ALASKCHEM Engineering Ralph Hulbert, P.E.

PO Box 1846, Palmer, AK 99645 phone (907)746-4587; fax (907)746-4586; email hulbert@alaska.net

June 4, 2003

Rich Sundet
ADEC/CS
550 Cordova St.
Anchorage, AK 99501

Re: **Prescott – Chipperfield; ADEC #CS100.151; Revised Workplan**

The revised remediation workplan is enclosed. This draft was prepared in response to our meeting of 5/13/03 and the preceding comments supplied by Dan Duncan and yourself on 3/25/03and 4/24/03 respectively to the concept draft workplan of 3/24/03.

This draft is not complete; several important documents are being prepared and some await further input from ADEC. However, this draft should be sufficient to enable you to perform the public notice you require. The remaining submittals will be completed before the public notice period passes. We anticipate final approval and a notice to proceed from you by mid July.

The details of the deed notice will require additional input from ADEC. Discussions regarding financial assurance have been initiated, but with no further response from ADEC. Unless ADEC can promptly respond, and include critical details for the equitable servitude template, we will be obliged to unilaterally prepare the deed notice.

In our 5/13/03 meeting, you requested for the first time that areas determined in the site assessment to already meet ADEC and site goals must still be resampled for lab analysis. The site assessment workplan was approved by EPA and ADEC, executed as written with high quality control standards, and results accepted by EPA. The assessment forms the basis for the excavation and confirmation sampling of this workplan. Your reluctance to accept the assessment, and request for additional sampling, manifests a change in sampling frequency to satisfy ADEC and site goals.

If you have any questions, please call.

Sincerely,

Ralph Hulbert

Ralph Hulbert, P.E.

Enc: Final Remediation Workplan for 427 Chipperfield Dr.; 6/4/03 Draft

Cc: Mary Jane Henrickson
Dan Duncan, EPA
Jim Frechione, ADEC

PO Box 1846, Palmer, AK 99645 phone (907)746-4587; fax (907)746-4586; email hulbert@alaska.net

Final Remediation Workplan
for
427 Chipperfield Dr.;
Lot 30A Block 6, First Add'n. Alaska Industrial Sub.

ADEC File CS100.151
Reckey 1988210900601

Prepared for:

Mary Jane Henrickson, Owner
Formerly owned by:
Prescott Equipment Company

Prepared by:

Ralph Hulbert, P.E.

Date:

June 4, 2003

Final Remediation Workplan
for
427 Chipperfield Dr.

Table of Contents

			page
I.	**Summary**		**1**
II.	**Background and Risks**		**1**
III.	**Remediation**		**2**
	1.	**General Goals and Requirements**	**2**
	2.	**Regulatory and Document Preparation**	**3**
		a. Public Notice	**3**
		b. Stormwater Pollution Prevention Plan (SWPPP)	**3**
		c. Site Safety and Health Plan (SSHP)	**3**
		d. Deed Notices	**3**
	3.	**Groundwater Sampling**	**3**
	4.	**Removal of PCB Contaminated Soil >100**	**4**
	5.	**Excavate Soil <100 ppm PCB**	**5**
	6.	**Stockpiling and Construction of Cell**	**7**
	7.	**Grading and Final Sampling**	**9**
	8.	**Decision Quality Control**	**9**
IV.	**Post-Closure**		**11**
	1.	**Routine Inspection and Repair**	**11**
	2.	**Groundwater Monitoring**	**11**
	3.	**Recording of Institutional Controls**	**12**
V.	**Schedule and Reporting**		**12**

Figure 1	**Site Location**	**14**
Figure 2	**Site Sketch, NE Half**	**15**
Figure 3	**Site Sketch, SW Half**	**16**
Figure 4	**Cell Construction Sketch**	**17**
Figure 5	**Proposed Timeline** NOT INCLUDED THIS DRAFT	**18**

Appendix 1 Remediation Concept Proposal
Appendix 2 Stormwater Pollution Prevention Plan (SWPPP) NOT INCLUDED THIS DRAFT
Appendix 3 Site Safety and Health Plan (SSHP) NOT INCLUDED THIS DRAFT
Appendix 4 Deed Notice; Equitable Servitude Agreement NOT INCLUDED THIS DRAFT
Appendix 5 PCB Field Test Kit Instructions NOT INCLUDED THIS DRAFT
Appendix 6 Liner Specifications

Final Remediation Workplan
for
427 Chipperfield Dr.

I. Summary

This site, located in the Mountain View area of Anchorage, Alaska, previously operated as an equipment salvage yard owned by Prescott Equipment Company (see Figure 1). The primary contaminants of concern at the site are polychlorinated biphenyls (PCBs). Remediation shall remove all soils with PCBs >100 ppm and dispose them in an out-of-state TSCA approved landfill. Remaining soil with contaminants of 10-100 ppm PCB and DRO/RRO above ADEC's alternative cleanup limits for the site shall be encapsulated in a buried onsite cell. This cell shall be lined and covered with concrete slabs to prevent inadvertent disturbance. A deed restriction noting the presence of this cell and conditions for its perpetual maintenance shall be recorded. Final cleanup site goals are <5 ppm for in situ soil and 1 ppm for final exposed gravel surface.

This remediation complies with applicable requirements of:

- 40 CFR 761.61(a): This is EPA's regulation under TSCA for self implementing remediation for PCB contaminated soils.
- 18 AAC 75.340(e): This is ADEC's Method 3 for determining cleanup standards based on site specific risks.

II. Background and Risks

There have been several extensive investigations of this site. The most pertinent for this workplan are summarized below:

- <u>Interim Site Assessment Report, February 2001</u>: This investigation characterized the entire site for PCB contamination, using test kits and laboratory analyses. A map was developed of the surface contamination at various concentrations, including depths of penetration. Quantities of contaminated soil and concrete were estimated. A proposal was presented for use of test kits with lab results. EPA has accepted this assessment for characterization.

- <u>Screening for Petroleum and Metals, July 2001</u>: This investigation characterized specific stains and locations requested by ADEC, indicating the site had only minor contamination from petroleum or metals. Two small spots had DRO above Method 3 limits; site specific DRO limits were subsequently specified by ADEC.

- <u>Remediation Concept Proposal, 4/8/02</u>: This detailed analysis of risks using three different models (refer to §761.61(c)) is included as Appendix 1. The analysis indicated capping of soil <100 ppm PCBs according to EPA's generic remedy (see §761.61(a)) presented the lowest overall risk of the several potential remediations. Soil <100 ppm left in place and capped under the generic remedy would have an estimated lifetime excess cancer risk of

~$5x10^{-6}$ from PCB exposure according to extension of ADEC's model, and <$1.75x10^{-6}$ by EPA's model. The fatality risk from transportation accidents of hauling the estimated 28 yd^3 of soil with PCBs >100 ppm is ~$4x10^{-6}$. Off-site disposal of larger volumes of less contaminated soil would cause greater health risk than leaving onsite. The concept proposal, the basis for this workplan, would further reduce risks below the generic capping by consolidating all soil with PCB>~5 ppm into a compact armored cell for greater long term security, and topping with clean gravel over the entire site.

- Fall 2002 Results: This report detailed investigations of the floor drain in the old slab. Elevated PCBs were found in the sludge plugging the drain, but only moderately low levels of PCBs in the underlying soil. The report also modeled the potential for any of the contaminants identified in the many reports to impact groundwater. The SESOIL screening model was used with conservative default inputs, including PCB concentration of 1500 ppm and DRO of 3350 mg/kg. No impacts to groundwater at 35 ft deep were predicted.

The goal of this workplan is to effect the remediation with the lowest practicable long term human health and ecological risks. In practice, this requires consideration of three main interrelated variables; total estimated risks of a given proposed remediation, available resources to effect that remediation, and time available.

III. Remediation

1. General Goals and Requirements

The cleanup goals of this remediation include the following:

- Soil >100 ppm PCB will be removed for off-site disposal in a TSCA landfill. This complies with §761.61(a)(4)(i)(B), EPA's self-implementing limits for cleanup of bulk PCB remediation waste in low occupancy areas using soil capping.
- Soil between 5-100 ppm will be consolidated in an on-site cell and capped. This is more rigorous than EPA's default surface cleanup level of 25 ppm for low occupancy and ADEC's 10 ppm level for industrial/commercial sites.
- Final soil gravel surface concentration goal is 1 ppm PCB.

Figures 2 and 3 are site sketches showing the areas of the various contamination levels.

This workplan and the remediation described will comply with EPA's self-implementing remediation cleanup levels in accordance with 40 CFR 761.61(a). EPA accepted the use of test kits on 3/4/03, as described in the PCB Test Kit Validation Proposal for sampling to demonstrate remediation, in accordance with 40 CFR 761.320-.326. However, ADEC will only allow lab analyses for confirmation. Consequently, field kits will be used only for screening. This reduces the quality control required for their use, but greatly increases delays for lab analyses.

2. Regulatory and Document Preparation

This draft workplan anticipates the completion and agreement of additional regulatory permits and requirements before a final workplan approval and notice to proceed.

a. Public Notice

ADEC has announced intentions to prepare a thirty day public notice concerning this remediation. Once the public notice period has begun, the remaining documents will be prepared in anticipation of final approval and notice to proceed as soon as practical following the 30 day period.

b. Stormwater Pollution Prevention Plan (SWPPP)

One of the pathways for dispersion is surface water runoff. The SWPPP describes mitigation of pollution dispersion via stormwater during and after remediation. Federal regulations effective March 2003 bring the size threshold for plan requirement down to 1 acre. EPA, ADEC, and the Municipality of Anchorage must all approve of the SWPPP. A separate component of the plan will address wind dispersion. The SWPPP is attached as Appendix 2.

c. Site Safety and Health Plan (SSHP)

Reducing overall health risk is the reason for this project; the actual remediation presents increased risk to workers. The SSHP describes general and specific safe work practices at this site. The SSHP will include PCB specific procedures including equipment and personnel decontamination. The SSHP is attached as Appendix 3.

d. Deed Notices

Institutional controls shall be recorded as a deed notice in the form of an equitable servitude agreement, developed and approved according to both ADEC and EPA regulations (§761.61(a)(8)). The notice shall include or refer to the cleanup levels applicable and demonstrated, requirements for low occupancy (EPA) or non-residential use (ADEC), the location of the disposal cell, and requirements for perpetual maintenance. Provisions for financial assurance of post closure compliance shall be described. This notice shall be recorded and certified by the owner within 60 days of completion of cleanup activities. A draft of the equitable servitude agreement is included as Appendix 4.

3. Groundwater Sampling

Following approvals and notice to proceed, two monitoring wells will be constructed near the east and west corners as shown on Figures 2 and 3 (avoiding utilities and fences). Contamination discovered to date does not indicate a significant threat to groundwater. However, the long usage of the site for salvage operations, and proximity to the adjacent former Army National Guard site, where groundwater contamination has been discovered, give cause for concern.

Wells shall be either conventionally bored or driven, screened above and below water table, estimated to be 35-40 ft deep. No soil samples will be retrieved. Wells shall be developed, sampled, and analyzed for DRO/RRO, PCBs, cadmium, and volatile organic compounds. Elevation of water table shall be surveyed, and separate benchmarks established (to be incorporated with the cell as-built survey). The survey shall include a monitoring well on the adjacent lot.

Wellheads shall be initially finished as pedestals, and later finished as flush mounts when the surface is completed. Long term monitoring and decommissioning is described in Section IV.

4. Removal of PCB Contaminated Soil >100 ppm

Following approval of the submittals described in the previous section, and notice to proceed, remediation will commence with removal of the high PCB concentration soil.

There are 5 soil nodes found to exceed the 100 ppm PCB level, each representing a 10x10 ft area. These will be excavated to the approximate depths (.5-4 ft) and aerial extent of the 100 ppm level for each node as estimated in the characterization report. Any field indications, such as staining or PID signal, will be sought as aids to guide excavation. Excavated soil will be placed on a liner, or (preferably) directly into containers suitable for transport. A small excavator with a smooth lip bucket will be used.

Since the cost of disposal for this soil is ~$600/yd^3, over-excavation will be reduced as much as possible. In turn, this will require a greater screening effort to assure the goal is confidently reached. It is quite likely that all contamination will not be removed the first pass, necessitating repeated excavation and screening.

Field test kits for PCB screening will be the enzyme linked immunoassay analysis (ELISA), a semi-quantitative method similar to the EnviroGuard brand described in EPA's ETV report for the technology and referenced as EPA Method 4020. Current vendors include SDI (EnSys) and EnviroLogix (ET-013); systems have become standardized. The EPA Method and manufacturer's instructions are included as Appendix 5.

The same grid will be used as in the original characterization, but the spacing between nodes shall be 5 ft instead of the original 10 ft. Each of the original "hot" nodes represents an area of influence 10x10 ft; typical confirmation sampling will overlay this area with 9 new nodes, each with area of influence of 25 ft^2 (total area of 225 ft^2). Each new node will be marked and sampled using a 2 inch diameter by 6 inch probe, decontaminated between samples. Up to nine nodes will be composited for a single field analysis by taking aliquots of each discrete sample.

If the composite field analysis is $\leq$100 ppm, excavation is deemed complete for the area represented by that composite. If the field analysis is >100 ppm, the remaining discrete samples may be analyzed individually or recomposited (4-5 nodes each) for analysis. Once the remaining "hot" node(s) is determined, it will be excavated, and the excavated area resampled. After all soil >100 ppm PCB is believed to have been removed, a new composite(s) will be prepared for confirmation. Confirmation sampling protocol will comply with 40 CFR 761.280-.298 as described above; node spacing will be on 5 ft centers, nine nodes maximum per composite. Samples will be submitted for lab analyses using EPA Method 8082.

If each of the new 9 node composite samples tests clean, only 5 lab analyses would be needed in this phase. If any lab analysis exceeds 100 ppm, further corrective action is required. This may involve retesting the lab sample as described in the Quality Control section, or further excavation and resampling. For this resampling (and each subsequent resampling until all composites are <100 ppm) the grid will be offset by 2 ft.

There is one node on the concrete slab that was apparently >100 ppm. Excavation, screening using the kits, compositing, and laboratory confirmation analyses will be the same as for soil. Sampling protocol following EPA Region I guidance, as used in the site assessment, will be continued; 1x3 inch cores will be drilled in concrete and collected as samples. Some concrete may be completely removed, exposing gravel; this will be sampled as described above. Composites shall not mix soil and concrete samples.

This soil and concrete with regulatory status >100 ppm PCB will be sent to a TSCA regulated facility. The facility may require additional sampling, although that is not expected. Transportation will be in accordance with 49 CFR (as required by 40 CFR 761.65(6)). Also, there are 2 supersacks, ~3 yd^3, of soil generated at another site (1924 Post Rd.) by the owner and stored here in anticipation of disposal along with this PCB soil. The supersacks are non-TSCA, non-RCRA, but contain mercury and low levels of PCBs, making them unsuitable for convenient local disposal. These sacks will be transported with the PCB soil, to the extent practical and allowed. Manifests and certificates of disposal will be provided in the final report.

5. Excavate Soil <100 ppm PCB

After demonstration of removal of all PCBs >100 ppm, the remaining PCB contamination will be placed in the cell to the extent practical. Because of the low risk of this on-site cell and low cost of construction, over excavation is a practical strategy to reduce risk of leaving any high concentrations of PCB soil near the surface. This also reduces the chance of missing a cleanup goal, and the cost of repeating excavation and lab analyses.

EPA's regulatory level is 25 ppm, ADEC's default industrial level is 10 ppm, and the in situ site goal is <5 ppm. This implies different standards for demonstration; EPA desires confirmation of the ≤25 ppm level be demonstrated by their protocols, ADEC desires at least the 10 ppm level be demonstrated with their protocols, and the owner seeks scientific demonstration to the <5 ppm site goal. Finally, a representation of the final surface after grading the clean fill is desired. Both agencies have the freedom to apply other criteria and standards as they see fit. EPA has specific sampling protocols specified in regulations, but ADEC has none. EPA accepted the site assessment for delineation of areas requiring remediation, while ADEC requests further testing of areas found clean in the assessment. A unified sampling protocol could not be negotiated.

The area presumed to have PCB concentration of 25-100 ppm is ~9200 ft^2, including areas of inference of 9 composite samples (900 ft^2 each), plus 6 individual nodes (100 ft^2 each), plus the 5 nodes just excavated to the 100 ppm level. This area must be remediated and confirmed to $\leq$25 ppm to meet EPA limits, 10 ppm to meet ADEC limits, and <5 ppm for the site goals.

First, however, the actual nodes that exceed 25 ppm within those 9 composites must be determined in order to reduce unnecessary sampling. Each node within the 9 hot composites (81 total nodes) will be resampled. Smaller composites of 4-5 contiguous nodes will be analyzed with the kits; hot composites will be reanalyzed using the kits to determine actual nodes >25 ppm. After excavation of each hot node, confirmation sampling to meet EPA's $\leq$25 ppm limit requires 5 ft node spacing, 9 nodes maximum per composite, and lab confirmation by method 8082 as described above for the $\leq$100 ppm demonstration.

The area presumed to have PCB concentration of 10-25 ppm is all of the above described area, plus an additional ~10,000 ft^2. This area requires excavation to <5 ppm and confirmation to ADEC's satisfaction that at least the 10 ppm level is met. Finally, the area to which the site goal of <5 ppm applies includes the entire site surface of ~59,000 ft^2.

Areas identified as 10-25 ppm will be initially excavated to an average depth of 1 ft. Areas identified as 5-10 ppm will be initially excavated to an average depth of 3-6 inches. Areas identified as 0-5 ppm will be graded smooth following all other removals.

Confirmation sampling for the areas 0-25 ppm will consist of placing nodes at 20 ft spacing and compositing 9 nodes per sample for laboratory analysis by Method 8082. If further excavation is required following a failed lab sample, the hot nodes will be determined by screening with the kits, excavated, screened for completeness, and then resampled with 5 ft offset from the first sample for confirmatory lab analysis.

Any node or composite that has already been verified by laboratory analysis to have met an applicable lower limit (e.g., if a composite sampled for the 100 ppm demonstration is <25 ppm) need not be excavated or sampled for that lower limit. PCB surface cleanup limits for ADEC will have been met when each in situ sample submitted for lab analysis is <10 ppm PCB.

The weighted area average of all final lab analyses for the site will be determined. Each lab analysis will represent an area of inference, A_i; the sum of all represented areas, $\sum A_i$, will equal the total yard area. The weighted area average, C_a, shall be the sum of the individual PCB analyses C_i, in ppm, times the area of inference of that individual sample divided by the total area:

$$C_a = [\sum(C_i)(A_i)] / \sum A_i$$

This weighted average goal is <5ppm; additional excavation and sampling may be required after demonstration of ADEC goals. This average is more representative of PCB surface distribution should advanced fate and effect modeling be desired in the future.

The remediation for PCBs is also expected to be sufficient for metals and the several petroleum surface stains. ADEC requests that two spots described in the 7/01 report be sampled after excavation and analyzed for DRO/RRO. Excavation will proceed in these areas to the limit of visual and PID signals, and then sampled below the last indication and analyzed for DRO/RRO.

For the entire site, each node sample will be tested with a PID and other field indications of petroleum noted; soil will be excavated to the extent of field indications. All excavations will be further characterized to the extent possible as either disturbed or undisturbed native soils. Potential utilidors or other disturbances that may indicate buried tanks or leachfields will be noted and investigated as appropriate.

5. Soil Stockpiling and Construction of Cell

Excavated soil <100 ppm PCB will first be placed in a stockpile in an area <25 ppm PCB and the total volume of soil estimated prior to constructing the cell. The inactive portion of the stockpile will be covered to reduce wind dispersion.

Soil placed into the cell shall be sampled. There are no regulatory requirements for stockpile sampling; the purpose is to provide representative concentrations for future reference, most likely for an advanced fate and effect model. Current models indicate the risk pathways for PCBs are ingestion and dermal contact, with no potential to leach into groundwater. A mobile carrier, such as leachable petroleum, can disperse PCBs. Again, current models indicate the maximum petroleum concentrations observed present no quantifiable risk to groundwater.

The soil is presumed to be well mixed, with respect to fate and effect model presumptions, after placement in the cell due to the excavation, stockpiling, moving, and dozing. Three composite samples will be collected; each composite shall consist of nine subsamples. Each composite shall represent approximately 1/3 of the total volume of the cell. Each composite shall be analyzed for PCBs and DRO. The average of the PCB and DRO concentrations will be used in the SESOIL model to predict risk to groundwater under different scenarios, including complete failure of the containment cell. Speciation of the PCBs into individual congeners is desirable for future modeling; the raw laboratory analysis data will be included in the record.

The constructed cell will have approximate net depth of 10 ft, net width of ~40 ft, with length sufficient to hold all the collected PCB soil up to 100 ppm. Dimensions of the cell depend on available liner sizes, since a single piece bottom is desired. The volume of soil of 10-100 ppm PCB has been estimated to be ~500 yd^3; the volume of soil expected to be put in the cell is ~1000 yd^3, or even more if convenient. The cost of increasing the size of the cell to accommodate lower concentration PCB is believed to be relatively inexpensive compared to the potential benefits of lower risk and lower analysis costs.

The cell will be placed near the southeastern fence line, at least 15 ft away from utility easements or most likely areas of future construction (see Figure 2). Before digging the cell, the entire site except under the contaminated soil stockpile will have been demonstrated to meet EPA, ADEC and site cleanup goals. Next, the concrete will be cut into readily movable slabs, then stacked; any extending rebar will be removed. Next, a pit will be excavated ~12 ft deep for a net cell thickness of ~10 ft; area of excavation shall be determined from available liner dimensions (with suitable backslopes). The clean excavated material will then be stockpiled for future spreading across the site.

To the extent appropriate, the cell construction will comply with Attachment A of the Soil Treatment Guidance, ADEC 11/7/02. The top and bottom liner will be 20 mil oil resistant reinforced polyethylene, equivalent to OR RPE© 25 by Layfield (see Appendix 6 for specifications). This liner has a special chemical resistant coating, suitable for much higher oil or PCB concentrations than found in this application. Predicted life as an exposed cover in an aggressive environment is rated as 3-5 years; rated life as a deeply buried undisturbed liner in dry benign conditions is unspecified, but considerably longer. However, the purpose of the liner is not to hold free liquids or even prevent leaching; the soil has been predicted to not leach contaminants without any liner.

Any soil to be placed against the liner shall be visibly screened to eliminate sharp objects. The 3 inches of soil directly under the bottom or top liner shall be 100% passing ¾ inch screen and compacted. Soil covering the bottom liner shall be at least 12 inches free draining sandy gravel 100% passing the 3/8 inch screen. The first layer of backfill placed in the cell shall be sufficient depth, at least 18 inches, to cushion equipment such as a small dozer placed in the cell to spread and compact the fill. Sidewalls of the cell shall be built and compacted as the cell is filled with fine grained soil in contact with the liner. The entrance ramp to the pit shall include a cushioned bridge of protective material over the rolled up liner. To the extent possible, traffic over the liner edge will be reduced by placement of soil into the pit by excavator rather than dump truck.

After all PCB contaminated soil is placed and compacted in the cell, the surface shall be smoothed with a 2% crown to shed water, covered with 3 inches of compacted ¾ inch minus gravel, and the bottom liner folded over the top edges. The top liner shall be placed to completely overlap the bottom liner, then covered with at least 12 inches of compacted 3/8 inch minus gravel. The concrete slabs shall be placed over this gravel and around the top sides. Final cover of ~1 ft of gravel will be graded over the concrete slabs. Final grade shall be higher than adjacent with ~2% slope so runoff does not pool over the cell.

The cover will be constructed without heavy equipment operating over it until at least 18 inches of material covers the liner. Concrete slabs will be carefully set in place over the fine gravel. An as-built survey showing location of the cell will be provided. Figure 4 shows the cell concept.

In summary, the primary purpose of the cell is to keep the soil from further being dispersed. Due to the extremely low solubility of the PCBs at the site, contaminants will not leach from the soil within the cell, even without a liner. This significantly reduces the liner's importance. Features of the cell, in order of importance for its long term purpose include:

1) The concrete armor reduces or prevents inadvertent excavation;
2) the cell location and deeper burial allows site use, including surface grading or paving, without exposure to contamination;
3) the deed notice requires continued awareness and maintenance of the cell;
4) the top cover reduces infiltration into the soil and protects the soil from surface fuel spills;
5) the liner serves primarily to mark the cell location and reduce dispersion by inadvertent excavation.

Requirements for perpetual maintenance of the cell are included in the deed restriction in the form of an equitable servitude agreement. The cell is designed to require only inspection instead of regular maintenance. Minor settling may be encountered during the first couple years. A caveat to not store fuel over the liner is included in the agreement.

7. Grading and Final Sampling

After completion of the cell, the clean gravel will be spread over the over the entire site and contoured to conform to the SWPPP. The minimum thickness of this clean fill will be 3 inches over areas already <5 ppm.

Following final grading, the entire site surface will be sampled for PCBs. Sample nodes shall be 20 ft spacing; 4 composite samples will be taken representing the entire site, each composed of up to 40 subsamples. Applicable cleanup levels for both EPA and ADEC will already have been demonstrated, as well as the site goal of <5 ppm left in situ. The purpose is to provide a representative concentration of the gravel surface for use in fate and effect modeling.

8. Decision Quality Control

The quality of the data used to make cleanup decisions must be evaluated and reviewed. An understanding of the uncertainty involved at each step is required. Uncertainties include:

1. 1-3 orders of magnitude: Range of concentrations predicted by the various fate and effect models to result in a given acceptable health risk. See Appendix 1.
2. ±100% or more: Uncertainty of a specific sampling plan to obtain data required for the chosen fate and effect model. Surface sampling reflects the model pathway and maximum use of compositing enables more accurate determination of representative concentration.
3. ±100% or more: Range of concentrations in a small sampling area. Increasing the number of subsamples in a composite reduces this uncertainty.
4. ±100%: Variability of 20 g analysis samples within the 300 g collected sample. Heterogeneous media, such as the gravel at this site, have higher variability. Most labs routinely exclude pebbles >3/8 inch from the analyzed subsample, resulting in significant positive bias. EPA methods specify grinding of oversize, but this is never done routinely. Extracting subsamples larger than 20 g, or averaging multiple extractions, reduce this uncertainty. Approved EPA methods have no provisions, but kits are easily adapted.
5. 28-113%: Recovery for PCB extraction of homogeneous prepared samples by EPA reference labs during their evaluation of EPA method 3541/8082. Variability in real media is expected to be much higher. EPA found the overall accuracy of the quantitative test kits (extraction plus analysis) to be significantly better than the reference laboratory, but no comparison of only the extraction recovery could be found (kits use methanol while the EPA method uses methylene chloride, acetone, and/or hexane).
6. ±20%: Method 8082 acceptable error range for analysis of reference extracts. The semiquantitative PCB test kit evaluated by EPA (similar to the kit to be used for screening) was found to be biased high (false positives) on 47% of the samples and biased low (false negatives) on 1% of the samples. This strong positive bias is designed by the kit manufacturer.

The relatively huge decision uncertainties described in items 1-3 are minimized to the extent possible by complete site assessment, careful evaluation of all foreseeable baseline and remediation human health risks, and development of a sampling plan appropriate for the model.

The relatively smaller, but still substantial, decision uncertainties of items 4-6 are the realm of laboratory quality assurance and quality control (QA/QC). Consideration of the uncertainties enables appropriate corrective action.

Each sample submitted to the lab for verification will be a split of a larger composite or discrete sample. Each sample shall be well mixed, and splits taken equally representative of the entire sample. Due to the heterogeneity of the gravel matrix and contaminant distribution, there can be great variation between any finite size sample; careful mixing and subsampling reduces this variation. A split of each sample sent to the lab will first be analyzed with the PCB test kit.

The kits can easily extract larger sample volumes by proportionately increasing sample and methanol volume, thereby reducing a large source of error (item #4); this simple technique is not available for lab analyses. Thus, while the kits are inherently less precise than lab analyses (field conditions vs. controlled laboratory), the greater accuracy of the larger extraction volume renders the kits potentially more accurate overall.

For this workplan, ADEC's regulatory decisions will be based entirely on the laboratory analyses. The PCB test kits will be used for screening. Consequently, the reliability of the kits is judged by how well they predict the lab results rather than their absolute accuracy or precision. The lab results themselves have only internal QA/QC parameters reported by the lab for the analysis only; there is no independent absolute comparison for this medium that includes extraction.

Relative QA/QC comparisons are derived from multiple analyses of a given sample, such as:

- Completely different samples and composites of the same area can be sent to different labs; this may evaluate errors from the entire sampling/analysis process.
- Splits of each subsample can be used to form a duplicate composite.
- Duplicate splits of a given composite can be sent to different labs.
- Duplicate splits of a given composite can be sent to the same lab, at same or different times for separate equipment runs.
- Aliquots of a given sample submitted to a lab can be sequentially removed and analyzed by the same lab, or preferably different labs, until the total sample volume is gone (typically 7-15 analyses). This is the best way to estimate the variability of the lab methods and test the anecdotal high bias of initial analyses due to pebble size screening.

Unfortunately, there are no quantitative control parameters for real heterogeneous media, unlike uniform fine grained performance evaluation samples. The high variability of duplicate samples of heterogeneous media is simply accepted as "environmental variability", not without reason, which entirely avoids the question of extraction bias or finding more representative methods.

For this workplan, the following QA/QC shall apply:

- Duplicate splits of all samples to be sent to the lab for PCB analysis by method 8082 will first be analyzed by the test kits and will have passed at the appropriate regulatory level. Samples analyzed by the kits will extract 50 g.
- The 100 ppm demonstration requires greater accuracy due to the cost penalty for over excavation. Additional kit standards will be used for each test to improve accuracy.
- If a lab sample exceeds 100 ppm, it is probably more likely the lab is in error, since the lab extracts smaller volume and the kits are normally biased high. The cost for over excavation favors questioning the lab. In such case, the remaining lab sample will be retrieved from the lab and submitted to a different (or the same) lab for repeat analysis. If the average of the lab analyses meets criteria, the sample demonstrates the level has been met. This may be repeated multiple times until the average of all values is below 100 ppm.
- If the average remains above 100 ppm, the area represented by the composite or individual nodes will be re-excavated and resampled as previously described.
- The same averaging process may apply to demonstration of other levels (10 and 25 ppm), although the economic incentive is less; re-excavating and resampling may be the first choice corrective action depending on the sample result.
- Any lab sample that passes internal laboratory standard QA/QC for the method, is above the PQL (has a finite reported result), and has no specific lab qualifier is presumed valid.

The quality of decisions for effecting the goals of this remediation rely much less on the laboratory analyses used for final verification than on the preceding steps including site assessments, comparative risk analyses of remedial options, remedial design, and excavation screening.

V. Post-Closure

1. Routine Inspection and Repair

The cell area will be visually inspected quarterly for subsidence for the first three years. Minor subsidence is expected. Differential subsidence of greater than one foot or crack separation of more than 2 inches will require careful excavation to uncover the liner, inspection of the liner, and repair if torn (using manufacturer's recommended practices), followed by careful backfilling and compaction.

Routine cell inspection reports shall be kept permanently on site and shall be available for inspection by ADEC. A copy of the inspection report shall be submitted annually to ADEC. If any inspection indicates repairs may be required, ADEC shall be notified before further investigation, and again within 5 days of completed investigation or repair.

2. Groundwater Monitoring

If initial sampling indicates groundwater contaminants are below MCLs, groundwater will be sampled every 5 years for PCBs and analyzed by method 8082, or its ADEC approved successor.

The annual report shall also indicate the monitoring wells have been inspected for damage to the surface fixtures, and appropriate repairs made. A monitoring well presents a finite risk of allowing surface contamination to reach the aquifer. At some time in the life of a monitoring well, that risk exceeds the value of any further information likely to be obtained by that well. At that time, the well should be properly decommissioned. If ADEC requests decommissioning, the owner shall do so within 3 months, using methods currently approved by ADEC. The owner may also request decommissioning, and shall provide information requested by ADEC (such as modeling) to enable them to approve decommissioning.

3. Recording of Institutional Controls

Institutional controls, as described in Section III. 2. d. and Appendix 4, shall be recorded and certified by the owner within 60 days of completion of cleanup activities.

VI. Schedule and Reporting

This workplan is presented as an evolving draft. The concept must be initially approved, then greater detail worked out and agreed to. Problems with details have forced revisions of the initial concept, and may again do so. Some significant components of this workplan must necessarily remain as conceptual drafts until additional information is obtained during remediation or third party agencies grant approvals.

The major impediment to scheduling is estimating the date of the notice to proceed. There is increased cost and risk of having to stop remedial activities due to onset of winter. Consequently, certain tasks should not be started unless there is reasonable expectation of being completed before onset of freezing weather. Following final approval of the workplan and its components by ADEC and notice to proceed, the owner will evaluate how much, if any, of the workplan can safely be accomplished this season. That portion of the workplan will be implemented; the site will be stabilized and shut down for the winter, then the work will be resumed in spring 2004.

Schedule components include:

- Conditional approval of this draft: Once ADEC gives conditional approval of this draft workplan, they can publish a public notice. Other components and appendices to this workplan can then be prepared.
- Public notice: ADEC intends to prepare and submit a public notice. Only after a certain period after the notice will ADEC formally approve the workplan and grant approval to proceed. Preparation of other required permits will proceed during this public notice period, but no remediation will occur.
- SWPP Plan: This will be prepared and approval sought during the public notice period.
- Deed Notice: Draft documents will be prepared and confirmed during the public notice period, based on reasonable expectations of remediation results. Remediation will not proceed until the draft has been approved.
- Site Safety and Health Plan: This is required before any remediation begins.

- Remediation Logistics: Following all required approvals and notice to proceed from ADEC, remediation will be started:
  - Monitoring wells constructed and sampled: 4-21 day lead time
  - Lab results for groundwater: 7-21 days
  - Reconfirmation of workplan based on groundwater results: 0-30 days
  - PCB test kits will be purchased; they have a limited shelf life: 7 day lead time.
  - Crew and equipment mobilization for 100 ppm removal: 4-7 day lead time.
  - Excavation, containerization, field screening, sampling to 100 ppm: 4-10 days
  - Lab results for EPA 100 ppm demonstration: 7-21 days; may be repeated
  - EPA verbal confirmation of 100 ppm demonstration: 1-7 days
  - Preparation of >100 ppm soil for shipping: 1-2 days (14-60 days for certification)
  - Preparation of <100 ppm soil stockpile area, stockpile concrete; 1-3 days
  - Resample, field screen >25 ppm composites, identify >25 ppm nodes: 2-4 days
  - Excavation, stockpiling, field screening, sampling to 25 ppm: 3-5 days
  - Lab results for EPA 25 ppm demonstration: 7-21 days
  - EPA verbal confirmation of 25 ppm demonstration: 1-7 days
  - Excavation, stockpiling, field screening, sampling to <5 ppm: 5-10 days
  - Lab results for ADEC 10 ppm demonstration, site goals and stockpile: 7-21 days
  - ADEC verbal confirmation of 10 ppm demonstration: 1-7 days
  - Construct cell, backfill, finish, survey: 7-15 days
  - Spread clean gravel over site, grade, sample: 3-5 days
  - Lab results for final site surface demonstration: 7-21 days
  - Preparation of remediation final report: 7-21 days
  - Recording of deed notices: 1-60 days

The above tasks are in general chronological order. Some of the tasks can be performed simultaneously, albeit with some increased difficulty, while waiting for results or interim approvals. Certain results and approvals must be received before any significant additional work can proceed. The timeline generally assumes a very high degree of equipment and manpower availability. If there are frequent pauses in the work, the remobilizations required will substantially extend the timeline. A proposed timeline is shown on Figure 5.

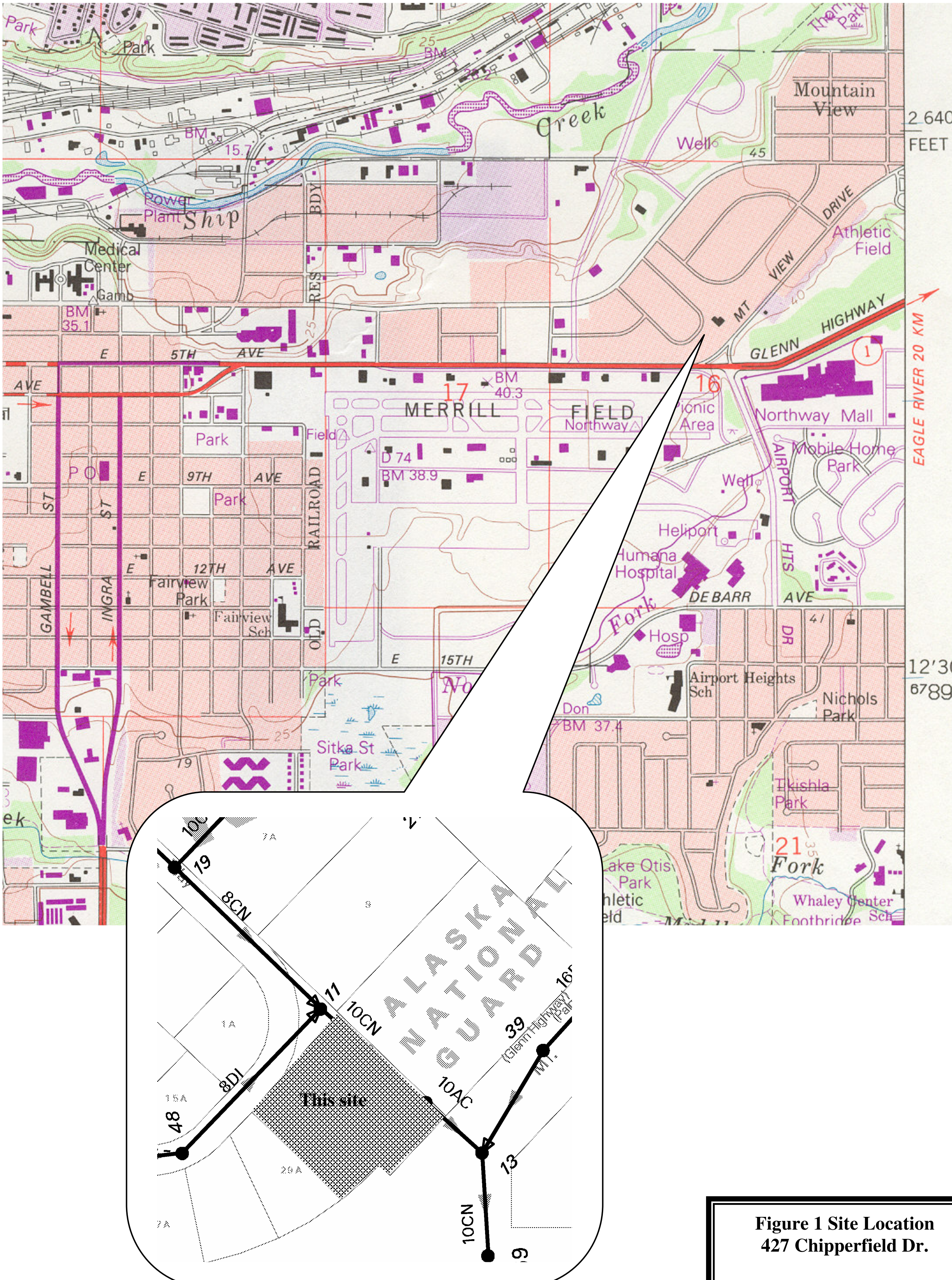


Figure 1 Site Location
427 Chipperfield Dr.

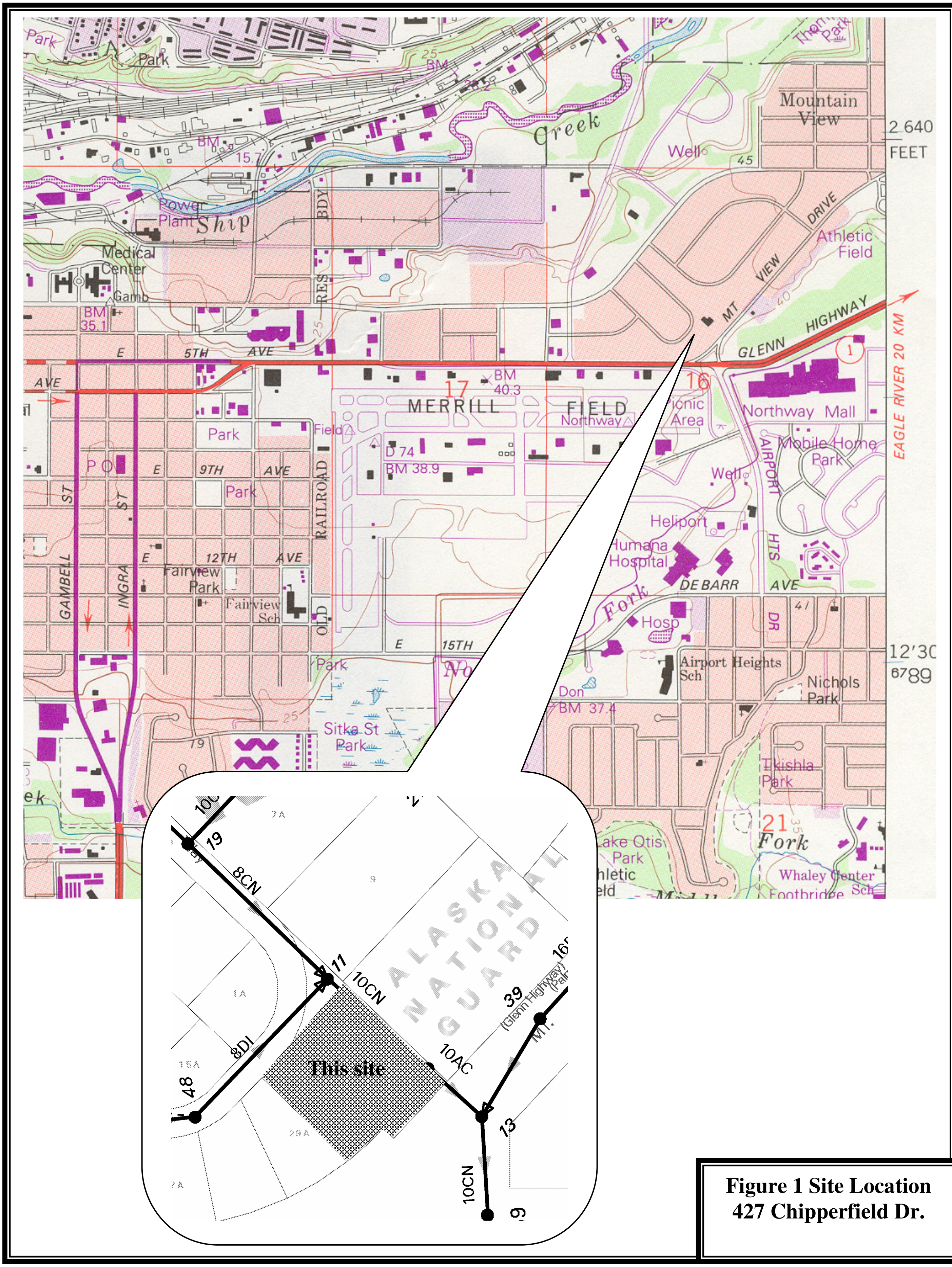
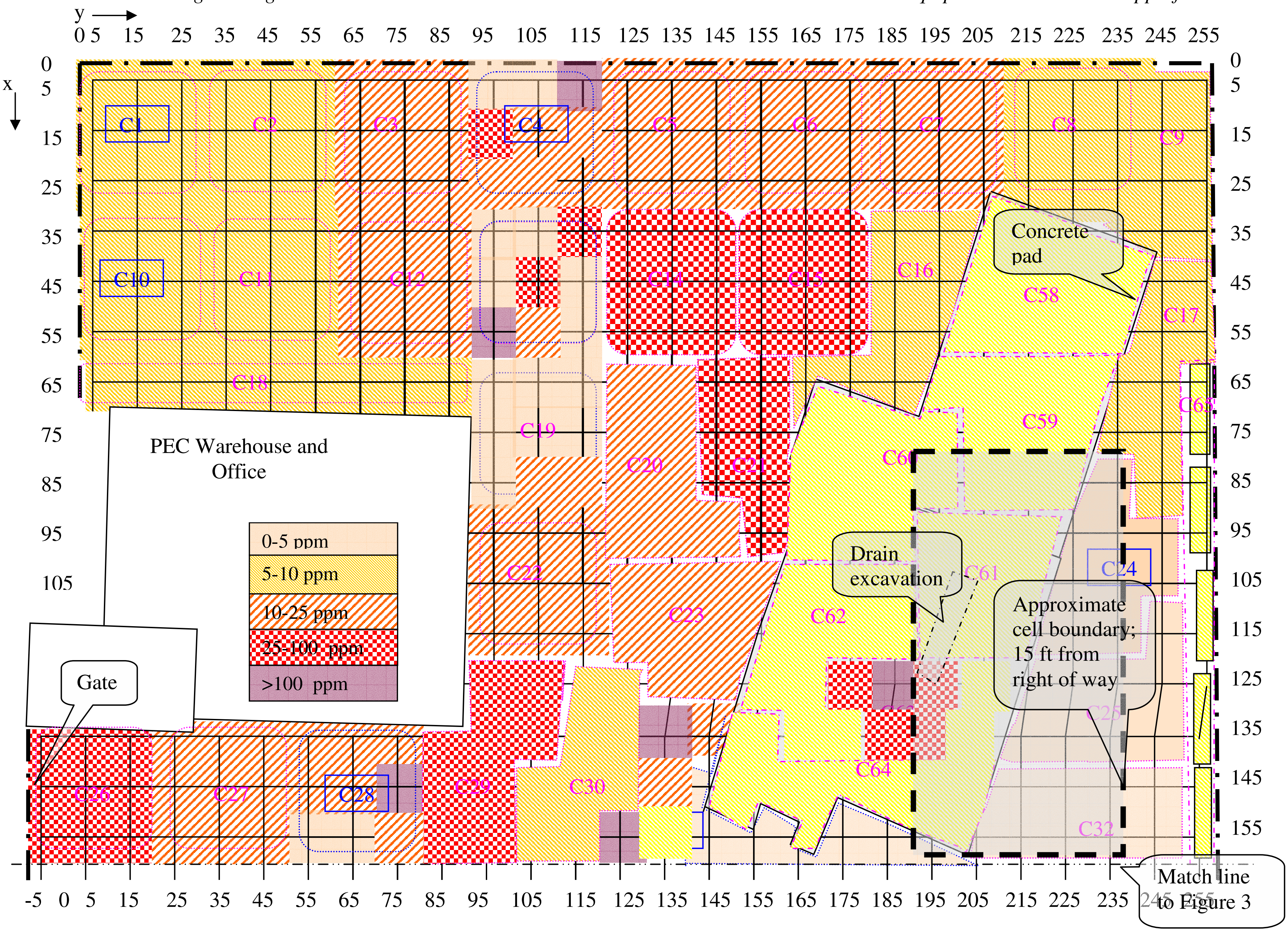
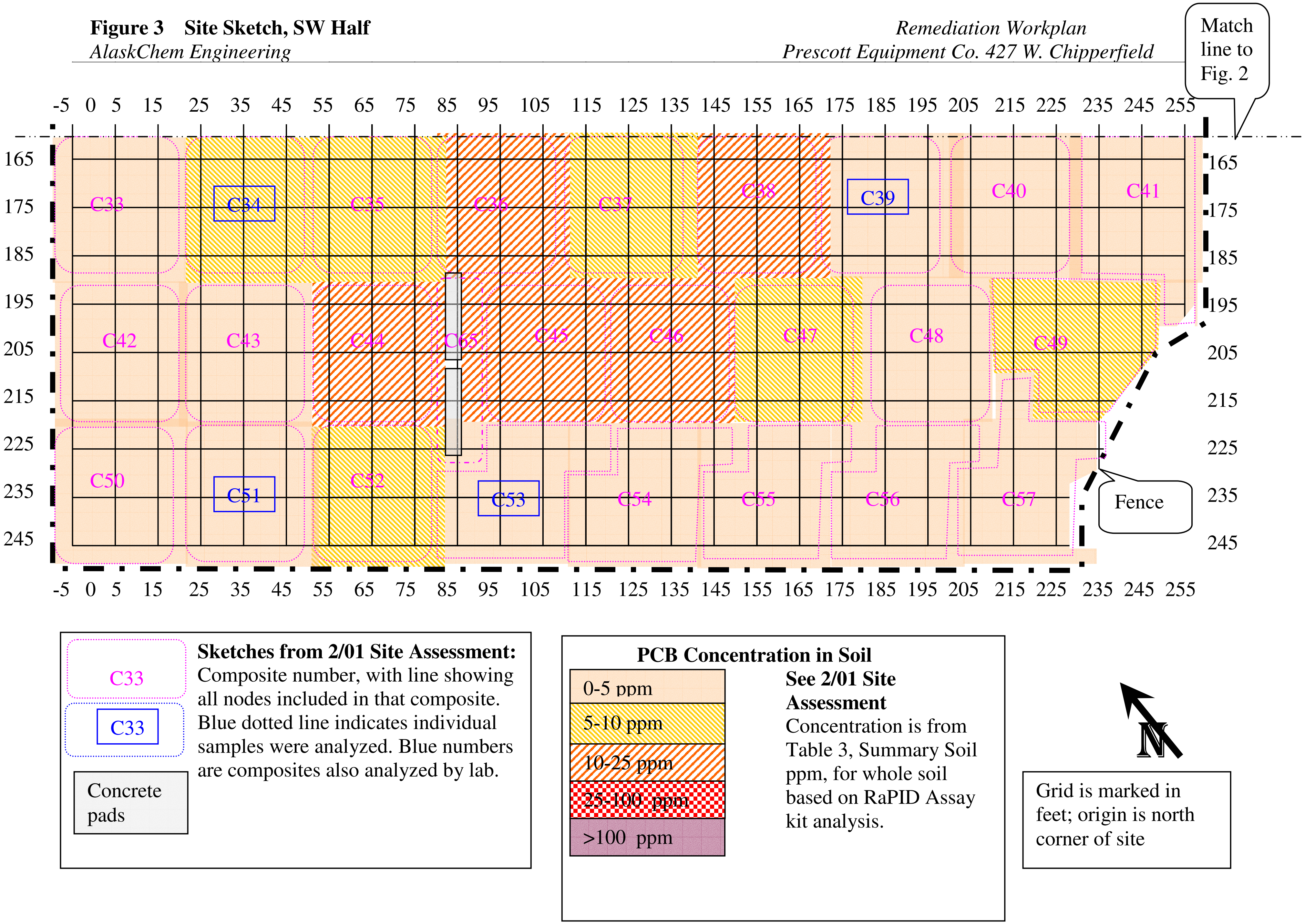


Figure 1 Site Location
427 Chipperfield Dr.

Figure 2 Site Sketch, NE Half *Remediation Workplan*

AlaskChem Engineering **6/4/03 DRAFT** *Prescott Equipment Co. 427 W. Chipperfield*




Match line to Fig. 2
-5 0 5 15 25 35 45 55 65 75 85 95 105 115 125 135 145 155 165 175 185 195 205 215 225 235 245 255
165 175 185 195 205 215 225 235 245
C33 C34 C35 C36 C37 C38 C39 C40 C41
C42 C43 C44 C65 C45 C46 C47 C48 C49
C50 C51 C52 C53 C54 C55 C56 C57
Fence
Sketches from 2/01 Site Assessment: Composite number, with line showing all nodes included in that composite. Blue dotted line indicates individual samples were analyzed. Blue numbers are composites also analyzed by lab.
C33
C33
Concrete pads
PCB Concentration in Soil
0-5 ppm
5-10 ppm
10-25 ppm
25-100 ppm
>100 ppm
See 2/01 Site Assessment
Concentration is from Table 3, Summary Soil ppm, for whole soil based on RaPID Assay kit analysis.
N
Grid is marked in feet; origin is north corner of site

To the extent appropriate, the cell construction will comply with Attachment A of the Soil Treatment Guidance, ADEC 11/7/02

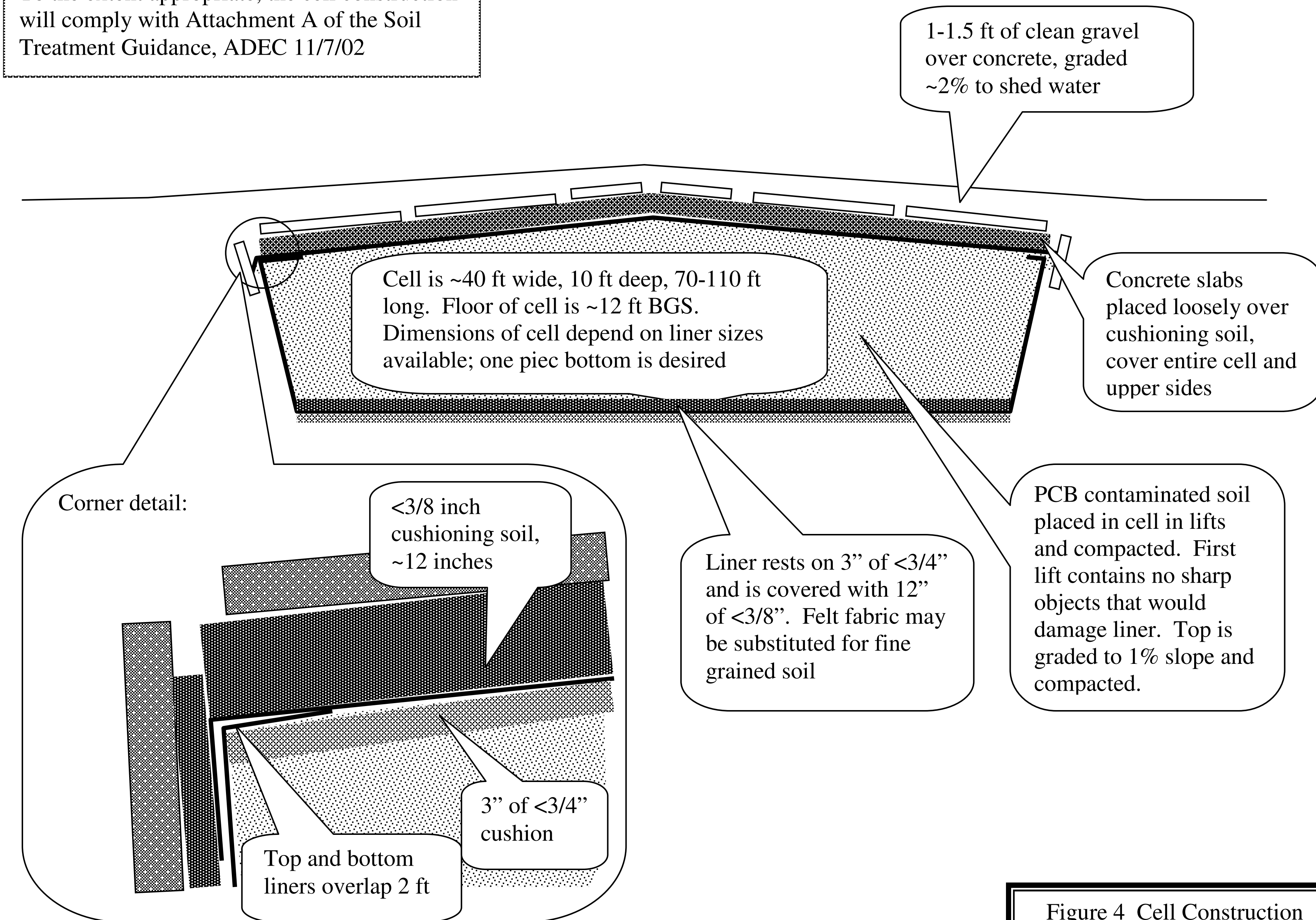


Figure 4 Cell Construction Sketch

Layfield OR RPE

Oil Resistant Reinforced Polyethylene (OR RPE®) is our standard material for short term soil remediation use.

OR RPE® is a variation of the basic RPE® materials with enhanced chemical and oil resistance. OR RPE® is our most commonly used short term soil remediation lining material. It is a light weight, high strength, low cost geomembrane material that is easily fabricated into large sizes with the extended chemical resistance required for soil remediation applications.

OR RPE® is different from our standard RPE® materials in that the coating is a chemically resistant HDPE material. This coating is more resistant to the hydrocarbons found at most soil remediation sites.

OR RPE® is typically used as a site liner for short to medium term soil remediation applications. For clean up of hydrocarbon contaminated sites, or for sites that contained PCB's, PAH's, heavy metals, or creosote, OR RPE® is an excellent soil remediation lining choice.

OR RPE® can also be used as a cover material in aggressive environments where chemical resistance is important. OR RPE® is UV stabilized and can be used as an exposed cover for between 3 to 5 years (depending on location and use).

2 Dec 2002	OR RPE® Typical Material Properties	
Style	**ASTM**	**OR RPE® 25**
Thickness (Nominal)		20 mil 0.5 mm
Grab Tensile Strength	D5034	348 lbs 1550 N
Elongation	D751	15%
Tear Resistance	D2261-71	108 lbs 480 N
Burst Strength	D751-73	595 psi 4100 kPa

Low Temperature	D2136	-67°F -55°C
UV Resistance	G53-84 2000 Hours	>80%

7 Jan 2002	OR RPE® Minimum Shop Seam Strengths	
Style	**ASTM**	**OR RPE® 25**
Heat Bonded Seam Strength	D4545 25.4 mm (1") Strip	140 ppi 24.5 N/mm
Peel Adhesion Strength	D4545 25.4 mm (1") Strip	FTB AD-DEL

Each and every liner panel we produce is a custom panel. The way we set up our shop is unique in that our shop welders produce prefabricated panels to best match your containment area. We size each panel to fit, without waste, in a logical sequence in your containment area. In containments with irregular shapes we size our panels to best accommodate the irregular size.

OR RPE® FABRICATION SIZES		
Material Style	**2500 lb Panel size 1130 kg**	**4000 lb Panel size 1800 kg**
OR RPE® 25	39,700 ft^2 3,700 m^2	63,500 ft^2 5,900 m^2

There are no theoretical limits to the size of the liner panels that we can prefabricate but there are some practical limits, notably panel weight. Panel weight is important because of the limits of handling equipment that will be available in the field. OR RPE® is normally limited to a maximum panel weight of 2,500 lbs (1,200 kg); however, if a skilled installation crew is available then a panel of up to 4,000 lbs (1,800 kg) is possible.

Panels are accordion folded in one direction and then rolled in the other direction. Unfolding instructions and dimensions are marked on the individual liner panel. Each panel is wrapped in an opaque, weather resistant covering suitable for shipment and storage.

All shop fabricated seams are 100% visually inspected by the welding operator. Every fifth seam is tested for Film Tear Bond and destructively tested in peel and shear. Quality control reports are prepared with each panel produced. For projects larger that a single panel size, we will fabricate multiple panels that are then assembled in the field using tape seams.