

**ENCLOSURE 2
ATTACHMENT 4**

SHINE MEDICAL TECHNOLOGIES, INC.

**SHINE MEDICAL TECHNOLOGIES, INC. APPLICATION FOR CONSTRUCTION PERMIT
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION**

**PRELIMINARY SAFETY ANALYSIS REPORT CHANGES
(MARK-UP)**

Acronyms and Abbreviations

Acronym/Abbreviation

Definition

°F	degrees Fahrenheit
°C	degrees Celsius
µS/cm	micro-Siemens per centimeter
AEA	Atomic Energy Act of 1954
ac.	acre
AHA	aceto hydroxamic acid
[Proprietary Information]	[Proprietary Information]
[Proprietary Information]	[Proprietary Information]
[Proprietary Information]	[Proprietary Information]
Btu/hr	british thermal units per hour
Btu/scf	british thermal units per standard cubic feet
<u>[Proprietary Information]</u>	<u>[Proprietary Information]</u>
cfm	cubic feet per minute
CFR	Code of Federal Regulations
Ci	curies
CO ₂	carbon dioxide
CP	Construction Permit
<u>[Proprietary Information]</u>	<u>[Proprietary Information]</u>
d or D	deuterium
D-T	deuterium-tritium
DSSI	Diversified Scientific Services, Inc.
EPA	U.S. Environmental Protection Agency
ER	Environmental Report
ES	EnergySolutions
FDA	U.S. Food and Drug Administration
ft.	feet

[Proprietary Information] The spent [Proprietary Information] are solidified in a shielded waste processing hot cell. The used resin is classified as GTCC waste and is shipped as Type B to an off-site location for long-term storage at WCS.

As discussed above, the target solution cleanup system uses an anion exchange column to remove technetium and iodine. When the anion exchange resin is replaced, the spent resin is solidified on-site and sent off-site for disposal (WCS in Andrews, Texas).

There will be no solid waste disposal at the SHINE site.

19.2.5.3.2 Liquid Radioactive Waste System

Liquid waste discharged from the various processes at the SHINE facility (other than spent solvent) are combined into one of two tanks. Two tanks are needed to allow liquid waste to decay and also so that a somewhat consistent radiological environment exists for waste processing. Once the first tank is filled the other tank will begin to fill. At this point the pH is adjusted so that the waste can be passed through an [Proprietary Information] This allows the majority of the liquid stream to become Class A waste. This cleaned-up material is then sent to an evaporator for volume reduction. The evaporator overheads are reused and the bottoms are solidified and shipped to ES for final disposal. The spent resin treatment is discussed in the section above. No liquid radioactive waste is discharged from the SHINE facility.

The spent solvent is not a RCRA waste and is replaced once per year. The solvent is sent to a processor (Diversified Scientific Services, Inc [DSSI], in Kingston, Tennessee) for thermal treatment.

[Proprietary Information] This waste is classified as Class B waste and is shipped as Type B to WCS in Andrews, Texas.

[Proprietary Information] The waste is solidified in a hot cell using Portland cement. Some additives may be required based on the final chemistry of incoming resin and precipitate. These shipments are Type B shipments.

There will be no liquid waste disposal at the SHINE site.

19.2.5.4 Proposed Hazardous Material Disposal Activity

The only hazardous (or potentially hazardous) materials are [Proprietary Information] and the zeolite beds. Although small quantities of [Proprietary Information] is expected to pass TCLP, and is not considered hazardous waste. Waste streams with a hazardous component are mixed low-level waste such as the zeolite beds and are handled as described in Subsection 19.2.5.3.1.

**Table 19.2.5-1 Estimated Type and Quantity of Radioactive Wastes Associated with the SHINE Facility
(Sheet 1 of 3)**

Description	Matrix	Class as Generated	Contents	Volume	Volume as shipped (ft ³)	55-gallon drum equivalent as shipped	Shipment Type	Number of Shipments/yr	Destination
Neutron Generator	Solid	A	Activated metal parts						
Extraction Columns	Solid	A	Stainless resin columns	4338 ft ³ /yr	4338	590	LSA	3.00	ES
Class A Trash	Solid	A	PPE, Mo-99 purification glassware, filters, etc						
Spent Solvent	Liquid ^(a)	A	n-dodecane, tributyl phosphate	22 gallons/yr	--	0.4	LSA	1.00	DSSI
Tc/I columns	Resin	C	Resin	16 <u>gallons/yr</u>	23	3.1	Type B	0.3	WCS
Zeolite Beds	Solid	GTCC	Silver coated beds	0.4 ft ³ /yr	0.4	0.05	Type B	1.00	WCS
[Proprietary Information]	[Proprietary Information]	GTCC	Resin	16 <u>gallons/yr</u>	23	3.1	Type B	0.3	WCS
[Proprietary Information]	[Proprietary Information]	B	[Proprietary Information]	295 gallons/yr	79	11	Type B	1.00	WCS