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10 CFR 50.4
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September 10, 2009

UN#09-382

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: UniStar Nuclear Energy, NRC Docket No. 52-016
Calvert Cliffs Nuclear Power Plant, Unit 3
TRAGIS and RADTRAN Information Need Response

A supplemental Need for Information request was made by the NRC Environmental Project Manager for Calvert Cliffs Nuclear Power Plant (CCNPP) Unit 3 in a telephone conversation on Thursday, August 20, 2009. The request was to provide input/output files from TRAGIS and RADTRAN programs for alternative sites. The response to the TRAGIS and RADTRAN information need is provided in the enclosure.

This response does not include any new regulatory commitments.

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If there are any questions regarding this transmittal, please contact me at (410) 470-4205, or Mr. Dimitri Lutchenkov at (410) 470-5524.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on September 10, 2009

A handwritten signature in black ink, appearing to read 'Greg Gibson', with a long horizontal stroke extending to the right.

Greg Gibson

Enclosure: NRC Information Need Response, TRAGIS and RADTRAN Evaluation
Applicability to Alternative Sites, Calvert Cliffs Nuclear Power Plant Unit 3,
Calvert County, Maryland

cc: Surinder Arora, NRC Project Manager, U.S. EPR Projects Branch
Laura Quinn, NRC Environmental Project Manager, U.S. EPR COL Application
Getachew Tesfaye, NRC Project Manager, U.S. EPR DC Application (w/o enclosure)
Loren Plisco, Deputy Regional Administrator, NRC Region II (w/o enclosure)
Silas Kennedy, U.S. NRC Resident Inspector, CCNPP, Units 1 and 2
U.S. NRC Region I Office

Enclosure

**NRC Information Need Response
TRAGIS and RADTRAN Evaluation Applicability to Alternative Sites
Calvert Cliffs Nuclear Power Plant Unit 3
Calvert County, Maryland**

Need for Information Request: A supplemental Need for Information request was made by the NRC Environmental Project Manager for Calvert Cliffs Nuclear Power Plant (CCNPP) Unit 3 in a telephone conversation on Thursday, August 20, 2009, to provide input/output files from TRAGIS and RADTRAN programs for alternative sites.

Response: TRAGIS and RADTRAN evaluations were only conducted for the Proposed Site, Calvert Cliffs (CCNPP), for the COLA. Input/output information for both programs for CCNPP were subsequently provided in UNE response to RAI 185 (UNE Letter 08-018, dated June 12, 2008). It has been and continues to be the UNE position that conducting detailed TRAGIS and RADTRAN evaluations for alternative sites is beyond reconnaissance level. However, it can be shown that the CCNPP calculations can be evaluated on a statistical basis to conclude that the three alternative sites (Bainbridge, EASTALCO and Thiokol) would have person-Sievert (person-Sv) exposure similar to or less than that of CCNPP and that the overall aggregate person-Sv exposure difference of the alternative sites is statistically insignificant from that calculated for CCNPP.

The TRAGIS evaluation for CCNPP identified routes and calculated distances to/from CCNPP to be used by RADTRAN to calculate in-transit population exposure in person-Sv. Three routes were evaluated; 1) Unirradiated Fuel Truck from Richland WA to CCNPP, 2) Radioactive Waste Truck from CCNPP to the Hanford Repository, and 3) Irradiated Fuel Truck from CCNPP to Yucca Mountain. Figure 1 below shows an example of these three routes on a macro level. As can be seen, the Maryland portion of these routes accounts for a very small portion of these trips. The actual distances are summarized in the attached table and are about 2700 miles for each of the three. The Maryland portion of that distance is approximately 156 - 235 miles or 6% -9% of the total and is shown graphically in Figure 2. Furthermore, within Maryland itself there is a common convergence near Frederick near or about the intersection of I-270 and I-70. Travel west of this point would follow a common route for CCNPP and the three alternative sites. These specific distances calculated utilizing Google Maps© are as follows:

- CCNPP to Frederick (I-270/I70) is 99.1 miles (Figure 3)
- Bainbridge to Frederick (I-270/I70) is 92.5 miles (Figure 4)
- Thiokol to Frederick (I-270/I70) is 99.8 miles (Figure 5)
- EASTALCO to Frederick (I-270/I70) is 6.3 miles (Figure 6)

The remaining distances to the west from Frederick within Maryland were calculated utilizing Google Maps© and are as follows:

- Frederick (I-270/I70) to I-80/MD/WV border for Yucca Mt route is 42 miles
- Frederick to I-70/MD/PA border for Richland WA and Hanford Repository routes is 52.2 miles

As such, the common distance, including the portion within Maryland west of Frederick, is in the order of 2600 miles, while the site specific portions from each site (e.g., CCNPP, Bainbridge, EASTALCO and Thiokol) to Frederick ranges from 6.3 to 100 miles or ~0.2% to ~3.7% of total distance.

RADTRAN calculates exposures based on distance/time duration and population density. Although nearly a 1/4 of the total urban and ~15% of the total suburban distance is within Maryland, the total person-Sv exposure in rural areas accounts for approximately 70% of the aggregate person-Sv of the entire route for the three cases evaluated. Additionally, the transportation route from Bainbridge to Frederick is statistically similar based on the observation that the CCNPP and Bainbridge routes both follow initial rural routes and then partially circumvent major metropolitan (i.e., urban/suburban) areas of Washington, DC and Baltimore, respectively, before converging at Frederick.

RADTRAN also evaluates non-radiological data, accidents and fatalities. Review of the output indicates that the rural sections dominate the accident rates and Maryland's portion of rural route is only 3% of the total distance of which only ~2/3 of the total in-state distance, from CCNPP or alternate site, is before convergence at Frederick. This would tend to even further statistically reduce the effects of route differences of the alternate sites (as compared to CCNPP). Fatalities are zero for each of the CCNPP cases and, as such, statistically should have little or no effect due to nuances in routes from any of the alternate sites (as compared to CCNPP).

Therefore, it can be concluded that:

- Due to the relative small distance differences to the common point of intersection in Frederick MD, the overall change in person-Sv exposure is insignificant when comparing CCNPP and the three alternative sites
- The person-Sv exposure from CCNPP and/or Thiokol to Frederick MD is equal to or greater than that of Bainbridge
- EASTALCO would have the lowest person-Sv exposure to value

In conclusion, it can be deduced that the overall person-Sv exposure difference between any of the alternative sites and CCNPP should be statistically insignificant when compared to the overall person-Sv exposure of any of the three postulated transportation routes evaluated for CCNPP.

FIGURE 1



FIGURE 2

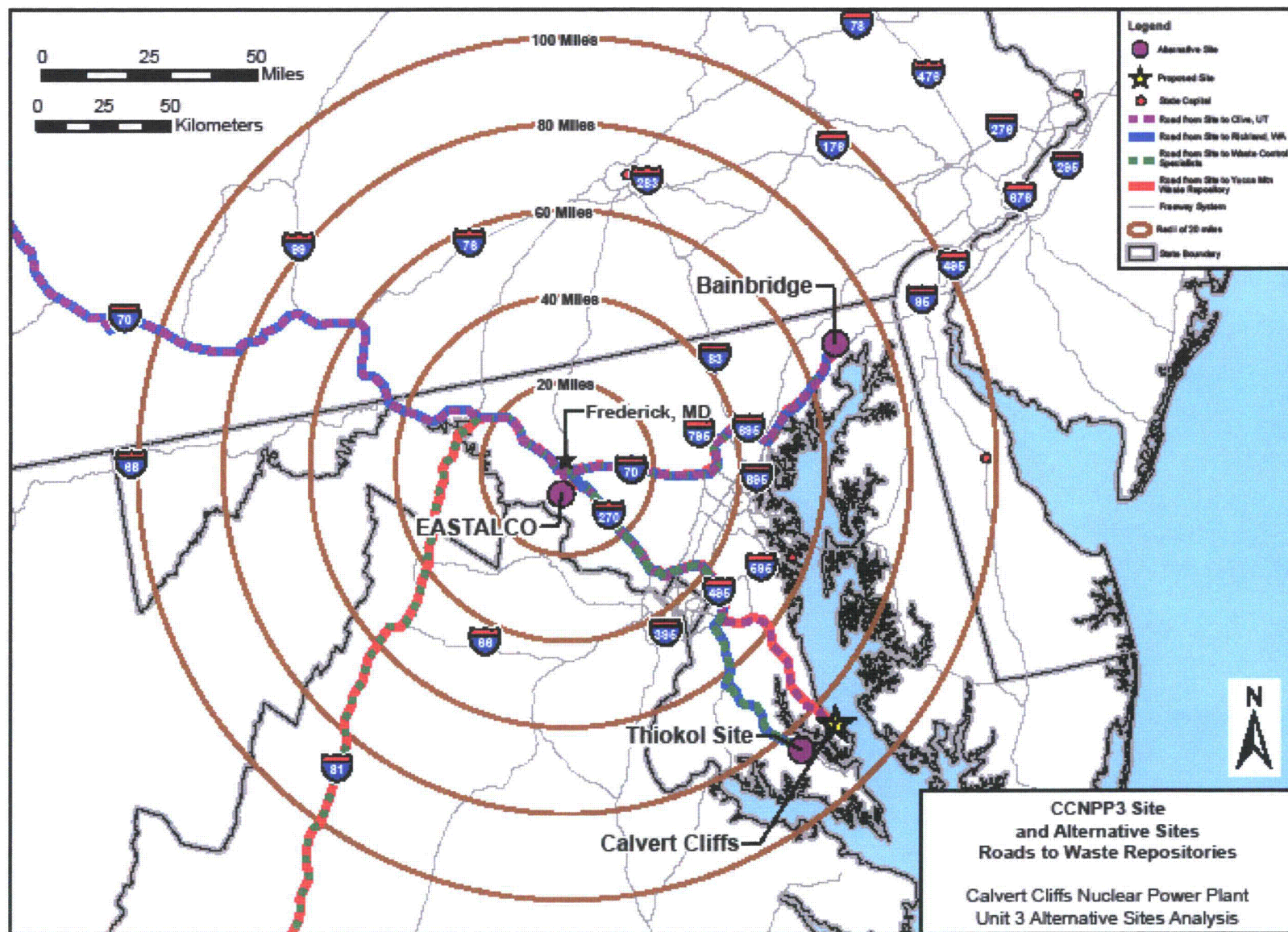


Figure 3

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Directions to I-270 N
99.0 mi – about 2 hours 1 min – up to 2 hours 50
mins in traffic

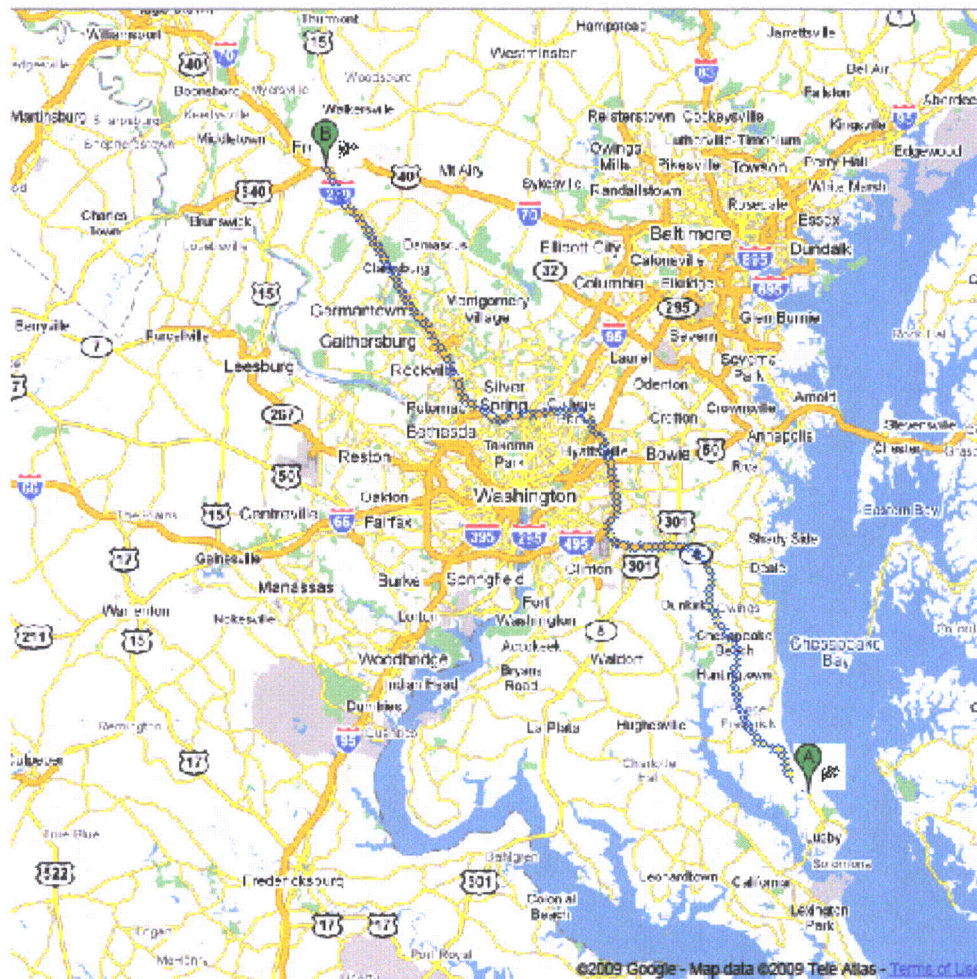


Figure 4

Port Deposit, MD to I-70 W - Google Maps

Directions to I-70 W
92.5 mi – about 1 hour 37 mins



http://maps.google.com/maps?f=d&source=s_d&saddr=port+deposit,+md&daddr=39.404367,-77.446747... 9/7/2009

Figure 5

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Directions to I-70 W
99.5 mi – about 2 hours 1 min – up to 2 hours 50
mins in traffic

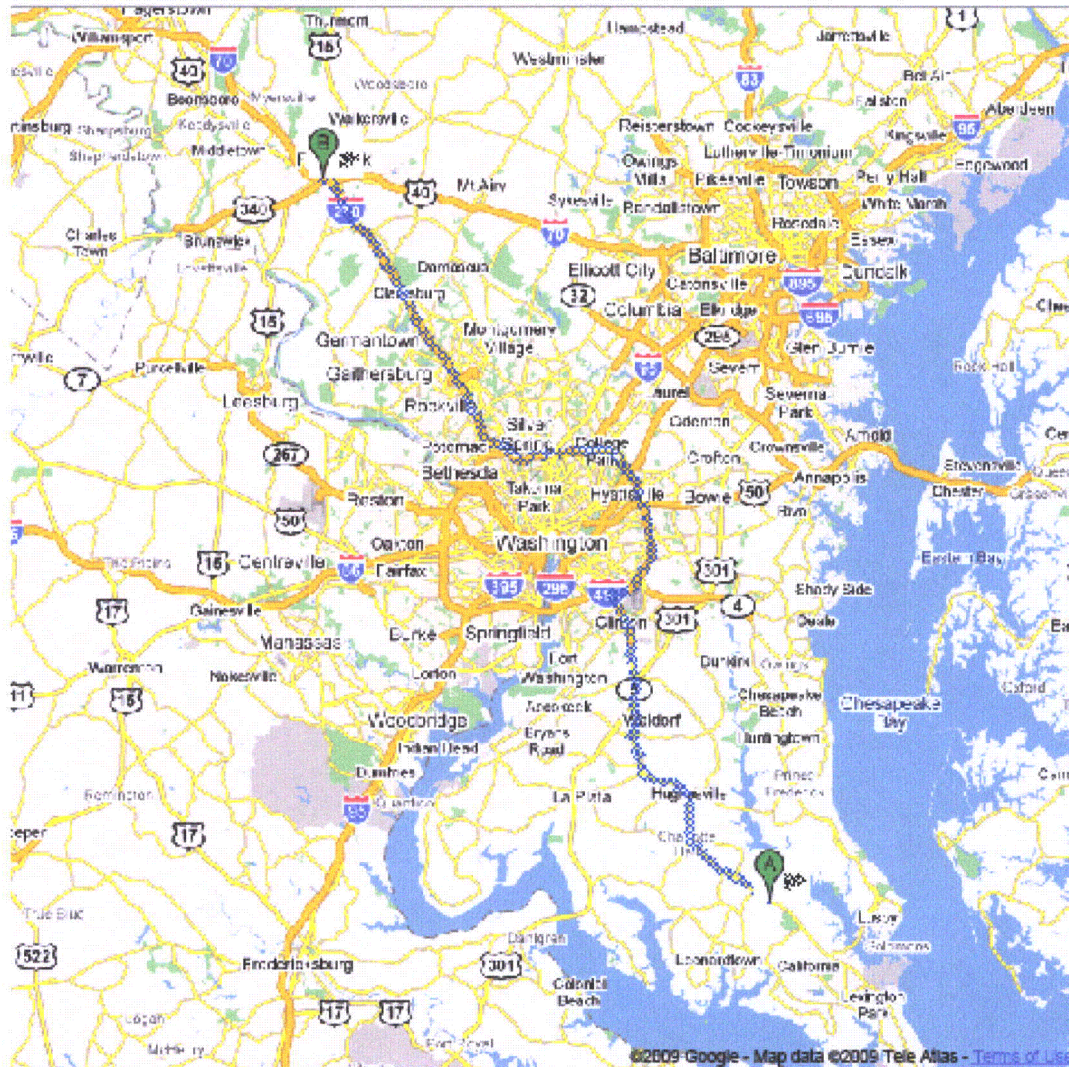


Figure 6

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Directions to I-70 E
6.8 mi – about 13 mins

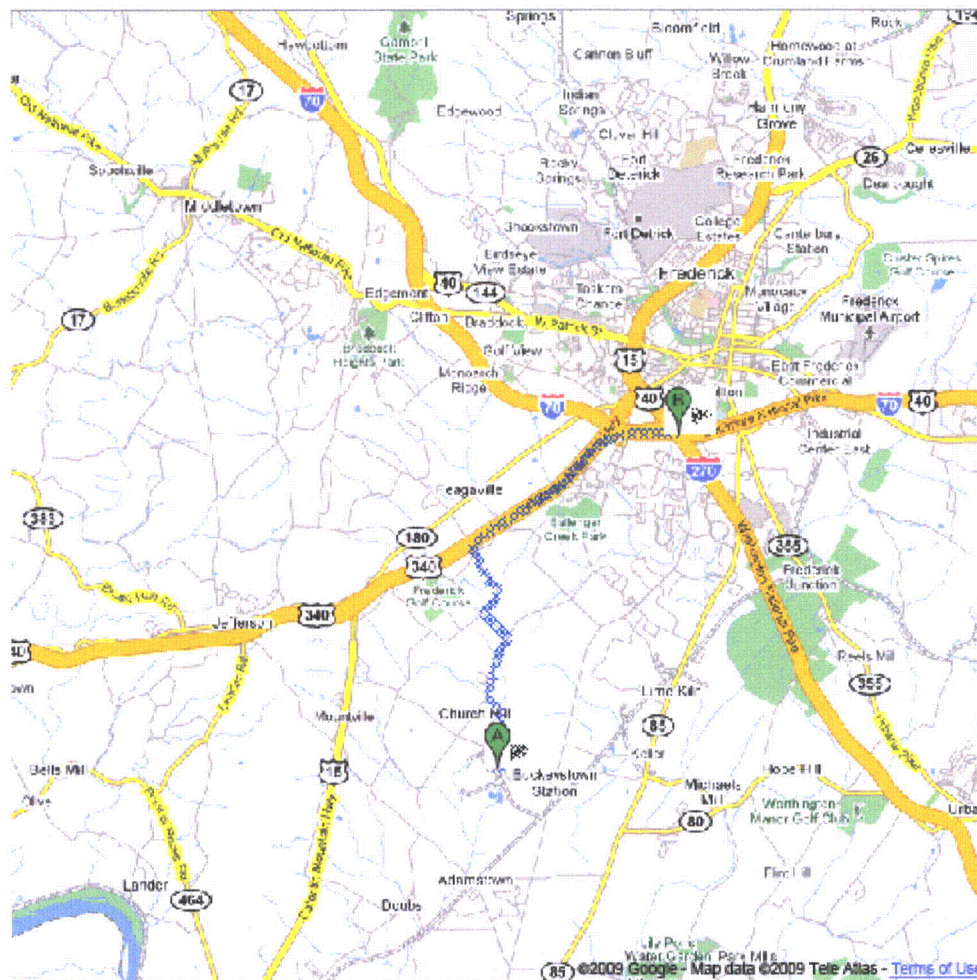


TABLE – TRAGIS & RADTRAN DATA FROM RAI 185 RESPONSE

Unirradiated Fuel Truck from Richland WA to CCNPP					Radioactive Waste Truck from CCNPP to Hanford Rep.					Irradiated Fuel Truck from CCNPP to Yucca MT.				
State	Area Type	Distance		Pop Density	State	Area Type	Distance		Pop Density	State	Area Type	Distance		Pop Density
		(km)	(miles)	(ppsm)			(km)	(miles)	(ppsm)			(km)	(miles)	(ppsm)
[ID]	Rural	357.0	221.8	11.3	[ID]	Rural	74.8	46.5	8.7	[AZ]	Rural	46.8	29.1	3.2
	Suburban	79.3	49.3	278.7		Suburban	37.0	23.0	371.3		Suburban	0.3	0.2	135.8
	Urban	7.3	4.5	2,219.6		Urban	4.8	3.0	2,100.2		Urban	-	-	-
	Total		275.6			Total		72.5			Total		29.3	
[IL]	Rural	178.4	110.9	14.4	[IL]	Rural	6.0	3.7	21.1	[IL]	Rural	178.4	110.9	14.4
	Suburban	73.0	45.4	323.6		Suburban	86.6	53.8	455.8		Suburban	73.0	45.4	323.6
	Urban	10.2	6.3	2,379.1		Urban	28.2	17.5	2,518.0		Urban	10.2	6.3	2,379.1
	Total		162.6			Total		75.1			Total		162.6	
[IN]	Rural	136.7	84.9	19.9	[IN]	Rural	136.7	84.9	19.9	[IN]	Rural	136.7	84.9	19.9
	Suburban	97.3	60.5	276.3		Suburban	97.3	60.5	276.3		Suburban	97.3	60.5	276.3
	Urban	9.4	5.8	2,354.7		Urban	9.4	5.8	2,354.7		Urban	9.4	5.8	2,354.7
	Total		151.2			Total		151.2			Total	243.4	151.2	
[IA]	Rural	377.8	234.8	16.4	[MN]	Rural	392.0	243.6	14.2	[IA]	Rural	393.8	244.7	15.7
	Suburban	107.7	66.9	272.7		Suburban	49.3	30.6	210.2		Suburban	95.4	59.3	268.0
	Urban	5.8	3.6	2,191.1		Urban	1.1	0.7	2,268.5		Urban	5.1	3.2	2,185.2
	Total		305.3			Total		274.9			Total		307.1	
[NE]	Rural	649.1	403.3	9.9	[MT]	Rural	777.0	482.8	8.4	[NE]	Rural	652.2	405.3	10.0
	Suburban	71.5	44.4	270.2		Suburban	103.0	64.0	299.3		Suburban	75.6	47.0	268.5
	Urban	8.0	5.0	2,410.2		Urban	8.6	5.3	2,220.9		Urban	7.0	4.3	2,401.8
	Total		452.7			Total		552.2			Total		456.6	
[OH]	Rural	220.0	136.7	19.8	[OH]	Rural	220.0	136.7	19.8	[NV]	Rural	252.6	157.0	4.8
	Suburban	151.4	94.1	303.4		Suburban	151.4	94.1	303.4		Suburban	15.5	9.6	267.6
	Urban	14.7	9.1	2,179.6		Urban	14.7	9.1	2,179.6		Urban	1.5	0.9	2,318.5
	Total		239.9			Total		239.9			Total		167.5	
[OR]	Rural	301.0	187.0	8.2	[PA]	Rural	174.1	108.2	17.0	[OH]	Rural	220.0	136.7	19.8
	Suburban	32.2	20.0	313.2		Suburban	119.6	74.3	303.9		Suburban	151.4	94.1	303.4
	Urban	2.3	1.4	1,976.3		Urban	7.7	4.8	2,123.7		Urban	14.7	9.1	2,179.6
	Total		208.5			Total		187.3			Total		239.9	
[PA]	Rural	174.1	108.2	17.0	[SD]	Rural	602.7	374.5	7.9	[PA]	Rural	80.2	49.8	21.1
	Suburban	119.6	74.3	303.9		Suburban	57.3	35.6	254.0		Suburban	85.3	53.0	325.8
	Urban	7.7	4.8	2,123.7		Urban	2.5	1.6	2,364.5		Urban	7.2	4.5	2,259.4
	Total		187.3			Total		411.7			Total		107.3	
[UT]	Rural	186.8	116.1	9.7	[WA]	Rural	235.9	146.6	6.0	[UT]	Rural	471.6	293.0	9.9
	Suburban	51.6	32.1	257.8		Suburban	36.9	22.9	418.4		Suburban	106.5	66.2	362.6
	Urban	1.5	0.9	2,112.2		Urban	8.7	5.4	2,170.5		Urban	32.2	20.0	2,472.3
	Total		149.1			Total		174.9			Total		379.2	

TABLE – TRAGIS & RADTRAN DATA FROM RAI 185 RESPONSE (continued)

Unirradiated Fuel Truck from Richland WA to CCNPP					Radioactive Waste Truck from CCNPP to Hanford Rep.					Irradiated Fuel Truck from CCNPP to Yucca Mt.				
State	Area Type	Distance		Pop Density	State	Area Type	Distance		Pop Density	State	Area Type	Distance		Pop Density
		(km)	(miles)	(ppsm)			(km)	(miles)	(ppsm)			(km)	(miles)	(ppsm)
[WA]	Rural	44.1	27.4	1.5	[WI]	Rural	220.6	137.1	18.7	[WV]	Rural	45.2	28.1	19.3
	Suburban	8.6	5.3	604.4		Suburban	75.8	47.1	253.1		Suburban	24.1	15.0	214.1
	Urban	4.7	2.9	2,293.2		Urban	5.5	3.4	2,145.2		Urban	0.5	0.3	1,764.7
	Total		35.7			Total		187.6			Total	69.7	43.4	
[WY]	Rural	607.2	377.3	4.9	[WY]	Rural	320.5	199.1	5.7	[WY]	Rural	607.2	377.3	4.9
	Suburban	33.9	21.1	399.4		Suburban	14.0	8.7	439.1		Suburban	33.9	21.1	399.4
	Urban	3.4	2.1	1,966.6		Urban	2.2	1.4	1,902.3		Urban	3.4	2.1	1,966.6
	Total		400.5			Total		209.2			Total		400.5	
[MD]	Rural	90.3	56.1	23.9	[MD]	Rural	90.3	56.1	23.9	[MD]	Rural	190.6	118.4	19.5
	Suburban	127.2	79.0	386.0		Suburban	127.2	79.0	386.0		Suburban	155.6	96.7	364.4
	Urban	29.8	18.5	2,531.7		Urban	29.8	18.5	2,531.7		Urban	32.7	20.3	2,501.5
	Total		153.7			Total		153.7			Total		235.4	
TOTAL ROUTE	Rural		2,064.5		TOTAL ROUTE	Rural		2,019.8		TOTAL ROUTE	Rural		2,035.2	
	Suburban		592.4			Suburban		593.7			Suburban		567.9	
	Urban		65.1			Urban		76.6			Urban		77.0	
	Total		2,722.0			Total		2,690.0			Total		2,680.0	
TOTAL ROUTE Vs [MD]	Rural		3%		TOTAL ROUTE Vs [MD]	Rural		3%		TOTAL ROUTE Vs [MD]	Rural		6%	
	Suburban		13%			Suburban		13%			Suburban		17%	
	Urban		28%			Urban		24%			Urban		26%	
	Total		6%			Total		6%			Total		9%	
IN-TRANSIT POPULATION EXPOSURE IN PERSON-SV														
Unirradiated Fuel Truck from Richland WA to CCNPP					Radioactive Waste Truck from CCNPP to Hanford Rep.					Irradiated Fuel Truck from CCNPP to Yucca Mt.				
	Rural			2.05E-05		Rural			1.05E-03		Rural			1.03E-03
	Suburban			7.21E-06		Suburban			4.19E-04		Suburban			3.99E-04
	Urban			1.80E-06		Urban			7.08E-05		Urban			7.12E-05
	Total			2.95E-05		Total			1.54E-03		Total			1.50E-03
NON-RADIOLOGICAL DATA (ACCIDENTS and FATALITIES)														
Unirradiated Fuel Truck from Richland WA to CCNPP					Radioactive Waste Truck from CCNPP to Hanford Rep.					Irradiated Fuel Truck from CCNPP to Yucca Mt.				
	Rural	ACCIDENTS		3.32E+00		Rural	ACCIDENTS		3.32E+00		Rural	ACCIDENTS		3.28E+00
	Suburban			9.54E-01		Suburban			9.56E-01		Suburban			9.14E-01
	Urban			1.05E-01		Urban			1.23E-01		Urban			1.24E-01
	Rural	FATALITIES		0.00E+00		Rural	FATALITIES		0.00E+00		Rural	FATALITIES		0.00E+00
	Suburban			0.00E+00		Suburban			0.00E+00		Suburban			0.00E+00
	Urban			0.00E+00		Urban			0.00E+00		Urban			0.00E+00