Attachment A: **Comments on Westvaco Trona Mining Operations and Use of Diesel Equipment**

As is well known, the Westvaco facility in Green River, WY, where trona is mined and processed, was a participant in DEMS and was identified as Mine I. Trona, chemically sodium sesquicarbonate, is the ore that we refine into soda ash, which, in turn, we make into sodium bicarbonate (baking soda) and our customers use to make glass, paper products, laundry detergents, , and a variety of other products. The facility has both mining operations and surface facilities that process the ore at the same physical location. This is similar to the situations at the other seven mines that participated in DEMS.

The mining operations are carried out in trona ore seams about sixteen hundred feet underground in operations that extend over many square miles. The ore seams are about 12 feet in thickness and the ore is of high purity. Adjacent geologic structures contain some methane which can off-gas into the areas where trona is mined resulting in what is called, in accordance with federal mine safety law, a "gassy" mine. Hence, the need to minimize the methane gas concentration and avoid the potential for explosions or fires. This concern is the major factor driving the mine's high ventilation rate. Of course, the high ventilation rates also reduce the concentration of any gases or particulate matter emitted into the mine atmosphere.

The Westvaco mine is heavily electrified and has been so since the beginning of operations. Electrical-powered equipment is used to mine the trona ore at what are called faces, transport it at the mine horizon via conveyors to central shafts, and then to hoist the ore to the surface for processing. Most importantly, very large electrically powered fans provide high amounts of ventilation which dilutes any methane that may be liberated during mining and sweeps it away, thereby rendering it harmless. All of our electric-powered equipment used in the mining face underground must also be approved by the federal Mine Safety and Health Administration ("MSHA") as "permissible" for use in a "gassy" environment. This means that the equipment is designed, constructed, and installed so as not to cause a mine explosion or fire. When and where we use diesel-powered equipment depends on several factors, including the tasks at hand, engine efficiency, and horsepower needs. Diesel-powered equipment is used primarily to transport personnel and material from the vertical shafts to the mine face and in support operations. Because our mine is "gassy," smoking is prohibited underground.

It is important to recognize that each non-metal mine has unique characteristics related to the location of the mine, the geologic structure being mined, the nature of the processing operations and the mission and goals of the management and other employees. Thus, the information provided on the Westvaco trona mine should not be accepted as automatically being applicable to other non-metal mines. Special caution should be exercised in how data from individual mines are aggregated and evaluated. Even mines located in close proximity to each other, such as the trona mines in southwest Wyoming, have unique differences in their operations. The differences among non-metal mines extracting different ores (limestone, salt, potash and trona) are even more striking. These differences are most notable in the nature and extent of ventilation, how large volumes of ore are moved, and the amount and kind of diesel equipment used. The differences in the associated surface operations are also substantial, including bulk processing and purification, highly sophisticated chemical processing and, in the case of the Limestone facility, operation of large kilns.

Table 1 below provides a summary of some key information on the non-metal mines included in DEMS. The data shown are for 1982. This year was selected for illustration purposes since several analyses of DEMS data have indicated the strongest association between diesel exhaust exposure and excess lung cancer, over and above that attributed to cigarette smoking, occurred when a 15-year lag was used. The data shown was taken from the data set originally developed by the NIOSH/National Cancer Institute ("NCI") team conducting DEMS, working with the individual mine operators. The detailed data in the table is an example of the data that is available for each mine on a year-by-year basis. The Adjusted Horsepower estimates were developed cooperatively by the mine operators and NIOSH/NCI taking account of the fraction of time each piece of equipment was used. The specific source of the summary data is the mine-specific data obtained by the Engine Manufacturers Association ("EMA") from the NCI in response to a Freedom of Information Act ("FOIA") request. Multiple parties, including HEI, already have access to the mine-specific data set originally acquired by the EMA.

The mine-specific data set developed by NIOSH/NCI in cooperation with the mine operators is an extraordinarily robust set of data for each mine on a year-by-year basis from the beginning of mine operations through the beginning of use of diesel equipment in each mine until shortly after the end of follow-up of DEMS workers (December 31, 1997). The robust nature of the data set will be illustrated with summary data for all eight mines and detailed diesel equipment inventory information for two mines; Limestone Mine A and Trona Mine I.

The data shown in Table 1 illustrate major differences among the eight DEMS mines with regard to the mode of ventilation (natural in the limestone mine and mechanical in the other seven mines), marked differences in the amount of mechanical ventilation, and important distinctions in the kind and horsepower of diesel equipment in use in each of the mines. The diverse nature of the diesel engines used is extraordinary; some were air-cooled, most were water cooled, some were uniquely designed for mining operation, while others were adapted from diesel engines used in larger markets. Some were used in fixed locations while most were mobile, and the rated HP ranged from as low as a few HP to hundreds of HP.

The differences between our trona mine (Mine I) and the limestone mine (Mine A) are striking. Our mine is the most heavily ventilated (1,630,000 cfm) of the eight mines and makes modest use of diesel equipment (1,493 Adjusted Horsepower), while Mine A makes much more extensive use of diesel equipment (6,862 Adjusted Horsepower). The ventilation in limestone Mine A is unknown since it relied primarily on natural ventilation as described in the DEMS/FOIA request data set. By way of background, Mine A was the earliest of the eight mines dieselized (in 1947) and by 1956 was using 1585 Adjusted Horsepower of diesel equipment, with the horsepower used increasing each year as larger horsepower pieces of equipment were introduced. Diesel equipment was not introduced in our Mine I until 1956, did not reach 604 Adjusted Horsepower until 1972, and slowly ramped up over the decades.

Table 2, also below, is a detailed listing of the diesel-powered equipment in use in Mine I (Westvaco) in 1982. The modest use of diesel-powered equipment and the low horsepower rating of most of our equipment relates to the nature of the mining operation in the mine. As previously noted, in our mine, trona ore is moved by electrically powered conveyor belts miles in length from the face where it is mined to central vertical shaft locations where it is hoisted to the surface. For Mine I, note the low horsepower of most of the equipment; only four pieces of equipment had in excess of 105 HP (150, 210, 210 and 375 HP). Two pieces of equipment had the highest Adjusted HP of 70.125.

Table 3 below is a similar compilation for Limestone Mine A. In the Limestone Mine, as contrasted to our Mine I, ore is carried by large diesel-powered haulage units moving on a relatively level plane from where the ore is mined to the mine opening. The HP of most of the

53 diesel-powered units exceeded 150 HP with some as large as 635 HP. Thirteen of the units had Adjusted HP in excess of 200 HP and eight units had Adjusted HP of 382.5 or 508. Similar data on the specific diesel equipment used is available for each of the other mines that participated in DEMS along with notes on each mine's operations.

There is no question about the impacts of the marked differences in ventilation and diesel equipment usage on exposure of underground miners. Not surprisingly, the measured respirable elemental carbon ("REC") exposures in Mine I were some of the lowest measured among the eight mines; and those in Limestone Mine A were the highest measured in 1998-2000 after DEMS concluded (recall vital statistics were collected on workers through December 31, 1997). In this respect, it is useful to note that the larger area of Limestone Mine A, relative to the Trona Mine I entries, would have a lower velocity (especially with only natural ventilation) and would reduce the speed with which the exhaust is moved out of the immediate limestone work area. Based on the Adjusted Horsepower and ventilation data for earlier years, it is reasonable to expect the differences between Mine I and Mine A were very likely greater pre-1982. This is reflected in Figure 1, below which provides a summary of the Adjusted Horsepower and ventilation rates for the various DEMS mines.

The information provided in Tables 2 and 3 on the individual pieces of diesel equipment in use in the two mines represents a "snap shot" in time for each of these mines. Similar "snap shots" can be developed for the years prior to and after 1982 for both mines. Most importantly, such "snap shots" can also be developed for each of the other six mines. These inventories of diesel equipment and the associated ventilation records are the critical base information under-girding the development of the ***estimates*** of REC used in the epidemiological analyses of the DEMS data. Thus, it would be very useful to include in an Appendix to the HEI Panel Report tables for each of the DEMS mines similar to Tables 2 and 3 to help the readers understand the diversity of diesel-powered equipment used among the eight mines in DEMS. Moreover, the text of the Panel's Report should note the availability of the total data set.

As noted, surface operations at each of the eight DEMS operations are also quite varied. The surface operations at the Westvaco facility are designed to process trona ore into a range of products. Many of the operations at our site are quite complex chemical operations, including facilities that are designed to produce pharmaceutical grade sodium bicarbonate. A limited number of diesel-powered units are used in the Westvaco surface operations. However, diesel-powered trucks and, occasionally, locomotives access these surface operations to move product off-site. In addition, the facility is located in rural, sparsely populated southwest Wyoming. It is well known that Wyoming is windy, ranked first in the U.S. in average annual wind speed. In nearby Rock Springs, the long-term average wind speed is just over 10 mph, and gusts of 30-60 mph are regularly encountered. Not surprising, exposures of surface workers at our facility to diesel exhaust are virtually zero because the low diesel emissions on the surface are rapidly diluted and move east with the wind.

This commentary is provided to illustrate the kind of information available for rigorous evaluation of the exposure assessment information on each mine by the HEI Panel. In that regard, the exposure assessment material presented at the May 4 HEI Conference by Professor Paul Demers and the subsequent discussion suggested that the Panel Members were not familiar with the mining operations conducted in the eight non-metal mines included in DEMS, especially similarities and differences among the mines. One photograph shown was of a CAT front loader in a Canadian uranium mine. This equipment is certainly not typical of the equipment used in our trona mine. Likewise, the photo taken of a truck on the surface with trees in the background, is not representative of any diesel-powered equipment used in our trona operation.

The vital importance of the retrospective exposure assessment to an epidemiological analyses is clear since there were very few, if any, actual measurements of REC in any of the eight mines for the period when vital statistics on workers were collected by December 31, 1997 and earlier. The initial DEMS exposure assessments conducted by NIOSH/NCI personnel used a number of assumptions to go from Adjusted HP and ventilation in each mine to estimates of exposure to REC for individual workers over time in each mine. It was surprising that the validity of these assumptions was not discussed by Professor Demers or other Panel members at the Conference. Indeed it was surprising that this topic was not covered by Professor David Foster who is an internationally recognized expert on diesel technology. The lack of any discussion of the uncertainty in the REC estimates was very disappointing since it is clear that the validity of the subsequent epidemiological analyses is dependent on the degree of confidence that can be placed on the individual estimates of REC exposure for all of the workers enrolled in DEMS. To state the obvious, if the estimates of REC exposure are highly uncertain then the epidemiological analyses will certainly be highly uncertain.

In any event, it will be important for the HEI Panel to address the uncertainty of the REC exposure estimates jointly with the uncertainty estimates for the epidemiological findings. On the one hand, summary statistics that incorporate estimates of uncertainty at each step for complex processes are useful. On the other hand, it is well recognized that analyses that focus on only a single step, such as conducted in the epidemiological analyses using the DEMS data, can be misleading. In view of the importance of the REC estimates, the issue of uncertainties in these estimates is addressed in Attachment B.

The discussion of radon as a potential carcinogenic hazard that could confound an estimation of diesel exhaust-attributable lung cancer risk over and above the substantial lung cancer risk from cigarette smoking was useful. As a mine operator, we recognize that radon exposure is a lung cancer hazard. In our Westvaco mine this hazard is well controlled by the large amount of ventilation used. This is reflected in the fact that only 20% of the radon measurements in the Trona Mine I exceed the limits of detection, compared to 85% in Mine A which is naturally ventilated, and 70% in Mine E that mines salt (see Table 1). It was interesting that some concern was expressed about the radon data, which was based on real measurements, while the Panel appeared to accept the estimates of REC developed via complicated and uncertain extrapolation methods.

Several visuals were shown that compared the diesel exhaust lung cancer hazards among the different mines and between never-underground and always underground workers. These kinds of presentations are of keen interest because we want to better understand the relevance of any of the results of the several analyses of the DEMS data to both past and current employees in all jobs at the Westvaco facility, whether conducted by the original NIOSH/NCI investigators or the more recent analyses by independent scientists.

From a "common sense" view we were struck by the reduced "lung cancer hazard signal" in the always-underground workers compared to never-underground workers. In our operations, it would be expected that the individuals always working underground would have the highest exposures to diesel exhaust and be the most important for identifying and estimating any excess lung cancer risk associated with diesel exhaust or radon exposure. It is noteworthy that Moolgavkar et al. (2015) found reduced lung cancer hazard ratios and reduced statistical significance for always-underground workers, compared to the findings of Attfield et al. (2012) for ever-underground workers using the same statistical methods. It was surprising that this critical difference was not highlighted in the Panel's presentation. These observations should be presented and discussed in the Panel's final report.

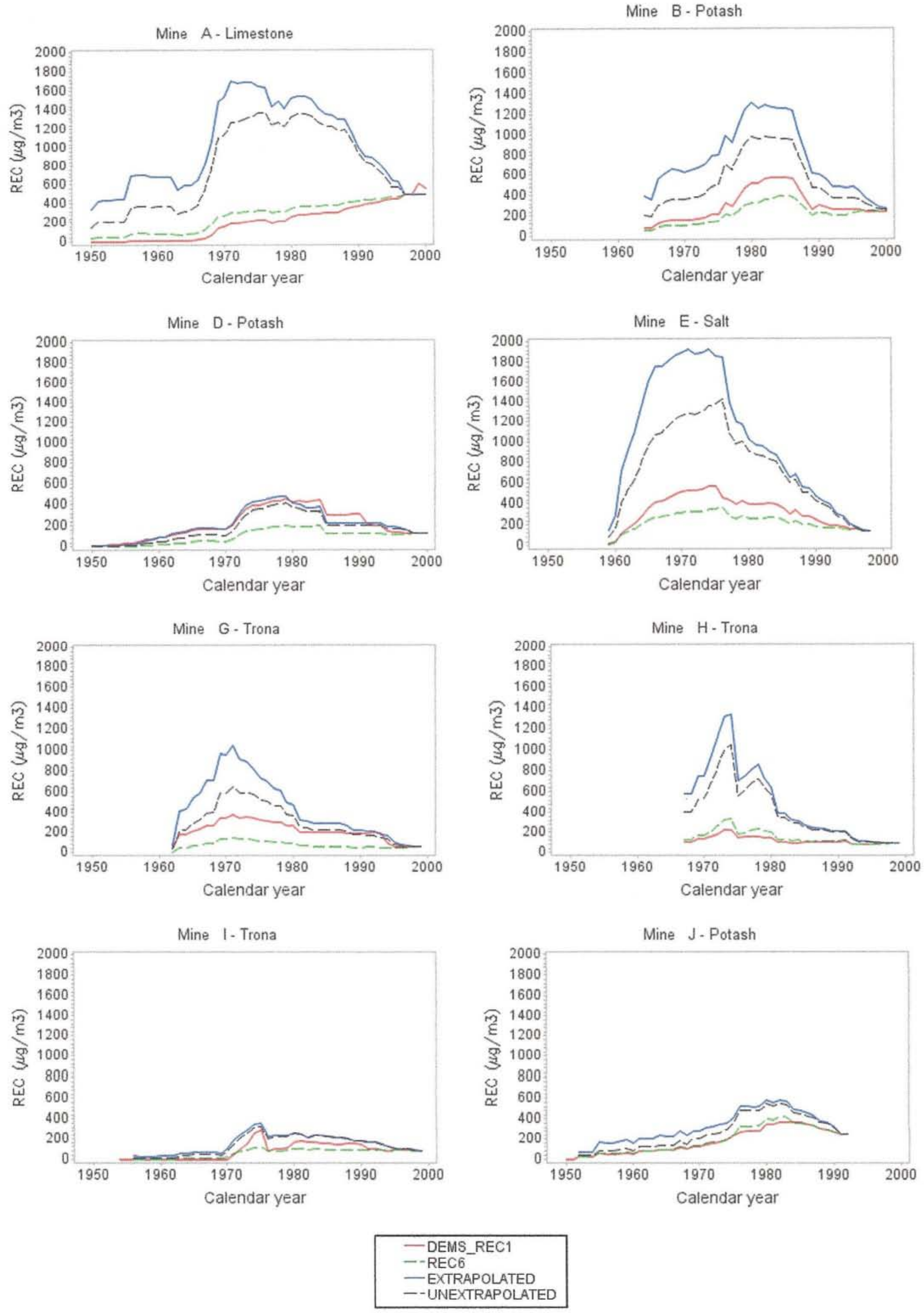

Figure 1: Adj Horsepower and Ventilation Rates for DEMS Mines (from Crump, Van Landingham and McClellan memo of May 21, 2015 to Greenbaum and Krewski)

Table 1. Non-Metal Mines Included in Diesel Exhaust in Miners Study

				1982 Activity		
Mine	**State**	**Ore**	**Ventilation**	**Cfm (in thousands)**	**Diesel (Adj HP)**	**Radon (% values above Level of Detection)**
A	Missouri	Limestone	Natural	--	6,862	85
B	New Mexico	Potash	Mechanical	250	892	44
D	New Mexico	Potash	Mechanical	360	2,326	39
J	New Mexico	Potash	Mechanical	240	1,421	38
E	Ohio	Halite	Mechanical	234	2,804	70
G	Wyoming	Trona	Mechanical	450	638	24
H	Wyoming	Trona	Mechanical	950	1,110	15
I	Wyoming	Trona	Mechanical	1,630	1,493	20

Table 2a. **Diesel Exhaust in Miners Study, Trona Mine I Diesel Equipment in Underground Use in 1982**

			Engine			
Category	**Sub-Category**	**Manufacturer**	**Year In**	**Year Out**	**HP**	**Adj HP**
Boss Buggy	Service	Kubota L-175	1975	1986	17	2.125
Boss Buggy	Service	Kubota L-175	1975	1989	17	2.125
Boss Buggy	Service	Kubota L-175	1975	1993	17	2.125
FEL	Small Loader	Perkins	1976	1990	15	1.825
Fork Lift	Fork Lift	Ford 201	1981	1988	57.5	31.625
Fork Lift	Fork Lift	Ford 201	1982	1989	57.5	31.625
Fork Lift	Fork Lift	Ford 201	1982	1990	57.5	31.625
Load, Haul and Dump (LHD)	LHD	Cat 3304	1977	1987	105	44.625
LHD	LHD	Cat 3304	1978	1987	105	44.625
LHD	LHD	Cat 3304	1979	1990	105	44.625
LHD	LHD	Cat 3304	1979	1990	105	44.625
LHD	LHD	Cat 3304	1979	1992	105	44.625
LHD	LHD	Cat 3304T	1980	1992	165	70.125
LHD	LHD	Cat 3304T	1980	1993	165	70.125
LHD	LHD	Cat 3304	1980	1993	105	44.625
LHD	LHD	Cat 3304	1980	1994	105	44.625
LHD	LHD	Cat 3304	1980	1994	105	44.625
LHD	LHD	Cat 3304	1980	1998	105	44.625
Lab Truck	Lab Truck	Deutz F4L-912W	1975	1988	45	11.25
Lab Truck	Lab Truck	Ford 201	1980	1990	47.5	11.875
Lab Truck	Lab Truck	Ford 201	1980	1990	47.5	11.875
Lab Truck	Lab Truck	Ford 201	1980	1992	47.5	11.875
Miscellaneous	Crane	Deutz F46-912W	1964	2003	55	2.75
Miscellaneous	Crane	Deutz	1964	1987	27	1.35
Miscellaneous	Alternator	Cat D333	1965	2003	150	7.5
Miscellaneous	Lift	Cat 3308	1977	2003	210	10.5
Miscellaneous	Lift	Cat 3308	1977	2003	210	10.5
Miscellaneous	Alternator	Cat 3408	1977	2003	375	18.75

Table 2b. Diesel Exhaust in Miners Study, Trona Mine I Diesel Equipment in Underground Use in 1982 - Cont'd.

			Engine			
Category	**Sub-Category**	**Manufacturer**	**Year In**	**Year Out**	**HP**	**Adj HP**
Personnel Truck	Service	Perkins	1980	1987	52.5	7.875
Personnel Truck	Service	Perkins	1980	1987	55.0	8.25
Personnel Truck	Service	Perkins	1980	1987	55.0	8.25
Personnel Truck	Service	Perkins	1980	1987	52.5	7.875
Personnel Truck	Service	Perkins	1980	1987	52.5	7.875
Personnel Truck	Service	Perkins	1980	1987	52.5	7.875
Personnel Truck	Service	Perkins	1981	1987	52.5	7.875
Personnel Truck	Service	Perkins	1981	1987	52.5	7.875
Personnel Truck	Service	Perkins	1981	1987	52.5	7.875
Personnel Truck	Service	Perkins	1981	1989	52.5	7.875
Personnel Truck	Service	Perkins	1981	1988	52.5	7.875
Personnel Truck	Man Trip	Dentz F4L-912W	1981	1989	55	8.25
Personnel Truck	Man Trip	Deutz F4L-912W	1981	1989	55	8.25
Personnel Truck	Man Trip	Deutz F4L-912W	1981	1989	55	8.25
Personnel Truck	Man Trip	Deutz F4L-912W	1981	1989	55	8.25
Personnel Truck	Man Trip	Perkins 4.108	1981	1989	52.5	7.875
Powder Wagon	Powder Wagon	Ford 201	1973	1982	45.0	20.5
Powder Wagon	Powder Wagon	Perkins	1976	1983	45.0	22.5
Powder Wagon	Powder Wagon	Perkins	1976	1988	45.0	22.5
Powder Wagon	Powder Wagon	Perkins	1976	1988	45	22.5
Roof Bolter	Roof Bolter	Cummins 39BT	1971	1985	100.0	60.0
Roof Bolter	Roof Bolter	Cummins 39BT	1979	2003	100.0	60.0
Roof Bolter	Roof Bolter	Cummins 39BT	1980	2003	100.0	60.0

Table 2c. Diesel Exhaust in Miners Study, Trona Mine I Diesel Equipment in Underground Use in 1982 - Cont'd.

			Engine			
Category	**Sub-Category**	**Manufacturer**	**Year In**	**Year Out**	**HP**	**Adj HP**
Utility Truck	Utility Truck	Deutz F4L-912W	1975	1988	45	7.875
Utility Truck	Utility Truck	Deutz F4L-912W	1975	1988	45	7.875
Utility Truck	Utility Truck	Deutz F4L-912W	1975	1988	45	7.875
Utility Truck	Utility Truck	Deutz F4L-912W	1975	1988	45	7.875
Utility Truck	Utility Truck	Deutz F4L-912W	1975	1982	45	14.625
Utility Truck	Utility Truck	Deutz F4L-912W	1975	1993	45	14.625
Utility Truck	Utility Truck	Deutz F4L-912W	1975	1994	45	14.625
Utility Truck	Utility Truck	Deutz F4L-912W	1975	1994	45	14.625
Utility Truck	Utility Truck	Deutz F4L-912W	1976	1988	45	7.875
Utility Truck	Utility Truck	Deutz F4L-912W	1976	1994	45	14.625
Utility Truck	Utility Truck	Deutz F4L-912W	1976	1994	45	14.625
Utility Truck	Utility Truck	Deutz F4L-912W	1976	1994	45	14.625
Utility Truck	Utility Truck	Deutz F4L-912W	1976	1994	45	14.625
Utility Truck	Utility Truck	Ford 201	1977	1994	41	11.275
Utility Truck	Utility Truck	Ford 201	1977	1997	41	16.40
Utility Truck	Utility Truck	Ford 201	1978	2003	41	16.40
Utility Truck	Utility Truck	Deutz F4L-912W	1979	2003	69	22.425
Utility Truck	Utility Truck	Cummins 239B	1978	2003	72	19.8
Utility Truck	Utility Truck	Deutz F4L-912W	1980	2003	69	13.8
Utility Truck	Utility Truck	Deutz F4L-912W	1980	2003	69	18.975
Utility Truck	Utility Truck	Deutz F4L-912W	1980	2003	69	18.975
Utility Truck	Utility Truck	Deutz F4L-912W	1980	2003	69	18.975
Utility Truck	Utility Truck	Deutz F4L-912W	1980	2003	69	18.975
Welder	Welder	Deutz F4L 912W	1976	1993	55	6.875
Welder	Welder	Deutz F4L 912W	1976	1993	55	6.875
Welder	Welder	Cummins 359	1980	2003	95	6.875
TOTAL					5,418.0	1,492.48

Table 3a. Diesel Exhaust in Miners Study, Limestone Mine A: Diesel Equipment in Underground Use in 1982

			Engine			
Category	**Sub-Category**	**Manufacturer**	**Year In**	**Year Out**	**HP**	**Adj HP**
Special Equipment	Compressor	GMC 502	1971	1988	70	3.5
Cats, Graders, Loaders	Dozer	Cat 3306F	1979	1993	140	21.0
Sp Eq	Drill	GMC 671	1978	1983	238	107.1
Sp. Eq	Drill	GMC 671	1978	1983	238	107.1
Sp Eq	Drill	GMC 671	1979	1987	200	90.0
Sp Eq	Drill	GMC 671	1979	1987	200	90.0
Fork Trucks	Fork Truck	White 125	1975	1983	63	25.2
Fork Trucks	Fork Truck	---	1978	1983	88	35.2
Fork Trucks	Ford Truck	Perkins	1980	1988	88	35.2
Fork Trucks	Ford Truck	Perkins	1981	1990	63	25.2
Fork Trucks	Ford Truck	Perkins	1981	1994	88	35.2
Sp Eq	Generator	1AJIMG	1962	1995	85	4.25
C, G, L	Grader	Cat 3304	1977	1989	125	37.5
C, G, L	Grader	Cat 3304	1982	2000	125	37.5
C, G, L	Loader	Cummins VT1	1977	1982	635	508.0
C, G, L	Loader	Cummins VT1	1977	1983	635	508.0
C, G, L	Loader	Cummins VT1	1978	1984	635	508.0
C, G, L	Loader	Cummins VT1	1979	1986	635	508.0
C, G, L	Loader	ICH DT-4	1980	1987	100	80.0
C, G, L	Loader	Cummins VT1	1980	1988	635	508.0
Sp Eq	Pump	Cummins KTA	1976	1989	600	30.0
Sp Eq	Pump	Cummins V37	1977	1992	149	7.45
Sp Eq	Pump	GM5044	1979	1999	100	5.00
Sp Eq	Pump	Cummins KTA	1980	1999	600	30.00

Table 3b. Diesel Exhaust in Miners Study, Limestone Mine A: Diesel Equipment In Underground Use in 1982 Cont'd.

		Engine				
Category	**Sub-Category**	**Manufacturer**	**Year In**	**Year Out**	**HP**	**Adj HP**
Sp Eq	Scaling Rig	Cummins NHE	1969	1988	220	99.0
Sp Eq	Scaling Rig	Cummins V47	1969	1989	190	85.5
Sp Eq	Scaling Rig	---	1970	1994	175	78.75
Sp Eq	Scaling Rig	Cummins NHZ	1971	1996	250	112.5
Sp Eq	Scaling Rig	GMC 104	1976	1999	190	85.5
Sp Eq	Scaling Rig	Cummins NHZ	1978	1999	220	99.0
C, G, L	Tractor	F3L812	1970	1993	83	3.15
Small Trucks	Truck – Light	International	1976	1985	155	62.0
Small Trucks	Truck – Light	Ford	1977	1985	175	70.0
Small Trucks	Truck – Light	Chevrolet	1978	1988	155	62.0
Small Trucks	Truck – Light	Chevrolet	1978	1989	155	62.0
Small Trucks	Truck – Light	Chevrolet	1978	1990	155	62.0
Small Trucks	Truck – Light	Chevrolet	1978	1990	155	62.0
Small Trucks	Truck – Light	Ford	1979	1990	175	70.0
Small Trucks	Truck – Light	Chevrolet	1979	1991	155	62.0
Small Trucks	Truck – Light	Chevrolet	1979	1991	155	62.0
Small Trucks	Truck – Light	Chevrolet	1979	1991	155	62.0
Small Trucks	Truck – Light	Ford	1980	1992	175	70.0
Heavy Duty Truck	Rock Haulage	Cat D343	1975	1982	245	208.25
Heavy Duty Truck	Rock Haulage	Cat D343	1977	1982	245	208.25
Heavy Duty Truck	Rock Haulage	Cat D343	1977	1988	245	208.25
Heavy Duty Truck	Rock Haulage	Cat D343	1977	1988	245	208.25
Heavy Duty Truck	Rock Haulage	Cat D343	1977	1989	245	208.25
Heavy Duty Truck	Rock Haulage	Cat 34.8	1979	1989	450	382.5
Heavy Duty Truck	Rock Haulage	Cat 34.8	1981	1990	450	382.5
Heavy Duty Truck	Rock Haulage	Cat 34.8	1981	1992	450	382.5
Heavy Duty Truck	Screening – Haulage	Cummins NTA	1981	1984	380	12.67
Heavy Duty Truck	Screening – Haulage	Cummins NTA	1981	1985	380	12.67
Sp Eq	Welder	GMC 205	1970	1998	48	2.4
TOTAL					12,991.0	6,832.28