SUMMARY OF MODEL TOXICS CONTROL ACT-RELATED ACTIVITIES AT THE SURPLUS YARD OPERATED BY PANAMA MACHINERY AND EQUIPMENT

3126 HILL AVENUE
EVERETT, WA 98206
(JANUARY-FEBRUARY, 1997)

Report Prepared for:

Panama Machinery & Equipment, Inc.

by:

Kintu Enterprises
9225 NE 128th Lane
Kirkland, WA 98034

February 21, 1997

TABLE OF CONTENTS

INTRODUCTION

This report documents recently completed environmental activities at the surplus or scrap yard under lease to Panama Machinery and Equipment, Inc., doing business as (d.b.a.) Everett Steel Companies (Panama). These activities consisted of:

The excavation, removal and disposal of 433 tons of contaminated soil from existing stock piles, solid waste in containers and petroleum-stained surface soils

The coll33———————————————————————□ection and analysis of samples of surface soil across the surplus yard

The installation and sampling of three groundwater monitoring wells in the southern half of the surplus yard

Panama undertook these activities in response to requirements of the Washington State Model Toxics Control Act (MTCA). There are six basic steps in the cleanup process under MTCA:

1. Site Discovery

2. Initial Investigation (Site hazard assessment by recipients of early notice letters)

3. Site Hazard Assessment (Ranking of sites by Ecology)

4. Detailed Site Study (RI/FS)

5. Cleanup Action Plan

6. Cleanup and Monitoring

In addition, interim actions, generally measures designed to reduce or control sources of contamination pending completion of the plan for final cleanup, may be taken at any point in the process.

Everett Steel Companies is named on the Washington State Department of Ecologys (Ecology) list of Confirmed or Suspected Contaminated Sites (CSCS) at two sites involving the surplus yard33———————————————————————Î. Inclusion on the list of CSCS indicates the receipt of early notice letters. According to the MTCA process, Panama, as Everett Steel Companies, is not necessarily a party potentially responsible for cleanup (PLP), but the findings place the onus on Panama to investigate as if it had been determined to be a PLP. Panama was obligated as a next step to conduct a site hazard assessment at both sites. Site hazard assessment includes sampling of soil, groundwater, and other media suspected of contamination based on information provided in the site discovery step to determine if there is a need for further investigation. The removal and disposal of stock piles of contaminated soil, stained surface soils, and solid wastes was necessary to 1) remove known volumes of above ground contamination that exceeds MTCA Method A cleanup levels for industrial soils, 2) reduce known and suspected sources of contaminants to subsurface soil, surface water, and groundwater on the surplus yard, and 3) cle44————————————————————————˝ar the way for representative sampling of surface soils for site hazard assessment.

The surplus yard was first included on the CSCS as Site #2805. An Ecology inspector visited the surplus yard on March 30, 1993 and identified soil and surface water contaminated by petroleum. Panama received an early notice letter from Ecology on April 17, 1993 stating that soil and surface water were contaminated by petroleum. The letter further states that Ecology suspects that soil, surface water, groundwater and sediments are contaminated by priority pollutant metals, non-priority pollutant metals, polychlorinated biphenyls (PCBs), and non-halogenated solvents. The early notice letter represents site discovery. In response, Panama initiated a phased response under the Independent Remedial Action Program (IRAP) as permitted under MTCA. Prior to the activities just completed, the phased approach consisted of sampling stock piles of soils, stained soils, and solid wastes in containers, sampling deeper soils and attem44————————————————————————Òpting to sample groundwater, and clearing the surplus yard of salvageable materials.

The surplus yard is also Site #2806 on the CSCS. A tenant of a building adjacent to the southeastern corner of the surplus yard, Quantum Wood Windows, installed a monitoring well as part of an environmental audit. The monitoring well was sampled on July 29, 1993, and results showed three metals (arsenic, lead, and chromium) above MTCA Method A cleanup levels. A report of the findings written by Quantum Wood Windows consultant opines that Quantum Wood Windows is not the likely source of the contamination, and states that there is a scrap yard immediately to the northwest of the property. Ecology sent Everett Steel Companies an early notice letter on June 28, 1996 and added a site on the CSCS named Everett Steel Companies/ Quantum Wood Windows. The site is included due to confirmed groundwater contamination by priority pollutant metals in the monitoring well at Quantum Wood Windows. Currently, Ecology is44—————————
» in the process of assessing the hazard posed by the site using the Washington Ranking Model and is awaiting the results of a hazard assessment by the PLPs. The Snohomish County Health Department has made periodic inquiries to Panama since 1993 about groundwater contamination based on the results from the one sample at Quantum Wood Windows.

What follows is a summary of the results of the interim action and site hazard assessments, and recommendations for next steps. Detailed descriptions of field activities and original laboratory data sheets are included as Attachments A and B. Historical data (1992-1995) from the surplus yard is included as Attachment C.

SUMMARY OF RESULTS

Excavation and Disposal of Contaminated Soils and Solid Waste

The objectives of the excavation and removal of contaminated soils and solid waste were to 1) remove contaminated stock piles, stained soils, and solid wastes in containers known to exceed the MTCA Method A cleanup 55—————————————— Úlevels for industrial soils identified in 1993, 2) reduce known and suspected sources of contaminants to subsurface soil, surface water, and groundwater on the surplus yard, and 3) clear the ground to permit representative samples of surface soils to be collected as part of the site hazard assessment. Stock piled soils, stained surface soils, and solid waste exceeded the MTCA Method A residential cleanup levels for arsenic, cadmium, chromium, lead, mercury and total petroleum hydrocarbons (Table 1), and the Method A industrial cleanup levels for cadmium, chromium, lead, mercury and total petroleum hydrocarbons (Table 2).

The soil and solid waste were removed from seven areas of existing stock piles, containers of solid waste, or stained surface soil (Figures 1 and 2). The original estimated volume to be removed was 360 tons. The actual volume of contaminated soil was found to be significantly greater after excavation began. Excavation and removal were halted at 433 tons because of budget55————————————— ˘ary constraints and the need to conduct further investigation to define the extent of subsurface contamination. Two identified areas caused the significant discrepency between the original estimate and what was observed. The largest stock pile, composed of metal shavings, petroleum stained soil and burning table debris, fills a topographic depression that is deeper than previously estimated. It also contained several boulder-sized concretions of burning table debris inside the pile that added significantly to the weight of what was removed. Approximately 90% of the material removed came from the largest stock pile.

Petroleum contamination in the area of the former guillotine shearer was found to extend to approximately three feet in depth over at least 2,000 square feet. In several places, petroleum contamination two feet below the surface exhibited a strong odor. The volume, depth and concentration of hydrocarbon contamination were unexpected based on earlier samples and operational history. Add55———————— Œitional investigation into past operation revealed there had been a spill of approximately 1,500 gallons of hydraulic fluid in the mid 1980s, the result of a broken hydraulic line. An attempt was made to include the deeper contaminated soils in the volume of soils being removed. This effort was curtailed when it became apparent that removing the volume of subsurface soil would significantly exceed the approved budget. Also, determining the extent of petroleum contamination will require additional field investigation. An attempt was made to establish the lateral extent of petroleum contamination in the field using the back hoe. Significant staining was observed approximately ten feet from the western fence line. Concrete and other obstructions prevented exploration at the fence line. Potential off-site migration of petroleum should be part of the next phase of investigation. The southern limit of petroleum contamination was not determined either. Surplu55——————————————————…s steel approximately 70 meters south of the footing of the shearer obstructed further exploration using the back hoe. Excess excavated soils were replaced pending further investigation.

All other areas were completely excavated. Contaminated soils were sent to a sanitary landfill owned and operated by Waste Management, Inc.:

Columbia Ridge Landfill
18177 Cedar Springs Lane
Arlington, OR 97812
tel: 541-454-2030

Surface Soil Sampling Across the Site

After the completion of removal activities, surface soil samples were collected and analyzed to 1) confirm removal of the stock piles, stained soils, and solid waste, and 2) to assess the degree to which the soils across the site are contaminated as suspected by Ecology. The sampling strategy consisted of dividing the site into thirteen sectors biased towards known areas of contamination in the western and southern portions of the surplus yard, and divided into equal grids in the eastern portion of the66————————————————————————ÿ site where no known areas of contamination exist (Figure 3). Composite samples were collected to represent area contamination. The numbers of samples do not comport with Ecologys guidance regarding statistically-based numbers of samples for area contamination, but that rigor is not required at this stage in the MTCA process. Samples were collected from a depth of approximately 6 inches to avoid bias from atmospheric fallout. Analytes selected were TPH-D, TPH-O, PCBs, and Resource Conservation and Recovery Act metals (because they include the priority pollutant metals that have historically been found in the surplus yard, as well as the metals on the MTCA Method A list). An expanded list of analytes may be required if additional investigation is warranted. Details regarding field activities are included in Attachment A.

Table 3 summarizes the analytical results, and Figure 3 shows the locations of samples. Contaminants of concern are TPH-D, TPH-O, arsenic, cadm66——————————————
‹ium, chromium, lead, mercury, and PCBs. The distribution of contaminants above MTCA Method A cleanup levels for residential and industrial scenarios is:

TPH-D was detected in surface soils in five sectors from the middle of the site to the southern end. TPH-D was not detected in soils at the depth of the groundwater monitoring wells screens. The level is the same for residential and industrial scenarios.

TPH-O was detected in surface soils in twelve of the thirteen sectors. TPH-O was not detected in soils at the depth of the groundwater monitoring wells screens. The level is the same for residential and industrial scenarios.

Arsenic was detected in one sector above the cleanup level for industrial soils, near the former paint shed, and in three sectors above the cleanup level for residential soils, the additional two sectors located in the eastern portion of the site. Arsenic was not detected in soils at the depth of the groundwater monitoring wells screens.

Cadmiu66————————————————————————¸m was detected in four sectors above the cleanup level for industrial soils, principally in the eastern and southern areas of the site. It was detected in six sectors above the cleanup level for residential soils, the additional two sectors located near the shearer in the middle of the site. Cadmium was not detected in soils at the depth of the groundwater monitoring wells screens.

Chromium was not detected above the cleanup level for industrial soils. It was detected in seven sectors above the cleanup level for residential soils, in the eastern and southern portions of the site, and near the shearer in the middle of the site. Chromium was not detected in soils at the depth of the groundwater monitoring wells screens.

Lead was detected in five sectors above the cleanup level for industrial soils, principally in the eastern and southern areas of the site, and near the shearer. It was detected in nine sectors above the cleanup level for residential soils, the additional four sectors located in the sou77————————————¸thern half of the site. Lead was not detected in soils at the depth of the groundwater monitoring wells screens.

Mercury was detected in eight sectors above the cleanup level for industrial and residential soils, in the eastern and southern areas of the site, and near the shearer. The cleanup levels are the same for both scenarios. Mercury was not detected in soils at the depth of the groundwater monitoring wells screens.

PCBs were detected in two sectors above the cleanup level for industrial soils in the eastern portion of the site. PCBs were not detected in soils at the depth of the groundwater monitoring wells screens.

These results demonstrate that there is widespread contamination of surface soils in the surplus yard. A significant range of contaminants were detected in the eastern portion of the site where no known sources of contamination exist. Furthermore, several of the contaminants, PCBs, mercury, lead, and arsenic are not associated with known past activities by Panama in the surplus y77—————
,ard. The concentrations and distributions of contaminants as well as questions regarding the provenance of some strongly suggest the need for further study before taking further remedial action.

Anecdotal information supports a strategy of additional investigation before taking further remedial action:

There was once a ditch down the spine of the surplus yard.
The surplus yard was graded in the 1970s which could have spread contaminants.
Transformers were explicitly rejected from the scrap yard.
No cars were scrapped in the surplus yard.
Surrounding properties have had major environmental releases in the past.
Arsenic and lead contamination is prevalent in the general area of Everett.

Groundwater Sampling in the Southern Portion of the Site

Three permanent, four-inch diameter groundwater monitoring wells were installed in the southern portion of the site to assess the presence of contamination in groundwater beneath the surplus yard in the area adjacent to the monitoring w77—
›ell at Quantum Wood Windows. The monitoring wells were installed in a triangular orientation to assess the direction of groundwater flow relative to the monitoring well at Quantum Wood Windows by measuring static water levels in the three wells.

In addition to analyzing samples for contamination and identifying the direction of groundwater flow, the yield of the wells was assessed and specific conductance of the groundwater was measured during development and purging to determine if an alternative usage scenario would be feasible. Ecology requires an assumption that all groundwater may be used as a source of drinking water unless yield is too low (less than 0.5 gallons per minute) or water quality parameters are too poor (extremely high dissolved solids).

Figure 4 illustrates the locations of the three monitoring wells and the well at Quantum Wood Windows. Drilling and well logs are included in Attachment A. At the time of measurement, groundwater appeared to flow to 88————————————————
Óthe southeast, in the direction of Quantum Wood Windows. In addition, the results of analysis show concentrations of arsenic, chromium, and lead above MTCA Method A levels (Table 4) in the well PMW-2 located next to the former large stock pile, and concentration of lead above MTCA cleanup levels in well PMW-3 in the southeastern portion of the site. The contaminants detected are the same as those that were detected in the monitoring well at Quantum Wood Windows in 1993. The well located adjacent to the contamination from the shearer had no analytes above MTCA cleanup levels. The sample from well PMW-2 also contained TPH, though at a level below the MTCA Method A limit. It was the only detection of TPH in groundwater.

The original plan was to sample the well at Quantum Wood Windows at the same time the other three wells were sampled. Access included stipulations by Quantum Wood Windows to which Panama could not agree, therefore only the wells on the surplus yard were sampled.

The mo88————————————————ænitoring wells recovered too quickly after purging to have yields less than 0.5 gallons per minute, and the measurements of specific conductance were all in the normal range of dissolved solids content. As such, the groundwater probably does not meet the parameters necessary for Ecology to consider a usage lower than drinking water. The issue of seasonality, however, has not been addressed. As stated earlier in this report, groundwater appears to be perched and much deeper during the dry season. The only monitoring well in the area that has been measured during the dry season is the one at Quantum Wood Windows, which had a static water level of fifteen feet below the surface. A till layer at approximately twenty-five feet below ground surface appears to serve as the bottom of the zone containing this groundwater. The water levels in the three monitoring wells on the surplus yard ranged from three to five feet below ground surface (refer t88————————————————пo well logs in Attachment A and Table 4). Further investigation to determine seasonality could affect Ecologys view of the usability of the groundwater beneath the surplus yard.

There are several reasons for additional investigation of groundwater:

The presence of contaminants above MTCA cleanup levels in two of the three monitoring wells requires further investigation under MTCA.

The direction of groundwater flow and past data from the monitoring well at Quantum Wood Windows suggest the surplus yard may be the source for off-site migration of contaminated groundwater.

Quantum Wood Windows has not demonstrated that it is not responsible for contamination of groundwater beneath its operation.

Arsenic, lead, and chromium may be the result of a source other than past activities by Panama at the surplus yard.

The presence of TPH in one monitoring well, and the significant volume and high concentration of near surface TPH contaminated so99——————————————————flil suggest downward migration is occurring.

RECOMMENDATIONS

The findings of the site hazard assessments of the surplus yard in connection with Sites #2805 and 2806 on the CSCS list are that there is soil contamination over the majority of the surface of the surplus yard above MTCA Method A cleanup levels for TPH, several metals, and PCBs. There is evidence of subsurface TPH contamination in the vicinity of the former shearing operation to a depth of approximately three feet over an undetermined surface area. Off-site migration of TPH from the area of the shearer beyond the western fence line is possible. Groundwater contamination above MTCA Method A cleanup levels was detected in two of three monitoring wells. Lead, chromium and arsenic were detected in one well, and lead in another. Moreover, the direction of groundwater flow indicates the possibility that the surplus yard is the source of the same three contaminants detected in an off-site monitoring well to the southe99——————————— „ast.

These findings should be investigated further. It is recommended, however, that Panama discontinue independent remedial action and enter into an Agreed Order with Ecology for a focused remedial investigation and feasibility study. There are several reasons to pursue this strategy:

An Agreed Order will provide Panama with assurance that it is doing what is required by MTCA, and not a voluntary action that could be rejected by Ecology after the fact.

An Agreed Order provides ongoing access to Ecology during the process of investigation that can help contain costs by containing the scope of investigation.

An Agreed Order facilitates cost recovery from other PLPs.

Panama cannot connect several detected contaminants in soil or groundwater samples to any of its past or present operations. An Agreed Order allows Panama to name other PLPs.

Quantum Wood Windows is listed with Everett Steel Companies in connection with confirmed groundwater contamination (Site #2806), and shou99—————————————— ¢ld share the costs of sampling on its property. Quantum Wood Windows has not done sufficient investigation to demonstrate that Panama is the cause of contamination in groundwater in its monitoring well.

The scope of the focused remedial investigation, feasibility study and cleanup action plan should include:

Request for an Agreed Order under WAC 173-340-530.

Focused Remedial Investigation

Identification of natural or manmade background levels of contaminants of concern in soil and groundwater

Investigation of other plausible sources of the detected contaminants in soil and groundwater (e.g., other local contamination, the imported fill, the property owner)

Investigation of the source and pathway of contaminants in groundwater and surface water (if applicable) across the site

Representative sampling of surface soils and subsurface soils to the limit of assumptions regarding direct exposure (fifteen feet below g1010——————————— πround surface) and analysis for known and suspected contaminants

Determination of the lateral extent of petroleum contamination in the vicinity of the former shearing operation

Risk Assessment to determine cleanup levels appropriate to the site, and therefore to determine appropriate remedial alternatives (new policy regarding risk-based cleanup levels for TPH will be used)

Identification of Applicable and Relevant and Appropriate requirements that may determine site-specific cleanup levels

A determination of the need for remedial action (including No Further Action)

Focused Feasibility Study and Cleanup Action Plan

An evaluation and ranking of focused remedial action alternatives

A Cleanup Action Plan

Negotiating the removal of the surplus yard from the list of CSCS

FIGURES AND TABLES

ATTACHMENT A:
FIELD NOTES

ATTACHMENT A:

FIELD NOTES

Excavation and Removal Activities

Excavation of Stock Piles of 1313————————————————————————–Contaminated Soil and Stained Surface Soil

Seven areas of stock piled soil, stained soil, and contained solid waste were identified for removal and disposal. The majority of these stockpiles contain one or more of the following: burning table cuttings, metal shavings, spent steel shot, petroleum product, or paint chips.

On January 20, 21, and 22, 1997 a representative of Boateng & Associates monitored the excavation and loading of the waste material stockpiles, and petroleum stained soils. Four hundred and thirty-three tons of contaminated soil and solid waste was removed from the site in 16 truckloads. Disposal subcontractor services were provided by Advanced Environmental Technical Services (AETS) of Tukwila, Washington. AETS profiled the waste for disposal, excavated the soils and solid wastes at the direction of the Boateng representative, transported the materials by truck to its sanitary solid waste landfill, Columbia Ridge in Arlington, Oregon.

Duri1313————————————————————————Ûng the excavation of petroleum-stained soils in the vicinity of the guillotine shearer, it was discovered that the extent of petroleum contamination extended deeper, (approximately 3-4 feet), and encompasses an area much larger than the surficial staining indicated. Representative soil samples were collected from the western and southern excavation sidewalls and stockpiled material to aid in determining the nature of the petroleum product, these samples are identified as PM-GEX-1,2, and 3 (see Tables 3 and 5).

Removal of Solid Waste in Containers

Solid waste stored in several containers and debris bins was removed from the containers for disposal along with the stock piled soil. One bin containing anchor chain black was disposed of entirely since the weathered bituminus material could not be effectively removed from the container.

On January 23,1997, the Boateng sampling team returned to the site to collect surface soil samples from the upper 6 inches of soil across the site. The project si1313————————————————————————Ÿte was divided into thirteen sectors. Each sector was sampled at two random locations. Effort was made to avoid biasing the samples with obviously contaminated soil. The two random samples were then homogenized to form a single composited sample with a total of 13 samples being submitted to the analytical laboratory, On-Site Environmental in Redmond, WA. These soil samples are identified as PM-SC-1 through 13 (see Table 3).

Groundwater Monitoring Wells

Groundwater Monitoring Well Installation

On February 3, 1997, three 4-inch diameter groundwater monitoring wells, PMW-1, PMW-2 and PMW-3, were installed by Cascade Drilling, Inc. (Cascade) of Woodinville, Washington. Well drilling was accomplished using a Central Mining Equipment, CME 75 continuous flight hollow-stem auger drill rig (with 8-inch-outside-diameter augers). The hollow-stem auger drilling method was chosen due to the high mobility of equipment, the shallow nature of the borings, and the speed of dr1414——————————————Íilling and well installation.

Split spoon samples were collected at 5-foot drill intervals for visual soil description, photoionization detector (PID) screening, and laboratory analysis. One additional sample from each boring was collected near the expected water table (7 feet) to visually determine the presence of free-phase petroleum hydrocarbons. The drill augers and associated equipment were decontaminated by steam-cleaning prior to drilling each well to minimize the potential for cross-contamination. The locations of the monitoring wells (PMW-1,PMW-2 and PMW-3), as well as the existing Quantum Wood Windows groundwater monitoring well, are illustrated in Figure 3. The PMW-1, PMW-2 and PMW-3 boring logs are included at the end of this attachment.

Monitoring Well Construction

Monitoring well drilling and construction were conducted in accordance with Minimum Standards for Construction and Maintenance of Wells, Chapter 173-160 Washington Administrative Code (WAC).

The following 1414——————————————ódetails apply to the construction of the new monitoring wells :

Wells were installed to a depth of 20 feet below the surface grade.

Wells were constructed with 10 feet of 4-inch-diameter schedule 40 PVC screen and 10 feet of blank casing.

Well screen openings were 0.01-inch, machine-cut slots with a minimum of 44 slots per foot.

The annular space between the aquifer sands and the PVC casing was filled with #2/12 LoneStar, Lapis Lustre Monterey Sand to approximately 3 feet above the top of the screen. The annular space above the top of the sand pack was filled with approximately 6 feet of medium-sized bentonite chips.

From the top of the bentonite seal to surface the remaining annular space was filled with ready-mix concrete.

The wells were completed above the ground surface. 8-inch-diameter and three foot high steel "stick-up" access covers were installed over the PVC well casing riser and set into1414——————————————÷ concrete to provide a water resistant enclosure. In addition, the PVC well casing riser is equipped with a locking, water-tight cap.

Well Development

The completed wells were developed to equilibrate them with surrounding groundwater and to ensure their ability to provide representative samples of groundwater. The wells were developed by surging the well at the screened interval using a 3.5 inch diameter PVC bailer. Following the surging activities the wells were bailed by hand to remove silt and fine sands that may have accumulated in the well sump. The surging action corrects the borehole skinning effect commonly associated with hollow-stem auger drilling. Well development continued until water drawn from the well was generally free of fine sand. All wells exhibited a water level drawdown due to the rate of water removal and quickly recovered to near the initial static water level measurement a short time after bailing had ceased.

Investigation Derived 1515————————————————————————¸Waste (IDW)

Sources of investigation derived wastes generated during the installation and sampling of the monitoring wells include: soil cuttings from the drilling operation, drilling and sampling equipment decontamination water, well development water, and well purge water from the groundwater sampling event. Soil cuttings from the drilling operation have been placed on top of plastic sheeting and in covered stockpiles near the monitoring wells. Waste water is temporarily being stored on site in unlined steel 17-H, DOT-approved, 55-gallon drums pending disposal. All drums were labeled with indelible ink identifying the contents, source of contents, and their status as non-hazardous waste.

Sample Collection

Soil and groundwater sampling occurred during two separate sampling events. The newly installed monitoring wells were allowed to equilibrate with ambient groundwater conditions for 2-days before groundwater samples were collected. Soil and groundwater sampling activities were conducted under th1515————————————‟e guidelines established in the site specific Health and Safety Plan.

Soil Sampling

Six soil boring samples were collected on February 3, 1997. Two samples were collected from each monitoring well at depth intervals of 5 and 15 feet. These samples were then submitted to the analytical laboratory for evaluation of total petroleum hydrocarbon and metals content.

All soil samples were visually inspected in the field by a Boateng geologist, then described and logged on the field well log form. Soil core samples were collected at 5-foot drill intervals using a standard penetration, split barrel sampler, 18 inches in length and with a 2.5-inch inside diameter. Soils were described in the field in general accordance with the Unified Soil Classification System (USCS). The USCS designation described on the boring logs is an approximation based on the American Society of Testing and Materials (ASTM) visual manual soil description method (ASTM D 2487). The boring log1515—∆s are included at the end of Attachment A.

The sampling depths of interest were at 5 feet below grade where the water table was expected to be encountered, and mid-well screen approximately 15 feet below grade. Soil samples from the borings were collected from this zone since many petroleum products are less dense than water and tend to "float" on the groundwater table.

All soil samples were screened in the field for traces of total volatile organics (VOCs) with a photoionization detector (PID) equipped with an 10.7 electron volt lamp and calibrated with 100 parts per million (ppm) isobutylene reference gas. Field screening of soil samples with the PID indicated that none of the soil samples from the soil borings contained volatile hydrocarbons measured in the vapor headspace while the sample was confined in an airtight plastic bag

Soil samples were immediately placed into laboratory-supplied, precleaned 4-ounce glass jars with screw-down, Teflo1616————————————÷n-lined septum top lids. The sample jar was filled to capacity to reduce the amount of headspace in the containers. This sample container was labeled with the site name, project number, time, date, sample collector's name, and type of analysis requested. The soil sample was immediately placed into a chilled ice chest and transported under chain-of-custody protocol to the analytical laboratory for chemical analyses.

Groundwater Sampling

Groundwater samples were collected on February 3, 1997. Three groundwater monitoring wells were sampled, PMW-1, PMW-2, and PMW-3.

Prior to collecting groundwater samples from the monitoring wells, standing water in the well casing was purged. This was done to ensure that groundwater samples were representative of ambient groundwater. Three well casing volumes were removed from each monitoring well prior to collecting groundwater samples. The actual volumes ranged from 32 gallons purged from PMW-2 to 38 gallons purged from P1616————————————◊MW-1. All wells were purged using a 3.5-inch-diameter PVC bailer. Significant water level drawdown was noticed in the monitor wells except well PMW-3. All wells were allowed to recover to approximate static water level conditions prior to sampling. Field data logs showing field measurements and well purging data are included at the end of this attachment.

Sample containers were carefully filled to minimize overfilling which would result in the loss of preservatives placed in the containers by the laboratory. Groundwater samples were placed in appropriate containers which were supplied by the laboratory and handled in a manner similar to that of the soil samples. All samples were immediately placed into a chilled ice chest and transported to the analytical laboratory under chain-of-custody protocol.

HYDROGEOLOGY

Well Head Survey

The elevation of the tops of the well casings were surveyed on February 3rd. The elevation survey was accomplished using an auto leve1616————————————fil, with the top of casing elevation surveyed relative to an arbitrary reference elevation bench mark of 100 feet established on the concrete slab immediately west of well PMW-3.

Groundwater Flow

The slope of the water table is the hydraulic gradient under which groundwater movement or flow generally takes place. Shallow groundwater elevations beneath the subject site were determined by subtracting the measured depth to groundwater from the surveyed reference elevation on the well casing, resulting in the relative elevation of groundwater in a particular well or point. The water level data used to establish the inferred groundwater flow direction was taken from information recorded during the February 3, 1997 groundwater sampling event.

Shallow groundwater beneath the site (see Figure 3) is believed to flow in a southeast direction.

ATTACHMENT B
LABORATORY DATA SHEETS

ATTACHMENT C:
SUMMARY OF HISTORICAL DATA
FROM THE SURPLUS YARD
(1992-1995)

181818|18˘˘181818N18181818181818181818181818181818‘1818181818181818181818181818
18181818181818181818181818181818181818181818181818181818181818181818181818181818
181818181818O18181818181818‘1818181818181818181818181818181818181818181818181818
181818181818181818181818181818181818181818
181818
18181818181818181818M18181818181818‘18181818181818181818181818181818181818181818
181818181818181818181818181818181818181818181818
181818
1818181818181818]18181818181818‘181818181818181818181818181818181818181818181818
18181818181818181818181818181818181818181818
181818
1818181818181818\P18
18
1818181818‘18181818181818181818181818181818181818181818181818181818181818181818
181818181818181818181818
181818
1818181818181818\p18

This piece of property will be referred to as a surplus yard in this report because its current function is to stage surplus steel. Scrap metal operations were conducted from approximately 1968 until the mid 1980s.

2720 34th Street Everett, WA

Preliminary Investigation of the Old Surplus Yard (ICF Kaiser Engineers report, August 1993)

Based on data gathered by ICF Kaiser and estimates from the bidding removal contractors after inspecting the site

Washington State Department of Ecology, Toxics Cleanup Program, Guidance on Sampling and Data Analysis Methods, January 1995, Publication No. 94-49

Locations are approximated at this point. The precise coordinates of the wells and other site features will be determined using global positioning equipment during the next phase of investigation. The expense of formal surveying was not necessary at this stage of investigation.

212121212121˘˘2121212121212121621˘˘212121*21212121212121212121212121212121212121
2121212121212121212121213B2121212121212121212121212121+212121212121212121DSET2121
¶21?˘˘212121.21H21212121 212121D21
21FN˘˘21ÚY®21212121212121212121212121212121212121212121212121212121212121212121212121
21212121212121212121+2121212121212121212121212121.2121‘212121212121212121212121212121212121
21˘˘2121212121212121>212121212121
\2121‘212121212121212121212121212121212121˘˘2121212121212121
{212121212121}2121‘21212121212121212121212121212121212121˘˘2121212121212121©212121212121
´2121‘2121212121212121212121212121212121 2121˘˘2121212121212121◊21
2121212121 Ÿ2121‘2121212121212121212121212121212121
2121˘˘2121212121212121
212121212121
2121‘212121212121212121212121212121212121212121˘˘2121212121212121
3212121212121215 2121‘212121212121212121212121212121212121212121˘˘2121212121212121a212121212121
c2121‘2121212121212121212121212121212121212121˘˘2121212121212121è212121212121ë2121‘212121
21212121212121212121212121212121˘˘2121212121212121Ω212121212121ø2121‘21212121212121212121
2121212121 2121˘˘2121212121212121Î212121212121Ì2121‘2121212121212121212121212121212121
2121˘˘2121212121212121212121212121212121212121‘2121212121212121212121212121212121
2121˘˘2121212121212121G212121212121I2121‘2121212121212121212121212121212121

2222˘˘22222222222222u222222222222-w2222‘2222222222222222222222222222
2222˘˘22222222222222-£222222222222 ≤2222‘2222222222222222222222222222

2323˘˘23232323232323 —
232323232323"”2323‘23232323232323232323232323232323˘˘23232323232323"˘2323232323
23%2323‘23232323232323232323232323232323˘˘23232323232323%-
232323232323'/2323‘23232323232323232323232323232323˘˘23232323232323'[2323232323
23)]2323‘23232323232323232323232323232323˘˘23232323232323)â232323232323+ã2323‘23
232323232323232323232323232323˘˘23232323232323+∑232323232323-
π2323‘23232323232323232323232323232323˘˘23232323232323-
Â232323232323/Ù2323‘23232323232323232323232323232323˘˘23232323232323023232323232
232"2323‘23232323232323232323232323232323˘˘2323232323232323.232323232323=2323‘23
23232323232323232323 2323232323˘˘2323232323232323
\232323232323
z2323‘232323232323232323232323

2424242424˘˘2424242424242424~242424242424ä2424‘2424242424242424242424

2525252525˘˘252525252525252525ä252525252525®2525‘25252525252525252525

2626262626˘˘262626262626262626¨262626262626∏2626‘262626262626262626262626

2727272727˘˘2727272727272727∏272727272727÷2727‘2727272727272727272727

28——————————————28282828˘˘2828282828282828 ⁄282828282828
Ê2828‘282828282828282828282828

29——————————————29292929˘˘2929292929292929 Ê292929292929

2929‘2929292929292929292929

30
30303030˘˘3030303030303030
303030303030
3030‘3030303030303030303030

31
31313131˘˘3131313131313131
313131313131
23131‘313131313131313131313131

3232323232˘˘32323232323232323263232323232323B3232‘32323232323232323232323232

3333333333ˇˇ3333333333333333B333333333333`3333'333333333333333333333

3434343434˘˘3434343434343434d343434343434p3434‘34343434343434343434

3535353535˘˘3535353535353535p353535353535é3535‘3535353535353535353535

3636363636˘˘3636363636363636í363636363636û3636‘3636363636363636363636

3737373737˘˘3737373737373737û373737373737°3737‘37373737373737373737373737

3838383838˘˘3838383838383838¿383838383838Ã3838‘38383838383838383838

3939393939˘˘3939393939393939Ã393939393939Í3939'393939393939393939393939

40 40404040˘˘4040404040404040Ó404040404040˙4040‛404040404040404040404040

41 41414141˘˘4141414141414141˙4141414141414141‛41414141414141414141

42 42424242˘˘424242424242424242424242424242(4242‘42424242424242424242424242

43 43434343˘˘43434343434343434343(434343434343F4343‘4343434343434343434343

44444444˘˘4444444444444444J444444444444V4444‘4444444444444444444444

45
45454545ˇˇ4545454545454545V454545454545t4545‘4545454545454545454545

47474747˘˘4747474747474747-x474747474747-Ñ4747‘4747474747474747474747

49494949˘˘4949494949494949–Ñ494949494949–¢4949‘49494949494949494949494949494949˘
˘4949494949494949 ≤494949494949 –
4949‘49494949494949494949494949494949˘˘4949494949494949"‘494949494949"‡4949‘4949
4949494949494949494949494949˘˘4949494949494949"‡494949494949"˛4949‘494949494949
49494949494949494949˘˘4949494949494949%494949494949%

5050‘50505050505050505050505050505050˘˘5050505050505050%

515151515151%,5151‘51515151515151515151515151————————————51515151˘˘5151
515151515151'0515151515151'<5151‘51515151515151515151515151————————————
51515151˘˘5151515151515151'<515151515151'Z5151‘51515151515151515151515151————————
51515151˘˘5151515151515151)^515151515151)j5151‘51515151515151515151515151————————
51515151˘˘5151515151515151)j515151515151)à5151‘5151515151515151515151515151515151˘
˘5151515151515151+å515151515151+ò5151‘5151515151515151515151515151515151˘˘51515151
51515151+ò515151515151+∂5151‘5151515151515151515151515151515151˘˘5151515151515151-
∫515151515151-∆5151‘5151515151515151515151515151515151˘˘5151515151515151-
∆515151515151-
‰5151‘5151515151515151515151515151515151˘˘5151515151515151/Ù515151515151O5151‘5151
515151515151515151515151————————————51515151˘˘5151515151515151651˘˘515151*
51515151515151515151515151515151515151515151515151515151513B515151515151515151515151
+5151515151515151DSET515151Ç51˘˘515151.51H51515151
51515151Ü51_☐˘☐˘51ŰY§51515151515151515151515151515151515151515151515151515151513
B515151515151515151515151+51————————————————————————————
515151515151515151515151‘515151515151515151515151
515151515151˘˘5151515151515151`51˘˘515151*515151515151515151515151515151515151515151
5151515151513B51515151515151515151515151+51515151515151515151‘515151515151515151
51

515151515151515151515151515151Ï515151515151515151515151515151515151DSET515151T5151
515151515151Ç5151
515151
515151515151515151ŰYò51ŰY†51ŰYú5151515151515151515151515151515151‘5151ŰX§515151515151
5151515151515151515151515151515151515151
5151515151

52525252525252

54545454545454 545454545454ÚYî545454Kintu
Enterprises5454545454DSET545454Ç54ˇˇ545454.54H54545454

555555555555555555□˘˘□˘˘55ÚYê5555555555555555555555555555555555555555555555555
5555553B5555555555555555555555555+55
555555555555555555555-5555‘5555555555555555555555
555555555555˘˘555555555555.55
˘˘555555*55555555555555555555555555555555555555555555555553B5555555555555
5555555555+5555555555555555555555‘555555-555555555555555
555555555555555555555555555555555555555555555555‘555555-5555555555555
555555555555555555555555Ï55555555555555555555‘555555-5555555555555
555555555555555555555555Ï55555555555555555555‘555555-5555555555555
55-5555555555555555555555Ï555555555555555555555‘555555-5555555555555
55 5555555555555555555555Ï555555555555555555555‘555555-5555555555555
55"5555555555555555555555Ï555555555555555555555‘555555-5555555555555
55$5555555555555555555555Ï555555555555555555555‘555555-5555555555555
55&5555555555555555555555Ï555555555555555555555‘555555-5555555555555
55(5555555555555555555555Ï555555555555555555555‘555555-5555555555555
55*5555555555555555555555Ï555555555555555555555‘555555-5555555555555
55,5555555555555555555555Ï555555555555555555555‘555555-5555555555555
55.5555555555555555555555Ï55555555555555555555555555555555555555555555
555555555555555555555555555555555555555555555555555555555555555555555555555555
555555555555555555555555555555555555555555555555555555555555555555555555555555
55DSET555555T55555555555555555 555555
555555

565656565656565656ÚYÑ56ÚYå56ÚYà565656565656565656565656565656‘56-56ÚX»5656-565656
56565656565656565656565656565656565656
565656565656
5656565656

57575757575757

58-58585858585858 585858585858ÚYÄ585858Kintu Enterprises
5858585858DSET585858Ç58˘˘585858.58H58585858

595959uNV59äJ≠□˘□˘59ÚY|59595959595959595959595959595959595959595959595959595959

593B59595959595959595959595959+59

59595959595959595959

6060‘606060606060606060606060606060606060˘˘606060606060.60
˘˘606060*606060606060606060606060606060606060606060606060606060603B60606060606060
6060606060+60606060606060606060‘606060

61616161616161 6161616161616161616161616161Ï61616161616161616161‘616161

62626262626262 626262626262626262626262626262Ï62626262626262626262‛626262

63636363636363 636363636363636363636363636363Ï636363636363636363636363‘636363

64646464646464 64646464646464646464646464Ï646464646464646464‘646464

65656565656565   65!656565656565656565656565Ï6565656565656565656565‘656565

66666666666666 66#66666666666666666666666Ï6666666666666666666‘666666

67676767676767 67%676767676767676767676767Ï676767676767676767676767'676767

68686868686868   68'68686868686868686868686868Ï686868686868686868686868‛686868

69696969696969 69)696969696969696969696969Ï69696969696969696969‘696969

70707070707070   70+707070707070707070707070Ï70707070707070707070‘707070

71717171717171   71-71717171717171717171717171Ï717171717171717171717171‘717171

72727272727272

72/727272727272727272727272Ï7272727272727272727272727272727272727272727272
72727272727272727272727272727272727272727272727272727272727272727272727272727272
72727272727272727272727272727272727272727272727272727272727272727272727272727272
72DSET727272T72727272727272@7272727272

7373737373737373ÚYl73ÚYx73ÚYt73ÚYp73737373737373737373‘73

74ÚXÿ7474

757575757575757575757575757575757575757575757575757575

7676767676

76 76)767676 767676767676767676ÚX076¯ıÓ76Ó76Ó

¸¶77Ú[<+777777 7777777777 77ÚYh777777 Page -
7777777777DSET777777Ç77˘˘777777.77H77777777777777777777777777˘˘77ÚYd77777777
777777777777777777777777777777777777777777777773B7777777777777777777777777+77———
7777777777777777777-7777‘77777777777777777777777777777777˘˘77777777777777`77˘
˘777777*777777777777777777777777777777777777777777777777777773B777777777777777
77777777+77777777777777777777‘777777-77777777777777
770777777777777777777777777777777777777777777777777777777777DSET777777T77
77777777777777
777777777777777777777777777777ÚYX77ÚY`77ÚY\77777777777777777777777777777‘77-77ÚX®
7777-77777777777777777777777777777777777777777777
777777777777
7777777777

78787878787878

79-797979797979 797979797979ÚYT797979Kintu Enterprises
7979797979DSET797979Ç79˘˘797979.79H797979797979 79Â79W798E˘˘˘˘79ÚYP79797979797979
79797979797979797979797979797979797979793B7979797979797979797979+79————————
7979797979797979797979-7979‘7979797979797979797979797979797979˘˘7979797979279˘˘
797979*797979797979797979797979797979797979797979797979797979793B79797979797979797979
79797979+797979797979797979797979‘797979-797979797979
791797979797979797979797979Ï79797979797979797979‘797979-797979797979
79379797979797979797979797979 79797979797979797979‘797979-797979797979
79579797979797979797979797979 79797979797979797979‘797979-797979797979
79779797979797979797979797979 79797979797979797979‘797979-797979797979
79979797979797979797979797979 79797979797979797979‘797979-797979797979
79;79797979797979797979797979
797979797979797979797979797979797979797979797979797979797979797979797979797979797979
797979797979797979797979797979797979DSET797979T79797979797979 797979797979797979797979
797979ÚYD79ÚYL79ÚYH79797979797979797979797979797979‘79-79ÚXú7979-79797979797979797979
797979797979797979797979797979
797979797979797979797979797979$79797979797979————————————————————————

80-808080808080

814818181818181

82!82828282828282 828282828282ÚY@828282Kintu Enterprises
8282828282DSET828282Ç82˘˘828282.82H82828282828282eI82ser□˘□˘82Ì•¯828282828282
8282828282828282828282828282828282828282828282823B828282828282828282828282+82————
82828282828282828282

8383‘8383838383838383838383838383838383˘˘838383838383283˘˘838383*83838383838383
838383838383838383838383838383838383838833B838383838383838383838383+838383838383
83838383‘838383

84848484848484 842848484848484848484848484∞84848484848484848484‘848484

85858585858585   854858585858585858585858585 85858585858585858585‘858585

86868686868686 866868686868686868686868686 8686868686868686868686‘868686

87878787878787 878878787878787878787878787 87878787878787878787‘878787

88888888888888 88:888888888888888888888888 8888888888888888888‘888888

89898989898989   89<8989898989898989898989898989

898989898989898989898989898989898989898989898989898989898989898989898989898989898989898989898989898989898989898989898989
89898989898989898989898989898989898989DSET898989T89898989898989898989@8989898989898989898989898989
89898989Ì¶89Ú\p89ÚX†89Ì•l89898989898989898989898989‘89

90ÚX¨9090

919191919191919191919191919191919191919191919191919191

9292929292
9292 92"929292 929292929292929292ÚX092˜-92Ó92Ó

¸¶93ÚX°+939393 9393939393 93Ú]$939393 Page -
9393939393DSET939393Ç93˘˘939393.93H93939393939393Â93W938E□˘□˘93Ì¶939393939393
939393939393939393939393939393939393939393939393933B939393939393939393939393+93————————
9393939393939393939393-9393‘93939393939393939393939393939393939393˘˘9393939393939393¥93—
939393*939393939393939393939393939393939393939393939393939393933B9393939393939393
93939393+9393939393939393939393‘939393-9393939393939393=93939393939393939393939393

˘˘9494949494949494‘949494-9494949494ÚZ 94?94949494949494949494949494
94949494949494949494‘949494-94949494949494
94>949494949494949494949494Ã9494949494949494949494949494949494949494949494
94DSET949494T94949494949494
9494949494949494949494————949494Ì•Ä94Ì•à94Ì•Ñ9494949494949494
949494949494‘94-94Ú[9494-94949494949494949494949494949494949494949494
9494949494949494949494$94949494949494————

95-959595959595

964969696969696

97!979797979797 97979797979797Ì•p979797Kintu Enterprises
979797979797979797FNTM97979797CUTS97979797DSUM979797Õ979797Panama Scrapyard
Report97979797979797|{Report on removal of MTCA contaminated surface soils from
the scrapyard, and surface soil and groundwater sampling results.979797Kenneth
V.B. Jennings979797
Draft
2/9797979797HDNI9797979797STYL979797>˘˘97979797@97STYL97ÚY$97ÚX¯9797979797ÚY
97ÚY97ÚY97ÚY97ÚY9797ÚX¸979797979797979797979797˘˘9797979797˘˘9797p97979797
97˘˘˘˘979797979797979797979797˘˘97979797979797979797˘˘979797979797˘˘˘˘9797979797
9797˘˘97979797979797979797˘˘97979797 97
97˘˘979797 97979797˘˘9797897
97

97˘˘97979797979797 ˘˘9797979797
97˘˘979797
97979797
˘˘9797979797
97˘˘97979797979797˘˘9797979797
9797˘˘˘˘97979797 9797979797979797 97˘˘97
97979797˘˘9797979797 97 979797˘˘9797979797˘˘97 97979797 97 97
97˘˘979797979797˘˘97 97979797
97
979797˘˘97 97979797˘˘˘˘979797É97

9898 98ˇˇ98

98989898ˇˇˇˇ989898

98

98989898ˇˇ9898989898 ˇˇˇˇ98989898

99999999˘˘9999   999999   ˘˘˘˘9999999999999999˘˘9999 999999 ˘˘˘˘999999Â99999999˘˘99
99999999

˘˘˘˘1001001006100100100100100˘˘100100   100100100
˘˘˘˘100100100100100100100100˘˘100100 100100100
˘˘˘˘100100100100100-100100100˘˘100100100100100
˘˘˘˘100100100 100100100100100˘˘100100
100100100
˘˘˘˘100100100100100 100100100˘˘100100

101101101
˘˘˘˘101101101———————————————101101#101101101˘˘101101101101101
˘˘˘˘101101101j101101$101 101˘˘101—————————————————————————————
101101101101

˘˘˘˘102102102102102%102102102˘˘102$102102102102˘˘˘˘102102102

102102&102102102˘˘102$102 102102102˘˘˘˘102102102———

102102'102102102˘˘102102

102102102 ˘˘˘˘102102102———102102,102

102˘˘102102102102102102˘˘˘˘102102102———1021020102

102˘˘102102102102102102˘˘˘˘102102102———1021025102

102˘˘102102102102102102˘˘˘˘102102102———102-102:102

102˘˘102102102102102102˘˘˘˘102102102———102102>102

102˘˘102102102102102102˘˘˘˘102102102———102 102B102

102˘˘102102102102102102˘˘˘˘102102102

103!103
103   103ˇˇ103——————————103103103103ˇˇˇˇ103103103103"103

104104104˘˘104
104104104104˘˘˘˘104104104

105#105

106 106˘˘106

106106106106

˘˘˘˘106106106106$106106106106˘˘106

107 107107107˘˘˘˘107107107107%107107107107˘˘107

108108108108˘˘˘˘108108108108&108108108108˘˘108,108108108108˘˘˘˘108108108108'108
108108108˘˘108,108108108108˘˘˘˘108108108W108(108108108˘˘˘˘108108108108108˘˘108
108108V108)108(108 108108108
108108108108-˘˘˘˘108108108(108*108+108108108˘˘108(108 108108108˘˘˘˘108108108–
108+108108 108˘˘108108108108108 ˘˘˘˘108108108108,108)108108108˘˘108108108108108
˘˘˘˘108108108
108-108-108108108˘˘108
108108108108˘˘˘˘108108108108.1081108108108˘˘1080108108108108˘˘˘˘108108108108/108
2108108108˘˘1080108108108108˘˘˘˘10810810810801087108108108˘˘1085108108108108˘˘˘˘
10810810810811083108108108˘˘108:108108108108˘˘˘˘10810810810821086108108108˘˘108:
108108108108˘˘˘˘1081081081083108.108108108˘˘1085108108108108˘˘˘˘1081081081084108
8108108108˘˘108>108108108108˘˘˘˘10810810810851089108108108˘˘108>108108108108˘˘˘˘
1081081081086108?108108108˘˘108B108108108108˘˘˘˘1081081081087108/108108108˘˘108B
108108108108˘˘˘˘1081081081088108108108108˘˘108$108
108108108˘˘˘˘1081081081089108;108108108˘˘108$108

109109109˘˘˘˘109109109
109:109109 109˘˘109 109109109109
˘˘109:109109109109;109!109109109˘˘109109109109109
˘˘˘˘109109109109<1094109109109˘˘109
109109109109˘˘109,109109109109=109"109109109˘˘109109109109109
˘˘109109`1098˘˘109109109109
109HASHÅ&
109<Å&109-Å&1109"Å&
109!å
$⁄109» Õó109/» Óö109.»·Ã∑109 OT‘1090
OU◊1093 OXÑ1096 OYá1097 O_T1095 OÄW1094 ¡Ã∞109' ¡Ì≥109& …ıU109 …ıh109 …ıy109 …ı
õ109 …ı¨109 W109À-SÙ109À-W§109 À-^t109ÀüÀ–109ÀßÙo109ÃÌıU109*ÕÀıQ109)·¥ﬁ„109&
109
…ıU109

…ı^110$ …ıh110
…ıq110% …ıy110 W110
•Ùq110

•Ùz111#¸Ç·1112¸£‰1111⁄Ç111-A&

112+A&
112;A & 112=J…ıU112J…ıX1129J…ıh112J…ık1128KßÙo112L:†Q112hπ—⁄112112j≠◊a112————————
rßÈl112(z´·o112}Bod112——
112112211211211211211 2 112CHAR112ÚY112°˘˘112112112112˘˘112112112112112112112

113113113113113113113113113113˘˘113113113113

˘˘114114114114114114114˘˙114114114˘˘114114114114114114114˘Î114114114

˘˘115115115115115115"115˘ﬂ115115115

˘˘116116116116116116

116˘˚116116116116 ˘˘116116116116116Ä116116116116116116

116116116˘˘116116116

116116116116116˘˘116116116

˘˘117117117
117117117117˘˘117
117
˘˘117117117117117117117˘˘117
117117
˘˘117117117117117 117˘˘117
117
˘˘117117117117117117'117˘˘117
117
˘˘117117117117117117G117˘˘117
117
˘˘117117117117117117117˘˘117
117

ˇˇ118118118118118118118ˇˇ118
118118

˘˘119119119119119119W119˘˘119
119
119119119119119119119'119˘⁄119
119119 119˘˘˘˘119119119
119˘˚119119119 ˘˘˘˘˘˘119119119&119˘€119119119119
˘˘119119119119119119119119119119119119119119119119119˘˘119119119119119119"119˘˘119119119

˘˘120120120120120120120120˘˘120120120

˘˘121121121

121121 121˘˙121

121

˘˘121121121121121121121˘˙121

121121 ˘˘121121121121121121"121˘ﬂ121121121

˘˘122122122122122122122˘˙122
122 ˘˘122122122122122 122ﬂ˙122
122
122122122ö122˘˘122122122122
122HASH122122122122122122122Ñ122122 122122
122122
122122

123123123

123123 1231231232123123 123123

123123

123123123 123123

124"124124%124
1243124
124U124

125f125125

126126"

127127"127 127127127R127————————————————————————————ˇˇ127127127127
127CELL127ÚY127127ˇˇ127127127-
ˇ127127127127127127127127127127127ˇˇ127127127;127127-
ˇ127127127127127127127127127ˇˇ127127127127127127127127127127127127127127127127127
127127127127"127————————————————————————————ˇˇ127127127127—————————————————————————————————
127HASH127127127127127127ˇ127
127127127127127127127^127————————————————————————————ˇˇ127127127127 127GRPH127ÚY

128Ì˘˘128128128˘128128128128128128128128128128128128˘˘128128128;128128˘128128128
128128128128128128128˘˝128128128128128128128128128128128128128128128128128128128
128128128128128"128————————————˘˘128128128128————————————
128HASH128128128128128————————————128————————————128128128
128

129!129
129129l129 129RULR129ÚY
129129˘˘129129129˘129129129129129129129129129129129129129129129129129129129129129129
129129129129129129129129129129129129129129129129129129129129129129129129129129129129
129129129129129129129129129129129129129129129129129129129129129129129129129129129129
129129129129129129129129129129129129129129129129129129129129129129129129129129129129
129129˘˘129129129129129˘129129129129129129129129129129129129129129129129129129129129
129129129129129129129129129129129129129129129129129129129129129129129129129129129129
129129129129129129129129129129129129129129129129129129129129129129129129129129129129
129129129129129129129129129129129129129129129129129129129129129129129129129129129129
129129˘˘129129129129˝129129129129@129129129129129129129129129129129129129129129
129129129129129129129129129129129129129129129129129129129129129129129129129129129129
129129129129129129129129129129129129129129129129129129129129129129129129129129129129
129129129129129129129129129129129129129129129129129129129129129129129129129129129129˘˘
129129129129129129129129129129129129129129129129129129129129129129129129129129129129
129129129129129129129129129129129129129129129129129129129129129129129129129129129129
129129129129129129129129129129129129129129129129129129129129129129129129129129129129
129129129129129129129129129129129129129129129129129129129129129129129129129129129129
129˘˘129129129129‡129129129129129129129129129129129129129129129

130$130.130Q130.130l130.130ê130.130¥130.130ÿ130.130¸130.
130.D130.h130.å130.∞130.ÓÙ+ëB130Ûy'+ëJ130Ûté+ëZ130Ût,+ì‰+˘˘130130130130˝130130
130130Ä130130130130130130130130130130130130130130130130130130130130130130130130130130
130130130130130130130130130130130130130130130130130130130130130130130130130130
130130130130130130130130130130130130130130130130130130130130130130130130130130
130130130130130130130130130130130130130130130130130˘˘130130130
130130˘130130130130Ä130130130130130130130130130130130130130130130130130130130130
130130130130130130130130130130130130130130130130130130130130130130130130130130
130130130130130130130130130130130130130130130130130130130130130130130130130130
130130130130130130130130130130130130130130130130130130130130130˘˘130130130130130
˘130130130130130130130130130130130130130130130

131$131.131Q131.131l131.131ê131.131¥131.131ÿ131.131¸131.
131.D131.h131.å131.∞131.ÓÙ+ëB131Ûy'+ëJ131Ûté+ëZ131Ût,+ì‰+ˇˇ131131131131‡-
131131131131131131131131131131131131131131131131

132$132.132H132.132l132.132ê132.132¥132.132ÿ132.132¸132.
132.D132.h132.å132.∞132.ÓÙ+ëB132Ûy'+ëJ132Ûté+ëZ132Ût,+ì‰+˘˘132132132
132132˘132132132132132132132132132132132132132132132

133$133.133H133.133l133.133ê133.133¥133.133ÿ133.133¸133.
133.D133.h133.å133.∞133.ÓÙ+ëB133Ûy'+ëJ133Ûté+ëZ133Ût,+ì‰+˘˘133133133133133,133
133133¿133133133133$133133133133133

134$134.134H134.134l134.134ê134.134¥134.134ÿ134.134¸134.
134.D134.h134.å134.∞134.ÓÙ+ëB134Ûy'+ëJ134Ûté+ëZ134Ût,+ì‰+134˘˘˘˘134134˘134134134
134¿134˘Ó134134134134134134

135$135.135H135.135l135.135ê135.135¥135.135ÿ135.135¸135.
135.D135.h135.å135.∞135.ÓÙ+ëB135Ûy'+ëJ135Ûté+ëZ135Ût,+ì‰+ˇˇ135135135135,135135
135135¿135135135135135135135135135

136$136.136H136.136l136.136ê136.136¥136.136ÿ136.136¸136.
136.D136.h136.å136.∞136.ÓÙ+ëB136Ûy‘+ëJ136Ûté+ëZ136Ût,+ì‰+˘˘136136136136136˘136
136136136¿136136136136136136136136136136

137$137.137H137.137l137.137ê137.137¥137.137ÿ137.137¸137.
137.D137.h137.å137.∞137.ÓÙ+ëB137Ûy'+ëJ137Ûté+ëZ137Ût,+ì‰+ˇˇ137137137137,137137
137137@137137137137137137137137137

138$138.138H138.138l138.138ê138.138¥138.138ÿ138.138¸138.
138.D138.h138.å138.∞138.ÓÙ+ëB138Ûy'+ëJ138Ûté+ëZ138Ût,+ì‰+˘˘138138138———————————
138138˘138138138138@138138138138138138138138138

139$139.139H139.139l139.139ê139.139¥139.139ÿ139.139¸139.
139.D139.h139.å139.∞139.ÓÙ+ëB139Ûy'+ëJ139Ûté+ëZ139Ût,+ì‰+ˇˇ139139139139,139139
139139¿139139139139139139139139139

140$140.140H140.140l140.140ê140.140¥140.140ÿ140.140¸140.
140.D140.h140.å140.∞140.Z»140^``+ó+ëP140`Æ140ÚZ»+ó++ëf˘˘140140140140140˘140140
140140¿140140140140140140140140140140

141$141.141H141.141l141.141ê141.141¥141.141ÿ141.141¸141.
141.D141.h141.å141.∞141.Z»141□^`+ó+ëP141□`Æ141ÚZ»+ó++ëfˇˇ141141141141,141141141
141¿141141141141141141141141141141

142$142.142H142.142l142.142ê142.142¥142.142ÿ142.142¸142.
142.D142.h142.å142.∞142.142142142142142142□142142142142142142ÚZÃ142Û|Û142Ú]142˚+
ëf˘˘142142142142142˘142142142142¿142142142142142142142142142142

143$143.143H143.143l143.143ê143.143¥143.143ÿ143.143¸143.
143.D143.h143.å143.∞143.143143143143143143□143143143143143143ÚZÃ143Û|Û143Ú]143˚+
ëf˘˘143143143143,143143143143¿143143143143143143143143143

144$144.144H144.144l144.144ê144.144¥144.144ÿ144.144¸144.
144.D144.h144.å144.∞144.Z‰144□^`144ÚZ¯+ëP144□`Æ144ÚZ‰144ÚZ¯++ëf˘˘144144144144144
˘144144144144¿144144144144144144144144144

145$145.145H145.145l145.145ê145.145¥145.145ÿ145.145¸145.
145.D145.h145.å145.∞145.Z‰145^`145ÚZ¯+ëP145`Æ145ÚZ‰145ÚZ¯++ëfˇˇ145145145145,
145145145145¿145145145145145145145145145

146$146.146H146.146l146.146ê146.146¥146.146ÿ146.146¸146.
146.D146.h146.å146.∞146.Z¸146□^`146Ú[˘+146————————————————————V|@Äõp146Ú[¥146
146146

˘˘˘˚˘˘147147147147147˘147147147147¿147147147147147147147147147147

148$148.148H148.148l148.148ê148.148¥148.148ÿ148.148¸148.
148.D148.h148.å148.∞148.Z¸148□^`148Ú[˘+148————————————————————V|@Äõp148Ú[¥148
148148

˘˘˘˚˘˘149149149149,149149149149¿149149149149149149149149149149

150$150.150H150.150l150.150ê150.150¥150.150ÿ150.150¸150.
150.D150.h150.å150.∞150._h150□^`150Ű[¥+ëP150□`Æ150Ú_h150Ű[¥++ëf˘˘150150150150150
˘150150150150¿150150150150150150150150150

151$151.151H151.151l151.151ê151.151¥151.151ÿ151.151¸151.
151.D151.h151.å151.∞151._h151□^`151Ú[¥+ëP151□`Æ151Ú_h151Ú[¥++ëfˇˇ151151151151,
151151151151¿151151151151151151151151151151

152$152.152H152.152l152.152ê152.152¥152.152ÿ152.152¸152.
152.D152.h152.å152.∞152.[Ã152^``152Ú[Ë+ëP152`Æ152Ú[Ã152Ú[Ë++ëfˇˇ152152152152152
ˇ152152152152¿152152152152152152152152152152

153$153.153H153.153l153.153ê153.153¥153.153ÿ153.153¸153.
153.D153.h153.å153.∞153.[Ã153□^`153Ú[Ë+ëP153□`Æ153Ú[Ã153Ú[Ë++ëf˘˘153153153

154154154154154154154154154154$154154154154154154154154154154154154154154154154154
154154154154154154154154154154154154154154154154154154154154154154154154154154
154154154154154154154154154154154154154154154154154154154154154154154154154154
154154154154154154154154154154154154154154154154154154154154ˇˇˇˇˇˇ154,154154154¿
154154154154$154154154154154

155$155.155H155.155l155.155ê155.155¥155.155ÿ155.155¸155.
155.D155.h155.å155.∞155.ÓÙ+ëB155Ûy‘+ëJ155Ûté+ëZ155Ût,+ì‰+ˇˇ155155155155,ˇ155155
155¿155155155155$155155155155155

156$156.156H156.156l156.156ê156.156¥156.156ÿ156.156¸156.
156.D156.h156.å156.∞156.ÓÙ+ëB156Ûy‘+ëJ156Ûté+ëZ156Ût,+ì‰+˘˘156156156156156˘156
156156¿156156156156$156156156156156

157$157.157H157.157l157.157ê157.157¥157.157ÿ157.157¸157.
157.D157.h157.å157.∞157.ÓÙ+ëB157Ûy‛+ëJ157Ûté+ëZ157Ût,+ì‰+˘˘157157157157157˘157
157157157@157157157157157157157157157157157157157157157157157157157157157157157157157
157157157157157157157157157157157157157157157157157157157157157157157157157157157157
157157157157157157157157157157157157157157157157157157157157157157157157157157157157
157157157157157157157157157157157157157157157157157157157157157157157157 157˘˘157157157157
157HASHÄ157˘157Ä˝157∆˘©é157«€®¨157…E0À157…E4{157…E;K157…∑®ß157…ø—F157
'/È157 '3ô157 ':i157 ôß≈157 °-d157

À„—F158Ã≈-d158 Ã≈—F158-158158158158158——————————158158˘158˘158158158158
0158158158 ⌀—F158 ⌀—O158ü-f158ü-o158——————————
Ú^ÿ158‛]ˆ158@158˘158 @˝158I⌀—F158J°-d158

159159159ñ159C159*159159159

159LKUP159159159159159 159

159159159159159 159 159

159#159!159"159(159$159+159%159&159

160'160
160

161161:1618161161161161161161161;161=161161161161161161)161,161<161*161161-
16131617161161.161/1611161<1611612161016141615161-1619161=161@1611616161A˘˘161
1611610161˘˘161161161$161
161NAME161161Default161161161161161161161161161161161161161161161161161161161161
161161161161161161161Default
SS161161161161161161161161161161161161161161161161161161161161161161161161161
Header161161161161161161161161161161161161161161161161161161161161161161161161
161161161161
Body161161161161161161161161161161161161161161161161161161161161161161161161161
161161161161161Footer161161161161161161161161161161161161161161161161161161161
161161161161161161161161161Footnote161161161161161161161161161161161161161161161
161161161161161161161161161161161

Footnote
Index162162162162162162162162162162162162162162162162162162162162Bullet162162162
162162162162162162162162162162162162162162162162162162162162162162162162162162
162162162162162162162162162162162162d162162162162D162———————————
162FNTM162162
Helvetica162162162162162162162162162162162162162162162162162162162162162
162162162162162162162162162162162162162162162162162162162162162162162162162162
162162162162162162162162————————————162Geneva162162162162162162162162
162162162162162162162162162162162162162162162162162162162162162162162162162162
162162162162162162162162162162162162162162162162162162162162162162162162162————
162————————————————————————————
Geneva162162162162162162162162162162162162162162162162162162162162162162162162162
162162162162162162162162162162162162162162162162162162162162162162162162162162
162162162162162162162˘˘162———————————————————
Chicago162162162162162162162162162162162162162162162162162162162162162162162162162
162162162162162162162162162162162162162162162162162162162162162162162162162162
162162162162162162ÿ162Century
Schoolbook162162162162162162162162162162162162162162162162162162162162162162
162162162162162162162162162162162162162162162162162162162162162162162162162ETBL162162162@
FNTM162162“∑CUTS162162“øDSUM162162“«HDNI162162”úSTYL162162”¶ETBL162162Ú˘˛˝¸˚˙˘¯□
ÒÚÛÙıˆ˜