Staff report
3262

State of Oregon
Department of Environmental Quality **Memorandum**

To: Bruce Gilles, Manager 10-11-07
NWR Cleanup and Emergency Response

Date: October 09, 2007

From: Mark Pugh, NWR Cleanup and Emergency Response

Subject: Staff Report
Palmberg Paving Site
448 McCormick Gardens Road
Gearhart, Oregon
ECSI #3262

Introduction

This Staff Report presents the basis for the Oregon Department of Environmental Quality's (DEQ's) proposed no further action (NFA) finding for an investigation and soil cleanup at property located at 448 McCormick Gardens Road in Gearhart, Oregon (Figure 1).

Bill Palmberg Jr., the property owner, originally entered DEQ's Voluntary Cleanup Program (VCP) under the Independent Cleanup Pathway (ICP) on January 10, 2002, by signing an agreement for DEQ technical consultation and oversight during a site investigation and cleanup. The results of the investigation and soil cleanup summary were presented in an *Independent Cleanup Pathway Final Report* dated September 16, 2003 (Tim O'Gara, 2003a). Based on DEQ's review of the report and other file information a NFA determination was issued by DEQ on January 5, 2004. DEQ evaluated the site under industrial and occupational risk scenarios, and did not consider residential use based on land use information provide by Mr. Palmberg.

On February 6, 2006 Mr. Palmberg entered into a Letter Agreement with DEQ to provide additional review and oversight of field work to determine if the site was protective for residential use. The subsequent field investigation was documented in a report dated September 1, 2006 (O'Gara, 2006) and additional correspondence (O'Gara, 2006a, 2006b). Based on a review of this report DEQ concluded that the majority of the site, with the exception of tax lot 1000, did not present a significant threat to human health or the environment. DEQ determined issued a conditional NFA dated December 20, 2006. The NFA applied to all tax lots comprising the site with the exception of tax lot 1000 due to residual contamination in site soil at levels exceeding residential risk-based standards and inadequate sampling coverage on this tax lot.

Additional sampling described below was conducted to complete the site characterization and to determine the extent of contamination on tax lot 1000.

The site was previously determined by DEQ to be protective of beneficial groundwater use and for wildlife at the site. Because the change of proposed site use to residential does not affect these conclusions, additional investigation focused on verifying the extent of contamination in soil. Accordingly, this Staff Report and risk evaluation herein focuses on residential exposure to soil contaminants on tax lot 1000.

Site background information and the risk evaluation for other media under an occupational exposure scenario is contained in DEQ's Staff Report dated November 4, 2003.

Site Location and Operational History

The entire site covers 27.36 acres of relatively flat land approximately 0.5 miles east of the Pacific Ocean, in Township 6 North (T6N), Range 10 West (R10W), Section 3. The northern portion of the site is occupied by remnants of the former Palmberg Paving Company, Inc. (PPCI). The site is comprised of 11 tax lots (Figure 2). An approximately 4.8 acre man-made lake is located in the south central portion of the site (Figure 3). Tax lot 1000 is approximately 5 acres in the east-central portion of the site. It was used by an automobile wrecking company from 1958 to 1960. A sand and gravel mining operation occupied the central site area in the early to mid 1960s. The quarry created by the mining operation filled with groundwater, resulting in the present day lake. The discharge from the lake is piped to the south beneath the adjacent roadway and discharges to a drainage that flows to the Pacific Ocean.

The site area has been mapped as a seasonally flooded Palustrine forested wetland. Most of the trees at the site were removed during mining activities, and the site is now largely covered with grass.

Beneficial Land Use

The site is currently vacant, with the exception of dumpsters being stored on paved areas in the north part of the site. With the exception of the access road extending to the west, which is zoned R-2 (medium density housing), the entire site is zoned RA (rural agriculture), which allows one residential dwelling per acre. The site is bounded by residential properties to the southeast and to the north. Based on the extent of contamination, the locality of facility is contained completely within the property boundary.

Mr. Palmberg has indicated he wishes to utilize the property for residential purposes. There are indications that wetland areas are present at the site, but they are located some distance from the impacted site areas. Areas adjacent to the lake, and the lake itself provides ecological habitat for mammals (e.g., deer, raccoon) migratory waterfowl and songbirds. It is reported by the owner that the lake has been stocked and provides recreational fishing.

Previous Site Investigations on Tax Lot 1000

Phase 1 and Phase 2 Site Investigations

A Phase 1 and Phase 2 investigation was conducted on behalf of the City of Gearhart (City) in 2001 (Peratrovich, Nottingham & Drage, Inc., 2001). The Phase 1 assessment identified the three former asphalt plant areas, the former wrecking yard, and an equipment cleaning area. During the Phase 2 investigation six test pits were advanced in the wrecking yard area. Upon encountering household and automotive-related solid waste the investigation was terminated. It does not appear that any samples were submitted for laboratory analysis.

Expanded Preliminary Assessment (Clearwater Environmental Services, 2002)

Clearwater Environmental Services (CES) conducted an Expanded Preliminary Assessment (XPA) in June 2002 (CES, 2002). The scope of work included excavating 5 test pits on tax lot 1000 (Figure 3). Total petroleum hydrocarbon (TPH) and polycyclic aromatic hydrocarbons (PAHs were not detected in any of these 5 samples.

Metals were detected at levels within the range of expected naturally occurring concentrations.

June and September 2006 Investigation (O'Gara 2006a, 2006b)

Sampling was conducted in the former automobile wrecking yard to provide better sampling coverage and to refine the nature and extent of contamination Eight borings were advanced in the wrecking yard area (GP-E through GP-L; Figure 3).

Sampling locations were selected to provide a sampling transect in the vicinity of previous test pits AW-1 and AW-3 where car parts and other anthropogenic debris had been observed. Subsequently an additional six shallow (<1 foot) soil samples (AW1-1, AW-1-20-west, AW-2-1, AW-3-20-east) were collected on September 28, 2006.

Sample I-2 was the only sample in the wrecking yard area with contaminant concentrations above risk-based levels for residential exposure. Benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene and lead exceeded the RBC for direct contact under a residential exposure scenario (Tables 1, 2 and 3).

The TPH-oil concentration in I-2 (4,910 mg/kg) exceeds the DEQ UST Program Level II Soil Matrix Cleanup Standard (500 mg/kg) and the TPH-D RBC for residential exposure (3,900), which is considered a conservative screening concentration for TPH-oil.

Current Investigation: September 2007 Sampling

DEQ required additional field work to complete the characterization for tax lot 1000, including accurately locating historical sample stations, and collection of additional soil

samples to provide better sampling coverage of tax lot 1000. Six test pits were advanced (TP-A through TP-F; Figure 3). One sample was collected from each test for laboratory analysis of TPH, PAHs and lead. All samples yielded non-detect results at sufficiently low detection limits.

Risk Evaluation

Sample concentrations were compared to DEQ's generic risk-based concentration (RBCs) for exposure to soil contaminants under a residential exposure scenario.

Sample I-2 is the only sample in the wrecking yard area with contaminant concentrations above risk-based levels for residential exposure. Benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene and lead exceeded the RBC for direct contact under a residential exposure scenario, and were identified as contaminants of potential concern (COPCs). Concentrations of these analytes were less than 10 times their respective RBCs.

The TPH-oil concentration in I-2 (4,910 mg/kg) exceeds the TPH-D RBC for residential exposure (3,900), which is considered a conservative screening concentration for TPH-oil. TPH-oil also was identified as a COPC.

The highest residual TPH-D concentration in soil (2,490 mg/kg) is below the RBC for direct contact under a residential scenario and was not identified as a COPC.

To assess the potential risk attributable to these detections from the former wrecking yard on tax lot 1000, DEQ calculated the 90% upper confidence limit (UCL) of the mean for each COPC using the United States Environmental Protection Agency (EPA) ProUCL (v.4.0) software. ProUCL spreadsheets are included as Appendix A.

The resulting concentrations are considered suitable exposure point concentrations (EPCs) based on reasonable maximum exposure (RME), and were compared to human health screening criteria.

The results were as follows:

	90% UCL[1]	RBC (direct contact-residential)
TPH-oil	1,330 mg/kg	3,900 mg/kg
benzo(a)pyrene	**0.226 mg/kg**	0.062 mg/kg
benzo(b)fluoranthene	0.336 mg/kg	0.62 mg/kg
dibenz(a,h)anthracene	0.0421 mg/kg	0.062 mg/kg
lead	328.7 mg/kg	400 mg/kg

[1] Because the data distribution was not normal or lognormal, various non-parametric values for the 90% UCL were considered. Based on the hierarchy of preferred methods per the ProUCL Version 4 Users Guide, the 90% UCL derived from the Chebyshev method was selected for the EPC.

Benzo(a)pyrene is the only contaminant with an EPC above its RBC. Despite the fact that benzo(a)pyrene only was detected in one sample, and relatively low detection limits were achieved, the resulting EPC exceeds its RBC by a factor of about 3.5.

Discussion

To further assess the potential risk posed by benzo(a)pyrene, its estimated lateral extent in soil was compared to a hypothetical 1-acre lot located on the wrecking yard footprint. The extent of contamination, based on surrounding samples, was assumed to be a circle with a radius of 25 feet around GP-I (Figure 2), corresponding to approximately 2000 square feet (ft^2). Assuming a one-acre lot containing I-2, the percentage of soil impacted above RBCs for a 1 acre lot is:

$2000\ ft^2/43{,}000\ ft^2 \times 100 = 4\%$

For evaluating risk over the 1 acre exposure interval it is assumed that a resident will spend equal time over the entire 1-acre lot during the course of their exposure duration. In this case, given the localized occurrence of benzo(a)pyrene, a resident would be exposed to contamination around I-2 only 4 % of the time. Thus an RBC based on exposure over the entire 1-acre lot over predicts the risk to a resident posed by the limited contamination.

Based on the limited detection of benzo(a)pyrene, the localized area impacted above RBCs, the probability of residential exposure to contaminated soil for a period of time that would result in an unacceptable risk appears low.

Recommendation

DEQ reviewed the existing environmental information for the site and concluded that the site does not present a significant threat to human health or the environment, and that a no further action (NFA) is warranted. The proposed NFA finding is consistent with Oregon Revised Statutes (ORS) 465.200 through 465.455 and Oregon Administrative Rules (OAR) Chapter 340, Division 122, Sections 010 to 115.

There are localized areas of residual soil contamination in the PCCI operational areas of the site and tax lot 1000. Soil from these areas is solid waste and needs to be managed accordingly. Should it be excavated or otherwise disturbed during development it needs to be characterized and managed according to all applicable local, County, State and Federal regulations.

DEQ's previously approved the soil removal action in the earlier NFA determination following a public comment period. Therefore an additional public comment period is not required.

I request you approve my recommendation to issue a NFA determination.

References

Clearwater Environmental Services, 2002, *Expanded Preliminary Assessment (XPA) Report, Former Palmberg Paving Company, Inc. Parcel, Gearhart, Oregon.* August 5, 2002.

Tim O'Gara, 2003a, *Independent Cleanup Pathway Final Report, Palmberg Paving Company*. September 16, 2003.

Tim O'Gara, 2006, *Independent Cleanup Pathway Final Report, Palmberg Paving Company*. September 1, 2006.

Tim O'Gara, 2006a, *Additional Sampling, Palmberg Paving*, October 13, 2006.

Tim O'Gara, 2006b, *Additional Tabulation of Sampling, Palmberg Paving*, October 19, 2006.

Tim O'Gara, 2007, *Additional Sampling on Tax Lot 1000 for Palmberg Paving*, September 21, 2007.

Attachments:

Figure 1: Site Location
Figure 2: Tax Lot Boundaries and Area of Former Wrecking Yard
Figure 3: Current and Past Sampling Tax Lot 1000

Appendix A: ProUCL Spreadsheets

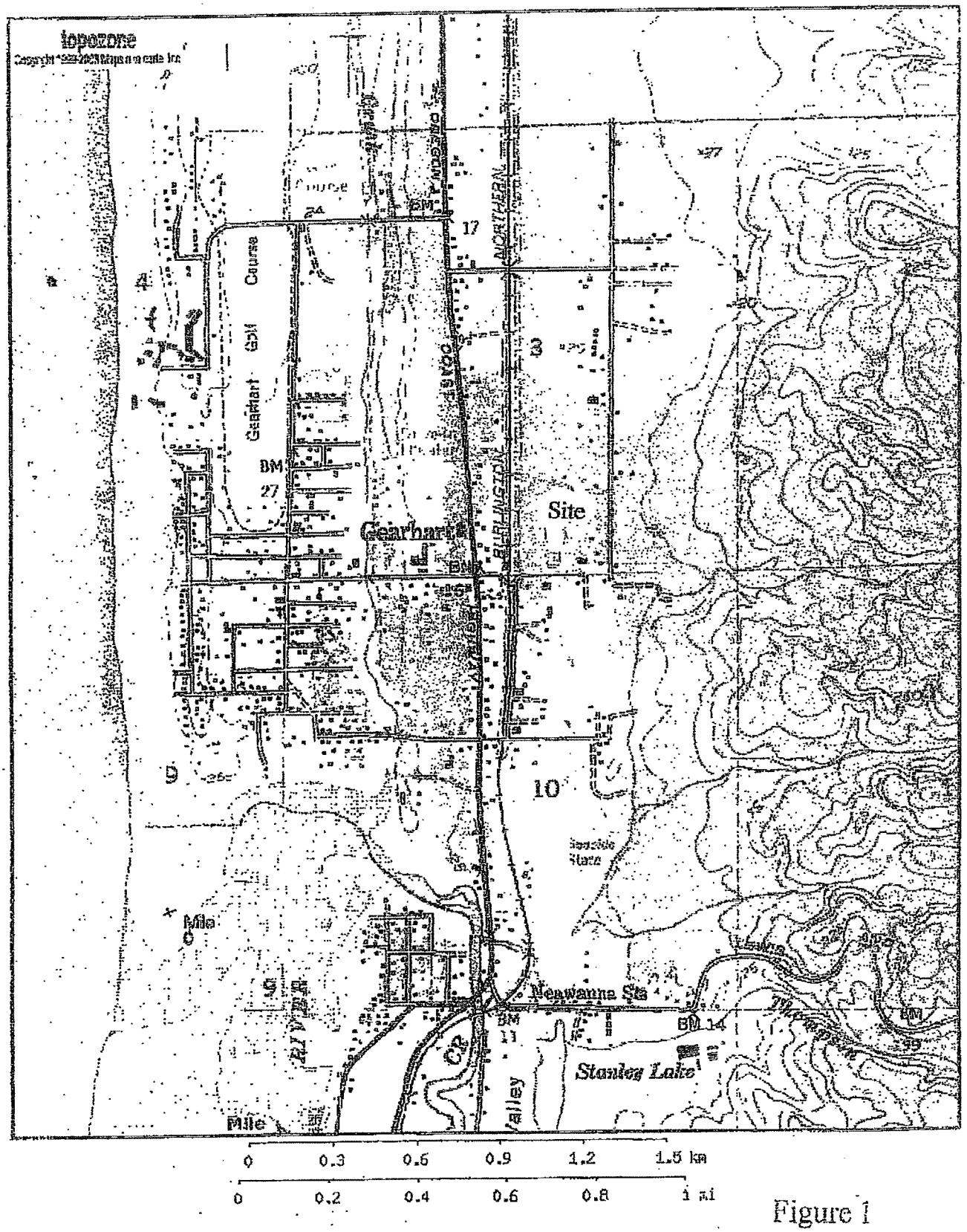


Figure 1
Site Location

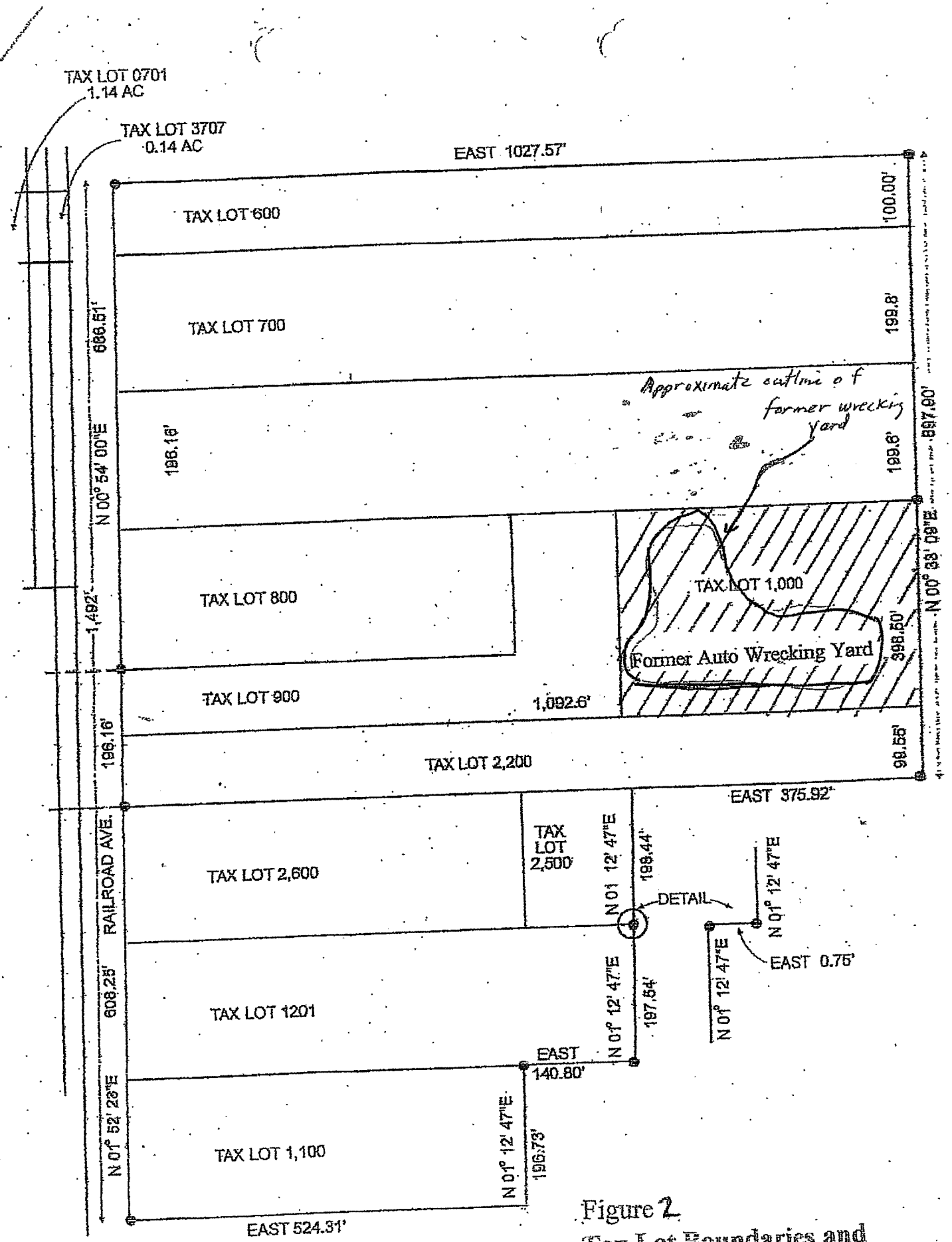
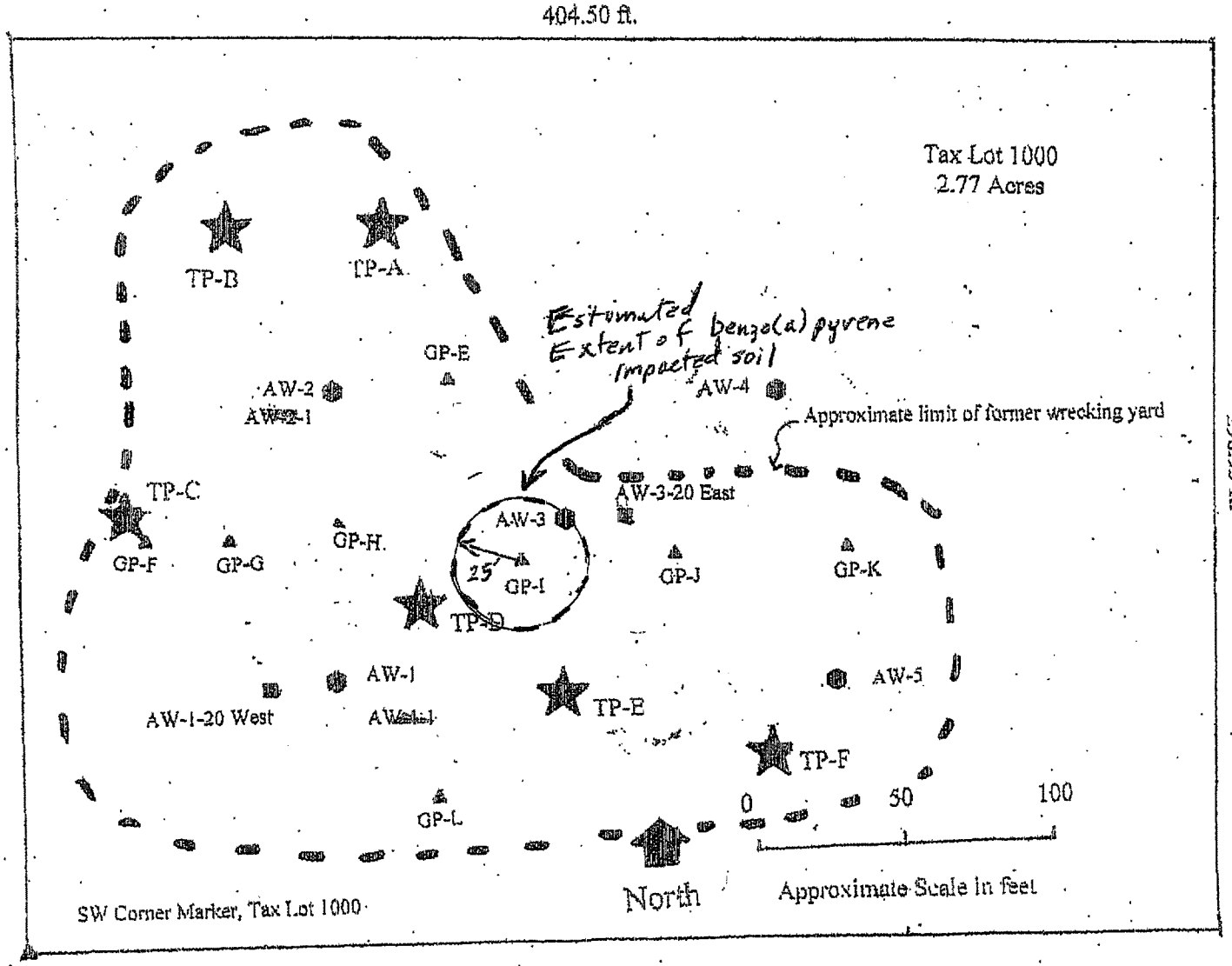


Figure 2.
Tax Lot Boundaries and
Area of Former Wrecking Yard



Current Samples

Sampling completed by Clearwater Environmental, 2002

Sampling from June 21, 2006

Sampling from September 28, 2006

Figure 3
Current and Past Sampling
Tax Lot 1000

Appendix A
ProUCL Spreadsheets

	Normal UCL Statistics for Full Data Sets - Benzo(a)pyrene
User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	90%

Number of Valid Samples	9
Number of Unique Samples	3
Minimum	0.003
Maximum	0.5
Mean	0.0607
Median	0.003
SD	0.165
Variance	0.0272
Coefficient of Variation	2.718
Skewness	2.989
Shapiro Wilk Test Statistic	0.413
5% Shapiro Wilk Critical Value	0.829

Data not Normal at 5% Significance Level

90% UCL (Assuming Normal Distribution)

Student's-t LCL	-0.0161
Student's-t UCL	0.137

Data do not follow a Discernable Distribution (0.05)

May want to try Nonparametric UCLs

	Lognormal Statistics for Full Data Sets
User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	90%
Number of Bootstrap Operations	2000

Number of Valid Samples	9
Number of Unique Samples	3
Minimum of log data	-5.809
Maximum of log data	-0.693
Mean of log data	-5.005
SD of log data	1.762
Variance of log data	3.106
Shapiro Wilk Test Statistic	0.551
Shapiro Wilk 5% Critical Value	0.829
Data not Lognormal at 5% Significance Level	
90% UCL (Assuming Normal Distribution)	
90% Student's-t UCL	0.137
ML Estimates Assuming Lognormal Distribution	
Mean	0.0317
SD	0.146
Coefficient of Variation	4.619
Skewness	112.4
Median	0.0067
80% Quantile	0.0295
90% Quantile	0.0642
95% Quantile	0.122
99% Quantile	0.405
MVU Estimate of Median	0.00562
MVU Estimate of Mean	0.023
MVU Estimate of SD	0.0466
MVU Estimate of Standard Error of Mean	0.0137
Non-Parametric UCLs	
90% Adjusted-CLT UCL (Adjusted for Skewness)	0.17
90% Modified-t UCL (Adjusted for Skewness)	0.147
90% Hall's Bootstrap UCL	1.306
90% Bootstrap t UCL	1.302
90% BCA Bootstrap UCL	0.116
90% Chebyshev (Mean, Sd) UCL	0.226
95% Chebyshev (Mean, Sd) UCL	0.3
97.5% Chebyshev (Mean, Sd) UCL	0.404
99% Chebyshev (Mean, Sd) UCL	0.608

selected as exposure point concentration

UCLs (Assuming Lognormal Distribu	
90% H-UCL	0.282
90% Chebyshev (MVUE) UCL	0.0642
95% Chebyshev (MVUE) UCL	0.0829
97.5% Chebyshev (MVUE) UCL	0.109
99% Chebyshev (MVUE) UCL	0.16
Data do not follow a Discernable Distribution (0.05)	
May want to try Non-Parametric UCLs	

	Normal UCL Statistics for Full Data Sets - Benzo(b)fluoranthen
User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	90%

Number of Valid Samples	9
Number of Unique Samples	3
Minimum	0.003
Maximum	0.748
Mean	0.0882
Median	0.003
SD	0.248
Variance	0.0613
Coefficient of Variation	2.806
Skewness	2.995
Shapiro Wilk Test Statistic	0.405
5% Shapiro Wilk Critical Value	0.829

Data not Normal at 5% Significance Level

90% UCL (Assuming Normal Distribution)

Student's-t LCL	-0.027
Student's-t UCL	0.203

Data do not follow a Discernable Distribution (0.05)

May want to try Nonparametric UCLs

	Lognormal Statistics for Full Data Sets
User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	90%
Number of Bootstrap Operations	2000

C0

Number of Valid Samples	9
Number of Unique Samples	3
Minimum of log data	-5.809
Maximum of log data	-0.29
Mean of log data	-4.96
SD of log data	1.886
Variance of log data	3.559
Shapiro Wilk Test Statistic	0.545
Shapiro Wilk 5% Critical Value	0.829
Data not Lognormal at 5% Significance Level	
90% UCL (Assuming Normal Distribution)	
90% Student's-t UCL	0.203
ML Estimates Assuming Lognormal Distribution	
Mean	0.0415
SD	0.243
Coefficient of Variation	5.841
Skewness	216.8
Median	0.00701
80% Quantile	0.0343
90% Quantile	0.0786
95% Quantile	0.156
99% Quantile	0.564
MVU Estimate of Median	0.00573
MVU Estimate of Mean	0.0282
MVU Estimate of SD	0.0621
MVU Estimate of Standard Error of Mean	0.0179
Non-Parametric UCLs	
90% Adjusted-CLT UCL (Adjusted for Skewness)	0.253
90% Modified-t UCL (Adjusted for Skewness)	0.217
90% Hall's Bootstrap UCL	2.885
90% Bootstrap t UCL	2.882
90% BCA Bootstrap UCL	0.171
90% Chebyshev (Mean, Sd) UCL	0.336
95% Chebyshev (Mean, Sd) UCL	0.448
97.5% Chebyshev (Mean, Sd) UCL	0.603
99% Chebyshev (Mean, Sd) UCL	0.909

→ selected as exposure point concentration

UCLs (Assuming Lognormal Distribut	
90% H-UCL	0.497
90% Chebyshev (MVUE) UCL	0.0819
95% Chebyshev (MVUE) UCL	0.106
97.5% Chebyshev (MVUE) UCL	0.14
99% Chebyshev (MVUE) UCL	0.206
Data do not follow a Discernable Distribution (0.05)	
May want to try Non-Parametric UCLs	

	Normal UCL Statistics for Full Data Sets - Dibenz(ah)anthracene
User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	90%

Number of Valid Samples	9
Number of Unique Samples	3
Minimum	0.003
Maximum	0.0853
Mean	0.0146
Median	0.003
SD	0.0275
Variance	7.5607E-4
Coefficient of Variation	1.885
Skewness	2.658
Shapiro Wilk Test Statistic	0.511
5% Shapiro Wilk Critical Value	0.829

Data not Normal at 5% Significance Level

90% UCL (Assuming Normal Distribution)

Student's-t LCL	0.00179
Student's-t UCL	0.0274

Data do not follow a Discernable Distribution (0.05)

May want to try Nonparametric UCLs

UCLs (Assuming Lognormal Distribu	
90% H-UCL	0.0381
90% Chebyshev (MVUE) UCL	0.0241
95% Chebyshev (MVUE) UCL	0.0303
97.5% Chebyshev (MVUE) UCL	0.0388
99% Chebyshev (MVUE) UCL	0.0556
Data do not follow a Discernable Distribution (0.05)	
May want to try Non-Parametric UCLs	

	Lognormal Statistics for Full Data Sets - Dibenz(ah)anthr
User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	90%
Number of Bootstrap Operations	2000

Number of Valid Samples	9
Number of Unique Samples	3
Minimum of log data	-5.809
Maximum of log data	-2.462
Mean of log data	-5.202
SD of log data	1.244
Variance of log data	1.547
Shapiro Wilk Test Statistic	0.571
Shapiro Wilk 5% Critical Value	0.829
Data not Lognormal at 5% Significance Level	
90% UCL (Assuming Normal Distribution)	
90% Student's-t UCL	0.0274
ML Estimates Assuming Lognormal Distribution	
Mean	0.0119
SD	0.023
Coefficient of Variation	1.923
Skewness	12.89
Median	0.00551
80% Quantile	0.0157
90% Quantile	0.0271
95% Quantile	0.0426
99% Quantile	0.0995
MVU Estimate of Median	0.00505
MVU Estimate of Mean	0.0105
MVU Estimate of SD	0.0142
MVU Estimate of Standard Error of Mean	0.00453
Non-Parametric UCLs	
90% Adjusted-CLT UCL (Adjusted for Skewness)	0.0321
90% Modified-t UCL (Adjusted for Skewness)	0.0287
90% Hall's Bootstrap UCL	0.0517
90% Bootstrap t UCL	0.0489
90% BCA Bootstrap UCL	0.0304
90% Chebyshev (Mean, Sd) UCL	0.0421
95% Chebyshev (Mean, Sd) UCL	0.0545
97.5% Chebyshev (Mean, Sd) UCL	0.0718
99% Chebyshev (Mean, Sd) UCL	0.106

Selected as exposure point concentration

	Normal UCL Statistics for Full Data Sets Lead
User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	90%

C0

Number of Valid Samples	14
Number of Unique Samples	9
Minimum	0.5
Maximum	1140
Mean	85.18
Median	0.85
SD	303.7
Variance	92216
Coefficient of Variation	3.565
Skewness	3.739
Shapiro Wilk Test Statistic	0.311
5% Shapiro Wilk Critical Value	0.874

Data not Normal at 5% Significance Level

90% UCL (Assuming Normal Distribution)

Student's-t LCL	-24.4
Student's-t UCL	194.8

Data do not follow a Discernable Distribution (0.05)

May want to try Nonparametric UCLs

	Lognormal Statistics for Full Data Sets Lead
User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	90%
Number of Bootstrap Operations	2000

C0

Number of Valid Samples	14
Number of Unique Samples	9
Minimum of log data	-0.693
Maximum of log data	7.039
Mean of log data	0.925
SD of log data	2.133
Variance of log data	4.55
Shapiro Wilk Test Statistic	0.703
Shapiro Wilk 5% Critical Value	0.874
Data not Lognormal at 5% Significance Level	
90% UCL (Assuming Normal Distribution)	
90% Student's-t UCL	194.8
ML Estimates Assuming Lognormal Distribution	
Mean	24.53
SD	237.3
Coefficient of Variation	9.675
Skewness	934.6
Median	2.522
80% Quantile	15.18
90% Quantile	38.8
95% Quantile	84.22
99% Quantile	360.3
MVU Estimate of Median	2.14
MVU Estimate of Mean	16.61
MVU Estimate of SD	53.54
MVU Estimate of Standard Error of Mean	10.63
Non-Parametric UCLs	
90% Adjusted-CLT UCL (Adjusted for Skewness)	247.1
90% Modified-t UCL (Adjusted for Skewness)	208.3
90% Hall's Bootstrap UCL	4339
90% Bootstrap t UCL	4498
90% BCA Bootstrap UCL	248.3
90% Chebyshev (Mean, Sd) UCL	328.7
95% Chebyshev (Mean, Sd) UCL	438.9
97.5% Chebyshev (Mean, Sd) UCL	592
99% Chebyshev (Mean, Sd) UCL	892.7

Selected as exposure point concentration

UCLs (Assuming Lognormal Distribu	
90% H-UCL	195
90% Chebyshev (MVUE) UCL	48.5
95% Chebyshev (MVUE) UCL	62.95
97.5% Chebyshev (MVUE) UCL	83
99% Chebyshev (MVUE) UCL	122.4
Data do not follow a Discernable Distribution (0.05)	
May want to try Non-Parametric UCLs	

	Normal UCL Statistics for Full Data Sets Heavy Lab
User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	90%

Number of Valid Samples	15
Number of Unique Samples	8
Minimum	26
Maximum	4910
Mean	354.1
Median	28
SD	1260
Variance	1588518
Coefficient of Variation	3.56
Skewness	3.873
Shapiro Wilk Test Statistic	0.286
5% Shapiro Wilk Critical Value	0.881

Data not Normal at 5% Significance Level

90% UCL (Assuming Normal Distribution)

Student's-t LCL	-83.64
Student's-t UCL	791.8

Data do not follow a Discernable Distribution (0.05)

May want to try Nonparametric UCLs

	Lognormal Statistics for Full Data Sets - Heavy Oil
User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	90%
Number of Bootstrap Operations	2000

C0

Number of Valid Samples	15
Number of Unique Samples	8
Minimum of log data	3.258
Maximum of log data	8.499
Mean of log data	3.694
SD of log data	1.333
Variance of log data	1.776
Shapiro Wilk Test Statistic	0.339
Shapiro Wilk 5% Critical Value	0.881
Data not Lognormal at 5% Significance Level	
90% UCL (Assuming Normal Distribution)	
90% Student's-t UCL	791.8
ML Estimates Assuming Lognormal Distribution	
Mean	97.66
SD	216.3
Coefficient of Variation	2.214
Skewness	17.5
Median	40.2
80% Quantile	123.4
90% Quantile	221.7
95% Quantile	359.8
99% Quantile	892.2
MVU Estimate of Median	37.88
MVU Estimate of Mean	88.59
MVU Estimate of SD	144.7
MVU Estimate of Standard Error of Mean	34.4
Non-Parametric UCLs	
90% Adjusted-CLT UCL (Adjusted for Skewness)	1004
90% Modified-t UCL (Adjusted for Skewness)	846
90% Hall's Bootstrap UCL	96401
90% Bootstrap t UCL	168736
90% BCA Bootstrap UCL	1005
90% Chebyshev (Mean, Sd) UCL	1330
95% Chebyshev (Mean, Sd) UCL	1773
97.5% Chebyshev (Mean, Sd) UCL	2386
99% Chebyshev (Mean, Sd) UCL	3592

UCLs (Assuming Lognormal Distribu							
90% H-UCL	227.2						
90% Chebyshev (MVUE) UCL	191.8						
95% Chebyshev (MVUE) UCL	238.5						
97.5% Chebyshev (MVUE) UCL	303.4						
99% Chebyshev (MVUE) UCL	430.9						
Data do not follow a Discernable Distribution (0.05)							
May want to try Non-Parametric UCLs							