Stepan

Stepan Company

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September 16, 2010

Ms. Yolande Norman
US Nuclear Regulatory Commission
2 White Flint North, Mail Stop 8F5
11545 Rockville Pike
Rockville MD 20852-2738

Re: Docket: 40-8610; License STC-1333

Dear Ms. Norman:

Thank you for agreeing to meet with Stepan Company ("Stepan") and its representatives on October 12, 2010 to discuss classification and disposal alternatives for low radioactivity concentration soils excavated from Stepan's Maywood facility. As you are aware, Stepan has requested "NRC recognize or authorize exemption of certain soil stockpiled on its plant site in Maywood, New Jersey from requirements of regulation in 10 CFR Part 40." We understand that classification of thorium residue stored in licensed burial pits on Stepan's Maywood site as byproduct material is affecting your staff decision concerning our request. This letter seeks to provide some additional information regarding disposal to facilitate discussions at our meeting.

By way of background, thorium contamination in addition to the NRC-licensed storage areas on the Stepan property is subject to the Federal Facilities Agreement between the United States Corps of Engineers (the "Corps") and the United States Environmental Protection Agency ("EPA") and is being remediated under the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA") by the Corps under the Formerly Utilized Sites Remedial Action Program ("FUSRAP"). The currently stockpiled soil Stepan seeks to dispose of was collected from areas of the Stepan property already remediated and released by the Corps under the FUSRAP. Thus, in accordance with the Corps' remedial action requirements, the soil of interest has radioactivity concentration of less than 15 pCi Ra^{226} + Th^{232}/g above background in subsurface soil with an ALARA goal of 5 pCi/g and less than 50 pCi U^{238}/g soil. In fact, surveys indicate mean and median radioactivity concentration on land areas from which stockpiled soil was removed are approximately 4 pCi Ra^{226} + Th^{232}/g soil.

Radiochemical properties of the natural uranium and thorium series in the soil involved could qualify as *byproduct material*, as *source material*, or as *residual radioactive material*. We understand that, in response to a petition by Envirocare, NRC has classified the material from the Maywood site as byproduct material. While Stepan does not endorse that decision, even if the soil that is not subject to the NRC license is to be so classified, it nevertheless seems rational to apply equivalent criteria to assure radiological safety in disposal of the soil in question, regardless of classification.

We are aware that 10 CFR Part 40 deals with byproduct material and with source material. Presumably, exemption of an insignificant concentration of natural uranium series

and thorium series could be accommodated by 10 CFR Part 40.13 if source material or an insignificant concentration of byproduct material could be accommodated by 10 CFR Part 40.14. Absent guidance for exemption of byproduct material under Part 40.14 appropriate for such low radioactivity concentration as in Stepan's soil, Stepan evaluated the soil relative to guidance and practice applied to an unimportant concentration of source material. In particular, Stepan evaluated whether uranium and thorium are less than 0.05 wt% of the soil, evaluated whether potential radiological dose will be less than 25 mrem/yr to a member of the public in the identified disposal location, and pursued contingency of approval of the cognizant agency in the State in which disposal is planned.

By our analyses, the soil we described would satisfy the aforementioned technical and safety criteria. It appears that while radiochemically identical material might be classified as either source material or as §11.e.2 byproduct material, our material was reportedly not exempted for disposal solely because it is classified as byproduct material. Yet, it would seem that classification should not override our mutual interests in safe management of the material, as seems to be occurring.

For identical material of such very low radioactivity concentration, it would seem reasonable that technical and safety criteria for disposal be consistent, regardless of classification. If your staff decides Stepan's soil is not already exempt, we suggest that using the precedent of practices applied to exempt an unimportant concentration of source material for disposal would also provide reasonable assurance of safety in disposal of the same low radioactivity concentration material when classified as §11.e.2 byproduct material. In that event, we would suggest that could be the basis for exempting Stepan's oil from regulation under provision of 10 CFR Part 40.14(a).

In addition to stockpiled soil already mentioned, Stepan is also holding an additional quantity of approximately 30 yd^3, or about 40 tons, of soil and rubble from construction projects on its plant site in Maywood, NJ. It is described in an attachment hereto. Mixing this solid waste into the stockpiled soil would increase the average uranium concentration from 1.1 pCi/g in stockpiled soil to 1.2 pCi/g in the mixture and would increase the thorium concentration from 1.9 pCi/g in stockpiled soil to 2.4 pCi/g in the mixture. Expressed as a fraction of 0.05 wt% uranium + thorium, the fraction in the stockpiled soil, 0.041, would increase to 0.051 when combined with the additional soil and rubble. Considering a proportionate increase in potential radiological dose, the mixture would still pose less than 25 mrem/yr in any disposal scenario.

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In accordance with the Commission's policy concerning mixing to satisfy waste acceptance criteria for disposal. Stepan respectfully requests your concurrence that solid waste described in the attachment herewith may be combined with stockpiled soil described in Stepan's request of April 10, 2010 and disposed as proposed therein.

If you have any questions or comments about this request, please contact me at telephone 201 712 7644. We look forward to discussing this issue with you on October 12, 2010 at your offices.

Sincerely yours,

Mark Stanek

enc: description of solid waste

Description of Solid Waste in Containers

1.1. Physical Description and Origin

About 30 yd^3 of solid waste accumulated from dismantlement of coal-fired boiler firebrick, clean-up of coal ash, and excavation of adjacent soil and gravel is stored in containers on-site. Although some measured radioactivity in the waste is expected to be attributable to naturally-occurring uranium series and thorium series in coal ash and firebrick in these solid wastes, some is attributable to contamination of soil originating from historical processing of monazite ore.

1.2. Quantity

The solid wastes are stored in a 20 yd^3 roll-off dumpster, a 5 yd^3 tote container, and in 45 fifty-five-gallon drums. Total volume of solid waste contents is about 30 yd^3. Estimated weight of solids in all drums is 17 tons. Total weight in the entire lot is estimated to be 40 tons.

1.3. Characterization Measurements

1.3.1. Sampling

A composite sample was taken of contents of each of the 20 yd^3 roll-off dumpster, the 5 yd^3 tote container, and the drums.

1.3.2. Analytical Measurements

Each of the samples was analyzed by gamma spectrometry for uranium series and thorium series radionuclides. Considering years elapsed since any processing and that uranium was not extracted, both the uranium series and the thorium series are expected to be in approximate radioactive equilibrium. The best estimates derived from analyses of uranium series and thorium series radioactivity concentrations in the waste are in Table 1. The radioanalytical data from which the best estimates are reduced are summarized in Table 2.

Firebrick and coal ash contain higher concentrations of uranium series and thorium series than typical earthen soil. They may account for some but not all of the uranium and thorium in solid waste in the containers. Soil, gravel, and some coal ash were taken from an outdoor area before remedial action by the FUSRAP and likely contribute to the radioactivity.

potentially consequent to intended disposal of the stockpiled soil. He estimated that:

1. During transportation to a landfill and during transfer from transport hoppers into a landfill, potential radiological dose to any person is estimated to be less than one millirem.
2. In the event a house were constructed atop the landfill containing the waste soil, albeit in violation of land use restriction specified by RCRA Subtitle C, residents would experience less than one millirem/yr radiological dose provided the landfill remains intact.
3. Even in the event a house were constructed atop the landfill and were to incorporate a basement that intrudes into buried waste soil and excavated soil were spread onto land surface, its residents would be estimated to experience less than 17 millirem/yr in consequence to disposal of the waste soil.

Mixing the additional 30 yd^3 of solid waste into the 1600 yd^3 stockpiled soil would increase average uranium concentration from 1.1 pCi/g in stockpiled soil to 1.2 pCi/g in the mixture and would increase thorium concentration from 1.9 pCi/g in stockpiled soil to 2.4 pCi/g in the mixture. Expressed as a fraction of 0.05 wt% natural U + Th, the fraction in the stockpiled soil, 0.041, would increase to 0.051 when combined with the additional soil and rubble. Considering a proportionate increase in potential radiological dose, the mixture would still pose less than 25 mrem/yr in any exposure scenario.

Table 2. Uranium Series and Thorium Series in Rubble in Containers

Location	Sample ID	Radionuclide							Best Estimates			
									Reported		Imputed by Progeny	
		Ac228 (pCi/g)	Pb212 (pCi/g)	Tl208 (pCi/g)	U238 (pCi/g)	Th234 (pCi/g)	Ra226 (pCi/g)	Bi214 (pCi/g)	Th232 (pCi/g)	U238 (pCi/g)	Th232 (pCi/g)	U238 (pCi/g)
20 cu yd rolloff container	SO-50681-120409-dp-01 dup	19.4	22.4	17.0	1.4	1.4	4.6	4.6		1.4	19.6	3.5
20 cu yd rolloff container	SO-50681-120409-dp-01	19.6	22.0	17.2	3.3	3.3	4.3	4.3		3.3	19.6	4.0
5 cu yd tote container	SO-50681-120409-dp-02	24.1	24.5	21.5	2.8	2.8	2.1	2.1		2.8	23.4	2.3
45 ea., 0.27 cu yd steel drums	SO-50681-DRUM-01	59.5	59.7	55	12.9	12.9	5.6	5.6		12.9	58.1	8.0