STATE OF ALASKA

WALTER J. HICKEL, GOVERNOR

DEPT. OF ENVIRONMENTAL CONSERVATION

P.O. Box 871064
Wasilla, Alaska
99687-9998
(907) 376-503

May 17, 1994

Mr. Keith Kringlen
Chevron U.S.A. Products Company
Site Assessment & Remediation Group
20500 Richmond Beach Drive N.W.
Seattle, Washington 98177

Re: Former Chevron Valdez Terminal, Ground Water Quality Results Monitoring Report, Review

Dear Mr. Kringlen:

On January 6, 1993, the Department received a letter from the consulting firm of HartCrowser, Inc., which has performed quarterly ground water sampling for the referenced facility. Please accept the Department's apologies for the delay in responding to the letter, which is due to limited staffing in the Valdez District Office. I have completed my review of the submittal and have the following comments:

In the letter, HartCrowser requests that the quarterly monitoring be reduced to twice annually. The letter included graphs for 4-1/2 years of quarterly data that shows the benzene concentration in each of the monitor wells was less than 0.200 mg/L, the alternate ground water cleanup level approved by the Department in a letter dated July 10, 1992.

In review of the Compliance Order By Consent for this facility, and the Department's July 10, 1992 letter approving the alternate ground water cleanup level, it appears that the criteria set forth in those documents for modifying the monitoring plan has been met.

Based upon the historical sampling data, it appears that the quarterly monitoring can be reduced to twice annual sampling of the same monitor wells, in the spring and fall of each year. (I was informed by HartCrowser that the spring, 1994 sampling event was conducted. I am looking forward to reviewing the results of that sampling event.)

If you have any questions, please do not hesitate to contact me.

Sincerely,

Mike Krieber
Env. Engineering Associate

cc: Breck Tostevin AG Office
Dan Lawn ADEC/MSDO/VFO
Mr. Herminio Muniz, Hart Crowser

WALTER J. HICKEL, GOVERNOR

DEPT. OF ENVIRONMENTAL CONSERVATION

SOUTHCENTRAL REGIONAL OFFICE
Contaminated Site Programs
3601 C Street, Suite 1334
Anchorage, AK 99503

Telephone: (907) 563-6529
Fax: (907) 273-4330

July 10, 1992

RECEIVED
JUL 14 1992
DEPARTMENT OF
ENVIRONMENTAL CONSERVATION
MSDO

Chevron Research & Technology Company
Attn: J. P. Hughes
PO Box 4054
Richmond, CA 94804-0054

Dear Mr. Hughes:

The department has completed review of the Draft February 1992 Development of Risk-Based Groundwater Cleanup Levels for the Former Chevron Terminal Site in Valdez, Alaska (tank farm/bulk plant) and your May 29, 1992 letter regarding cleanup levels at the former Chevron Bulk Terminal in Valdez. The proposed groundwater cleanup level of 0.200 mg/l benzene is conditionally approved dependent on Chevron's compliance with the conditions described below:

1. Quarterly groundwater monitoring will be continued for a period of three years after the groundwater clean-up level has been reached at the facility boundary. Monitoring will be performed in accordance with a new monitoring plan approved by the department or in accordance with the current monitoring plan. After three years, the need to perform additional monitoring will be assessed. The department considers continued monitoring necessary to approve a risk based cleanup standard of the proposed level and to ensure that off-site benzene levels do not increase once active remediation has been terminated.

2. Additional groundwater remediation will be necessary if off-site benzene contamination levels in excess of the 0.200 mg/l cleanup level are detected.

3. Conditions specified in Compliance Order by Consent and Agreement Settling Liability #89-24-010-01 will be followed.

4. Groundwater directly beneath and adjacent to the site may pose an unacceptable risk to any future users of the groundwater. The department expects and requests that Chevron notify any interested parties of the potential risks associated with contaminated groundwater at the former Valdez Chevron Terminal. Examples of parties

which may have an interest in the site include the City of Valdez, local utility companies, current and future site owners, nearby residents, etc.

The risk based clean-up levels were developed assuming residential ingestion of groundwater in the down-gradient area. The proposed clean-up level is associated with a 6.7×10^{-5} risk. This level of risk would normally require greater scrutiny before receiving department approval. However, current city zoning ordinances prohibit the use of groundwater in the area down-gradient from the site, so it is unlikely that any residents of Valdez will actually use the contaminated groundwater. If city zoning ordinances are changed to allow use of potentially contaminated groundwater then the acceptable clean-up level must be reevaluated.

If contaminated groundwater is ever pumped out of the aquifer Chevron is responsible for ensuring that the contaminated groundwater is properly and lawfully managed. Dewatering operations during the excavation of utility trenches and building foundations are examples of situations which may result in the generation of contaminated groundwater.

Please contact me at (907) 563-6529 if you have any questions.

Sincerely,

Max W. Schwenne
Site Discovery and Clean-up Program Manager

MS:el

cc: Mike Krieber
Breck Tostevin
Judy Kitagawa
City of Valdez

(SCRO) MAX\CHEVRON.RSK

Chevron

Chevron Research and Technology Company
1003 West Cutting Boulevard, Richmond, California
Mail Address: P.O. Box 4054, Richmond, CA 94804-0054

Environmental Group

May 29, 1992

Valdez Risk Assessment

Mr. Max Schwenne
State of Alaska
Department of Environmental Conservation
3601 C Street, Suite 1350
Anchorage, AK 99503

Dear Mr. Schwenne:

Thank you for the recent opportunity to meet with you and Mike Krieber to discuss the risk assessment prepared by PTI, for the former Chevron Bulk Terminal in Valdez. At the end of that meeting, you asked that we summarize our position and propose benzene clean-up levels for ground water at the site, based on the conclusions of that risk assessment. The following sections outline our summary and proposal.

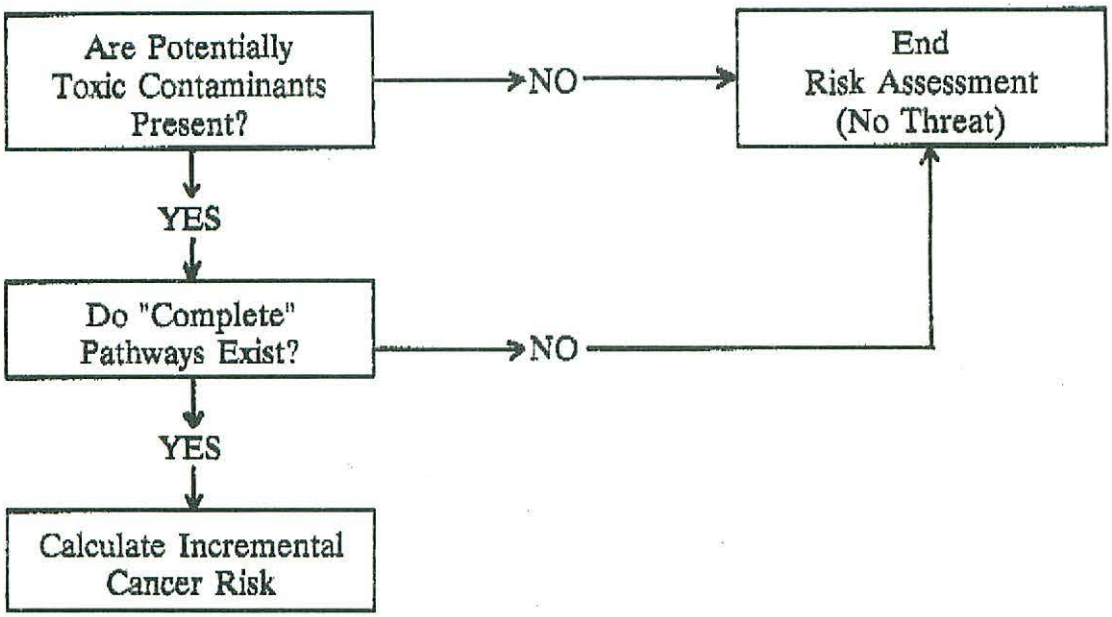
Determining Whether a Risk Actually Exists

As you know, a risk assessment normally involves several steps. To begin with, you usually identify any constituents at the site which could potentially be toxic to humans. Secondly, you look for any pathways by which the contaminants (identified in step one) might potentially come in contact with people. And finally you look at each contaminant with a "complete" pathway to humans and assess the incremental risk of humans getting cancer based on contact with that particular contaminant, along the identified pathway. These incremental risks are usually described by saying that a certain concentration may lead to say a 10^{-5} increased risk of getting cancer because of exposure to that contaminant.

Another way of looking at the same data, however, is to say that if 10^5 (or 100,000) people were exposed to that level of the contaminant, then one out of those 100,000 people would have an incremental, or somewhat greater chance of developing cancer from that exposure. The population of Valdez is less than 4,000 people rather than 100,000 figure used to calculate risk levels.

So, one could also say that if you had 25 towns[1] (each the size of Valdez) and everyone in all 25 towns were exposed to the same risk, then there is an incremental chance that one person from among all those people would develop cancer. Consequently, the chances of that one person (who might develop cancer), actually living in Valdez is rather small.

In theory, the risk assessment process is supposed to be a sequential series of steps, in which you don't proceed to the next step unless the previous step is "positive." In other words, a partial flow chart of the risk assessment process might look something like this:



Chevron decided to ask PTI to run a ground water scenario because the ultimate purpose of the risk assessment was to establish ground water clean-up levels. It should be noted, however, that following the standard procedures outlined above, the risk assessment process at Valdez would by all rights have ended once we realized that there were no "complete" pathways. Essentially we would have determined that, under the conditions chosen for this assessment, a risk simply did not occur.

It should also be noted that for an actual ground water or a vapor pathway to develop, it would require either a change in the laws of man, or a change in the laws of nature, or both. First of all, as PTI points out, zoning laws for the city of Valdez do not allow anyone to drill a water well downgradient of the terminal property. Hence there is no "complete" pathway for the ground water ingestion scenario. Secondly, the shallow depth of the ground water would probably preclude someone from constructing a building with a basement

[1]100,000 people, divided by 4,000 people per town = 25 towns.

downgradient of the terminal site (unless they intended to run a sump pump 24 hours a day in order to drain the basement). And thirdly, ground water would have to defy the laws of nature and begin to flow "upgradient" from the terminal site, in order to reach the daycare center and lead to a possible vapor problem.

The Conservative Nature of this Risk Assessment

As you have no doubt noticed, the risk assessment prepared by PTI is a very "conservative" document (i.e., it's conclusions are based on some very conservative assumptions). We agree with PTI that, especially where humans may be impacted, an assessment of this nature should err on the conservative side. We did want, however, to point out several examples where these assumptions were especially conservative, and the resulting implications:

1. For the vapor inhalation scenario, the model assumes that someone will be spending 24 hours a day in the basement for basically their whole life - a rather far fetched assumption.

2. For the ground water scenario, the model assumes that someone will be drinking two liters of contaminated water every day. Two liters is roughly equal to 8½ cups. As PTI points out, this two liter drinking water ingestion rate is considered high, since it was originally derived by the U.S. Army in estimating water needs for service people in the field (i.e., engaged in vigorous activity).

3. While available data on humans indicates that only 50% of inhaled benzene vapors are absorbed by the lungs, this study assumed that 100% of the benzene would be absorbed.

4. In calculating the potential for noncancer health risks, "uncertainty factors" of between 100 and 1,000 were used. For example, if lab tests indicated that the lowest concentration at which a particular constituent appeared to cause cancer was, say 10 ppm, then EPA set the "concern" level at somewhere between 0.1 and 0.01 ppm.

5. PTI discusses the fact that benzene concentrations in the source area would be expected to decrease over time. This obviously makes sense, because if some of the benzene is being slowly carried away downgradient, and if there is no addition of new benzene into the source area, then it is logical to assume that the source area concentration would decrease. In fact, Figure B-5 (from the Risk Assessment) shows the expected decrease in the benzene concentration in the source area. And yet the model used to calculate the risk levels shown in Table 9, used the very conservative assumption that the benzene concentration in the source area never decreases.

[Note that Figure B-5 indicates that even without any sort of remediation at the site, the benzene concentration in the source area would drop to levels connected to a 10^{-5} cancer risk (30 ppb) in roughly 12 years, and to levels tied to a 10^{-6} risk (3 ppb) in less than 70 years.]

This is sort of the modeling equivalent of "having your cake and eating it too." In other words, if you start with a fixed benzene concentration (53 ppb in the case of Valdez), and no additional benzene is added to the soil, then you can have *one* of two scenarios. *Either* some of the benzene is moving downgradient (causing a potential threat offsite), in which case the benzene concentration in the source area must be decreasing over time. *Or,* the concentration in the source area remains constant over time, which means that all of the benzene must be staying in the source area and therefore, no benzene is moving downgradient, so there isn't a potential health risk offsite. The "constant source" assumption used in this model however, implies in effect, that the benzene both stays in the source area and moves away downgradient.

While these are just a couple of the many conservative assumptions used in this risk assessment, let me summarize the implication of even these few examples. Basically we are talking about calculating incremental cancer risks based on somewhere between ten thousand and one million people (each of them between 100 and 1,000 more sensitive to contaminants that the average person), all simultaneously moving to Valdez and then proceeding to violate the local zoning codes by building a huge structure with a (partially flooded) basement, immediately downgradient of the terminal site. This vast crowd then spends the entire rest of their lives locked in this basement, presumably conducting military maneuvers! Meanwhile, back in the source area, in sort of a self-perpetuating scheme, the low levels of benzene causing all this trouble, are somehow managing to both migrate downgradient and remain in the source area at the same time.

The EPA has acknowledged both the usefulness and limitations of the "worst-case scenario" approach for risk assessments. In their words:

> "A legitimate use of worst-case scenarios is to determine if the exposure or risk is low enough even at this extreme, so as to dismiss concern for this scenario. **It is not legitimate to use a worst-case scenario to prove that there in fact exists a concern in a real population."**
>
> EPA, 53 Fed. Reg.,
> No. 232, 1988.

Another way of saying this is that a "no risk" determination for a worst-case scenario can be used to show that a real risk does not exist. However, the determination that a risk may exist (based on a worst-case scenario) does not prove that such a risk actually does exist.

Such a risk would only occur if all of the worst-case assumptions actually existed at the site--a situation that clearly does not occur at the Valdez terminal.

Benzene Levels at the Site

In spite of the conservative nature of this risk assessment, the actual levels of benzene found in ground water at the site (even before remediation) all fall within the 10^{-4} to 10^{-6} risk ranges suggested by EPA. For example, PTI calculated that the "average" benzene concentration in the source area (where the highest levels of benzene occur) is 53 ppb. According to their model, and the data presented in Table 9, 53 ppb would only result in a risk level of roughly 1.8×10^{-5}.

The 53 ppb average was calculated using the benzene data from Table B-6. You will note that this table contains one anomalously high value of 330 ppb (MW-11 on 10/20/89). If one throws out this anomalously high value (as PTI chose to throw out the anomalously low value of <0.001 for MW-4 on 11/1/90), and recalculates the "average," you get 30.5 ppb. Again according to Table 9, a benzene level of 30.5 ppb corresponds to an incremental risk value of roughly 1.02×10^{-5}.

Conclusions

When looking at the risk assessment presented by PTI, one notices the following points:

1. This is a very "conservative" document, in which numerous worst-case assumptions were made in the course of calculating the "risk-based benzene clean-up levels" shown in Table 9. The EPA has indicated that these worst-case scenarios cannot be used to prove the presence of an actual risk to a real population. However, Table 9 (especially if it is separated from the rest of the document) could potentially be used to indicate, for example, that a benzene concentration of 53 ppb in the source area actually causes greater than a 10^{-5} incremental risk of getting cancer.

2. Of the two incomplete pathways (vapor inhalation and ground water ingestion), PTI states that (the vapor inhalation) scenario.... "represents the most plausible exposure scenario for this site." According to the risk-based clean-up levels shown in Table 9, the currently existing (i.e., un-remediated) benzene levels in ground water at the site already fall well below the levels associated with even a 10^{-6} risk level for a vapor inhalation scenario. So, in spite of the conservative nature of the risk assessment, and the fact that a completed pathway does not exist, there appears to be no risk even if humans did come in contact with benzene vapors from the site.

3. We are left then to deal with risk levels (shown in Table 9) for a purely hypothetical, non-existent ground water scenario, based on very conservative, worst-case assumptions.

FROM: Jennifer Roberts

TO: Ron Klein

DATE: 02-19-91
TIME: 17:04

CC:
SUBJECT: Chevron Valdez RA
PRIORITY:
ATTACHMENTS: 415 620 9952

Ron, would you give Tom Peregrin a call about the RA and legal negotiations. The problem seems to be that Chevron management would like a definite cleanup number before signing (Tom thinks it's ok with the dollars, that's his personall opinion). He had envisioned a different type of RA but understands why we want a baseline RA. What he would like to do is to use more worst case approach to the ground water modelling. Rather than do the summer sampling as proposed by PTI he would like to use a series of partitioning coeffecents. This summer they will be installing the bio remedation equipment and the modelling will not be applicable. I don't have any problem with what Tom is proposing and he is going to call PTI and talk to them. Hope you had a nice vacation, today has the Tuesday from Hell!!!!!! Thank goodness I'm leaving.

3-1-91 10:54 left Message for Peargin
3-1-91 11:00 Discussed with Jennifer Roberts + Tom Peargin on conference call.
Note on Jennifer Roberts

FROM: Jennifer Roberts

TO: Tim Law

DATE: 02-19-91
TIME: 08:38

CC: Ron Klein

SUBJECT: Chev Valdez Risk Assessment
PRIORITY:
ATTACHMENTS:

Tim, when will the maps and other information that I requested for the Risk Assessment be here???? If I am on vacation (2/20 to 3/4) will you please send the info to Ros Schoof
PTI Environmental Services
15375 SE 30th Place, Suite 250
Bellevue, Washington 98007

Thanks for the help, Jennifer

FROM: Jennifer Roberts

TO: Valdez D.O. - Steve Provant
VALDEZ D.O. - Tim Law

DATE: 01-17-91
TIME: 14:04

CC: Jennifer Roberts
Ron Klein

SUBJECT: Chevron Valdez Risk Assessment
PRIORITY:
ATTACHMENTS:

We've reached an agreement with Chevron for the risk assessment at the Valdez tank farm. Chevron will be paying for the assessment by a consultant (PTI) and ADEC will be the managers and define the scope, without any input by Chevron. Ron and I are acting as project managers and will make sure that you have input to and review all documents.

I need some help, would you please see if you can find these items and I'll send them to our consultant.

1. Valdez city map
2. Any Valdez demographic info
3. Info on local drinking water sources and City well regulations.
4. Any applicable city laws (ie well regulations)
5. City topographic map
6. Any city soils and geologic maps
7. A contact name for someone with the city who to answer questions and perhaps review the Risk Assessment
8. Any proposed landuse in the area

2.7.91 10:17 Asked Tim Law to follow up on this. Told him needed by next week.

Re-evaluated progress at sites identified in file review + RZA report

Egan Drive

Gate

Tank Truck Load Rack

OLD PIPELINE TO COPPER VALLEY ELECTRIC

Stockpiled Material from Chevron cleanup

TP-O DRPH 915 GRPH 21.5

OLD FILL PIPES

Chevron Cleanup

TP-N O/W Separator

MW-100

TP-M Pumphouse

Warehouse

TP-G

Soil Processing Inc. George Kleum $37-$47/ton depending on fuel source

Plant is valdez using to snow to melt.

Notes:

1. RZA identified high soil cont. levels
2. Wait gone talking about moving tanks to west
3. Chevron + Tesoro have additional soil cleanup + trenty stockpiled soil

Strategy

a. cleanup accessible soil and place tanks

b. remove tanks in eastern area out of service as new tanks installed

c. "immediately" treat removed tanks and soil to finish cleanup.

VALDEZ MAINTENANCE FACILITY PAD PERIMETER

STOCKPILED SOIL from Tesoro Cleanup

MW-12

Clean first

EXCAVATION

1-2 ft Cleanup by Tesoro

TP-E DRPH 1500 GRPH 292

DRAIN TP-Q

21 19 12 15 9 14 20 18 8 13 10 11 16

TP-L

TP-D/D(A) DRPH 3900

S3-1 S3-3 S3-4 S3-5 S3-6 S3-7 S3-2

MW-13

MW-4

TBM

MW-11

MW-21

Tesoro's overtopped tank

TP-A DRPH 4500 GRPH 2960

TP-B

TP-C

DRPH 767 GRPH 17256

EXCAVATION

1-2 ft surface cleanup by Tesoro

TP-F

Dike DRPH 2120 GRPH 135

DRAIN DRPH 710 GRPH 17.6

DRPH 447

TP-H

To Dock

TP-I

DRPH 294 TP-J

DRPH 3460 GRPH 46.3 TP-K

1-2 ft Cleanup by Tesoro

Scale: 1" = approx. 90'

Tks out of SOC.

Buried Pipe

Aboveground Pipe

(8) Storage Tanks

TP-M ⊕ SHALLOW BORING

TP-O SHALLOW BORING/PIEZOMETER

TP-G DEEP BORING/PIEZOMETER

● EXISTING MONITORING WELLS

DRPH DIESEL RANGE PETROLEUM HYDROCARBONS

GRPH GASOLINE RANGE PETROLEUM HYDROCARBONS

Tesoro Cleanup - Aug 93

Chevron Cleanup - Sept-Oct 93

— — — INFERRED BOUNDARY FOR >500-PPM DRPH IN SOIL (10 TO 16.5-FEET BGS)

——— INFERRED BOUNDARY FOR >1,500-PPM DRPH IN SOIL (10 TO 16.5-FEET BGS)

SOURCE: HART CROWSER (1989)

RZA AGRA Alaska, Inc.
ENGINEERING & ENVIRONMENTAL SERVICES

711 H STREET
SUITE 450
ANCHORAGE, ALASKA 99501-3442

W.O.	31-01469
DESIGN	--
DRAWN	--
DATE	12-7-93
SCALE	AS NOTED
F.N.	(CONPLAN)

PETRO STAR, INC.
TESORO BULK FUEL PLANT
VALDEZ, ALASKA

LEVEL II ESA
CONTAMINANT PLAN

FIGURE 5

Alaska Dept. of Environmental Conservation

SOUTHCENTRAL REGIONAL OFFICE
3601 C Street, Suite 1334
Anchorage, AK 99503

Phone #: 563-6529
Fax #: 562-4026

To: Jeff Oster **Fax #** (206) 233-0644

F

N heet 4 **Subject:**

S

C

Jeff Oster
Immunex
(206) 233-0644

TRANSMISSION REPORT

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Chevron

Chevron Environmental Health Center, Inc.
A Subsidiary of Chevron Corporation
15299 San Pablo Avenue, Richmond, California
Mail Address: P.O. Box 4054, Richmond, CA 94804-0054

January 16, 1991

Valdez Bulk Fuel Terminal
Risk Assessment Work Plan

RECEIVED
JAN 18 1991
DEPARTMENT OF
ENVIRONMENTAL CONSERVATION
SCRO

Mr. Ron Klein
Alaska Department of Environmental Conservation
3601 C Street, Suite 1334
Anchorage, Alaska 99503

Dear Mr. Klein:

I have been asked by Mr. Tom Peargin to provide you with Chevron's suggestions regarding the general format of the Valdez Bulk Fuel Terminal risk assessment work plan, especially as it relates to exposure scenarios. It is my understanding that these suggestions will be considered by PTI Environmental Services as they generate the work plan under DEC's direction.

Hazard Identification - The source of the groundwater contamination at this site is hydrocarbons from petroleum fuel, primarily diesel. The chemicals which should be included in the risk assessment are benzene, toluene, ethylbenzene, and xylenes (BTEX). Since benzene, which is a carcinogen, will probably drive the cleanup it can be used as an indicator compound.

Exposure Assessment - The risk assessment should focus on groundwater contamination only since surficial soils will be excavated thereby removing a potential source of exposure. The exposure assessment of the groundwater should be divided into onsite and offsite exposure.

Since domestic water supply wells don't exist onsite, and future use of groundwater beneath the facility will be controlled by the property owner, an assessment of potable uses is not required. However, non-potable uses such as irrigation may be considered. This would allow consideration of dermal and inhalation exposure.

Two downgradient monitor wells (MW-21 and MW-22) were installed offsite in November 1989 and have been sampled quarterly through 1990. Both show a trend of increasing benzene and total BTEX concentrations with time (although maximum benzene levels in the furthest downgradient well are only 2 ppb). These wells indicate that a portion of the dissolved hydrocarbon plume extends beyond the downgradient property boundary. Since there is the potential for contamination of offsite drinking water, an assessment of the potential pathways of exposure should be performed. Fate and transport modeling could be performed to determine what concentrations nearest the contamination source (monitor well MW-4)

would yield acceptable potable water concentrations to a hypothetical receptor at the downgradient property boundary. Such modeling of dissolved constituents can be performed with a high level of confidence due to the seasonally consistent water table gradient beneath the site and the well documented aquifer hydraulic conductivities.

Toxicity Assessment - In order to properly evaluate the potential for adverse health effects, the values obtained from the exposure assessment are compared with appropriate criteria. The appropriate criteria should include potency values and Reference Doses (RfD) from EPA's Integrated Risk Information System (IRIS) or Health Effects Assessment Summary Tables. Offsite exposure scenarios involving ingestion of drinking water should be assessed using EPA's MCLs.

If you would like to discuss the contents of this letter, please feel free to contact me at (415) 231-6088.

Sincerely,

Thomas F. Booze, Ph.D.
Toxicologist

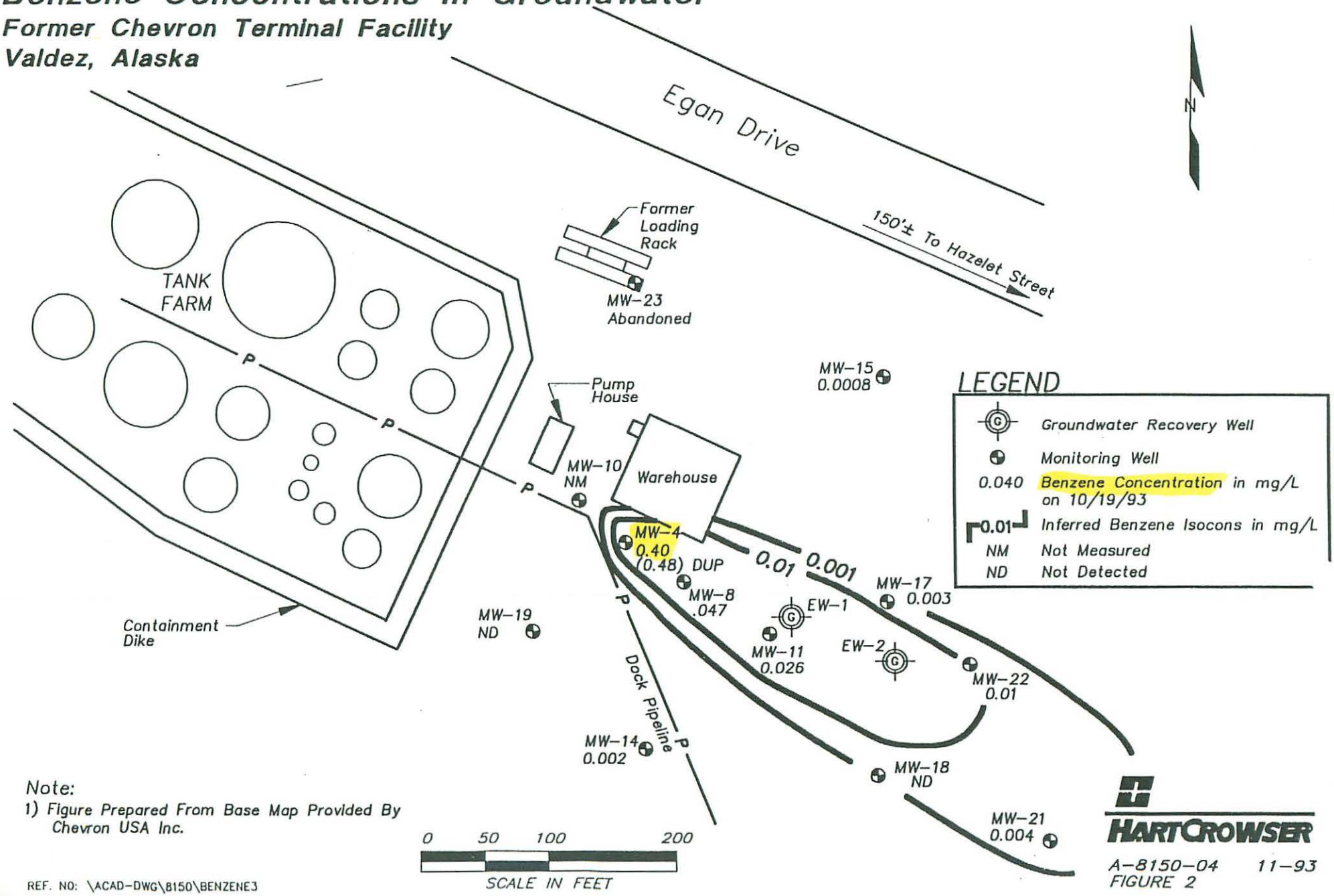
TFB:temp4-co/0191-020

cc: Tom R. Peargin
Chevron Research and Technology Company

Benzene Concentrations In Groundwater

Former Chevron Terminal Facility

Valdez, Alaska



Note:

1) Figure Prepared From Base Map Provided By Chevron USA Inc.

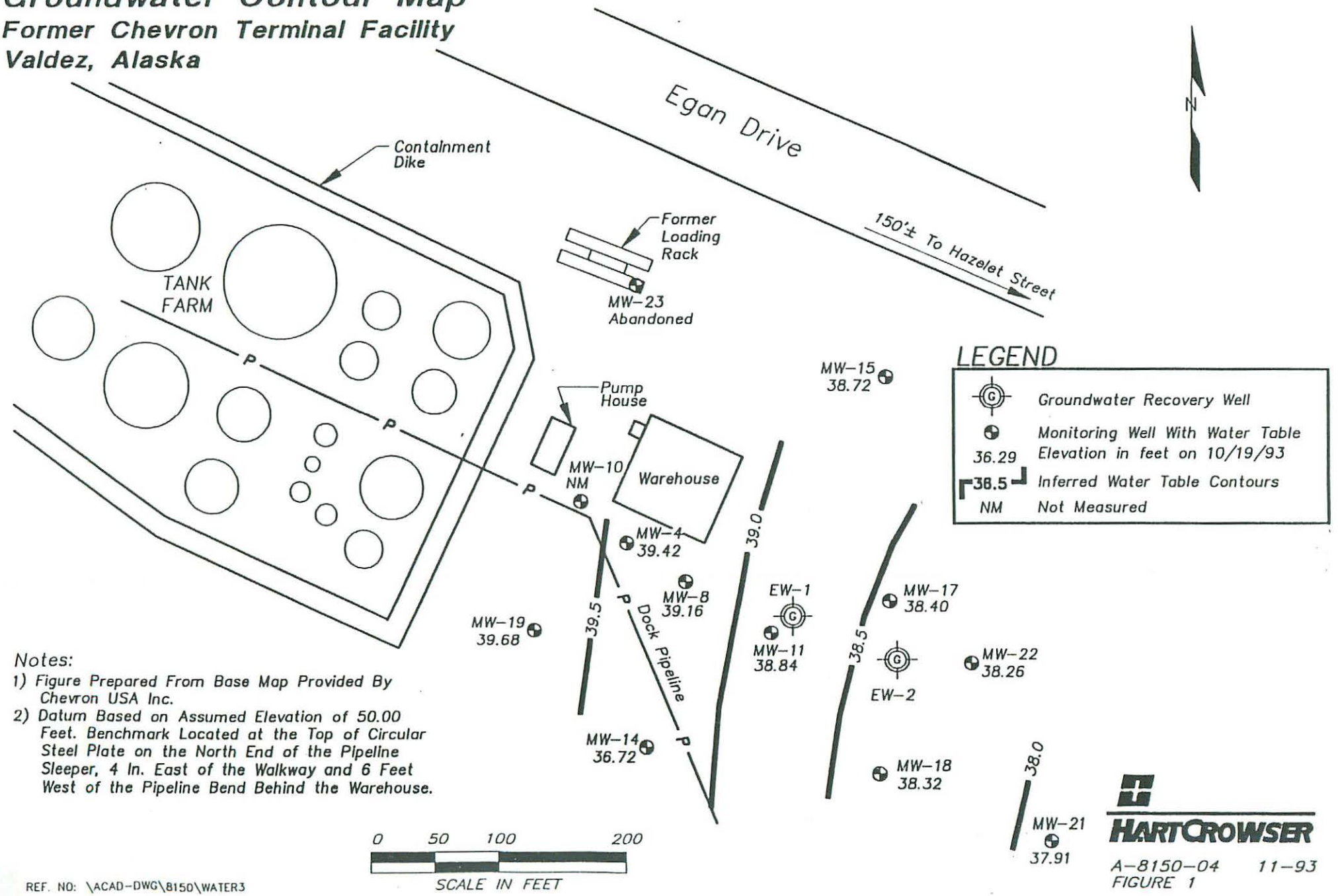
REF. NO: \ACAD-DWG\8150\BENZENE3

HARTCROWSER

A-8150-04 11-93

FIGURE 2

Groundwater Contour Map
Former Chevron Terminal Facility
Valdez, Alaska

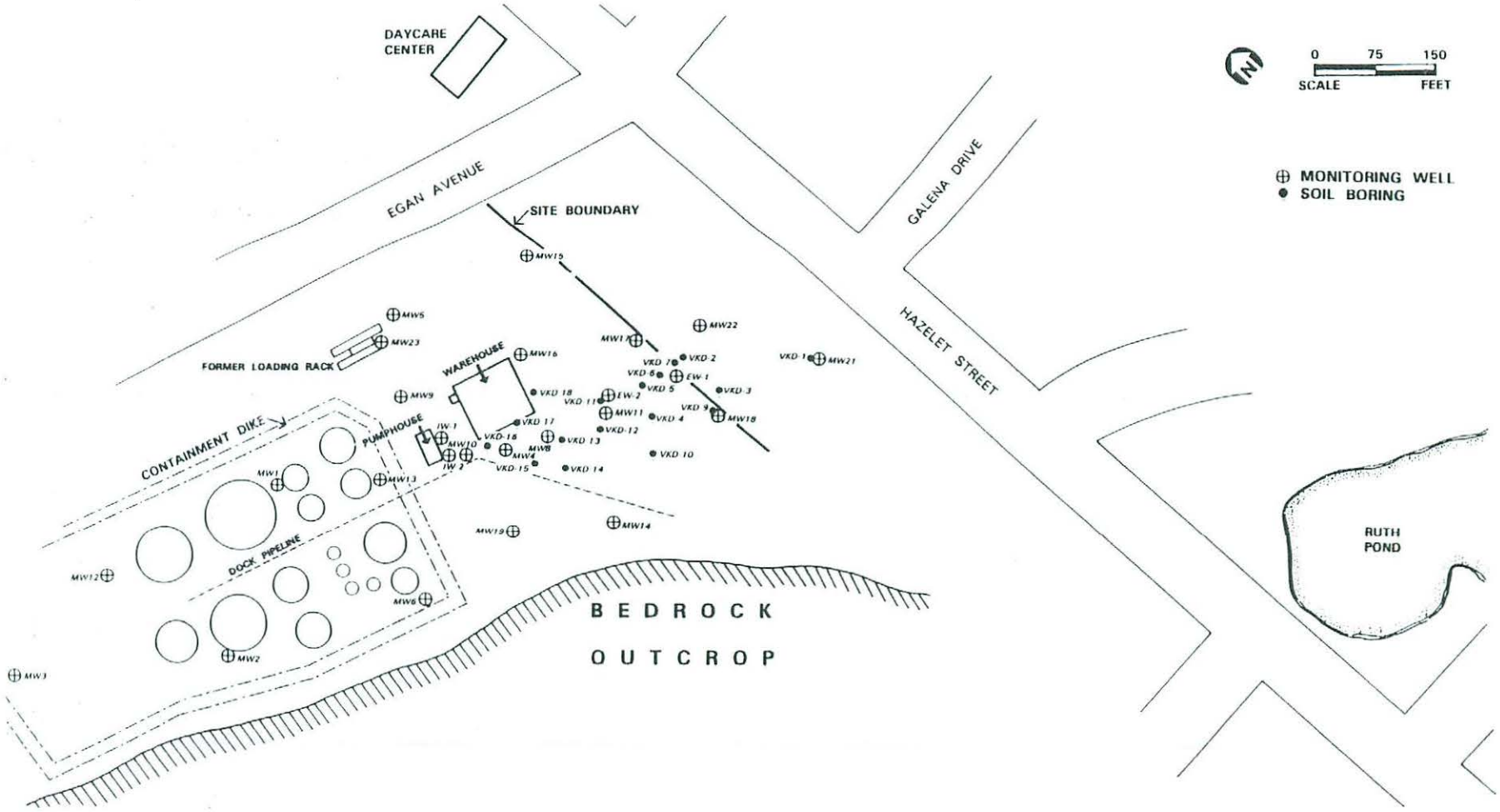


Notes:
1) Figure Prepared From Base Map Provided By Chevron USA Inc.
2) Datum Based on Assumed Elevation of 50.00 Feet. Benchmark Located at the Top of Circular Steel Plate on the North End of the Pipeline Sleeper, 4 In. East of the Walkway and 6 Feet West of the Pipeline Bend Behind the Warehouse.

REF. NO: \ACAD-DWG\8150\WATER3

HARTCROWSER

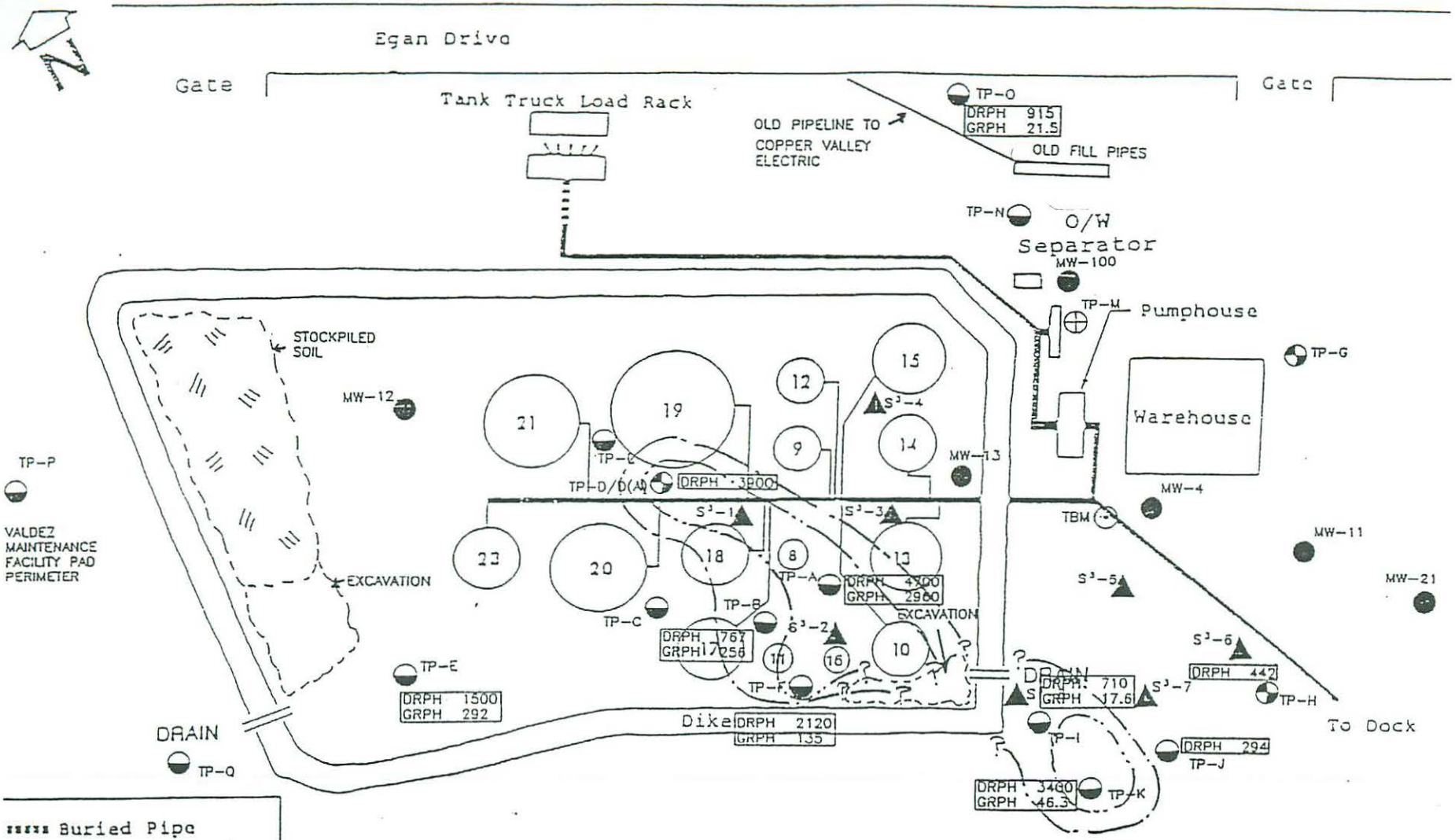
A-8150-04 11-93
FIGURE 1



Source: Hart Crowser (1991)

Figure B-1. Site map showing monitoring well and soil boring locations.

C139-0102-0292



SOURCE: HART CROWSER (1989)

RZA AGRA Alaska, Inc. ENGINEERING & ENVIRONMENTAL SERVICES *711 H STREET* *SUITE 450* *ANCHORAGE, ALASKA 99501-3442*	W.O. 31-01469 DESIGN -- DRAWN -- DATE 12-7-93 SCALE AS NOTED F.N. (CONPLAN)	PETRO STAR, INC. TESORO BULK FUEL PLANT VALDEZ, ALASKA LEVEL II ESA CONTAMINANT PLAN FIGURE 5	

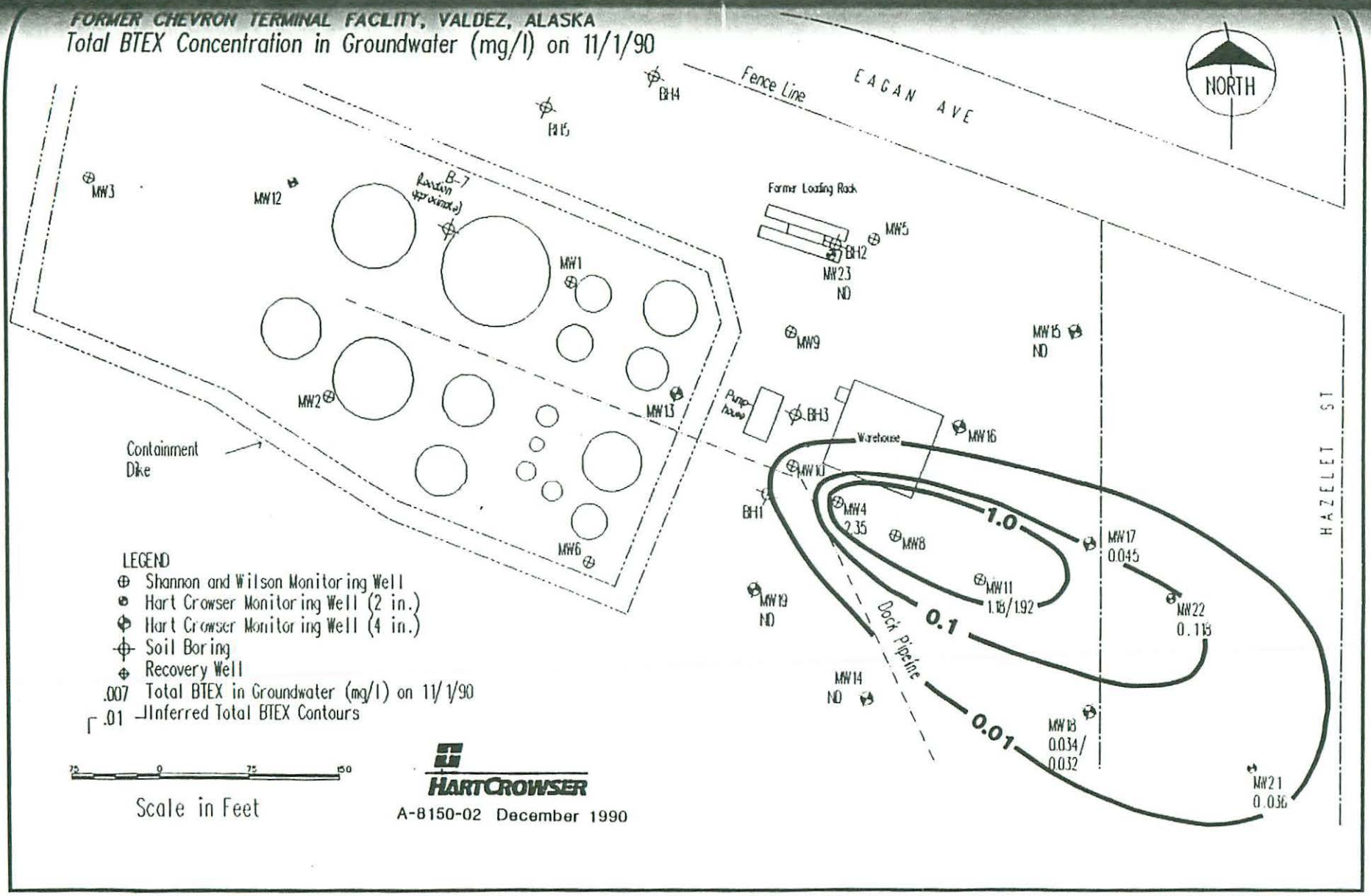


Figure 3. Site map showing total BTEX concentration in groundwater.

Chevron proposes, based on these considerations, that a benzene clean-up level of 0.2 mg/L be adopted for ground water at the property boundary. Even if one were to accept the numbers shown in Table 9 as actual risk levels, the 0.2 mg/L we have proposed falls in the 6.7×10^{-5} range.

Additional Considerations

In spite of the fact that the PTI assessment now indicates that no actual risk exists nor is one expected to occur (since complete pathways do not exist), Chevron will continue to fulfill the terms of the consent agreement previously signed on 1/3/92. These include:

1. The payment of $100,000 - made to the state of Alaska on 12/30/91;

2. Continued quarterly monitoring of ground water at the site;

3. Continued operation of the existing bioremediation system for a minimum of one year;

4. Removal of petroleum contaminated soil and gravel located within five feet of the ground surface at several locations upgradient of the bioremediation system.

Please feel free to contact me at (510) 242-5952 if you have any questions.

Very truly yours,

Pat Hughes

J. P. Hughes

JPH:rso
Valdez.JPH

cc: R. D. Brinkmann - Seattle
K. E. Kringlen - Seattle

PETRO STAR INC.

P.O. Box 56239, North Pole, AK 99705-1239

TELEPHONE: (907) 488-0730 FAX #: (907) 488-9057

FAX TRANSMITTAL

DATE: April 21, 94 NUMBER OF PAGES (Including Cover Page) _____ TIME 7:15 A

TO: Dan Lawn COMPANY _____

FROM: Lars N. Peterson RECIPIENT FAX # 424-4386

COMMENTS: Dan,

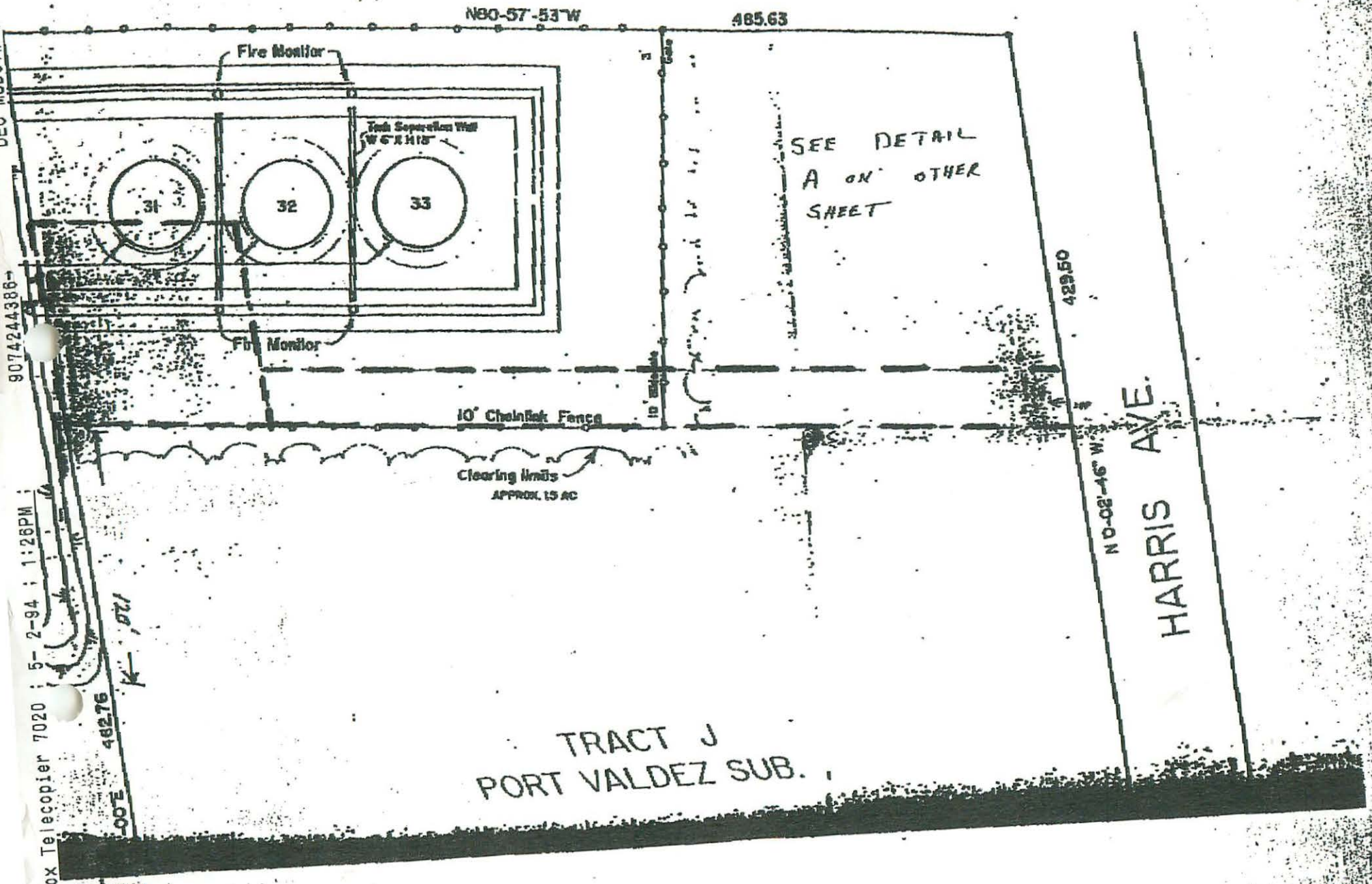
Here is a quick sketch reflecting our plan or approach.

First choice is use existing containment, however given the soil & ground water condition we felt the unknown scope of the cleanup would not allow enough time for design, estimate work & permitting. Given this, we elected to use Tract J, our vacant parcel.

Will mail "D" size Dwg. of this off Tomorrow to your office

If you have any questions, Please Call me @ 488-7590

Lars


N80-57-53"W
485.63
Fire Monitor
Tank Separation Wall
31
32
33
Fire Monitor
SEE DETAIL A ON OTHER SHEET
429.50
10' Chainlink Fence
Clearing limits
APPROX. 1.5 AC
N 0-02-46" W
HARRIS AVE.
TRACT J
PORT VALDEZ SUB.
462.76
9074244386
5- 2-94 ; 1:26PM ;
Telecopier 7020

EGAN

STATE OF ALASKA
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PRINCE WILLIAM SOUND DISTRICT OFFICE____
VALDEZ FIELD OFFICE_X_
P.O. BOX 1709 VALDEZ, ALASKA 99686

PHONE: 907-835-4698
FAX: 907-835-2429

FACSIMILE TRANSMITTAL

TO: Ron Kline 273-4331
Mike K matsu

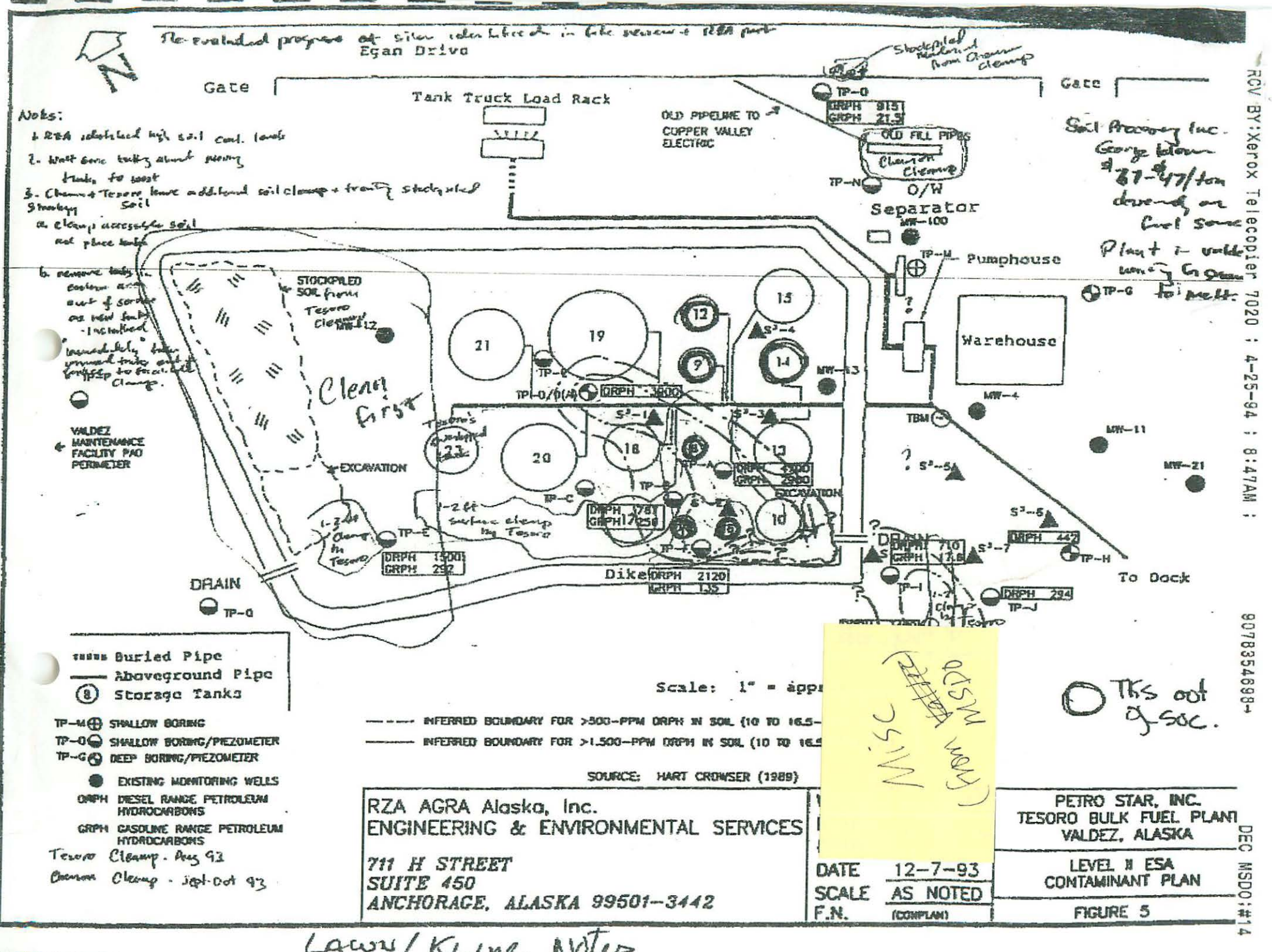
FAX NUMBER:

FROM: Laun

DATE: 5/2/94 TIME: 13:15

NUMBER OF PAGES INCLUDING COVER SHEET 4

COMMENTS: FYI



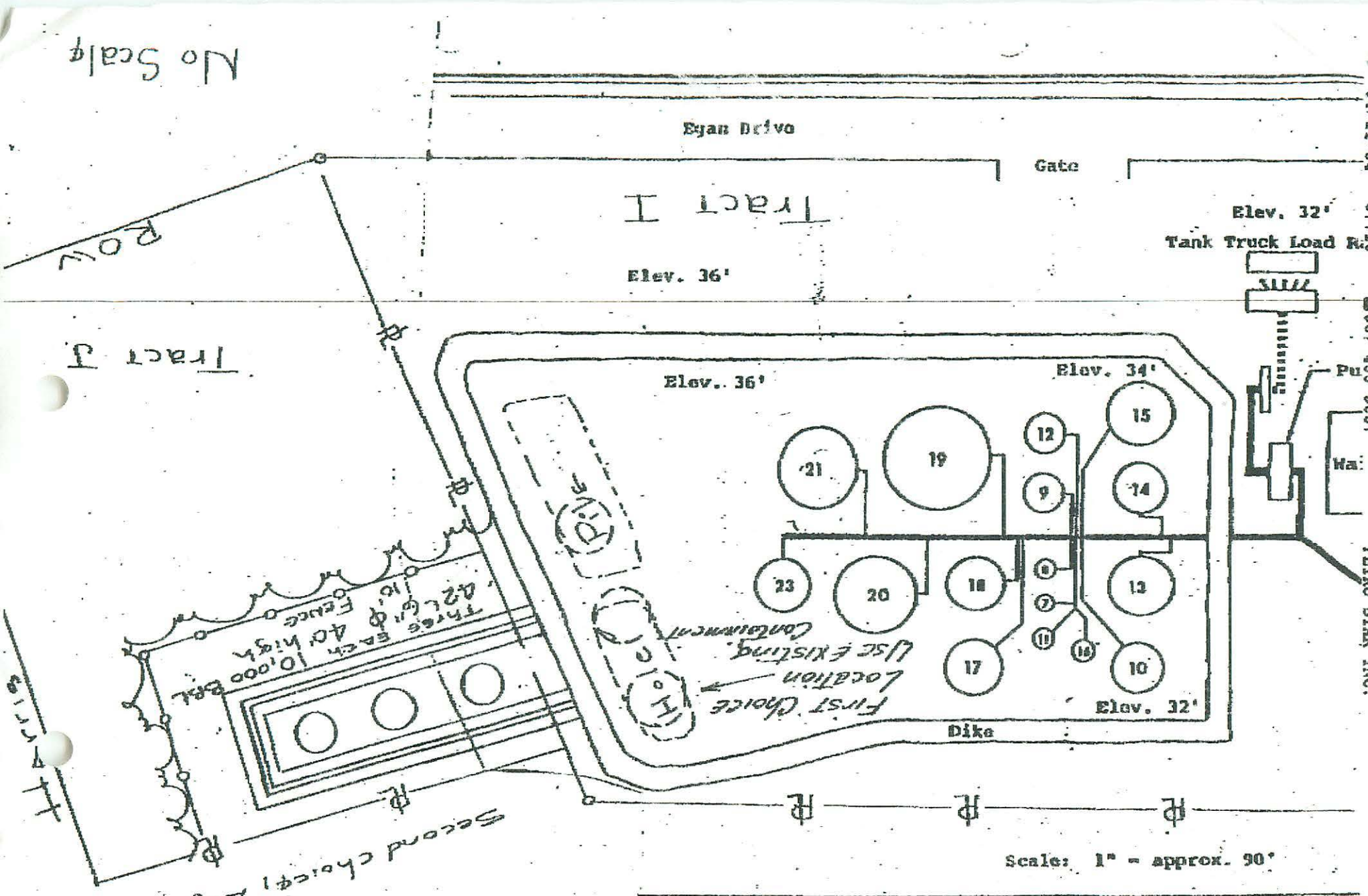


FIGURE 2-2. VALDEZ TERMINAL PLOT PLAN: TANK FARM