

Request to Amend
Source Material License SUA-1358
White Mesa Mill
Docket No. 40-8681

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INTRODUCTION

Energy Fuels Nuclear, Inc. ("EFN") operates an NRC-licensed uranium mill located approximately six miles south of Blanding, Utah. The mill processes natural (native, raw) uranium ores and feed materials other than natural ores. These alternate feed materials are generally processing products from other extraction procedures, which EFN will process primarily for the source material content. All waste associated with this processing is, therefore, 11e.(2) byproduct material; or, as stated in the alternate feed analysis noticed in Federal Register Volume 57, No. 93:

"The fact that the term 'any ore' rather than 'unrefined and unprocessed ore' is used in the definition of 11e.(2) byproduct material implies that a broader range of feed materials could be processed in a mill, with the wastes still being considered as 11e.(2) byproduct material".

This application to amend NRC Source Material License SUA-1358 requests an amendment to allow EFN to process a specific alternate feed primarily for its source material content, and to dispose of the associated 11e.(2) byproduct material in accordance with the Mill operating procedures.

1.0 MATERIAL COMPOSITION AND VOLUME

EFN is requesting an amendment to Source Material License SUA-1358 to authorize receipt and processing of certain ore concentrates resulting from the processing of natural ore for the extraction of [] metal products. For ease of reference, this ore concentrate is referred to herein as the "Uranium Material". The Uranium Material is not a residue from a water treatment process.

The Uranium Material is being acquired by [] and that party (the "Material Supplier") will ship the Uranium Material to the White Mesa Mill. The Material Supplier holds and maintains a license issued by the NRC which allows the Material Supplier to hold and ship the Uranium Material.

The Material Supplier is acquiring the Uranium Material from [] a metal producer (the "Party of Origin") which has held the Uranium Material, in anticipation of further processing, in secure concrete and cinder block vaults at a facility owned and operated by the Party of Origin near

[]. The Party of Origin also holds and maintains a license issued by the NRC which allows the Party of Origin to hold the Uranium Material.

The Party of Origin and Material Supplier estimates that the Uranium Material weighs approximately [] tons (dry basis). The Material Supplier estimates the average uranium content to be []. Physically, the Uranium Material consists of a wet filter press cake (60% solids content). Isotopic analysis of the uranium material is currently being performed at an independent laboratory and results will be forwarded to the NRC as an addendum to this amendment request.

After the uranium is extracted from the Uranium Material in the solvent extraction circuit, the material will be processed through the vanadium solvent extraction circuit for the recovery of metal concentrates []. The Party of Origin estimates the concentration of metals in the Uranium Material to be []. The metals recovery process will be very similar to the process used to recover vanadium during mill operations when vanadium/uranium feedstock is processed.

1.1 Radiochemical Data

Preliminary laboratory analysis indicates a uranium content of approximately []. Isotopic analysis of the uranium material is currently being performed at an independent laboratory, and results will be forwarded to the NRC as an addendum to this amendment request.

1.2 Review of Hazardous Constituent Data

NRC guidance suggests that if a proposed feed material consists of hazardous waste, listed under subpart D §§261.30-33 of 40 CFR (or comparable RCRA authorized State regulations), it would be subject to EPA (or State) regulation under RCRA. To avoid the complexities of NRC/EPA dual regulation, such feed material may not be approved for processing at a licensed mill. If the licensee can show that the proposed feed material does not consist of a listed hazardous waste, this issue is resolved. NRC guidance further states that feed material exhibiting only a characteristic of hazardous waste (ignitable, corrosive, reactive, toxic) would not be regulated as hazardous waste and could therefore be approved for recycling and extraction of source material. The NRC Alternate Feed Guidance also states that NRC staff may consult with EPA (or the State) before making a determination of whether the feed material contains hazardous waste.

The Party of Origin, based on its analysis of the Uranium Material and process knowledge, believes that the Uranium Material contains no RCRA listed wastes. The Party of Origin purchased natural ores and contacted the ore concentrate with hydrofluoric acid at elevated temperatures in a closed digester system to extract metal products [] in a soluble form for further purification and conversion. The Uranium Material was separated from the aqueous [] stream and stored at the Party of Origin's facility. Despite this process knowledge, a composite sample has been submitted for analysis and analytical results of Method 8260 analysis will be forwarded to the NRC as soon as the analysis is completed.

1.3 Regulatory Considerations

According to NRC guidance, for the tailings and wastes from the proposed processing to qualify as 11e.(2) byproduct material, the feed material must qualify as "ore." NRC has established the following definition of ore:

"Ore is a natural or native matter that may be mined and treated for the extraction of any of its constituents or any other matter from which source material is extracted in a licensed uranium or thorium mill".

Classification as Alternate Feed

As described under 1.2 above, the Uranium Material is not be subject to regulation as a listed hazardous waste as defined in the Resource Conservation and Recovery Act, as amended, 42 U.S.C. §6901-6991 and its implementing regulations, or comparable State laws or regulations governing the regulation of listed hazardous wastes. In Section 4.0, below, EFN certifies that the Uranium Material is to be processed primarily for the recovery of uranium and for no other primary purpose. EFN justifies the certification on the financial considerations of the transaction between EFN and the Material Supplier which is based on the value of the uranium and other metals to be recovered from the Uranium Material.

Preliminary laboratory analysis indicates a uranium content of approximately []. This grade is very similar to many natural ores from the Colorado Plateau. Historically, EFN and its predecessor operators have economically recovered and sold uranium concentrates from ore of this grade if vanadium in sufficient quantities could be recovered from the ore to generate a "vanadium credit" against the cost of processing the uranium ore. That is, in the production budgeting process utilized for the Mill, the "credit" against the processing costs for the recovery

of the uranium that is generated by the value of the metal concentrates recovered from the Uranium Material allows the production of a uranium concentrate at a very low cost. This recovery of uranium and other metals is very similar to the historical milling operations by EFN and its predecessors at the Mill utilizing vanadium/uranium feedstocks.

The uranium content of the Uranium Material, in conjunction with the metals [] content, estimated by the Party of Origin to be approximately [], justifies processing the Uranium Material by EFN to extract the uranium concentrates. The value of the recovered products [] demonstrates the economic viability of the processing of the Uranium Material by EFN for the recovery of uranium concentrates.

1.4 Shipping

The material will be shipped to the White Mesa Mill in 25-cubic-yard intermodal containers. The containers will be shipped via truck from a facility owned and operated by the Party of Origin near [], to a nearby rail head. The containers will then be loaded on rail cars and transported to a rail facility for transport to the White Mesa Mill. The containers will be removed from the rail cars and transported the remaining distance to the Mill via truck. Empty containers will be returned to the facility or origin by the same method.

The Uranium Material will be shipped as LSA (low specific activity) Radioactive Hazard Class 7 Hazardous Material as defined by DOT regulations. The Material Supplier will arrange with a materials handling contractor for the proper labeling, placarding, manifesting and transport of each shipment of the Uranium Material. Each shipment will be "exclusive use" (i.e., the only material in each container will be the Uranium Material).

2.0 PROCESS

The Uranium Material will be offloaded from its intermodal bin into a small batch repulp tank equipped with an agitator. Water will be added to aid in the breakup of the Uranium Material as it is agitated in the tank to generate a slurry. The slurry will be pumped to one of the Pulp Storage Tanks.

The Uranium Material slurry is first contacted with sulfuric acid in the Mill's leach tanks where the bulk of the [] metals will go into solution along with a portion of the uranium content. The solution will then be pumped to the leach circuit, where it will be mixed with tailings solution for further pH adjustment. Additional sulfuric acid will be added as necessary for pH control in the leach circuit. The solution will then be transferred to the CCD circuit for washing. The bulk of the washed solids are then contacted with caustic soda (NaOH) in the leach tanks to further break up the ore matrix, thereby freeing up uranium for subsequent leaching. The resulting solids are again washed and a portion of the solids, separated from the slurry by a filter press, are sent to tails. The remaining solids are then contacted with an hydrochloric acid solution and then washed and then recycled to the first acid leach step to maximize metal recovery. The hydrochloric acid leach liquor, now containing most of the uranium from the solids, is run through the Mill's uranium solvent extraction circuit to recover the uranium concentrates. Sulfuric acid is added to a portion of the raffinate from the circuit to precipitate calcium sulfate (gypsum) which is separated from the resulting slurry by a second filter press and discharged to tails. The filtrate is reused in the process as a strip solution for recovering the metals from the Mill's vanadium solvent extraction circuit. In this step, the sulfuric acid leach liquor generated in the first leach step is run through the Mill's vanadium solvent extraction circuit to recover the metal concentrates. The two filter presses referred to above will be added to the existing process and some minor additional piping for recirculation will be added to facilitate the maximum recovery of uranium and the metal concentrates. A diagram of the process flow, showing the addition of the filter presses and the additional piping is attached as Attachment 3.

3.0 SAFETY MEASURES

The Uranium Material will be delivered to the mill via closed intermodal bin. The Uranium Material will be dumped into an existing pre-leach tank where initial processing will begin. The material will proceed through the leach circuit, CCD circuit, and into the solvent extraction circuit in normal process fashion as detailed in Section 2.0 above. Metallurgical recovery of the metal [] concentrates will proceed in the solvent extraction circuit using the existing vanadium recovery process and normal mill organic extractant reagents. Since there are no major process changes to the mill circuit, and since the extraction process sequence is very similar to processing conventional uranium solutions, it is anticipated that no extraordinary safety hazards will be encountered.

Employee exposure potential during initial material handling operations is expected to be no more significant than what is normally encountered during conventional milling operations. Employees will be provided with personal protective equipment including full-face respirators. Airborne particulate samples will be collected and analyzed for gross alpha concentrations. If uranium airborne concentrations exceed 25 percent of the DAC, full-face respiratory protection will be implemented during the entire sequence of material dumping operations. Spills and splashed material that may be encountered during this initial material processing shall be wetted and collected during routine work activity. Sample material of the Uranium Material indicates it is a neutral material with a measured pH of approximately [] after dissolution in water. Therefore, it is anticipated that no unusual PPE apparel will be required other than coveralls and rubber gloves during material handling activities. Respiratory protection will be implemented as determined.

3.1 Control of Airborne Contamination

EFN does not anticipate unusual or extraordinary airborne contamination dispersion when processing the uranium material. The contamination potential is expected to be less than what is normally encountered when processing conventional uranium ore. The successive extraction process circuitry from CCD through solvent extraction and into precipitation are all liquid processes, and the potential for airborne contamination dispersion is minimal.

Uranium extraction proceeds through the mill circuit as if the Uranium Material were uranium ore. As the Uranium Material is transferred into the mix transfer tank, a water spray system on top of the mix tank will be activated. The material is a moist cake as received (moisture content

up to 40%). Nevertheless, water spray provisions are provided when handling bulk material processing.

The efficiency of airborne contamination control measures during the material handling operations will be assessed in the immediate vicinity of the mix tank. Airborne particulate samples and breathing zone samples will be collected in those areas during initial material processing activities and analyzed for gross alpha. The results will establish health and safety guidelines which will be implemented throughout the material processing operations.

Personal protective equipment, including respiratory protection, will be provided to those individuals engaged in material processing. Additional environmental air samples will be taken at nearby locations in the vicinity of material processing activities to ensure adequate contamination control measures are effective and that the spread of uranium airborne particulates have been prevented.

3.2 Radiation Safety

The radiation safety program which exists at the White Mesa Mill, pursuant to the conditions and provisions of NRC License Number SUA-1358, and applicable Regulations of the Code of Federal Regulations, Title 10, is adequate to ensure the maximum protection of the worker and environment, and is consistent with the principle of maintaining exposures of radiation to individual workers and to the general public to levels As Low As Reasonably Achievable (ALARA).

3.3 Vehicle Scan

As uranium material arrives at the White Mesa Mill site, an initial radiation survey will be made of the vehicle and intermodal bin to ensure the cargo has not sustained any leakage or rupture of contents during transportation, and that the radiation levels are consistent with DOT requirements. After the cargo has been offloaded at the mill site, a radiation survey of the vehicle and intermodal bin will be performed consistent with standard mill procedures (Attachment 2). In general, radiation levels are in accordance with applicable values contained in the NRC Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material, U.S. NRC, May, 1987. If radiation levels indicate values in excess of the above limits, appropriate decontamination procedures would be implemented. However, these limits are

appropriate for materials and equipment released for unrestricted use only, and do not apply to restricted exclusive use shipments. As stated in Section 1.4 above, the shipments of uranium material to and from the White Mesa Mill will be dedicated, exclusive loads; therefore, radiation surveys and radiation levels consistent with DOT requirements will be applied to returning vehicles and cargo.

4.0 CERTIFICATION

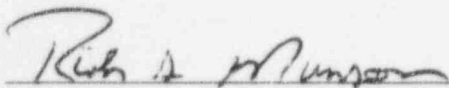
In accordance with the NRC Guidance on alternate feed materials, the financial conditions of the business arrangements with the Material Supplier regarding the Uranium Material justify the processing of the Uranium Material by EFN primarily for the recovery of uranium in conjunction with the recovery of the [] metal concentrates from the Uranium Material. The financial value of the Uranium Material assures that this material is not a "waste" that would have to be disposed of as radioactive or mixed waste unless it could be processed at a uranium mill. As discussed above, processing costs to recover the uranium content from the Uranium Material are minimal, and the processing of this material will be profitable to EFN. Following is the Certification that the material is being processed primarily for recovery of uranium.

**Certification of Energy Fuels Nuclear, Inc.
(the "Licensee")**

I, Richard A. Munson, the undersigned, for and on behalf of the Licensee, do hereby certify as follows:

1. The Licensee intends to enter into a contract with [] (the "Material Supplier") under which the Licensee will process certain natural ore concentrate material at the White Mesa Uranium Mill for the recovery of uranium. As demonstrated in the foregoing amendment application, based on the financial considerations surrounding this material and the processing transaction, the Licensee hereby certifies and affirms that such concentrate material is being processed primarily for the recovery of uranium and for no other primary purpose.

2. The Licensee further certifies and affirms that such concentrate material, as alternate feed to a licensed uranium mill, is not subject to regulation as a listed hazardous waste as defined in the Resource Conservation and Recovery Act, as amended, 42 U.S.C. §6901-6991 and its implementing regulations, or comparable State laws or regulations governing the regulation of listed hazardous wastes. The Licensee is obtaining such concentrate material as an alternate feed, consistent with NRC guidance, for the uranium recovery process being conducted at the White Mesa Mill.



Signature

April 3, 1997
Date

Richard A. Munson
Corporate Counsel
Energy Fuels Nuclear, Inc.

AFFIDAVIT

I, Richard A. Munson, Corporate Counsel of Energy Fuels Nuclear, Inc. ("EFN") do swear that the request to the U.S. Nuclear Regulatory Commission ("NRC"), dated as of April 3, 1997, for an Amendment to Source Material License SUA-1358, contains confidential commercial and/or financial information held in confidence by EFN and that it meets the criteria as listed under §63.2 of the Government Records and Access Act, and 10 CFR 2.790(b).

In support of the claim of confidentiality, the following is submitted:

IDENTITY OF DOCUMENT OR PART SOUGHT TO BE WITHHELD:

- a. The parts of the cover letter transmitting the Request for Amendment to be withheld as confidential are set forth in brackets on pages 1 through 3 of the letter;
- b. The parts of the body of the Request for Amendment to be withheld as confidential are set forth in brackets on pages 1 through 9 of the Request;
- c. Attachment 1 is to be withheld;
- d. Attachment 3 is to be withheld.

STATEMENT OF REASONS:

General Statement

EFN understands that the policy of the Commission concerning commercial or financial information, believed by EFN to be confidential, is to achieve an effective balance between legitimate concerns for protection of competitive positions and the right of the public to be fully apprised as to the basis for and effects of licensing actions. EFN further understands that it is within the discretion of the Commission to withhold confidential commercial or financial information.

EFN is actively seeking alternative feedstocks of material containing quantities of uranium that can be commercially recovered at the White Mesa Mill. EFN has invested significant time and monies in developing information and contacts necessary to achieve the market position EFN is developing for such recovery projects. The alternative feedstocks are an integral piece of EFN's long term business plan and they play a role in maintaining jobs and activity at the White Mesa Mill.

Initially, EFN did not appreciate the value that its contacts represented. However, as evidenced by the interest shown in industry publications following the submittal of the Request for Amendment filed for the alternative feedstock commonly referred to as the "KOH Material", EFN now realizes that its contacts and business arrangements with those contacts has significant intrinsic value, much like "customer lists" developed by retail or publishing businesses which are recognized, and closely guarded, as confidential and proprietary information. The submission of

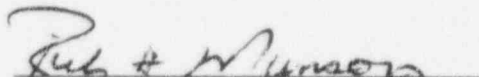
this request for amendment is related to another successful effort by EFN and its contacts to create a commercial opportunity consistent with the proper use of the White Mesa Mill.

Consistent with this realization of EFN's place in the marketplace and the value of its customer list, EFN is requesting that (i) information related to the source and nature of the alternative feedstock and (ii) information concerning how EFN has structured its arrangement with the source of the material, be withheld from public disclosure because disclosure of such information is likely to cause substantial harm to the competitive position of EFN.

Specific Points

- The confidential information is currently held in confidence by EFN and is not available from other public sources of information.
- As described above, the confidential information is currently information of the type that is normally held in confidence by EFN.
- The confidential information is being transmitted to the NRC in confidence.

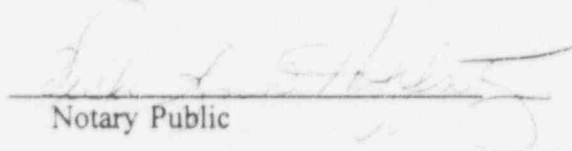
I hereby certify to the Commission that I have been specifically delegated the function of reviewing the information sought to be withheld and that I am authorized to apply for its withholding on behalf of Energy Fuels Nuclear, Inc.


Richard A. Munson
Corporate Counsel
Energy Fuels Nuclear, Inc.

STATE OF COLORADO)
)
COUNTY OF DENVER)

On April 3, 1997, personally appeared before me Richard A. Munson, who being duly sworn, did say that he is the Corporate Counsel of Energy Fuels Nuclear, Inc., and that the said instrument was signed on behalf of said corporation.

NOTARY PUBLIC
VICKI LYNN HOFSETZ
STATE OF COLORADO
My Commission Expires **Aug. 12, 1998**


Notary Public

My Commission expires:

3/12/98

ATTACHMENT 2

Energy Fuels Nuclear, Inc.
White Mesa Mill
Equipment Release/Radiological Survey Procedure

2.1 Release of Equipment

All materials, equipment and scrap which are intended for release from the mill site for unrestricted use, are surveyed for radiological contamination levels in accordance with the limits set forth in NRC document, "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of License for Byproduct of Source Materials", dated September, 1984. The instructions in this guide in conjunction with Table I specify the radioactivity and Radiation exposure rate limits which are used in accomplishing the decontamination and survey of surfaces and equipment prior to abandonment or release for unrestricted use.

2.1.1. Materials and Scrap

Scrap material and equipment such as pumps, process equipment, etc. which require repair services are cleaned appropriately in an effort to eliminate residual contamination prior to surveying for radiological contamination levels. Radioactivity on the surface of equipment and materials is measured by surveying for alpha contamination, using the appropriate, portable, calibrated alpha survey instruments, such as Eberline Model ESP-1 "Portable Smartmeter" surveying instrument equipped with an AC-3-7 alpha scintillation probe, or other equivalent instrument. Radiation exposure rate measurements are made on these materials using calibrated exposure rate instruments such as a Ludium Model 3 Beta-Gamma survey meter and probe or equivalent instrument. Materials and equipment are released from the mill site for unrestricted use if the total alpha contamination concentration and exposure rate measurements are less than the applicable limits contained in Table I of the NRC Guide.

2.1.2. Procedure

1. Obtain appropriate calibrated alpha survey instrument from radiological lab.
2. Check meter performance and function using Th-230 calibration source.
3. Survey items on surface for alpha contamination at numerous locations sufficient to determine average and potential maximum contamination levels.
4. Slowly scan over surface of each item @ 1 cm height and determine average and maximum exposure rate measurements

2.1.2 continued

5. Contamination levels exercised at the mill site for release of equipment for unrestricted use is a total alpha contamination level of 1000 disintegrations per minute per 100 cm² (dpm/100 cm²), and a radiation exposure limit of 0.2 millirad per hour (mr/hr) with a maximum not to exceed 1.0 mr/hr.
6. In the event these limits are exceeded, the item is decontaminated by appropriate means and re-surveyed.
7. If the limit for a total alpha contamination is again exceeded, an alpha smear survey over 100 cm² area is taken to determine removable alpha contamination. In addition, a fixed alpha measurement of the area is made using an alpha meter. If the limits of Table I NRC Guide are exceeded, a more rigorous decontamination method is applied.

2.1.3 Vehicle and Mobile Equipment Release

Vehicle and mobile equipment release proceeds on a similar basis as material and equipment release. An alpha survey is made and an exposure survey is made on the interior and exterior surfaces of the vehicle, particularly the tires and exposed undercarriage, if the conveyance is non-dedicated for exclusive use transport. Paying particular attention to the tires and undercarriage during a survey determines whether a vehicle has become contaminated while crossing in and through the mill Restricted Area. The applicable criteria for contamination limits, decontamination, procedures, surveys / re-surveys and ultimate release are identical to those in paragraph 2.1.2.

If a vehicle is classified as exclusive use whose single transport purpose is intended specifically for hauling radioactive materials on a continued basis, then, only the exterior surface and tires of the transport vehicle are surveyed when leaving the restricted area. Examples of these transport vehicles include: ore haulage trucks and closed bulk transport tankers. Applicable alpha contamination and exposure rate levels are those specified in 49 CFR 173.441 and 173.442. The mill site exercises an alpha contamination control level of 1000 dpm/100 cm² protocol for the transport vehicle tires only upon exiting the mill site. No internal alpha surveys are done on the internal surfaces of closed transport tankers dedicated for exclusive use until these vehicles become decommissioned.