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**RF & P**

MAY 02 1994

**LAW DEPARTMENT**

April 22, 1994

Ms. Nancy Rios  
U.S. Environmental Protection Agency  
Region III  
841 Chestnut Street  
Philadelphia, PA 19107

Re: L.A. Clarke Superfund Site

Dear Ms. Rios:

The object of this letter is to follow up on the work being performed by RF&P and USEPA Region III to arrive at a mutually acceptable surface soil cleanup level for the L.A. Clarke NPL site. New data and analysis have confirmed our previous determination that 60 mg/kg benzo(a)pyrene equivalents an appropriate and health protective cleanup level for the site. Before reporting on the new analyses that we have undertaken, I would like to take this opportunity to briefly summarize the history of this endeavor.

#### **HISTORY OF CLEANUP LEVEL DEVELOPMENT AT THE SITE**

On October 15, 1993, USEPA informed RF&P that it was disapproving previously submitted cleanup levels and recommended an alternative approach. Specifically, USEPA approved the use of Monte Carlo analysis; however, it rejected the remainder of the assessment because of the "use of the regression analysis and incorrect assumptions for the soil ingestion rate and fraction ingestion parameters." USEPA also presented a suggested Monte Carlo analysis that led to a cleanup level of 1.67 mg/kg polycyclic aromatic hydrocarbons (PAHs) as benzo(a)pyrene corresponding to an excess lifetime upperbound cancer risk of 1E-06. This cleanup level was associated with the 90th percentile of exposures from the Monte Carlo analysis. Subsequent to this, USEPA informed RF&P that the target risk for the site would be 1E-05 rather than 1E-06 to account for the fact that the hypothetical future receptor would be occupational rather than residential and also to reflect the fact that the Record of Decision (ROD) effectively prevents exposure in its requirement for a 1.5 foot deep clean fill cap. When used in conjunction with USEPA's Monte Carlo analysis, this would yield a cleanup level of 17 mg/kg benzo(a)pyrene equivalents (for operational purposes this should probably be rounded to one significant figure or 20 mg/kg).

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During the period from February 18, 1994 to March 11, 1994, RF&P submitted documentation and an alternative Monte Carlo analysis to USEPA. The rationale for this subsequent analysis was an apparent internal contradiction in the earlier analysis. This contradiction was associated with the use of exposure factors that more accurately reflected a residential population despite the fact that the target hypothetical receptor is a worker. The analysis led to the conclusion that 60 mg/kg benzo(a)pyrene equivalents in soil would be protective of a broad worker population. Attachment 1 to this document presents the complete history of the application of Monte Carlo analysis to the development of cleanup levels at the L.A. Clarke site.

### **ANALYSIS OF USEPA'S CONCERNS REGARDING SOIL INGESTION AND EXPOSURE FREQUENCY**

On March 16, 1994, RF&P met with USEPA to discuss the results of the re-analysis. In general, USEPA agreed with the approach presented by RF&P; however, it disagreed with two of the factors presented in the analysis -- the adult soil ingestion rate and the exposure frequency. The soil ingestion rate used in the analysis was a lognormal distribution with a geometric mean of 24.7 mg/day, arithmetic mean of 34 mg/day, a minimum of 5.2 mg/day, and a maximum of 370 mg/day. It should be kept in mind that this distribution is based on a residential rather than an occupational scenario; thus, it will overestimate exposure for the hypothetical worker target receptor at the site. It was agreed by both USEPA and RF&P that a definitive adult soil ingestion study had not been performed, however, this was the best available analysis. Since the submission of this analysis, a new publication has appeared that corroborates the use of the soil ingestion rate proposed by RF&P. Gephart et al. (1994) performed an analysis of existing adult incidental soil ingestion data and concluded that conservative defaults for this parameter should lie in the range from 1 to 10 mg/day (compared to USEPA's default value of 100 mg/day). The value range of 1 to 10 mg/day has been used by other investigators (Copeland et al. 1993). It is important to note that USEPA has set the default ingestion rate for workers (50 mg/day) at a value that is one-half that assumed for residential exposure (100 mg/day) based on the assumption that half of the total adult exposure will occur at work. The derivation of this value is discussed in further detail below. Other USEPA analyses (USEPA 1992A) have assumed exposure via the soil ingestion pathway to occur only during the ages of 2-6 although they acknowledge that adults may ingest soil while gardening and that farmers may have a non-trivial soil ingestion pattern. Thus, it may be concluded that the probability distribution used in the Monte Carlo analysis for soil ingestion represents a reasonable, albeit conservative, depiction of incidental ingestion for the general adult population.

USEPA was also concerned that the exposure frequency wasn't sufficiently conservative to account for all potential incidents of inadvertent soil ingestion by a hypothetical worker. The analysis performed by RF&P used a normal distribution with a mean frequency of 125 days per year, a minimum of 1 day per year, and a maximum of 250 days per year. This maximum is

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based on the assumption that a worker works 5 days per week, 50 weeks per year and is consistent with USEPA's default value (see below). The midpoint of the range was taken to be the average and a normal distribution was developed based on the Central Limit Theorem and the properties of the normal distribution. In essence, this distribution assumes that the typical worker engages in inadvertent ingestion of soil half the time that he/she is at work, however, there is a subpopulation who contacts soil every day at work and another subpopulation who contacts soil at a frequency less than daily. The distribution was designed to reflect the behavior of the operator/fabricator/laborer category that was selected by USEPA as the target population.

USEPA responded with a triangular exposure frequency distribution with a most likely value of 250 days per year, maximum of 300 days per year, and a minimum of 125 days per year. This assumes that the typical worker engages in incidental ingestion of soil daily and that, in addition, there is a population of workers that works more than the typical worker and contacts soil essentially every day on the job during this time. The worker represented by this population would work 6 days per week throughout the year, obtain only one week vacation, take only seven holidays, and receive no time off for sickness or personal leave. It should be kept in mind that the USEPA standard default reasonable maximum value for exposure frequency of workers is 250 days per year, reflecting a worker who works five days per week for 50 weeks per year (USEPA 1991). It should be noted that Region III's proposed probability distribution with a maximum of 300 days per year is inconsistent with this standard default value. The inclusion of USEPA Region III's triangular distribution in the Monte Carlo simulation resulted in a cleanup level of 40 mg/kg benzo(a)pyrene equivalents.

An analysis of the literature was undertaken to evaluate the likely behavior of the hypothetical target receptor. Data obtained from the Bureau of Labor Statistics (Table 1) indicates that, in 1992, 78.1% of the working population is characterized as full time (> 35 hours per week) and 21.9% percent is part time (1-34 hours per week). Of the full time workers, 77.6% worked 50-52 weeks per year (including vacation, sick leave, and holidays), while the remaining 22.4% worked less than 50 weeks per year. Thus, without even considering time off, we see that the probability of being a full time worker who works at least 50 weeks per year can be represented by the product of the fraction of workers that are full time and the fraction of workers working 50-52 weeks per year ( $0.781 \times 0.776$ ) or about 61%. Most workers also receive vacation, holidays, and time off for sickness or personal reasons. Workers in the United States commonly receive between one and five weeks paid vacation (BLR 1994). Data for non-exempt<sup>1</sup> workers indicate that 44% of industries grant 5 weeks of vacation and 85% grant 4 weeks. In addition, 86% of manufacturing industries grant six paid holidays (BLR 1994) and an additional 10

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<sup>1</sup>The term, "non-exempt" is used to designate those employees who are eligible for over-time compensation. We would anticipate that most workers in the operator/fabricator/laborer category are designated non-exempt.

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TABLE 1

MONTE CARLO INPUT VARIABLES

| Variable                         | Distribution Used in Monte Carlo  | RME Point Estimate                | RME Location                             |
|----------------------------------|---|-----------------------------------|--|
| Cancer Slope Factor (CSF)        | 7.3 (mg/kg/day)-1<br>95% UCL  | 7.3 (mg/kg/day)-1                 | 95% UCL                                  |
| Target Risk (TR)                 | 1E-05   | 1E-05                             | Not applicable                           |
| Averaging Time (AT)              | 70 years - constant   | 70 years                          | Not applicable                           |
| Fraction Ingested (FI)           | 1-constant  | 1                                 | Maximum                                  |
| Exposure Frequency (EF)          | Triangular<br>Likeliest - 244 days<br>Min. - 219 day, Max. - 249 days   | 250 days                          | Upperbound                               |
| Ingestion Rate (IR)              | Lognormal distribution<br>Geometric mean - 24.7 mg/d<br>(Arithmetic mean - 34.0 mg/d)<br>Geometric standard deviation - 2.22 mg/d<br>Min. - 5.2 mg/d, Max. 370 mg/d | 50 mg/day<br><br>(100 mg/day) (a) | 62nd percentile<br><br>(92nd percentile) |
| Body Weight (BW)<br>Female       | Normal<br>Mean - 65.4 kg<br>Standard deviation - 14.6 kg<br>Min. - 33 kg, Max. - 118 kg   |                                   |  |
| Male                             | Normal<br>Mean - 78 kg<br>Standard deviation - 13.5 kg<br>Min. - 49 kg, Max. - 121 kg   | 70 kg                             | Average of male and female means         |
| Exposure Duration (ED)<br>Female | Lognormal<br>Mean - 4.7 years<br>Standard deviation 5.9 years<br>Min. - 0.3 yrs, Max. - 28 yrs.   |                                   | 82nd percentile                          |
| Male                             | Lognormal<br>Mean - 5.1 years<br>Standard deviation - 6.7 years<br>Min. - 0.3 yrs., Max. - 32 yrs.  | 25 years                          | 80th percentile                          |
| Hours at work per week (HW)      | Lognormal<br>Mean - 25.1 hrs./wk<br>Standard deviation - 18.4 hrs/wk<br>Min. - 0 hrs, Max. - 107 hrs/wk   | 40 hours                          | 55th percentile                          |

(a) Default assumption for general adult population.  
 UCL = Upper Confidence Limit.

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holidays are granted on a variable basis (for example 80% of industries grant the day after Thanksgiving and 58% grant Good Friday). Three to 5% of manufacturing industries grant paid leave for care of spouse, child, or parent and approximately 70% of industries grant unpaid leave for this type of care<sup>2</sup>. Data on the number of sick days were not available. Last, there is no evidence that overtime work is common. The Bureau of Labor Statistics (Johnson 1994) reports for general building and contracting trades (the labor category that would conceivably be out of doors the most) that the average worker worked 37.5 hours per week in 1992. This has remained relatively constant since 1970 when the average was 36.3 hours per week.

All of these data present a comprehensive picture that clearly demonstrates the low probability of USEPA's proposed exposure frequency distribution and corroborates the probability of the exposure frequency previously developed by RF&P.

In order for the incidental ingestion of soil exposure pathway to be complete, the worker receptor must be in a position to contact contaminated soil on a regular basis. This means that a critical assumption in the Monte Carlo analysis is the amount of time that a worker actually contacts soil during the workday. In order to investigate the completeness of the pathway, an analysis was undertaken to determine the nature of the occupations that were included in the Operator/Fabricator/Laborer category that was selected by USEPA and RF&P as the most likely hypothetical future receptor. A comprehensive tabulation of the jobs represented by this category is attached. Analysis of these occupations reveals a low probability for being outside or contacting soil for any significant amount of time. This analysis is corroborated by job descriptions for relevant occupations (i.e. building trades workers, material movement workers) reported in the literature (Wright 1993).<sup>3</sup> Thus, although the Monte Carlo analysis assumes that soil is contacted daily, there is actually an extremely low probability that this is the case. These data even suggest that the original analysis using a normal distribution with a mean of 125 days may actually have over-estimated exposures to the operator/fabricator/laborer category.

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<sup>2</sup>It is likely that this will increase in the future due to the passage of the Family Leave Act.

<sup>3</sup>Some of Wright's descriptions are of particular interest to the hypothetical future receptor at the site: "Forklift operators stack crates in warehouses and load and unload trucks and boxcars when their machinery is required...Many material handlers, or handling laborers, work in the motor vehicle and equipment manufacturing field. They unload and load parts and raw materials from railroad cars, ships, and trucks...Warehousemen are given a billing with all the part numbers and quantities needed by a customer. They then go through the warehouse filling the order, and then take it to be packed and shipped."

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### **REFINED MONTE CARLO ANALYSIS**

The information provided above allows us to create a Monte Carlo analysis accounting for documented exposure frequency. A synthesis of the data presented by BLR (1994) suggests that a typical worker in the first few years of employment receives two weeks vacation and 6 holidays. The data on overtime suggests that a 40 hour workweek is a reasonable assumption. Thus, starting with 260 days (52 weeks X 5 days per week), we can arrive at an average value of 244 days per year after subtracting two weeks vacation and 6 holidays. The data show that some people only get one week vacation, thus a reasonable maximum value would be 249 days. On the other hand, some people get three additional weeks of vacation and up to 10 additional holidays, thus a reasonable minimum would be 219 days. A triangular distribution is assumed since it is a low information peaked distribution that allows bounds to be placed on the simulated values (Taylor 1993). This analysis conservatively assumes that the receptor is a full time worker who does not take any sick leave or family care leave during the year. It also assumes, despite the evidence to the contrary, that the worker will contact outdoor soil every day she/he is at work.

In addition, our analysis of soil ingestion rates suggests that the probability distribution accepted by USEPA is biased upward since we failed to take into account the fact that only one-half of the exposure occurs at work consistent with USEPA default exposure assumptions. In order to evaluate this, the data of Gephart et al. (1994) on hours per week worked were incorporated into the Monte Carlo assessment. These data are based on the Exposure Factors Handbook (USEPA 1989) and are thus compatible with regulatory policy. In conducting the Monte Carlo analysis, the data that describe hours worked per week were divided by 80 waking hours per week to account for the fact that the workday only occupies half of the time spent awake during the work week (5 days per work week with 16 waking hours per day). This is the same way in which USEPA derived the worker default ingestion value of 50 mg/day from the standard adult value of 100 mg/day. The data were then treated as a lognormal distribution with a mean of 25.1 hours per week, standard deviation of 18.4 hours per week, minimum of zero hours per week, and maximum of 107 hours per week. The skewness of this distribution helps to account for any individual workers who could be regularly engaged in overtime work. Note that at the upper end of this distribution, the ratio of hours worked to 80 hours per week will be greater than one, effectively resulting in conservative soil ingestion rates. All other exposure factor distributions were the same as in the previous submission, however, the body weight distributions were modeled as normal rather than log-normal distributions in keeping with recent scientific results in this area (Gephart et al. 1994). This analysis yields a soil cleanup level of 100 mg/kg as benzo(a)pyrene. The distributions used in this analysis are shown in Table 1. The complete analysis may be seen in Figure 1.

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A sensitivity analysis was performed to evaluate various combinations of exposure factor distributions. This analysis used various options for exposure frequency and the distributional form of the fraction of hours worked. These options included the exposure frequency distribution suggested by USEPA, modeling exposure frequency as a constant point estimate of 250 days per year, and modeling exposure frequency as a uniform distribution (based on the assumption that there is an equal probability of soil contact for any number of days at work). The analysis also included various options for soil ingestion rates based on USEPA's policies and the work of Gephart et al. (1994). The alternative distributions evaluated in the sensitivity analysis are shown in Table 2. The result of these evaluations yielded a range of cleanup levels from 50, using USEPA's suggested statistical values, to 180 mg/kg as benzo(a)pyrene. It should be kept in mind that these cleanup levels should be compared to kriged site-wide averages as specified by USEPA in their letter of October 15, 1993.

In addition to these analyses, Monte Carlo simulation was conducted using site data. This analysis was limited to surface soil AT the western portion of the site due to the fact that the eastern portion and the floodplain are contaminated to lower levels and it was felt that their inclusion would dilute the risk. Three sets of data were combined for use in this analysis. These included the data from USEPA's Remedial Investigation (Weston 1988), GC/MS data collected by Hydrosystems on behalf of RF&P, and field HPLC data collected by Hydrosystems on behalf of RF&P.<sup>4</sup> The GC/MS data were converted to benzo(a)pyrene equivalents using USEPA's methodology (USEPA 1993b). The HPLC data were transformed to benzo(a)pyrene equivalents following least squares linear regression of co-located samples. Problems with previously discussed regressions were obviated by focusing on carcinogenic PAHs and by utilizing detection limits such that the PAH profile was represented. Other standard data management techniques were used such as substituting one-half of the quantification limit for samples reported as "non-detect" as per USEPA's risk assessment guidance for Superfund (USEPA 1989). In addition, samples with locations too close to be differentiated visually were averaged. This treatment yielded a total of 110 samples for benzo(a)pyrene equivalents in surface soil. Analysis of coefficients of skewness and plotting on log-probability coordinates (USEPA 1992b) reveals that this is a log-normal distribution.

These site data were then used in a Monte Carlo assessment of risk incorporating various assumptions for exposure frequency and ingestion rate as above. A worst case analysis was conducted using the triangular distribution for exposure frequency suggested by Region III in conjunction with the assumption that all of an adult's incidental soil ingestion occurs while at work. This yielded a 90th percentile residual risk of 2E-05. The conceptual removal of all soil samples with concentrations over 150 mg/kg will result in a residual risk less than 1E-05 at the

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<sup>4</sup>The data collected by Hydrosystems (Hydrosystems 1992a,b) has been previously submitted to USEPA and is incorporated into this document by reference.

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TABLE 2

SENSITIVITY ANALYSIS

| TRIAL | EXPOSURE FREQUENCY<br>(days/year)                                | HOURS WORKED<br>PER WEEK<br>(hours) | CLEANUP<br>LEVEL<br>(mg/kg) (a) |
|-------|--|-------------------------------------|---------------------------------|
| 1     | Triangular (125, 250, 300)                                       | Percentiles (c)                     | 100                             |
| 2     | Triangular (125, 250, 300)                                       | Lognormal (d)                       | 100                             |
| 3 (b) | Triangular (219, 244, 249)                                       | Lognormal                           | 100                             |
| 4     | Point Estimate - 250   | Lognormal                           | 100                             |
| 5     | Normal ( $\bar{x} = 125$ , $s = 41.6$ ,<br>min. = 1, max. = 250) | Lognormal                           | 100                             |
| 6     | Uniform (1-250)  | Lognormal                           | 180                             |
| 7     | Normal ( $\bar{x} = 150$ , $s = 50$ ,<br>min. = 1, max = 300)    | None                                | 50 (e)                          |
| 8     | Uniform (1-300)  | None                                | 60                              |

(a) Results rounded to nearest 10 mg/kg.

(b) See Refined Monte Carlo Analysis in text.

(c) Exposure Factors Handbook.

(d) See Table 1.

(e) Corresponding to descriptive statistics provided by USEPA.

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90th percentile of exposure. This analysis thus yields a cleanup level of 150 mg/kg benzo(a)pyrene equivalents. There is an important distinction between a cleanup level calculated using the Monte Carlo analysis that incorporates site data and one calculated using the Monte Carlo analysis proposed by USEPA which relies only on exposure factors. USEPA's method of back-calculating cleanup levels using Monte Carlo yields an average value whereas the forward calculation method using site data yields a value that is not to be exceeded at the site. The relationship between this level and the remainder of the site data is that if all soils containing greater than 150 mg/kg benzo(a)pyrene equivalents were to be removed, the residual risk at the 90th percentile of exposure will be less than 1E-05. If the Monte Carlo analysis is conducted using the set of assumptions that is most reflective of worker behavior, the current risk at the site is 6E-06 at the 90th percentile of exposure (Figure 2).

### **DISCUSSION OF FACTORS NOT TAKEN INTO ACCOUNT**

USEPA's risk assessment guidance for Superfund (USEPA 1989) and guidance for risk characterization (USEPA 1992c) require a candid evaluation of the uncertainties present in a risk assessment. Although many of the uncertainties in this development of cleanup levels have been encompassed within the Monte Carlo simulation, several areas have not been taken into account where conservative rather than realistic assumptions have been used throughout the assessment including the following:

- ◆ Meteorologic data do not support frequent contact with soil. Meteorological data obtained from Dulles International Airport (the nearest station to the site) show that 51 days out of the year have maximum temperatures greater than 90° F and 109 days have minimum temperatures lower than 32° F. In addition, there is greater than 0.01 inch of rainfall on 111 days and greater than 1 inch of snow or hail on 4 days. These observations strongly suggest that inclement weather is likely to preclude daily contact with soil.
- ◆ The analysis does not take natural biodegradation into account. Many risk assessments performed by USEPA (1990, 1992a, 1993a) include biological, chemical, or physical degradation as a means to reduce chemical concentrations over the exposure period. For example, USEPA (1988) reports average degradation rate constants for benzo(a)pyrene and fluoranthene to be 0.80, and 0.60 year<sup>-1</sup>, respectively. These rates suggest that there will be a significant reduction in PAHs (between a factor of 10 and a factor of 50) over the worker exposure period due to natural degradation.
- ◆ There is scientific evidence that the cancer slope factor for benzo(a)pyrene is an overestimate. Thorslund and Farrar (1990) modeled the carcinogenic potency of benzo(a)pyrene using the two-stage model and found the cancer slope factor to be 2.9

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(mg/kg/day)<sup>1</sup>. This is approximately 2.5 times less potent than the slope factor currently used by USEPA.

- ◆ The application of 1.5 ft clean fill will effectively prevent all exposure. USEPA has based its risk assessment calculations on a worker's daily contact with contaminated soil, however, the ROD calls for contaminated soil to be covered by 1.5 feet of clean fill. It is difficult to conceive of a scenario in which soil deeper than 1.5 feet is contacted on a routine basis. Other USEPA risk assessments consider 1-2 cm to be a reasonable depth for direct contact scenarios (USEPA 1993a, 1992a). thus, there is a very low probability of routine contact with soil below 1.5 ft. (46 cm).

Taken together, these uncertainties suggest that the risk associated with the hypothetical future use of the site by a worker could be over-estimated by up to an order of magnitude. This supports the selection of a higher value for the range of cleanup levels than has been proposed by RF&P.

#### SUMMARY AND CONCLUSIONS

Analysis of the hypothetical worker exposure scenario using two different Monte Carlo techniques and a variety of assumptions for probability distributions has led to cleanup levels in the range from 50 mg/kg, using statistical data suggested by USEPA, to 180 mg/kg benzo(a)pyrene equivalents with a best estimate of 100 mg/kg as benzo(a)pyrene using other scientifically valid exposure assumptions. RF&P feels that these analyses, in addition to the qualitative analyses of worker behavior and uncertainties, corroborates the previously developed cleanup levels that converged at RF&P's proposed 60 mg/kg benzo(a)pyrene equivalents.


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In conclusion, multiple Monte Carlo analyses have been performed that strongly support the following cleanup-levels corresponding to different target risk levels:

| <u>Target Risk</u> | <u>Cleanup Level (mg/kg B[a]P Equivalents)</u> |
|--------------------|--|
| 1E-06              | 6  |
| 1E-05              | 60   |
| 1E-04              | 600  |

Very truly yours,



WEINBERG CONSULTING GROUP Inc.  
Paul C. Chrostowski, Ph.D.  
Principal

PCC/bp

Enclosure

cc Scott Slagley  
Channing Martin, Esq.

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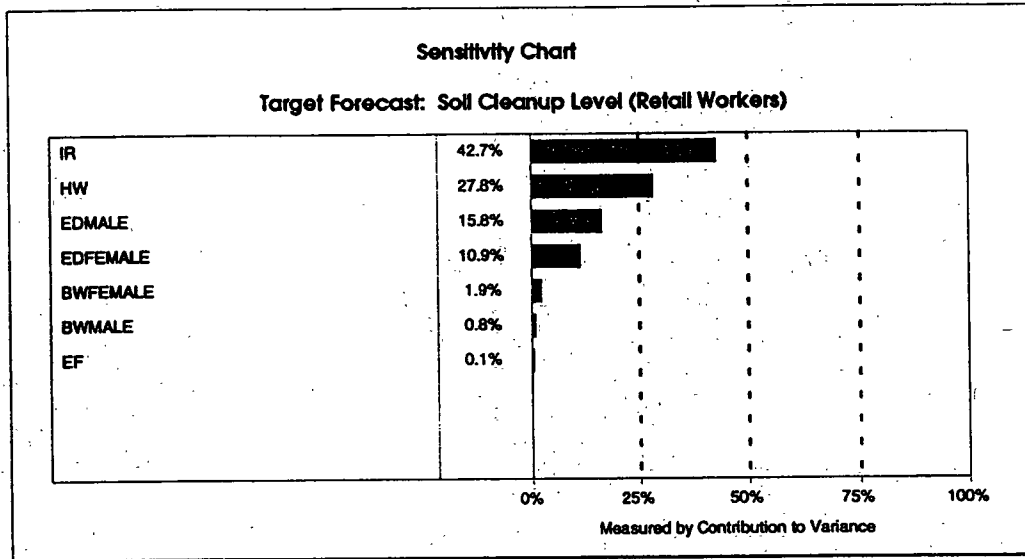
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# FIGURE 1

### Crystal Ball Report

Simulation started on 4/13/94 at 15:17:12

Simulation stopped on 4/13/94 at 15:18:29



**Forecast: Soil Cleanup Level (Retail Workers)**

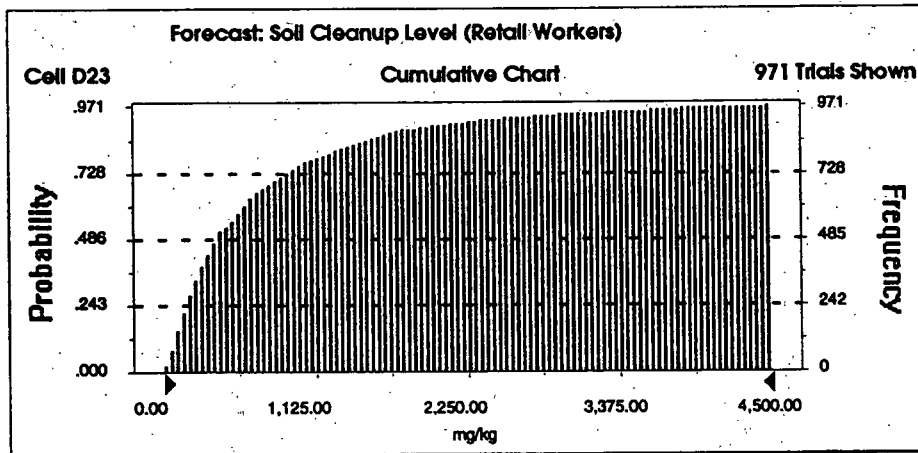
Cell: D23

**Summary:**

Display Range is from 0.00 to 4,500.00 mg/kg  
 Entire Range is from 12.01 to 14,146.48 mg/kg  
 After 1,000 Trials, the Std. Error of the Mean is 42.43

**Statistics:**

|                       | <u>Value</u> |
|-----------------------|--------------|
| Trials                | 1000         |
| Mean                  | 894.66       |
| Median                | 432.32       |
| Mode                  | ---          |
| Standard Deviation    | 1,341.65     |
| Variance              | 1,800,029.40 |
| Skewness              | 4.18         |
| Kurtosis              | 27.56        |
| Coeff. of Variability | 1.50         |
| Range Minimum         | 12.01        |
| Range Maximum         | 14,146.48    |
| Range Width           | 14,134.46    |
| Mean Std. Error       | 42.43        |





**Forecast: Soil Cleanup Level (Retail Workers) (cont'd)**

Cell: D23

**Percentiles:**

| <u>Percentile</u> | <u>mg/kg</u> |
|-------------------|--------------|
| 0%                | 12.01        |
| 10%               | 103.81       |
| 20%               | 167.36       |
| 30%               | 244.56       |
| 40%               | 333.42       |
| 50%               | 432.32       |
| 60%               | 622.22       |
| 70%               | 856.78       |
| 80%               | 1,269.90     |
| 90%               | 1,974.49     |
| 100%              | 14,146.48    |

End of Forecast

**Assumptions**

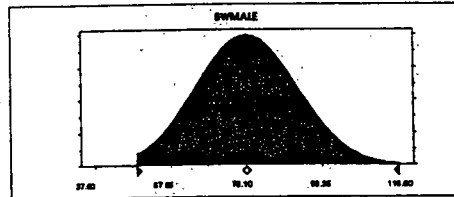
**Assumption: BWMALE**

Cell: D8

Normal distribution with parameters:  
 Mean  
 Standard Dev.

78.10  
 13.50

Selected range is from 48.60 to 121.00  
 Mean value in simulation was 78.56



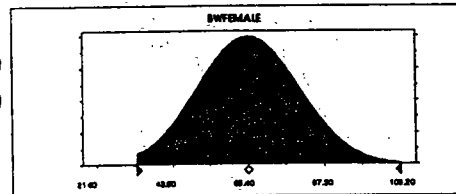
**Assumption: BWFEMALE**

Cell: D9

Normal distribution with parameters:  
 Mean  
 Standard Dev.

65.40  
 14.60

Selected range is from 33.00 to 118.00  
 Mean value in simulation was 65.90



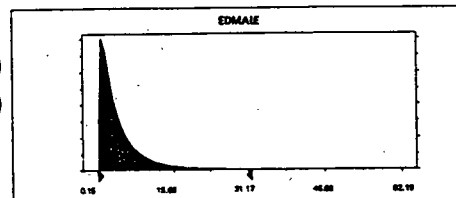
**Assumption: EDMALE**

Cell: D12

Lognormal distribution with parameters:  
 Mean  
 Standard Dev.

5.10  
 6.69

Selected range is from 0.30 to 31.87  
 Mean value in simulation was 4.72



**Assumption: EDFEMALE**

Cell: D16

Lognormal distribution with parameters:

Mean

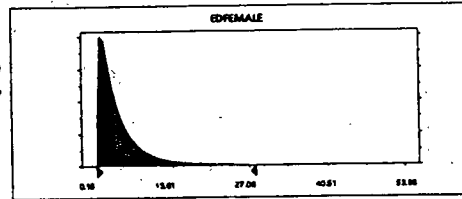
4.65

Standard Dev.

5.87

Selected range is from 0.30 to 28.06

Mean value in simulation was 4.32



**Assumption: IR**

Cell: D13

Lognormal distribution with parameters:

Mean

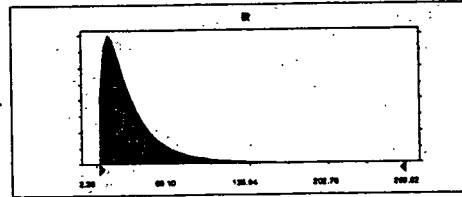
33.91

Standard Dev.

31.94

Selected range is from 5.20 to 369.81

Mean value in simulation was 34.36



**Assumption: EF**

Cell: D11

Triangular distribution with parameters:

Minimum

219.00

Likeliest

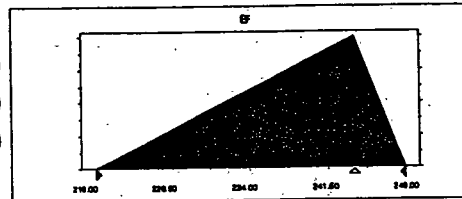
244.00

Maximum

249.00

Selected range is from 219.00 to 249.00

Mean value in simulation was 237.33



**Assumption: HW**

**Cell: D20**

**Lognormal distribution with parameters:**

**Mean**

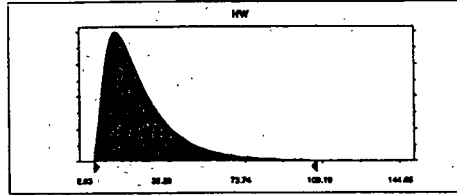
**25.07**

**Standard Dev.**

**18.38**

**Selected range is from 0.00 to 107.00**

**Mean value in simulation was 24.45**



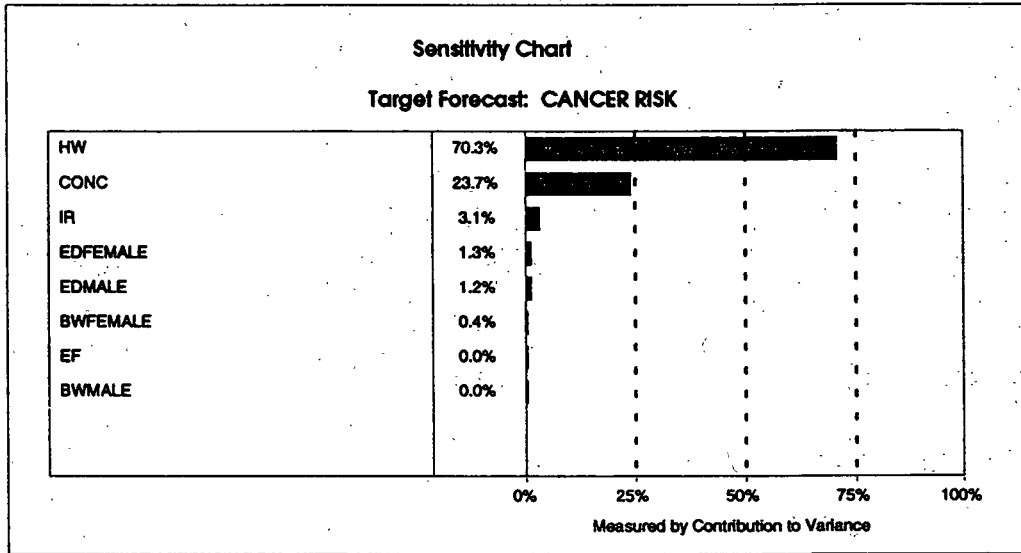
**End of Assumptions**

# FIGURE 2

**Crystal Ball Report**

Simulation started on 4/13/94 at 17:10:56

Simulation stopped on 4/13/94 at 17:12:23



**Forecast: CANCER RISK**

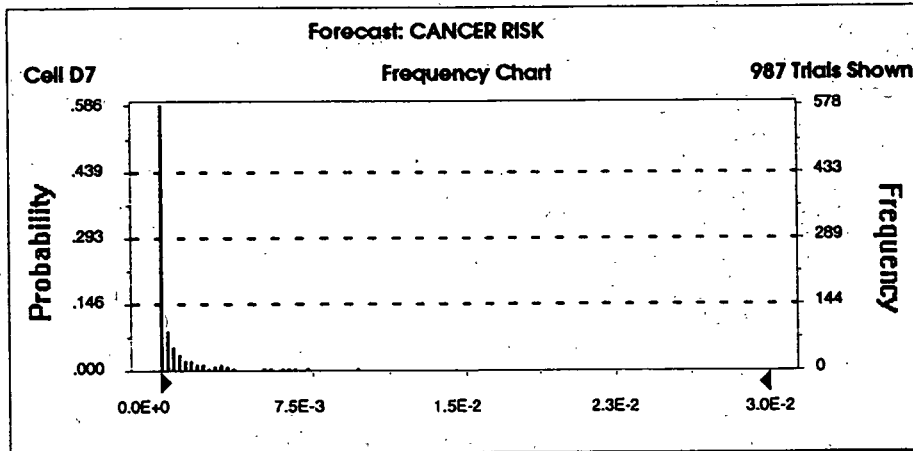
Cell: D7

**Summary:**

Display Range is from 0.0E+0 to 3.0E-2  
 Entire Range is from 0.0E+0 to 1.5E-1  
 After 1,000 Trials, the Std. Error of the Mean is 3.2E-4

**Statistics:**

|                       | <u>Value</u> |
|-----------------------|--------------|
| Trials                | 1000         |
| Mean                  | 2.6E-03      |
| Median                | 1.4E-04      |
| Mode                  | 0.0E+00      |
| Standard Deviation    | 1.0E-02      |
| Variance              | 1.1E-04      |
| Skewness              | 9.23E+00     |
| Kurtosis              | 1.07E+02     |
| Coeff. of Variability | 3.92E+00     |
| Range Minimum         | 0.0E+00      |
| Range Maximum         | 1.5E-01      |
| Range Width           | 1.5E-01      |
| Mean Std. Error       | 3.25E-04     |



**Forecast: CANCER RISK (cont'd)**

Cell: D7

## Percentiles:

| <u>Percentile</u> | <u>Value x10<sup>3</sup> (a)</u> |
|-------------------|----------------------------------|
| 0%                | 0.0E+00                          |
| 10%               | 0.0E+00                          |
| 20%               | 1.2E-06                          |
| 30%               | 1.0E-05                          |
| 40%               | 5.4E-05                          |
| 50%               | 1.4E-04                          |
| 60%               | 3.8E-04                          |
| 70%               | 7.5E-04                          |
| 80%               | 1.8E-03                          |
| 90%               | 6.0E-03                          |
| 100%              | 1.5E-01                          |

End of Forecast

(a) These calculations are based on input values in  $\mu\text{g}/\text{kg}$ . Risks should be multiplied by  $10^{-3}$  for a  $\text{mg}/\text{kg}$  basis.



**Forecast: HOURS CHECK**

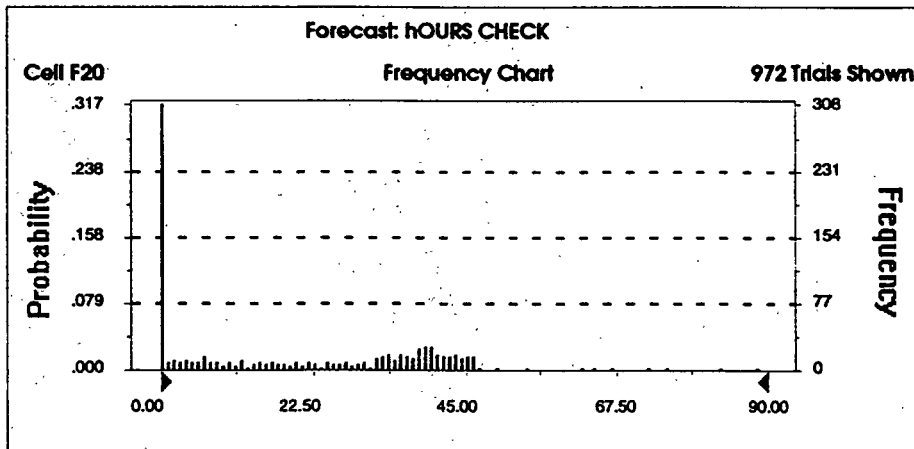
Cell: F20

**Summary:**

Display Range is from 0.00 to 90.00  
 Entire Range is from 0.00 to 106.53  
 After 1,000 Trials, the Std. Error of the Mean is 0.78

**Statistics:**

|                       | <u>Value</u> |
|-----------------------|--------------|
| Trials                | 1000         |
| Mean                  | 24.07        |
| Median                | 20.21        |
| Mode                  | 0.00         |
| Standard Deviation    | 24.79        |
| Variance              | 614.39       |
| Skewness              | 1.06         |
| Kurtosis              | 3.89         |
| Coeff. of Variability | 1.03         |
| Range Minimum         | 0.00         |
| Range Maximum         | 106.53       |
| Range Width           | 106.53       |
| Mean Std. Error       | 0.78         |



**Forecast: hOURS CHECK (cont'd)**

Cell: F20

**Percentiles:**

| <u>Percentile</u> | <u>Value</u> |
|-------------------|--------------|
| 0%                | 0.00         |
| 10%               | 0.00         |
| 20%               | 0.06         |
| 30%               | 0.34         |
| 40%               | 8.13         |
| 50%               | 20.21        |
| 60%               | 32.05        |
| 70%               | 37.59        |
| 80%               | 41.31        |
| 90%               | 46.86        |
| 100%              | 106.53       |

**End of Forecast**

**Assumptions**

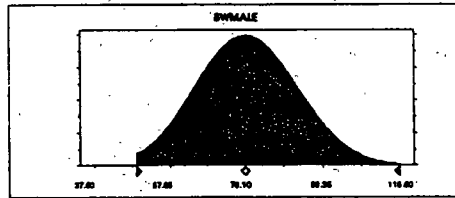
**Assumption: BWMALE**

Cell: D8

Normal distribution with parameters:  
 Mean  
 Standard Dev.

78.10  
 13.50

Selected range is from 48.60 to 121.00  
 Mean value in simulation was 78.57



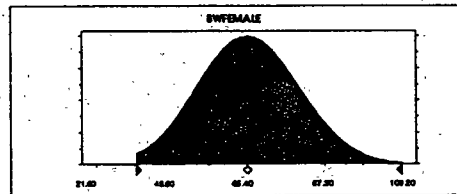
**Assumption: BWFEMALE**

Cell: D9

Normal distribution with parameters:  
 Mean  
 Standard Dev.

65.40  
 14.60

Selected range is from 33.00 to 118.00  
 Mean value in simulation was 65.88



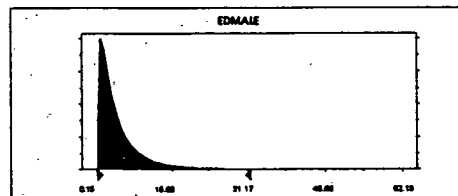
**Assumption: EDMALE**

Cell: D12

Lognormal distribution with parameters:  
 Mean  
 Standard Dev.

5.10  
 6.69

Selected range is from 0.30 to 31.87  
 Mean value in simulation was 4.71



**Assumption: EDFEMALE**

Cell: D16

Lognormal distribution with parameters:

Mean

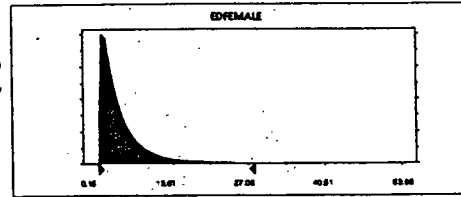
4.65

Standard Dev.

5.87

Selected range is from 0.30 to 28.06

Mean value in simulation was 4.31



**Assumption: IR**

Cell: D13

Lognormal distribution with parameters:

Mean

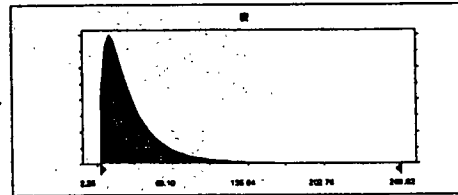
33.91

Standard Dev.

31.94

Selected range is from 5.20 to 369.81

Mean value in simulation was 34.43



**Assumption: EF**

Cell: D11

Triangular distribution with parameters:

Minimum

219.00

Likeliest

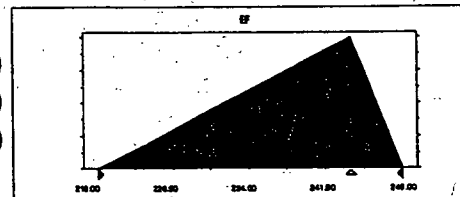
244.00

Maximum

249.00

Selected range is from 219.00 to 249.00

Mean value in simulation was 237.33



**Assumption: HW**

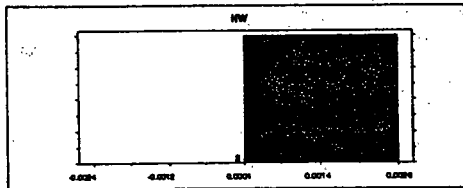
Cell: D20

Custom distribution with parameters:

Relative Pro

|                            |         |    |                   |
|----------------------------|---------|----|-------------------|
| Single point               | 0.0000  |    | 0.100000          |
| Continuous range           | 0.0001  | to | 0.0600 0.100000   |
| Continuous range           | 0.0600  | to | 0.3400 0.100000   |
| Continuous range           | 0.3400  | to | 8.3100 0.100000   |
| Continuous range           | 8.3100  | to | 20.2200 0.100000  |
| Continuous range           | 20.2200 | to | 32.0800 0.100000  |
| Continuous range           | 32.0800 | to | 37.6800 0.100000  |
| Continuous range           | 37.6800 | to | 41.3300 0.100000  |
| Continuous range           | 41.3300 | to | 46.8800 0.100000  |
| Continuous range           | 46.8800 | to | 107.0000 0.100000 |
| Total Relative Probability |         |    | 1.000000          |

Mean value in simulation was 24.0664



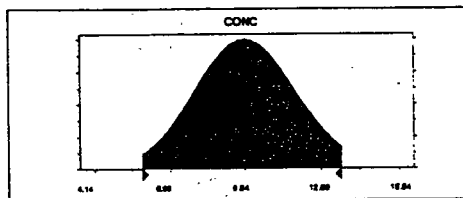
**Assumption: CONC**

Cell: D23

Lognormal distribution with parameters:

Mean 9.84 (log space)  
 Standard Dev. 1.90 (log space)

Selected range is from 5.93 to 13.40  
 Mean value in simulation was 58,874.92



# ATTACHMENT A



**Weinberg Consulting Group Inc.**

1220 Nineteenth Street, NW, Suite 300  
Washington, D.C. 20036-2400  
(202) 833-8077 • Fax (202) 833-7057

March 11, 1994

Ms. Nancy Rios  
U.S. Environmental Protection Agency  
841 Chestnut Street  
Philadelphia, PA 19107

Dear Nancy:

RF&P Railroad Company (RF&P) is pleased to have this opportunity to present to the United States Environmental Protection Agency (USEPA) Region III revised remedial goals for soil cleanup at the L.A. Clarke Superfund site, Spotsylvania County, Virginia. This document is based largely on USEPA's letter of October 15, 1993 to RF&P that disapproved the previously submitted cleanup levels and recommended an alternative approach. Specifically, USEPA approved the use of Monte Carlo analysis, however, rejected the remainder of the assessment because of the "use of the regression analysis and incorrect assumptions for the soil ingestion rate and fraction ingestion parameters." USEPA also presented a suggested Monte Carlo analysis that led to a cleanup level of 1.67 mg/kg polycyclic aromatic hydrocarbons (PAHs) as benzo(a)pyrene<sup>1</sup> corresponding to a lifetime upperbound excess cancer risk of 1E-6. This cleanup level was associated with the 90th percentile of exposure from the Monte Carlo analysis, i.e., less than 10 percent of all possible exposures would present a lifetime upperbound excess cancer risk that was greater than 1E-6. A copy of USEPA's letter is included as Attachment 1 to this document. Subsequent to this letter, USEPA informed RF&P that the target risk for the site would be 1E-5 rather than 1E-6.

In general, RF&P agrees with USEPA's review and accepts USEPA's recommended approach. Specifically, RF&P concurs with the method for using Monte Carlo analysis, the algorithm to be used in the assessment, a fraction ingested (FI) value of 1, the industrial worker scenario, and the target risk. Upon review of USEPA's letter, RF&P researched the underlying assumptions used in USEPA's Monte Carlo analysis and found some of them to be contradictory to exposure factors that would reasonably be anticipated for future use of the site. These distributions had been incorporated or utilized in a series of documents starting with "Proposal for Revision of

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<sup>1</sup> Implementation of this cleanup level or the levels cited later in this document requires the conversion of chemical-specific measurements for carcinogenic PAHs to benzo(a)pyrene equivalents. Operationally speaking, this involves multiplying the individual concentrations by relative potency values (USEPA 1993) and summing the products of his multiplication. As discussed in the October 15 letter, these sums will be used to calculate a kriged site-wide average which then can be compared to the cleanup levels to assess the extent of remediation.

Ms. Nancy Rios  
March 11, 1994  
Page 2

Soil Cleanup Standards for Operable Unit 1, L.A. Clarke Site, Spotsylvania County, Virginia" dated March 23, 1993. The distributions presented in these documents and later used by USEPA are consistent with a residential exposure rather than an occupational worker exposure. For example, the distribution for exposure frequency hypothesizes a maximum exposure of 350 days per year, contrary to the generally accepted regulatory value of 250 days per year (USEPA 1991) associated with working five days per week, 50 weeks per year. As you are aware, 350 days per year is the reasonable maximum exposure (RME) value for residential exposure (USEPA 1991). Similarly, the probability distribution for exposure duration presents a maximum value of 49 years which is more consistent with residential exposure than with the generally used regulatory value for occupational exposure of 25 years which is located at the 95th percentile on the distribution (USEPA 1991). A similar problem was found with body weight that included workers weighing as little as 8.8 kg (19 pounds) in the distribution. A review of USEPA guidance (USEPA 1989) suggests that the body weight of 8.8 kg is impossible for a worker population.

Dr. Paul Chrostowski and Ms. Lorraine Pearsall of the Weinberg Consulting Group, acting on behalf of RF&P, discussed these apparent discrepancies with Mr. Andrew Palestini and Ms. Nancy Rios of USEPA and received verbal approval to revise the Monte Carlo simulation to more accurately reflect the worker population. The revised assessment would incorporate the changes suggested by USEPA in the October 1993 letter and agreed to by RF&P in addition to the revised target risk level. It was agreed that the distributions would reflect the entire United States population rather than a local population, on the assumption that potential future immigration into the area could be drawn from anywhere within the United States. It was also agreed that interim deliverables would be submitted to USEPA for review to expedite the process. These deliverables were sent on February 17, 1994 and March 3, 1994 and are included with this document as Attachment 2 and Attachment 3. These deliverables included the raw data for exposure factor distributions of exposure duration, ingestion rate, and body weight in addition to supporting demographic data.

The same equation cited by USEPA in the October 15 letter was used in our Monte Carlo simulation. Body weight and exposure duration parameters were represented as  $(Fr_m * BWMALE + Fr_f * BWFEMALE)$  and  $(Fr_m * EDMALE + Fr_p * EDFEMALE)$  where  $Fr_m$  = fraction of males in the labor force and  $Fr_p$  = fraction of females in the labor force. A fraction of 0.55 was used for males and a fraction of 0.45 was used for females based on national data, although these fractions are also representative of state and county data.

The input distributions reflecting a worker population and including USEPA's October 15, 1993 recommendations are summarized in Table 1 and Table 2. These tables present the form of the distribution, measures of central tendency and dispersion, locations of minima and maxima, and the location of the RME value on the distribution used. Table 3 contains the underlying data for the distributions used to define exposure duration. The Monte Carlo analysis was implemented using Crystal Ball Version 3.0 with Latin Hypercube Sampling, Lotus 1,2,3 Release 4, and



TABLE 1

MONTE CARLO INPUT VARIABLES

| Variables                  | Distribution Used in Monte Carlo  | RME Point Estimate                | RME Location                             |
|----------------------------|---|-----------------------------------|--|
| Cancer Slope Factor (CSF)  | 7.3 (mg/kg/day)-1<br>95% UCL  | 7.3 (mg/kg/day)-1                 | 95% UCL                                  |
| Target Risk (TR)           | 1E-05   | 1E-05                             | Not applicable                           |
| Averaging Time (AT)        | 70 years - constant   | 70 years                          | Not applicable                           |
| Fraction Ingested (FI)     | 1-constant  | 1                                 | Maximum                                  |
| Exposure Frequency (EF)    | Normal distribution<br>Mean - 125 days<br>Standard deviation - 41.2 days<br>Min. - 1 day, Max. - 250 days   | 250 days                          | Maximum                                  |
| Ingestion Rate (IR)        | Lognormal distribution<br>Geometric mean - 24.7 mg/d<br>(Arithmetic mean - 34.0 mg/d)<br>Geometric standard deviation - 2.22 mg/d<br>Min. - 5.2, Max. 370 | 50 mg/day<br><br>(100 mg/day) (a) | 62nd percentile<br><br>(92nd percentile) |
| Body Weight (BW)<br>Female | Lognormal<br>Mean - 64 kg<br>Standard deviation - 13 kg<br>Min. - 33 kg, Max. - 118 kg  |                                   |  |
| Male                       | Lognormal<br>Mean - 78 kg<br>Standard deviation - 12 kg<br>Min. - 49 kg, Max. - 121 kg  | 70 kg                             | Average of male<br>and female means      |

(a) Default assumption for general adult population.

TABLE 2

EXPOSURE DURATION (a)

| Labor Category         | Sex    | Mean | Standard Deviation | Range     |
|------------------------|--------|------|--------------------|-----------|
| Operator/Mover/Laborer | Male   | 5.1  | 6.7                | 0.3 - 32  |
|                        | Female | 4.7  | 5.9                | 0.3 - 28  |
| Technical              | Male   | 5.7  | 7.4                | 0.33 - 35 |
|                        | Female | 4.6  | 5.3                | 0.35 - 26 |
| Management             | Male   | 8.0  | 8.5                | 0.71 - 42 |
|                        | Female | 5.6  | 5.8                | 0.52 - 28 |
| Service                | Male   | 4.0  | 7.1                | 0.12 - 32 |
|                        | Female | 3.5  | 5.7                | 0.12 - 26 |
| Retail                 | Male   | 3.8  | 6.8                | 0.11 - 30 |
|                        | Female | 3.0  | 5.1                | 0.10 - 23 |
| General Sales          | Male   | 5.2  | 6.5                | 0.35 - 31 |
|                        | Female | 2.9  | 4.7                | 0.11 - 22 |

a) All values in years, all distributions lognormal. RME value of 25 corresponds to approximately 81st percentile on distribution of male operator/mover/laborer.

TABLE 3

## CUMMULATIVE PERCENTILES FOR VARIOUS LABOR CATEGORIES

| Employment<br>Duration,<br>Years | Managerial and<br>Professional | Technical (a) | Sales | Retail<br>Sales | Service | Operator/<br>Mover/<br>Laborer (b) |
|----------------------------------|--------------------------------|---------------|-------|-----------------|---------|------------------------------------|
| <b>Men: 16 Years and Over</b>    |                                |               |       |                 |         |                                    |
| 0.25                             | 7.3                            | 9.9           | 14.5  | 21.8            | 21.2    | 14.8                               |
| 0.8                              | 16.5                           | 23.3          | 27.4  | 39.3            | 38.7    | 28.7                               |
| 2                                | 25.5                           | 36.5          | 38.3  | 51.8            | 50.3    | 39.8                               |
| 3                                | 33.6                           | 46.5          | 47.4  | 61.4            | 58.9    | 49.3                               |
| 4.5                              | 45.7                           | 58.7          | 59.2  | 72.7            | 69.5    | 61.1                               |
| 7.5                              | 59.3                           | 72.6          | 71.6  | 81.3            | 79.2    | 71.4                               |
| 12                               | 73.4                           | 83.9          | 82.4  | 88.3            | 88.1    | 82.4                               |
| 17                               | 82.8                           | 89.3          | 89.7  | 93.5            | 92.7    | 89.6                               |
| 22                               | 90                             | 94.2          | 94.6  | 96.5            | 96.2    | 94.7                               |
| 25+                              | 100                            | 100           | 100   | 100             | 100     | 100                                |
| <b>Women: 16 Years and Over</b>  |                                |               |       |                 |         |                                    |
| 0.25                             | 10.8                           | 13.3          | 23.3  | 24              | 22.1    | 16.2                               |
| 0.8                              | 21.7                           | 25.2          | 41.8  | 42.9            | 40      | 31.4                               |
| 2                                | 33.4                           | 37.7          | 54.7  | 55.5            | 52.1    | 42.6                               |
| 3                                | 42.4                           | 49.9          | 64.3  | 64.3            | 61.8    | 50.9                               |
| 4.5                              | 55.7                           | 63.7          | 75.6  | 75.4            | 73.6    | 62.9                               |
| 7.5                              | 69.5                           | 77.1          | 84.9  | 84.8            | 82.7    | 73.9                               |
| 12                               | 83.3                           | 88.1          | 93.6  | 93.1            | 91.1    | 85.6                               |
| 17                               | 90.9                           | 94.2          | 96.8  | 96.5            | 95      | 93                                 |
| 22                               | 96.4                           | 97.2          | 98.7  | 98.5            | 97.6    | 96.9                               |
| 25+                              | 100                            | 100           | 100   | 100             | 100     | 100                                |

SOURCE: Bureau of Labor Statistics, 1991.

(a) Listed as Technical Related Support in source data.

(b) Listed as Operator/Fabricator/Laborer in source data.

Microsoft Windows 3.1. The development of cleanup goals using Crystal Ball has been previously reported in the literature (Lloyd et al. 1992). Five thousand iterations were used for each simulation. A complete simulation package for one of the potential receptor groups may be seen in Figure 1. The first two pages of the figure show the probability distributions for the variable factors that were used in the simulation. Other factors (e.g. cancer slope factor, averaging time) were input as constants (Table 1). The third page of the figure is the simulation output. The fourth page of the figure represents the percentiles of the output distribution. This cumulative distribution is the mirror image of that presented by USEPA in the October 15 letter, therefore, the soil cleanup level is represented by the 10th percentile (compared to the 90th percentile in USEPA's October 15 letter). This is comparable to stating that 90 percent of the exposures will present risks less than or equal to  $1E-5$  whereas USEPA's presentation states that 10 percent of the exposures will present risks greater than  $1E-5$ . The forecasted soil cleanup level should be rounded off to one significant figure for scientific reasons; practicality of the cleanup and/or analytical techniques may require rounding off to one significant figure. Thus, for this target receptor, the predicted soil cleanup level for carcinogenic PAHs as benzo(a)pyrene equivalents is 56 mg/kg. The last page of the figure presents a sensitivity analysis of the variables used in the exposure assessment. This particular example shows that ingestion rate and exposure duration account for most of the variability in exposure.

The soil cleanup levels calculated for the various receptor groups are shown in Figure 2 along with a weighted average cleanup level representative of all potential exposure groups from the Commonwealth of Virginia. As can be seen from this figure, the cleanup levels range from 40 mg/kg benzo(a)pyrene equivalents for managerial personnel to 80 mg/kg benzo(a) pyrene equivalents for retail sales personnel. The weighted averages are 56 mg/kg benzo(a)pyrene equivalents including general sales or 61 mg/kg benzo(a) pyrene equivalents when using retail sales as the sales category. Weighted averages calculated on a national basis were in the range of 55 - 58 mg/kg benzo(a)pyrene equivalents, not substantially different than those calculated using the Virginia population. Workers in many of these labor categories are unlikely to contact soil on a regular basis. For example, although the data from the Bureau of Labor Statistics indicate that managers will be associated with a longer exposure duration, it is virtually impossible to envision a manager who would contact contaminated soil at frequencies up to 250 times per year. As noted previously, RF&P anticipates no development activities at the site, however, if any development transpired, light industry, warehousing, or industrial park types of activities would be the most likely types of development to occur at the site in the future. The most reasonable receptor considering future use of the site is the operator/mover/laborer category. This type of worker could be engaged in grounds maintenance, maintenance of structures and utilities, transport of materials across the land surface, or outdoor security work. Due to this, we recommend that USEPA adopt a cleanup level of 56 mg/kg benzo(a)pyrene equivalents (or 60 mg/kg expressed as one significant figure) for the L.A. Clarke site. This would protect the most probable receptor (operator/mover/laborer) in addition to protecting lower probability categories expressed as a weighted average of exposures.

Ms. Nancy Rios

March 11, 1994

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F&P is interested in resolving the matter of the cleanup levels in an expeditious fashion. We stand ready to answer questions concerning this analysis and will be available for a conference call or meeting as necessary if any questions remain. Please feel free to call Scott Slagley at RF&P or the personnel at the Weinberg Group if you have any questions.

**Literature Cited:**

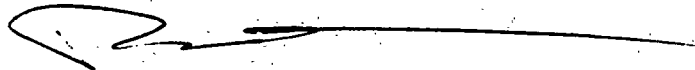
Lloyd, K.J., Thompson, K.M., and Burmaster, D.E. 1992. Probabilistic Technique for Backcalculating Soil Cleanup Targets. In ASTM STP 1158, Superfund Risk Assessment in Soil Contamination Studies, ASTM, Philadelphia, PA.

United States Environmental Protection Agency (USEPA). 1989. Exposure Factors Handbook. OHEA, Washington, DC. EPA-600/8-89/043.

United States Environmental Protection Agency (USEPA). 1991. Standard Default Exposure Factors. OSWER, Washington, DC. OSWER Directive 9285.6-03.

United States Environmental Protection Agency (USEPA). 1993. Interim Policy on Estimating Risk from Exposure to Polycyclic Aromatic Hydrocarbons at Superfund Sites. Draft Memorandum from H. Longest, OERR, November 1993.

Very truly yours,



WEINBERG CONSULTING GROUP Inc.

Paul C. Chrostowski, Ph.D.

Principal

PCC/bp

Attachments

# FIGURE 1

## Assumptions

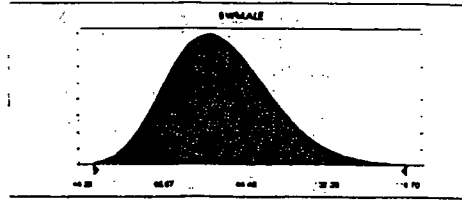
### Assumption: BWMALE

Cell: D8

Lognormal distribution with parameters:

Mean 77.63  
Standard Dev. 11.55

Selected range is from 48.57 to 120.90  
Mean value in simulation was 77.61



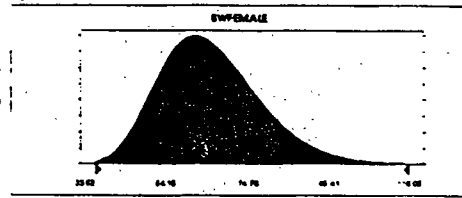
### Assumption: BWFEMALE

Cell: D9

Lognormal distribution with parameters:

Mean 63.72  
Standard Dev. 13.33

Selected range is from 32.98 to 117.92  
Mean value in simulation was 63.68



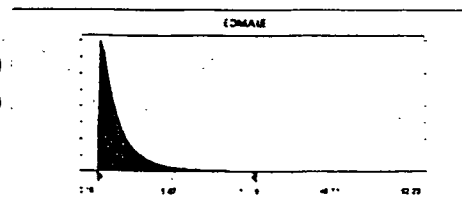
### Assumption: EDMALE

Cell: D12

Lognormal distribution with parameters:

Mean 5.10  
Standard Dev. 6.69

Selected range is from 0.30 to 31.87  
Mean value in simulation was 4.72



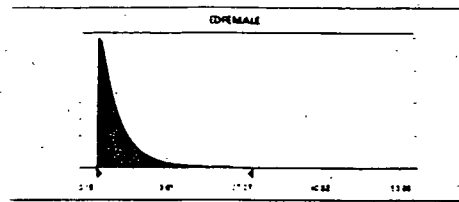
**Assumption: EDFEMALE**

Cell: D16

Lognormal distribution with parameters:

Mean 4.65  
Standard Dev. 5.87

Selected range is from 0.30 to 28.06  
Mean value in simulation was 4.32



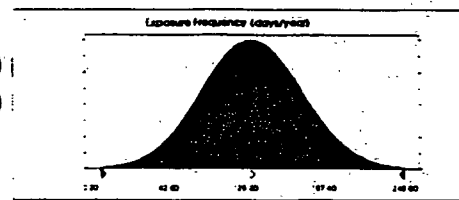
**Assumption: Exposure Frequency (days/year)**

Cell: D11

Normal distribution with parameters:

Mean 125.00  
Standard Dev. 41.60

Selected range is from 1.00 to 250.00  
Mean value in simulation was 125.03



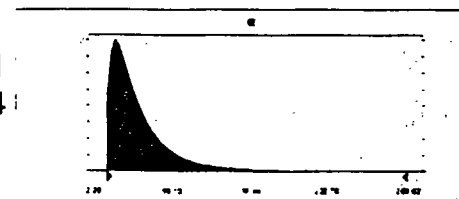
**Assumption: IR**

Cell: D13

Lognormal distribution with parameters:

Mean 33.91  
Standard Dev. 31.94

Selected range is from 5.20 to 369.81  
Mean value in simulation was 34.45



End of Assumptions



**Forecast: Soil Cleanup Level (Operator/Mover/Labor**

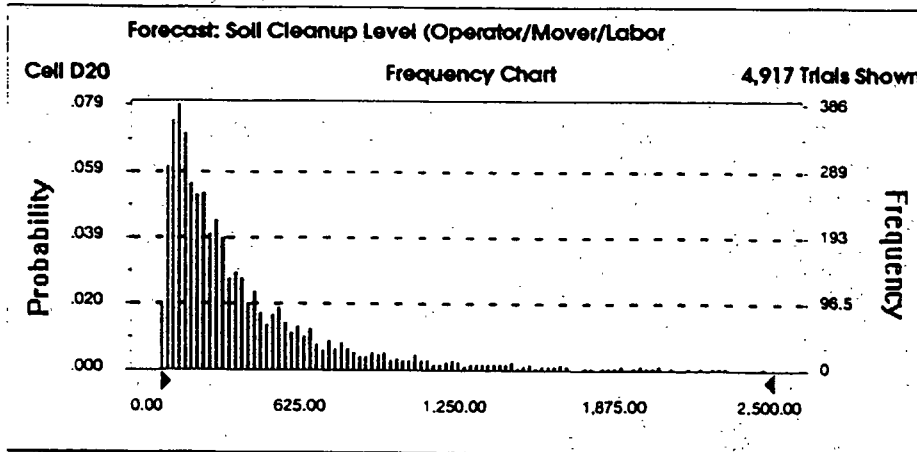
Cell: D20

**Summary:**

Display Range is from 0.00 to 2,500.00  
Entire Range is from 2.65 to 17,504.11  
After 5,000 Trials, the Std. Error of the Mean is 10.09

**Statistics:**

|                       | <u>Value</u> |
|-----------------------|--------------|
| Trials                | 5000         |
| Mean                  | 427.29       |
| Median                | 227.76       |
| Mode                  | ---          |
| Standard Deviation    | 713.82       |
| Variance              | 509,543.78   |
| Skewness              | 8.37         |
| Kurtosis              | 131.74       |
| Coeff. of Variability | 1.67         |
| Range Minimum         | 2.65         |
| Range Maximum         | 17,504.11    |
| Range Width           | 17,501.46    |
| Mean Std. Error       | 10.09        |



**Forecast: Soil Cleanup Level (Operator/Mover/Labor (cont'd)**

**Cell: D20**

**Percentiles:**

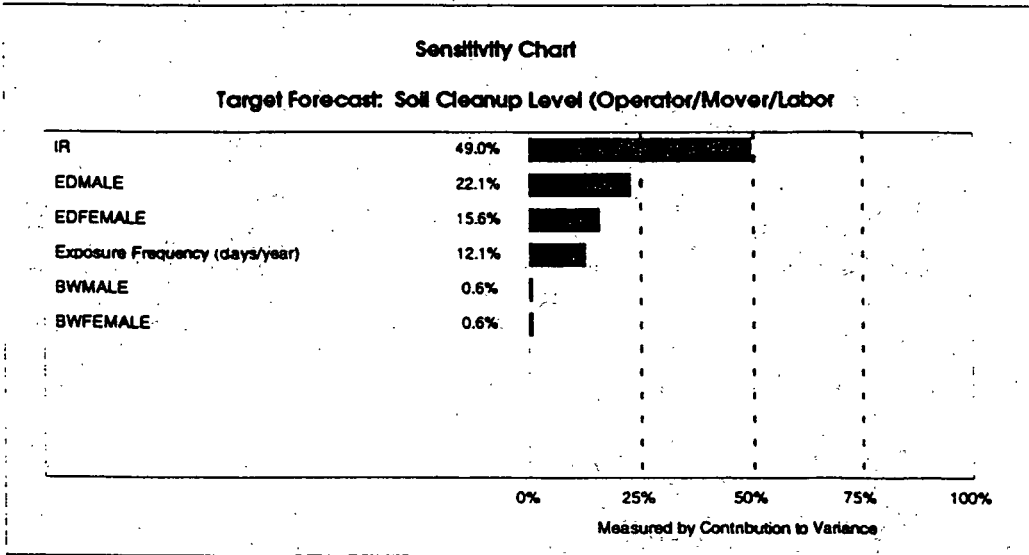
| <u>Percentile</u> | <u>Value</u> |
|-------------------|--------------|
| 0%                | 2.65         |
| 10%               | 56.59        |
| 20%               | 89.67        |
| 30%               | 125.93       |
| 40%               | 172.87       |
| 50%               | 227.76       |
| 60%               | 294.46       |
| 70%               | 398.94       |
| 80%               | 568.37       |
| 90%               | 946.18       |
| 100%              | 17,504.11    |

**End of Forecast**

# Crystal Ball Report

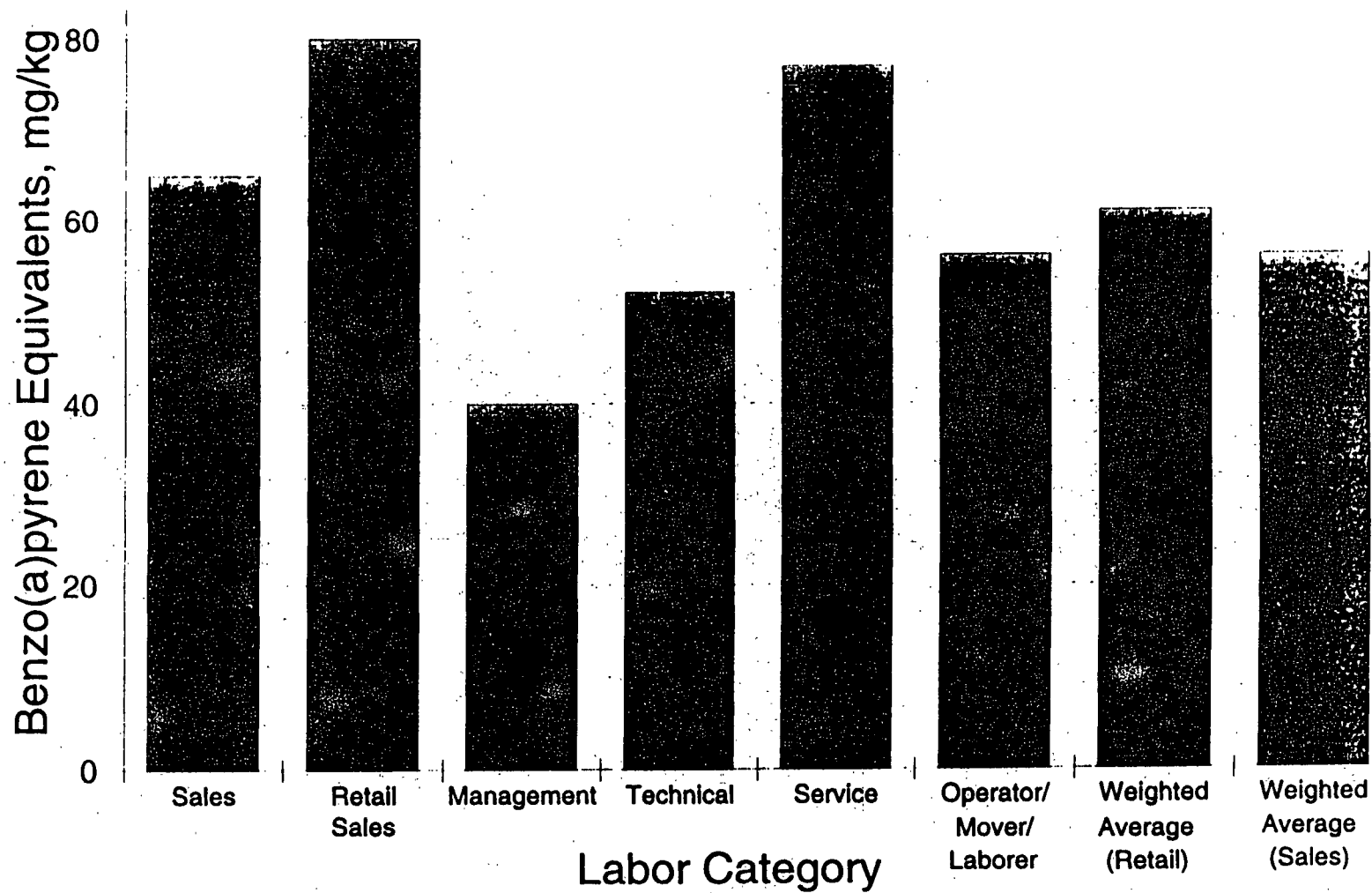
Simulation started on 3/3/94 at 10:01:03

Simulation stopped on 3/3/94 at 10:06:27



## FIGURE 2

**Figure 2**  
**Cleanup Levels per Labor Category**



# ATTACHMENT A-1



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION III  
841 Chestnut Building  
Philadelphia, Pennsylvania 19107-4431

October 15, 1993

VIA FACSIMILE

Mr. Scott Slagley  
RF&P Corporation  
23rd Floor  
600 East Main Street  
Richmond VA 23219

Dear Mr. Slagley:

In the letter dated July 23, 1993, EPA accepted the use of the Monte Carlo stochastic methodology in determining a site-specific soil cleanup level. It was also stated in the letter that a determination of the revised soil cleanup level would not be made until EPA received and reviewed a full report from ICF Kaiser. Your response was that, upon receipt of the data we requested, we, in fact, had the full report. EPA's preliminary findings on the soil cleanup level petition were discussed on August 31, 1993 in a conference call between yourself, ICF Kaiser, Jeff Howard, Nancy Rios, and myself.

EPA and the Virginia Department of Environmental Quality (VDEQ) have completed the review of "The Proposal for Revision of Soil Cleanup Standards for OU1". In accordance with Section VIII (I) of the Consent Decree, EPA is disapproving the proposal because of the use of the regression analysis and incorrect assumptions for the soil ingestion rate and fraction ingested parameters. Further discussion of these issues and the necessary revisions are discussed below. EPA is requiring that a revised proposal conforming with the comments contained in this letter be submitted by November 1, 1993.

As indicated above, EPA approved the use of the Monte Carlo stochastic method you proposed in "The Proposal for Revision of Soil Cleanup Standards for OU1". However, as we discussed with you and ICF Kaiser on several occasions, the sampling data utilized in the proposal is not adequate to perform the regression analysis included in the proposal.

Most of the data used in the proposal are qualified as non-detects "U" or "UD". The quantitation limits reported are extremely high. It is apparent from the quantitation limits that the samples contained high levels of an unknown concentration of total PNAs and carcinogenic PNAs that required dilution. Therefore, it is difficult to express the relationship (i.e., the ratio) between total PNAs and carcinogenic PNAs at the Site.

Also, as we have indicated to you on previous occasions, the number of site-specific surface soil samples available for use as input values is insufficient. In trying to compensate for this deficiency, ICF Kaiser included subsurface soil samples in their analyses. However, because of the lack of sufficient sampling data, an analysis to show the statistical significance between surface and subsurface PNAs cannot be accurately performed and the test for significance is not valid.

As such, Toxicity Equivalence Factors (TEFs) cannot be utilized at this time. TEFs can only be used when acceptable data are available to determine the relative percentage of each of the carcinogenic PNAs in the soil at the Site.

In addition to deleting the regression analysis from the proposal, the following two revisions must be incorporated before EPA can approve a revised soil cleanup level:

- Utilize the EPA recommended default value of 50 mg/kg for the soil ingestion rate in the RME soil cleanup level determination in lieu of the 24 mg/kg value suggested by ICF Kaiser. EPA recommends the default value unless site-specific data is available. No site-specific data was submitted with the proposal to support the 24 mg/kg value.
- Delete the use of a fraction ingested from the contaminated source of 0.5 (unitless) for the RME soil cleanup level and 0.24 for the Monte Carlo simulation assessment as suggested by ICF Kaiser. EPA recommends 1 in both determinations.

Enclosed with this letter are the algorithm to be used in the assessment (Attachment 1), the exposure parameters to be used in the deterministic and stochastic approaches (Attachment 2), and a graph of what EPA expects the soil cleanup levels will be when using Monte Carlo.

After the revisions listed above are incorporated, the site-specific soil cleanup level for this site will be 1.67 mg/kg carcinogenic PNAs, benzo(a)pyrene equivalence. This cleanup level equates to a 1E-06 risk level (the risk level in the March 31, 1988 Record of Decision) at the 90th percentile. The determination of a site-specific cleanup level is based on benzo(a)pyrene and the slope factor for benzo(a)pyrene of 7.3E+00. Because the Site is large and has an industrial future use scenario, the cleanup level could be met as an average within the area of actual soil remediation.

The average concentration of all of the soil which requires treatment must meet the site-specific cleanup level. Soil which does not require treatment cannot be included in determining whether the average has been met. Documentation demonstrating that treated soil meets the cleanup level must conform with the



EPA guidance "A Guide: Methods for Evaluating the Attainment of Cleanup Standards For Soils and Solid Media".

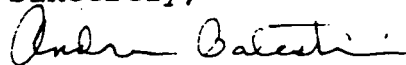
Once the revised soil cleanup level is established, we will need to direct our collective attention to cleanup technologies which can meet this level. In the 90-Day Action Plan, Phase I of the technical approach for OUI landfarming consists of a review of existing data to determine if landfarming could meet the revised cleanup level and an evaluation of other remedial technologies on the basis of cost and technical feasibility. Phase 2 in the 90-Day Action Plan consists of actual design work, including treatability studies. EPA is recommending a slight modification to this approach which would lead to the development of a proven cleanup technology within a shorter timeframe.

An immediate evaluation of landfarming (based on the site-specific data generated to date) and any other feasible technologies would be the most logical approach at this time. A ROD Amendment would probably be required if a technology other than landfarming is determined to be the most feasible to meet the cleanup level. The ROD Amendment would have to be processed prior to initiating the design work. The EPA recommendations are to complete the necessary treatability studies and evaluate the technology against the Nine-Point Criteria prior to the ROD Amendment to make sure the technology to be selected in the ROD Amendment is capable of meeting the cleanup level and is cost-effective. If a recommendation for landfarming as the cleanup technology is made and approved, actual remedial design work, including treatability studies, could be initiated as proposed in the 90-Day Action Plan.

I have recently been in contact with someone in the Technical Assistance Section of the Superfund Technology Demonstration Division regarding a possible Superfund Innovative Technology Evaluation (SITE) demonstration at this site for an innovative technology known as Biotreat. Under the SITE program, a bench-scale treatability study would be performed with soil from the site without any cost to you. If you would be interested in information regarding this innovative technology, I could arrange a meeting with this person to discuss details regarding this technology and participation in the SITE program.

If you would like to discuss any of the above, please do not hesitate to contact me at (215) 597-1286.

Sincerely,



Andrew Palestini,  
Remedial Project Manager

cc: Jeff Howard, VDEQ  
Doug Taylor, ICF Kaiser  
Channing Martin, Williams, Mullen, Christian & Dobbins

**Attachment 1**  
**Algorithm Used in the Assessment**

$$\text{RBC} = \frac{\text{TR} * \text{BW} * \text{AT} * 365}{\text{EF} * \text{ED} * \text{IR}/10^6 * \text{CSF}}$$

- RBC** = Risk-based Concentration (mg/kg)
  - TR** = Target Risk (unitless)
  - BW** = Body Weight (mg/kg)
  - AT** = Averaging Time (years)
  - EF** = Exposure Frequency (days)
  - ED** = Exposure Duration (days/year)
  - IR** = Ingestion Rate (mg/day)
  - CSF** = Cancer Slope Factor (mg/kg/d)<sup>-1</sup>
- (note fraction ingested from contaminated source was assumed to be 1)

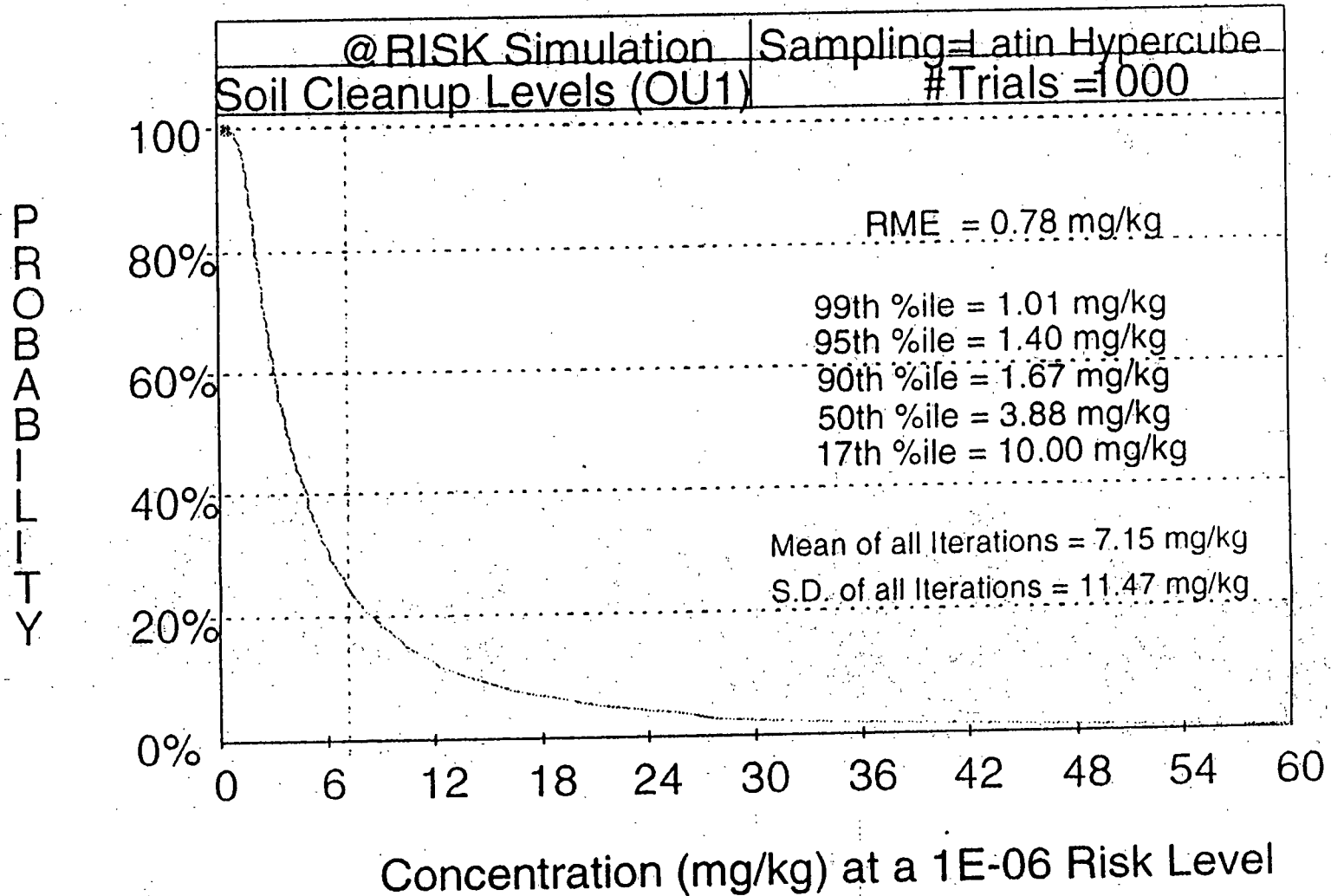
Attachment 2

LA Clarke Operable Unit 1  
 Soil Cleanup Levels for Carcinogenic PAHs  
 Exposure Parameters Used in the Assessment of Soil Cleanup Levels  
 for the Deterministic and Stochastic Approaches

| Exposure Parameter        | Value Used in the RME Approach | Distribution Used in the Monte Carlo Approach   |
|---------------------------|--------------------------------|---|
| Target Risk (TR)          | 1E-06                          | 1E-06   |
| Body Weight (BW)          | 70                             | Normal Distribution<br>Arithmetic Mean 71.8<br>Standard Deviation 15  |
| Averaging Time (AT)       | 70                             | 70  |
| Exposure Frequency (EF)   | 250                            | Truncated Normal Distribution<br>Arithmetic Mean 175<br>Standard Deviation 58<br>Minimum 1<br>Maximum 350   |
| Exposure Duration (ED)    | 25                             | Truncated Normal Distribution<br>Arithmetic Mean 14.6<br>Standard Deviation 11.9<br>Minimum 1<br>Maximum 49 |
| Ingestion Rate (IR)       | 50                             | Lognormal Distribution<br>Geometric Mean 24<br>Geometric Standard Deviation 2.22                            |
| Cancer Slope Factor (CSF) | 7.3                            | 7.3   |

# LA Clarke Operable Unit 1

## Soil Cleanup Levels for Carcinogenic PAHs



# ATTACHMENT A-2



**Weinberg Consulting Group Inc.**

1220 Nineteenth Street, NW, Suite 300  
Washington, D.C. 20036-2400  
(202) 833-8077 • Fax (202) 833-7057

February 18, 1994

Ms. Nancy Rios  
U.S. Environmental Protection Agency  
841 Chestnut Street  
Philadelphia, PA 19107

Dear Nancy:

As per your telephone request, I am enclosing the material that forms the basis of the soil ingestion distribution for adults. There are some minor discrepancies between our interpretation of the data and what ICF used, however, I will highlight these after I explain how the distribution was derived.

The first paper, Binder et al., "Estimating the Amount of Soil Ingested by Young Children Through Tracer Elements" contains the study performed by the Centers for Disease Control that is the basis of the data. The second paper, Thompson and Burmaster 1991, presents a reanalysis of Binder et al.'s data using actual fecal stool weights rather than the default value assumed by Binder et al. Table I, Page 340 of this paper presents the distributions of soil ingestion data for children. In performing Monte Carlo analyses for children, we advocate using the average of the two tracers (Al and Si) presented in the right hand column, a log-normal distribution, and the mean standard deviation of the underlying distribution directly from the paper. The reason that we don't use the Ti data is because of the presence of Ti in many non-soil materials, such as the white pigment in toothpaste and in the diet. It is interesting to note that the Superfund default value lies between the 90th and 95th percentiles on the distribution. These data need to be adjusted before they are used to estimate adult soil ingestion. In order to accomplish this, we use data from the third paper, Calabrese et al. 1990. Table 9 of this paper, presents Children:Adult soil ingestion ratios. We used the medians, since the data are log-normally distributed. Additionally, Calabrese et al. report the Zr data as ">16". We assumed that >16 had the value of "20" derived from the 16 of the children data and the -4 of the adult data (since it is impossible to ingest a negative value of soil, we assumed that the true value could be zero and that the 4 could be added to the children value. The geometric mean of the medians is 2.51. We then used this value to scale the children's data as follows:

Ms. Nancy Rios  
February 18, 1994  
Page 2

Children's geometric mean =  $e^{4.13} = 62.2$

Adult's geometric mean = children's geometric mean/scaling factor =  $62.2/2.51 = 24.7$  mg/day.  
(Note, ICF uses 24, but I would retain 3 significant figures here)

Assume adults standard deviation = children's standard deviation

Adult's max = children's max divided by scaling factor =  $921/2.51 = 370$  mg/day.

Adult's min = children's min divided by scaling factor =  $13/2.51 = 5.2$  mg/day.

(I'm not sure how ICF got their minimum and maximum, however, the derivation shown here is scientifically compatible with the data--since the max is lowered and the min is raised, there is probably little effect on the outcome)

The use of these values puts the standard default value for adults of 100 mg/day at about the 92nd percentile which is compatible with a high end assumption; the standard worker default value is at the 62nd percentile on the distribution, which is more consistent with a somewhat conservative central tendency estimate.

I hope you find this information to be interesting and useful. We will be sending you the data for the other distributions as soon as we process it. Please feel free to call me or Lorraine if you have any questions.

Very truly yours,



WEINBERG CONSULTING GROUP Inc.  
Paul C. Chrostowski, Ph.D.  
Principal

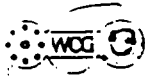
PCC/pc

Enclosure

cc Scott Slagley (w/o enclosures)

# ATTACHMENT A-3





**Weinberg Consulting Group Inc.**

1220 Nineteenth Street, NW, Suite 300  
Washington, D.C. 20036-2400  
(202) 833-8077 • Fax (202) 833-7057

March 3, 1994

Ms. Nancy Rios  
U.S. Environmental Protection Agency  
841 Chestnut Street  
Philadelphia, PA 19107

Dear Nancy:

As discussed in our telephone call, we are transmitting to you some of the raw data that we intend to use for our Monte Carlo evaluation for worker exposure at the L.A. Clark site. In addition to transmitting the data, I would like to take this opportunity to discuss some of the information contained in the data summaries and how we propose to use the data in our evaluation.

The first two reports are demographic surveys for the area of the site and, as per your request, for the United States as a whole. The first demographic report contains information on the city of Fredericksberg, VA, Spotsylvania County, VA, and the state of Virginia. The second report contains the United States data. It is most likely that future workers at the site will be drawn from the local population, however, as you pointed out, it is possible that they could be drawn from a broader area. We intend to use these data to define the occupational classes expected to be present during any future activity at the site in addition to furnishing general information concerning population demographics such as gender distributions both in the worker population and the population at large. The Virginia report (Page 2) gives the predominant labor categories as Managerial/Professional, Technical, Sales/Admin. Support, Service, and Operator/Mover/Laborer. RF&P considers light industry, warehousing, or industrial park types of activities to be most likely to occur at the site in the future. Therefore, the Operator/Mover/Laborer category is probably the most appropriate for the site. We will include other categories, however, in the interest of completeness.

The second report is from the Bureau of Labor Statistics (BLS). This is essentially the same report used by USEPA in the Standard Default Exposure Factors guidance (OSWER Directive 92855.6-03) with the exception that it is a year later. Several options presented themselves in

interpreting these data. First, parallel summaries are produced for workers 16 years old and over and for those 25 years old and over. We have opted to use the 16 and over data since it appears reasonable to assume that people in the age group from 16 to 24 could potentially work at a future industry at the site. Second, data are presented for both sexes combined and for males and females separately. We have chosen to keep the sexes separate so that we could link this report best with the demographic reports discussed above and with the body weight data discussed below. Third, data are separated for race and Hispanic origin or, alternatively combined. We have opted for the combined form to be as inclusive as possible. Reference to these tables will yield BLS labor categories that are consistent with the demographic survey. For example, the category of "operators, fabricators, and laborers" in the BLS report corresponds to Operator/Mover/Laborer in the demographic report. The BLS data are given as crude percents, thus, they require transformation prior to use in the Monte Carlo analysis. The first step of the transformation process was to sum the individual percentiles to yield a cumulative percentile distribution. The median (in this case the median, 50th percentile and geometric mean will all be the same) was obtained by interpolation from the cumulative percentiles. For example, in the category of Operator/Mover/Laborer for 16 years and older a value of 3 years corresponds to the 49.7th percentile which is sufficiently close to the 50th percentile to be called the geometric mean. The geometric standard deviation was obtained from the formula:

$$\text{Percentile} = (\text{GM})(\text{GSD})^x$$

Where:

GM = geometric mean

GSD = geometric standard deviation

x = exponent from the Z distribution corresponding to the percentile in question.

(This is a common statistical formula that may be used for interpretation of percentiles from lognormal distributions. It has been used in other cases by USEPA, for example, it is a component of the UBK model for assessing exposure to lead).

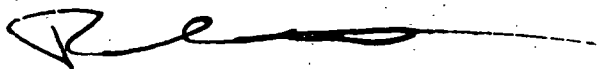
A similar method was used to solve for the 1st and 99th percentiles which were assumed to represent the minimum and maximum of the distribution.

Body weight distributions were obtained from the NHANES II data attached as the last document. These were received as a fax from Dr. Robert Kuczmarski of the National Center for Health Statistics. We are trying to get a better copy for our final report. The data were selected to be compatible with the BLS and demographic data, i.e., the age group of 18-74 years for all races, but separated by sex.. The minimum, maximum, and standard deviation were all calculated as above.

Ms. Nancy Rios  
March 3, 1994  
Page 3

We are ready to proceed with the actual Monte Carlo runs. Please give me or Lorraine a call if you have any questions or suggestions for use of these data.

Very truly yours,



WEINBERG CONSULTING GROUP Inc.  
Paul C. Chrostowski, Ph.D.  
Principal

PCC/bp

Enclosure

cc Scott Slagley, RF&P (w/o enclosures)

# ATTACHMENT B

| 1990<br>Census<br>code  | Occupation category  | 1990<br>Census<br>code                               | Occupation category   |
|---|--|--|---|
| <b>PRECISION PRODUCTION, CRAFT, AND REPAIR OCCUPATIONS—Con.</b> |  | <b>OPERATORS, FABRICATORS, AND LABORERS</b>          |   |
| Precision Production Occupations—Con.                           |  | <b>Machine Operators, Assemblers, and Inspectors</b> |   |
| Precision Metal Working Occupations—Con.                        |  | Machine Operators and Tenders, Except Precision      |   |
| 649   | Engravers, metal (6823)  |  | Metalworking and Plastic Working Machine Operators                                    |
| 653   | Sheet metal workers (pt 6824)  |  | Lathe and turning machine set-up operators (7312)                                     |
| 654   | Sheet metal worker apprentices (pt 6824)                                 |  | Lathe and turning machine operators (7512)  |
| 655   | Miscellaneous precision metal workers (6829)                             |  | Milling and planing machine operators (7313, 7513)                                    |
| Precision Woodworking Occupations                               |  |  | Punching and stamping press machine operators (7314, 7317, 7514, 7517)                |
| 656   | Patternmakers and model makers, wood (6831)                              | 703  | Rolling machine operators (7316, 7516)  |
| 657   | Cabinet makers and bench carpenters (6832)                               | 704  | Drilling and boring machine operators (7318, 7518)                                    |
| 658   | Furniture and wood finishers (6835)                                      | 705  | Grinding, abrading, buffing, and polishing machine operators (7322, 7324, 7522)       |
| 659   | Miscellaneous precision woodworkers (6839)                               | 706  | Forging machine operators (7319, 7519)  |
| Precision Textile, Apparel, and Furnishings Machine Workers     |  | 707  | Numerical control machine operators (7326)  |
| 666   | Dressmakers (pt 6852, pt 7752)   | 708  | Miscellaneous metal, plastic, stone, and glass working machine operators (7329, 7529) |
| 667   | Tailors (pt 6852)  | 709  | Fabricating machine operators, n.e.c. (7339, 7539)                                    |
| 668   | Upholsterers (6853)  | 713  | Metal and Plastic Processing Machine Operators  |
| 669   | Shoe repairers (6854)  | 714  | Molding and casting machine operators (7315, 7342, 7515, 7542)                        |
| 674   | Miscellaneous precision apparel and fabric workers (6856, 6859, pt 7752) | 715  | Metal plating machine operators (7343, 7543)  |
| Precision Workers, Assorted Materials                           |  | 719  | Heat treating equipment operators (7344, 7544)  |
| 675   | Hand molders and shapers, except jewelers (6861)                         | 723  | Miscellaneous metal and plastic processing machine operators (7349, 7549)             |
| 676   | Patternmakers, lay-out workers, and cutters (6862)                       | 724  | Woodworking Machine Operators   |
| 677   | Optical goods workers (6864, pt 7477, pt 7677)                           | 725  | Wood lathe, routing, and planing machine operators (7431, 7432, 7631, 7632)           |
| 678   | Dental laboratory and medical appliance technicians (6865)               | 726  | Sawing machine operators (7433, 7633)   |
| 679   | Bookbinders (6844)   | 727  | Shaping and joining machine operators (7435, 7635)                                    |
| 683   | Electrical and electronic equipment assemblers (6867)                    | 728  | Nailing and tacking machine operators (7636)  |
| 684   | Miscellaneous precision workers, n.e.c. (6869)                           | 729  | Miscellaneous woodworking machine operators (7434, 7439, 7634, 7639)                  |
| Precision Food Production Occupations                           |  | 733  |   |
| 686   | Butchers and meat cutters (6871)   |  |   |
| 687   | Bakers (6872)  |  |   |
| 688   | Food batchmakers (6873, 6879)  |  |   |
| Precision Inspectors, Testers, and Related Workers              |  |  |   |
| 689   | Inspectors, testers, and graders (6881, 828)                             |  |   |
| 693   | Adjusters and calibrators (6882)   |  |   |
| Plant and System Operators                                      |  |  |   |
| 694   | Water and sewage treatment plant operators (691)                         |  |   |
| 695   | Power plant operators (pt 693)   |  |   |
| 696   | Stationary engineers (pt 693, 7668)                                      |  |   |
| 699   | Miscellaneous plant and system operators (692, 694, 695, 696)            |  |   |

| 1990<br>Census<br>code | Occupation category   | 1990<br>Census<br>code | Occupation category   |
|------------------------|---|------------------------|---|
|                        | <b>OPERATORS, FABRICATORS, AND<br/>LABORERS—Con.</b>                          |                        | <b>OPERATORS, FABRICATORS, AND<br/>LABORERS—Con.</b>              |
|                        | <b>Machine Operators, Assemblers, and<br/>Inspectors—Con.</b>                 |                        | <b>Machine Operators, Assemblers, and<br/>Inspectors—Con.</b>     |
|                        | <b>Machine Operators and Tenders, Except<br/>Precision—Con.</b>               |                        | <b>Machine Operators and Tenders, Except<br/>Precision—Con.</b>   |
|                        | <b>Printing Machine Operators</b>   |                        | <b>Machine Operators, Assorted Materials—Con.</b>                 |
| 734                    | Printing press operators (7443, 7643)   | 774                    | Photographic process machine operators<br>(6863, 6868, 7671)      |
| 735                    | Photoengravers and lithographers (6842,<br>7444, 7644)                        | 777                    | Miscellaneous machine operators, n.e.c.<br>(pt 7479, 7665, 7679)  |
| 736                    | Typesetters and compositors (6841, 7642)                                      | 779                    | Machine operators, not specified                                  |
| 737                    | Miscellaneous printing machine operators<br>(6849, 7449, 7649)                |                        | <b>Fabricators, Assemblers, and Hand Working<br/>Occupations</b>  |
|                        | <b>Textile, Apparel, and Furnishings Machine<br/>Operators</b>                | 783                    | Welders and cutters (7332, 7532, 7714)                            |
| 738                    | Winding and twisting machine operators<br>(7451, 7651)                        | 784                    | Solderers and brazers (7333, 7533, 7717)                          |
| 739                    | Knitting, looping, taping, and weaving machine<br>operators (7452, 7652)      | 785                    | Assemblers (772, 774)   |
| 743                    | Textile cutting machine operators (7654)                                      | 786                    | Hand cutting and trimming occupations<br>(7753)                   |
| 744                    | Textile sewing machine operators (7655)                                       | 787                    | Hand molding, casting, and forming<br>occupations (7754, 7755)    |
| 745                    | Shoe machine operators (7656)   | 789                    | Hand painting, coating, and decorating<br>occupations (7756)      |
| 747                    | Pressing machine operators (7657)   | 793                    | Hand engraving and printing occupations<br>(7757)                 |
| 748                    | Laundrying and dry cleaning machine<br>operators (6855, 7658)                 | 795                    | Miscellaneous hand working occupations<br>(7758, 7759)            |
| 749                    | Miscellaneous textile machine operators<br>(7459, 7659)                       |                        | <b>Production Inspectors, Testers, Samplers, and<br/>Weighers</b> |
|                        | <b>Machine Operators, Assorted Materials</b>                                  | 796                    | Production inspectors, checkers, and<br>examiners (782, 787)      |
| 753                    | Cementing and gluing machine operators<br>(7661)                              | 797                    | Production testers (783)  |
| 754                    | Packaging and filling machine operators<br>(7462, 7662)                       | 798                    | Production samplers and weighers (784)                            |
| 755                    | Extruding and forming machine operators<br>(7463, 7663)                       | 799                    | Graders and sorters, exc. agricultural (785)                      |
| 756                    | Mixing and blending machine operators<br>(7664)                               |                        | <b>Transportation and Material Moving<br/>Occupations</b>         |
| 757                    | Separating, filtering, and clarifying machine<br>operators (7476, 7666, 7676) |                        | <b>Motor Vehicle Operators</b>                                    |
| 758                    | Compressing and compacting machine<br>operators (7467, 7667)                  | 803                    | Supervisors, motor vehicle operators (8111)                       |
| 759                    | Painting and paint spraying machine<br>operators (7669)                       | 804                    | Truck drivers (8212-8214)   |
| 763                    | Roasting and baking machine operators,<br>food (7472, 7672)                   | 806                    | Driver-sales workers (8218)                                       |
| 764                    | Washing, cleaning, and pickling machine<br>operators (7673)                   | 808                    | Bus drivers (8215)  |
| 765                    | Folding machine operators (7474, 7674)  | 809                    | Taxicab drivers and chauffeurs (8216)                             |
| 766                    | Furnace, kiln, and oven operators, exc.<br>food (7675)                        | 813                    | Parking lot attendants (874)                                      |
| 768                    | Crushing and grinding machine operators<br>(pt 7477, pt 7677)                 | 814                    | Motor transportation occupations, n.e.c. (8219)                   |
| 769                    | Slicing and cutting machine operators (7478,<br>7678)                         |                        | <b>Transportation Occupations, Except Motor<br/>Vehicles</b>      |
| 773                    | Motion picture projectionists (pt 7479)                                       |                        | <b>Rail Transportation Occupations</b>                            |
|                        |   | 823                    | Railroad conductors and yardmasters<br>(8113)                     |
|                        |   | 824                    | Locomotive operating occupations (8232)                           |
|                        |   | 825                    | Railroad brake, signal, and switch<br>operators (8233)            |
|                        |   | 826                    | Rail vehicle operators, n.e.c. (8239)                             |

| 1990<br>Census<br>code                                     | Occupation category  |
|--|--|
| <b>OPERATORS, FABRICATORS, AND LABORERS—Con.</b>           |  |
| <b>Transportation and Material Moving Occupations—Con.</b> |  |
| Transportation Occupations, Except Motor Vehicles—Con.     |  |
| Water Transportation Occupations                           |  |
| 828  | Ship captains and mates, except fishing boats (pt 8241, 8242)        |
| 829  | Sailors and deckhands (8243)   |
| 833  | Marine engineers (8244)  |
| 834  | Bridge, lock, and lighthouse tenders (8245)                          |
| Material Moving Equipment Operators                        |  |
| 843  | Supervisors, material moving equipment operators (812)               |
| 844  | Operating engineers (8312)   |
| 845  | Longshore equipment operators (8313)                                 |
| 848  | Hoist and winch operators (8314)                                     |
| 849  | Crane and tower operators (8315)                                     |
| 853  | Excavating and loading machine operators (8316)                      |
| 855  | Grader, dozer, and scraper operators (8317)                          |
| 856  | Industrial truck and tractor equipment operators (8318)              |
| 859  | Miscellaneous material moving equipment operators (8319)             |
| <b>Handlers, Equipment Cleaners, Helpers, and Laborers</b> |  |
| 864  | Supervisors, handlers, equipment cleaners, and laborers, n.e.c. (85) |
| 865  | Helpers, mechanics and repairers (863)                               |

| 1990<br>Census<br>code  | Occupation category                                    |
|---|--|
| <b>OPERATORS, FABRICATORS, AND LABORERS—Con.</b>                |  |
| <b>Handlers, Equipment Cleaners, Helpers, and Laborers—Con.</b> |  |
| Helpers, Construction and Extractive Occupations                |  |
| 866   | Helpers, construction trades (8641-8645, 8648)         |
| 867   | Helpers, surveyor (8646)                               |
| 868   | Helpers, extractive occupations (865)                  |
| 869   | Construction laborers (871)                            |
| 874   | Production helpers (861, 862)                          |
| Freight, Stock, and Material Handlers                           |  |
| 875   | Garbage collectors (8722)                              |
| 876   | Stevedores (8723)                                      |
| 877   | Stock handlers and baggers (8724)                      |
| 878   | Machine feeders and offbearers (8725)                  |
| 883   | Freight, stock, and material handlers, n.e.c. (8726)   |
| 885   | Garage and service station related occupations (873)   |
| 887   | Vehicle washers and equipment cleaners (875)           |
| 888   | Hand packers and packagers (8761)                      |
| 889   | Laborers, except construction (8769)                   |
| <b>MILITARY OCCUPATIONS</b>                                     |  |
| 903   | Commissioned Officers and Warrant Officers             |
| 904   | Non-commissioned Officers and Other Enlisted Personnel |
| 905   | Military occupation, rank not specified                |
| <b>EXPERIENCED UNEMPLOYED NOT CLASSIFIED BY OCCUPATION</b>      |  |
| 909   | Last worked 1984 or earlier                            |

# TRANSPORTATION AND MATERIAL MOVING OCCUPATIONS

## 803 SUPERVISORS, MOTOR VEHICLE OPERATORS

Dispatcher, n. s.—401 exc. ambulance  
Dispatcher, n. s.—500-691

Manager  
Route, delivery  
Storage garage—750

Roadmaster—401

Supervisor  
Bus drivers—401  
Cab—402  
Delivery, n. s.—580-691  
Dispatcher, trucks, cabs and busses  
Distribution—422

Driver  
Milk-route—101  
Retail-route—101  
Road, motor vehicle operators—401  
Route delivery

Transportation—Any not listed above  
Truck—410  
N. s.—410

## 804 TRUCK DRIVERS

Auto-carrier driver  
Auto-crane driver  
Auto-haulaway driver  
Auto hauler  
Auto-transport driver

Automobile-transport driver—(410)  
Baggageman—410  
Basket man—101,601  
Batch-mixing-truck driver  
Bottle hop—101

Bull driver—410  
Car escort  
Car ferrier  
Car-pick-up man—590,612-622,750,751  
Car pilot

Chauffeur—410  
City routeman  
Coal deliveryman  
Coal hauler—041,672  
Commercial-trailer-truck driver

Concrete-mixer driver  
Concrete-mixing truck driver—060,251  
Concrete-truck driver  
Contract-mail carrier—410  
Co-pilot—410

Crane operator—590,612-622,750,751  
Cream gatherer—(410)  
Cream hauler—(410)  
Cross-country-truck driver—(410)  
Dairy-truck driver—101

Delivery boy or girl, n. s.—500-671 exc. newspaper 672-691  
Delivery driver—100,412,421,441,442, 581,582,641-662,681-691,722,752,760  
Delivery driver—Any not listed above  
Delivery truck driver—552,672  
Delivery-truck driver—Auto transport 410

Delivery-truck driver—Mixed in transit concrete 251  
Delivery-truck driver—Any not listed above  
Diesel-truck driver  
Directory carrier—441  
Distributed directories—Directory distribution 741

Distributor operator—060  
Dray-truck driver—(410)  
Drip pumper—450-452  
Driver-mechanic—412  
Driver, milk pickup—101,400,410

## 804 TRUCK DRIVERS—Con.

Driver, pick-up—400,410  
Driver, n. s.—412,421,441,442,581, 582,641-662,681-691,722,752,760

Driver, n. s.—Any not listed above  
Dump-truck driver  
Dumpster driver

Dumpster operator  
Errand boy or girl—642  
Escort vehicle driver—(432)  
Explosives-truck driver—192,292  
Expressman—410

Farm truck driver—010,011,030  
Feedmobile driver  
Fertilizer applicator  
Fertilizing-machine operator—010, 020,030  
Food-service agent—641,762

Food-service driver—641,762  
Fuel-oil-truck driver  
Fuel-truck driver

Furniture-mover driver—(410)  
Garbage collector, truck driver—(471)

Garbage-truck driver—(471)  
Gas-truck driver

Goat driver—011,030  
Gravel hauler—(060)  
Gravel-truck driver

Grocery boy—550,601  
Hauler—Any not listed above  
Highway-truck driver

Hook-up driver—(410)  
Hostler—410

Jockey—410  
Jumper—410  
Line driver—410  
Liquid fertilizer servicer—010,030  
Livestock trucker—OWN 410

Log hauler—230,231  
Log-truck driver—230,231  
Mail carrier—OWN 410  
Mail-messenger contractor—OWN 742  
Mail-truck driver—412

Mailmaster—PR 410  
Maintenance-truck driver—LGOV 900- 932  
Milk collector  
Milk hauler  
Milk-truck driver—Milk hauling 410

Moto-mix operator  
Moving van driver  
Oil deliverer—(552)  
Oil-spraying-machine operator—010, 011,030,021  
Oil-transport driver

Oil-truck driver  
Order boy—500-691  
Order runner—500-691  
Over-the-road driver—410  
Owner-operator—410

Parcel-post truck driver—412  
Parts runner, delivery  
Pick-up driver—Exc. 771  
Pick-up man—410,590,612-622,750,751  
Pick-up-truck driver

Powder-truck driver—192,292  
Ready-mix-truck driver—251  
Road driver—410  
Route deliveryman—Exc. 101,111,120, 560,771  
Route driver—Exc. 101,111,120,560, 771

Route jumper  
Route rider—Exc. 101,111,120,560,771  
Routeman—Any not listed above  
Rubbish collector, truck driver  
Rubbish-truck driver

Runner, n. s.—590,612-622,750,751  
Sand hauler  
Semi-truck driver  
Service-car driver—(751)  
Serviceman, exc. repair—552,672

## 804 TRUCK DRIVERS—Con.

Special-delivery boy—580-691  
Sprinkler driver—(471)  
Sprinkling-truck driver—(471)  
Star-route-mail man—OWN 410  
Street-flusher driver—471

Street sprinkler—471  
Tank driver  
Tank-truck driver  
Tank-truck operator  
Tank-wagon driver

Tank-wagon operator  
Tanker driver  
Teamster, truck driver—040-050  
Tow-car driver—590,612-622,750,751  
Tow-truck operator—590,612-622,750, 751

Towman—590,612-622,750,751  
Tractor-trailer driver  
Trailer driver  
Trailer-truck driver  
Transfer man—PR 410

Transit-mix operator—251  
Transit-mixer driver—251  
Transit-mixer operator—251  
Transport driver  
Transport-truck driver

Trash collector, truck driver—(471)  
Trash hauler—(471)  
Truck chauffeur  
Truck driver, milk pickup—101  
Truck driver, n. s.—412,642,771

Truck driver, n. s.—United Parcel Service 410  
Truck driver, n. e. c.—Any not listed above  
Truck hop  
Truck hopper  
Truck jumper

Truck switcher—410  
Trucker—OWN 410  
Trucking—OWN 410  
Truckman—OWN 410  
Truckman—040-050,060

Van driver, exc. driving people  
Wagon boy—580-691  
Waste-collection driver  
Water truck driver—042,060  
Wrecker driver—590,612-622,750,751

Wrecker operator—590,612-622,750,751  
Wrecking-car driver  
Yard spotter—410

## 806 DRIVER-SALES WORKERS

Bakery deliveryman—(111)  
Bobtailer—OWN  
Bread distributor—111  
Bread jockey—111  
Breadman—Bakery 111

Cigarette-machine filler—(670)  
Coin-box collector  
Coin collector—670  
Coin-machine collector  
Collector—Coin-operated machines 670

Delivery boy or girl, n. s.—101  
Delivery driver—101,111,120,171,560, 670,671,771  
Delivery-truck driver—101,111  
Distributor—PR 171  
Driver-salesperson



# TRANSPORTATION AND MATERIAL MOVING OCCUPATIONS

## 806 DRIVER-SALES WORKERS—Con.

Driver-serviceman, vending machine  
 Driver, n. s.—101,111,120,171,560, 670,671,771  
 Gum-machine filler—Vending machine sales  
 670  
 Iceman—562,682

Inspector  
 Coin box—441

Jukebox checker—(810)  
 Jukebox routeman—(810)  
 Laundry agent—(771)  
 Laundry-routeman—771  
 Machine filler—Vending machine sales 670  
 Milk deliveryman—101

Milk-route deliveryman—101  
 Milk-truck driver—Exc. milk hauling 410  
 Milk-wagon driver—101  
 Milkman—101  
 Pay-station collector—441

Pick-up driver—771  
 Pick-up man—771  
 Relay man—111,771  
 Route attendant—Vending machine sales 670  
 Route deliveryman—101,111,120,560, 771

Route driver—101,111,120,560,771  
 Route rider—101,111,120,560,771  
 Routeman—101,111,120,560,771  
 Rural carrier—PR 171  
 Sales driver

Salesperson  
 Dairy-route—101  
 Deliveryman, any commodity  
 Driver  
 Route  
 Truck-driver

Wagon driver—552  
 N. s.—Bakery route 111  
 N. s.—Milk route 101

Serviceman-machine filler—Vending machine  
 sales 670  
 Special-events driver—Soft drink bottling co.  
 120  
 Towel distributor—771  
 Vending-machine-coin collector  
 Vending-machine filler—(670)  
 Vending-machine serviceman, route  
 Vending-route serviceman  
 Vendor—Vending machine route 670

## 808 BUS DRIVERS

Bus driver  
 Bus operator—(401)  
 Coach operator—401  
 Driver, n. s.—Bus co. 401  
 Interstate-bus driver—401

Jitney driver—401  
 Mobile-lounge driver or operator  
 Motor-bus driver  
 Motor-coach operator—401

Operator  
 With class of worker exc. OWN—Bus co. 401

School-bus driver  
 School-bus operator  
 Stage driver—401

Supervisor  
 Transportation—401

Trackless trolley driver—(401)  
 Van driver, driving people

## 809 TAXICAB DRIVERS AND CHAUFFEURS

Ambulance driver, n. s.  
 Auto driver  
 Cab driver—402  
 Chauffeur—Any not listed above  
 Chauffeurette  
 Courtesy-car driver—590,612-622,750, 751  
 Crew car driver  
 Deliverer, car rental—750  
 Delivery driver—401,402,440,700-721, 731-  
 750,761-770,772-841,851,860-932  
 Drive-away driver—351

Drive-away man—351  
 Driver-chauffeur  
 Driver, delivering new autos—612  
 Driver-utility worker—351  
 Driver, n. s.—402,440,700-721,731- 750,761-  
 770,772-841,851,860-932

Driver, n. s.—401 exc. bus co  
 Escort-car driver  
 Flag-car driver  
 Funeral-car driver  
 Hack driver—402

Hacker—402  
 Hearse driver  
 Jeep driver  
 Jitney driver—402  
 Limousine driver

Livery-car driver  
 Motor pool driver  
 New-car driver—351  
 Owner—Taxicab 402

Supervisor  
 Transportation—402

Taxi driver—402  
 Taxicab driver—402  
 Tow-bar driver—351  
 Wide-load escort—(432)

## 813 PARKING LOT ATTENDANTS

Attendant, n. s.—Parking lot 750  
 Auto hiker  
 Auto parker—(750)  
 Car chaser—590,612-622,750,751  
 Car hiker—590,612-622,750,751  
 Car hop—590,612-622,750,751  
 Car hopper—590,612-622,750,751  
 Car hostler—590,612-622,750,751  
 Car jockey—500,590,612-622,750,751  
 Car parker  
 Car runner—Parking lot 750  
 Car shagger—590,612-622,750,751  
 Hiker—590,612-622,750,751  
 Lot boy—Parking lot 750  
 Parking attendant—Exc. drive in theater 800

Parking-lot attendant—(750)  
 Parking-lot laborer—(750)  
 Ramp jockey—(750)  
 Shag boy—590,612-622,750,751  
 Spotter, parking lot  
 Truck spotter

## 814 MOTOR TRANSPORTATION OCCUPATIONS, N.E.C.

Delivery driver, motorcycle  
 Leaf-sucker operator  
 Motorcycle deliveryman  
 Motorcycle driver, delivery  
 Power-sweeper operator

Street-cleaning-equipment operator  
 Street-sweeper operator—471  
 Sweeper, n. s.—060,471  
 Sweeper operator, roads and parking lots  
 Tractor-sweeper operator

## 823 RAILROAD CONDUCTORS AND YARDMASTERS

C T C operator—400  
 Car chaser—120  
 Car dispatcher—040-050  
 Car distributor—040-050  
 Car spotter—120  
 Conductor—100-392,400  
 Dispatcher, railroad, exc. inspecting  
 Dispatcher, n. s.—400  
 Freight conductor—400

Manager  
 Yard—400

Motor boss—040-050  
 Passenger conductor—400  
 Railroad conductor—400  
 Road conductor—400  
 Roadmaster—400  
 Sleeping car conductor—400

Supervisor  
 Dispatcher, trains  
 Engines, road—400  
 Switchman—400  
 Transportation—400  
 Yard, n. s.—400

Ticket collector—400,401  
 Traffic control operator—400  
 Train conductor—400  
 Trainmaster—400,500  
 Yard conductor—400,401  
 Yardmaster—400

## 824 LOCOMOTIVE OPERATING OCCUPATIONS

Assistant  
 Engineer—400

Car mover—400  
 Coal trammer—272,280  
 Diesel-dinkey operator  
 Diesel-locomotive fireman—(400)  
 Dinkey driver  
 Dinkey-engine fireman

Dinkey engineman  
 Dinkey-locomotive operator  
 Dinkey man  
 Dinkey motorman  
 Dinkey operator

Dinkey skinner  
 Donkey-engine fireman  
 Dump motorman—041  
 Electric locomotive fireman—400  
 Electric motorman

Elevated motorman—401  
 Engine hostler—400  
 Engine pilot—400

Engineer  
 Diesel—400  
 Diesel dinkey  
 Diesel locomotive—400  
 Dinkey  
 Dinkey locomotive

Freight—400  
 Locomotive—(400)  
 Lokie—041  
 Mine motor  
 Narrow gage—270,271,280-291,300

Railroad, operating train—400  
 Yard—400  
 N. s.—400

Engineman—400  
 Fireman, n. s.—400  
 Firer, locomotive  
 Goat driver—270  
 Haulage engineman  
 Hostler—400

## TRANSPORTATION AND MATERIAL MOVING OCCUPATIONS

### 824 LOCOMOTIVE OPERATING OCCUPATIONS—Con.

Ingot-buggy operator—270-291,300-370,400,760  
 Ingot-car operator—270-291,300-370, 400,760  
 Larriman  
 Larry-car man  
 Larry-car operator

Locomotive fireman—(400)  
 Locomotive operator—040-050  
 Lokie driver—041  
 Mine motorman  
 Motor driver—041,042,270,401

Motor operator—041,042,270,401  
 Motor runner—400  
 Motorman—040-050,100-392,400,401  
 Narrow-gauge operator

**Operator**  
 With class of worker exc. OWN—401, exc. bus co.

Pilot, n. s.—400  
 Rail-car operator—230,400  
 Rail-detector-car operator—400  
 Rail-tractor operator—270-291,300-370,400,760  
 Railroad fireman  
 Relay motorman—041

Roundhouse fireman—400  
 Shop fireman—400  
 Slag motorman—270-291,300-370,400, 760  
 Steam-locomotive fireman—(400)  
 Streetcar motorman—401

Streetcar operator—401  
 Track-car operator—400  
 Trackmobile operator  
 Train operator, engineer—400  
 Trainman—400,401

Tram operator—401  
 Trammer  
 Trip motorman—040-050  
 Trip-motor operator—040-050  
 Trolley-car operator—401

Trolley operator—401  
 Work-car operator—400  
 Yard motorman—400,401

### 825 RAILROAD BRAKE, SIGNAL, AND SWITCH OPERATORS

Air-brake operator—400  
 Air-hose coupler—400

**Apprentice**  
 Lineman—Substation 060

Brake coupler, road freight—(400)  
 Brake holder—041  
 Brake rider—040-050  
 Brakeman, train  
 Brakeman, n. s.—040-050,160,270-301, 400  
 Braker, passenger train—400

Car coupler—040-050,400  
 Car hopper—400  
 Car rider—041,400  
 Car runner—400  
 Car shifter—400

Car shunter—400  
 Coupler—040,050,400  
 Coupling man—400  
 Dinkkey brakeman  
 Dukey rider—040-050

### 825 RAILROAD BRAKE, SIGNAL, AND SWITCH OPERATORS—Con.

Enginehouse brakeman—040-050  
 Flagman—400  
 Freight brakeman—400  
 Gang rider—041  
 Headman—400

**Helper**  
 Locomotive operator's—(400)

Motor brakeman—040-050  
 Narrow-gauge brakeman  
 Nipper—041  
 Passenger brakeman—400  
 Patcher, n. s.—041  
 Railroad brakeman—400

Railway switchman—400  
 Rider—041  
 Rope rider—040-050  
 Set rider—041  
 Snapper—040-050

Swamper—040-050  
 Switch tender—400,401  
 Switchman—040-050,400  
 Trailer—041-050  
 Trainman—040-050

Trip rider—040-050  
 Tub rider—041  
 Yard brakeman—400  
 Yard coupler—Railroad cars 400  
 Yard switchman—400

### 826 RAIL VEHICLE OPERATORS, N.E.C.

Ballast-cleaning operator—400  
 Ballast regulator operator—400  
 Block operator—400  
 Car-retarder operator—400  
 Control-tower operator—400

**Engineer**  
 Turntable—400

Interlocker—400  
 Laborer, car barn—400,401  
 Leverman—400  
 Power-ballast machine operator—400  
 Railway equipment operator—400  
 Retarder operator—400

Semaphore operator—400  
 Signal operator—400  
 Signal-tower director—400  
 Signal-tower operator—400  
 Signalman—400,401

Tableman—400  
 Tamping-machine operator—400  
 Target man—400  
 Tower director—400  
 Tower operator—400

Tower switchman—400  
 Tower watchman—400  
 Towerman—400,401  
 Track-broom operator—400,401  
 Train director—400  
 Transfer-table operator—400

### 828 SHIP CAPTAINS AND MATES, EXCEPT FISHING BOATS

Barge captain—(420)  
 Barge master—(420)  
 Barge mate—420  
 Barge pilot—420  
 Boat captain, exc. fishing

Boat driver—420  
 Boat master—420  
 Boat operator—420  
 Boat pilot—060,420  
 Boatman—Exc. 060

Canal-boat captain—420  
 Canal-boat operator—(420)  
 Canal driver—(420)  
 Captain, exc. fishing vessel—810  
 Captain, n. s.—060,420,761,810 exc. fishing vessel

Deck officer—420  
 Derrick-boat captain—060  
 Dock hand—421  
 Dredge captain—(060)  
 Dredge mate—(060)

Dredgemaster—060  
 Ferry pilot—420  
 Ferry terminal agent—420  
 Ferryboat captain—420  
 Ferryboat operator—420

Ferryboat pilot—420  
 First mate—060,420  
 First officer—420  
 Fourth mate—420  
 Fourth officer—420

Launch operator  
 Lighter captain—(420)  
 Marine pilot—420  
 Marine superintendent—(420)  
 Maritime officer—420

Master—420  
 Master mariner—(420)  
 Master pilot—420  
 Mate, n. s.—060,420  
 Motorboat captain—(420)

Motorboat operator—(420)  
 Navigation officer—420  
 Navigator—420  
 Officer—U.S. Merchant Marine 420  
 Oil-tanker captain—420

Pilot, n. s.—060,420  
 Port captain—420  
 River captain—420  
 River pilot—(420)  
 Sailing master—420

Sailing officer—420  
 School-boat driver—420  
 Scow captain—(420)  
 Sea captain—420  
 Second mate—060,420

Second officer—060,420  
 Shipmaster—(420)  
 Skipper—420  
 Sloop operator—420  
 Sloop captain—420

Speedboat driver—420  
 Speedboat operator—420  
 Steamboat captain—(420)  
 Steamboat pilot—(420)

**Supervisor**  
 Ferry terminal—420

Third mate—060,420  
 Third officer—060,420  
 Towboat captain—(420)  
 Towing—420  
 Tugboat captain—(420)  
 Tugboat mate—(420)  
 Tugboat operator—(420)  
 Yacht master—761,420

# TRANSPORTATION AND MATERIAL MOVING OCCUPATIONS

## 829 SAILORS AND DECKHANDS

A.B. Seaman—420  
 Able seaman—420  
 Barge hand—(420)  
 Bargeman—(420)  
 Boat deckhand—060,420

Boat hand—420  
 Boat laborer—420  
 Boatman—060  
 Cabin boy—420  
 Cadet—420

Captain's boy—420  
 Chief engineer's boy—420  
 Chief yeoman—U.S. Coast & Geodetic Survey 930  
 Crewman—U.S. Corps of Engineers 060  
 Deck boy—420

Deck cadet—420  
 Deck mate—Dredgeboat 060  
 Deckhand, n. s.—042,060,400,420  
 Dredge deckhand—(060)  
 Dredge hand—(060)

Dredge worker—060  
 Ferryman—420  
 Float tender—420  
 Floatman—400,410  
 Handyman, n. s.—Dredgeboat 060

Helper  
 N. s.—Canal boat 420  
 N. s.—420 exc. canal boat

Laborer, boat or ship—420  
 Lighterman—420  
 Lookout—420  
 Marine-water tender—Dredge boat 060  
 Mariner—420  
 Master-at-arms—420

Merchant marine—420  
 Merchant seaman—420  
 Ordinary seaman—420  
 Quartermaster—420  
 Riverman—060,420

Roustabout—420  
 Sailor—(420)  
 Scaler—420  
 Scowman—(420)  
 Seaman—Exc. 032

Steersman—Canal boat 420  
 Tankerman—420  
 Utility man—Dredge boat 060  
 Water tender—420  
 Wheelman—420  
 Wiper—420  
 Yachtsman—(420)

## 833 MARINE ENGINEERS

Engineer  
 Deck—420  
 Marine, n. s., Less than associate degree  
 Marine, operating or maintaining equipment  
 Operating, n. s.—420  
 Operating equipment, n. s.—420

Marine fireman—420  
 Marine oiler—(420)

Mechanic  
 Marine—032,060,420,810  
 Marine engine—032,060,420,810

Oiler—420  
 Refrigerating oiler—420  
 Striker—420

## 834 BRIDGE, LOCK, AND LIGHTHOUSE TENDERS

Assistant  
 Dam tender's

Bridge leverman  
 Bridge opener  
 Bridge operator  
 Bridge tender  
 Bridgeman—Exc. 060,432  
 Buoy tender—FGOV

Crossing tender—401  
 Crossing watchman—401  
 Dam attendant  
 Dam operator—Exc. 230  
 Dam tender—Exc. 230

Drawbridge operator—(432)  
 Drawbridge tender—(432)  
 Lighthouse keeper—(931)  
 Lock keeper—420  
 Lock master—420

Lock operator—060,420,450  
 Lock tender, n. s.—060,420,450  
 Lockman—420,450  
 Marine-tower operator—420  
 Station gateman—401-432  
 Tender, locks—420  
 Tender, n. s.—U. S. Lighthouse 931

## 843 SUPERVISORS, MATERIAL MOVING EQUIPMENT OPERATORS

Chute boss—041  
 Cotton header—420  
 Dirt contractor  
 Dock boss—420  
 Gang boss—Stevedoring 420

Gang leader—400  
 Hatch boss—420  
 Hauling contractor—410  
 Header—420  
 House mover—OWN 060

Manager  
 Platform, material handler

Oil dispatcher—042,200,422  
 Rig superintendent—060  
 Superintendent, stevedoring—420

Supervisor  
 Car—400  
 Cargo—420  
 Coal-yard  
 Crane-crew  
 Field, pipe-lines—422

Gang, n. s.—400  
 Gang, n. s.—Stevedoring 420  
 Gas-pumping-station—451  
 Grading—060  
 Hatch—420

Labor—Stevedoring 420  
 Load-out—040,041,050  
 Material-crew—060,231,232  
 Material-handling  
 Platform, material handling—542

Pumping—422  
 Reactor fueling—192  
 Rigger—060  
 Section—400  
 Stevedoring—420

Track, n. s.—110  
 Warehouse, material handling  
 Warehouse, traffic  
 Yard, building materials or lumber—502,580  
 Yard, n. s.—160,241  
 N. s.—Stevedoring 420

## 844 OPERATING ENGINEERS

Apprentice  
 Operating engineer

Engineer  
 Cable—Exc. 441  
 Clamshell  
 Crane  
 Derrick  
 Dragline

Dredge  
 Dredge boat  
 Hoisting, exc. pile driving  
 Jammer—230  
 Loader—230

Locomotive crane  
 Operating, n. s.—Exc. 420  
 Operating equipment, n. s.—Exc. 420  
 Operating-heavy equipment  
 Power shovel

Scrap drop—270,271,280-291,300  
 Shovel  
 Steam shovel  
 Yarder—230  
 Yarding—230

Equipment driver—060  
 Equipment operator, n. s.—060  
 Heavy-equipment operator, n. s.—Any not listed above  
 Heavy-road construction equipment operator—(060)  
 Machine operator, n. s.—060  
 Road-equipment operator—060

Road-machine operator—060  
 Road-machine runner—060  
 Tower-crane operator—060

## 845 LONGSHORE EQUIPMENT OPERATORS

Baggageman—420  
 Crane operator—420  
 Electric-crane operator—420  
 Electric craneman—420  
 Longshoreman, operating material handling equipment—420  
 Stevedore, operating material handling equipment—(420)

## 848 HOIST AND WINCH OPERATORS

Air-hoist operator  
 Air-lift operator  
 Boat-hoist operator—420  
 Boat puller—420  
 Bridge rigger—(060)

Building rigger—060  
 Cable operator—060  
 Cable-way operator  
 Cage operator  
 Cage tender—040-050

Casing puller—042  
 Chute operator—420  
 Clutchman—042  
 Coal handler—420  
 Coal trimmer—420

Coal-trimmer-machine operator—420  
 Coke loader—270  
 Corner-bead man—060  
 Cupola hoist operator—270-291,300-370,400,760  
 Cupola hoistman—270-291,300-370,400, 760

## TRANSPORTATION AND MATERIAL MOVING OCCUPATIONS

### 848 HOIST AND WINCH OPERATORS— —Con.

Derrick operator  
Derrick worker, well service—042  
Derrickman—042  
Dry-transfer man—231-242  
Dump operator  
Engineer  
  Skip hoist  
Foot tender—041  
Footman—041  
Gin-pole operator—060  
Hoist operator  
Hoisting engineman  
Hoistman—Exc. 100  
Hydraulic boom operator—040,280  
Jammer operator—230  
Jump roll operator—231  
Leverman—230,231  
Log loader—230,231  
Marine railway operator—360  
Ore trimmer—(420)  
Pack changer—220  
Pack puller—220  
Pipe puller—042  
Pitman—Any not listed above  
Rig operator—042  
Rigger, n. s.—060  
Rigger-up—060  
Rigging man—060  
Rigging-up man—060  
Rod puller—042  
Rodman, n. s.—042  
Scrap-hoist operator—270,271,280-291,300  
Scraper-loader operator—040,041,050  
Skip-hoist operator  
Slinger—060  
Slope runner—041  
Slope tender—041  
Slopeman—041  
Steam-hoist operator  
Stiff-leg operator  
Telescope operator—420  
Transfer controller—231,232  
Tugger operator—040-050  
Vault installer, cementery  
Well puller, n. s.—042  
Winch driver—040-050  
Winch operator—040-050  
Winch runner—040-050  
Winch stripper—270,271,280-291,300  
Winchman—040  
Yard worker—360  
Yarder operator—230  
Yarder puncher—230

### 849 CRANE AND TOWER OPERATORS

Acid craneman  
Boom-cat operator—041  
Boom-crane operator  
Boomsling operator  
Bottom craneman—270,271,280-291,300  
Bridge-crane operator  
Burial-vault deliverer and installer  
Cantilever-crane operator—360  
Cathead man—060  
Charging craneman—270-291,300-370,400,760  
Cherry-picker operator—060,441,450-452  
Cinder-dump craneman—270,271,280-291,300  
Cinder-pit craneman—270,271,280-291,300  
Clamshell operator  
Coal-tower operator  
Coke-crane operator—270,271,280-291,300  
Crane-ladle person—270-291,300-370,400,760  
Crane operator—Exc. 420,590,612-622,750,751  
Demolition-crane operator  
Derrick-boat leverman

### 849 CRANE AND TOWER OPERATORS —Con.

Derrick-boat operator  
Diesel-crane operator  
Electric-crane operator—Exc. 420  
Electric craneman—Exc. 420  
Erecting-crane operator  
Gantry-crane operator  
Hydrocrane operator  
Ingot stripper—270-291,300-370,400,760  
Ladle craneman  
Locomotive-crane operator  
Mill craneman  
Mixer craneman  
Mold shaker—270-291,300-370,400,760  
Mold shifter—270,271,280-291,300  
Mold washer—270,271,280-291,300  
Mold-yard craneman  
Monorail-charger operator—270,271,280-291,300  
Monorail-crane operator  
Monorail operator—231,232  
Ore bridge operator—270,271,280-291,300  
Overhead-crane operator  
Overhead craneman  
Pig-machine craneman—270,271,280-291,300  
Pit craneman  
Pouring craneman—270,271,280-291,300  
Power-crane operator  
Scrap-drop craneman—270,271,280-291,300  
Scrap-drop operator—270,271,280-291,300  
Sorting-grapple operator—230  
Steam-crane operator  
Steel craneman  
Stripper man—270,271,280-291,300  
Tower-crane operator—360  
Tower-loader operator—420  
Tractor-crane operator  
Whirley operator  
Wrecking-crane engineman  
Yard craneman

### 853 EXCAVATING AND LOADING MACHINE OPERATORS

Aerial-tram operator—040,041,050  
Air-shovel operator  
Back-digger operator  
Back-filler operator  
Back-hoe-machine operator  
Back-hoe operator  
Catshovel driver—(060)  
Clamshovel operator  
Diesel-scoop operator  
Digging-machine operator—040-050,060  
Dragline operator  
Dredge leverman  
Dredge operator  
Duck-bill operator—041  
Duck operator—041  
Duckman—041  
Earth-moving-equipment operator  
Earth-moving-machine operator  
Electric-scoop operator  
Electric-shovel operator  
Excavator  
Excavator operator—040,050-060  
Foundation digger  
Gas-shovel operator  
Guyline operator—060  
Harvester operator—040-050  
Hoe runner—060  
Horseback excavator  
Joy loader—040-050  
Joy-loading-machine operator—040-050  
Joy operator—040-050  
Loader operator—040,041,050,060  
Loading-machine operator—040,041,050,060  
Machine loader—040-050  
Mechanical-shovel operator

### 853 EXCAVATING AND LOADING MACHINE OPERATORS—Con.

Muck operator—040,050-060  
Mucker operator—040,050-060  
Mucking machine operator—040,050-060  
Payload-machine operator  
Payload operator  
Pit-shovel operator  
Plunger-scoop operator  
Plunger-shovel operator  
Power-digger operator  
Power-shovel operator  
Scoop driver  
Scoop-operator  
Septic-tank installer  
Septic-tank setter  
Shovel operator  
Slackline operator—060  
Steam-shovel operator—(060)  
Steam-shovel runner—(060)  
Steam shovelman—(060)  
Stripper-shovel operator  
Tower-excavator operator  
Tram operator—040-050  
Trench-shovel operator  
Trencher driver  
Trenching-machine operator

### 855 GRADER, DOZER, AND SCRAPER OPERATORS

Angle-dozer operator  
Asphalt-surface-heater operator—060  
Black-top roller—060  
Blade-grader operator  
Blade man—060  
Blade operator—060  
Bulldozer  
Bulldozer operator—Exc. 270-291,300-370,400,760  
Bush hog operator  
Car runner—040-050  
Ditcher operator  
Ditching-machine operator  
Dozer man  
Dozer operator  
Elevating-grader operator—040,050-060  
Engineer  
  Bulldozer  
  Ditching machine  
  Road roller—060  
  Street roller—060  
Form-grader—060  
Gang-mower operator  
Gradall operator—(060)  
Grader, n. s.—Road maintenance 060  
Grader man—040-050,060  
Grader operator—040-050,060  
Grader patrolman—060  
Grading-machine operator—040-050,060  
Heater-planer operator—060  
Land leveler—060  
Leverman—060,040  
Maintainer operator—060  
Maintenance operator—060  
Motor-grader operator—040,050-060  
Motor-patrol operator—060  
Patrol driver—060  
Patrol operator—060  
Power-grader operator—040-050,060  
Road grader—060  
Road-grader operator—060  
Road-hogger operator—060  
Road-machine scraper—060  
Road packer operator—060  
Road-patrol driver—060  
Road-patrol operator—060  
Road-roller operator—060

## TRANSPORTATION AND MATERIAL MOVING OCCUPATIONS

### 855 GRADER, DOZER, AND SCRAPER OPERATORS—Con.

Roller-machine operator—060  
 Roller operator—060  
 Rooter operator—060  
 Sanitary landfill operator—471  
 Scarifier operator—060  
 Scrapper operator—040-050,060  
 Steam-roller operator—060  
 Tournapull operator  
 Tournapull-scraper operator  
 Utility-tractor operator—060

### 856 INDUSTRIAL TRUCK AND TRACTOR EQUIPMENT OPERATORS

Carrier operator—100-392  
 Carry-all driver—100-392  
 Cat driver  
 Cat operator  
 Cat skinner  
 Cat tender—230  
 Caterpillar driver  
 Caterpillar operator  
 Caterpillar-tractor operator  
 Charger-car operator—Coke 270  
 Charging-car operator—Coke 270  
 Clark driver  
 Diesel-tractor operator  
 Dolly driver—100-392  
 Electric-car operator—100-392  
 Electric-dolly operator—100-392  
 Electric-lift-truck driver  
 Electric-mule driver  
 Electric-mule operator  
 Electric-truck driver  
 Electric-truck operator  
 Electric trucker  
 Euclid operator  
 Finger-lift operator  
 Fork-lift driver  
 Fork-lift operator  
 Fork operator  
 Fork-truck driver  
 Front-end-loader operator  
 Hauler—230  
 Hi-lift operator  
 Hi-lo driver  
 Hi-low truck driver  
 Hi-ranger operator  
 High-lift driver  
 High-lift-mule operator  
 High-lift operator  
 Hot-car man—Coke 270  
 Hot-car operator—270,271,280-291,300  
 Hy-lift operator  
 Hydraulic-lift driver  
 Hyster driver  
 Hyster-machine operator  
 Industrial-tractor driver  
 Industrial-truck driver  
 Industrial-truck operator  
 Inside trucker  
 Jitney driver—Exc. 401,402  
 Jitterbug operator—231,232  
 Larry operator  
 Larryman  
 Lead handler—292  
 Lead loader  
 Lift driver  
 Lift-truck operator  
 Lifter driver  
 Log-carrier operator—230-242  
 Logging-tractor operator—031,230,231  
 Lumber-carrier driver—230-242  
 Lumber-carrier operator—230-242

### 856 INDUSTRIAL TRUCK AND TRACTOR EQUIPMENT OPERATORS—Con.

Lumber-stacker driver  
 Marsh-buggy operator  
 Mold-car pusher—270,271,280-291,300  
 Mule operator—Exc. 132-150  
 Package-lift operator  
 Plowing gardens—(030)  
 Power-mule operator  
 Power-truck driver—100-392  
 Quencher operator—Coke 270  
 Quenching-car man—Coke 270  
 Quenching-car operator—Coke 270  
 Ross-carrier driver—231,232  
 Ross-lift operator—231-242  
 Skidder driver  
 Skidder leverman  
 Skidder loader  
 Skidder operator  
 Skidder runner  
 Skip-load driver—060  
 Skip operator—270,271,280-291,300  
 Skipman—270,271,280-291,300  
 Snaker, tractor driver—241  
 Stacker driver  
 Stacker operator  
 Straddle bug  
 Straddle-bug driver  
 Straddle-bug operator  
 Straddle-carrier operator  
 Straddle-truck driver  
 Teamster, tractor driver—230  
 Tier-lift operator  
 Tier-truck driver  
 Tow boy—100-392  
 Tow driver—100-392  
 Tow-motor driver  
 Tow-motor operator  
 Tractor driver, lift truck  
 Tractor driver, n. s.—Any not listed above  
 Travelift operator—060  
 Uke driver  
 Uke operator  
 Unloader operator—112,121  
 Wheel-loader operator

### 859 MISCELLANEOUS MATERIAL MOVING EQUIPMENT OPERATORS

Acid loader—180-192  
 Acidizer—042  
 Airveyor operator  
 Apprentice  
 Pumper-gager—180-192,200,422  
 Apron man—231-242  
 Ash-conveyor man—400  
 Barge loader—(420)  
 Beltman—040-050  
 Board boy—132-150  
 Board filler—142,181  
 Board stacker  
 Boat loader—420  
 Bobbin boy—132-150  
 Bobbin carrier—132-150  
 Bobbin collector—132-150  
 Bobbin girl—132-150  
 Bobbin hauler—132-150  
 Bobbin trucker—100-222,231-392  
 Boom-conveyor operator  
 Booster-station operator  
 Bottom cager—040-050  
 Bottom man—041  
 Bottomer—041  
 Brick setter—252,262  
 Brick wheeler—(252)

### 859 MISCELLANEOUS MATERIAL MOVING EQUIPMENT OPERATORS—Con.

Bucket operator—251  
 Buggy driver—040-050  
 Bull-chain man—231  
 Cager operator—102  
 Cake boy—180  
 Canal tender—470  
 Car dropper—040-050  
 Car dumper—041  
 Car-dumper operator—270,271,280-291, 300  
 Car pincher—040-050  
 Car runner—Exc. 040-050,400, parking lot 750  
 Car shifter—270  
 Car trimmer—400  
 Carman—040-050  
 Carrier—060,100-162,172-222,231-392  
 Carrier boy—060,100-162,172-222,231- 392  
 Carry boy—060,100-222,231-392  
 Cart driver  
 Cat-wagon operator—100-392  
 Cement-boat-and-barge loader—251  
 Cementer, n. s.—042  
 Chain hooker—Exc. 230  
 Charge-machine operator—180-192  
 Chip-bin conveyor tender—160-162  
 Chip-bin operator—160-162  
 Chip-loft worker—160-162  
 Chip unloader—160  
 Clay carman—252  
 Cloth boy—132-150  
 Cloth carrier—132-150  
 Cloth hauler—132-150  
 Coal cager—041  
 Coal carrier—100-392  
 Coal-equipment operator—450-452  
 Coal handler—Exc. 420  
 Coal screener—270,271,280-291,300  
 Coal whipper  
 Coke wheeler  
 Collector—132-150  
 Cone man—132-150  
 Cone trucker—132-150  
 Conveyor attendant—100-392  
 Conveyor-belt operator—100-392  
 Conveyor console operator  
 Conveyor man—040-050  
 Conveyor operator  
 Conveyor system dispatcher  
 Conveyor tender  
 Cooker loader—112,121  
 Crane chaser—Exc. 230  
 Crane follower—Exc. 230  
 Crane hooker—Exc. 230  
 Derrick follower—Exc. 230  
 Distributor—142,180,182,191,192  
 Distributor—151,231,232,270,271,280- 291,300  
 Ditch tender—Exc. 010,011,030  
 Dock hand—420  
 Dope boy—290,300  
 Dope runner—132-150  
 Dragman—251  
 Drayman—(410)  
 Drier-take-off tender—340-350  
 Dropper—040-050  
 Drum carrier—182,191,192  
 Dry-house wheeler—270,271,280-291, 300  
 Dumpcart driver—060  
 Engineer  
 Station, mainline—422  
 Filling carrier—132-150  
 Filling hand—132-150  
 Filling hauler—132-150  
 Floorman, material handler  
 Floorman, n. s.—100-111,120-130, 160- 220,222,232,242-392  
 Flumer—102,112,121

## TRANSPORTATION AND MATERIAL MOVING OCCUPATIONS

### 859 MISCELLANEOUS MATERIAL MOVING EQUIPMENT OPERATORS— Con.

Freight trucker—GOV or PR  
Gas-pumping-station operator—450-452  
Gas transfer operator  
Gravel wheeler  
Hack driver—432

Hand trucker  
Hauler—040-050,100,130,132-150,220  
Hazard waste handler  
Hazardous material specialist—Exc. 060  
Headman—040-050  
Heavy-equipment operator, n. s.—100-392

Helper  
Floor—142,180

High rigger—440,810  
Hitcher—Exc. 230  
Hogshead dumper—130  
Irradiated-fuel handler—180-192  
Kiln-transfer operator—231,241  
Laborer, hoisting

Laborer, malthouse—120  
Lander—040-050  
Lead cargoman—421  
Line mover—361  
Load dropper—040-050

Loader, ships or barges  
Loader, n. s.—420  
Loader operator—100-222,241-392  
Log hooker—231  
Log snaker—230,231

Logger, driving horses—Sawmill 231  
Maintenance-of-canal—472  
Manganese wheeler  
Material carrier  
Material loader

Merchandise carrier—580-691  
Merchandise collector—580-691  
Metal buggyman—270,271,281-291,300  
Monitor car operator—040,041,050  
Monorail-car man—130

### 859 MISCELLANEOUS MATERIAL MOVING EQUIPMENT OPERATORS— Con.

Monorail hooker—231,232  
Moveman  
Mule driver—Exc. 010,011,030  
Mule packer—410  
Oil-field pumper

Oil pumper—042  
Oil-well pumper—042  
Oil-well service operator—042  
Oven loader—111  
Pack master—Pack train 410

Package-pick-up boy—591,600,631,661, 663  
Packer, n. s.—Pack train 410  
Palletizer  
Paper handler—171  
Paper stacker

Patrolman—472  
Pick-up boy—100-392  
Pigment pumper—211  
Pigment pusher  
Plane man—041

Plane runner—041  
Plane tender—041  
Pneumatic-hoist operator—060,231, 251,282  
Production-supply-equipment tender—112,121  
Puffer—040-050

Puffer boy—040-050  
Puffer man—040-050  
Puffer tender—040-050  
Pump tender, n. s.—Exc. 590,612-622, 750,751  
Pumper—042

Pumper-gager—180-192,200,422  
Pumper, head—042  
Pumpman—Exc. 590,612-622,750,751  
Rack carrier  
Rackman—Exc. 200,422

Rider—472  
Roll handler—160  
Roll hauler—132-150  
Roll-scale man—270,271,280-291,300  
Roll trucker—160

Routing-equipment tender—110  
Sandfill operator—040-041,050  
Ship loader—(420)  
Shore hand, dredge or barge—040,041, 050,060  
Shore man—040

### 859 MISCELLANEOUS MATERIAL MOVING EQUIPMENT OPERATORS— Con.

Shuttle-buggy operator—040,041,050  
Shuttle-car operator—040,041,050  
Shuttle man—040-050  
Signalman—050  
Silo man—251

Silo operator—130  
Silo tender—251  
Skidder man  
Skip loader—040,041,050  
Skip tender—040,041,050

Slag wheeler—270-291,300-370,400,760  
Snaker, driving horses—230  
Spool boy—132-150  
Spool carrier—132-150  
Spool hauler—132-150

Spragger—040,041,050  
Stacker, machine—231-241  
Staker, n. s.—Any not listed above  
Storer—400  
Stow man—400

Suction man—010  
Supplies packer—Pack train 410  
Tank-car loader  
Teamster, horses or mule  
Tipple man

Tipple operator—041,231,232  
Tipple tender—110  
Tipple worker—041,231,232  
Top cager—040,041,050  
Top carrier—132-150

Top loader—040,041,050  
Transfer-car operator—270,271,280-291,300  
Transfer man—252  
Trolley operator—111  
Truckman—100-392

Utility girl—100-392  
Wagon man—230  
Wagoner—031  
Waste-disposal attendant  
Water carter—230

Water hauler  
Water tender—470  
Wharf tender—420  
Wharfman—420  
Wheeler—Any not listed above

Windlass man  
Windlasser  
Wire wheeler  
Yarn man—132-150  
Zanjero—472

## HANDLERS, EQUIPMENT CLEANERS, HELPERS, AND LABORERS

### 864 SUPERVISORS, HANDLERS, EQUIPMENT CLEANERS, AND LABORERS, N.E.C.

Grip boss—440,800  
 Supervisor  
 Aircraft cleaning—421,931,932  
 Car-wash—750  
 Garbage collector—(471)  
 Labor—Any not listed above  
 Mail handlers, exc. sorting mail—400,412  
 Parking lot—(750)  
 Ramp, n. s.—421  
 Refuse collector—(471)  
 Tank cleaning—420  
 Trash collector—(471)

### 865 HELPERS, MECHANICS AND REPAIRERS

Assistant  
 Blacksmith's  
 Car sander—351,590,612-622,750,751  
 Helper  
 Air-conditioner installer window unit  
 Airframe-&-power-plant-mechanic  
 Armature-winder, repair  
 Automobile-body-repairer  
 Automobile-mechanic  
 Blacksmith's—040-050,230  
 Car mechanic's  
 Construction-equipment-mechanic  
 Cooper's  
 Diesel-mechanic  
 Electrical, automotive  
 Elevator-constructor  
 Elevator-repairer  
 Environmental-control-system installer  
 servicer's  
 Fire-equipment-inspector's  
 Garage—(751)  
 Gas-appliance-servicer  
 Gas fitter's  
 Gas-regulator-repairer  
 Hydroelectric-machinery-mechanic—452  
 Industrial gas service's—452  
 Instrument-repairer  
 Instrument-technician's  
 Last-repairer  
 Locksmith's—(760)  
 Machinist's—040-050  
 Machinist, outside—360  
 Maintenance mechanic  
 Maintenance-repairer, factory or mill  
 Mechanic's  
 Meter-repairer  
 Motorboat-mechanic  
 Ordnance-artificer—932  
 Over hauler  
 Pinsetter-mechanic  
 Powerhouse-mechanic  
 Pump-servicer  
 Refrigeration-mechanic  
 Salvager—200  
 Service-mechanic, compressed-gas equipment  
 Sewing-machine-repairer  
 Signal maintainer  
 Spray-gun-repairer  
 Streetcar-repairer  
 Street-light repairer  
 Street-light-servicer  
 Tractor-mechanic  
 N. s.—751  
 Laborer, n. s.—621,750,751  
 Overhauler, n. s.—100  
 Sander, n. s.—750,751

### 866 HELPERS, CONSTRUCTION TRADES

Assistant  
 Carpenter's  
 Electrician's—060,450  
 Painter's—060  
 Paperhanger's  
 Plumber's  
 Roofer's—060  
 Brick tender—060  
 Bricklayer tender—060  
 Form layer—Exc. bridge construction 060  
 Form setter—Exc. 171,172, bridge construction 060  
 Helper  
 Asbestos worker's  
 Awning hanger's—060,152,682  
 Boat joiner's—360  
 Boring machine operator's—060  
 Bricklayer's firebrick or refractory tile  
 Bricklayer's, n. s.  
 Brickmason's  
 Cabinetmaker's  
 Carpenter's  
 Carpet or rug layer's  
 Cement finisher's  
 Core-drill operator's  
 Core driller's—Exc. 040-050  
 Cupola liner's—270-291,300-370, 400,760  
 Cupola patcher's—270-291,300-370, 400,760  
 Door liner's—270,271,280-291,300  
 Dragline operator  
 Drill runner's—060  
 Electrical, n. s.—450-452  
 Electrician's—060,360  
 Furnace mechanic's—060  
 Gas leak inspector's—450-452  
 Gas main fitter's—450-452  
 Gas meter installer's—450-452  
 Glazier's  
 Hammerman's—060  
 Horizontal-earth-boring machine operator—060  
 Hot top liner's—270,271,280-291, 300  
 Insulator's  
 Joiner's—060,360,361,400-432  
 Ladle liner's—270,271,280-291,300  
 Linoleum layer's—(631)  
 Marble setter's  
 Mason's  
 Metalsmith's  
 Monument setter's  
 Paperhanger's  
 Pile-driver operator's  
 Pipe coverer's  
 Pipe fitter's  
 Plasterer's  
 Plumber's  
 Protective signal repairer's  
 Protective signal installer's  
 Rig builder's—042,060  
 Rigger's—060,200,360  
 Rigging—060,200,360  
 Roofer's  
 Sheet metal worker's  
 Ship painter's—360  
 Shipwright's—360  
 Shot-core drill operator's  
 Spout liner's—270  
 Steam fitter's  
 Stonemason's  
 Test borer's  
 Tile layer's  
 Tile setter's  
 Timber framer's—040,041,050  
 Tinner's

### 866 HELPERS, CONSTRUCTION TRADES—Con.

Helper—Con.  
 Tombstone erector's  
 Tuck pointer's  
 Wash driller's  
 Water-main installer's—470  
 Laborer, construction or leak gang—450-452  
 Mason tender—060  
 Pipe cutter—060  
 Plaster tender—060  
 Plasterer's tender—060  
 Plumber's cub

### 867 HELPERS, SURVEYOR

Aide, n. s.—Surveying 882  
 Assistant  
 Surveyor's—(882)  
 Axman—882  
 Chain carrier—882  
 Chainman—040-050,882  
 Chainman—Highway Commission 060  
 Helper  
 Civil engineer's—882  
 Surveyor's, chain  
 Surveyor's, rod  
 Surveyor's, n. s.  
 Line puller—882  
 Lineman, n. s.—882  
 Note keeper—882  
 Noteman—882  
 Recorder—882  
 Rodman, surveying crew  
 Rodman, n. s.—060,040,041,050,400, 882  
 Stake driver—060,882  
 Stake runner, surveying crew  
 Stake setter—882  
 Stakeman—882  
 Survey crew or survey worker, chainman, rodman, axman  
 Survey rodman  
 Tapeman—400,882

### 868 HELPERS, EXTRACTIVE OCCUPATIONS

Assistant  
 Miner's—040-050  
 N. s.—040-050  
 Helper  
 Blaster's  
 Churn driller's—040-050  
 Clean-out driller's—042  
 Core driller's—040-050  
 Cutter operator's—040-050  
 Derrickman's—042  
 Driller's—042  
 Hammerman's—040-050  
 Joy operator's—041  
 Machine—040-050  
 Miner's  
 Mining  
 Rotary driller's—042  
 Seismograph—042  
 Shale-planer operator's—050  
 Shooter's—042  
 N. s.—040-050  
 Powder carrier

# HANDLERS, EQUIPMENT CLEANERS, HELPERS, AND LABORERS

## 869 CONSTRUCTION LABORERS

Adz man—060  
 Air-breaker operator—060  
 Air-drill operator—060  
 Air-gun operator—060  
 Air-hammer operator—Exc. 040-050  
 Air-tool operator—060  
 Asphalt layer—060  
 Asphalt patcher—060  
 Asphalt paver—060  
 Asphalt raker—060  
 Asphalt smoother—060  
 Asphalt-spreader—060  
 Asphalt tamper—060  
 Asphalt worker—060  
 Axman—060  
 Batch dumper—060  
 Beller—060  
 Bellman—060  
 Belter—060  
 Beltman—060  
 Black-top man—060  
 Black-top raker—060  
 Black topper—060  
 Bottom man—060  
 Breast worker—060  
 Brick carrier  
 Brick cleaner—060  
 Brick washer—060  
 Bridge builder—060,400  
 Broom man—060  
 Brush cutter—060  
 Bull-float finisher—060  
 Burlap man—060  
 Caisson worker—060  
 Cement breaker—060  
 Cement cutter—060  
 Chuck tender—060  
 Cinder crew worker—060  
 Cleane n. s.—060  
 Concre. -buster operator—060  
 Concrete curer—060  
 Concrete handler  
 Concrete layer—060  
 Concrete man—060  
 Concrete mixer—Exc. 251  
 Concrete pourer—060  
 Concrete puddler—060  
 Concrete spreader—060  
 Concrete-vibrator operator—060  
 Concrete worker—060  
 Connection man—060  
 Construction person—060,400,422,451, 452  
 Construction worker  
 Culvert installer—060  
 Demolition-hammer operator—060  
 Demolition man  
 Demolition specialist—292  
 Digger—Any not listed above  
 Dirt shoveler—Exc. 040-050  
 Ditch digger—060  
 Ditch rider—Exc. 010,011,030  
 Ditcher—Exc. 010,011,030  
 Dope pourer—060  
 Dopeman—060  
 Dowel-pin man—060  
 Dredge pipeman—(060)  
 Drifter—060  
 Dust handler—060  
 Fence-post driver—Exc. 010,011,030  
 Fire-pot operator—060  
 Flagman—060,441  
 Flare man—060  
 Form-stripper—060  
 Grade tamper—060  
 Grader, n. s.—060 exc. road maintenance

## 869 CONSTRUCTION LABORERS—Con.

Gravel screener—060  
 Grommet man—060  
 Ground hand—450  
 Groundman—060,401,441,450-452  
 Groundsman—060  
 Groutman—060  
 Grunt—450-452  
 Grunt man—450-452  
 Handyman, n. s.—060  
 Helper  
 Driller's—Exc. 042  
 House mover's—060  
 Pumper's—Exc. 180,182,191,192,200  
 Tree trimmer's—450-452  
 N. s.—060  
 High man—060  
 Hod carrier—060  
 Hole digger  
 Hoseman—060, exc. building insulation  
 Jet man—060  
 Jetting-machine operator—060  
 Joint filler—060  
 Joint sealer—060  
 Kettle firer—060  
 Kettle worker—060  
 Kettleman—060  
 Laborer, construction  
 Laborer, track repair—400,401  
 Laborer, n. s.—060  
 Land clearer—060  
 Macadam raker—060  
 Maintenance man, n. s.—060  
 Manhole stripper—441  
 Mastic man—060  
 Mat man—060  
 Mat weaver—060  
 Mesh man—060  
 Mixer, n. s.—060  
 Mixer tender—060  
 Mixing-plant dumper—060  
 Mop man—060  
 Mortar carrier—060  
 Mortar maker—060  
 Mortar man—060  
 Mortar mixer—060,251  
 Mud-jack nozzleman—060  
 Odd jobs, n. s.—060  
 Oil heaterman—060  
 Paper steamer—060  
 Pick-and-shovel man—060  
 Pile header—060  
 Pile trimmer—060  
 Piling setter—060  
 Pin puller—060  
 Pitman—060  
 Plowman—060  
 Pole setter—060,401,441,450-452  
 Pourer, n. s.—060  
 Powder loader—040-050  
 Puddler—060  
 Rail layer  
 Rail setter—400  
 Repairer  
 Ditch—Irrigation co. 470  
 Pipe line—422,451,452  
 Sewer  
 Sidewalk—(060)  
 Right-of-way clearer—060  
 Right-of-way cutter—060  
 Right-of-way man—400  
 Riprap man—060  
 Rivet flunky—060  
 Road builder—GOV or PR exc. 230  
 Road maker  
 Road mender—060  
 Road patcher—060  
 Road worker—060  
 Rockman—060

## 869 CONSTRUCTION LABORERS—Con.

Rod placer—060  
 Rod puller—060  
 Roughneck—Water well drilling 060  
 Roustabout—060  
 Rubble placer—060  
 Sand hog—060  
 Scoop filler—060  
 Service-line layer—451  
 Sewer builder—060  
 Sewer digger—060  
 Shoveler—060  
 Signaler—060  
 Signalman—060  
 Skilled laborer—060  
 Skip tender—060  
 Sledger  
 Slip dumper—060  
 Slip filler—060  
 Slipman—060  
 Snow-fence erector—(060)  
 Steel layer—Road construction 060  
 Steel placer—060  
 Steel post installer—450-452  
 Stone breaker—060  
 Straightedge man—060  
 Straw boss—060  
 Street worker—060  
 Stripe marker—060  
 Tagman—060  
 Tamper—060  
 Tar kettle runner—060  
 Tar man—060  
 Tar pot man—060  
 Trench digger  
 Tunnel man—Exc. 040,041,050  
 Tunnel mucker—060  
 Tunnel worker  
 Turntable man—060  
 Vibrator operator—060  
 Wagon winder—060  
 Wall cleaner—060  
 Wall scraper—(060)  
 Wall steamer—060  
 Wall washer—060  
 Wallpaper cleaner—060  
 Wallpaper scraper—060  
 Well cleaner—Exc. 042  
 Whitewasher—060

## 874 PRODUCTION HELPERS

Assistant  
 Welder's  
 Busher—Exc. 270,271,280-291,300  
 Helper  
 Aircraft machinist's  
 Anglesmith's—360  
 Annealer's  
 Automatic pad making machine operator's—150  
 Bag machine operator's—161  
 Baker's—Exc. 641,762  
 Bander & cellophaner, machine—130  
 Beamer's—132-150  
 Beater engineer's—160  
 Beater man's—160  
 Beater room—160  
 Benchman's  
 Bender's  
 Bias cutter's—210  
 Bias-machine operator's—210  
 Blacksmith's—Exc. 040-050,230  
 Blanket winder's—161  
 Blast furnace—270  
 Blender's—221  
 Blow down—180,182,191,192



# HANDLERS, EQUIPMENT CLEANERS, HELPERS, AND LABORERS

## 874 PRODUCTION HELPERS—Con.

Helper—Con.  
 Blow pit—160,161  
 Boiler—361,400,401,422  
 Boiler room  
 Boilermaker's  
 Bolter's—110  
 Bottler's  
 Box-blank-machine operator's—241  
 Brass molder's  
 Brewer's  
 Briquette-machine operator's—201  
 Busher—262  
 Butcher's  
 Buzzsaw operator  
 C D mixer's—211  
 Cable splicer's  
 Cable tester's  
 Cableman's  
 Cake-press operator's—180  
 Calendar-let-off—211  
 Calendar-machine operator's—100-392  
 Calendar man's—211  
 Calendar-wind-up—210,211  
 Carbon-furnace operator's  
 Carman's—400  
 Carton forming machine  
 Caster's—270-291,300-370,400,760  
 Casting machine operator's—340-350  
 Casting room—180  
 Catalytic-converter operator's  
 Catcher's—270-291,300-370,400,752,760  
 Cell tender's—191,192  
 Char-filter operator's—121  
 Chrome plater's  
 Clarifier operator  
 Cloth-shrinking machine operator's—132-150  
 Coater—132-150  
 Contact acid plant operator's  
 Cook's—100-392  
 Corrugator's—270,271,280-291,300  
 Cupola melter's—270-291,300-370,400,760  
 Cupola tapper's—270-291,300-370,400,760  
 Cupola tender's—270-291,300-370,400,760  
 Cutting machine tender's  
 Cylinder die machine—161  
 L'airy—101  
 Dental ceramist—372  
 Distillation operator's—192  
 Diver's  
 Doubler's—270,271,280-291,300  
 Drawing-in machine tender  
 Drawbench operator's—270,271,280  
 Dressmaker's—Exc. 100-392  
 Drier—191,192,342  
 Drier operator's—192,211  
 Drop forger's—270-291,300-370,400,760  
 Drop-hammer operator's  
 Dry cleaner's—771  
 Dry kiln operator's—252  
 Dry-press operator's—251,252  
 Dye-reel operator's—132-150  
 Dye weigher's  
 Electric welder's  
 Electrician's—Exc. 060,360  
 Engine house  
 Engine room  
 Etcher's, hand—171,172  
 Evaporator's—121  
 Extractor operator's—192  
 Extruder operator—221  
 Fagot heater's—270,271,280-291,300  
 Feed mixer's—110  
 Felting-machine-operator's—142,150  
 Filer's—231,232  
 Filler shredder's—130  
 Filter tank tender's—110

## 874 PRODUCTION HELPERS—Con.

Helper—Con.  
 Filtering machine tender's—110  
 Fireman's  
 First—270,271,280-291,300  
 Flotation-tender's—040,280  
 Flour blender's—110  
 Forgerman's—270-291,300-370,400,760  
 Forger's—270-291,300-370,400,760  
 Foundry  
 Furnace  
 Furnace mechanic's—Exc. 060  
 Furniture finisher's  
 Hardener's—381  
 Heat treater's—270-291,300-370,400,760  
 Heater engineer's—160  
 Heater room—160  
 Heater's—270,271,280-291,300  
 Ice cream freezer—101  
 Impregnator's—342  
 Installer's—441  
 Iron molder's  
 Jig builder's—351,352,362  
 Keeper's—270,271,280-291,300  
 Kiln burner's—252  
 Kiln operator's  
 Kitchen—112  
 Knitter's—132-150  
 Laboratory  
 Laundry—Exc. 761  
 Lead caster  
 Line—450  
 Lineman's—441,442,450  
 Liner's  
 Liquor bridge operator's—112  
 Lithographer's—(172)  
 Loom fixer's  
 Machine—Exc. 040-050  
 Machinist's—Exc. 040-050  
 Make-up operator's—192  
 Melter's—270,271,280-291,300  
 Miller  
 Miller's, distillery—120  
 Milliner's  
 Millwright's  
 Mold capper's—270,271,280-291,300  
 Mold maker—390,391  
 Molder's—270-291,300-370,400,760  
 Needle punch machine operator  
 Open hearth—270,271,280-291,300  
 Ornamental metal worker  
 Oven heater—270  
 Painter's, auto  
 Pan—191,192  
 Pickler's—100-392  
 Pilot control operator's  
 Piper's—361,400,401,422  
 Plater's  
 Polymerization—221  
 Pressman's—171,172  
 Printer's—100-392  
 Puddler's—270-291,300-370,400,760  
 Pug mill operator's—251  
 Pumper's—180,182,191,192  
 Purification operator's—191,192  
 Radio mechanic's—(752)  
 Reagent tender's  
 Reheater's—270,271,280-291,300  
 Retort furnace—272,280  
 Rigger's—352,362  
 Riveter's—270-291,300-370,400,760  
 Roller's—270-291,300-370,400,752,760  
 Rolling mill operator  
 Rotary shearman's—270,271,280-291,300  
 Rougher's—270,271,280-291,300  
 Sawyer's  
 Second—270,271,280-291,300

## 874 PRODUCTION HELPERS—Con.

Helper—Con.  
 Section hand—132-150  
 Serviceman's—450  
 Sheet heater's—270,271,280-291,300  
 Shiplifter's—360  
 Shipping room  
 Sign painter's  
 Signal—400  
 Signalman's—400  
 Sirup mixer's  
 Slat-basket maker  
 Slime plant operator's  
 Slitting machine operator's  
 Slotter operator's  
 Spar machine operator  
 Spiral tube winder's  
 Splicer's—441  
 Splitting machine operator's  
 Station—400  
 Steel pourer—270-291,300-370,400,760  
 Still operator's  
 Stillman's—100-392  
 Stitch bonder machine operator  
 Stranding machine operator  
 Switchboard wireman's—441  
 Tailor's  
 Tapper's—270,271,280-291,300  
 Third—270,271,280-291,300  
 Tomb maker's  
 Toolmaker's  
 Toolroom—310,312-320,331  
 Treater's  
 Treating engineer's—231-242  
 Tube machine operator's  
 Tumbler machine operator's  
 TV installer's—(752)  
 Upholsterer's  
 Veneer clipper  
 Wash-oil pump operator's  
 Washer engineer's—160,161  
 Water-gas—451  
 Welder's  
 Wet-end—180  
 Wire weaver  
 N. s.—760  
 N. s.—Mfg. not listed above  
 Hide splitter—220  
 Hot-box checker—400  
 Hot box operator  
 Hot-box spotter—400  
 Rack puller—111  
 Scrap breaker—270,271,280-291,300  
 Tailor's aide  
 Tandem-mill sticker—270-291,300-370,400,760  
 Tire bagger—210  
**875 GARBAGE COLLECTORS**  
 Ash collector—471  
 Collector—471  
 Disposal man—471  
 Dumpman—471  
 Engineer  
 Sanitation, garbage or trash collection  
 Garbage collector, exc. truck driver—(471)  
 Garbage man—(471)  
 Garbage pick-up man—(471)  
 Helper  
 Garbage truck—471  
 N. s.—471  
 Refuse collector  
 Rubbish collector, exc. truck driver  
 Sanitation man, n. s.—471  
 Trash collector, exc. truck driver—(471)  
 Waste collector

# HANDLERS, EQUIPMENT CLEANERS, HELPERS, AND LABORERS

## 876 STEVEDORES

Banana carrier—420  
Banana handler—420  
Banana loader—420  
Boom-storage man—420  
Buggyman—420

Cargo bracer—420  
Cargo handler—420  
Cargo man—420  
Cargo-station man—420  
Cargo trimmer—420

Coal shoveler—420  
Coal-wheeler  
Cotton jammer—420  
Flag signalman—Dock 420  
Freight handler—420

Freight loader—420  
Freight unloader—420  
Gang leader—Stevedoring co. 420  
Gang-plank workman—420  
Grain handler—420

Grain trimmer—420  
Hold man—420  
Laborer, dock or pier—420  
Laborer, wharf  
Longshoreman, n. s.—420

Lumper—420  
Ore puncher—(420)  
Pierman—200  
Puncher—420  
Ship fastener—(420)

Snubber—420  
Stevedore, exc. operating material handling equipment—(420)  
Trestleman—420  
Trimmer, n. s.—420  
Trucker—420

Truckman—420  
Unloader—420  
Wheeler—420

## 877 STOCK HANDLERS AND BAGGERS

Assembly-line service—100-392  
Bag boy—601  
Bagger—Exc. 040-050,151,771  
Basin cleaner—Sewer 471  
Box boy—601

Box-order girl—Hosiery 132  
Boxer—601,610,611  
Bundle boy—601  
Bundle girl—591,663  
Caddy—601

Caddy boy—601  
Car boy—601  
Car hop—601  
Carry-out boy—601  
Carry-out boy and shelf stocker—580-691

Cart boy—601  
Clerk, stocking, stocks shelves and delivery—500-691  
Clerk, n. s.—550,601  
Coal bagger—672  
Courtesy boy—591,601,611

Floorperson, stock handler  
Freezer man—102,121  
Freezer unloader—102,121  
Goods layer—142  
Grocery caddy—550,601

## 877 STOCK HANDLERS AND BAGGERS —Con.

Grocery carrier  
Grocery clerk, stocking—550,601  
Grocery clerk, n. s.—550,601  
Grocery sacker—550,601

Helper  
Stock handler, baggers—500-691  
Stockroom

Icebox man—101,550,602  
Laborer, n. s.—601  
Make-up man—060,100-162,180-392.  
Material chaser—100-392  
Order filler, n. s.—Exc. 641  
Package boy

Package collector—580-640,642-691  
Packer and carry-out boy  
Paper stripper—161,171,172  
Parcel boy—580-691  
Parcel carrier—580-691

Parcel-pick-up man—601  
Parts runner, exc. delivery  
Pattern boy—151  
Produce clerk—601  
Produce man—601

Produce runner—550  
Refrigeration houseman—100  
Sack boy—601  
Sack filler  
Sacker—Exc. 010,030

Sacker and carry-out boy—601  
Service boy, n. s.—100-392,591  
Service girl—100-392  
Shelf stocker—500-691  
Stock boy

Stock boy and deliverer—601  
Stock clerk, delivery—601  
Stock clerk, stock shelves—500-691  
Stock girl  
Stock handler

Stock shelves and deliver—601  
Stock shelves and or carry out—580-691  
Stock sorter—432  
Stock taker  
Stock unloader

Stock work and or carry out—580-691  
Stockman—500-691  
Store clerk, stocking  
Store clerk, n. s.—601  
Store hand—580-691

Supply boy  
Supply man, exc. clerical  
Transfer girl

## 878 MACHINE FEEDERS AND OFFBEARERS

Acid dumper—340-350  
Asbestos-shingle-shearing machine operator—262  
Assembly-machine operator, pen or pencil—391

Assistant  
Printer's, floor covering—391

Back feeder, plywood layup line—231  
Back tender—132-150  
Bag sewer exc. textile—Exc. 132,142, 150  
Bakery worker  
Ball-machine operator—112  
Bar catcher—270,271,280-291,300

Barking-machine feeder—231-242  
Base remover—340-350  
Batch m. er—251,252  
Batch trucker—210  
Bead picker—211

Beam carrier, hauler, man, pusher—132,150  
Beam-racker—132-150  
Beater and pulper  
Belt-knife feeder—221  
Belt-line feeder—100-392

## 878 MACHINE FEEDERS AND OFFBEARERS—Con.

Belt sander, stoneworking  
Beveling-machine operator—132,151, 152,161,390,391  
Bisque placer—261  
Block-breaker operator—180,182,191, 192  
Block feeder—391

Block handler—160-162  
Blower feeder, dyed raw stock—132-150  
Board catcher—100-392  
Bobbin-cleaning-machine operator—132-150  
Bone-char operator—180-192

Boom man—160  
Box stacker  
Brake lining curer  
Break-off worker—231,232  
Brick catcher—252

Brick loader  
Brick off-bearer—252  
Broomcorn scraper—391  
Broomcorn seeder—391  
Bulb filler—342

Bundle sorter—231,232  
Bundles hanger—130  
Burr grinder—372  
Cake knocker—121  
Cake puller—121

Cake puncher—121  
Calcine furnace loader—190  
Calender feeder—211  
Can boy—132-150  
Can carrier

Can dragger—132-150  
Can doffer—132-150  
Can feeder—100-392  
Can pusher—132-150  
Cane feeder—112

Carbon-rod inserter—340-350  
Card boy—132-150  
Carrotting-machine offbearer—151  
Carry-in boy—250  
Carton-counter feeder—130

Casing cleaner—100  
Casing-in-line feeder—171,172  
Casing-machine operator—100  
Catcher—100-122,132-252,261-392,400, 760  
Cell stripper—180

Cementer, machine applicator—221  
Chain offbearer—231,241  
Chainman—231  
Chicle-grinder feeder—112  
Chip-crusher operator—272,280

Chip drier—272,280  
Chip washer—120  
Chipman—120  
Chipper feeder—160  
Chute feeder—Exc. 230

Cigar-machine feeder—130  
Cigarette-making-machine hopper feeder—130  
Cleat feeder—241  
Cleat layer—241  
Clip-loading-machine feeder—292,362

Clipper, machine—132  
Cloth doffer—132-150  
Cloth feeder—132-150  
Cloth-printing utility worker—132,150  
Clothespin machine operator—241

Coal feeder operator—270  
Coaling-machine feeder—221  
Color drier—132,150  
Compound-coaling-machine offbearer—300  
Comp. m. er—180,181,192

Comp. m. er—100-392  
Comp. m. er—100-392  
Comp. m. er—100-392  
Comp. m. er—100-392  
Comp. m. er—100-392  
Comp. m. er—100-392  
Comp. m. er—100-392  
Comp. m. er—100-392

AR300078

# HANDLERS, EQUIPMENT CLEANERS, HELPERS, AND LABORERS

## MACHINE FEEDERS AND OFFBEARERS—Con.

n feeder—142  
 n puller—121  
 n washer—180  
 n wringer—180  
 n-sorting machine feeder—391  
 er—211  
 er feeder—050  
 la charger, insulation—160,161, 251  
 station operator—112,121  
 worker—110  
 r, brush or broom—391  
 r, wet machine—160  
 g-machine offbearer—152  
 ler-press feeder—171,172  
 man—PR 101  
 hand, n. s.—031  
 ery-table feeder—270,291,300, 400,760  
 ert-cup-machine feeder—111  
 aticizer feeder—381  
 lcanizer charger—211  
 ster hand—100,392  
 tand loader—132-150  
 r—132-150  
 —132-152  
 attendant—151  
 feeder—100-210,212-392  
 operator—132-152  
 hain operator—231  
 hain puller—231  
 hain worker—231  
 iln feeder—231-242  
 iln loader—231-242  
 g-oven attendant—132,151  
 er  
 mill operator—132-150  
 -banding-off bearer—231,232,242  
 runner—251  
 g-machine feeder—250  
 ouching machine operator—241  
 bing-machine feeder—112  
 ct puller—Naval stores 192  
 ctor loader & unloader—192  
 er-curling-machine operator—(152)  
 er-cutting-machine feeder—(152)  
 er-drying machine operator—(152)  
 in worker—110  
 er-catcher, tobacco—130  
 hanger—(251)  
 tipping machine tender—391  
 feeder—130  
 hing machine operator—160  
 -breaker feeder—150  
 boning-machine feeder—121  
 dressing-machine feeder—100,121  
 machine feeder—121  
 skinning-machine feeder—121  
 straightener—121  
 rperson, machine feeder  
 oy—171,172  
 ing-machine feeder—171,172  
 ie feeder—192  
 ing-machine operator—132  
 g-furnace loader—372  
 g-machine feeder—151  
 j tailer—231,232  
 ering-machine feeder—171,172  
 s-vial-bending conveyor feeder—281  
 ing operator, black powder—192  
 t placer—261  
 e former, automatic  
 g-machine offbearer—241  
 er, machine—Exc. 231-242  
 n-chain-off-bearer—231  
 n-chain operator—231  
 n-chain puller—231

## 878 MACHINE FEEDERS AND OFFBEARERS—Con.

Green-chain worker—231  
 Green chainer—231  
 Green chainman—231  
 Grey-cloth tender, printing—132-150  
 Guider—391  
 Hacker—252  
 Hair spinner—100-392  
 Hair-spinning-machine operator—391  
 Hat-forming machine feeder—132,151, 152,161,390,391  
 Hay-sorter, archery equipment—390  
 Head machine feeder  
 Heat curer—132-150  
 Helper  
 Abrasive mixer's—(251)  
 Beveling & edging machine operator's—250  
 Charger operator's—270,271,280- 291,300  
 Cocoa bean roaster's—112  
 Compounder's—200  
 Corrugator operator's—161  
 Crutcher's—182  
 Digester operator's—160,251  
 Edger machine—262  
 Factory  
 Hot metal mixer operator's—270, 271,280- 291,300  
 Long-goods, machine—121  
 Mill operator's  
 Molder's—372  
 Multiple-drum sander's—241  
 Paper-processing machine—160,161  
 Photostat operator's  
 Pig-machine operator's—270,271, 280- 291,300  
 Pole-peeling-machine operator's—241  
 Press—212  
 Printer-slotter's—161  
 Reduction-furnace operator's—180, 191,192  
 Roof-cement & paint maker's  
 Rug cleaner's—771  
 Rug cutter's—141  
 Scorer—161  
 Slasher tender's—132-150  
 Slice-plug-cutter operator's—130  
 Slitter-creaser-slotter's—161  
 Stone driller's—262  
 Stretcher leveler operator's—272, 280  
 Tester operator's—272,280  
 Top-precipitator operator's—180, 280  
 Trimmer's—231,232  
 Tuber machine operator's—210,211  
 Turning-machine operator's—241  
 Veneer jointer's—231,232  
 Wrapping machine—130  
 N. s.—112,121  
 Hog feeder—231-242  
 Hog man—231-242  
 Hoop coiler—241  
 Hopper feeder  
 Hopper filler  
 Hopper man  
 Horser-up—220  
 Hose cutter, machine—201  
 Hose tubing backer—211  
 Injection molding machine off-bearer—391  
 Jogger—171,172  
 Kiln loader—100-112,121-150,152-392  
 Kiln placer—261  
 Kiln remover—100,150,152-392  
 Knocker—121  
 Laborer, electroplating—300  
 Laborer, hot-plate plywood press—231  
 Laborer, pie bakery—111  
 Laborer, shellfish processing—121  
 Laborer, vat house—192  
 Laborer, n. s.—181,210,211,272,280, 340-350

## 878 MACHINE FEEDERS AND OFFBEARERS—Con.

Laminated plastic tabletop molding wrapper—242  
 Lath puller—231  
 Layer—250  
 Loader, magazine grinder—160  
 Loader, n. s.—180,182,191,192,200  
 Loader-unloader, screen-printing—132-150  
 Loading machine operator—290,291,300  
 Log feeder—230,231  
 Lowerator operator—141  
 Lumber tailer—230,231  
 Machine feeder—100-392  
 Machine tailer—231-242  
 Magazine feeder—290,291,300  
 Magazine filler—132-150  
 Magazine hand—132-150  
 Mangle-press catcher—132-150  
 Matcher off-bearer—231-242  
 Material distributor—100-392  
 Mending carrier—132  
 Mica-laminating machine feeder—262  
 Mirror machine feeder—250  
 Mottler-machine feeder—391  
 Nail-polish brush machine feeder—391  
 Nailing-machine feeder—231,232  
 Necker—Exc. 250  
 Nut chopper—102,112,121  
 Odd bundle worker—130  
 Off-bearer—100-392  
 Opener, hat & cap—132,151  
 Order filler, linseed oil—121  
 Outsole flexer—221  
 Package crimper—132-150  
 Packing floor worker—130  
 Packing-machine can feeder—130  
 Pad-machine feeder—231,232  
 Paint pourer—391  
 Paper-bag press operator—161  
 Perfect-binder-feeder-offbearer—171, 172  
 Pig-iron loader—270,271,280-291,300  
 Pillowcase turner—152  
 Pin maker  
 Pitch worker—372  
 Placer—252  
 Planer feeder—231-242  
 Planer off-bearer—231  
 Planer tailer—231-242  
 Planning feeder—231,232  
 Plastic-design applier—221  
 Plate-take-out worker—340-350  
 Plug shaper, machine—130  
 Poly-packer & heat sealer—372  
 Pond worker—160,231  
 Pony rougher—270,271,280  
 Preparation room worker—262  
 Press buckler  
 Press feeder—Exc. 171-172  
 Print-line feeder—242  
 Print-line tailer—242  
 Pulp-grinder feeder—160  
 Pulverizer feeder—100-392  
 Quill boy—132-150  
 Quill cleaner—132-150  
 Quill collector—132-150  
 Quill Skinner—132-150  
 Quill stripper—132-150  
 Rack loader—130,391  
 Racker, n. s.—Exc. 111,381,802  
 Rag-cutting-machine feeder  
 Raised printer—171,172  
 Reed-press feeder—160,161,251  
 Resaw tailer—231-242  
 Retort unloader—192  
 Rip tailer—231-242  
 Rockman—121  
 Rodman, n. s.—132-150

## HANDLERS, EQUIPMENT CLEANERS, HELPERS, AND LABORERS

### 878 MACHINE FEEDERS AND OFFBEARERS—Con.

Rotary-cutter feeder—160  
 Rotary-drier feeder—180,191,192  
 Rubber-roller grinder—391  
 Ruling-machine feeder—171-172  
 Sander, stoneworking  
 Saw feeder—231-242  
 Saw tailer—231-242  
 Sawyer—262  
 Scrap sorter—272,280  
 Seal mixer—340-350  
 Sequins spooler—212  
 Service worker—100-392  
 Shake loader—231-242  
 Sheet tailer—231-242  
 Shingle catcher—231-242  
 Shredded-filler hopper feeder—130  
 Shuttle hand—132-150  
 Skinning machine feeder—100  
 Slab puller—231,232  
 Slab stripper—231,232  
 Slabber—182  
 Slabman—231,232  
 Slicing machine tender—241  
 Slip feeder—231,232  
 Soap chipper—182  
 Spike-machine heater—270-280  
 Spike-machine feeder—270-280  
 Splitting-machine feeder—222  
 Spooler operator—132-150  
 Spout tender—180,192 exc. salt  
 Spray-machine loader—261  
 Spray-unit feeder  
 Stacker, automatic—300  
 Stacker tender—231,232  
 Stave-planer tender—231,232  
 Steak tenderizer, machine—100  
 Steam-tunnel feeder—231,232  
 Stem sizer—391  
 Sticker, n. s.—231,232  
 Stitching-machine-feeder offbearer—171-172  
 Strander—270,271,280-291,300  
 Stranner—270,271,280-291,300  
 Strip catcher—231,232  
 Stripper, machine—370  
 Stripper, n. s.—210-212  
 Suppository-molding-machine operator—181  
 Sweatband cutting-machine operator—151  
 Sweatband flanger—151  
 Swing tender—132-150  
 Switch maker—100-392  
 Tabber—352,362  
 Table worker, n. s.—222  
 Tableman—231,232  
 Tag stringer  
 Tagger  
 Tail boy—231-242  
 Tail dogger—231-242  
 Tailer—231-242  
 Tailer-off—231-242  
 Take-away man—231,232  
 Take-off boy—100-392  
 Take-off girl—100-392  
 Take-off man—100-392  
 Taker—220  
 Taker-off, n. s. or any specified—100-392  
 Temple marker—100  
 Thermograph operator—172  
 Thread-pulling-machine attendant—151  
 Threading-machine feeder, automatic—331  
 Tobacco-cloth reclaiming—150  
 Tobacco hanger—130  
 Top-dyeing machine loader—132-150  
 Tray filler—130  
 Tripper—231,232  
 Tube handler—132-150

### 878 MACHINE FEEDERS AND OFFBEARERS—Con.

Turn-down man—231,232  
 Twisting-machine operator—340-350  
 Unscrambler—102,121  
 Utility man—112  
 Veneer-drier feeder—231-242  
 Veneer-jointer offbearer—231,232  
 Veneer-stock layer—231-241  
 Ware server—250  
 Warp boy—132-150  
 Warp coiler—132-150  
 Warp hauler—132-150  
 Warp placer—132-150  
 Warpman—132-150  
 Washing-machine loader & puller—771  
 Waste chopper, waste & batting—150  
 Waste machine offbearer—150  
 Waste-paper-hammermill operator—160  
 Weight checker—100-392  
 Wet cotton feeder—132-150  
 Wire charger—340-350  
 Wire threader—381  
 Wood handler—160  
 Woodworking-machine feeder—231-242  
 Woodworking-machine offbearer—231-242  
 Wool-washer feeder—132-150

### 883 FREIGHT, STOCK, AND MATERIAL HANDLERS, N.E.C.

Assorter—Any not listed above  
 Bad-work gatherer—130  
 Bale piler—132-150  
 Bale stacker  
 Barrel handler  
 Barrel loader  
 Battery stacker—342  
 Beef lugger—100  
 Beef pusher—100  
 Blender laborer—130  
 Block piler  
 Block stacker  
 Board runner—261  
 Board turner—231-242  
 Bolt loader—241  
 Bottle carrier—250  
 Box-car bracer  
 Box-car loader  
 Brick pitcher—252  
 Brick stacker—(252)  
 Brick tosser—252  
 Bucket pusher—251  
 Buggy loader—231,232  
 Bulk loader—552  
 Bulk-sugar handler—112  
 Bull-gang worker—Exc. 231  
 Bull-wheel man—231  
 Bundle collector—580-691  
 Cage loader—270,271,280-291,300  
 Cage unloader—270,271,280-291,300  
 Cager—040,041,050  
 Can handler—102  
 Can piler—100  
 Car blocker—100-222,231-392  
 Car bracer  
 Car hop—101,550,602  
 Car knocker  
 Car loader  
 Car packer—400  
 Car pincher—Coke 270  
 Car storer  
 Car stower  
 Car unloader  
 Cargo handler—Exc. 420  
 Cargo head—421

### 883 FREIGHT, STOCK, AND MATERIAL HANDLERS, N.E.C.—Con.

Cargo man—421  
 Chain puller—231  
 Chainman—270,271,280-291,300  
 Chute man—Exc. 040-050  
 Clay carrier—261  
 Coal loader—041,672  
 Coal passer  
 Coal-trimmer—Exc. 420  
 Coal unloader—100-392  
 Cokeman  
 Conveyor loader—100-392  
 Core piler—270-291,300-370,400,760  
 Core stacker—270-291,300-370,400,760  
 Crumb packer—180  
 Dock hand—Any not listed above  
 Drum handler—210,211  
 Dry-yard man—102  
 Dry-yard worker—102  
 Dumpman—Exc. 171,172,471  
 Dust puller—272,280  
 Feed handler  
 Fertilizer loader—Fertilizer 582  
 Floor attendant—250  
 Floorperson, n. s.—TV. Broadcasting Co. 440  
 Fly man—800  
 Flyer—440,810  
 Freezer worker  
 Freezing room worker—102,121  
 Freight-car loader—(400)  
 Freight handler—Exc. 420  
 Freight hustler—400  
 Freight loader—Exc. 420  
 Freight man  
 Freight sorter  
 Freight unloader—Exc. 420  
 Fruit dumper—102  
 Furniture mover  
 Glass carrier—250  
 Glass handler—250  
 Glaze carrier—261  
 Grain handler—551  
 Grain scooper  
 Grain shoveler  
 Green-end man—231  
 Grey-roll man—132-150  
 Grip—440,800  
 Gripman—440,800  
 Guideman—060  
 Gum puller—112  
 Ham passer—100  
 Handler—Exc. 261  
 Helper  
 Boat loader's—420  
 Car dumper operator's—120  
 Deliveryman's  
 Furniture mover's  
 Loader's  
 Loading dock—101  
 Mover's  
 Mud-mixer's—Coke 270  
 Naphthalene operator's—Coke 270  
 Setter's—252  
 Transfer-table operator's—361,400  
 Truck driver's  
 Van driver's  
 N. s.—410  
 Ice-cream vaultman—(101)  
 Iron carrier—270-291,300-370,400,760  
 Iron handler—270,271,280-291,300  
 Iron piler—270,271,280-291,300  
 Kiln puller—231-242  
 Kiln pusher—231-242  
 Laborer, n. s.—401,402,410,411  
 Lead setter—190  
 Leaf tier—130  
 Lime-kiln man—112  
 Line palletizer, stacking boxes on pallets

## HANDLERS, EQUIPMENT CLEANERS, HELPERS, AND LABORERS

### 883 FREIGHT, STOCK, AND MATERIAL HANDLERS, N.E.C.—Con.

Line-service attendant, loading, unloading—421  
 Line service man, woman—100-392  
 Lithopone charger—190  
 Loader, n. s.—Any not listed above  
 Loader operator—230-232

Loading-dock hand  
 Log buncher—230,231  
 Luger  
 Lumber bearer—Sawmill 231  
 Lumber carrier

Lumber handler  
 Lumber loader—230,231  
 Lumber mover  
 Lumber piler  
 Lumber stacker

Lumber straightener—230,231  
 Mail handler, exc. sorting mail—400, 412  
 Material handler  
 Meat carrier—100  
 Meat lugger—100

Meat passer—100  
 Meat puller—100  
 Metal handler—270-391  
 Metal loader—270,271,281-291,300  
 Milk handler—400

Mold runner—261  
 Mover—PR Exc. machinery moving 410  
 Moving man—PR 410  
 Munitions handler  
 Offal icer, poultry—100

Offal man, poultry—100  
 Package sorter—400-421  
 Passer—100  
 Piano mover—(410)  
 Piler—Exc. 132-150

Pipe roller—252  
 Platform loader  
 Platform man—Any not listed above  
 Potato loader—Exc. 010,030  
 Prop man—800

Property man—800  
 Rack pusher—221  
 Rackman—200,422  
 Ramp attendant, n. s.—421  
 Rampman, food or baggage handling—421

Rampman, n. s.—421  
 Recording-studio set-up worker—741  
 Refrigerator mover—410  
 Retort forker—192  
 Retort loader—192

Rod piler—270,271,280-291,300  
 Roll carrier—132-222,392  
 Roving boy—132-150  
 Roving carrier—132-150  
 Roving girl—132-150

Roving hand—132-150  
 Roving hauler—132-150  
 Runner, n. s.—100  
 Sack lifter—110  
 Salt lifter—192

Scene shifter—440,800  
 Scrap carrier  
 Scrap collector  
 Scrap-iron loader—511  
 Shackler—100

Shank carrier—100  
 Shed man—231-242  
 Shingle carrier  
 Skin piler  
 Snow shoveler

Spreader—100  
 Stacker, n. s.  
 Stage hand—(800)  
 Stage man—440,800  
 Steel handler

### 883 FREIGHT, STOCK, AND MATERIAL HANDLERS, N.E.C.—Con.

Steel unloader—270,271,280-291,300  
 Stock hanger—220  
 Stock-house man—270,271,280-291,300  
 Stock lifter—160  
 Stock mover

Stock puller  
 Stockman—160,270,271,280-291,300  
 Storage man—121  
 Taker-away—100  
 Taker-down—220,250

Taker-out—250  
 Tare man—142  
 Terminal worker—410  
 Tie loader—400  
 Tin stacker—300

Tire layer—210  
 Tosser—100,252  
 Tray boy, n. s.—102,121  
 Truck bracer  
 Truck loader

Truck loader and unloader  
 Truck packer—400  
 Unloader—Exc. 420  
 Van loader  
 Vault man—101,121,550,602

Vegetable handler—432  
 Vessel scrapper—270,271,280-291,300  
 Ware boy—261  
 Ware carrier—261  
 Waste hand—132-150

Wharf tender—Coke 270  
 Wharf worker—420  
 Wharfman—Coke 270  
 Wool supplier—132-150  
 Work distributor—100-392

Yarn boy—132-150  
 Yarn carrier—132-150  
 Yarn hauler—132-150

### 885 GARAGE AND SERVICE STATION RELATED OCCUPATIONS

Attendant, n. s.—621  
 Attendant, n. s.—552,590,612-622,751  
 Auto servicer—PR 621  
 Auto-tire man  
 Automobile-self-service-station attendant—(621)

Automobile-service-station attendant—(621)  
 Battery charger—590,612-622,750,751  
 Boat fueler—420  
 Bus greaser—(401)  
 Car greaser—590,612-622,750,751

Car lubricator—590,612-622,750,751  
 Car servicer  
 Curb boy—621  
 Drive man—590,612-622,750,751  
 Driveway attendant—621  
 Employee—621  
 Filler—621

Filling-station attendant—PR or WP 621  
 Filling-station laborer—621  
 Front attendant—590,612-622,750,751  
 Front man—621  
 Fueler—401-410,621  
 Garage attendant—(751)

Garage hand—(750)  
 Garage laborer—(751)  
 Garageman—GOV or PR 412,750,751  
 Gas attendant, pumping gasoline, servicing cars, etc.—590,612-622, 750,751  
 Gas attendant, n. s.—590,612-622,750, 751

Gas dispenser—590,612-622,750,751  
 Gas jockey—590,612-622,750,751  
 Gas pumper—590,612-622,750,751  
 Gas station attendant—PR 621  
 Gasateria attendant—590,612-622,750, 751

### 885 GARAGE AND SERVICE STATION RELATED OCCUPATIONS—Con.

Gasoline attendant—590,612-622,750, 751  
 Gasoline service man—590,612-622; 750,751  
 Grease man—590,612-622,750,751  
 Grease monkey—410,590,612-622,750, 751  
 Grease-rack worker—590,612-622,750, 751

Greaser—401,590,612-622,750,751  
 Hand, n. s.—621  
 Handyman, n. s.—590,612-622,750,751

Helper  
 Laborers, n. e. c.—621  
 Service station—621  
 N. s.—PR or WP 621  
 N. s.—Service station 621

Line-service attendant, fueling, refueling  
 Lot boy—612  
 Lot man—612  
 Lubricating specialist—590,612-622, 750,751  
 Lubrication man—590,612-622,750,751  
 Lubrication servicer—590,612-622, 750,751  
 Lubricator—590,612-622,750,751  
 Luke man—590,612-622,750,751

Mechanic  
 Tire

Nightman—590,612-622,750,751  
 Parts chaser—590,612-622,750,751  
 Pitman—590,612-622,750,751  
 Pump attendant—590,612-622,750,751  
 Pump operator—590,612-622,750,751  
 Pump tender, n. s.—590,612-622,750; 751  
 Pumpman—590,612-622,750,751

Repairer  
 Tire—210,590,612-622,750,751

Rim buster—590,612-622,750,751  
 Sales attendant—621

Salesperson  
 Gas station, exc. cashier—PR 621  
 Gas station, n. s.—PR 621  
 Service station, exc. cashier—PR 621  
 Service station, n. s.—PR 621  
 N. s.—PR 621

Service boy, n. s.—621,750,751  
 Service-station attendant—Exc. OWN 621  
 Serviceman, n. s.—621  
 Servicing cars, pumping gas, etc.  
 Station attendant, pumping gasoline or servicing cars—PR or WP 612-622, 750,751  
 Station attendant, n. s.—PR or WP 612-622,750,751

Stationman—PR 621  
 Tankman—590,612-622,750,751  
 Tender, n. s.—621  
 Tire changer  
 Tire fixer

Tire man  
 Tire moulder—580-691,750,751  
 Tire service man  
 Truck greaser—590,612-622,750,751  
 Used-car-lot man—612  
 Utility man—590,612-622,750,751

### 887 VEHICLE WASHERS AND EQUIPMENT CLEANERS

Aircraft cleaner  
 Airplane cleaner—421  
 Apparatus cleaner—441  
 Assembly cleaner—040,280  
 Attendant, n. s.—Car wash 750

Auto cleaner  
 Auto detailer—351,612,750,751  
 Auto or automotive porter  
 Auto polisher—(751)  
 Auto washer

Barrel cleaner—Exc. 292  
 Barrel washer  
 Beer-coil cleaner  
 Bell cleaner—270,271,280-291,300  
 Belt cleaner—310

# HANDLERS, EQUIPMENT CLEANERS, HELPERS, AND LABORERS

## 887 VEHICLE WASHERS AND EQUIPMENT CLEANERS—Con.

Bin cleaner—110,120  
 Blanket washer—040  
 Blow-off man  
 Body cleaner—351  
 Boiler blower—270,271,280-291,300  
 Boiler cleaner  
 Boiler-tube blower  
 Boiler washer  
 Booth cleaner—Auto 351  
 Box-car washer  
 Box-truck washer—100  
 Brush cleaner  
 Buffer, auto wash  
 Bus cleaner—(401)  
 Bus washer—(401)  
 Cabin cleaner, aircraft  
 Can cleaner  
 Can washer  
 Car carder—721  
 Car cleaner, exterior—400  
 Car cleaner, n. s.—Exc. 040-050  
 Car conditioner—590,612,622  
 Car cooper  
 Car detailer—351,612,carwash 750,751  
 Car dryer—590,612-622,750,751  
 Car scrubber—361  
 Car washer  
 Car wiper—590,612-622,750,751  
 Catch-basin cleaner—(760)  
 Cell cleaner—181-192  
 Cesspool cleaner—(760)  
 Char puller—112  
 Cleaner, buses, cars, trucks  
 Cleaner, equipment or machinery  
 Cleaner, n. s.—151,221  
 Coke-still cleaner—200  
 Condenser cleaner—280  
 Container washer  
 Cooker cleaner—102  
 Core cleaner—270-291,300-370,400,760  
 Cutch cleaner—300  
 Detailer, n. s.—612,750,751  
 Die cleaner—100-392  
 Dishwashing-machine operator—111  
 Drum cleaner—100-392  
 Engine cleaner—400  
 Engine wiper—400  
 Equipment cleaner  
 Filter changer—180  
 Filter cleaner—180,380  
 Filter-screen cleaner—120  
 Filter washer—192  
 Flue blower  
 Flue cleaner  
 Flusher—110  
 Freight-car cleaner—400  
 Furnace cleaner  
 Glass cleaner—351  
 Harness brusher—132-150  
 Harness cleaner—132-150  
 Head porter, cleaning—590,612-622, 750,751  
 Helper  
 Screen tender's—160  
 N. s.—750  
 Kerrick-kleaner operator—421  
 Kettle cleaner—120  
 Kln cleaner—251,252  
 Last cleaner—221  
 Latrine cleaner—040,041,050  
 Laundry attendant—750,751  
 Lingo cleaner—132-150  
 Loom blower—132-150  
 Loom cleaner—132-150  
 Machine cleaner  
 Machine wiper—100-392

## 887 VEHICLE WASHERS AND EQUIPMENT CLEANERS—Con.

Machinery cleaner  
 Mill washer—210,211  
 Millstone cleaner—190  
 Mold cleaner—Exc. 210  
 Mold-sheet cleaner—300  
 Net washer—211  
 New-car-make-ready man, exc. mechanic  
 Oil-tank-car cleaner  
 Pan boy—111  
 Pan cleaner—Exc. 641  
 Pan washer—111  
 Plate cleaner  
 Platemanager—180  
 Polisher, n. s.—590,612-622,750,751  
 Porter, cleaning—590,612-622,750,751  
 Porter, used car lot—500,612  
 Porter, n. s.—590,612-622,750,751  
 Press cleaner—171,172  
 Press washer—121,171,172  
 Rack washer—100  
 Rail washer—132-150  
 Reed cleaner—132-150  
 Roll cleaner—132-150  
 Roll picker—132-150  
 Roller cleaner—132-150  
 Roller picker—132-150  
 Rotor-plate washer—340-350  
 Sand blaster—751  
 Sanitation man, cleaning equipment  
 Sanitation man, cleaning machinery  
 Sanitation man, hosing docks & pens—100  
 Sanitation man, hosing machinery  
 Sanitation man, n. s.—101  
 Saw cleaner—231,232  
 Scraper—100-392  
 Screen cleaner—160,161,211,251  
 Shaker washer—110  
 Shield cleaner—270,271,280-291,300  
 Ship cleaner—(420)  
 Ship washer—(420)  
 Simonizer—590,612-622,750,751  
 Soapstoner—210  
 Spinneret cleaner—180  
 Spinning-frame cleaner—132-150  
 Stator-plate washer—340-350  
 Steam cleaner—590,612-622,750,751  
 Steamer—750  
 Sterilizer—120  
 Still cleaner—100-392  
 Stone cleaner—120  
 Stove cleaner—270,271,280-291,300  
 Suction-plate-carrier cleaner—130  
 Switch cleaner—401  
 Talcer—210  
 Tank-car cleaner—200  
 Tank cleaner  
 Tank processor—352  
 Tanker serviceman—410  
 Telephone cleaner—(742)  
 Telephone sterilizer—(741)  
 Tower cleaner—200  
 Trolley cleaner—100  
 Truck cleaner  
 Truck washer  
 Tube blower—251,270,271,280-291,300  
 Tube cleaner  
 Tube washer—132-150  
 Vat cleaner—011,101,120,550,602  
 Vat washer—(100)  
 Wagon washer  
 Wash and grease man—590,612-622,750, 751  
 Wash boy—590,612-622,750,751  
 Wash-rack man—351,352,362,612-622, 750,751  
 Wash-rack operator—351,352,362,590, 612-622,750,751  
 Washer, n. s.—Any not listed above

## 887 VEHICLE WASHERS AND EQUIPMENT CLEANERS—Con.

Washerman—200  
 Washroom cleaner—121  
 Water-filter cleaner—470  
 Wheel cleaner  
 Wiper—Any not listed above

## 888 HAND PACKERS AND PACKAGERS

Apple-packing header—550  
 Assembler  
 Nuts and bolts—290  
 Bag filler  
 Bag loader—292  
 Bag sealer  
 Bagger—151,771  
 Band shover—Cotton compress 030  
 Bander, hand—130  
 Bandoleer packer—292,362  
 Barrel filler—120  
 Batt packer—100-392  
 Bin filler—102,130  
 Binder & wrapper packer—130  
 Blueprint trimmer  
 Book packer—172,663,850,852  
 Box packer—100-392  
 Boxer—100-392  
 Bulb-packer—Exc. 010,030,550,551,561  
 Bulk filler—102  
 Bulker—130  
 Bundle boy—151,771  
 Bundle girl—151,771  
 Bundle packer—580-691  
 Bundle tier—151,771  
 Bundle wrapper—580-691,771  
 Bundler, n. s.—Any not listed above  
 Burlapper—242  
 Butcherette—580-691  
 Butter wrapper—101  
 Caddy packer—100-392  
 Cake icer and packer—Bakery 111  
 Cake wrapper—Exc. 180  
 Can top setter—100-122  
 Candy packer—(112)  
 Card boxer—(172)  
 Carton wrapper  
 Case filler  
 Case folder—102  
 Case liner  
 Case packer—102  
 Case sealer—100-392  
 Caser—Any not listed above  
 Cellophane worker—Cigar 130  
 Cellophaner  
 Checker and packer—100-392  
 Cheese wrapper  
 Cigar packer—130  
 Cigar wrapper  
 Citrus-fruit packer—102  
 Cloth-bolt bander—142  
 Cloth packer—132-150  
 Container filler  
 Cooky packer—111  
 Core loader—292  
 Cotton tier  
 Crater  
 Crucible packer—261  
 Cube-machine tender—112  
 Dental floss packer  
 Egg caser  
 Egg crater  
 Egg packer—(550)  
 Electric-blanket packer  
 Export packer  
 Fish-egg packer—121  
 Fish packer  
 Floorperson, n. s.—112  
 Foil wrapper—100-392

# HANDLERS, EQUIPMENT CLEANERS, HELPERS, AND LABORERS

## 888 HAND PACKERS AND PACKAGERS

-Con.

Food handler—Frozen food locker 411  
 Fruit packer—102  
 Furniture crater  
 Furniture packer  
 Gift-basket packer  
 Gift packer  
 Gift wrapper—580-691  
 Glove wrapper—100-392  
 Grain packer—551  
 Grain-sacker—110  
 Greens tier—561,562  
 Handkerchief folder—151  
 Heel packer—221  
 Hogshead filler—130  
 Hosiery bagger—132  
 Icer, n. s.—102,121,550  
 Jack prizer—130  
 Knockdown man—100-392  
 Laborer, gold leaf—300  
 Line-out man—130  
 Linker—100  
 Locker attendant—411  
 Locker plant attendant—Frozen food locker 411  
 Meat packager  
 Meat packer  
 Meat wrapper—100,550,601,611  
 Mophead trimmer and wrapper—242  
 Nip wrapper—130  
 Olive packer—102,121  
 Order packer or packager  
 Package liner  
 Package sealer  
 Package wrapper  
 Packager  
 Packager or packer and weigher  
 Packer, hand—Exc. 372  
 Packer-fuser—192  
 Packing and inspecting—100-392  
 Packing clerk  
 Packing-line worker—210,211  
 Packing-room worker  
 Paper-pattern folder—172  
 Parcel wrapper—580-691  
 Pastry wrapper  
 Pill packer—181  
 Plastic bubble packer  
 Plug shaper, hand—130  
 Poultry-dressing worker—100  
 Poultry packer—(100)  
 Pretzel packer—111  
 Primer boxer—292  
 Prizer hand—130  
 Produce wrapper—100-392  
 Repacker  
 Rope tier—100  
 Rosin-barrel filler—192  
 Rosin-barrel filler—360  
 Sample girl—111,112  
 Sample wrapper—100-392  
 Sandwich wrapper—(641)  
 Sausage linker—100  
 Sausage stringer—100  
 Sausage wrapper—100  
 Seed packer  
 Shake packer—231-242  
 Shingle packer  
 Shingle weaver—231-242  
 Shipping clerk, crating  
 Shipping clerk, packing  
 Shoe packer—221  
 Shot bagger—292,362  
 Shrimp packer  
 Singer, hand—142,150  
 Table worker, packager  
 Tie-up boy

## 888 HAND PACKERS AND PACKAGERS

-Con.

Tie-up worker—321  
 Tier  
 Timber packer—231-242  
 Tobacco prizer—Exc. 010,030  
 Toy packer—100-392  
 Tube wrapper—100-392  
 Vegetable packer—102,121  
 Wiener packer  
 Wrapper  
 Wrapper-off—130  
 Wrapping clerk—580-691  
 Yarn packer—132-150  
 Yarn wrapper—132-150  
**889 LABORERS, EXCEPT CONSTRUCTION**  
 Acid filler—340-350  
 Aging-room hand—132-150  
 Air and water filler  
 Alley cleaner—471  
 Aluminum can collector  
 Animal stunner—100  
 Apron cleaner—262  
 Apron operator—160  
 Ash handler  
 Ash man  
 Ash-pit man—400  
 Assembler  
 Bellows—371  
 N. s.—Supermarket warehouse 601  
 B and B gang worker—400  
 Back hand—040,041,050  
 Bacon stringer—100  
 Bag liner—152,161,222  
 Bag turner  
 Bagging salvager—132-150  
 Balcony worker—250  
 Bale opener  
 Bandoleer straightener-stamper—292, 362  
 Bankman—252  
 Bark skinner—160  
 Barker—231,232  
 Barrel cleaner—292  
 Barrel drainer—241  
 Barrel marker—241  
 Barrow man  
 Basket filler—102  
 Battery charger—Any not listed above  
 Battery starter—040,041,050  
 Bedder—Tannery 220  
 Beef selector—601  
 Beet topper—112  
 Bellman—270,271,280-291,300  
 Belt tender—100-392  
 Belt turner—100-392  
 Bend-up—270,271,280-291,300  
 Billet boy—270-291,300-370,400,760  
 Billet straightener—270-291,300-370, 400,760  
 Binder stripper, hand—130  
 Binman—270,271,281-291,300  
 Bleach packer—192  
 Bleeder—400  
 Blind cleaner—722  
 Blintze roller—121  
 Blocker, n. s.—100  
 Blotter girl—130  
 Blow-off worker—242  
 Blower—130  
 Board setter—220  
 Bobbin disk—250  
 Body hanger—351  
 Boiling-house hand—112,121  
 Bone-char puller—121  
 Bone picker—192  
 Bone puller—121  
 Boner, n. s.—151

## 889 LABORERS, EXCEPT CONSTRUCTION—Con.

Book cleaner—(852)  
 Booker—210  
 Bosh—272,280  
 Bottle cleaner  
 Bottle feeder—100-392  
 Bottle washer  
 Bottom maker—270,271,280-291,300  
 Box lidder—100-392  
 Box nailer—100-392  
 Box turner—Fruit cannery 102  
 Bread paner—(111)  
 Bread racker—(111)  
 Bread stacker—(111)  
 Brick cleaner—252  
 Brick-kiln worker—252  
 Brick-yard hand—(252)  
 Bridge-gang worker—400  
 Bridge maintainer—Exc. 060  
 Bridge work—400  
 Brim raiser—151  
 Briner—102  
 Broke handler—160  
 Broke man—160  
 Brush washer—132-150  
 Brusher—Mfg. not listed above  
 Bucket hooker—270,271,280-291,300  
 Bumper—252  
 Bunch trimmer, mold—130  
 Bundle breaker—150  
 Bundler, n. s.—220,231,501-511,531- 540,560- 571  
 Burlap spreader—152  
 Bushel girl—151  
 Button splitter, hand—391  
 Buttoner—132,151  
 Cable puller—Exc. 230  
 Cake wrapper—180  
 Candle cutter—391  
 Candy cutter, hand—112  
 Candy spreader—112  
 Canvas shrinker  
 Car cleaner, n. s.—040-050  
 Car filler—041  
 Car icer—(400)  
 Car mover—Exc. 400  
 Car pre-cooler—(400)  
 Car pusher—270,271,280-291,300  
 Carboy filler—180,182,191,192  
 Carcass washer—100  
 Cardboard inserter—132,151,152  
 Cart attendant, bringing in carts for groceries, etc  
 Casting chipper  
 Casting cleaner  
 Casting-house laborer  
 Casting-house man—270,271,280-291, 300  
 Cattle sorter—100  
 Cell preparer—180  
 Cellarman—100  
 Chainer—Exc. 132-150,230  
 Chalk cutter—391  
 Char-dust cleaner & salvager—112  
 Cherry cutter—102  
 Chicken catcher—Exc. 011,030  
 Chicken cleaner  
 Chicken dresser—Exc. 011,030  
 Chicken hanger  
 Chicken picker—Exc. 011,030  
 Chopper—031,192,672  
 Chore boy—100-222,231-392  
 Chore man—220  
 Chute loader  
 Chute man—040-050  
 Chute operator—050  
 Chute pulier—041  
 Chute tapper—040  
 Chute tender—Exc. 230

# HANDLERS, EQUIPMENT CLEANERS, HELPERS, AND LABORERS

## 889 LABORERS, EXCEPT CONSTRUCTION—Con.

Cinder man—270,271,280-291,300  
 Cinder pitman—270,271,280-291,300  
 Cinder snapper—270,271,280-291,300  
 Circus hand—810  
 Circus laborer—810  
 Circus roustabout—810  
 Clam picker—121  
 Clam shucker  
 Clam sorter—121  
 Clamper—Pens and pencils 391  
 Cleaner, furniture—242  
 Cleaner, smoking pipes—391  
 Cleaner, n. s.—Any not listed above  
 Clipper, brush and broom—391  
 Cloth-edge singer—132-150  
 Cloth spreader, screen printing—132-150  
 Cloth tearer—151  
 Coal carrier—672  
 Coal-chute worker—400  
 Coal hiker—672  
 Coal-shoveler—Exc. 420  
 Color boy—132-150  
 Color-strainer—132-150  
 Company laborer—040-050  
 Conduit cleaner—401  
 Cone treater—100-392  
 Connie boy—272,280  
 Connie cleaner—272,280  
 Connie scratcher—272,280  
 Container maker  
 Conversion man—101  
 Conveyor man—160,210,211,231  
 Cooler man  
 Core dipper—351  
 Core paster—270-291,300-370,400,760  
 Core sticker—270-291,300-370,400,760  
 Corn detasseler—Exc. 010,030  
 Cotton baler—Exc. 010,030  
 Counter—100,220  
 Cowboy—Stockyards 432  
 Crab picker—(121)  
 Cream dumper—011,101,550,602  
 Crossband layer—231  
 Cuff folder—132  
 Curb attendant—771  
 Curve cleaner—400  
 Cutter, banana room—550  
 Cylinder handler—192  
 Dairy hand—Exc. 011  
 Dairy worker—550,602  
 Dampener—220  
 Damperman—270  
 Dauber—100-222,231-392  
 Deblocker—372  
 Defroster  
 Detasseler—Exc. 010,030  
 Dewaxer—371  
 Dial brusher—381  
 Dipper, clock & watch hands—381  
 Dipper, jewelry—391  
 Dipper, pens & pencils—391  
 Dipper, n. s.—132-152,391  
 Disassembler, n. s.—531  
 Disintegrator feeder—190  
 Dismantler—531  
 Distresser—242  
 Distributor cleaner—130  
 Ditch cleaner—Exc. 010,011,030  
 Ditch worker—470,472  
 Dogger—231,232  
 Doll-wig hackler—(390)  
 Dolly pusher—440  
 Dollyman—Exc. 060,360  
 Door boy—270,271,280-291,300  
 Door opener—270,271,280-291,300

## 889 LABORERS, EXCEPT CONSTRUCTION—Con.

Door operator—270,271,280-291,300  
 Door puller—270,271,280-291,300  
 Dope sprayer—220  
 Doper—220  
 Drag-down—270,271,280-291,300  
 Drag-down man—270,271,280-291,300  
 Drag-out man—270,271,280-291,300  
 Dragger-out—270,271,280-291,300  
 Drain cleaner—471  
 Drainer man—160  
 Drainman—040-050  
 Drawer—252,261  
 Dresser—100,550  
 Drip-box tender—110  
 Driver, n. s.—100  
 Drop man—231,232  
 Drop-wire hanger—132-150  
 Drosser—272,280  
 Drossman—272,280  
 Dry-dip man—220  
 Dry-kiln man  
 Drying room attendant, hat & cap—132,151  
 Ducker—100  
 Dust-box tender—252  
 Dust-box worker—262  
 Dyer, artificial flowers—391  
 Dynamite reclaiming—192  
 Edger tailer—231-242  
 Egg breaker—100  
 Egg separator  
 Electrode cleaner—340-350  
 Enamel pulverizer—391  
 Endband cutter, hand—151  
 Engine watchman—400  
 Extra gang—400  
 Fabric lay-out worker—132-150  
 Factory laborer—(392)  
 Factory worker, exc. machine  
 Fagot maker—270,271,280-291,300  
 Filler man—130  
 Filler-room attendant—130  
 Filler spreader—130  
 Film loader—800  
 Finisher, n. s.—180  
 Finishing machine tender—160  
 Firewood cutter  
 Fish-bin tender—121  
 Fish chopper, gang knife—121  
 Fish drier—121  
 Flagman—040-050,270,271,280-291,300, 810  
 Flaker—121  
 Flapper—270-291,300-370,400,760  
 Flask carrier—270-291,300-370,400, 760  
 Flask cleaner—270-291,300-370,400, 752,760  
 Flask handler—270-291,300-370,400, 760  
 Flask man—270,271,280-291,300  
 Flask pusher—270-291,300-370,400,760  
 Flocker—140  
 Floorhand—Exc. 042  
 Floorperson, n. s.—241  
 Fluxer—270,271,280-291,300  
 Food selector—601  
 Forker—100  
 Foundry hand—270-291,300-370,400,760  
 Foundry worker—270-291,300-370,400, 760  
 Frame hand—152  
 Frame stripper—192  
 Fringer  
 Frozen-food selector—601  
 Fruit cutter—Exc. 010,030  
 Fuel-house attendant, man, etc.—231  
 Fueler—400,420,421  
 Gaggerman—270-291,300-370,400,760  
 Gambrelor—100  
 Gandy dancer—400

## 889 LABORERS, EXCEPT CONSTRUCTION—Con.

Garage servicer, industrial—751  
 Garment folder—132,151  
 Garment turner—132,151  
 Garnisher—112  
 Gas & oil servicer—590,612,620-622, 641,750,751  
 Gasoline attendant—421  
 Globe changer—450-452  
 Globe cleaner—450-452  
 Glove cleaner—771  
 Glove former exc. automatic  
 Glove turner  
 Gold burnisher—261  
 Grader, n. s.—400,441  
 Grain trimmer—Exc. 420  
 Grave digger—(712)  
 Greaser—292  
 Grinder, n. s.—231,232  
 Grizzlyman—040  
 Gut carrier—100  
 Ham stringer—100  
 Hand finisher, toys and games—390  
 Handyman, n. s.—100-222,231-392  
 Handyman, n. s.—Any not listed above  
 Hangar attendant—421  
 Hanger—Exc. 771  
 Hanger-off—100  
 Hatch tender—420  
 Heading-up-machine man—190  
 Helper  
 Barrow man's—270,271,280-291,300  
 Boat-hoist operator's—590,622  
 Cane weigher's—121  
 Chemical compounder—192  
 Coppersmith's  
 Cotton ginner's—(030)  
 Crane  
 Creeping-machine-operator—161  
 Cutter's—160  
 Drill press operator's  
 Dyer's—771  
 Ferryboat-operator's  
 Florist's—562,681  
 Gambrelor's—100  
 Gas maker's—451  
 Ginner's—030  
 Glass blower's—250  
 Glass cutter's—250  
 Grease man's—270,271,280-291,300  
 Hammersmith's  
 Hostler's—400  
 Hot saw—270,271,280-291,300  
 Laborers, n.e.c.—500-620,622-691  
 Larriman's  
 Lead burner  
 Lime-kiln man's—112  
 Loading machine operator's—040, 041,050  
 Log loader's—230  
 Metal fabricating shop  
 Monorail—231,232  
 Oil-burner servicer & installer  
 Oil-well-service operator's—042  
 Oiler's—400  
 Patcher's—Coke 270  
 Picker tender's—142  
 Pig-lead melter's—190  
 Pointer's—270,271,280-291,300  
 Rug dyer's—771  
 Rug inspector's—141  
 Shactor's—100  
 Shear—270,271,280-291,300  
 Shear-grinder-operator's—132-150  
 Shearman's—270,271,280-291,300  
 Soaker's—132-150  
 Socket welder's—270,271,280-291, 300



## HANDLERS, EQUIPMENT CLEANERS, HELPERS, AND LABORERS

### 889 LABORERS, EXCEPT CONSTRUCTION—Con.

Helper—Con.  
 Stretcherman's—270,271,280-291,300  
 Tinsmith's  
 Varnish maker's—190  
 Varnish melter's—190  
 Vessel scrapper's—270,271,280-291, 300  
 Washtub man's—190  
 Yarn mercerizer operator's—132-150  
 N. s.—110  
 N. s.—Boarding kennels 030  
 N. s.—Any not listed above  
 Hide curer—100  
 Hide handler—(220)  
 Hide-mill man—220  
 Hide salter—100  
 Hide selector  
 Hide shaker  
 Hide spreader—100  
 Hide trimmer—220  
 Hide worker—100  
 Hog counter—100  
 Hog driver—(100)  
 Hog pusher—100  
 Hogshead opener—130  
 Hogshead-salvage man—130  
 Holder—100  
 Holding for sticker—100  
 Hoof trimmer—100  
 Hook puller—132-150  
 Hook tender—Exc. 230  
 Hook-up—270,271,280-291,300  
 Hook-up man—231-242,351  
 Hooker—Any not listed above  
 Hooker-on—Exc. 100,230  
 Hooker-up—Exc. 100,230  
 Hookman—Any not listed above  
 Hose stripper—211  
 Hostler—Any not listed above  
 Houseman, n. s.—251,400  
 Iceman—(121)  
 Icer, n. s.—361,400,401,432  
 Igniter capper—292  
 Jacket changer—270-291,300-370,400, 760  
 Jackman—Any not listed above  
 Jamb cutter—270  
 Japanner—220  
 Jewel stringer—381  
 Jigger—391  
 Job hand—130  
 Junkman—531  
 Keg washer—120  
 Kettle loader—190  
 Kiln drawer—100-150,152-392  
 Kiln hand—261  
 Kiln loader—120  
 Kiln worker—252,261  
 Kilnman—231-242,252  
 Knocker—100  
 Knocker-off—270,271,280-291,300  
 Knocker-out—270  
 Knockout man—270  
 Label coder  
 Label remover—120  
 Laborer, airport maintenance—421  
 Laborer, candlemaking—391  
 Laborer, cheesemaking—101  
 Laborer, circus—810  
 Laborer, concrete plant—251  
 Laborer, cook-house—192  
 Laborer, laundry—771  
 Laborer, petroleum refinery—200  
 Laborer, pipelines—422  
 Laborer, prestressed concrete—251  
 Laborer, sirup machine—110  
 Laborer, solder making—280  
 Laborer, tailings-dam—040,280  
 Laborer, exc. track repair—400,401

### 889 LABORERS, EXCEPT CONSTRUCTION—Con.

Laborer, warehouse  
 Laborer, wood preserving plant—241  
 Laborer, any other specified type, n.e.c.  
 Laborer, n. s.—040-050  
 Laborer, n. s.—100,150,190,220,252, 390,391  
 Laborer, n. s.—Any not listed above  
 Ladle watcher—270,271,280-291,300  
 Lamination spinner—340-350  
 Lamp cleaner, street light  
 Lapper, n. s.—161  
 Lath tier—231  
 Laundry laborer—771  
 Lead sprinkler—190  
 Leather coater—220  
 Leather currier—220  
 Leather dresser—220  
 Leather drier—220  
 Leather finisher—220  
 Leather flesher—220  
 Leather grainer—220  
 Leather roller  
 Leather scraper—220  
 Leather scrubber—220  
 Leather seasoner—220  
 Leather shaver—220  
 Leather skinner—220  
 Leather splitter—220  
 Leather sponger—220  
 Leather sprayer—220  
 Leather staker—220  
 Leather stretcher—220  
 Leather tacker—220  
 Leather toggler—220  
 Leather whitener—220  
 Lifter  
 Light cleaner, street light  
 Liner inserter—130  
 Lines tender—420  
 Lint cleaner—Cotton gin 030  
 Log-chain worker—230,231  
 Log-haul operator—230,231  
 Log-pond man  
 Log washer—230,231  
 Looper—270,271,280-291,300  
 Loose-end finder, bobbins—132-150  
 Lumberman—PR 580  
 Lumberman—231-242  
 Lumper—Any not listed above  
 Luteran—270  
 Magazine man—192  
 Magazine worker—192  
 Magnet placer—270,271,280-291,300  
 Maintenance man, n. s.—400  
 Maintenance-of-way—400  
 Make-up girl—100-392  
 Manganese breaker—270  
 Manual plate-filler—292,362  
 Mash-filter-cloth changer—120  
 Mattress stripper—242  
 Meat hanger—100  
 Meat scrubber—100  
 Meat selector—601  
 Meat soaker—100  
 Meat stringer—100  
 Meat washer—100  
 Metal grader—531  
 Metal sorter—531  
 Mill feeder—100-392  
 Mill tender—190  
 Mine laborer  
 Mixer slagman—270,271,280-291,300  
 Mold breaker—270-291,300-370,400,760  
 Mold cleaner—210  
 Mold dumper—250,270,271,280-291,300  
 Mold parter—180

### 889 LABORERS, EXCEPT CONSTRUCTION—Con.

Mold presser—130  
 Mold sander—252  
 Mold swabber—270-291,300-370,400,760  
 Mold-yard man—270,271,280-291,300  
 Motor polarizer—381  
 Mucker  
 Mud-car man—270  
 Neck skewer—100  
 Newspaper stuffer—Exc. 171  
 Novelty worker—101  
 Nursery laborer—Exc. 010,030  
 Odd-job laborer  
 Odd jobs, exc. day worker—761  
 Odd jobs, n. s.—Any not listed above  
 Oil extractor—270-291,300-370,400, 760  
 Open-hearth laborer—270,271,280-291, 300  
 Opener, n. s.—132-150,160  
 Order clerk, exc. clerical  
 Order picker  
 Order puller  
 Order runner—100  
 Order selector  
 Ore fielder—270,271,280-291,300  
 Oremán—272,280  
 Oriental rug stretcher  
 Outside laborer—040-050  
 Oven dauber—Coke 270  
 Oven laborer—Coke 270  
 Oyster opener  
 Oyster picker—121  
 Oyster shucker  
 Oyster sorter—121  
 Packing-house laborer  
 Paint remover  
 Paper bundler—Newspaper 171  
 Paper inserter—171 exc. newspaper, 100-162,172-392  
 Paper sorter—Exc. 100-392  
 Parachute marker—152  
 Pass boy—270,271,280-291,300  
 Paster, screen printing—132-150  
 Pattern carrier—270-291,300-370,400, 760  
 Pattern ruler—152  
 Pick remover—132-150  
 Picker—130  
 Picker-packer, fills orders  
 Picking-table worker—130  
 Pickler—270-291,300-370,400,760  
 Pig handler—270-291,300-370,400,760  
 Pillow cleaner—152  
 Pipe chipper—270,271,280  
 Pipe cleaner—270,271,280-291,300  
 Pipe-smoker-machine operator—391  
 Pipe stripper—251  
 Pipeman—451,470  
 Pit hand—270,271,280-291,300  
 Pit laborer—270,271,280-291,300  
 Pit shoveler  
 Pit slagman—270,271,280-291,300  
 Pitcher—Exc. 810  
 Pitman—270,271,280-291,300  
 Plate stacker, hand—340-350  
 Plugger man—040  
 Poler—132-150  
 Pot pusher—272,280  
 Poultry cleaner—Exc. 011,030  
 Poultry dresser—Exc. 011,030  
 Poultry hanger—100  
 Poultry killer—(100)  
 Poultry picker—Exc. 011,030  
 Poultry pinner—Exc. 011,030  
 Purer, candles—391  
 Purer, n. s.—Exc. 060,270-291,300-370,400,760  
 Powderer—151  
 Press hand, knit goods—132  
 Pretzel twister—111

# HANDLERS, EQUIPMENT CLEANERS, HELPERS, AND LABORERS

## 889 LABORERS, EXCEPT CONSTRUCTION—Con.

Priming mixture carrier—292  
 Puller—031,112,121,231  
 Rack boy—111  
 Rack girl—111,221  
 Rack maker—300  
 Racker, jewelry—391  
 Racker, sports equipment—390  
 Racker, n. s.—111,381  
 Rag collector—132-150,531  
 Rag cutter  
 Rag grader—531  
 Rag sorter—Exc. 100-392  
 Rag washer—132-150  
 Ragman—132-150,531  
 Rail walker—400  
 Railroad hand—400  
 Railroad worker—400  
 Railroader—400  
 Railroadng—400  
 Raker—141  
 Raw cheese worker—101  
 Reel hooker—270,271,280-291,300  
 Reel man—270,271,280-291,300  
 Reeler—220  
 Refresher—220  
 Refueler—400,420,421  
 Rehanger—130  
 Rejogger—171,172  
 Remnants cutter—132-150  
 Resin man—100  
 Resin painter—100  
 Resin remover—100  
 Resin shaver—100  
 Reverser, footballs, basketballs, etc.—390  
 Ribbon cleaner—142,150  
 Riser—270,271,280-291,300  
 Rocker—220  
 Rod and tube straightener—180  
 Rod straightener—270-291,300-370, 400,760  
 Roll-on man—231,232  
 Rope cleaner—132-150  
 Roustabout—Any not listed above  
 Runner man—270,271,280-291,300  
 Sack cleaner  
 Salvage worker—Exc. 270-291,300-370, 400,760  
 Sand-car man—401  
 Sand carrier  
 Sand conditioner—270-291,300-370, 400,760  
 Sand cutter—270-291,300-370,400,760  
 Sand drier—Exc. 050  
 Sand mixer, n. s.  
 Sand screener—Exc. 040-050  
 Sand shoveler—Exc. 040-050  
 Sand sifter—270-291,300-370,400,760  
 Sand temperer—270-291,300-370,400, 760  
 Sand wheeler  
 Sandboy—252  
 Sausage-meat trimmer—100  
 Sausage tier—100  
 Scaler—270-291,300,360  
 Scavenger—Exc. 230  
 Scrap boy—270,271,280-291,300  
 Scrap hooker—270,271,280-291,300  
 Scrap-metal collector—531  
 Scrap picker  
 Scrap piler—270,271,280-291,300  
 Scrap sorter—221  
 Screener—252  
 Screenman—471  
 Sea shell gatherer—032  
 Seam steamer—151  
 Searcher—130  
 Seasoner—220  
 Second-crusher man—270,271,280-291, 300  
 Section gang—400

## 889 LABORERS, EXCEPT CONSTRUCTION—Con.

Section hand—Any not listed above  
 Section laborer—400  
 Section man—400  
 Seed trucker—121  
 Selector—500-571,601  
 Septic tank cleaner—(760)  
 Sequins stringer—221  
 Serviceman, n. s.—Septic tanks 760  
 Sewage-screen operator—471  
 Sewer cleaner—(471)  
 Shade-cloth finisher—242  
 Shake-out man—270,271,280-291,300  
 Shaker—112,121,130,231-242,270,271, 280-291,300  
 Shaker-out—130,270,271,281-291,300  
 Shank pinner—100  
 Shaver—100,771  
 Shear scrapman—270,271,280-291,300  
 Shed hand—252  
 Sheep sorter—432  
 Ship scaler—360  
 Ship scraper—(360)  
 Shoveler—Exc. 060  
 Shover—100  
 Shrouder—100  
 Side-door man—272,280  
 Sifter—181,252  
 Sign poster, exc. posting  
 Signal boy—270,271,280-291,300  
 Signalman—270,271,280-291,300,360  
 Silk opener—142  
 Singer (burning)—100  
 Sizer, n. s.—132-150  
 Skid man—100,270,271,280-291,300  
 Skid strapper  
 Skid wrapper  
 Skin toggler—220  
 Skip pitman—270,271,280-291,300  
 Skull grinder—100  
 Slag dumper—270-291,300-370,400,760  
 Slagman—270-291,300-370,400,760  
 Slip-box changer—270-291,300-370, 400,760  
 Slip tender—231,232  
 Slipman—231,232  
 Slunk-skin curer—100  
 Smoke-room operator—151  
 Smoked meat preparer—100  
 Smoking-pipe-liner—391  
 Soaking-room operator—180  
 Soda-room man—180  
 Soda-room operator—180  
 Sorter—432  
 Spike driver—400  
 Spiker—400  
 Spreader—Exc. 100  
 Sprigger—130  
 Stabber—422,451,452  
 Stainer—220,391  
 Stamper—151-152  
 Starcher, artificial flowers—391  
 Stave-mill hand—231-242  
 Stayer—100-392  
 Steamblaster—060  
 Steamer—100  
 Steel chipper—270,271,280-291,300  
 Steel pickler—270-291,300-370,400, 760  
 Stick puller—112  
 Stiffener—151  
 Stock counter—432  
 Stock digger—160  
 Stock driver—Exc. 011,030  
 Stock picker  
 Stock pitcher—160  
 Stock selector  
 Stocker—270-291,300-370,400,760  
 Stockroom selector

## 889 LABORERS, EXCEPT CONSTRUCTION—Con.

Stower—100  
 Strainer—100-392  
 Straw-hat washer operator—151  
 Street cleaner—471  
 Street-light cleaner—450-472  
 Street sweeper—471  
 Striker—252,270,271,280-291,300,410, 672  
 Striker-off—252  
 Stringer—100,220  
 Strip picker—231,232  
 Stripper, hand—130  
 Stripper, n. s.—040,041,050,192,372  
 Stuffer—270-291,300-370,400,760  
 Suture polisher—372  
 Suture winder, hand—372  
 Swabber—220  
 T-rail turner—270,271,280-291,300  
 Table-cover folder—152  
 Table hand—130  
 Tack cleaner—220  
 Tack picker—220  
 Tailings man—121  
 Tamale maker—(102)  
 Tapper—251  
 Tar chaser—Coke 270  
 Tar man—270-291,300-370,400,760  
 Tasseler—152  
 Tent man—810  
 Thread separator—132-150  
 Thresher, n. s.—190  
 Tie binder—151  
 Tie layer—400  
 Tie man—400  
 Tie presser—132  
 Tie tamper—400  
 Tierce filler—100  
 Timber cutter—450  
 Tin-container straightener—130  
 Tipper—231,232  
 Tire duster—210  
 Tire stripper—210  
 Tissue packer  
 Tobacco shaker—130  
 Toggler—220  
 Tong carrier—270,271,280-291,300  
 Tonger—270,271,280-291,300  
 Tongue carrier—100  
 Tool boy  
 Tool carrier  
 Tool chaser  
 Tool dispatcher  
 Track dresser—400  
 Track fitter—401  
 Track greaser—401  
 Track laborer—400  
 Track layer—040-050,400,401  
 Track maintainer—400  
 Track sweeper—401  
 Track walker—400,401

# HANDLERS, EQUIPMENT CLEANERS, HELPERS, AND LABORERS

## 889 LABORERS, EXCEPT CONSTRUCTION—Con.

Track worker—270-291,300-370,400,760  
 Trackman  
 Tree girdler  
 Tree trimmer—450  
 Trimmer loader—231,232  
 Trimmer, n. s.—040-050

Trimmer, n. s.—110,672  
 Trimmer, n. s.—Grain elevator 551  
 Tripe finisher—100  
 Tripe scraper—100  
 Tripe washer—100

Trolley boy—100  
 Truck striker  
 Tub washer—132-150  
 Turkey picker—Exc. 011,030  
 Turkey pinner—Exc. 011,030

## 889 LABORERS, EXCEPT CONSTRUCTION—Con.

Turner—102,121  
 Twister, hand—130  
 Upholstery cleaner—242  
 Valve fitter—211  
 Valve inserter—211  
 Valver—211

Vatman—242  
 Veneer puller—231,232  
 Vessel slagman—270,271,280-291,300  
 Warehouse hand—410  
 Warehouse selector

Warehouseman, exc. clerical  
 Washer, pencils—391  
 Washer, n. s.—381  
 Wasteman—Exc. 040-050  
 Water boy—Exc. 641,762,770  
 Water carrier—Exc. 641

## 889 LABORERS, EXCEPT CONSTRUCTION—Con.

Waterman—Exc. 032  
 Waxer—250  
 Weight shifter—270-291,300-370,400, 760  
 Wheel roller—361,400,401,432  
 Wiper—342

Wire brusher—360  
 Wood chopper—761  
 Wood cutter—761  
 Wood-pole treater—241  
 Wood sawyer—761  
 Wool puller—132-150

Wrecker—531  
 Wrencher—270,271,280-291,300  
 Yard cleaner—400  
 Yard jacker—231,232  
 Yard laborer—040-050

Yard laborer—Any not listed above  
 Yardman, n. s.—Any not listed above  
 Yeast pusher  
 Yeast tender—290,291,300