DEPARTMENT OF THE ARMY
BALTIMORE DISTRICT U S ARMY CORPS OF ENGINEERS
ENVIRONMENTAL REMEDIATION RESIDENT OFFICE
P O BOX 56
ABERDEEN PROVING GROUND MD 21010 0056

REPLY TO
ATTENTION OF

ORIGINAL
AR Copy

SUBJECT Contract No DACA31 95 D 0083 Task Order No 16 Southern Maryland Wood Treating Site Stream Restoration Plan August 2000

Chris Guy
U S Environmental Protection Agency
Region III
1650 Arch Street
Philadelphia Pennsylvania 19103 2029

Dear Chris

Enclosed is one (1) copy of the Stream Restoration Plan for the Southern Maryland Wood Treatment Site Hollywood Maryland I have also provided Dave Healy of the Maryland Department of the Environment with one (1) copy for his use and Mr Eric Newman of the US Environmental Protection Agency with one (1) copy for his use

If you have any questions regarding the enclosed document please contact me at your convenience at (301) 573 5471

Sincerely,

Edward Hughes P E
Project Engineer

Copies Furnished

Eric Newman USEPA III
David Healy MDE

Stream Excavation and Restoration Plan
for
Southern Maryland Wood Treatment Site
Hollywood, Maryland

Prepared for

U S Army Corps of Engineers – Baltimore District
10 South Howard Street
Baltimore, Maryland 21203

Prepared by

The IT Group
25202 Three Notch Road
Hollywood, Maryland 20636

September 2000

ORIGINAL (Red)

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INTRODUCTION

In the spring of 2000 The IT Group began remediation of the wetland areas of the west tributary of Old Tom s Run below the Southern Maryland Wood Treating (SMWT) site

The Pre-Design Study (Dames and Moore 1992) suggested contaminants were transported from onsite surface soils to stream sediments through surface runoff/erosion Storm events that caused the waste lagoons to overflow into the stream or contaminated groundwater which infiltrated the freshwater pond that fed into the west tributary were other proposed routes for contamination into Old Tom s Run

As required in the Site-Specific Work Plan (EA Engineering Science and Techology 1997) and the ROD (Record of Decision September 1995) The IT Group presents in this document the background excavation activities sampling results and planned restoration activities for the west tributary wetland areas impacted by remedial activities While remedial measures were designed to minimize harm to wetlands some adverse effects were unavoidable Restorative and/or mitigative measures have been developed for review by U S Environmental Protection Agency (USEPA) and Maryland Department of the Environment (MDE)

BACKGROUND

The Southern Maryland Wood Treating Site (SMWT) operated from 1965 until 1978 L A Clarke and Son Inc (L A Clarke) operated a pressure-treatment facility for wood at the site where creosote and pentachlorophenol (PCP) were used as wood preservatives Evidence of contamination was first discovered in the early 1970 s when the St Mary s County Department of Environmental Hygiene conducted a site inspection in conjunction with L A Clarke s request for a new onsite production well Operations ceased in 1978 when L A Clarke filed for bankruptcy

Unlined lagoons were used to dispose of the liquid process waste During some events i e storms contaminated material and liquid overflowed the lagoons and as a result the sediment in the west tributary of Old Tom s Run became contaminated Contaminated groundwater infiltration into the freshwater pond (subsequently excavated and backfilled during remediation of Pit 4) and the erosion of contaminated soil into the stream were also proposed as contaminant transport mechanisms The site was listed on the National Priorities List (NPL) in 1986 In 1990 a sheetpile barrier wall was installed surrounding the Pit 4 lagoon area including the freshwater pond to prevent the spread of contamination

The SMWT site is located within the Atlantic Coastal Plain physiographic province Topographic relief across the site is about 35 feet with elevations

ranging between approximately 116 to 154 feet above mean sea level (MSL) The SMWT site lies on the axes of several sub-basin drainage divides such that runoff from the site discharges to tributaries that straddle the site to the east south and west These tributaries Old Tom s Run then Brooks Run and finally McIntosh Run discharge to the Potomac River Regionally the site is located near the axis of the drainage divide between the Potomac and Patuxent River Basins

A BIOTA INVESTIGATION

In February 1989 USEPA requested that U S Fish and Wildlife Service (USFWS) conduct a biota investigation including wetlands delineation fish and amphibian survey and benthic invertebrate survey (USFWS 1990) The study was conducted to provide preliminary documentation of on-site and off-site impacts to fish and wildlife resources and their habitats and to document baseline conditions to determine the success of future mitigation

Two sites immediately downstream of the SMWT site one each on the western and eastern tributaries were selected as the sites most likely to be impacted by the SMWT operation Six other sites were selected for reference and comparison Data were collected between October 1989 and March 1990 at these eight sites Benthic invertebrates were collected identified and analyzed using USEPA Rapid Bioassessment Methodology

A total of 2 4 acres of wetlands was delineated on SMWT property The freshwater pond was surrounded by palustrine emergent wetland growing on steep eroded banks Vegetation consisted of various annual grasses herbs and wetland species Wetland areas associated with the freshwater pond were calculated by the USFWS to be 0 40 acres of which 0 14 acres was open water and 0 26 acres was palustrine emergent wetland Water exiting the south end of the pond formed the west tributary of Old Tom's Run Of the total wetlands not associated with the pond 0 32 acres occurred as a steep-banked stream channel (0 18 acres of the west tributary and 0 14 acres of the east tributary) 0 91 acres occurred as a braided swampy stream channel of Old Tom s Run in the south portion of the property and 0 77 acres occurred as seeps alongside the channels

RECORD OF DECISION

In recognition of the wetlands issue the USEPA issued the following policy statement contained in the ROD

> The RI/FS for the SMWT site has determined that site wetlands contain site-related environmental contaminants at levels which constitute an unacceptable risk to public health and the environment Excavation and/or treatment of the sediments of concern will be required to eliminate this unacceptable risk The selected remedy will require excavation of these sediments

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> The excavation and fill activities of concern shall be conducted in a manner consistent with provisions of Appendix A of 40 CFR Part 6 The subject regulations have been entitled Statement of Procedures on Floodplain Management and Wetland Protection These procedures constitute policy and guidance for carrying out provision of Executive order 11990 This order addressed Protection of Wetlands

The ROD as executed on September 1995 Section 7 0 (4) pg 24 states

> to protect surface water quality and to restore sediments in the pond and tributaries to acceptable levels for the protection of aquatic life *Sediment cleanup levels have been set at 3 2 ppm low molecular weight* PAHs 9 6 ppm high molecular weight PAHs and 0 4 ppm PCP

DAMES AND MOORE PRE-DESIGN STUDY

Stream sediment samples collected in 1988 from the west tributary were contaminated with total PAHs at concentrations in the tens of parts per million up to 1 900 feet downstream of the freshwater pond Data from the samples collected between 1 900 and 4 450 feet from the freshwater pond found PAHs ranging from 3 to 30 mg/kg by UV field screening At distances between 4 450 and 7 125 feet sediment contamination ranged from nondetectable to 41 ug/kg of PAHs using contract laboratory program methods Five additional samples were collected over an interval stretching several thousand additional feet down the stream channel These samples were analyzed by the UV field screen which found PAH concentrations ranging from nondetectable to 22 000 ug/kg However the presence of paved roads over the stream and the influx of many smaller streams to the main tributary over this distance added much uncertainty about the source of the contamination

D&M Sampling of the Western Tributary

Additional sediment sampling from the western tributary was conducted in two phases (1) the initial phase conducted during March and April of 1991 and (2) the follow-on phase performed during February and March of 1992 to fill data gaps that remained after the initial investigation

Two sediment samples were obtained from the western tributary during the initial sampling phase Sample point SE-04 is located just downstream of the pond and SE-05 is located near the confluence of the western tributary and eastern tributary of Old Tom s Run These two locations represented the high and low range of detectable PAHs reported in 1988 They also represent two different stream depositional environments (i e moderate to high gradient alluvial stream channel at SE-04 and low gradient wetland environment at SE-05) The sample collected at SE-04 contained a total PAH concentration of 22 860 ug/kg No PAHs were detected in the sample collected at SE-05

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Seventeen additional sediment samples (SE-12 through SE-28) were collected from the western tributary during the second phase of sampling The second sampling phase was conducted to more accurately determine the extent of contamination along the stream (Pre-Design Study Dames and Moore 1992)

SITE-SPECIFIC WORK PLAN

The Site-Specific Work Plan developed for ICF Kaiser (The IT Group) by EA Engineering in July 1997 estimated that the material to be removed from the western tributary would be up to 2 000 cubic yards

The IT Group took the following considerations into account when using the Work Plan and D&M Pre-Design Report to develop a remediation plan for the west tributary of Old Tom s Run

- Patterns of bedload sediment transported in the stream may have modified the current conditions enough that conclusions regarding area and contaminant levels from the 1992 study may not be reliable for proposed remediation work
- The location of the stream may have shifted due to deposition particularly in the lower braided portion of the stream Stream location may also have been altered by the presence of an old beaver dam not referred to in earlier documents

EXCAVATION AND SAMPLING

The initial SMWT west tributary remediation began in 1999 by verifying the hot spots identified in 1992 Verification samples were obtained during July and September 1999 from the 15 previously sampled locations plus depositional and discolored areas Phase I excavations proceeded in February and March 2000 based upon the verification sample results The original excavation was limited to the surficial 6-inches of sediment Post excavation samples were then collected to determine if the contamination was removed The post excavation samples revealed that the contamination was deeper than initially thought Subsequent Phase II excavations to a depth of 18 to 24-inches has removed the remaining sediments above cleanup criteria

Phase I Sampling

The IT Group began sampling activities in the west tributary on July 28 1999 Previous sampling locations were resampled and analyzed by the on-site laboratory using Method SW846 8270C The analytical results are presented in Attachment 2 as Table 1, and maps detailing the sample locations are included in Attachment 1 The sample locations above criteria are presented in the insert below

Sample ID	Date	PCP ug/Kg	Sum Low mw PAH ug/Kg	Sum High mw PAH ug/Kg
SE24	7/1/99	200	7900	130000

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None of the locations previously identified as contaminated were found to be above the cleanup criteria One location SE24 was found to be above the cleanup criteria though that location was non-detect for all contaminants of concern when sampled in 1992

Twenty new sampling locations along the streambed were selected based on areas of deposition and discoloration between SE04 and SE05 Seven of these new locations were above cleanup criteria Sample SE46 was the furthest downstream sample above cleanup criteria and samples SE47 and SE48 collected approximately 300 feet further downstream were below cleanup criteria The sample locations above criteria were

Sample ID	Date	PCP ug/Kg	Sum Low mw PAH ug/Kg	Sum High mw PAH ug/Kg
SE34	7/1/99	200	2500	28000
SE35	7/1/99	200	51000	580000
SE37	7/1/99	160	1700	16000
SE38	7/1/99	200	4600	2000
SE40	7/1/99	200	2400	15000
SE45	7/1/99	200	220000	1600000
SE46	7/1/99	200	1500	9900

Phase II Sampling

In order to define the horizontal extent of contamination in the upper and lower reaches of the west tributary thirty-six new locations were sampled during December 1999 and January 2000 These samples were collected from the surficial six-inches in the streambed and surrounding wetland areas Eleven locations contaminated above criteria were located in the upper reach or lower reach of the west tributary There were no locations in the middle reach above cleanup criteria The eastern tributary and the drainage gullies between the eastern tributary and Pit 1 Pit 2 and Pit 3 areas of the site were also sampled There were no locations in the drainage gullies or eastern tributary above cleanup criteria

In January 2000 Flora Surveying Associates began a pre-excavation survey of the stream including relative elevation transects in eight locations On January 19 2000 the concrete monument marking the corner of the McKay property was identified and a transect of samples collected every 20 feet between wetland

boundaries along the property line One of these samples PL-05 was above cleanup criteria

On February 7 2000 the painted stone marking the property line of the Learning Center property was located and a transect of samples collected every 10 feet between the property corner and the wetland boundary Two of these samples PL-11 and PL-14 were above cleanup criteria Samples above criteria were

Sample ID	Date	PCP ug/Kg	Sum Low mw PAH ug/Kg	Sum High mw PAH ug/Kg
SE56	12/22/99	390	2800	14000
SE60	12/22/99	1800	13000	84000
SE62	1/7/00	520	3600	21000
SE64	1/7/00	210	1900	11000
SE66	1/7/00	1400	130000	780000
SE67	1/7/00	1400	16000	120000
SE68	1/7/00	1000	270000	430000
SE70	1/7/00	3300	19000	120000
SE74	1/13/00	700	3200	14000
SE75	1/13/00	620	2600	14000
SE80	1/14/00	1900	15000	66000
PL-05	1/19/00	810	4400	18000
PL-11	2/7/00	640	2800	15000
PL-14	2/7/00	860	2400	11000

Phase I Excavation

The initial work plan for excavation activities in the upper and lower reach of the west tributary was finalized on February 17 2000 This plan outlined excavation and sampling activities for the identified contaminated locations in the upper and lower reaches of the west tributary By this date the freshwater pond referred to in earlier Pre-Design Study or Work Plan documents had been excavated along with other contaminated soils inside the sheetpile wall Primary features of the scope of work to be performed included

- Excavation of surface sediments to a depth of 6 inches between the annual high water level marks on the stream banks
- Use of a tracked mini-excavator (e g bobcat with small backhoe attachment)
- Excavated soils loaded into a low impact machine (e g John Deere Gator)
- Verification sampling consisting of one composite from the bottom of the excavation and one sediment grab sample from 2 feet upstream of the excavation and one sediment grab sample from 2 feet downstream of the excavation

- A map showing the new limits of disturbance proposed for excavation
- A table showing the analytical results of sampling conducted to date

Verification sampling conducted March 1 through March 14 2000 showed that contaminant levels were higher in the excavated areas than before excavation began These verification samples were collected at the bottom of the excavations and represented a six to 12-inch depth interval compared to the zero to 6-inch interval used before excavation commenced Verification results above criteria are summarized below

Sample ID	Date	PCP ug/Kg	Sum Low mw PAH ug/Kg	Sum High mw PAH ug/Kg
SE38B	3/1/00	83 5	2400000	850000
SE71B	3/1/00	83 5	3500	2700
SE95	3/1/00	83 5	81000	41000
SE96	3/1/00	280	560000	210000
SE97	3/1/00	620	18000	20000
SE40B(Q)	3/1/00	83 5	5300	5000
SE71B(Q)	3/1/00	83 5	9900	8100
SE97(Q)	3/1/00	200	40000	30000
SE38C	3/7/00	83 5	280000	140000
SE95B	3/7/00	110	440000	140000
SE96B	3/7/00	83 5	39000	16000
SE40C	3/8/00	83 5	5300	1200
SE99	3/8/00	83 5	16000	12000
SE100	3/8/00	83 5	3400	1300
SE24A-U	3/10/00	310	3900	33000
SE80A	3/10/00	540	13000	130000
SE80A-1	3/10/00	560	6000	51000
SE34B-U	3/13/00	460	4300	38000
SE68B-U	3/13/00	1100	7700	99000
SE80B-N	3/13/00	3500	16000	130000
SE80B-S	3/13/00	620	6100	68000
SE80B-E	3/13/00	2100	9300	38000
SE80B-W	3/13/00	1400	5700	26000
SE60A	3/14/00	450	4900	29000
SE66A	3/14/00	1100	160000	510000
SE67A	3/14/00	1500	14000	100000
SE102	3/17/00	83 5	4800	1700
SE104	3/17/00	83 5	3700	2600

The sample numbering scheme was expanded to accommodate resampled locations after excavation the location of verification samples collected and the offsite laboratory In addition to the SE(sediment)##(location number) a letter was appended (SE## sequential alphabetic character) to denote resampling of a

location after excavation Sample verifications collected from outside the excavation were identified by appending a –alphabetic character to denote if the verification was collected upstream -U downstream -D or in a compass direction from the excavation west for example -W If the sample was analyzed offsite the sample ID has the laboratory identified parenthetically (Q) for Quanterra Laboratory and later (STL) for Severn Trent Laboratories In the table above sample SE80A is an excavation bottom composite sampled for the first time after excavation Similarly sample SE80B-N describes a sample collected after two excavations two feet outside the excavation boundary to the north

Phase II Excavation

On May 10, 2000 The IT Group met with U S Army Corps of Engineers (USACE) to discuss changes and updates to the excavation plan Primary changes to the original excavation plan included

- Excavation of contaminated sediments an additional twelve inches
- Use of a Caterpillar 312 excavator and a Caterpillar 250 dump truck for removal of contaminated sediments
- Construction of a road to permit access for the dump truck

For the remainder of May and June excavation and sampling activities continued with additional samples collected in areas at a depth of up to three feet to confirm that contamination did not extend below 18 inches below surface

The upper reach area was excavated and verified clean and the continuous section of the lower reach SE68 through SE46 began to verify clean The excavation at SE 75 through SE74 was completed The excavation at SE80 continued to test above criteria on the excavation walls Upper reach verification samples are summarized below

Sample ID	Date	PCP ug/Kg	Sum Low mw PAH ug/Kg	Sum High mw PAH ug/Kg
SE49	9/24/99	200	1400	2000
SE103	3/17/00	55	1100	1100
SE71D	3/17/00	83 5	1500	800
SE109	5/2/00	83 5	2900	1400
SE38D	5/2/00	83 5	1700	1000
SE102B	5/2/00	83 5	800	800
SE111	5/3/00	260	1400	5800
SE112	5/3/00	110	800	1300

Sample ID	Date	PCP ug/Kg	Sum Low mw PAH ug/Kg	Sum High mw PAH ug/Kg
SE111(STL)	5/3/00	83 5	500	4000
SE113(STL)	5/3/00	83 5	800	1800
SE116	7/10/00	83 5	600	800

Visible stains located approximately 12 inches below ground surface level were observed on the excavation walls in SE80 and areas SE68 through SE46 This layer of stained material extended to the wetland boundary along the east side of the continuous section of the lower reach at a level corresponding to sediments defined as E Horizon deposits This subsurface deposit is a mineral horizon lighter in color than material above and below it Fine clays and organic substances have been washed out of it by percolating waters Large areas of the continuous section were verified as below cleanup criteria when the excavation of the east wall was extended to include areas up to the wetland boundary

Phase III Sampling

Beginning on June 16 through July 7 2000 fourteen new transects were sampled and analyzed Transect locations were through the original Dames and Moore locations plus two locations further downstream SE 54 and SE 115 Transects consisted of three locations between the wetland boundary at three depths zero to six inches six to twelve inches and twelve to eighteen inches Final analysis including off-site laboratory verification of on-site results above cleanup criteria identified three additional samples above cleanup criteria SE27 1-6 SE24-2-12 and SE54-1-6 SE 27-1 was near one of the locations sampled by Dames and Moore above cleanup criteria SE54-1 was near a location previously identified for excavation downstream of SE81 SE24-2 was adjacent to an identified location above criteria SE24

Five additional transect samples above criteria by onsite analyses SE54-2-6 SE27-2-6 SE23-1-6 SE23-2-12 and SE23-2-18 were not above criteria when analyzed by the off-site laboratory Severn Trent Laboratory (STL) The on-site laboratory uses higher detection limits than the off-site laboratory This biases the onsite results high since one-half of the detection limit is used for non-detects in the summation of low and high molecular weight PAHs Samples results above criteria are listed below

Sample ID	Date	PCP ug/Kg	Sum Low mw PAH ug/Kg	Sum High mw PAH ug/Kg
SE54-1-6	6/22/00	980	2900	13000
SE54A-1-6 (STL)	6/29/00	83	3800	9600

Sample ID	Date	PCP ug/Kg	Sum Low mw PAH ug/Kg	Sum High mw PAH ug/Kg
SE27-1-6	6/22/00	2100	8800	130000
SE24-2-12	6/23/00	450	2700	13000
SE54-2-6	6/22/00	1200	3700	18000
SE54A-2-6 (STL)	6/29/00	170	1100	2900
SE27-2-6	6/22/00	440	2000	6900
SE27-2-6 (STL)	7/11/00	8	200	1200
SE23-1-6	6/23/00	710	2800	15000
SE23-1-6 (STL)	7/11/00	46	1200	4900
SE23-2-12	6/23/00	320	2000	12000
SE23-2-12 (STL)	7/11/00	7	1700	5500
SE23-2-18	6/23/00	280	2600	16000
SE23-2-18 (STL)	7/11/00	6 5	200	600

Selection of the transect locations was based on rational techniques selecting one sample near the original Dames and Moore locations and two other locations in depressions or discolored areas between the wetland boundaries The results of the transect sampling showed that the downstream extent of contamination was upstream of the confluence of the east and west tributaries (SE05) near the McKay property line The results also show that the middle reach of the west tributary is not contaminated and the upper reach of the west tributary has been remediated below cleanup criteria

Phase III Excavation

Phase III excavations removed the remaining contaminated sediments The downstream areas were reached by placing swamp mats between the end of the stone and geotextile access road and the locations to be excavated The excavator carried the excavated sediments between the identified locations and the dump truck

Sample results that verified the excavated locations as clean are summarized below Detailed results are included in Table 1 of Attachment 2 and the sample locations are detailed in the map labeled Lower Reach West Tributary Section B August 25 2000 located in Attachment 1

By location

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- The excavation of SE24 including SE24-2 totaled approximately 60 cubic yards of removed contaminated sediment This excavation varied in depth from 3 feet to 1 5 feet Width varied between 8 feet and 17 feet and was approximately 40 feet long This excavation was confirmed clean by the following samples

Sample ID	Date	PCP ug/Kg	Sum Low mw PAH ug/Kg	Sum High mw PAH ug/Kg
SE24A	3/10/00	84	800	3500
SE24A-D	3/10/00	140	1000	5300
SE24A(STL)	3/14/00	36	800	5500
SE24C-U	6/5/00	140	1800	6900
SE24-1-6'	6/23/00	350	1700	6300
SE24-1-12'	6/23/00	390	2100	8100
SE24-1-18"	6/23/00	83 5	600	800
SE24B-2	7/7/00	83 5	600	700
SE24B-2-W (STL)	7/11/00	19	400	2600
SE24F-U	7/21/00	83 5	700	1200
SE24F-U(STL)	7/21/00	6 5	900	1600
SE24F-E(STL)	7/25/00	16	1100	5800
SE24F-W(STL)	7/25/00	7 5	2000	7500
SE24G-E	8/1/00	270	1300	4500

- The excavation of SE80 totaled 22 cubic yards of removed sediment in an area 2 feet deep 12 feet wide and 25 feet long This excavation was confirmed clean by the following samples

Sample ID	Date	PCP ug/Kg	Sum Low mw PAH ug/Kg	Sum High mw PAH ug/Kg
SE80-2 5'	5/8/00	83 5	600	800
SE80C-S	5/26/00	210	900	2700
SE80F-S-12	6/2/00	130	900	3300
SE80F-S-14	6/2/00	150	1100	5000
SE80F-S-16"	6/2/00	83 5	600	800
SE80G(STL)	7/28/00	6 5	270	510
SE80G-E	8/1/00	180	2300	8700

- The straight stretch of the lower stream from SE68 to SE46 represents approximately 225 cubic yards of removed sediment The excavation varied in depth from 1 5 feet to 5 feet from 17 feet to 26 feet wide and was approximately 140 feet long Operator error caused this excavation to be deeper than intended This excavation was confirmed clean by the following samples

Sample ID	Date	PCP ug/Kg	Sum Low mw PAH ug/Kg	Sum High mw PAH ug/Kg
SE68-3	5/8/00	83 5	500	800
SE68D	7/6/00	83 5	1200	6200
SE68D-U	7/13/00	83 5	1000	3200
SE35A	3/14/00	180	1800	7800
SE35B	6/14/00	83 5	1000	2200
SE67B-E	7/6/00	83 5	600	700
SE67F (STL)	8/21/00	6 5	200	700
SE60C	7/13/00	83 5	800	1100
SE66A	6/12/00	83 5	1300	4800
SE114B-S	8/1/00	43	600	800
SE114B-N	8/1/00	83 5	500	700
SE114B(STL)	7/28/00	6	110	640
SE45A	3/14/00	120	1900	7700
SE45-0 5'	5/9/00	86	800	2900
SE45-1'	5/9/00	83 5	600	900
SE45-1 5'	5/9/00	83 5	800	900
SE45A	6/12/00	83 5	600	900
SE45A-E	6/12/00	78	900	2800
SE45C-W(STL)	7/28/00	6 5	370	1000
SE65	1/7/00	120	1000	3800
SE59	12/22/99	290	1800	7800
SE59A-E	6/12/00	83 5	600	900
SE59A-E (STL)	6/12/00	7	400	1500
SE59B	7/6/00	60	800	900
SE58	12/22/99	320	1900	8100
SE58B	6/14/00	120	1200	8500
SE64A	3/14/00	110	1000	3800
SE64B	6/14/00	83 5	600	800
SE57B	6/14/00	83 5	600	800
SE57B-E	6/14/00	68	700	1900
SE63	1/7/00	90	800	2100
SE63C	7/6/00	83 5	500	1300
SE63C(STL)	7/6/00	6 5	200	200
SE56C	7/6/00	65	1000	6500
SE55	12/22/99	83 5	1300	4900
SE55A	5/26/00	83 5	600	1100
SE55B	6/14/00	83 5	600	1300
SE55C	7/6/00	83	1000	7400
SE55C-E	7/6/00	65	700	1300
SE62A	5/26/00	77	800	1600
SE62B	6/14/00	70	800	3200

Sample ID	Date	PCP ug/Kg	Sum Low mw PAH ug/Kg	Sum High mw PAH ug/Kg
SE46A	5/26/00	94	800	2000
SE46A-D	5/26/00	83 5	700	1400
SE46B	6/14/00	83 5	600	1600

- The excavation of SE 75 SE70 and SE74 totaled 33 cubic yards in an area 1 foot deep 20 feet wide and 45 feet long and confirmed clean by the following samples

Sample ID	Date	PCP ug/Kg	Sum Low mw PAH ug/Kg	Sum High mw PAH ug/Kg
SE75A	6/14/00	83 5	600	800
SE70A	6/14/00	64	600	1200
SE74A	6/14/00	210	1300	3900

- The excavation of PL14 occupied an area 2 feet deep by 5 feet square representing less than 2 cubic yards of removed sediments and confirmed clean by the following samples

Sample ID	Date	PCP ug/Kg	Sum Low mw PAH ug/Kg	Sum High mw PAH ug/Kg
PL14B	7/6/00	96	800	1800
PL14-D	7/13/00	83 5	600	1200
PL14-U	7/13/00	83 5	700	2200

- The excavation of PL11 was 2 feet deep by 8 feet wide and 8 feet long representing 4 5 cubic yards of removed sediments and confirmed clean by the following samples

Sample ID	Date	PCP ug/Kg	Sum Low mw PAH ug/Kg	Sum High mw PAH ug/Kg
PL11A-W	7/31/00	250	1100	3100
PL11A	7/31/00	83 5	600	800
PL11A(STL)	7/31/00	8 5	120	490
PL11B-N(STL)	8/1/00	7	500	1100
PL11B-S(STL)	8/1/00	27	500	1900

ORIGINAL (Red)

° The excavation of SE81 was 1 5 feet deep by 8 feet wide by 16 feet long representing 7 cubic yards of removed sediments and confirmed clean by the following samples

Sample ID	Date	PCP ug/Kg	Sum Low mw PAH ug/Kg	Sum High mw PAH ug/Kg
SE81B-E	7/25/00	210	1300	3400
SE81B-N	7/25/00	47	600	1200
SE81B	7/25/00	83 5	600	800
SE81B-W	7/25/00	83 5	600	800
SE81B-S	7/25/00	62	700	1100
SE81B(STL)	7/25/00	8	110	400

° The excavation of SE37and SE72 was 1 5 feet deep by 15 feet wide by 20 feet long representing 16 cubic yards of removed sediments and confirmed clean by the following samples

Sample ID	Date	PCP ug/Kg	Sum Low mw PAH ug/Kg	Sum High mw PAH ug/Kg
SE37/72-B (STL)	7/28/00	10 5	1500	7900
SE37/72B	7/31/00	270	1500	5100
SE37/72B-E	7/31/00	130	800	2100
SE37C-N(STL)	8/2/00	21	600	3000
SE37/72C-W (STL)	8/2/00	26	600	2400
SE37C-S(STL)	8/2/00	7 5	500	1200

° The excavation of SE54-1 was 2 feet deep by 8 feet wide by 8 feet long representing 9 cubic yards of removed sediments and confirmed clean by the following samples

Sample ID	Date	PCP ug/Kg	Sum Low mw PAH ug/Kg	Sum High mw PAH ug/Kg
SE54-1-12'	6/22/00	83 5	600	800
SE54-1-18"	6/22/00	83 5	600	800
SE54A-1-12"	6/29/00	170	900	2200
SE54A-1-18"	6/29/00	83 5	600	800
SE54B-1	7/25/00	83 5	600	800
SE54-1-E	7/25/00	160	900	1800
SE54B-1-S (STL)	7/28/00	42	1000	3900

° The excavation of PL05 was 1 5 feet deep by 8 feet wide and 8 feet long representing 3 cubic yards of removed sediments and confirmed clean by the following samples

Sample ID	Date	PCP ug/Kg	Sum Low mw PAH ug/Kg	Sum High mw PAH ug/Kg
PL05B-S	7/25/00	130	800	1700
PL05B	7/25/00	70	700	1300
PL05B(STL)	7/25/00	7 5	100	600
PL05C-N(STL)	7/28/00	8	610	3200

° The excavation of SE27-1 was 1 5 feet deep by 8 feet wide by 8 feet long representing 3 cubic yards of removed sediments and confirmed clean by the following samples

Sample ID	Date	PCP ug/Kg	Sum Low mw PAH ug/Kg	Sum High mw PAH ug/Kg
SE27-1-12	6/22/00	100	900	3700
SE27-1-18"	6/22/00	83 5	600	800
SE27B-1-N (STL)	8/3/00	18	700	3000
SE27B-1-S (STL)	8/3/00	30	1900	4800
SE27B-1-E (STL)	8/3/00	6 5	86	120
SE27B-1(STL)	8/3/00	26	1100	4800

WETLANDS RESTORATION SCOPE OF WORK

The west tributary is a small stream along the southwestern site boundary For discussion purposes the stream has been divided into segments swale upper reach middle reach lower reach The west tributary begins as a small channel or swale originating from surface water runoff from the site and the adjacent agricultural field north and west A continuously running spring located in the adjacent field also contributes to the stream headwaters The upper reach receives water from the swale and Pit 4 area and begins to form a stream with distinct firm silty clay banks The upper reach is located on the fringe of a forested area The middle reach located on a forested hillside is a fast moving rocky bottom channel that has a distinct firm silty clay bank and bed The channel of the middle reach is approximately 3 to 5 feet wide The vegetation surrounding the channel is that of a mature forest The lower reach located at the base of the hill has a slow-moving less defined channel This section of stream has a sandy bed and bank and becomes braided as it enters a forested

wetland An abandoned beaver dam is located between the middle and lower reach Photos of the stream and surrounding environment are included in Attachment 3

Swale Area

The swale area along the westside of Pit 4 was formed when the sheetpile wall was installed The swale area has been rerouted approximately 4 feet west of its channel so that the sheetpile could be cut off below grade The swale captures and channelizes the runoff and spring water from the adjacent agricultural area to the north and west To reduce the impact of flowing water in the new channel approximately 100 feet of the swale the upgradient end is stone lined Stone check dams have been installed every 75 feet to lessen the impact of flowing water on the remaining portion of the swale The non-stone portion of the channel will receive 6-inches of clean topsoil and be seeded The area will then be stabilized with a biodegradable jute mat to hold the soil and seed in place

Upper Reach

The contaminated portion of the upper reach of the west tributary was excavated and verified clean This area contains a detention basin (see Attachment 4 Detention Basin Detail) to absorb energy and assist with the settling of suspended solids The basin was installed immediately downstream of the sheetpile wall Approximately 20 linear feet of the sheet pile wall was removed to the blue clay approximately 114 feet above mean sea level to ensure that the Pit 4 area is properly drained

Middle Reach

The middle reach of the west tributary is a fast moving channel that has a distinct bank and is approximately 3 to 5 feet wide The middle reach has been determined to be clean Verification samples were collected along four transects identified on the attached figure labeled Middle Reach West Tributary July 17 2000 Transect samples were obtained to confirmed that contamination has not migrated along the banks of the middle reach section of the stream The location of the lateral transect sample was based on the likelihood of being contaminated i e low lying areas Each transect consisted of three discrete sample locations and three samples were obtained at depth from each location (0-6 6-12 and 12-18 inches) All samples were determined to be below the site cleanup criteria No additional sampling excavation grading or restoration will occur in the middle reach section

Lower Reach

The lower reach of the West Tributary is slow moving and the channel is less defined The stream becomes braided and enters a forested wetland Isolated

hot spots and continuous areas of contamination have been found in depressed areas The random distribution of hot spots may be due in part to the braided hummocky nature of the lower reach

To further determine the extent of contamination nine additional transects were sampled in the same fashion as the middle reach Transect results from July 3 and 6 2000 also indicate that the stream is not contaminated further downstream than SE54-1

RESTORATION

The restoration may be modified as necessary to adapt to field conditions or as deemed necessary to ensure success The ultimate success of the restoration activities will be determined by the results of the post construction monitoring activities

The initial step in any land disturbance activity is to ensure that the soil and erosion control structures are in place and meet the requirements of an approved Soil and Erosion Control Plan

All seed used must conform to the requirements of the Maryland Seed Law and Regulations The composition of the seed mixes selected were

TABLE 1

Detention Basin Floor Seeding – Low Maintenance Mixture			
Percent	Botanical Name	Common Name	Indicator
20 0%	*Agrostis alba*	Red Top	FACW
20 0%	*Agrostis stolonifera*	Creeping Bentgrass	FACW
20 0%	*Carex vulpinoidea*	Fox Sedge	OBL
20 0%	*Poa palustris*	Fowl Bluegrass	FACW
20 0%	*Puccinellia distans*	Alkaligrass	OBL

TABLE 2

Lower Reach Wetland Mix			
Percent	Botanical Name	Common Name	Indicator
40 0%	*Elymus virginicus*	Virginia Wild Rye	FACW-
22 5%	*Polygonum arifolium*	Tearthumb	OBL
17 5%	*Leersia oryzoides*	Rice Cutgrass	OBL
15 0%	*Juncus effusus*	Soft Rush	FACW+
2 5%	*Lobelia cardinalis*	Cardinal Flower	FACW+
2 5%	*Saurus cernuus*	Lizard s Tail	OBL

TABLE 3

Haul Road Seed Mix			
Percent	Botanical Name	Common Name	Indicator
25-50	*Lolium perenne*	Perennial Ryegrass	FAC
25-50	*Secale cereale*	Grain Rye	FAC
25-50	*Lolium multiflorum*	Annual Ryegrass	FAC

Seed mix will be sown at the rate of 20 pounds per acre An additional 5 pounds per acre of annual ryegrass (*Lolium multiflorum*) shall be added to the seed mix as a companion crop and to aid in erosion control

Upper reach

The upper reach of the stream restoration includes the sediment detention basin and its discharge to the existing stream channel The finished grade of Pit 4 and the swale above the detention basin is approximately 123 feet in elevation The detention basin is located at the southwest corner of Pit 4 The basin was designed to receive the up slope drainage, approximately 9 acres from the swale and Pit 4 The basin is comprised of a rip-rap plunge wall/bowl and adjacent vegetated wetlands The shape of the basin conforms to the contours of the area with an approximate size of 5 000 square feet The rip-rap plunge wall/bowl is approximately 20 feet wide and extends 10 to 14 feet to maintain a 2 to 1 grade The bowl portion is approximately 6 to 8 feet in depth and filled with rip-rap The remainder of the basin has a natural bottom with earthen banks The basin has an average depth between 2 and 3 feet approximately 1 5 feet below the adjacent stream The weir crest the height of discharge has an elevation equal to that of the stream at the point of discharge approximately 115 feet above sea level Stone was used to support and stabilize the side walls of the basin Seeps on the eastern wall are directed into the basin and a berm was placed along the existing logging road above the seeps to redirect the surface runoff into the lower end of the detention basin Two stone weir outlets were constructed to allow the water to flow into the main and secondary stream The stone weir outlet has a depth of 1 5 feet and a minimum width of 4 feet (see Attachment 4 Detention Basin Detail) The natural portion was shaped and graded using a 6-inch lift of topsoil seeded and stabilized The seed mix was be a commercial facultative wetland seed mix indicative to the region The seed mix listed above as Detention Basin Floor Seeding – Low Maintenance Mixture was sown at a rate of 20 pounds per acre with a companion crop of annual rye The area was then stabilized with a biodegradable jute mat to hold the soil and seed in place The annual rye provides a quick growth spurt to provide soil and erosion control The annual rye also assists in trapping moisture and provides shading for the wetland seed The wetland seed will ultimately out-compete the annual rye and provide an aesthetically pleasing and wildlife supporting cover crop

Middle reach

No restoration will occur in the middle reach section

Lower reach

The lower reach of the west tributary required several different types of restoration techniques as discussed during the site inspection performed on August 2 2000 with USEPA USACE USFWS MDE and IT The isolated pockets that have been remediated and the locations where swamp mats were utilized and removed were raked and graded to soften the slope between the adjacent undisturbed land and the remediated areas These pockets enhance the naturally hummocky wetland forest and eventually these pockets will fill in with sediment and leaf matter and will offer a nutrient rich environment These areas were seeded with the Lower Reach Wetland Mix Table 2 at the rate of 20 pounds per acre An additional 5 pounds per acre of annual ryegrass (*Lolium multiflorum*) was added to the seed mix as a companion crop and to aid in erosion control

The upper section of the large excavation SE 68 to SE 67 was backfilled to grade with bank run (a locally obtained mixture of streambed gravel sand and clay) Large tree stumps were also placed upright along and within the large excavation area SE 68 to SE 46 The area was seeded with the Lower Reach Wetland Mix and annual ryegrass as above The area that received the backfill was covered with jute mat after it was seeded to further aid in erosion control

The area known as SE 70 74 and 75 was contoured to allow the stream to meander Large logs stumps and road material were utilized to develop the meanders The material will eventually trap sediments resulting in a meandering stream The area was seeded with the Lower Reach Wetland Mix and annual ryegrass as above

All downed tree branches and brush not being utilized to create the meanders or snags will be cut and scattered in the undisturbed upslope areas

Haul Road

The upland haul road was removed and returned to the area s original grade At the base of the upland haul road just above SE24 a hay bale check damn was installed Additional earthen berms were installed on steeper slopes of the haul road to slow and direct the surface water away from the restored areas The soil beneath the road was loosened with excavating equipment to a depth of one foot The entire area was seeded with the Haul Road Seed Mix Table 3 to expedite the stabilization The area was then stabilized with a biodegradable jute mat to hold the soil and seed in place

Old Logging Road

The soil on the pre-existing logging road was loosened with excavating equipment to a depth of a couple of inches The logging road was then seeded with the Haul Road Seed Mix to prevent erosion A portion of the logging road above the detention basin was bermed to direct surface water runoff to the lower end of the detention basin

EROSION AND SEDIMENT CONTROL

The contractor is required to conduct excavation activities in a manner that will minimize the transport of sediment from exposed areas of the site Erosion and sediment controls should be constructed in accordance with Maryland Standards and Specification for Soil Erosion and Sediment Control

Three geotextile and sandbag sedimentation traps have been placed downstream of the excavations in the lower reach These sediment traps also have Pig™ booms to absorb floatable organics that may enter the sediment traps Hay bales are also placed just downstream of individual excavation locations to help control suspended solids

The erosion and sediment control plan for SWMT is included in this document as Attachment 6

MONITORING PLAN

Once the mitigation area has been planted the monitoring plan will go into effect Long-term monitoring of the site will occur annually in August over a three-year period or until EPA/MDE determine that monitoring is no longer required Throughout the first year quarterly visits will be conducted in conjunction with groundwater sampling More frequent informal inspections will also follow significant stormwater events during the first year to ensure that the mitigation area is not subjected to severe erosion without prompt corrective actions

Specific areas within the disturbed areas will be selected based on the best professional judgement of personnel experienced in wetland studies Sample plots will be created in the non-disturbed and disturbed areas in the same manner General areas for locating study plots in the disturbed areas may be

- The downstream portion of the lower reach where swamp mats were placed
- The upstream portion of the lower reach where the stone access road was removed and the continuous excavation was backfilled with bankrun
- The swale beside Pit 4
- The upper haul road
- The detention basin

Each plot will be surveyed so that the same plots may be utilized each year One meter square plots will be located in disturbed and representative undisturbed areas A goal of 100 percent total herbaceous areal cover has been set for the wetland area The 100 percent cover refers to normalization of the restored areas compared to baseline plots (undisturbed areas with similar elevation) to determine the overall success of the seeding

The monitoring will determine the success of the herbaceous species both planted and volunteer species within the restored wetlands Areal cover will be estimated by measuring the area that would be covered by projecting above ground plant structures (stems and leaves) perpendicularly onto the ground The sampling area will be a square meter plot Cover measurements will be made from a point of view directly above each plot Within each plot the pooled coverage of all herbaceous species will be recorded to the nearest five percent The percent cover and wetland frequency indicator value of each species will be recorded

If the levels of success are not met due to the death lack of vigor of the plant material or the installed plant material being out-competed by non-desirable species then the deficiencies must be corrected by reinstallation If non-desirable species such as the invasive weeds *Phragmites australis* (common reed) and *Lythrum salicaria* (Purple loosestrife) invade the area they will be managed to limit competition with the planting Invasive species coverage is compared to the coverage of such species present in the reference plot Invasive species coverage shall not exceed the reference plot concentration Management of non-desirable species will be achieved by pulling or manual cultivation In instances of a non-desirable species monoculture the select areas will be chemically treated

Memoranda shall be issued following stormwater inspections during the first year post-planting Monitoring reports shall be submitted as addendum to each of the monitoring well reports during the three years following post-planting The monitoring report will be prepared as documentation of the findings and to verify that coverage goals are achieved These reports will be drafted within 45 days of the monitoring event The reports will include a description of the monitoring techniques details of the monitoring event problems encountered recommended solutions and photographs The reports and memoranda will be submitted to USACE with copies provided to the USEPA and MDE

Permanent photographic points will also be established in the field to further document the success of the vegetation in each of the sampling plots From the head stake of each transect an up-slope permanent point will be established and photographed during the first monitoring event and yearly thereafter Copies of the photographs will be included in the annual report

A benthic study shall be conducted in 2003 Benthic invertebrates will be collected identified and analyzed using USEPA Rapid Bioassessment Methodology A finding of no significant impact within the mitigated areas compared to the non-disturbed areas of the wetland shall signal the end of annual monitoring assuming that herbaceous coverage goals have been met These findings shall be presented in a report acceptable to USEPA for inclusion in the five-year review document

Upland monitoring

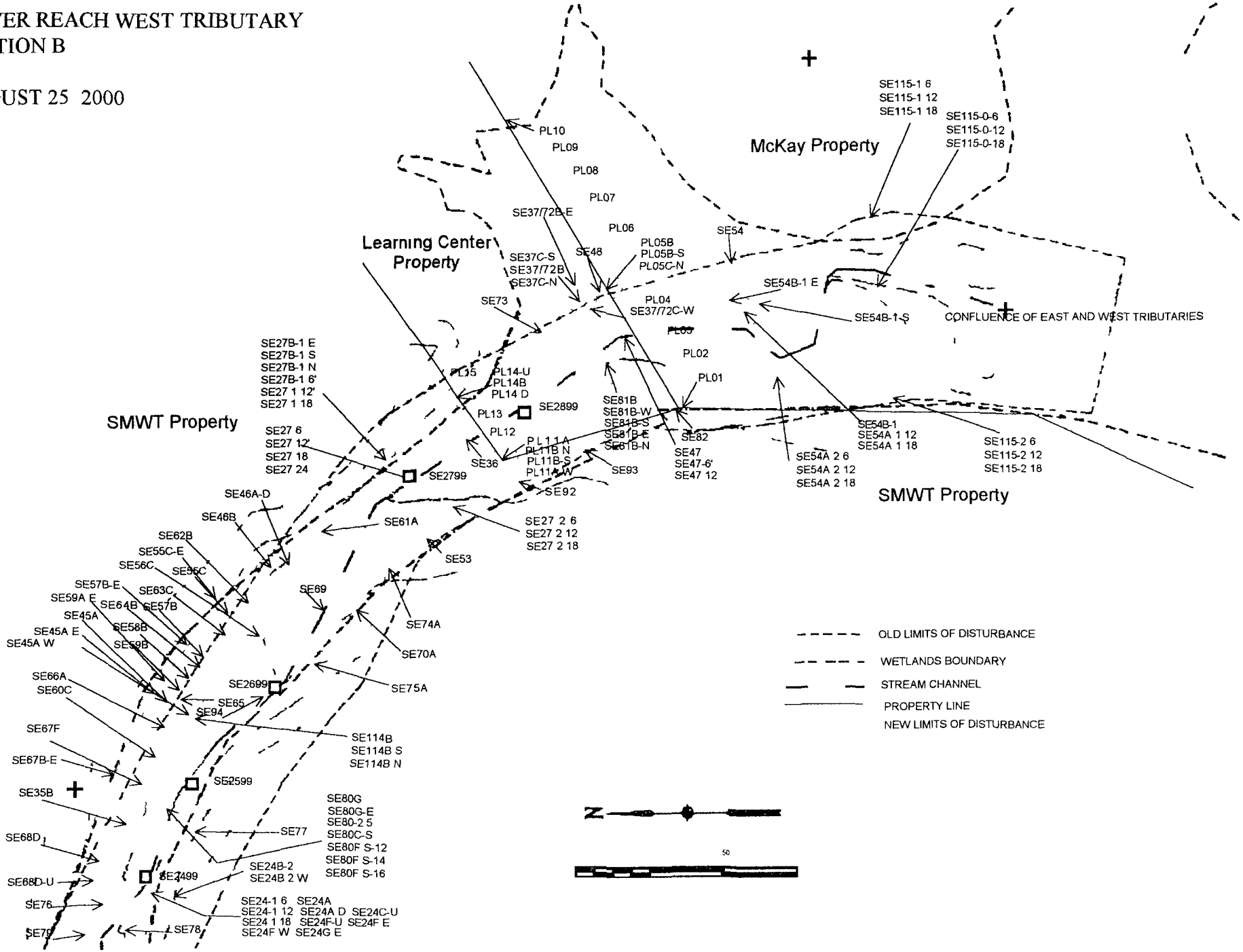
Upland monitoring and reporting will be conducted at the same frequency and duration as wetland mitigation monitoring A regulatory goal of 85 percent total herbaceous areal coverage has been set for the monitoring program for the upland seeding area The 85 percent goal is based on the coverage of all herbaceous plants existing within the plot

Transects will be created across the disturbed upland areas of the site The endpoints of each transect will be surveyed so that the same transects may be utilized each year One transect shall bisect each of Pits 1 2 3 4 and 5 and the decon/TDU areas One meter square plots will be located at 100-foot intervals along each transect Percent areal coverage of all herbaceous species will be visually quantified from each plot

ATTACHMENT 1

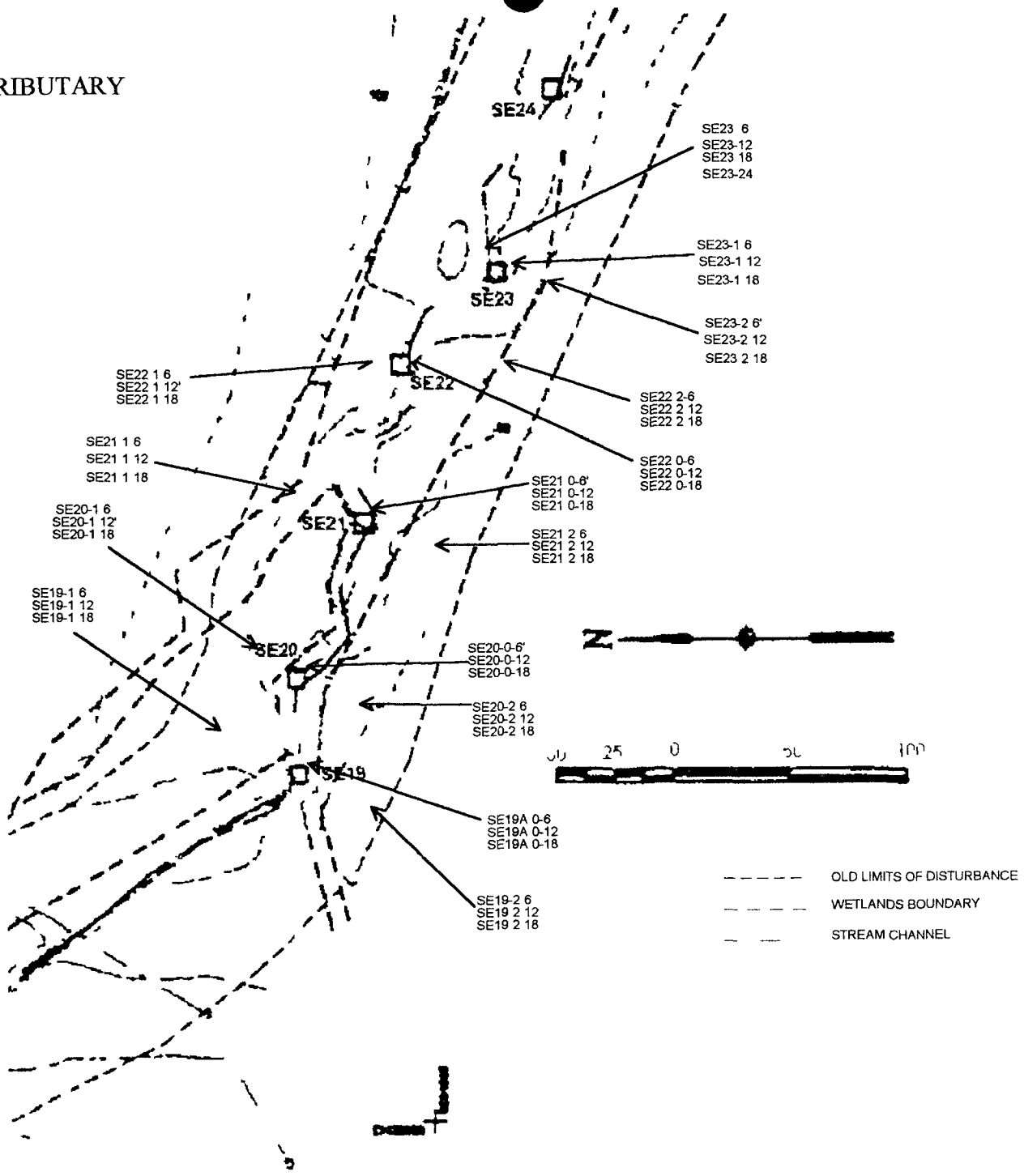
LOWER REACH WEST TRIBUTARY
SECTION B

AUGUST 25 2000



LOWER REACH WEST TRIBUTARY
SECTION A

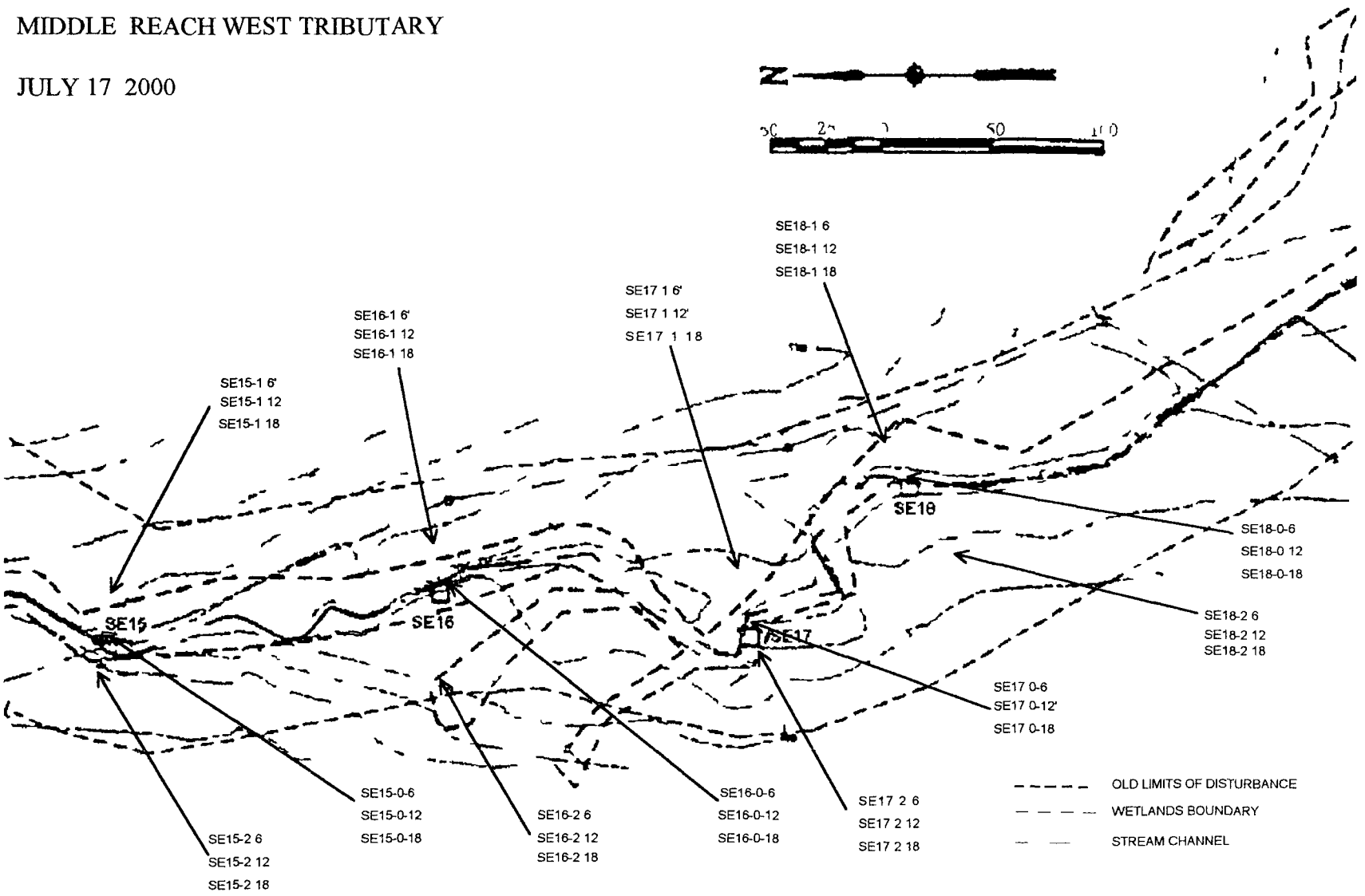
JULY 17 2000



ORIGINAL
Read

MIDDLE REACH WEST TRIBUTARY

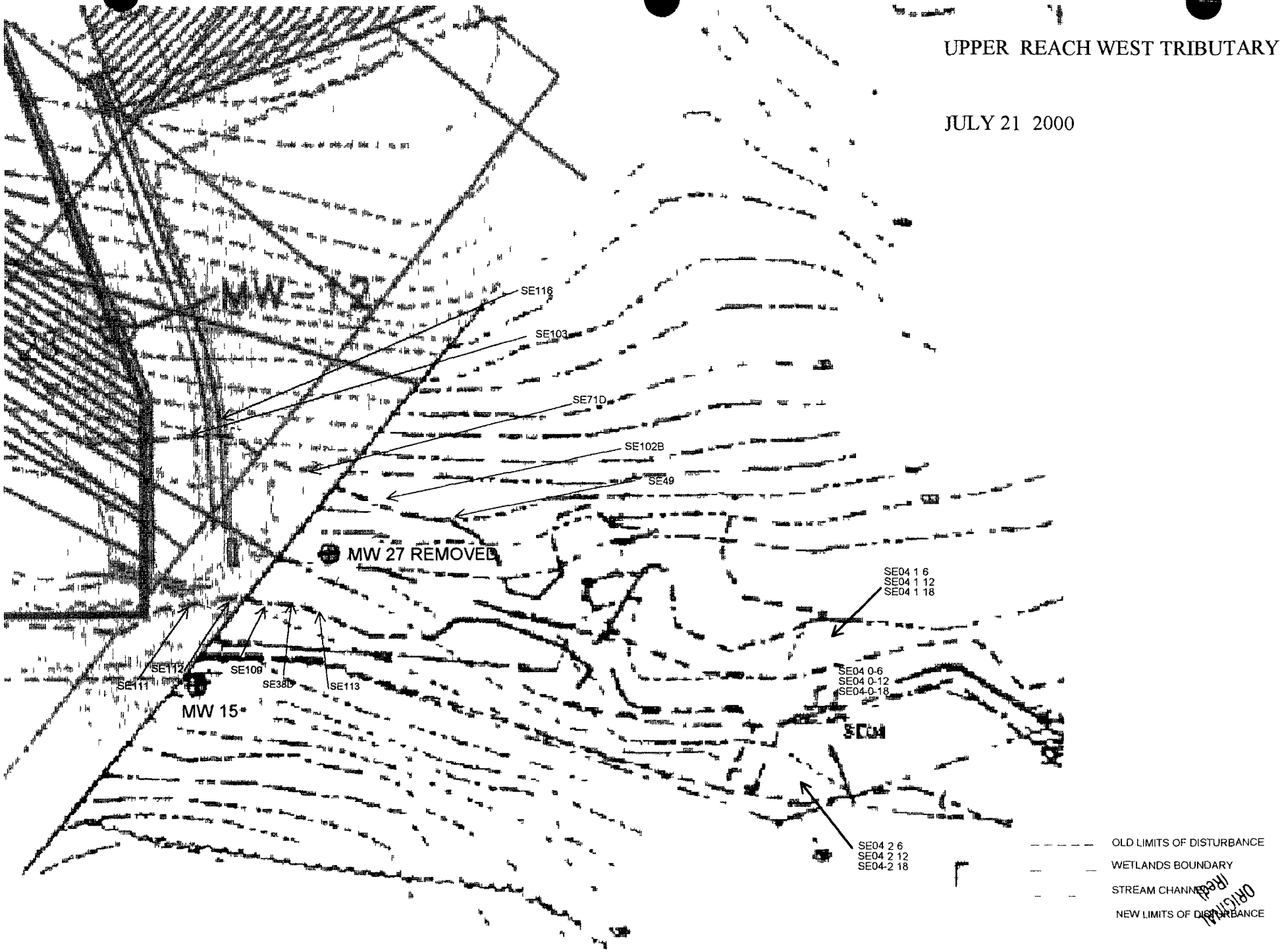
JULY 17 2000



ORIG NAL (Red)

UPPER REACH WEST TRIBUTARY

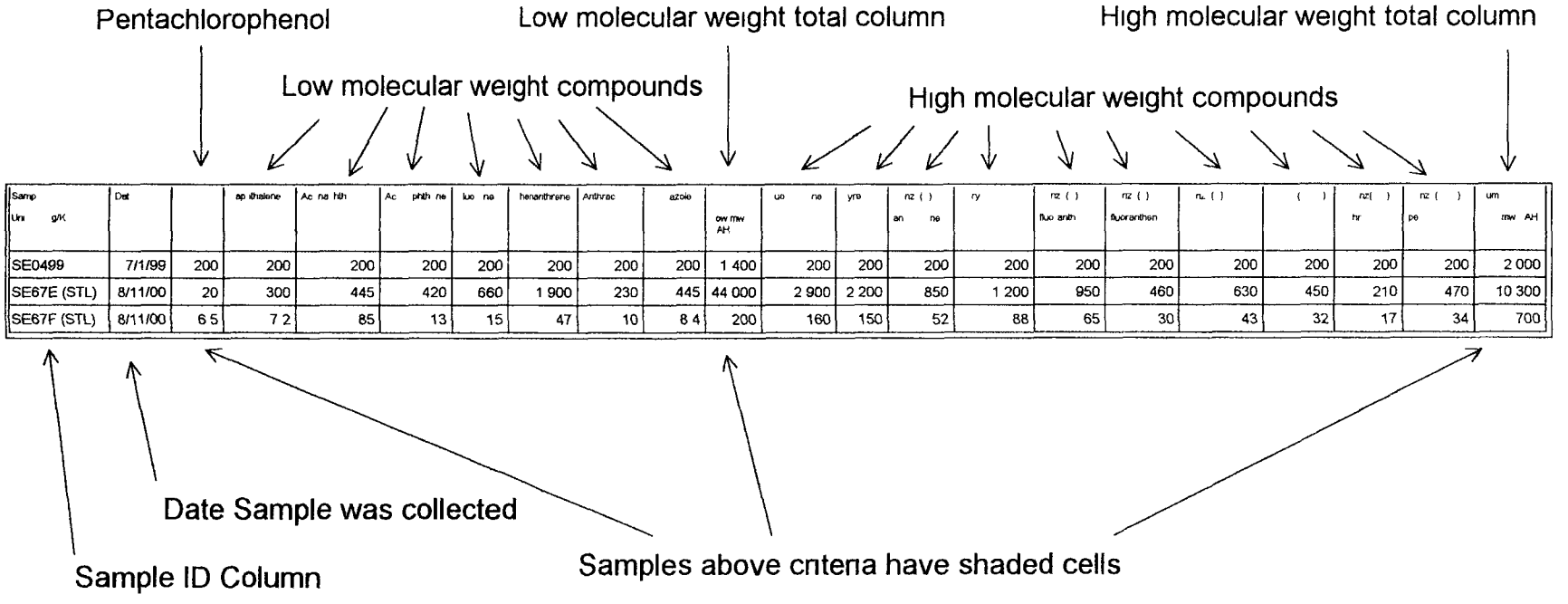
JULY 21 2000



ATTACHMENT 2

Table 1 Diagram
Analytical Summary of Sediment Samples

The following pages contain Table 1 presenting all of the analytical information gathered from sediment samples The data is presented in chronological order and sample results above criteria are shaded Table 1 is diagrammed below



Samp Unit g/K	Dat		ap thalene	Ac na hth	Ac phth ne	luo ne	henanthrene	Anthrac	azole	ow mw AH	uo ne	yre	nz ( ) an ne	ry	nz ( ) fluo anth	nz ( ) fluoranthen	n ( )	( )	nz[ ] hr	nz ( ) pe	um mw AH
SE0499	7/1/99	200	200	200	200	200	200	200	200	1 400	200	200	200	200	200	200	200	200	200	200	2 000
SE67E (STL)	8/11/00	20	300	445	420	660	1 900	230	445	44 000	2 900	2 200	850	1 200	950	460	630	450	210	470	10 300
SE67F (STL)	8/11/00	6 5	7 2	85	13	15	47	10	8 4	200	160	150	52	88	65	30	43	32	17	34	700

CRITERIA

Pentachlorophenol greater than or equal to 400 ug/kg
Low molecular weight sum greather than or equal to 3 200 ug/kg
High molecular weight sum greather than or equal to 9 600 ug/kg

the igroup

Analytical Summary of Sediment Samples

S mpl	D t	[redacted]	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Carbazole	Sum [redacted] Low mw PAH s	luoranthene	Pyrene	Benzo( ) anthracene	Chrysene	Benzo( ) fluoranthene	Benzo( ) fluoranthene	Benzo( )pyrene	ndeno( ) pyrene	Dibenz( ) anthracene	Benzo(g) peryler	Sum [redacted] High mw PAH s
lts ug/K																					
SE0499	7/1/99	200	200	200	200	200	200	200	200	1400	200	200	200	200	200	200	200	200	200	200	2000
SE1599	7/1/99	200	200	200	200	200	200	200	200	1400	550	360	540	1200	600	510	200	200	200	200	4600
SE1699	7/1/99	200	200	200	200	200	200	200	200	1400	200	200	200	200	200	200	200	200	200	200	2000
SE1799	7/1/99	200	200	200	200	200	200	200	200	1400	200	200	200	200	200	200	200	200	200	200	2000
SE1899	7/1/99	200	200	200	200	200	200	200	200	1400	200	200	200	200	200	200	200	200	200	200	2000
SE1999	7/1/99	200	200	200	200	200	200	200	200	1400	200	200	200	200	200	200	200	200	200	200	2000
SE2099	7/1/99	200	200	200	200	200	590	200	200	1800	430	250	200	200	200	200	200	200	200	200	2300
SE04 1	7/1/99	200	200	200	200	200	200	200	200	1400	200	200	200	200	200	200	200	200	200	200	2000
SE16 1	7/1/99	200	200	200	200	200	200	270	200	1500	840	600	370	350	220	200	200	200	200	200	3400
SE16 2	7/1/99	200	200	200	200	200	200	200	200	1400	200	200	200	200	200	200	200	200	200	200	2000
SE2199	7/1/99	200	200	200	200	200	200	200	200	1400	200	200	170	250	200	200	200	200	200	200	2000
SE21 1	7/1/99	200	200	200	200	200	200	200	200	1400	200	200	360	720	430	370	350	200	200	200	3200
SE21 2	7/1/99	200	200	200	200	200	200	200	200	1400	200	200	200	200	200	200	200	200	200	200	2000
SE21 3	7/1/99	200	200	200	200	200	200	200	200	1400	200	200	200	200	200	200	200	200	200	200	2000
SE2299	7/1/99	200	200	200	200	200	200	200	200	1400	200	200	200	200	200	200	200	200	200	200	2000
SE2399	7/1/99	200	200	200	200	200	200	200	200	1400	350	420	310	480	210	1290	210	200	200	200	3900
SE2499	7/1/99	200	200	640	200	670	3800	2200	200	[redacted]7900	36000	25000	14000	20000	9300	6300	8000	1000	2300	3900	[redacted]130000
SE2599	7/1/99	200	200	200	200	200	200	200	200	1400	200	200	330	790	450	390	440	350	200	310	3700
SE2699	7/1/99	200	200	200	200	200	200	200	200	1400	200	200	200	200	200	200	200	200	200	200	2000
SE2799	7/1/99	200	200	200	200	200	200	200	200	1400	200	200	200	200	200	200	200	200	200	200	2000
SE2899	7/1/99	200	200	200	200	200	200	200	200	1400	200	200	200	200	200	200	200	200	200	200	2000
SE29	7/1/99	200	200	200	200	200	200	200	200	1400	200	200	200	200	200	200	200	200	200	200	2000
SE30	7/1/99	200	200	200	200	200	200	200	200	1400	200	200	200	200	200	200	200	200	200	200	2000
SE31	7/1/99	200	200	200	200	200	200	200	200	1400	200	200	200	200	200	200	200	200	200	200	2000
SE32	7/1/99	200	200	200	200	200	200	200	200	1400	200	200	160	390	410	260	220	200	200	200	2400
SE33	7/1/99	200	200	200	200	200	200	200	200	1400	200	200	200	150	180	200	200	200	200	200	1900
SE34	7/1/99	200	200	230	200	200	730	750	200	2500	1700	2200	2900	8900	4700	2200	2800	930	470	740	[redacted]28000
SE35	7/1/99	200	200	1600	2000	4600	32000	10000	200	[redacted]51000	190000	170000	48000	75000	32000	21000	24000	7700	2800	6000	[redacted]580000
SE36	7/1/99	200	200	200	200	200	200	200	200	1400	200	200	200	200	200	200	200	200	200	200	2000
SE37	7/1/99	160	200	220	200	200	200	470	200	1700	420	650	1300	4100	3100	2000	1800	1000	500	940	[redacted]16000
SE38	7/1/99	200	2100	200	810	520	560	200	200	[redacted]4600	200	200	200	200	200	200	200	200	200	200	2000
SE39	7/1/99	200	200	200	200	200	200	200	200	1400	200	200	200	200	200	200	200	200	200	200	2000
SE40	7/1/99	200	200	200	200	200	1200	220	200	2400	7000	5100	770	730	700	260	270	200	200	200	[redacted]15000
SE41	7/1/99	200	200	200	200	200	200	200	200	1400	200	200	200	200	200	200	200	200	200	200	2000
SE42	7/1/99	200	200	200	200	200	200	200	200	1400	200	200	200	200	200	200	200	200	200	200	2000
SE43	7/1/99	200	200	200	200	200	200	200	200	1400	200	200	200	200	200	200	200	200	200	200	2000
SE44	7/1/99	200	200	200	200	200	200	200	200	1400	200	200	200	190	1500	740	450	590	190	450	4700
SE45	7/1/99	200	200	4000	16000	24000	140000	40000	540	[redacted]9220000	710000	480000	110000	120000	84000	49000	55000	4300	8000	17000	[redacted]1600000
SE46	7/1/99	200	200	190	200	200	200	260	200	1500	290	490	540	1600	2600	1400	1200	780	300	670	[redacted]9900
SE47	7/1/99	200	200	200	200	200	200	200	200	1400	200	200	200	200	200	200	200	200	200	200	2000
SE48	7/1/99	200	200	200	200	200	200	180	200	1400	200	150	430	1200	1300	570	720	430	200	360	5600
SE49	9/24/99	200	200	200	200	200	200	200	200	1400	200	200	200	200	200	200	200	200	200	200	2000
SE50	9/24/99	200	200	200	200	200	200	200	200	1400	200	200	200	200	200	200	200	200	200	200	2000
SE51	9/24/99	200	200	200	200	200	200	200	200	1400	200	200	200	200	200	200	200	200	200	200	2000
SE52	9/24/99	200	200	200	200	200	200	200	200	1400	200	200	200	200	200	200	200	200	200	200	2000
SE53	9/24/99	200	200	200	200	200	200	200	200	1400	200	200	200	200	200	200	200	200	200	200	2000
SE54	9/24/99	200	200	200	200	200	200	200	200	1400	200	200	200	200	200	200	200	200	200	200	2000
SE55	12/22/99	83 5	83 5	330	83 5	83 5	80	540	83 5	1300	190	180	360	1000	890	550	580	550	83 5	540	4900
SE56	12/22/99	390	83 5	810	83 5	66	310	1400	86	2800	1300	1300	1200	3400	2000	1000	1500	1400	92	1300	[redacted]14000
SE58	12/22/99	320	83 5	570	70	72	170	890	64	1900	390	360	620	1700	1400	900	850	920	61	910	8100
SE59	12/22/99	290	83 5	520	83 5	83 5	150	870	58	1800	400	400	620	1700	1300	820	730	890	67	860	7800

Criter a
PCP _400ug/kg
low mol wt sum _ 3200ug/kg
high mol wt sum _9600ug/kg
Shaded areas are above criteria

ORIGINAL Red

Analytical Summary of Sediment Samples

S mpl	Date	[redacted]	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Carbazole	Sum Aromatics Low mw PAH's	Fluoranthene	Pyrene	Benzo( ) anthracene	Chrysene	Benzo( ) fluoranthene	Benzo(k) fluoranthene	Benzo( )pyrene	Indeno( ) ene	Dibenz( ) anthracene	Benzo(g) perylene	Sum High mw PAH's
its ug/K																					
SE60	12/22/99	[redacted]6800	83 5	3600	200	300	1400	6800	420	[redacted]13000	8000	6500	7300	14000	18000	4900	9900	7600	500	6800	[redacted]84000
SE61	1/7/00	83 5	83 5	83 5	83 5	83 5	83 5	49	83 5	600	50	83 5	83 5	99	64	83 5	83 5	83 5	83 5	83 5	800
SE62	1/7/00	[redacted]520	83 5	1100	83 5	92	340	1800	110	[redacted]3600	1900	2400	1700	4500	3200	1600	2000	2000	130	1900	[redacted]21000
SE63	1/7/00	90	83 5	140	83 5	83 5	83 5	250	83 5	800	83	79	150	460	360	220	200	220	83 5	200	2100
SE64	1/7/00	210	83 5	490	83 5	83 5	170	860	83 5	1900	730	830	1100	2800	1800	1000	1200	870	69	810	[redacted]11000
SE65	1/7/00	120	83 5	210	83 5	83 5	97	390	83 5	1000	220	210	290	910	590	430	360	340	83 5	330	3800
SE66	1/7/00	[redacted]1400	83 5	8800	20000	18000	62000	24000	83 5	[redacted]130000	290000	200000	77000	89000	48000	26000	30000	12000	1300	11000	[redacted]780000
SE67	1/7/00	[redacted]1400	83 5	3800	290	850	2700	7700	440	[redacted]16000	18000	13000	12000	20000	22000	3700	12000	7300	1600	6500	[redacted]120000
SE68	1/7/00	[redacted]1000	83 5	4500	27000	47000	160000	28000	1800	[redacted]270000	160000	120000	35000	47000	20000	16000	16000	5800	83 5	5300	[redacted]430000
SE69	1/7/00	53	83 5	120	83 5	83 5	83 5	180	83 5	700	68	52	100	230	210	120	150	160	83 5	160	1300
SE70	1/7/00	[redacted]3300	83 5	6300	83 5	83 5	1000	11000	83 5	[redacted]19000	2600	7600	7500	26000	22000	15000	13000	11000	840	10000	[redacted]120000
SE71	1/7/00	83 5	83 5	83 5	360	480	2000	83 5	83 5	[redacted]3200	310	220	83 5	160	140	83 5	83 5	83 5	83 5	83 5	1300
SE72	1/13/00	400	83 5	540	83 5	83 5	230	980	83 5	2100	450	410	680	1800	1700	1000	880	970	83 5	940	8900
SE73	1/13/00	230	83 5	320	83 5	83 5	110	590	83 5	1400	230	200	320	1100	1100	630	500	560	83 5	530	5300
SE74	1/13/00	[redacted]700	83 5	980	83 5	83 5	210	1600	110	[redacted]3200	130	570	850	2500	3100	1800	1600	1800	150	1700	[redacted]14000
SE75	1/13/00	[redacted]620	83 5	750	83 5	58	210	1300	87	2600	850	820	1000	3200	2200	1400	1400	1400	100	1300	[redacted]14000
SE76	1/13/00	160	83 5	310	83 5	83 5	160	570	83 5	1400	310	270	520	1400	1100	790	650	560	83 5	530	6200
SE77	1/13/00	300	83 5	450	83 5	83 5	200	810	83 5	1800	340	340	700	2000	1600	940	940	770	73	730	8400
SE78	1/13/00	100	83 5	150	83 5	83 5	81	270	83 5	800	240	200	250	650	630	380	290	250	83 5	240	3200
SE79	1/14/00	83 5	83 5	83 5	83 5	83 5	66	80	83 5	600	88	74	81	210	170	120	90	83 5	83 5	65	1100
SE80	1/14/00	[redacted]1900	83 5	2700	380	83 5	6000	5600	250	[redacted]15000	16000	10000	4000	7700	7600	5600	4700	5000	380	4600	[redacted]86000
SE81	1/14/00	400	83 5	630	83 5	83 5	99	1100	82	2200	410	83 5	390	900	1500	790	640	1100	76	1000	6900
SE82	1/14/00	140	83 5	200	83 5	83 5	84	320	83 5	940	89	79	100	250	480	280	210	290	83 5	270	2100
SE83	1/15/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	580	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	840
SE84	1/15/00	160	83 5	230	190	250	890	450	83 5	2200	570	380	200	380	1100	530	350	390	83 5	350	4300
SE 85	1/15/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	580	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	840
SE 86	1/15/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	580	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	840
SE 87	1/15/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	580	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	840
SE 88	1/15/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	580	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	840
SE 89	1/15/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	580	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	840
SE 90	1/15/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	580	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	840
SE 91	1/15/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	580	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	840
PL 01	1/19/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	580	83 5	83 5	83 5	83 5	81	83 5	83 5	83 5	83 5	83 5	830
PL 02	1/19/00	67	83 5	83	83 5	83 5	83 5	140	83 5	640	83 5	83 5	83 5	120	280	120	110	120	83 5	120	1200
PL-03	1/19/00	210	83 5	290	83 5	83 5	83 5	480	83 5	1200	59	97	140	340	770	440	330	500	83 5	490	3200
PL 04	1/19/00	180	83 5	250	83 5	83 5	83 5	470	83 5	1100	120	130	210	570	650	300	320	400	83 5	430	3200
PL 05	1/19/00	[redacted]810	83 5	1200	83 5	73	240	2600	120	[redacted]4400	400	420	1100	3900	3900	1600	1700	2400	140	2300	[redacted]18000
PL 05(Q)	1/19/00	140	700	700	700	105	105	105	700	3100	290	220	370	1200	1500	620	940	1200	210	1600	8000
PL 06	1/19/00	77	83 5	120	83 5	83 5	83 5	200	83 5	700	83 5	83 5	100	310	310	140	150	160	83 5	170	1600
PL 07	1/19/00	83 5	83 5	83 5	83 5	83 5	83 5	98	83 5	600	83 5	83 5	83 5	68	130	83 5	83 5	83 5	83 5	83 5	870
PL 08	1/19/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	56	83 5	83 5	83 5	83 5	83 5	810
PL 09	1/19/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	840
PL 10	1/19/00	95	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	62	67	83 5	83 5	83 5	83 5	83 5	800
PL 11	2/7/00	[redacted]840	700	380	700	140	78	73	700	2800	340	730	770	2000	3200	2000	2100	1500	140	1900	[redacted]15000
PL 12	2/7/00	230	46	280	280	14	72	50	280	1000	240	250	350	950	1300	610	1000	960	55	1300	7020
PL 13	2/7/00	250	83 5	470	83 5	83 5	83 5	800	83 5	1700	190	190	410	1100	920	710	520	690	83 5	660	5500
PL 14	2/7/00	[redacted]860	550	550	550	110	61	46	550	2400	340	390	450	1200	2300	1300	1400	1500	110	2000	[redacted]11000
PL 15	2/7/00	83	45	83 5	83 5	83 5	62	83 5	83 5	500	57	44	83 5	52	53	83 5	83 5	83 5	83 5	83 5	700
SE92	2/7/00	320	52	270	320	65	39	43	320	1100	240	340	350	880	1300	780	1000	970	65	1300	7200
SE93	2/7/00	100	83 5	120	83 5	83 5	83 5	180	83 5	700	41	74	92	220	300	180	190	150	83 5	150	1500
SE94	2/7/00	140	270	240	270	19	120	70	240	1200	380	1100	380	1100	1100	470	840	700	55	930	7100

Cr te a
PCP _400ug/kg
low mol wt sum _ 3200ug/kg
high mol wt sum _9600ug/kg
Shaded areas are abo e criter a

ORIGINAL (Red)

Analytical Summary of Sediment Samples

S mpl	D t	PCP	Naphthalene	Acenaphthylene	Acenaphthene	luorene	Phenanthrene	Anthracene	Carbazole	Sum	luoranthene	Pyrene	Benzo( ) anthracene	Chrysene	Benzo(b) fluoranthene	Benzo( ) fluoranthene	Benzo( )pyrene	Indeno( ) ene	Dibenz( ) anthracene	Benzo(g) perylene	Sum
lts in g/K										Low mw PAHs											High mw PAHs
SE38B	3/1/00	83 5	780000	16000	360000	300000	850000	67000	36000	2400000	400000	250000	63000	55000	25000	22000	23000	6700	83 5	6200	850000
SE40B	3/1/00	83 5	430	83 5	400	400	1400	160	47	2900	830	550	160	170	83	62	64	83 5	83 5	83 5	2200
SE71B	3/1/00	83 5	190	83 5	430	520	2000	160	75	3500	1100	720	180	180	86	78	71	83 5	83 5	83 5	2700
SE95	3/1/00	83 5	14000	330	12000	11000	40000	2300	1400	81000	21000	14000	2100	1700	680	650	630	180	83 5	160	41000
SE96	3/1/00	280	180000	3400	84000	69000	200000	16000	11000	560000	93000	61000	15000	15000	6300	5600	5700	1800	83 5	1600	210000
SE97	3/1/00	620	3500	270	2600	2400	7900	1200	300	18000	8600	5300	1400	1800	1100	770	510	290	83 5	260	20000
SE98	3/1/00	83 5	66	83 5	460	510	870	83 5	120	2200	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE38C	3/7/00	83 5	56000	1900	45000	40000	120000	9900	3400	280000	63000	41000	10000	9500	4100	3800	3700	1100	430	1000	140000
SE95B	3/7/00	110	160000	2100	66000	53000	140000	8200	7000	440000	66000	42000	9700	8300	4600	2900	3600	960	110	890	140000
SE96B	3/7/00	83 5	10000	230	5900	5400	15000	1400	600	39000	7500	4800	1200	1100	480	430	440	140	83 5	130	16000
SE40B(Q)	3/1/00	83 5	83 5	83 5	83 5	1000	3600	210	260	5300	2200	1500	290	420	150	77	110	57	84	83 5	5000
SE71B(Q)	3/1/00	83 5	83 5	400	1400	1600	5900	370	160	9900	3700	2400	490	620	290	130	190	77	150	83 5	8100
SE97(Q)	3/1/00	200	7300	2700	5400	5500	18000	970	83 5	40000	14000	8500	1800	1900	1300	610	680	380	220	430	30000
SE40C	3/8/00	83 5	2400	83 5	1600	340	700	54	94	5300	330	210	68	75	83 5	83 5	83 5	83 5	83 5	83 5	1200
SE71C	3/8/00	83 5	700	83 5	670	470	1000	58	120	3100	230	140	83 5	50	83 5	83 5	83 5	83 5	83 5	83 5	1000
SE99	3/8/00	83 5	1500	100	2000	2600	9100	700	170	16000	5300	3400	880	750	370	320	330	110	83 5	100	12000
SE100	3/8/00	83 5	1200	83 5	600	380	960	78	73	3400	410	250	69	71	83 5	83 5	83 5	83 5	83 5	83 5	1300
SE24A	3/10/00	84	83 5	120	83 5	83 5	140	250	83 5	800	220	190	320	810	500	400	420	260	83 5	260	3500
SE24A U	3/10/00	310	83 5	680	83 5	230	980	1800	83 5	3900	3800	4600	3900	6800	4200	3600	3500	1400	83 5	1400	33000
SE24A D	3/10/00	140	83 5	190	83 5	83 5	140	370	83 5	1000	280	270	520	1300	860	610	610	380	83 5	380	5300
SE80A	3/10/00	540	83 5	1600	83 5	860	5400	4600	83 5	13000	42000	28000	12000	17000	8900	7700	7100	3100	83 5	2900	130000
SE80A 1	3/10/00	560	83 5	1700	83 5	83 5	680	3300	83 5	6000	6200	6400	4000	11000	6000	4300	6000	3400	83 5	3200	81000
SE34B U	3/13/00	460	76	850	130	210	990	1900	130	4300	4900	6200	4100	9000	4600	2900	3400	1600	180	1500	38000
SE68B U	3/13/00	1100	83 5	2200	97	270	620	4200	230	7700	15000	20000	8700	21000	10000	8000	7500	4300	340	3900	99000
SE80B N	3/13/00	3500	83 5	4300	160	430	1700	9000	540	16000	24000	20000	10000	25000	16000	11000	12000	7800	350	6900	130000
SE80B S	3/13/00	620	83 5	1500	86	120	650	3500	140	6100	14000	9500	6300	16000	6400	4900	5300	2600	220	2300	68000
SE80B E	3/13/00	2100	83 5	2900	98	220	480	5200	330	9300	850	1100	2600	6400	9300	3300	4700	5100	260	4500	38000
SE80B W	3/13/00	1400	83 5	1700	66	140	320	3200	220	5700	860	960	1600	4400	5600	2400	4500	2900	200	2600	26000
SE45A	3/14/00	120	83 5	200	190	200	630	480	83 5	1900	2200	1600	580	1200	590	440	420	290	83 5	270	7700
SE60A	3/14/00	450	110	680	450	450	1600	1500	100	24900	7900	6000	2400	4200	2500	1900	1700	1100	94	1000	29000
SE35A	3/14/00	180	61	360	73	110	390	680	83 5	1800	750	790	580	1900	1000	740	840	550	83 5	530	7800
SE64A	3/14/00	110	83 5	190	83 5	83 5	100	330	83 5	1000	460	420	320	860	500	360	320	270	83 5	250	3800
SE66A	3/14/00	2100	63	3200	23000	21000	88000	20000	83 5	160000	220000	150000	42000	40000	18000	17000	15000	4500	400	3600	510000
SE67A	3/14/00	1500	83 5	3500	340	620	2100	6700	370	14000	18000	17000	1000	24000	13000	9800	11000	5700	410	4800	100000
SE24A(STL)	3/14/00	36	110	210	83 5	28	170	100	83 5	800	480	400	560	1300	810	380	560	350	280	420	5500
SE40D	3/17/00	83 5	47	83 5	43	83 5	100	83 5	83 5	500	98	73	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE71D	3/17/00	83 5	430	83 5	310	180	320	83 5	61	1500	87	55	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE102	3/17/00	83 5	180	83 5	680	830	2700	160	120	4800	710	380	41	53	83 5	83 5	83 5	83 5	83 5	83 5	1700
SE103	3/17/00	55	130	83 5	210	130	400	80	83 5	1100	300	210	81	110	77	63	52	83 5	83 5	83 5	1100
SE104	3/17/00	83 5	1000	83 5	590	470	1300	220	82	3700	820	580	200	280	190	140	140	83 5	83 5	83 5	2600
SE105	4/6/00	94	83 5	100	83 5	83 5	55	170	83 5	660	98	92	87	210	260	160	130	170	83 5	160	1500
SE106	4/6/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	580	83 5	83 5	83 5	83 5	83 5	83 5	41	83 5	83 5	83 5	790
SE107	4/6/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	580	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	840
SE108	4/6/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	580	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	840
SE109	5/2/00	83 5	1300	83 5	560	40	710	93	67	2900	440	300	92	110	130	76	72	50	83 5	46	1400
SE110	5/2/00	250	83 5	83 5	83 5	83 5	47	83 5	83 5	500	190	130	83 5	62	58	83 5	83 5	83 5	83 5	83 5	900
SE38D	5/2/00	83 5	83 5	83 5	790	250	310	83 5	55	1700	220	150	83 5	50	83 5	83 5	83 5	83 5	83 5	83 5	1000
SE102B	5/2/00	83 5	91	75	250	130	45	83 5	83 5	800	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE111	5/3/00	260	83 5	340	83 5	83 5	67	620	83 5	1400	140	310	280	950	1500	760	560	560	200	500	5800
SE112	5/3/00	110	110	59	150	110	160	120	83 5	800	220	170	89	180	160	110	86	83	83 5	84	1300
SE68 3	5/8/00	83 5	83 5	83 5	71	47	83 5	83 5	83 5	500	48	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800

Criteria
PCP _400ug/kg
low mol wt sum _ 3200ug/kg
high mol wt sum _9600ug/kg
Shaded areas are above criteria

Analytical Summary of Sediment Samples

Sampl	D te	[redacted]	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Carbazole	Sum [redacted] Low mw PAH	Fluoranthene	Pyrene	Benzo( ) nthracene	Chrysene	Benzo( ) fluoranthene	Benzo( ) fluoranthene	Benzo( )pyrene	Indeno( ) pyre	Dibenz( ) anthracene	Benzo(g) perylene	Sum [redacted] High mw PAH
nits ug/K																					
SE80 2 5	5/8/00	83 5	83 5	83 5	120	47	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE45 0 5	5/9/00	86	83 5	170	58	54	100	270	83 5	800	220	230	170	560	410	270	330	300	83 5	280	2900
SE45 1	5/9/00	83 5	83 5	83 5	45	83 5	90	83 5	83 5	600	140	110	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	900
SE45 1 5	5/9/00	83 5	83 5	83 5	200	260	72	47	83 5	800	160	92	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	900
SE111(STL)	5/3/00	83 5	83 5	83 5	83 5	83 5	82J	14J	140	500	240	180	1100	460	450	83 5	510	83 5	430	510	4000
SE113(STL)	5/3/00	83 5	95J	83 5	83 5	62J	210	36J	440	800	370	230	270	120	190	83 5	340	83 5	75	83 5	1800
SE80E	5/31/00	83 5	4400	130	2600	1600	3200	410	110	[redacted]12000	3100	2200	650	860	370	300	290	130	83 5	120	8100
SE46A	5/26/00	94	83 5	160	83 5	83 5	83 5	270	83 5	800	77	86	120	370	350	250	180	240	83 5	220	2000
SE62A	5/26/00	77	83 5	130	83 5	83 5	83 5	240	83 5	800	83 5	61	95	310	300	180	140	180	83 5	170	1600
SE55A	5/26/00	83 5	83 5	70	83 5	83 5	83 5	130	83 5	600	66	63	79	250	190	110	110	83 5	83 5	100	1100
SE80D E	5/31/00	180	130	540	830	1100	300	2100	63	[redacted]5100	19000	14000	5100	6100	4400	1900	2300	850	100	760	[redacted]55000
SE80C W	5/26/00	[redacted]530	83 5	930	90	240	1100	2200	92	[redacted]4700	11000	7000	3800	6300	4200	2700	2800	1500	130	1400	[redacted]41000
SE80C N	5/26/00	[redacted]930	83 5	1600	73	150	650	2900	200	[redacted]5700	2600	2500	2800	7200	5300	2700	3100	2700	190	2400	[redacted]31000
SE80C E	5/26/00	[redacted]2700	83 5	3700	160	330	730	6500	380	[redacted]12000	2900	4900	6900	16000	14000	1800	7000	6300	390	5500	[redacted]66000
SE80C S	5/26/00	210	83 5	210	83 5	83 5	46	340	83 5	900	80	87	230	570	470	340	300	260	83 5	260	2700
SE68B U	5/26/00	[redacted]2000	83 5	4000	200	420	860	7000	370	[redacted]13000	35000	36000	20000	22000	27000	2500	9000	6700	380	5600	[redacted]160000
SE61A	5/26/00	210	83 5	470	83 5	83 5	83 5	650	83 5	1500	260	260	420	1200	870	570	580	570	83 5	530	5300
SE46A D	5/26/00	83 5	83 5	110	83 5	83 5	83 5	160	83 5	700	77	80	110	320	240	150	130	130	83 5	120	1400
SE24B U	5/26/00	190	83 5	400	110	140	460	770	50	2000	1100	1100	1300	3000	2200	1100	1500	720	76	640	[redacted]18000
SE80D	5/31/00	220	1300	630	12000	13000	37000	3400	370	[redacted]68000	28000	19000	5100	5400	3200	2400	2300	870	92	780	[redacted]267000
SE24C	5/31/00	83 5	73	83 5	560	760	2400	270	83 5	[redacted]4200	1400	1100	180	250	140	110	110	57	83 5	54	3500
SE80F	6/2/00	280	83 5	430	99	140	600	1000	83 5	2400	3800	2500	1400	2300	1500	1000	1200	780	260	740	[redacted]15000
SE80F S 12	6/2/00	130	83 5	160	83 5	83 5	88	330	83 5	900	58	43	330	780	480	330	500	320	110	320	3300
SE80F S 14	6/2/00	150	83 5	220	83 5	83 5	120	410	83 5	1100	180	140	560	1400	670	470	700	390	140	380	5000
SE80F S 16	6/2/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE24C U	6/5/00	140	160	260	200	170	360	520	83 5	1800	570	510	770	1600	1100	730	770	390	140	360	6900
SE23 6	6/9/00	190	83 5	280	83 5	83 5	62	460	83 5	1100	82	150	290	1200	1700	1000	400	560	83 5	510	6000
SE23 12	6/9/00	76	83 5	120	83 5	83 5	83 5	190	83 5	700	83 5	60	110	510	760	380	160	220	78	210	2600
SE23 18	6/9/00	130	83 5	160	83 5	83 5	83 5	260	83 5	800	83 5	91	140	720	990	570	270	310	110	290	3600
SE23 24	6/9/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE27 6	6/9/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE27 12	6/9/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE27 18	6/9/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE27 24	6/9/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE47 6	6/9/00	83 5	83 5	110	83 5	83 5	83 5	180	83 5	700	83 5	83 5	70	200	310	180	120	210	60	200	1500
SE47 12	6/9/00	83 5	83 5	83 5	83 5	83 5	83 5	58	83 5	600	83 5	83 5	83 5	61	95	56	83 5	58	83 5	57	700
SE66A	6/12/00	83 5	83 5	58	220	180	520	170	83 5	1300	1700	1400	370	430	270	200	190	99	83 5	97	4800
SE114	6/12/00	[redacted]420	83 5	410	48	75	180	720	55	1600	260	370	980	1000	1400	860	660	750	250	710	7200
SE60A	6/12/00	83 5	2200	110	800	540	1500	330	61	[redacted]5500	3100	2400	790	1200	500	410	390	170	60	170	9200
SE45A W	6/12/00	320	83 5	550	83 5	67	180	990	53	2000	840	960	840	2200	1800	1300	1100	1000	330	960	[redacted]1000
SE45A	6/12/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	87	130	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	900
SE45A E	6/12/00	78	83 5	190	83 5	83 5	50	300	83 5	900	160	190	160	450	520	290	320	320	83 5	310	2800
SE59A	6/12/00	180	83 5	410	120	260	1500	960	83 5	[redacted]3400	6200	5600	2400	3400	2200	1600	1400	730	240	700	[redacted]24000
SE59A E	6/12/00	83 5	83 5	52	83 5	83 5	83 5	110	83 5	600	98	83	53	130	120	95	58	80	83 5	77	900
SE67A	6/12/00	83 5	91	120	1100	1300	6200	680	98	[redacted]9600	5500	4000	1200	1300	570	460	510	180	63	160	[redacted]14000
SE67A E	6/12/00	[redacted]31600	83 5	10000	36000	45000	220000	45000	1100	[redacted]360000	710000	530000	130000	130000	73000	52000	48000	16000	6000	14000	[redacted]1700000
SE59A E (STL)	6/12/00	7	120	44	120	5 8	27	11	120	400	170	150	110	260	220	100	110	150	120	130	1500
SE74A	6/14/00	210	83 5	290	83 5	83 5	66	560	83 5	1300	130	140	240	640	720	460	410	540	83 5	550	3900
SE46B	6/14/00	83 5	83 5	79	83 5	83 5	83 5	130	83 5	600	200	180	110	290	210	150	130	130	83 5	130	1600
SE55B E	6/14/00	380	83 5	740	83 5	83 5	120	1300	63	2500	310	380	640	2000	2400	1500	1100	1400	190	1300	[redacted]13000
SE64B	6/14/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	78	64	83 5	81	73	58	83 5	83 5	83 5	83 5	800

Criteria
PCP _400ug/kg
low mol wt sum _ 3200ug/kg
high mol wt sum _9600ug/kg
Shaded areas are above criteria

Analytical Summary of Sediment Samples

Sampl	D t	[redacted]	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Carbazole	Sum [redacted] Low mol PAH	Fluoranthene	Pyrene	Benzo( ) anthracene	Chrysene	Benzo(b) oranthene	Benzo(k) fluoranthene	Benzo( )pyrene	Indeno( ) ne	Dibenz( ) anthracene	Benzo(g) perylene	Sum [redacted] High mol PAH
its ug/K																					
SE57B	6/14/00	83 5	83 5	83 5	83 5	83 5	83 5	50	83 5	600	150	100	50	88	82	57	52	83 5	83 5	83 5	800
SE55B	6/14/00	83 5	83 5	76	53	83 5	49	130	83 5	600	160	130	82	190	180	130	100	120	83 5	120	1300
SE56B	6/14/00	150	83 5	330	83 5	61	210	610	83 5	1500	1900	1800	760	1700	1100	660	7220	560	83 5	540	[redacted]6000
SE62B	6/14/00	70	83 5	150	83 5	83 5	69	270	83 5	800	500	440	230	560	400	270	260	230	83 5	230	3200
SE57B E	6/14/00	68	83 5	120	83 5	83 5	83 5	210	83 5	700	80	78	150	450	330	220	190	180	83 5	170	1900
SE58B	6/14/00	120	83 5	240	83 5	47	160	490	83 5	1200	2400	1600	680	1100	760	530	520	390	83 5	390	8500
SE75A	6/14/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE70A	6/14/00	64	67	74	83 5	83 5	83 5	140	83 5	600	51	88	64	190	200	130	120	130	83 5	130	1200
SE63B	6/14/00	220	110	420	83 5	78	220	800	83 5	1800	1500	1400	2400	1500	960	910	790	65	760	83 5	[redacted]10000
SE68C	6/14/00	270	450	790	2300	3000	9700	2700	130	[redacted]19000	17000	12000	4900	7400	4700	3600	3000	1500	140	1400	[redacted]56000
SE35B	6/14/00	83 5	150	83 5	220	160	280	70	83 5	1000	720	570	180	220	110	94	87	83 5	83 5	83 5	2200
SE19A 6	6/16/00	360	83 5	330	83 5	83 5	110	540	83 5	1300	220	470	410	1000	1400	770	810	560	53	530	6200
SE19 12	6/16/00	[redacted]980	83 5	960	58	90	270	1700	89	[redacted]3300	1700	2700	1900	4000	5800	3000	2800	1700	130	1600	[redacted]25000
SE19 18	6/16/00	110	83 5	160	92	96	63	270	83 5	800	330	400	320	600	620	430	440	240	83 5	240	3700
SE19 24	6/16/00	83 5	83 5	83 5	84	92	83 5	83 5	83 5	600	78	53	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE19 30	6/16/00	83 5	83 5	83 5	83 5	83 5	83 5	60	83 5	600	55	81	83 5	110	150	92	87	69	83 5	56	900
SE18 6	6/16/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	140	110	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	900
SE8 12	6/16/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE18 18	6/16/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE18A 12	6/16/00	7 5	24 5	7 9	24 5	13	2 4	6 5	24 5	100	37	23	6 1	11	5 3	2 8	3 6	1 7	2	3 1	100
SE19A 6	6/16/00	17	140	45	140	28	100	32	140	600	260	320	220	540	620	300	430	300	270	320	3600
SE54 0 12	6/22/00	130	83 5	160	83 5	83 5	83 5	310	83 5	900	54	53	130	500	500	280	170	260	79	260	2300
SE54 0 18	6/22/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE54 1 6	6/22/00	[redacted]980	83 5	930	83 5	83 5	83 5	1500	95	2900	160	560	470	1200	3600	2400	1300	1500	550	1400	[redacted]13000
SE54 1 12	6/22/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE54 1 18	6/22/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE54 2 6	6/22/00	[redacted]1200	83 5	1300	83 5	79	75	2000	110	[redacted]3700	190	620	770	2400	5800	1900	1800	2200	170	2000	[redacted]18000
SE54 2 12	6/22/00	160	83 5	230	83 5	83 5	83 5	360	83 5	1000	83 5	150	140	540	850	540	320	370	ND	360	3400
SE54 2 18	6/22/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE27 1 6	6/22/00	[redacted]2100	83 5	2800	83 5	210	250	5200	200	[redacted]8800	31000	30000	14000	16000	21000	2800	6100	4900	260	4400	[redacted]130000
SE27 1 12	6/22/00	100	83 5	180	83 5	83 5	83 5	300	83 5	900	550	540	240	630	580	410	230	270	ND	250	3700
SE27 1 18	6/22/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE27 2 6	6/22/00	[redacted]440	83 5	580	83 5	83 5	80	980	67	2000	290	360	400	1000	1300	1100	700	890	71	830	6900
SE27 2 12	6/22/00	120	83 5	180	83 5	83 5	83 5	320	83 5	900	74	92	120	360	450	280	210	260	83 5	250	2200
SE27 2 18	6/22/00	83 5	83 5	59	83 5	83 5	83 5	98	83 5	600	83 5	83 5	83 5	140	150	78	55	77	83 5	71	900
SE23 1 6	6/23/00	[redacted]710	83 5	830	83 5	83 5	140	1500	90	2800	270	730	880	2500	3900	2000	1700	1500	120	1400	[redacted]15000
SE23 1 12	6/23/00	250	83 5	380	83 5	83 5	65	660	83 5	1400	83 5	310	360	1200	1600	940	720	660	240	630	6700
SE23 1 18	6/23/00	83 5	83 5	83 5	83 5	83 5	83 5	80	83 5	600	83 5	56	55	160	170	140	87	74	83 5	72	1000
SE23 2 6	6/23/00	120	83 5	200	83 5	83 5	220	420	83 5	1200	230	190	520	1400	860	610	580	350	83 5	350	5200
SE23 2 12	6/23/00	320	83 5	510	83 5	83 5	230	950	83 5	2000	460	420	950	2800	2400	1200	1500	910	78	860	[redacted]12000
SE23 2 18	6/23/00	280	83 5	500	83 5	74	430	1400	74	2600	730	680	1800	4600	2500	1700	1800	890	78	830	[redacted]16000
SE24 1 6	6/23/00	350	83 5	450	83 5	83 5	79	790	83 5	1700	210	350	500	1000	1200	770	730	740	58	700	6300
SE24 1 12	6/23/00	390	83 5	600	83 5	83 5	120	1100	59	2100	190	250	590	1500	1700	830	1000	990	76	940	8100
SE24 1 18	6/23/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE24 2 6	6/23/00	220	83 5	350	83 5	83 5	140	610	83 5	1400	250	260	510	1400	1100	730	640	540	83 5	530	6000
SE24 2 12	6/23/00	[redacted]450	83 5	710	83 5	83 5	250	1400	73	2700	330	360	1200	3200	2400	1400	1300	1200	96	1100	[redacted]12000
SE24 2 18	6/23/00	83 5	83 5	93	83 5	83 5	83 5	190	83 5	700	73	94	140	390	310	220	190	180	83 5	180	1900
SE22 1 6	6/26/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	700	510	83 5	900	83 5	83 5	83 5	83 5	83 5	83 5	2700
SE22 1 12	6/26/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE22 1 18	6/26/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE21 0 12	6/26/00	83 5	83 5	83 5	83 5	83 5	97	46	83 5	600	210	150	140	140	56	50	47	83 5	83 5	83 5	1000

Cr teria
PCP _400ug/kg
low mol wt sum _ 3200ug/kg
high mol wt sum _9600ug/kg
Shaded areas are above crite ia

ORIGINAL (Red)

Sampl	D t	[redacted]	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Carbazole	Sum [redacted]	luoranthene	Pyrene	Benzo( ) anthracene	Chrysene	Benzo( ) fluoranthene	Benzo(k) uoranthene	Benzo( )pyrene	Indeno( ) pyrene	Dibenz( ) anthracene	Benzo(g) perylene	Sum [redacted]
ts ug/K										Low mol PAH											High mol PAH
SE115 1-6	6/27/00	120	83 5	190	83 5	83 5	83 5	340	83 5	900	58	54	160	540	530	250	220	210	83 5	180	2300
SE115 1 12	6/27/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	59	51	83 5	83 5	83 5	83 5	800
SE115 1 18	6/27/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	60	50	83 5	83 5	83 5	83 5	83 5	800
SE115 0 6	6/27/00	83 5	83 5	59	83 5	83 5	83 5	110	83 5	600	71	50	65	150	190	100	95	100	83 5	100	1000
SE115 0 12	6/27/00	91	83 5	120	83 5	83 5	83 5	210	83 5	700	50	83 5	130	400	320	200	160	200	83 5	200	1800
SE115-0 18	6/27/00	190	83 5	260	83 5	83 5	98	470	83 5	1200	160	140	360	1000	670	600	480	460	83 5	460	4400
SE115 2 6	6/27/00	83 5	83 5	83 5	83 5	83 5	83 5	100	83 5	600	83 5	83 5	83 5	98	190	89	87	96	83 5	98	1000
SE115 2 12	6/27/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE115 2 18	6/27/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE22 0 12	6/26/00	72	83 5	150	83 5	83 5	140	320	83 5	900	110	110	570	1300	750	590	530	300	83 5	270	4600
SE22 0 18	6/26/00	130	83 5	200	83 5	83 5	160	420	83 5	1100	280	250	630	1700	1000	780	700	370	83 5	350	6100
SE20 1 6	6/26/00	150	83 5	160	83 5	83 5	83 5	240	83 5	800	83 5	82	82	220	710	400	170	250	83 5	230	2300
SE20 1 12	6/26/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE20 1 18	6/26/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE21 0 18	6/26/00	83 5	83 5	83 5	83 5	83 5	71	150	83 5	600	130	87	50	91	84	53	59	83 5	83 5	83 5	800
SE22 2-6	6/26/00	63	83 5	97	83 5	83 5	83 5	160	83 5	700	65	65	120	420	590	270	160	160	69	150	2100
SE22 2 12	6/26/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE22 2 18	6/26/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE20 2 6	6/26/00	83 5	83 5	83 5	83 5	83 5	83 5	64	83 5	600	83 5	57	63	120	110	92	63	46	83 5	83 5	800
SE20 2 12	6/26/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE20 2 18	6/26/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE21 1 6	6/26/00	83 5	83 5	63	83 5	83 5	83 5	90	83 5	600	63	83 5	83 5	75	120	70	70	70	83 5	75	800
SE21 1 12	6/26/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE21 1 18	6/26/00	83 5	48	83 5	83 5	83 5	83 5	83 5	83 5	500	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE21 2 6	6/26/00	83 5	52	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE21 2 12	6/26/00	83 5	56	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE21 2 18	6/26/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE20 0 12	6/27/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE20 0 18	6/27/00	83 5	83 5	83 5	83 5	83 5	83 5	47	83 5	500	83 5	83 5	83 5	60	100	66	55	51	83 5	47	700
SE19 2 6	6/27/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE19 2 12	6/27/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE19 2 18	6/27/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE19 1 6	6/27/00	60	83 5	75	83 5	83 5	83 5	120	83 5	600	83 5	83 5	83 5	110	520	290	120	140	83 5	130	1600
SE19 1 12	6/27/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	47	210	120	58	54	83 5	47	900
SE19 1 18	6/27/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE27 2 18 (STL)	6/22/00	7 5	25 5	33	25 5	5	5 3	4	25 5	100	46	56	38	100	110	51	63	78	65	67	700
SE54A 2 6(STL)	6/29/00	44	600	340	340	70	70	25	340	1800	70	210	180	460	940	440	500	550	120	650	4100
SE115 1 6 (STL)	6/29/00	21	175	175	175	35 5	35 5	33	175	800	200	120	200	560	710	290	410	530	100	650	3800
SE54A 1 6(STL)	6/29/00	83	850	850	850	170	34	170	850	[redacted]3800	170	510	270	610	2700	1400	1100	1100	240	1500	[redacted]9600
SE19A 0 12(STL)	6/29/00	7	90	61	90	31	150	25	90	500	510	400	170	260	190	85	120	62	7 3	95	1900
SE19A 0 6	6/29/00	83 5	83 5	83 5	77	97	360	98	83 5	900	560	370	160	210	150	110	98	47	83 5	46	1800
SE19 0 12	6/29/00	62	83 5	120	83 5	83 5	100	250	83 5	800	400	310	390	690	450	350	340	190	83 5	180	3400
SE19A 0 18	6/29/00	83 5	83 5	83 5	83 5	83 5	69	83 5	83 5	600	110	74	46	70	55	83 5	83 5	83 5	83 5	83 5	800
SE54A 1 6	6/29/00	[redacted]890	83 5	910	83 5	85	60	1600	94	2900	46	500	410	1200	3500	2000	1200	1300	140	1200	[redacted]11000
SE54A 1 12	6/29/00	170	83 5	190	83 5	83 5	83 5	310	83 5	900	45	90	82	210	550	390	200	260	83 5	240	2200
SE54A 1 18	6/29/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE54A 2 6	6/29/00	170	83 5	240	83 5	83 5	83 5	410	83 5	1100	58	110	150	420	680	440	320	350	83 5	320	2900
SE54A 2 12	6/29/00	83 5	83 5	72	83 5	83 5	83 5	120	83 5	600	93	86	51	150	200	140	87	98	83 5	89	1100
SE54A 2 18	6/29/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE18 1 6	6/29/00	130	83 5	150	83 5	83 5	83 5	240	83 5	800	83 5	69	68	150	460	240	150	180	81	160	1600
SE18 1 12	6/29/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800

Criteria
PCP _400ug/kg
low mol wt sum _ 3200ug/kg
high mol wt sum _9600ug/kg
Shaded areas are above criteria

Analytical Summary of Sediment Samples

Sampl	D t	[redacted]	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Carbazole	Sum [redacted] Low mw PAH [redacted]	Fluoranthene	Pyrene	Benzo( ) anthra_ene	Chrysene	Benzo( ) fluoranthene	Benzo(b) fluoranthene	Benzo( )pyrene	Indeno( ) pyrene	Dibenz( ) anthracene	Benzo(g) perylene	Sum [redacted] High mw PAH [redacted]
its In g/K																					
SE18 1 18	6/29/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE18 2 6	6/29/00	330	83 5	390	83 5	83 5	83 5	610	52	1400	68	210	200	470	1600	680	510	480	48	440	4700
SE18 2 12	6/29/00	83 5	83 5	59	83 5	83 5	83 5	88	83 5	600	83 5	83 5	83 5	72	180	87	65	63	83 5	56	900
SE18 2 18	6/29/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE15 2 6	7/3/00	[redacted]500	83 5	530	83 5	83 5	52	920	76	1800	160	270	320	640	1500	900	640	700	68	640	5800
SE15-2 12	7/3/00	[redacted]420	83 5	83 5	83 5	83 5	83 5	670	50	1100	70	170	170	390	900	570	400	490	170	440	3800
SE15 2 18	7/3/00	110	83 5	83 5	83 5	83 5	83 5	140	83 5	600	87	69	83 5	110	130	89	83 5	49	83 5	83 5	900
SE17 1 6	7/3/00	83 5	83 5	8/3 5	83 5	83 5	83 5	83 5	83 5	500	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE17 1 12	7/3/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE17 1 18	7/3/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE17 0 6	7/3/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE17 0 12	7/3/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE17 0 18	7/3/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE17 2 6	7/3/00	100	83 5	63	83 5	83 5	83 5	140	83 5	600	51	64	64	110	220	140	93	110	83 5	110	1000
SE17 2 12	7/3/00	140	83 5	83 5	83 5	83 5	83 5	110	83 5	600	52	49	49	120	110	86	43	66	83 5	65	700
SE17 2 18	7/3/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE16 1 6	7/3/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE16 1 12	7/3/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	39	83 5	83 5	83 5	83 5	83 5	83 5	800
SE16 1 18	7/3/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE15 0 6	7/3/00	83 5	83 5	83 5	130	84	67	240	78	800	50	37	83 5	40	83 5	83 5	83 5	83 5	83 5	83 5	700
SE15-0 12	7/3/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE15 0 18	7/3/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE15 1 6	7/3/00	92	83 5	92	83 5	83 5	83 5	180	83 5	700	92	100	130	240	250	170	140	130	83 5	120	1500
SE15 1 12	7/3/00	230	83 5	83	83 5	83 5	83 5	370	60	800	280	210	140	340	370	300	150	190	61	190	2200
SE15 1 18	7/3/00	[redacted]440	83 5	150	83 5	83 5	67	880	83 5	1400	3500	3800	660	1300	890	570	460	340	84	310	[redacted]12000
SE16 2 6	7/3/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE16 2 12	7/3/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE16 2 18	7/3/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE16 0 6	7/3/00	83 5	58	83 5	83 5	83 5	83 5	120	83 5	600	45	83 5	93	190	170	130	120	83 5	83 5	76	1100
SE16 0 12	7/3/00	44	83 5	57	83 5	83 5	83 5	100	83 5	600	53	83 5	50	120	140	110	99	86	83 5	85	900
SE16 0 18	7/3/00	86	83 5	120	83 5	83 5	85	250	83 5	800	120	68	230	220	320	240	210	170	83 5	170	1800
SE63C	7/6/00	83 5	46	44	57	83 5	83 5	82	83 5	500	70	62	48	120	83	71	64	654	83 5	58	1300
SE56C	7/6/00	65	83 5	210	120	93	71	380	83 5	1000	1400	1000	500	1100	780	570	480	320	83 5	290	6500
SE55C	7/6/00	83	83 5	200	83 5	83 5	77	390	83 5	1000	2300	1400	610	920	590	490	390	300	83 5	280	7400
SE55C E	7/6/00	65	83 5	100	83 5	83 5	83 5	180	83 5	700	83 5	83 5	64	180	270	200	120	150	57	130	1300
SE59B	7/6/00	60	83 5	48	54	65	120	350	83 5	800	120	100	52	120	120	84	59	67	83 5	60	900
SE17 0 6 (STL)	7/3/00	7	14	83	32	32	28	4 4J	22 5	200	18	15	3 7	4 2	5 5	2 3	2 8	1 5	4 6	5 1	100
PL14B	7/6/00	96	83 5	150	83 5	83 5	83 5	280	83 5	800	51	70	77	210	420	310	140	220	83 5	190	1800
SE60B	7/6/00	280	950	1100	2900	3600	11000	3900	83 5	[redacted]23500	23000	9600	8500	8100	7700	3500	4400	1700	64	1400	[redacted]68000
SE67B	7/6/00	84	250	360	1200	1300	3600	1100	83 5	[redacted]7900	7500	5700	2000	3000	1400	1200	1100	490	83 5	440	[redacted]23000
SE67B E	7/6/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	60	74	83 5	62	51	83 5	83 5	83 5	83 5	83 5	700
SE68D	7/6/00	83 5	83 5	140	140	130	290	300	83 5	1200	1700	1400	500	930	520	410	350	190	83 5	160	6200
SE68C U	7/6/00	140	83 5	520	83 5	73	170	1000	83 5	2000	1200	8200	3500	5500	3100	2100	1600	750	83 5	650	[redacted]27000
SE04 0 6	7/6/00	83 5	83 5	83 5	83 5	83 5	140	83	83 5	600	390	250	83 5	79	70	48	83 5	83 5	83 5	83 5	1300
SE04 0 12	7/6/00	88	83 5	83 5	48	110	480	110	83 5	1000	740	430	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	1800
SE04 0 18	7/6/00	83 5	83 5	83 5	57	91	110	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE04 1 6	7/6/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE04 1 12	7/6/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE04 1 18	7/6/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE04 2 6	7/6/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE04 2 12	7/6/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800

Criteria
PCP _400ug/kg
low mol wt sum ≥ 3200ug/kg
high mol wt sum _9600ug/kg
Shaded areas are above criteria

Analytical Summary of Sediment Samples

Sample	D t	PCP	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Carbazole	Sum Low mw PAH	Fluoranthene	Pyrene	Benzo( ) anthracene	Chrysene	Benzo( ) fluoranthene	Benzo(k) fluoranthene	Benzo( )pyrene	ndeno( ) yrei	Dibenz( ) anthracene	Benzo(g) perylene	Sum High mw PAH
Its g/K																					
SE04 2 18	7/6/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE24D	7/7/00	93	430	340	780	960	4200	1200	83 5	[redacted]8000	10000	7800	3200	3800	2200	1500	1500	600	66	530	[redacted]31000
SE24B 2	7/7/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	55	50	83 5	49	83 5	83 5	83 5	83 5	83 5	83 5	700
SE24B 2 W	7/7/00	[redacted]460	83 5	730	56	76	210	1400	110	2700	600	660	700	2200	2000	1000	1200	1300	110	1200	[redacted]11000
SE116	7/10/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE60C	7/13/00	83 5	150	83 5	130	96	180	83 5	83 5	800	260	200	57	72	83 5	83 5	83 5	83 5	83 5	83 5	1100
SE67C	7/13/00	83 5	120	46	690	700	1800	240	45	[redacted]3600	1900	1400	410	370	210	190	180	79	83 5	73	4900
PL14 D	7/13/00	83 5	83 5	62	83 5	83 5	83 5	120	83 5	600	75	63	93	210	170	130	110	110	83 5	110	1200
SE68D U	7/13/00	83 5	83 5	48	170	180	280	130	83 5	1000	1000	780	240	400	190	170	140	82	83 5	76	3200
PL14 U	7/13/00	83 5	83 5	90	83 5	83 5	83 5	180	83 5	700	160	240	210	480	290	210	190	160	83 5	150	2200
SE15-1 18(STL)	7/11/00	7	22 5	22 5	22 5	4 6	2	4 9	22 5	100	3 8	3 1	1 7	3 7	8 3	3 8	4	6 5	4 6	7 8	50
SE27 2 6(STL)	7/11/00	8	50	50	50	10 5	14	9 6	50	200	44	45	61	180	230	100	140	160	10 5	220	1200
SE23 2 18(STL)	7/11/00	6 5	20 5	20 5	20 5	17	25	28	20 5	200	40	32	55	120	110	50	76	58	16	77	600
SE15-2 6(STL)	7/11/00	16	115	115	115	24	17	9 6	115	500	24	140	89	160	470	200	240	230	70	310	1900
SE23 1 6(STL)	7/11/00	46	265	265	265	13	98	64	265	1200	140	230	370	880	1000	470	610	480	55	690	4900
SE24B 2 W(STL)	7/11/00	19	80	80	80	7 4	67	35	80	400	170	150	210	510	440	200	280	250	83	330	2600
SE15 2 12 (STL)	7/11/00	20	115	115	115	23 5	14	10	115	500	23 5	130	95	190	550	250	280	300	93	390	2300
SE23 2 12(STL)	7/11/00	7	225	225	225	140	290	370	225	1700	290	220	770	1500	820	440	640	320	45 5	450	5500
SE24E	7/14/00	83 5	230	83 5	1300	1200	2100	140	110	[redacted]5200	470	280	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	1400
SE24E U	7/14/00	[redacted]2700	2700	14000	73000	91000	360000	64000	2700	[redacted]507400	650000	430000	130000	130000	72000	46000	50000	17000	1900	16000	[redacted]1500000
SE68C U(STL)	7/6/00	71	11000	11000	11000	2250	510	2250	11000	[redacted]49000	36000	24000	6600	7500	5000	2500	2800	1800	2250	2400	[redacted]91000
SE63C(STL)	7/6/00	6 5	46	21 5	48	26	10	3 1	21 5	200	26	22	12	31	34	15	19	24	5 7	30	200
SE24FU	7/21/00	83 5	83 5	83 5	81	81	250	46	83 5	700	330	240	65	73	49	83 5	83 5	83 5	83 5	83 5	1200
SE24FU W	7/21/00	310	83 5	530	83 5	67	270	1100	78	2200	490	420	920	2700	2100	1200	1200	1000	83	1000	[redacted]11000
SE24FU E	7/21/00	[redacted]420	83 5	680	130	170	490	1400	130	3100	940	990	1300	3100	2800	1400	1500	1200	100	1100	[redacted]14000
SE24E U(STL)	7/18/00	210	125000	125000	15000	81000	340000	33000	125000	[redacted]844000	260000	250000	58000	59000	29000	14000	21000	16000	25500	6900	[redacted]740000
SE81B E	7/25/00	210	83 5	320	83 5	83 5	83 5	520	83 5	1300	83 5	120	160	480	670	450	320	510	83 5	500	3400
SE81B N	7/25/00	47	83 5	84	83 5	83 5	83 5	140	83 5	600	83 5	83 5	50	170	210	130	100	120	83 5	120	1200
PL05B S	7/25/00	130	83 5	150	83 5	83 5	83 5	280	83 5	800	83 5	83 5	82	250	340	150	140	250	83 5	250	1700
SE54B 1 S	7/25/00	[redacted]740	83 5	630	83 5	83 5	83 5	1100	70	2100	64	370	280	820	1900	1000	690	890	83	820	6900
SE54B 1	7/25/00	83 5	83 5	83 5	83 5	83 5	83 5	77	83 5	600	83 5	83 5	83 5	74	140	110	60	67	83 5	60	800
PL05B	7/25/00	70	83 5	110	83 5	83 5	83 5	190	83 5	700	83 5	83 5	64	200	220	130	110	160	83 5	160	1300
SE54 1 E	7/25/00	160	83 5	170	83 5	83 5	83 5	290	83 5	900	52	73	92	250	370	230	170	240	83 5	220	1800
SE81B W	7/25/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	800
SE81B	7/25/00	83 5	83 5	59	83 5	83 5	83 5	110	83 5	600	83 5	83 5	83 5	76	120	74	83 5	79	83 5	74	800
SE81B S	7/25/00	62	83 5	98	83 5	83 5	83 5	170	83 5	700	83 5	83 5	83 5	120	210	95	73	120	83 5	110	1100
PL05B N	7/25/00	[redacted]560	83 5	1100	83 5	99	260	1900	100	[redacted]3600	2500	3600	4900	5200	3700	3600	2000	1500	490	1400	[redacted]29000
SE24F U(STL)	7/21/00	6 5	110	110	54	84	390	51	110	900	660	490	120	110	70	33	50	19	22	25	1600
PL05B(STL)	7/25/00	7 5	24 5	24 5	24 5	5	11	4 5	24 5	100	41	31	28	83	120	46	49	99	5	100	600
SE24F E(STL)	7/25/00	16	250	250	250	20	78	46	250	1100	50	260	370	930	1500	650	570	690	50	750	5800
SE81B(STL)	7/25/00	8	27	27	27	5 5	7	2 1	10	110	32	21	12	40	92	33	29	77	5 5	79	400
SE24F W(STL)	7/25/00	7 5	375	375	375	47	350	89	375	2000	910	1100	680	1300	1200	500	680	480	75	550	7500
PL11A W	7/31/00	250	83 5	260	83 5	83 5	83 5	420	83 5	1100	83 5	130	150	410	700	530	320	390	83 5	350	3100
SE72B S	7/31/00	[redacted]550	83 5	620	83 5	83 5	98	1000	78	2000	64	180	390	1100	1300	810	620	1100	76	1000	6600
PL11A N	7/31/00	[redacted]910	83 5	730	83 5	83 5	83 5	1200	84	2300	120	650	510	1700	2800	1700	1200	1200	110	1100	[redacted]11000
SE37/72B W	7/31/00	[redacted]670	83 5	730	83 5	83 5	67	1300	84	2400	170	190	380	880	1300	750	590	1100	76	1000	6400
SE37/72B E	7/31/00	130	83 5	150	83 5	83 5	83 5	280	83 5	800	83 5	83 5	130	490	450	240	140	220	83 5	190	2100
PL11A	7/31/00	83 5	83 5	83 5	83 5	83 5	83 5	83 5	83 5	600	83 5	83 5	83 5	58	56	83 5	83 5	83 5	83 5	83 5	800
SE37/72B	7/31/00	270	83 5	410	83 5	83 5	68	710	83 5	1500	200	260	350	1100	890	580	460	620	83 5	570	5100
PL11A S	7/31/00	[redacted]420	83 5	490	83 5	83 5	62	800	59	1700	84	280	520	1700	1600	1000	780	700	68	630	7400
SE37B N	7/31/00	[redacted]500	83 5	790	83 5	61	87	1300	86	2500	210	510	600	2200	2100	1100	990	1200	88	1000	[redacted]10000

Criteria
PCP _400ug/kg
low mol wt sum _ 3200ug/kg
high mol wt sum _9600ug/kg
Shaded areas are abo e criteria

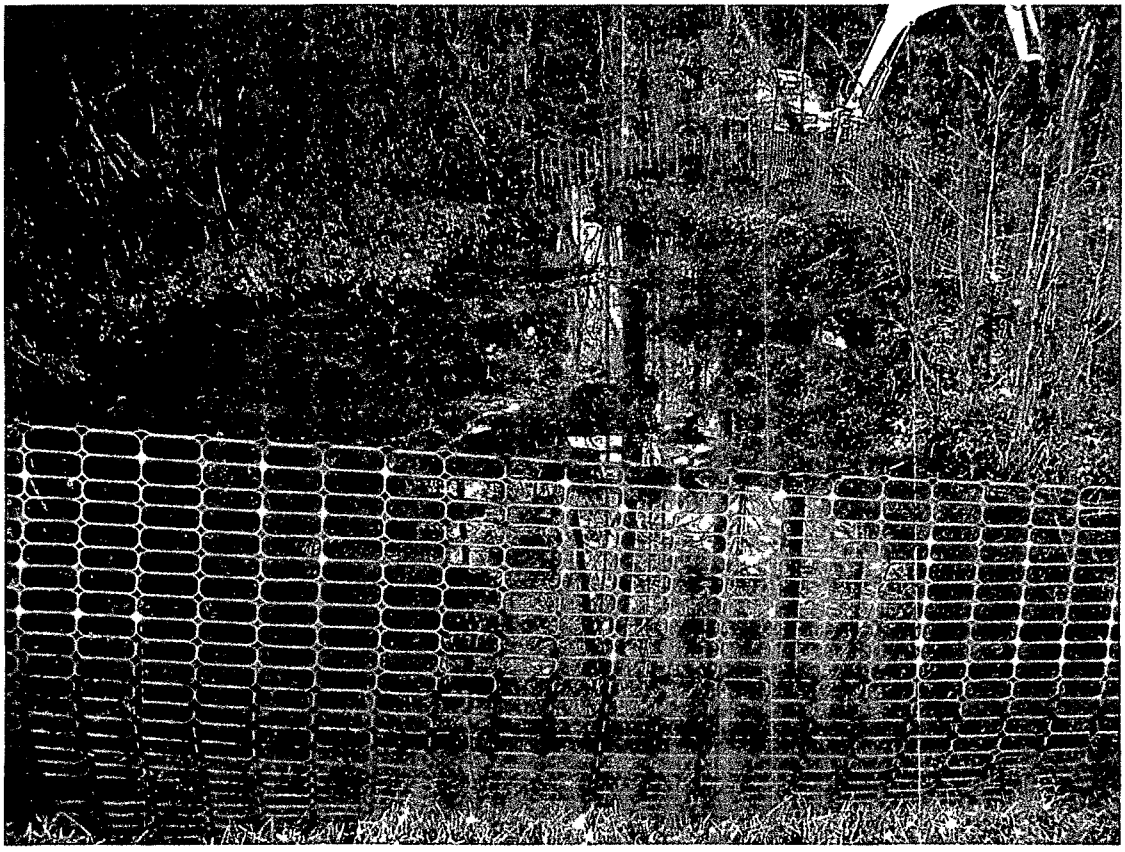
Analytical Summary of Sediment Samples

S mpl	D t	[illegible]	Naphthalene	Acenaphthylene	Acenaphthene	luorene	Phenanthrene	Anthracene	Carbazole	Sum [illegible] Low mw PAH ug	Fluoranthene	Pyrene	Benzo( ) anthracene	Chrysene	Benzo(b) uoranthene	Benzo(k) uoranthene	Benzo( )pyrene	Indeno( ) pyrene	Dibenz( ) anthracene	Benzo(g) perylene	Sum [illegible] High mw PAH ug
Its ug/																					
SE80G E	8/1/00	180	140	300	340	300	560	610	54	2300	2000	1500	690	1300	960	670	580	500	83 5	460	8700
SE24G E	8/1/00	270	83 5	320	83 5	83 5	83	540	83 5	1300	200	240	290	770	970	630	410	490	83 5	450	4500
SE114B S	8/1/00	43	83 5	46	83 5	83 5	83 5	100	83 5	600	83 5	61	83 5	83 5	110	76	64	72	83 5	65	800
SE114B N	8/1/00	83 5	83 5	83 5	83 5	83 5	83 5	48	83 5	500	48	60	83 5	52	57	42	83 5	83 5	83 5	83 5	700
PL11A(STL)	7/31	8 5	27 5	27 5	27 5	5 5	2 9	1 9	27 5	120	25	22	18	47	110	51	50	57	51	63	490
SE54B 1S(STL)	7/28	42	235	235	235	47 5	24	12	235	1000	180	30	100	290	980	570	400	560	380	400	3900
SE37/72 B(STL)	7/28	10 5	345	345	345	17	93	48	345	1500	470	220	350	1000	1500	600	730	1200	630	1200	7900
SE80G(STL)	7/28	6 5	43	16	33	43	78	14	43	270	180	110	38	41	41	18	29	19	17	21	510
PL05C N(STL)	7/28	8	130	130	130	7 8	52	29	130	610	210	200	160	520	550	220	320	400	200	400	3200
SE45C W(STL)	7/28	6 5	42 5	42 5	110	71	54	9 2	42 5	370	72	62	41	120	190	86	110	130	78	130	1000
SE114B(STL)	7/28	6	19 5	19 5	19 5	15	19	5 6	7 9	110	150	110	44	68	70	31	52	41	35	41	640
PL11B N(STL)	8/1/00	7	120	120	120	24	10	4 6	120	500	38	49	47	130	260	120	120	110	81	130	1100
PL11B S(STL)	8/1/00	27	115	115	115	24	23	22	115	500	69	59	110	400	400	200	180	200	110	200	1900
SE37C N(STL)	8/2/00	21	130	130	130	26	41	26	130	600	140	150	190	450	530	240	300	400	200	390	3000
SE37/72C W(STL)	8/2/00	26	125	125	125	25	25	15	125	600	110	48	84	250	510	180	180	390	200	430	2400
SE37C S(STL)	8/2/00	7 5	125	125	125	5 5	22	7 2	125	500	65	54	41	130	240	94	87	180	89	210	1200
SE67D(STL)	8/3/00	19	600	600	100	460	1700	240	600	[illegible]4300	4000	3200	1100	1700	1200	560	810	600	230	690	[illegible]14000
SE27B 1 N(STL)	8/3/00	18	175	175	175	35	15	12	83	700	100	97	110	350	560	260	280	420	220	460	3000
SE27B 1 S(STL)	8/3/00	30	450	450	450	90	43	15	450	1900	290	410	180	550	940	390	490	590	290	690	4800
SE27B 1 E(STL)	8/3/00	6 5	21	13	21	4 3	1 5	4 3	21	86	3 1	4 5	4 1	7 5	35	11	12	17	10	14	120
SE27B 1(STL)	8/3/00	26	240	240	240	49	33	19	240	1100	520	620	230	460	810	370	370	540	270	610	4800
SE67E	8/11/00	59	870	140	880	720	1600	380	83	[illegible]4700	2000	1400	540	870	440	380	330	220	83 5	200	6500
SE67E (STL)	8/11/00	20	300	445	420	660	1900	230	445	[illegible]4400	2900	2200	850	1200	950	460	630	450	210	470	[illegible]10300
SE67F (STL)	8/21/00	6 5	7 2	85	13	15	47	10	8 4	200	160	150	52	88	65	30	43	32	17	34	700

Criteria
PCP _400ug/kg
low mol wt sum _ 3200ug/kg
high mol wt sum _9600ug/kg
Shaded areas are above criteria

ATTACHMENT 3

View of St Mary s County Learning Center Property (March 2000)



Upper Stream Excavation (February 2000)

ORIGINAL (Red)

Downstream View from the Continuous Stretch (May 2000)

Downstream View from SE73 (June 2000)

Head of Stream Upper Reach Down Gradient from Pit 4 (June 2000)

Mini Excavator at Work (February 2000)

ORIGINAL (Red)

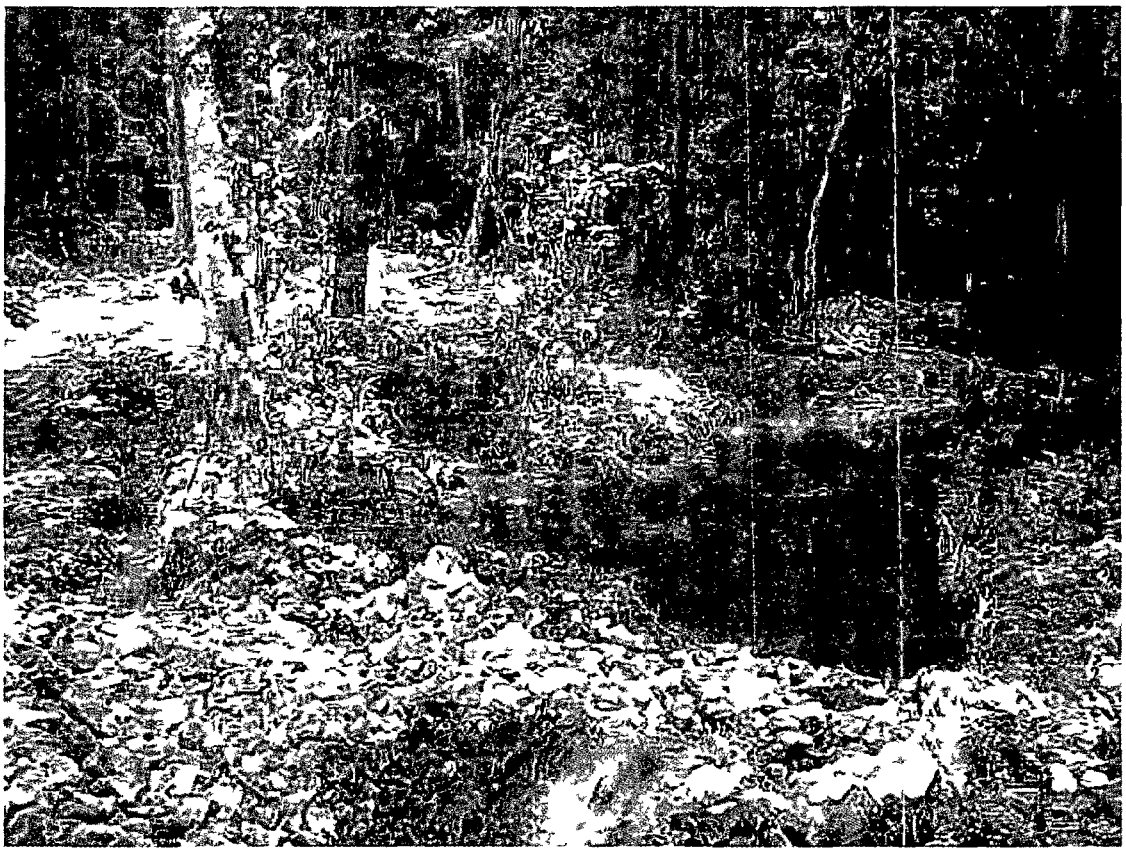
View from the End of the Excavation Haul Road (June 2000)

Sample Location SE 21 (Lower Reach Section A) (June 2000)

ORIGINAL (Red)

Second Sedimentation Trap (June 2000)

Stream Haul Road (May 2000)

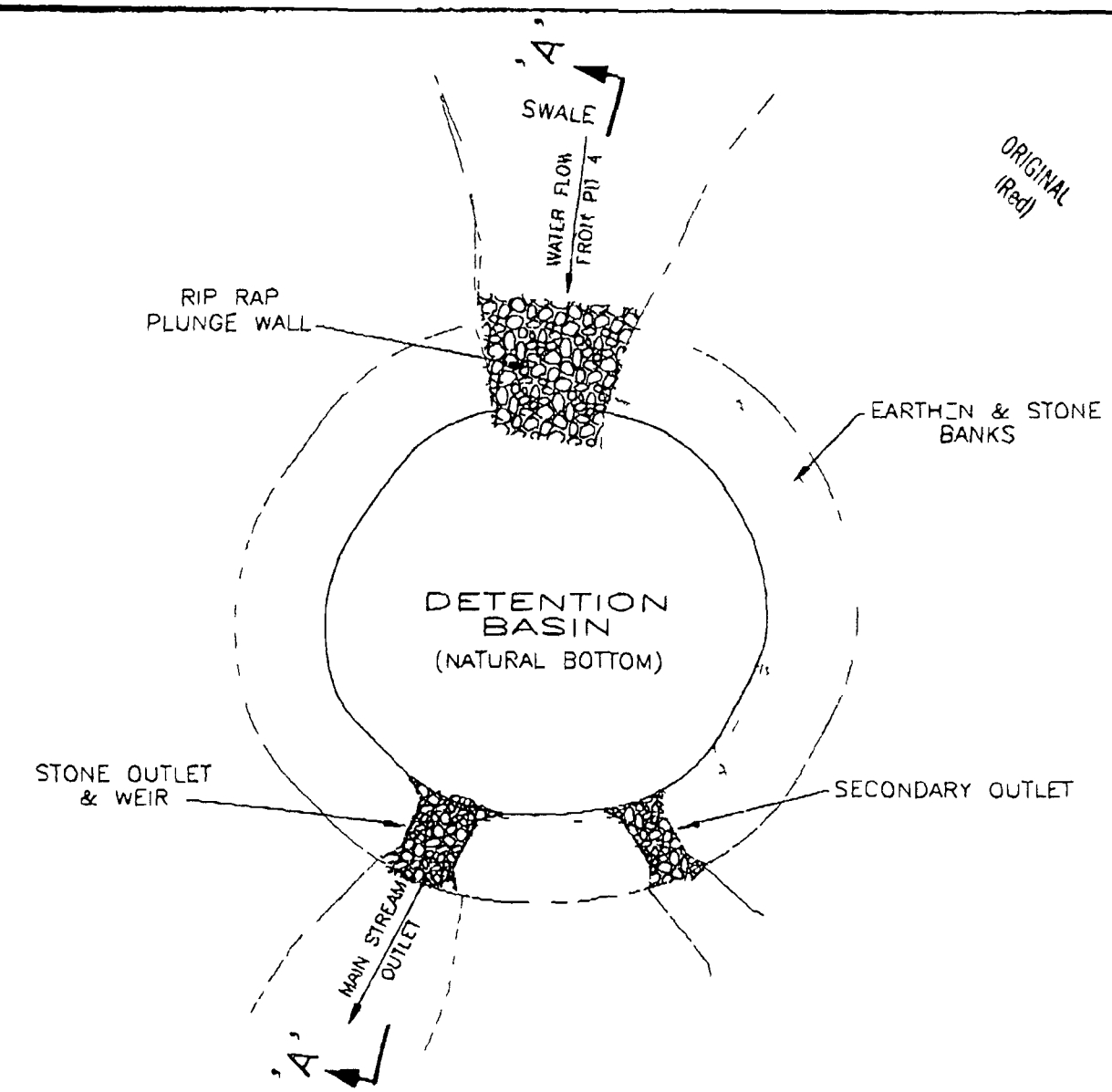


Excavation at Sample Location SE 80 (May 2000)

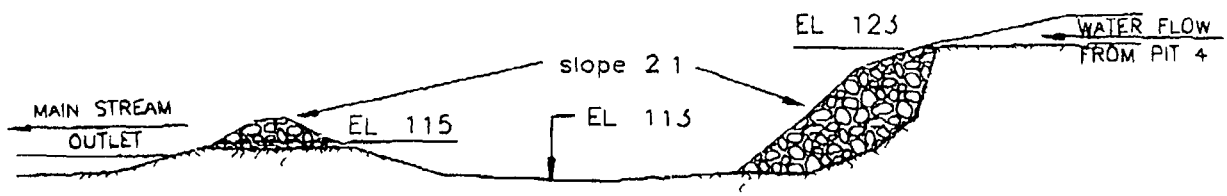
Third Sedimentation Trap (June 2000)

ATTACHMENT 4

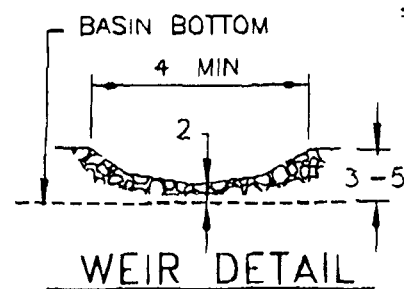
IMAGE	X-REF	OFFICE	DRAWN BY	CHECKED BY	APPROVED BY	DRAWING NUMBER
-	- -	SOM	J Donzo 7/13/00			706556-A?



PLAN VIEW



SECTION 'A-A'



WEIR DETAIL

IT CORPORATION

DETENTION BASIN DETAIL
SOUTHERN MARYLAND WOOD TREATMENT FACILITY

666716-a1.dwg 07/13/00 2:36pm JRD

IT CORPORATION
A Member of The IT Group

cc to Ditcher, OGS
Dave Miller Original
back to me (KT)

By FMG Date 06/23/00 Subject CHANNEL DESIGN Sheet No 1 of 11

Chkd By [illegible] Date 6/27/00 SOUTHERN MARYLAND WOOD PLANT Proj No 24-7160

05 cm X 05 cm

Purpose To design a channel to carry run-off from Pit #4 once the [illegible] of Pit #4

References 1) Goldman, Steven J, et al, "Erosion & Sediment Control Handbook", McGraw Hill Publishing Co 1986

2) "Urban Hydrology For Small Watersheds TR-55 Soil Conservation Service, Washington, DC [illegible]

3. [illegible] Pit #4

50 ft crest
5:1 [illegible]
20' lined

} n = 0.060 for 0.060 with a slope of 3%

Pit #4

47 acres ≈ 50 acres (See Sheet 3)

Calculations
Using Rational Method,
$Q = CiA$ where Q = runoff rate, cfs
C = runoff coefficient
i = precipitation intensity, in/hr
A = Watershed area, acres

$$C = \frac{(15\text{acres} \times 0.15) + (5\text{acres} \times 0.40) + (5\text{acres} \times 0.25)}{15\text{acres}}$$

$C = 0.27$ (See Sheet 4)

25-year, 30 min = 2.45 inches (See Sheet 5)

25 year, 1-hour 3 inches (See Sheet 6)

IT CORPORATION
A Member of The IT Group

By PMG Date 06/23/00 Subject CHANNEL DESIGN Sheet No 6 of 11

Chkd By PSV Date 6/26/00 SOUTHERN MARYLAND WOOD TREATING PLANT Proj No 8 716

0.5 cm X 0.5 cm

$T_c = 0.66$ hrs (See Sheet 7)

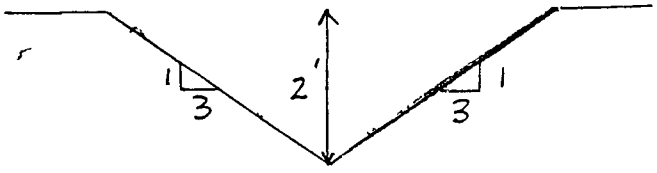
$$i = \frac{3.66 in}{40 min} \times \frac{60 min}{1 hr} = 4.0 in/hr$$

$A = 15$ acres

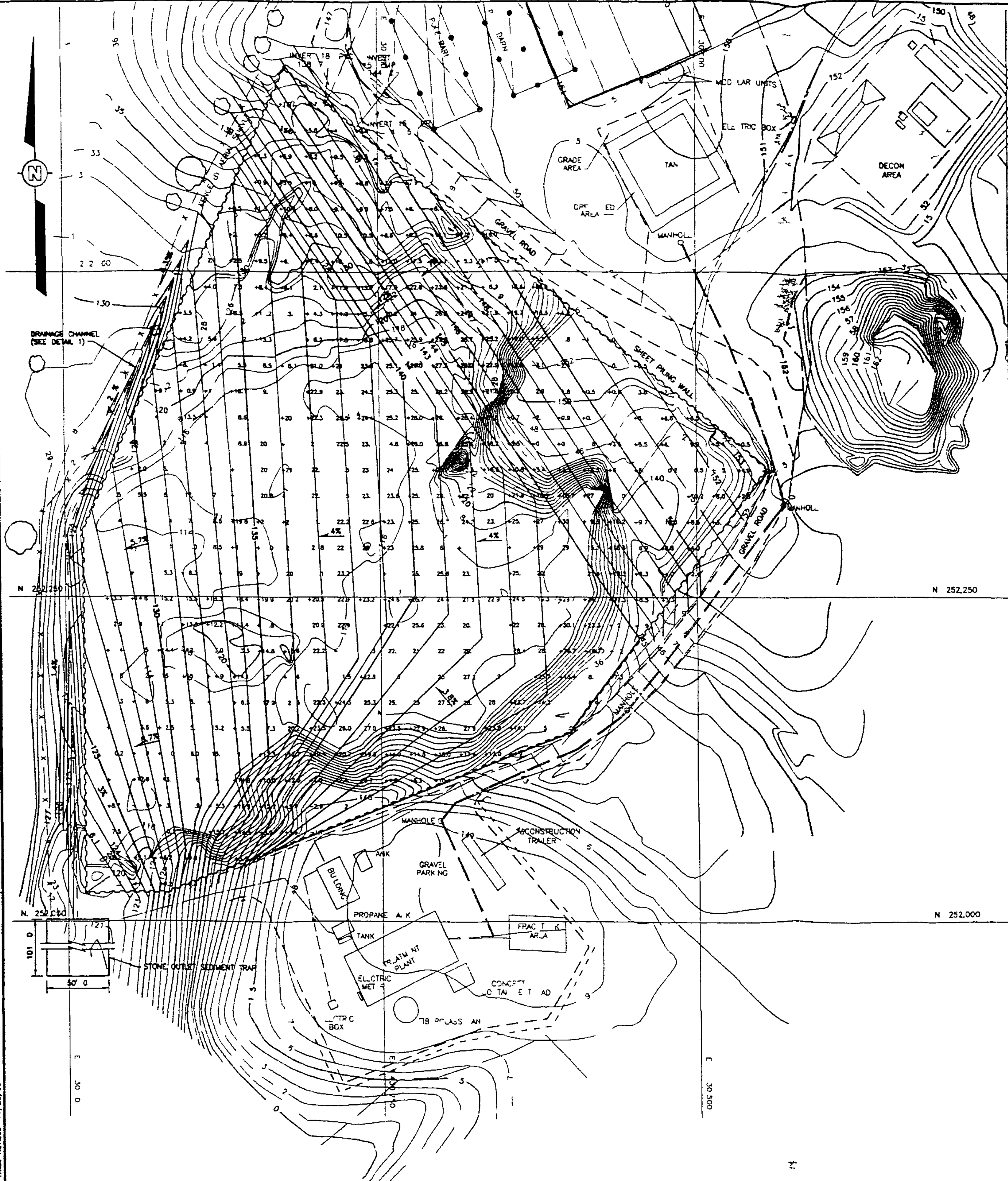
$Q = CiA = 0.27 \times (4.0 in/hr) \times (15 acres)$

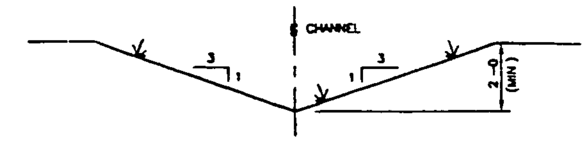
$Q = 16.2$ cfs ≈ 17 cfs

Channel Sizing (See Sheet 11)



- approximate slope ~ 2%
- channel to be grass lined





DETAIL 1
DRAINAGE CHANNEL

N.T.S.

NOTE
CHAN EL WILL BE GRASS LINED

Volume Report 06/26/2000
Comparing GRID file: C./sc14/DATA/866716/ex.grd
and GRID file: C./sc14/DATA/866716/866716E1a.grd
Grid corner locations: 1429851 69,252008.05 to 1430736.69 252683.05
Grid resolution X. 177 Y 135 Grid cell size X. 5.00 Y 5.00
Area in Cut 7889.5 sq ft, 0.181 acres
Area in Fill: 193405.3 sq ft, 4 440 acres
Total inclusion area 201294 7 sq ft, 4 6 1 acres
Cut to Fill ratio: 0.00
Average Cut Depth: 1.38 Average Fill Depth 15 90
Cut (C.Y) / Area (acres) 87.27
Fill (C Y) / Area (acres) 24652.26
Cut volume 10888.36 cubic ft, 403 27 cub yards
Fill volume: 3075849.39 cubi ft, 113920 35 cubic yards

DRAFT

SCALE 0 40 80 120 FEET

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE

IT CORPORATION

U S ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
BALTIMORE MARYLAND

PIT #4 GRADING PLAN
SOUTHERN MARYLAND WOOD
TREATMENT FACILITY
HOLLYWOOD MD

DESIGNED BY	PMG	6/26/00	CHECKED BY	PSY	6/26/00
DRAWN BY	GSJ/RW	6/26/00	APPROVED BY		-
SCALE: AS SHOWN	DRAWING NO 866716-E1		SHEET NO --		REVISION NO --

O:\Project\866716\866716E1.dwg
Plot Date/Time 06/26/00 04 11pm
Format Revised 11/23/99
Images Xr 1
VERIFY SCALE

TABLE 4 1 Rational Method *C* Values (13)

Land use	*C*	Land use	*C*
Business		Lawns	
Downtown areas	0 70–0 95	Sandy soil flat, 2%	0 05–0 10
Neighborhood areas	0 50–0 70	Sandy soil average 2–7%	0 10–0 15
Residential		Sandy soil steep 7%	0 15–0 20
Single family areas	0 30–0 50	Heavy soil flat, 2%	0 13–0 17
Multi units detached	0 40–0 60	Heavy soil, average 2–7%	0 18–0 22
Multi units attached	0 60–0 75	Heavy soil steep 7%	0 25–0 35
Suburban	0 25–0 40	Agricultural land 0–30%	
Industrial		Bare packed soil	
Light areas	0 50–0 80	Smooth	0 30–0 60
Heavy areas	0 60–0 90	Rough	0 20–0 50
Parks cemeteries	0 10–0 25	Cultivated rows	
Playgrounds	0 20–0 35	Heavy soil no crop	0 30–0 60
Railroad yard areas	0 20–0 40	Heavy soil with crop	0 20–0 50
Unimproved areas	0 10–0 30	Sandy soil no crop	0 20–0 40
Streets		Sandy soil with crop	0 10–0 25
Asphaltic	0 70–0 95	Pasture	
Concrete	0 80–0 95	Heavy soil	0 15–0 45
Brick	0 70–0 85	Sandy soil	0 05–0 25
Drives and walks	0 75–0 85	Woodlands	0 05–0 25
Roofs	0 75–0 95	Barren slopes >30%	
		Smooth impervious	0 70–0 90
		Rough	0 50–0 70

Note The designer must use judgment to select the appropriate *C* value within the range Generally larger areas with permeable soils flat slopes and dense vegetation should have lowest *C* values Smaller areas with dense soils moderate to steep slopes and sparse vegetation should be assigned highest *C* values

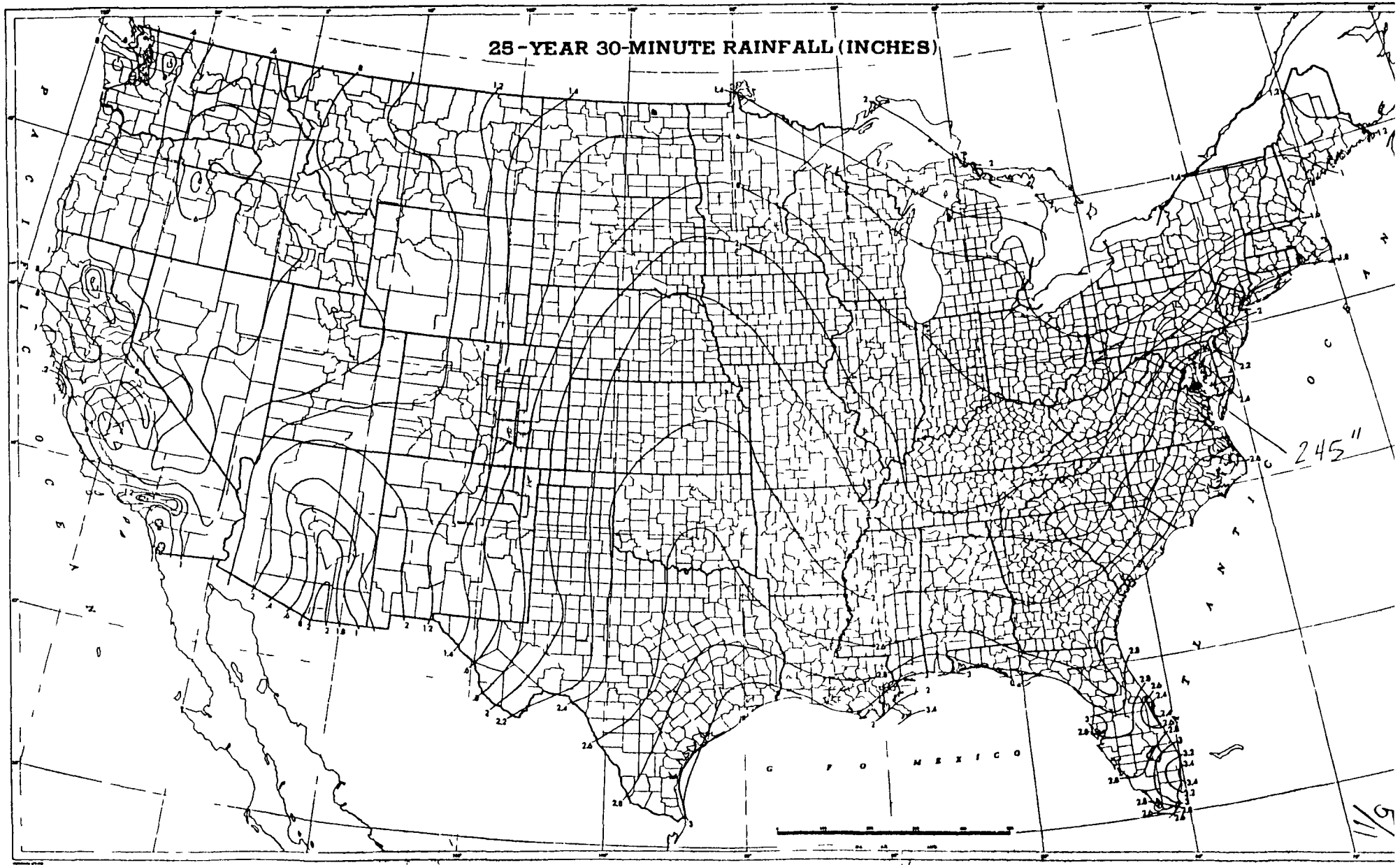
From Portland Cement Association *Handbook of Concrete Culvert Pipe Hydraulics* 1964 p 45

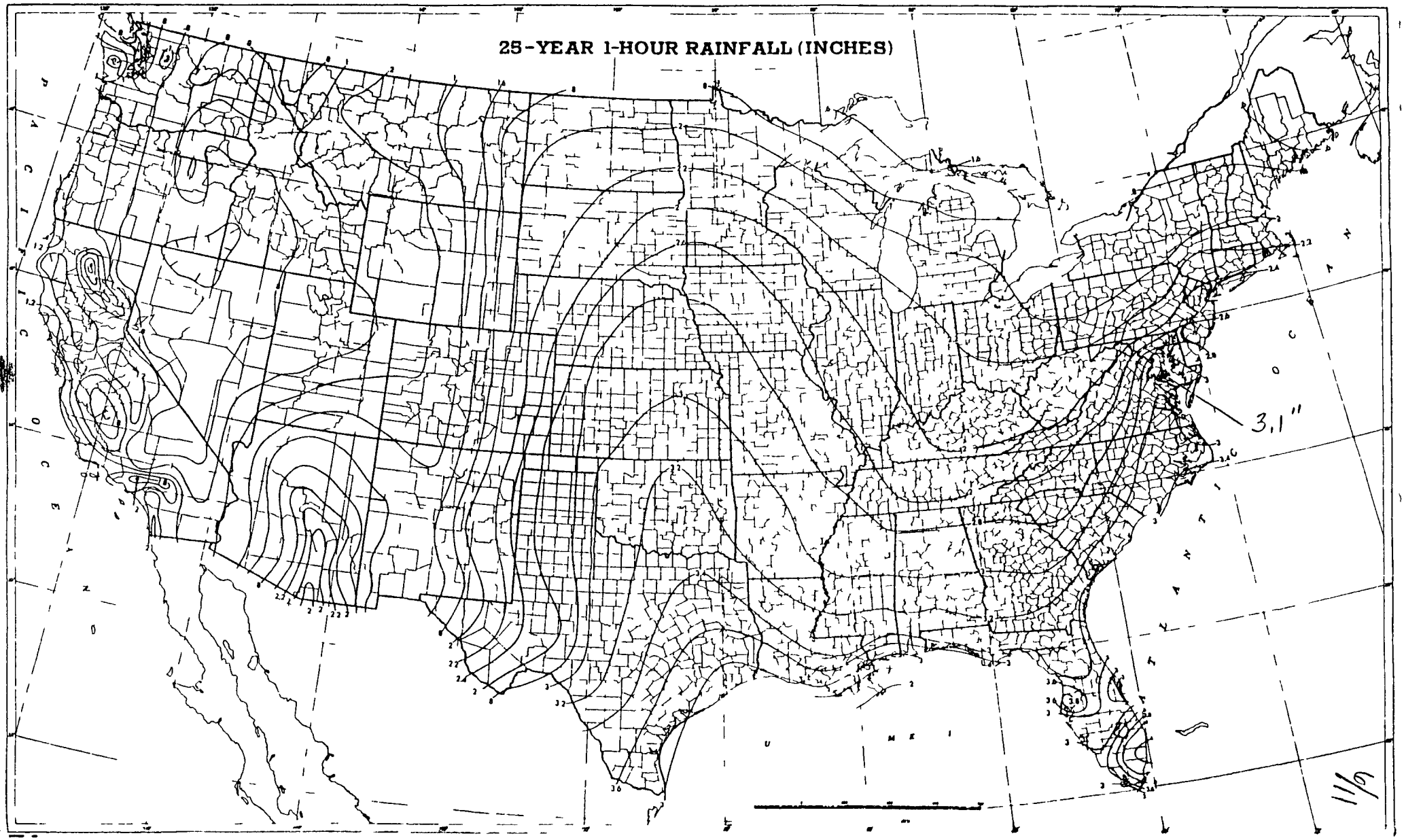
the range given by considering factors such as permeability soil type steepness and vegetation

For construction sites when the soil is bare and the slope is less than 30 per cent use the agricultural values in the table and consider soil conditions and density of vegetation For areas with temporary vegetative cover select a value from the ranges for cultivated rows for undisturbed areas under natural grass and shrub cover assign an appropriate unimproved areas *C* value between 0 10 and 0 30 If the slope gradient is greater than 30 percent for example 3 1 or 2 1 choose a value in the range 0 50–0 90 under barren slopes Soil depth or depth to impermeable rock influences the choice within the ranges given the *C* value is higher for shallower soils For sites with mixed land uses compute a weighted average of the individual *C* values as follows

If area $A = x + y$ then

$$C \text{ (weighted)} = \frac{(x \times C) + (y \times C_y)}{A}$$


25-YEAR 30-MINUTE RAINFALL (INCHES)
G O F M E X I C O
245"


25-YEAR 1-HOUR RAINFALL (INCHES)
3.1"

7/11

Worksheet 3 Time of concentration (T_c) or travel time (T_t)

Project Southern Maryland Wood Part By PMG Date 06/23/00

Location Hollywood Maryland Checked FSN Date 4/21/00

Circle one (Present) Developed

Circle one (T_c) T_t through subarea

NOTES Space for as many as two segments per flow type can be used for each worksheet

Include a map schematic, or description of flow segments

Sheet flow (Applicable to T_c only)		Segment ID		
1	Surface description (table 3-1)		LIGHT UNDER BRUSH	RANGE (NATURAL)
2	Manning's roughness coeff., n (table 3-1)		0.40	0.13
3	Flow length, L (total L ≤ 300 ft)	ft	150	150
4	Two-yr 24-hr rainfall P_2	in	3.1	3.4
5	Land slope s	ft/ft	0.03	0.03
6	$T_t = \frac{0.007 (nL)^{0.8}}{P_2^{0.5} s^{0.4}}$ Compute T_t	hr	0.41 + 0.17 = 0.58	

(See Sheet 8)

(See Sheet 9)

Shallow concentrated flow		Segment ID		
7	Surface description (paved or unpaved)		UNPAVED	
8	Flow length L	ft	360	
9	Watercourse slope, s	ft/ft	0.03	
10	Average velocity, V (figure 3-1)	ft/s	2.8	
11	$T_t = \frac{L}{3600\ V}$ Compute T_t	hr	0.04 +	= 0.04

(See Sheet 10)

Channel flow		Segment ID		
12	Cross sectional flow area a	ft^2	4.61	
13	Wetted perimeter, p_w	ft	7.8	
14	Hydraulic radius, $r = \frac{a}{p_w}$ Compute r	ft	0.59	
15	Channel slope, s	ft/ft	0.02	
16	Manning's roughness coeff., n		0.04	
17	$V = \frac{1.49\ r^{2/3} s^{1/2}}{n}$ Compute V	ft/s	3.7	
18	Flow length, L	ft	550	
19	$T_t = \frac{L}{3600\ V}$ Compute T_t	hr	0.04 +	= 0.04
20	Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19)	hr		0.66

Sheet flow

Sheet flow is flow over plane surfaces It usually occurs in the headwater of streams With sheet flow the friction value (Manning s n) is an effective roughness coefficient that includes the effect of raindrop impact drag over the plane surface obstacles such as litter, crop ridges and rocks and erosion and transportation of sediment These n values are for very shallow flow depths of about 0 1 foot or so Table 3-1 gives Manning s n values for sheet flow for various surface conditions

For sheet flow of less than 300 feet use Manning s kinematic solution (Overton and Meadows 1976) to compute T_t

$$T_t = \frac{0\ 007\ (nL)^{0\ 8}}{(P_2)^{0.5}\ s^{0\ 4}} \qquad \text{[Eq 3-3]}$$

Table 3-1 —Roughness coefficients (Manning s n) for sheet flow

Surface description	n[1]
Smooth surfaces (concrete asphalt, gravel or bare soil)	0 011
Fallow (no residue)	0 05
Cultivated soils	
Residue cover ≤20%	0 06
Residue cover >20%	0 17
Grass.	
Short grass prairie	0 15
Dense grasses[2]	0.24
Bermudagrass	0 41
Range (natural)	0 13
Woods:[3]	
Light underbrush	0 40
Dense underbrush	0.80

[1]The n values are a composite of information compiled by Engman (1986).
[2]Includes species such as weeping lovegrass bluegrass buffalo grass, blue grama grass, and native grass mixtures.
[3]When selecting n consider c ver to a height of about 0 1 ft. This is the only part of the plant c ver hat will obstruct sheet flow

where

T_t = travel time (hr)
n = Manning s roughness coefficient (table 3-1)
L = flow length (ft)
P_2 = 2 year 24 hour rainfall (in) and
s = slope of hydraulic grade line (land slope ft/ft)

This simplified form of the Manning s kinematic solution is based on the following (1) shallow steady uniform flow (2) constant intensity of rainfall excess (that part of a rain available for runoff) (3) rainfall duration of 24 hours and (4) minor effect of infiltration on travel time Rainfall depth can be obtained from appendix B

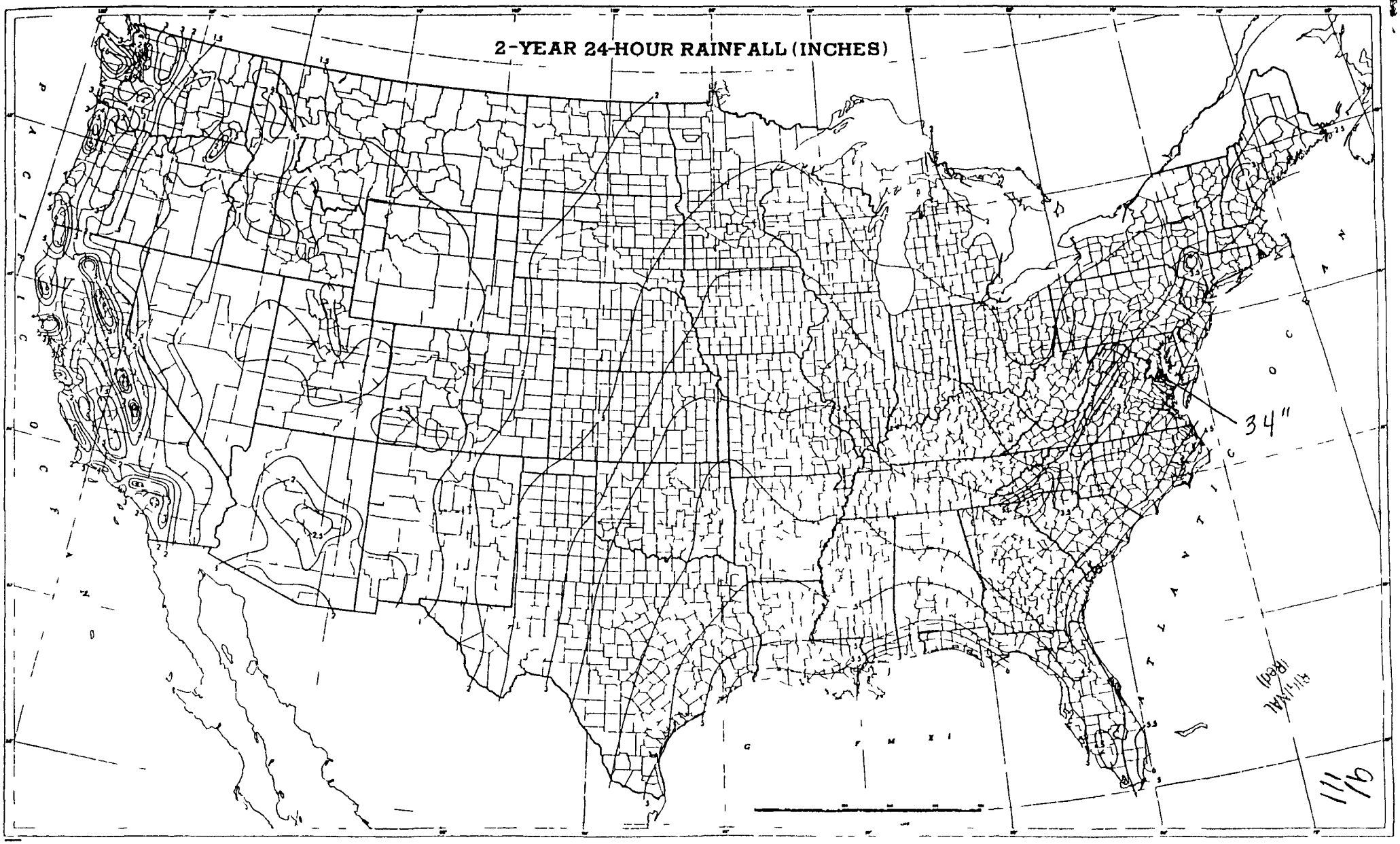
Shallow concentrated flow

After a maximum of 300 feet sheet flow usually becomes shallow concentrated flow The average velocity for this flow can be determined from figure 3-1 in which average velocity is a function of watercourse slope and type of channel. For slopes less than 0 00b ft/ft use equations given in appendix F for figure 3-1 Tillage can affect the direction of shallow concentrated flow Flow may not always be directly down the watershed slope if tillage runs across the slope

After determining average velocity in figure 3 1 use equation 3 1 to estimate travel time for the shallow concentrated flow segment

Open channels

Open channels are assumed to begin where surveyed cross section information has been obtained where channels are visible on aerial photographs or where blue lines (indicating streams) appear on United States Geological Survey (USGS) quadrangle sheets Manning s equation or water surface profile information can be used to estimate average flow velocity Average flow velocity is usually determined for bank full elevation


2-YEAR 24-HOUR RAINFALL (INCHES)
34"

10/11

ORIGINAL (Red)

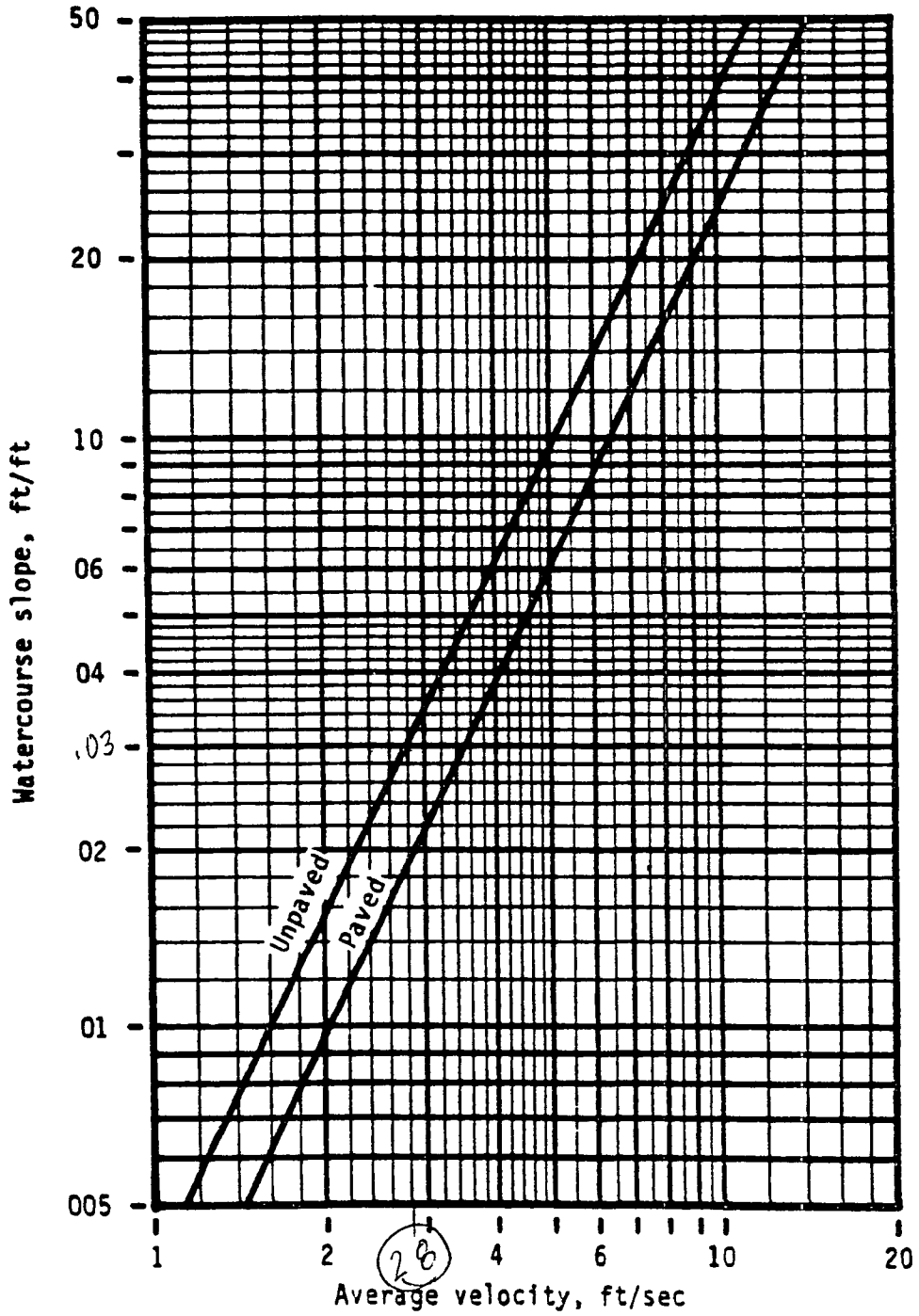


Figure 3 1 —Average velocities for estimating travel time for shallow concentrated flow

11/11

Triangular Channel Analysis & Design
Open Channel - Uniform flow

ORIGINAL (Red)

Worksheet Name Triangular Channel

Comment Southern Maryland Wood Treatment Facility

Solve For Depth

Given Input Data

Left Side Slope	3 00 1 (H V)
Right Side Slope	3 00 1 (H V)
Manning's n	0 040
Channel Slope	0 0200 ft/ft
Discharge	17 00 cfs

Computed Results

Depth	1 24 ft
Velocity	3 69 fps
Flow Area	4 61 sf
Flow Top Width	7 44 ft
Wetted Perimeter	7 84 ft
Critical Depth	1 15 ft
Critical Slope	0 0301 ft/ft
Froude Number	0 83 (flow is Subcritical)

< 4 fps channel grass lined

Required Depth = 1.24 ft + 0.5 ft freeboard
= 1.74 ft (minimum)

actual depth 2' OK

Open Channel Flow Module, Version 3 15 (c) 1990
Haestad Methods Inc * 37 Brookside Rd * Waterbury, Ct 06708

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ORIGINAL (Red)

By PSV Date 6/21/00 Subject Southern MD Wood Trtmt Fac Sheet No 1 of 6

Chkd By PMG Date 06/26/00 Trap Capacity Requirements Proj No 866716

.25 in X 25 i

Objective Determine capacity and design requirements for sediment trap where the runoff from disturbed area will be directed

Given The disturbed area is within the limits of sheet piles, and is 47 acres The runoff from this area will be directed to the temporary sediment trap It is assumed that no run-on into this area will be allowed, and the runoff from only this area will be flowing into the sediment trap without mixing with other flows

Reference 1994 Maryland standards and Specifications for Soil Erosion and Sediment Control, MDE, 1994

Calculations Total Drainage area for trap = 47 Acres
≈ 50 Acres

ST-II sediment trap will be appropriate

Storage capacity

wet Volume = 50 x 1800 = 9,000 ft³

Dry Volume = 50 x 1800 = 9,000 ft³

Total volume = 18,000 ft³

Weir length = 50 x 40 = 20 ft

Reqd trap Bottom Dimensions = 101' x 50'

Side slopes = 2H 1V

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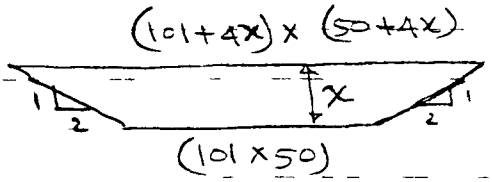
By RSV Date 6/21/00 Subject Southern MD Wood Tint Fac Sheet No 2 of 6

Chkd By PMG Date 06/26/00 Trap Cap Requirements Proj No 866716

25 in X 25 in

calculate min ht of wet storage

Required vol = 9,000 ft^3



$$Vol = \frac{(101+4x)(50+4x)+(101\times 50)}{2} \times x = 9000$$

$$\frac{5050+200x+404x+16x^2+5050}{2}\, x = 9000$$

$$x\left(2525+100x+202x+8x^2+2525\right) = 9000$$

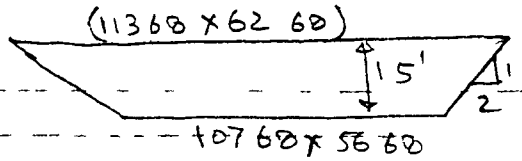
$$x\left(8x^2+302x+5050\right) = 9000$$

$$8x^3+302x^2+5050x-9000 = 0$$

by trial & error $x = 1.62$ ft
$= 19.4$ inches
$= 20$ inches (say)
$= 1.67$ ft

Similarly, the height of dry storage can be calculated to be 15 ft

Check



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ORIGINAL (Red)

By PSV Date 6/21/00 Subject Southern MD Wood Tmt Fac Sheet No 3 of 6

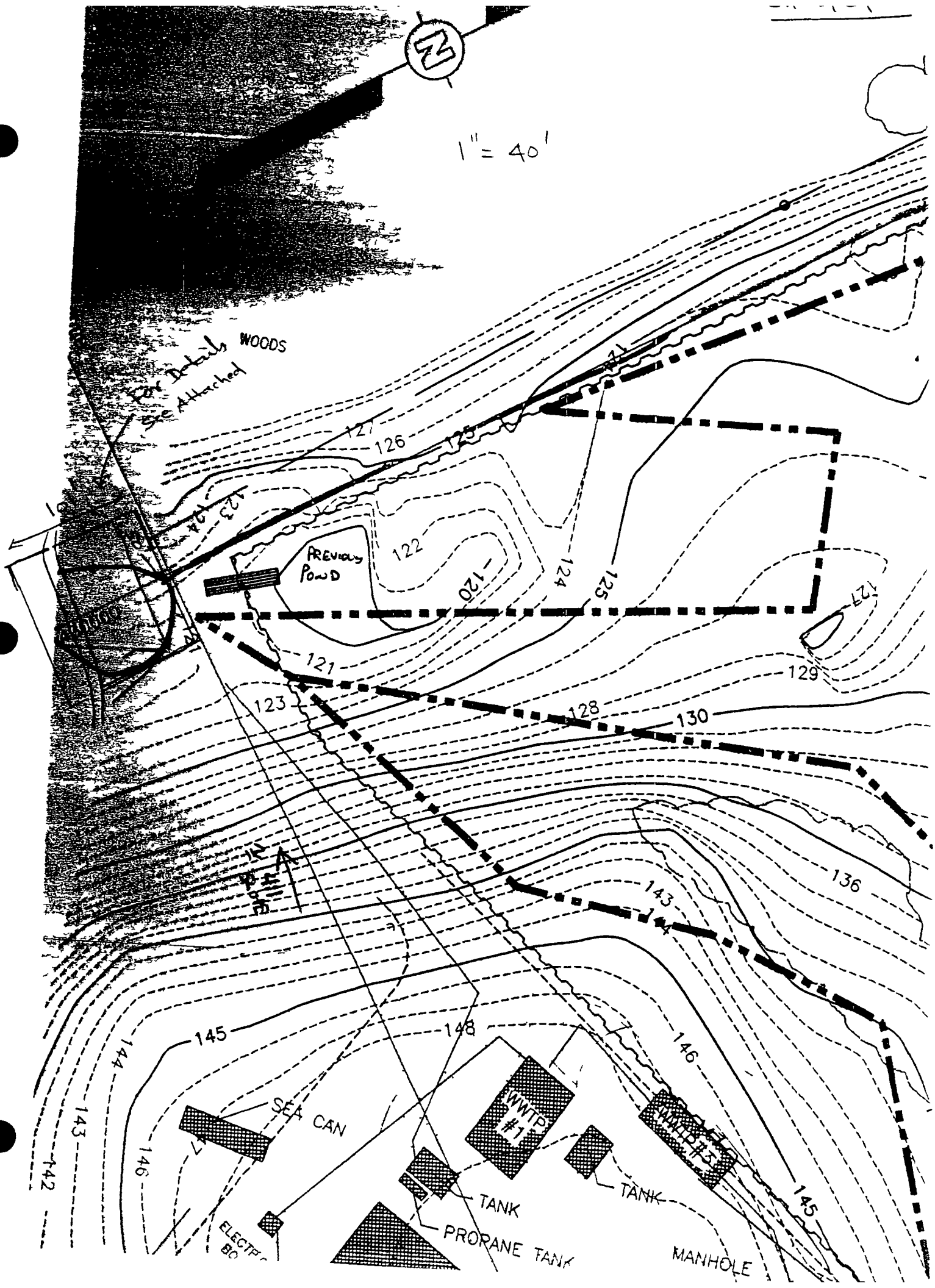
Chkd By PMG Date 06/26/00 Trap Cap Requirements Proj No 866716

.25 in X 25 in

$$\text{dry Vol} = \frac{(113.68 \times 62.68) + (107.68 \times 56.68)}{2} 15$$

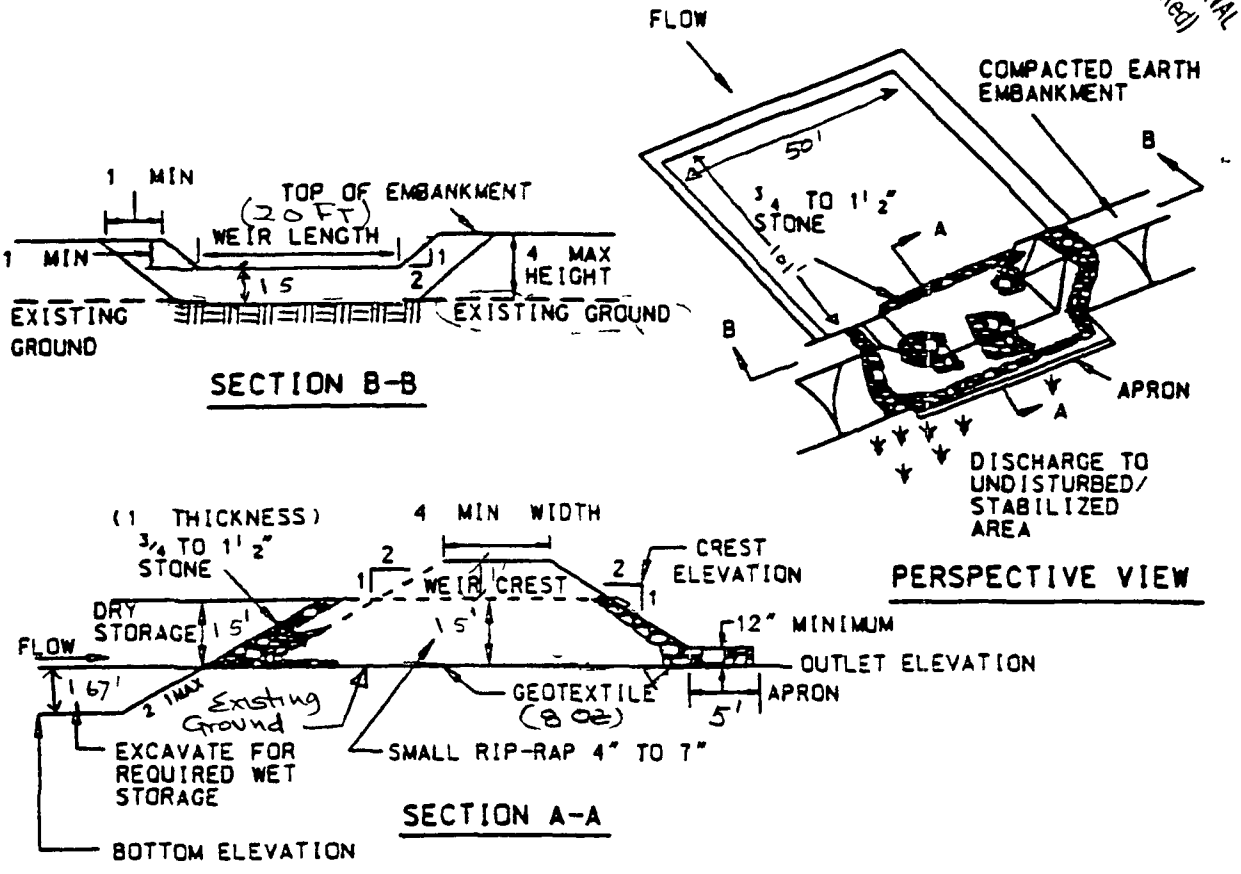
$$= 9{,}922 > 9{,}000 \text{ ft}^3 \quad \text{OK}$$

Conclusion The proposed sediment trap details and specs are included in sheets 4 through 6


2
1" = 40'
For Details WOODS
See Attached
PREVIOUS POND
SEA CAN
WWTP #1
WWTP #3
TANK
TANK
PROPANE TANK
MANHOLE
ELECTRIC BOX
120
121
122
123
124
125
126
127
128
129
130
136
142
143
144
145
146
148

DETAIL 9 - STONE OUTLET SEDIMENT TRAP - ST II

ORIGINAL (Red)



Construction Specifications

1 Area under embankment shall be cleared grubbed and stripped of any vegetation and root mat The pool area shall be cleared

2 The fill material for the embankment shall be free of roots and other woody vegetation as well as over-sized stones rocks organic material or other objectionable material The embankment shall be compacted by traversing with equipment while it is being constructed

3 All cut and fill slopes shall be 2 1 or flatter

4 The stone used in the outlet shall be small rip-rap 4" to 7" in size with a 1 thick layer of 3/4 to 1 1/2" washed aggregate placed on the upstream face of the outlet Stone facing shall be as necessary to prevent clogging Geotextile Class C may be (8 oz) substituted for the stone facing by placing it on the inside face of the stone outlet

5 Sediment shall be removed and trap restored to its original dimensions when the sediment has accumulated to one half of the wet storage depth of the trap Removed sediment shall be deposited in a suitable area and in such a manner that it will not erode

STONE OUTLET SEDIMENT TRAP - ST II

6 The structure shall be inspected periodically and after each rain and repairs made as needed

7 Construction of traps shall be carried out in such a manner that sediment pollution is abated Once constructed the top and outside face of the embankment shall be stabilized with seed and mulch Points of concentration inflow shall be protected in accordance with Grade Stabilization Structure criteria The remainder of the interior slopes should be stabilized (one time) with seed and mulch upon trap completion and monitored and maintained erosion free during the life of the trap

8 The structure shall be dewatered by approved methods removed and the area stabilized when the drainage area has been properly stabilized

9 Refer to Section D for specifications concerning trap dewatering

10 Minimum trap depth shall be measured from the weir elevation

11 The elevation of the top of any dike directing water into the trap must equal or exceed the elevation of the trap embankment

12 Geotextile Class C (802) shall be placed over the bottom and sides of the outlet channel prior to the placement of stone Sections of filter cloth must overlap at least 1 with the section nearest the entrance placed on top The filter cloth shall be embedded at least 6" into existing ground at the entrance of the outlet channel

13 Outlet - An outlet shall be provided including a means of conveying the discharge in an erosion free manner to an existing stable channel

ATTACHMENT 5

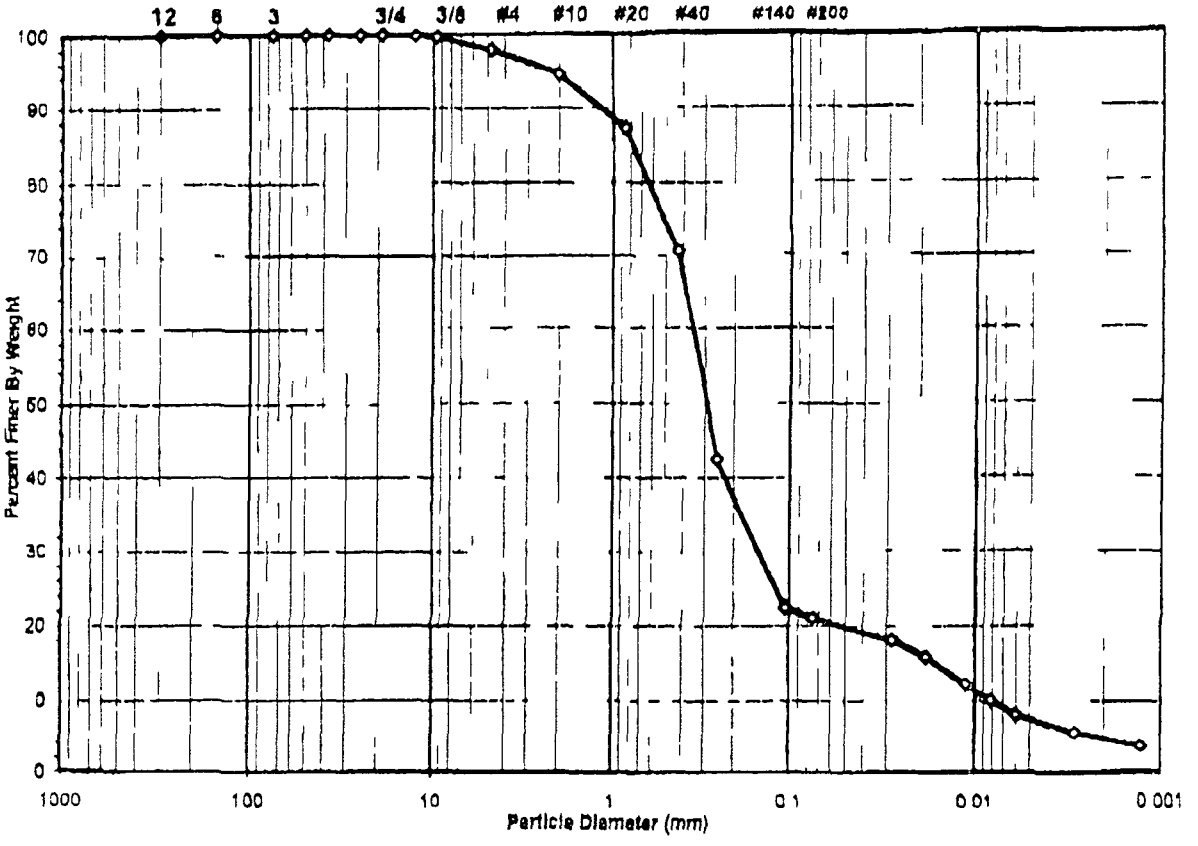
geotechnics

SIEVE AND HYDROMETER ANALYSIS
ASTM D 422 63 (SOP S3)

ORIGINAL (Red)

Client	STL	Boring No	NA
Client Reference	IT/ SMWT C0F300129	Depth (ft)	NA
Project No	00191 01	Sample No	SE19A 0 8
Lab ID	00191 01 001	Soil Color	BROWN

	SIEVE ANALYSIS			HYDROMETER	
USCS	cobbles	gravel	sand	silt and clay fraction	
USDA	cobbles	gravel	sand	silt	clay



USCS Summary		
Sieve Sizes (mm)		Percentage
Greater Than #4	*Gravel*	2 14
#4 To #200	*Sand*	76 89
Finer Than #200	*Silt & Clay*	20 98

USCS Symbol	*sc ASSUMED* (W/ ORGANICS)
USCS Classification	*CLAYEY SAND*

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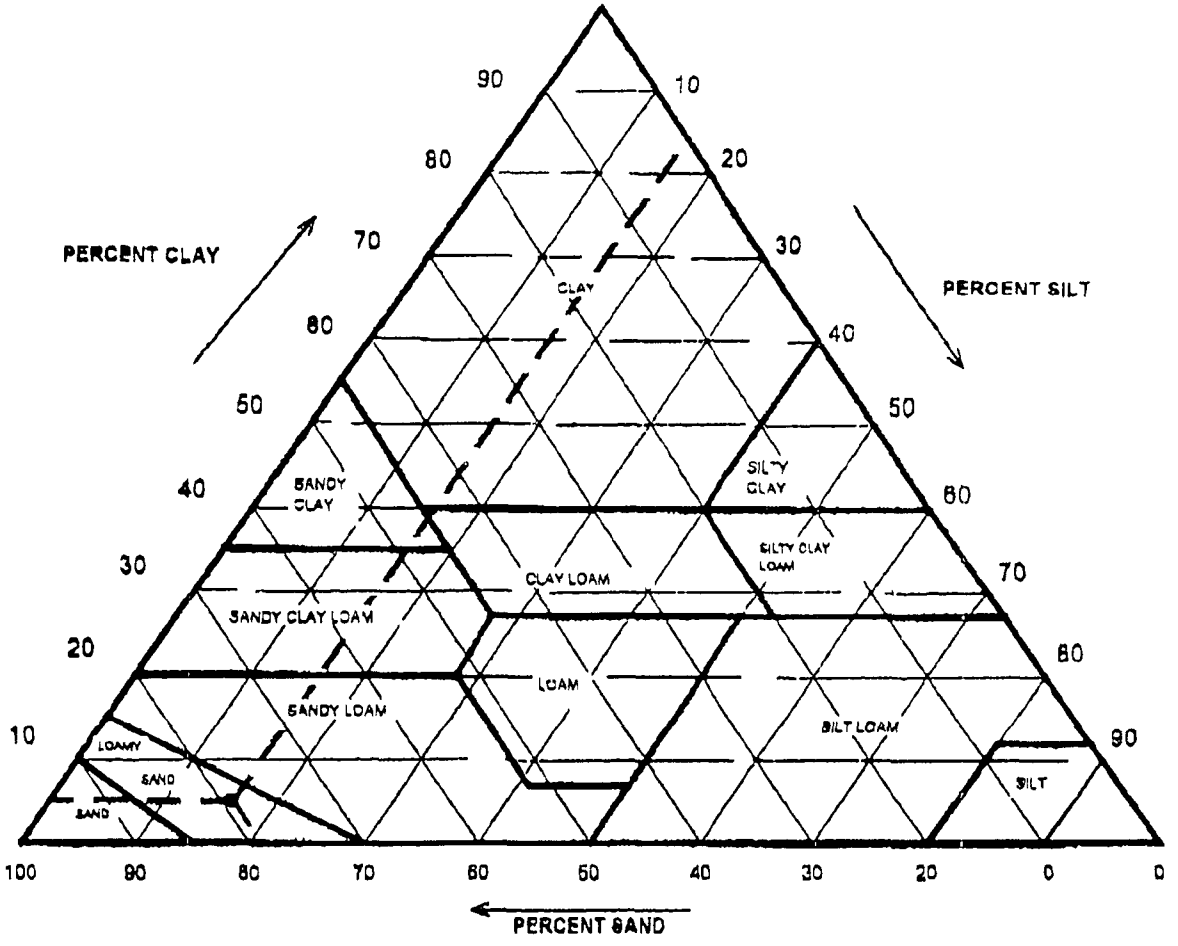
USDA CLASSIFICATION CHART

Client	STL	Boring No	NA
Client Reference	IT/ SMWT C0F300129	Depth (ft)	NA
Project No	00191 01	Sample No	SE19A 0 6
Lab ID	00191 01 001	Soil Color	BROWN



Particle Size (mm)	Percent Finer	USDA SUMMARY	Actual Percentage	Corrected % of Minus 2 0 mm material for USDA Classificat
		Gravel	5 55	0 00
2	94 45	*Sand*	74 88	79 05
0 05	19 79	*Silt*	15 00	15 89
0 002	4 78	*Clay*	4 78	5 06

USDA Classification ***LOAMY SAND***

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geotechnics ORIGINAL (Red)

WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP S3)

Client	STL	Boring No	NA
Client Reference	IT/ SMWT C0F300128	Depth (ft)	NA
Project No	00191 01	Sample No	SE19A 0 6
Lab ID	00191 01 001	Soil Color	BROWN

Moisture Content of Passing 3/4 Material		Water Content of Retained 3/4 Material	
Tare No	1683	Tare No	NA
Wgt Tare + Wet Specimen (gm)	877 90	Wgt Tare + Wet Specimen (gm)	NA
Wgt Tare + Dry Specimen (gm)	697 60	Wgt Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	98 98	Weight of Tare (gm)	NA
Weight of Water (gm)	180 30	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	598 62	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**30 1**	**Moisture Content (%)**	**NA**

Wet Weight 3/4 Sample (gm)	NA	Weight of the Dry Specimen (gm)	598 62
Dry Weight 3/4 Sample (gm)	473 04	Weight of minus #200 material (gm)	125 58
Wet Weight +3/4 Sample (gm)	NA	Weight of plus #200 material (gm)	473 04
Dry Weight + 3/4 Sample (gm)	0 00		
Total Dry Weight Sample (gm)	NA		

Sieve Size	Sieve Opening (mm)	Wgt of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12	300	0 00	0 00	0 00	100 00	100 00
6	150	0 00	0 00	0 00	100 00	100 00
3	75	0 00	0 00	0 00	100 00	100 00
2	50	0 00	0 00	0 00	100 00	100 00
1 1/2'	37 5	0 00	0 00	0 00	100 00	100 00
1	25 0	0 00	0 00	0 00	100 00	100 00
3/4	19 0	0 00	0 00	0 00	100 00	100 00
1/2	12 5	1 20	0 20	0 20	99 80	99 80
3/8	9 50	0 60	0 10	0 30	99 70	99 70
#4	4 75	10 99	1 84	2 14	97 86	97 86
#10	2 00	20 43	3 41	5 55	94 45	94 45
#20	0 85	43 67	7 30	12 84	87 16	87 16
#40	0 425	100 11	16 72	29 57	70 43	70 43
#60	0 250	167 77	28 03	57 59	42 41	42 41
#140	0 106	120 16	20 07	77 67	22 33	22 33
#200	0 075	8 11	1 35	79 02	20 98	20 98
Pan		125 58	20 98	100 00		

Tested By JP Date 7/7/00 Checked By LB Date 7-10-00

DCN: CT-S3A DATE 8-23-98 REVISION 1

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HYDROMETER ANALYSIS
ASTM D 422 63 (SOP S3)

Client	STL	Boring No	NA
Client Reference	IT/ SMWT C0F300129	Depth (ft)	NA
Project No	00191 01	Sample No	SE19A 0 6
Lab ID	00191 01 001	Soil Color	BROWN

Elapsed Time (min)		R Measured	Temp (°C)	R Corrected	N (%)	K Factor	Diameter (mm)	N (%)
0	NA	NA	NA	NA	NA	NA	NA	NA
2	43 0	43 5	22 8	37 1	86 1	0 01300	0 0278	16 1
5		39 0	22 8	32 6	75 7	0 01300	0 0183	15 9
15		31 5	22 8	25 1	58 3	0 01300	0 0112	12 2
30		27 0	22 8	20 8	47 8	0 01300	0 0082	10 0
80		23 0	23	16 8	38 8	0 01297	0 0059	8 1
269		18 0	23 3	11 8	27 0	0 01293	0 0029	5 7
1440		14 0	23 2	7 8	17 7	0 01294	0 0013	3 7

Soil Specimen Data		Other Corrections	
Tare No	527		
Tare + Dry Material (gm)	148 73	a Factor	0 99
Weight of Tare (gm)	101 06	Composite Correction	6 38
Weight of Deflocculant (gm)	5 0	Percent Finer than # 200	20 98
Weight of Dry Material (gm)	42 87		
		Specific Gravity	2 7 Assumed

Note *Hydrometer test is performed on # 200 sieve material*

Tested By TO Date 7/6/00 Checked By LB Date 7-10-00

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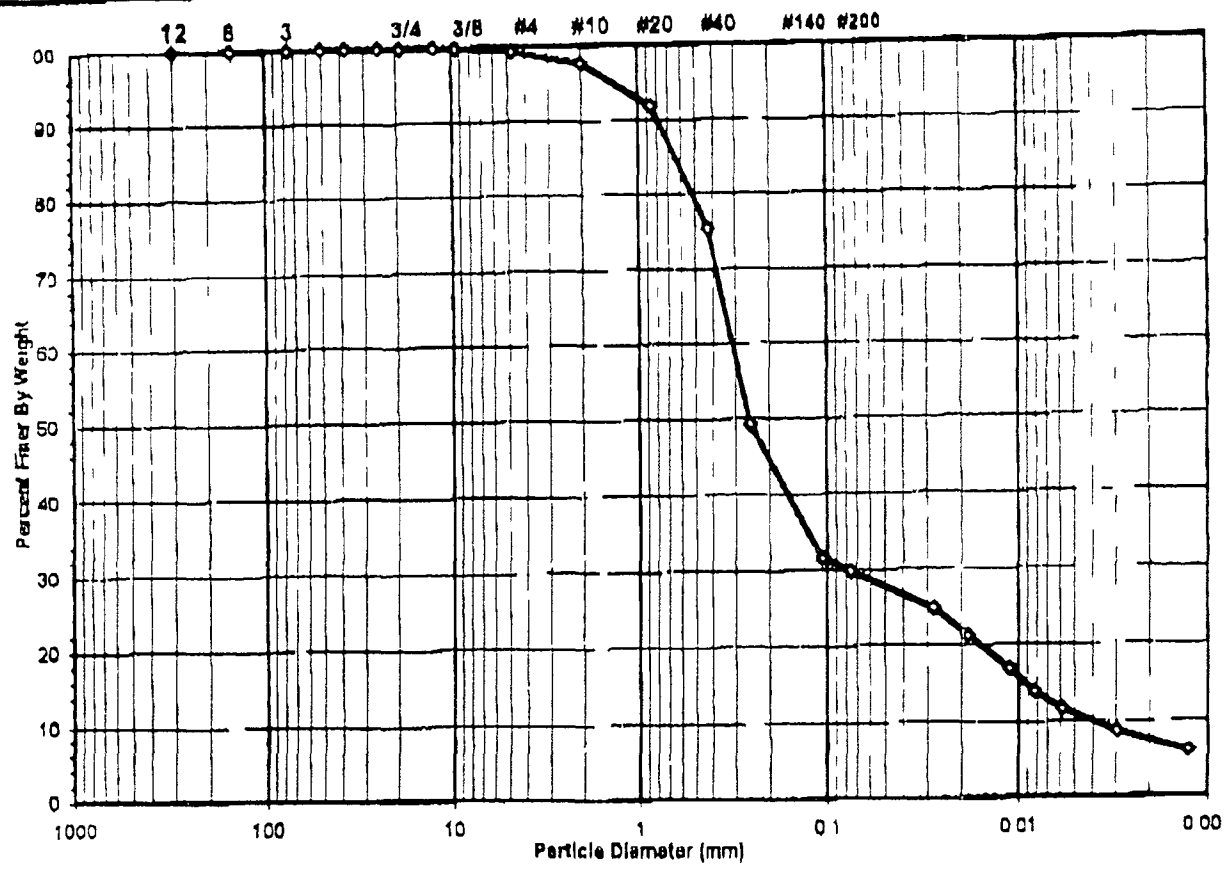
SIEVE AND HYDROMETER ANALYSIS
ASTM D 422 63 (SOP S3)

Client	STL	Boring No	NA
Client Reference	IT/ SMWT C0F300129	Depth (ft)	NA
Project No	00191 01	Sample No	SE19A 0 12
Lab ID	00191 01 002	Soil Color	BROWN

	SIEVE ANALYSIS			HYDROMETER	
USCS	cobbles	gravel	sand	silt and clay fraction	
USDA	cobbles	gravel	sand	silt	clay



USCS Summary		
Sieve Sizes (mm)		Percentage
Greater Than #4	*Gravel*	0 62
#4 To #200	*Sand*	69 64
Finer Than #200	*Silt & Clay*	29 74

USCS Symbol	***sc, ASSUMED*** (W/ ORGANICS)
USCS Classification	*CLAYEY SAND*

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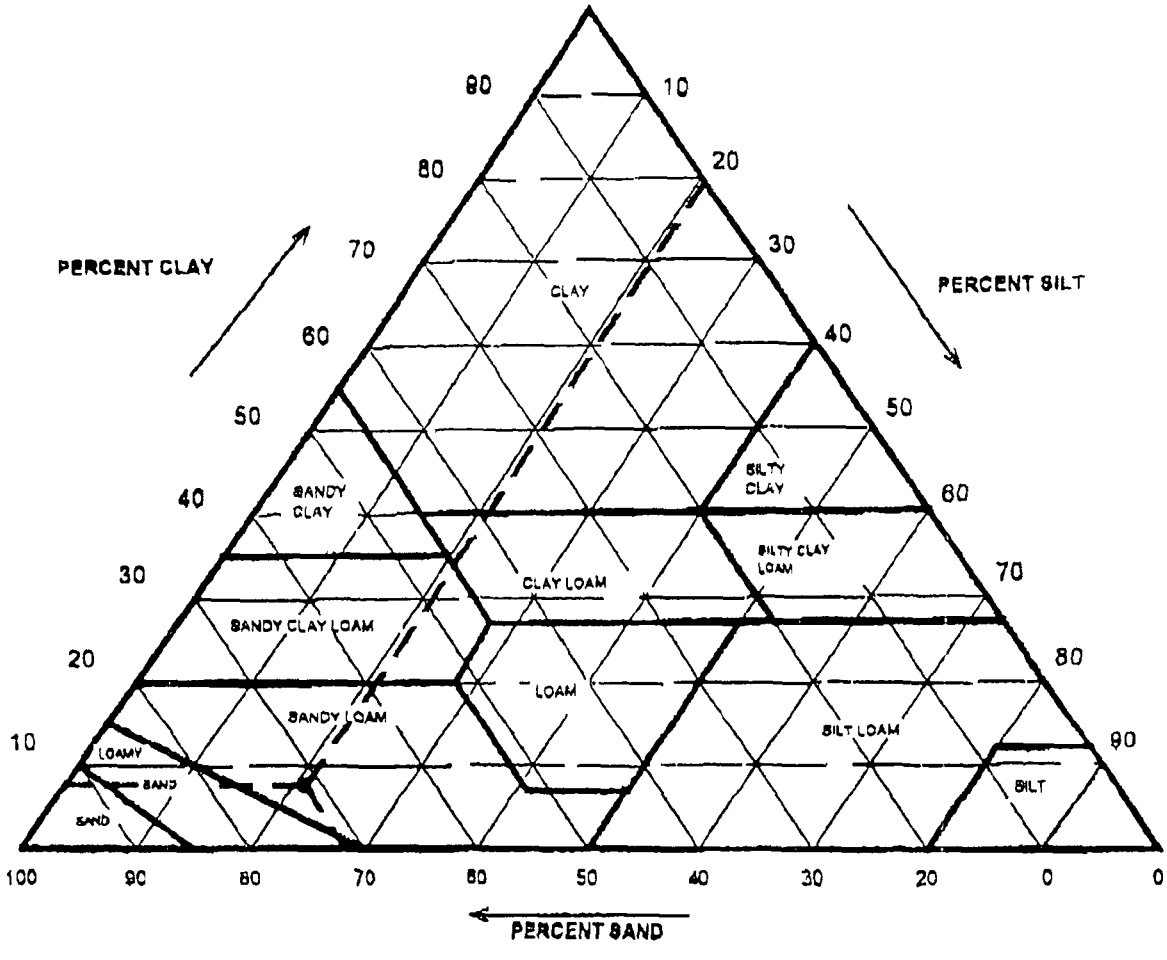
Geotechnics (ORIGINAL Signed)

USDA CLASSIFICATION CHART

Client	STL	Boring No	NA
Client Reference	IT/ SMWT C0F300129	Depth (ft)	NA
Project No	00191 01	Sample No	SE19A 0 12
Lab ID	00191 01 002	Soil Color	BROWN



Particle Size (mm)	Percent Finer	USDA SUMMARY	Actual Percentage	Corrected % of Minus 2 0 mm material for USDA Classificat
		Gravel	2 38	0 00
2	97 62	*Sand*	69 90	71 61
0 05	27 72	*Silt*	20 29	20 79
0 002	7 42	*Clay*	7 42	7 60

USDA Classification ***SANDY LOAM***

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geotechnics

WASH SIEVE ANALYSIS

ASTM D 422 63 (SOP 53)

Client	STL	Boring No	NA
Client Reference	IT/ SMWT C0F300128	Depth (ft)	NA
Project No	00191 01	Sample No	SE19A 0 12
Lab ID	00191 01 002	Soil Color	BROWN

Moisture Content of Passing 3/4 Material		Water Content of Retained 3/4 Material	
Tare No	2485	Tare No	NA
Wgt Tare + Wet Specimen (gm)	1300 30	Wgt Tare + Wet Specimen (gm)	NA
Wgt Tare + Dry Specimen (gm)	1096 90	Wgt Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	95 56	Weight of Tare (gm)	NA
Weight of Water (gm)	203 40	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	1001 34	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**20 3**	**Moisture Content (%)**	**NA**

Wet Weight 3/4 Sample (gm)	NA	Weight of the Dry Specimen (gm)	1001 34
Dry Weight 3/4 Sample (gm)	703 52	Weight of minus #200 material (gm)	297 82
Wet Weight +3/4 Sample (gm)	NA	Weight of plus #200 material (gm)	703 52
Dry Weight + 3/4 Sample (gm)	0 00		
Total Dry Weight Sample (gm)	NA		

Sieve Size	Sieve Opening (mm)	Wgt of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12	300	0 00	0 00	0 00	100 00	100 00
6	150	0 00	0 00	0 00	100 00	100 00
3	75	0 00	0 00	0 00	100 00	100 00
2	50	0 00	0 00	0 00	100 00	100 00
1 1/2	37 5	0 00	0 00	0 00	100 00	100 00
1	25 0	0 00	0 00	0 00	100 00	100 00
3/4	19 0	0 00	0 00	0 00	100 00	100 00
1/2	12 5	0 00	0 00	0 00	100 00	100 00
3/8	9 50	1 74	0 17	0 17	99 83	99 83
#4	4 75	4 49	0 45	0 62	99 38	99 38
# 0	2 00	17 81	1 78	2 38	97 62	97 62
#20	0 85	58 32	5 82	8 21	91 79	91 79
#40	0 425	165 48	16 53	24 73	75 27	75 27
#80	0 250	261 44	26 11	50 84	49 16	49 16
#140	0 106	176 46	17 62	68 46	31 54	31 54
#200	0 075	17 98	1 80	70 26	29 74	29 74
Pan		297 82	29 74	100 00		

Tested By JP Date 7/7/00 Checked By UB Date 7-10-00

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HYDROMETER ANALYSIS
ASTM D 422 63 (SOP S3)

Client	STL	Boring No	NA
Client Reference	IT/ SMWT C0F300129	Depth (ft)	NA
Project No	00191 01	Sample No	SE19A 0 12
Lab ID	00191 01 002	Soil Color	BROWN

Elapsed Time (min)		R Measured	Temp (°C)	R Corrected	N (%)	K Factor	Diameter (mm)	N (%)
0	NA	NA	NA	NA	NA	NA	NA	NA
2	43 0	44 0	22 8	37 6	83 3	0 01300	0 0277	24 8
5		38 5	22 8	32 1	71 1	0 01300	0 0184	21 2
15		32 0	22 8	25 8	58 7	0 01300	0 0112	16 9
30		27 5	22 8	21 1	48 8	0 01300	0 0082	13 9
82		24 0	23	17 6	39 0	0 01297	0 0058	11 6
250		19 5	23 3	13 1	29 0	0 01293	0 0030	8 8
1440		15 5	23 2	9 1	20 2	0 01294	0 0013	6 0

Soil Specimen Data		Other Corrections	
Tare No	1624		
Tare + Dry Material (gm)	149 84	a Factor	0 99
Weight of Tare (gm)	99 93	Composite Correction	6 38
Weight of Deflocculant (gm)	5 0	Percent Finer than # 200	29 74
Weight of Dry Material (gm)	44 71		
		Specific Gravity	2 7 Assumed

Note *Hydrometer test is performed on # 200 sieve material*

Tested By TO Date 7/8/00 Checked By LB Date 7-10-00

DCN GT 83A DATE 8-23-96 REVISION 3

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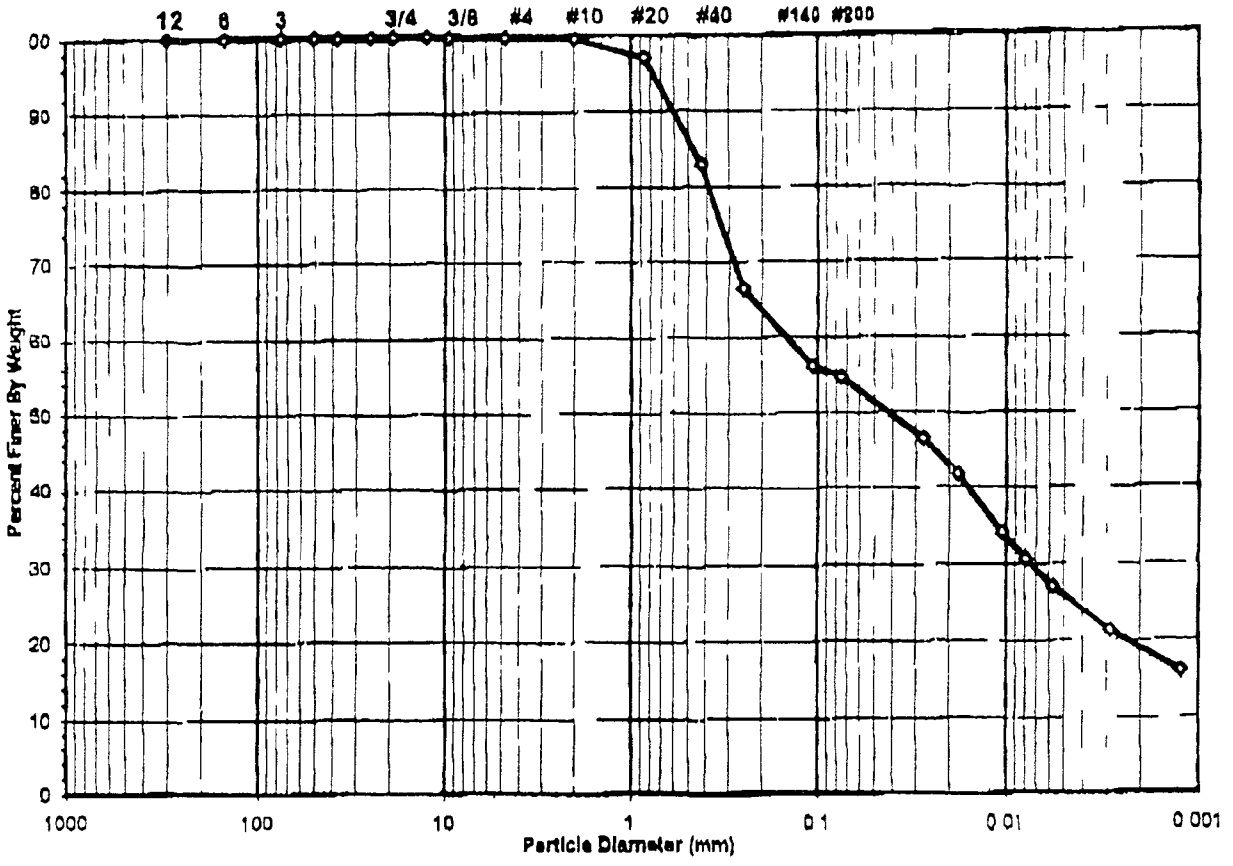
SIEVE AND HYDROMETER ANALYSIS
ASTM D 422 63 (SOP S3)

Client	STL	Boring No	NA
Client Reference	IT/ SMWT C0F300129	Depth (ft)	NA
Project No	00191 01	Sample No	SE19A 0 ,8
Lab ID	00191 01 003	Soil Color	BROWN

	SIEVE ANALYSIS			HYDROMETER	
USCS	cobbles	gravel	sand	silt and clay fraction	
USDA	cobbles	gravel	sand	silt	clay



USCS Summary		
Sieve Sizes (mm)		Percentage
Greater Than #4	*Gravel*	0 16
#4 To #200	*Sand*	45 20
Finer Than #200	*Silt & Clay*	54 64

USCS Symbol	*cl, ASSUMED*
USCS Classification	*SANDY LEAN CLAY*

DCN GT 03A DA E 0 33-99 REVISION 3

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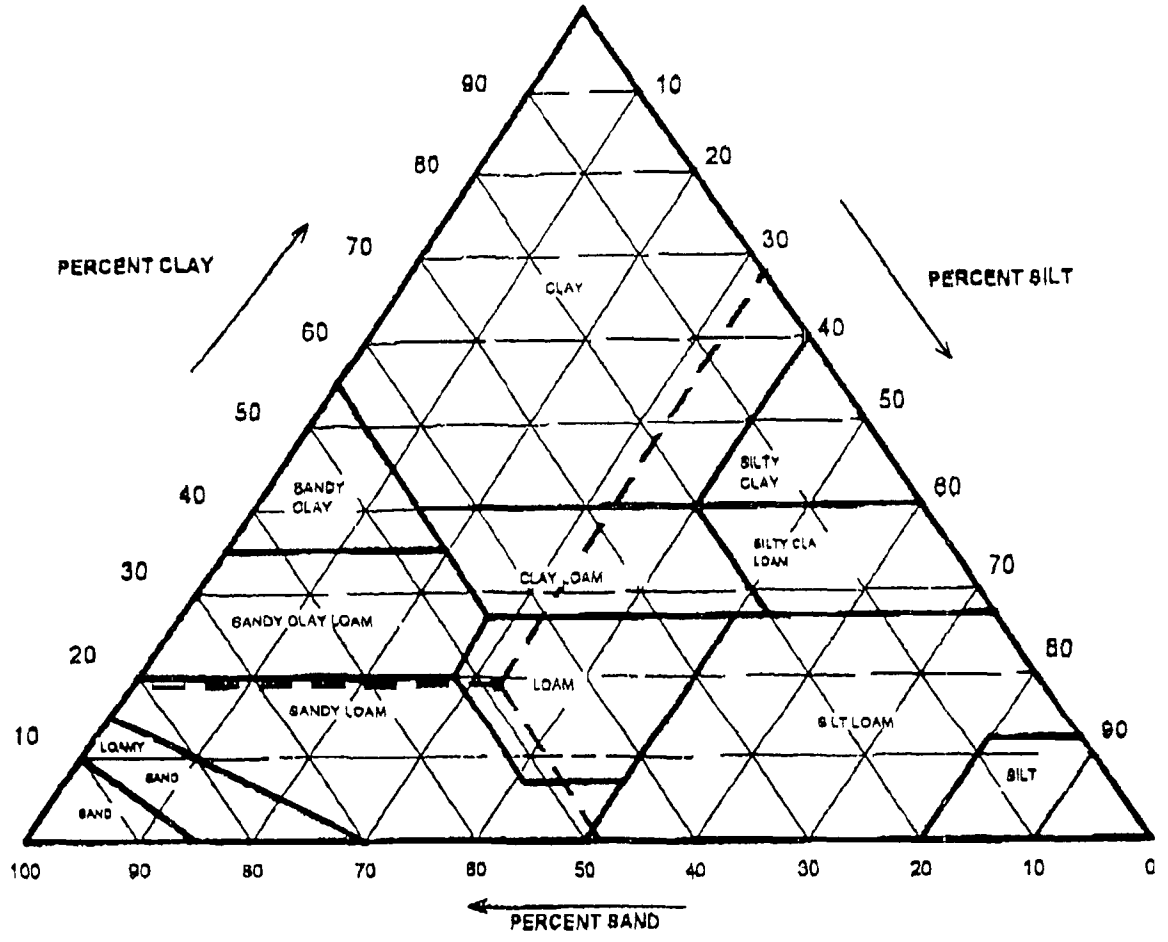
USDA CLASSIFICATION CHART

Client	STL	Boring No	NA
Client Reference	IT/ SMWT C0F300129	Depth (ft)	NA
Project No	00191 01	Sample No	SE19A 0 18
Lab ID	00191 01 003	Soil Color	BROWN



Particle Size (mm)	Percent Finer	USDA SUMMARY	Actual Percentage	Corrected % of Minus 2 0 mm material for USDA Classificat
		Gravel	0 37	0 00
2	99 63	*Sand*	48 29	48 47
0 05	51 34	*Silt*	32 37	32 49
0 002	18 97	*Clay*	18 97	19 04

USDA Classification ***LOAM***

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Geotechnics

WASH SIEVE ANALYSIS

ASTM D 422 63 (SOP 83)

Client	BTL	Boring No	NA
Client Reference	IT/ SMWT C0F300129	Depth (ft)	NA
Project No	00191 01	Sample No	SE19A 0 18
Lab ID	00191 01 003	Soil Color	BROWN

Moisture Content of Passing 3/4 Material		Water Content of Retained 3/4 Material	
Tare No	2455	Tare No	NA
Wgt Tare + Wet Specimen (gm)	1395 10	Wgt Tare + Wet Specimen (gm)	NA
Wgt Tare + Dry Specimen (gm)	1150 80	Wgt Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	96 98	Weight of Tare (gm)	NA
Weight of Water (gm)	244 30	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	1053 82	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**23 2**	**Moisture Content (%)**	NA

Wet Weight 3/4 Sample (gm)	NA	Weight of the Dry Specimen (gm)	1053 82
Dry Weight 3/4 Sample (gm)	478 05	Weight of minus #200 material (gm)	575 77
Wet Weight +3/4 Sample (gm)	NA	Weight of plus #200 material (gm)	478 05
Dry Weight + 3/4 Sample (gm)	0 00		
Total Dry Weight Sample (gm)	NA		

Sieve Size	Sieve Opening (mm)	Wgt of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12	300	0 00	0 00	0 00	100 00	100 00
6	150	0 00	0 00	0 00	100 00	100 00
3	75	0 00	0 00	0 00	100 00	100 00
2	50	0 00	0 00	0 00	100 00	100 00
1 1/2	37 5	0 00	0 00	0 00	100 00	100 00
1	25 0	0 00	0 00	0 00	100 00	100 00
3/4	19 0	0 00	0 00	0 00	100 00	100 00
1/2	12 5	0 00	0 00	0 00	100 00	100 00
3/8	9 50	0 46	0 04	0 04	99 96	99 96
#4	4 75	1 22	0 12	0 16	99 84	99 84
#10	2 00	2 26	0 21	0 37	99 63	99 63
#20	0 85	26 99	2 56	2 94	97 06	97 06
#40	0 425	148 48	14 09	17 02	82 98	82 98
#60	0 250	175 66	16 67	33 69	66 31	66 31
#140	0 106	107 83	10 23	43 93	56 07	56 07
#200	0 076	15 15	1 44	45 36	54 64	54 64
Pan		575 77	54 64	100 00		

Tested By JP Date 7/7/00 Checked By UB Date 7-10-00

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Geotechnics

HYDROMETER ANALYSIS
ASTM D 422 63 (SOP 63)

Client	STL	Boring No	NA
Client Reference	IT/ SMWT C0F300129	Depth (ft)	NA
Project No	00191 01	Sample No	SE19A 0 18
Lab ID	00191 01 003	Soil Color	BROWN

Elapsed Time (min)		R Measured	Temp (°C)	R Corrected	N (%)	K Factor	Diameter (mm)	N (%)
0	NA	NA	NA	NA	NA	NA	NA	NA
2	45 5	46 0	22 8	39 8	84 8	0 01300	0 0272	48 4
5		42 0	22 8	35 8	78 3	0 01300	0 0178	41 7
16		35 5	22 8	29 1	62 4	0 01300	0 0105	34 1
30		32 5	22 8	26 1	56 0	0 01300	0 0078	30 8
60		29 5	23	23 1	49 5	0 01297	0 0057	27 1
250		24 5	23 3	18 1	38 8	0 01293	0 0029	21 2
1440		20 0	23 2	13 8	29 2	0 01294	0 0012	15 8

Soil Specimen Data		Other Corrections	
Tare No	1621		
Tare + Dry Material (gm)	153 04	a Factor	0 89
Weight of Tare (gm)	101 84	Composite Correction	8 38
Weight of Deflocculant (gm)	5 0	Percent Finer than # 200	54 64
Weight of Dry Material (gm)	48 2		
		Specific Gravity	2 7 Assumed

Note *Hydrometer test is performed on # 200 sieve material*

Tested By TO Date 7/6/00 Checked By UR Date 7-10-00

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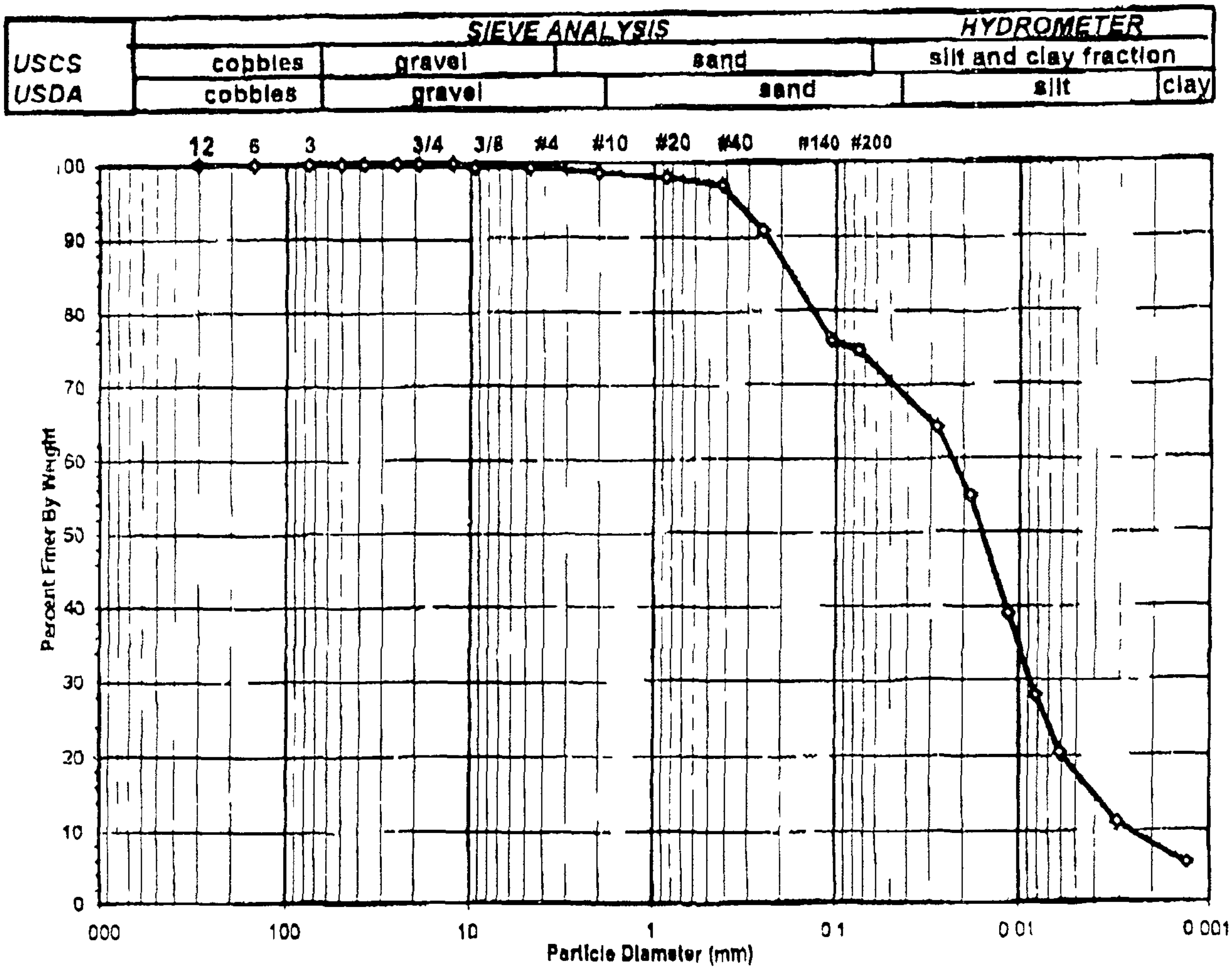
geotechnics

SIEVE AND HYDROMETER ANALYSIS
ASTM D 422 63 (SOP S3)

Client	STL	Boring No	NA
Client Reference	IT/ SMWT C0F300129	Depth (ft)	NA
Project No	00191 01	Sample No	SE54A 2 6
Lab D	00191 01 004	Soil Color	BROWN



USCS Summary		
Sieve Sizes (mm)		Percentage
Greater Than #4	*Gravel*	0 56
#4 To #200	*Sand*	24 88
Finer Than #200	*Silt & Clay*	74 56

USCS Symbol *cl ASSUMED*
(W/ ORGANICS)

USCS Classification *LEAN CLAY WITH SAND*

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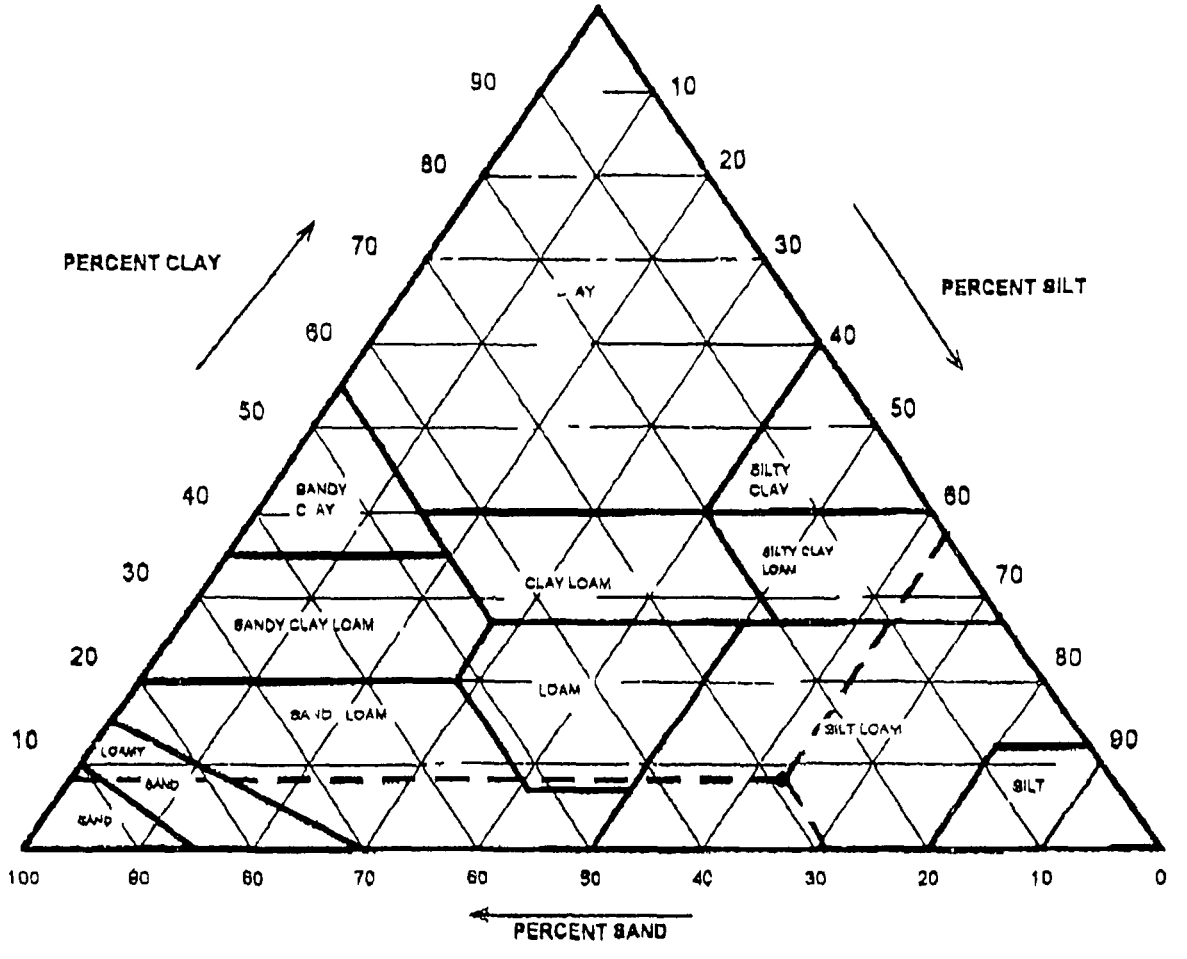
USDA CLASSIFICATION CHART

Client	STL	Boring No	NA
Client Reference	IT/ SMWT C0F300129	Depth (ft)	NA
Project No	00191 01	Sample No	SE54A 2 6
Lab ID	00191 01 004	Soil Color	BROWN

ORIGINAL (Red)



Particle Size (mm)	Percent Finer	USDA SUMMARY	Actual Percentage	Corrected % of Minus 2 0 mm material for USDA Classificat
		Gravel	1 20	0 00
2	98 80	*Sand*	28 47	28 82
0 05	70 32	*Silt*	62 17	62 92
0 002	8 18	*Clay*	8 18	8 26

USDA Classification ***SILT LOAM***

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Geotechnics

WASH SIEVE ANALYSIS

ASTM D 422 63 (SOP S3)

ORIGINAL (Red)

Client	STL	Boring No	NA
Client Reference	IT/ SMWT C0F300129	Depth (ft)	NA
Project No	00191 01	Sample No	SE54A 2 6
Lab ID	00191 01 004	Soil Color	BROWN

Moisture Content of Passing 3/4 Material		Water Content of Retained 3/4 Material	
Tare No	1631	Tare No	NA
Wgt Tare + Wet Specimen (gm)	970 90	Wgt Tare + Wet Specimen (gm)	NA
Wgt Tare + Dry Specimen (gm)	703 20	Wgt Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	95 57	Weight of Tare (gm)	NA
Weight of Water (gm)	267 70	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	607 63	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**44 1**	**Moisture Content (%)**	NA

Wet Weight 3/4 Sample (gm)	NA	Weight of the Dry Specimen (gm)	607 63
Dry Weight 3/4 Sample (gm)	154 56	Weight of minus #200 material (gm)	453 07
Wet Weight +3/4 Sample (gm)	NA	Weight of plus #200 material (gm)	154 56
Dry Weight + 3/4 Sample (gm)	0 00		
Total Dry Weight Sample (gm)	NA		

Sieve Size	Sieve Opening (mm)	Wgt of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12	300	0 00	0 00	0 00	100 00	100 00
6	150	0 00	0 00	0 00	100 00	100 00
3	75	0 00	0 00	0 00	100 00	100 00
2	50	0 00	0 00	0 00	100 00	100 00
1 1/2	37 5	0 00	0 00	0 00	100 00	100 00
1	25 0	0 00	0 00	0 00	100 00	100 00
3/4	19 0	0 00	0 00	0 00	100 00	100 00
1/2	12 5	0 00	0 00	0 00	100 00	100 00
3/8	9 50	2 85	0 47	0 47	99 53	99 53
#4	4 75	0 55	0 09	0 56	99 44	99 44
#10	2 00	3 90	0 64	1 20	98 80	98 80
#20	0 85	4 66	0 77	1 97	98 03	98 03
#40	0 425	6 32	1 04	3 01	96 99	96 99
#60	0 250	37 41	6 16	9 17	90 83	90 83
#140	0 106	90 43	14 88	24 05	75 95	75 95
#200	0 075	8 42	1 39	25 44	74 56	74 56
Pan		453 07	74 56	100 00		

Tested By JP Date 7/7/00 Checked By UB Date 7-10-00

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ORIGINAL (Red)

HYDROMETER ANALYSIS
ASTM D 422 63 (SOP 53)

Client	STL	Boring No	NA
Client Reference	IT/ SMWT C0F300129	Depth (ft)	NA
Project No	00191 01	Sample No	SE54A 2 3
Lab ID	00191 01 004	Soil Color	BROWN

Elapsed Time (min)		R Measured	Temp (°C)	R Corrected	N (%)	K Factor	Diameter (mm)	N (%)
0	NA	NA	NA	NA	NA	NA	NA	NA
2	45 0	44 5	22 8	38 1	86 0	0 01300	0 0278	84 1
5		39 0	22 8	32 6	73 6	0 01300	0 0183	54 9
15		28 5	22 8	23 1	52 1	0 01300	0 0114	38 8
32		23 0	22 8	16 6	37 5	0 01300	0 0081	27 9
61		18 5	23	12 1	27 3	0 01297	0 0060	20 4
250		13 0	23 3	6 6	14 9	0 01293	0 0031	11 1
1440		9 5	23 2	3 1	7 0	0 01294	0 0013	5 2

Soil Specimen Data		Other Corrections	
Tare No	2882		
Tare + Dry Material (gm)	158 23	a Factor	0 99
Weight of Tare (gm)	107 34	Composite Correction	6 38
Weight of Deflocculant (gm)	5 0	Percent Finer than # 200	74 56
Weight of Dry Material (gm)	43 89		
		Specific Gravity	2 7 Assumed

Note *Hydrometer test is performed on # 200 sieve material*

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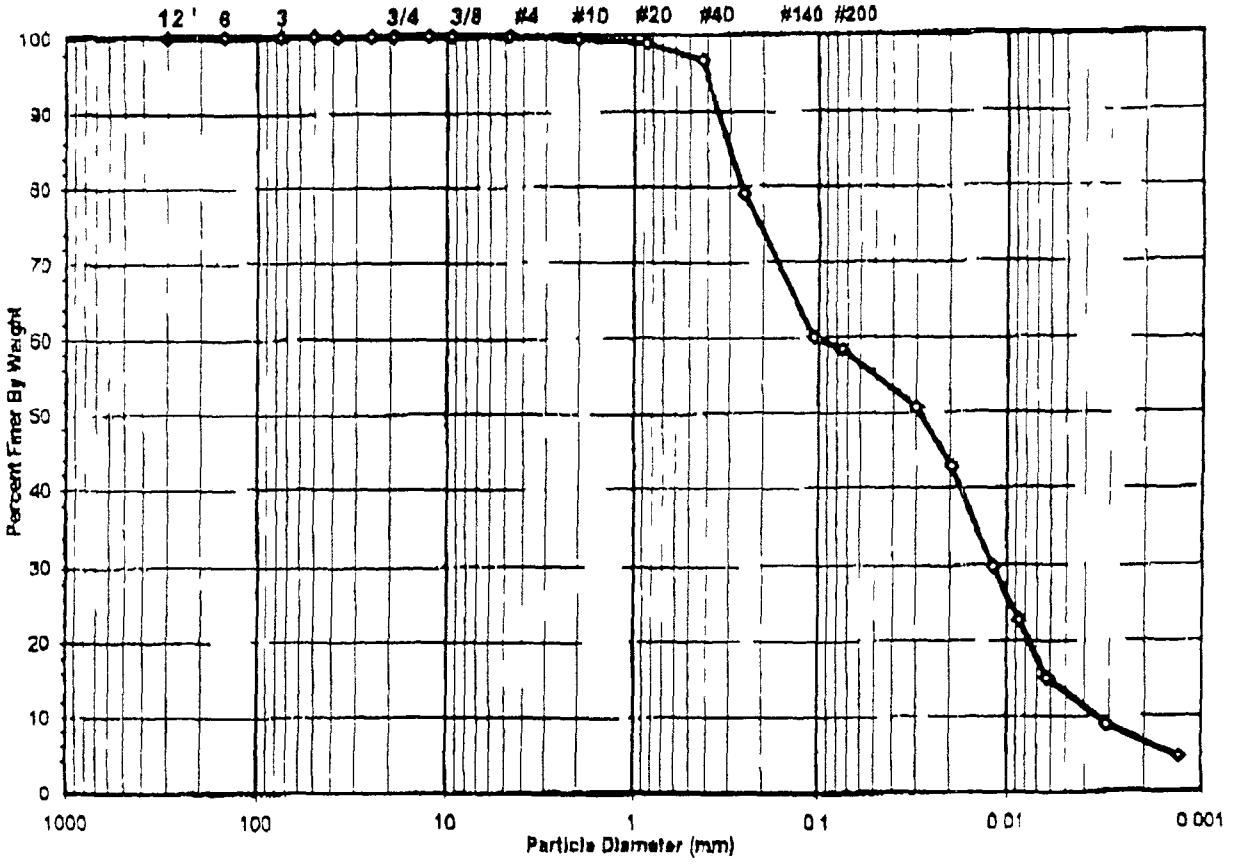
ORIGINAL (Red)

SIEVE AND HYDROMETER ANALYSIS
ASTM D 422 63 (SOP S3)

Client	STL	Boring No	NA
Client Reference	IT/ SMWT C0F300128	Depth (ft)	NA
Project No	00191 01	Sample No	SE54A 2 12
Lab ID	00191 01 005	Soil Color	BROWN

	SIEVE ANALYSIS			HYDROMETER	
USCS	cobbles	gravel	sand	silt and clay fraction	
USDA	cobbles	gravel	sand	silt	clay



USCS Summary		
Sieve Sizes (mm)		Percentage
Greater Than #4	*Gravel*	0 11
#4 To #200	*Sand*	41 53
Finer Than #200	*Silt & Clay*	58 37

USCS Symbol	*cl, ASSUMED* (W/ ORGANICS)
USCS Classification	*SANDY LEAN CLAY*

DCN CT 63A DATE 9-23 99 REVISION 8

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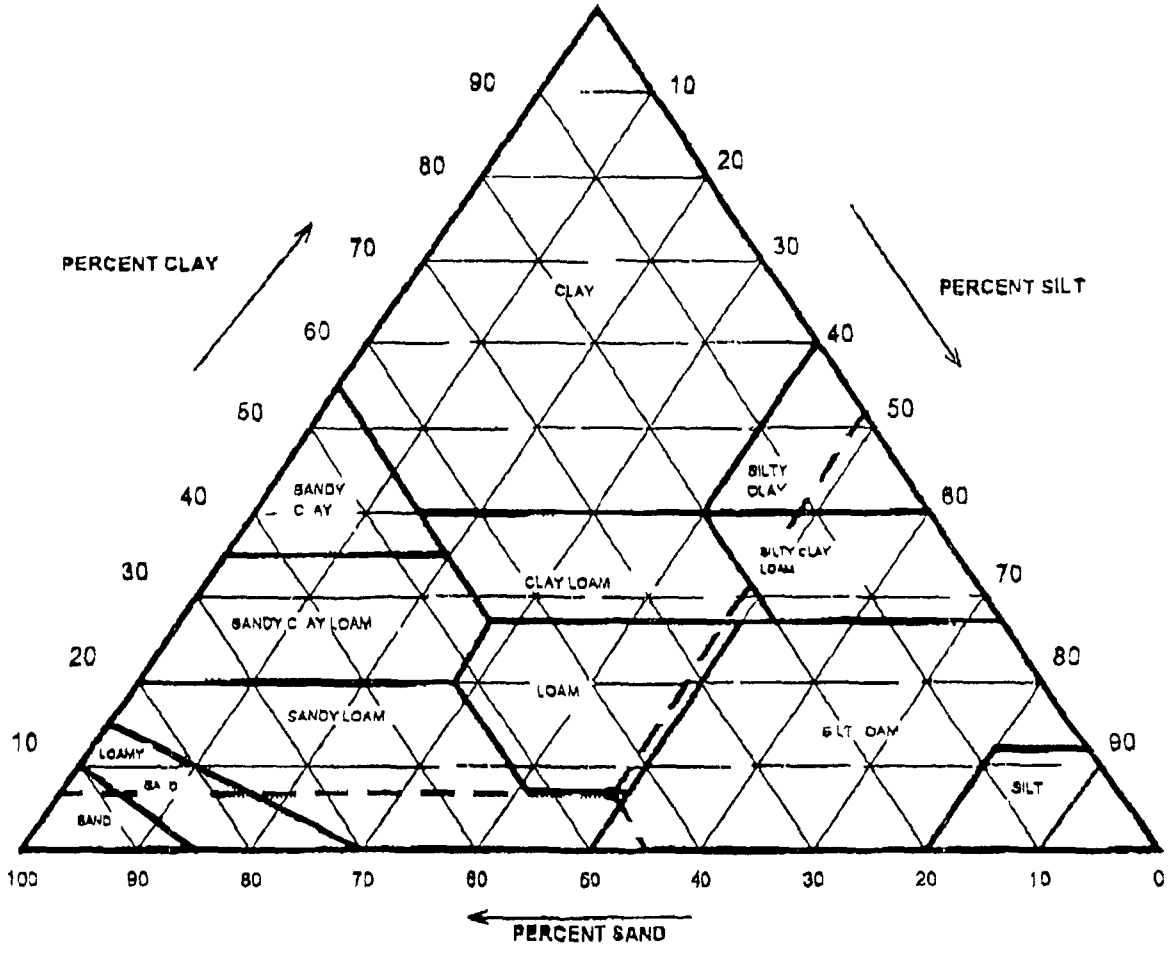
USDA CLASSIFICATION CHART

Client	STL	Boring No	NA
Client Reference	IT/ SMWT C0F300129	Depth (ft)	NA
Project No	00181 01	Sample No	SE54A 2 12
Lab ID	00181 01 005	Soil Color	BROWN

ORIGINAL (Red)



Particle Size (mm)	Percent Finer	USDA SUMMARY	Actual Percentage	Corrected % of Minus 2 0 mm material for USDA Classificat
		Gravel	0 49	0 00
2	99 51	*Sand*	44 54	44 78
0 05	54 86	*Silt*	48 29	48 63
0 002	6 67	*Clay*	6 87	6 71

USDA Classification ***SANDY LOAM***

DCN GT 85A DATE 6 23 00 REVISION 3

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WASH SIEVE ANALYSIS

ASTM D 422 63 (SOP 93)

Client	STL	Boring No	NA
Client Reference	IT/ SMWT C0F300129	Depth (ft)	NA
Project No	00191 01	Sample No	SE54A 2 12
Lab ID	00191 01 005	Soil Color	BROWN

Moisture Content of Passing 3/4 Material		Water Content of Retained 3/4 Material	
Tare No	529	Tare No	NA
Wgt Tare + Wet Specimen (gm)	1139 70	Wgt Tare + Wet Specimen (gm)	NA
Wgt Tare + Dry Specimen (gm)	897 00	Wgt Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	101 69	Weight of Tare (gm)	NA
Weight of Water (gm)	242 70	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	795 31	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**30 5**	**Moisture Content (%)**	**NA**

Wet Weight 3/4 Sample (gm)	NA	Weight of the Dry Specimen (gm)	795 31
Dry Weight 3/4 Sample (gm)	331 12	Weight of minus #200 material (gm)	464 19
Wet Weight +3/4 Sample (gm)	NA	Weight of plus #200 material (gm)	331 12
Dry Weight + 3/4 Sample (gm)	0 00		
Total Dry Weight Sample (gm)	NA		

Sieve Size	Sieve Opening (mm)	Wgt of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12	300	0 00	0 00	0 00	100 00	100 00
6	150	0 00	0 00	0 00	100 00	100 00
3	75	0 00	0 00	0 00	100 00	100 00
2	50	0 00	0 00	0 00	100 00	100 00
1 1/2	37 5	0 00	0 00	0 00	100 00	100 00
1	25 0	0 00	0 00	0 00	100 00	100 00
3/4	19 0	0 00	0 00	0 00	100 00	100 00
1/2'	12 5	0 00	0 00	0 00	100 00	100 00
3/8	9 50	0 00	0 00	0 00	100 00	100 00
#4	4 75	0 84	0 11	0 11	99 89	99 89
#10	2 00	3 08	0 39	0 49	99 51	99 51
#20	0 85	5 11	0 64	1 14	98 86	98 86
#40	0 425	17 42	2 19	3 33	96 67	96 67
#60	0 250	140 93	17 72	21 05	78 95	78 95
# 40	0 106	150 99	18 99	40 03	59 97	59 97
#200	0 075	12 75	1 60	41 63	58 37	58 37
Pan		464 19	58 37	100 00		

Tested By JP Date 7/7/00 Checked By LB Date 7-10-00

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ORIGINAL (Red)

HYDROMETER ANALYSIS
ASTM D 422 63 (SOP S3)

Client	STL	Boring No	NA
Client Reference	IT/ SMWT C0F300129	Depth (ft)	NA
Project No	00191 01	Sample No	SE54A 2 12
Lab ID	00191 01 005	Soil Color	BROWN

Elapsed Time (min)		R Measured	Temp (°C)	R Corrected	N (%)	K Factor	Diameter (mm)	N (%)
0	NA	NA	NA	NA	NA	NA	NA	NA
2	35 0	35 5	22 8	29 1	86 7	0 01300	0 0288	80 6
5		31 0	22 8	24 6	73 3	0 01300	0 0185	42 8
15		23 5	22 8	17 1	51 0	0 01300	0 0118	29 8
30		19 5	22 8	13 1	39 1	0 01300	0 0086	22 8
60		15 0	23	8 6	25 7	0 01297	0 0062	15 0
250		11 5	23 3	5 1	15 2	0 01293	0 0031	8 8
1440		9 0	23 2	2 8	7 8	0 01294	0 0013	4 8

Soil Specimen Data		Other Corrections	
Tare No	514		
Tare + Dry Material (gm)	139 55	a Factor	0 99
Weight of Tare (gm)	101 31	Composite Correction	6 38
Weight of Deflocculant (gm)	5 0	Percent Finer than # 200	58 37
Weight of Dry Material (gm)	33 24		
		Specific Gravity	2 7 Assumed

Note *Hydrometer test is performed on # 200 sieve material*

Tested By TO Date 7/8/00 Checked By UB Date 7-10-00

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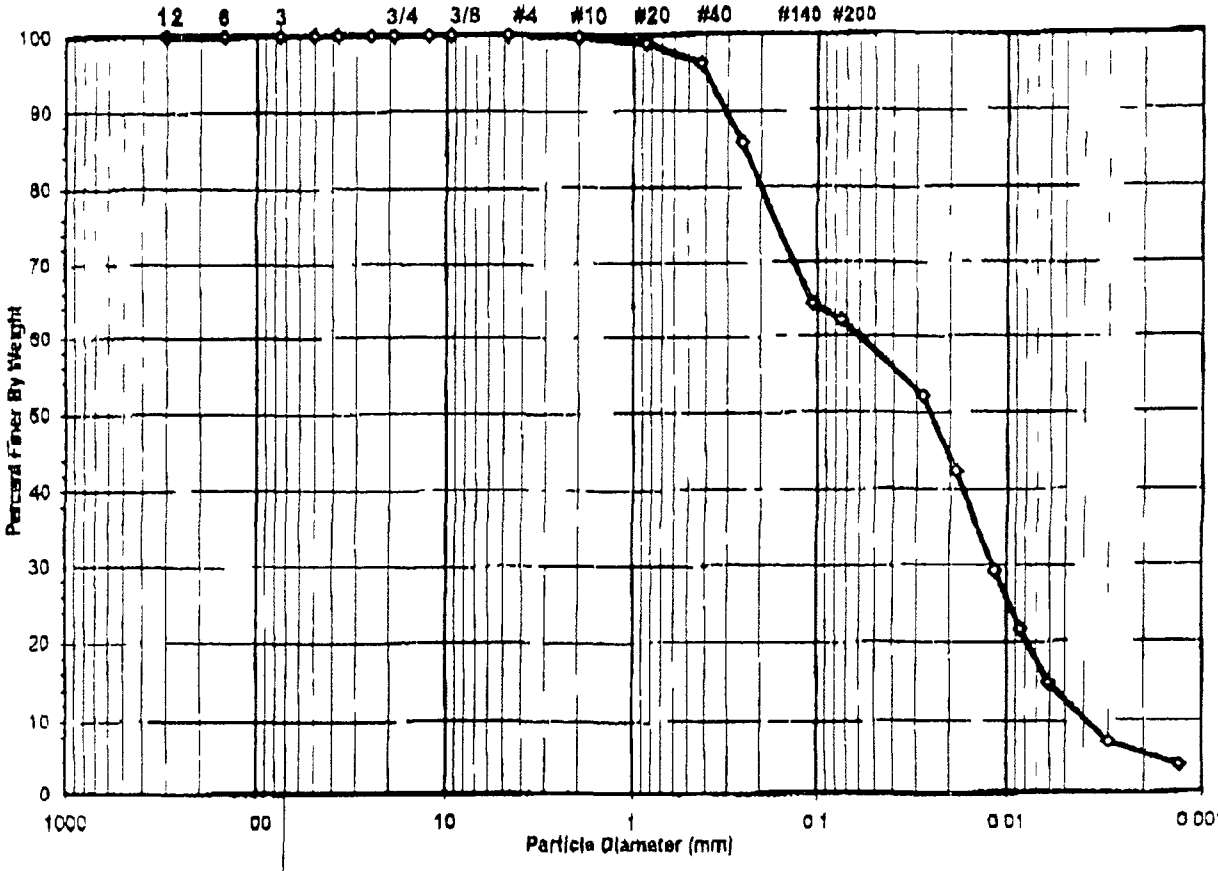
SIEVE AND HYDROMETER ANALYSIS
ASTM D 422 63 (SOP S3)

Client	STL	Boring No	NA
Client Reference	IT/ SMWT C0F300129	Depth (ft)	NA
Project No	00191 01	Sample No	SE54A 2 :8
Lab ID	00191 01 006	Soil Color	BROWN

ORIGINAL (Red)

	SIEVE ANALYSIS			HYDROMETER	
USCS	cobbles	gravel	sand	silt and clay fraction	
USDA	cobbles	gravel	sand	silt	clay



Sieve Sizes (mm)	USCS Summary	Percentage
Greater Than #4	*Gravel*	0 08
#4 To #200	*Sand*	37 82
Finer Than #200	*Silt & Clay*	62 10

USCS Symbol *cl ASSUMED* (W/ ORGANICS)

USCS Classification *SANDY LEAN CLAY*

DCN CT 83A DATE 6 23 99 REVISION 3

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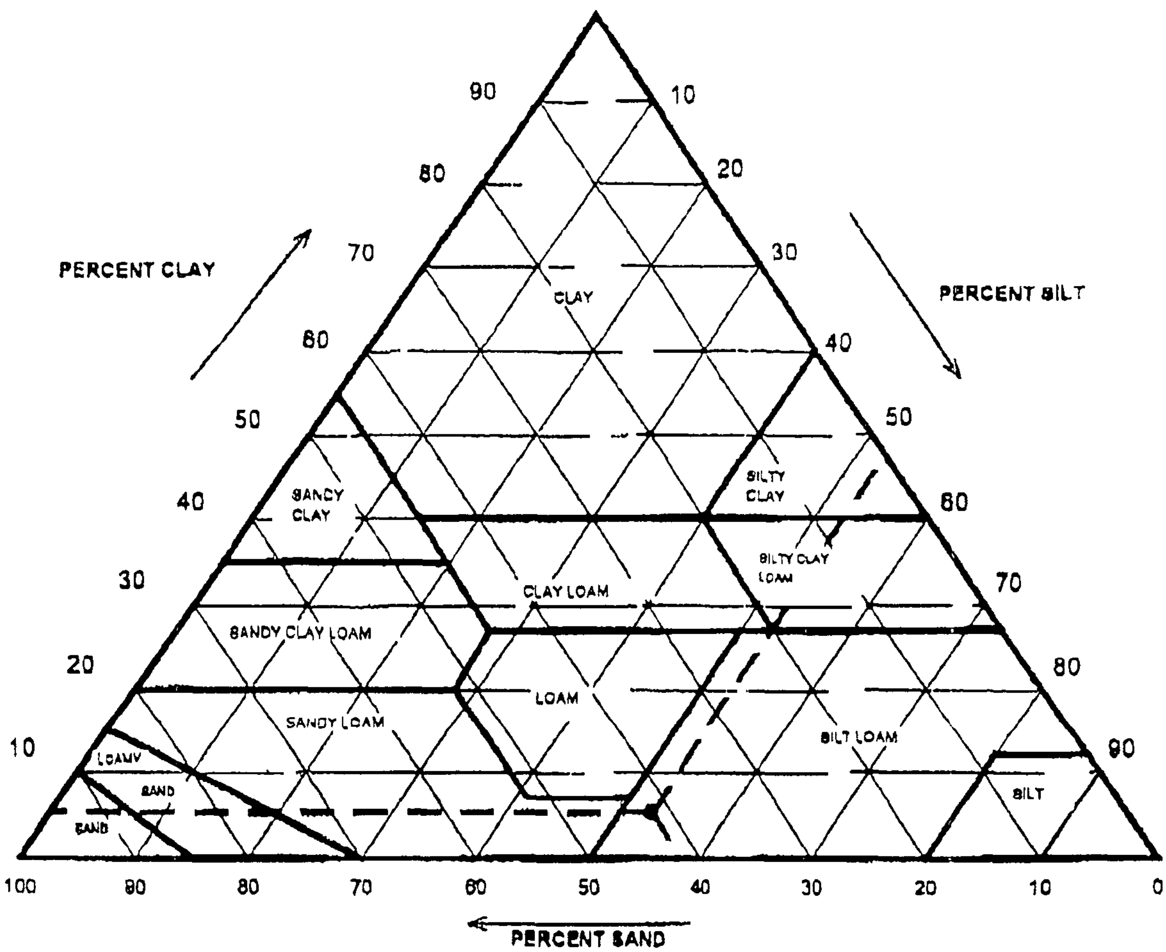
USDA CLASSIFICATION CHART

ORIGINAL (Red)

Client	STL	Boring No	NA
Client Reference	IT/ SMWT C0F300129	Depth (ft)	NA
Project No	00191 01	Sample No	SE54A 2 18
Lab ID	00191 01 008	Soil Color	BROWN



Particle Size (mm)	Percent Finer	USDA SUMMARY	Actual Percentage	Corrected % of Minus 2 0 mm material for USDA Classificat
		Gravel	0 30	0 00
2	99 70	*Sand*	41 72	41 85
0 05	57 98	*Silt*	52 59	52 75
0 002	5 39	*Clay*	5 39	5 41

USDA Classification ***SILT LOAM***

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ORIGINAL (Red)

WASH SIEVE ANALYSIS

ASTM D 422 63 (SOP 53)

Client	STL	Boring No	NA
Client Reference	IT/ SMWT C0F300128	Depth (ft)	NA
Project No	00191 01	Sample No	SE54A 2 18
Lab ID	00191 01 006	Soil Color	BROWN

Moisture Content of Passing 3/4 Material		Water Content of Retained 3/4 Material	
Tare No	2454	Tare No	NA
Wgt Tare + Wet Specimen (gm)	1044 80	Wgt Tare + Wet Specimen (gm)	NA
Wgt Tare + Dry Specimen (gm)	833 80	Wgt Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	100 17	Weight of Tare (gm)	NA
Weight of Water (gm)	211 20	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	733 43	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**28 8**	**Moisture Content (%)**	NA

Wet Weight 3/4 Sample (gm)	NA	Weight of the Dry Specimen (gm)	733 43
Dry Weight 3/4 Sample (gm)	277 94	Weight of minus #200 material (gm)	455 49
Wet Weight +3/4 Sample (gm)	NA	Weight of plus #200 material (gm)	277 94
Dry Weight + 3/4 Sample (gm)	0 00		
Total Dry Weight Sample (gm)	NA		

Sieve Size	Sieve Opening (mm)	Wgt of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12	300	0 00	0 00	0 00	100 00	100 00
6	150	0 00	0 00	0 00	100 00	100 00
3	75	0 00	0 00	0 00	100 00	100 00
2	50	0 00	0 00	0 00	100 00	100 00
1 1/2'	37 5	0 00	0 00	0 00	100 00	100 00
1	25 0	0 00	0 00	0 00	100 00	100 00
3/4	19 0	0 00	0 00	0 00	100 00	100 00
1/2'	12 5	0 00	0 00	0 00	100 00	100 00
3/8	9 50	0 00	0 00	0 00	100 00	100 00
#4	4 75	0 68	0 08	0 08	99 92	99 92
#10	2 00	1 81	0 22	0 30	99 70	99 70
#20	0 85	6 92	0 81	1 10	98 90	98 90
#40	0 425	19 33	2 64	3 74	96 26	96 26
#80	0 250	77 18	10 52	14 26	85 74	85 74
#140	0 106	156 94	21 40	35 66	64 34	64 34
#200	0 075	16 40	2 24	37 90	62 10	62 10
Pan		455 49	62 10	100 00		

Tested By JP Date 7/7/00 Checked By UB Date 7-10-00

DCN GT 53A DATE 6 23 99 REVISION 3

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HYDROMETER ANALYSIS
ASTM D 422-63 (SOP 83)

ORIGINAL (Red)

Client	STL	Boring No	NA
Client Reference	IT/ SMWT C0F300129	Depth (ft)	NA
Project No	00191 01	Sample No	SE54A 2 18
Lab ID	00191 01 008	Soil Color	BROWN

Elapsed Time (min)		R Measured	Temp (C)	R Corrected	N (%)	K Factor	Diameter (mm)	N (%)
0	NA	NA	NA	NA	NA	NA	NA	NA
2	43 0	44 0	22 8	37 8	83 7	0 01300	0 0277	52 0
5		37 0	22 8	30 6	68	0 01300	0 0186	42 3
15		27 5	22 8	21 1	47 0	0 01300	0 0115	29 2
30		22 0	22 8	15 6	34 7	0 01300	0 0085	21 6
62		17 0	23	10 6	23 6	0 01297	0 0061	14 7
272		11 5	23 3	5 1	11 4	0 01293	0 0030	7 1
1440		9 0	23 2	2 6	5 8	0 01294	0 0013	3 6

Soil Specimen Data		Other Corrections	
Tare No	861		
Tare + Dry Material (gm)	152 75	a Factor	0 99
Weight of Tare (gm)	103 26	Composite Correction	6 38
Weight of Deflocculant (gm)	5 0	Percent Finer than # 200	62 10
Weight of Dry Material (gm)	44 49		
		Specific Gravity	2 7 Assumed

Note *Hydrometer test is performed on # 200 sieve material*

Tested By TO Date 7/6/00 Checked By LB Date 7-10-00

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ORIGINAL
(Red)

ATTACHMENT 6

US Army Corps
of Engineers
Baltimore District

Delivery Order No 0016
Total Environmental
Restoration Contract
DACA31-95-D-0083

ORIGINAL (Red)

SOUTHERN MARYLAND WOOD TREATMENT SUPERFUND SITE IN HOLLYWOOD, MARYLAND

Soil Erosion Control Plan

FINAL PLAN

September 1997

TABLE OF CONTENTS

1 0 INTRODUCTION

This Soil Erosion and Control Plan has been prepared for use at the Southern Maryland Wood Treating Site (SMWT) by ICF Kaiser Engineers Inc (ICF Kaiser) under contract number DACA31 95 D 008 Delivery Order 0016 for the U S Army Corps of Engineers (ACOE) This plan consists in large part of portions of the Site Specific Work Plan prepared by EA dated July 1997 This plan has been prepared to provide a single guidance document for related site activities such as soil excavation materials handling soil erosion and control backfilling of treated soil stormwater management and dewatering

The scope of remedial actions at the SMWT consists generally of excavating areas contaminated by previous wood treating activities and past attempts at site rehabilitation low temperature thermal desorption of excavated soil to meet cleanup standards and delisting criteria backfilling excavated areas with treated soil collection and removal of free phased product (both DNAPL and LNAPL) treatment and discharge of groundwater stormwater and thermal desorption unit quench water and restoring the site to the grades shown in the July 1997 SSWP An estimated area of 8 acres will be disturbed during the project in order to excavate treat and backfill approximately 145 000 tons of soil

Maryland Department of Environment (MDE) Water Management Administration (WMA) has reviewed the draft SSWP prepared by EA dated April 1997 The WMA prepared a review comments letter dated July 29 1997 This plan was prepared to address the comments presented by WMA by compiling related sections from the July 1997 SSWP supplemented by edited site plans additional text and inclusion of pertinent MDE s Standards and Specifications For Soil Erosion and Sediment Control (94 S S)

This document consists of selected portions of the July 1997 SSWP and edited site plans from the July 1997 SSWP The remainder of the document is organized as follows Section 2 0 presents an edited version of Section 3 0 from the July 1997 SSWP Section 3 0 consists of an edited version of the July 1997 specification 02010 Sediment Erosion and Control Section 4 0 includes an edited version of the July 1997 specification 02215 Excavation and Handling of Materials Section 5 0 presents an edited version of the July 1997 specification 02217 West Tributary Sampling Excavation, and Restoration Section 6 0 consists of an edited version of the July 1997 specification 02220 Backfilling Compaction and Grading Section 7 0 includes an edited version of the July 1997 specification 02665 Stormwater Management and Const uction Dewatering Section 8 0 Includes an edited version of the July 1997 specification 02960 Site Restoration

2 0 WORK PLAN TEXT SECTION 3 0 SOIL AND MATERIALS HANDLING

This section describes the areas to be excavated the general approach to excavation and the verification sampling approach backfilling procedures both criteria for clean soil and compaction methods open excavation supports requirements construction dewatering stormwater management erosion and sediment control and decontamination

2 1 EXCAVATION

Soils and sediments which exhibit contaminant concentrations in excess of the clean up criteria established in the ROD will be excavated for on site treatment The excavation areas include the following Land Treatment Area Northeast Tank Area Containment Area Western Tributary and Upper Site Area In addition to these excavation areas the potential exists for the presence of contamination in the drainage swale west of the containment area Any soil suspected of being contaminated should be sampled

Excavated contaminated soil will be temporarily stored in areas designated as contaminated soil storage area and contaminated soil loading Soil and sediment treated on site by thermal desorption will be temporarily stored in the area designated as the unconfirmed clean soil stockpile area This area is sized to provide 11 days of storage based on 14 ton/hr throughput 1 4 ton/cy loose density and 10 ft high soil piles After soils have been confirmed as meeting the criteria for backfill it may be moved to the confirmed clean soil stockpile area as designated on the drawings No lining is required for under this soil storage area However it is required hat stabilizing vegetative cover be provided on soil stockpiles stored in this area for longer than 14 days In addition hay bales or other sediment and erosion controls mus be used to prevent erosion and sediment transport from this as well as other storage areas

The Contractor is required to establish a grid to record sampling locations and allow a systematic method of characterizing soil contamination Systematic and biased sampling frequencies collection methods analytical methods and quality control requirements are discussed in detail in the Field Sampling Plan

Field screening methods will be predominantly used where materials are suspected of being contaminated but do not exhibit visual evidence or a detectable odor Where contamination is visually observed or a detectable odor is present this sampling will not be conducted and the material will be excavated for treatment If field analysis is not conducted to characterize the material it shall be excavated for onsite treatment or verification samples shall be collected Since these samples will verify that the objectives of the ROD have been met for excavation of contaminated soil laboratory analysis will be used to verify whether the limits of contamination have been reached The results of laboratory analysis for verification should be compared to the actual clean up values of 0 1 ppm B(a)P equivalence for surface soil and 1 0 ppm B(a)P equivalence for subsurface soil Sampling protocols and requirements are discussed in more detail in the Field Sampling Plan

2 2 BACKFILLING

The Contractor will backfill and compact soil in the excavation areas generally (within one to two feet so that the general final slope is achieved) to the final grades indicated on the drawings No backfilling activities will occur in the west tributary Treated sediments that were excavated from the western tributary will be backfilled in the containment area

Backfilling may occur in part of an excavation pit where excavation is ongoing provided that the treated backfill soil does not contact contaminated soil remaining in the excavation Backfilling and compaction will be conducted in accordance with the substantive requirements of Maryland regulations for the control of noise pollution stormwater management and erosion and sediment control as specified Although the ROD specified that clean fill should be backfilled below the water table the project team including EPA and the community has agreed that treated soil may be backfilled below the water table

Soil backfilled greater than 6 ft below final grade will be placed in 2 ft lifts and compacted by at leas four passes with a tracked excavator Soil backfilled less than 6 ft below final grade will be placed in 1 ft lifts and compacted by at least four passes with a tracked excavator The moisture content of the soil will be manipulated by the Contractor in order to achieve sufficient compaction improve handling and minimize fugitive dust

ORIGINAL (Red)

2 3 CONSTRUCTION DEWATERING

The Contractor is required to conduct site dewatering as necessary to prepare contaminated soil and pond sediment for excavation The dewatering system will consist of a combination of underground and surface suction points Extracted water will be pumped to the on site water treatment facility for treatment prior to discharge to the West Tributary

The dewatering system is anticipated to consist of one or more systems of well points for extraction of groundwater a fixed inlet in the onsite pond and several temporary sumps located in the excavation areas to collect surface water as indicated on the drawings F om these collection points water will be pumped through temporary site piping to the on site water treatment facility The temporary sumps and site piping may be moved several times throughout the course of site remediation as required

Any non aqueous phase liquid (NAPL) and dense non aqueous phase liquid (DNAPL) free product pumped from the ground and/or surface water during dewatering operations will be stored packaged transported and disposed of in accordance with applicable federal state and local requirements Two tanks have been shown on the site plan just north of the new water treatment facility for equalizat on of influent water as well as separation of free produc (and sediment) One of these tanks will be used for stormwater and groundwater

2 4 STORMWATER MANAGEMENT

The criteria for stormwater management includes he prevention of sediment transport from the site by stormwater discharges and the control of surface water runoff to prevent the transport of contaminat on by surface water discharge to uncontaminated areas

Temporary sumps will be installed in each excavation pit as needed as represented on the drawings to create temporary sediment basins Stormwater which collects in these basins will be pumped either to the tank at the water treatment facility or to the onsite pond for temporary storage Discharges from these temporary sediment basins to off site or clean surface water bodies will not be allowed Tne stormwater level in the temporary sediment basins must be pumped down and maintained as low as possible to provide dry conditions for excavation and to prevent discharges

Runon of stormwater from uncontaminated areas of the site should be prevented by the use of temporary earth dikes as appropriate The earth dikes excavation contours must be maintained to prevent run on and runoff of stormwater between contaminated and uncontaminated areas At no time should runoff from a contaminated area of the site be allowed to traverse uncontaminated parts of the site or neighboring property

2 5 EROSION AND SEDIMENT CONTROL

It is required that excavation activities be conducted in a manner that will minimize the transport of sediment from exposed areas of the site Sediment and erosion controls should be installed in accordance with the Erosion and Sediment Control Sequence of Operation The areas of exposed soil should be minimized in order to decrease the potential for sediment laden runoff to leave these areas Soils which are exposed or stockpiled for longer than 14 days should be seeded in accordance with the notes page The following erosion and sediment control structures are specified for use as indicated on the drawings

- Stabilized construction entrance
- Silt fence
- Super silt fence
- Stone check dam
- Rip rap channel
- Earth dike

2 6 DECONTAMINATION

The existing decontamination facility will be used for decontamination activities at the site Equipment and vehicles leaving the Exclusion Zone will pass through the decontamination facility for the

removal of soil or other materials that may be contaminated The equipment and material will be washed down with high pressure low volume pressure washers provided by the Contractor Decontamination will occur on the designated wash pad at the existing facility Materials washed off of the equipment and vehicles will be collected in the existing solid and liquid collection structure for temporary storage

Solid materials collected in the existing collection structure will be transported to the onsite thermal desorption unit for treatment Liquid waste collected in the existing collection structure should be regularly pumped out and transported to the onsite groundwater treatment facility for treatment Other solid waste such as disposable coveralls or towels which cannot be treated by thermal desorption should be disposed of off site in accordance with applicable requirements

3 0 WORK PLAN SPECIFICATIONS SECTION 02010 SEDIMENT EROSION AND CONTROL

This section provides information regarding sediment erosion and control requirements The information in this section includes materials specifications and other guidance and should be used in conjunction with the edited site plans

3 1 QUALITY ASSURANCE

Erosion and sediment control structures shall be installed as shown and specified on the drawings and in accordance with the approved erosion and sediment control plan

The Contractor shall provide the necessary stabilized construction entrances straw bales silt fence earth dikes and/or other temporary erosion control measures to contain all his work activities and as directed by the Contracting Officer Straw bales shall be either wire bound or string tied with bindings around sides rather than over and under Crushed stone for stabilized construction entrance shall conform to ASTM Designation C 33 88 size No 2 (1 5 to 2 5 inches) Silt fence shall be Envirofence preassembled silt fence by Mirafi Inc or approved equivalent Seed shall be certified by the Maryland Department of Agriculture and shall conform to requirements of Maryland State Law and Regulations and MSHA Section 920 04 01 For temporary stabilization of inactive confirmed clean soil stockpiles that will be in place while the site activities are considered inactive provide temporary grass stabilization in accordance with the notes sheet of the drawings Site work will be considered inactive if no soil excavation backfilling or thermal treatment activities occur for 14 consecutive days

Erosion control measures shall be established at the beginning of construction and maintained during the entire period of construction The Contractor shall repair or replace erosion control measures as needed

All land disturbing activities are to be planned and conducted to minimize the size of the area to be exposed at any one time and the length of the time of exposure

Surface water runoff originating upgrade of exposed areas should be controlled to reduce erosion and sediment loss during the period of exposure

When the increase in peak velocity of storm water runoff resulting from a land disturbing activity is sufficient to cause accelerated erosion of the receiving stream provide measures to control both the velocity and the rate of release so as to minimize accelerated erosion and increased sedimentation of the stream All land disturbing activities are to be planned and conducted so as to minimize off site sedimentation damage

3 2 DUST CONTROL

Dust generated from the Contractor's performance of the work shall be controlled by the Contractor by applying either water or calcium chloride with the approval of the Contracting Officer Water and calcium chloride shall be provided in the amounts and locations necessary to suppress dust within the limits of work

4 0 WORK PLAN SPECIFICATIONS SECTION 02215 EXCAVATION AND HANDLING OF MATERIALS

This section includes the Contractor's requirements associated with the excavation handling and disposal of contaminated potentially contaminated and non contaminated materials during construction activities and includes methods for staging and segregating of contaminated materials potentially contaminated materials and non contaminated materials

4 1 EXCAVATION

The location of all underground and overhead utilities that may interfere with excavation prior to beginning work will be verified All excavation of contaminated and non contaminated soil shall be performed to the grade lines indicated on the construction drawings unless excavation or verification sampling and analysis indicate that the actual limits of contamination deviate from those indicated on the drawings Suitable materials excavated from the site shall be used as backfill materials onsite following treatment as required The area of exposed soil shall be kept to a practical minimum at all times All excavations that extend down to or below the groundwater level shall be dewatered by lowering and maintaining the groundwater level at least 12 inches below the bottom of the excavation

4 2 EXCAVATION OF SOILS OUTSIDE OF THE EXCLUSION ZONE

Excavation of soils outside of the exclusion zone shall be performed to the limits indicated on the construction drawings and as necessary to install site facilities including but not limited to utilities trailers thermal treatment units structures haul roads stockpile areas and staging areas Upon excavation these materials shall be classified as non contaminated or potentially contaminated and handled appropriately In general soil excavated beyond the exclusion zone s assumed to be non contaminated unless contamination is visible in which case the soil would be classified as potentially contaminated Suitable materials shall be used as backfill onsite Non contaminated materials that are unsuitable for backfill shall be disposed of off site in accordance with applicable regulations

4 3 EXCAVATION OF SOIL WITHIN THE EXCLUSION ZONE

The Contractor shall excavate soil within the exclusion zone within the limits of contamination indicated on the drawings using visual and olfactory indications When visual contamination or odor is diminished and are not good indicators field screening may be conducted to provided guidance in locating excavation end points Verification samples will be collected in accordance with the Field Sampling Plan when the Contractor judges based on contour lines field observations and field screening results that the actual limits of contamination may have been reached Upon receiving analytical results of excavation sampling indicating that the limits of contamination have been reached the Contractor shall then backfill those areas with treated soil meeting delisting criteria

4 4 PROTECTION OF CLAY LAYER

No excavation shall penetrate the clay layer without the prior approval of the Contracting Officer The Contractor shall take all necessary precautions to protect the surface of the clay layer from damage or penetration Heavy construction equipment that may compromise the integrity of the clay layer shall not be operated directly on the clay layer

4 5 EXCAVATION SIDEWALL STABILIZATION

Sidewalls of all excavations shall be laid back at slopes no steeper than 2 1 horizontal to vertical unless otherwise noted Sections of the sheet pile wall exposed by excavation shall be stabilized in accordance with SECTION 02390 SHEET PILE WALL STABILIZATION CUTTING AND DISPOSAL of the July 1997 SSWP

4 6 HANDLING OF SOILS

Excavated soil classified as contaminated materials shall be transported from the excavation to the Contaminated Soil Stockpile Area shown on the drawings Transport of these materials shall follow hauling roads designated for this purpose as indicated on the drawings Excavated contaminated soil shall remain onsite in the designated stock pile until it is moved to the thermal desorption unit roofed area in preparation of loading into the thermal desorption units Solids recovered from on site decontamination activities shall be

stored with other contaminated soil in preparation for on site treatment Potentially contaminated soil shall be handled as contaminated soil until it is re classified

Non contaminated soil shall not come in contact with contaminated soil At no time shall non contaminated soil be stockpiled down slope from contaminated or potentially contaminated soil The vehicles and equipment will be decontaminated prior to use for handling non contaminated soil and shall use clean haul roads designated for the transport of non contaminated materials as indicated on the construction drawings

The contaminated soil stockpiling area shall have a base liner to prevent migration of contaminants to adjacent soil and groundwater The base liner shall have a protective surface of 12 mil plastic sheeting overlain with geotextile and 4 to 6 inches of stone The contaminated soil shall remain uncovered during dry weather to allow the soil to dry prior to thermal desorption

Within the areas designated for potentially contaminated soil stockpiles including treated soil that is unconfirmed the Contractor shall construct and maintain a stockpile facility in accordance with the specifications above for Contaminated Soil Stockpiles Treated but unconfirmed soil shall be stockpiled separately from other untreated potentially contaminated soil Treated but unconfirmed soil stockpiles shall be individually flagged with identifying numbers and dates for ease of association with analytical data

Non contaminated soils including treated soil which has been confirmed shall be stockpiled in designated areas as indicated on the construction drawings The Contractor shall take necessary precautions to control erosion from these stockpiles using straw bales as appropriate Any in active non contaminated soil stockpile that is in place while the site work is considered inactive shall be covered or temporarily vegetated in accordance with SECTION 02960 SITE RESTORATION Base liners are not required for these stockpiles

4 7 MONITORING WELL PROTECTION AND ABANDONMENT

The Contractor shall take necessary precautions to prevent damage to existing monitoring wells onsite during excavation Wells that can be salvaged shall be protected during excavation to prevent contamination Wells that do not penetrate into the clay confining layer and are located in areas designated for excavation will be pulled out during excavation Any other wells to be abandoned shall be abandoned in accordance with Maryland regulations (COMAR 26 04 04 11)

4 8 MATERIAL DISPOSAL

All non contaminated materials shall be disposed of onsite as backfill material with the exception of demolition debris and large vegetation which cannot be chipped or shredded Decontaminated demolition debris asbestos containing material and large vegetation which can not be chipped or shredded shall be disposed of off site in accordance with applicable regulations In addition any soils or other materials whic are so grossly contaminated that they cannot be treated onsite by thermal desorption as determined by the Contracting Officer shall be containerized and transported off site for disposal at an appropriate disposal facility in accordance with applicable hazardous waste handling transport and disposal regulations All wastes scheduled for off site disposal shall be temporarily stored onsite analyzed and treatment standards determined in preparation for shipment in accordance with RCRA Land Disposal Regulations (40 CFR Parts 268 7 268 9 and 268 50) It is anticipated that all site wastes can be successfully treated by single or multiple passes through the thermal desorption units (solids) or the water treatment plant (liquids exclusive of free product)

Waste materials generated by onsite construction activities resulting in the support zone shall be considered as non contaminated wastes to be disposed of off site These waste materials include but are not limited to office waste food packaging and related wastes concrete formwork material and equipment packaging crates and pallets miscellaneous steel scrap containers and wasted concrete

5 0 WORK PLAN SPECIFICATIONS SECTION 02217 WEST TRIBUTARY SAMPLING, EXCAVATION, AND RESTORATION

This section includes the Contractor's requirements for sampling and analysis of depositional sediments in the west tributary as well as excavation of materials determined to be contaminated in the west tributary The sampling requirements for the west tributary as specified in this section differ from the sampling requirements of the upland areas of the site

The confirmation sampling of sediments to determine that contamination is present along the west tributary will commence after excavation of the upland areas of the site The locations of sampled sediments are shown on the drawings are taken from the July 1997 SSWP which was based on Dames and Moore s Pre Design Report (1992) The locations and areal extent of sediment removal will be determined based on the results of the confirmation sampling The west tributary has been broken into three reaches defined here as the Upper Middle and Lower Reaches The Upper Reach extends from the existing sheet pile wall downstream to the first intersection of the west tributary with the property line The Middle Reach extends between the two intersections of the west tributary with the existing property lines and the Lower Reach which extends approximately 425 ft downstream of the second intersection of the west tributary with the property line to the confluence of the east and west tributaries

ORIGINAL (Red)

6 0 WORK PLAN SPECIFICATIONS SECTION 02220 BACKFILLING, COMPACTION AND GRADING

This section includes the Contractor's requirements associated with the backfilling compaction and grading of soils

6 1 UNSUITABLE AND SUITABLE MATERIALS

Unsuitable materials include all materials that contain debris roots organic or frozen materials materials classified in ASTM D 2487 as MH PT OH and OL boulders larger than 12 inches and materials that are determined by the Contracting Officer as unsuitable for providing a stable slope fill or subgrade Otherwise suitable material which is unsuitable due to excess moisture content and cannot be dried out by manipulation or mixing with drier soils to the satisfaction of the Contracting Officer Unyielding materials defined as rock or gravelly soils with stones greater than 6 inches in any dimension shall be considered unsuitable Only material which is not defined as unsuitable shall be used and is therefore deemed suitable

6 2 BACKFILLING

Treated soils qualifying as suitable materials shall be used to backfill the excavated areas Backfilling activities shall be conducted in compliance with the substantive requirements of Maryland regulations or the control of noise pollution COMAR 26 02 03 02 A (2) and B (2) and COMAR 26 02 03 03 A) storm water management (COMAR 26 17 02) and erosion and sediment control (COMAR 26 09 01 11) Backfilling that will affect site wetlands shall be conducted in accordance with the requirements of SECTION 02960 SITE RESTORATION No backfilling activities shall occur in the western tributary Treated sediments that were excavated from the western tributary shall be backfilled in the containment area

6 3 PREPARATION OF BACKFILL AREAS

Reasonable measures shall be taken by the Contractor to minimize wetness of areas designated for backfilling No backfilling shall occur in areas with standing water In dewatered areas the water table shall be maintained at least 12 inches below the bottom of the excavation until backfilling is complete

6 4 COMPACTION OF TREATED SOILS

Soils backfilled greater than 6 ft below final grade shall be placed in 2 ft lifts and compacted by at least four passes with a tracked excavator Soils backfilled less than 6 ft below final grade shall be placed in 1 ft lifts and compacted by at least four passes with a tracked excavator The moisture content of the soil shall be manipulated in order to achieve sufficient compaction improve handling and minimize fugitive dust

6 5 GRADING

The site shall be graded to approximately the final site contours as indicated on the drawings Existing site drainage patterns shall be restored following the excavation and treatment of site soils so that the pre construction and post construction peak stormwater discharge rates are similar Temporary measures implemented for erosion and sediment control including but not limited to temporary drainage swales and earth dikes shall be removed from the site and affected areas shall be restored to the topography indicated on the drawings The Contractor shall submit a final grading plan for the containment area if the final grades differ significantly from those indicated on the drawings

6 6 SPREADING TOPSOIL

If the Contractor elects to import topsoil rather than amending treated soil for use as topsoil these requirements shall apply The application of topsoil shall follow grading activities at the site Areas from which topsoil has been removed shall be topsoiled The subgrade shall be pulverized to a depth of 50 mm (2 inches) by disking or plowing for the bonding of topsoil with the subsoil Topsoil shall then be uniformly spread graded and compacted to the thickness elevations and slopes shown and left free of surface irregularities Topsoil shall be compacted by one pass of a tracked excavator Topsoil shall not be placed when the subgrade is frozen excessively wet extremely dry or in a condition otherwise detrimental to seeding planting or proper grading

7 0 WORK PLAN SPECIFICATIONS SECTION 02665, STORMWATER MANAGEMENT AND CONSTRUCTION DEWATERING

This section includes the Contractor s requirements for management of stormwater and dewatering of soils to be excavated Critical information regarding the subsurface conditions (i e boring logs geotechnical test data pumping test data chemical test data and water quality data) is contained in the Dames and Moore Predesign Report

7 1 STORMWATER MANAGEMENT

Surface water from off site and from uncontaminated areas of the site shall be directed away from excavation and construction areas Surface water runoff from excavated areas that are or may be contaminated will not be allowed Diversion ditches dikes and grading shall be provided and maintained as necessary during construction In addition temporary sumps shall be used in the excavation pits as needed to control accumulation of standing water in open excavations as indicated on the drawings All surface water that contacts exposed contaminated areas shall be collected and stored in the excavations and temporary sump areas until being transferred either to the on site pond or to the on site water treatment facility holding tank for treatment

7 2 CONSTRUCTION DEWATERING

The Contractor shall control the groundwater in all excavations in a manner that will preserve the strength and integrity of the foundation soil and not cause instability of the excavation slopes Where necessary to achieve these purposes the groundwater elevation shall be lowered in advance of excavation to an elevation at least 12 inches below the bottom of the excavation The Contractor shall use sumps dewatering wells wellpoints collection trenches or similar procedures to lower the groundwater elevation Any dewatering wells or wellpoints utilized shall be installed with suitable screens and filter packing so that excessive pumping of fines does not occur All water collected during dewatering activities shall be directly transported to the on site water treatment facility for treatment

7 3 TRANSPORT PIPING

Transport piping shall be above grade where possible and shall be inspected daily by the Contractor for leakage Leaking or damaged sections of pipe shall be repaired or replaced immediately Piping shall be routed so as to minimize interference with site activities and traversing of uncontaminated soils

8 0 WORK PLAN SPECIFICATIONS SECTION 02960 SITE RESTORATION

This section includes the Contractor's requirements for restoring the wetlands and the uplands of the site The general intent of site restoration is to stabilize and re-vegetate the uplands of the site with grasses and plants that are indigenous to the site and to re construct wetlands that are disturbed in the wetland areas with plants and trees that are suitable for those areas A necessary part of restoring the vegetation of the site is amending the treated soil so it is capable of supporting the restored vegetation An accredited soil testing laboratory shall be employed to assist with exact specification of soil amendments to be incorporated into the treated soil Re vegetation of the site will follow final grading which is specified in SECTION 02220 BACKFILLING COMPACTION AND GRADING

Restoration of the site requires the approximate final grade lines to be established as indicated on the drawings Pre-construction drainage patterns shall be restored to all areas of the site Following final grading disturbed areas of the site shall be re vegetated in accordance with the notes page indicated on the drawings