LEWIS UPSHUR LEPC COMMODITY FLOW STUDY
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LEWIS-UPSHUR LOCAL EMERGENCY PLANNING COMMITTEE
COMMODITY FLOW STUDY

1.0 INTRODUCTION

1.1 Purpose of Study

The Emergency Planning and Community Right-to-Know Act (EPCRA), also known as Title III of the Superfund Amendment and Reauthorization Act (SARA), was passed by Congress in 1986 and provides for the collection and availability of information regarding the use, storage, production, and release of hazardous chemicals to the public and emergency responders in local communities. In 1993, the West Virginia Legislature passed House Bill 2382 to implement the EPCRA in West Virginia. The State Emergency Response Commission (SERC) serves as the administrative body for the implementation of House Bill 2382 at the state level; the SERC works cooperatively with the Local Emergency Planning Committees (LEPCs) serving the counties of West Virginia. The EPCRA is indicative of the fact that Congress realizes the risk to communities posed by the use, storage, and transportation of hazardous materials. West Virginia's implementation of the EPCRA indicates the state's realization of this risk as well.

As part of the implementation of the EPCRA, §15-5A-7(d)(3) of the West Virginia Code states that local emergency planning committees shall develop and implement comprehensive emergency response plans. As part of the process of developing these plans, LEPCs conduct various hazard analysis and risk assessment studies, of which this commodity flow study is an example.

Utilizing a Hazardous Materials Emergency Planning (HMEP) grant from the West Virginia SERC (FY 2006), the Lewis-Upshur LEPC coordinated the completion of this flow study. In February of 2006, the LEPC Chair submitted letters requesting information from each of the covered facilities in both counties. In July of the same year, members of the Lewis County Citizens Emergency Response Team (CERT) and the Upshur County CERT completed the highway data collection portions of this project. Following the collection of data, the information was provided to JH Consulting, LLC (JHC) of Buckhannon, West Virginia for final analysis and assimilation into report format. (*NOTE: Detailed methodologies are provided in the discussions below.)

The intent of this study is to provide emergency managers and responders in Lewis and Upshur Counties with information to more fully advise efforts to mitigate, prepare for, response to, and recover from hazardous materials incidents. The efforts may significantly minimize damage or harm to equipment, facilities, personnel, and to the community at large.

1.2 Description of the Study Area

Lewis and Upshur Counties in north central West Virginia comprise the study area. By the jurisdiction of the counties combined, the study area includes a land area of 737 square miles (Lewis – 382; Upshur - 355) and a total estimated population of 40,911, according to 2005 Census estimates (Lewis – 17,199; Upshur – 23,712). Two (2) of the major transportation routes in north central West Virginia traverse the counties: Interstate 79 crosses north-south through the eastern portion of Lewis County and US Route 33 passes west-east through the northern portion of both counties.

All three (3) municipalities in the study area are located in close proximity to these transportation routes. US Route 33 actually passes through downtown Weston in Lewis County and borders residential and commercial areas in Buckhannon (Upshur County). I-79 passes just to the east of both Jane Lew and Weston in Lewis County. Both Lewis and Upshur Counties can be considered rural areas with *most* of their critical and covered facilities being located in or near these municipalities. As such, I-79 and US 33 are critical components of the shipment of materials/supplies to the critical and covered facilities in both counties. Hazardous materials incidents involving storage or transport are likely to occur in or near the municipalities, thus increasing the potential for significant harm to each community.

The topography of both counties can be considered steep to gently sloping. Roadway access to many of the outlying communities is somewhat difficult due to the terrain. I-79 and US 33 (east of I-79) are the only four (4)-lane divided highways in the study area; all other roadway access is two (2)-lane highway (such as US 33 west of I-79, US 19, US 119, WV 20, and WV 4) or one (1)-lane paved/gravel base roadway.

The climate of the study area is variable with four (4) distinct seasons. The weather is influenced by air masses from both Canada and the Gulf of Mexico. Additionally, extreme weather coming from the Atlantic Ocean can affect both counties. The average annual precipitation for the study area is 48.8 inches (Lewis – 49.6”; Upshur

– 47.9”), including an average snowfall of 42.5-65”. Average temperatures are as follows: January – 29.3° F, July - 72° F, Annual - 52° F. The usual wind direction is from the west.

It is significant to note that the primary role of the railroad in both counties is the transport of coal. As such, an in-depth study of commodity flow on rails was not undertaken. Also, neither Lewis nor Upshur County contain navigable waterways; as such, there is no risk associated with water transport. Both counties do contain intricate underground pipeline networks carrying primarily natural gas. There are also several small compressor stations in both counties and a relatively large compressor facility near Camden in Lewis County. The risks associated with these stations and pipelines are explosions. Consequently, an in-depth commodity flow analysis for pipelines is not included as part of this document.

2.0 HIGHWAY ANALYSIS

2.1 National and State Statistics

The number of reported hazardous materials incidents in the United States has steadily increased since 1983. The data represents a sharp spike in incidents in 1994 and reports the highest annual number of incidents through the three (3)-year period as 1999 – 2001. Figure 2.1.a. depicts the total number of reported hazardous material incidents in the United States between 1983 and 2005.

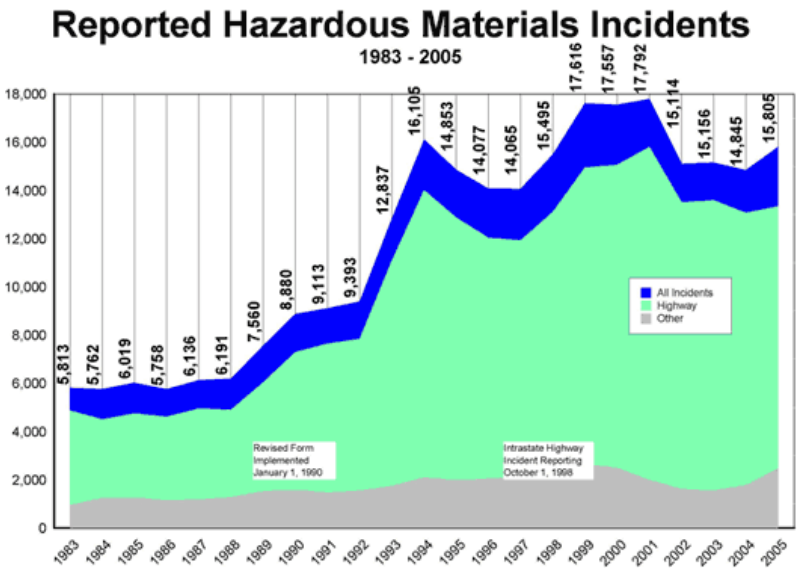


Figure 2.1.a *(Source: PHMSA – Office of Hazardous Materials Safety*

The green area above represents the highway incidents that have occurred. Data such as this has

lead the US Department of Transportation to believe that the majority of hazardous material incidents in the United States occur on roadways. Figure 2.1.b. confirms this belief.

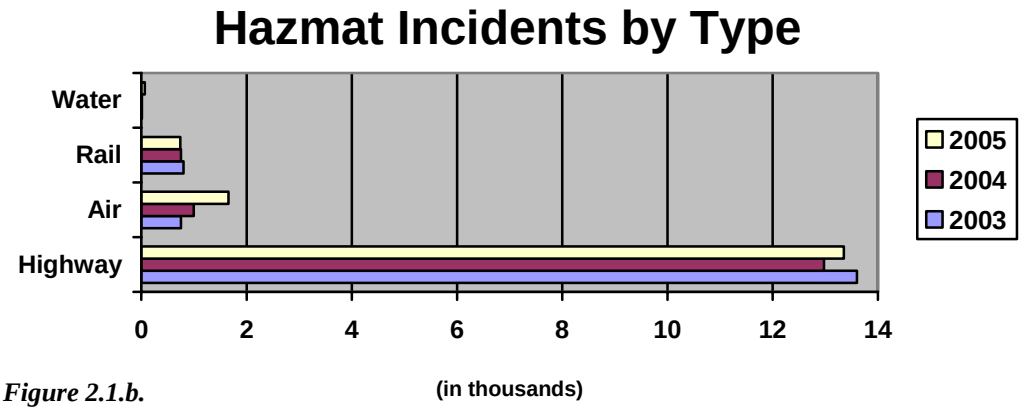


Figure 2.1.b.

The USDOT also maintains data on the cause of hazardous material incidents. (Due to the data presented above and the relevance to this report, only highway data will be presented from this point forward.) For 2003 and 2004, the cause of incidents is generally grouped into four (4) categories: human error, package failure, vehicle accident/derailment, and other. For 2005, data categories were significantly refined. According to the USDOT, the causes of the highway incidents have been as follows:

- 2003: **Human Error** – 11,727; **Package Failure** – 1,528; **Vehicle Accident/Derailment** – 299; **Other** – 47
- 2004: **Human Error** – 11,160; **Package Failure** – 1,533; **Vehicle Accident/Derailment** – 233; **Other –** 53
- 2005: See Figure 2.1.c. below.

Figure 2.1.c.

Mode of Transportation/Cause – 2005

Abrasion	96	Inadequate Preparation for Transportation	830
Broken Component or Device	176	Inadequate Procedures	89
Commodity Self-Ignition	7	Inadequate Training	12
Commodity Polymerization	2	Incompatible Product	8
Conveyor or Material Handling Equip. Mishap	83	Incorrectly Sized Component or Device	8
Corrosion – Exterior	28	Loose Closure, Component, or Device	1,584
Corrosion – Interior	54	Misaligned Materials, Component, or Device	14
Defective Component or Device	797	Missing Component or Device	23
Derailment	1	Overfilled	198
Deterioration or Aging	166	Over-Pressurized	65
Dropped	1,808	Rollover Accident	120
Fire, Temperature, or Heat	22	Stub Sill Separation from Tank (Tank Cars)	1
Forklift Accident	1,263	Threads Worn or Cross Threaded	19
Freezing	20	Too Much Weight on Package	545
Human Error	1,375	Valve Open	204
Impact w/ Sharp or Protruding Object	920	Vandalism	2
Improper Preparation for Transportation	893	Vehicular Crash or Accident Damage	99
Inadequate Accident Damage Protection	15	Water Damage	24
Inadequate Block and Bracing	1,323	Cause Not Reported	1,095
Inadequate Maintenance	7		

There are many types of hazardous materials that are transported over roadways, each divided into "classes" of materials that are denoted on the placards labeling shipments. Figure 2.1.d. lists the hazardous material classes involved in the 2003, 2004, and 2005 incidents. (NOTES: Figure 2.1.d. contains highway *estimates*. The USDOT estimates for all modes of transport (including the highway numbers) are listed in parentheses. Due to the possibility that multiple classes may be involved in a single incident, incident totals in Figure 2.1.d. may be slightly different than elsewhere presented.)

Figure 2.1.d.

Hazmat Incidents by Class

Hazard Class	2003	2004	2005
1: Explosives	**12** (*13*)	**11** (*12*)	**30** (*36*)
2: Flammable, non-flammable, & poisonous gases	**573** (*635*)	**607** (*690*)	**780** (*924*)
3: Flammable liquids	**6,145** (*6,828*)	**5,702** (*6,479*)	**7,583** (*8,985*)
4: Other ignitable hazards	**92** (*102*)	**88** (*100*)	**50** (*59*)
5: Oxidizers	**412** (*458*)	**408** (*464*)	**241** (*285*)
6: Poisonous & infectious materials	**747** (*830*)	**1,019** (*1,157*)	**535** (*634*)
7: Radioactive materials	**14** (*15*)	**7** (*8*)	**19** (*23*)
8: Corrosives	**5,178** (*5,753*)	**4,682** (*5,321*)	**3,404** (*4,033*)
9: Other miscellaneous hazards	**745** (*828*)	**643** (*731*)	**768** (*910*)

The USDOT also maintains the results of the hazardous materials incidents discussed above. Figure 2.1.e. presents the results. (NOTES: Figure 2.1.e. also contains highway *estimates*. The USDOT estimates for all modes of transport (including the highway numbers) are listed in parentheses. Due to the possibility of multiple results within a single incident, the totals in Figure 2.1.e. may be slightly different than elsewhere presented.)

Figure 2.1.e.

Hazmat Incident Results

Result	2003	2004	2005
Vapor (Gas) Dispersion	**528** (*587*)	**524** (*595*)	**397** (*470*)
Material Entered Waterway/Sewerway	**59** (*62*)	**49** (*51*)	**39** (*46*)
Spillage	**13,258** (*14,731*)	**12,584** (*14,300*)	**12,267** (*14,534*)
Fire	**52** (*58*)	**53** (*60*)	**43** (*51*)
Explosion	**14** (*15*)	**10** (*11*)	**39** (*46*)
Environmental Damage	**69** (*77*)	**92** (*105*)	**56** (*66*)
Other	**289** (*321*)	**337** (*383*)	N/A
None	**28** (*31*)	**21** (*24*)	**766** (*908*)

The USDOT Bureau of Transportation Statistics completes a commodity flow study every five (5) years as part of the US Census Bureau's Economic Census. According to the 1993 study, 2.4% of 234.2 million tons of commodities shipped (or 31,878 tons) throughout the United States originated in West Virginia. (*NOTE: Data for West Virginia was not reported in the most recent flow study due to sampling irregularities.) One can easily see that West Virginia has only a few main arterial transportation lines, including Interstates 64, 68, 70, 77, 79, and 81 and US Routes 19, 33, 50, and 119. These routes likely see a significant portion of those shipped commodities. It is significant to note that Interstate 79 and US 33 pass through Lewis County and US 33 passes through Upshur County.

According to the 2002 USDOT Bureau of Transportation Statistics commodity flow study, the following modes of transportation were used for commodity shipments originating within West Virginia:

- Truck (20.9%)
- Rail (55%)
- Water (6.4%)

Coal was considered a commodity in the study, which explains why the rail percentage is somewhat inflated.

Data posted by both the USDOT and WVDOT will allow for a direct comparison of highway hazardous materials events in West Virginia for the three (3)-year period of 2001 to 2003. Figure 2.1.f. depicts this comparison. As can be seen, during the period for which the USDOT and WVDOT maintained data, the trends somewhat mirror each other. The slightly lower WVDOT numbers can be attributed to the fact that the WVDOT only listed hazardous materials incident data for "large truck" accidents whereas the USDOT data lists hazardous materials incidents by all vehicle categorizations.

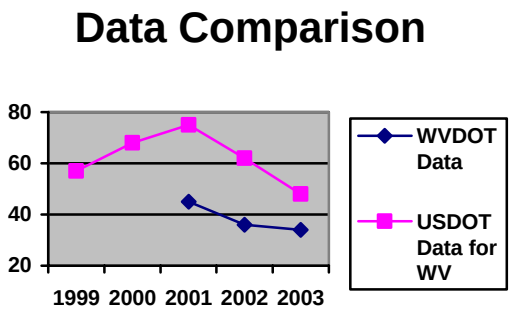


Figure 2.1.f.

It is significant to note that the same trend can be depicted within the USDOT's data for hazardous materials incidents nationwide during the same period. The number of incidents rises from 14,953 in 1999 to a high of 15,806 in 2001 and decreases steadily to 13,506 in 2002 and 13,601 in 2003.

According to the *2003 Crash Data* document prepared by the WV Department of Transportation (WVDOT), DOH Traffic Engineering Division, a total of 51,376 crashes occurred on West Virginia roadways in 2003. Figure 2.1.g. provides information on the crash trends on the surveyed highways in Lewis and Upshur Counties.

Figure 2.1.g.

Crash Data by Route

Highway	Total Crashes	w/ Fatalities	w/ Injuries	Property Damage Only
Interstate 79	1,165	9	376	780
US Route 33 (Corr. H)	130	0	49	81

Of the total number of crashes in the state, 2.5% occurred on highways that pass through Lewis and Upshur Counties. (Of course, many of these accidents likely occurred outside of Lewis and Upshur Counties.) The WVDOT also maintains crash data on "large vehicles", including bulk trucks and vans. Of the 3,550 "large vehicle" crashes listed in the 2003 report, 0.96% (34) were carrying hazardous cargo at the time of the crash. The number of hazardous cargo incidents has steadily decreased since 2001, where the number of incidents was 45. (According to the WVDOT, 36 incidents occurred in 2002.)

Over the period 2001 to 2003, an average of 7.4% of total crashes involved "large vehicles". Of those large vehicle accidents, an average of 1.01% of them involved hazardous cargo. Figure 2.1.h. applies these percentages to the 2003 data to estimate the number of large vehicle accidents (and those involving hazardous materials) on I-79 and US 33. (NOTE: Average percentages were utilized in an effort to more accurately characterize trends involving large vehicles, both with and without hazardous cargo.)

Figure 2.1.h.

Large Vehicle/Hazmat Accidents by Route

Route	Total Crashes	*Large Vehicle Accidents (LVA)*	*LVAs Involving Hazardous Cargo*
Interstate 79	1,163	*86*	*1*
US Route 33 (Corr. H)	130	*9*	*0*

** Italicized figures are estimates derived by mathematical computations using WVDOT data.*

Figure 2.1.i. shows crash data for Lewis and Upshur Counties, as based on the 2003 WVDOT report.

Figure 2.1.i.

Crash Data by Jurisdiction

Jurisdiction	Crashes	w/ Fatalities	w/ Injuries	Property Damage Only	Total Resulting Economic Loss
Lewis County	565	9	152	404	$55,285,800
Upshur County	516	2	183	331	$29,298,400
Buckhannon	133	0	32	101	$2,582,000
Weston	92	0	16	76	$1,328,600

The above economic loss category is based on estimates by the Federal Highway Administration as follows:

- Fatality: $3,400,000
- Incapacitating Injury (Type A Injury): $236,000
- Non-Incapacitating, Evident Injury (Type B Injury): $48,000
- Non-Evident (Complaint of or Possible) Injury (Type C Injury): $25,000
- Property Damage Only Crash: $2,600

2.2 Methodology

To complete the highway analysis, roadway monitoring sites were established along the primary transportation routes in both counties. In Lewis County, Interstate 79, a major north-south route through West Virginia, was monitored. The southbound site was established at the Jane Lew exit (#105) and staffed from 12 a.m. to 10 p.m. The northbound site was established at the rest stop south of the Weston area and monitored from 12 a.m. to 8 a.m. From 8 a.m. to 4 p.m., the northbound lane was monitored at the Jane Lew exit. All sites were operational during the same day.

In Upshur County, both the east and westbound lanes of US Route 33 (Corridor H) were monitored. The eastbound site was established at the intersection of the Red Rock Road, west of the Buckhannon city limits and was staffed from 5 a.m. to 9 p.m. The westbound site was established at the intersection of the Childers Run Road and monitored from 5 a.m. to 10 p.m. Both sites were monitored on the same day.

Each site was staffed by a two (2)-person crew comprised of a "site inspector" and a "site recorder". The site inspector identified the type of truck and the ID number of any posted placard; this information was then noted by the site recorder. Due to the high volumes of traffic at the monitoring sites, particularly along I-79, both the inspector and the recorder monitored truck traffic.

Total traffic volume data was also researched for the study area. This data will allow the planning committee to compare total traffic versus total hazmat traffic. The committee can then also determine the probability of crashes on the studied highways by using this volume data and the crash data presented above.

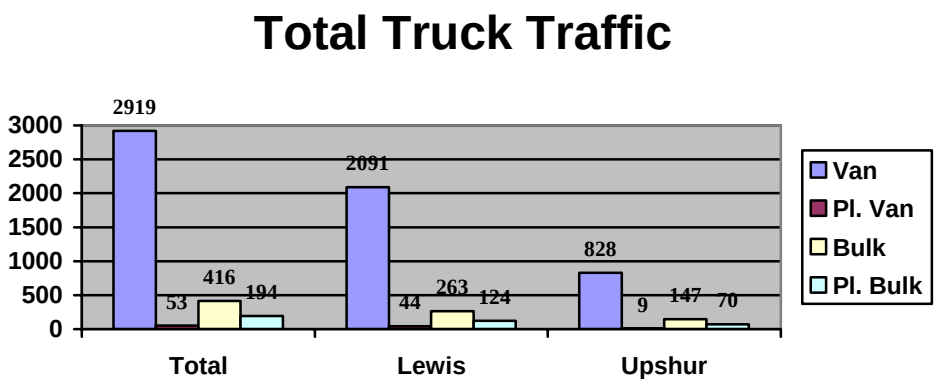
2.3 Field Data

2.3.1 Totals

Interstate 79 and US Route 33 were chosen as the study area because they are likely the most heavily traveled routes through each county. Both are four-lane, divided highways (at the monitoring sites) leading to several points outside of Lewis and Upshur Counties. (Interstate 79 connects the capital city of Charleston with Clarksburg, Fairmont, and Morgantown, and well as Pittsburgh, Pennsylvania. US Route 33 passes through Buckhannon on its way to Elkins and Franklin, WV and

Harrisonburg, Virginia. US 33 serves as a major arterial connecting those cities to I-79 and cities north and south.)

A total of 3,088 trucks were counted during the monitoring periods. Of those trucks, 2,186 (70.9%) were counted on Interstate 79 in Lewis County. The remaining 902 trucks (29.1%) were counted on US 33 in Upshur County. Monitors reported 248 (8.03%) of the total number of trucks as being placarded and carrying hazardous materials. In Lewis County, 169 placarded vehicles (68%) were counted. Seventy-nine (79) placarded vehicles (32%) passed through Upshur County. A total of 64 different placards were recorded. Figure 2.3.1.a. depicts the total truck traffic counted.



Figures are taken from total placards counted; some vehicles displayed multiple placards.
Figure 2.3.1.a.

Trucks were counted in two (2) basic categories: van and bulk. The "van" category consisted of small and large box trucks, dump trucks, flat bed trailers, and log/lumber trucks. "Bulk" trucks were tankers or concrete trucks. It is significant to note that a much higher percentage of "bulk" trucks were placarded (46.6%) than "vans" (1.8%). Figure 2.3.1.b. divides the total placarded vehicles into hazard classes.

Placards by Hazard Class

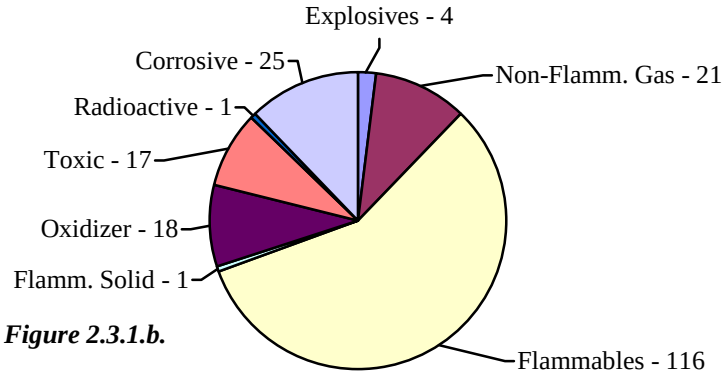


Figure 2.3.1.b.

Approximately 46.77% of the total placarded vehicles recorded were carrying flammable materials. Corrosive materials were the second-most regularly-carried materials (10.08%) followed by non-flammable gases (8.47%). Oxidizers (7.26%) and toxic (poisonous) materials (6.85%) were also frequently recorded. Figure 2.3.1.c. shows the percentages of hazard classes by county.

Figure 2.3.1.c.

Placards by Hazard Class by County

County	*Flam.*	*Corr.*	*Non-Flam.*	*Oxidizer*	*Toxic*	*Total*	*Remaining*
Lewis	71 (42.01%)	22 (13.02%)	15 (8.88%)	17 (10.06%)	11 (6.51%)	*136 (80.48%)*	*33 (19.52%)*
Upshur	44 (55.70%)	3 (3.80%)	6 (7.59%)	1 (1.27%)	6 (7.59%)	*60 (75.95%)*	*19 (24.05%)*

The whole numbers are the total number of trucks counted in each county. The percentages represent the % that class comprised of the total trucks ***in that county.***

As can be seen from Figure 2.3.1.c., the counties do not follow the exact trends as the combined study area. Flammables are overwhelmingly the most-frequently transported materials in both counties. However, I-79 in Lewis County sees significantly more corrosive and oxidizer traffic than does US 33 in Upshur County. Upshur County, in turn, sees a higher *percentage* of toxic traffic. Both counties see similar percentages of non-flammable gases. When analyzing the total number of trucks actually carrying these placards, Lewis County saw a greater

number of trucks in all classes (even those not listed here).

Of the flammable materials sighted in Lewis and Upshur Counties, gasoline was the most frequently transported hazardous material, comprising approximately 54.3% of the flammable placards recorded (and 25.4% of the total placards sighted). Gasoline was also the most frequently-recorded material in each county (20.12% of all Lewis County placards and 36.71% of all Upshur County placards). Diesel fuel was the second-most frequently transported material in the counties combined comprising approximately 11.2% of the flammable materials recorded.

The majority of corrosive placards did not have an ID number listed; they simply read "Corrosive". However, of the corrosive placards containing ID numbers, the following materials were recorded: sulfur dioxide, phosphorus trichloride, sulfuric acid, di-n-butylamine, cyclohexylamine, batteries, organic peroxide (Type F), and corrosive liquid. A complete listing of the materials sighted is included as Appendix 1 to this report.

Twelve (12) of the 49 different types of materials that were sighted at the monitoring points appear on the US Environmental Protection Agency's list of "extremely hazardous substances". The recorded "extremely hazardous substances" are as follows.

- Acrolein dimer stabilized – 2607
- Ammonium nitrate fertilizer – 2067
- Ammonium nitrate liquid – 2426
- Anhydrous ammonia – 1005
- Chlorine – 1017
- Cyclohexylamine – 2357
- Diflourophosphoric acid – 1768
- Hydrogen peroxide (concentrated over 60%) – 2015
- Phosphoric trichloride – 1809
- Sulfuric acid – 1830
- Sulfuric acid (fuming) – 1832
- Sulphur dioxide – 1079

Figure 2.3.1.d. shows the total number of trucks counted with an "Extremely Hazardous Substance" (EHS) placard. The figure also lists the number of trucks with EHSs in each county.

Figure 2.3.1.d.

Trucks Carrying EHSs

EHS	*Total Trucks*	*Total (Lewis)*	*Total (Upshur)*
Acrolein dimer stabilized	2	2	0
Ammonium nitrate fertilizer	5	5	0
Ammonium nitrate liquid	2	2	0
Anhydrous ammonia	1	1	0
Chlorine	1	1	0
Cyclohexylamine	1	1	0
Diflourophosphoric acid	1	0	1
Hydrogen peroxide (conc. > 60%)	1	1	0
Phosphoric trichloride	1	1	0
Sulfuric acid	1	1	0
Sulfuric acid (fuming)	2	2	0
Sulphur dioxide	1	1	0
TOTAL	**19**	**18**	**1**

As can be seen, the overwhelming majority of EHSs (95%) were counted in Lewis County. Figure 2.3.1.e. depicts the EHS hazardous materials traffic in relationship with the total hazardous materials traffic.

EHS vs. Total Hazmat Traffic

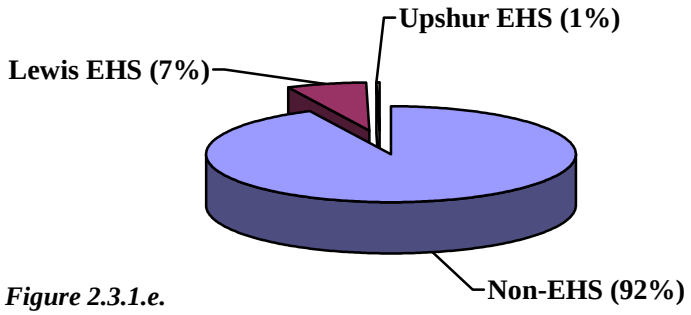


Figure 2.3.1.e.

Figure 2.3.1.f. shows the total number of EHS-carrying trucks on a county-by-county basis.

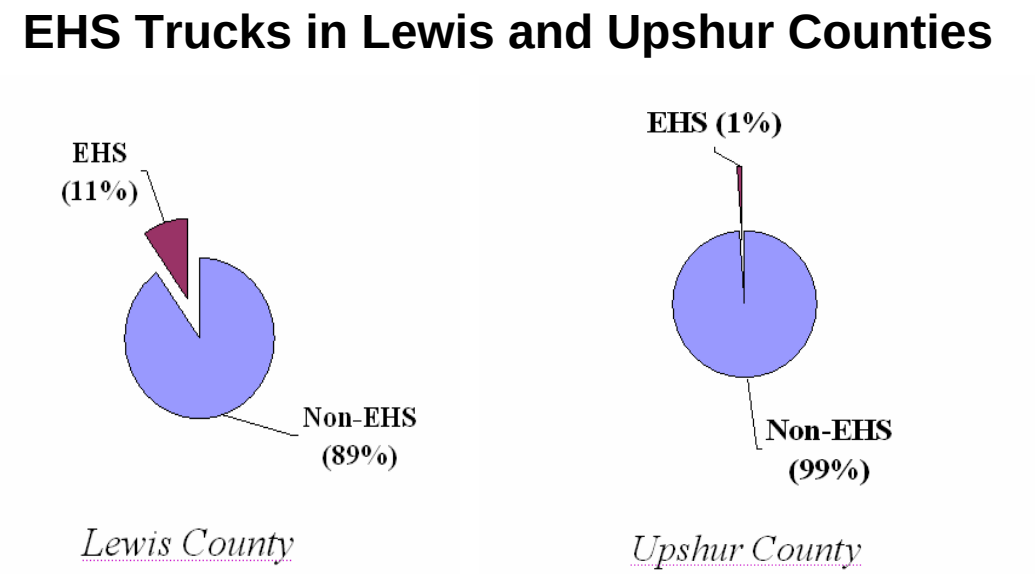


Figure 2.3.1.f.

2.3.2 Site Specific Data

This section contains specific data for each of the five (5) monitoring sites that were studied as part of the commodity flow study. Data sheets are included as Appendix 2.

Planning Assumptions

Traffic *(12A – 8A)*	**Traffic** *(8A – 4P)*	**Traffic** *(4P – 12A)*	**Hazmat** *(12A – 8A)*	**Hazmat** *(8A – 4P)*	**Hazmat** *(4P – 12A)*
20%	50%	30%	19%	55%	26%

2.3.2.i. I-79 South (Jane Lew) – Lewis County

This site was monitored from 12 a.m. until 10 p.m. A total of 1,242 trucks were recorded, 7.2% of which (89) were placarded. Several "extremely hazardous substances" were noted at this site, including sulfuric acid, hydrogen peroxide (concentrated greater than 60%), ammonium nitrate fertilizer, and

cyclohexylamine. Other materials sighted include the following (the total number of corresponding placards is in parentheses).

- Ammonium Nitrate Fertilizer (4)
- Butyl Acrylate (1)
- Carbon Dioxide (1)
- Coal Tar Distillates (1)
- Corrosive (3)
- Corrosive Liquid Acidic (1)
- Cumene (1)
- Cyclohexylamine (1)
- Dangerous (1)
- Diesel (3)
- Elevated Temperature Liquid (4)
- Explosive 1.4 (1)
- Flammable (3)
- Gasoline (20)
- Hexaldehyde (1)
- Hydrogen Peroxide (conc. greater than 60%) (1)
- Liquid Hazardous Waste (3)
- Liquid Nitrogen (1)
- Methylethyl Ketone (1)
- Methyl Methacrylate Mononmer (1)
- Neon (1)
- Nitrogen (1)
- Non-Flammable Gas (3)
- Oxidizer (1)
- Oxygen (3)
- Paint (1)
- Phenylenediamines (1)
- Polymeric Beads (1)
- Propane (4)
- Refrigerant Gas (1)
- Resin Solution (1)
- Sulfuric Acid (1)
- Sulfuric Acid Fuming (1)

The West Virginia Department of Transportation's (WVDOT) Planning and Research Division tallies total daily traffic counts for the state's roadways on a revolving basis. The most recent data for Lewis and Upshur Counties is 2003. During that study, an estimated 23,000 vehicles passed near this monitoring site in a 24-hour period.

Due to the amount of time that this site was monitored, an estimated hourly breakdown will be used to calculate daily estimations to compare to the WVDOT figures. If a total of 1,242 trucks were recorded during a 10-hour monitoring period, then an average of 124.2 trucks were seen per hour. The actual study period lacks two (2) hours to be a 24-hour period, or an additional

248.4 trucks. Thus, it is estimated that a total of 1,490 trucks passed through this site during the 24-hour period in which the site monitoring was done. As such, approximately 6.5% of the total traffic at this site was truck traffic.

The same hourly methodology was utilized to calculate the hazardous materials traffic. By this calculation, approximately 107 placarded vehicles passed through this site in the 24-hour period during which the study took place. Further, an estimated 0.5% of the total traffic through this site was placarded.

2.3.2.ii. I-79 North (Rest Area) – Lewis County

This site was monitored from 12 a.m. until 8 a.m. A total of 309 trucks were recorded, 20 of which (6.5%) carried placards. Ammonium nitrate was the only "extremely hazardous substance" recorded. Other materials sighted include the following (the total number of corresponding placards is in parentheses).

- Ammonium Nitrate (1)
- Corrosive (2)
- Diesel (4)
- Explosive (2)
- Gasoline (4)
- Non-Flammable Gas (1)
- Organic Peroxide Type F (1)
- Propane (1)

According to the WVDOT, a total of 19,500 vehicles pass near to this site daily. This figure includes all cars, pick-ups, SUVs, van trucks, and bulk trucks. Using the 309 total trucks monitored at this site as well as the planning assumption listed above, it is estimated that 1,546 trucks passed through this site during the 24-hour period of the study. It is further estimated that 7.9% of the total daily traffic at this site is truck traffic.

Twenty (20) placarded vehicles were recorded at this monitoring site. Using the planning assumptions above, approximately 105 placarded vehicles passed through this site in the 24-hour period during which monitoring took place. As such, approximately 0.54% of the total daily traffic at this site is

placarded.

2.3.2.iii. I-79 North (Jane Lew) – Lewis County

This site was monitored from 8 a.m. until 4 p.m. A total of 803 trucks were recorded, 59 of which (7.4%) carried placards. Several "extremely hazardous substances" were noted, including acrolein dimer stabilized, ammonium nitrate fertilizer, anhydrous ammonia, chlorine, phosphorus trichloride, sulfuric acid, and sulfur dioxide. Other materials sighted include the following (the total number of corresponding placards is in parentheses).

- Acrolein Dimer Stabilized (2)
- Ammonium Nitrate Liquid (2)
- Anhydrous Ammonia (1)
- Batteries Wet filled w/ Acid (1)
- Chlorine (1)
- Corrosive (3)
- Diesel (2)
- Dimethylaminoethyl Acrylate (1)
- Elevated Temperature Liquid (1)
- Ethyl Crtonate (1)
- Flammable (2)
- Gasoline (10)
- Hydrochloric Acid (2)
- Hydrogen Peroxide (conc. less than 60%) (2)
- Liquid Hazardous Waste (1)
- Magnesium Diphenyl (1)
- Maleic Anhydride (1)
- Methyl Methacrylate Monomer (1)
- Nitrogen (6)
- Oxidizing Liquid (1)
- Oxygen (2)
- Pesticide (2)
- Phosphorus Trichloride (1)
- Propane (1)
- Radioactive (1)
- Resin Solution (1)
- Sulfur Dioxide (1)
- Sulfuric Acid (1)
- Thallium (2)
- Toxic (1)

According to the WVDOT, a total of 24,500 vehicles pass near to this site daily. This figure includes all cars, pick-ups, SUVs, van trucks, and bulk trucks. Using the 803 total trucks monitored at this site as well as the planning

assumptions listed above, it is estimated that 1,606 trucks passed through this site during the 24-hour study period. It is estimated that 6.6% of the total daily traffic at this site is truck traffic. These figures are comparable to the figures estimated for the south bound lane of I-79 discussed above. The higher number of north bound trucks here than at the rest area monitoring site is also consistent with the overall WVDOT data (notice the significantly higher number of total vehicles at the Jane Lew site).

Fifty nine (59) placarded vehicles were recorded at this monitoring site. Using the planning assumptions above, approximately 107 placarded vehicles passed through this site during the 24-hour period of which the monitoring period was a part. As such, approximately 0.44% of the total daily traffic at this site is placarded. Again, these figures are comparable with the other I-79 sites and the WVDOT data.

2.3.2.iv. US 33 West (Red Rock Road) – Upshur County

This site was monitored from 5 a.m. to 9 p.m. A total of 543 trucks were sighted during the monitoring period, 42 (7.7%) of which were placarded. One (1) "extremely hazardous substance" was recorded: diflourophosphoric acid anhydrous. The other materials listed at this site include the following (the total placards are shown in parentheses).

- Biohazard (1)
- Brine (4)
- Dicholordimethyl Ether (1)
- Diesel (1)
- Diflourophosphoric Acid Anhydrous (1)
- Elevated Temperature Liquid (2)
- Di-n-Butylamine (2)
- Gasoline (14)
- Liquid Nitrogen (1)
- Nitrogen (1)
- Non-Flammable Gas (2)
- Oil (1)
- Propane (1)
- Resin Solution (2)
- Stannic Phosphides (1)

The WVDOT reports that approximately 13,500 vehicles pass through this site on a daily basis. Using an hourly average breakdown of the monitored

truck traffic, it can be estimated that 814 trucks passed through this site during the 24-hour period containing the monitored hours. As such, approximately 6% of the total traffic at this site is truck traffic.

Again using the hourly average breakdown, approximately 62 placarded vehicles passed through this site in the 24-hour period. Thus, 0.46% of the total daily traffic at this site is placarded.

2.3.2.v. US 33 East (Childers Run Road) – Upshur County

This site was monitored from 5 a.m. to 10 p.m. A total of 438 trucks were sighted during the monitoring period, 37 (8.4%) of which were placarded. No extremely hazardous substances were recorded. The materials there were listed are as follows (the total placards are shown in parentheses).

- Diesel (3)
- Elevated Temperature Liquid (3)
- Environmentally Hazardous Substance (1)
- Explosive (1)
- Flammable (3)
- Gasoline (15)
- Lead Dioxide (1)
- Non-Flammable Gas (2)
- Oil (1)
- Oxygen (1)
- Propane (1)
- Toxic (2)

The WVDOT estimates that 11,500 vehicles pass through this site on a daily basis. Using an hourly average breakdown of the monitored truck traffic, it can be estimated that 619 trucks passed through this site during the 24-hour period containing the monitored hours. As such, approximately 5.4% of the total traffic at this site is truck traffic.

Again using the hourly average breakdown, approximately 53 placarded vehicles passed through this site in the 24-hour period. Thus, 0.46% of the total daily traffic at this site is placarded.

2.4 Conclusions

The following conclusions can be made using the highway analysis data. Conclusions regarding the covered facilities analysis and the overall nature of the hazardous materials risk in Lewis and Upshur Counties are presented below.

- National hazardous materials incident trends *generally* predicted the hazardous materials that would be seen locally.
  - Confirmations
    - Class 3 Flammables are involved in the most incidents nationally and were the most frequently recorded materials in both counties.
    - Class 8 Corrosives were involved in the second most incidents nationally and tallied the second-highest number of notes locally.
    - Class 2, which includes non-flammable gases, ranks third nationally in incidents and was the third-most recorded type of materials locally.
  - Deviations
    - The number of oxidizers and poisonous (toxic) materials were opposite (locally) from the national trends.
    - Explosives were recorded more frequently than national trends would have predicted.
- Total traffic estimates from the WVDOT and the number of trucks witnessed at the monitoring sites along I-79 confirm that many trucks (or total vehicles) exit I-79 onto US 33 (either east or west).
- The WVDOT's total traffic estimates and the US 33 monitoring sites confirm that a significant amount of truck (and total) traffic exits US 33 into the City of Buckhannon.
- A significant number of "extremely hazardous substances" are transported via I-79.
- Emergency responders, especially in Lewis County, must be prepared for a variety of hazardous materials incident. While gasoline is the most frequently transported product through both counties, a wide variety of other materials from all hazard classes are transported, thus not allowing local responders to disregard

any materials grouped in a particular hazard class.

3.0 COVERED FACILITIES ANALYSIS

3.1 Methodology

In addition to the highway analysis, a general "information request" was distributed to the reporting facilities throughout both counties. Each facility was sent a form that requested a list of the chemicals used or stored, the mode of transportation used to transport the chemicals to the facility, the frequency and volumes of shipments, and storage locations at each facility. This information was collected to both verify and supplement the highway study data. It will allow the local emergency planning committee to determine which types of materials are present year-round and which materials are simply "passing through" to facilities in other areas.

3.2 Field Data

Nineteen (19) organizations responded to the information request, three (3) of which represent oil and natural gas operations. Ramsey Associated Petroleum and D.G. Haney, Inc. reported crude oil for a combined total of seven (7) wells in Lewis County. Dominion Exploration and Production, Inc. reported crude oil and brine water transport in both counties. Crude oil and brine are not listed as "extremely hazardous substances".

The 16 other respondents represent a variety of businesses and industries that use and/or store a multitude of materials. Figure 3.2.a. lists the remaining respondents with the materials they use/store.

Figure 3.2.a.

Respondent Facilities with Materials

Facility	*Material(s)*
Airgas Mid America, Inc. *Buckhannon*	Propane
Airgas Mid America, Inc. *Horner*	Propane
Allegheny Wireline Services	Diesel
City of Buckhannon	Chlorine, Potassium Permanganate
Coastal Lumber Company	Diesel
Halliburton	BC 140, Calcium Chloride, Cal Seal 60, Cement Class A, Clay Control NEM, Clay Fix II, Econonlite Additive, FE 1A, Flo Chek P, Gilsonite Resin, HC 2, Hydrochloric Acid, Losurf 300, Liquified Nitrogen, Pheno Seal, Potassium Chloride, Pozmix A, Salt, Sand (Brown), Sand (White), Sand 16/30, Silicalite, Spherelite, SSA 2, WG 35
Interstate Chemical Company	Sodium Hydroxide
Martin Oil Company	Diesel, Gasoline
PTC Alliance	Petroleum, Sulfuric Acid, Waste Sulfuric Acid
Southern States Coop. *Buckhannon*	Aromatic Hydrocarbon, Calcium Hydroxide
Southern States Coop. *Weston*	Calcium Hydroxide
St. Joseph's Hospital	Diesel, Liquid Oxygen
Upshur County Bus Garage	Diesel, Gasoline
Viking Pools/CPC	Styrene
West Fork Regional Water Plant	Chlorine
WV Division of Highways	Antifreeze, Calcium, Diesel, Gasoline, H.D. Oil, Sodium Chloride

The following figures illustrate the materials stored in total and in each county as well as the frequency of material shipments. "Extremely hazardous substances" are graphed in red.

Figure 3.2.b.

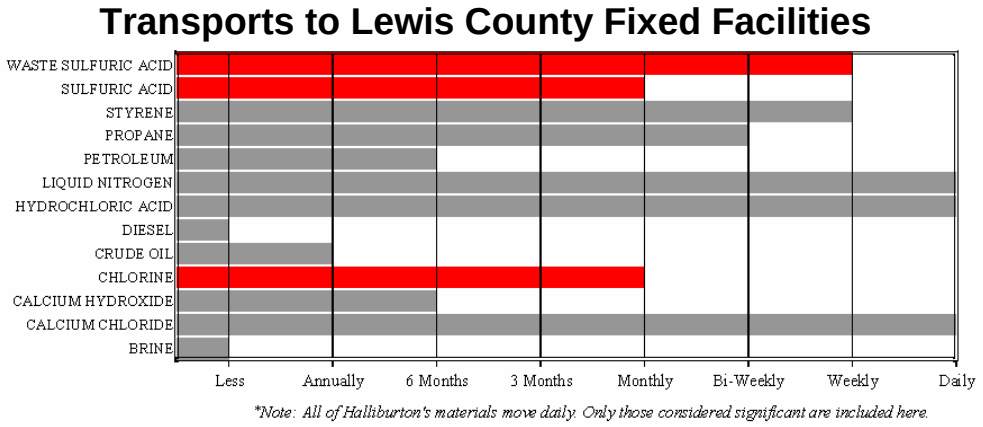


Figure 3.2.c.

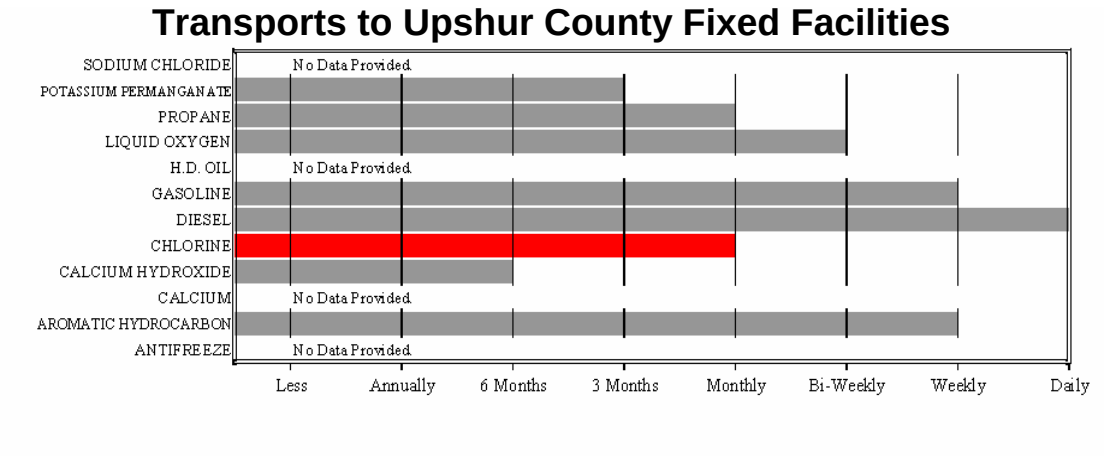
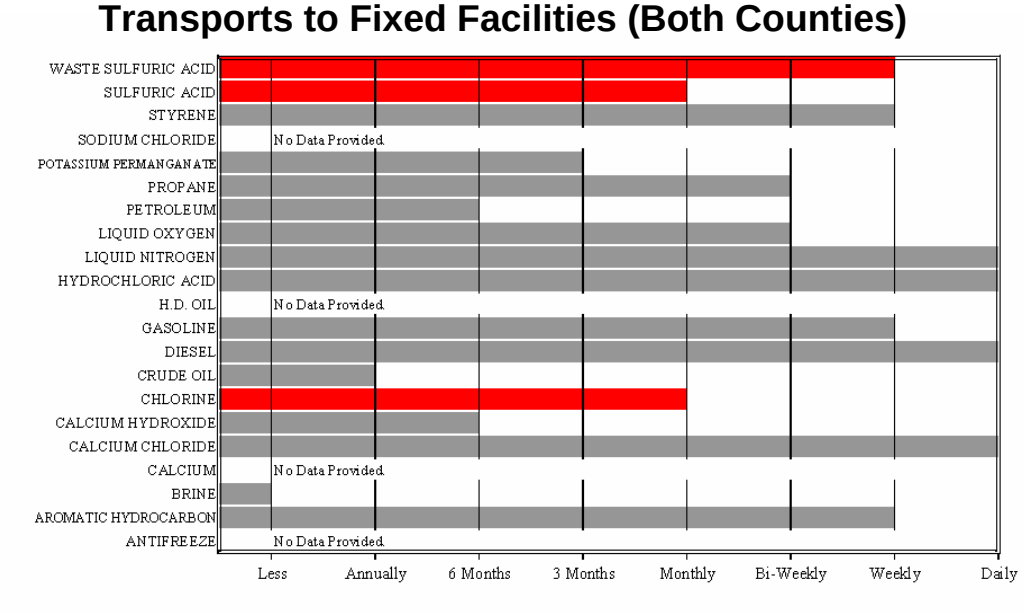


Figure 3.2.d.



Some facilities that are known covered facilities in both Lewis and Upshur County did not respond to the initial survey. Figure 3.2.e. shows the facilities that were included in the LEPC's 1999 *Commodities Flow Study* or 2001 *Risk Analysis* but did not respond to the 2006 questionnaire, along with the materials they were reported to use and/or store.

Figure 3.2.e.

Reporting Facilities from the 1999 Commodities Flow Study

Facility	*Material(s)*	*Delivery Route(s)*
American AGIP Company, Inc.	Ethylene Glycol	I-79 (Exit 108)
JF Allen Block Plant	Diesel, Iron Oxide Pigment, Portland Cement	US 33 E
JF Allen Lorentz Plant	Asphalt Emulsion, Diesel, Fly Ash, Gasoline, Limestone Dust, Liquid Petroleum Asphalt, Portland Cement	US 33 E
Stonewall Jackson Memorial	Oxygen	I-79 to US 33 W
St. Gobain (Corhart)	Chronic Oxide, Hydrochloric Acid, *Nitric Acid*, Silica, Sodium Hydroxide, Titanium Dioxide	I-79 to US 33 E
Trus Joist Weyerhauser	Clear Board Sealer, Diesel, Emulsified Wax, Ethylene Glycol, Propane, Microllam Phenolic Resin, Parallam Phenolic Resin, Sodium Hydroxide, Hydraulic Oil, Thermal Oil	I-79 to US 33 E
Uponor ETI	Calcium Carbonate, Calcium Strearate, Parrafin Wax, Polyvinyl Chloride, Titanium Dioxide	I-79 to US 33 E

These facilities are still in operation in the study area; therefore, it becomes a planning assumption that the chemicals reported in the former study are considered in this updated study. The frequency of shipments, however, was not provided.

3.2.1 Oil and Natural Gas Respondents

The oil and natural gas organizations that participated indicated minimal shipments of crude oil in a year's span. D.G. Haney, Inc. reported one (1) 60 barrel shipment from each of their two (2) Lewis County locations every two (2) years. Ramsey Associated Petroleum indicates that they ship a small tanker of crude oil from each of five (5) Lewis County locations once per year. In both counties combined, Dominion Exploration and Production ships approximately 294,000 gallons of crude oil and 1,290,000 gallons of brine annually.

Due to the extent of oil and natural gas operations in Lewis and Upshur

Counties, crude oil and brine water are anticipated to be transported via tanker on a daily basis. As confirmation, both crude oil and brine water were recorded at the monitoring sites during the highway analysis.

3.2.2 Airgas Mid America, Inc.

Both Airgas facilities in the study area – along US 33 near Buckhannon and in Horner, reported storing propane (CAS 74-98-6, UN 1075). Interstate 79 to US 33 is the primary transport route for both facilities. The Buckhannon facility receives one (1) shipment per month from Inergy (9,000 gallon tanker), Rich Energy (9,000 gallon tanker), and Airgas (3,000 gallon tanker). A shipment is also received from Dominion; however, no quantity was provided. The Horner facility receives two (2) shipments (3,000 gallon tankers) per month from Airgas.

3.2.3 Allegheny Wireline Services

Allegheny Wireline Services indicated that they receive approximately one (1) 3,000 gallon shipment of diesel (CAS 68476-37-6, UN 1993) annually. The shipment is received from Woodford Oil; thus, the shipment originates in Elkins, travels west on US 33 to River Avenue in Weston.

Representatives from Allegheny Wireline stated that they were in the process of removing the above-ground (4,000 gallon) storage tank. As such, they do not anticipate any further shipments of diesel.

3.2.4 City of Buckhannon

The City of Buckhannon reported the materials used and stored at their water treatment plant. The plant receives a one (1)-ton cylinder of chlorine (CAS 7782-50-5, US 1017) from Brenntag every 30 to 45 days. Potassium permanganate, not more than two (2) shipments of 330 lbs., is also delivered by SAL Chemical every 60 to 90 days. Both shipments are via I-79 to US 33.

3.2.5 Coastal Lumber Company

Coastal Lumber only receives diesel (CAS 68476-34-6, UN 1993) at its Buckhannon facility. Approximately one (1) shipment per month arrives via US 33. The shipment averages over 2,000 gallons.

3.2.6 Halliburton

Halliburton's Jackson's Mill facility uses and/or stores a variety of materials. See Appendix 3 for information on Halliburton's materials. Hydrochloric acid (CAS 7647-01-0, UN 1789) is the most significant material of note. Halliburton receives four (4) 5,000 gallons shipments of acid monthly from Reagent and transports approximately 800 gallons itself daily.

3.2.7 Interstate Chemical Company

Interstate Chemical ships sodium hydroxide (CAS 1310-73-2, UN 1823) via tanker truck on a daily basis via US Route 19 to Interstate 79. Shipments range in size from 1,000 to 5,000 gallons.

3.2.8 Martin Oil Company

Martin Oil both receives and ships diesel (CAS 68476-34-6, UN 1993) and gasoline (CAS 8006-61-9, US 1203) on a weekly basis. Eighteen (18) 7,500 gallon tankers of diesel arrive from Fairmont south on I-79 to US 33. Two (2) 8,600 gallon tankers of gasoline also arrive from Fairmont each week.

Diesel and gasoline are loaded onto 4,000 gallon-capacity Martin Oil trucks and shipped from their storage facility to various jobs and drilling locations.

3.2.9 PTC Alliance

Two (2) different hazardous materials are shipped to and from PTC Alliance. One hundred (100) gallons of sulfuric acid (CAS 7664-93-9, UN 1830) are received from Interstate Chemical monthly in 350 gallon totes. Further, approximately two (2)

450 gallon shipments of petroleum (CAS 8002-05-9, UN 1267) arrive by tanker from Allegheny Petroleum per year. Both shipments arrive via the Jane Lew exit (#108) of I-79.

On a weekly basis, Envirite of Ohio removes approximately 4,500 gallons of waste sulfuric acid via I-79 north from the facility. The waste that is removed is concentrated at between 10% and 12%.

3.2.10 Southern States Co-op

Both Southern States facilities in the study area reported calcium hydroxide (CAS 1305-62-0). They receive approximately two (2) shipments per year. The Buckhannon facility receives approximately 44,000 lbs. via box trailer over US 33 from Weston. The Weston facility receives nine (9) to 12 tons of 50 lb. containers via US 33 from Elkins or I-79 from Pennsylvania.

Additionally, the Buckhannon facility stores aromatic hydrocarbons (CAS 749-86) received from CNG through McIlvane via US 33 out of Weston. During non-heating season, approximately one (1) to two (2) 9,000 to 10,000 gallon loads are received weekly. During heating season, approximately four (4) to six (6) loads are received.

3.2.11 St. Joseph's Hospital

Diesel fuel (CAS 68476-34-6, UN 1993) and liquid oxygen (CAS 7782-44-7, UN 1073) are stored at St. Joseph's Hospital in Buckhannon. Both materials are shipped via US 33. Martin Oil ships 2,000 gallons of diesel on an annual basis to the hospital and Airgas ships 1,000 gallons of liquid oxygen biweekly.

3.2.12 Upshur County Bus Garage

The school bus garage in Upshur County stores 5,000 gallons of gasoline (CAS 8006-61-9, UN 1203) and 10,000 gallons of diesel (CAS 68476-34-6, UN 1993) at its site. The transporter is Bruceton Petroleum, who utilizes I-79 to US 33 or County Route 151 every two (2) months.

3.2.13 Viking Pools/CPC

Viking Pools/CPC utilizes styrene (CAS 100-42-5, UN 2055) at their Jane Lew facility. Shipments are received weekly from Hexion via I-79 (Jane Lew exit). Shipments are composed of approximately 660 lbs. in 55 gallon drums.

3.2.14 West Fork Regional Water Plant

WV American Water Company's West Fork Regional Water Plant stores and utilizes chlorine (CAS 7782-50-5, UN 1017) for water treatment. The facility receives monthly one (1)-ton shipments over I-79 (South Weston exit to US 19) from Brenntag.

3.2.15 WV Division of Highways (Upshur)

The WVDOT Division of Highways stores and utilizes several materials at its Upshur County facility. Three hundred ninety-two (392) gallons of antifreeze are stored in 55 gallon drums. Approximately 110 lbs. of calcium (CAS 7440-70-2, UN 1401) in 50 lb. bags is kept on site. For equipment, up to 5,000 gallons of diesel fuel (CAS 68476-34-6, UN 1993) is stored, as is up to 5,000 gallons of gasoline (CAS 8006-61-9, UN 1203). Approximately 1,000 gallons of oil are kept in 55 gallon drums. Finally, approximately 625 tons of sodium chloride is kept on site.

3.3 Conclusions

The following conclusions can be determined following the covered facilities analysis.

- The covered facilities analysis revealed several other types of hazardous materials in the study area not accounted for by highway monitoring. A total of 24 materials were reported by covered facilities and not reported during the highway analysis.
- Additionally, the covered facilities analysis confirmed many of the hazardous materials sighted on Interstate 79 and US Route 33.

- The only "extremely hazardous substance" chemical not sighted on the roadways was nitric acid.
- 38% of the chemicals listed as used/stored at covered facilities are shipped at on a weekly or daily basis. (19% of the total list is shipped daily.)

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 Conclusions

The following list illustrates the conclusions that can be drawn regarding the transport, use, and storage of hazardous materials in Lewis and Upshur Counties.

- A total of 87 different materials are reflected in this commodity flow study.
  - Twenty four (24) materials (28%) were identified only by the covered facilities analysis.
  - Forty-one (41) specific materials (47%) were recorded during the highway analysis but not reported by any covered facilities.
  - Thirteen (13) "extremely hazardous substances" that require extraordinary planning and response considerations were recorded (as part of the total 87).

- In addition to those 87 materials above, a total of 25 other placards were recorded that did not have a readily available UN number. The most significant of these were four (4) Class 1 explosives, one (1) Class 4 flammable solid, and one (1) Class 7 radioactive.
- Of the 248 trucks bearing placards, nineteen (19) carried an EPA-designated "extremely hazardous substance".
  - Two (2) of the three (3) "extremely hazardous substances" reported during the covered facilities analysis were sighted during the highway analysis. Chlorine and sulfuric acid were reported by roadway monitors; nitric acid was not reported.

- In general, flammable materials are the most-frequently transported materials in both counties.

- Corrosive materials are the second-most frequently transported materials in Lewis County
- Non-flammable gases and toxic materials are the second-most frequently transported materials in Upshur County.
- A higher number of oxidizers were recorded than expected.

4.2 Recommendations

4.2.1. Update this flow study on a regular basis.

Both Lewis and Upshur Counties, as has all of north central West Virginia, have been fortunate enough to see a continued economic growth during recent years. As such, the nature of the counties' industry will change and so will the amounts and types of hazardous materials being utilized and stored. In order for this document to remain an accurate, viable basis for hazardous materials planning and training efforts, these continual changes will need to be reflected. The document should be updated every three (3) to five (5) years.

4.2.2. Compare this flow study with studies prepared by neighboring counties (specifically Braxton, Gilmer, Harrison, and Randolph) in an attempt to ascertain the frequency of "pass through" shipments.

The results of this study indicate that a significant number of hazardous materials not regularly used/stored in Lewis or Upshur Counties are being transported on their roadways. Without a destination in the study area, the frequency and quantities of these shipments cannot be determined. Coordination with neighboring counties not only supplements and confirms the data in this report, but it also fosters a positive working relationship with responders in those counties.

4.2.3. Include monitoring sites along US Route 33 West, US Route 19, WV Route 20, US Route 119, and WV Route 4 during future flow studies.

Interstate 79 and US Route 33 are the primary arterial routes through Lewis and Upshur Counties. However, this study does not account for the traffic leaving I-

79 onto US 33 and going west through the City of Weston. Further, the report does not include data for hazardous materials flow from I-79 and US 33 into other parts of the study area via the secondary arterial routes listed above.

4.2.4. Include a railway analysis in future flow studies.

The Appalachian and Ohio (A&O) Railroad is expanding operations in Upshur County. Although the primary commodity transported via rail is coal, emergency services personnel have noticed several tank cars in transport via rail.

4.2.5. Include a pipeline analysis in future flow studies.

The oil and natural gas industry is significant in both counties. In addition to the many small pipelines that traverse the study area, a major east-west pipeline flows through the southern parts of both counties (according to the *Upshur County Multi-Jurisdictional Hazard Mitigation Plan*). Although emergency responders through both counties know what commodity flows through pipelines, it would be helpful to depict the pressures carried in those lines as well as times of the year segments of pipelines are shut in, the location of compressor stations, etc.

4.2.6. Conduct an in-depth hazardous materials vulnerability and risk assessment that includes covered facilities.

This study includes brief analyses of the hazardous materials risk at some of the covered facilities in each county. A detailed vulnerability and risk assessment would characterize not only commodity flow, but also at-risk populations, potential protective measures, etc. A detailed vulnerability and risk assessment would be a companion to this document.

4.2.7. Ensure that responders are properly trained in the response to incidents involving petroleum products.

Gasoline, diesel, and propane (and crude oil) are the most-frequently transported products in both counties. Thus, they are the hazardous materials most

likely to be involved in an incident. As such, responders should seek training to properly prepare themselves for such an incident.

4.2.8. Ensure that responders are properly trained in the response to incidents involving chlorine and sulfuric acid.

While there are several other types of "Extremely Hazardous Substances" (EHS) being transported through the study area (particularly Lewis County), chlorine and sulfuric acid were the EHS materials sighted along the roadways *and* reported in the covered facilities analysis. Consequently, they are the EHS materials most likely to be involved in an incident and responders should thus properly prepare for their release.

4.2.9. Design emergency exercises that include the materials recorded by this study.

Other recommendations in this report call for the need to properly train local responders. A significant aspect of this preparedness is designing realistic exercises involving the materials they are likely to encounter. Training efforts are misspent if involving materials that responders are highly unlikely to see in a local incident.

4.2.10. Encourage covered facilities that use/store chlorine and/or sulfuric acid to participate in emergency exercises.

Any facility that actively participates in emergency exercises enhances the overall preparedness in the study area. However, those facilities with chlorine or sulfuric acid (WVAWC West Fork Regional Water Treatment Plant, Buckhannon Water Treatment Plant, and PTC Alliance) should be particularly encouraged to participate due to the EPA designation of the materials they use/store.

4.2.11. Develop and maintain a database of covered facilities throughout both counties.

The covered facilities analysis contained in this report is somewhat erratic due to the inconsistency in the covered facilities that participated in this study and those that were reported in the 1999 *Commodities Flow Study*. Developing and

maintaining a database will allow emergency managers to maintain communications with a consistent group of covered facilities (i.e. the information can simply be updated rather than totally re-collected on an annual basis). Entering known covered facilities into a database also frees emergency managers to coordinate with potential or new facilities to ensure as many facilities as possible are in compliance with SARA Title III.

4.2.12. Standardize data collection methods.

The data that was collected for this study was much more than adequate. However, data was not collected consistently at all of the monitoring sites. Such items as staffing the sites during the same time periods and specifying if it is needed to list all truck types (i.e. dump trucks, concrete, flat beds, etc.) should be addressed and held constant. Consistent data will allow for more direct comparisons and more in-depth analysis.

4.2.13. Establish communications with other industries, such as the mining and agricultural industries.

The highway analysis reported such materials as anhydrous ammonia and ammonia-based fertilizers. These materials are commonly associated with the mining and agricultural industries. Efforts should be made to characterize the local risk surrounding these operations. Coordination with these entities may help to explain the higher percentage of oxidizers noted in this report.

5.0 REFERENCES

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APPENDIX 1

MATERIALS IN LEWIS AND UPSHUR COUNTIES

1.0 MATERIALS LIST

1.1 Numbered Placards

1005: ***Anhydrous ammonia****
1017: ***Chlorine****
1065: *Neon*
1075: *Propane or butane*
1079: ***Sulphur dioxide****
1136: *Coal tar distillates*
1193: *Methylethyl ketone*
1203: *Gasoline*
1207: *Hexaldehyde*
1247: *Methyl methacrylate monomer*
1263: *Paint*
1433: *Stannic phosphides*
1673: *Phenylenediamines*
1707: *Thallium*
1768: ***Diflourophosphoric acid****
1789: *Hydrochloric acid*
1809: ***Phosphoric trichloride****
1830: ***Sulfuric acid****
1831: ***Sulfuric acid (fuming)****
1862: *Ethyl crotonate*
1866: *Resin solution*
1872: *Lead dioxide*
1918: *Cumene*
1942: *Ammonium nitrate*
1977: *Nitrogen*
1983: *Refrigerant gas*
1993: *Diesel*
2005: *Magnesium diphenyl*
2014: *Hydrogen peroxide (<60%)*
2015: ***Hydrogen peroxide (>60%)****
2067: ***Ammonium nitrate fertilizer****
2187: *Carbon dioxide (refrigerated)*
2211: *Polymeric beads*
2215: *Maleic anhydride*
2248: *Di-n-butylamine*
2249: *Dichlorodimethyl ether*
2348: *Butyl acrylate*
2357: ***Cyclohexylamine****
2426: ***Ammonium nitrate liquid****
2607: ***Acrolein dimer stabilized****
2794: *Batteries (wet, filled w/ acid)*
3007: *Pesticide*
3077: *Environmentally haz. substance*
3082: *Liquid hazardous waste*
3110: *Organic peroxide type F*
3139: *Oxidizing liquid*
3257: *Elevated temperature liquid*
3265: *Corrosive liquid (acidic)*
3302: *Dimethylaminoethyl acrylate*

**** Denotes Extremely Hazardous Substance***

1.2 Placards by Hazard Class Only

The following placards were recorded during the roadway analysis without UN numbers. This list includes a brief description of the hazard that may be associated with these placards.

- *Biohazard*: Inhalation or contact with substance may cause infection, disease, or death
- *Corrosive*: Toxic; inhalation, ingestion, or skin contact may cause severe injury or death
- *Dangerous*: Produce flammable and toxic gases upon contact with water OR may explode from heat, shock, friction, or contamination
- *Explosives 1.4*: Explosives without a significant blast hazard
- *Flammable*: Highly flammable; easily ignited by heat, sparks, or flame; may form explosive mixtures with air
- *Liquid Nitrogen*: Contact with gas or liquified gas may cause burns, severe injury, and/or frostbite
- *Non-Flammable Gas*: Vapors may cause dizziness or asphyxiation without warning; vapors are heavier than air and likely to spread along the ground
- *Oxidizer*: May explode from friction, heat, or irritation; will accelerate burning when involved in a fire
- *Oxygen*: Substance does not burn but will support combustion; some may react explosively with fuels
- *Radioactive*: Some materials may burn, but not readily; radiation presents minimal risk to transport workers or emergency responders
- *Toxic*: Toxic; inhalation, ingestion, or skin contact may cause severe injury or death

1.3 Additional Materials at Covered Facilities

The following materials, in addition to those listed above, were reported only by the covered facilities that participated in the survey as well as those that whose information was gathered from previous LEPC projects. UN numbers are provided, if known.

- Antifreeze
- Aromatic Hydrocarbon (UN 1964, 1965, or 3295)
- Asphalt Emulsion (Asphalt UN: 1999)
- BC 140
- 1401: Calcium
- Calcium Carbonate
- Calcium Chloride
- Calcium Hydroxide
- Calcium Strearate
- Cal Seal 60
- Cement Class A
- Chronic Oxide
- Clay Control NEM
- Clay Fix II
- Clear Board Sealer
- Econonlite Additive
- Emulsified Wax
- 1171: Ethylene Glycol
- FE 1A
- Flo Chek P
- Fly Ash
- Gilsonite Resin
- HC 2
- Hydraulic Oil
- Iron Oxide Pigment (Iron Oxide UN: 1376)
- Limestone Dust
- Liquified Petroleum
- Losurf 300
- Microllam Phenolic Resin
- ***2032: Nitric Acid****
- Parafin Wax
- Parallam Phenolic Resin
- 1267: Petroleum
- Pheno Seal
- Polyvinyl Chloride
- Potassium Chloride
- 1490: Potassium Permanganate
- Portland Cement
- Pozmic A
- Salt
- Sand
- Silica
- Silicate
- Sodium Chloride
- 1823: Sodium Hydroxide
- Spherelite
- SSA 2
- 2055: Styrene
- 1832: Sulfuric Acid (Waste)
- Thermal Oil
- Titanium Dioxide
- WG 35

**** Denotes Extremely Hazardous Substance***

2.0 COMPLETE EXTREMELY HAZARDOUS SUBSTANCES LIST

CAS No.	Chemical name	Notes	Reportable quantity * (pounds)	Threshold planning quantity (pounds)
75-86-5	Acetone Cyanohydrin.	.....	10	1,000
1752-30-3	Acetone Thiosemicarbazide.	.....	1,000	1,000/10,000
107-02-8	Acrolein.....	.....	1	500
79-06-1	Acrylamide.....	l	5,000	1,000/10,000
107-13-1	Acrylonitrile.....	l	100	10,000
814-68-6	Acrylyl Chloride..	h	100	100
111-69-3	Adiponitrile.....	l	1,000	1,000
116-06-3	Aldicarb.....	c	1	100/10,000
309-00-2	Aldrin.....	.....	1	500/10,000
107-18-6	Allyl Alcohol.....	.....	100	1,000
107-11-9	Allylamine.....	.....	500	500
20859-73-8	Aluminum Phosphide	b	100	500
54-62-6	Aminopterin.....	.....	500	500/10,000
78-53-5	Amiton.....	.....	500	500
3734-97-2	Amiton Oxalate....	.....	100	100/10,000
7664-41-7	Ammonia.....	l	100	500
300-62-9	Amphetamine.....	.....	1,000	1,000
62-53-3	Aniline.....	l	5,000	1,000
88-05-1	Aniline, 2,4,6-Trimethyl-.	.....	500	500
7783-70-2	Antimony Pentafluoride.	.....	500	500
1397-94-0	Antimycin A.....	c	1,000	1,000/10,000
86-88-4	ANTU.....	.....	100	500/10,000
1303-28-2	Arsenic Pentoxide.	.....	1	100/10,000
1327-53-3	Arsenous Oxide....	h	1	100/10,000
7784-34-1	Arsenous Trichloride.	.....	1	500
7784-42-1	Arsine.....	.....	100	100
2642-71-9	Azinphos-Ethyl....	.....	100	100/10,000
86-50-0	Azinphos-Methyl...	.....	1	10/10,000
98-87-3	Benzal Chloride...	.....	5,000	500
98-16-8	Benzenamine, 3-(Trifluoromethyl)-	.....	500	500
100-14-1	Benzene, 1-(Chloromethyl)-4-Nitro-	.....	500	500/10,000
98-05-5	Benzenearsonic Acid.	.....	10	10/10,000
3615-21-2	Benzimidazole, 4,5-Dichloro-2-(Trifluoromethyl)-	g	500	500/10,000
98-07-7	Benzotrichloride..	.....	10	100
100-44-7	Benzyl Chloride...	.....	100	500
140-29-4	Benzyl Cyanide....	h	500	500
15271-41-7	Bicyclo[2.2.1]Hept	.....	500	500/10,000

	ane-2-Carbonitrile, 5-Chloro-6-((((Methylamino)Carbonyl)Oxy)Imino)-, (1s-(1-alpha,2-beta,4-alpha,5-alpha,6E))-			
534-07-6	Bis(Chloromethyl) Ketone.	.....	10	10/10,000
4044-65-9	Bitoscanate.....	.....	500	500/10,000
10294-34-5	Boron Trichloride.	.....	500	500
7637-07-2	Boron Trifluoride.	.....	500	500
353-42-4	Boron Trifluoride Compound With Methyl Ether (1:1)	.....	1,000	1,000
28772-56-7	Bromadiolone.....	.....	100	100/10,000
7726-95-6	Bromine.....	l	500	500
1306-19-0	Cadmium Oxide.....	.....	100	100/10,000
2223-93-0	Cadmium Stearate..	c	1,000	1,000/10,000
7778-44-1	Calcium Arsenate..	.....	1	500/10,000
8001-35-2	Camphechlor.....	.....	1	500/10,000
56-25-7	Cantharidin.....	.....	100	100/10,000
51-83-2	Carbachol Chloride	.....	500	500/10,000
26419-73-8	Carbamic Acid, Methyl-, O-(((2,4-Dimethyl-1, 3-Dithiolan-2-yl)Methylene)Amino)-	d	1	100/10,000
1563-66-2	Carbofuran.....	.....	10	10/10,000
75-15-0	Carbon Disulfide..	l	100	10,000
786-19-6	Carbophenothion...	.....	500	500
57-74-9	Chlordane.....	.....	1	1,000
470-90-6	Chlorfenvinfos....	.....	500	500
7782-50-5	Chlorine.....	.....	10	100
24934-91-6	Chlormephos.....	.....	500	500
999-81-5	Chlormequat Chloride	h	100	100/10,000
79-11-8	Chloroacetic Acid.	.....	100	100/10,000
107-07-3	Chloroethanol.....	.....	500	500
627-11-2	Chloroethyl Chloroformate	.....	1,000	1,000
67-66-3	Chloroform.....	l	10	10,000
542-88-1	Chloromethyl Ether	h	10	100
107-30-2	Chloromethyl Methyl Ether	c	10	100
3691-35-8	Chlorophacinone...	.....	100	100/10,000
1982-47-4	Chloroxuron.....	.....	500	500/10,000
21923-23-9	Chlorthiophos.....	h	500	500
10025-73-7	Chromic Chloride..	.....	1	1/10,000
62207-76-5	Cobalt, ((2,2[prime]-(1,2-Ethanediylbis (Nitrilomethylidy	.....	100	100/10,000

	ne)) Bis(6-Fluorophenolato)) (2-)-N,N[prime],O,O[prime])-			
10210-68-1	Cobalt Carbonyl...	h	10	10/10,000
64-86-8	Colchicine.....	h	10	10/10,000
56-72-4	Coumaphos.....	.....	10	100/10,000
5836-29-3	Coumatetralyl.....	.....	500	500/10,000
95-48-7	Cresol, o-.....	.....	100	1,000/10,000
535-89-7	Crimidine.....	.....	100	100/10,000
4170-30-3	Crotonaldehyde....	.....	100	1,000
123-73-9	Crotonaldehyde, (E)-	.....	100	1,000
506-68-3	Cyanogen Bromide..	.....	1,000	500/10,000
506-78-5	Cyanogen Iodide...	.....	1,000	1,000/10,000
2636-26-2	Cyanophos.....	.....	1,000	1,000
675-14-9	Cyanuric Fluoride.	.....	100	100
66-81-9	Cycloheximide.....	.....	100	100/10,000
108-91-8	Cyclohexylamine...	l	10,000	10,000
17702-41-9	Decaborane(14)....	.....	500	500/10,000
8065-48-3	Demeton.....	.....	500	500
919-86-8	Demeton-S-Methyl..	.....	500	500
10311-84-9	Dialifor.....	.....	100	100/10,000
19287-45-7	Diborane.....	.....	100	100
111-44-4	Dichloroethyl ether	.....	10	10,000
149-74-6	Dichloromethylphenylsilane	.....	1,000	1,000
62-73-7	Dichlorvos.....	.....	10	1,000
141-66-2	Dicrotophos.....	.....	100	100
1464-53-5	Diepoxybutane.....	.....	10	500
814-49-3	Diethyl Chlorophosphate	h	500	500
71-63-6	Digitoxin.....	c	100	100/10,000
2238-07-5	Diglycidyl Ether..	.....	1,000	1,000
20830-75-5	Digoxin.....	h	10	10/10,000
115-26-4	Dimefox.....	.....	500	500
60-51-5	Dimethoate.....	.....	10	500/10,000
2524-03-0	Dimethyl Phosphorochloridothioate	.....	500	500
77-78-1	Dimethyl sulfate..	.....	100	500
75-78-5	Dimethyldichlorosilane	h	500	500
57-14-7	Dimethylhydrazine.	.....	10	1,000
99-98-9	Dimethyl-p-Phenylenediamine	.....	10	10/10,000
644-64-4	Dimetilan.....	d	1	500/10,000
534-52-1	Dinitrocresol.....	.....	10	10/10,000
88-85-7	Dinoseb.....	.....	1,000	100/10,000
1420-07-1	Dinoterb.....	.....	500	500/10,000
78-34-2	Dioxathion.....	.....	500	500
82-66-6	Diphacinone.....	.....	10	10/10,000
152-16-9	Diphosphoramide, Octamethyl-	.....	100	100
298-04-4	Disulfoton.....	.....	1	500

514-73-8	Dithiazanine Iodide	.....	500	500/10,000
541-53-7	Dithiobiuret.....	.....	100	100/10,000
316-42-7	Emetine, Dihydrochloride	h	1	1/10,000
115-29-7	Endosulfan.....	.....	1	10/10,000
2778-04-3	Endothion.....	.....	500	500/10,000
72-20-8	Endrin.....	.....	1	500/10,000
106-89-8	Epichlorohydrin...	l	100	1,000
2104-64-5	EPN.....	.....	100	100/10,000
50-14-6	Ergocalciferol....	c	1,000	1,000/10,000
379-79-3	Ergotamine Tartrate	.....	500	500/10,000
1622-32-8	Ethanesulfonyl Chloride, 2-Chloro-	.....	500	500
10140-87-1	Ethanol, 1,2-Dichloro-, Acetate	.....	1,000	1,000
563-12-2	Ethion.....	.....	10	1,000
13194-48-4	Ethoprophos.....	.....	1,000	1,000
538-07-8	Ethylbis(2-Chloroethyl)Amine	h	500	500
371-62-0	Ethylene Fluorohydrin	c, h	10	10
75-21-8	Ethylene Oxide....	l	10	1,000
107-15-3	Ethylenediamine...	.....	5,000	10,000
151-56-4	Ethyleneimine.....	.....	1	500
542-90-5	Ethylthiocyanate..	.....	10,000	10,000
22224-92-6	Fenamiphos.....	.....	10	10/10,000
115-90-2	Fensulfothion.....	h	500	500
4301-50-2	Fluenetil.....	.....	100	100/10,000
7782-41-4	Fluorine.....	k	10	500
640-19-7	Fluoroacetamide...	j	100	100/10,000
144-49-0	Fluoroacetic Acid.	.....	10	10/10,000
359-06-8	Fluoroacetyl Chloride	c	10	10
51-21-8	Fluorouracil.....	.....	500	500/10,000
944-22-9	Fonofos.....	.....	500	500
50-00-0	Formaldehyde.....	l	100	500
107-16-4	Formaldehyde Cyanohydrin	h	1,000	1,000
23422-53-9	Formetanate Hydrochloride	d, h	1	500/10,000
2540-82-1	Formothion.....	.....	100	100
17702-57-7	Formparanate.....	d	1	100/10,000
21548-32-3	Fosthietan.....	.....	500	500
3878-19-1	Fuberidazole.....	.....	100	100/10,000
110-00-9	Furan.....	.....	100	500
13450-90-3	Gallium Trichloride	.....	500	500/10,000
77-47-4	Hexachlorocyclopentadiene	h	10	100
4835-11-4	Hexamethylenediamine, N,N[prime]-Dibutyl-	.....	500	500
302-01-2	Hydrazine.....	.....	1	1,000

74-90-8	Hydrocyanic Acid..	.....	10	100
7647-01-0	Hydrogen Chloride (gas only)	l	5,000	500
7664-39-3	Hydrogen Fluoride.	.....	100	100
7722-84-1	Hydrogen Peroxide (Conc > 52%)	l	1,000	1,000
7783-07-5	Hydrogen Selenide.	.....	10	10
7783-06-4	Hydrogen Sulfide..	l	100	500
123-31-9	Hydroquinone.....	l	100	500/10,000
13463-40-6	Iron, Pentacarbonyl-	.....	100	100
297-78-9	Isobenzan.....	.....	100	100/10,000
78-82-0	Isobutyronitrile..	h	1,000	1,000
102-36-3	Isocyanic Acid, 3,4- Dichlorophenyl Ester	.....	500	500/10,000
465-73-6	Isodrin.....	.....	1	100/10,000
55-91-4	Isofluorphate.....	c	100	100
4098-71-9	Isophorone Diisocyanate	.....	100	500
108-23-6	Isopropyl Chloroformate	.....	1,000	1,000
119-38-0	Isopropylmethylpyrazolyl Dimethylcarbamate	d	1	500
78-97-7	Lactonitrile.....	.....	1,000	1,000
21609-90-5	Leptophos.....	.....	500	500/10,000
541-25-3	Lewisite.....	c, h	10	10
58-89-9	Lindane.....	.....	1	1,000/10,000
7580-67-8	Lithium Hydride...	b	100	100
109-77-3	Malononitrile.....	.....	1,000	500/10,000
12108-13-3	Manganese, Tricarbonyl Methylcyclopentadienyl	h	100	100
51-75-2	Mechlorethamine...	c	10	10
950-10-7	Mephosfolan.....	.....	500	500
1600-27-7	Mercuric Acetate..	.....	500	500/10,000
7487-94-7	Mercuric Chloride.	.....	500	500/10,000
21908-53-2	Mercuric Oxide....	.....	500	500/10,000
10476-95-6	Methacrolein Diacetate	.....	1,000	1,000
760-93-0	Methacrylic Anhydride	.....	500	500
126-98-7	Methacrylonitrile	h	1,000	500
920-46-7	Methacryloyl Chloride	.....	100	100
30674-80-7	Methacryloyloxyethyl Isocyanate	h	100	100
10265-92-6	Methamidophos.....	.....	100	100/10,000
558-25-8	Methanesulfonyl Fluoride	.....	1,000	1,000
950-37-8	Methidathion.....	.....	500	500/10,000
2032-65-7	Methiocarb.....	.....	10	500/10,000
16752-77-5	Methomyl.....	h	100	500/10,000
151-38-2	Methoxyethylmercur	.....	500	500/10,000

	ic Acetate			
80-63-7	Methyl 2-Chloroacrylate	.....	500	500
74-83-9	Methyl Bromide....	l	1,000	1,000
79-22-1	Methyl Chloroformate	h	1,000	500
60-34-4	Methyl Hydrazine..	.....	10	500
624-83-9	Methyl Isocyanate.	.....	10	500
556-61-6	Methyl Isothiocyanate	b	500	500
74-93-1	Methyl Mercaptan..	l	100	500
3735-23-7	Methyl Phenkapton.	.....	500	500
676-97-1	Methyl Phosphonic Dichloride	b	100	100
556-64-9	Methyl Thiocyanate	.....	10,000	10,000
78-94-4	Methyl Vinyl Ketone	.....	10	10
502-39-6	Methylmercuric Dicyanamide	.....	500	500/10,000
75-79-6	Methyltrichlorosilane	h	500	500
1129-41-5	Metolcarb.....	d	1	100/10,000
7786-34-7	Mevinphos.....	.....	10	500
315-18-4	Mexacarbate.....	.....	1,000	500/10,000
50-07-7	Mitomycin C.....	.....	10	500/10,000
6923-22-4	Monocrotophos.....	.....	10	10/10,000
2763-96-4	Muscimol.....	.....	1,000	500/10,000
505-60-2	Mustard Gas.....	h	500	500
13463-39-3	Nickel Carbonyl...	.....	10	1
54-11-5	Nicotine.....	c	100	100
65-30-5	Nicotine Sulfate..	.....	100	100/10,000
7697-37-2	Nitric Acid.....	.....	1,000	1,000
10102-43-9	Nitric Oxide.....	c	10	100
98-95-3	Nitrobenzene.....	l	1,000	10,000
1122-60-7	Nitrocyclohexane..	.....	500	500
10102-44-0	Nitrogen Dioxide..	.....	10	100
62-75-9	Nitrosodimethylamine	h	10	1,000
991-42-4	Norbormide.....	.....	100	100/10,000
0	Organorhodium Complex (PMN-82-147)	.....	10	10/10,000
630-60-4	Ouabain.....	c	100	100/10,000
23135-22-0	Oxamyl.....	d	1	100/10,000
78-71-7	Oxetane, 3,3-Bis(Chloromethyl)-	.....	500	500
2497-07-6	Oxydisulfoton.....	h	500	500
10028-15-6	Ozone.....	.....	100	100
1910-42-5	Paraquat Dichloride	.....	10	10/10,000
2074-50-2	Paraquat Methosulfate	.....	10	10/10,000
56-38-2	Parathion.....	c	10	100
298-00-0	Parathion-Methyl..	c	100	100/10,000
12002-03-8	Paris Green.....	.....	1	500/10,000
19624-22-7	Pentaborane.....	.....	500	500
2570-26-5	Pentadecylamine...	.....	100	100/10,000

79-21-0	Peracetic Acid....	.....	500	500
594-42-3	Perchloromethylmercaptan	.....	100	500
108-95-2	Phenol.....	.....	1,000	500/10,000
4418-66-0	Phenol, 2,2[prime]-Thiobis(4-Chloro-6-Methyl)-	.....	100	100/10,000
64-00-6	Phenol, 3-(1-Methylethyl)-, Methylcarbamate	d	1	500/10,000
58-36-6	Phenoxarsine, 10,10[prime]-Oxydi-	.....	500	500/10,000
696-28-6	Phenyl Dichloroarsine	h	1	500
59-88-1	Phenylhydrazine Hydrochloride	.....	1,000	1,000/10,000
62-38-4	Phenylmercury Acetate	.....	100	500/10,000
2097-19-0	Phenylsilatrane...	h	100	100/10,000
103-85-5	Phenylthiourea....	.....	100	100/10,000
298-02-2	Phorate.....	.....	10	10
4104-14-7	Phosacetim.....	.....	100	100/10,000
947-02-4	Phosfolan.....	.....	100	100/10,000
75-44-5	Phosgene.....	l	10	10
732-11-6	Phosmet.....	.....	10	10/10,000
13171-21-6	Phosphamidon.....	.....	100	100
7803-51-2	Phosphine.....	.....	100	500
2703-13-1	Phosphonothioic Acid, Methyl-, O-Ethyl O-(4-(Methylthio) Phenyl) Ester	.....	500	500
50782-69-9	Phosphonothioic Acid, Methyl-, S-(2-(Bis(1Methylethyl)Amino)Ethyl) O-Ethyl Ester	.....	100	100
2665-30-7	Phosphonothioic Acid, Methyl-, O-(4-Nitrophenyl) O-Phenyl Ester	.....	500	500
3254-63-5	Phosphoric Acid, Dimethyl 4-(Methylthio)Phenyl Ester	.....	500	500
2587-90-8	Phosphorothioic Acid, O,O-Dimethyl-S-(2-Methylthio) Ethyl Ester	c, g	500	500
7723-14-0	Phosphorus.....	b, h	1	100
10025-87-3	Phosphorus Oxychloride	.....	1,000	500
10026-13-8	Phosphorus Pentachloride	b	500	500

7719-12-2	Phosphorus Trichloride	.....	1,000	1,000
57-47-6	Physostigmine.....	d	1	100/10,000
57-64-7	Physostigmine, Salicylate (1:1)	d	1	100/10,000
124-87-8	Picrotoxin.....	.....	500	500/10,000
110-89-4	Piperidine.....	.....	1,000	1,000
23505-41-1	Pirimifos-Ethyl...	.....	1,000	1,000
10124-50-2	Potassium Arsenite	.....	1	500/10,000
151-50-8	Potassium Cyanide.	b	10	100
506-61-6	Potassium Silver Cyanide	b	1	500
2631-37-0	Promecarb.....	d, h	1	500/10,000
106-96-7	Propargyl Bromide.	.....	10	10
57-57-8	Propiolactone, Beta-	.....	10	500
107-12-0	Propionitrile.....	.....	10	500
542-76-7	Propionitrile, 3-Chloro-	.....	1,000	1,000
70-69-9	Propiophenone, 4-Amino-	g	100	100/10,000
109-61-5	Propyl Chloroformate	.....	500	500
75-56-9	Propylene Oxide...	l	100	10,000
75-55-8	Propyleneimine....	.....	1	10,000
2275-18-5	Prothoate.....	.....	100	100/10,000
129-00-0	Pyrene.....	c	5,000	1,000/10,000
140-76-1	Pyridine, 2-Methyl-5-Vinyl-	.....	500	500
504-24-5	Pyridine, 4-Amino-	h	1,000	500/10,000
1124-33-0	Pyridine, 4-Nitro-,l-Oxide	.....	500	500/10,000
53558-25-1	Pyriminil.....	h	100	100/10,000
14167-18-1	Salcomine.....	.....	500	500/10,000
107-44-8	Sarin.....	h	10	10
7783-00-8	Selenious Acid....	.....	10	1,000/10,000
7791-23-3	Selenium Oxychloride	.....	500	500
563-41-7	Semicarbazide Hydrochloride	.....	1,000	1,000/10,000
3037-72-7	Silane, (4-Aminobutyl)Dietho xymethyl-	.....	1,000	1,000
7631-89-2	Sodium Arsenate...	.....	1	1,000/10,000
7784-46-5	Sodium Arsenite...	.....	1	500/10,000
26628-22-8	Sodium Azide (Na(N[INF]3[/INF]))	b	1,000	500
124-65-2	Sodium Cacodylate.	.....	100	100/10,000
143-33-9	Sodium Cyanide (Na(CN))	b	10	100
62-74-8	Sodium Fluoroacetate	.....	10	10/10,000
13410-01-0	Sodium Selenate...	.....	100	100/10,000
10102-18-8	Sodium Selenite...	h	100	100/10,000
10102-20-2	Sodium Tellurite..	.....	500	500/10,000

900-95-8	Stannane, Acetoxytriphenyl-	g	500	500/10,000
57-24-9	Strychnine.....	c	10	100/10,000
60-41-3	Strychnine Sulfate	.....	10	100/10,000
3689-24-5	Sulfotep.....	.....	100	500
3569-57-1	Sulfoxide, 3-Chloropropyl Octyl	.....	500	500
7446-09-5	Sulfur Dioxide....	1	500	500
7783-60-0	Sulfur Tetrafluoride	.....	100	100
7446-11-9	Sulfur Trioxide...	b	100	100
7664-93-9	Sulfuric Acid.....	.....	1,000	1,000
77-81-6	Tabun.....	c, h	10	10
7783-80-4	Tellurium Hexafluoride	k	100	100
107-49-3	TEPP.....	.....	10	100
13071-79-9	Terbufos.....	h	100	100
78-00-2	Tetraethyllead....	c	10	100
597-64-8	Tetraethyltin.....	c	100	100
75-74-1	Tetramethyllead...	c, 1	100	100
509-14-8	Tetranitromethane.	.....	10	500
10031-59-1	Thallium Sulfate..	h	100	100/10,000
6533-73-9	Thallous Carbonate	c, h	100	100/10,000
7791-12-0	Thallous Chloride.	c, h	100	100/10,000
2757-18-8	Thallous Malonate.	c, h	100	100/10,000
7446-18-6	Thallous Sulfate..	.....	100	100/10,000
2231-57-4	Thiocarbazide.....	.....	1,000	1,000/10,000
39196-18-4	Thiofanox.....	.....	100	100/10,000
297-97-2	Thionazin.....	.....	100	500
108-98-5	Thiophenol.....	.....	100	500
79-19-6	Thiosemicarbazide.	.....	100	100/10,000
5344-82-1	Thiourea, (2-Chlorophenyl)-	.....	100	100/10,000
614-78-8	Thiourea, (2-Methylphenyl)-	.....	500	500/10,000
7550-45-0	Titanium Tetrachloride	.....	1,000	100
584-84-9	Toluene 2,4-Diisocyanate	.....	100	500
91-08-7	Toluene 2,6-Diisocyanate	.....	100	100
110-57-6	Trans-1,4-Dichlorobutene	.....	500	500
1031-47-6	Triamiphos.....	.....	500	500/10,000
24017-47-8	Triazofos.....	.....	500	500
76-02-8	Trichloroacetyl Chloride	.....	500	500
115-21-9	Trichloroethylsilane	h	500	500
327-98-0	Trichloronate.....	k	500	500
98-13-5	Trichlorophenylsilane	h	500	500
1558-25-4	Trichloro(Chloromethyl)Silane	.....	100	100
27137-85-5	Trichloro(Dichlorophenyl) Silane.	.....	500	500

998-30-1	Triethoxysilane...	.....	500	500
75-77-4	Trimethylchlorosilane	.....	1,000	1,000
824-11-3	Trimethylolpropane Phosphite	h	100	100/10,000
1066-45-1	Trimethyltin Chloride	.....	500	500/10,000
639-58-7	Triphenyltin Chloride	.....	500	500/10,000
555-77-1	Tris(2-Chloroethyl)Amine	h	100	100
2001-95-8	Valinomycin.....	c	1,000	1,000/10,000
1314-62-1	Vanadium Pentoxide	.....	1,000	100/10,000
108-05-4	Vinyl Acetate Monomer	1	5,000	1,000
81-81-2	Warfarin.....	.....	100	500/10,000
129-06-6	Warfarin Sodium...	h	100	100/10,000
28347-13-9	Xylylene Dichloride	.....	100	100/10,000
58270-08-9	Zinc, Dichloro(4,4-Dimethyl-5((((Methylamino) Carbonyl) Oxy)Imino)Pentanenitrile)-, (T-4)-	.....	100	100/10,000
1314-84-7	Zinc Phosphide....	b	100	500

* Only the statutory or final RQ is shown. For more information, see 40 CFR table 302.4.

Notes:
a. This chemical does not meet acute toxicity criteria. Its TPQ is set at 10,000 pounds.
b. This material is a reactive solid. The TPQ does not default to 10,000
c. pounds for non-powder, non-molten, nonsolution form.
d. The calculated TPQ changed after technical review as described in the
e. technical support document.
f. Indicates that the RQ is subject to change when the assessment of
g. potential carcinogenicity and/or other toxicity is completed.
h. Statutory reportable quantity for purposes of notification under SARA
i. sect 304(a)(2).
j. [Reserved]
k. New chemicals added that were not part of the original list of 402
l. substances.
m. Revised TPQ based on new or re-evaluated toxicity data.
n. TPQ is revised to its calculated value and does not change due to
o. technical review as in proposed rule.
p. The TPQ was revised after proposal due to calculation error.
q. Chemicals on the original list that do not meet toxicity criteria but
r. because of their high production volume and recognized toxicity are
s. considered chemicals of concern (``Other chemicals'').

APPENDIX 2

MONITORING SITE SUMMARIES

This appendix contains data sheets for each of the five (5) monitoring sites included in this study. For the purposes of these sheets, the following definitions apply:

- Van
  - Large box truck
  - Small box truck
  - Dump
  - Flat bed trailer (including low-boys)
  - Log or lumber trucks
- Bulk
  - Tanker
  - Concrete truck

I-79 SOUTH (JANE LEW) MONITORING SITE

Non-Placarded Trucks					
Van				*Bulk*	
Sm/Lg Box	Dump	Flat Bed	Log/Lumber	Tanker	Concrete
1,065	6	5	5	71	1

At this site, monitors did not differentiate between the types of vans and bulks as much as at other monitoring sites. As such, the "Sm/Lg Box" and "Tanker" numbers may be somewhat inflated.

Placards Observed:

- Total number of vans w/ blank placards: 0
- Total number of bulks w/ blank placards: 0
- Total number of vans w/ placards (missed UN): 7
- Total number of bulks w/ placards (missed UN): 8

Placard Numbers											
Type	*Flamm.*	*O_2*	*Non-flamm. Gas*	*Dang.*	*Corr.*	*Liq. Nitro.*	*Exp. 1.4*	*1065*	*1075*	*1136*	*1193*
Van	0	2	1	1	2	0	1	0	0	0	0
Bulk	3	1	2	0	1	1	0	1	4	1	1
TOTAL	**3**	**3**	**3**	**1**	**3**	**1**	**1**	**1**	**4**	**1**	**1**

Placard Numbers											
Type	*1203*	*1207*	*1247*	*1263*	*1668*	*1673*	*1830*	*1831*	*1866*	*1918*	*1977*
Van	0	0	0	1	0	0	1	0	1	0	0
Bulk	20	1	1	0	1	1	0	1	0	1	1
TOTAL	**20**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**

Placard Numbers											
Type	*1983*	*1993*	*2015*	*2067*	*2187*	*2211*	*2348*	*2357*	*3082*	*3257*	*3265*
Van	0	1	0	1	0	1	0	0	1	0	0
Bulk	1	2	1	3	1	0	1	1	2	4	1
TOTAL	**1**	**3**	**1**	**4**	**1**	**1**	**1**	**1**	**3**	**4**	**1**

Placard Numbers	
Type	*Oxidizer*
Van	0
Bulk	1
TOTAL	**1**

Interstate 79

Jane Lew (Exit 105)

- *Northern Lewis County*
- *South bound (I-79) monitoring site*

**** Photo courtesy of www.mapWV.gov***

Jane Lew (Exit 105) Monitoring Site Looking North

Jane Lew (Exit 105) Monitoring Site Looking South

I-79 NORTH (REST STOP) MONITORING SITE

Non-Placarded Trucks					
Van				*Bulk*	
Sm/Lg Box	Dump	Flat Bed	Log/Lumber	Tanker	Concrete
276	0	0	0	13	0

At this site, monitors did not differentiate between the types of vans and bulks as much as at other monitoring sites. As such, the "Sm/Lg Box" and "Tanker" numbers may be somewhat inflated.

Placards Observed:

- Total number of vans w/ blank placards: 0
- Total number of bulks w/ blank placards: 0
- Total number of vans w/ placards (missed UN): 3
- Total number of bulks w/ placards (missed UN): 1

Placard Numbers								
Type	*Corr.*	*Exp.*	*Non-flamm. Gas*	*1075*	*1203*	*1942*	*1993*	*3110*
Van	0	2	1	0	0	0	0	0
Bulk	2	0	0	1	4	1	4	1
TOTAL	**2**	**2**	**1**	**1**	**4**	**1**	**4**	**1**

Photographs below.

Interstate 79

Rest Stop

- *North of Lewis-Gilmer County line*
- *North bound (I-79) monitoring site*

**** Photo courtesy of www.mapWV.gov***

I-79 Rest Stop Monitoring Site Looking North

I-79 Rest Stop Monitoring Site Looking South

I-79 NORTH (JANE LEW) MONITORING SITE

Non-Placarded Trucks					
Van				*Bulk*	
Sm/Lg Box	Dump	Flat Bed	Log/Lumber	Tanker	Concrete
690	0	0	0	54	0

At this site, monitors did not differentiate between the types of vans and bulks as much as at other monitoring sites. As such, the "Sm/Lg Box" and "Tanker" numbers may be somewhat inflated.

Placards Observed:

- Total number of vans w/ blank placards: 0
- Total number of bulks w/ blank placards: 0
- Total number of vans w/ placards (missed UN): 1
- Total number of bulks w/ placards (missed UN): 2

Placard Numbers											
Type	*Corr.*	*Flamm.*	*Radio.*	*Toxic*	*O_2*	*1005*	*1017*	*1075*	*1079*	*1203*	*1247*
Van	1	2	1	1	2	0	1	0	1	0	0
Bulk	2	0	0	0	0	1	0	1	0	10	1
TOTAL	**3**	**2**	**1**	**1**	**2**	**1**	**1**	**1**	**1**	**10**	**1**

Placard Numbers											
Type	*1705*	*1707*	*1789*	*1809*	*1831*	*1862*	*1866*	*1977*	*1993*	*2005*	*2014*
Van	0	0	0	0	0	0	1	0	0	0	0
Bulk	1	2	2	1	1	1	0	6	2	1	2
TOTAL	**1**	**2**	**2**	**1**	**1**	**1**	**1**	**6**	**2**	**1**	**2**

Placard Numbers										
Type	*2067*	*2215*	*2426*	*2607*	*2794*	*3007*	*3082*	*3139*	*3257*	*3302*
Van	1	0	0	2	1	2	0	0	0	0
Bulk	0	1	2	0	0	0	1	1	1	1
TOTAL	**1**	**1**	**2**	**2**	**1**	**2**	**1**	**1**	**1**	**1**

Photographs below.

Interstate 79

Jane Lew (Exit 105)

- *Northern Lewis County*
- *North bound (I-79) monitoring site*

**** Photo courtesy of www.mapWV.gov***

Jane Lew (Exit 105) Monitoring Site
Looking North

Jane Lew (Exit 105) Monitoring Site
Looking South

RED ROCK MONITORING SITE

Non-Placarded Trucks					
Van				*Bulk*	
Sm/Lg Box	Dump	Flat Bed	Log/Lumber	Tanker	Concrete
227	77	98	49	43	7

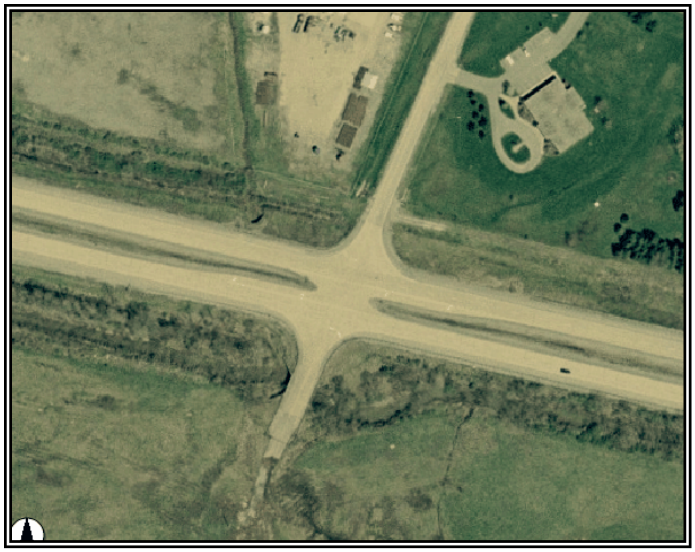
Placards Observed:

- Total number of vans w/ blank placards: 21
- Total number of bulks w/ blank placards: 5
- Total number of vans w/ placards (missed UN): 0
- Total number of bulks w/ placards (missed UN): 6

Placard Numbers											
Type	*1066*	*1075*	*1203*	*1270*	*1433*	*1705*	*1768*	*1866*	*1977*	*1993*	*2248*
Van	1	0	1	0	0	0	0	0	0	0	0
Bulk	0	1	13	1	1	1	1	2	1	1	2
TOTAL	**1**	**1**	**14**	**1**	**1**	**1**	**1**	**2**	**1**	**1**	**2**

Placard Numbers					
Type	*2249*	*3257*	*Bio-haz.*	*Brine*	*Non-flamm. Gas*
Van	0	0	1	0	2
Bulk	1	2	0	4	0
TOTAL	**1**	**2**	**1**	**4**	**2**

Photographs below.



Intersection

US Route 33/Red Rock Road
- *West of Buckhannon*
- *West bound (US 33) monitoring site*

**** Photo courtesy of www.mapWV.gov***

Red Rock Road Monitoring Site Looking East

Red Rock Road Monitoring Site Looking West

CHILDERS RUN MONITORING SITE

Non-Placarded Trucks					
Van				*Bulk*	
Sm/Lg Box	Dump	Flat Bed	Log/Lumber	Tanker	Concrete
358	0	6	4	29	4

At this site, monitors did not differentiate between the types of vans and bulks as much as at other monitoring sites. As such, the "Sm/Lg Box" and "Tanker" numbers may be somewhat inflated.

Placards Observed:

- Total number of vans w/ blank placards: 2
- Total number of bulks w/ blank placards: 2
- Total number of vans w/ placards (missed UN): 1
- Total number of bulks w/ placards (missed UN): 2

Placard Numbers											
Type	*1075*	*1203*	*1270*	*1872*	*1993*	*3077*	*3257*	*Flamm.*	*Exp.*	*O_2*	*Toxic*
Van	0	0	0	0	0	1	0	0	0	1	0
Bulk	1	15	1	1	3	0	3	3	1	0	2
TOTAL	**1**	**15**	**1**	**1**	**3**	**1**	**3**	**3**	**1**	**1**	**2**

Placard Numbers	
Type	*Non-flamm. Gas*
Van	1
Bulk	1
TOTAL	**2**

Photographs below.

Intersection

US Route 33/Childer's Run Road
- *East of Buckhannon*
- *East bound (US 33) monitoring site*

**** Photo courtesy of www.mapWV.gov***

Childer's Run Monitoring Site Looking East

Childer's Run Monitoring Site Looking West

APPENDIX 3

COVERED FACILITY DATA SHEETS

Facility	*Chemical*	*CAS*	*Quantity*	*Container Size*	*Route*	*Frequency*
Airgas Mid America, Inc. *Lewis*	Propane	74-98-6	3,000 gal.	Tanker	I-79 to US 33	Bi-Weekly
Airgas Mid America, Inc. *Upshur*	Propane	74-98-6	9,000 gal.	Tanker	I-79 to US 33	Monthly
	Propane	74-98-6	9,000 gal.	Tanker	I-79 to US 33	Monthly
	Propane	74-98-6	3,000 gal.	Tanker	I-79 to US 33	Monthly
Allegheny Wireline Services	Diesel Fuel	68476-34-6	3,000 gal.	Tanker	US 219 to US 33 W. to River Ave. in Weston	Annually
In process of removing storage tank. Anticipates no more deliveries.						
City of Buckhannon *Water Plant*	Chlorine	7782-505	1	1-ton Cylinder	I-79 to US 33	Monthly
	Potas-sium Perman-ganate	7722-647	1 or 2	330 lb.	I-79 to US 33	Every 2 – 3 Months
Coastal Lumber	Diesel Fuel	68476-34-6	> 2,000 gal.	Tanker	US 33	Monthly
Dominion Exploration & Production	Brine	NO INFO	1,290,000 gal.	NO INFO	NO INFO	Annually
	Crude Oil	8002-05-9	294,000 gal.	NO INFO	NO INFO	Annually
Halliburton	BC 140	141-43-5	330 gal.	Tanker	In: I-79 (Exit 105) to US 19 Out: I-79, US 19, US 33, SR 20, county roads	In: Weekly Out: Daily
	Cal Seal 60	10101-41-4	40,000 lbs.	50 lb. Bags	Same	In: 2 Months Out: Daily
	Calcium Chloride	10043-52-4	40,000 lbs.	50 lb. Bag	Same	In: Monthly Out: Daily
	Cement Class A	65997-15-1	50,000 lbs.	Tanker	Same	In: Daily Out: Daily
	Clay Control NEM	107-21-1	110 gal.	55-gal. Drum	Same	In: Bi-Weekly Out: Daily
	Clay Fix II	75-57-0	4,000 gal.	Tanker	Same	In: 6 Months Out: Daily
	Econon-lite Additive	6432-92-0	2,000 lbs.	50 lb. Bag	Same	In: Monthly (3 loads) Out: Daily
	FE-1A	64-19-7	330 gal.	Tanker	Same	In: Monthly Out: Daily

Halliburton (cont.)	Flo Chek P	1312-76-1	2,000 lbs.	50 lb. Bag	Same	In: Monthly (3 loads) Out: Daily
	Flo Chek P	1344-09-8	55 gal.	Tanker	Same	In: Monthly Out: Daily
	Gilsonite Resin	12001-43-6	10,000 lbs.	50 lb. Bag	Same	In: Monthly Out: Daily
	HC 2	61789-40-0	660 gal.	330 gal. Tanks	Same	In: Weekly Out: Daily
	Hydro-chloric Acid	7647-01-0	5,000 gal.	Tanker	Same	In: Weekly Out: Daily
	Potas-sium Chloride	7447-40-7	2,800 lbs.	50 lb. Bag	Same	In: Monthly Out: Daily
	Losurf 300	67-63-0	330 gal.	Tanker	Same	In: Monthly Out: Daily
	Liquid Nitrogen	7727-37-9	6,500 gal.	Tanker	Same	In: Daily Out: Daily
	Pheno Seal	9004-43-0	2,000 lbs.	50 lb. Bag	Same	In: Monthly Out: Daily
	Pozmix A	14808-60-7	50,000 lbs.	Dump Truck	Same	In: Weekly Out: Daily
	Salt	7647-14-5	40,000 lbs.	80 lb. Bag	Same	In: Monthly Out: Daily
	Brown Sand	14808-60-7	50,000 lbs.	Dump Truck	Same	In: Daily Out: Daily
	White Sand	14808-60-7	50,000 lbs.	Dump Truck	Same	In: Daily Out: Daily
	Sand 16/30	14808-60-7	50,000 lbs.	Dump Truck	Same	In: Annually Out: 4 Months
	Silicalite	7631-86-9	6,000 lbs.	50 lb. Bag	Same	In: Annually Out: Daily
	Spherelite	68131-74-8	28,000 lbs.	50 lb. Bag	Same	In: Monthly Out: Daily
	SSA 2	14808-60-7	50,000 lbs.	Dump Truck	Same	In: Monthly (3 loads) Out: Daily
	WG 35	9000-30-0	40,000 lbs.	50 lb. Bag	Same	In: 2 Months Out: Daily
D.G. Haney, Inc.	Crude Oil	8002-05-9	60 barrels	Tanker	Varies	2 Years
Interstate Chemical Company	Sodium Hydro-xide	1310-73-2	1-5,000 gal.	Tanker	I-79 to US 19, etc.	Daily
Martin Oil Company, Inc.	Diesel Fuel	68476-34-6	7,500 gal.	Tanker	I-79 (Fairmont) to E. US 33	Daily
	Gasoline	8006-61-9	8,600 gal.	Tanker	I-79 (Fairmont) to E. US 33	Weekly (2 loads)

PTC Alliance	Petro-leum	8002-05-9	450 gal.	Tanker	I-79 to Industrial Park (Jane Lew)	6 Months
	Sulfuric Acid	7664-93-9	2,100 gal.	350 gal. Totes	I-79 to Industrial Park (Jane Lew)	Monthly
	Waste Sulfuric Acid	7664-93-9 (10-12%)	4,500 gal.	Tanker	I-79 Outbound	Weekly
Ramsey Associated Petroleum	Crude Oil	8002-05-9	NO INFO	NO INFO	NO INFO	Annually
Southern States *Buckhannon*	Aromatic Hydro-carbon	74-98-6	9-10,000 gal.	Tanker	US 33 from Weston	Weekly (4-6 loads during heating season)
	Calcium Hydro-xide	1305-62-0	44,000 lbs.	Box Trailer	US 33 from Weston	6 Months
Southern States *Weston*	Calcium Hydro-xide	1305-62-0	9 – 12 tons	50 lb. Bag	US 33 from Elkins or I-79 from PA	6 Months
St. Joseph's Hospital	Diesel Fuel	64876-34-6	2,000 gal.	Tanker	US 33	Annually
	Liquid Oxygen	7782-44-7	1,000 gal.	Tanker	US 33	Bi-Weekly
Upshur County Bus Garage (BOE)	Diesel Fuel	68476-34-6	10,000 gal.	Tanker	I-79 to US 33 or SR 151	2 Months
	Gasoline	8006-61-9	5,000 gal.	Tanker	I-79 to US 33 or SR 151	2 Months
Viking Pools/CPC	Styrene	100-42-5	660 lbs.	55-gal. Drum	I-79	Weekly
WVAWC *West Fork Regional Water Plant*	Chlorine	7782-50-5	1	1-ton Cylinder	I-79 to US 19 South	Monthly
WVDOH	Calcium	NO INFO	110 lb.	50 lb. Bags	NO INFO	NO INFO
	Diesel Fuel	68476-34-6	3,700 gal.	Tank	NO INFO	NO INFO
	Gasoline	8006-61-9	3,400 gal.	Tank	NO INFO	NO INFO
	H.D. Oil	NO INFO	1,168 gal.	55-gal. Drum	NO INFO	NO INFO
	Sodium Chloride	NO INFO	627 tons	NO INFO	NO INFO	NO INFO