N00296.002203
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PRC

April 18, 1995

Mr. Stephen Chao, P.E.
Department of the Navy
Western Division
Naval Facilities Engineering Command
900 Commodore Drive, Building 208
San Bruno, California 94066-2402

CLEAN Contract Number N62474-288-D-5086
Contract Task Order 0236

Subject: Operable Unit 6 (OU6), Human Health Risk Assessment Re-evaluation of Risks Associated with OU6

Dear Mr.Chao:

Enclosed is the re-evaluation and comparison of risks associated with exposure to OU6 using methodologies from both the U.S. Environmental Protection Agency (EPA) and California Environmental Protection Agency Department of Toxic Substances Control (DTSC). This re-evaluation is in response to DTSC comments on the final OU6 Remedial Investigation (RI) Report (February 28, 1995).

Risks were recalculated, incorporating all of the requested changes, and are summarized in Table 1 (attached). Two risk estimates are presented: those calculated using DTSC exposure factors and those calculated using only EPA exposure factors. In the DTSC calculations, exposure frequency for the recreational receptor was changed to 260 days per year to account for the possibility that a person may exercise in the OU6 area 5 days per week for 25 years. All dermal absorption factors were changed to those recommended in DTSC guidance (1993). Soil ingestion for the occupational receptor was changed to 100 milligrams per day (mg/day) from 50 mg/day. Finally, the particulate emission factor of 5E-8 kilograms per cubic meter (kg/m^3) was used to estimate airborne concentration of contaminants for the particulate inhalation pathway for all receptors. In addition, copper was retained as a COC, and the hazard indices were calculated using the oral RfD of 3.7E-2 milligrams per kilogram-day.

The EPA risk estimates were calculated using EPA default parameters for recreational and future occupational exposures. Site-specific information regarding exposure time for all pathways and exposure frequency for contact with surface water were used in calculating the current risk estimates. Recreational exposures were calculated using an exposure frequency of 3 days per week for 25 years. The parameters that were used are presented in Attachment A, along with a summary of pathway-specific risks calculated using both DTSC and EPA methodologies.

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contains recycled fiber and is recyclable

As shown in Table 1, the risk estimated calculated using EPA parameters and site-specific information are one order of magnitude less than those estimated using DTSC parameters. The majority of this difference can be attributed to differences in the dermal exposure to soil pathway. Although the risks associated with inhalation of particulates varied by two orders of magnitude, this pathway contributed insignificantly to the overall risk. The highest total risk associated with inhalation of particulates is less than 1E-6. The highest total risks associated with dermal soil exposures are 1.3E-4 and 1.5E-5 using DTSC and EPA parameters, respectively. By contrast, risks associated with soil ingestion are less than 3E-6 using either DTSC or EPA parameters for occupational and recreational receptors.

In summary, the risks associated with exposure to OU6 are almost entirely due to dermal exposure to soil. Consideration should be given to the fact that a large degree of uncertainty is associated with this pathway. Neither DTSC nor EPA has developed slope factors specifically for dermal exposures. Furthermore, risks calculated using DTSC exposure parameters are one order of magnitude greater than those calculated using EPA methodology; this is due mainly to DTSC dermal absorbance factors. The Navy should schedule a conference call with EPA and DTSC to discuss the results of this re-evaluation.

Please call me at (303) 295-1101 if you have any questions regarding these results.

Sincerely,

Michael N. Jones

for Richard L. DeGrandchamp, Ph.D.
Principal Toxicologist

Attachment

cc: Joseph Chou, DTSC
Michael Wade, DTSC
Dan Stralka, EPA
Michael Gill, EPA
Michael Bessette, RWQCB

References:

DTSC. 1993. Preliminary Endangerment Assessment Guidance Manual. State of California, Environmental Protection Agency. July.

ATTACHMENT A

TABLE 1

NAS MOFFETT FIELD OU6
REMEDIAL INVESTIGATION
EXPOSURE PARAMETERS AND INTAKE ALGORITHM
CURRENT OCCUPATIONAL EXPOSURE:
SOIL INGESTION

$$\text{Intake (mg/kg-day)} = \frac{C \times IR \times EF \times ED \times ET \times CF}{BW \times AT}$$

Parameter			California-EPA RME	EPA RME
C	=	Chemical concentration (mg/kg)	Site specific	Site specific
IR	=	Ingestion rate (mg/day)	100[1]	50[2]
EF	=	Exposure frequency (days/year)[2]	250	250
ET	=	Exposure time (hr/day)[3]	1	1
ED	=	Exposure duration (years)[2]	25	25
CF	=	Conversion factor (kg/mg)	1.0E-6	1.0E-6
BW	=	Body weight (kg)[4]	70	70
AT	=	Averaging time (days)[2]		
		Noncarcinogenic	9,125	9,125
		Carcinogenic	25,550	25,550

Notes:

(1) DTSC (Dr. Michael Wade)

(2) EPA 1991.

(3) Site specific information. (Personal Communication, NAS Moffett Field Public Works, 1993).

(4) EPA 1989a.

mg/kg milligrams per kilogram
RME Reasonable Maximum Exposure

TABLE 1

NAS MOFFETT FIELD OU6
REMEDIAL INVESTIGATION
EXPOSURE PARAMETERS AND INTAKE ALGORITHM
FUTURE OCCUPATIONAL EXPOSURE:
SOIL INGESTION

$$\text{Intake (mg/kg-day)} = \frac{C \times IR \times EF \times ED \times ET \times CF}{BW \times AT}$$

Parameter			California-EPA RME	EPA RME
C	=	Chemical concentration (mg/kg)	Site specific	Site specific
IR	=	Ingestion rate (mg/day)	100[1]	50[2]
EF	=	Exposure frequency (days/year)[2]	250	250
ET	=	Exposure time (hr/day)[3]	8	8
ED	=	Exposure duration (years)[2]	25	25
CF	=	Conversion factor (kg/mg)	1.0E-6	1.0E-6
BW	=	Body weight (kg)[4]	70	70
AT	=	Averaging time (days)[2]		
		Noncarcinogenic	9,125	9,125
		Carcinogenic	25,550	25,550

Notes:

(1) DTSC (Dr. Michael Wade)

(2) EPA 1991.

(3) Site specific information. (Personal Communication, NAS Moffett Field Public Works, 1993).

(4) EPA 1989a.

mg/kg milligrams per kilogram
RME Reasonable Maximum Exposure

TABLE 2

NAS MOFFETT FIELD OU6
REMEDIAL INVESTIGATION
EXPOSURE PARAMETERS AND INTAKE ALGORITHM
CURRENT OCCUPATIONAL EXPOSURE:
DERMAL CONTACT WITH SURFACE SOIL

$$\text{Intake (mg/kg-day)} = \frac{C \times SA \times AB \times AF \times EF \times ED \times CF}{BW \times AT}$$

Parameter			California-EPA RME	EPA RME
C	=	Chemical concentration (mg/kg)	Site specific	Site specific
SA	=	Surface area (cm^2)[1]	5,800	2,910
AB	=	Absorption factor[2]	chemical specific[2]	chemical specific[3]
AF	=	Adherence factor (mg/cm^2)[4]	0.2	0.2
EF	=	Exposure frequency (events/year)[5]	250	250
ED	=	Exposure duration (years)[5]	25	25
CF	=	Conversion factor (kg/mg)	1E-6	1E-6
BW	=	Body weight (kg)[5]	70	70
AT	=	Averaging time (days)[5]		
		Noncarcinogenic	9,125	9,125
		Carcinogenic	25,550	25,550

Notes:

(1) EPA 1989b.

(2) DTSC (PEA guidance) 1993.

(3) If chemical specific values are not available, then absorption factors will be conservatively estimated at 1 percent for organics, 0.1 percent for inorganics (EPA 1992a), 6 percent for PCBs (EPA 1992a) and 3 percent for arsenic (DTSC 1994).

(4) EPA 1991.

(5) EPA 1989b.

mg/kg milligrams per kilogram
cm^2 square centimeters
RME Reasonable Maximum Exposure

TABLE 2

NAS MOFFETT FIELD OU6
REMEDIAL INVESTIGATION
EXPOSURE PARAMETERS AND INTAKE ALGORITHM
FUTURE OCCUPATIONAL EXPOSURE:
DERMAL CONTACT WITH SURFACE SOIL

$$\text{Intake (mg/kg-day)} = \frac{C \times SA \times AB \times AF \times EF \times ED \times CF}{BW \times AT}$$

Parameter			California-EPA RME	EPA RME
C	=	Chemical concentration (mg/kg)	Site specific	Site specific
SA	=	Surface area (cm^2)[1]	5,800	5,800
AB	=	Absorption factor[2]	chemical specific[2]	chemical specific[3]
AF	=	Adherence factor (mg/cm^2)[4]	0.2	0.2
EF	=	Exposure frequency (events/year)[5]	250	250
ED	=	Exposure duration (years)[5]	25	25
CF	=	Conversion factor (kg/mg)	1E-6	1E-6
BW	=	Body weight (kg)[5]	70	70
AT	=	Averaging time (days)[5]		
		Noncarcinogenic	9,125	9,125
		Carcinogenic	25,550	25,550

Notes:

(1) EPA 1989b.

(2) DTSC (PEA guidance) 1993.

(3) If chemical specific values are not available, then absorption factors will be conservatively estimated at 1 percent for organics, 0.1 percent for inorganics (EPA 1992a), 6 percent for PCBs (EPA 1992a) and 3 percent for arsenic (DTSC 1994).

(4) EPA 1991.

(5) EPA 1989b.

mg/kg milligrams per kilogram
cm^2 square centimeters
RME Reasonable Maximum Exposure

TABLE 3

NAS MOFFETT FIELD OU6
REMEDIAL INVESTIGATION
EXPOSURE PARAMETERS AND INTAKE ALGORITHM
FUTURE OCCUPATIONAL EXPOSURE:
DERMAL CONTACT WITH SURFACE WATER

$$\text{Intake (mg/kg-day)} = \frac{C \times SA \times AB \times AF \times EF \times ED \times CF}{BW \times AT}$$

Parameter			California-EPA RME	EPA RME
C	=	Chemical concentration (mg/kg)	Site specific	Site specific
SA	=	Surface area (cm^2)[1]	5,800	5,800
PC	=	Permeability constant (cm/hr)[2]	8.0 E-4	8.0 E-4
ET	=	Exposure time (hr/event)[3]	1	1
EF	=	Exposure frequency (events/year)[3]	2	2
ED	=	Exposure duration (years)[4]	25	25
CF	=	Conversion factor (L/cm^3)	1E-3	1E-3
BW	=	Body weight (kg)[5]	70	70
AT	=	Averaging time (days)[5]		
		Noncarcinogenic	9,125	9,125
		Carcinogenic	25,550	25,550

Notes:

(1) EPA 1989b.

(2) The permeability of water is used, but chemical specific permeability constants will be used when available for aqueous solutions.

(3) Site specific information (Personal communication, NAS Moffett Field Works, 1993).

(4) EPA 1989a.

(5) EPA 1991.

mg/kg milligrams per kilogram
cm^2 square centimeters
L/cm^3 Liters per cubic centimeter
RME Reasonable Maximum Exposure

TABLE 4

NAS MOFFETT FIELD OU6
REMEDIAL INVESTIGATION
EXPOSURE PARAMETERS AND INTAKE ALGORITHM
FUTURE OCCUPATIONAL EXPOSURE:
INGESTION OF SURFACE WATER

$$\text{Intake (mg/kg-day)} = \frac{C \times IR \times ET \times EF \times ED \times CF}{BW \times AT}$$

Parameter			California-EPA RME	EPA RME
C	=	Chemical concentration (mg/kg)	Site specific	Site specific
IR	=	Intake rate (ml/hour)[1]	50	50
ET	=	Exposure time (hr/event)[2]	1	1
EF	=	Exposure frequency (events/year)	2	2
ED	=	Exposure duration (years)[1]	25	25
CF	=	Conversion factor (L/ml)	1E-3	1-3
BW	=	Body weight (kg)[3]	70	70
AT	=	Averaging time (days)[1]		
		Noncarcinogenic	9,125	9,125
		Carcinogenic	25,550	25,550

Notes:

(1) EPA 1991.

(2) Site specific information (Personal communication, NAS Moffett Field Works, 1993).

(3) EPA 1989a.

mg/kg milligrams per kilogram
mg/hr milligrams per hour
L/ml Liters per milliliter
RME Reasonable Maximum Exposure

TABLE 5

NAS MOFFETT FIELD OU6
REMEDIAL INVESTIGATION
EXPOSURE PARAMETERS AND INTAKE ALGORITHM
CURRENT OCCUPATIONAL EXPOSURE:
INHALATION OF PARTICULATES

$$\text{Intake (mg/kg-day)} = \frac{C \times IR \times ET \times EF \times ED \times PEF}{BW \times AT}$$

Parameter			California-EPA RME	EPA RME
C	=	Chemical concentration (mg/kg)	Site specific	Site specific
IR	=	Inhalation rate (m^3/hr)	1.25	1.25
ET	=	Exposure time (hr/event)[1]	1	1
EF	=	Exposure frequency (events/year)[2]	250	250
BW	=	Body weight (kg)[3]	70	70
AT	=	Averaging time (days)[2]		
		Noncarcinogenic	9,125	9,125
		Carcinogenic	25,550	25,550
PEF	=	Particulate Emission Factor(kg/m^3)[3]	5E-8	2.2E-10
ED	=	Exposure duration (years)[3]	25	25

Notes:

(1) Site specific information (Personal communication, NAS Moffett Field Works, 1993).

(2) EPA 1991

(3) EPA 1989a.

mg/kg milligrams per kilogram
m^3/hr cubic meters per hour
kg/m^3 kilograms per cubic meter
RME Reasonable Maximum Exposure

TABLE 5

NAS MOFFETT FIELD OU6
REMEDIAL INVESTIGATION
EXPOSURE PARAMETERS AND INTAKE ALGORITHM
FUTURE OCCUPATIONAL EXPOSURE:
INHALATION OF PARTICULATES

$$\text{Intake (mg/kg-day)} = \frac{C \times IR \times ET \times EF \times ED \times PEF}{BW \times AT}$$

Parameter			California-EPA RME	EPA RME
C	=	Chemical concentration (mg/kg)	Site specific	Site specific
IR	=	Inhalation rate (m^3/hr)	1.25	1.25
ET	=	Exposure time (hr/event)[1]	8	8
EF	=	Exposure frequency (events/year)[2]	250	250
ED	=	Exposure duration (years)[3]	25	25
BW	=	Body weight (kg)[3]	70	70
AT	=	Averaging time (days)[2]		
		Noncarcinogenic	9,125	9,125
		Carcinogenic	25,550	25,550
PEF	=	Particulate Emission Factor(kg/m^3)[3]	5E-8	2.2E-10
ED	=	Exposure duration (years)[3]	25	25

Notes:

(1) Site specific information (Personal communication, NAS Moffett Field Works, 1993).

(2) EPA 1991

(3) EPA 1989a.

mg/kg milligrams per kilogram
m^3/hr cubic meters per hour
kg/m^3 kilograms per cubic meter
RME Reasonable Maximum Exposure

TABLE 6

NAS MOFFETT FIELD OU6
REMEDIAL INVESTIGATION
EXPOSURE PARAMETERS AND INTAKE ALGORITHM
RECREATIONAL EXPOSURE:
DERMAL CONTACT WITH SURFACE SOIL

$$\text{Intake (mg/kg-day)} = \frac{C \times SA \times AB \times AF \times EF \times ED \times CF}{BW \times AT}$$

Parameter			California-EPA RME	EPA RME
C	=	Chemical concentration (mg/kg)	Site specific	Site specific
SA	=	Surface area (cm^2)[1]	5,800	5,800
AB	=	Absorption factor[2]	chemical specific[2]	chemical specific[3]
AF	=	Adherence factor (mg/cm^2)[4]	0.2	0.2
EF	=	Exposure frequency (events/year)	260[5]	156[6]
ED	=	Exposure duration (years)[5]	25	25
CF	=	Conversion factor (kg/mg)	1E-6	1E-6
BW	=	Body weight (kg)[4]	70	70
AT	=	Averaging time (days)[5] Noncarcinogenic Carcinogenic	 9,125 25,550	 9,125 25,550

Notes:

(1) EPA 1992a.

(2) DTSC (PEA guidance) 1993.

(3) If chemical specific values are not available, then absorption factors will be conservatively estimated at 1 percent for organics, 0.1 percent for inorganics (EPA 1992a), 6 percent for PCBs (EPA 1992a), and 3 percent for arsenic (DTSC 1994).

(4) EPA 1991.

(5) 5 days/week for 52 weeks = 260 days/year (Dr. Michel Wade, DTSC).

RME Reasonable Maximum Exposure
mg/kg milligrams per kilogram
cm^2 square centimeters

TABLE 7

NAS MOFFETT FIELD OU6
REMEDIAL INVESTIGATION
EXPOSURE PARAMETERS AND INTAKE ALGORITHM
RECREATIONAL EXPOSURE:
SOIL INGESTION

$$\text{Intake (mg/kg-day)} = \frac{C \times IR \times EF \times ED \times CF}{BW \times AT}$$

Parameter			California-EPA RME	EPA RME
C	=	Chemical concentration (mg/kg)	Site specific	Site specific
IR	=	Ingestion rate (mg/day)[1]	100	100
EF	=	Exposure frequency (days/year)	260[2]	156[3]
ED	=	Exposure duration (years)[1]	25	25
CF	=	Conversion factor (kg/mg)	1.0E-6	1.0E-6
BW	=	Body weight (kg)[1]	70	70
AT	=	Averaging time (days)[5]		
		Noncarcinogenic	9,125	9,125
		Carcinogenic	25,550	25,550

Notes:

(1) EPA 1991.

(2) 5 days/week for 52 weeks = 260 days/year (Dr. Michel Wade, DTSC).

(3) Site specific information (3 days/week x 52 weeks/year = 156 days/year).

RME Reasonable Maximum Exposure
mg/kg milligrams per kilogram

TABLE 8

NAS MOFFETT FIELD OU6
REMEDIAL INVESTIGATION
EXPOSURE PARAMETERS AND INTAKE ALGORITHM
RECREATIONAL EXPOSURE:
INGESTION OF SURFACE WATER

$$\text{Intake (mg/kg-day)} = \frac{C \times IR \times EF \times ED \times CF}{BW \times AT}$$

Parameter			California-EPA RME	EPA RME
C	=	Chemical concentration (mg/kg)	Site specific	Site specific
IR	=	Intake rate (ml/day)[1]	50	50
ET	=	Exposure time (hr/event)[2]	1	1
EF	=	Exposure frequency (events/year)	6	6
ED	=	Exposure duration (years)[1]	25	25
CF	=	Conversion factor (L/ml)	1E-3	1E-3
BW	=	Body weight (kg)[1]	70	70
AT	=	Averaging time (days)[5]		
		Noncarcinogenic	9,125	9,125
		Carcinogenic	25,550	25,550

Notes:
[1] EPA 1991.

[2] Site specific information (Personal communication, NAS Moffett Public Field Works, 1993).

RME Reasonable Maximum Exposure
mg/kg milligrams per kilogram
ml/hr milligrams per hour
L/ml Liters per milliliter

TABLE 8

NAS MOFFETT FIELD OU6
REMEDIAL INVESTIGATION
EXPOSURE PARAMETERS AND INTAKE ALGORITHM
RECREATIONAL EXPOSURE:
INHALATION OF VAPORS (SOIL/SEDIMENT/SURFACE)

$$\text{Intake (mg/kg-day)} = \frac{C \times IR \times ET \times EF \times ED}{BW \times AT}$$

Parameter			California-EPA RME	EPA RME
C	=	Chemical concentration (mg/kg)[3]	Site specific	Site specific
IR	=	Inhalation rate (m^3/hr)[1]	2.5	1.25
ET	=	Exposure time (hr/day)[2]	1	1
EF	=	Exposure frequency (events/year)	260[4]	156[5]
ED	=	Exposure duration (years)[1]	25	25
BW	=	Body weight (kg)[1]	70	70
AT	=	Averaging time (days)[5]		
		Noncarcinogenic	9,125	9,125
		Carcinogenic	25,550	25,550

Notes:

(1) EPA 1991.

(2) Site specific information (Personal communication, NAS Moffett Public Field Works, 1993).

(3) Soil chemical concentrations were adjusted using volatilization factors, calculated as outlined in RAGS-B (EPA 1991b).

(4) 5 days/week x 52 weeks/year = 260 days/year (Dr. Michael Wade, DTSC).

(5) Site specific information (3 days/weeks x 52 weeks/year = 156 days/year).

m^3/kg milligrams per cubic meter
mg/kg milligrams per kilogram
m^3/hr cubic meters/per hour

TABLE 9

NAS MOFFETT FIELD OU6
REMEDIAL INVESTIGATION
EXPOSURE PARAMETERS AND INTAKE ALGORITHM
RECREATIONAL EXPOSURE:
INHALATION OF PARTICULATES

$$\text{Intake (mg/kg-day)} = \frac{C \times IR \times ET \times EF \times ED \times PEF}{BW \times AT}$$

Parameter			California-EPA RME	EPA RME
C	=	Chemical concentration (mg/kg)[3]	Site specific	Site specific
IR	=	Inhalation rate (m^3/hr)[1]	2.5	1.25
ET	=	Exposure time (hr/day)[2]	1	1
EF	=	Exposure frequency (events/year)	260[3]	156[4]
ED	=	Exposure duration (years)[1]	25	25
PEF	=	Particulate Emission Factor (kg/m^3)	5E-8	2.2E-10
BW	=	Body weight (kg)[1]	70	70
AT	=	Averaging time (days)[5]		
		Noncarcinogenic	9,125	9,125
		Carcinogenic	25,550	25,550

Notes:

(1) EPA 1991.

(2) Site specific information (Personal communication, NAS Moffett Public Field Works, 1993).

(3) 5 days/week x 52 weeks/year = 260 days/year (Dr. Michael Wade, DTSC).

(4) 3 days/week for 52 weeks = 156 days/year.

RME Reasonable Maximum Exposure
mg/kg milligrams per kilogram
m^3/hr cubic meters per hour

TABLE 10

MOFFETT FEDERAL AIRFIELD OU6
SUMMARY OF PATHWAY-SPECIFIC RISKS
CURRENT OCCUPATIONAL EXPOSURES

Pathway	DTSC	EPA
Soil Ingestion	2.8E-6	1.4E-6
Dermal Contact with Soil	1.3E-4	1.5E-5
Inhalation of Particulates	9.5E-8	4.2E-10
TOTAL	1.3E-4	1.6E-5

TABLE 11

MOFFETT FEDERAL AIRFIELD OU6
SUMMARY OF PATHWAY-SPECIFIC RISKS
FUTURE OCCUPATIONAL EXPOSURES

Pathway	DTSC	EPA
Soil Ingestion	1.9E-5	9.5E-6
Dermal Contact with Soil	1.3E-4	2.4E-5
Dermal Contact with Surface Water	3.0E-8	3.0E-8
Inhalation of Particulates	8.0E-7	3.5E-9
Ingestion of Surface Water	1.2E-7	1.2E-7
TOTAL	1.5E-4	3.4E-5

TABLE 12

MOFFETT FEDERAL AIRFIELD OU6
SUMMARY OF PATHWAY-SPECIFIC RISKS
RECREATIONAL EXPOSURE

Pathway	DTSC	EPA
Soil Ingestion	1.2E-6	7.4E-7
Dermal Contact with Soil	1.1E-4	1.6E-5
Dermal Contact with Surface Water	2.9E-6	2.9E-6
Inhalation of Particulates	6.3E-8	2.8E-10
Inhalation of Vapors	1.4E-9	5.0E-10
Ingestion of Surface Water	4.5E-8	4.5E-8
TOTAL	1.1E-4	2.0E-5

TABLE 13

MOFFETT FEDERAL AIRFIELD OU6
SUMMARY OF PATHWAY-SPECIFIC HAZARD INDICES
CURRENT OCCUPATIONAL EXPOSURE

Pathway	DTSC	EPA
Soil Ingestion	1.3E-2	6.4E-3
Dermal Contact with Soil	1.0E-1	5.3E-3
Inhalation of Particulates	1.5E-3	6.5E-6
TOTAL	1.1E-1	1.2E-2

TABLE 14

MOFFETT FEDERAL AIRFIELD OU6
SUMMARY OF PATHWAY-SPECIFIC HAZARD INDICES
FUTURE OCCUPATIONAL EXPOSURE

Pathway	DTSC	EPA
Soil Ingestion	2.3E-1	1.2E-1
Dermal Contact with Soil	1.3E-1	1.3E-2
Dermal Contact with Surface Water	8.8E-4	8.8E-4
Inhalation of Particulates	1.0E-2	4.4E-5
Ingestion of Surface Water	3.0E-3	3.0E-3
TOTAL	3.7E-1	1.4E-1

TABLE 15

MOFFETT FEDERAL AIRFIELD OU6
SUMMARY OF PATHWAY-SPECIFIC HAZARD INDICES
RECREATIONAL EXPOSURE

Pathway	DTSC	EPA
Soil Ingestion	1.1E-2	6.9E-3
Dermal Contact with Soil	1.4E-1	8.2E-3
Dermal Contact with Surface Water	2.5E-3	2.5E-3
Inhalation of Particulates	7.8E-4	3.4E-6
Inhalation of Vapors	1.2E-4	3.6E-5
Ingestion of Surface Water	1.1E-3	1.1E-3
TOTAL	1.6E-1	1.9E-2