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Project Number 6883

Mr. Lonnie Monaco  
Naval Facilities Engineering Command (NAVFACENGCOM)  
Northern Division  
Environmental Contracts Branch, Mail Stop No. 82  
10 Industrial Highway  
Lester, Pennsylvania 19113

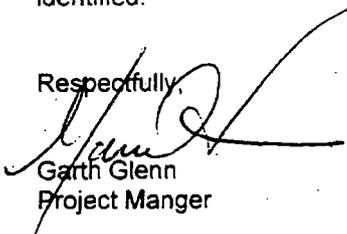
Reference: CLEAN Contract No. N624272-D-1298  
Contract Task Order (CTO) 252

Subject: Revised Human Health Risk  
Soils and Waste at Sites 6 and 7 Operable Unit 7 (OU-7)  
Naval Air Warfare Center (NAWC) Warminster, Pennsylvania

Dear Mr. Monaco:

Enclosed please find the revised risk assessment summary for the subject project. As indicated in the summary, the human health risk assessment for OU-7 presented in the 1999 RI report have been revised to reflect changes in the EPA carcinogenic classification of beryllium. The revised risk assessment summary indicates that no actionable carcinogenic risks have been identified.

Respectfully,

  
Garth Glenn  
Project Manger

GG/ejc.

C: Tom Ames (NAVFACENGCOM)  
Mike Fohner (NAVFACENGCOM)  
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Administrative Record

## REVISED BASELINE HUMAN HEALTH RISK ASSESSMENT

### Remedial Investigation Operable Unit 7 (OU-7) Soils and Waste at Sites 6 and 7 Former Naval Air Warfare Center (NAWC) Warminster, Pennsylvania

#### Introduction

This document presents revised baseline risk assessment cancer risk calculations and summaries for the Remedial Investigation Report for Operable Unit 7 (OU-7) NAWC, Warminster dated November 1999 [Tetra Tech NUS Corporation (TtNUS), 1999]. The estimated cancer risks calculated for OU-7 have been updated to reflect current EPA toxicological data and classifications that have been revised since the baseline risk assessment for OU-7 was completed. Specifically, as noted by EPA in their October 25, 1999 comment letter, beryllium is no longer considered a carcinogen by the ingestion and dermal pathways.

#### Summary

The OU-7 RI report presented estimated cancer risks associated with potential recreational and potential residential exposure to both site-wide surface and subsurface soils. The risk estimates were prepared using cancer reference dose data available from the Integrated Risk Information System (IRIS) at the time of the evaluation. At that time IRIS listed oral and dermal reference dose information for beryllium as it was classified by EPA as a Group B2 carcinogen (sufficient evidence of carcinogenicity in animals; inadequate evidence of carcinogenicity in humans). Since the time that the evaluation was completed, EPA has reclassified beryllium and updated IRIS to reflect that it no longer, based on evaluation of available data, considers beryllium a cancer threat by dermal contact or ingestion. The latest IRIS subsection regarding the Quantitative Estimate of Carcinogenic Risk From Oral Exposure to Beryllium states that, "The oral database ... previously used in the development of the oral slope factor on IRIS, is considered inadequate for the assessment of carcinogenicity. The basis for not using the Schroeder and Mitchener rat study (1975a) is that the incidences of gross or malignant tumors in the control and beryllium-exposed groups were not significantly different."

EPA Region 3 noted this change in position during the review of the draft final OU-7 RI report. Based on this comment the estimated cancer risk calculations that considered beryllium a carcinogen for the OU-7 baseline risk assessment have been revised.

The revised estimated cancer risks fall within the EPA acceptable risk range for hazardous waste sites. Based on this update and revision, OU-7 does not present an unacceptable cancer risk to either potential recreational or residential users.

#### Revised Risk Estimates

Table 1 (OU-7 RI Report Table 5-22) presents the revised estimated cancer risk for potential *recreational* exposure to site-wide subsurface soils. The revised total risk for this potential future receptor is 2.8E-06. This represents a decrease in the risk estimate from that originally presented in the OU-7 RI (1.02E-05).

Table 2 (OU-7 RI Report Table 5-30) presents the revised estimated cancer risk for potential *residential* exposure to site-wide surface soils. The revised total risk for this potential future receptor is 4.7E-05. This represents a decrease in the risk estimate from that originally presented in the OU-7 RI (1.7E-04).

Table 3 (OU-7 RI Report Table 5-32) presents the revised estimated cancer risk for potential residential exposure to site-wide subsurface soils. The revised total risk for this potential future receptor is 5.6E-05. This represents a decrease in the risk estimate from that originally presented in the OU-7 RI (1.8E-04).

No other risk assessment calculations or estimates are impacted by this change in designation for beryllium.

The EPA has identified the risk range of 1E-04 to 1E-06 as the acceptable target risk range for carcinogenic risks associated with hazardous waste sites. In general cancer risks that fall within this range are typically considered acceptable and do not require remedial action. The estimated cancer risks for future potential recreational and residential users fall within this risk range.

#### References

Tetra Tech NUS, Inc., 1999. Remedial Investigation Operable Unit 7 (OU-7) Soils and Waste at Sites 6 and 7 Former Naval Air Warfare Center Warminster, Pennsylvania. King of Prussia, Pennsylvania.

Tetra Tech NUS, Inc., 1999. Revised Final Remedial Investigation and Feasibility Study Reports Sites 6 and 7, Operable Unit 7 Naval Air Warfare Center Warminster, Pennsylvania Response to Comments letter dated November 8, 1999. Correspondence number PHIL-13551. King of Prussia, Pennsylvania.

EPA, 2000. Integrated Risk Information System (IRIS).

**TABLE 1 (TABLE 5-22)**  
**Summary of Risks by COPC, Sitewide Subsurface Soils - Estimated RME Cancer Risks for Site 6**  
**NAWC Warminster, Pennsylvania**

COPC	Estimated Cancer Risk Future Recreational Receptor		
	Ingestion	Dermal Contact	Total
arsenic	1.50E-06	1.06E-06	2.57E-06
beryllium	NT	NT	NT
cadmium	NT	NT	NT
chromium	NT	NT	NT
copper	NT	NT	NT
iron	NT	NT	NT
lead	NT	NT	NT
thallium	NT	NT	NT
zinc	NT	NT	NT
Aroclor-1254	2.32E-08	2.93E-08	5.25E-08
benzo(a)pyrene	1.69E-07	NT	1.69E-07
<b>TOTAL RISK:</b>	1.69E-06	1.09E-06	2.79E-06

Notes:

NT -- No toxicity factor (slope factor or RfD) was available or applicable for any COPCs selected for this area of interest and medium.

RME -- Reasonable Maximum Exposure: The combination activity patterns and intake dose assumptions that yield the highest exposure that is reasonably expected to occur.

**TABLE 2 (TABLE 5-30)**  
**Summary of Risks by COPC, Sitewide Surface Soils - Estimated RME Cancer Risks for Site 6**  
**NAWC Warminster, Pennsylvania**

COPC	Estimated Cancer Risk Future Residential Receptor		
	Ingestion	Dermal Contact	Total
aluminum	NT	NT	NT
arsenic	2.32E-05	1.35E-05	3.67E-05
barium	NT	NT	NT
beryllium	NT	NT	NT
cadmium	NT	NT	NT
chromium	NT	NT	NT
copper	NT	NT	NT
manganese	NT	NT	NT
mercury	NT	NT	NT
thallium	NT	NT	NT
Aroclor-1260	1.67E-07	1.72E-07	3.39E-07
benz(a)anthracene	5.35E-07	NT	5.35E-07
benzo(a)pyrene	5.28E-06	NT	5.28E-06
benzo(b)fluoranthene	5.49E-07	NT	5.49E-07
dibenz(a,h)anthracene	3.03E-06	NT	3.03E-06
indeno(1,2,3-cd)pyrene	3.93E-07	NT	3.93E-07
<b>TOTAL RISK:</b>	<b>3.32E-05</b>	<b>1.36E-05</b>	<b>4.68E-05</b>

Notes:

NT -- No toxicity factor (slope factor or RfD) was available or applicable for any COPCs selected for this area of interest and medium.

RME -- Reasonable Maximum Exposure: The combination activity patterns and intake dose assumptions that yield the highest exposure that is reasonably expected to occur.

**TABLE 3 (TABLE 5-32)**  
**Summary of Risks by COPC, Sitewide Subsurface Soils - Estimated RME Cancer Risks for Site 6**  
**NAWC Warminster, Pennsylvania**

COPC	Estimated Cancer Risk Future Residential Receptor		
	Ingestion	Dermal Contact	Total
aluminum	NT	NT	NT
arsenic	2.96E-05	1.72E-05	4.68E-05
barium	NT	NT	NT
beryllium	NT	NT	NT
cadmium	NT	NT	NT
chromium	NT	NT	NT
copper	NT	NT	NT
iron	NT	NT	NT
lead	NT	NT	NT
manganese	NT	NT	NT
mercury	NT	NT	NT
nickel	NT	NT	NT
silver	NT	NT	NT
thallium	NT	NT	NT
vanadium	NT	NT	NT
zinc	NT	NT	NT
Aroclor-1248	1.40E-07	1.44E-07	2.84E-07
Aroclor-1254	4.57E-07	4.73E-07	9.30E-07
Aroclor-1260	5.95E-07	6.15E-07	1.21E-06
benz(a)anthracene	3.22E-07	NT	3.23E-07
benzo(a)pyrene	3.33E-06	NT	3.33E-06
benzo(b)fluoranthene	3.89E-07	NT	3.89E-07
dibenz(a,h)anthracene	2.51E-06	NT	2.52E-06
indeno(1,2,3-cd)pyrene	2.96E-07	NT	2.96E-07
<b>TOTAL RISK:</b>	<b>3.76E-05</b>	<b>1.84E-05</b>	<b>5.61E-05</b>

Notes:

NT -- No toxicity factor (slope factor or RfD) was available or applicable for any COPCs selected for this area of interest and medium.

RME -- Reasonable Maximum Exposure: The combination activity patterns and intake dose assumptions that yield the highest exposure that is reasonably expected to occur.