

Recommended Uses

Decon Gel 1101 is recommended for decontamination of radioisotopes as well as particulates, heavy metals, water-soluble and insoluble organic compounds (including tritiated compounds). The hydrogel coating can be applied to horizontal, vertical and inverted surfaces and can be applied to most surfaces including bare, coated and painted concrete, aluminum, steel, lead, rubber, plexiglass, herculite, wood, porcelain, tile grout, and vinyl, ceramic and linoleum floor tiles. When dry, the product locks the contaminants into a polymer matrix. The film containing the encapsulated contamination can then be peeled and disposed of according to appropriate local, state and federal regulations.

Advantages of Decon Gel 1101 “Apply, Dry, Peel”

- Zero preparation
- Easy application
- Simple decontamination
- High decontamination factors
- User, material/substrate friendly
- Minimal odor, respirators not required
- Penetrates and removes contamination from cracks, pores and voids
- Dries into tough film that is easy to peel and dispose
- Minimizes contaminated waste material
- Ability to re-hydrate for forensics
 - Wet Analysis
 - Filtration of particulates

Product Characteristics*

- | | |
|------------------------------|-------------------------------------|
| ➤ Appearance | Blue Liquid |
| ➤ Shelf Life | 12 months |
| ➤ Density | 8.45-8.65 lbs/gal |
| ➤ Viscosity** | 10,000 – 20,000 cps |
| ➤ pH | 6.0-7.0 |
| ➤ Thinner | Water |
| ➤ Decontamination Percentage | up to 100% |
| ➤ Average Coverage | 20 to 50 ft ² per gallon |

* For Reference Only

** Brookfield, spindle 4, 30 rpm, 25°C

Product Data Sheet

Decon Gel 1101

Safety Recommendations

Decon Gel 1101 is safe when used as recommended. Respirators are not required under normal use conditions in well ventilated areas. Please review the product Material Safety Data Sheet for detailed safety information.

Application Procedure

Coating thickness required for good peel characteristics varies with substrate and generally increases with substrate porosity. Dry time increases with wet film thickness and can vary.

It is recommended that first time customers of Decon Gel learn how long the product will take to dry in their own environment and preferred thickness by first testing a small application on the same type of substrate that will be decontaminated.

- Coating can be used straight from the container without any stirring
- **Simply apply, allow to dry, peel, and dispose** according to applicable local, state and federal regulations.

Drying Time

Drying time depends on a combination of the ambient humidity, temperature, type of substrate and applied wet film thickness. This can take from as little time as an hour for thin coats in a dry environment with plenty of airflow, to overnight or longer if thicker coats are applied in humid environments. Dry times exceeding 24 hours may be required for the film thicknesses required for good peel performance on bare concrete, wood and other highly porous substrates. Applying supplemental heat can speed up the drying time.

Recommended Storage Conditions

Store Decon Gel 1101 within a temperature range of 40° to 90° F (4° to 32° C). If frozen, Decon Gel 1101 can be allowed to warm to room temperature and then used as normal.

Ordering Information

To order or learn more about Decon Gel 1101, please contact either Cellular Bioengineering Inc. or our marketing partner, Chesapeake Nuclear Services.



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