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**FACSIMILE TRANSMITTAL**

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		PAGE 1 OF:	9
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Jim:

Attached are the DOE slides regarding Cotter Concentrate.

Michelle Rehmann

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## *Cotter Concentrate Project*

**Colleen O'Laughlin**  
Project Manager

April 2, 1997

## *Cotter Concentrate*

### *What is it?*

- Form of Belgian Congo Ore
- Sludge-like Residue from Uranium Ore Processing
- Mixed Waste containing:
  - Radionuclides
  - Hazardous Constituents
- 1220 55-gallon drums of waste
- Eighty-eight percent of NTS current Mixed Waste inventory

## *Cotter Concentrate*

### *Project Description*

- Reclassify Cotter Concentrate from Regulated Solid Waste to Feedstock Material to comply with Energy Fuels Nuclear, Inc. (EFN) Nuclear Regulatory Commission (NRC) License
- Overpack each 55-gallon container in DOT-compliant container
- Ship material to EFN for Uranium Reclamation
- Dispose of Residual Waste in EFN's NRC-Licensed Mill Tailings Pond

## *Cotter Concentrate*

### *History*

- 1942 - Mallinckrodt Company in St. Louis generated radioactive residue while extracting uranium from Belgian Congo ore
- 1968 - Cotter Corporation of Golden, Colorado bought residues and extracted more uranium, plus copper, cobalt, and nickel
  - Residues now called Cotter Concentrate
- 1975 - Cotter Concentrate sent to Mound Facility in Miamisburg, Ohio
  - Mound extracted thorium-230 and protactinium-231
  - Mound discontinued extraction operations

## Cotter Concentrate

### History (cont.)

- 1987 - Mound shipped 1244 drums of Cotter Concentrate to NTS for storage
  - Considered a "strategic material"
- 1995 - Decreased demand for raw materials for nuclear weapons production
  - Removed "strategic material" designation
  - Now considered waste

## Cotter Concentrate

### History (cont.)

- 1996 - Federal Facility Compliance Act Consent Order negotiated between NDEP and DOE/NV
  - Included schedules for treatment via stabilization at proposed on-site facility
  - Cost of proposed on-site treatment facility: \$3.5 million
  - Unable to stabilize Cotter Concentrate

Could not  
stabilize in  
concrete,  
due to  
selenium

## *Cotter Concentrate*

### *History (cont.)*

- 1996 (cont.) - Issued Request for Proposals to treat Cotters
- Energy Fuels Nuclear, Inc. responded. Awarded proposal to perform additional uranium extraction and dispose of residuals.

## *Cotter Concentrate*

### *Why Are We Shipping?*

- Alternative to On-Site Treatment and Disposal
- Commercial process available to extract Uranium from material containing 1% Uranium
- Cotter Concentrate contains approximately 10% Uranium
- EFN's process successfully demonstrated on Cotter Concentrate samples

## *Cotter Concentrate*

### *Why Are We Shipping? (cont.)*

- Re-processing Cotters at EFN instead of on-site treatment and disposal equals \$2.5 million cost savings
- Project will demonstrate the commercial feasibility for full-scale implementation
  - Applicability to Fernald and other DOE sites
  - Thousands of tons of material potentially reclaimed at EFN
  - May remove need to construct some DOE complex treatment facilities




## *Cotter Concentrate*

### *Where Is It Going?*

- From NTS to Energy Fuels Nuclear, Inc. in Blanding, Utah
- Transport approximately 45 overpacked drums per truck
- Twenty-eight trips
- Empty overpack drums returned and reused
- Route not yet finalized
- NEPA


## *Cotter Concentrate*

### *When Is It Going?*

- April 1997 EFN receives approval of NRC License amendment
  - April 1997 Initiate material loading and transport
  - August 1997 Complete material transport to EFN
  - September 1997 Complete Final Project Report
- 

## *Cotter Concentrate*

### *Anticipated Project Accomplishments*

- Process majority of NTS current inventory of Mixed Waste
  - Eliminate entire NTS waste stream
  - Reclaim material instead of treating and disposing of it on site
  - Dispose of Residual Waste in EFN's NRC-Licensed Mill Tailings Pond
  - Fund majority of project with outside funds
  - Demonstrate process to other DOE sites with similar waste
- 



## Cotter Concentrate

More than 1,200 drums of a material known as Cotter Concentrate will soon leave the Nevada Test Site and go to good commercial use. By sending the material to the Energy Fuels Nuclear, Inc.<sup>1</sup> instead of disposing of it as radioactive mixed waste, DOE/NV stands to save close to \$3 million.

Cotter Concentrate consists of 1244 55-gallon drums of processed uranium ore residue that has been in storage at the Nevada Test Site Area 5 Radioactive Waste Management Site since November 1987. The story began in 1942, when the Mallinckrodt Company in St. Louis, Missouri was extracting uranium from ore that had been mined from the Belgian Congo and obtained from the United States. While processing this material, the Mallinckrodt Company generated a radioactive residue that became known as the St. Louis residue. The Cotter Corporation of Golden, Colorado, eventually bought these residues in 1968 and extracted from them more uranium, plus copper, cobalt, and nickel. The residue of this process became known as the Cotter Concentrate.

In 1975, Cotter Concentrate was sent to the Mound facility in Miamisburg, Ohio. Mound extracted thorium-230 and protactinium-231 from the material on a small scale for DOE programs, but it discontinued extraction operations for economic reasons.

In 1987, the building in which the Cotter Concentrate had been stored at Mound was designated for another use. Mound personnel contacted Nevada Test Site personnel and requested permission to ship the Cotter to Nevada. In November 1987, Mound shipped 1244 drums of the Cotter Concentrate, considered a "strategic material," to the NTS for storage.

In 1992, the Nevada Division of Environmental Protection questioned the designation of Cotter Concentrate as strategic material. This prompted DOE/NV to sample the material to determine whether it contained any hazardous waste constituents. The results indicated the material contained selenium, a regulated metal, and had a pH of between 10 and 14; this meant that if Cotter were considered a waste material, rather than strategic material, it would have to be classified as mixed (hazardous and radioactive) waste, subject to a whole new set of storage, treatment, and disposal rules.

Due to the decreased demand for raw materials for nuclear weapons production, DOE Headquarters determined there was no longer a strategic need for the Cotter Concentrate. In 1995, Cotters was declared a waste, with DOE/NV having responsibility for treatment and disposal.

Because Cotter Concentrate contained constituents regulated by the Resource Conservation and Recovery Act (RCRA), treatment would be required prior to disposal. No treatment method was readily available, so the "Cotter Concentrate Management Plan" was prepared and approved by the Nevada Division of Environmental Protection to allow Cotters to be stored at the Area 5 Strategic Materials Storage Yard while treatment options were pursued.



In March 1996, a Consent Order between the Nevada Division of Environmental Protection and DOE/NV was signed which included schedules for treating mixed waste located at the Nevada Test Site. The Consent Order included treatment schedules for Cotter Concentrate using stabilization on-site as the preferred method of treatment. The estimated cost of the proposed on-site treatment facility: \$3.5 million.

Treatability studies were performed on site with little success, so companies were solicited to perform treatability tests on the residue to establish the best method of treatment. During the solicitation process, Energy Fuels Nuclear responded with a proposal to perform additional uranium extraction on the residue at their Blanding Utah mill, which recently resumed operation. The company tested samples of the Cotter Concentrate and determined it could indeed process the material, but it would require an amendment to its Nuclear Regulatory Commission license to do so.

Late last year, DOE/NV and Bechtel Nevada helped Energy Fuels Nuclear develop the license amendment. Early in 1997, Energy Fuels Nuclear submitted the license to the NRC. Approval of the amendment is expected by the end of April; then, the company will be ready to accept the material at its Blanding, Utah plant.

DOE/NV and Bechtel Nevada will begin repackaging the material in May for shipment this summer. The total estimated cost to DOE/NV for license development, repackaging, and transport: \$680,000. There is no cost to DOE/NV for the uranium extraction process.

The benefit to DOE/NV and Bechtel Nevada lies not only in the cost savings realized by reprocessing rather than treatment and disposal, but also in having the material recycled and used as a resource—eventually used in the production of energy by commercial nuclear power plants—instead of discarded as a waste. The benefit to Energy Fuels Nuclear is that it obtains a high-grade uranium feedstock material for little cost and stands to eventually profit from the sale of the extracted uranium product. DOE/NV benefits in the cost savings realized from reprocessing of the material rather than treating and disposing of it as waste.

<sup>1</sup> Energy Fuels Nuclear, Inc. is presently in the process of being restructured, once restructuring is complete, Energy Fuels Nuclear will then be referred to as International Uranium (USA) Corporation (IUC).