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SUMMARY SCORESHEET FOR COMPUTING PROJECTED HRS SCORE

SITE NAME: FLYNN - LEARNER PROPERTY

CITY, COUNTY: HONOLULU, HONOLULU

EPA ID #: HID984468363 EVALUATOR: S. MACKENZIE

PROGRAM ACCOUNT #: _____ DATE: SEPTEMBER 1994

Lat/ Long: 21°19'37.294"/157°53'36.310" T/R/S: N/A

THIS SCORESHEET IS FOR A: PA X SI ___ Other (Specify) ___

RCRA STATUS (check all that apply):

___ Generator X Small Quantity Generator ___ Transporter ___ TSDF

___ Not Listed in RCRA Database as of (date of printout) ___/___/___

STATE SUPERFUND STATUS:

___ DTSC Annual Work Plan (formerly BEP) (date) ___/___/___

___ WQARF (date) ___/___/___ No State Superfund Status (date) 9/30/94

	S pathway	S^2 pathway
Groundwater Migration Pathway Score (S_{gw})	*	
Surface Water Migration Pathway Score (S_{sw})	100	10,000
Soil Exposure Pathway Score (S_s)	*	
Air Migration Pathway Score (S_a)	*	
$S^2_{gw} + S^2_{sw} + S^2_s + S^2_a$	XXXXXXXXXXXXXX XXXXXXXXXXXXXX	10,000
$(S^2_{gw} + S^2_{sw} + S^2_s + S^2_a) / 4$	XXXXXXXXXXXXXX XXXXXXXXXXXXXX	2500
$\sqrt{(S^2_{gw} + S^2_{sw} + S^2_s + S^2_a) / 4}$	XXXXXXXXXXXXXX XXXXXXXXXXXXXX	50

* Pathway evaluated, but not assigned a score (explain):

* GROUNDWATER PATHWAY WAS NOT SCORED BECAUSE THE NEAREST DRINKING WATER WELLS ARE 2-3 MILES UPGRADIENT OF THE SITE.
* THE AIR PATHWAY AND SOIL EXPOSURE PATHWAYS WERE NOT SCORED AS THERE ARE NO RESIDENCES, DAY CARE CENTERS, OR SCHOOLS ON OR WITHIN 200 FEET OF THE SITE

GROUNDWATER TO SURFACE WATER MIGRATION COMPONENT SCORESHEET

Factor Categories and Factors

DRINKING WATER THREAT

	Likelihood of Release to Aquifer	Maximum Value	Score	Rationale	Data Qual.
1.	Observed Release	550	550	1	H
2.	Potential to Release				
	2a. Containment	10			
	2b. Net Precipitation	10			
	2c. Depth to Aquifer	5			
	2d. Travel Time	35			
	2e. Potential to Release [lines 2a x (2b+2c+2d)]	500			
3.	Likelihood of Release (Line 1 or 2e)	550	550		
	Waste Characteristics				
4.	Toxicity/Mobility/Persistence	a	10,000	2	H
5.	Hazardous Waste Quantity	a	10	3	H
6.	Waste Characteristics (lines 4 x 5, then assign a value from Table 2-7)	100	18		
	Targets				
7.	Nearest Intake	50	Ø	4	H
8.	Population[d]				
	8a. Level I Concentrations	b	Ø	4	H
	8b. Level II Concentrations	b	Ø	4	H
	8c. Potential Contamination	b	Ø	4	H
	8d. Population (lines 8a+8b+8c)	b	Ø	4	H
9.	Resources	5	5	5	H
10.	Targets (Lines 7+8d+9)	b	5		
	Drinking Water Threat Score				
11.	Drinking Water Threat [(Lines 3 x 6 x 10)/82,500 subject to a maximum of 100]	100	0.6		

GROUNDWATER TO SURFACE WATER MIGRATION COMPONENT SCORESHEET (CONTINUED)

Factor Categories and Factors

HUMAN FOOD CHAIN THREAT

	Likelihood of Release	Maximum Value	Score	Rationale	Data Qual.
12.	Likelihood of Release (Same Value as Line 3)	550	550	1	H
	Waste Characteristics				
13.	Toxicity/Mobility/Persistence/ Bioaccumulation	a	5×10^7	6	H
14.	Hazardous Waste Quantity	a	100	7	E
15.	Waste Characteristics (Toxicity/Mobility/Persistence x Hazardous Waste Quantity x Bioaccumulation, then assign a value from Table 2-7)	1,000	180		
	Targets				
16.	Food Chain Individual[d]	50	50	1,7	E
17.	Population				
	17a. Level I Concentrations	b	620	1,7	E
	17b. Level II Concentrations	b	Ø	8	H
	17c. Potential Human Food Chain Contamination	b	Ø	8	H
	17d. Population (Lines 17a+17b+17c)	b	620		
18..	Targets (Lines 16+17d)	b	670		
	Human Food Chain Threat Score				
19.	Human Food Chain Threat [(Lines 12 x 15 x 18)/82,500 subject to a maximum of 100]	100	100		

GROUNDWATER TO SURFACE WATER MIGRATION COMPONENT SCORESHEET (CONTINUED)

Factor Categories and Factors

ENVIRONMENTAL THREAT

	Likelihood of Release	Maximum Value	Score	Rationale	Data Qual.
20.	Likelihood of Release (Same Value as Line 3)	550	550	1	H
	Waste Characteristics				
21.	Ecosystem Toxicity/Mobility/ Persistence/Bioaccumulation	a	5.0×10^6	9	H
22.	Hazardous Waste Quantity	a	100	7	E
23.	Waste Characteristics (Eco. Tox./Mob./Pers.x Hazardous Waste Quantity x Bioaccumulation, then assign a value from Table 2-7)	1,000	100		
	Targets				
24.	Sensitive Environments[d]				
	24a. Level I Concentrations	b	Ø	1, 10	E
	24b. Level II Concentrations	b	225	1, 10	E
	24c. Potential Contamination	b	0.0009	11	H
	24d. Sensitive Environments (lines 24a+24b+24c)	b	225.0009		
25.	Targets (Value from line 24d)	b	225.0009		
	Environmental Threat Score				
26.	Environmental Threat Score [(lines 20 x 23 x 25)/82,500 subject to a maximum of 60]	60	60		

GROUNDWATER TO SURFACE WATER MIGRATION COMPONENT SCORE FOR A WATERSHED

27.	Watershed Score [(Lines 11+19+26), subject to a maximum of 100]	100	60[c]

GROUNDWATER TO SURFACE WATER MIGRATION COMPONENT SCORE

28.	Component Score (Sof) (Highest score from Line 27 for all watersheds evaluated, subject to a maximum of 100)	100	100[c]

a Maximum value applies to waste characteristics category.
b Maximum value not applicable.
c Do not round to the nearest integer.
d Use additional tables.

GROUNDWATER TO SURFACE WATER MIGRATION COMPONENT CALCULATIONS (CONTINUED)

20. **Food Chain Targets**

Actual Contamination

Fishery	Contaminant	Concen-tration	Benchmark	(A) Assigned Population Value (Table 4-18)	(B) Level* Multiplier	(A x B)
INSHORE	PROJECTED			31	10	310
OFFSHORE				31	10	310
				Sum (A x B) Level I		620
				Sum (A x B) Level II		

* Level Multipliers
- Level I = 10
- Level II = 1

Potential Contamination

Fishery	Production (lb/yr)	(P) Assigned Population Value (Table 4-18)	Average Stream Flow at Fishery (cfs)	(DW) Dilution Weighting Factor (Table 4-13)	(DA) Dilution Weight Adjustment Factor (Table 4-27)	(PxDWxDA)
					Sum (PxDWxDA)	

Fisheries Subject to Potential Contamination = $\frac{\text{Sum (PxDWxDA)}}{10}$ = _____

GROUNDWATER TO SURFACE WATER MIGRATION COMPONENT CALCULATIONS (CONTINUED)

27. **Environmental Targets**

Actual Contamination

Sensitive Environment or Wetland Length (miles)	Contaminant	Concen-tration	Benchmark	(A) Assigned Value (Table 4-23 and/or 4-24)	(B) Level* Multip.	(A x B)
HAWAIIAN OWL	PROJECTED			75	1	75
HAWAIIAN STILT				75	1	75
KEEHI LAGOON				50	1	50
REEF RUNWAY				25	1	25

* Level Multipliers
- Level I = 10
- Level II = 1

Sum (A x B) Level I _____

Sum (A x B) Level II 225

Potential Contamination

Sensitive Environment or Wetland Length (miles)	(A) Assigned Value (Table 4-23 and/or 4-24)	Average Stream Flow (cfs)	(DW) Dilution Weighting Factor (Table 4-13)	(DA) Dilution Weighting Adjustment Factor (Table 4-27)	(AxDWxDA)
HUMPBACK WHALE	75		0.0001	0.6	0.0045
GREEN SEA TURTLE	75		0.0001	0.6	0.0045

Sum of (AxDWxDA) 0.009

Potential contamination = $\frac{\text{Sum (AxDWxDA)}}{10}$ = 0.0009

HAZARD RANKING SYSTEM (HRS) SCORING RATIONALES
FLYNN-LEARNER PROPERTY

GROUNDWATER TO SURFACE WATER MIGRATION PATHWAY

1. Observed Release: Chemical analysis of the groundwater in the upper aquifer indicated levels of lead and cadmium above MCL's for those compounds. These were unfiltered samples, and when wells were developed and samples obtained, chemical analysis indicated levels below detection limits. Laboratory analysis of soil at the site indicates levels of lead, cadmium, and zinc down to 5 and 7 feet below ground surface (bgs) at concentrations greater than 3 times background. Ground water at the site fluctuates between 5 to 6 bgs, thus ground water is in contact with contaminated soil. A value of **550** is assigned.

2. Toxicity/Mobility/Persistence: The hazardous substances of significance on-site currently are lead, cadmium, and zinc. Their presence has been established through extensive soil sampling conducted on-site, as well as off-site to establish background levels for these substances. Lead on-site is up to 630 times background and cadmium is up to 270 times background levels.

Substance	Toxicity	Mobility	Persistence	T/M/P
Cadmium	10,000	1.0	1.0	10,000
Zinc	10	0.01	1.0	0.1
Lead	10,000	0.01	1.0	100

Values obtained from the Superfund Chemical Data Matrix (SCDM) dated June 1994. The greatest T/M/P value was calculated to be **10,000**.

3. Hazardous Waste Quantity: The known source on site is contaminated soil. No removal action has taken place, thus a default value of **10** is assigned.

4. Nearest Intake: There are no drinking water intakes along the ground water to surface water migration path, thus a value of **0** is assigned.

5. Resources: The surface water in the migration path of ground water is used as a recreation area (Keehi Lagoon Beach Park), thus a value of **5** is assigned.

6. Toxicity/Mobility/Persistence/Bioaccumulation

Substance	Toxicity	Mobility	Persist.	Bioacc.	T/M/P/B
Cadmium	10,000	1.0	1.0	5,000	5.0E+7
Zinc	10	0.01	1.0	50,000	5,000
Lead	10,000	0.01	1.0	5,000	5.0E+5

The T/M/P/B values were obtained from the Superfund Chemical Data Matrix dated June 1994. The highest T/M/P/B value is for cadmium and is **5.0×10^7**.

7. Hazardous Waste Quantity: Having an observed release to groundwater, and having fisheries in Keehi Lagoon and the Pacific Ocean, which are within the 15-mile in-water segment, Level I concentrations are projected to be found when tissue samples are obtained. Thus a hazardous waste quantity default value of 100 is assigned.

8. Since the fisheries were projected to have Level I concentrations, no Level II or potential contamination was evaluated for the fisheries within the 15-mile in-water segment.

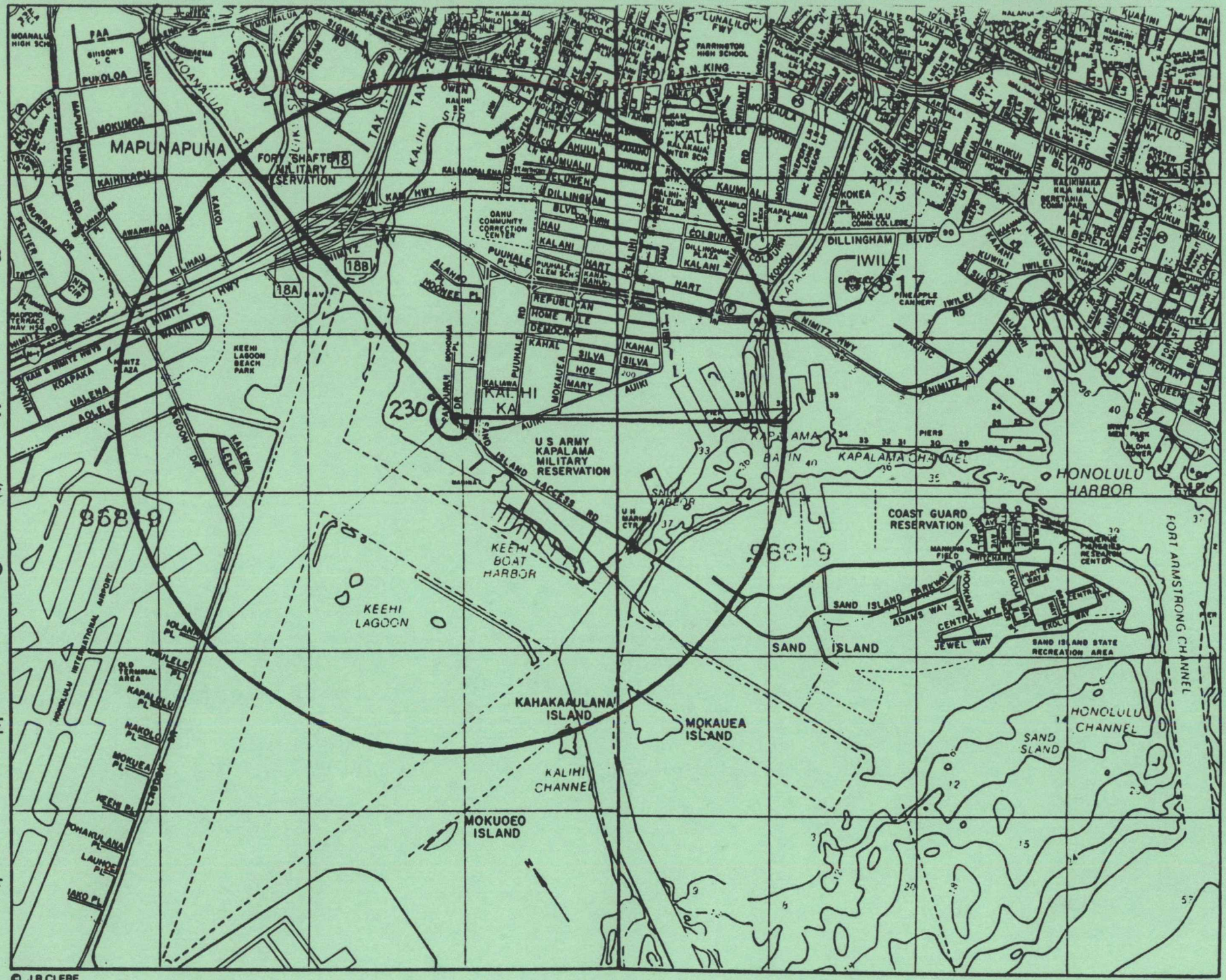
9. Ecosystem Toxicity/Mobility/Persistence/Bioaccumulation

Substance	Eco.Tox.	Mobility	Persist.	Bioaccum.	E/M/P/B
Cadmium	1,000	1.0	1.0	5,000	5.0E+6
Zinc	100	0.01	1.0	50,000	5.0E+4
Lead	1,000	0.01	1.0	5,000	5.0E+4

The E/M/P/B values were obtained from the Superfund Chemical Data Matrix (SCDM) dated June 1994. The highest E/M/P/B value is for cadmium, thus a value of **5.0E+6** is assigned.

10. Having an observed release to groundwater, and Keehi Lagoon and the Reef Runway are part of the 15-mile in-water segment, Level II concentrations are projected for the sensitive environments in these wetlands. Level I concentrations were not projected as benchmarks are for water and sampling would not be expected to indicate contamination due to tidal influence.

11. The Pacific Ocean is approximately 2 miles downgradient of the site, thus taking into account dilution effects, potential contamination was projected for the sensitive environments within the Pacific Ocean.



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DETERMINATION OF GROUND WATER TO SURFACE WATER ANGLE

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