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FINAL

Preliminary Ordnance and Explosives Site Assessment Report for the Green Beach Area

U.S. Naval Ammunition Support Detachment Vieques Island, Puerto Rico

Prepared for

Department of the Navy

Atlantic Division

Naval Facilities Engineering Command

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List of Acronyms

AOC	Area of Concern
ASR	Archive Search Records
bls	Below land surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLEAN	Comprehensive Long-Term Environmental Action Navy
DoD	Department of Defense
DOI	Department of the Interior
EBS	Environmental Baseline Survey
EIS	Environmental Impact Statement
EMA	Eastern Maneuver Area
EOD	Explosive Ordnance Disposal
ERM	Environmental Resources Management
FOSET	Findings of Suitability for Early Transfer
GBA	Green Beach Area
GPS	Global Positioning Satellite
IAS	Initial Assessment Study
IRP	Installation Restoration Program
LANTDIV	Atlantic Division
MCHC	Marine Corps Historical Center
mm	Millimeter
NAF	Naval Ammunition Facility
NAILS	National Archives website
NARA	National Archives and Records Administration
NASD	Naval Ammunition Support Detachment
NAVFACENGCOM	Naval Facilities Engineering Command
NHC	Naval Historical Center
NOSSA	Naval Ordnance Safety and Security Activity
NSRR	U.S. Naval Station Roosevelt Roads
OB/OD	Open Burn/Open Detonation
OE	Ordnance and explosives
RFA	RCRA Facility Assessment
ROTHR	Relocatable Over The Horizon Radar
SOW	Statement of Work
SWMU	Solid Waste Management Unit
UXO	Unexploded ordnance
WTA	Western Training Area

SECTION 1

Introduction

This Preliminary Ordnance and Explosives (OE) Site Assessment Report for the Green Beach Area (GBA) of the Naval Ammunition Support Detachment (NASD) has been prepared by CH2M HILL for the Naval Facilities Engineering Command (NAVFACENGCOM) Atlantic Division (LANTDIV) under Navy Contract N62470-95-D-6007, Navy Comprehensive Long-Term Environmental Action Navy (CLEAN), District III, Contract Task Order 216. This report addresses response actions taken to minimize risks to human health and the environment from potential exposure to OE that may have occurred at the GBA resulting from past Department of Defense (DoD) activities at the NASD on Vieques Island, Puerto Rico. Specifically, this report will present the findings of the Site Assessment field effort conducted at the GBA in conjunction with the ongoing Property Transfer of NASD. Because of the unconfirmed possibility that the GBA was used for military training, LANTDIV required that a Preliminary Site Assessment be completed to determine whether the GBA was contaminated with unexploded ordnance (UXO) and/or OE material. This Preliminary Assessment Report will be presented in accordance with the report outline located in the approved work plan (CH2M HILL, March 2001).

1.1 Background

This report addresses comments from the Naval Ordnance Safety and Security Activity (NOSSA) following its review of the Environmental Baseline Survey (EBS) document prepared for NASD for the western portion of Vieques Island. Review of site historical information suggested that the GBA, while not identified as an area of concern (AOC) in literature reviews and earlier site assessments, may have been impacted previously by the Western Training Area (WTA). The specific concerns:

- The safety concern associated with public access to the GBA that may have been impacted by UXO/OE and whether or not the WTA extends as far north as the GBA.

NOSSA recommended that the tasks listed below be included in the Initial OE Site Assessment:

- Archive records search to identify the boundary of the WTA. If the archive search cannot establish the area boundaries for the WTA, then the Green Beach area immediately north of Solid Waste Management Unit (SWMU) 4 and any inland openings from the beach should be used as the basis for the investigation.
- A magnetometer survey recorded by a Global Positioning Satellite (GPS), or other geo-positioning system, of the area identified by the archive records search described above. The survey will follow a statistical sampling plan.
- Removal of any identified UXO and ordnance components.

- Item "a." above was addressed prior to the field effort associated with this plan. Items "b." and "c." were addressed by the satisfactory completion of the field effort.

The objectives of this study were to:

1. Perform a visual inspection and geophysical survey to assess whether this parcel was contaminated with ordnance
2. Propose further action upon reviewing the data gathered from the field

1.2 Project Authorization

On January 31, 2000, President Clinton issued a directive to the Secretary of Defense stipulating that the Navy shall submit legislation to Congress to transfer NASD on Vieques Island, Puerto Rico, with the exception of approximately 100 acres of land on which the Relocatable Over The Horizon Radar (ROTHR) and Mount Pirata telecommunications sites are located, to the Government of Puerto Rico no later than May 1, 2001.

Legislation was passed by Congress on October 12, 2000, which authorized the transfer of NASD. In accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and DoD requirements, an EBS of NASD was conducted to assess the possible presence of sites potentially contaminated with hazardous materials resulting from past activities.

Through the EBS, the Navy identified 17 areas of potential contamination within NASD. Of these 17 areas, three sites were identified to potentially contain OE. Two of the three sites are referred to as SWMUs, and the remaining site is referred to as an AOC. These sites are listed below:

- SWMU 4 – Inactive Waste Explosive Open Burn/Detonation Area
- SWMU 6 – Mangrove Disposal Site
- AOC J – Former Operations Area Disposal Site

In addition, a site referred to as the WTA along Green Beach, NASD, Vieques, was identified as a site that could potentially contain OE. As part of the Navy's Installation Restoration Program (IRP), the three sites cited above are being investigated in accordance with the CERCLA process to assess the potential presence of hazardous constituents at the sites.

1.3 Purpose and Scope

The purpose of this report is to present the findings from the investigation by CH2M HILL and its subcontractors during the April field activity, as well as any previous investigations conducted at the GBA. In addition, recommendations will be provided based upon the findings of the Site Assessment as to whether a more complete characterization of the GBA is warranted.

1.4 Project Team

The field team was comprised of LANTDIV and subcontractors including CH2M HILL, Chemrad (geophysical services), and USA Environmental, Inc. (UXO services). Figure 1-1 presents the project field communication plan for the Green Beach UXO investigation, including representatives from NOSSA, U.S. Naval Station Roosevelt Roads (NSRR), and Navy Explosive Ordnance Disposal (EOD).

1.5 Project Objectives

The objectives were to assess whether the WTA extended along the GBA on the northwestern part of NASD, Vieques, and to evaluate whether this area contained OE. The Work Plan provided the framework and basic guidance for the performance of the OE site investigations in an effort to identify actions needed to allow for the safe and effective use of the site. The planned land use for Green Beach is as a wildlife refuge to be managed by the Department of the Interior (DOI). The required UXO clearance depth for land designated as a wildlife refuge is 1 foot below land surface (bls). This OE investigation was executed in accordance with OPNAVINST 8020.14, Department of the Navy Explosives Safety Policy, NAVSEA OP 5 Volume 1, Ammunition and Explosives Ashore, U.S. Army Engineering and Support Center, Huntsville IGD 00-003, Basic Safety Concepts and Considerations for Ordnance and Explosive Operations.

Specifically, the project objective of the assessment was to evaluate whether the GBA was contaminated with UXO and/or OE material resulting from Marine training activities in the WTA of NASD. Since the archive records search of NASD did not document the actual boundary and training activities associated with the WTA, the OE assessment was conducted along the beach, access roads, and the brush in between these two areas as described in the Initial Ordnance and Explosives Site Assessment Work Plan for the Green Beach Area (CH2M HILL, March 2001). The OE survey consisted of a visual sweep of the area, and a surface clearance of any identified OE, followed by a geophysical survey of the area, and an intrusive investigation of all anomalies identified by the geophysical survey. Figure 1-2 shows the areal extent of the OE assessment. The targeted potential OE for this site assessment on Green Beach included 20 millimeter (mm) projectiles and pyrotechnics. This was based on the archives record search, interviews with Navy personnel, and results from investigations at the former open burn/open detonation (OB/OD) area located immediately south of Green Beach.

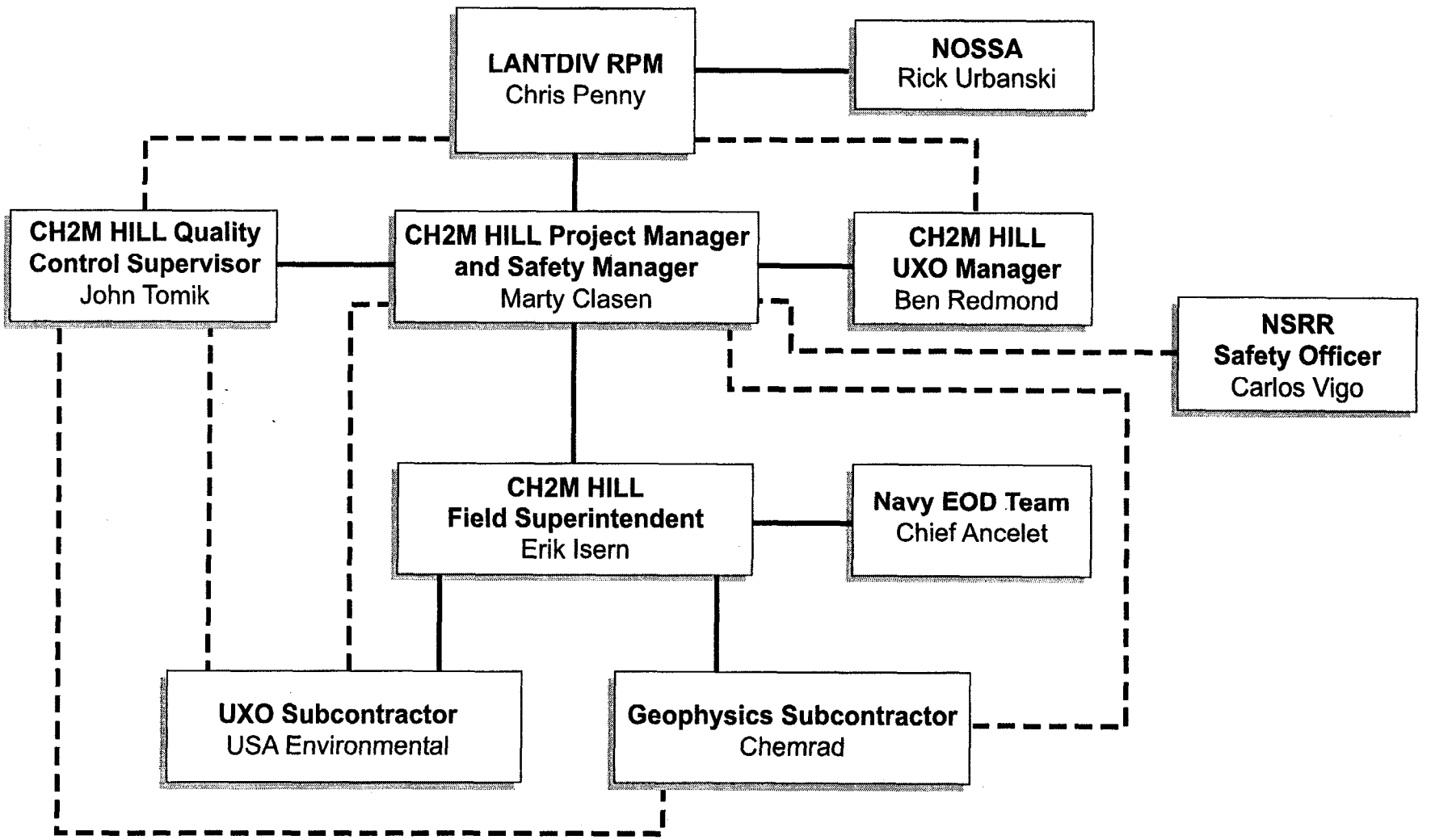

FIGURE 1-1
Green Beach UXO
Project Field Communication Plan

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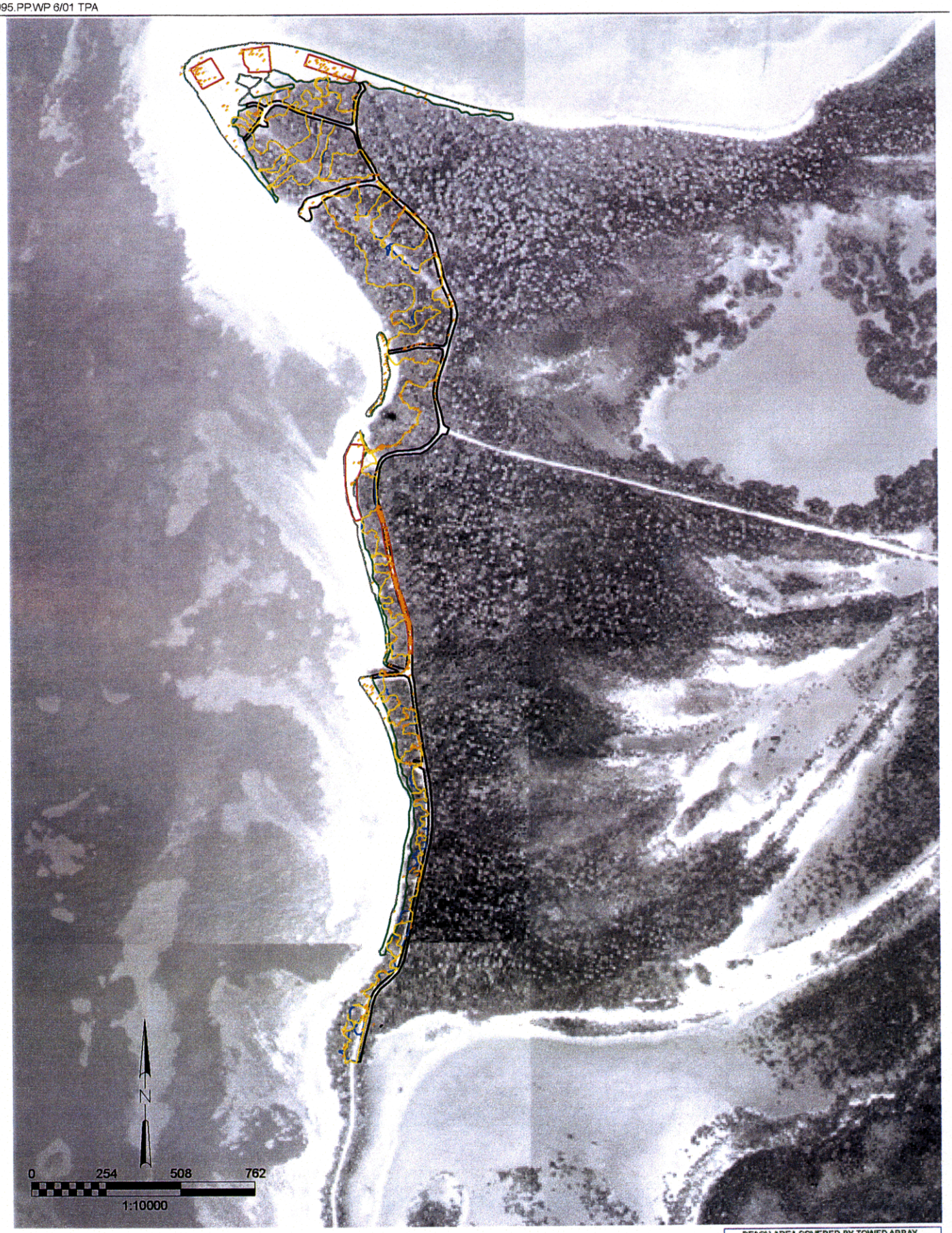

FIGURE 1-2
Geophysical Survey Areas

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SECTION 2

Site Description and History

2.1 NASD Background

Vieques is the largest offshore island of Puerto Rico, with a surface area of approximately 51 square miles. It is located approximately 7 miles east-southeast of the eastern end of the main island of Puerto Rico, where the NSRR is located (Figure 2-1). NASD occupies the western end of the island of Vieques, encompassing approximately 7,878 acres. The majority of NASD is undeveloped and heavily vegetated with trees, low-lying brush, and tall grasses. The southwestern portion of NASD is the least developed, with the exception of the communications facilities on top of Mount Pirata. The central eastern portion of the NASD was utilized for munitions magazines, which are scattered throughout the area. The northeastern portion of NASD is the most developed, containing facilities for the main support compound. The southeastern portion of NASD contains the ROTHR station and associated facilities.

NASD was utilized by the U.S. Navy Atlantic Fleet for storage of munitions. The activities at NASD were directed under the consolidated command of Commander Fleet Air Caribbean, Naval Forces Caribbean, and Antilles Defense Command, whose headquarters are at NSRR. The mission of NASD was to receive, store, and issue all ordnance authorized by NSRR for support of Atlantic Fleet activities. Munitions were stored in numerous bunkers located throughout NASD. Other than the bunkers, the only other significant developments at NASD consist of the main support compound located in the northeast portion of the facility, the Mount Pirata telecommunication sites located in the southwest portion of the facility, and the ROTHR site located in the southeastern portion of the facility.

Munitions currently are not stored at NASD and no Navy activities are being conducted at the facility, other than operations at the Mount Pirata telecommunication sites and the ROTHR facility. The main support compound is not in operation. NASD was transferred to the DOI (3,100 acres), the Municipality of Vieques (4,000 acres), and the Puerto Rico Conservation Trust (800 acres) on April 30, 2001.

Green Beach is located on the northwest corner of NASD. The beach has typically been open to the public for daytime use and is a popular anchorage spot for pleasure boats.

2.2 Physical Description

Green Beach covers an area of approximately 20 acres in the northwest corner of NASD. The beach area is approximately 1 mile long from the northern tip at Point Arenas to the southern end near the boundary of SWMU 4. Green Beach is currently part of the DOI property and is open to the public for daytime use. A dirt road runs parallel to the beach (north-south) and several dirt road entrances allow beach access. Two small cabanas are

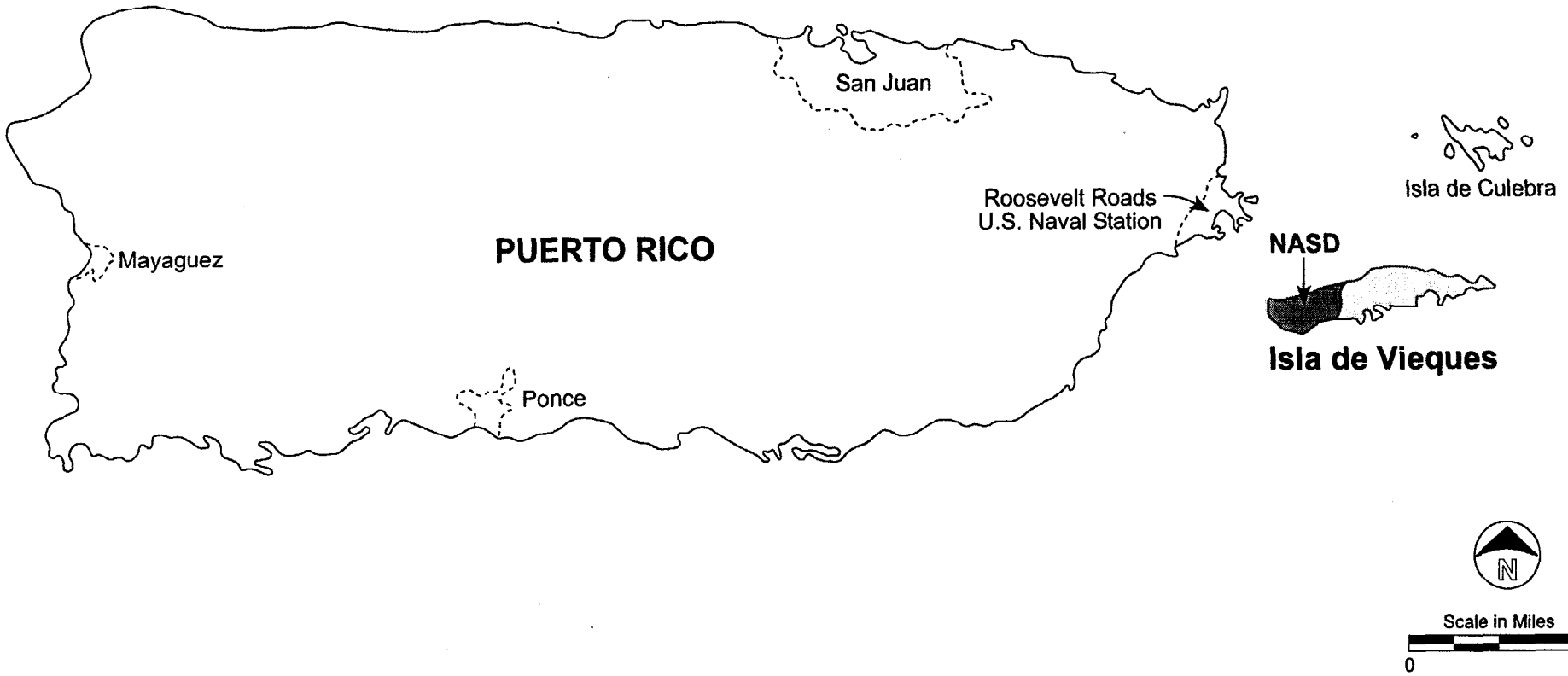

Figure 2-1
SITE LOCATION MAP
NASD, Vieques Island, Puerto Rico

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located in open areas along the beach. A vegetated area runs parallel to the beach between the beach and the north-south access road. The vegetated area consists of brush and small trees. The vegetation is light on the southern end of Green Beach, and increase in density and thickness from south to north along the beach.

2.2.1 Climate

The climate of Vieques is tropical-marine. Temperatures are nearly constant, with an annual average approximately 79°F. August is the warmest month (82°F) and February the coolest (76°F). Vieques lies directly in the path of the prevailing easterly trade winds that regulate the climate of Puerto Rico. The trade winds result in a rainfall pattern characterized by a dry season from December through July and a rainy season from August to November. Heavy precipitation may be induced by tropical storms from June to November. The western part of the island, where NASD is located, averages approximately 50 inches of rainfall per year, 50 percent of which occurs during the rainy season (U.S. Geological Survey [USGS], 1989).

2.2.2 Topography and Surface Water

The topography of Green Beach is fairly flat (Figure 2-2). In general, the site slopes gradually down from the center to the coastal areas in the north and west beach areas.

The only surface water present at the site occurs in Laguna Arenas (east of the main beach access road) and in a small lagoon on the southern-most end of Green Beach near Punta Boca Quebrada. These lagoons are generally very shallow, and are characterized by large concentrations of mangroves.

2.3 History

The U.S. Navy began using Vieques, in conjunction with NSRR, in the early years of World War II as a base for Allied fleets. Land was acquired in the eastern and western sectors of the island between 1941 and 1943. Construction of Mosquito Pier and the building of facilities and magazines for an ammunition storage depot were generally completed by 1943. The Naval Ammunition Facility (NAF) on Vieques, now known as NASD, operated until 1948, when ammunition was removed and the facility was closed. The facility was re-activated in 1962 in response to the Cuban missile crisis.

The mission of NASD was to receive, store, and issue ordnance authorized by NSRR for support of Atlantic Fleet units. It fulfilled this mission until recently, when the ammunition storage operations were de-activated and all remaining ordnance was removed. In the past, training exercises consisting of marine landing operations were conducted along the south and west beach areas, which include SWMU 4 and Green Beach. In 1978, NASD received more than 4,100 tons of explosives and ammunition. During this same period, more than 3,500 tons of ammunition and explosives were issued. Trans-shipments amounted to approximately 1,200 tons.

T:\Environmental\Puerto Rico Drawings\Vieques\Vieq-Fig2-2.dwg

Figure 2-2
FACILITY MAP
Naval Ammunition Support Detachment, Vieques Island

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The following sites at NASD which potentially contain OE that may have had an impact on GBA are shown on Figure 2-3:

- SWMU 4 – Inactive Waste Explosive Open Burn/Detonation Area
- Western Training Area

The following sections present the history of these sites.

2.3.1 SWMU 4 – Inactive Waste Explosive Open Burn/Detonation Area

SWMU 4 is located in the southwestern portion of NASD, and was used as an EOD range from at least 1969 to 1979. According to some reports, SWMU 4 may have been in use since the late 1940s. This range was used for the disposal of excess and retrograde ammunition and, on a twice yearly basis, for disposal of unexploded munitions found around the targets on the Eastern Maneuver Area (EMA) located in the eastern portion of Vieques and not part of NASD. Other explosive materials disposed at SWMU 4 included material from the rework of munitions (e.g., loose powder and primers) and ordnance items from the Torpedo Shop. Materials disposed of at the site included flares and cartridge-activated devices. The range had a maximum blow limit of 4,000 pounds of TNT equivalent.

SWMU 4 was closed in 1976 to most uses and swept for a 1-mile radius by EOD personnel at least three times (IAS, 1984). The range was reportedly fully closed in 1979, but some UXO has been found at the site. During the Preliminary Assessment/Site Investigation performed by CH2M HILL in April, May, and June 2000, ordnance including 20 mm HE, MK-230 fuzes, and a 60 mm mortar fuze were found at SWMU 4.

2.3.2 Western Training Area

Very little documentation exists regarding the location and activities that occurred in the WTA of NASD. The area is noted on a topographic map as the area between the magazine storage area and Green Beach. Reportedly (according to interviews with NASD personnel), the U.S. Marine Corps occasionally conducted amphibious assault exercises along Green Beach using blank ammunition and pyrotechnics. Documents and interviews confirmed that no live weapons firing was permitted during training exercises in the WTA, due to its proximity to storage magazines in the NASD area and the use of the Green Beach area by boaters.

2.4 Demographic Profile

Land access to Green Beach is controlled by a security gate at the entrance of NASD. Tourists and local residents are allowed to visit the beach by either car or boat. Green Beach is considered a good anchor destination by boaters and is frequented by fishermen.

2.5 Land Use

On April 30, 2001, approximately 4,000 acres were conveyed to the Municipality of Vieques, 3,100 acres (conservation zones) were transferred to the DOI, and 800 acres were placed under management of the Puerto Rico Conservation Trust. A total of 100 acres have been

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Figure 2-3
POTENTIAL OE SITES AT NASD
NASD, Vieques Island, Puerto Rico

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retained by the Navy. The Green Beach area surveyed was only used sporadically by the Navy for amphibious assaults. Otherwise, it is a popular anchoring area by boaters from mainland Puerto Rico. The area is located within the 3,100 acres that were transferred to the Department of Interior.

2.6 Analysis of Historical Records

2.6.1 Objectives and Activities Conducted

A records search, a site inspection, an aerial photo review, and personnel interviews conducted during the EBS did not identify any specific environmental issues related to the former WTA. NASD Vieques has never been used by the Navy as a weapons range. The documentation obtained during the EBS, however, did not provide detailed information on the location and activities of the former WTA.

Therefore, a more extensive search of archival records was conducted from March 13-23, 2001, in an attempt to determine the historical uses, activities, and boundaries of the WTA at NASD Vieques. Records and maps from the 1940s to the 1980s were reviewed. The primary purpose was to identify whether the WTA is potentially contaminated by explosives or UXO as a result of past training activities.

Initial inquiry to National Archives and Records Administration (NARA) staff determined that U.S. Marine Corps records prior to 1940 are kept in the main NARA location in downtown Washington, DC; records from 1940 to 1950 are kept in the NARA location at College Park, MD; and all records after-1950 remain in the custody of the U.S. Marine Corps. The following research activities were conducted:

- Records search at LANTDIV, NSRR, and/or Camp LeJeune. Records are only kept for 3 years at NSRR as per phone conversations with Madeline Rivera. Col. Robert Neller was contacted at Camp LeJeune, but no pertinent information was obtained.
- Interview and records search at the offices of R. Christopher Goodwin & Associates in Frederick, MD, for information discovered during a survey of archeological resources at NASD Vieques
- Interview and records search at the offices of ERM in Annapolis, MD, for records collected during the EBS
- Records search at the Naval Historical Center (NHC) at Washington Navy Yard in Washington, DC
- Records search at the Marine Corps Historical Center (MCHC) at Washington Navy Yard in Washington, DC
- Electronic search of National Archives website (NAILS)
- Records search at the National Archives at College Park and the NARA Cartographic Research Center in College Park, MD

Records held at the downtown Washington location were not searched, because those holdings are only for records prior to 1940. The Navy acquired and began using the NASD

Vieques property in 1941. The results of the archive records search are included in Section 3.1.3 of this document.

2.7 Previous Investigations

No previous environmental or OE/UXO investigations have been conducted in the WTA (including Green Beach).

2.8 Previous Removal Actions

No previous removal actions have been conducted in the Green Beach Area.

SECTION 3

Site Characterization

3.1 Site Assessment Field Effort

3.1.1 Site Description

Green Beach consists of open beach, dirt and sand access roads, and vegetative cover. The vegetative cover is sparse to the south, and becomes dense to the north. The cover reaches heights of more than 20 feet at most locations. The sizes of the beach and vegetative cover areas were estimated at 16 and 12.34 acres, respectively, based on photo images taken in 1994. Actual beach acreage was significantly reduced, however, by the effects of storm surges associated with Hurricane Georges in September 1998. The actual beach and road area surveyed was 7.65 acres. The geology consists primarily of beach and dune deposits made up of calcite, quartz and volcanic rocks, and fragment sand with local magnetite. Appendix A contains photographs of the field investigation.

3.1.2 Site Assessment Objectives

The objectives of this study were to evaluate and revise the previously completed Archive Search Report (Technical Memorandum, Summary of Archival Research on the Western Training Area, Vieques Island, PR, April 6, 2001, included as Appendix B) in an effort to identify the boundary of the WTA. Because the archive search could not establish the exact area boundaries for the WTA, Green Beach (located immediately north of SWMU 4) and the inland openings from the beach were the focus of the assessment.

Following the literature review, the objective was to perform a visual inspection and geophysical survey to assess whether this parcel was contaminated with ordnance. The survey was accomplished with several geophysical instruments, with the corresponding land survey information being recorded by Global Positioning System (GPS).

The final site assessment objective was the reacquisition of all anomalies identified by the geophysical survey and the subsequent intrusive investigation of each anomaly to identify, catalog, and properly dispose of all encountered material.

3.1.3 Assessment Tasks Completed

3.1.3.1 Summary of Archive Search Records (ASR)

NASD

In June 2000, CH2M HILL staff observed a map on the wall in a small office in Bldg. 2015 at NASD. The map appeared to be a USGS topographic map of the west side of Vieques with military training areas identified. "Marine Training Area" was printed in the western area near SWMU 4.

Personal accounts of retired Marine Corps personnel recall amphibious assaults in the late 1960s on Green Beach, using blank ammunition and pyrotechnics.

LANTDIV

A 1973 Draft Environmental Impact Statement (EIS) entitled *Atlantic Fleet Integrated Weapons Training Ranges (Culebra Study)* evaluated impacts of expanding weapons training at Vieques, as an alternative to live-fire training activities at Culebra Island (which were shut down July 1, 1975).

The 1973 Draft EIS includes a figure (Appendix B) showing boundaries for the WTA, comprising an "L" shape along the shoreline from Kiani Lagoon south to Playa Grande Lagoon and extending inland for roughly 1 mile. The WTA is depicted as a part of "Area I," the Naval Ammunition Depot. The source of information used for this figure is not cited, either on the figure itself or in the text.

According to the 1973 Draft EIS, the WTA was considered to be part of the "Fleet Marine Force training complex," along with the Eastern Training Area and the Surface and Air Impact Areas on the eastern side of the island. According to the EIS, the WTA was used by Fleet Marine Force units "primarily for conducting jungle warfare reconnaissance and ambush exercises. A beach at the westerly part of the area [not depicted on the figure] is allocated for amphibious training, but it is used rarely. No weapons firing is permitted during the aforementioned training exercises within the WTA due to its proximity to storage magazines in the Naval Ammunition Depot."

R. Christopher Goodwin & Associates

R. Christopher Goodwin & Associates' study of NASD Vieques archaeological resources for the Navy did not uncover any historical maps indicating the WTA or training activities on the western side of the island.

A copy of a map prepared by Goodwin was obtained, showing where a Phase I archeological survey of the NASD was performed. The survey consisted of pedestrian reconnaissance and shovel test pits at 25-foot intervals. Only a small portion of the western shoreline was surveyed, however, from Punta Boca Quebrada south about halfway to Punta Vaca. A considerable portion of the interior was also surveyed. Goodwin archeologists found one piece of unexploded ordnance—a shell—during the survey, near Punta Boca Quebrada, within the outer perimeter of SWMU 4; SWMU 4 is the former Inactive Waste Explosive OB/OD Area.

Environmental Resources Management

None of the references of the EBS showed boundaries of the WTA or evidence of training activities.

The only relevant information uncovered during the EBS came from interviewing several people who had worked and/or lived in the area over the past 30 years. The interviewees either did not remember any training exercises involving Marines landing on the western shore, or if they did, none involving ordnance other than (possibly) handguns. (These recollections, or lack thereof, would presumably include the time period of the 1973 Draft EIS.)

Between 1948 (when the Naval Ammunition Depot was closed) and 1962 (when the facility was reactivated during the Cuban missile crisis) the western lands were essentially unused by the Navy.

Naval Historical Center

At the NHC located at the Washington Navy Yard, Vieques files were searched. Although several training operations at Camp Garcia on the eastern side of the island were documented in the files, no mention was found of any other training exercise locations on the island. No detailed maps of the island were available at the NHC.

Marine Corps Historical Center

At the MCHC located at the Washington Navy Yard, Fleet Marine Force Atlantic Command Records, newspaper articles, and Battalion exercise records from the 1960s to 1989 were searched. An undated, hand-drawn map was obtained showing three "best landing beaches" on the western and northern shores of NASD Vieques. "A" Beach is indicated as "primary beach" and is a roughly ½-mile-long stretch of the north shoreline, centered on the area now identified by the EBS as AOC J. "B" Beach is shown as a 1-mile-long stretch of the north shore fronting the main operational area of the NASD support facility, from what is now designated AOC L westward almost to Mosquito Pier. The third (undesignated) landing beach is a ½-mile stretch of Green Beach, just south of Punta Arenas, including areas marked "Fuel Tanks" and "Fuel Pier."

The historian believes this map was created in the 1960s, because of certain markings found on it. That would put it around the NASD Vieques facility's reactivation period, following the Cuban missile crisis. It is not clear, however, whether the map depicts actual landing activities at the time or Navy/Marine Corps planning for possible future activities.

National Archives at College Park, Maryland

At the National Archives Cartographic Research Center, topographic maps of Vieques dating from the 1920s to the 1970s and nautical maps dating back to the 1940s were examined. No sign of any training area was found on the western portion of Vieques.

The Military textual reference section and the Civilian textual reference section provided maps and records of the Bureau of Yards and Docks (Naval Department), from the 1940s through the early 1960s.

One of these maps, titled "Maneuver Areas & Corridors Established for LANTFLEX 52," identifies the entire western Navy-owned portion of the island (west of the NASD main operational area) and several miles of surrounding waters as a "maneuver area;" the central Navy-owned portion (from Isabel Segunda west to Point Brigadier) as another "maneuver area;" and the eastern Navy-owned portion of the island (east of Point Brigadier) as an "impact area." This map also shows the land parcels covering most of what is now NASD Vieques as "presently occupied by" various private individuals.

Because this map apparently dates to the period when NASD Vieques was not in active use, it is not clear whether the map depicts actual maneuver activities on the western side at the time, or Navy/Marine Corps planning for future/proposed maneuver activities.

National Archives Electronic Search

NARA has a website called NAILs which allows general and specific searches based on keywords. A search was performed for keywords: Puerto Rico, Vieques Island, U.S. Marine Corps, U.S. Navy, Training Operations, and variations of all of the above. The only specific training items that came up in this search were films of training operations in Puerto Rico. These include:

- 1949 film by U.S. Army
- 1950 film by U.S. Army on Operation PORTREX, Joint exercises
- 1952 film by U.S. Navy on Operation TRAEX
- 1967 film by U.S. Navy on Operation Springboard
- 1967 film by U.S. Navy on A-7A Aircraft Ops in PR
- 1968 film by U.S. Navy on USS Hermitage and USS Raleigh Amphibious Ops

A search was also performed under general records including:

- U.S. Marine Corps Holdings, RG 127 and RG 287
- U.S. Navy Holdings, RG 428
- San Juan PR 10th Naval District Holdings RG 181.2.9

No document descriptions were found that would respond to the following query: USMC Amphibious Training Operations on Vieques Island, PR, from 1950-1970.

3.1.4 ASR Summary and Conclusions

A few of the documents and maps reviewed did suggest potential use of the western side of the island for training, but no specific records of training exercises on the western side of the island were found.

The only map found during the archival search showing boundaries for the WTA was a figure from the 1973 Draft EIS entitled *Atlantic Fleet Integrated Weapons Training Ranges (Culebra Study)*. This information is a secondary information source and the primary source is not cited, either on the table or in the accompanying text. The description of training exercises in the 1973 Draft EIS agrees with the general recollections of people interviewed during the EBS, i.e., that training exercises conducted in the WTA did not use live ordnance.

No evidence was obtained from the supplemental ASR to support a conclusion that the former WTA was contaminated with OE, other than SWMU 4 (the former Inactive Waste Explosive OB/OD Area). Reference information is included in Appendix B.

3.1.5 Geophysical Survey

The digital geophysical survey was performed by Chemrad along the Green Beach area. GPS survey controls were established and a geophysical test plot (prove-out) was conducted by Chemrad in an open beach area with dimensions of 50 feet by 200 feet. Five pieces of ordnance ranging from 20 mm projectiles to 60 mm mortars were buried 6 to 12 inches deep in the beach sand. Two geophysical surveys were performed in the prove out area, including a towed array of five Schonstedt 52CX fluxgate magnetometers, followed by a White Spectrum XLT active metal detector. Navy EOD personnel from the NSRR provided inert ordnance for the prove-out to set up calibration and detection limits on the

instruments. Once the prove-out was satisfactorily completed, USA Environmental, Inc. personnel performed a visual surface clearance prior to geophysical surveys to insure that the geophysical survey personnel were not exposed to potential unnecessary risk from UXO located on the ground surface. Following the visual surface clearance, Chemrad performed a DGM survey with a towed array of five Schonstedt 52CX fluxgate magnetometer on 7.65 acres along the beach and road areas covering 100 percent of these areas. The array of the magnetometers was towed behind an ATV, while collecting digital geophysical data and GPS data in the open beach and road areas. The data were collected from the instruments at a rate of 3 three data points per second, which equates to essentially collecting a data point for every square foot of area beneath the array. The precise X and Y coordinate location of each data point was determined by the GPS receiver mounted on top of the array. All GPS information was referenced to an established landmark close to the Green Beach Area. The data were processed onsite after an area of approximately 10,000 square feet was surveyed. All anomalies meeting the criteria for further investigation (greater than 40 counts per second) established during the prove-out were excavated to determine whether UXO was present and whether the anomaly analysis criteria was accurate. With this method, 100 percent of a site was DGM-mapped and all identified anomalies were intrusively investigated, resulting in a clearance to a depth of 1 foot bls as required by the intended future land use. Figure 3-1 depicts the geophysical survey areas and military items found.

Five sample grids of varying dimensions, covering a total area of 1.33 acres along the beach and roads, were surveyed with the White Spectrum XLT All Metals Detector. This instrument detected non-ferrous metals such as aluminum photoflash cartridges that would otherwise be missed by the fluxgate magnetometers. The White was conducted within grids located in areas typically used for the type of training reported to have been conducted in the GBA. Non-ferrous military ordnance and training items such as the aluminum photoflash cartridges were expected to be located in areas where personnel participating in amphibious assault training would have traversed from the beach into the heavily vegetated island interior.

Within the heavily vegetated areas, a path was cleared by or under the supervision of a UXO team member. The intent of the path was to allow geophysical surveying to be conducted in areas of dense vegetation where traversing would most likely have occurred during training exercises, without clear-cutting by surveying along existing paths which were generally less densely vegetated. These traverses progressed along the path of least resistance. This method allows a preliminary or reconnaissance level survey to be conducted in locations that will provide information representative of the densely vegetated portion of the GBA. The actual length of the path covered was 3.11 miles, of which 2.36 miles were covered with the Schonstedt 52CX Magnetometer. Geophysical data are included in Appendix C.

3.1.6 UXO Survey

USA Environmental, Inc., personnel verified the anomalies by excavating the area flagged by the geophysical team. A total of 591 targets identified by the geophysical contractor were investigated by the UXO team in accordance with the Statement of Work (SOW). Appendix D includes a list of the 591 targets identified. These items were excavated, identified,

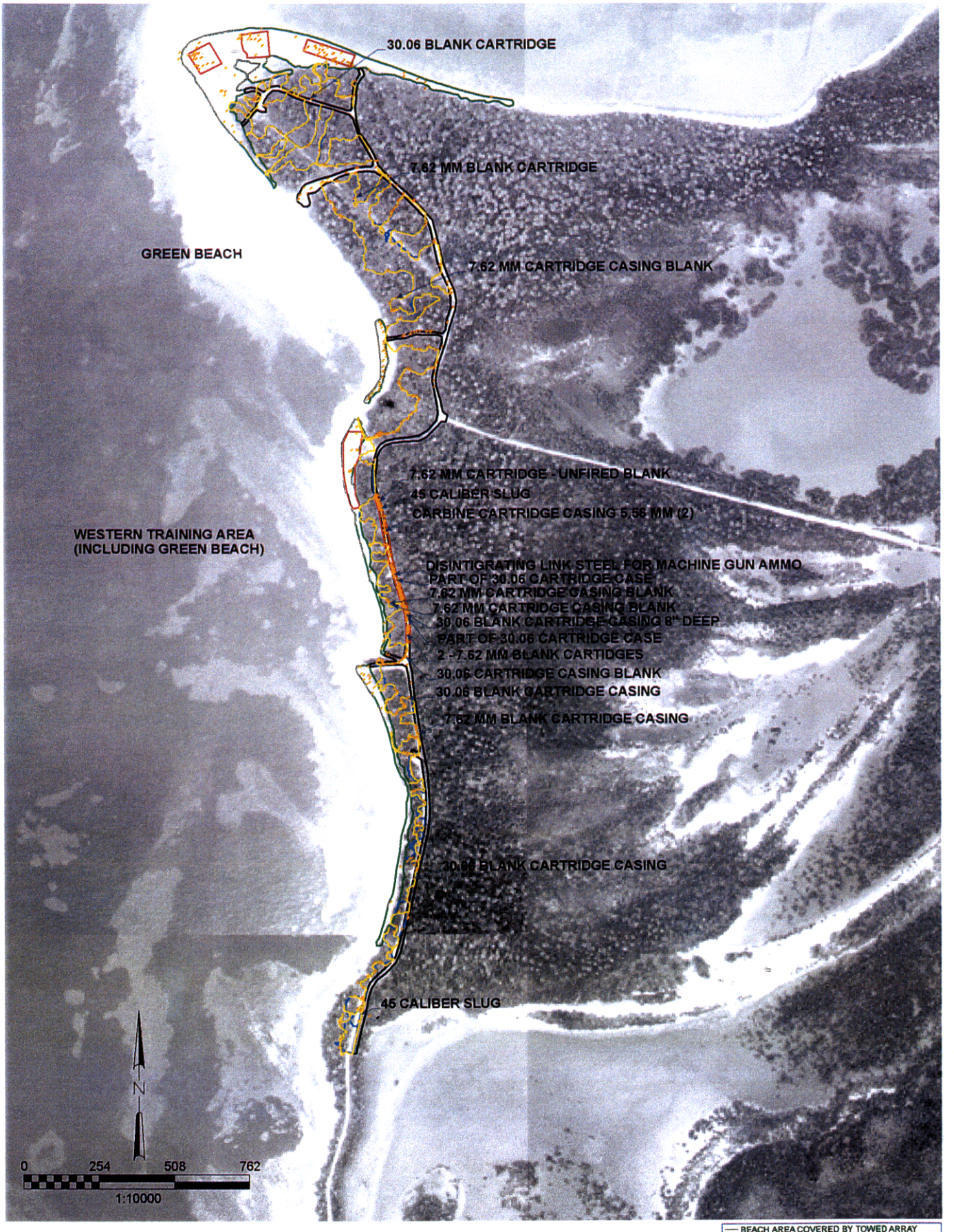

FIGURE 3-1
Geophysical Survey Areas

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and properly disposed of by USA UXO personnel. Appendix E contains copies of the USA Environmental Field Logs describing the field effort and the findings.

3.1.7 Evaluation of Statistical Applications

Green Beach was divided into two sectors simply recognized as the beach and the vegetated island interior. Statistical sampling was based, not on previous models like site stats/grid stats that use specialized software to generate random grids to be investigated, but rather on a probability sampling plan that considered the terrain, vegetation, and likely areas that might contain UXO because they are assessable.

Probability sampling provided a statistical approach that supported estimation or decision making to determine if UXO contamination existed on the site. The clear open area along the beach was 100 percent mapped using digital geophysical methods (DGM) resulting in no discovery of UXO.

The vegetated island interior of Green Beach was surveyed using a meandering path DGM survey along a corridor five feet wide and in excess of 20,000-ft long resulting in no discovery of UXO. The meandering path survey covered approximately 8 percent of the vegetative area.

The development of this approach included expert knowledge of the site, randomization in selecting the meandering path, and consideration of terrain and vegetation. This approach utilized the elements of a Total Assessment Strategy needed to provide defensible documentation. The amount of the statistical sampling area was determined based on USAESCH's UXO sampling protocols as listed in EM 1110-1-4009, OE Response. The minimum area required for a site less than 50 acres was 5.0 percent and the recommended minimum area was 7.5 percent. The vegetation area probability sampling was conducted on an area that exceeded 8.0 percent.

No UXO was discovered in either of the sample areas and no evidence was discovered to indicate that the area had ever been used for live fire training exercises that would leave behind a UXO problem. Recommendations for institutional controls are contained in Section 4.

At sites where no UXO is identified during the assessment has determined that statistics should be employed with caution. This is because most, if not all, of the currently available statistical methods use algorithms that require values for input parameters such as: upper and lower confidence levels, total area of project site, total area surveyed, number of UXO found, or acceptable UXO density for future land use. This will result in a UXO density even when no UXO has been found because of the uncertainty associated with less than 100 percent survey coverage.

In summary, using a statistical method while requiring a high confidence limit in the result would certainly result in an estimated UXO density greater than zero regardless of the site history or absence of identified UXO. Unfortunately, this can result in unnecessary characterization efforts and/or restrictions on future land use. Specifically, at a sector such as the island interior portion of GBA, evaluating the historical and physical evidence provides a more accurate assessment than one that would result from employing statistical

methods. For these reasons, it is recommended that the assessment of the potential for OE contamination of the Green Beach Area be based upon the results of the physical evidence.

3.2 Source, Nature, and Extent of Anomolies

A total of 591 anomalies were investigated. Most of the ferrous items were metal objects from the former sugar cane operations, including railroad spikes and bolts.

No UXO or OE was encountered within the project area. Futhermore, no photoflash cartridges were encountered as anticipated. Military items found included fired and unfired blank cartridges, small arms, and lead slugs. The two .45 caliber slugs identified are most likely not related to military training exercises, considering the timeframe in which the area was used.

Most of the non-ferrous anomalies consisted of aluminum cans, aluminum pull tabs, or pieces of foil including meal ready-to-eat (MRE) ration bags. The larger pieces of metal that were found were associated primarily with construction debris dating back to the area's sugar cane production days and/or the railroad that ran adjacent to that area. Most of these items were found around a molasses tank by the side of the beach access road. In addition, some anomalies were determined to be iron-containing rocks used as a sub-base for the road.

All items recovered were non-hazardous, and were disposed of at the permitted Dry Trash Landfill at NASD.

3.3 Description of Military-Related Items Encountered

The area was cleared to a depth of 1 foot as specified in the Work Plan. No ordnance items were recovered. The following table shows the Military-Related Items recovered during excavation of the anomalies.

Item	Material	Quantity
7.62 mm machine gun cartridge, blank, one not expended	Brass	8
30 mm cartridge, blank, expended	Brass	8
5.56 mm M-16 cartridge, blank, expended	Brass	2
45 caliber slug	Copper-covered lead	2
7.62 mm Ammo link, automatic weapon	Steel	1
	TOTAL ITEMS FOUND	21

In addition to the ammunition-related items, a military bayonet was found along the road at a depth of 1 foot.

Because of the insignificance of the findings, sections dedicated to Risk Assessment, Corrective Action, and Alternatives for Corrective Action are not warranted and will not be presented in this report.

SECTION 4

Conclusions and Recommendations

4.1 Conclusions

The results of the Preliminary Site Assessment indicate that no UXO or OE is present to a depth of 1 foot bls on the beach and road areas of Green Beach. In addition, no ordnance was detected from the surveys conducted in the densely vegetated areas between the beach and the roads. In general, the UXO/OE survey supported historical information for the site which determined that the site was never used as a range or otherwise exposed to live fire from military munitions. The findings of the geophysical survey and anomaly recovery identified 22 military training-related items, but no UXO. In accordance with the available regulatory and DoD Guidance, these findings do not require an evaluation of risk, nor do they warrant preparation of response action alternatives. The only potential risk represented by the types of items found would be the possible accidental firing of a small arms blank cartridge. The small arms blank cartridges, of which all but one were expended, have no projectiles and the only potential risks upon discharge would be a flash powder burn and noise impacts.

4.2 Recommendations

The Preliminary OE Site Assessment was planned and executed in accordance with the intended land use for GBA as the Vieques National Wildlife Refuge. The refuge, which encompasses 3,100 acres, will be managed by the DOI. Public access will be limited to daytime use only between the hours of 6 a.m. and 6 p.m. Considering the current and expected future land use and the conclusions presented above in Section 4.1, CH2M HILL recommends that No Further DoD Action is Indicated (NFDAI) for the GBA.

SECTION 5

References

CH2M HILL. *Final Initial Ordnance and Explosives Site Assessment Work Plan for the Green Beach Area.* March 2001.

EBS, Program Management Company. *Environmental Baseline Survey. Naval Ammunition Support Detachment, Vieques Island, Puerto Rico.* October 2000.

EIS. *Atlantic Fleet Integrated Weapons Training Ranges, Culebra Study.* 1973.

IAS. Greenleaf/Telesca Planners, Engineers, Architects, Inc. and Ecology and Environmental, Inc. *Initial Assessment Study, Naval Station Roosevelt Roads, Puerto Rico.* September 1984.

USAESCH. IGD 00-03. *Basic Safety Concepts and Considerations for Ordnance and Explosives Operations.* 2000.

USGS. *Water Resources Investigations Report 86-4100. Reconnaissance of the Ground-Water Resources of Vieques Island, Puerto Rico.* 1989.

ATV setup of the 5 Schonstedt towed array.

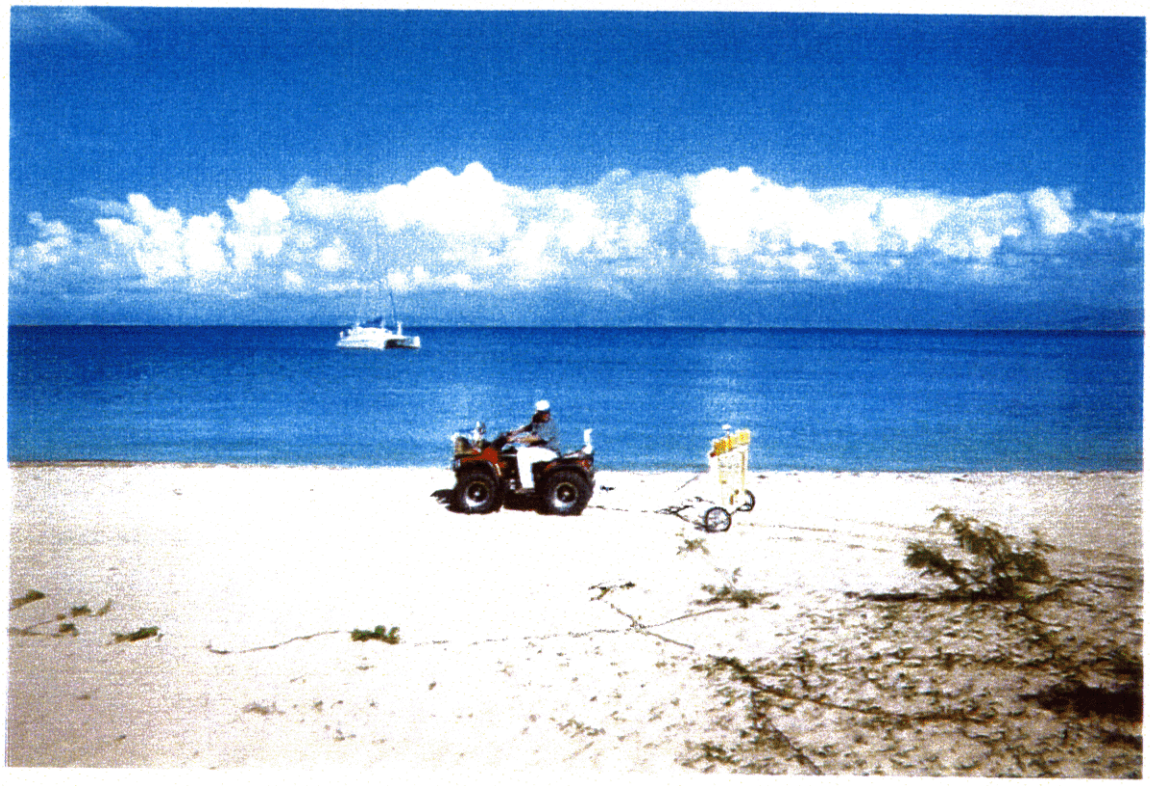
UXO team anomaly verification of reacquired points with Schonstedt instrument.

UXO team anomaly verification of reacquired points with White's instrument.

Data gathering along the beach with the White's instrument.

Typical UXO dig of anomalies.

Chemrad's NavTrack® system for data acquisition.



Data gathering along the beach with the towed array.

Anomaly verification along the road by UXO team.

Typical non-ferrous item encountered during the verification stage.

Traffic control measures for conducting the data collection along the road.

Brush clearing through the tract of land between the beach and access road.

Reference point setup for geosurvey.

Meandering Path data acquisition with the White's instrument.

Video documentation of object found by the UXO team.

Military artifacts found.

Ferrous artifacts obtained.

Non-ferrous artifacts obtained .

Ferrous artifacts found by the UXO team.

Summary of Archival Research on the Western Training Area,Vieques Island, PR

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PREPARED BY: Virginia Farris/WDC, Karen Duvall/WDC, Shannon Stokes/WDC, Erik Isern/TPA

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DATE: April 6, 2001

1. Background

As directed by Presidential Directive in January 2000 and authorized by Congress in October 2000, the Secretary of the Navy will transfer—no later than 1 May 2001—most of the real property that comprises the former Naval Ammunition Support Depot (NASD), located on the western side of Vieques Island, Puerto Rico (PR), to the Municipality of Vieques, the Puerto Rico Conservation Trust, and the Department of Interior (DOI). In accordance with regulations governing transfer of Federal property, the U.S. Navy completed an Environmental Baseline Survey (EBS) to determine the environmental suitability of the property for transfer in October 2000.

Through the EBS, the Navy identified 17 areas (encompassing about 490 acres) at NASD Vieques as potentially contaminated. Of these 17 potentially contaminated areas, 14 are located on property to be transferred to the Municipality of Vieques and 3 are located on property to be transferred to DOI. These areas are being investigated through the Navy'Installation Restoration program.

Another area of potential environmental concern that was identified during the EBS is the former "Western Training Area" (WTA), which is thought to have occupied the western and southwestern portions of NASD Vieques. The WTA reportedly was used for training exercises, including infrequent beach landings, by the Marines. The time periods involved were assumed to have been 1941-1948 and 1962-1980s, because those are the periods during which NASD Vieques was actively used by the Navy and Marine Corps.

However, none of the documents reviewed for the EBS identified the specific location of the WTA or documented any specific training exercises that were performed at the WTA.

2. Objectives and Activities Conducted

A records search, a site inspection, a review of historical aerial photos, and personnel interviews conducted during the EBS did not identify any specific environmental issues related to the former WTA. The documents reviewed did not indicate that NASD Vieques had ever been used by the Navy as a weapons range. However, the documentation obtained

during the EBS did not identify the location of the former Western Training Area or confirm whether or not Marine training exercises were conducted at this area.

Therefore, additional interviews were conducted in February and April 2000 and a more extensive search of archival records was conducted from March 13-23, 2000, in an attempt to determine the historical uses, activities, and site boundaries of the WTA at NASD Vieques. Records and maps from the 1940s to the 1980s were reviewed. The primary purpose was to identify whether the WTA is potentially contaminated by ordnance explosives or unexploded ordnance (OE/UXO), as a result of past training activities.

An initial inquiry to National Archives and Records Administration (NARA) staff determined that US Marine Corps records prior to 1940 are kept in the main NARA location in downtown Washington, DC; records from 1940 to 1950 are kept in the NARA location at College Park, MD; and all records post-1950 remain in the custody of the US Marine Corps.

The following research activities were conducted and the information obtained from each one is summarized in the following subsections:

- Interviewed personnel at NASD Vieques, Naval Station Roosevelt Roads (NSRR) in Ceiba, PR, Marine Corps Base Camp LeJeune in North Carolina, and offices of the Naval Facilitities Engineering Command, Atlantic Division (LANTDIV) (in Norfolk, Virginia), to determine the availability of any pertinent records and obtain any first-hand recollections of training exercises
- Interviewed project staff and reviewed project files at the offices of R. Christoper Goodwin & Associates in Frederick, MD, to obtain any relevant information discovered during a survey of archeological resources at NASD Vieques
- Interviewed project staff and reviewed project files at the offices of Environmental Resources Management (ERM) in Annapolis, MD, to obtain relevant documents collected during the October 2000 EBS for NASD Vieques
- Archival records search at the Naval Historical Center (NHC) at Washington Navy Yard in Washington, DC
- Archival records search at the Marine Corps Historical Center (MCHC) at Washington Navy Yard in Washington, DC
- Electronic search of National Archives website (NAILS)
- Archival records search at the National Archives at College Park and the NARA Cartographic Research Center, in College Park, Maryland

Records held at NARA's downtown Washington location were not searched, because those holdings only contain records prior to 1940. The Navy acquired and began using the NASD Vieques property in 1941.

2.1. NASD Vieques

In June 2000, CH2M HILL staff observed a map on the wall in a small office in Bldg. 2015 (Public Works) at NASD Vieques. The map appeared to be based on a USGS topographic map of the west side of Vieques, with military training areas identified. "Marine Training

Area" was printed on the western area, near SWMU-04. When the team returned in November 2000, the Puerto Rican Police had taken over Bldg. 2015 and the office was bare. Subsequent attempts to locate this map have been unsuccessful.

A retired Navy SEAL who trained on Vieques Island from 1968-1969 (and still resides there) was interviewed in February 2001. According to his recollection, only blanks were used during training on the western side of Vieques. No live ordnance was used. Another local resident, recalled amphibious assaults in the late 1960's on Green Beach, using blanks and pyrotechnics.

A former Marine from Puerto Rico, who is now employed by a Navy contractor, was interviewed in April 2001. He took part in an amphibious assault training exercise with Marine Corps Unit MEW-26 in the spring of 1984. Marines were deployed from NSRR via ship and landed on Green Beach in small landing craft. The training scenario involved one group of Marines hiding on the beach as the "enemy" for the other, amphibious assault group to attack. Troops fired machine guns loaded with 7.62-mm blank rounds and M-16 rifles with 5.62-mm blanks and threw smoke grenades. Pyrotechnic "flash bang" simulators (aluminum cartridges about 2-in in diameter and 4-in tall) were nailed to trees in the brushy area next to the beach, about 1 foot off the ground, and were set off by tripwires to simulate an ambush. These pyrotechnic simulators also could be set off by friction or heat.

To summarize, no training records or information about the boundaries of the WTA were found at NASD Vieques. However, interviews provided first-hand recollections to substantiate that live fire was not used in training exercises on the western side of the island.

2.2. Naval Station Roosevelt Roads (NSRR)

Madeline Rivera confirmed that the Environmental Operations Division (EOD), which is part of the Public Works Department, can only retain these types of records for 3 years. Because it has been more than 3 years since the Marine Corps used NASD Vieques for training exercises, relevant records are not available.

In April 2000, Carlos Vigo conducted an archive records search at NSRR and found two 1963 letters, requesting and approving an explosives disposal area at NASD Vieques, and a map identifying the actual center point of the explosives disposal area (now SWMU-04). These documents do not relate to training exercises at the WTA, but they provide additional information about SWMU-04 for the IR program.

No records of training or about the boundaries of the WTA were available at NSRR.

2.3. Marine Corps Base Camp LeJeune

At Camp LeJeune, EOD Officer (Donald Hashegan) stated that they do not have any available records of past Marine training exercises at NASD Vieques.

Colonel Robert B. Neller and Gunnery Sergeant Timothy R. Hoffman (G3) from the 2nd Marine Division were interviewed. To the best knowledge of personnel now, Green Beach was only used as a landing beach for amphibious training and no dud-producing ordnance was used there. According to range regulations dated 1992, the Green Beach area was a popular anchor location for boaters; it was used for amphibious attack exercises only; and no dud-producing fire was allowed to be used in this area. (These regulations are found in

AFWTFINST 3120.1M and are available under the military secure internet site AFWTFSEC.navy.smil.mil.)

In summary, no specific records of training exercises or the boundaries of the WTA were available at Camp LeJeune, but other information indicated that live fire was not allowed in the WTA.

2.4. LANTDIV

Jay Newbaker (EFDLANT) provided an excerpt from a 1973 Draft Environmental Impact Statement (EIS) entitled *Atlantic Fleet Integrated Weapons Training Ranges (Culebra Study)*. The Draft EIS evaluated impacts of expanding weapons training at Vieques, as an alternative to live-fire training activities at Culebra Island (which were shut down July 1, 1975).

The Draft EIS includes a figure (see Attachment 1) showing boundaries for the Western Training Area, comprising an "L" shape along the shoreline from Kiani Lagoon south to Playa Grande Lagoon and extending inland for roughly 1 mile. The WTA is depicted as a part of "Area I", the Naval Ammunition Depot. The source of information used for this figure is not cited, either on the figure itself or in the text.

According to the 1973 Draft EIS, at that time, the WTA was considered to be part of the "Fleet Marine Force training complex", along with the Eastern Training Area and the Surface and Air Impact Areas on the eastern side of the island. According to the EIS, the WTA was used by Fleet Marine Force units "primarily for conducting jungle warfare reconnaissance and ambush exercises... A beach at the westerly part of the area [not depicted on the figure] is allocated for amphibious training, but it is used rarely. No weapons firing is permitted during the aforementioned training exercises within the WTA due to its proximity to storage magazines in the Naval Ammunition Depot. "

In summary, the 1973 Draft EIS provides a description of training exercises in the WTA, statingthat live fire was not used; it also provides a map showing generalized boundaries, but does not cite a primary source for those boundaries.

2.5. R. Christoper Goodwin & Associates

Mike Simmons, Project Manager for the Navy's study of NASD Vieques archaeological resources, provided information obtained by that project. Goodwin's review of historical source documents did not uncover any historical maps indicating the Western Training Area or training activities on the western side of the island.

Goodwin performed a Phase I archeological survey of the NASD. The survey consisted of pedestrian reconnaissance and shovel test pits at 25-foot intervals. However, only a small portion of the western shoreline was surveyed, from Punta Boca Quebrada south about halfway to Punta Vaca. A considerable portion of the interior was also surveyed. Goodwin archeologists found one piece of unexploded ordnance—a shell—near Punta Boca Quebrada, within the perimeter of SWMU-04. SWMU-04 is the former Inactive Waste Explosive Open Burn/Detonation (OB/OD) Area that is being further investigated under the Navy's Installation Restoration (IR) Program.

2.6. Environmental Resources Management (ERM)

Matt Klimoski, project manager for the October 2000 Environmental Baseline Survey (EBS) of the NASD, furnished a copy of all EBS reference documents pertaining to the western portion of Vieques Island. None of these references showed boundaries of the WTA or evidence of training activities.

Mr. Klimoski confirmed that the only relevant information uncovered during the EBS came from interviewing several people who had worked and/or lived in the area over the past 30 years. He showed them historic aerial photos and prompted them for their memories of activities at NASD. The interviewees either did not remember any training exercises involving Marines landing on the western shore, or if they did, none using ordnance other than handguns firing blanks (although the occasional unauthorized use of live bullets could not be definitively ruled out). (These recollections would presumably include the time period of the 1973 Draft EIS.)

Between 1948, when the Naval Ammunition Depot was closed, and 1962, when the facility was reactivated during the Cuban missile crisis, the western lands were essentially unused by the Navy. Mr. Klimoski cautioned that the EBS had found some engineering drawings dating from the inactive period (1949-1961) that depicted proposed plans being considered for that area, which were never implemented; other plans and maps from that period might reflect planning, not actual land use. (On the other hand, because a 1995 search of the National Archives found extensive records of training on Culebra Island, he would expect to find the same kinds of records in the Archives for the WTA, if there was significant level of training on the western lands.)

2.7. Naval Historical Center

No records of training exercises on the western side of the island or detailed maps were found at the Naval Historical Center (NHC) at Washington Navy Yard.

The Historical Reference Archivist (Mike Walker) provided access to records of Amphibious Historical Reference Archivist (Mike Walker) provided access to records of Amphibious training on Vieques Island post-1946 and Fleet records post-1968. Notes were taken, because copying was not permitted.

Although several training operations at Camp Garcia on the eastern side of the island were documented in the files, no records of any other training exercise locations on the island were found.

2.8. Marine Corps Historical Center

At the Marine Corps Historical Center (MCHC) at Washington Navy Yard, Fleet Marine Force Atlantic Command Records, newspaper articles, and Battalion exercise records from the 1960s to 1989 were searched. (Records prior to 1960 have been sent to the National Archives.) Most of the records concerning training exercises did not list details such as beach landing locations. Some records did mention Red Beach, Garcia Beach, or Blue Beach, which are all located in the Eastern Maneuver Area (EMA) on the eastern end of Vieques.

An undated was obtained showing 3 "best landing beaches" on the western and northern shores of NASD Vieques. "A" Beach is indicated as "primary beach" and is a roughly ½-

mile-long stretch of the north shoreline, centered on the area now identified by the EBS as AOC J. "B" Beach is shown as a mile-long stretch of the north shore fronting the main operational area of the NASD support facility, from what is now designated AOC L westward almost to Mosquito Pier. The third (undesignated) landing beach is a ½-mile stretch of Green Beach, just south of Punta Arenas, including areas marked "Fuel Tanks" and "Fuel Pier" (see Attachment 3).

The MCHC historian who assisted with the research believes that this map was created in the 1960s, because of certain markings found on it. That would put it around the NASD Vieques facility's reactivation period, following the Cuban missile crisis. It is not clear, however, whether the map depicts actual landing activities at the time or Navy/Marine Corps planning for possible future activities.

No records of training exercises or information about the boundaries of the WTA were found at the MCHC.

2.9. National Archives at College Park, Maryland

At the Cartographic Research Center, topographic maps of Vieques dating from the 1920's to the 1970's and nautical maps dating back to the 1940's were examined. No sign of any training area on the western portion of Vieques was found.

The Military and Civilian Textual Reference sections provided maps and records of the Bureau of Yards and Docks (Naval Department), from the 1940's through the early 1960's. The records were mostly permits, deeds, property dispute memos, parcel maps and descriptions, and land acquisition maps. Most maps showing Naval property referred to most of the western area of Vieques as the Ammunition Storage Area.

Two real property maps of Vieques Island, circa 1952, were copied from the Bureau of Yards and Docks files. These maps delineate and provide acreage for parcels of Navy-owned lands, Navy-owned lands on lease, Navy-owned lands on permit, and privately-owned lands on Vieques Island (see Attachments 4 and 5).

One of these maps, titled "Maneuver Areas & Corridors Established for LANTFLEX 52" (Attachment 5), identifies the entire western Navy-owned portion of the island (west of the NASD main operational area) and several miles of surrounding waters as a "maneuver area"; the central Navy-owned portion (from Isabel Segunda west to Point Brigadier) as another "maneuver area"; and the entire eastern Navy-owned portion of the island (east of Point Brigadier) as an "impact area." This map also shows the land parcels covering most of what is now NASD Vieques as "presently occupied by" various private individuals.

Again, it is not clear whether the map depicts actual manuever activities on the western side at the time, or Navy/Marine Corps planning for future/proposed/potential manuever activities. (This map was created in the 1950s, during the time when the NASD area was not actively utilized by the Navy/Marine Corps. However, as the films described in the following section, it appears that some training exercises were conducted during this period.) It is also not clear whether it refers to land or sea maneuvers, or both.

2.10. National Archives Electronic Search

NARA has a website (called NAILs) that allows general and specific searches based on keywords. A search was performed for keywords: Puerto Rico, Vieques Island, US Marine Corps, US Navy, Training Operations, and variations of all of these. The only specific training-related items that came up in this online search were films of training operations in Puerto Rico:

- 1949 film by US Army
- 1950 film by US Army on Operation PORTREX, Joint exercises
- 1952 film by US Navy on Operation TRAEX
- 1967 film by US Navy on Operation Springboard
- 1967 film by US Navy on A-7A Aircraft Ops in Puerto Rico
- 1968 film by US Navy on USS Hermitage and USS Raleigh Amphibious Ops

A search was also performed under general records including:

- US Marine Corps Holdings, RG 127 and RG 287
- US Navy Holdings, RG 428
- San Juan PR 10th Naval District Holdings RG 181.2.9

No document descriptions were found that would cover the following query: USMC Amphibious Training Operations on Vieques Island, PR, from 1950-1970.

3. Summary and Conclusions

In summary, the documents and maps reviewed suggested that the western end of NASD Vieques was used by the Marines for occasional amphibious assault training. Additional anecdotal evidence about former training exercises was obtained from interviews. However, no records of specific training exercises or definitive training locations on the western side of the island were found. None of the historical maps provided evidence that could be used to delineate the boundaries of the WTA.

The only map found during the archival search showing possible site boundaries for the Western Training Area was a figure from the 1973 Draft EIS entitled *Atlantic Fleet Integrated Weapons Training Ranges (Culebra Study)*. This figure (Attachment 1) is a secondary information source and no primary source is cited on this figure. The text states that a beach at the western end was designated for amphibious training, but was rarely used.

Documents and interviews both confirmed that no live weapons firing was permitted during training exercises in the WTA, due to its proximity to storage magazines in the Naval Ammunition Depot (1973 Draft EIS) and the use of the Green Beach area by boaters (1992 range regulations).

The description of Marine training exercises found in the 1973 Draft EIS agrees with the personal recollections of the people who were interviewed and the 1992 range regulations: that training exercises conducted in the WTA were amphibious or land-based and that live ordnance was not used, only blanks and pyrotechnics.

No evidence was obtained to support a conclusion that the former WTA is contaminated by explosive ordnance or UXO as a result of past training activities. The possible UXO

contamination in the vicinity of SWMU-04 (the former Inactive Waste Explosive Open Burn/Open Disposal Area) is being investigated separately under the IR Program.

4. References

The following documents were obtained from **NSRR** archival files:	
1963	Explosives disposal area ashore at NAD Vieques, approval documented P.R. F-121:HMR 13 SEP 1963 by Chief, Bureau of Naval Weapons
1963	U.S. Naval Station, Navy #1506 request dated 26 Aug 1963 by Naval Speed Letter Code 85 8027 Serial: 0228 dated 26 AUG 1963.
1963	Map of NAD Vieques identifying the actual center point of the explosives disposal area.
The following documents were obtained from **LANTDIV** electronic archive files:	
1973	*Atlantic Fleet Integrated Weapons Training Ranges (Culebra Study).* Draft Environmental Impact Statement, prepared for Commander in Chief, U.S. Atlantic Fleet, by Tippetts-Abbett-McCarthy-Stratton Engineers and Consultants, New York, NY, 30 March 1973. Part 3, Vieques. (Provided as Adobe Acrobat (PDF) file.)
The following documents were obtained from **EBS files** at the offices of ERM:	
2000	Environmental Resources Management, *Environmental Baseline Survey, Naval Ammunition Support Detachment Vieques, Vieques Island, Puerto Rico*, October 2000.
1988	A.T. Kearney, Inc. and K.W. Brown & Associates, Inc. *Phase II RCRA Facility Assessment of the Naval Ammunition Facility, Vieques Island, Puerto Rico,* October 1988.
1984	Greenleaf/Telesca Planners, Engineers, Architects, Inc. and Ecology and Environment, Inc. *Initial Assessment Study of Naval Station Roosevelt Roads, Puerto Rico,* September 1984.
1995	U.S. Army Corps of Engineers, *Ordnance and Explosive Waste Archives Search Report for Culebra Island National Wildlife Refuge, Culebra, Puerto Rico,* February 1995.
MAPS AND DRAWINGS	
1936 & 1937	Environmental Resources Management, *Isla De Vieques, Puerto Rico, Environmental Findings from Aerial Photographic Analysis for the Naval Ammunition Storage Detachment, Imagery Date: 1936 & 1937*
1959	Environmental Resources Management, *Isla De Vieques, Puerto Rico, Environmental Findings from Aerial Photographic Analysis for the Naval Ammunition Storage Detachment, Imagery Date: 1959*
1964 & 1967	Environmental Resources Management, *Isla De Vieques, Puerto Rico, Environmental Findings from Aerial Photographic Analysis for the Naval Ammunition Storage Detachment, Imagery Date: 1964 & 1967*
1951	US Navy. *Map of Camp Area, Vieques, P.R.,* 30 June 1951 (in two maps).
Nov 1999	Department of the Navy Naval Facilities Engineering Command, LANTDIV. *Real Estate Summary Map, US Naval Station Roosevelt Roads, Puerto Rico,* 12 November 1999.
1980	Defense Mapping Agency Hydrographic Topographic Center, *Combat Training Chart, Isla de Vieques, Western Part,* 12 July 1980.
1947	US Navy Public Works. *Map of US Naval Ammunitions Depot, Vieques, Puerto Rico,* 30

	June 1947.
1985	US Navy. *Figure 3-1, Present and Former Boundaries of the Grazing Lease Areas on the NAF and EMA*, 1985 (from USGS 1951 base map).
Undated	US Navy. *Figure 1-2, Habitat Types on Vieques Island,* undated (based on USGS Isla de Vieques, P.R. Quadrangle).

The following documents were reviewed at the **Naval Historical Center** (copying was not permitted):

1946–1990	Amphibious Forces Command Files.
1968–1999	Department of Navy, Atlantic Fleet Weapons Training Facility, Commanding Officer Logs.

The following documents and maps were copied at the **Marine Corps Historical Center**:

1966	United States Marine Corp, 1st Battalion, 6th Marine, 2nd Marine Division, Fleet Marine Force. *Post Deployment Report*, CARIB 1-66, 1 July 1966.
Undated	United States Marine Corps. *Vieques Island, Western End.* H.O. Misc. 11981-25-2. Overlay of Isla De Vieques (Western End). (circa 1960s)
1964	*El Mundo* newspaper: "Of 26,000 Acres the Navy Owns in Vieques, 10,000 Are Not Being Used for Defense. Mayor Sees Condemnation Unnecessary." By A. Quinones Calderon, 27 April 1964.
1965	*El Mundo* newspaper: "Woolner Corporation Give up Tourism for Vieques." By Walter W. Wurfel, 18 July 1964.

The following maps were copied at the **National Archives at College Park**:

1952	Vieques, Puerto Rico. Proposed permit to R. Ortiz Suarez. PW Drawing No. 2214. District Public Works Office, 10th Naval District, San Juan, Puerto Rico. Signed 6/5/52.
Undated	Maneuver Areas & Corridors Established for LANTFLEX 52. Revised from PW Drawing No. 2085 (circa 1951-1952)

5. Attachments

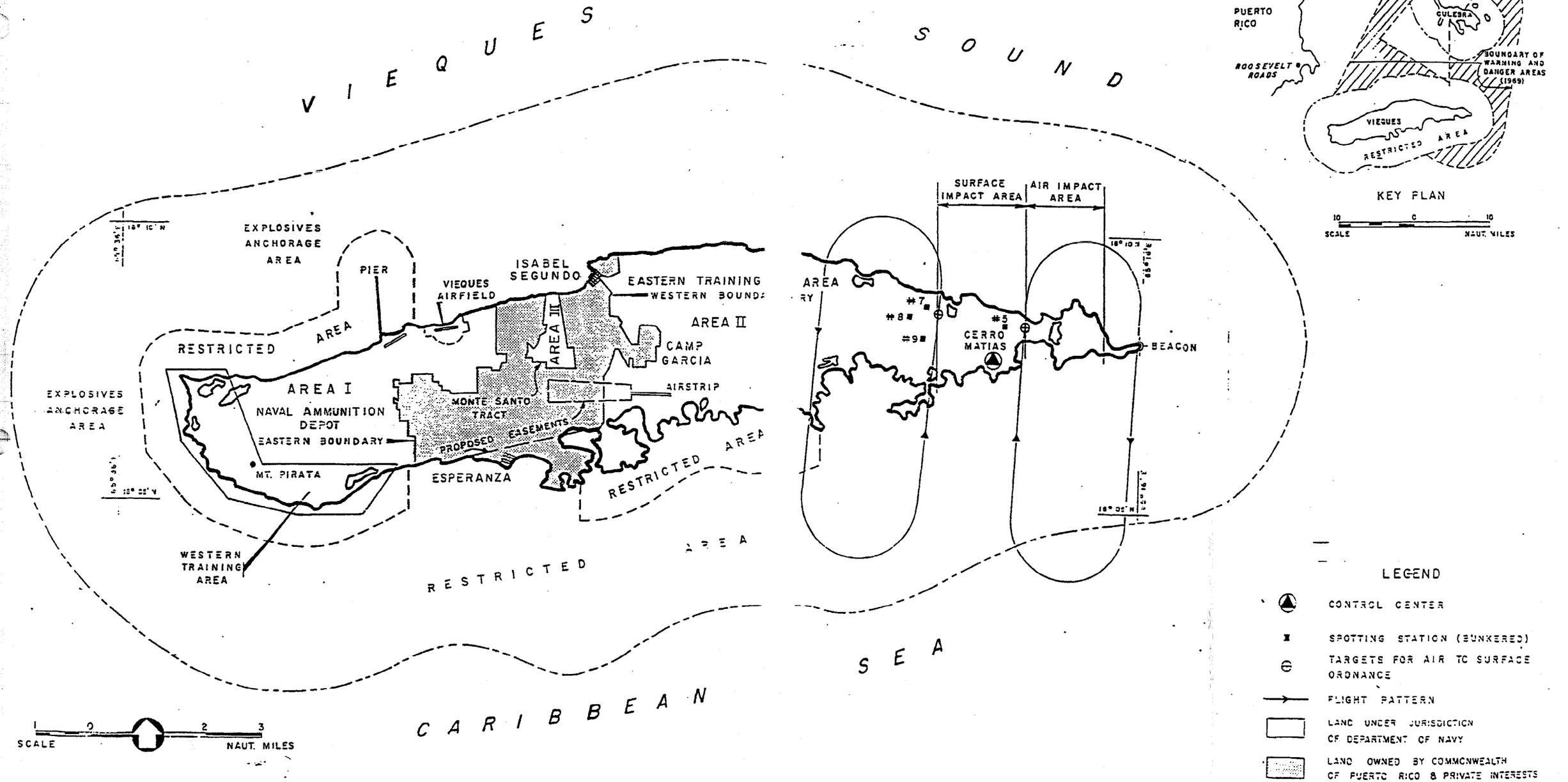
Excerpted portions of the following maps have been scanned as attachments to this report. Full-size copies are on file at CH2M HILL (Virginia Beach office).

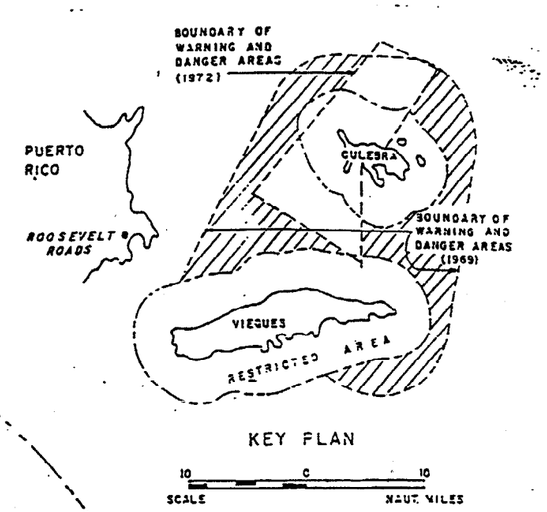
No.	Date	Title
1.	1973	Untitled figure from Draft EIS for *Atlantic Fleet Integrated Weapons Training Ranges (Culebra Study)*. Tippetts-Abbett-McCarthy-Stratton Engineers and Consultants, New York, NY. 30 March 1973.
2.	Undated (circa 2000)	(Untitled – map of archeological survey areas, western Vieques.) R. Christopher Goodwin & Assoc., Frederick, MD. **Note:** This map depicts the locations of archeological sites. Under historic preservation law and standards, this sensitive information must be safeguarded from general public distribution. Therefore, this map is not attached, but is on file at LANTDIV (Code EV23).
3.	Undated (circa 1960s)	United States Marine Corps, *Vieques Island, Western End.* H.O. Misc. 11981-25-2. [Based on] Overlay of Isla De Vieques (Western End).
4.	6/5/1952	Vieques, Puerto Rico. Proposed permit to R. Ortiz Suarez. PW Drawing No. 2214. District Public Works Office, 10th Naval District, San Juan, Puerto Rico.
5.	Undated (circa 1951-1952)	Maneuver Areas & Corridors Established for LANTFLEX 52. Revised from PW Drawing No. 2085.

6. Contact Information

The following persons or locations provided documents and/or maps cited in this report.

Source	Contact	Telephone
Naval Station Roosevelt Roads Ceiba, PR	Mr. Carlos E. Vigo Explosives Safety Office	(787) 865-3839/3840
Atlantic Division (LANTDIV) Norfolk, VA	Jay Newbaker Environmental Technical Support	(757) 322-4780
LANTDIV	Jay Newbaker	
Environmental Resources Management (ERM) Annapolis, MD	Matt Klimoski, EBS project manager	(410) 266-0006
Marine Corps Historical Center Building 98, Washington Navy Yard	Archives section HDH3	(202) 433-3439
National Archives at College Park 8601 Adelphi Road College Park, MD 20740-6001	Military and civilian records textual reference sections	(301) 713-6800
National Archives at College Park 8601 Adelphi Road College Park, MD 20740-6001	Cartographic Research Center	(301) 713-7040
Navy Historical Center Building 57, Washington Navy Yard	Mike Walker, Historical Reference Archivist, Operational Archives Branch	(202) 433-3224
R. Christopher Goodwin & Associates Frederick, MD	Mike Simmons, project manager	(301) 694-0428
	Bruce Larsen, LANTDIV contact	(757) 322-4885





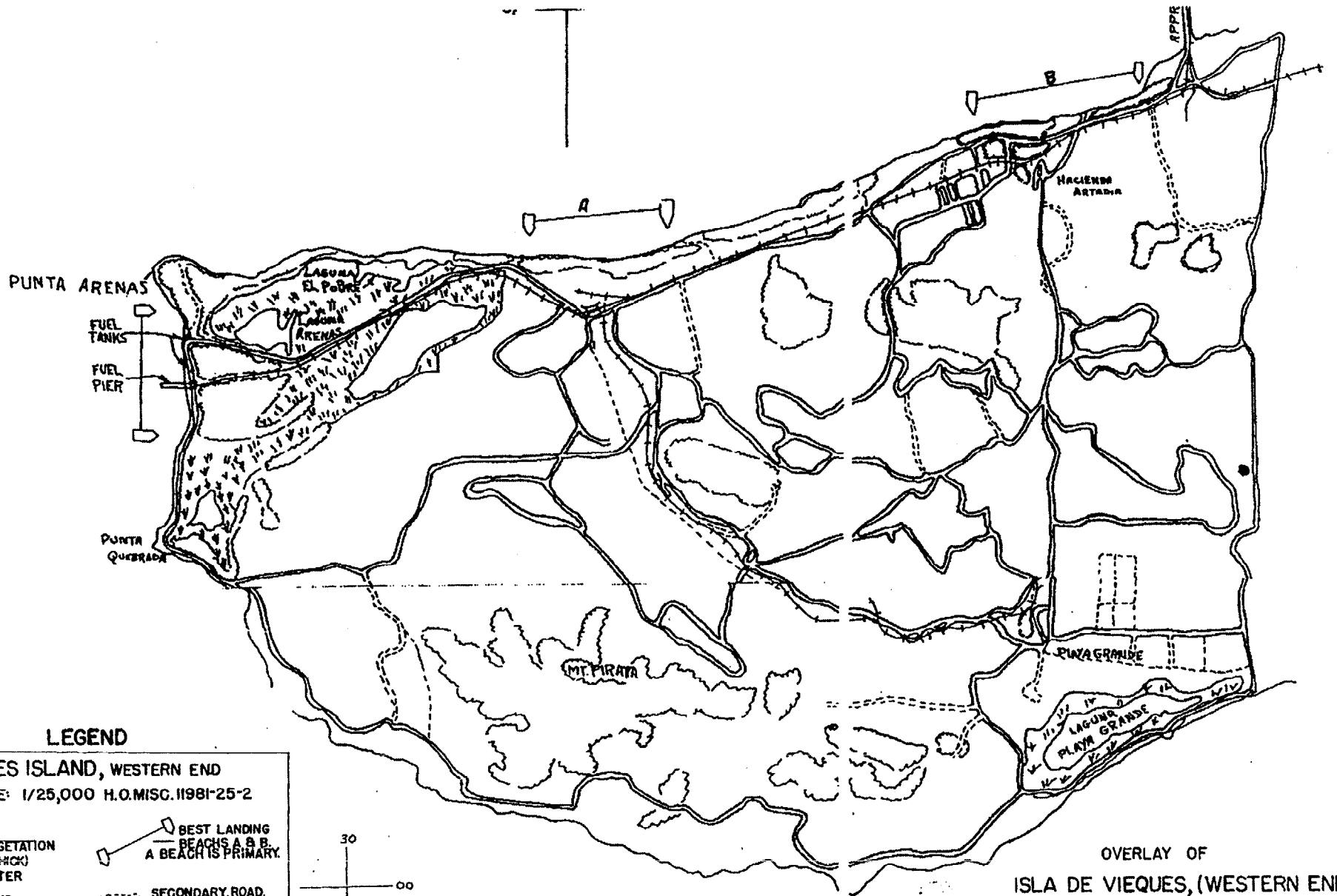
LEGEND

- CONTROL CENTER
- SPOTTING STATION (BUNKERED)
- TARGETS FOR AIR TO SURFACE ORDNANCE
- FLIGHT PATTERN
- LAND UNDER JURISDICTION OF DEPARTMENT OF NAVY
- LAND OWNED BY COMMONWEALTH OF PUERTO RICO & PRIVATE INTERESTS
- RESTRICTED AREA - SURFACE CRAFT
- RESTRICTED AREA - AIRCRAFT

02132 D06Z

ATTACHMENT 2

ATTACHMENT 3



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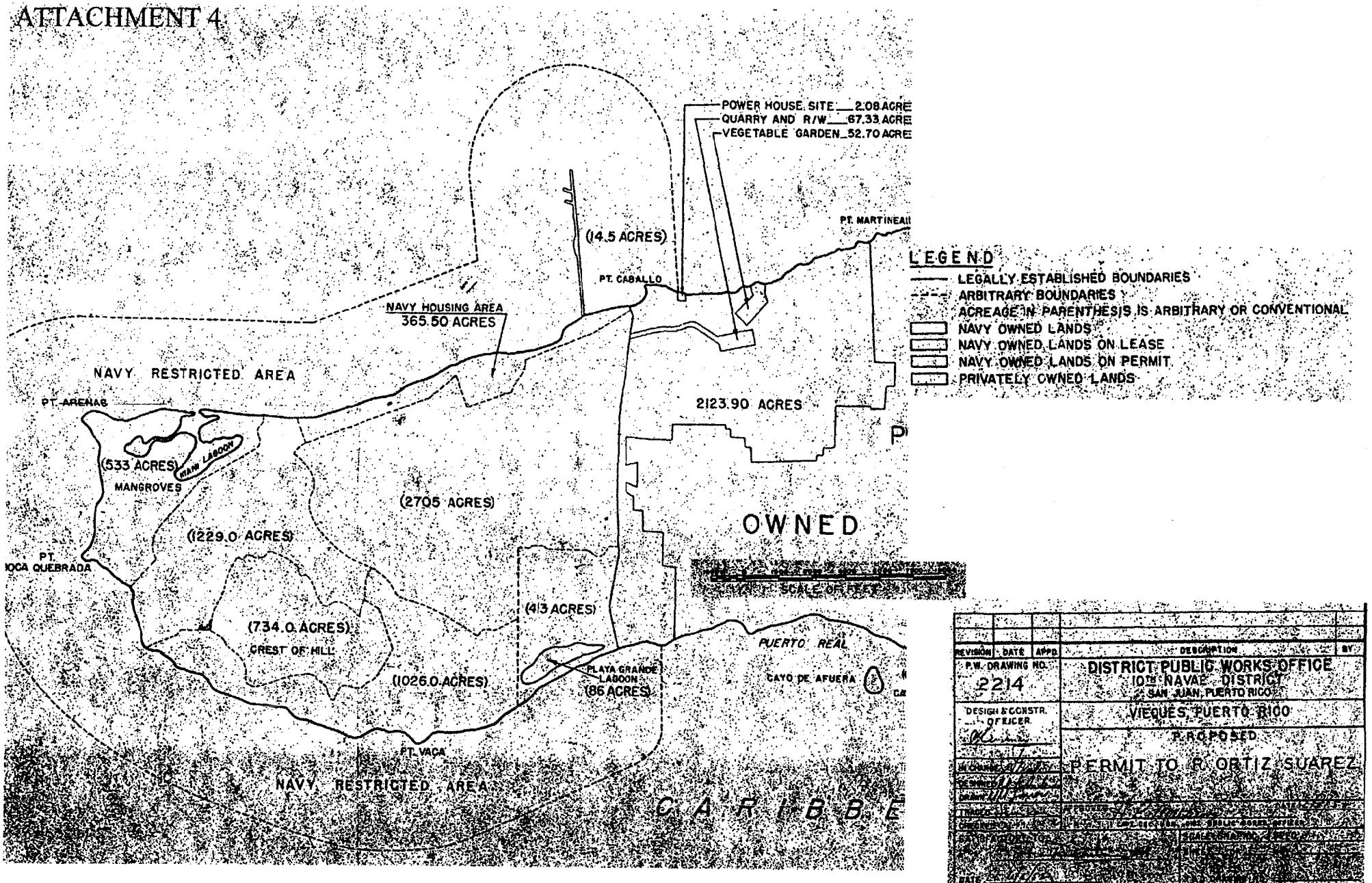
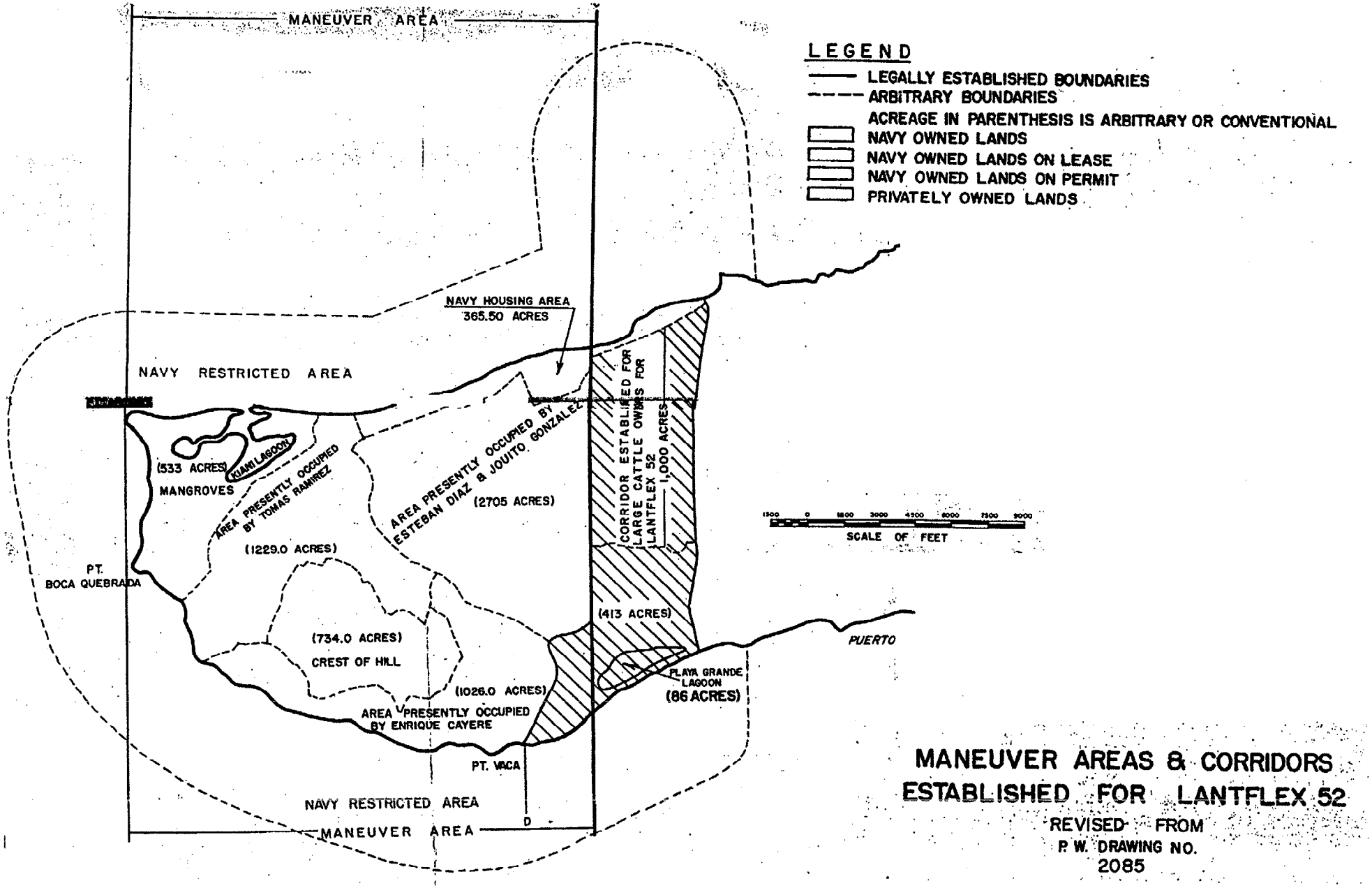


REVISION	DATE	APPD	DESCRIPTION	BY
P.W. DRAWING NO. 2214			DISTRICT PUBLIC WORKS OFFICE 10TH NAVAL DISTRICT SAN JUAN, PUERTO RICO	
DESIGN & CONSTR. OFFICER			VIEQUES, PUERTO RICO	
			PROPOSED	
			PERMIT TO R. ORTIZ SUAREZ	

ATTACHMENT 5



EXECUTIVE SUMMARY
for
DIGITAL GEOPHYSICAL MAPPING
at
Green Beach
on
Vieques Island, Puerto Rico

by

CHEMRAD

Under Subcontract to

CH2M Hill, Inc.

During the period 2 through 13 April, 2001, CHEMRAD conducted a digital geophysical mapping (DGM) campaign on Green Beach, Vieques Island, Puerto Rico. This work was conducted under subcontract to and supervision by CH2M Hill.

CHEMRAD used two navigation systems, UltraSonic Ranging and Data System (USRADS®) and Precision Differential Global Positioning System (PDGPS). The navigation systems were integrated with CHEMRAD's NavTrac® system for attaching location information with sensor data.

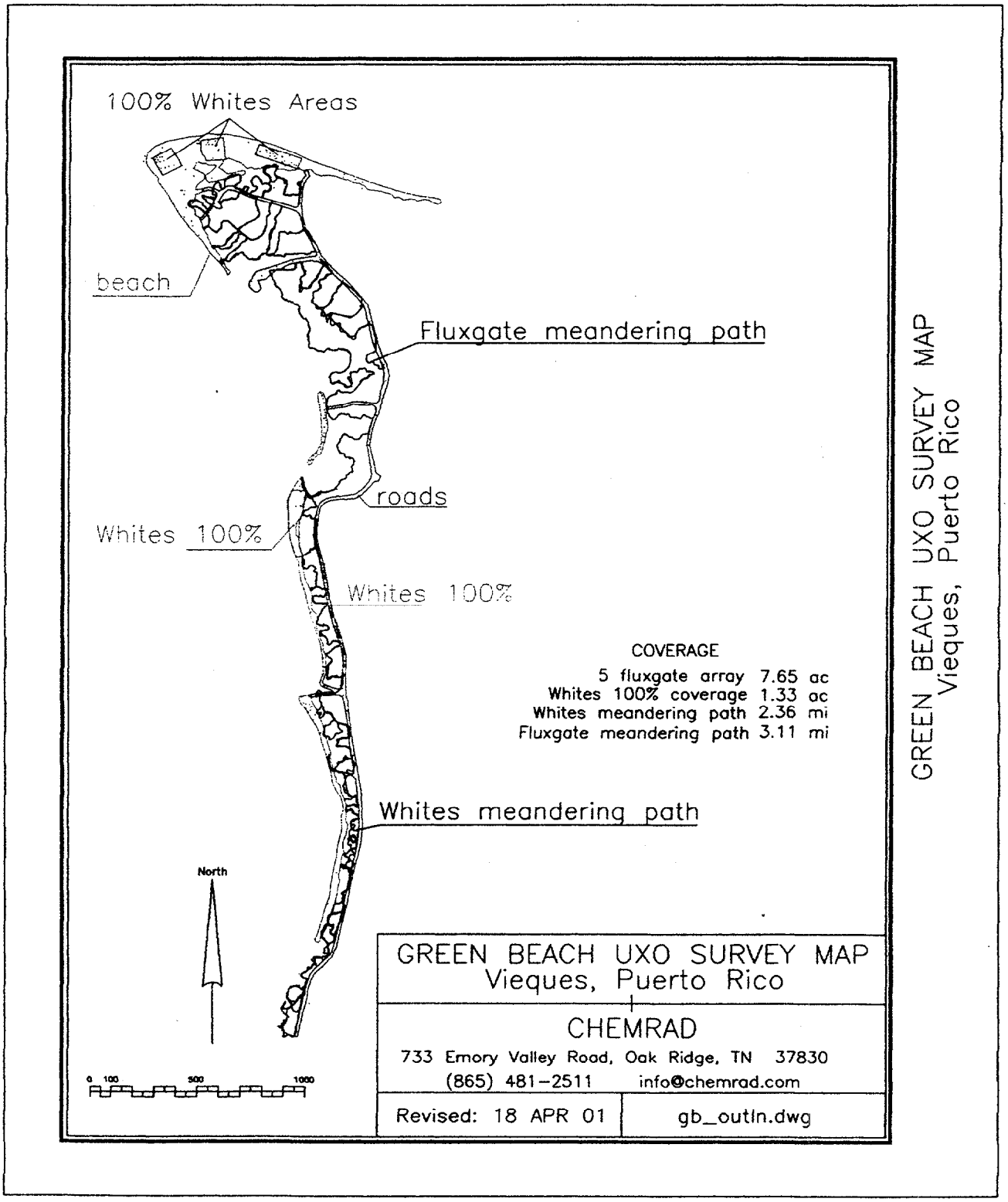
Three configurations were assembled by CHEMRAD for conduct of this DGM work:

- 5 Schonstedt 52C fluxgate magnetometer towed array with NavTrac,
- Single Whites Metal detector with NavTrac, and
- Single Schonstedt 52C fluxgate magnetometer with NavTrac.

The coverage during this DGM campaign is shown in the following table:

Detector System	Coverage
5 fluxgate magnetometer array	7.65 ac
Whites, 100% coverage	1.33 ac
Whites, meandering path	2.36 mi
Fluxgate magnetometer, meandering path	3.11 mi

A map of the coverage is shown on the following page.


100% Whites Areas
beach
Fluxgate meandering path
roads
Whites 100%
Whites 100%
COVERAGE
5 fluxgate array 7.65 ac
Whites 100% coverage 1.33 ac
Whites meandering path 2.36 mi
Fluxgate meandering path 3.11 mi
Whites meandering path
North
0 100 500 1000
GREEN BEACH UXO SURVEY MAP
Vieques, Puerto Rico
CHEMRAD
733 Emory Valley Road, Oak Ridge, TN 37830
(865) 481-2511 info@chemrad.com
Revised: 18 APR 01
gb_outln.dwg

No ordnance items were recovered. The following table shows the ammunition related residue recovered during reacquisition.

Item	quantity
7.62 cartridge, blank, expended	5
30-06 cartridge, blank, expended	9
30-06 cartridge, blank, not expended	1
45 cal ACP bullet, (slug only)	2
Ammo link, automatic weapon	1

A target list for all anomalies, including reacquisition results, is attached to this report.

Also attached is the Logger Analyze Track Map showing all 100% Schonstedt array coverage maps merged.

CHEMRAD demobilized to Oak Ridge on 13 April, 2001.

The CHEMRAD points of contact for this report is Michael R. Mason, CES, PG, senior geophysicist or Michael S. Blair, (865) 481-2511 or mblair@chemrad.com

TECHNICAL BASIS
for
DIGITAL GEOPHYSICAL MAPPING
at
Green Beach
on
Vieques Island, Puerto Rico

by

CHEMRAD

Under Subcontract to

CH2M Hill, Inc.

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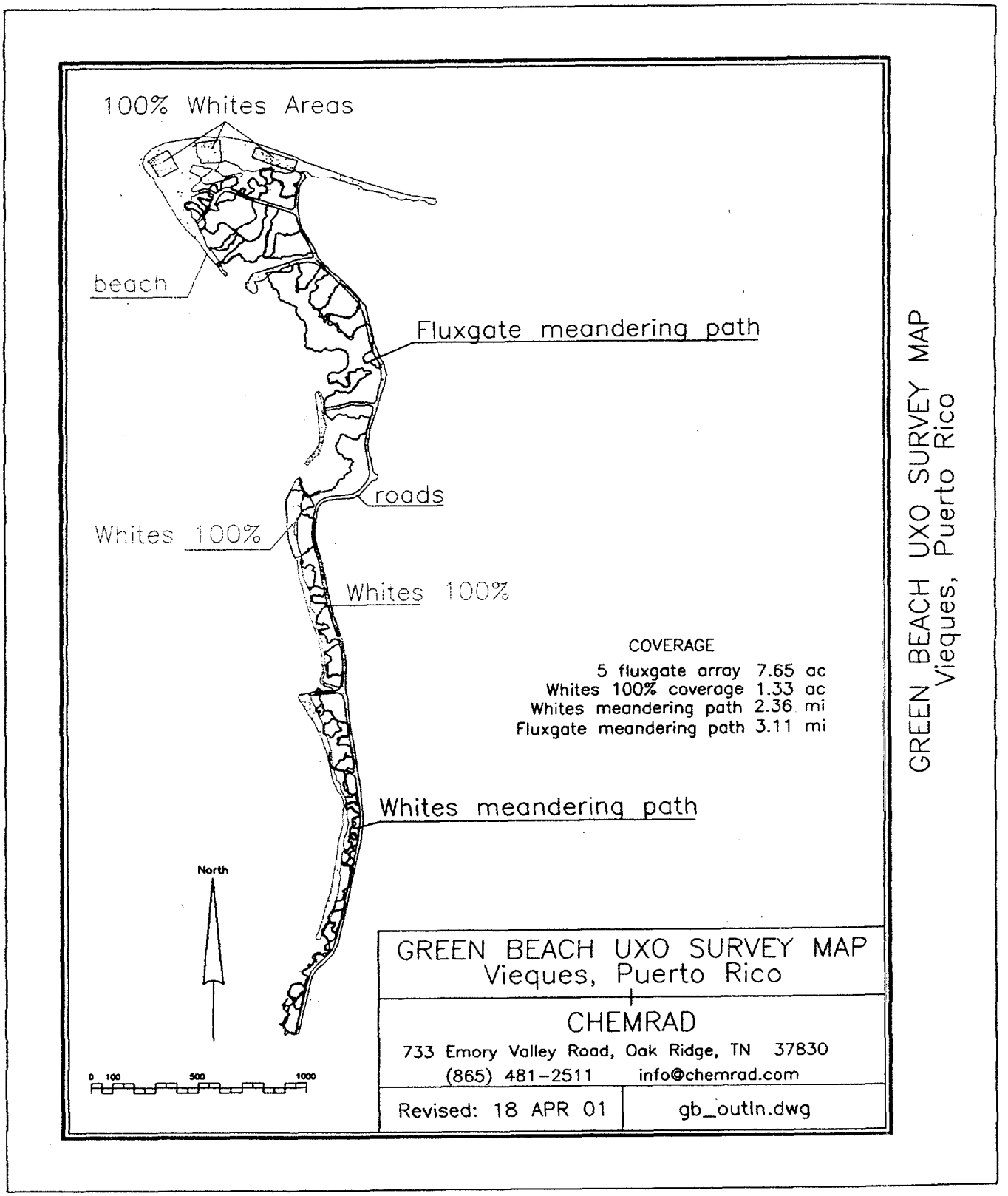


Geophysical Investigation Methods

Equipment

The geophysical survey was performed using three types of UXO detection instrumentation configurations:

Schonstedt Array – This array consisted of 5 Schonstedt 52CX fluxgate magnetometers placed vertically at 1 foot on center across a custom fabricated PVC frame. The wheel mounted frame was towed behind an ATV. The tips of the magnetometers were 6 inches above the nominal ground surface as determined at the wheels. The PDGPS antenna was mounted directly above the center of the frame on which the magnetometers were mounted. An offset from the antenna center to each detector was applied during data collection.

The line spacing was 6 feet. Resolution for the Schonstedt fluxgate magnetometer array at 3 readings per second at 3 fps, the line density was approximately 1 reading per square foot.

Schonstedt 52CX – A single Schonstedt 52CX fluxgate magnetometer, was deployed in meandering path surveys. The meandering path width of coverage was approximately three feet.

White's Spectrum XLT – A single White's Spectrum XLT metal detector was deployed in both 100% coverage in specified grids and in meandering path surveys. The width of coverage was approximately three feet.

The detectors were interfaced to PDGPS or USRADS. These instrumentation packages were selected based on the ordnance, soil type, terrain, and vegetation of the survey site.

Personnel

The geophysical survey team consisted of the senior survey technician who was responsible for the data collection and processing and one survey technician.

The data was processed and evaluated on location by the senior survey technician and dig sheets were prepared for reacquisition purposes.

Location Surveying, Mapping and Navigation System description

CHEMRAD's NavTrac™ data collection system interfaces conventional geophysical survey instrumentation with the Global Positioning Satellites (GPS) as a navigation engine. The position is plotted on a track map display as the data is collected so that coverage of the survey area can be monitored in real time. Position coordinates, position status codes, and the information from the detector readings are also displayed at the top of the computer screen.

PDGPS

The Precision Differential Global Positioning System (PDGPS) employs trilateration from 4 or more "visible" satellites out of a total constellation of 24 active satellites which orbit the globe. The three dimensional position of the receiver on the earth's surface is calculated iteratively using different combinations of those satellites which are above, normally, 15° from the horizon.

Because of errors that dilute the precision of the measurements, a base station or reference station placed over a known point is used to pass correction information to the roving receiver to remove those errors. The correction is normally passed by a radio signal from the base station to the roving receiver. This process is termed differential correction, hence, DGPS.

The navigation system utilizes differentially corrected GPS technology to determine the location of the geophysical survey sensor each second and consists of four basic elements, a Data Pack, GPS system, GPS base station, and the Master Control center.

USRADS

In the event that GPS technology is not possible in areas of tree canopy The navigation system that will be employed to produce the position-correlated survey data set will be the CHEMRAD Model 2300 Ultrasonic Ranging And Data System (USRADS). This navigation system utilizes ultrasonic techniques to determine the location of the geophysical survey sensor each second and consists of three basic elements, a Data Pack, up to 15 SRs, and the Master Control center.

The Data Pack will control the data collection process. Each second the Data Pack collects one GPS or USRADS location and 10 instrument data values. Through this process, the data from the detectors are synchronized with the generation of the DGPS or USRADS location stamp.

The Master Control Center consists of the Master Controller and a lap top computer. The Master Controller acts as the master timer for the system by collecting a location stamp each second and as data concentrator. Once the sequence has been indicated by the Master Controller, each device relays its information back to the Master Controller which

routes the data to the computer for calculating the sensor location and data storage. The information relayed to the computer consists of the 3 readings from each detector and a location determination each second.

The Master Controller computer system then computes the location of the survey sensor and displays the location and survey data on the computer screen. The survey data is color coded so that the operator can quickly view the data to ensure that both the navigation system and survey instruments are functioning properly.

Instrument drift (DC offset)

There was no requirement for drift considerations with the fluxgate magnetometer or metal detector technologies proposed for this project.

Standardization procedures

Geophysical Survey Instrument Performance Check/Standardization procedures are outlined below:

1) Collect quality point data prior to conducting a survey;
2) Monitor data quality during a survey by looking at adjacent line d data;
3) Collect redundancy point data after each survey;
4) Compare quality and redundancy point data;

Instrument response to a known standard

The response of the geophysical survey instrument was documented for the same item placed in its detection field at the start and end of each survey. This ensured that the instrument's response remains constant throughout the survey process.

Horizontal accuracy

The statement of work does not specify horizontal accuracy. However, CHEMRAD represents the horizontal accuracy of the PDGPS and USRADS system to be 20 cm (7.9 inches) CEP.

Data processing, Correction, and Analysis

The CHEMRAD Logger® software was used for both the data collection and analysis of the data. The Logger software was utilized in the field to ensure that the survey protocol was followed and that the highest quality survey instrument data were collected.

During the conduct of the survey, the geophysical instrument data were displayed in a position-correlated format on the computer screen. The format, called a Track Map,

color codes the geophysical survey instrument data so the geophysical anomalies appear on the computer near real time. The operator at the Master Control Center can analyze the data as they are being collected to monitor the sensor readings on adjacent lines to detect malfunction in the survey instrument. This also allowed the operator to monitor anomaly location and direct the surveyor (and UXO technician) back to areas that required additional or to provide immediate feedback on anomalies of interest. This real time monitoring and analysis of the data eliminates the possibility of surveying an area with a malfunctioning detector.

Upon completion of the data collection process, the Logger Analyze® program was used to process the geophysical data while the survey team was still on location. This phase of the analysis is performed to verify that the survey file is not corrupted.

Instrument drift correction

There was no requirement for drift considerations with the fluxgate magnetometer or metal detector technologies used on this project.

Diurnal drift correction

There was no requirement for drift considerations with the fluxgate magnetometer or metal detector technologies used on this project.

Digital filtering and enhancement

The CTC GeoUtility® software package was used to apply High Definition Processing (HDP) to the array data.

Correlation with ground truth

As each grid is surveyed, the data was analyzed to identify geophysical anomalies of interest while still on site. Geophysical anomalies that are detected at this phase were reacquired to monitor the performance of the system and to perform special reacquisition and or investigations by the UXO technician.

Quantitative interpretation and dig sheet development

The fluxgate magnetometer array generated five channels of information. Data were recorded and spatially adjusted for each of the five magnetometers. The information was displayed graphically to identify locations of the geophysical anomalies. The location for each geophysical anomaly wasthen be electronically ported to the dig sheet database to minimize the potential for human error in the transcription of the data.

Anomaly reacquisition

The dig sheets were used by a joint crew of CHEMRAD and UXO personnel to return to points of concern represented by the anomalies on the dig sheet. CHEMRAD used the same system to reacquire as was used to conduct the original DGM.

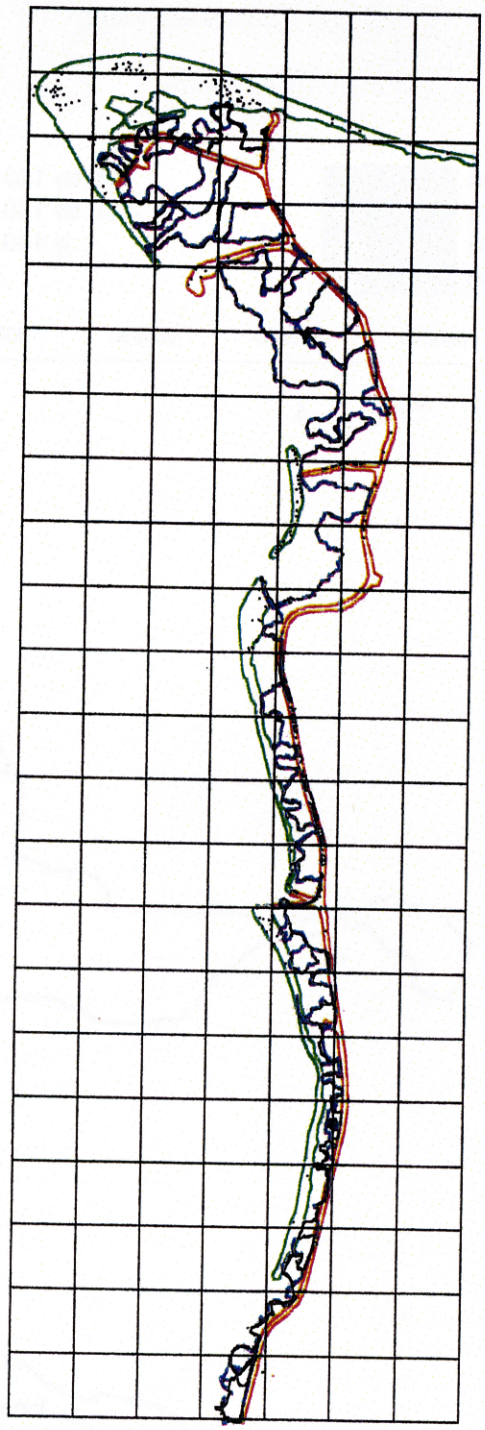
Maps & Data

Accompanying this report is a CD containing the following information:

- Survey maps .txt (ArcView compatible)
- Survey data files .dat
- Project maps .dwg (AutoCAD format)
- Target Locations .xls (Excel spreadsheet compatible)

The CHEMRAD points of contact for this report is Michael R. Mason, CES, PG, senior geophysicist or Michael S. Blair, (865) 481-2511 or mblair@chemrad.com

Grid Key



LOGGER Analyze v1.54m Track Map

Site: MPS_B19 ()

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Time:

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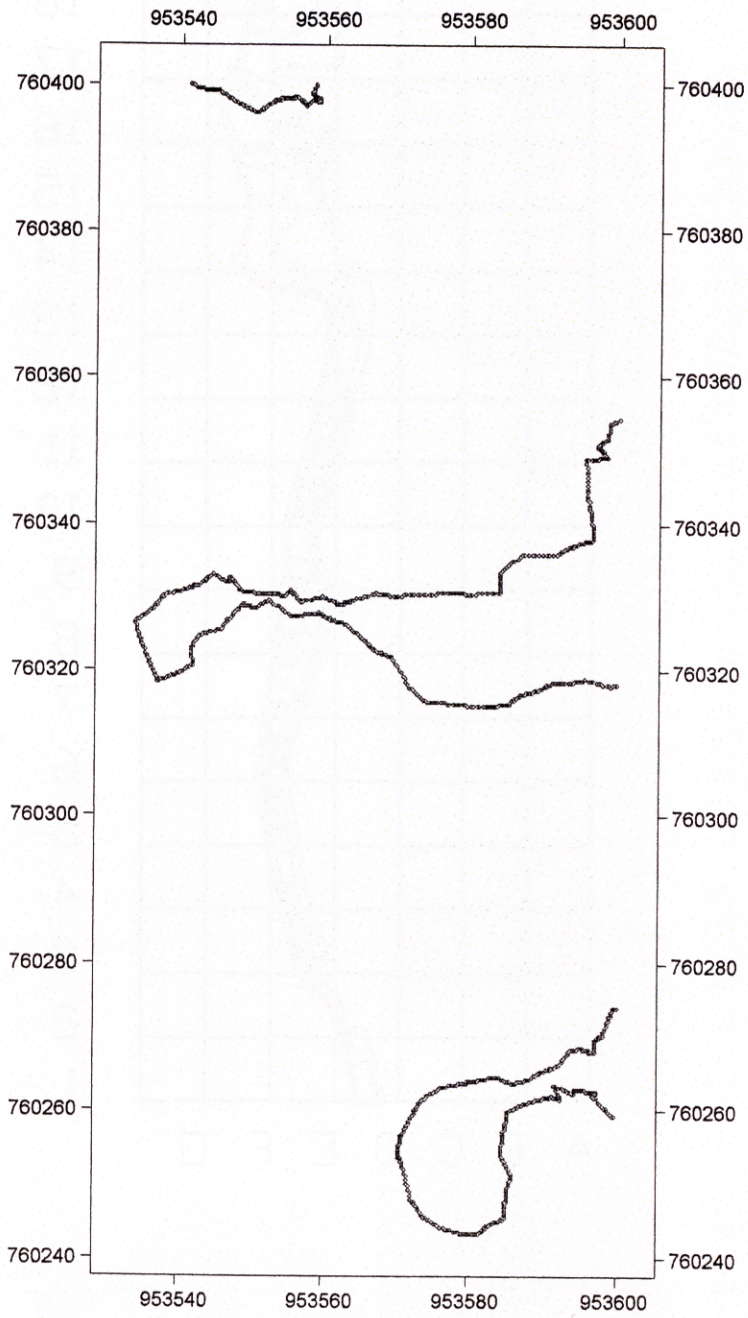
< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



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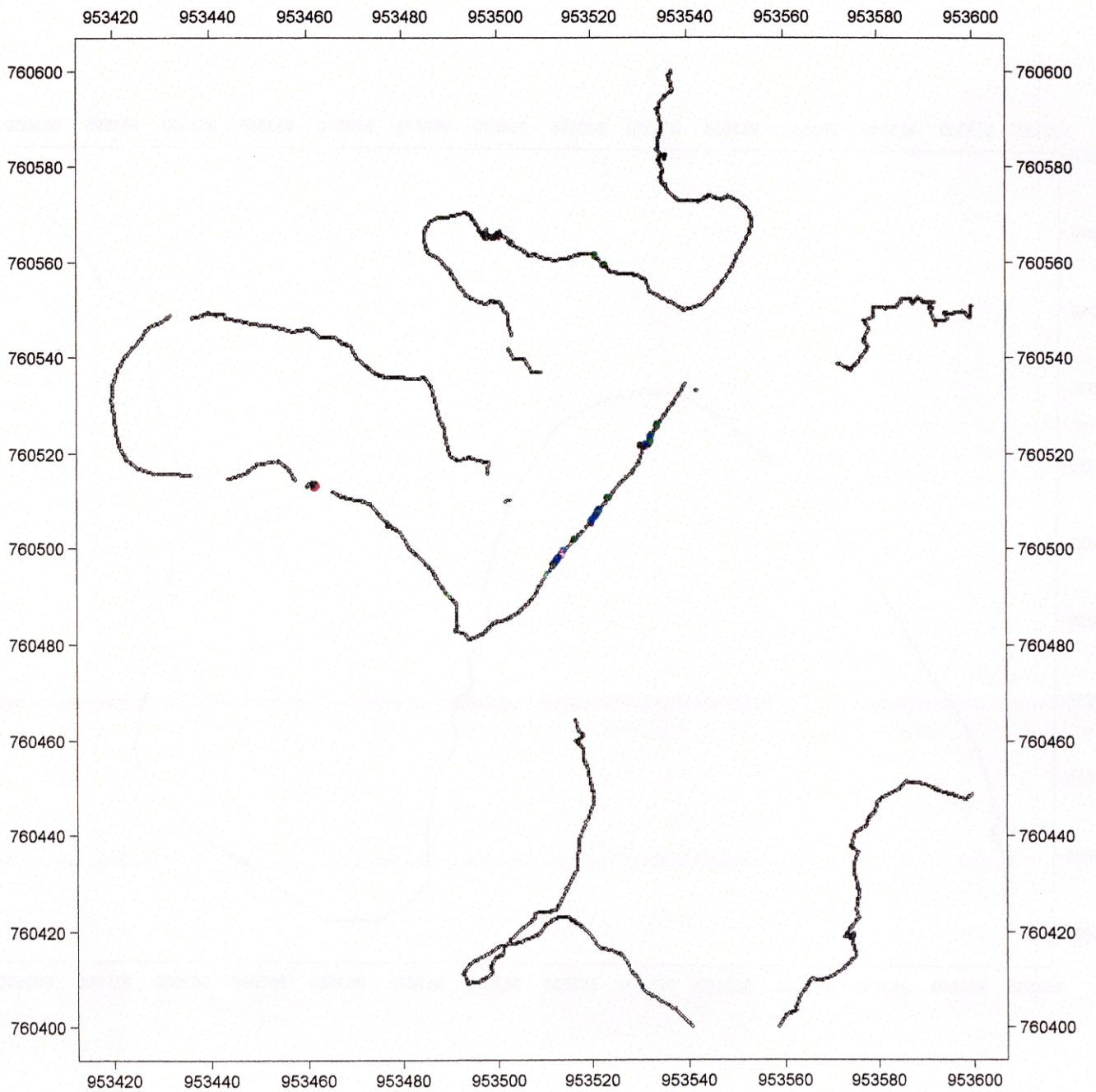

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60 to 80	> 140
80 to 100	

LOGGER Analyze v1.54m Track Map

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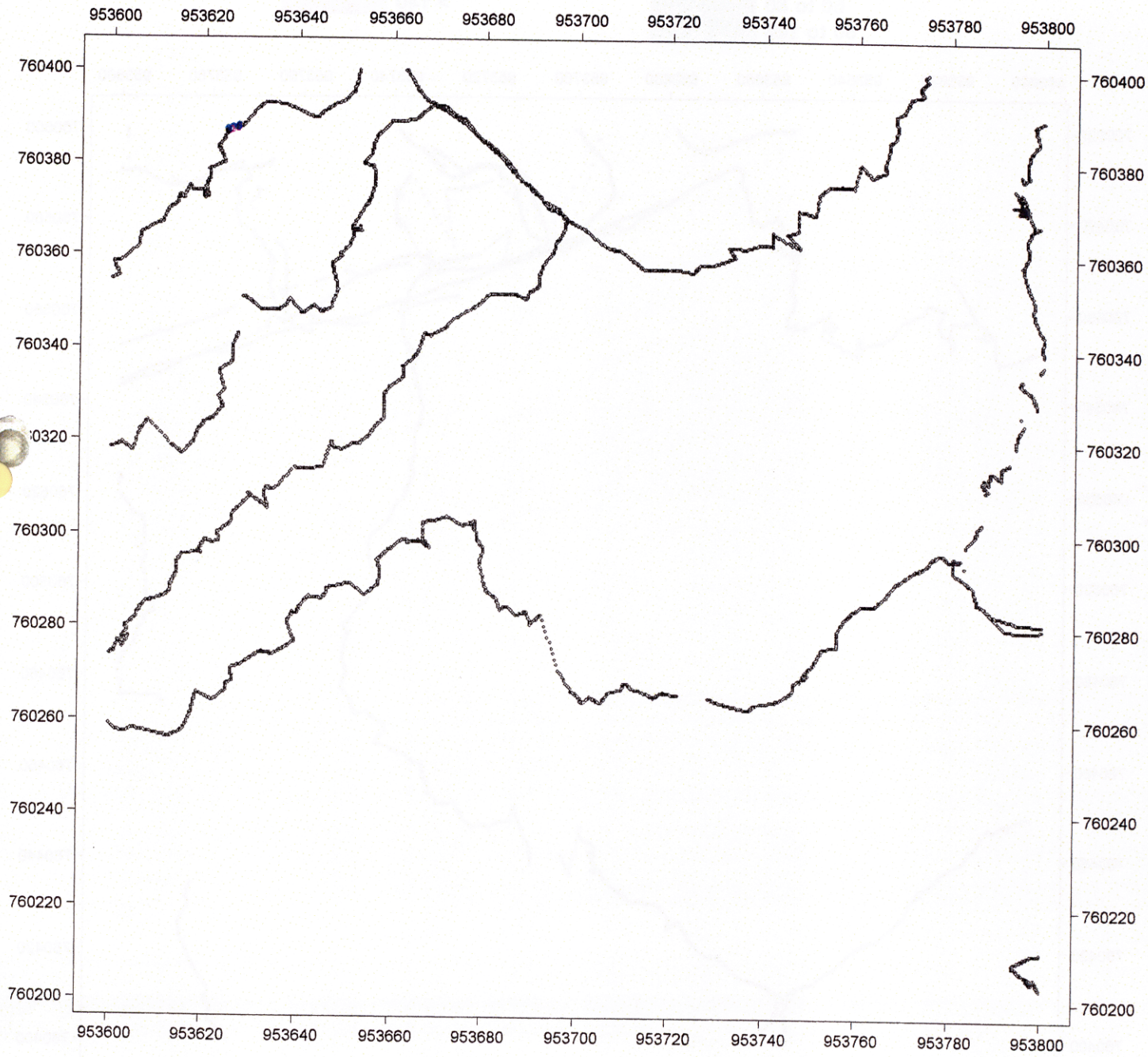

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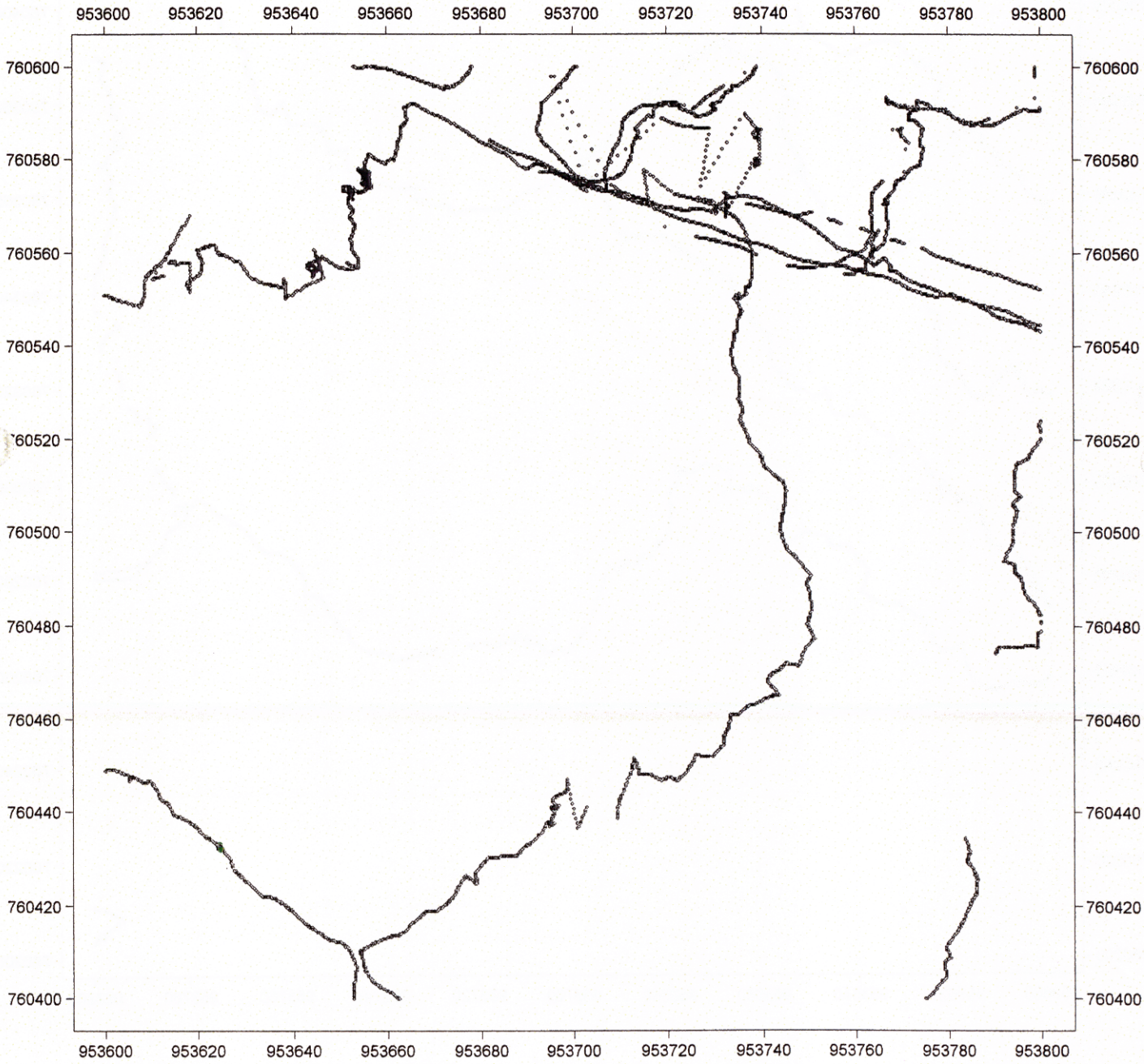

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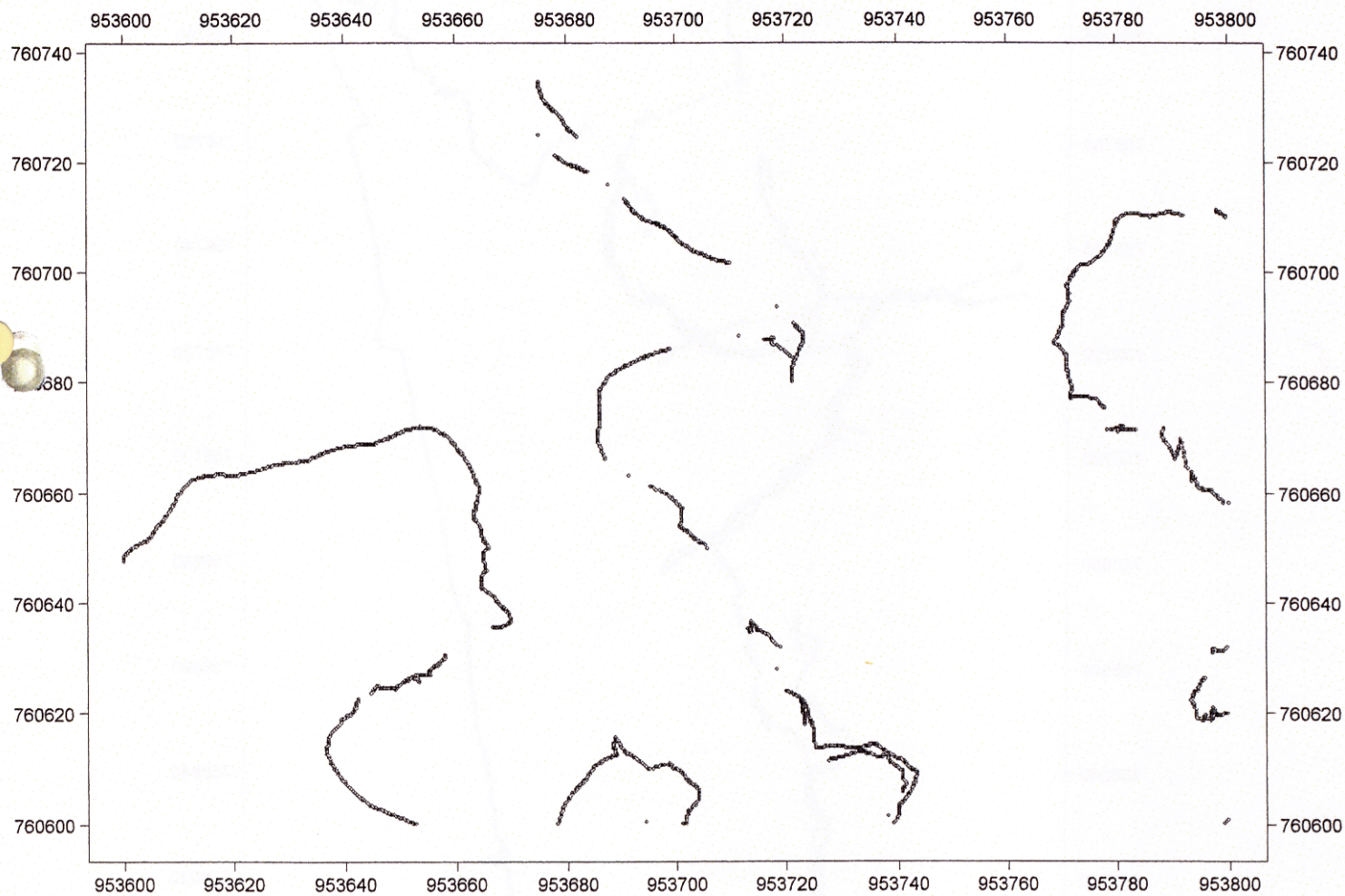
80 to 100	



LOGGER Analyze v1.54m Track Map

Site: MPS_D1 ()

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Time:

Threshold:
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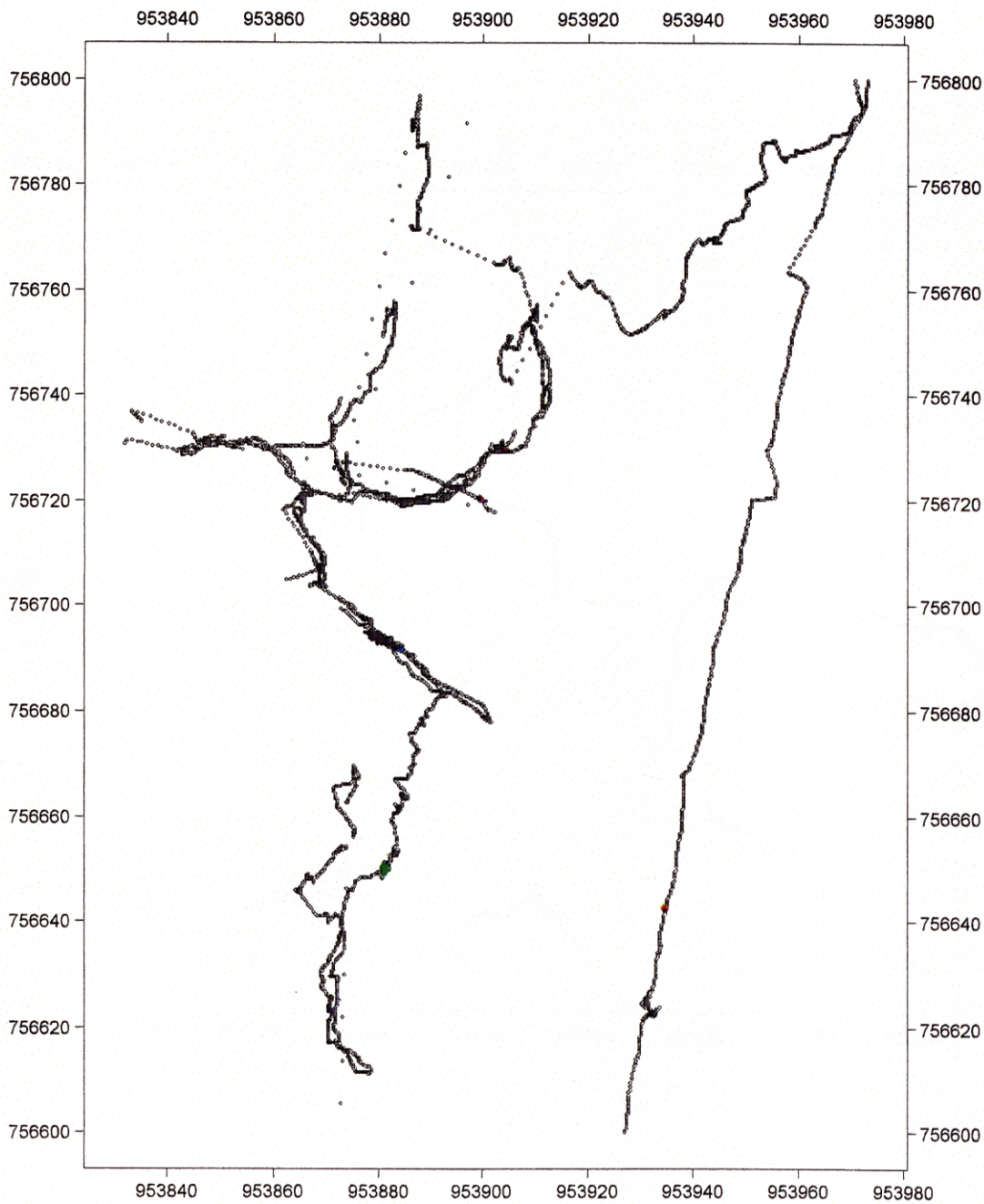
60 to 80	> 140
80 to 100	



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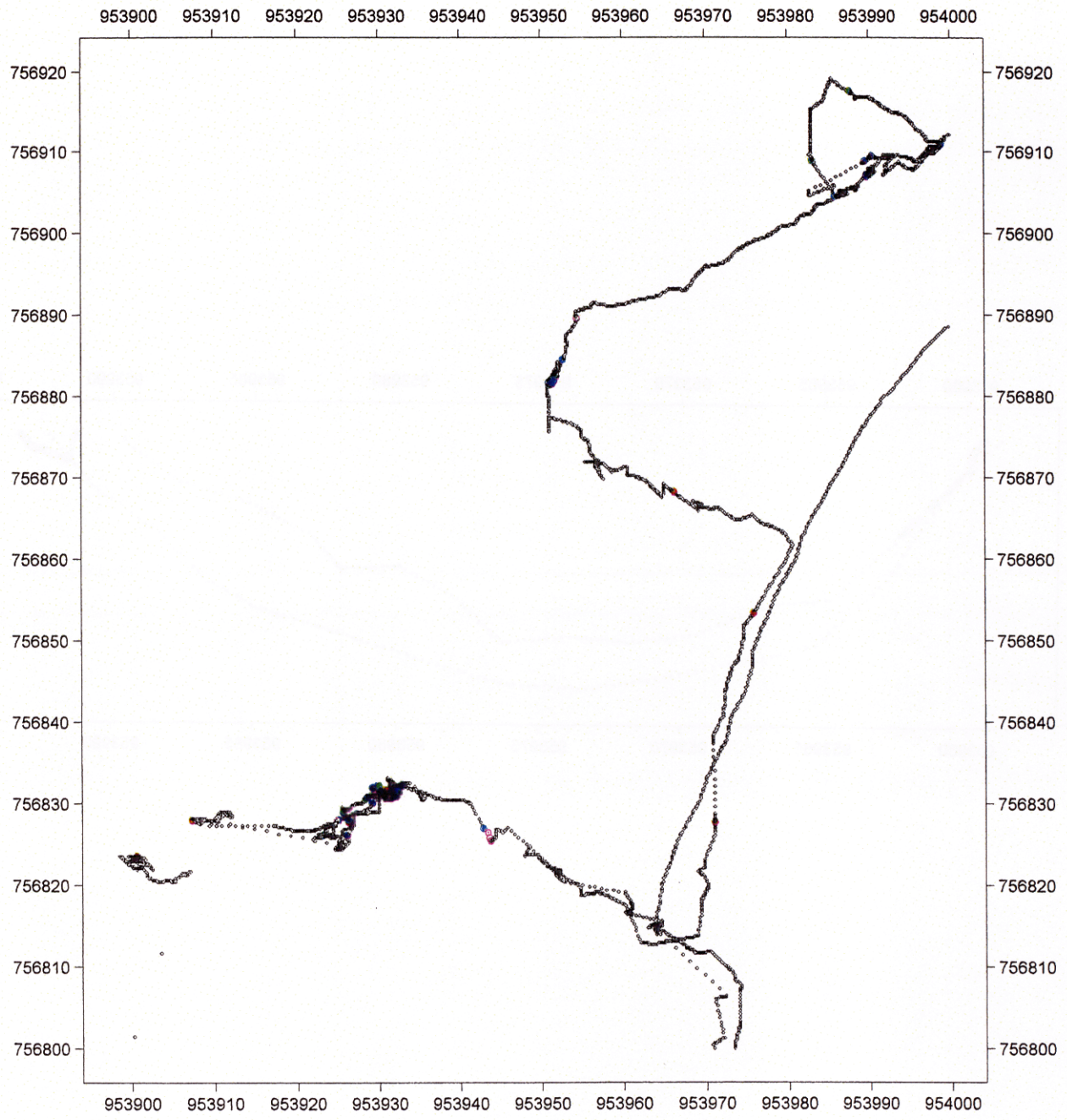
80 to 100	



11455.9388

LOGGER Analyze v1.54m Track Map

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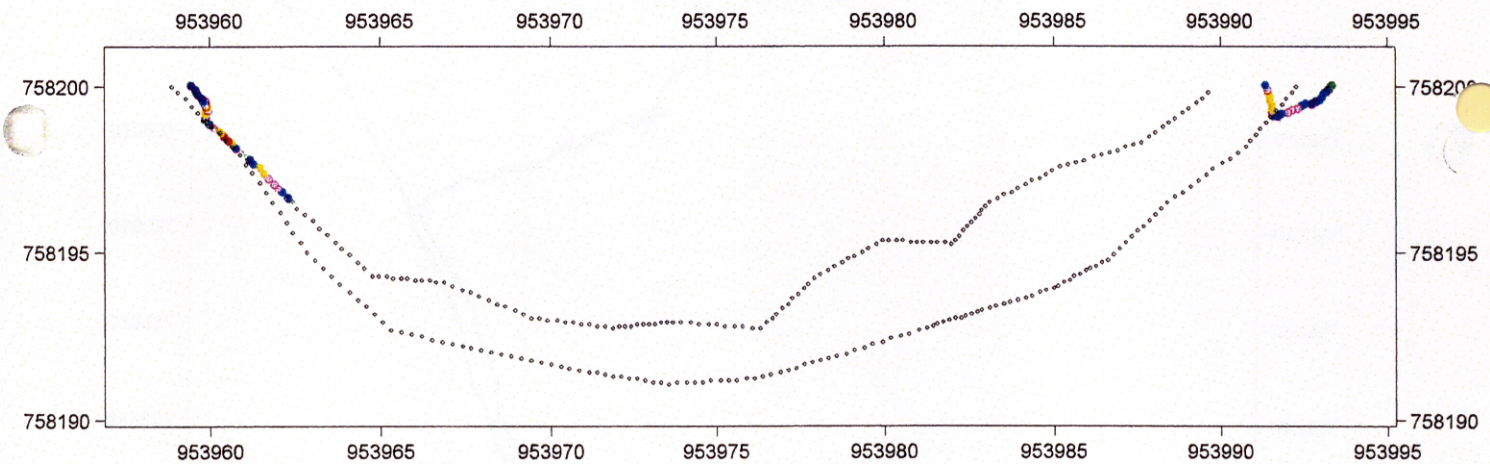
80 to 100	



LOGGER Analyze v1.54m Track Map

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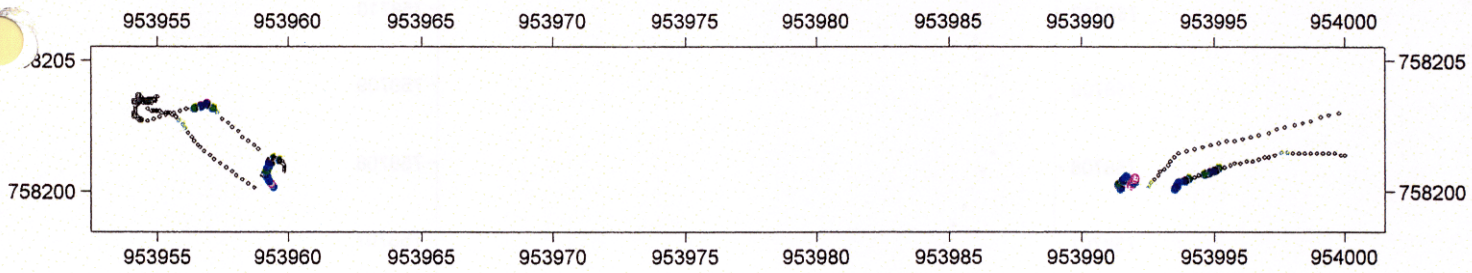
80 to 100	



LOGGER Analyze v1.54m Track Map

Site: MPS_D11 ()

Signal: Schonstedt (cps)

Time:

Threshold:
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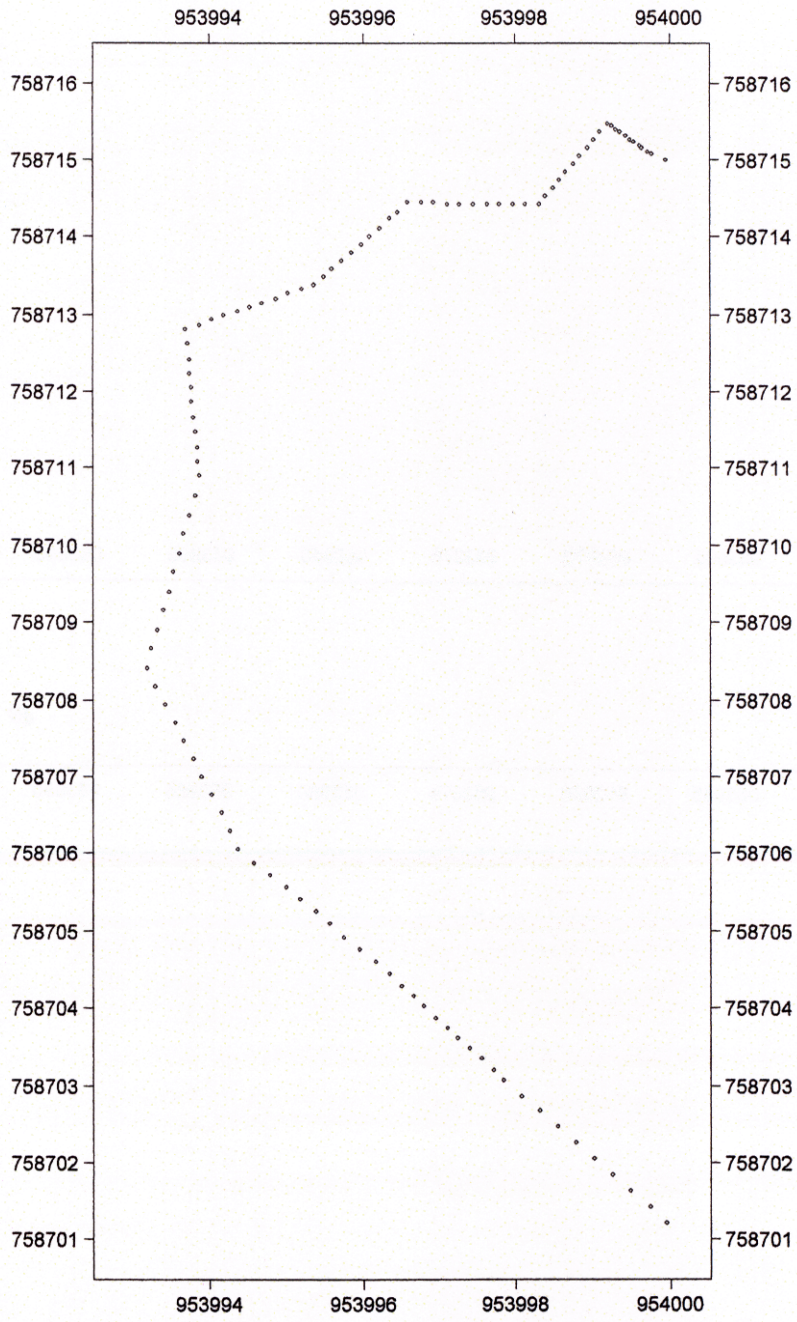
< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



LOGGER Analyze v1.54m Track Map

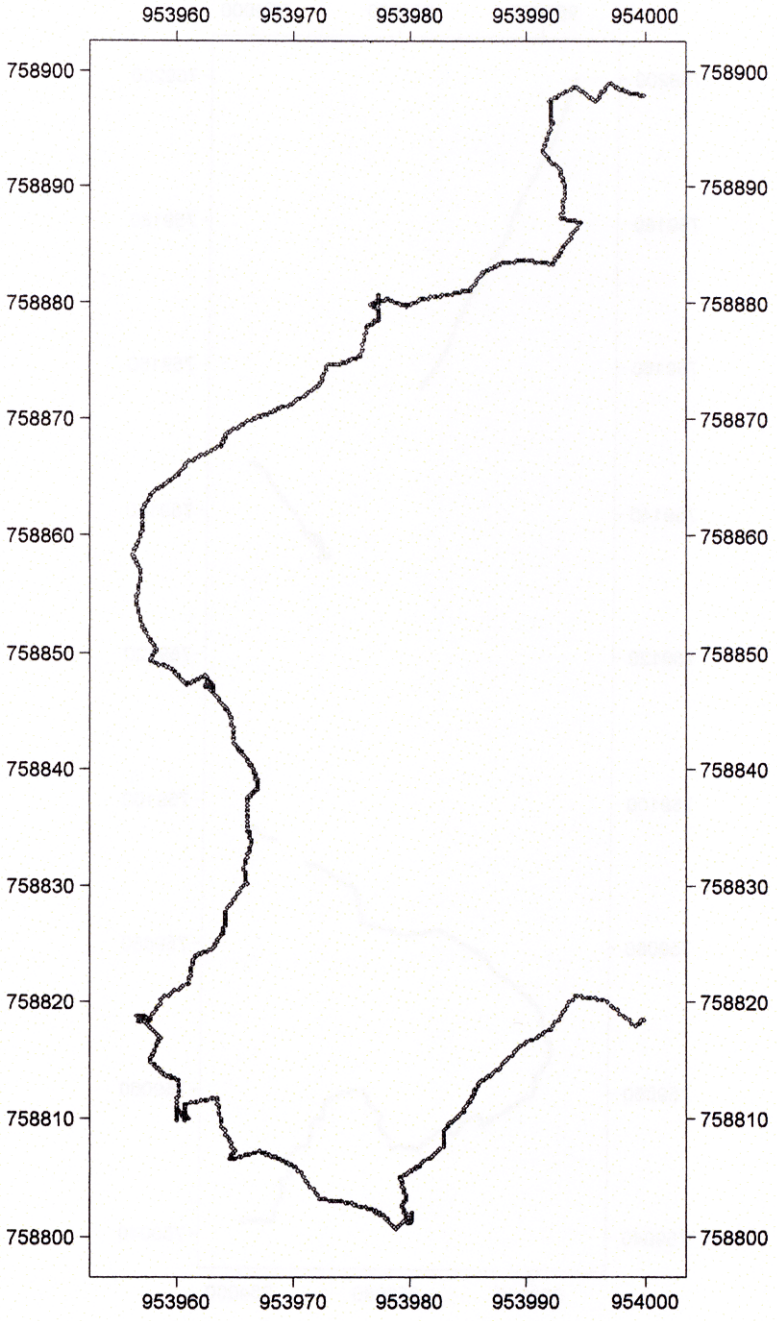
Site: MPS_D12 ()

Signal: Schonstedt (cps)

Time:

Threshold:
> 50 •

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	

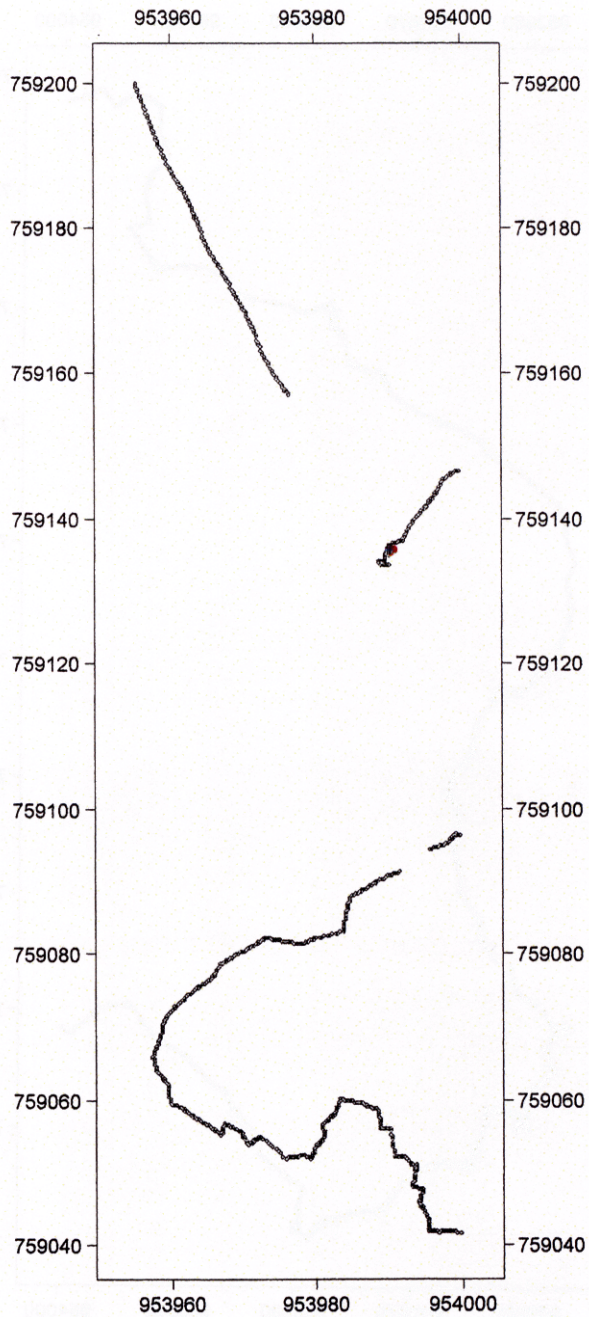


LOGGER Analyze v1.54m Track Map

Site: MPS_D13 () **Signal: Schonstedt (cps)** **Time:**

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



LOGGER Analyze v1.54m Track Map

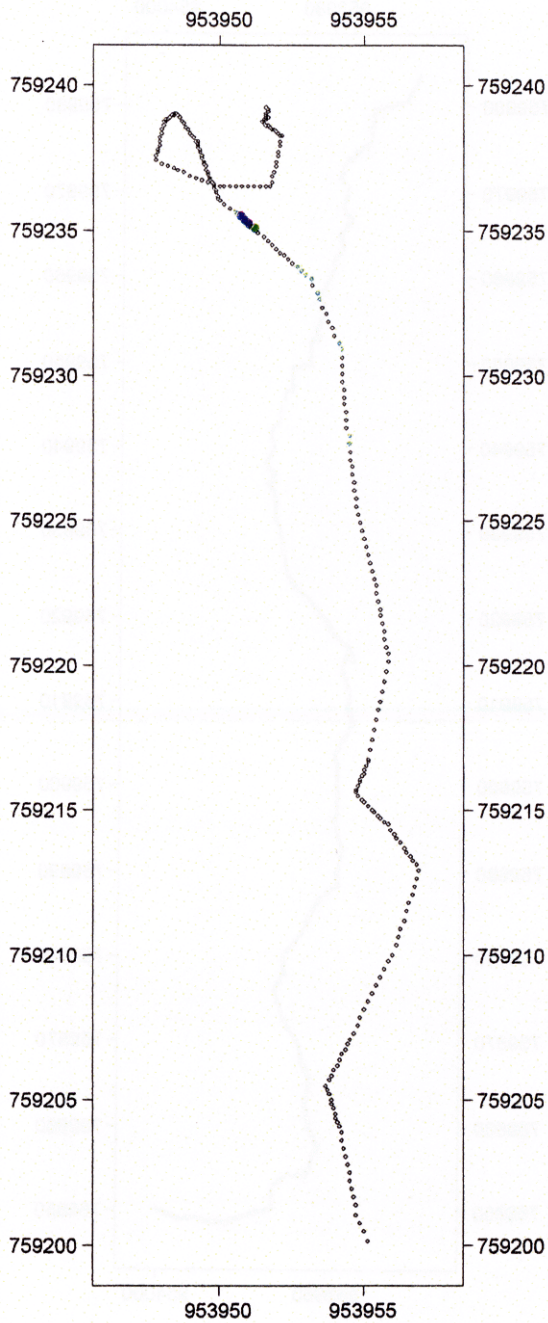
Site: MPS_D14 ()

Signal: Schonstedt (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



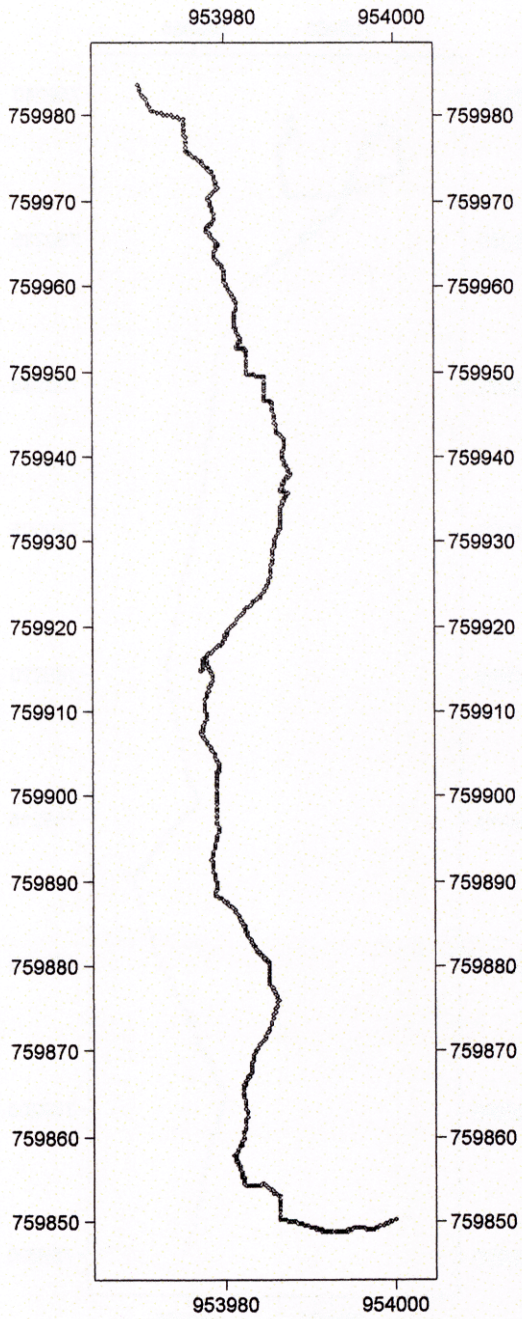
11455.9381

LOGGER Analyze v1.54m Track Map

Site: MPS_D17 () **Signal: Schonstedt (cps)** **Time:**

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	

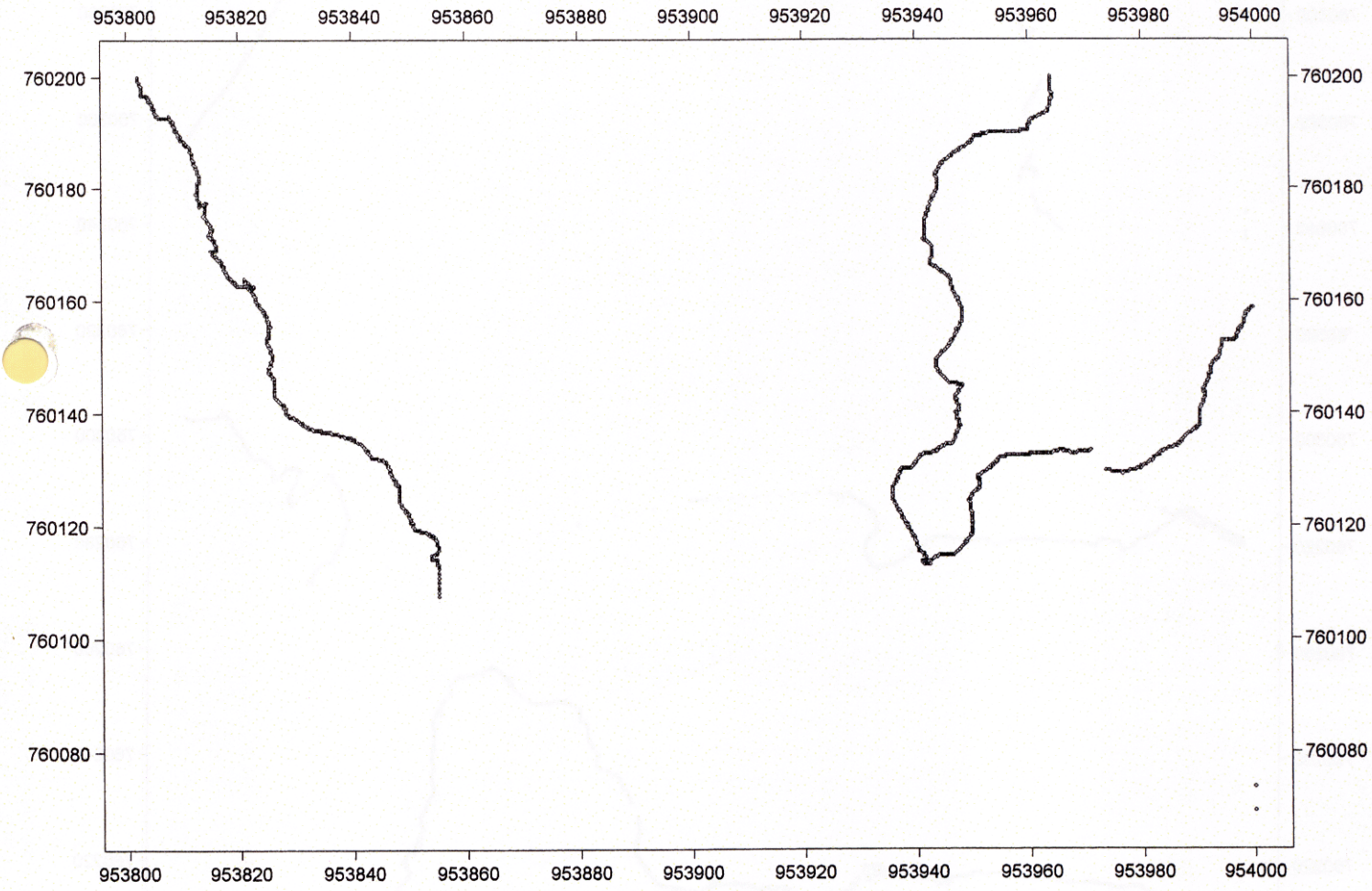


LOGGER Analyze v1.54m Track Map

Site: MPS_D18 () **Signal: Schonstedt (cps)** **Time:**

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



LOGGER Analyze v1.54m Track Map

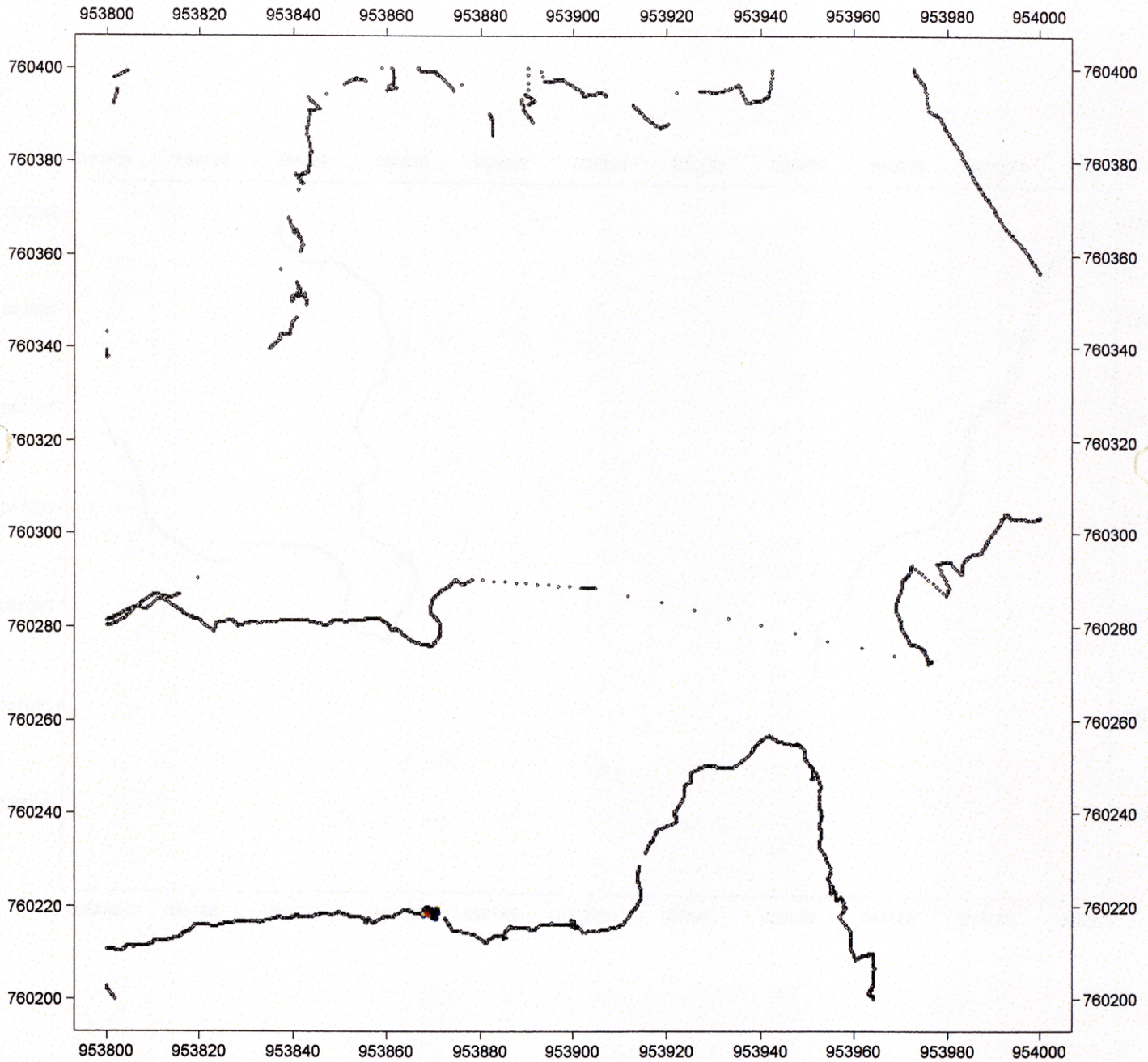
Site: MPS_D19 ()

Signal: Schonstedt (cps)

Time:

Threshold:
> 50 •

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



11455.9386

LOGGER Analyze v1.54m Track Map

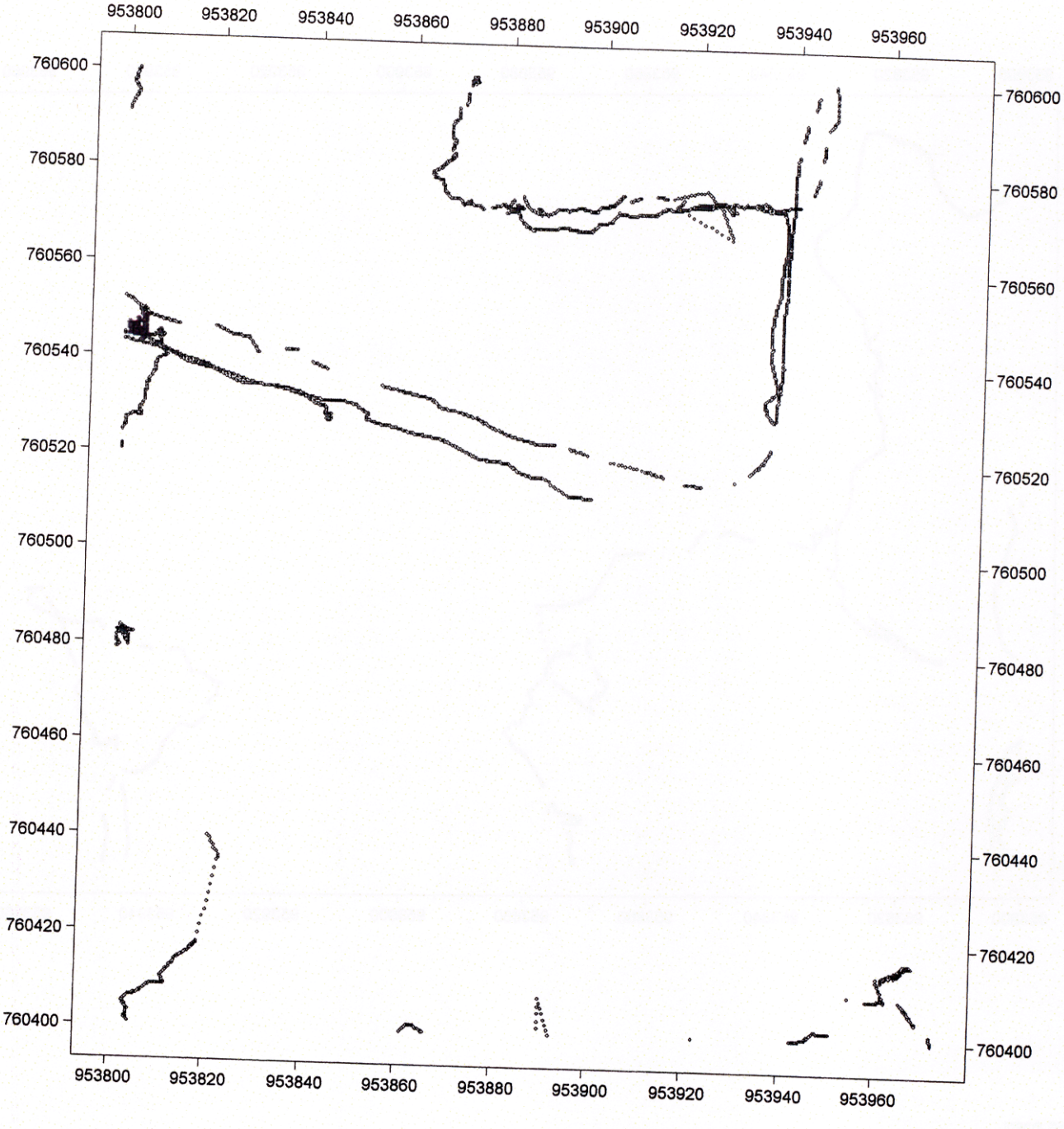
Site: MPS_D20 ()

Signal: Schonstedt (cps)

Time:

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



11455.9390

LOGGER Analyze v1.54m Track Map

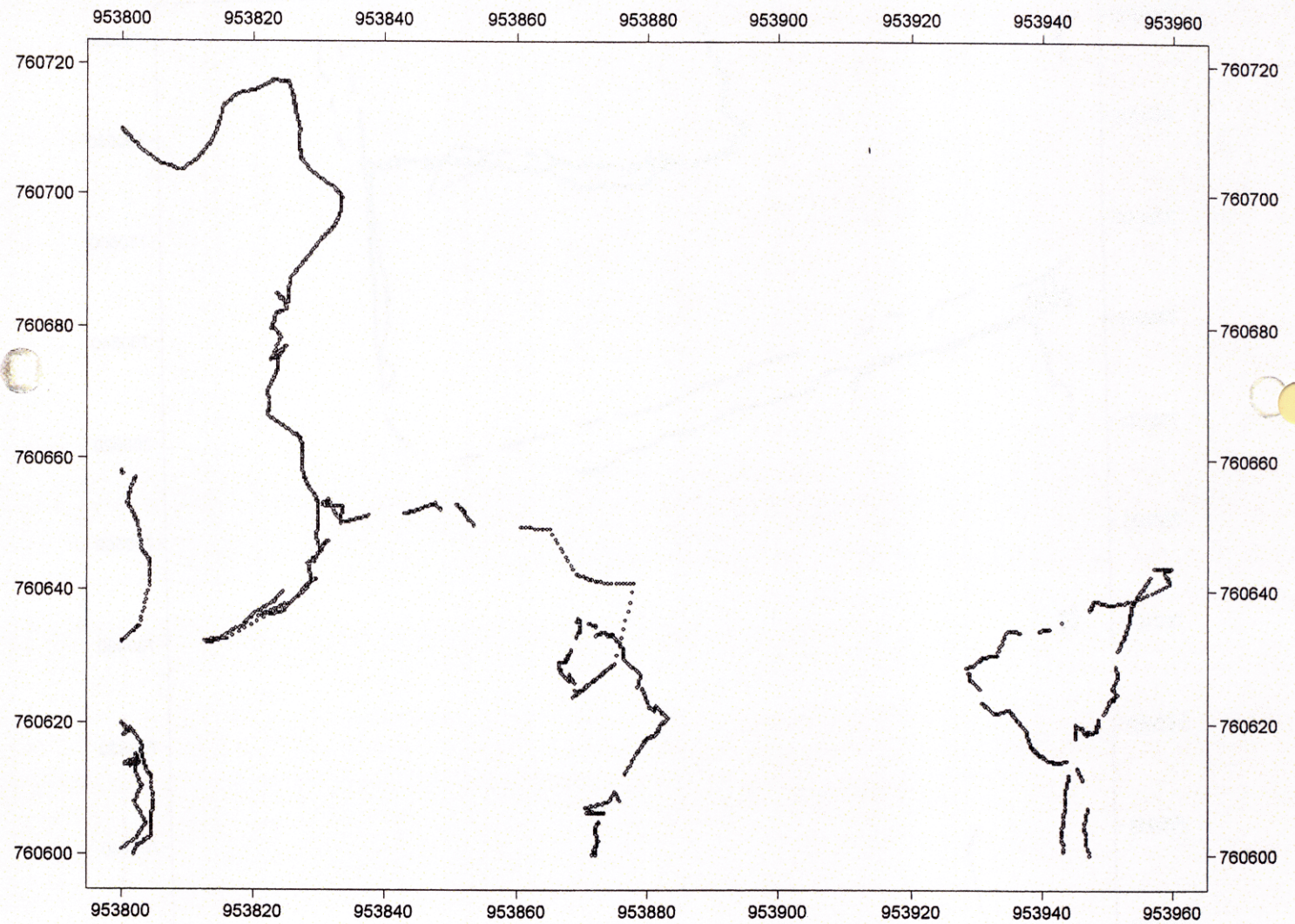
Site: MPS_D21 ()

Signal: Schonstedt (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



11455.9392

LOGGER Analyze v1.54m Track Map

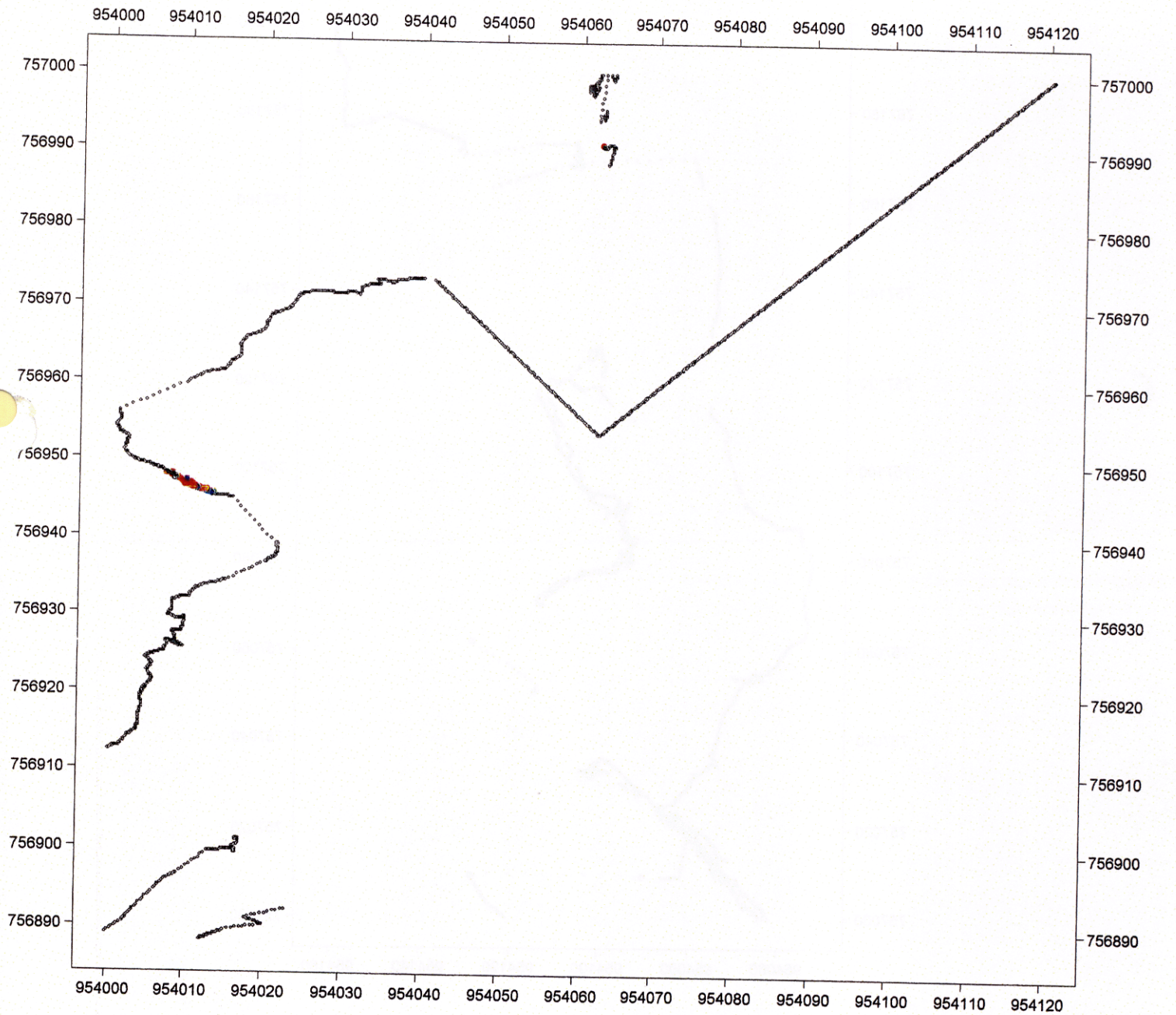
Site: MPS_E2 ()

Signal: Schonstedt (cps)

Time:

Threshold:
> 50 •

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



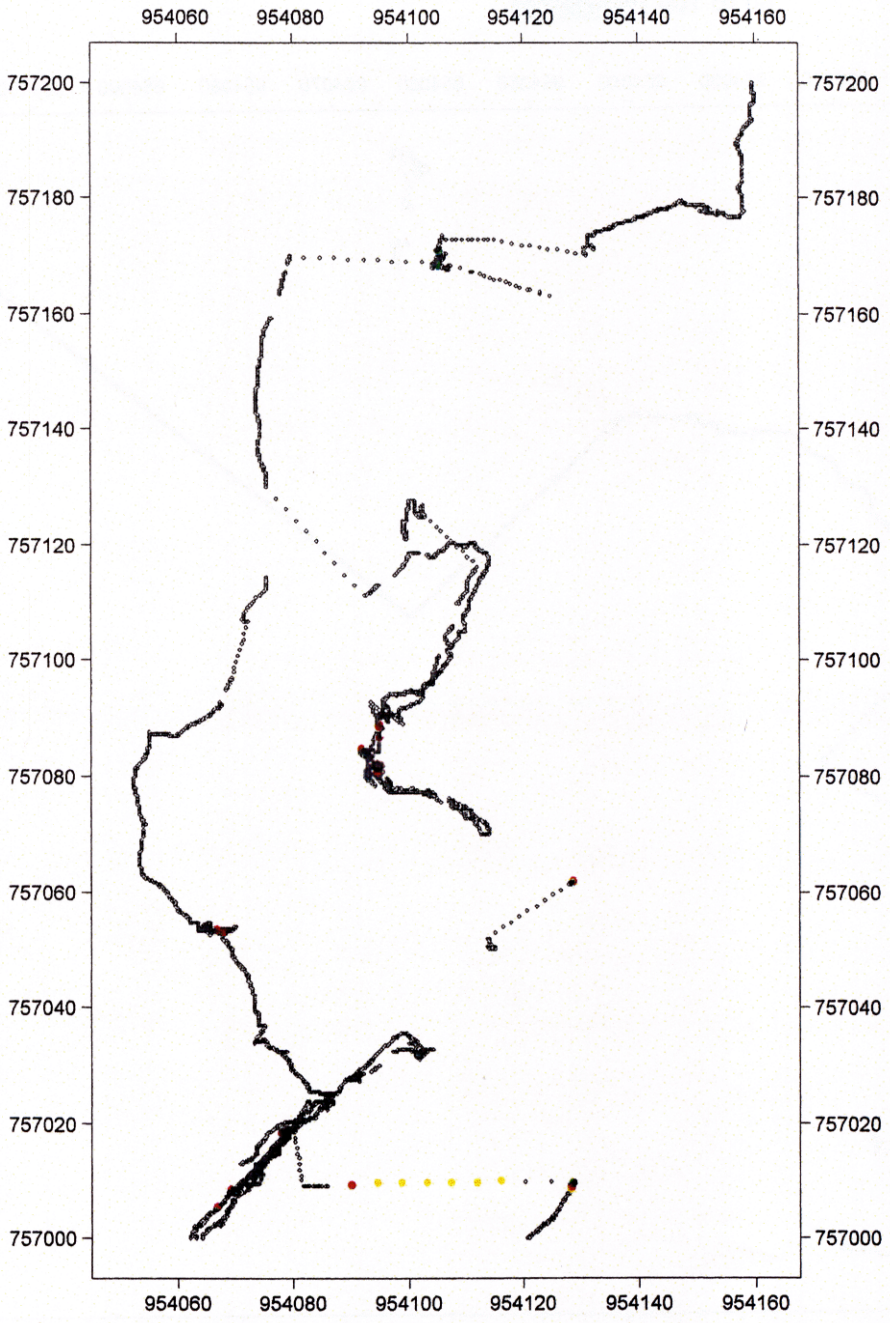
11455.9416

LOGGER Analyze v1.54m Track Map

Site: MPS_E3 () **Signal: Schonstedt (cps)** **Time:**

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



LOGGER Analyze v1.54m Track Map

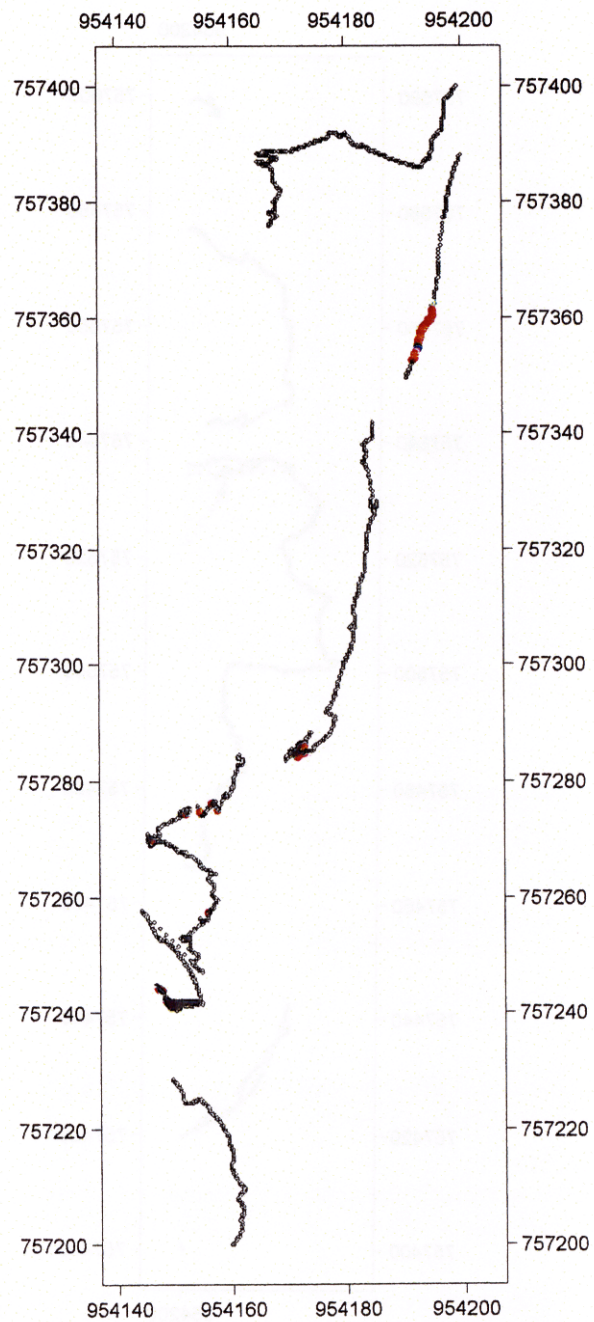
Site: MPS_E4 ()

Signal: Schonstedt (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



11455.9421

LOGGER Analyze v1.54m Track Map

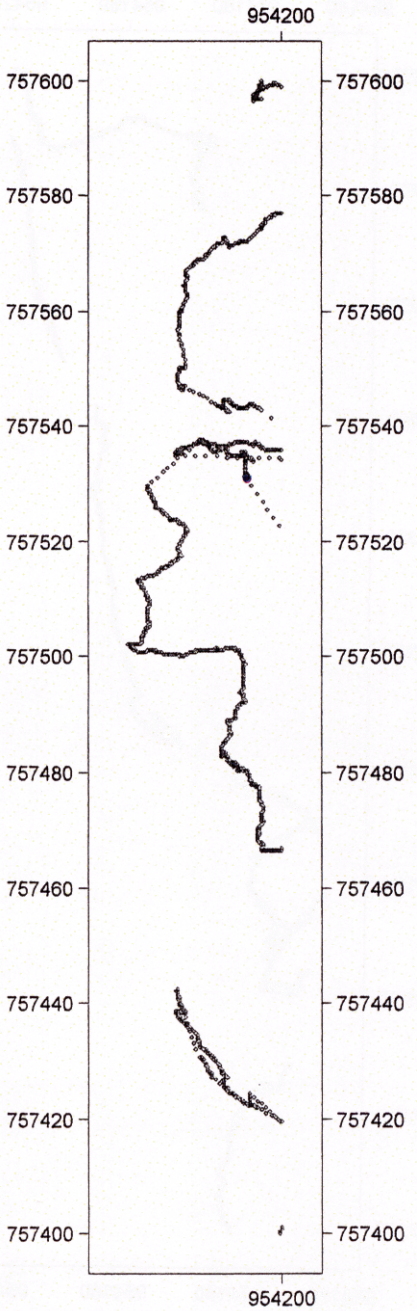
Site: MPS_E5 ()

Signal: Schonstedt (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



LOGGER Analyze v1.54m Track Map

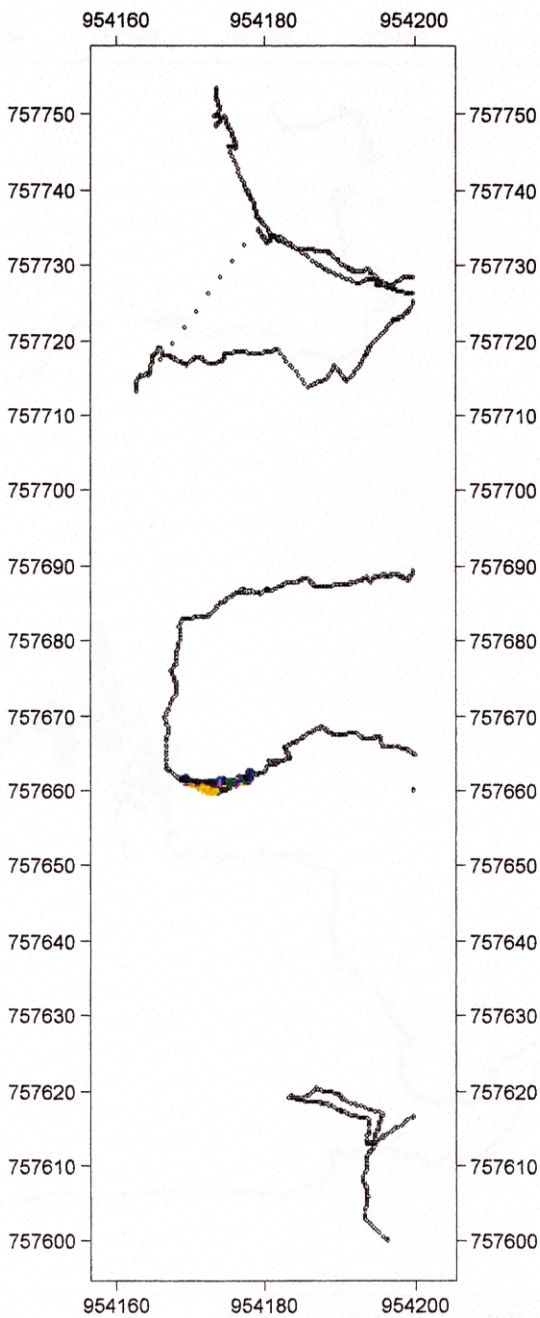
Site: MPS_E6 ()

Signal: Schonstedt (cps)

Time:

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



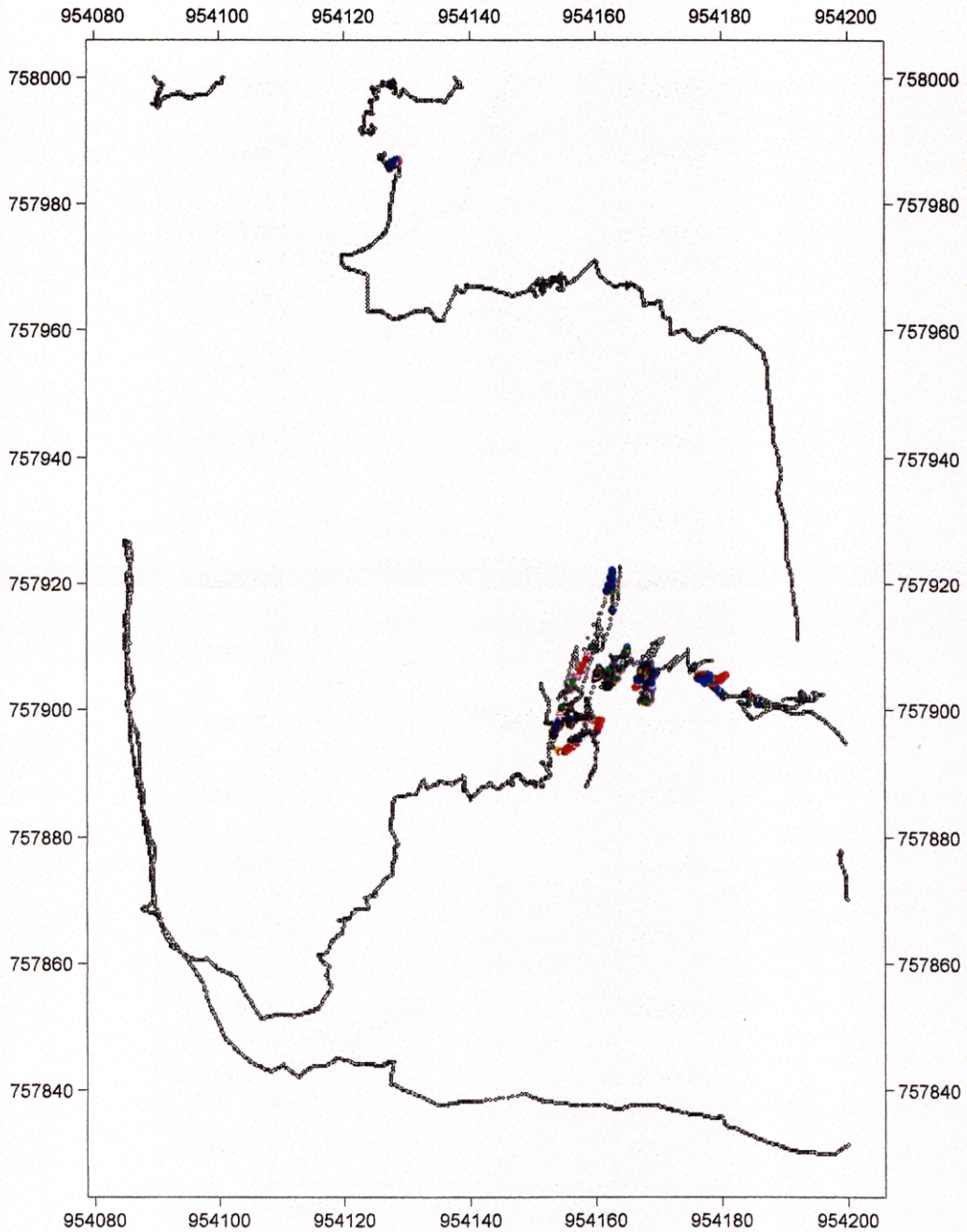
11455.9425

LOGGER Analyze v1.54m Track Map

Site: MPS_E7 () **Signal: Schonstedt (cps)** **Time:**

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	

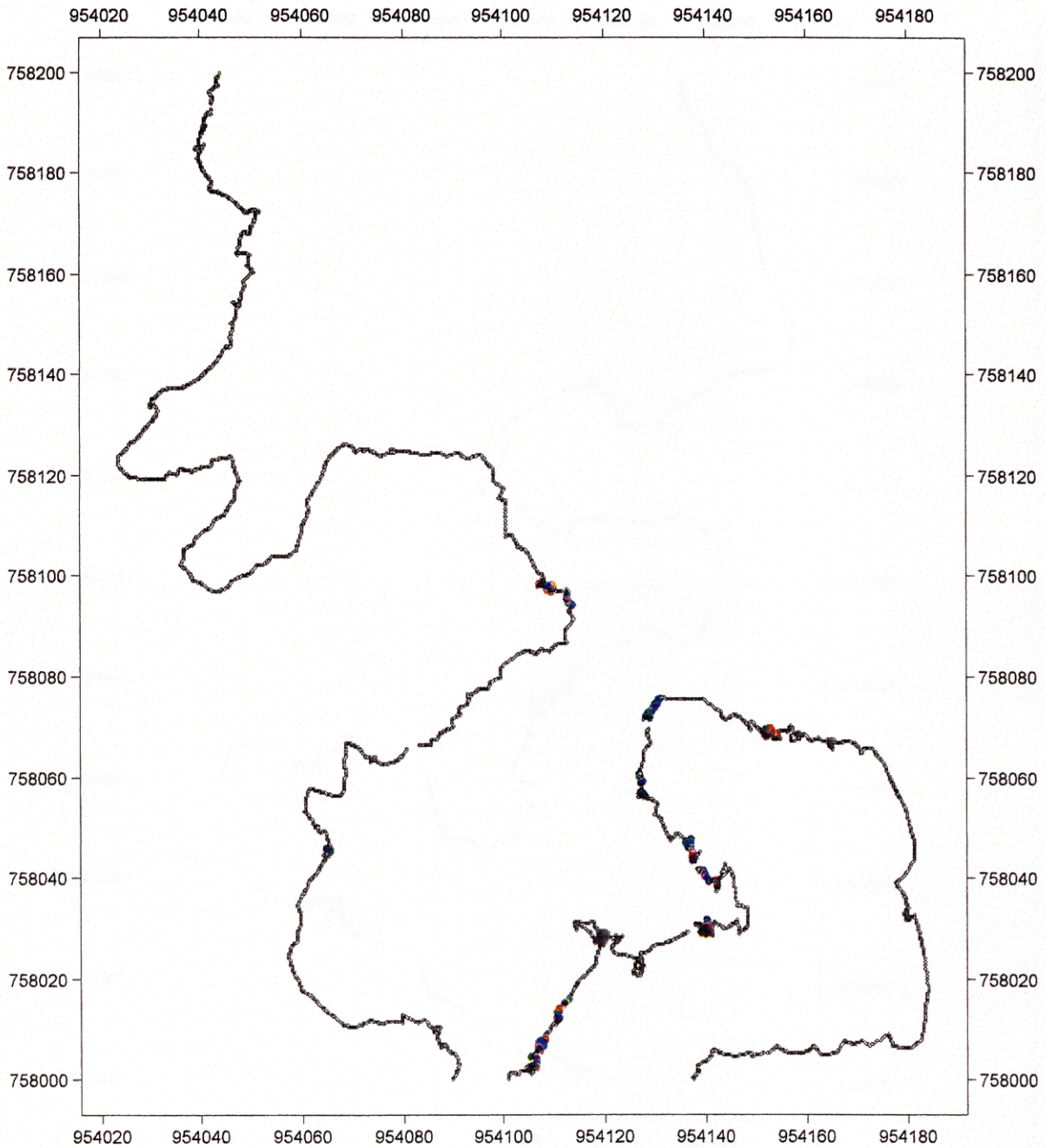


LOGGER Analyze v1.54m Track Map

Site: MPS_E8 () **Signal: Schonstedt (cps)** **Time:**

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	

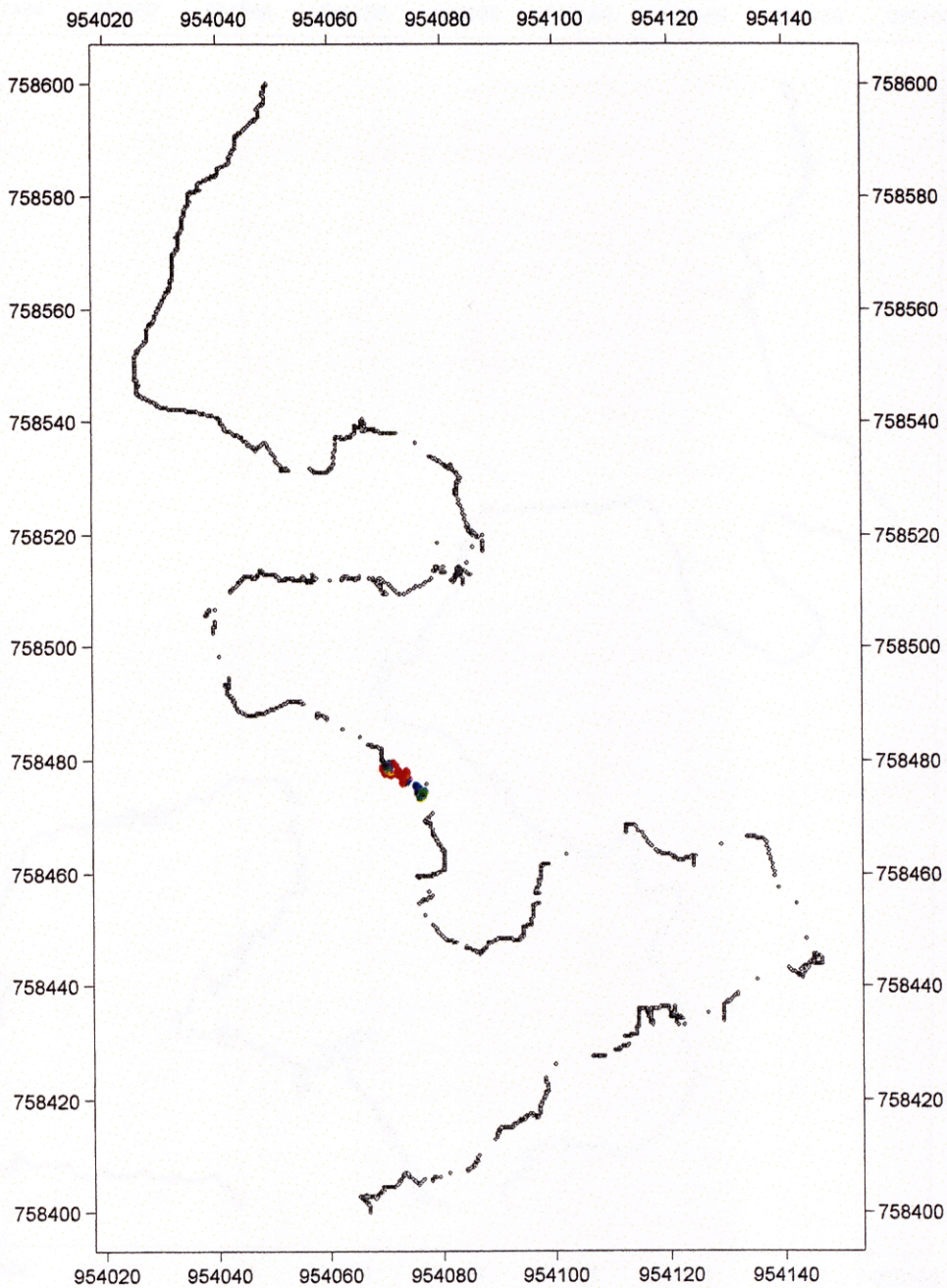


LOGGER Analyze v1.54m Track Map

Site: MPS_E10 () **Signal: Schonstedt (cps)** **Time:**

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



LOGGER Analyze v1.54m Track Map

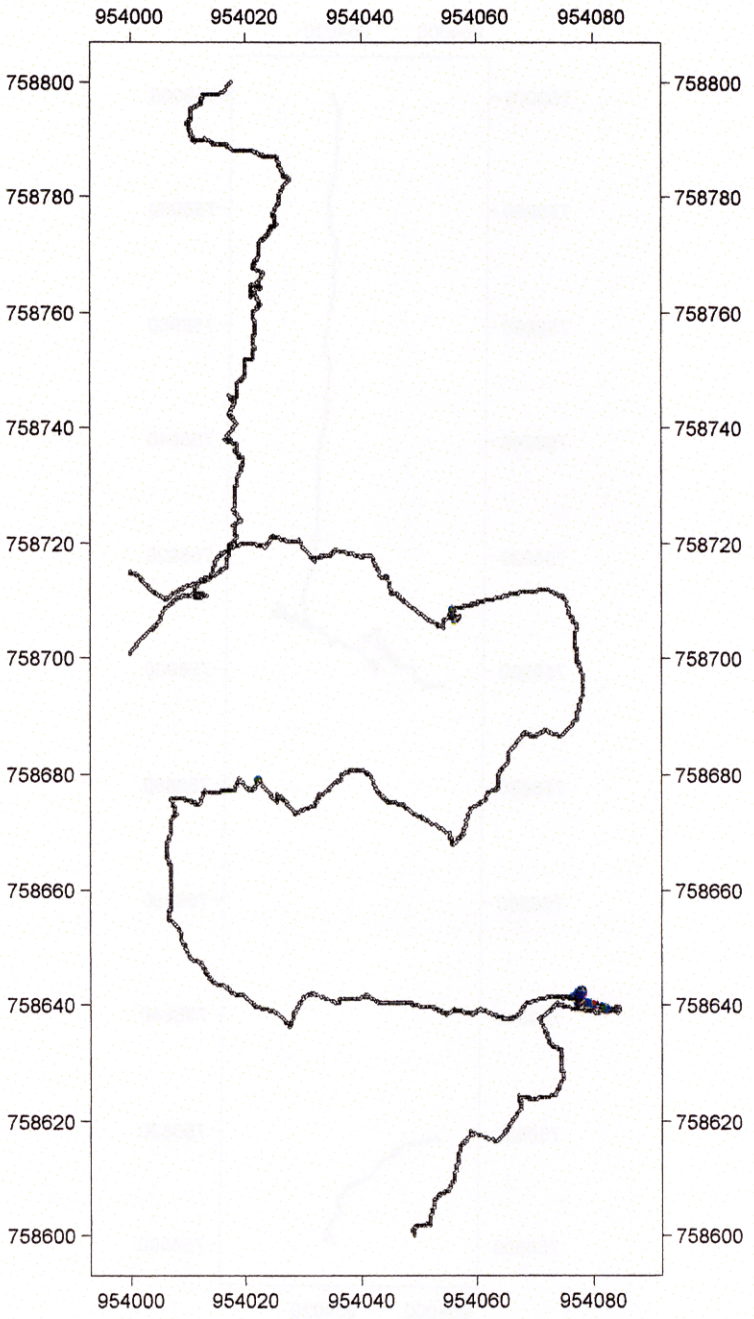
Site: MPS_E11 ()

Signal: Schonstedt (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



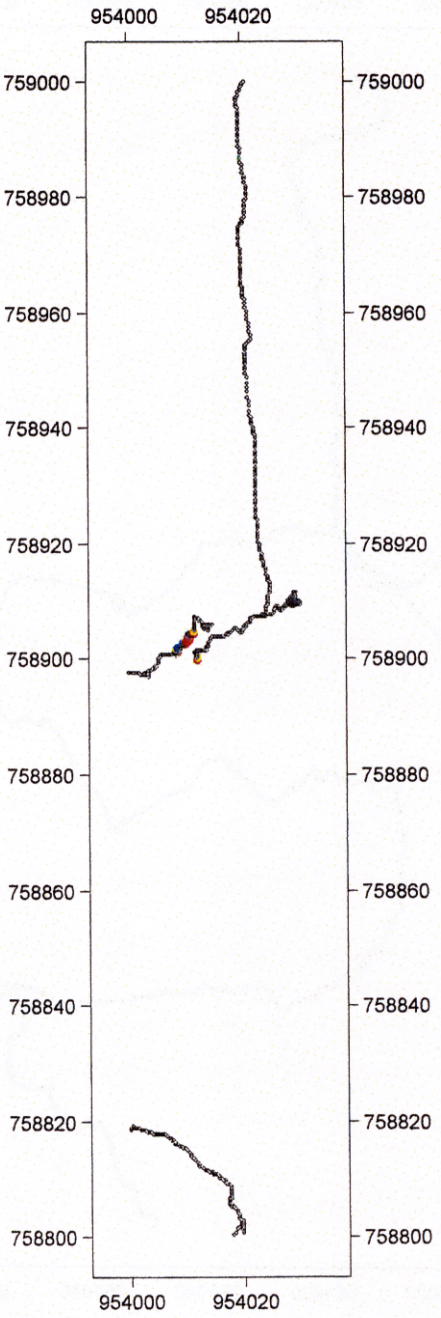
11455.9399

LOGGER Analyze v1.54m Track Map

Site: MPS_E12 () **Signal: Schonstedt (cps)** **Time:**

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



LOGGER Analyze v1.54m Track Map

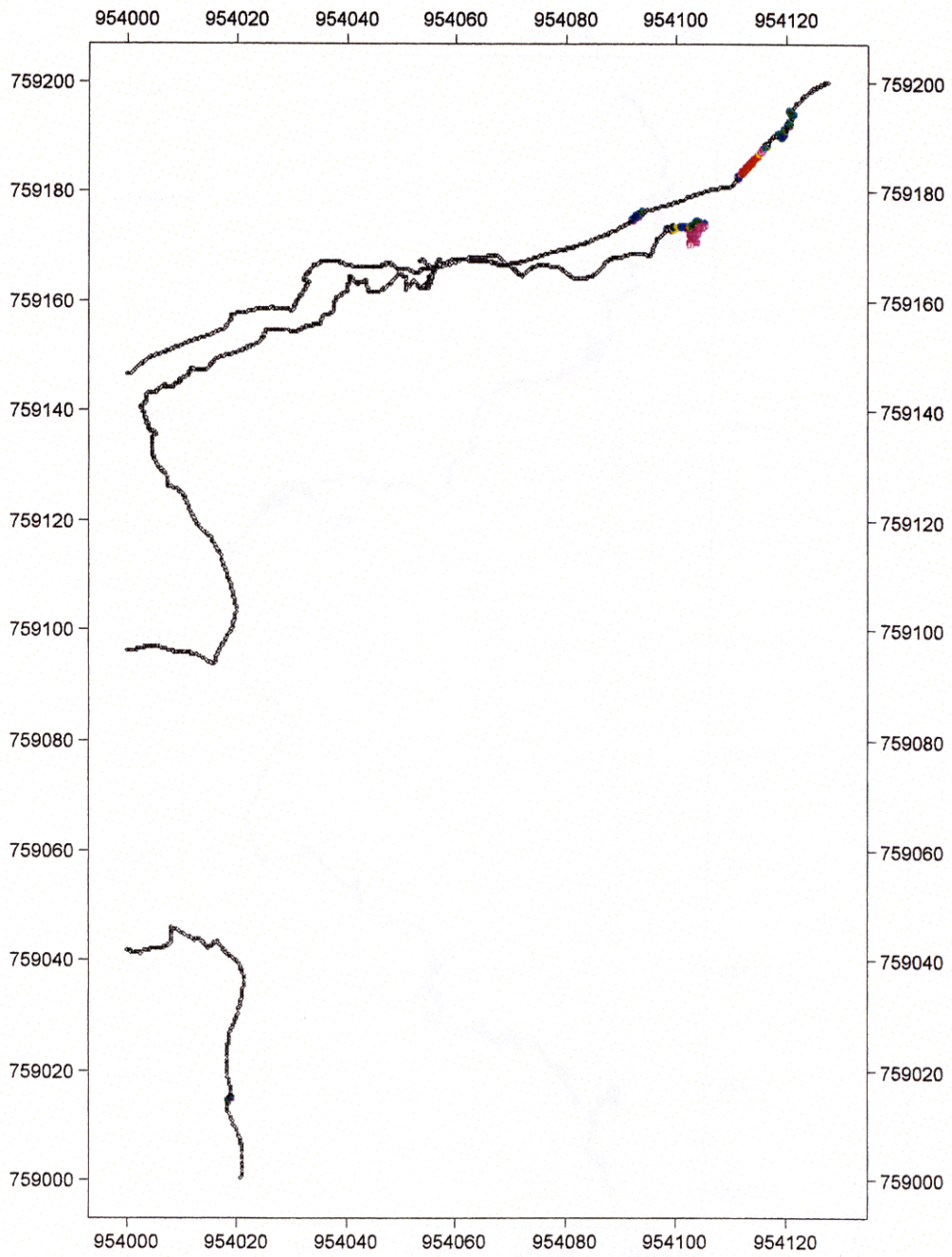
Site: MPS_E13 ()

Signal: Schonstedt (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



LOGGER Analyze v1.54m Track Map

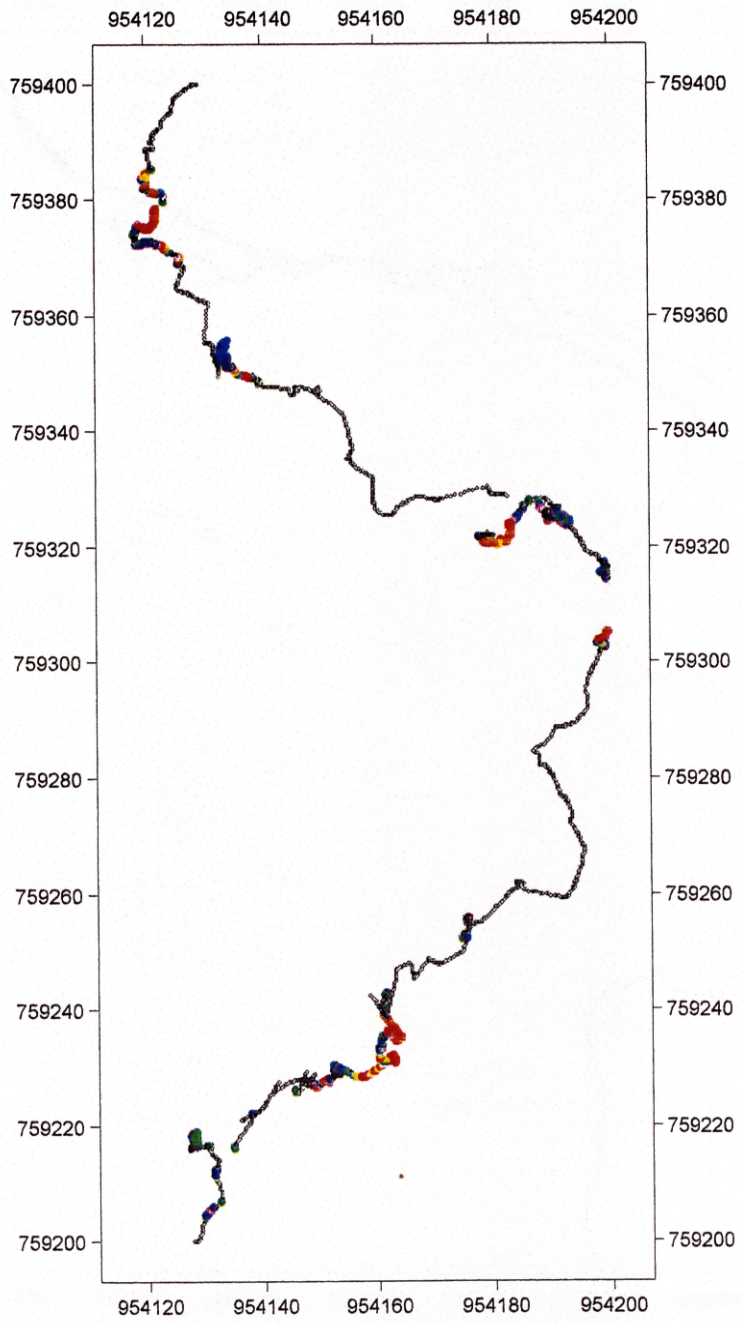
Site: MPS_E14 ()

Signal: Schonstedt (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



LOGGER Analyze v1.54m Track Map

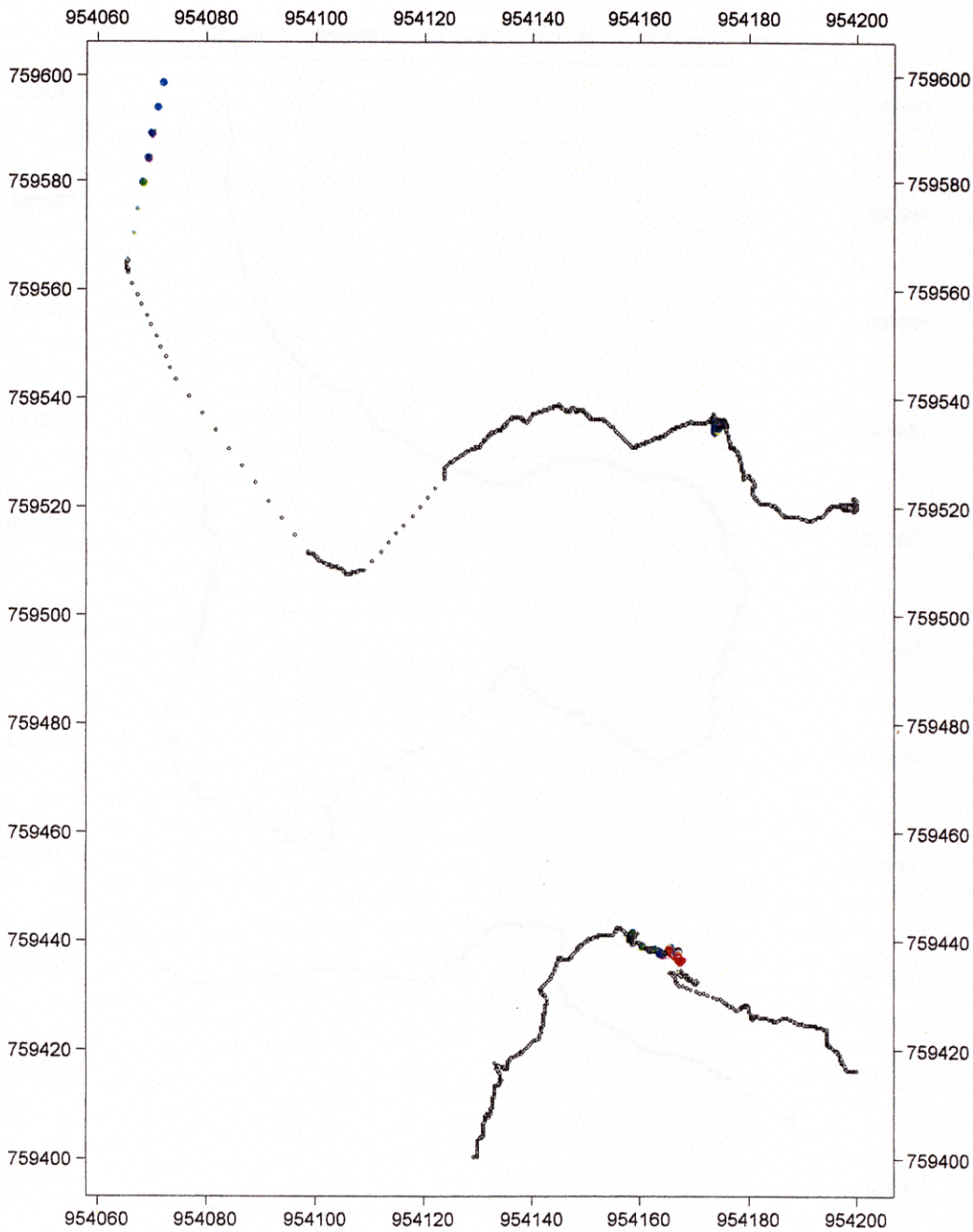
Site: MPS_E15 ()

Signal: Schonstedt (cps)

Time:

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



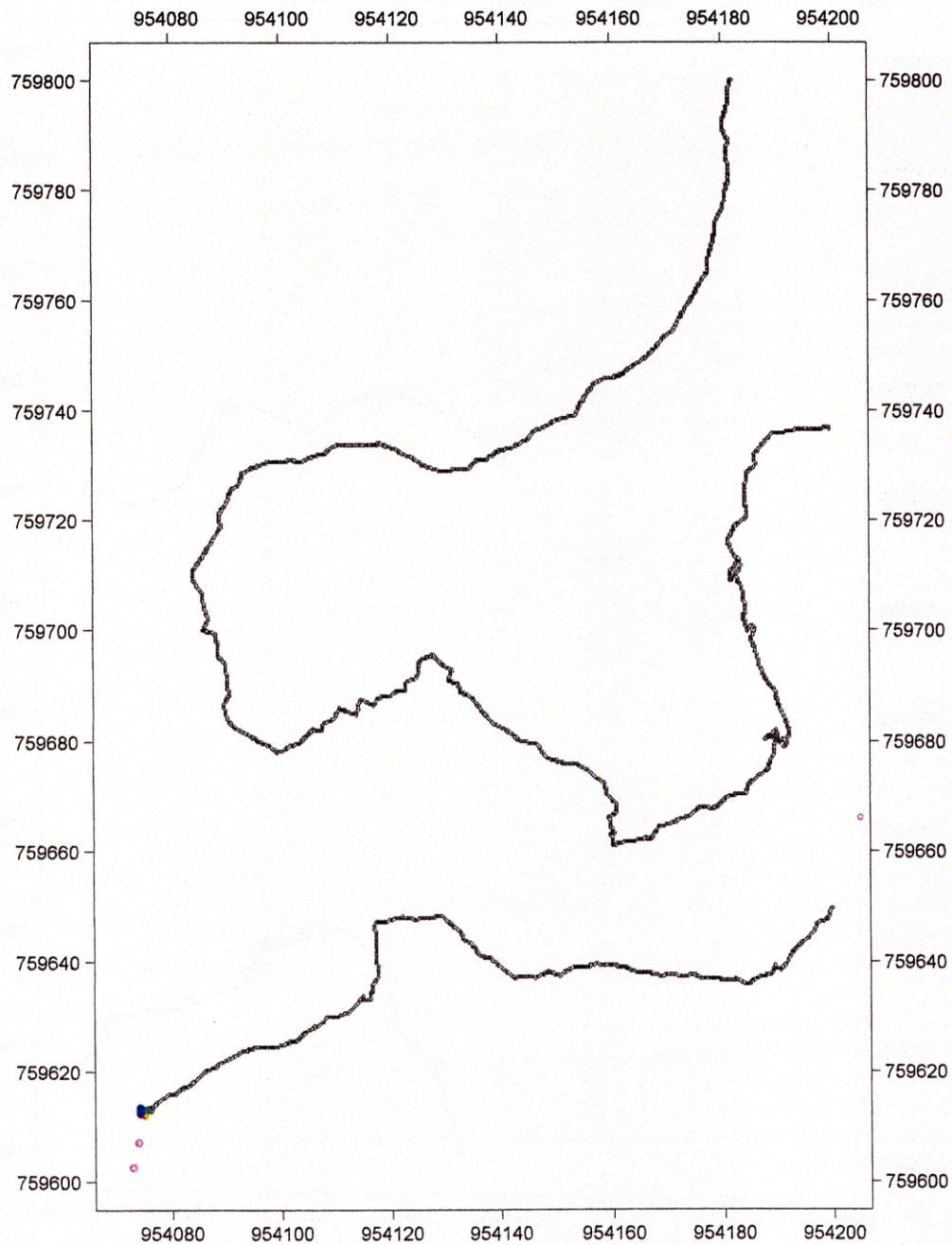
11455.9406

LOGGER Analyze v1.54m Track Map

Site: MPS_E16 () **Signal: Schonstedt (cps)** **Time:**

Threshold:
> 50 •

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	

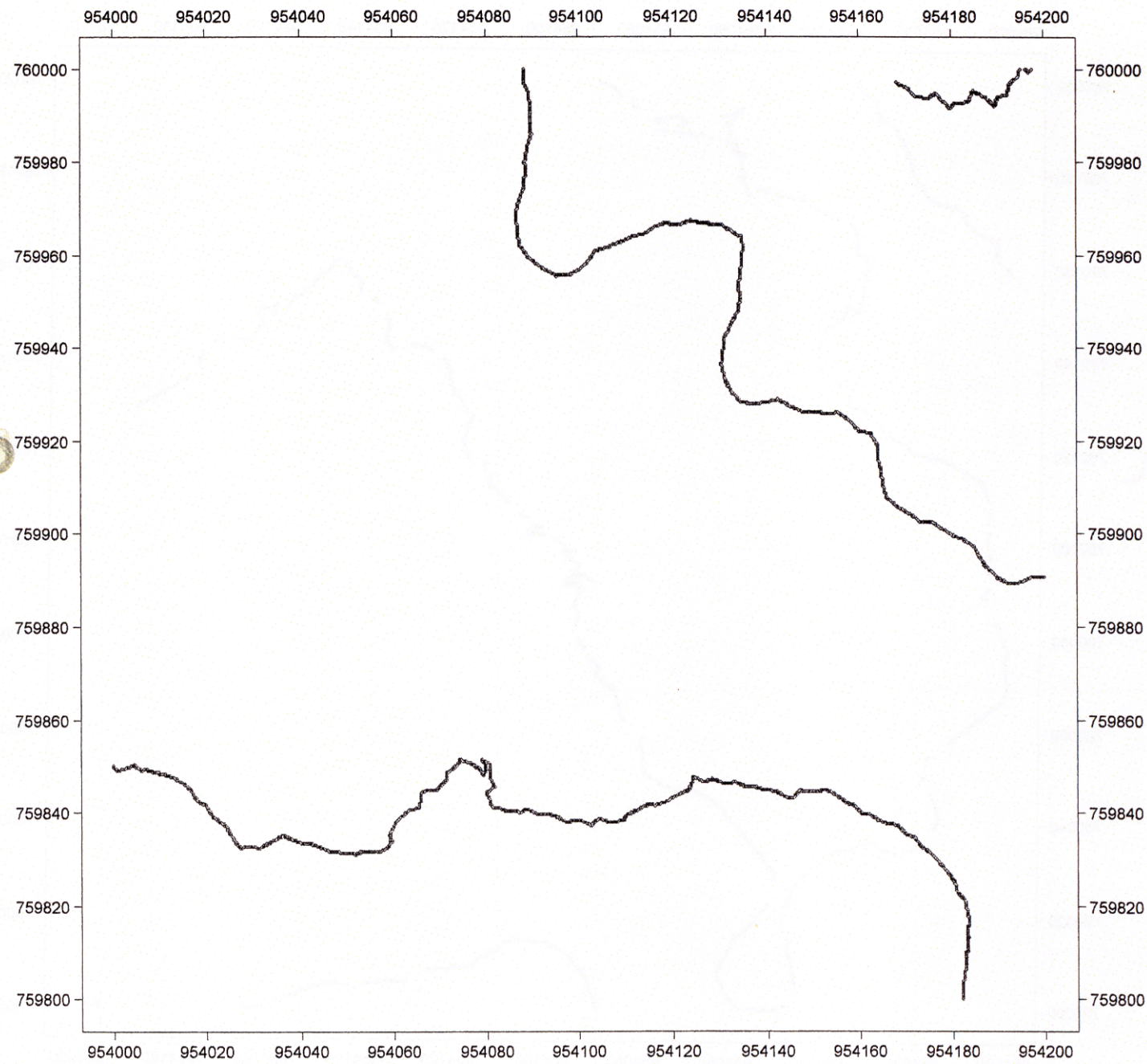


LOGGER Analyze v1.54m Track Map

Site: MPS_E17 () **Signal: Schonstedt (cps)** **Time:**

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



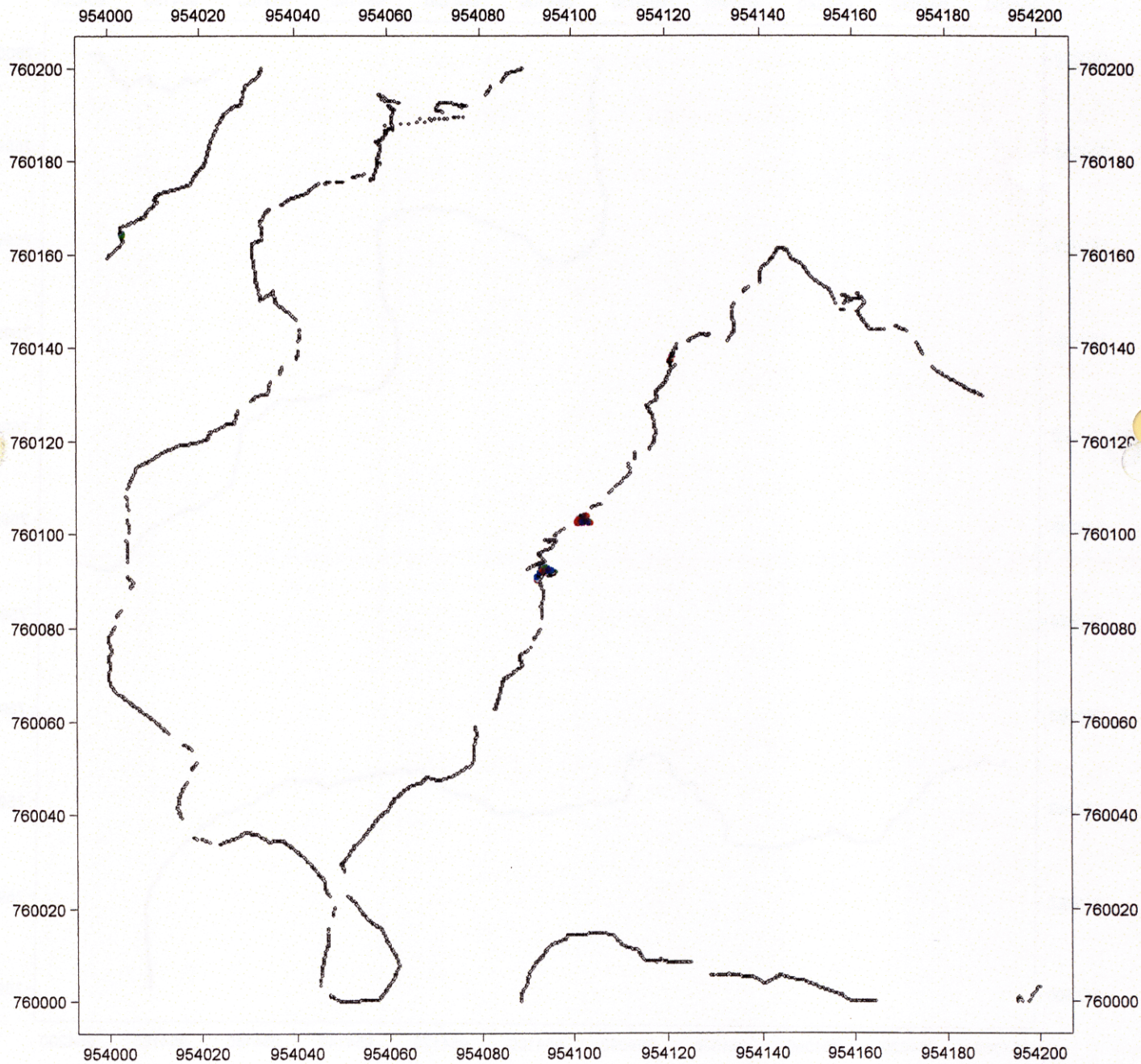
11455.9411

LOGGER Analyze v1.54m Track Map

Site: MPS_E18 () **Signal: Schonstedt (cps)** **Time:**

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



LOGGER Analyze v1.54m Track Map

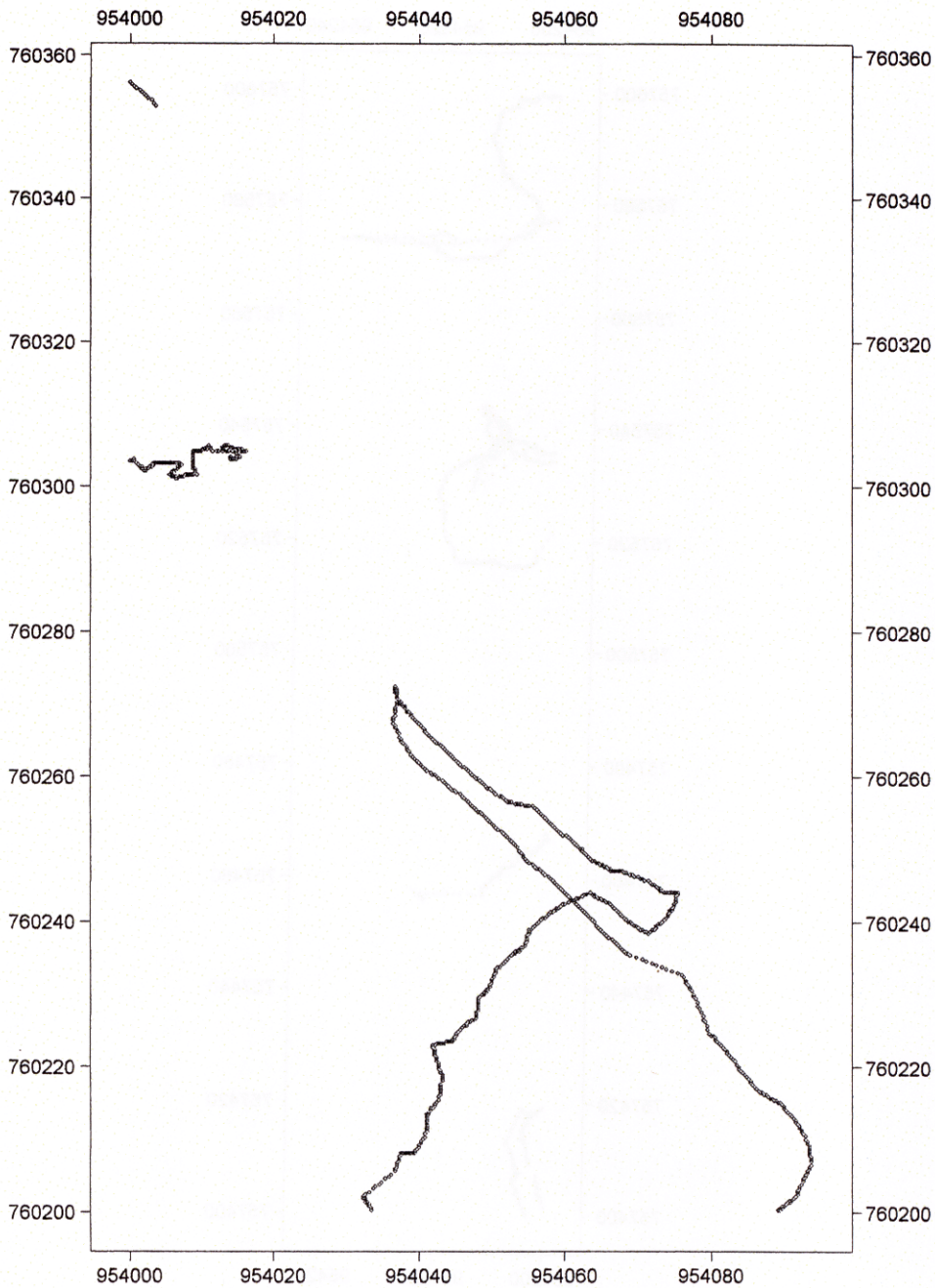
Site: MPS_E19 ()

Signal: Schonstedt (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



11455.9414

LOGGER Analyze v1.54m Track Map

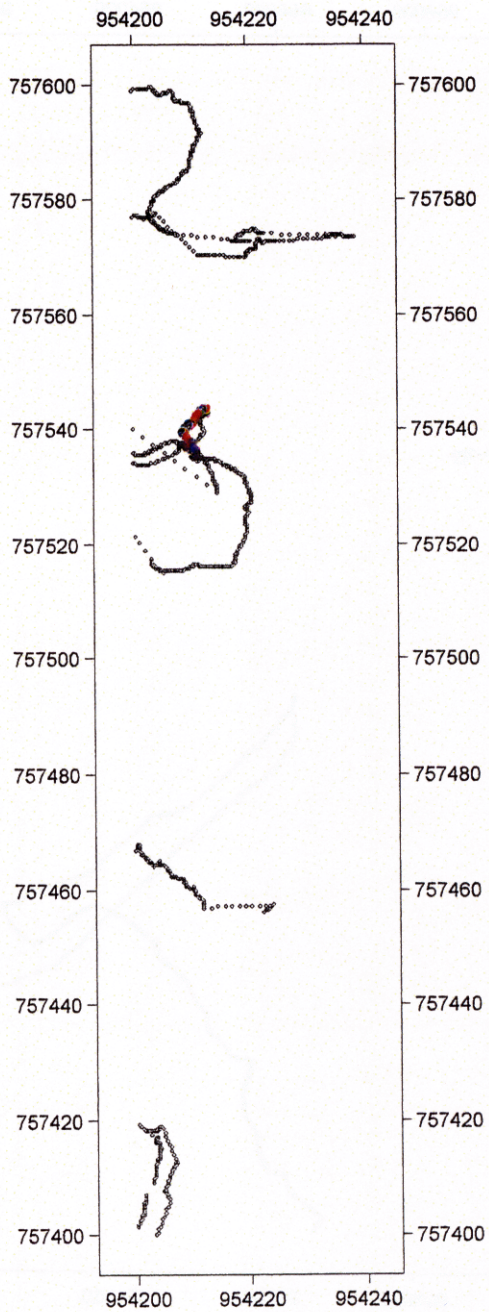
Site: MPS_F5 ()

Signal: Schonstedt (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



LOGGER Analyze v1.54m Track Map

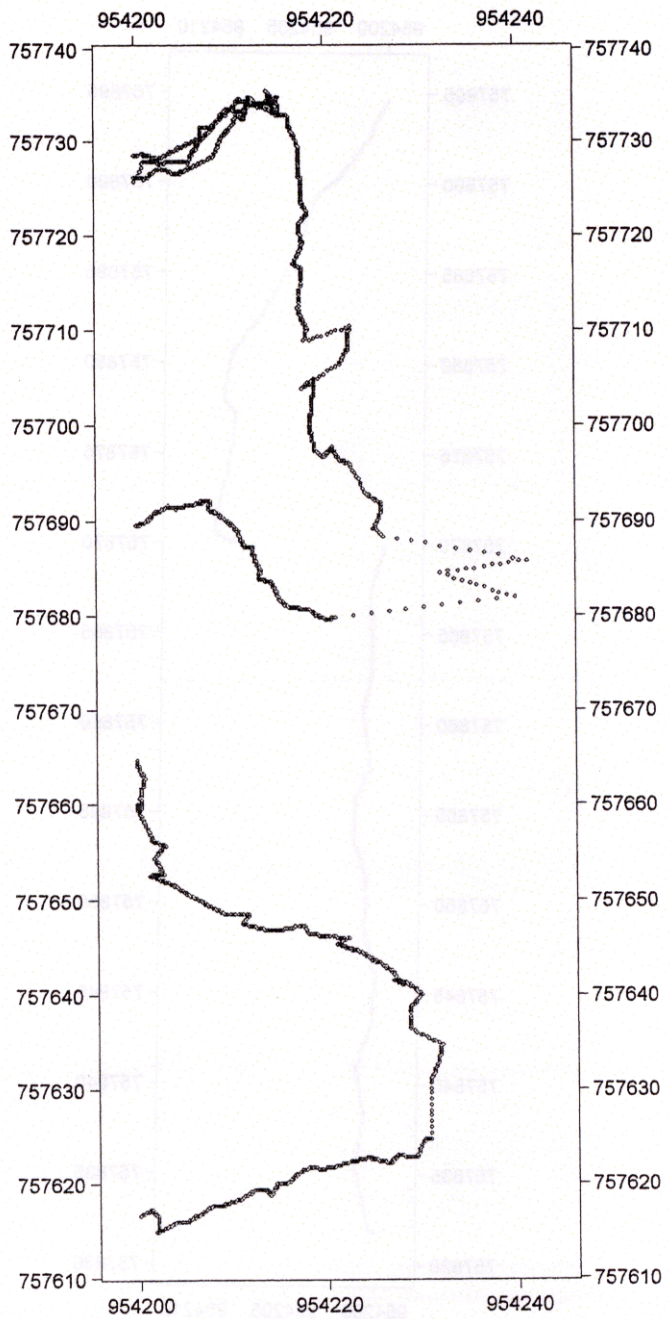
Site: MPS_F6 ()

Signal: Schonstedt (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



11455.9444

LOGGER Analyze v1.54m Track Map

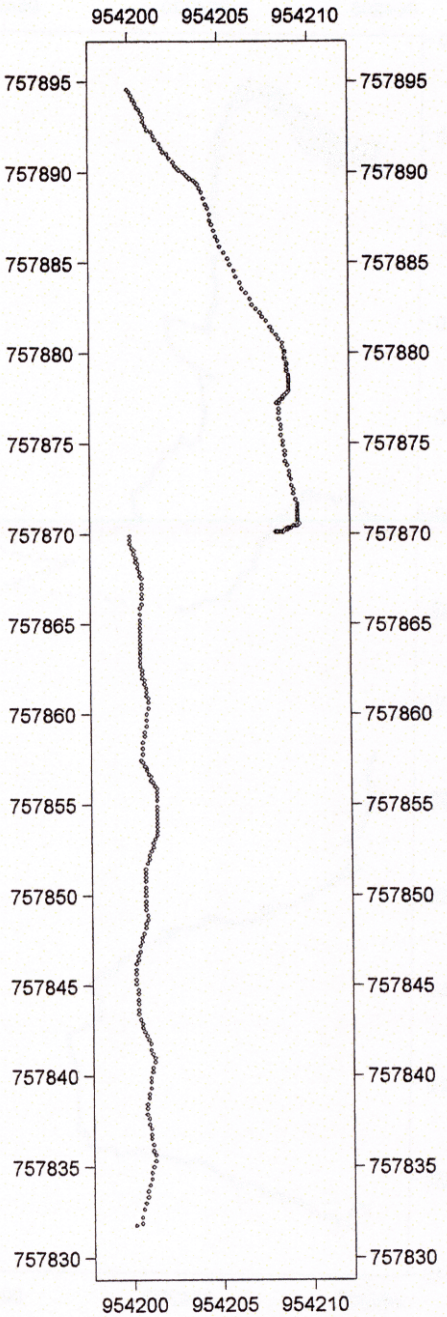
Site: MPS_F7 ()

Signal: Schonstedt (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	

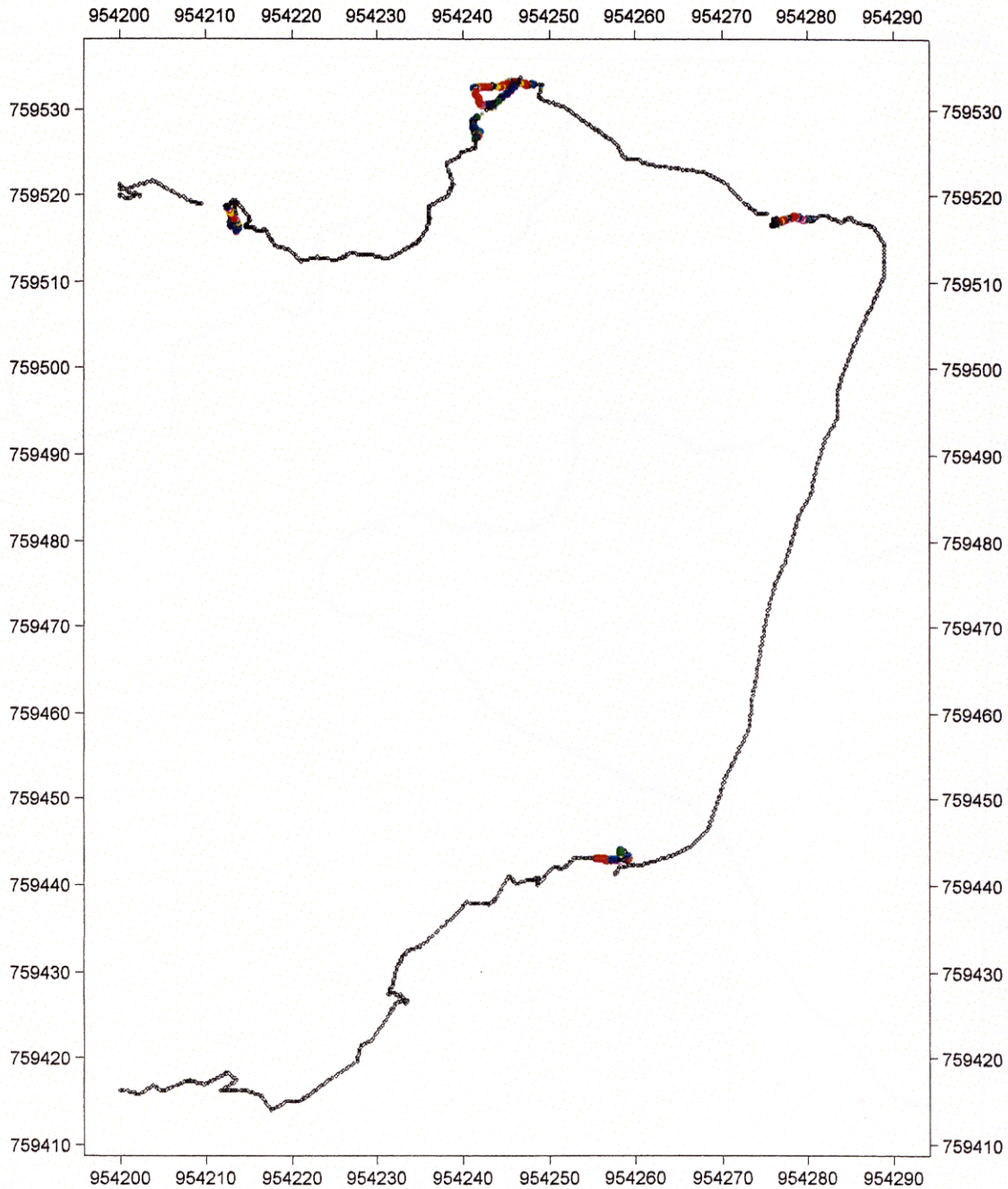


LOGGER Analyze v1.54m Track Map

Site: MPS_F15 () **Signal: Schonstedt (cps)** **Time:**

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



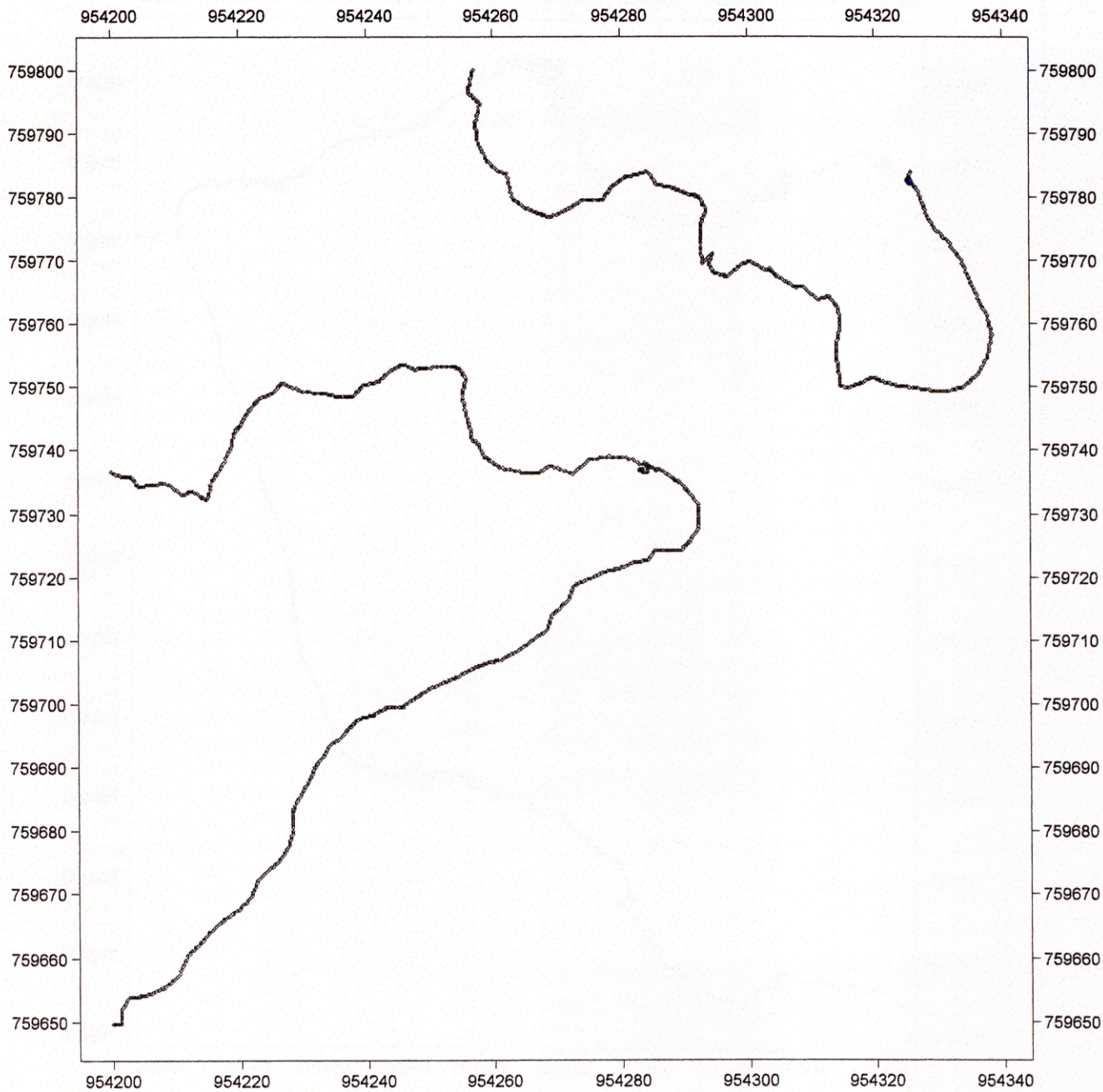
11455.9433

LOGGER Analyze v1.54m Track Map

Site: MPS_F16 () **Signal: Schonstedt (cps)** **Time:**

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	

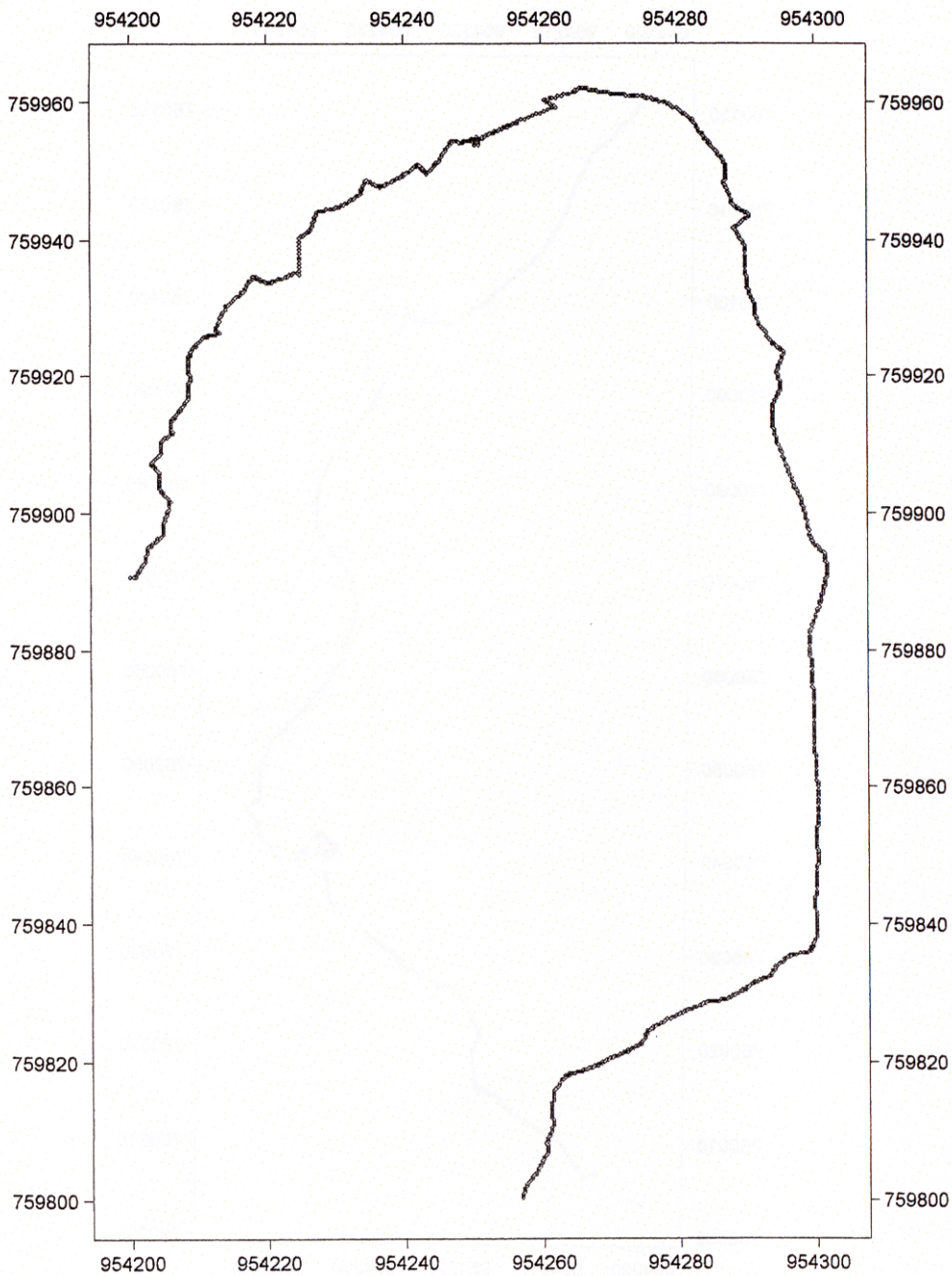


LOGGER Analyze v1.54m Track Map

Site: MPS_F17 () **Signal: Schonstedt (cps)** **Time:**

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



LOGGER Analyze v1.54m Track Map

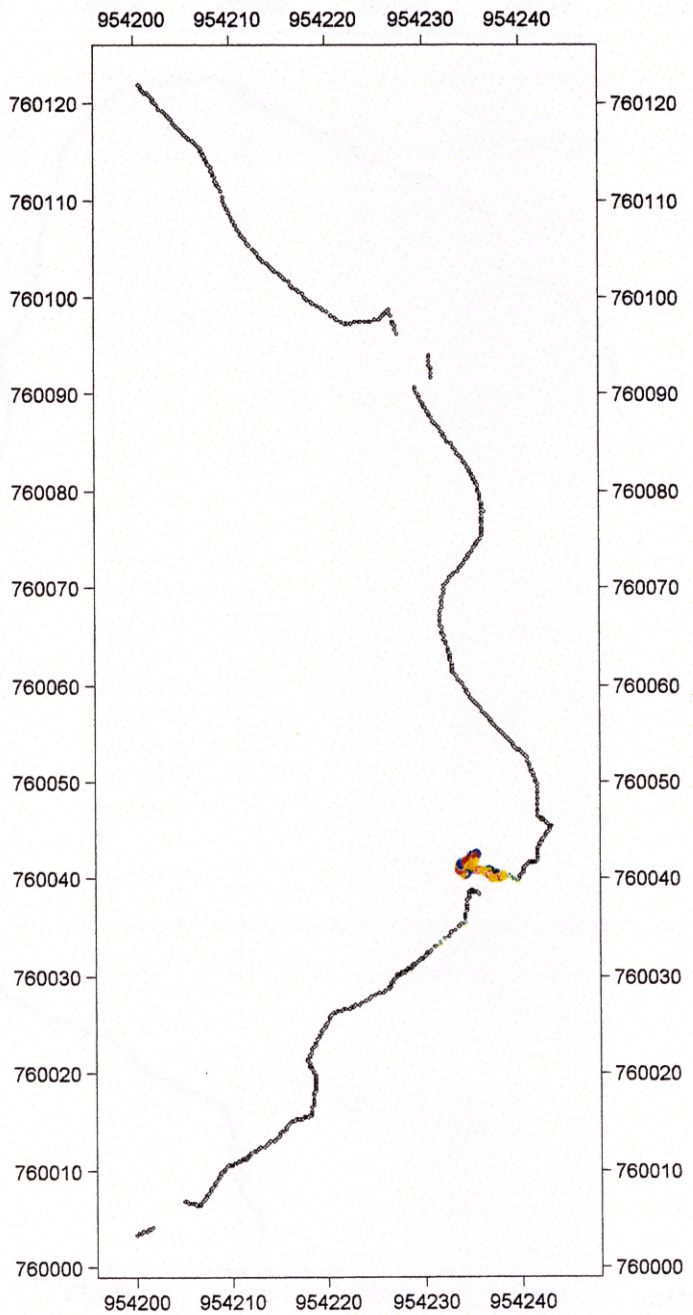
Site: MPS_F18 ()

Signal: Schonstedt (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



LOGGER Analyze v1.54m Track Map

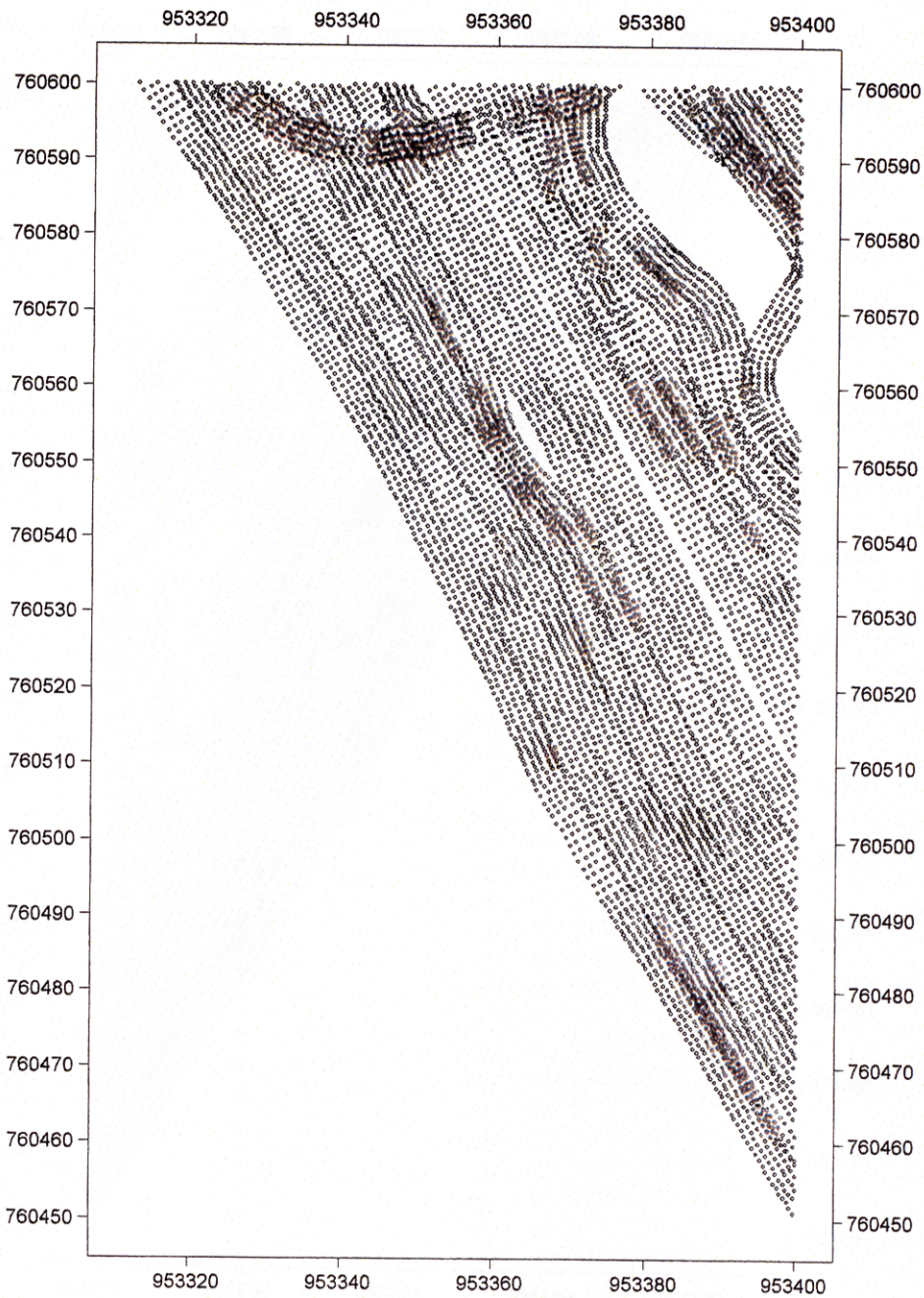
Site: SA_a20 ()

Signal: Array Signal (cps)

Time:

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



11455.8849

LOGGER Analyze v1.54m Track Map

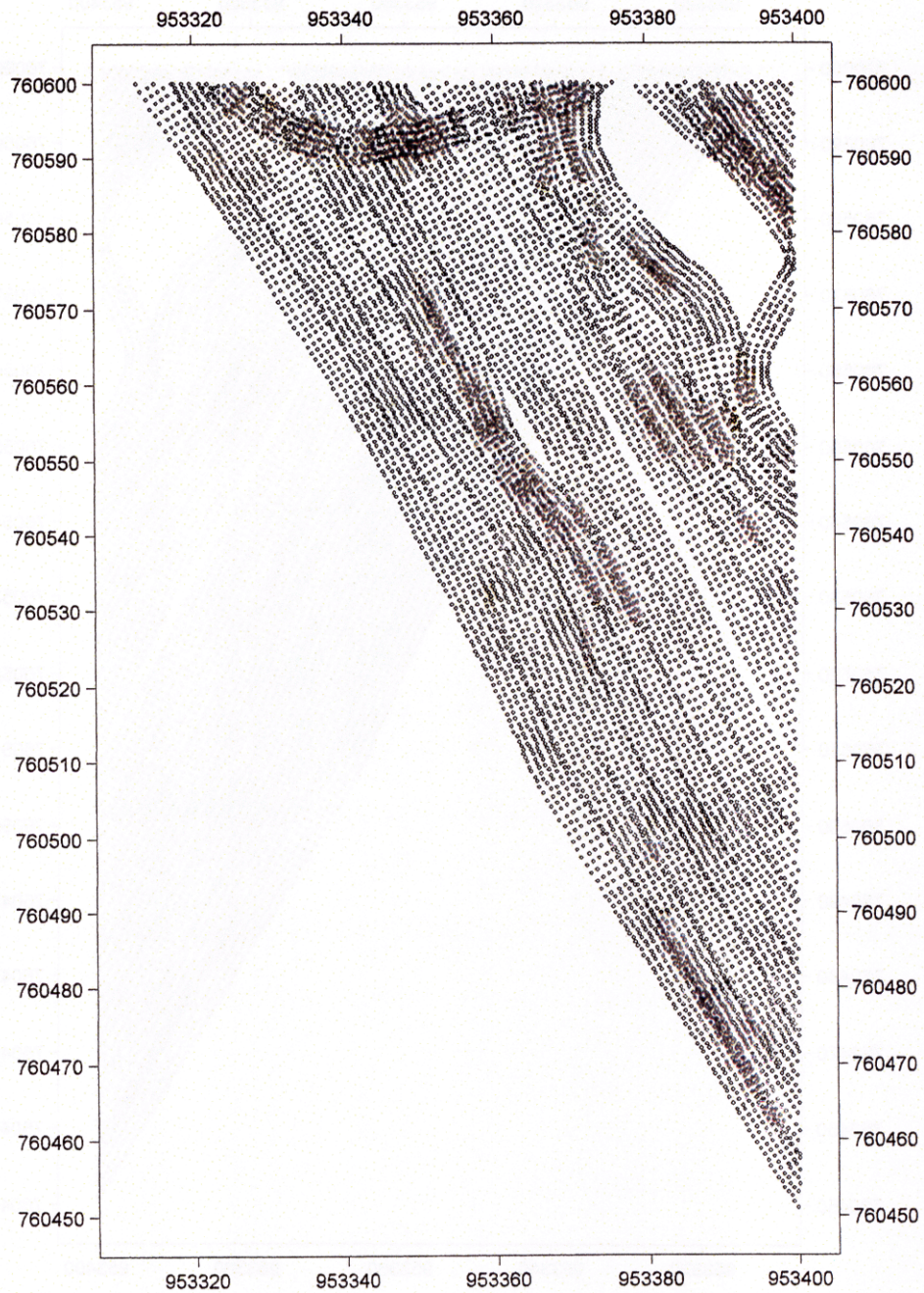
Site: SA_a20 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



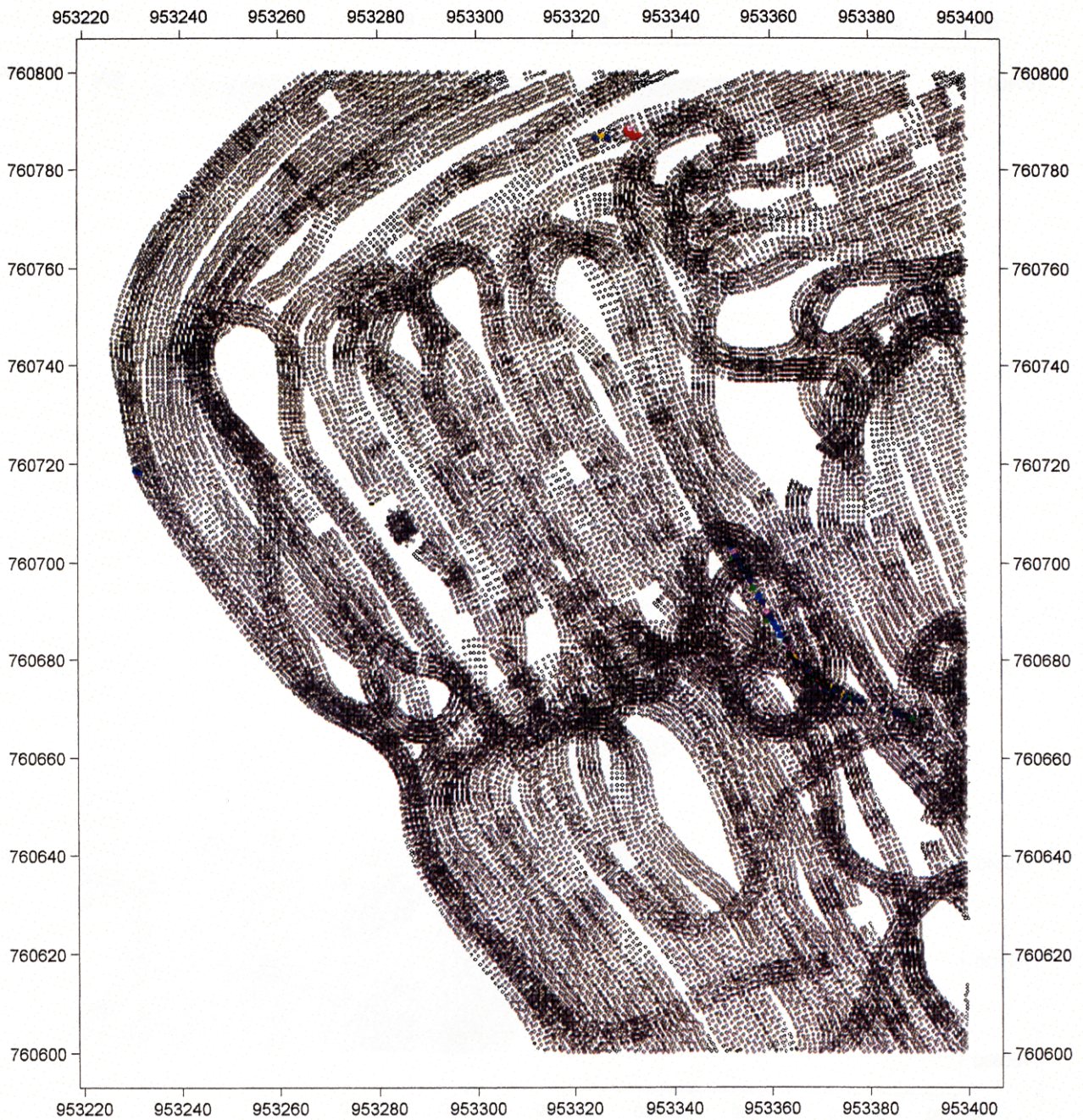
11455.8849

LOGGER Analyze v1.54m Track Map

Site: SA_a21 () **Signal: Array Signal (cps)** **Time:**

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



LOGGER Analyze v1.54m Track Map

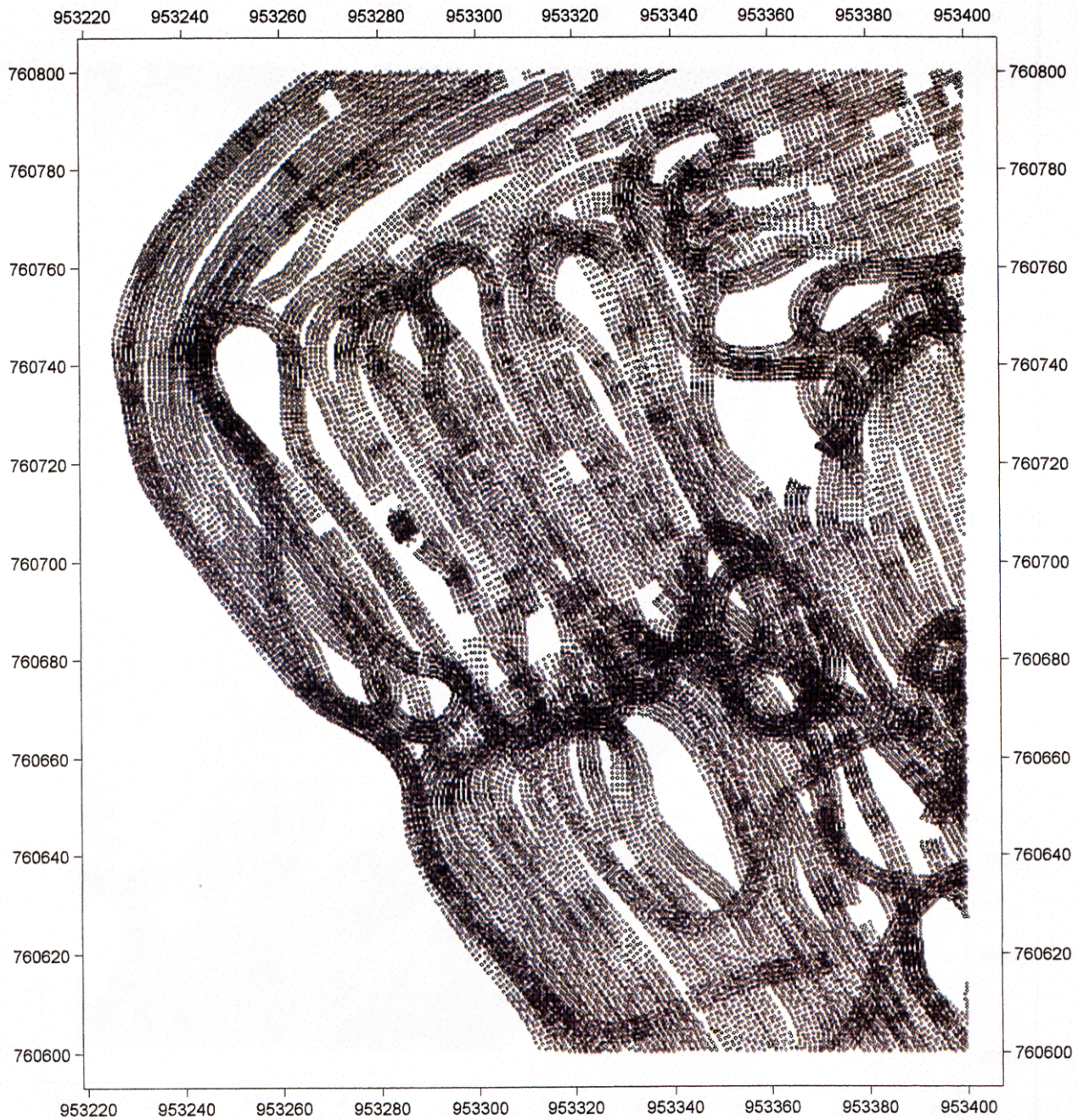
Site: SA_a21 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



11455.8865

LOGGER Analyze v1.54m Track Map

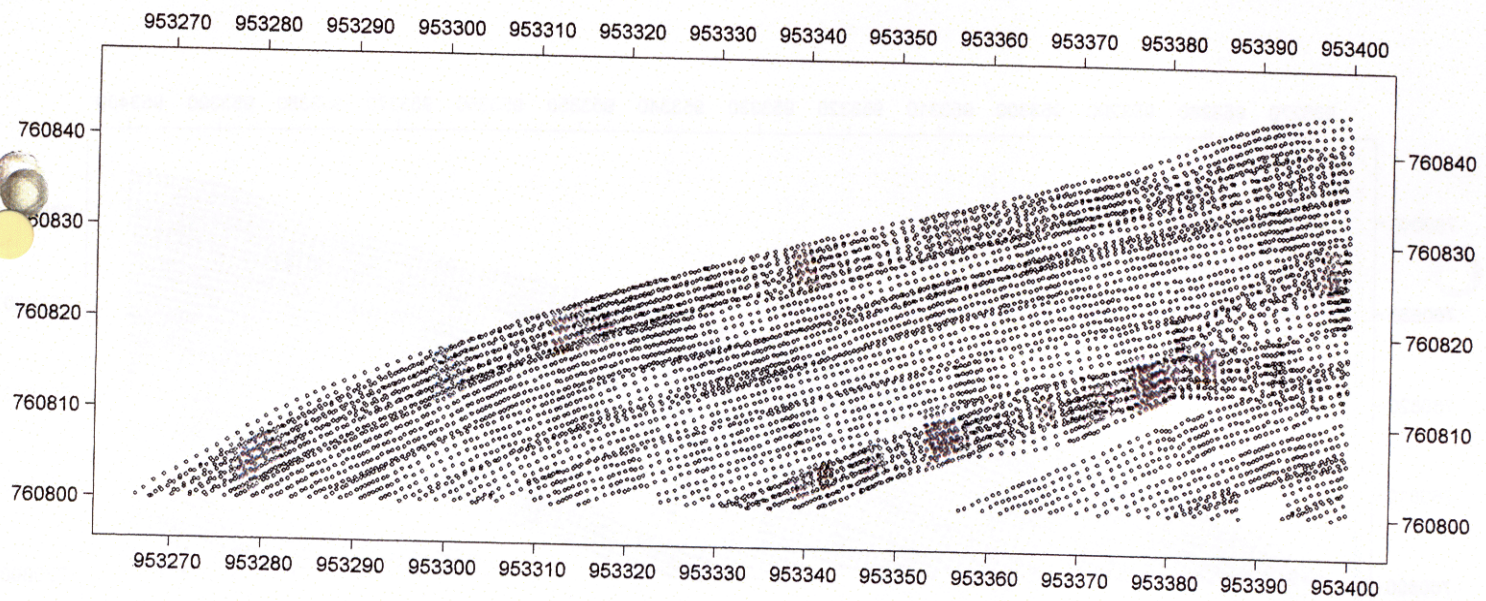
Site: SA_a22 ()

Signal: Array Signal (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



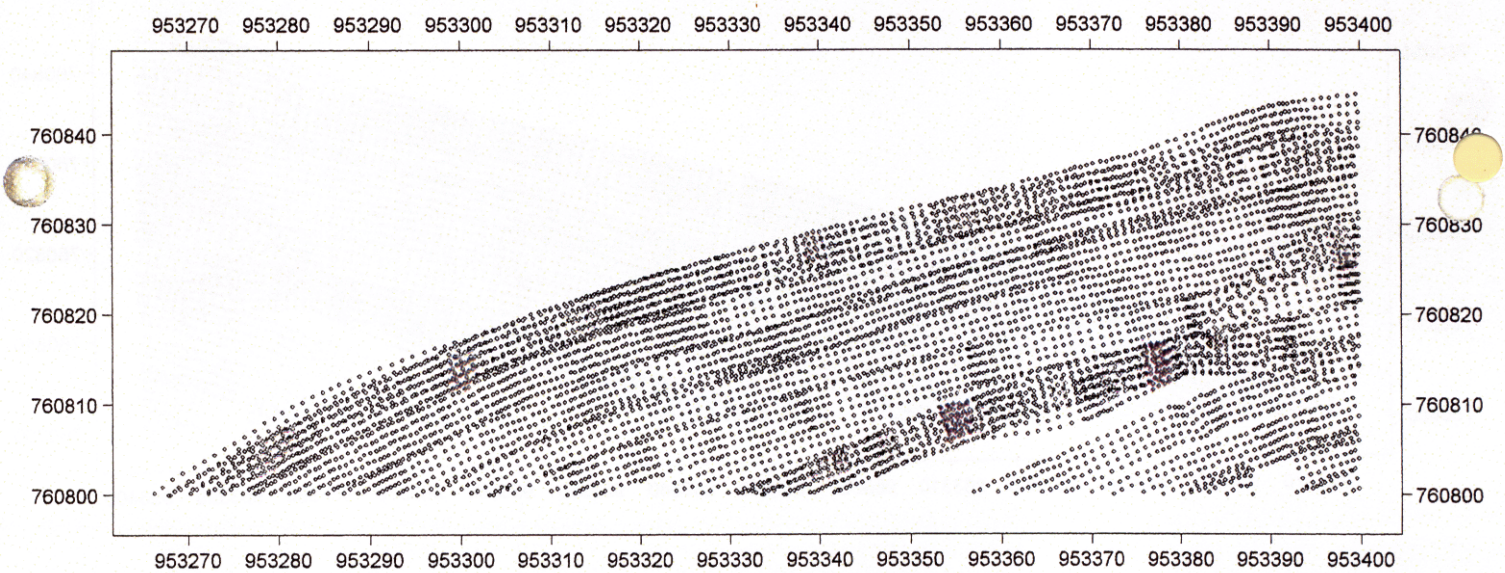
1455.8879

LOGGER Analyze v1.54m Track Map

Site: SA_a22 () **Signal: Array Background (cps)** **Time:**

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	

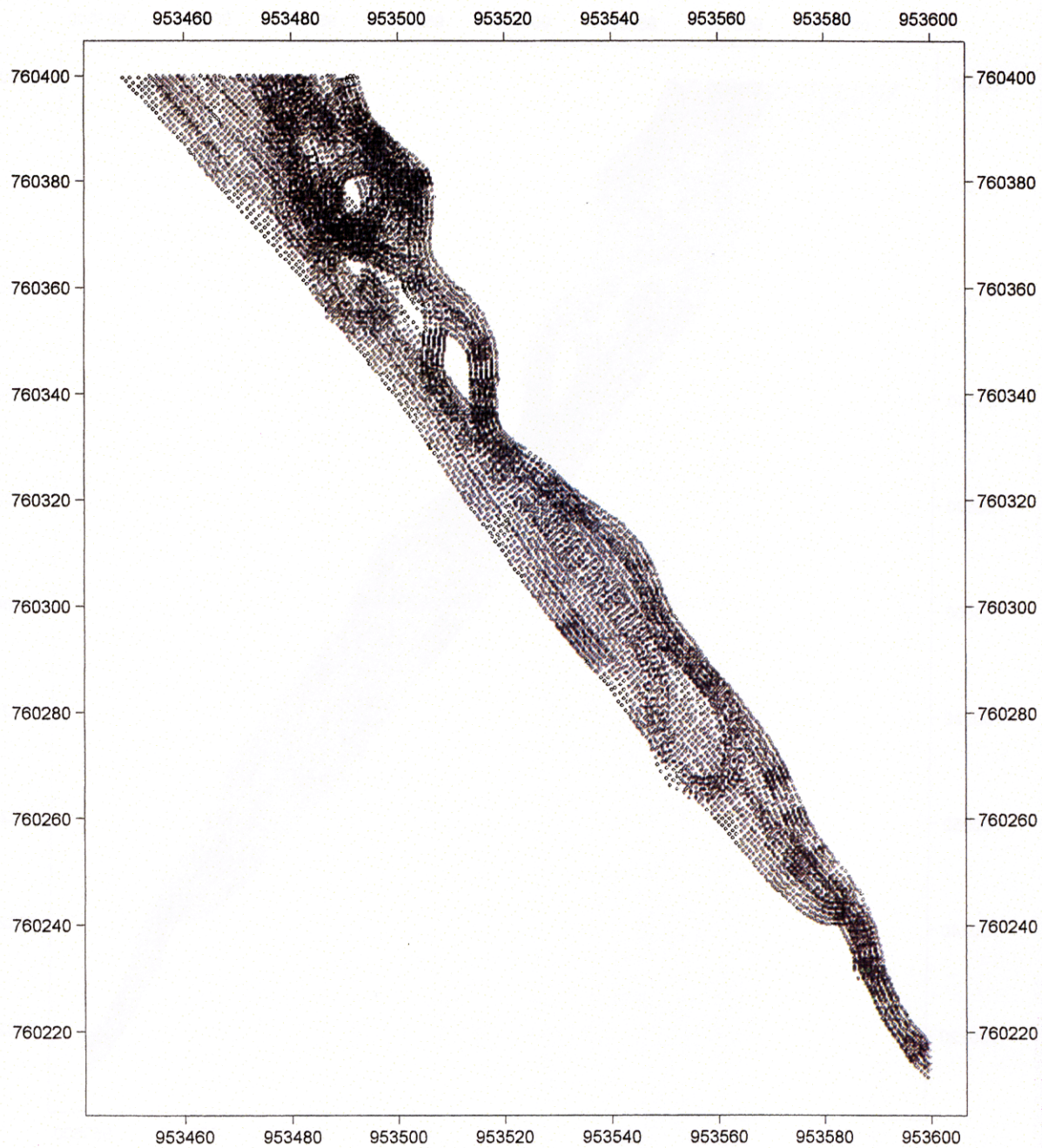


LOGGER Analyze v1.54m Track Map

Site: SA_b19 () **Signal: Array Signal (cps)** **Time:**

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140

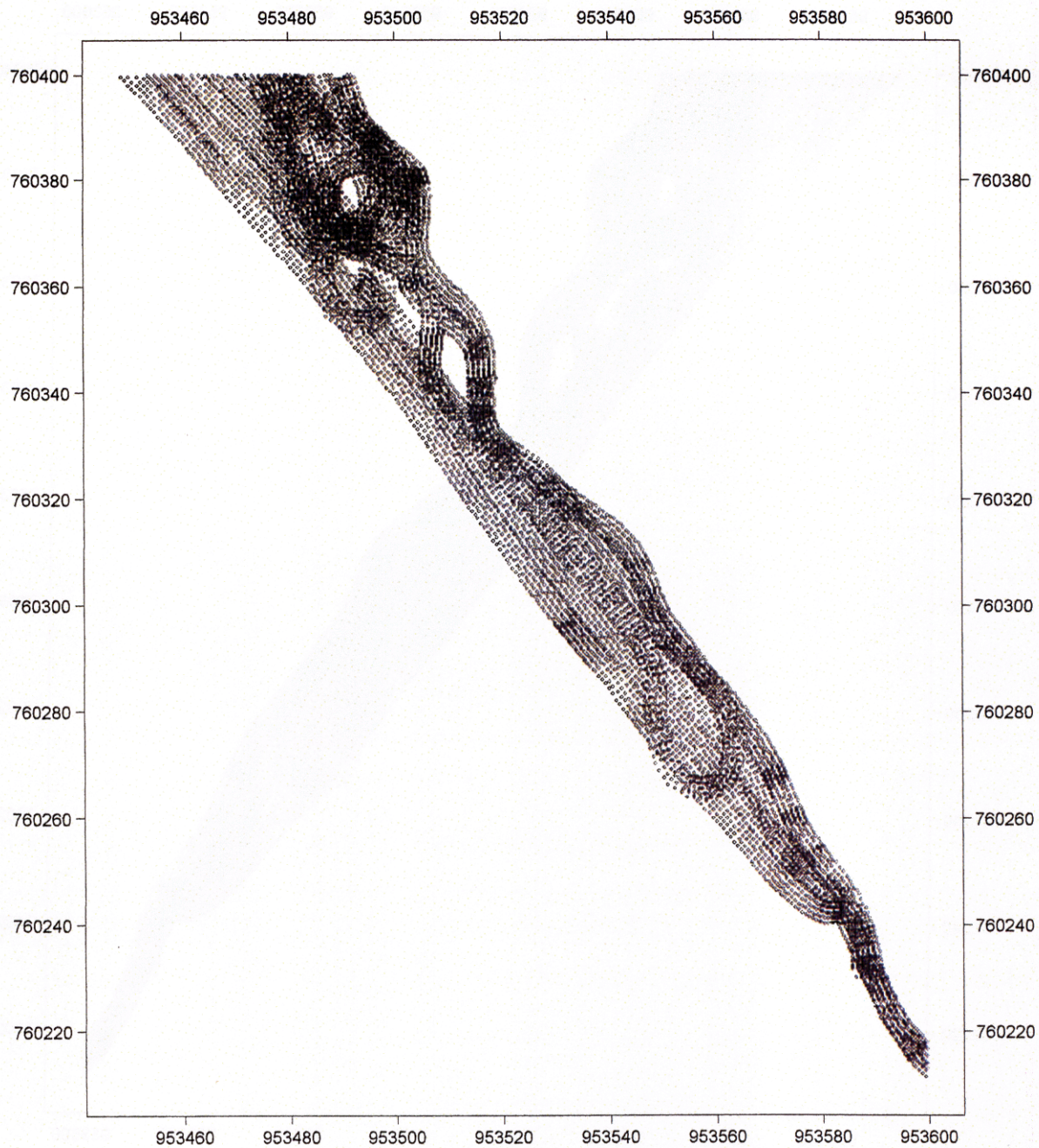


LOGGER Analyze v1.54m Track Map

Site: SA_b19 () **Signal: Array Background (cps)** **Time:**

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	

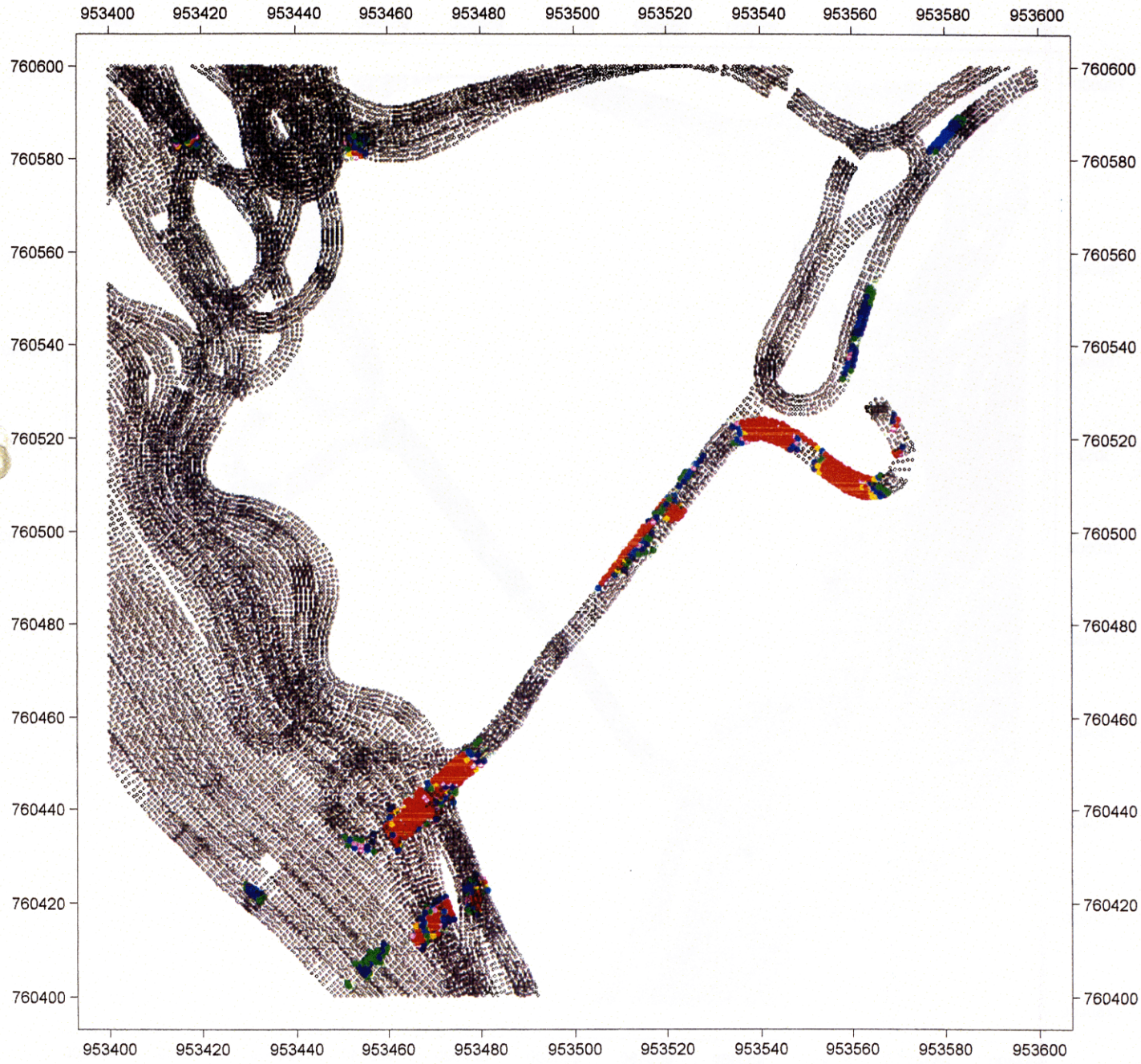


LOGGER Analyze v1.54m Track Map

Site: SA_b20 () **Signal: Array Signal (cps)** **Time:**

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



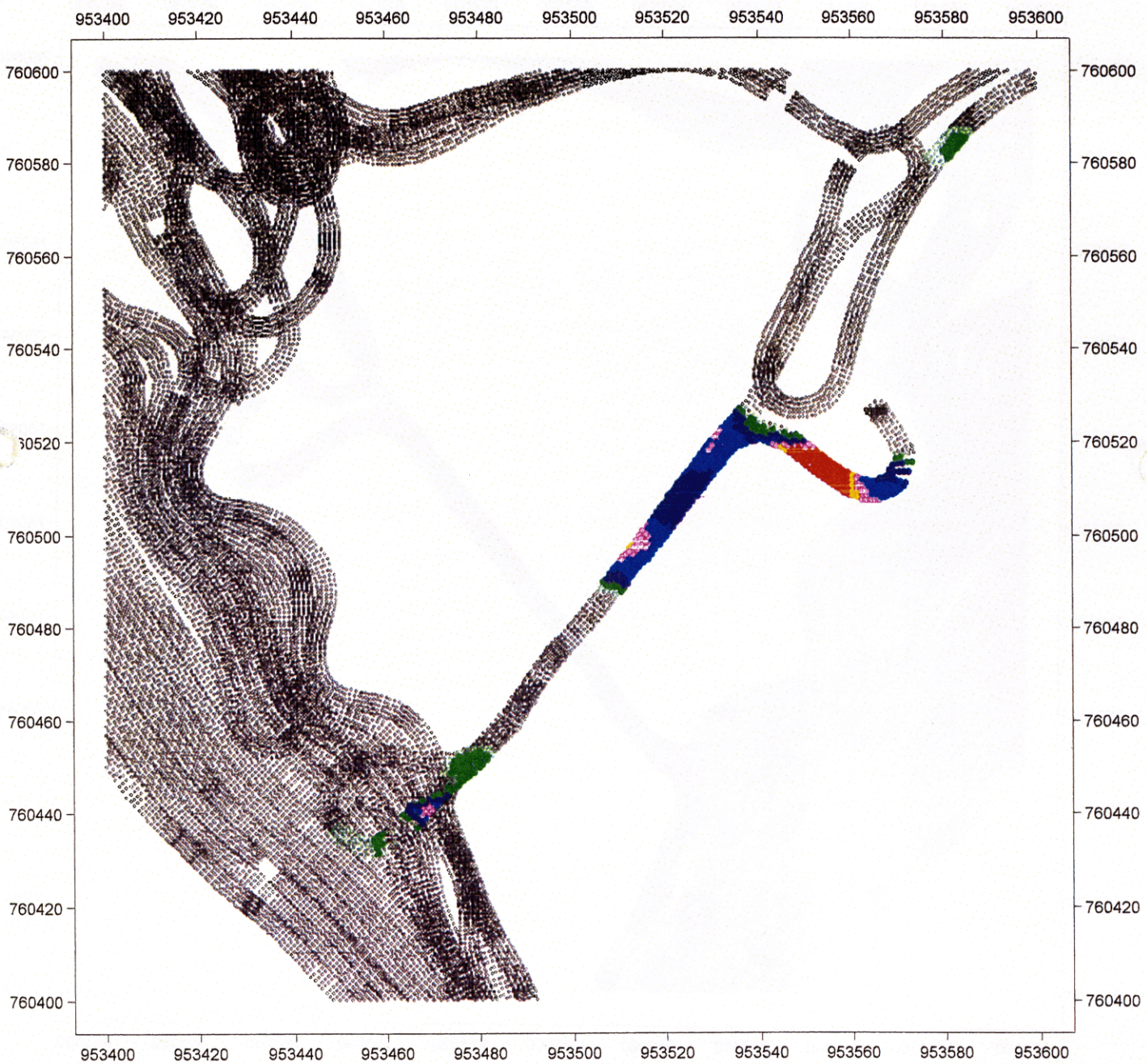
11455.8897

LOGGER Analyze v1.54m Track Map

Site: SA_b20 () **Signal: Array Background (cps)** **Time:**

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



LOGGER Analyze v1.54m Track Map

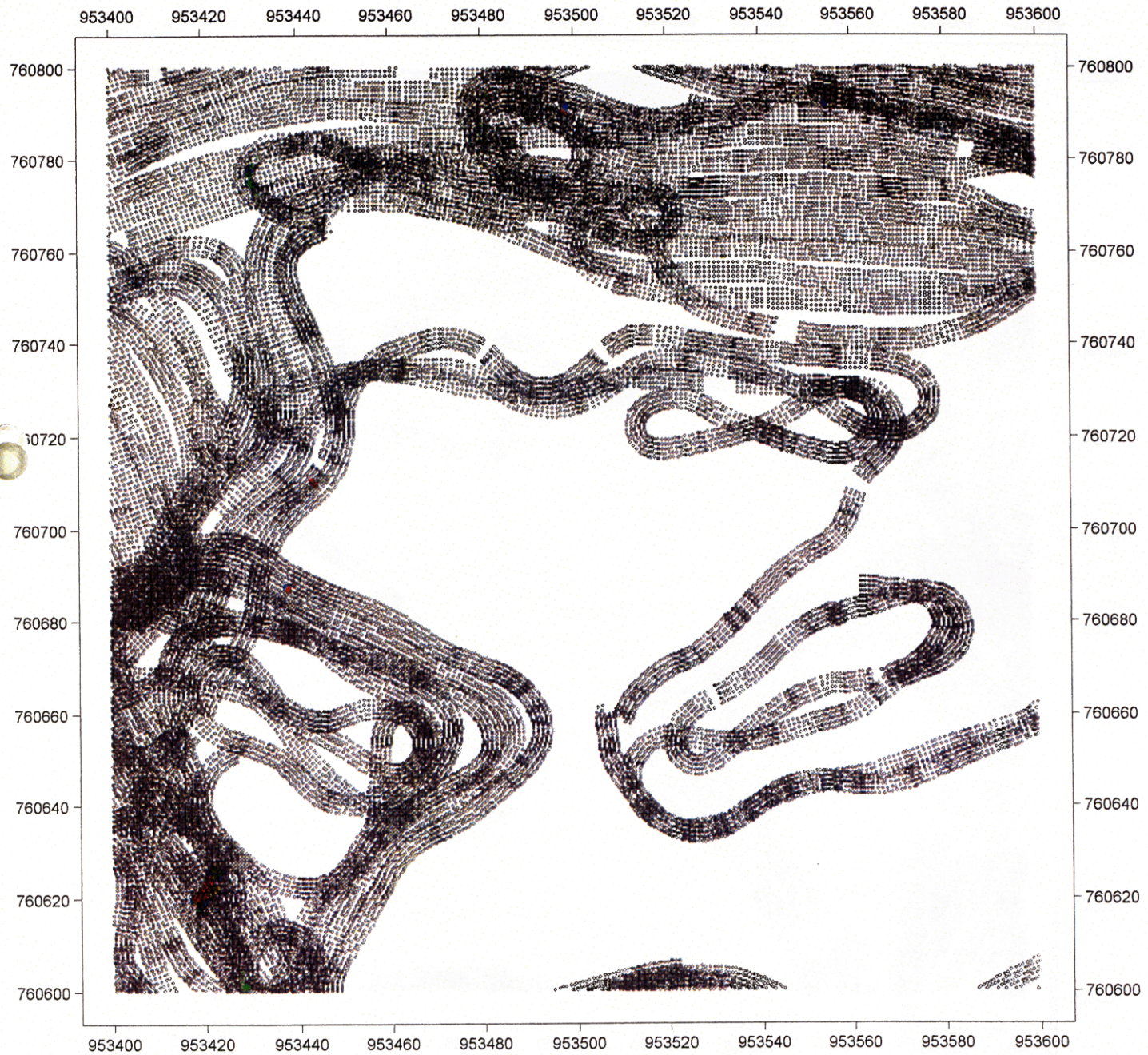
Site: SA_b21 ()

Signal: Array Signal (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	

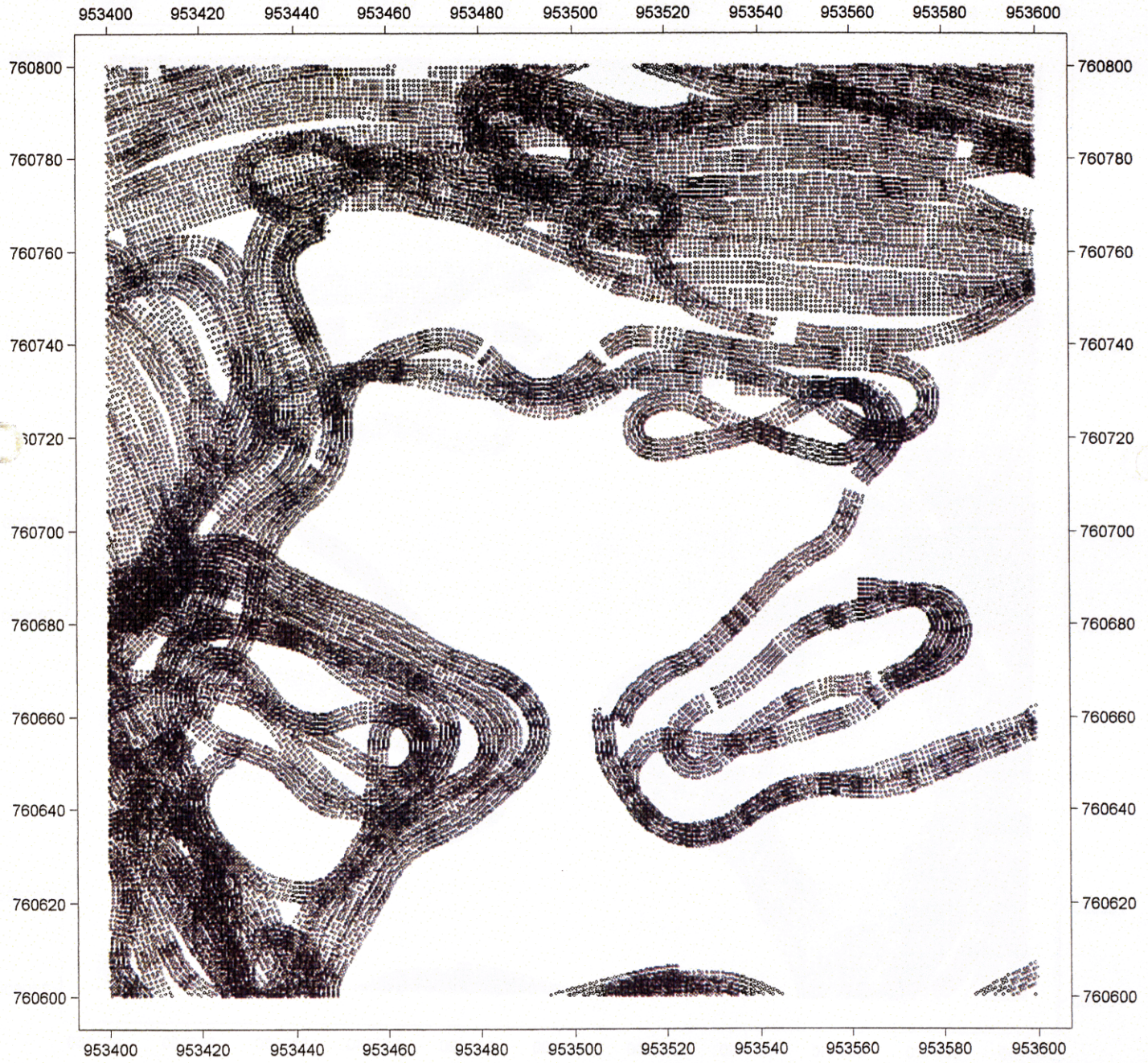


LOGGER Analyze v1.54m Track Map

Site: SA_b21 () **Signal: Array Background (cps)** **Time:**

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



LOGGER Analyze v1.54m Track Map

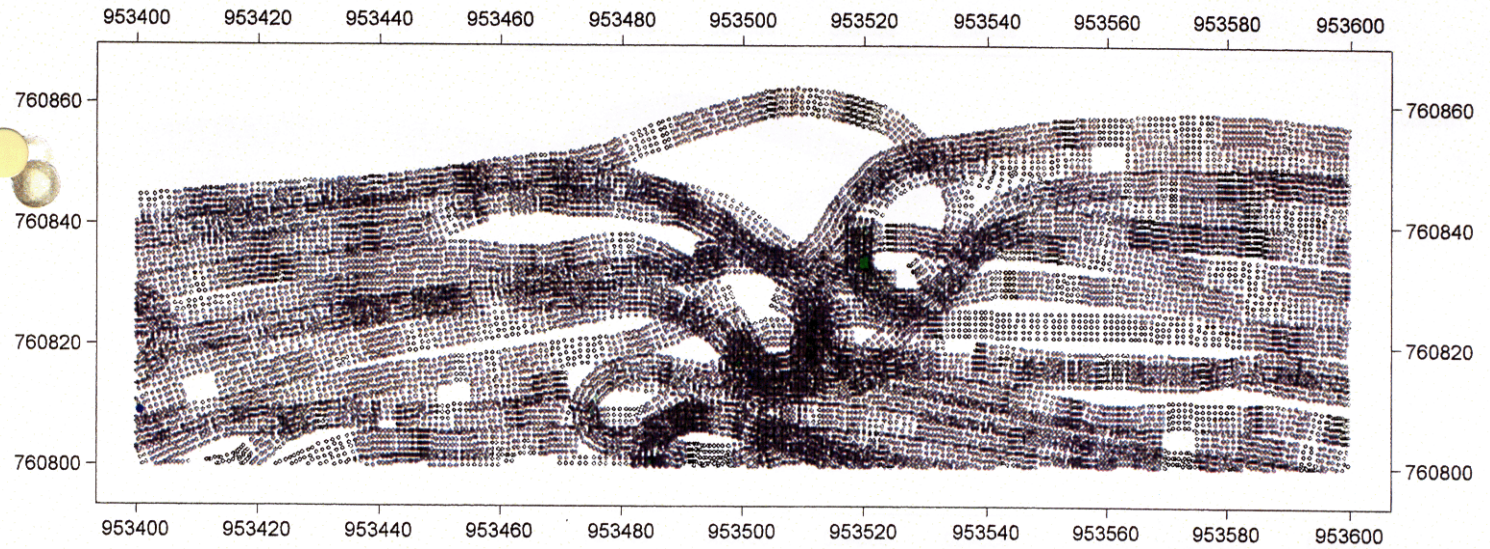
Site: SA_b22 ()

Signal: Array Signal (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



11455.8934

LOGGER Analyze v1.54m Track Map

Site: SA_b22 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	

LOGGER Analyze v1.54m Track Map

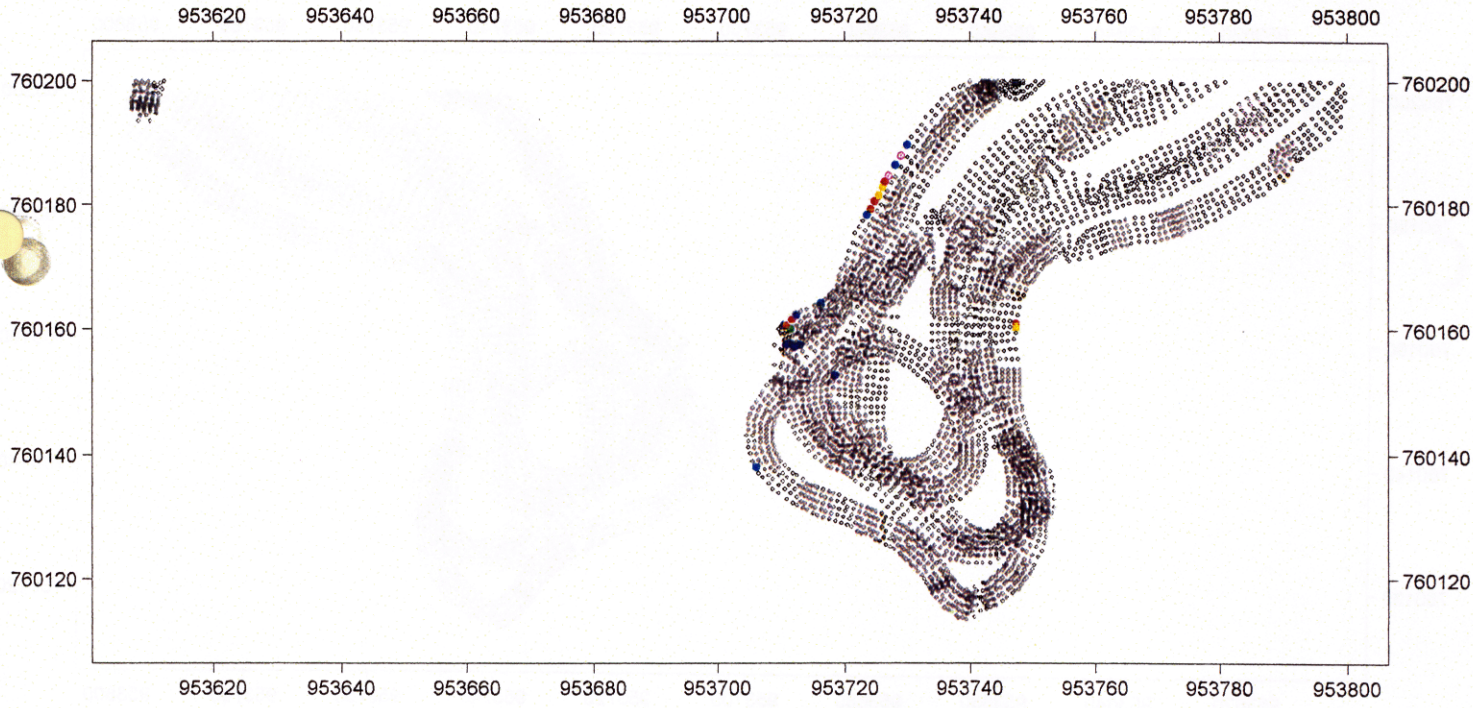
Site: SA_c18 ()

Signal: Array Signal (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



LOGGER Analyze v1.54m Track Map

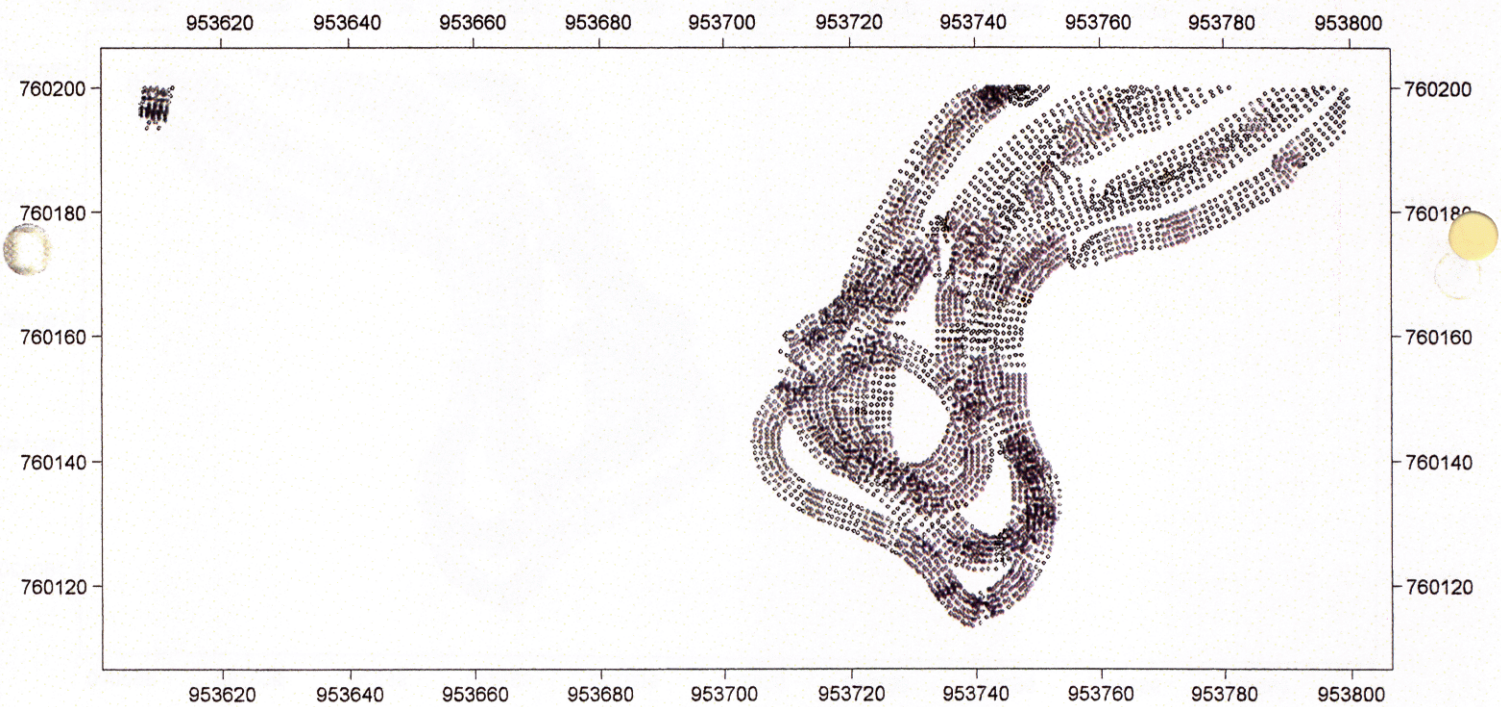
Site: SA_c18 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	

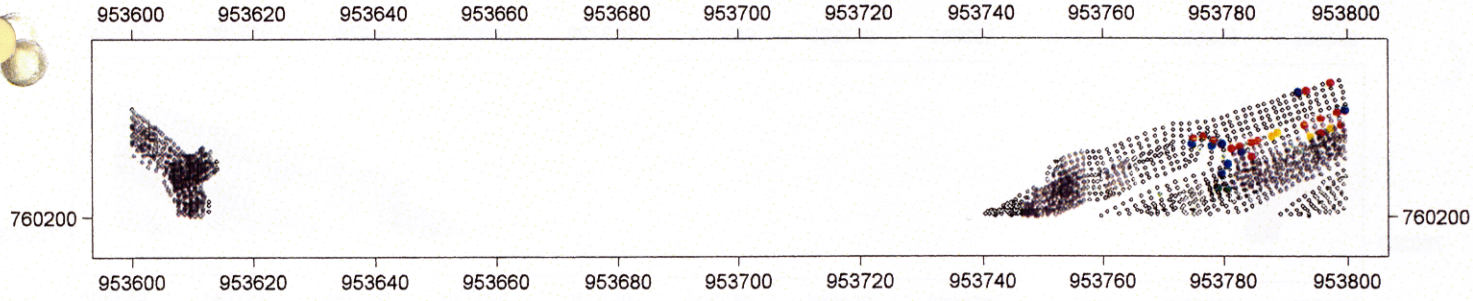


LOGGER Analyze v1.54m Track Map

Site: SA_c19 () **Signal: Array Signal (cps)** **Time:**

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



LOGGER Analyze v1.54m Track Map

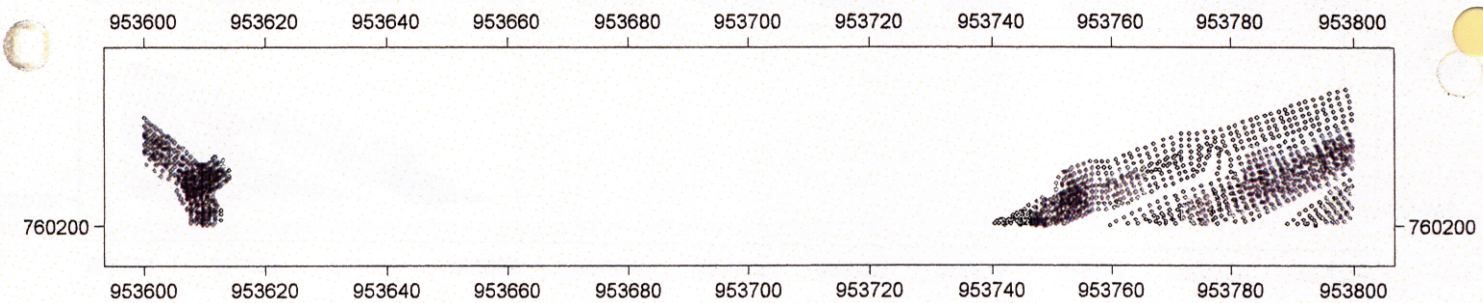
Site: SA_c19 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



LOGGER Analyze v1.54m Track Map

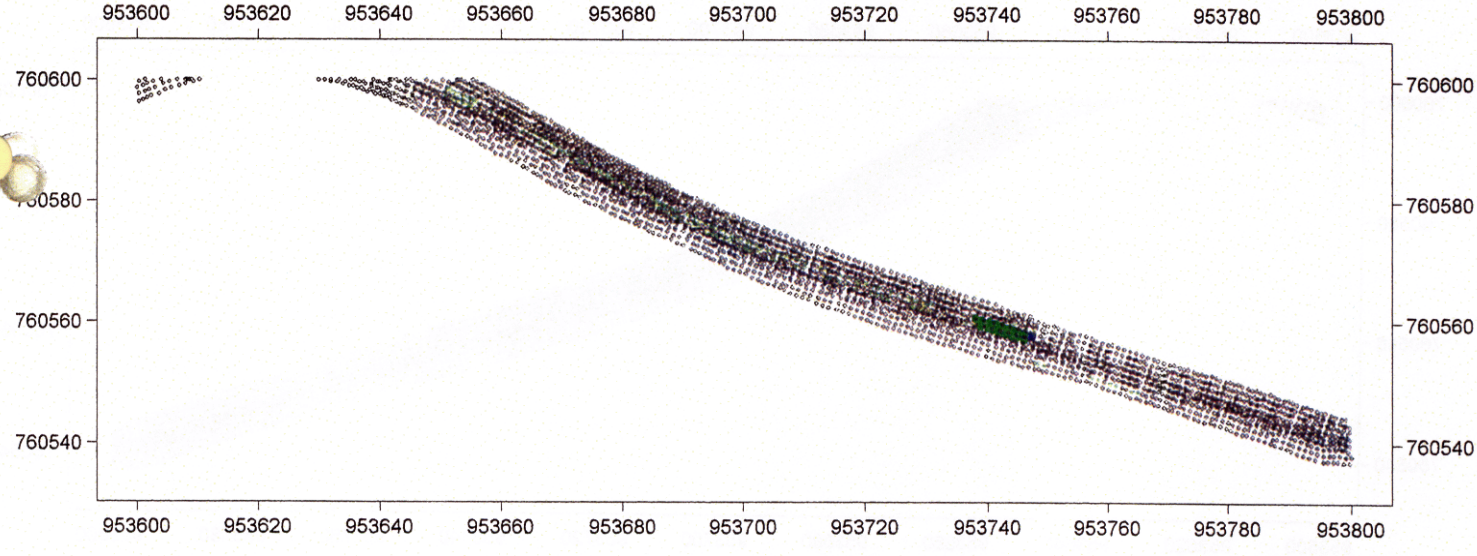
Site: SA_c20 ()

Signal: Array Signal (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



11455.8947

LOGGER Analyze v1.54m Track Map

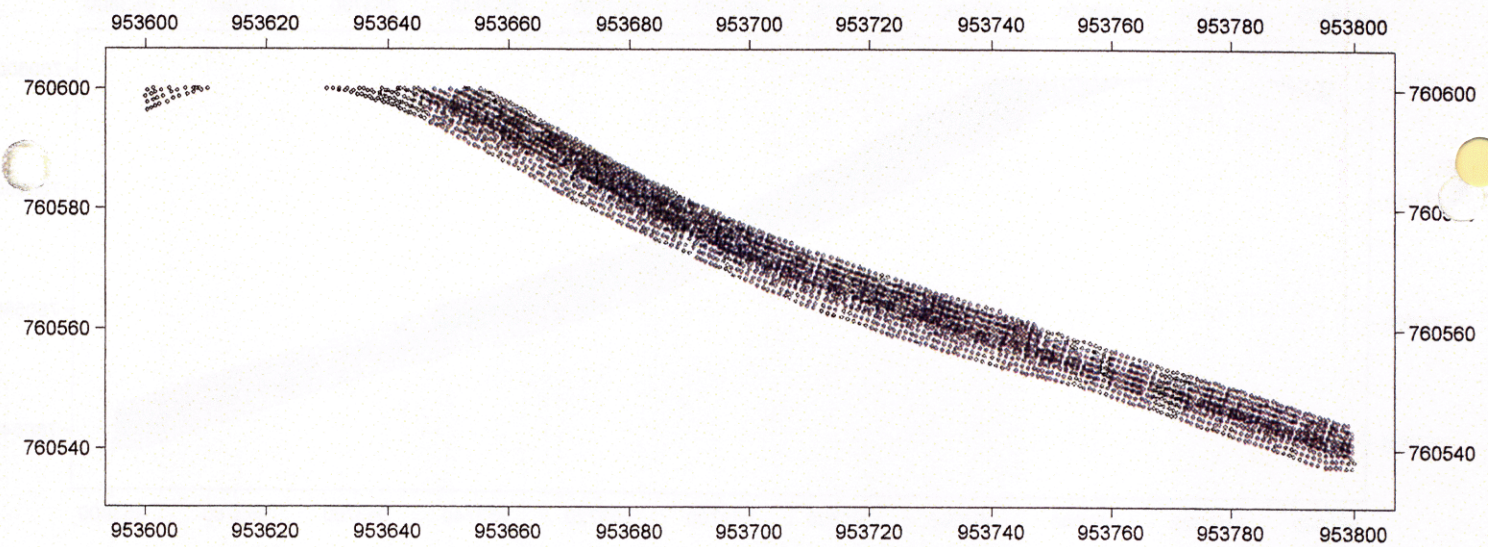
Site: SA_c20 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



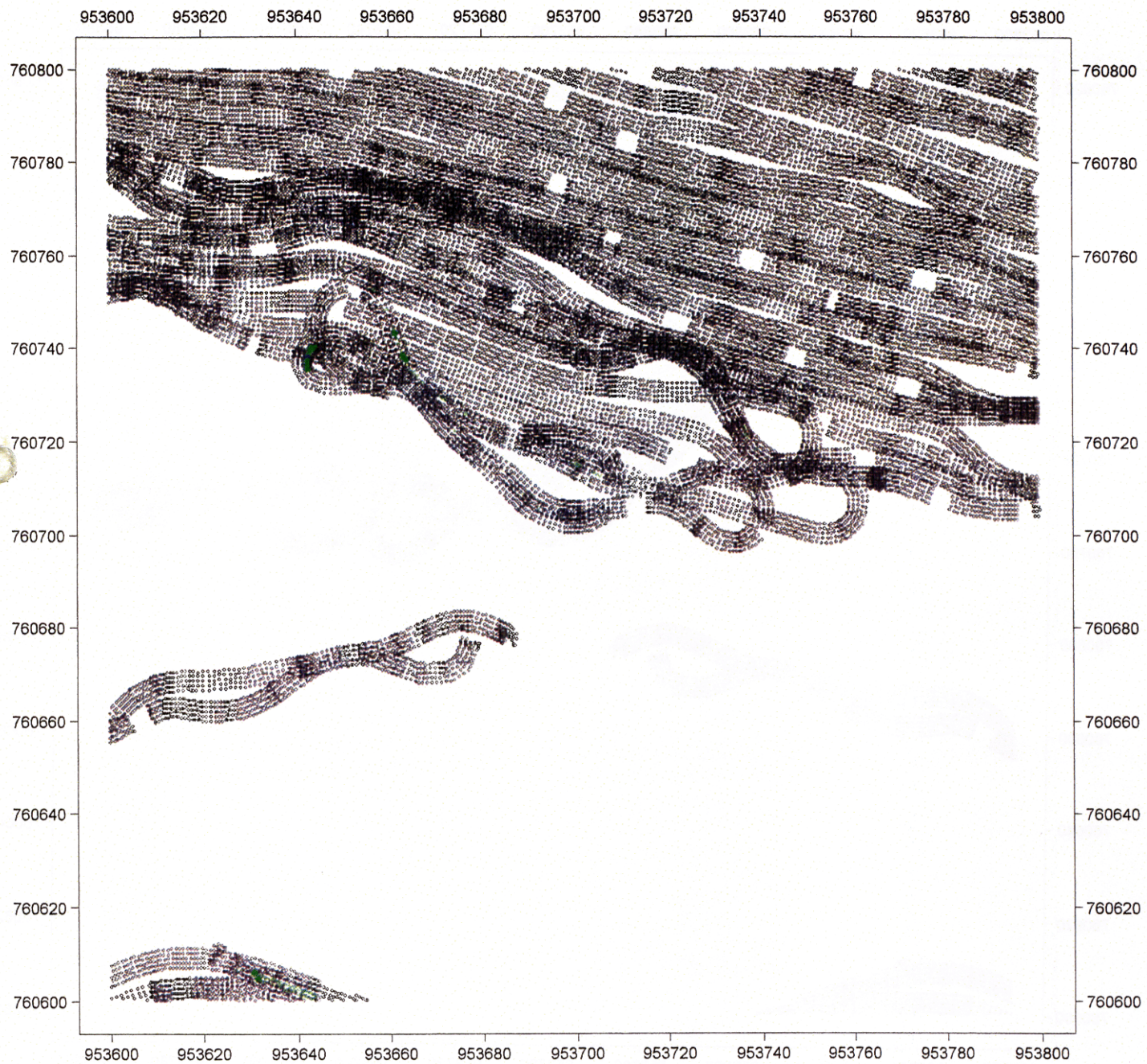
11455.8947

LOGGER Analyze v1.54m Track Map

Site: SA_c21 () **Signal: Array Signal (cps)** **Time:**

Threshold:
> 50 •

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



LOGGER Analyze v1.54m Track Map

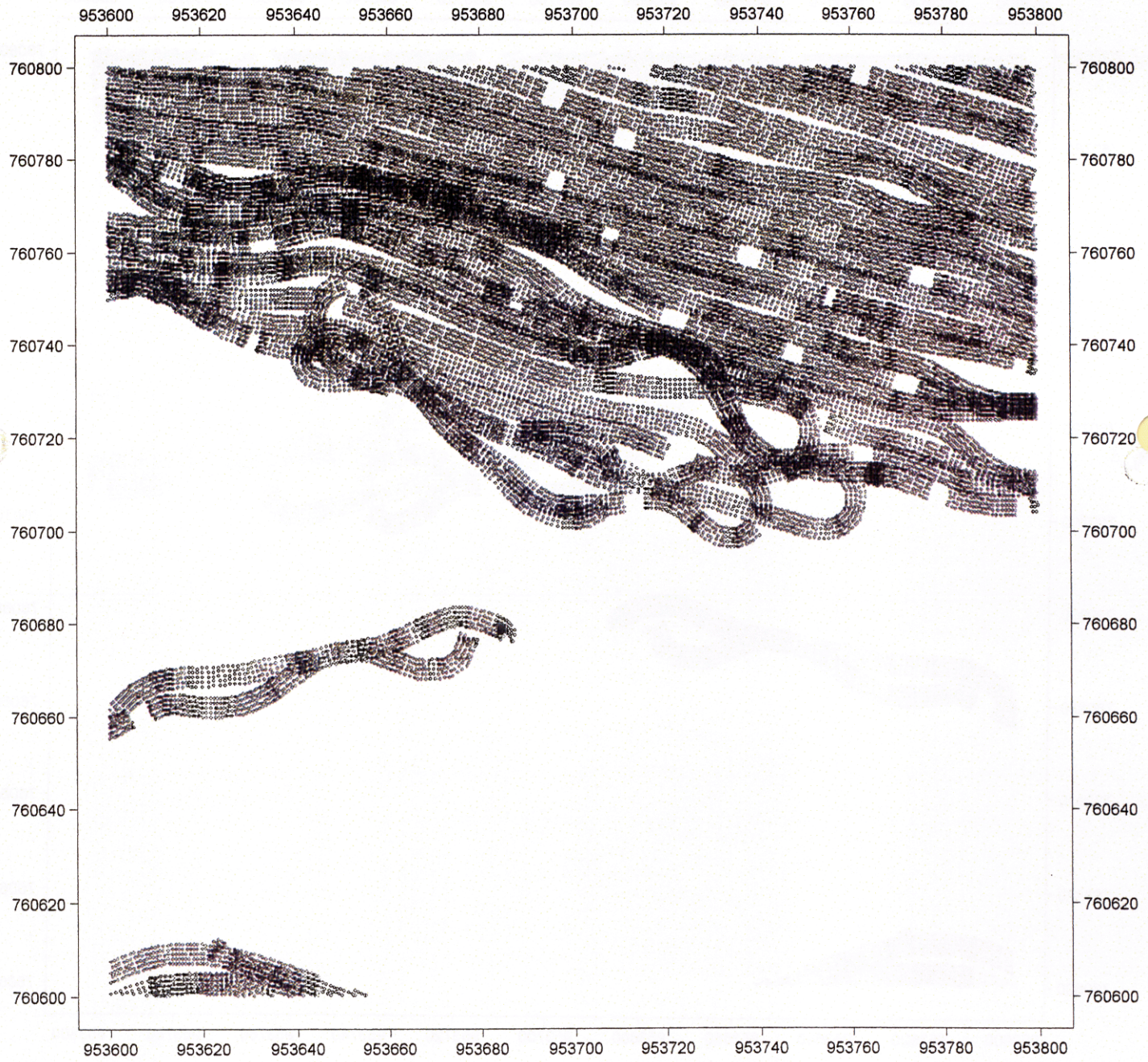
Site: SA_c21 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50 •

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



LOGGER Analyze v1.54m Track Map

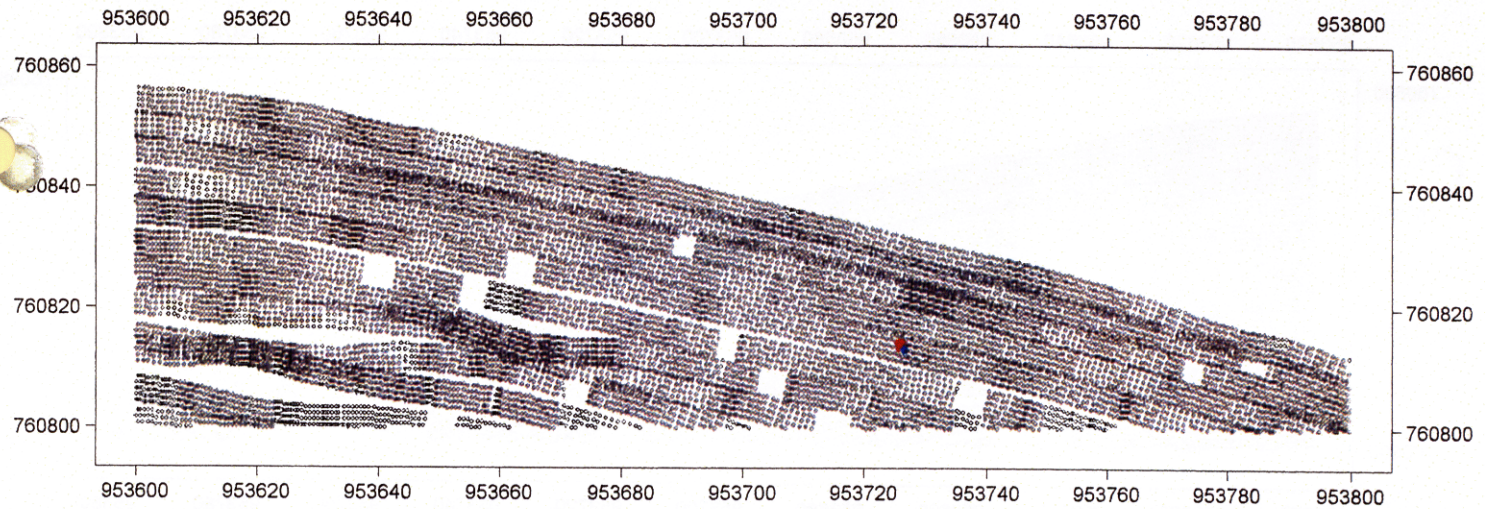
Site: SA_c22 ()

Signal: Array Signal (cps)

Time:

Threshold:
> 50 •

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



11455.8967

LOGGER Analyze v1.54m Track Map

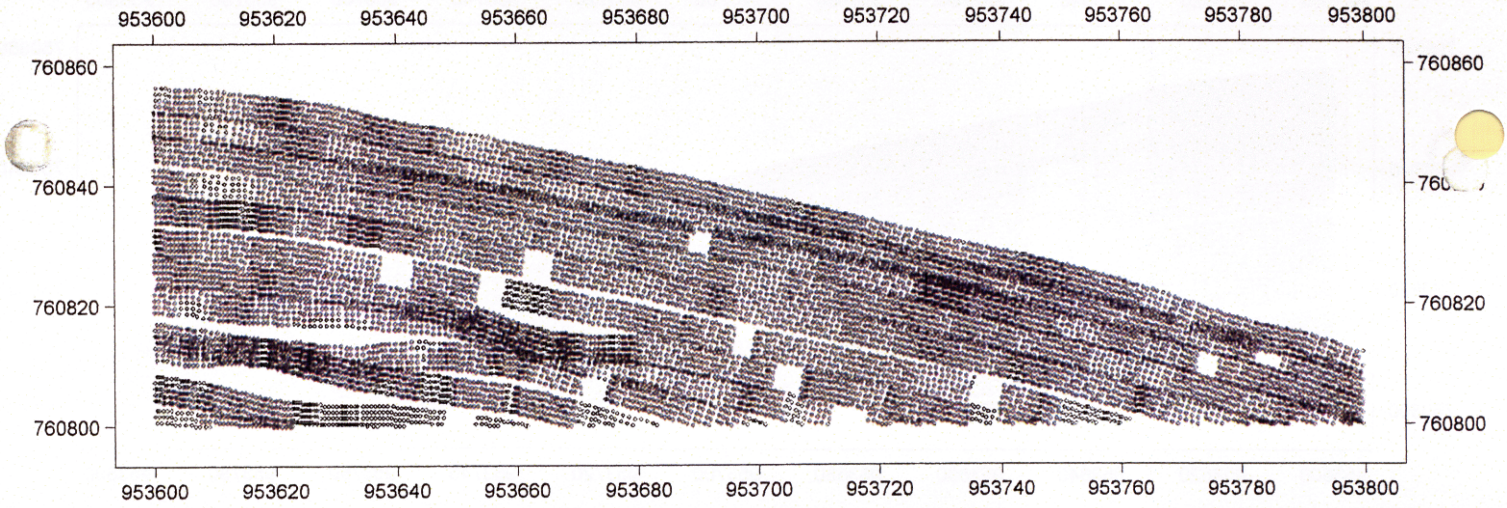
Site: SA_c22 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50 •

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	

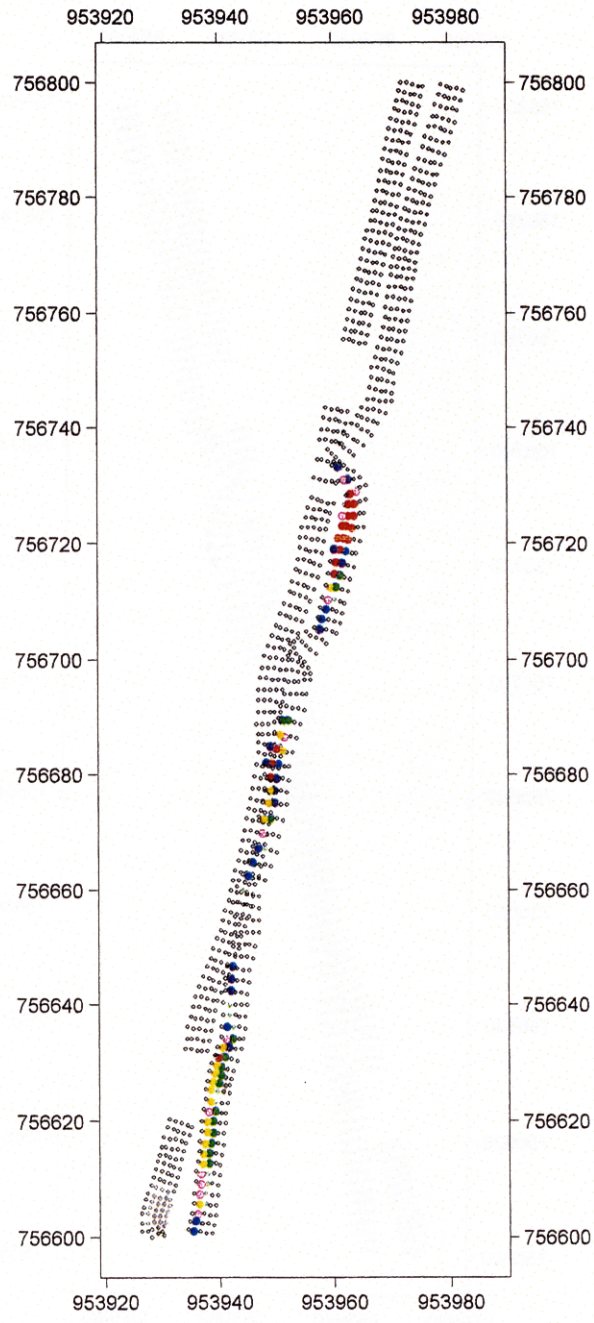


LOGGER Analyze v1.54m Track Map

Site: SA_d1 () **Signal: Array Signal (cps)** **Time:**

Threshold:
> 50 •

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



LOGGER Analyze v1.54m Track Map

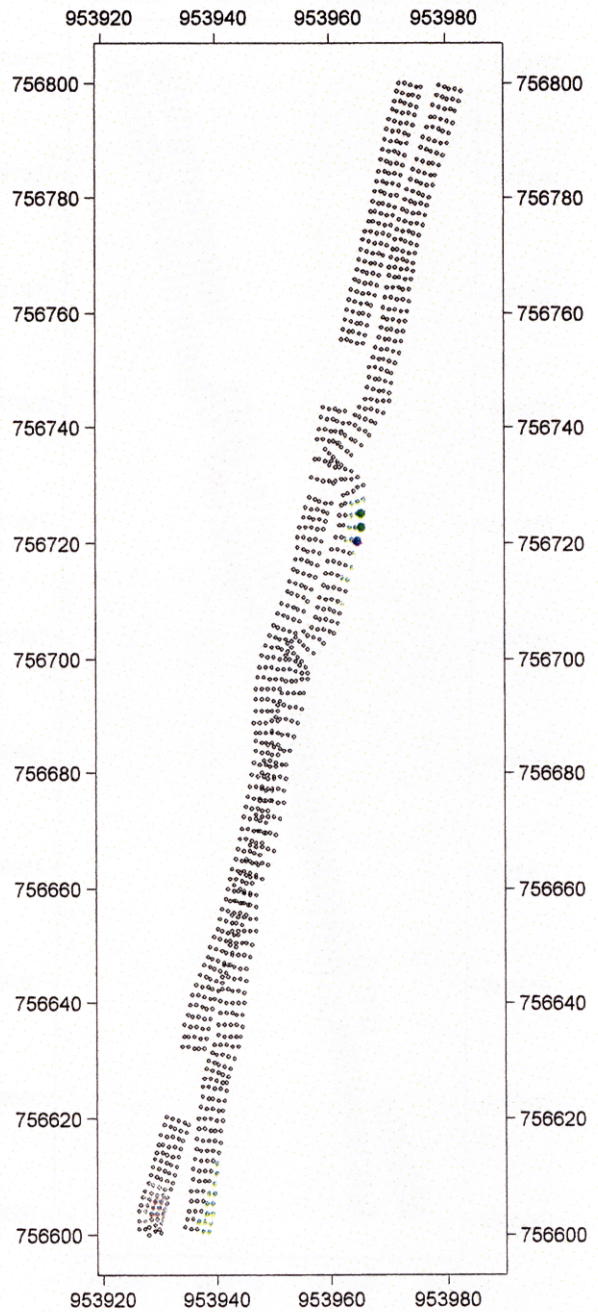
Site: SA_d1 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



LOGGER Analyze v1.54m Track Map

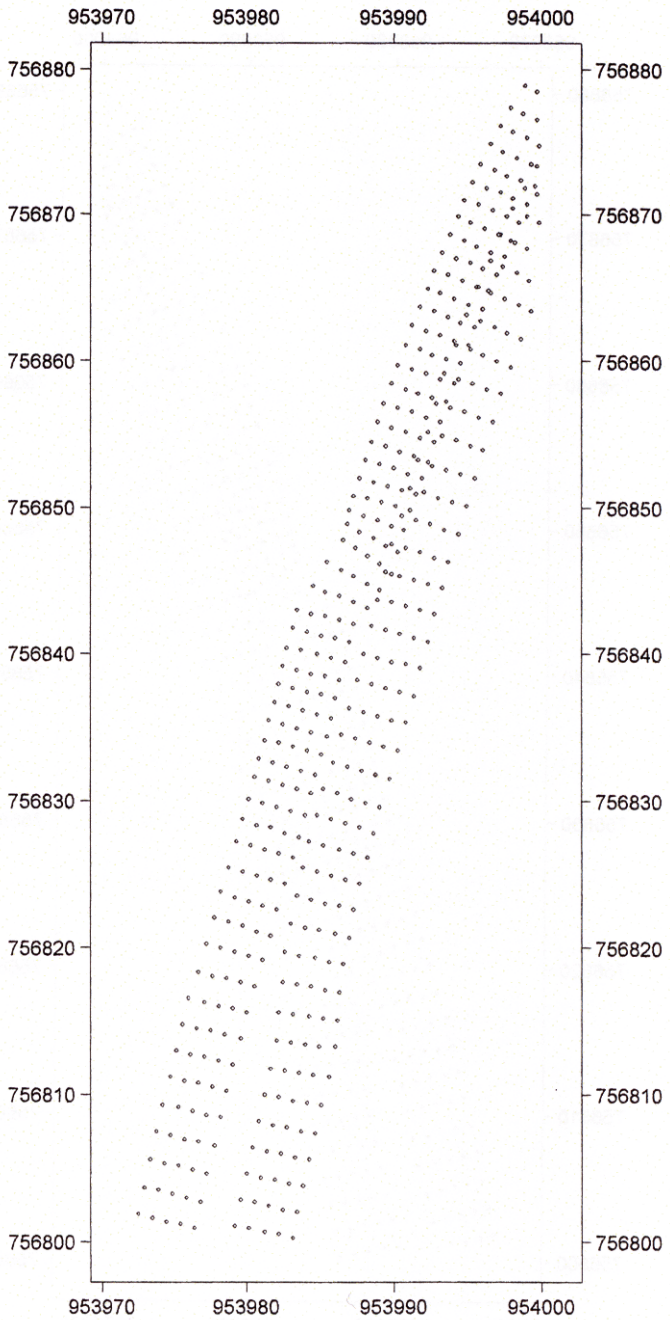
Site: SA_d2 ()

Signal: Array Signal (cps)

Time:

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



11455.9011

LOGGER Analyze v1.54m Track Map

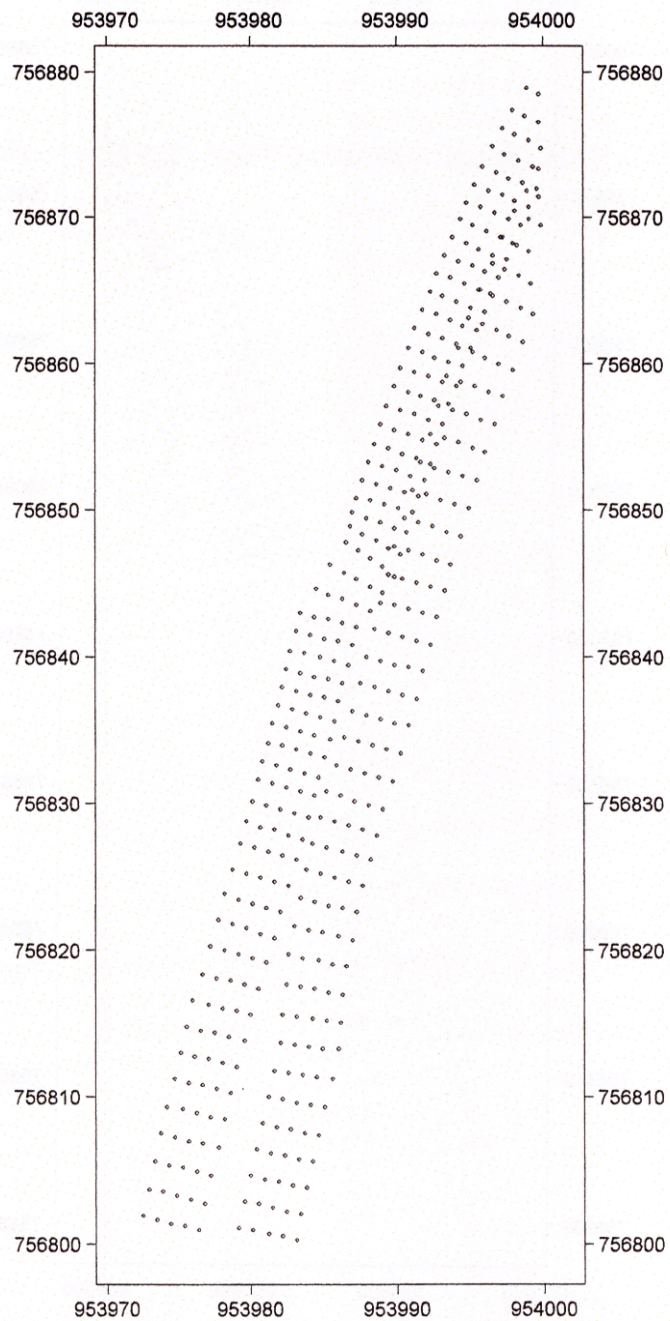
Site: SA_d2 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140

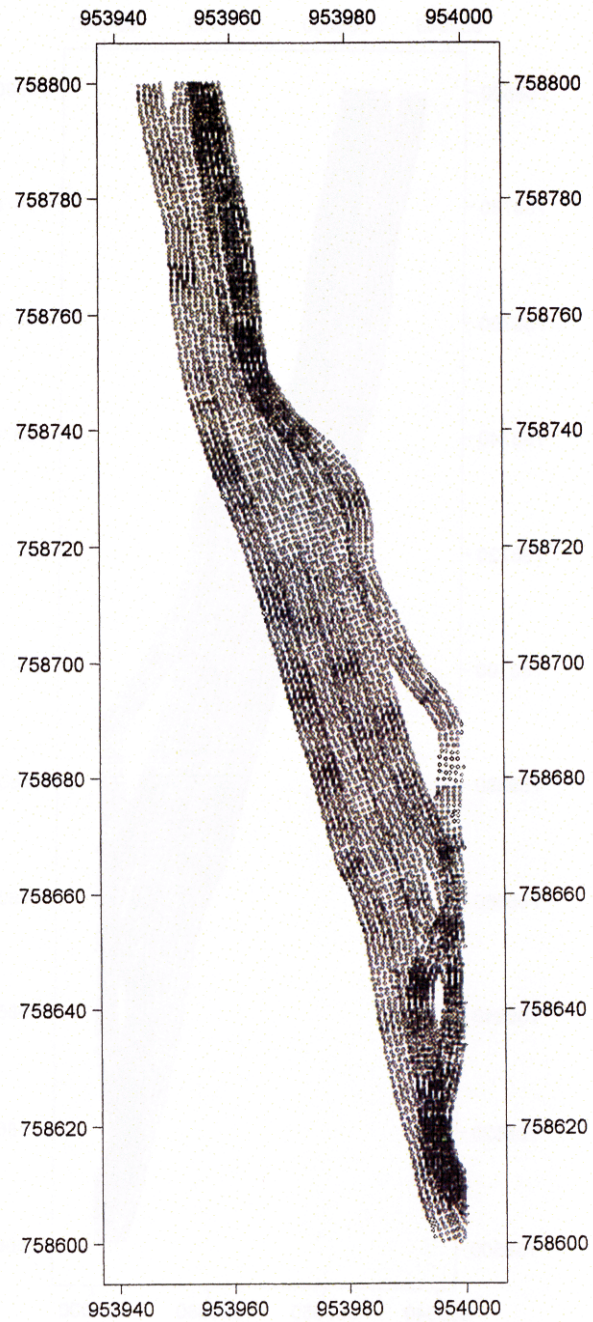


LOGGER Analyze v1.54m Track Map

Site: SA_d11 () **Signal: Array Signal (cps)** **Time:**

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



LOGGER Analyze v1.54m Track Map

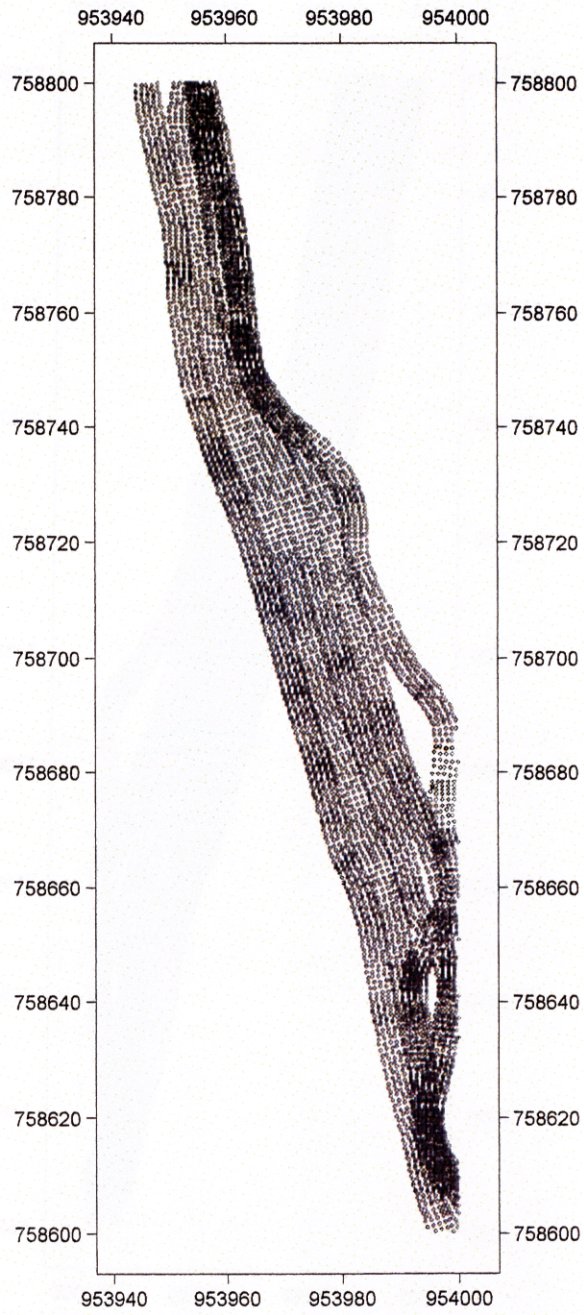
Site: SA_d11 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50 •

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



LOGGER Analyze v1.54m Track Map

Site: SA_d12 () **Signal: Array Signal (cps)** **Time:**

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140

LOGGER Analyze v1.54m Track Map

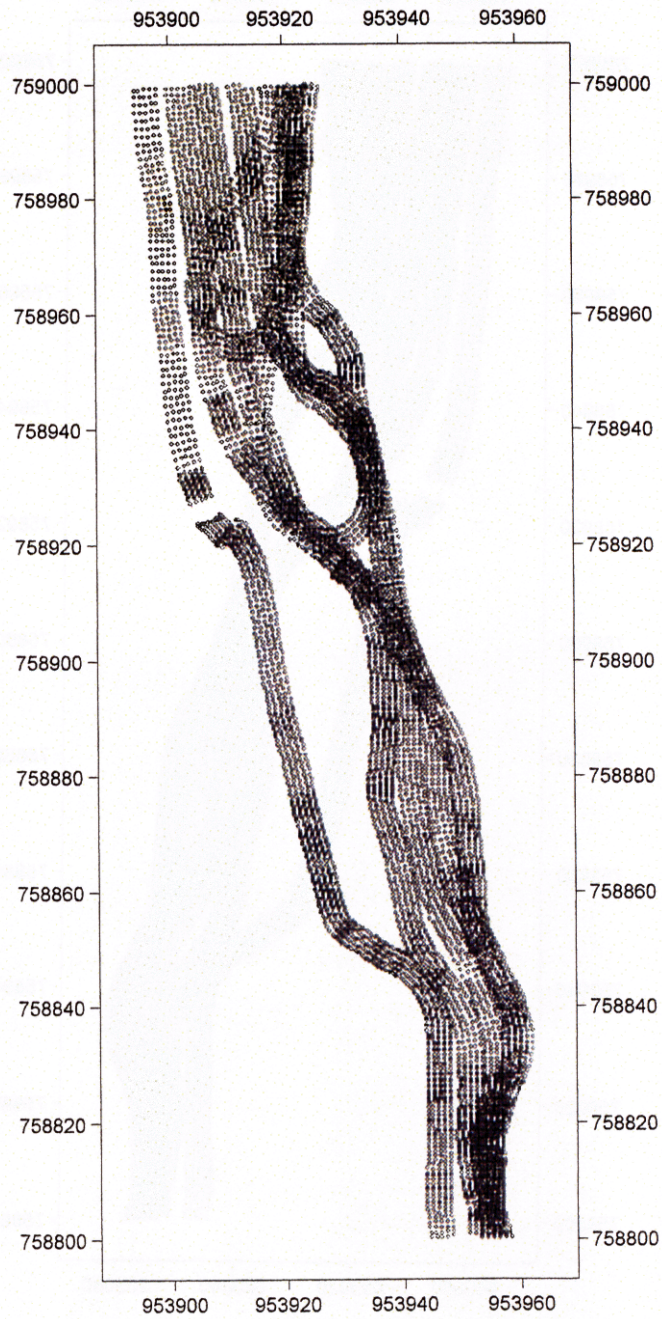
Site: SA_d12 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



LOGGER Analyze v1.54m Track Map

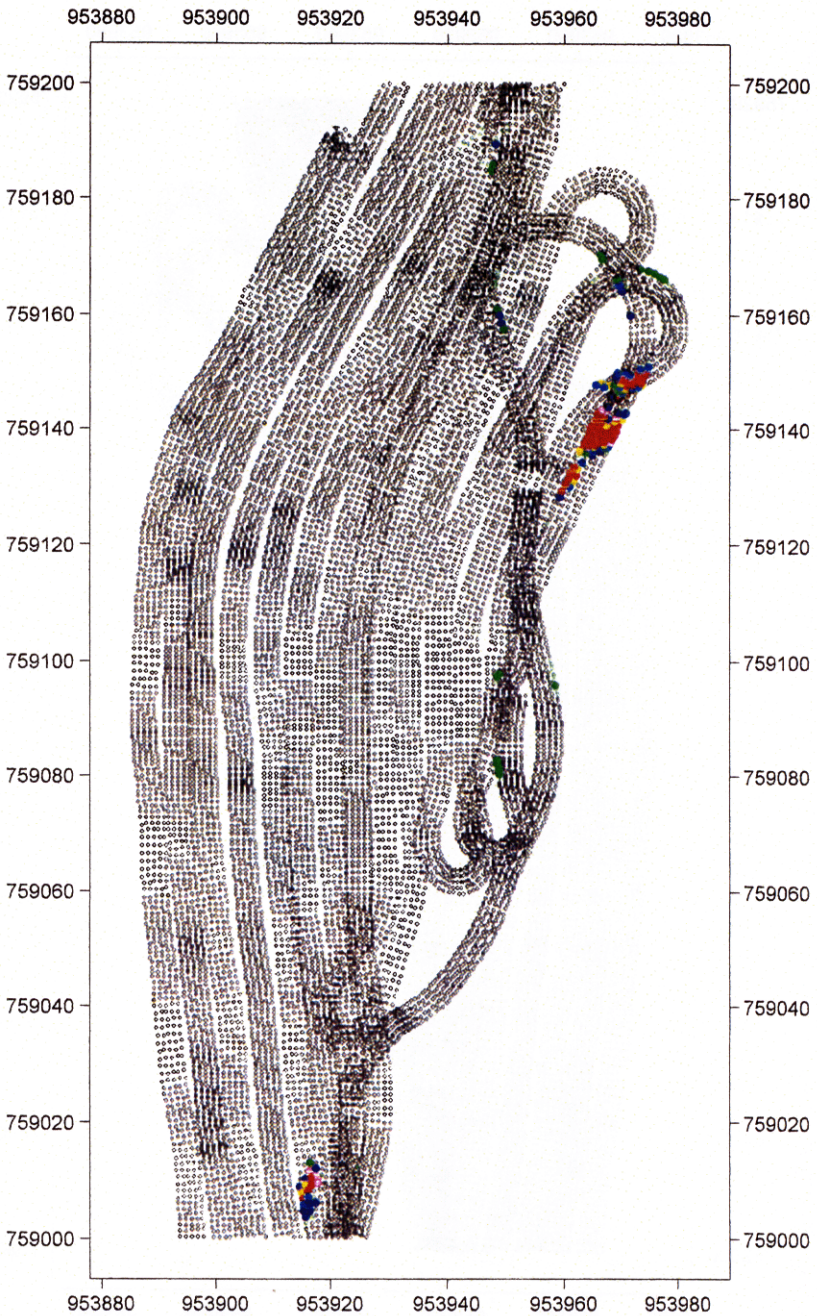
Site: SA_d13 ()

Signal: Array Signal (cps)

Time:

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



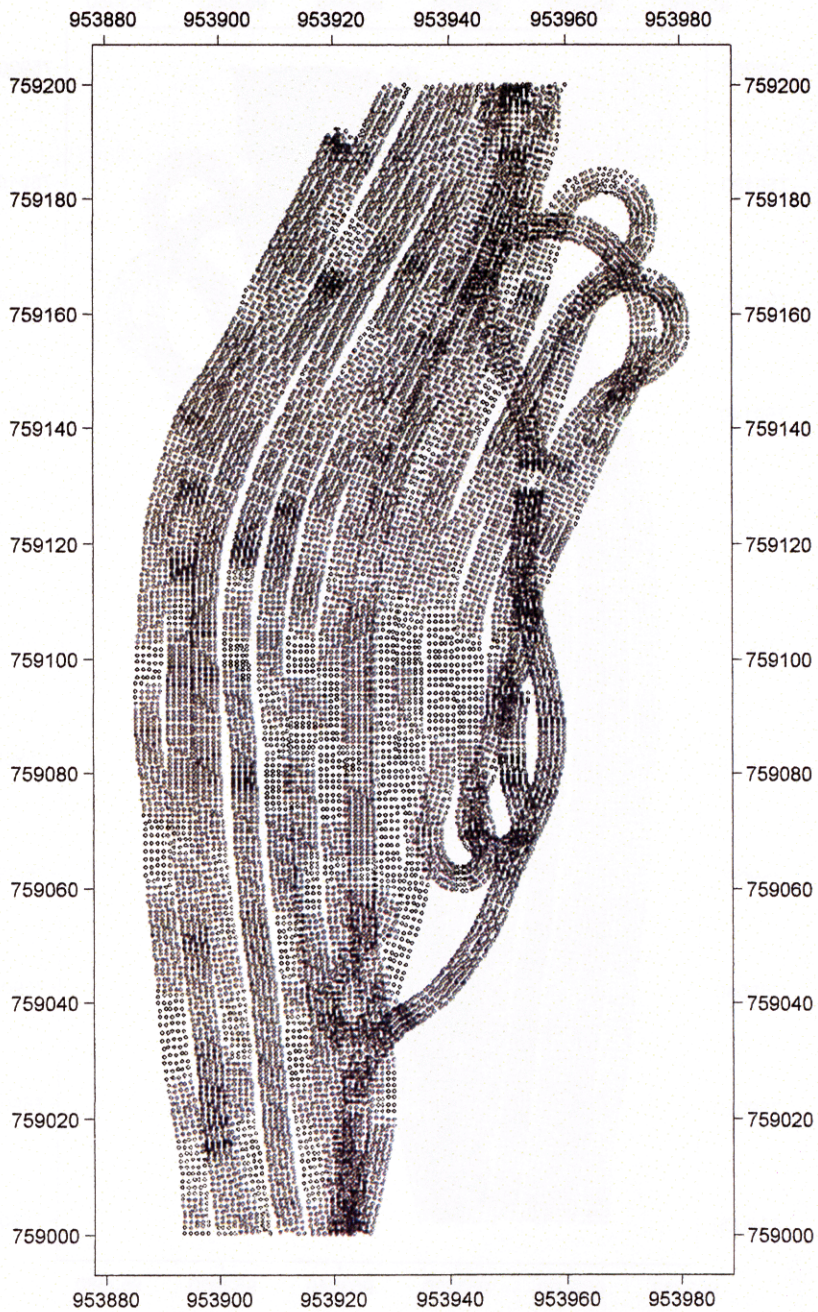
11455.8997

LOGGER Analyze v1.54m Track Map

Site: SA_d13 () **Signal: Array Background (cps)** **Time:**

Threshold:
> 50 •

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140

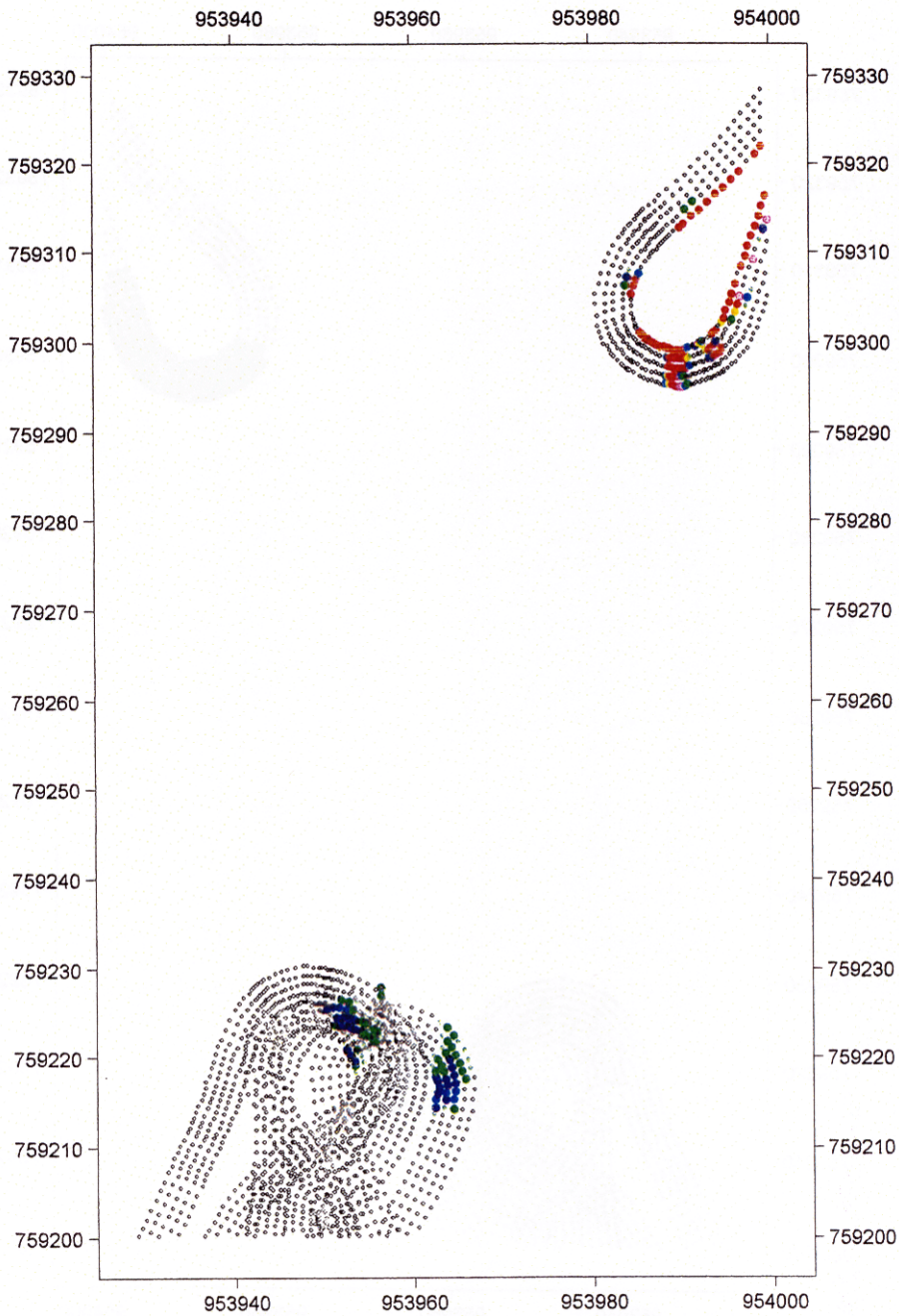


LOGGER Analyze v1.54m Track Map

Site: SA_d14 () **Signal: Array Signal (cps)** **Time:**

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



LOGGER Analyze v1.54m Track Map

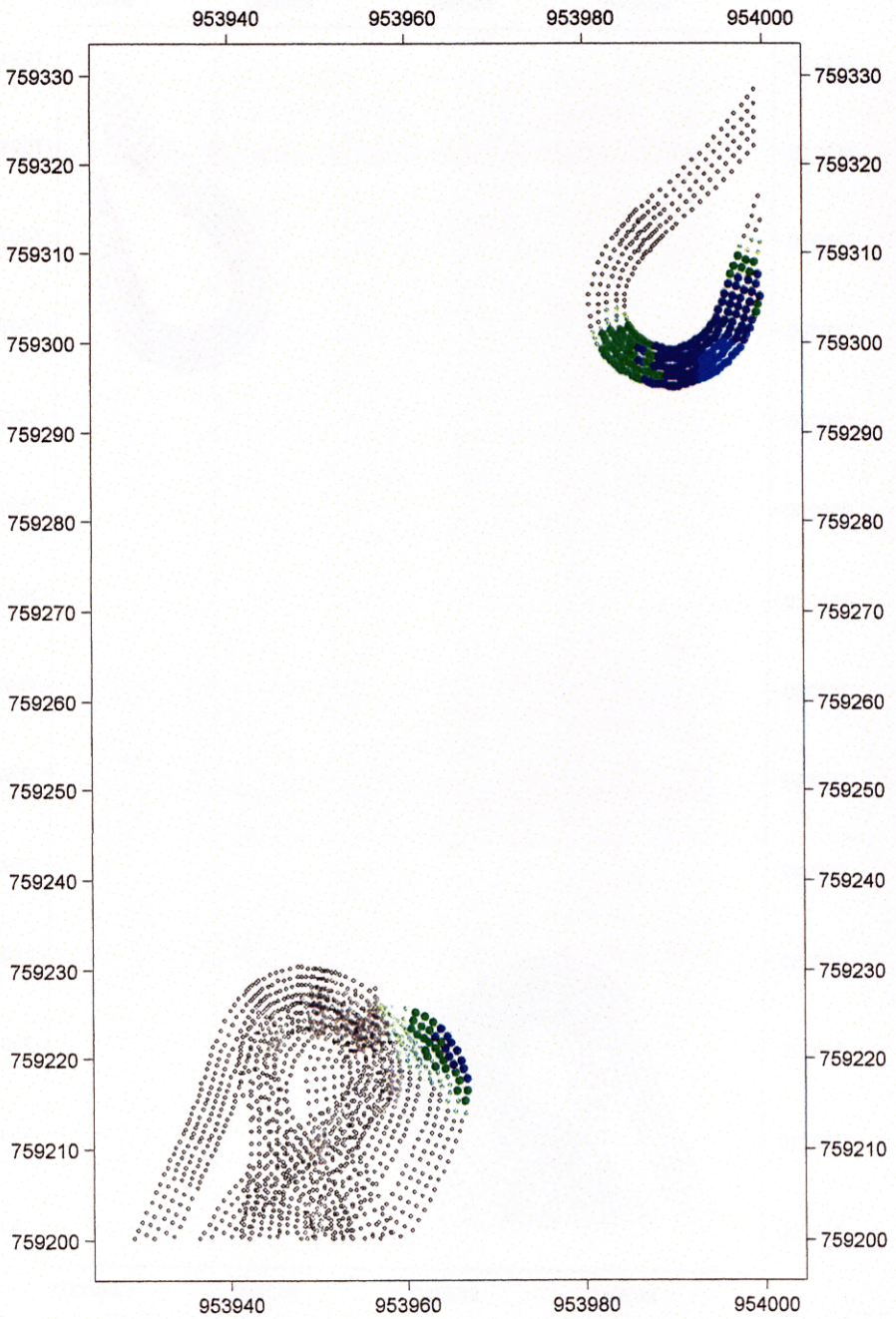
Site: SA_d14 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140

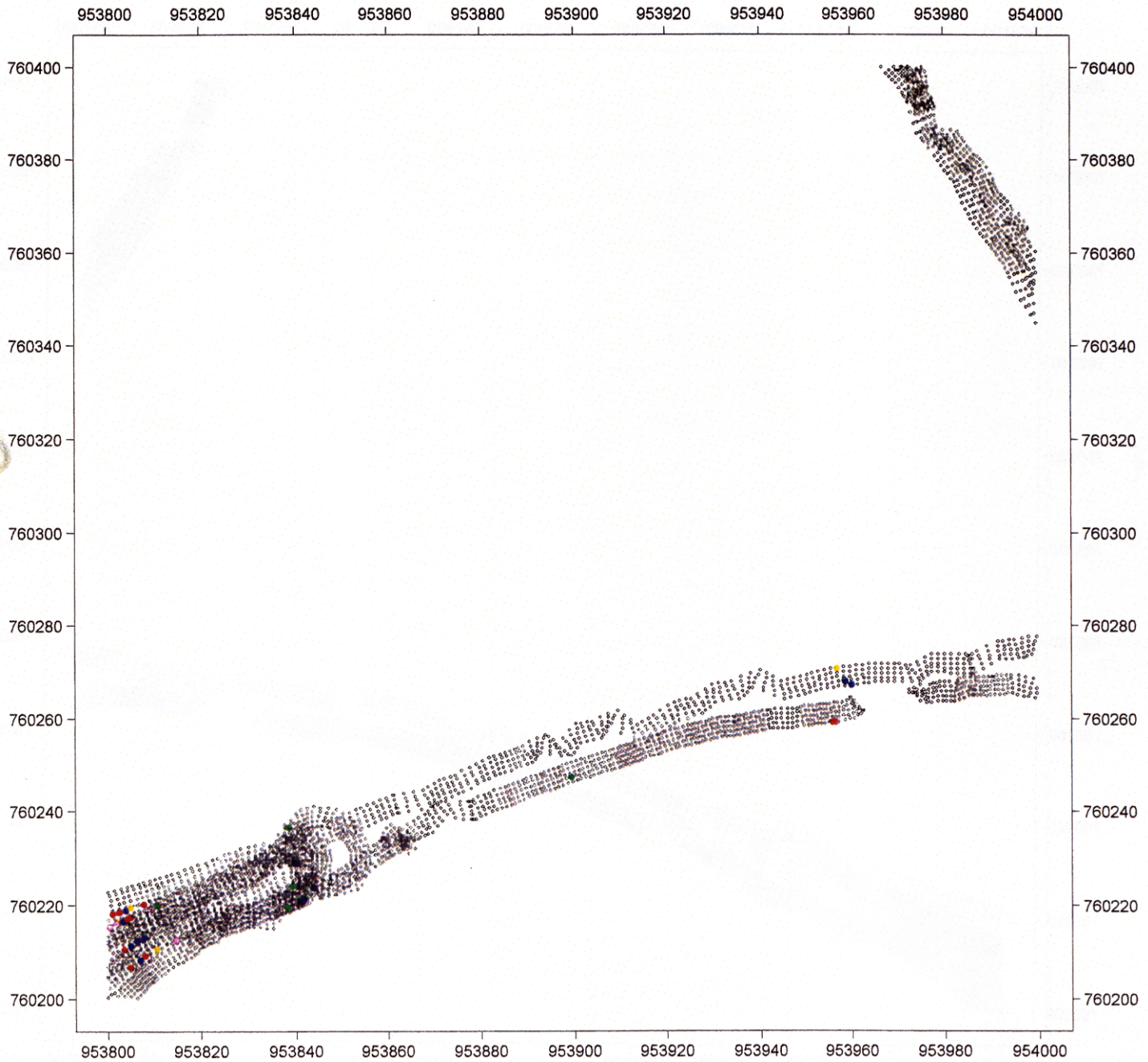


LOGGER Analyze v1.54m Track Map

Site: SA_d19 () **Signal: Array Signal (cps)** **Time:**

Threshold:
> 50 •

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140

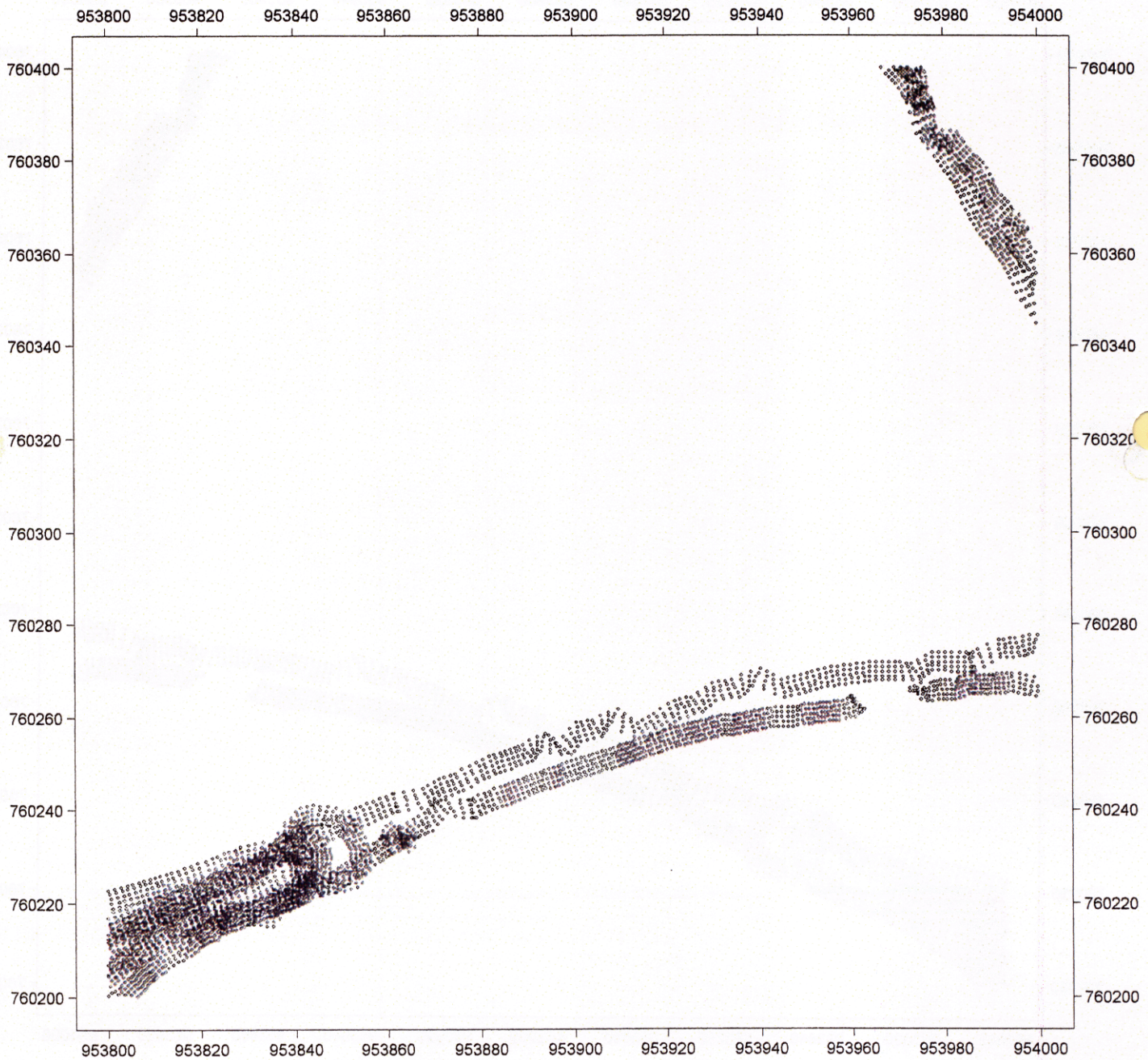


LOGGER Analyze v1.54m Track Map

Site: SA_d19 () **Signal: Array Background (cps)** **Time:**

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	

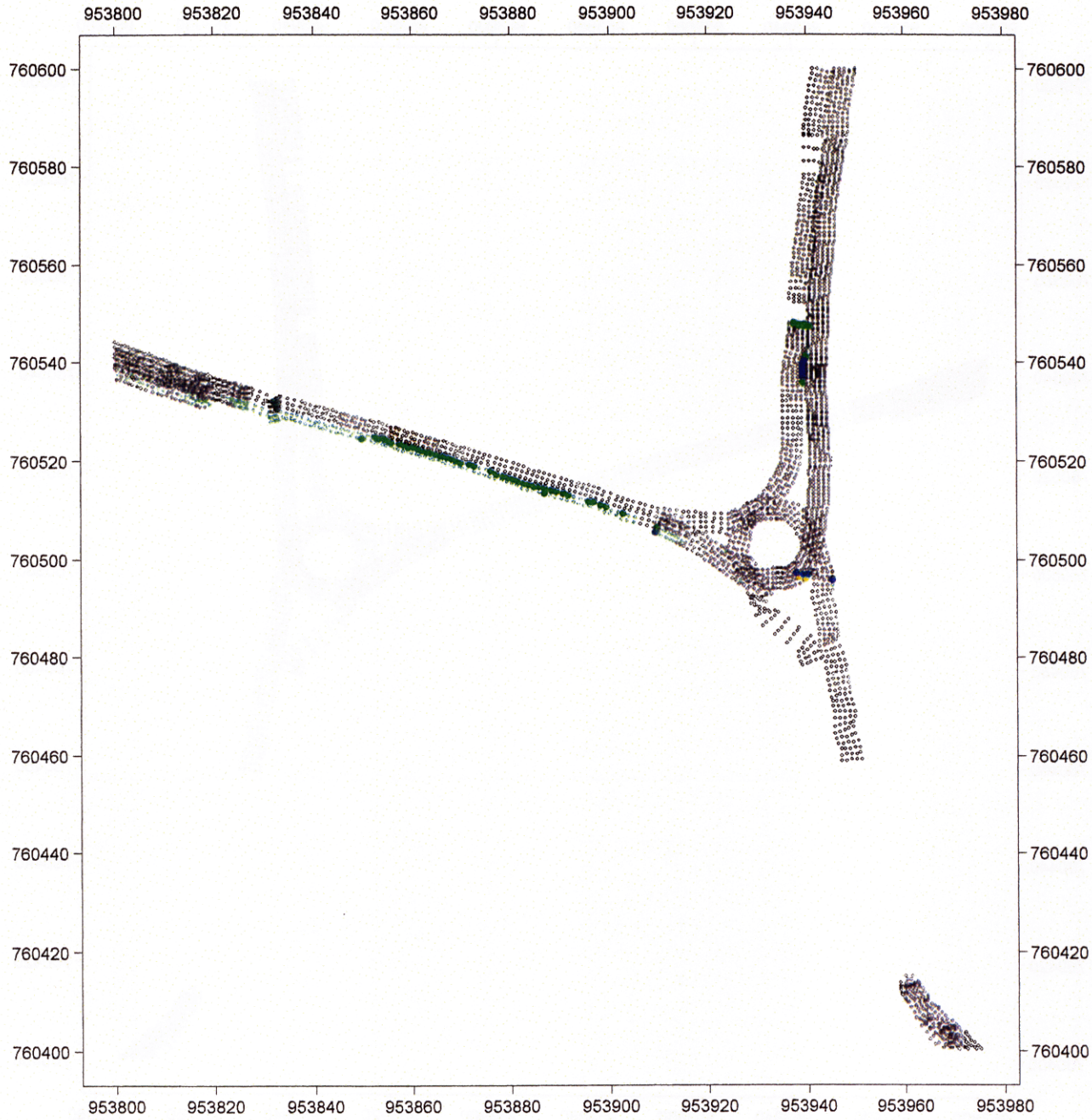


LOGGER Analyze v1.54m Track Map

Site: SA_d20 () **Signal: Array Signal (cps)** **Time:**

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



LOGGER Analyze v1.54m Track Map

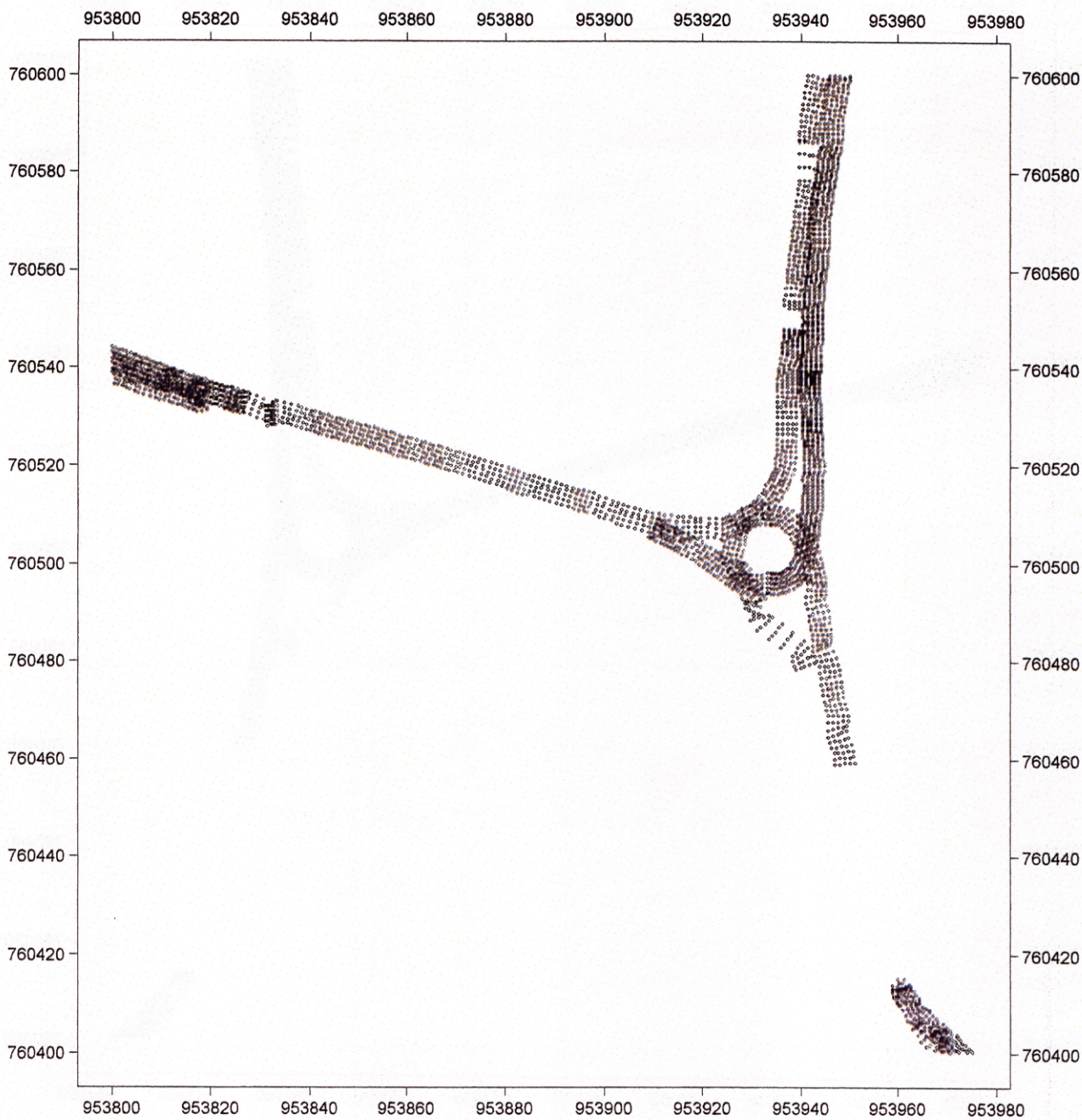
Site: SA_d20 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



11455.9014

LOGGER Analyze v1.54m Track Map

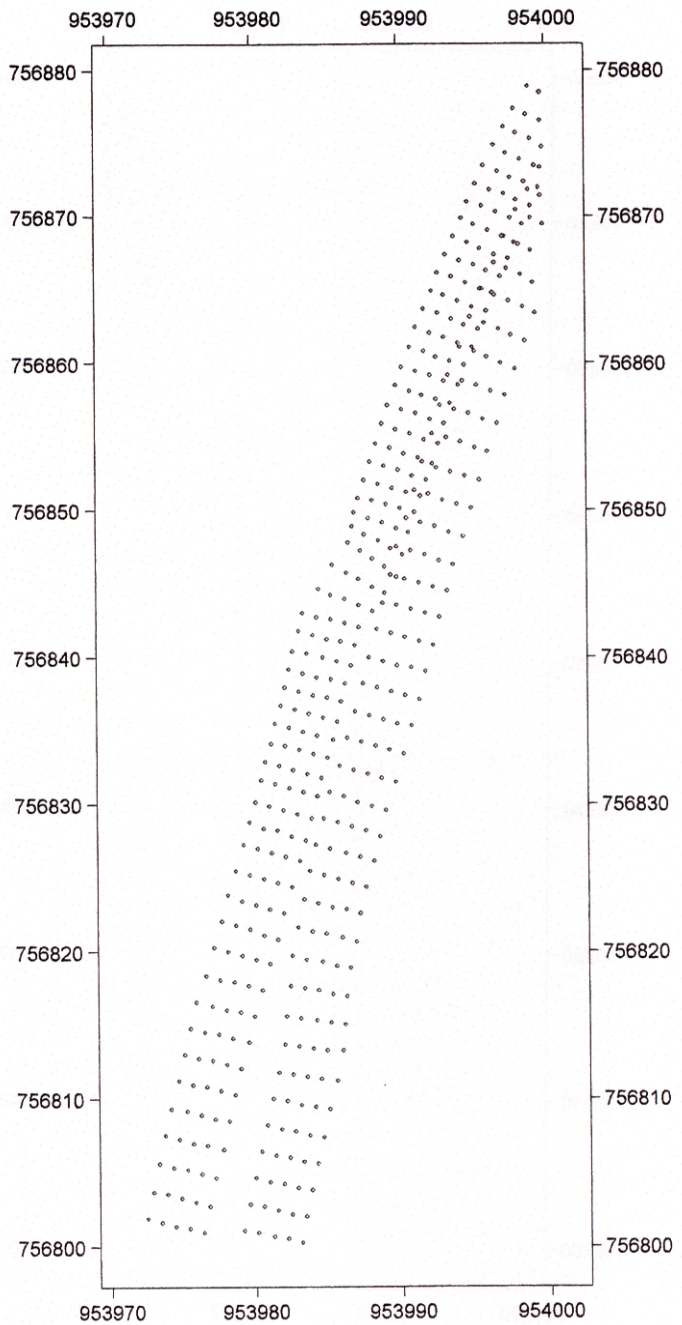
Site: SA_d2 ()

Signal: Array Signal (cps)

Time:

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



LOGGER Analyze v1.54m Track Map

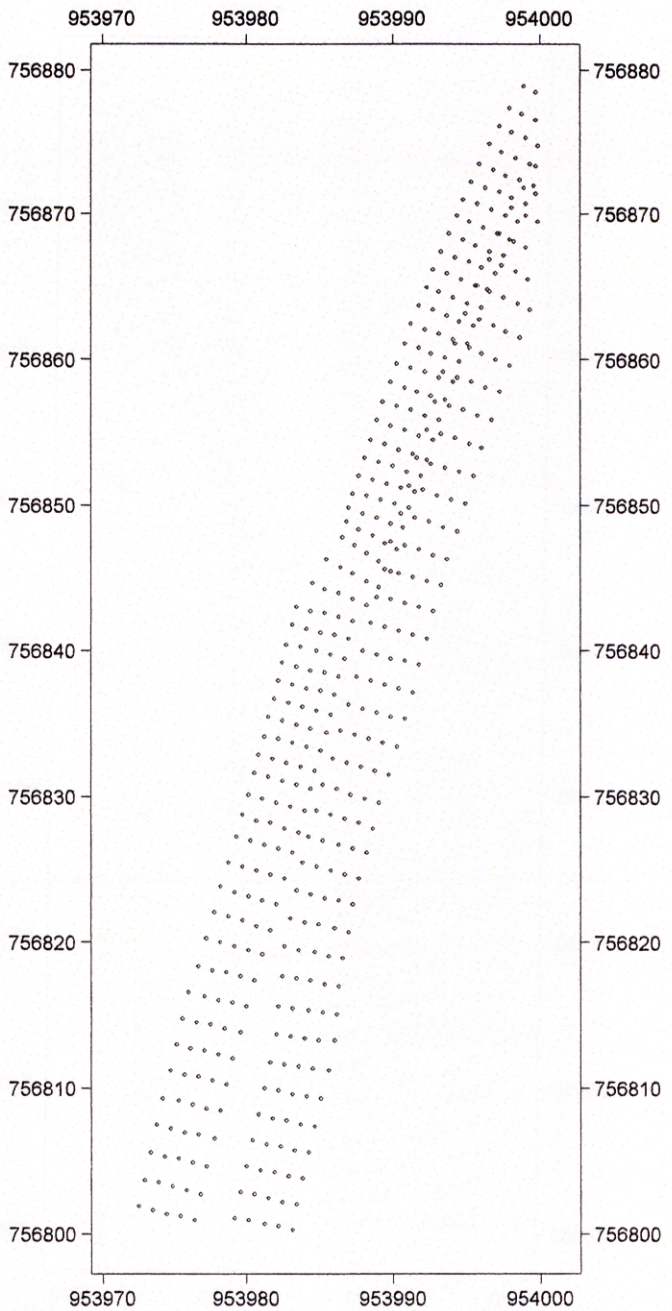
Site: SA_d2 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



LOGGER Analyze v1.54m Track Map

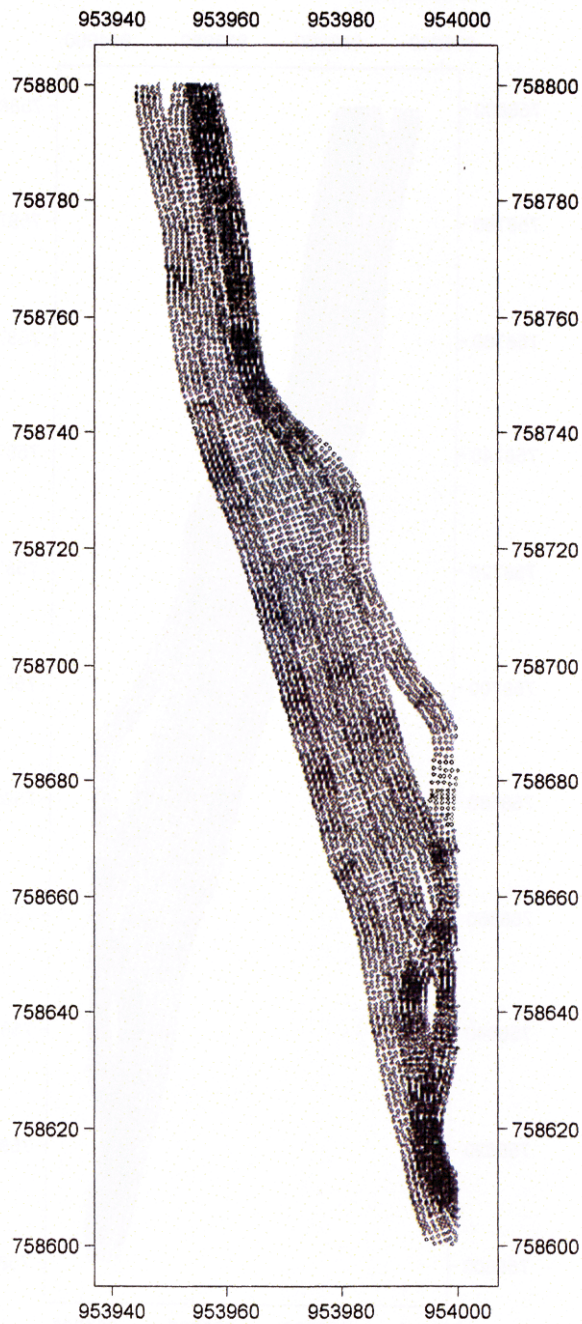
Site: SA_d11 ()

Signal: Array Signal (cps)

Time:

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



11455.8978

LOGGER Analyze v1.54m Track Map

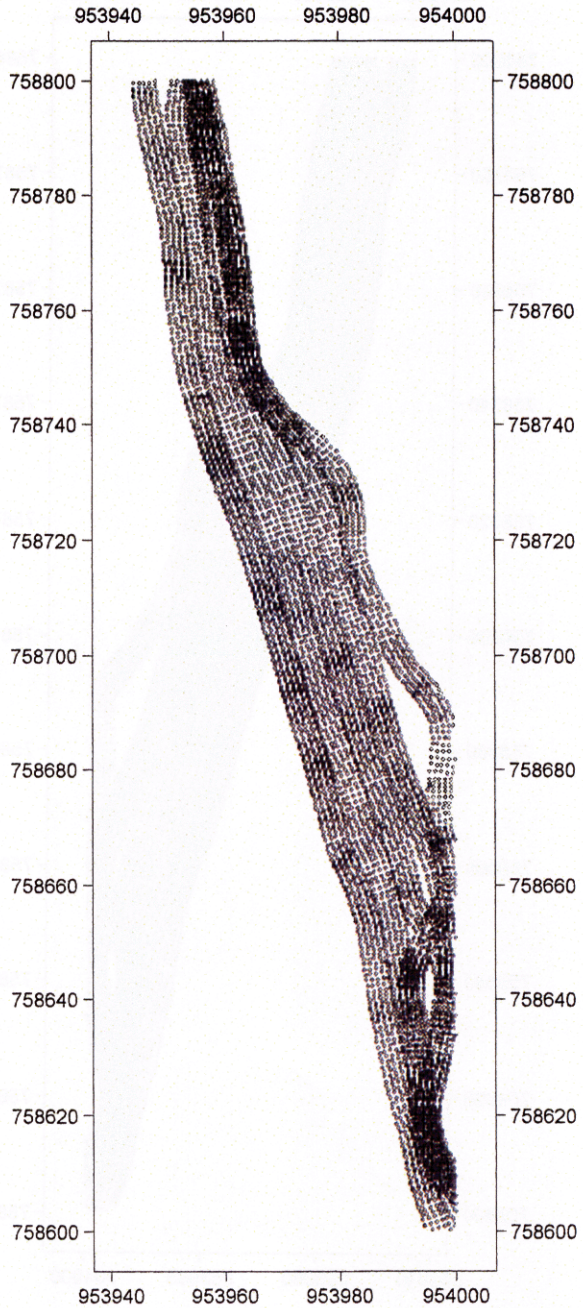
Site: SA_d11 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



LOGGER Analyze v1.54m Track Map

Site: SA_d12 ()

Signal: Array Signal (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	

LOGGER Analyze v1.54m Track Map

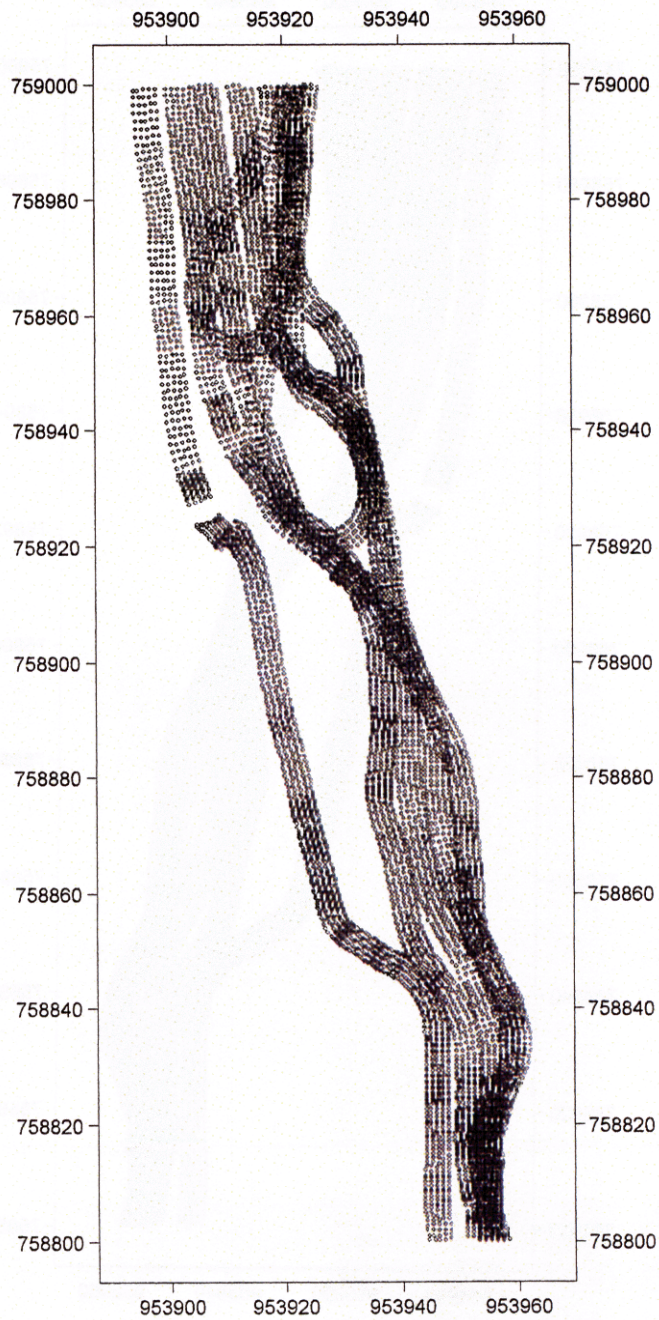
Site: SA_d12 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



LOGGER Analyze v1.54m Track Map

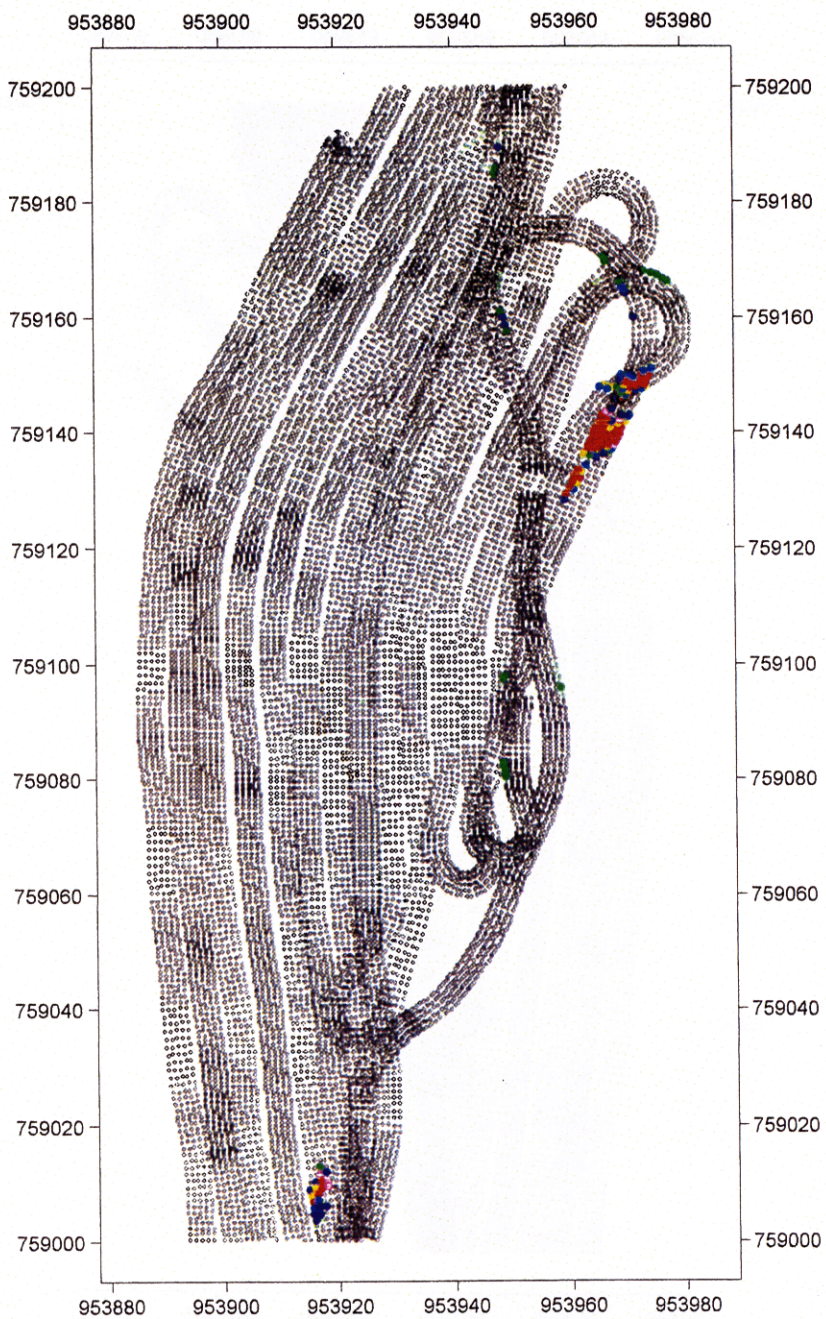
Site: SA_d13 ()

Signal: Array Signal (cps)

Time:

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



LOGGER Analyze v1.54m Track Map

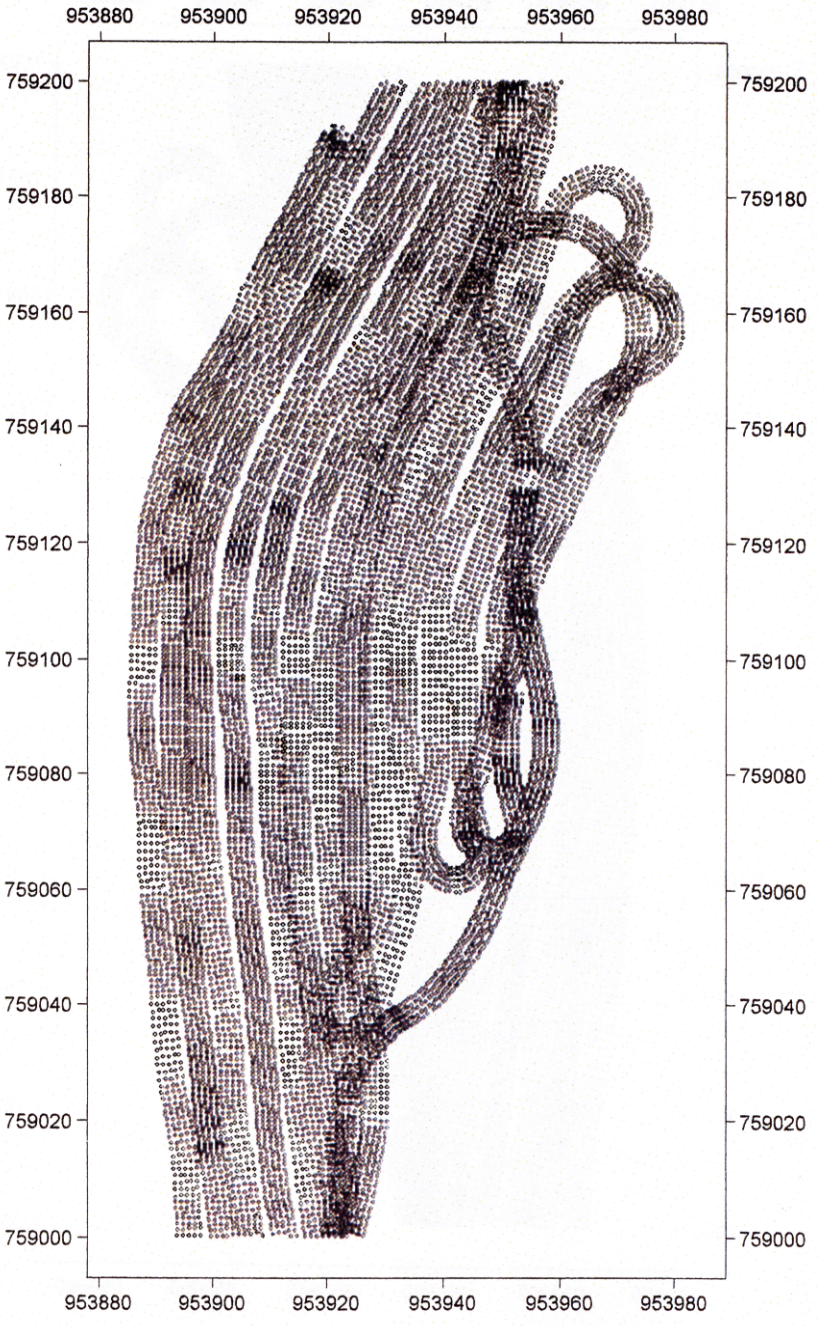
Site: SA_d13 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



11455.8997

LOGGER Analyze v1.54m Track Map

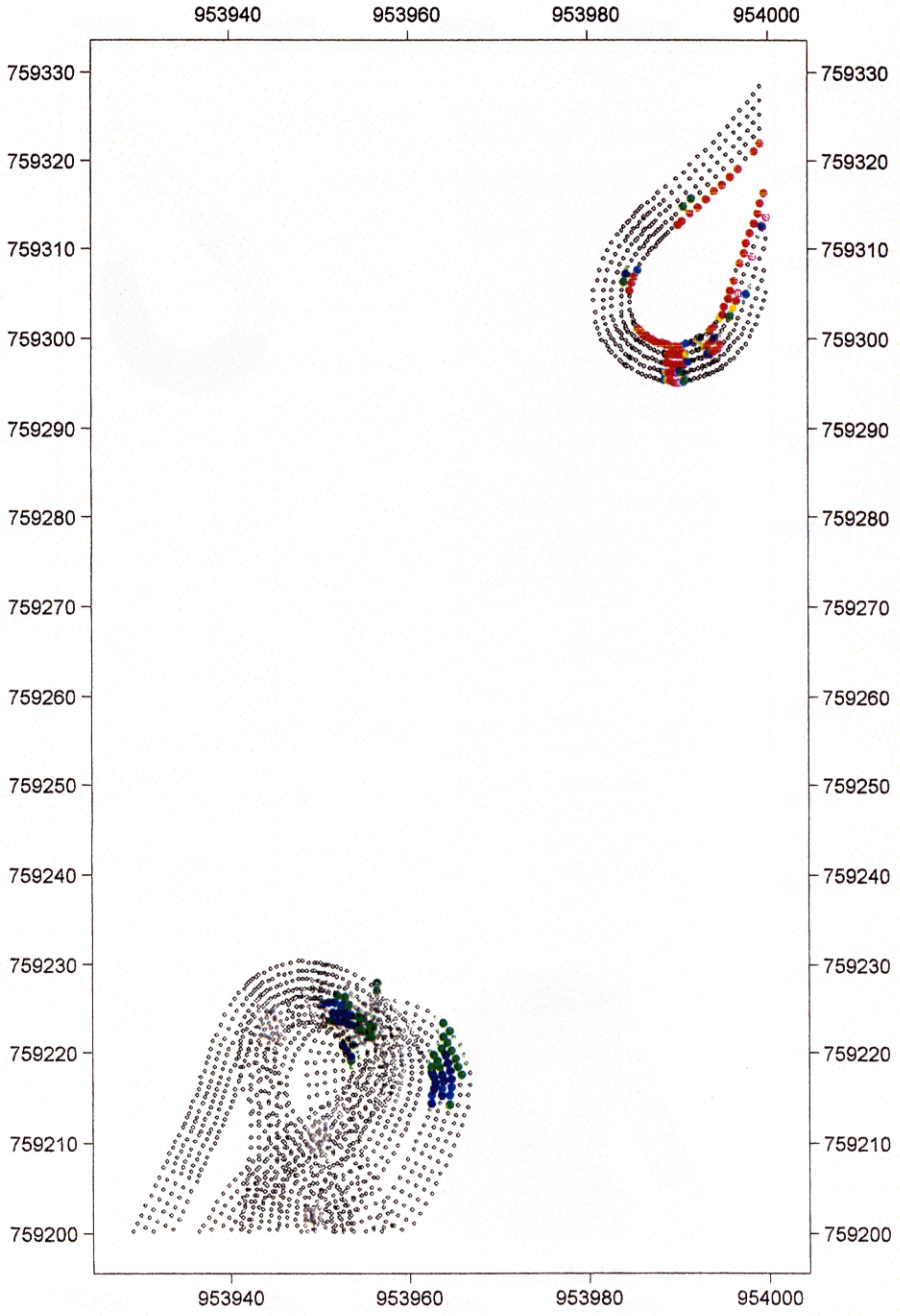
Site: SA_d14 ()

Signal: Array Signal (cps)

Time:

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



LOGGER Analyze v1.54m Track Map

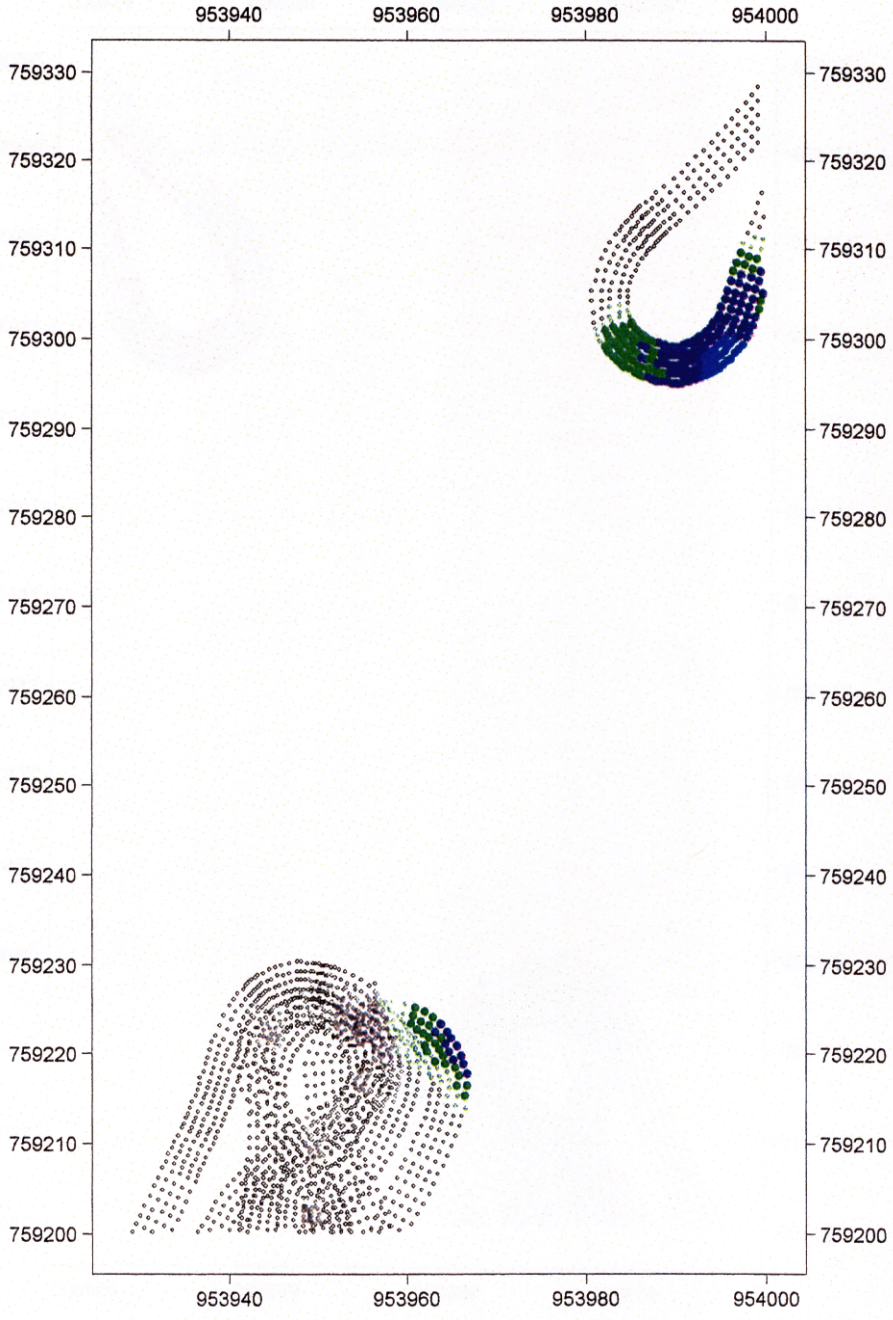
Site: SA_d14 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



LOGGER Analyze v1.54m Track Map

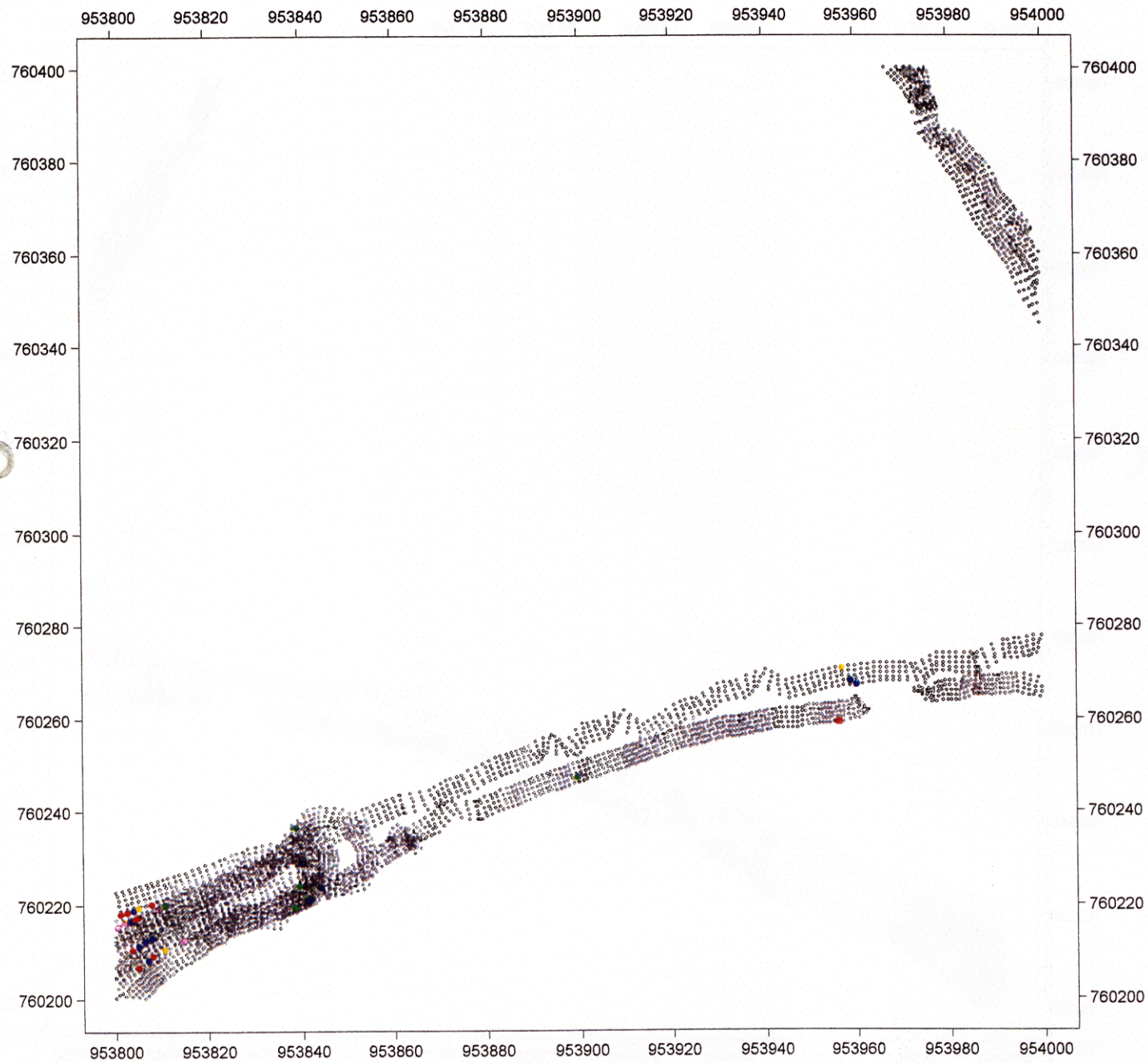
Site: SA_d19 ()

Signal: Array Signal (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



LOGGER Analyze v1.54m Track Map

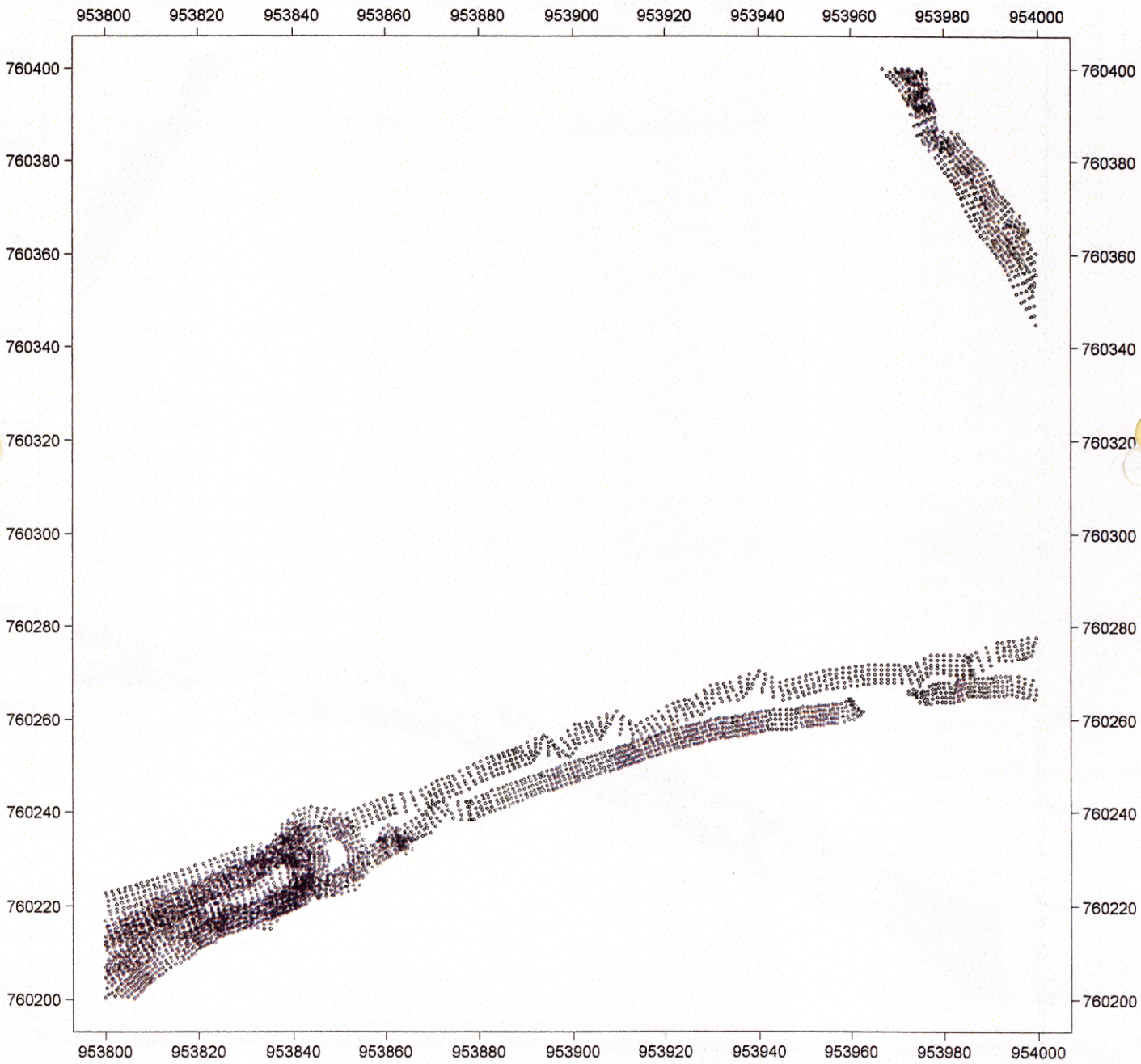
Site: SA_d19 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50 •

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



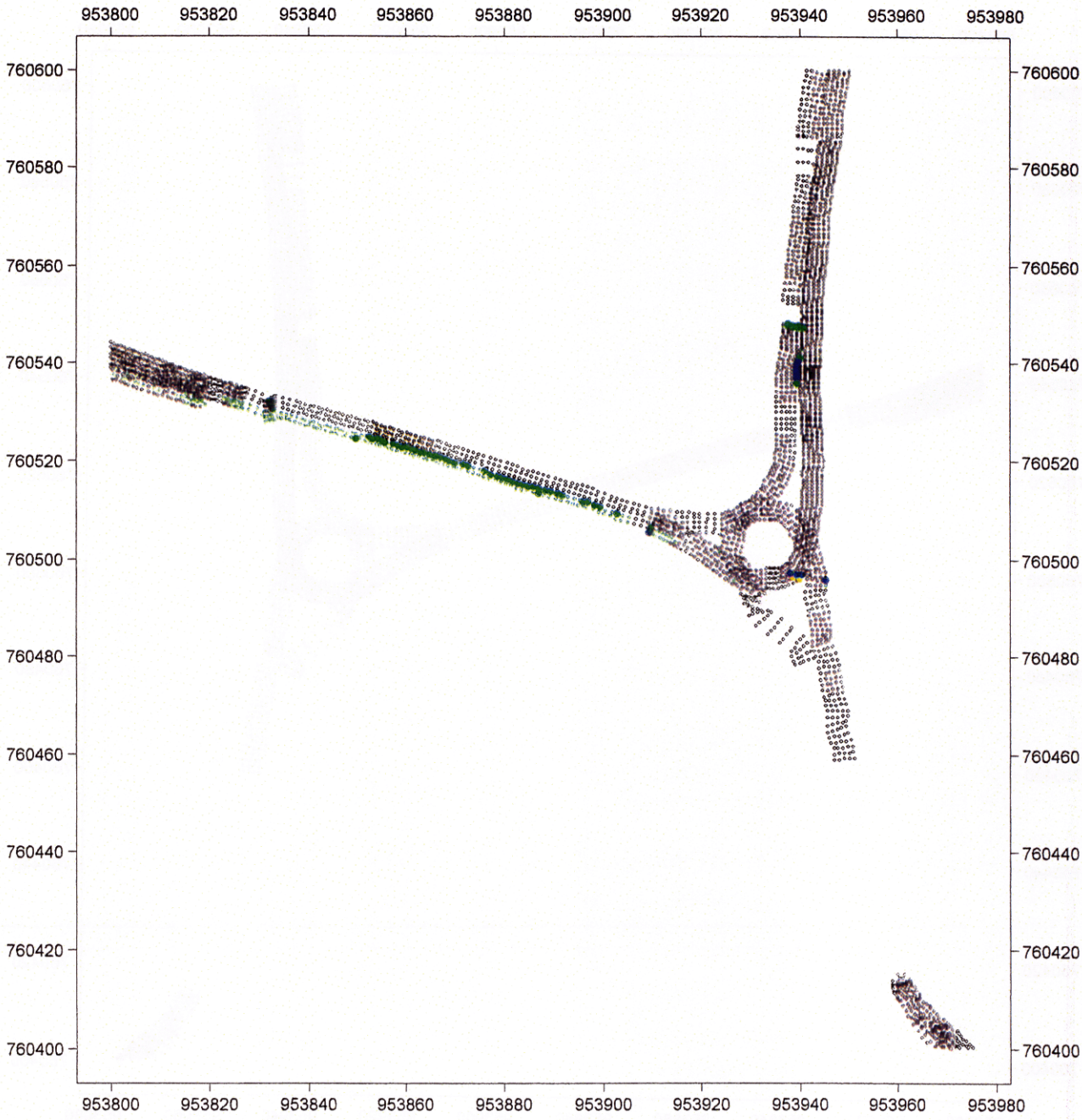
11455.9008

LOGGER Analyze v1.54m Track Map

Site: SA_d20 () **Signal: Array Signal (cps)** **Time:**

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



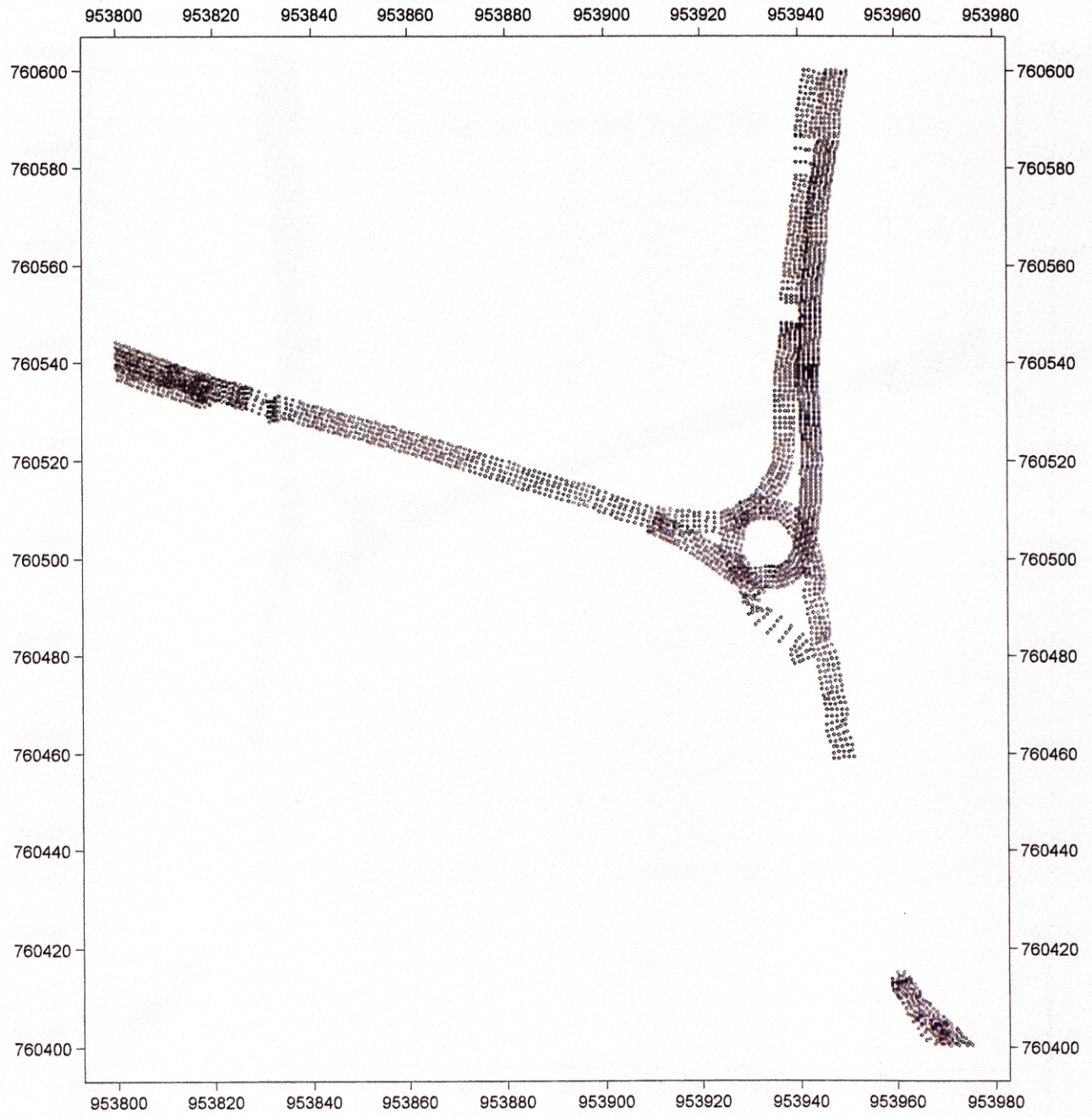
11455.9014

LOGGER Analyze v1.54m Track Map

Site: SA_d20 () **Signal: Array Background (cps)** **Time:**

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



LOGGER Analyze v1.54m Track Map

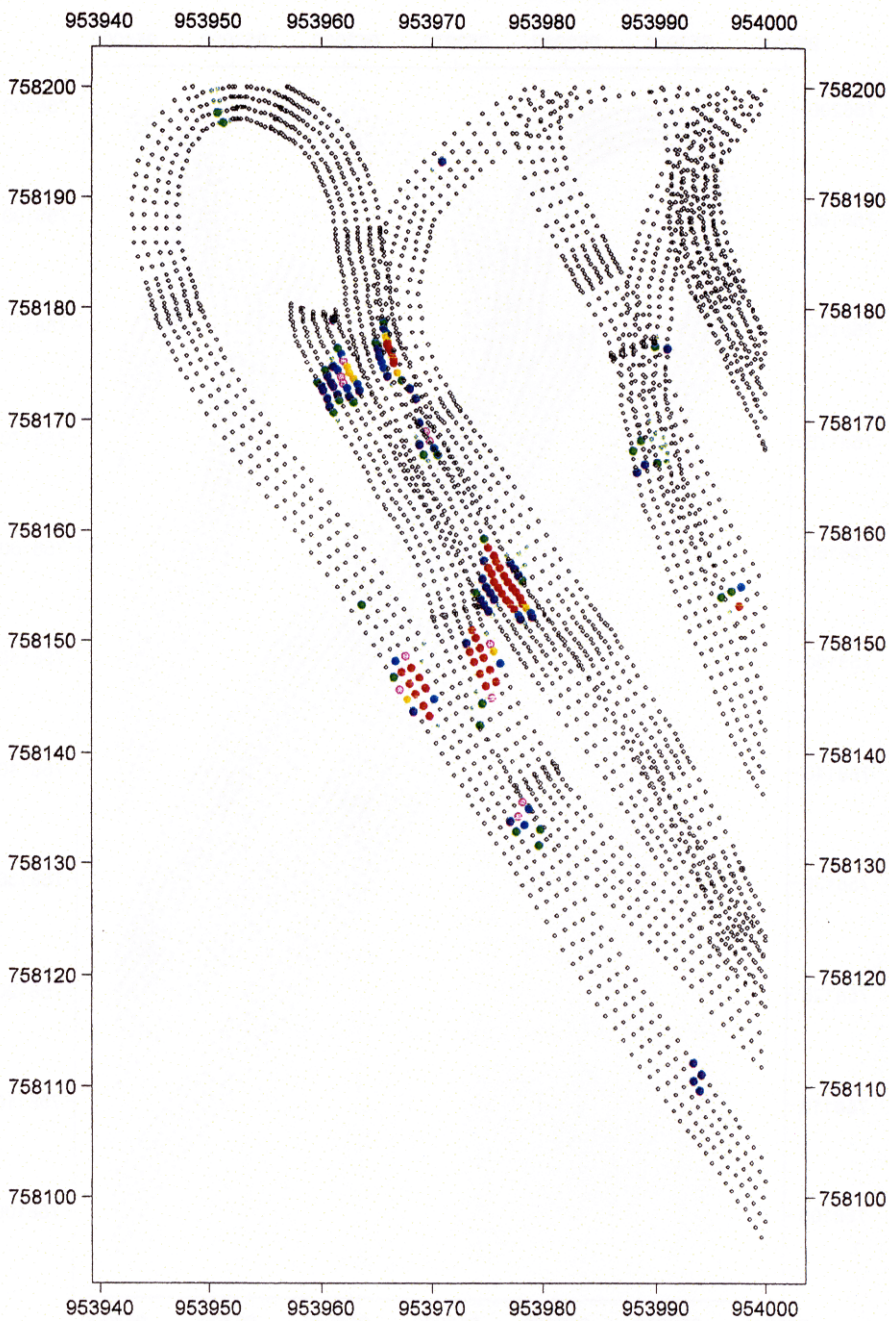
Site: SA_d8 ()

Signal: Array Signal (cps)

Time:

Threshold:
> 50 •

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



11455.8227

LOGGER Analyze v1.54m Track Map

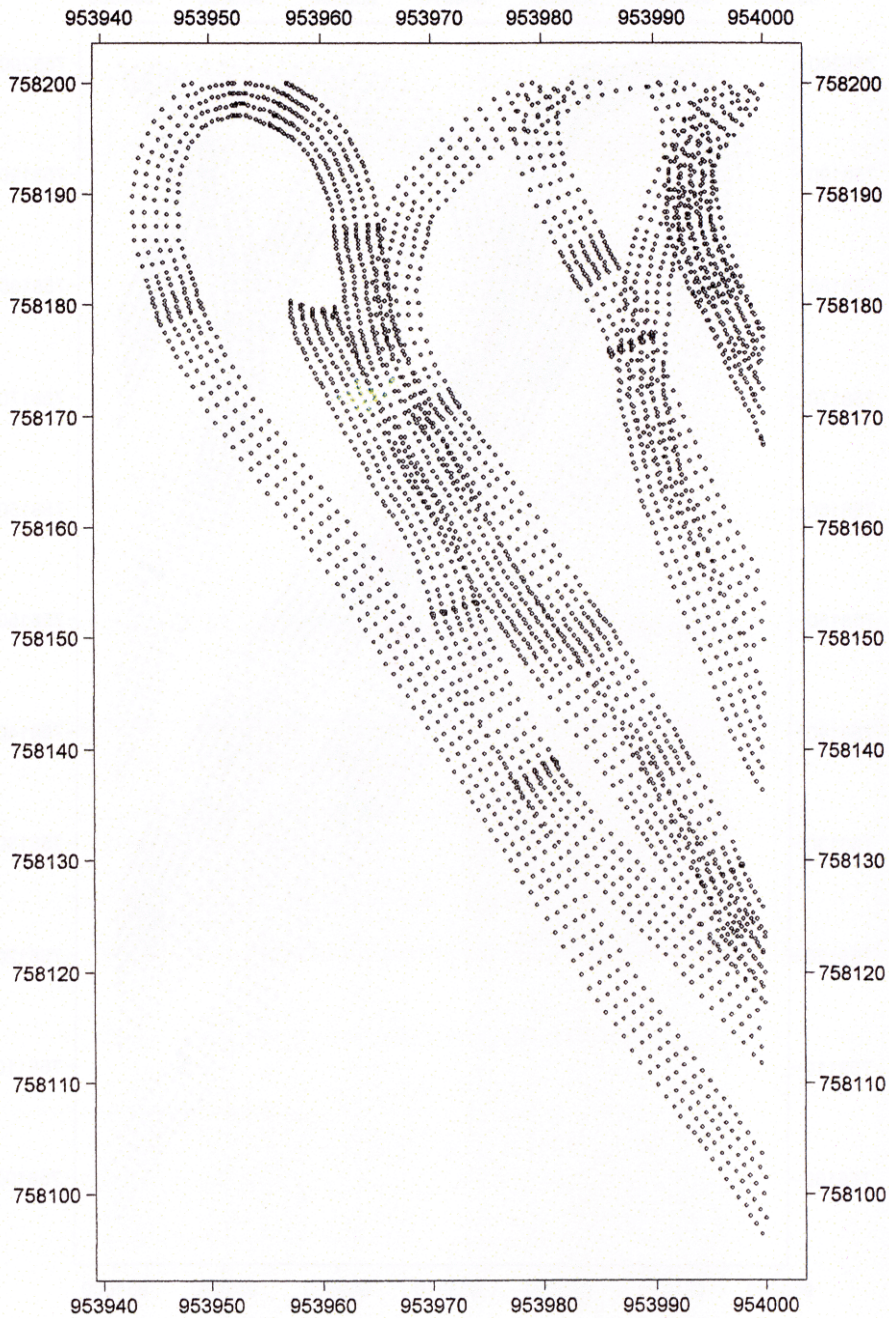
Site: SA_d8 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



LOGGER Analyze v1.54m Track Map

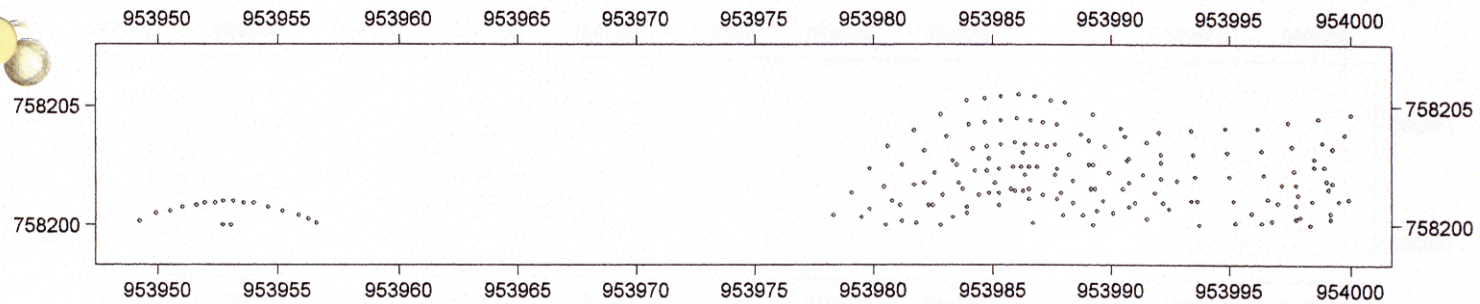
Site: SA_d9 ()

Signal: Array Signal (cps)

Time:

Threshold:
> 50 •

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



11455.8230

LOGGER Analyze v1.54m Track Map

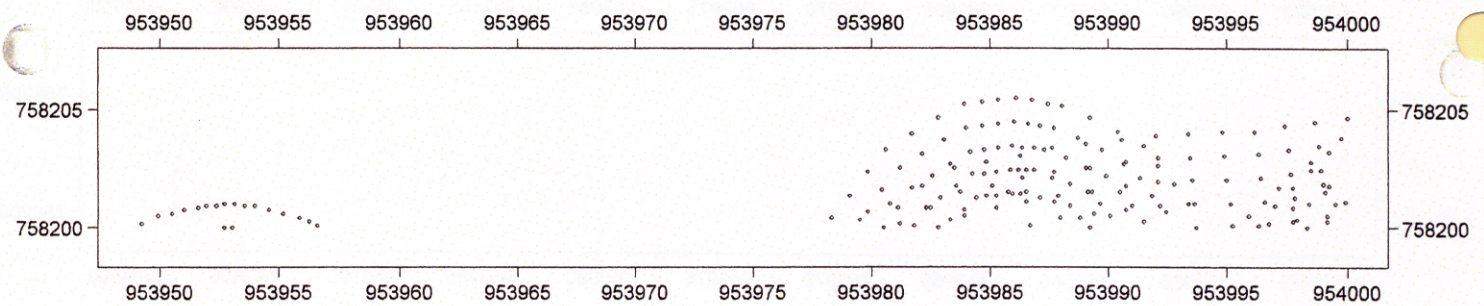
Site: SA_d9 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50 •

< 40	**100 to 120**
40 to 60	**120 to 140**
60 to 80	**> 140**
80 to 100	

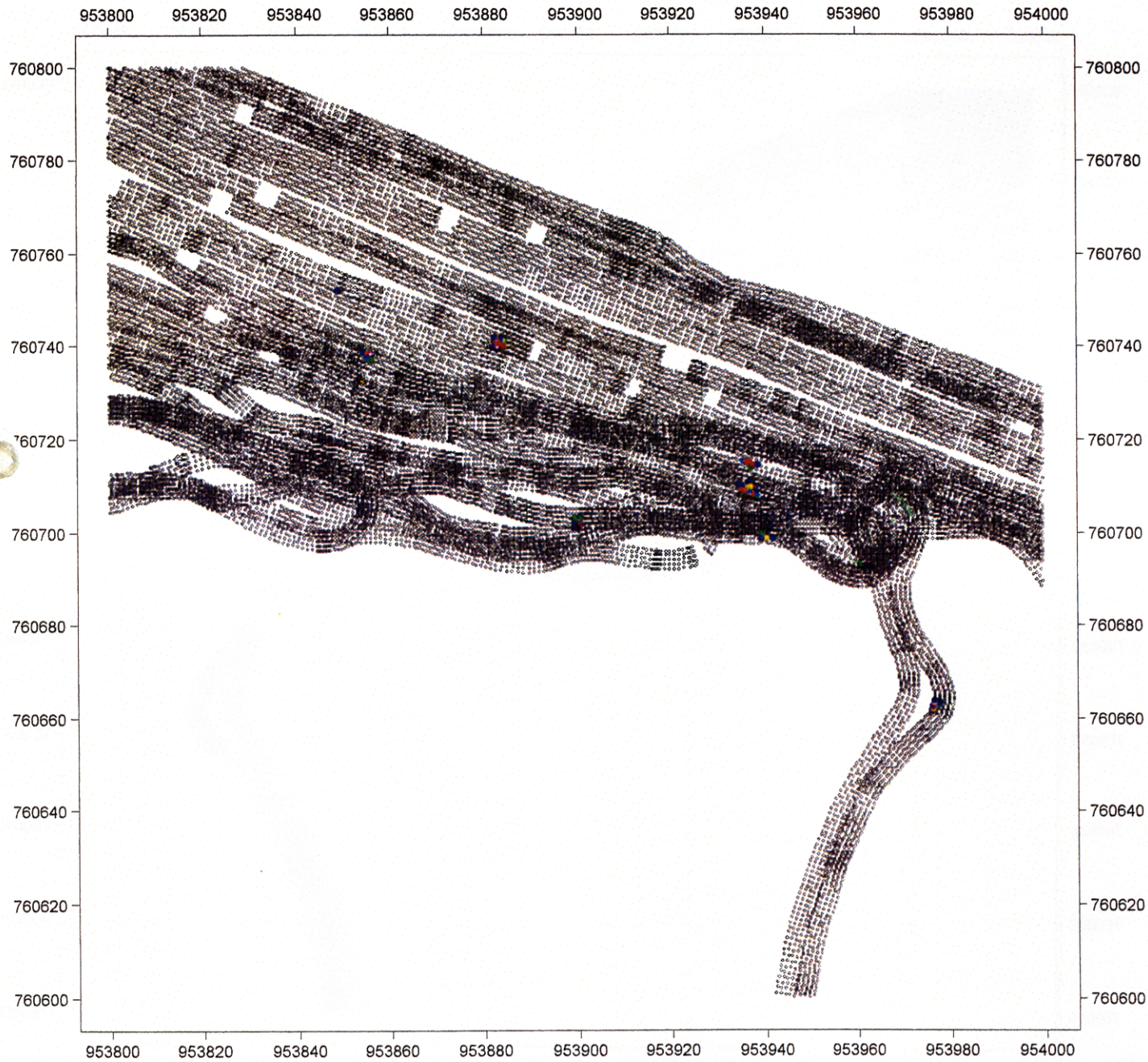


LOGGER Analyze v1.54m Track Map

Site: SA_d21 () **Signal: Array Signal (cps)** **Time:**

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



LOGGER Analyze v1.54m Track Map

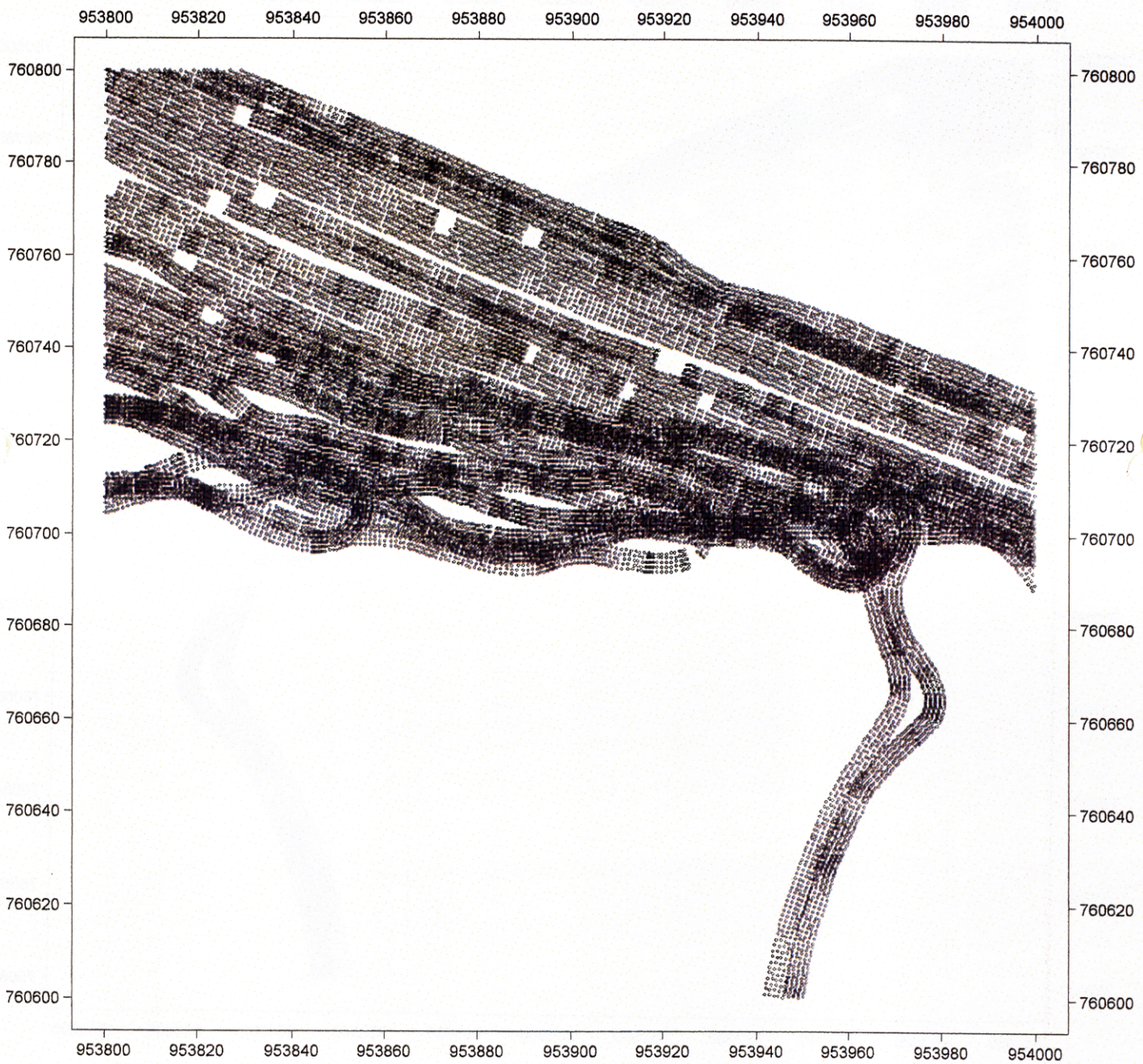
Site: SA_d21 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



11455.8216

LOGGER Analyze v1.54m Track Map

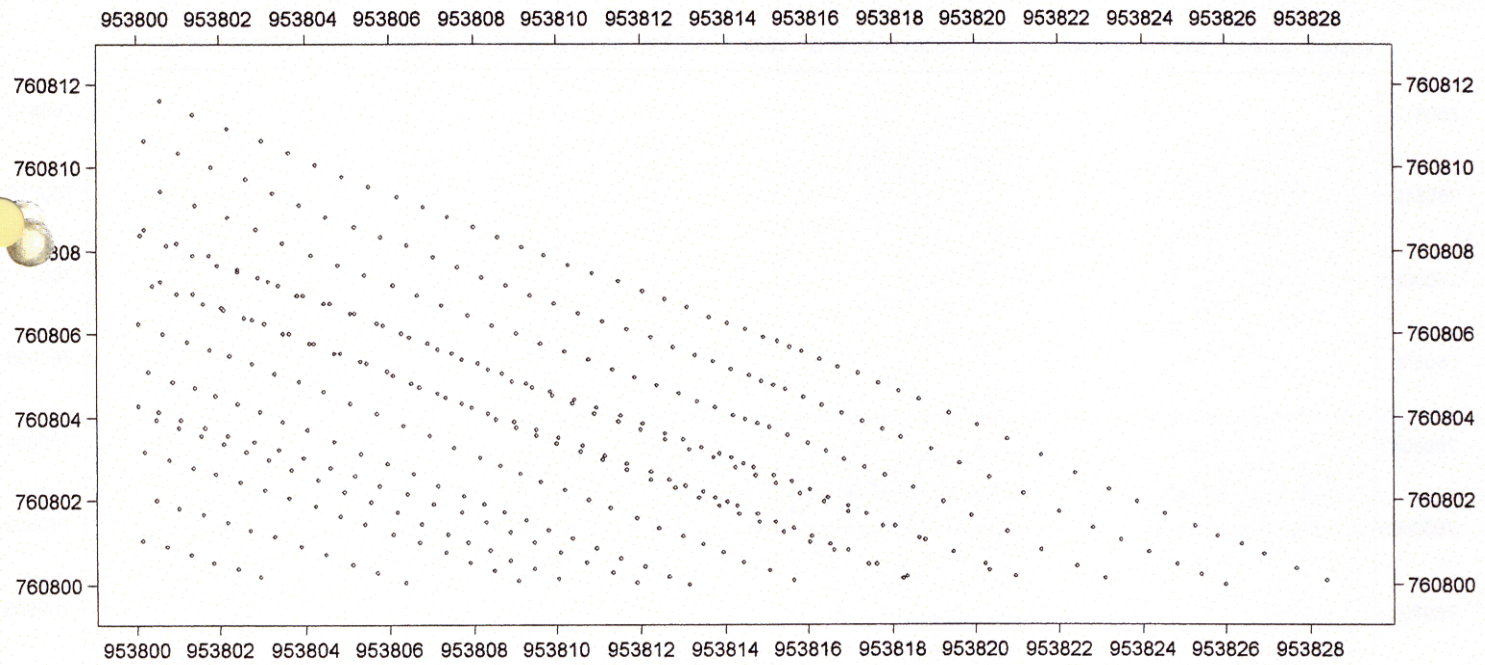
Site: SA_d22 ()

Signal: Array Signal (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



LOGGER Analyze v1.54m Track Map

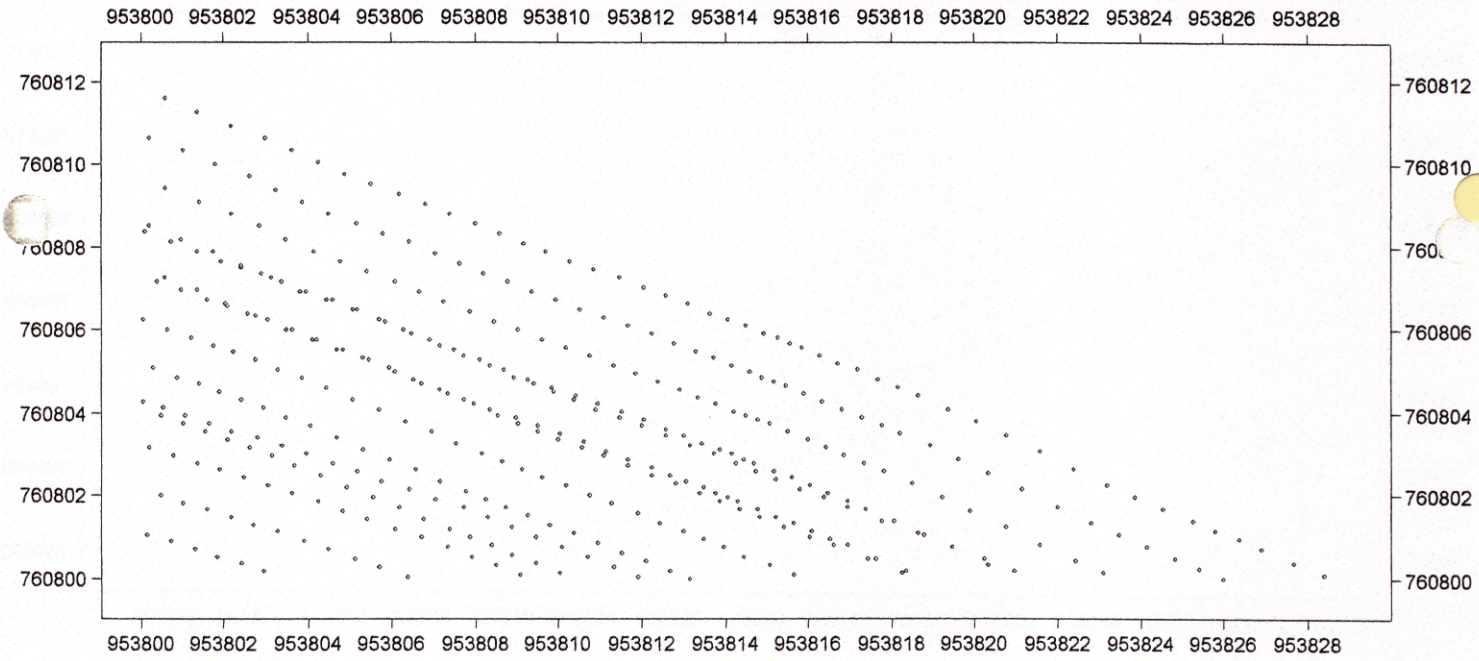
Site: SA_d22 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	

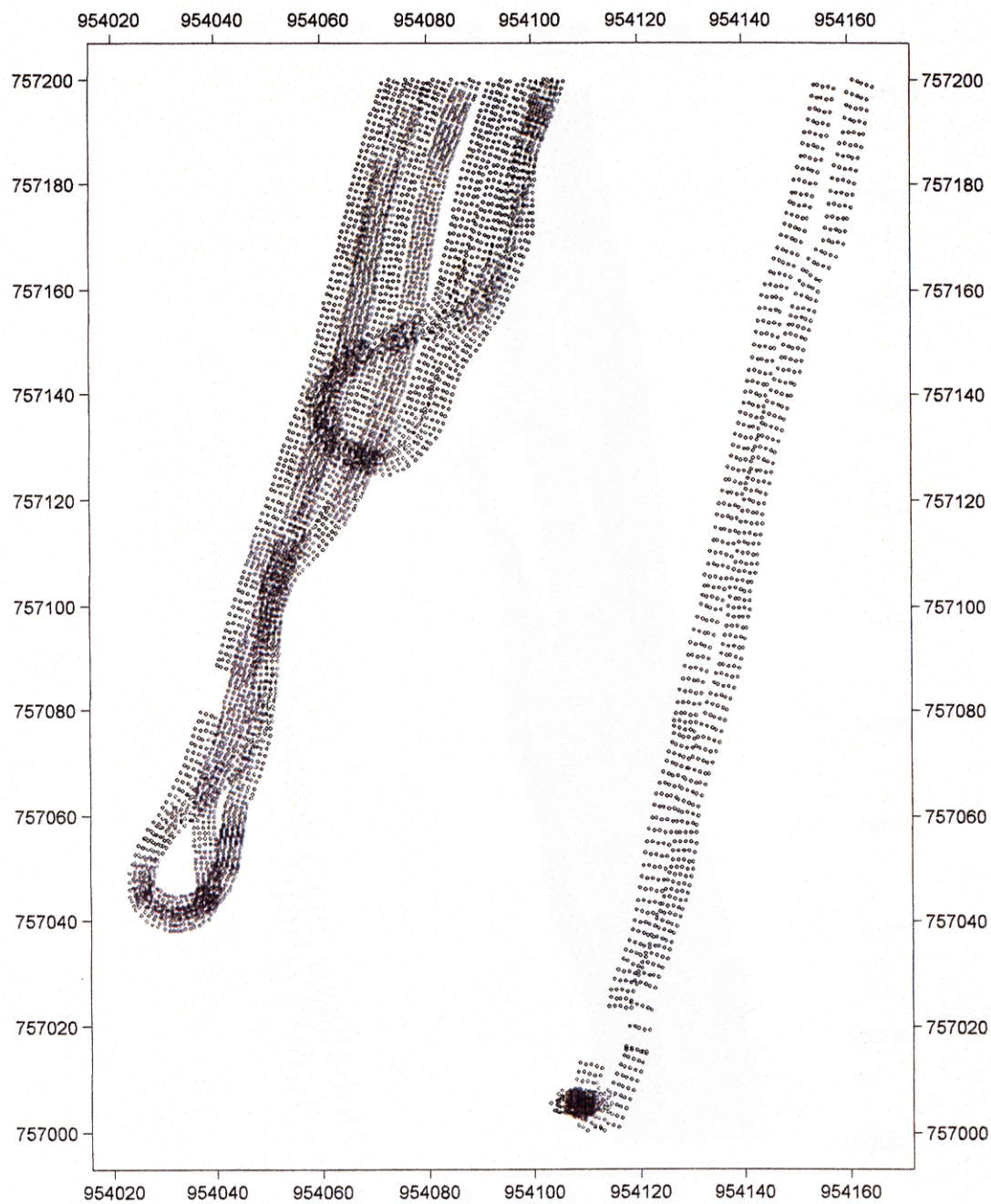


LOGGER Analyze v1.54m Track Map

Site: SA_e3 () **Signal: Array Background (cps)** **Time:**

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



LOGGER Analyze v1.54m Track Map

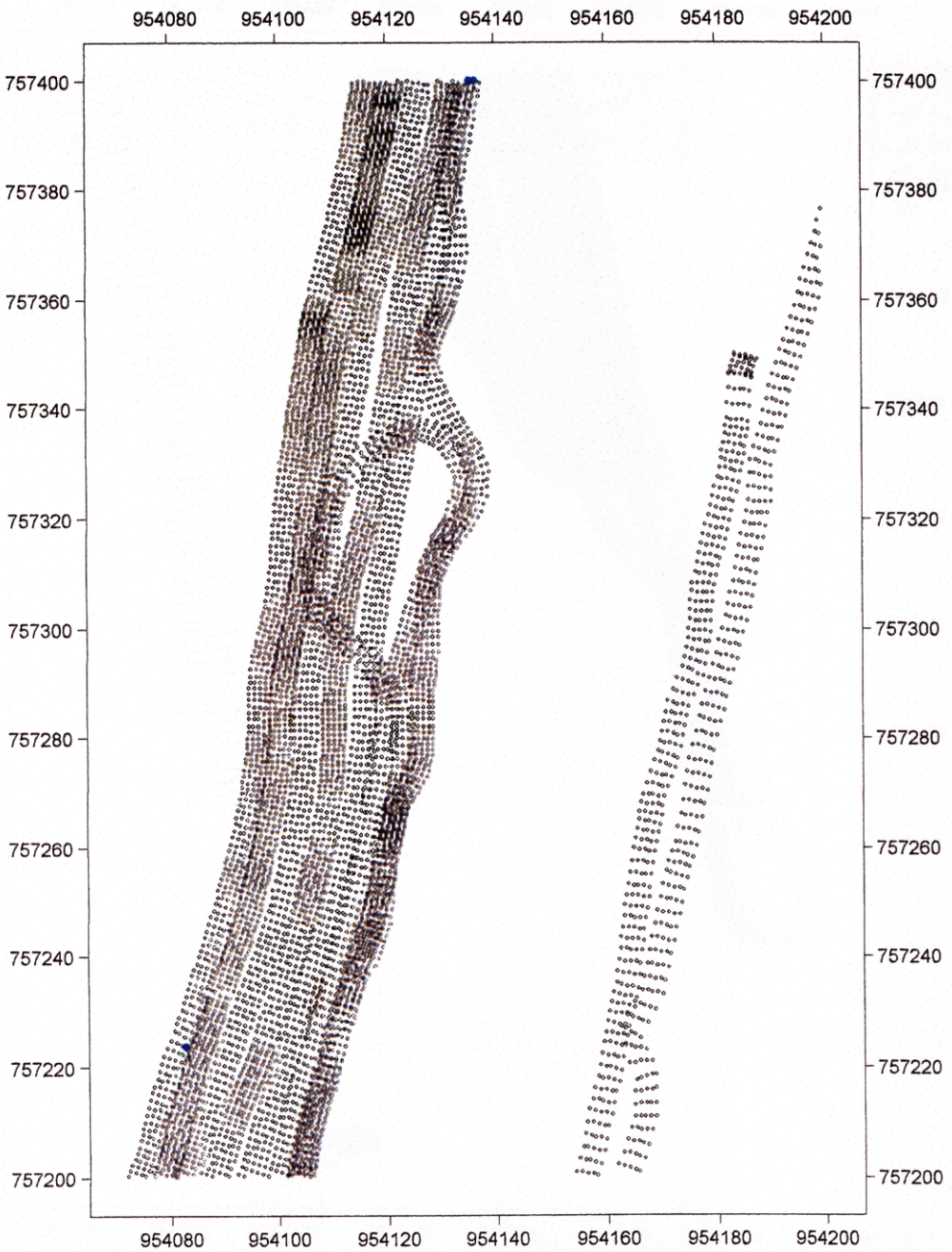
Site: SA_e4 ()

Signal: Array Signal (cps)

Time:

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140

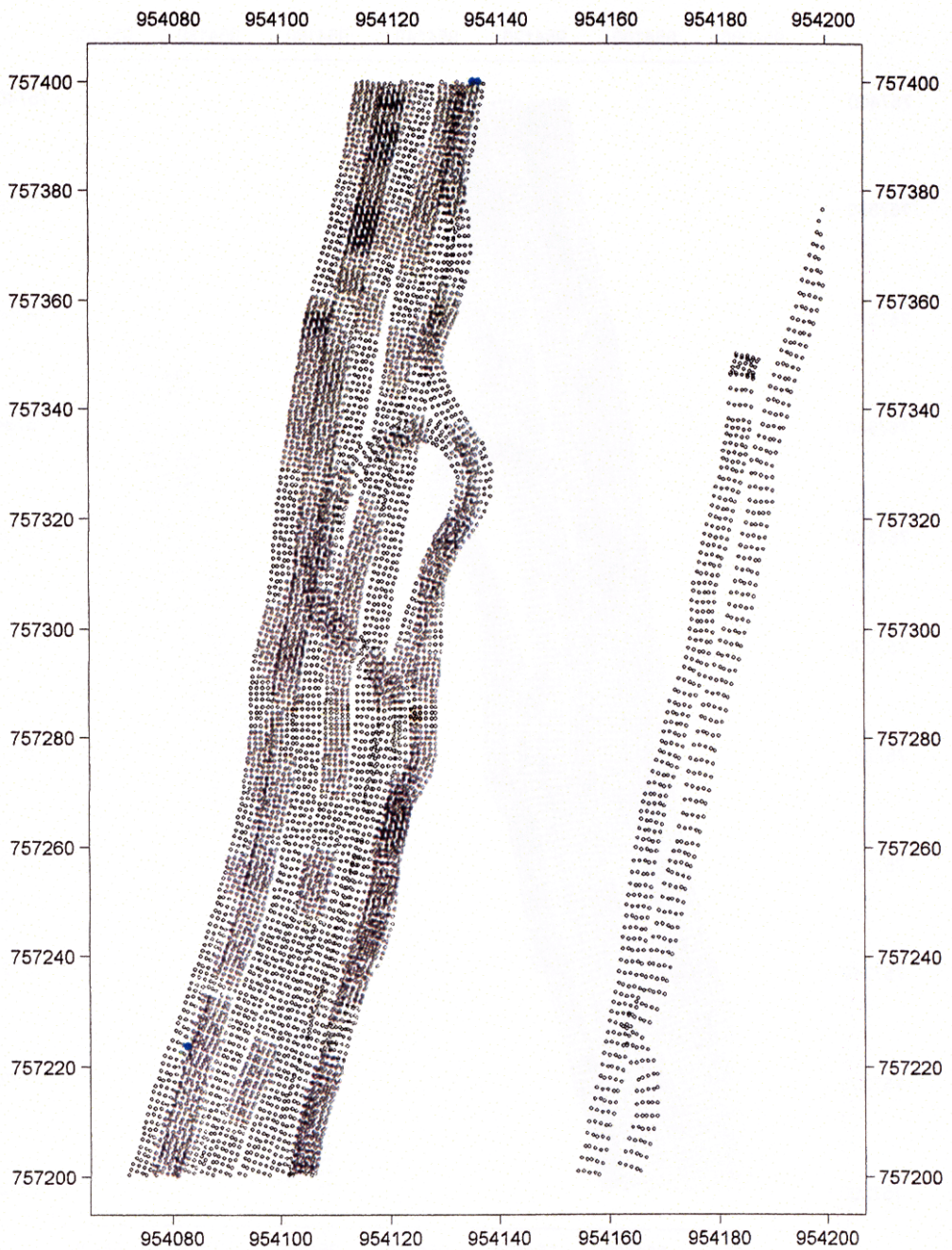


LOGGER Analyze v1.54m Track Map

Site: SA_e4 () **Signal: Array Signal (cps)** **Time:**

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



11455.8283

LOGGER Analyze v1.54m Track Map

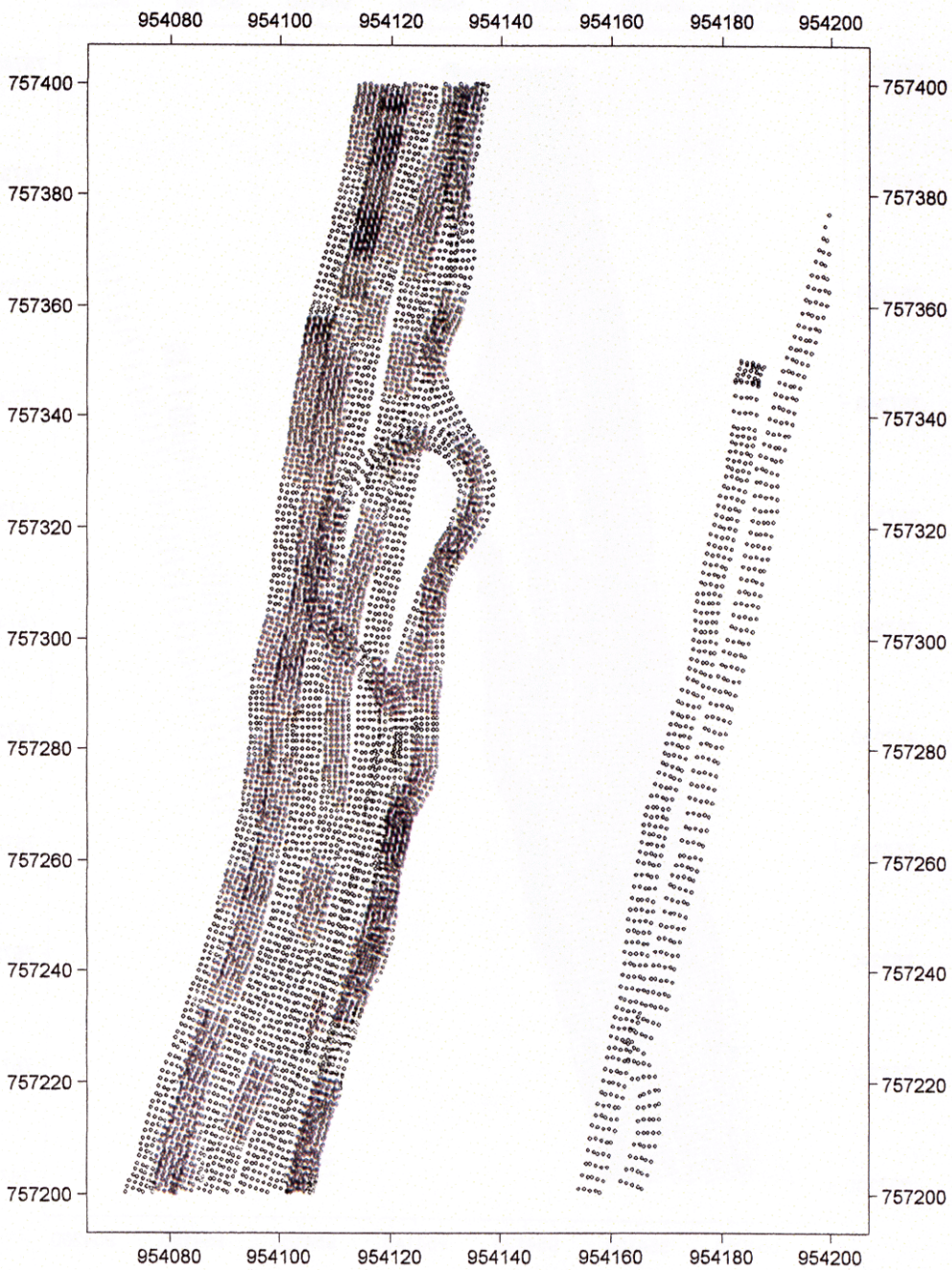
Site: SA_e4 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



11455.8283

LOGGER Analyze v1.54m Track Map

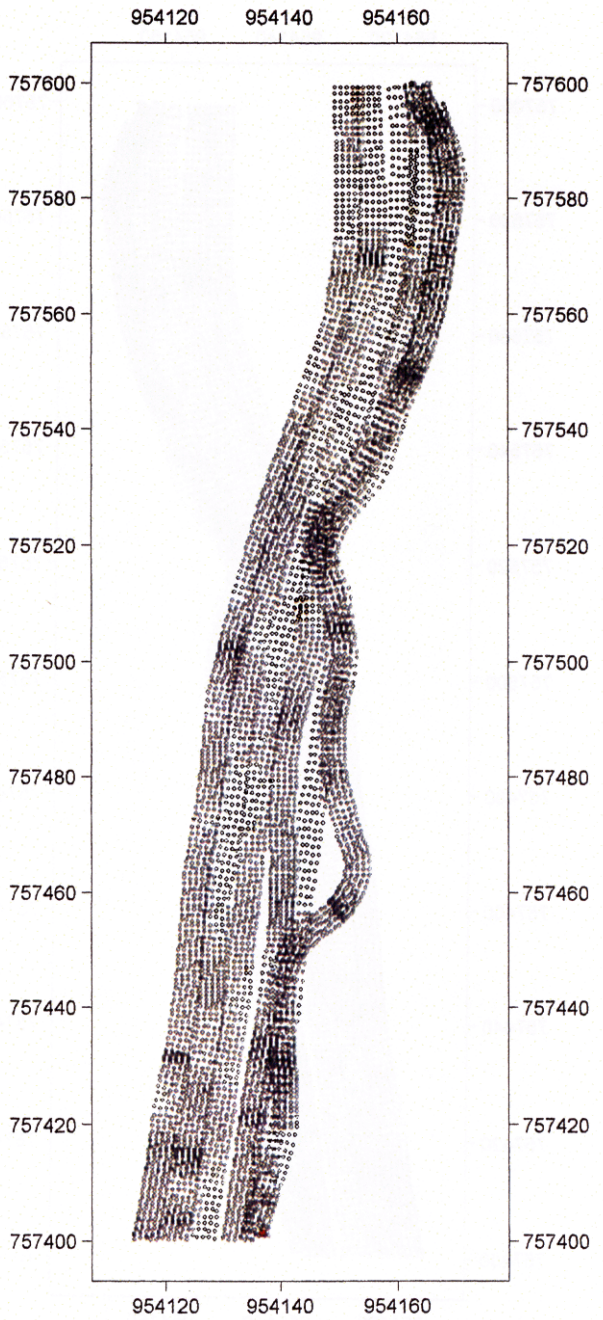
Site: SA_e5 ()

Signal: Array Signal (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



11455.8287

LOGGER Analyze v1.54m Track Map

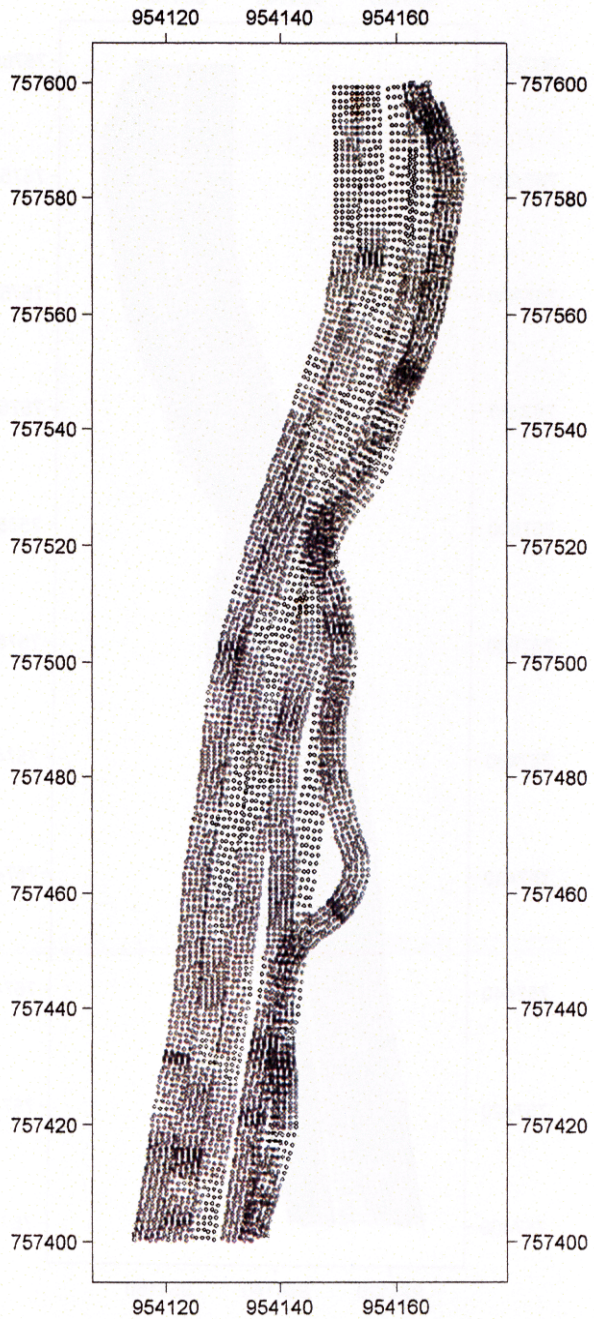
Site: SA_e5 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



LOGGER Analyze v1.54m Track Map

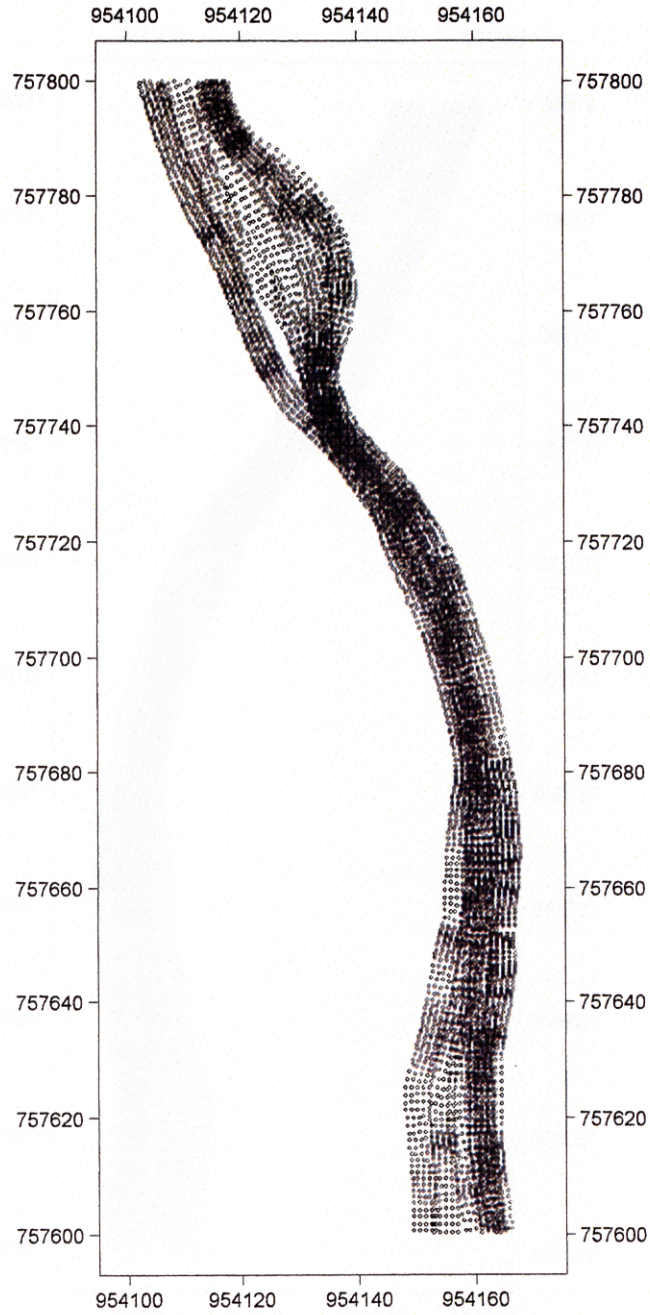
Site: SA_e6 ()

Signal: Array Signal (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



LOGGER Analyze v1.54m Track Map

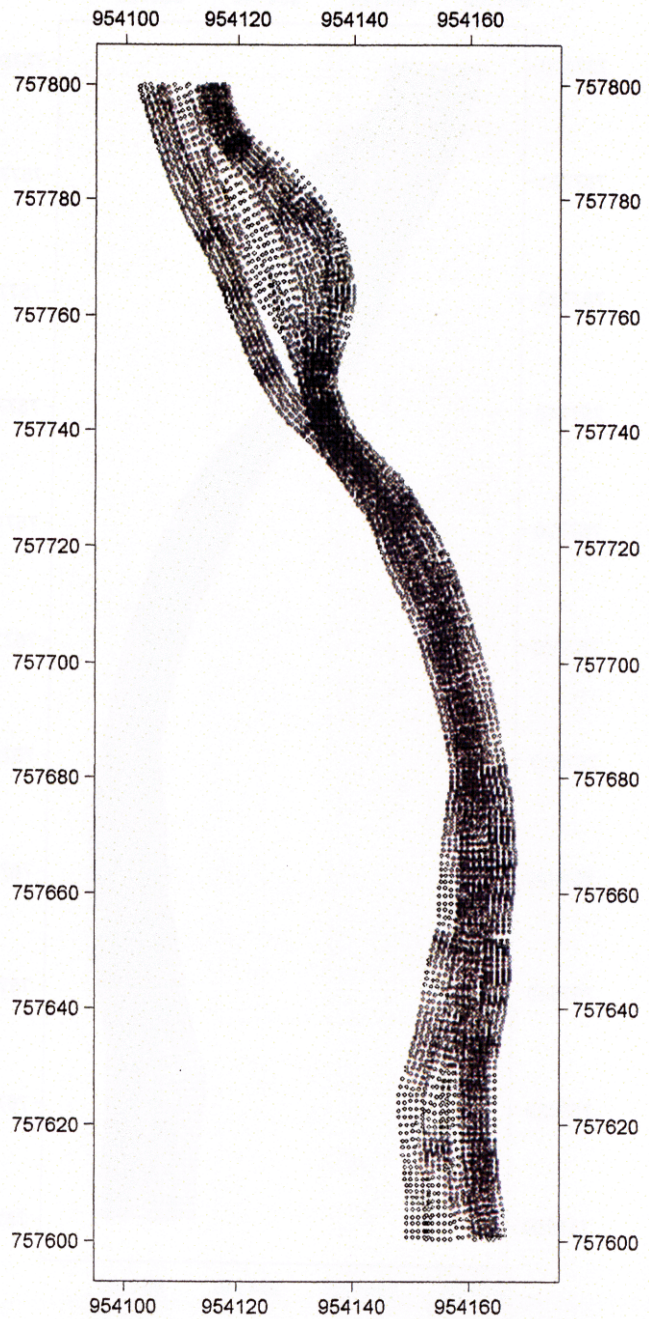
Site: SA_e6 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



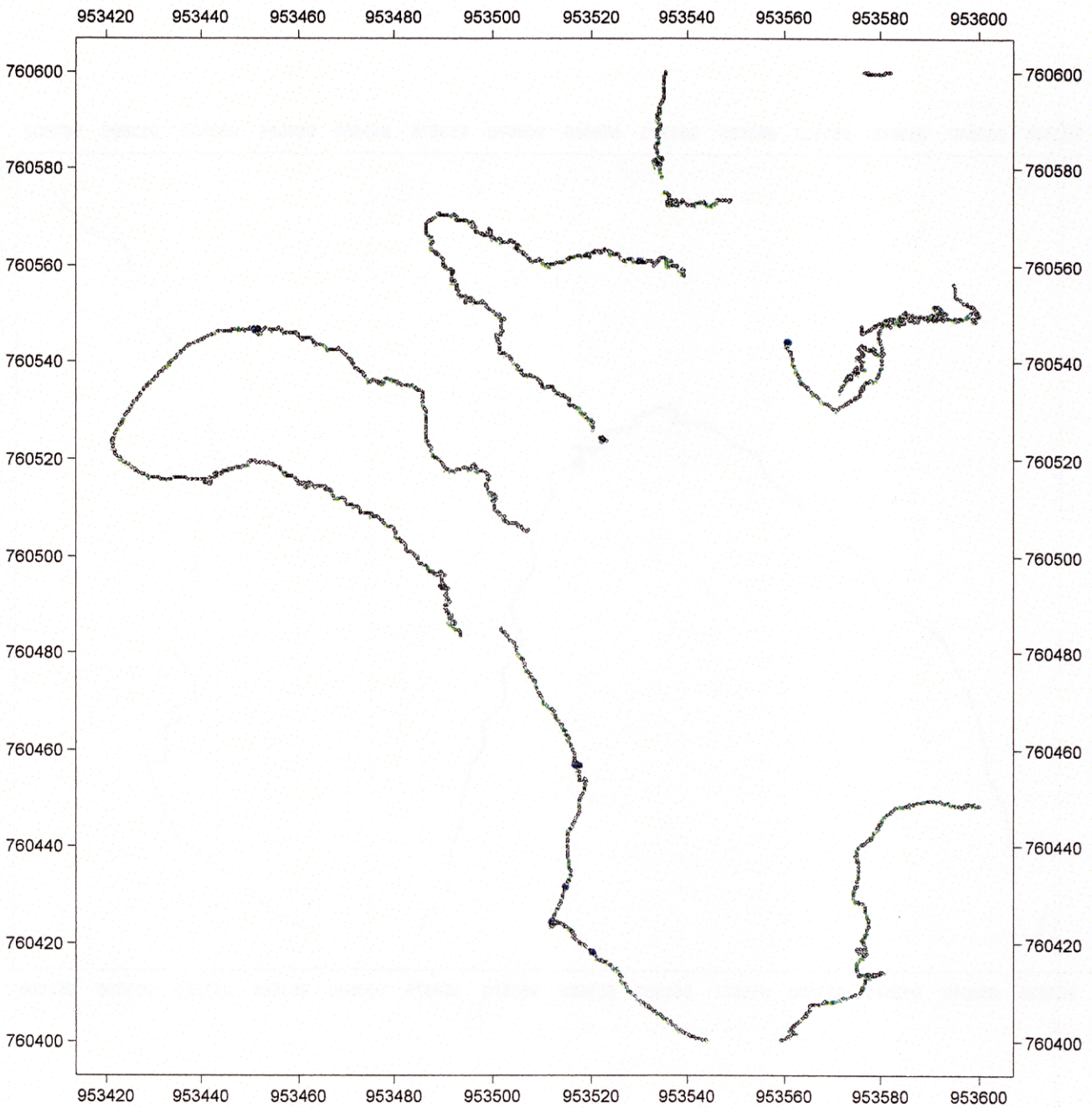
11455.8291

LOGGER Analyze v1.54m Track Map

Site: mpw_B20 () **Signal: Whites (cps)** **Time:**

Threshold:
> 60 •

< 50
50 to 60
60 to 70
70 to 80
80 to 90
90 to 100
> 100



1456.7265

LOGGER Analyze v1.54m Track Map

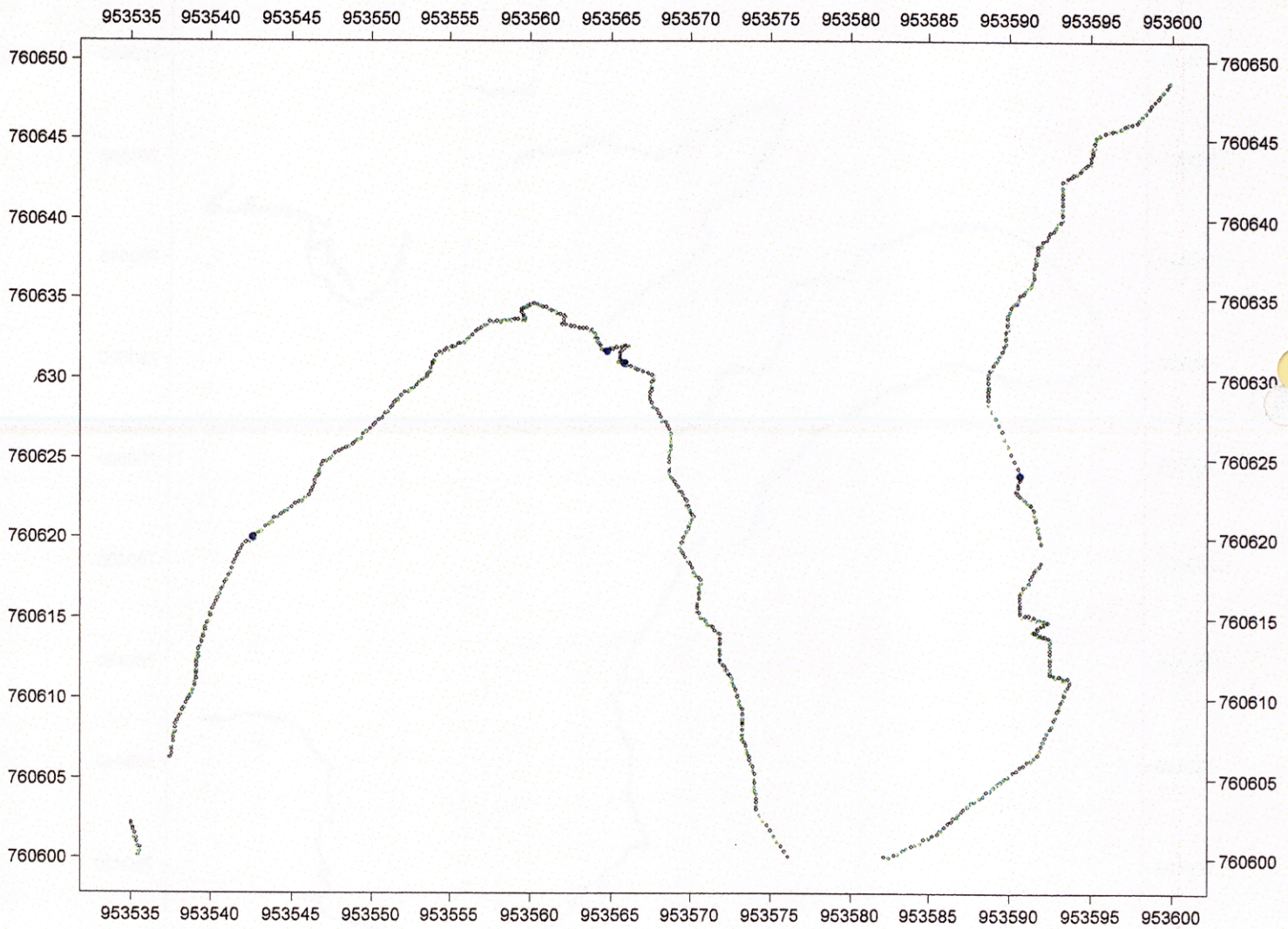
Site: mpw_B21 ()

Signal: Whites (cps)

Time:

Threshold:
> 60

< 50	80 to 90
50 to 60	90 to 100
60 to 70	> 100
70 to 80	

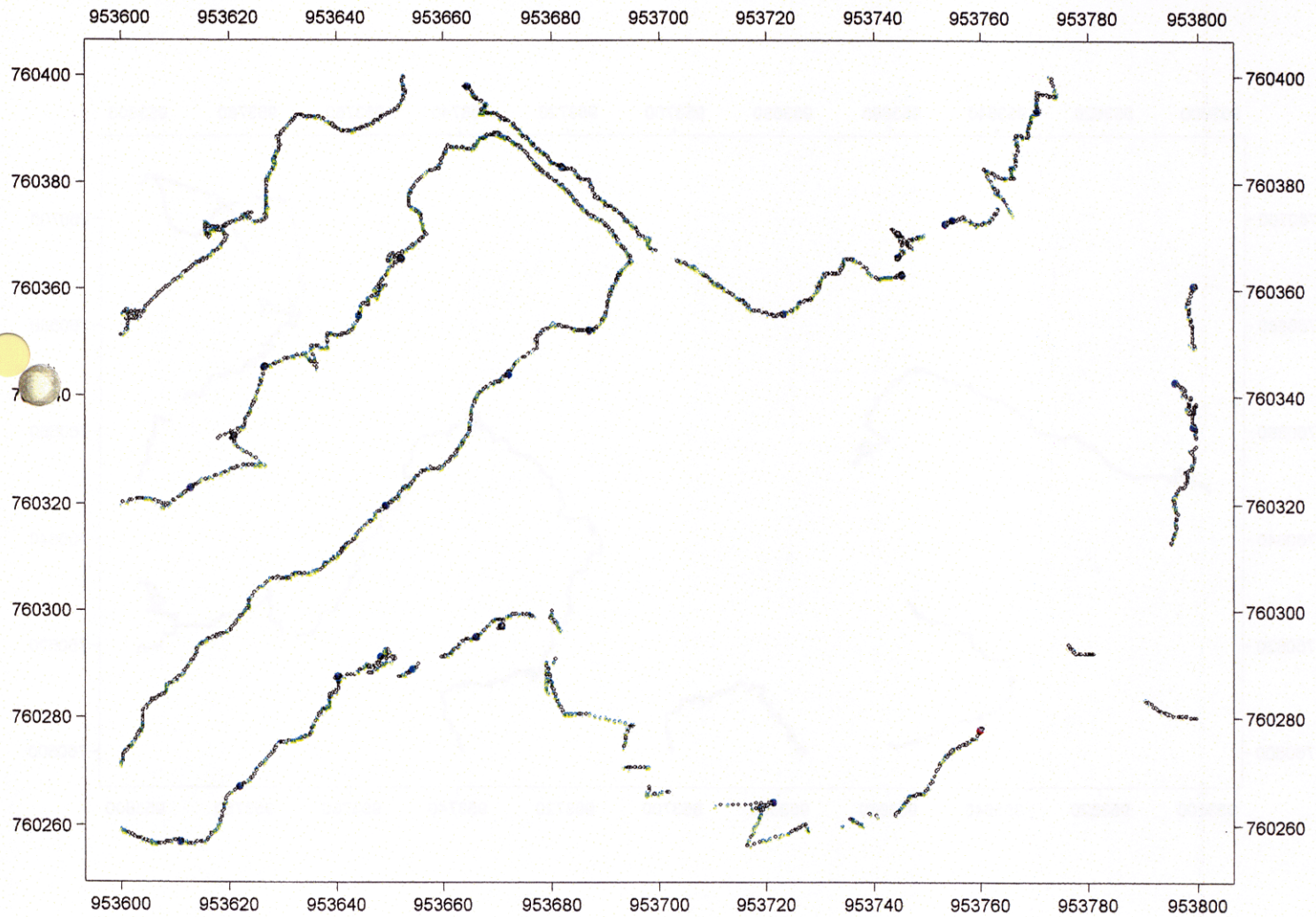


LOGGER Analyze v1.54m Track Map

Site: mpw_c19 () **Signal: Whites (cps)** **Time:**

Threshold:
> 60

< 50	**80 to 90**
50 to 60	**90 to 100**
60 to 70	**> 100**
70 to 80	



11456.7270

LOGGER Analyze v1.54m Track Map

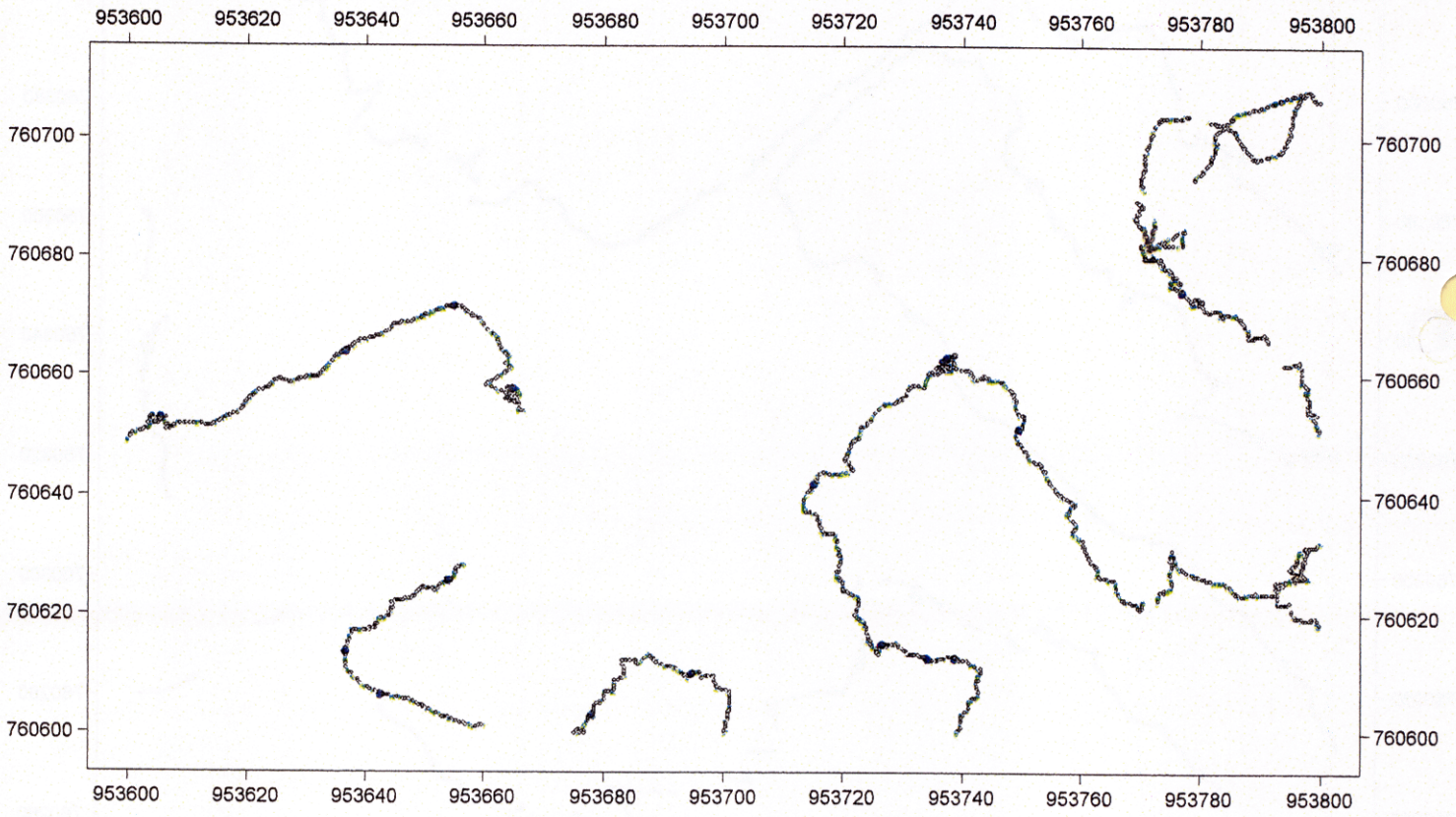
Site: mpw_c21 ()

Signal: Whites (cps)

Time:

Threshold:
> 60 •

< 50	80 to 90
50 to 60	90 to 100
60 to 70	> 100
70 to 80	



11456.7279

LOGGER Analyze v1.54m Track Map

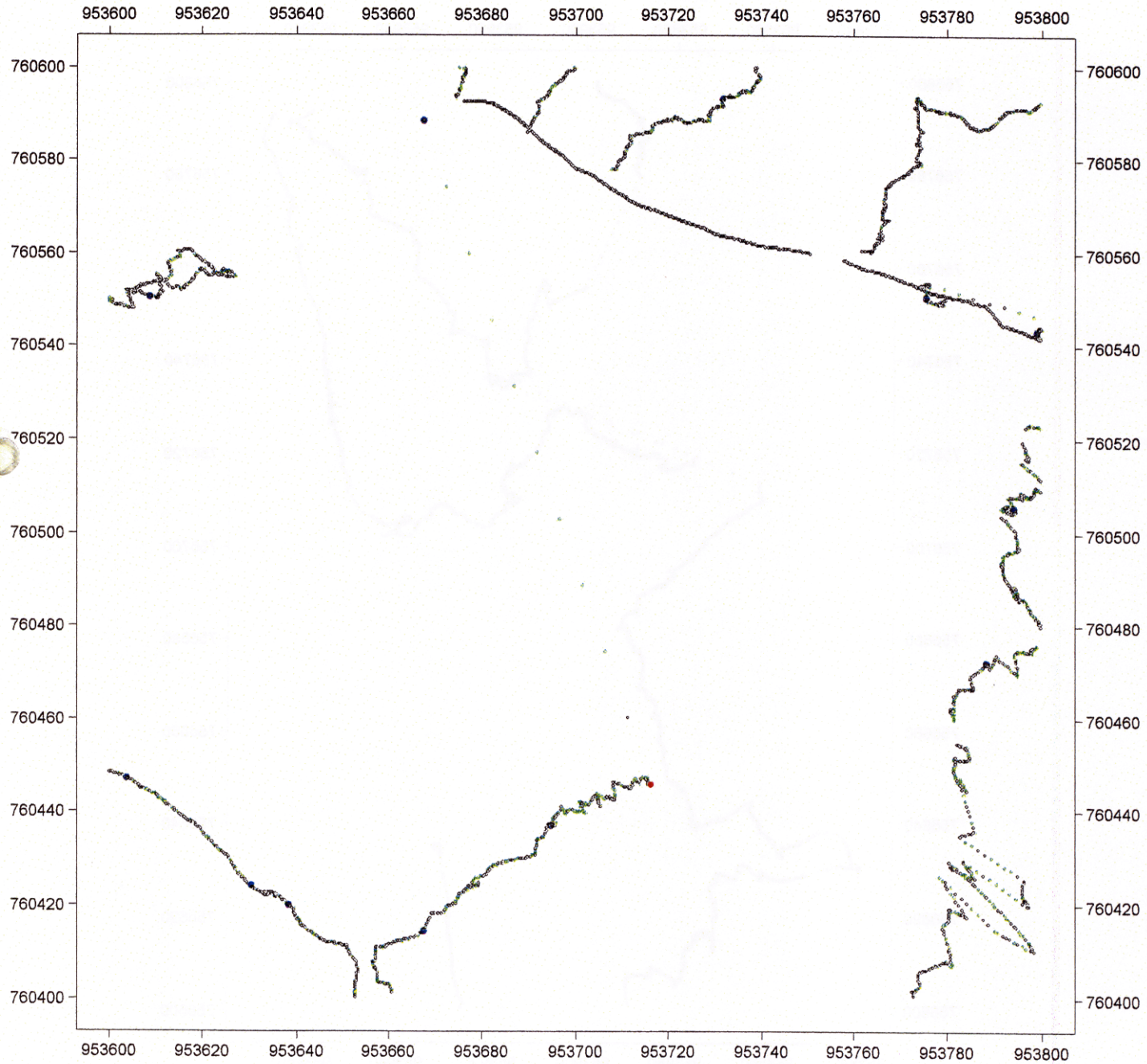
Site: mpw_c20 ()

Signal: Whites (cps)

Time:

Threshold:
> 60

< 50	80 to 90
50 to 60	90 to 100
60 to 70	> 100
70 to 80	



11456.7275

LOGGER Analyze v1.54m Track Map

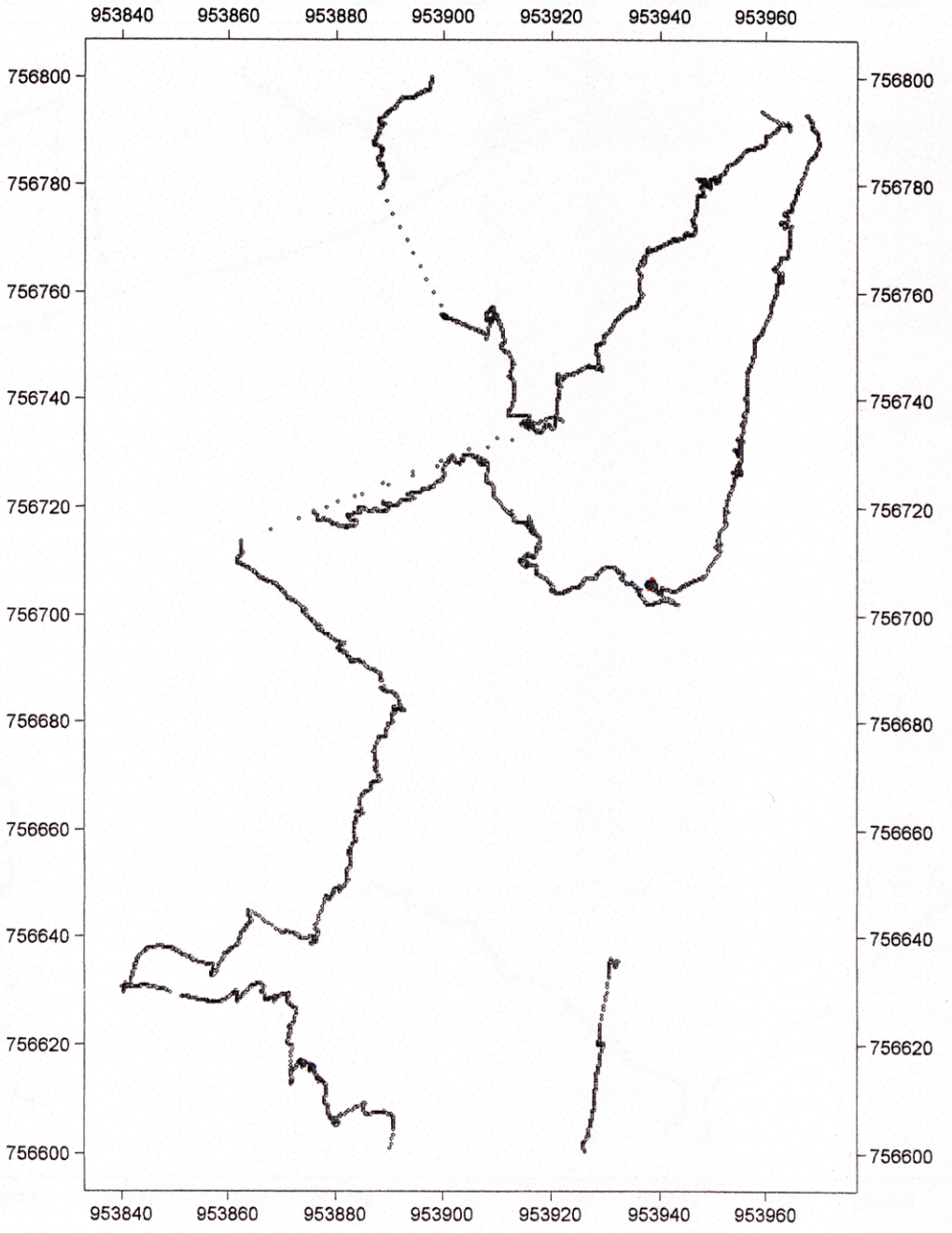
Site: mpw_d1 ()

Signal: Whites (cps)

Time:

Threshold:
> 60 •

< 50	80 to 90
50 to 60	90 to 100
60 to 70	> 100
70 to 80	



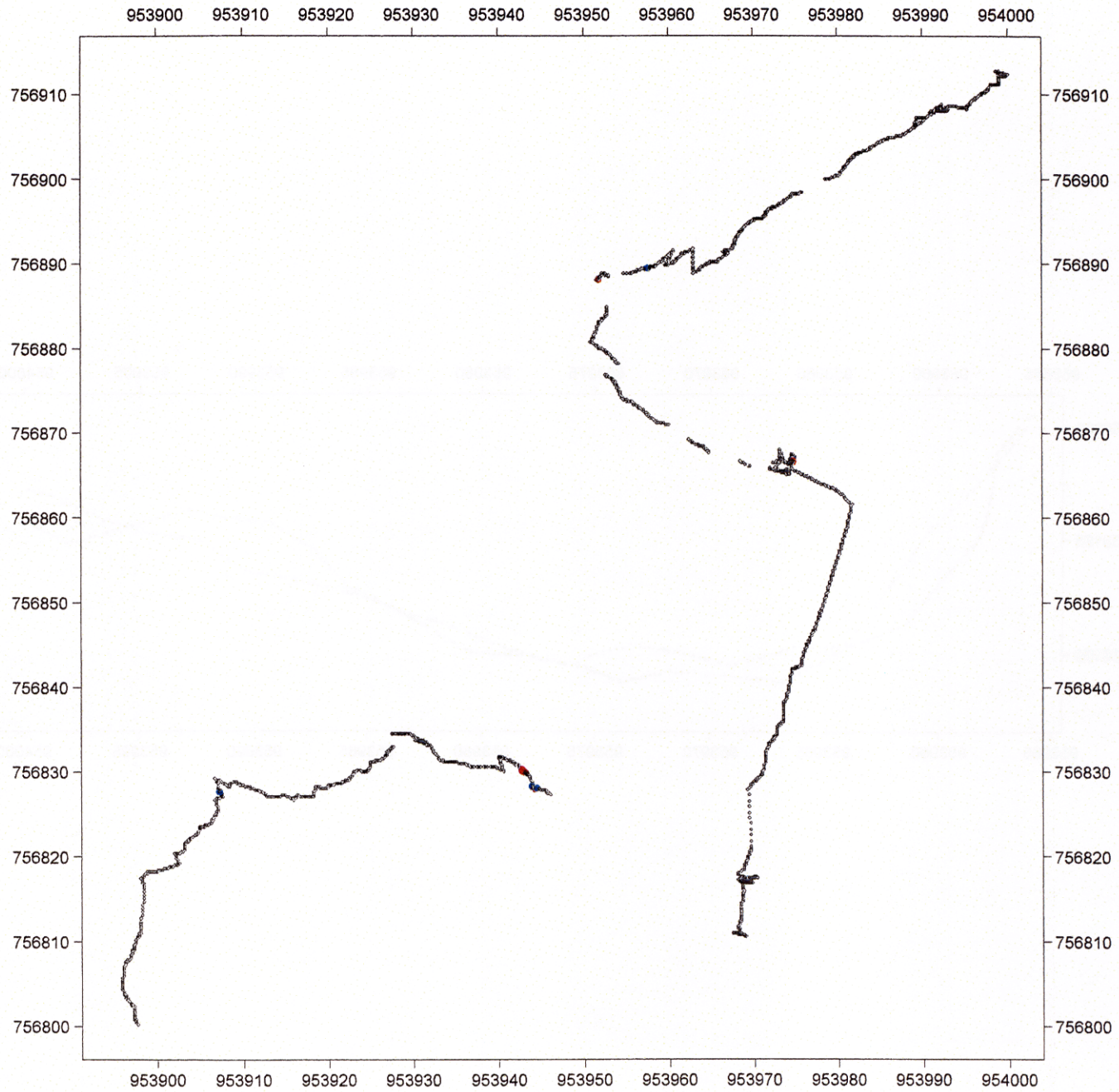
11456.7283

LOGGER Analyze v1.54m Track Map

Site: mpw_d2 () **Signal: Whites (cps)** **Time:**

Threshold:
> 60

< 50
50 to 60
60 to 70
70 to 80
80 to 90
90 to 100
> 100



LOGGER Analyze v1.54m Track Map

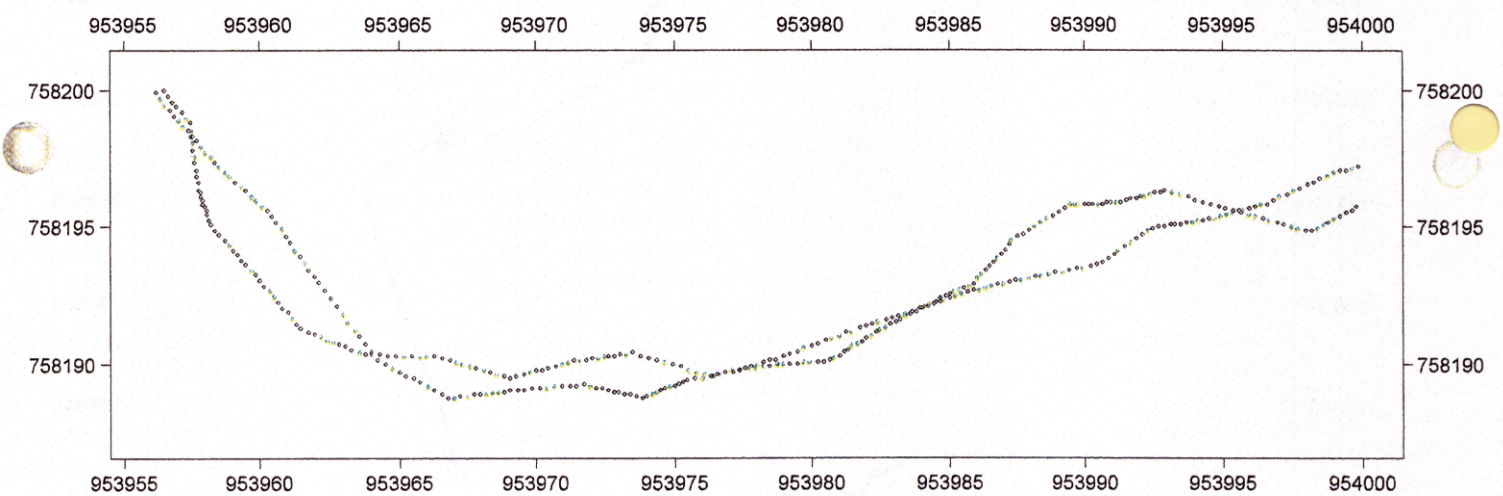
Site: mpw_d8 ()

Signal: Whites (cps)

Time:

Threshold:
> 60

< 50	80 to 90
50 to 60	90 to 100
60 to 70	> 100
70 to 80	



LOGGER Analyze v1.54m Track Map

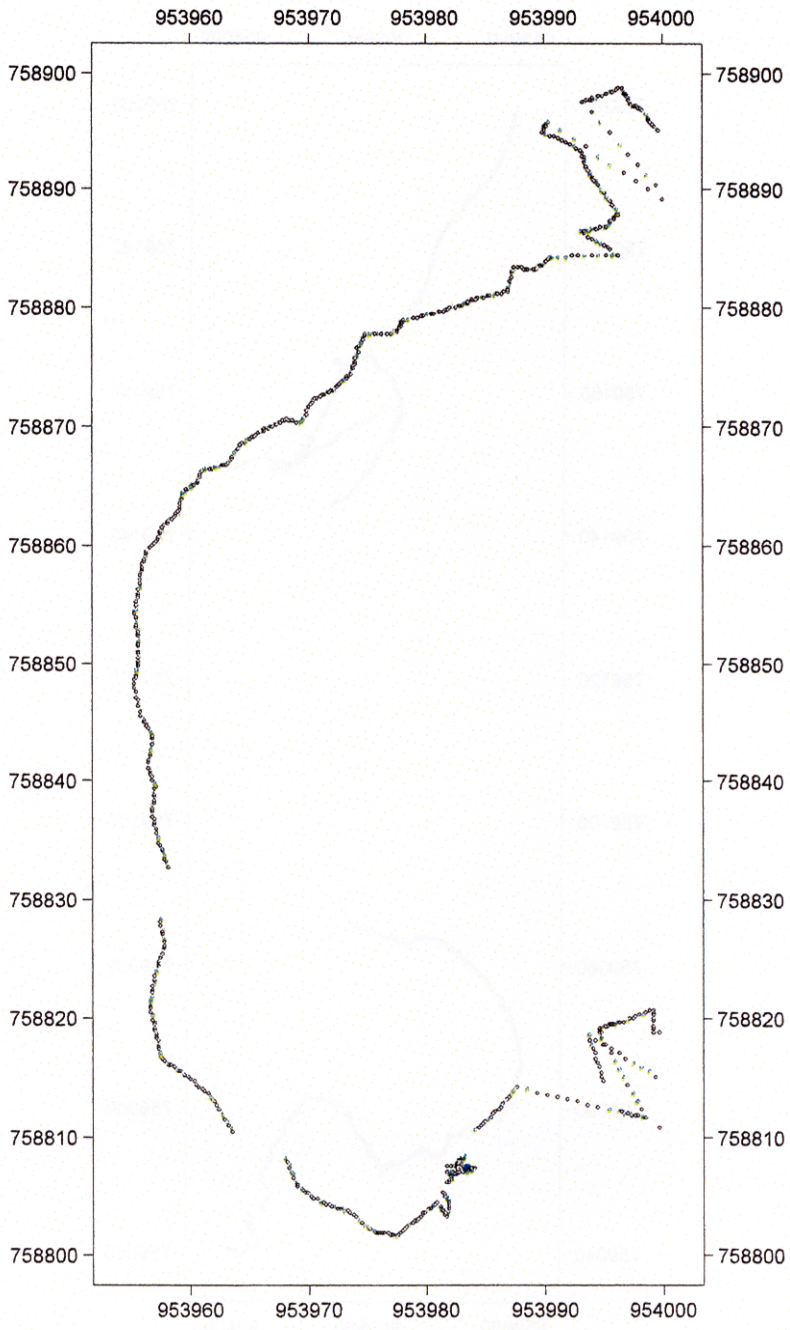
Site: mpw_d12 ()

Signal: Whites (cps)

Time:

Threshold:
> 60

< 50
50 to 60
60 to 70
70 to 80
80 to 90
90 to 100
> 100



11456.7285

LOGGER Analyze v1.54m Track Map

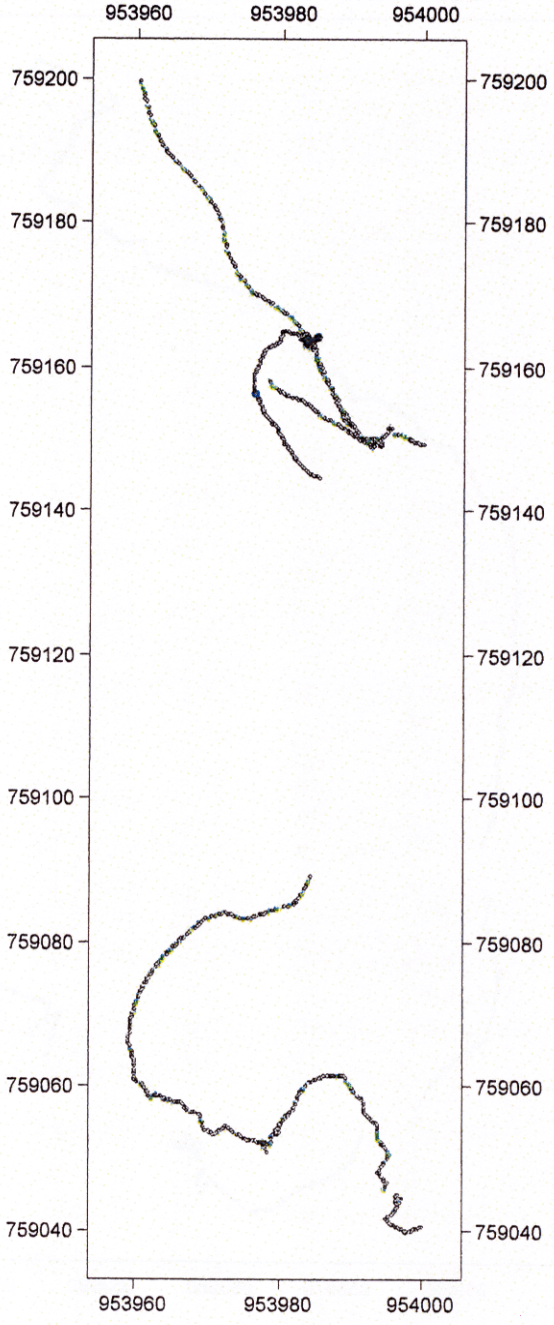
Site: mpw_d13 ()

Signal: Whites (cps)

Time:

Threshold:
> 60

< 50
50 to 60
60 to 70
70 to 80
80 to 90
90 to 100
> 100



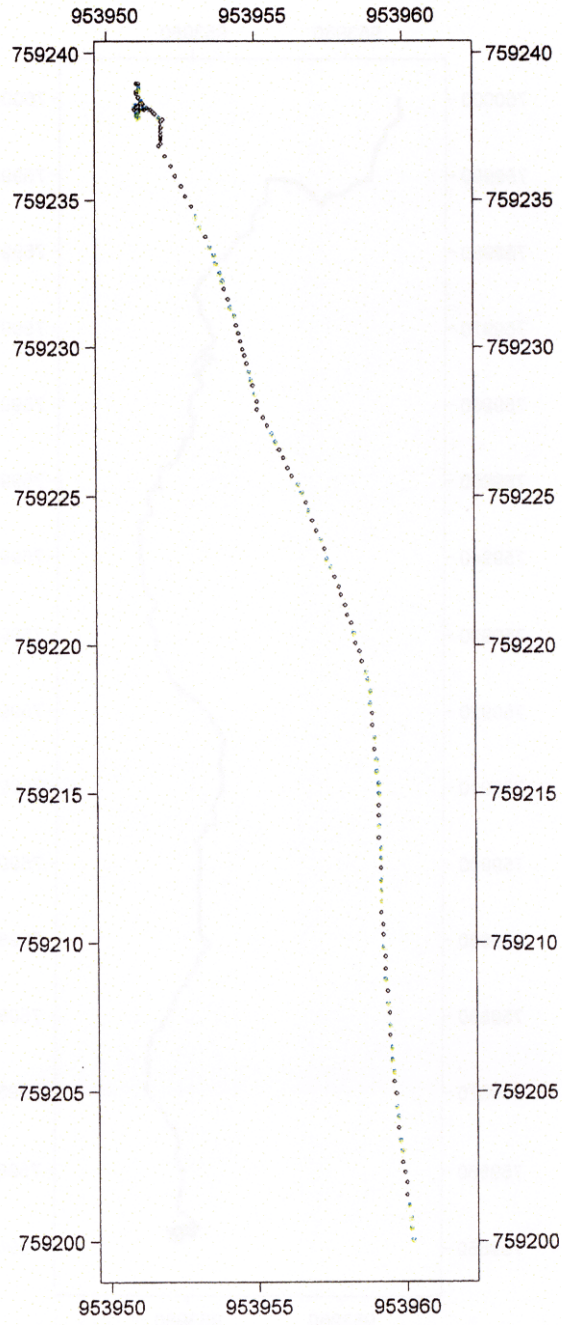
11456.7287

LOGGER Analyze v1.54m Track Map

Site: mpw_d14 () **Signal: Whites (cps)** **Time:**

Threshold:
> 60 •

< 50
50 to 60
60 to 70
70 to 80
80 to 90
90 to 100
> 100



LOGGER Analyze v1.54m Track Map

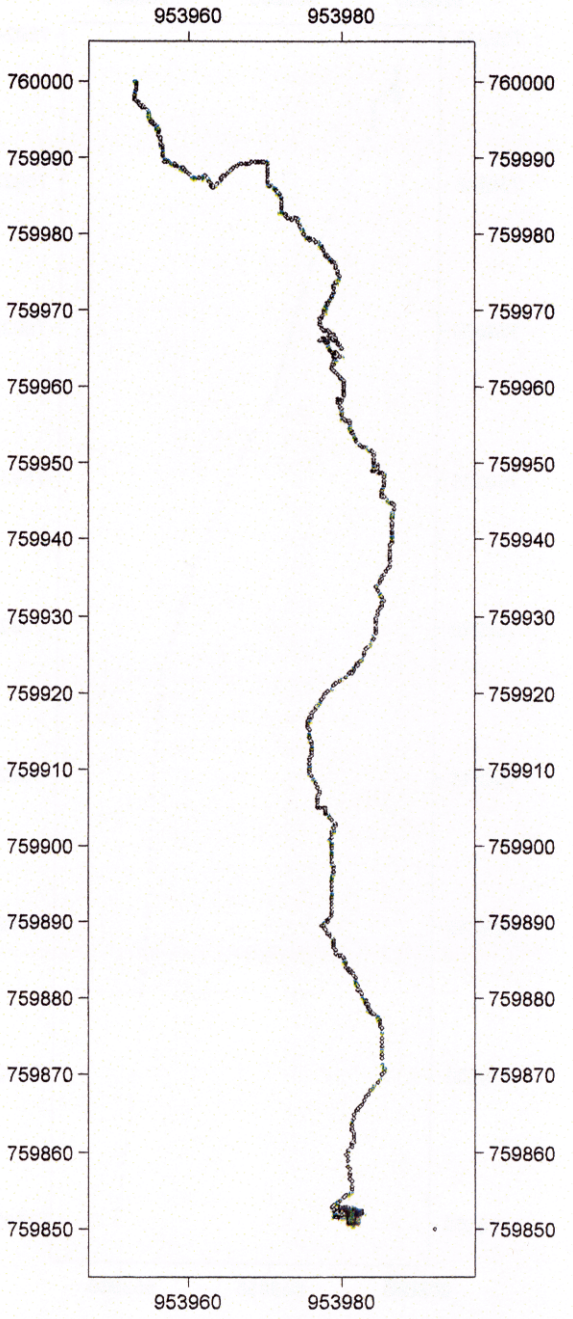
Site: mpw_d17 ()

Signal: Whites (cps)

Time:

Threshold:
> 60 •

< 50
50 to 60
60 to 70
70 to 80
80 to 90
90 to 100
> 100



LOGGER Analyze v1.54m Track Map

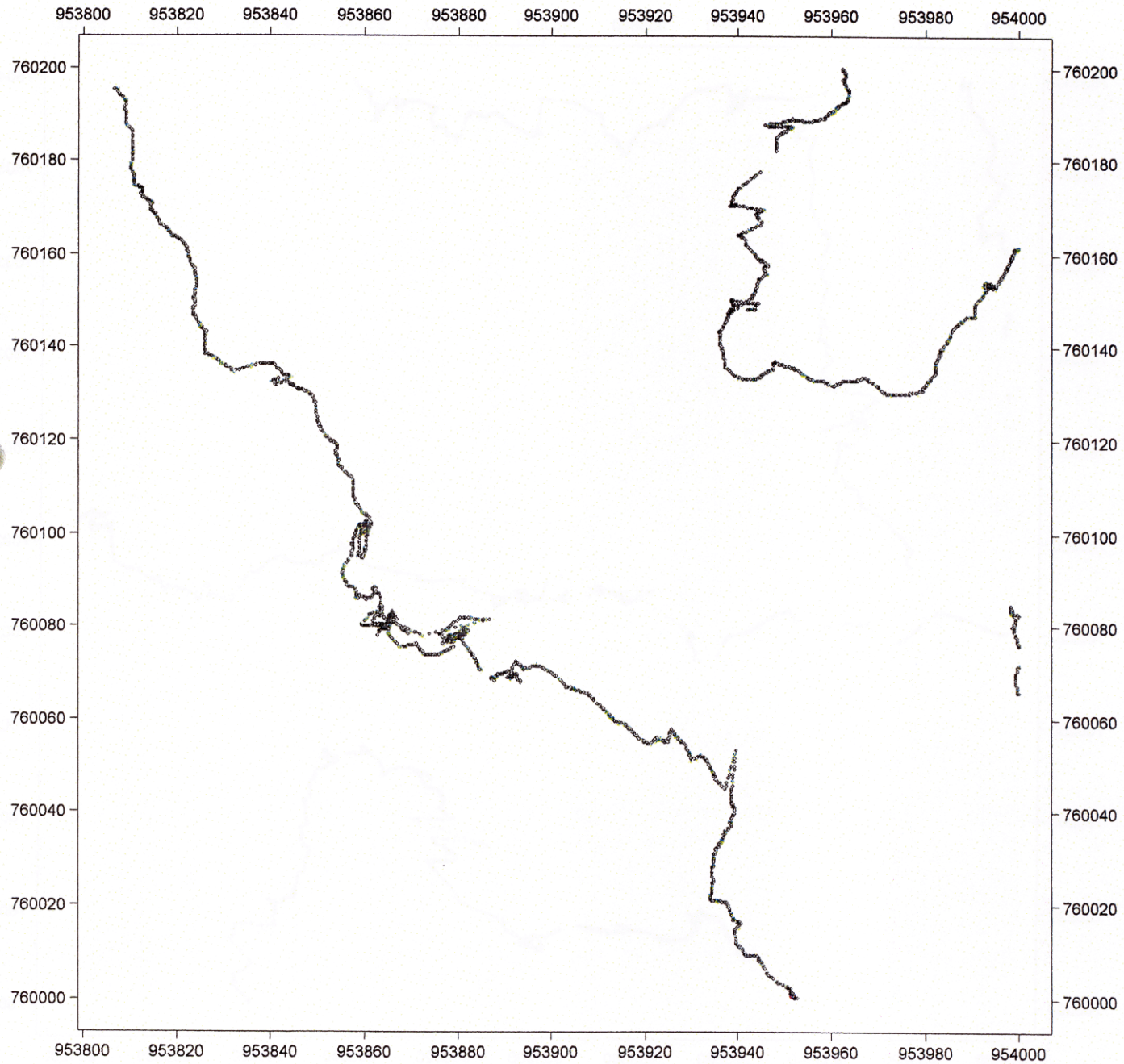
Site: mpw_d18 ()

Signal: Whites (cps)

Time:

Threshold:
> 60

< 50	80 to 90
50 to 60	90 to 100
60 to 70	> 100
70 to 80	



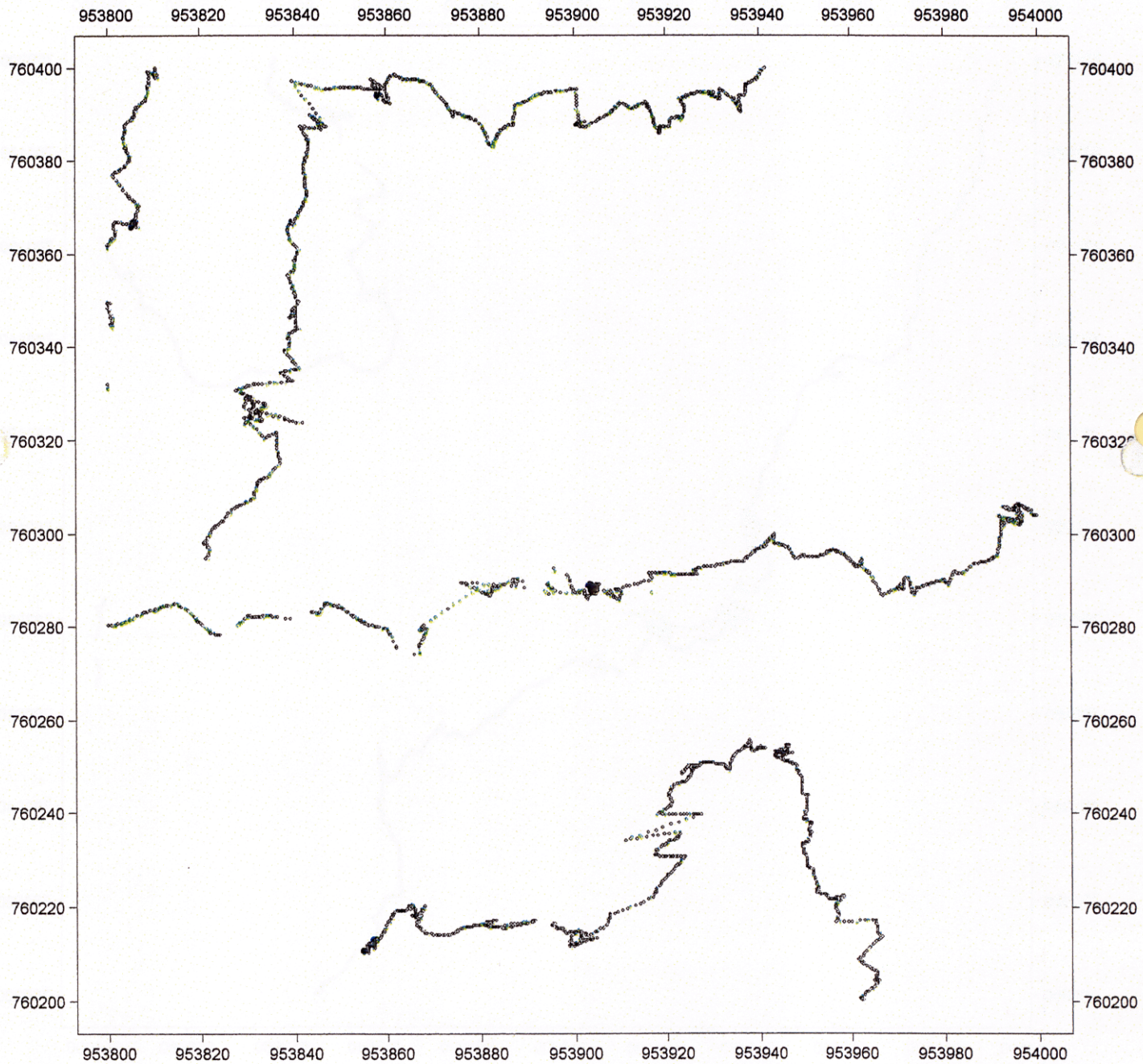
11456.7292

LOGGER Analyze v1.54m Track Map

Site: mpw_d19 () **Signal: Whites (cps)** **Time:**

Threshold:
> 60 •

< 50
50 to 60
60 to 70
70 to 80
80 to 90
90 to 100
> 100



LOGGER Analyze v1.54m Track Map

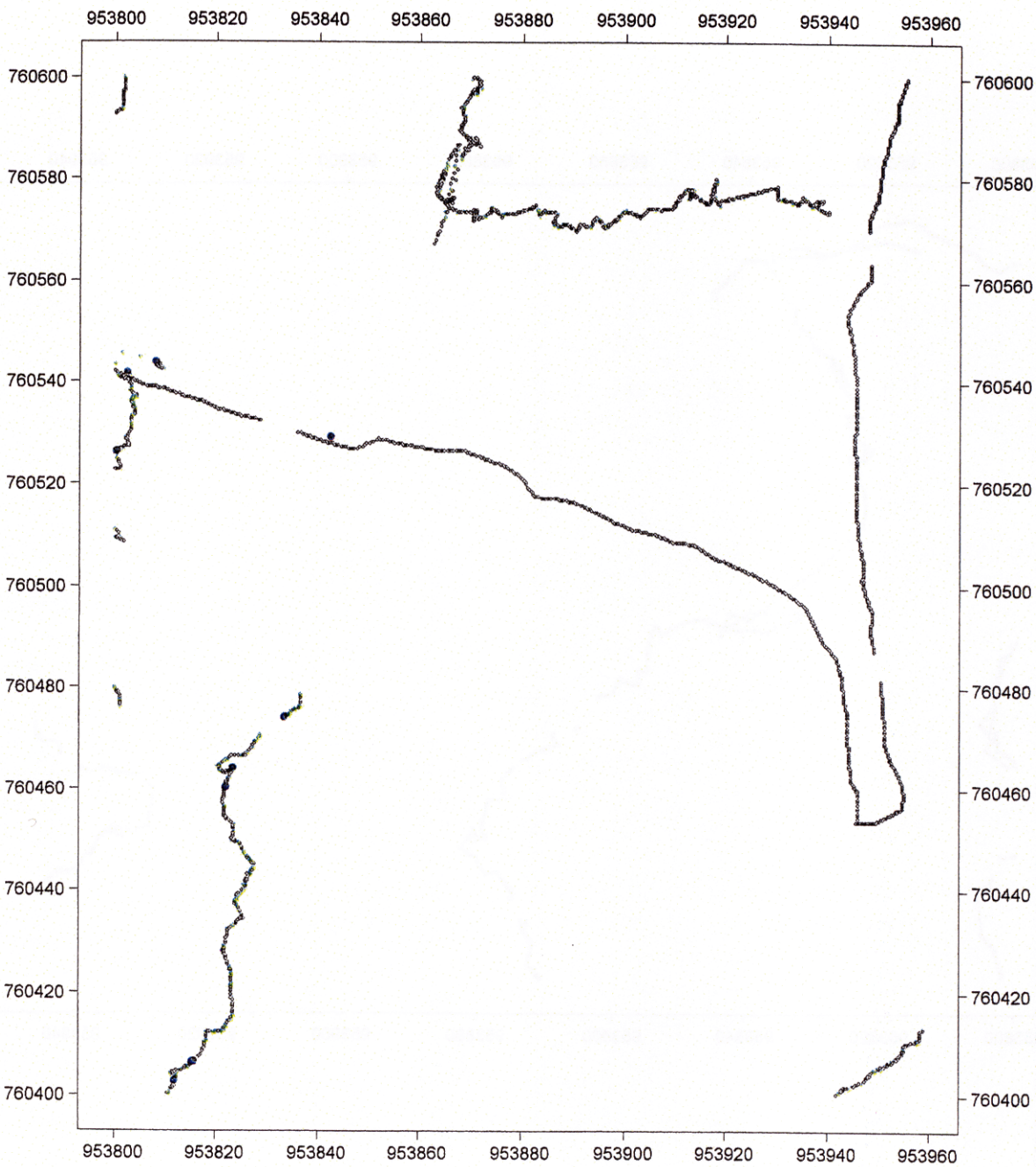
Site: mpw_d20 ()

Signal: Whites (cps)

Time:

Threshold:
> 60 •

< 50
50 to 60
60 to 70
70 to 80
80 to 90
90 to 100
> 100



11456.7300

LOGGER Analyze v1.54m Track Map

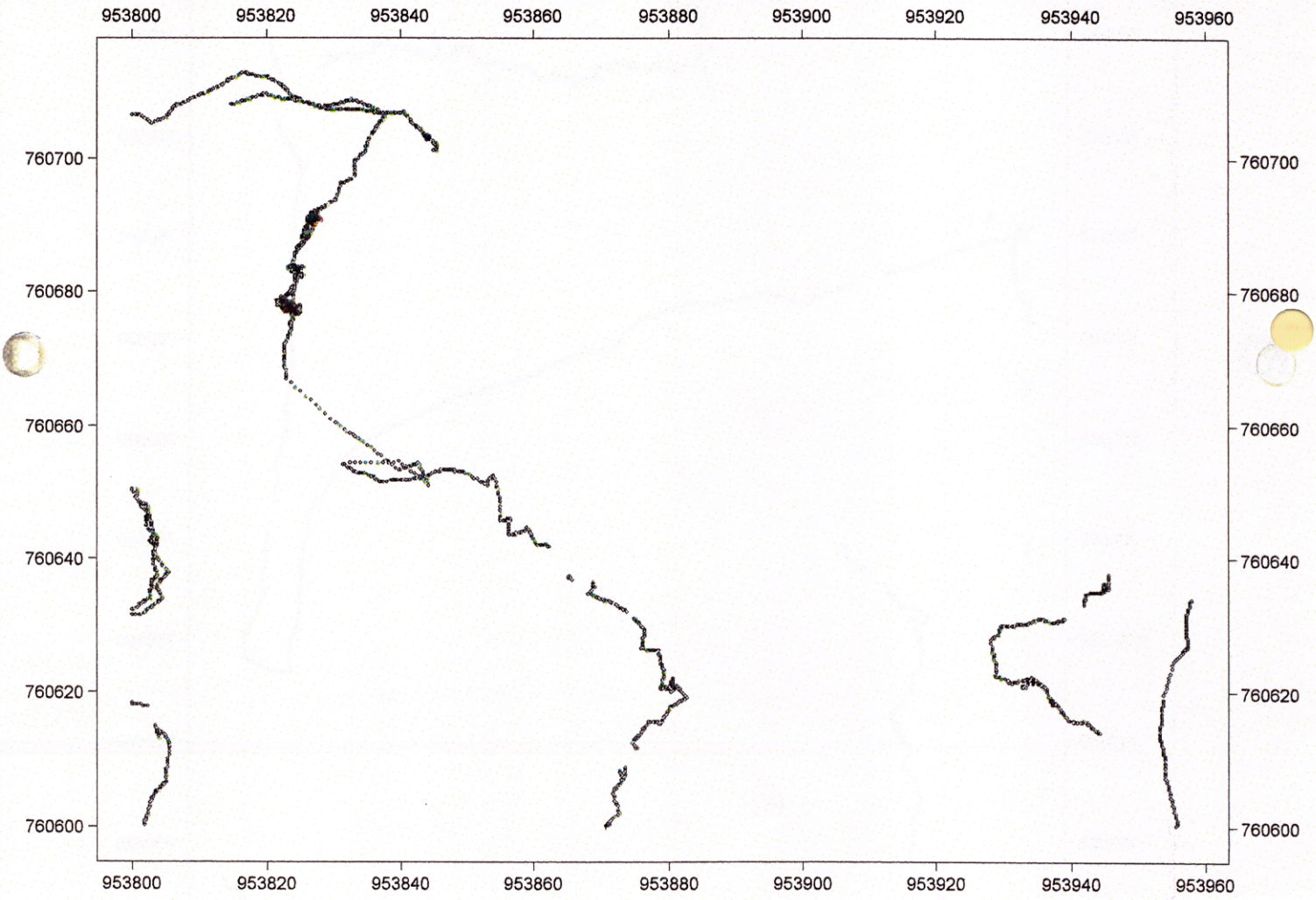
Site: mpw_d21 ()

Signal: Whites (cps)

Time:

Threshold:
> 60

< 50	80 to 90
50 to 60	90 to 100
60 to 70	> 100
70 to 80	



11456.7302

LOGGER Analyze v1.54m Track Map

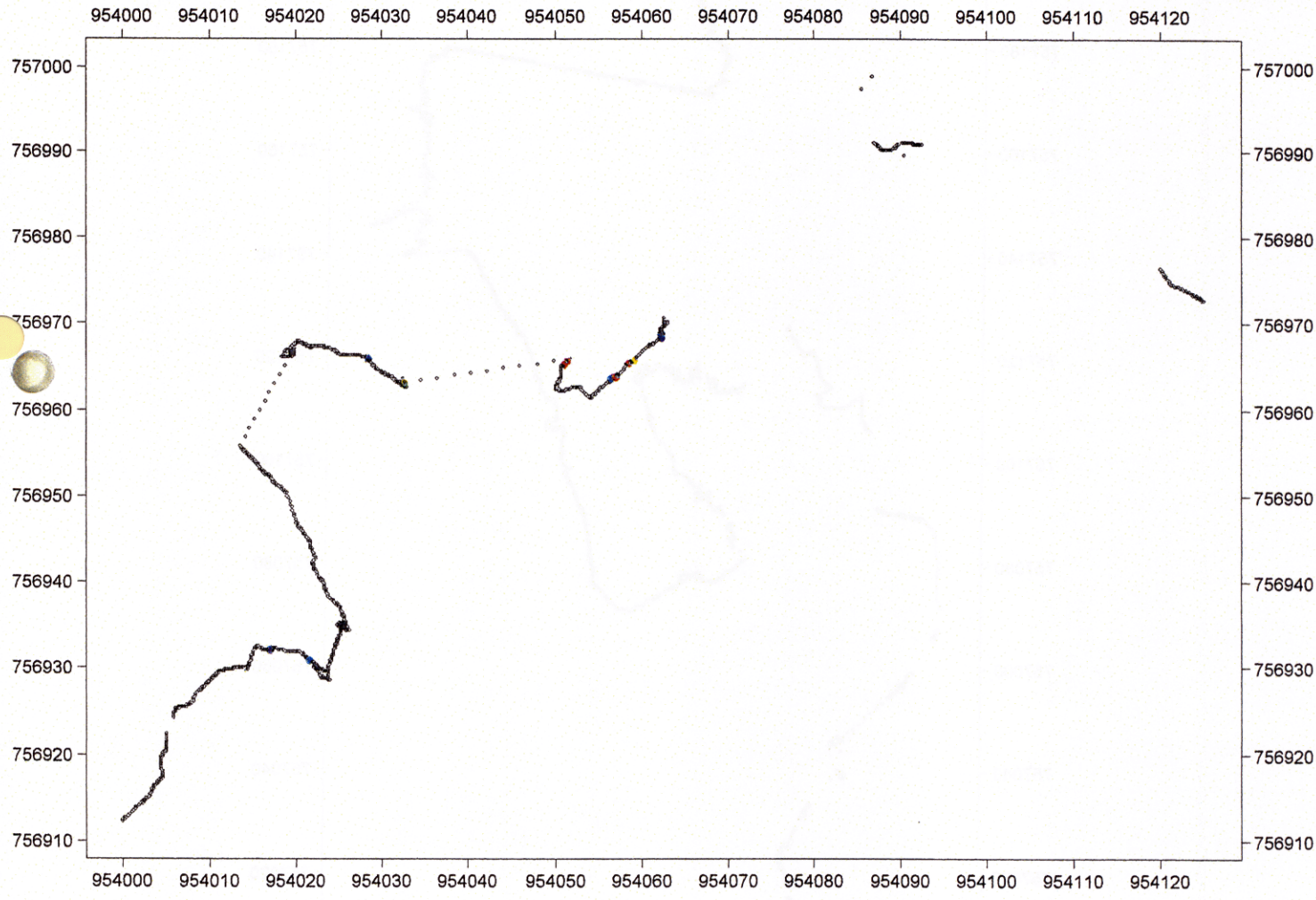
Site: mpw_e2 ()

Signal: Whites (cps)

Time:

Threshold:
> 60 •

< 50	**80 to 90**
50 to 60	**90 to 100**
60 to 70	**> 100**
70 to 80	

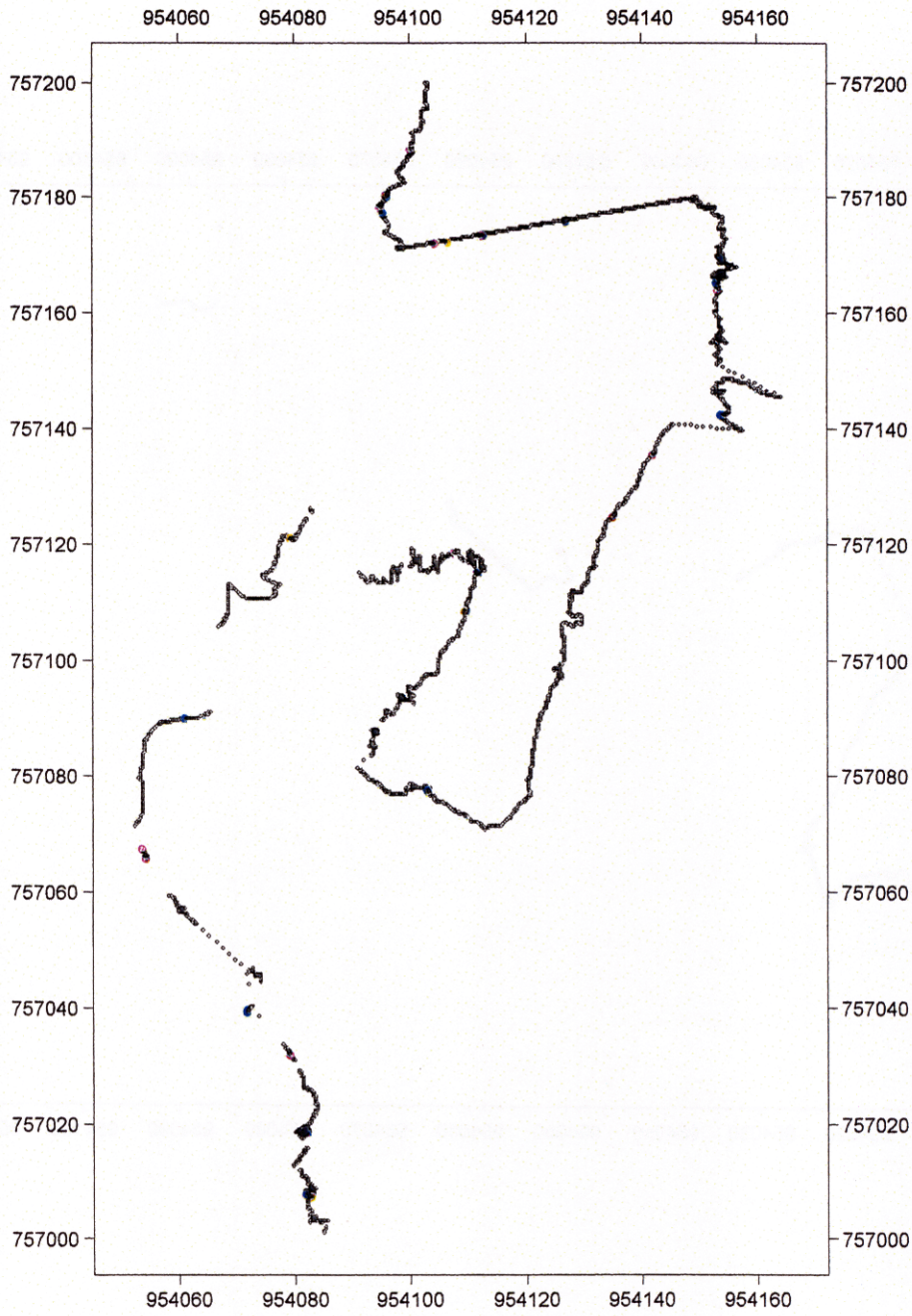


LOGGER Analyze v1.54m Track Map

Site: mpw_e3 () **Signal: Whites (cps)** **Time:**

Threshold:
> 60

< 50
50 to 60
60 to 70
70 to 80
80 to 90
90 to 100
> 100

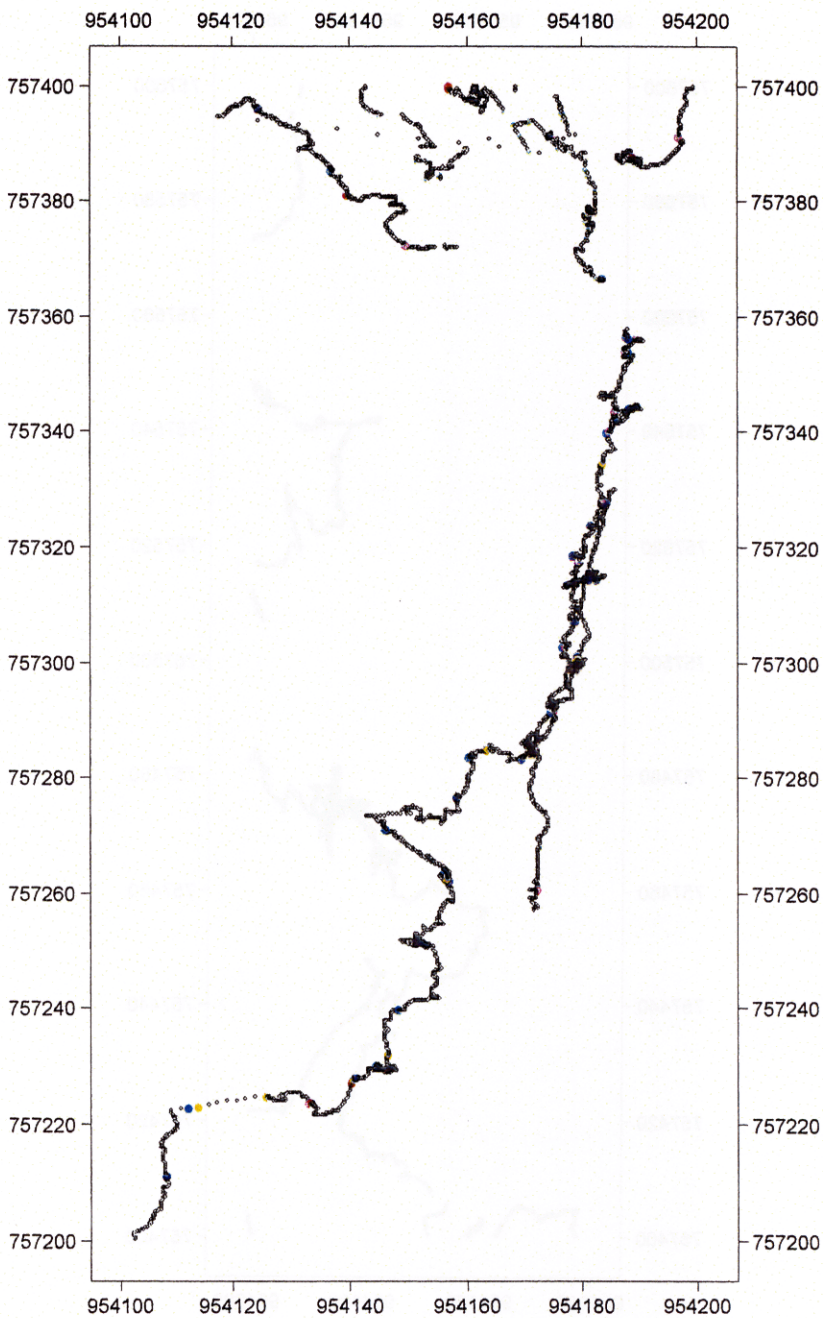


LOGGER Analyze v1.54m Track Map

Site: mpw_e4 () **Signal: Whites (cps)** **Time:**

Threshold:
> 60 •

< 50
50 to 60
60 to 70
70 to 80
80 to 90
90 to 100
> 100



11456.7338

LOGGER Analyze v1.54m Track Map

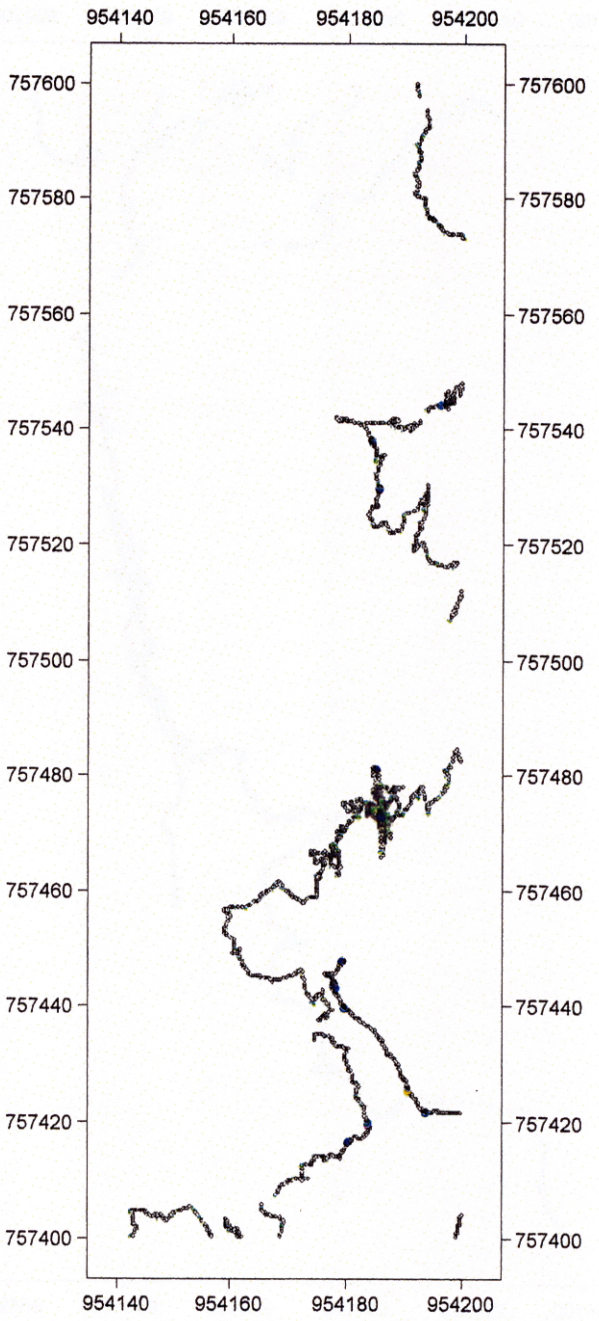
Site: mpw_e5 ()

Signal: Whites (cps)

Time:

Threshold:
> 60 •

< 50
50 to 60
60 to 70
70 to 80
80 to 90
90 to 100
> 100



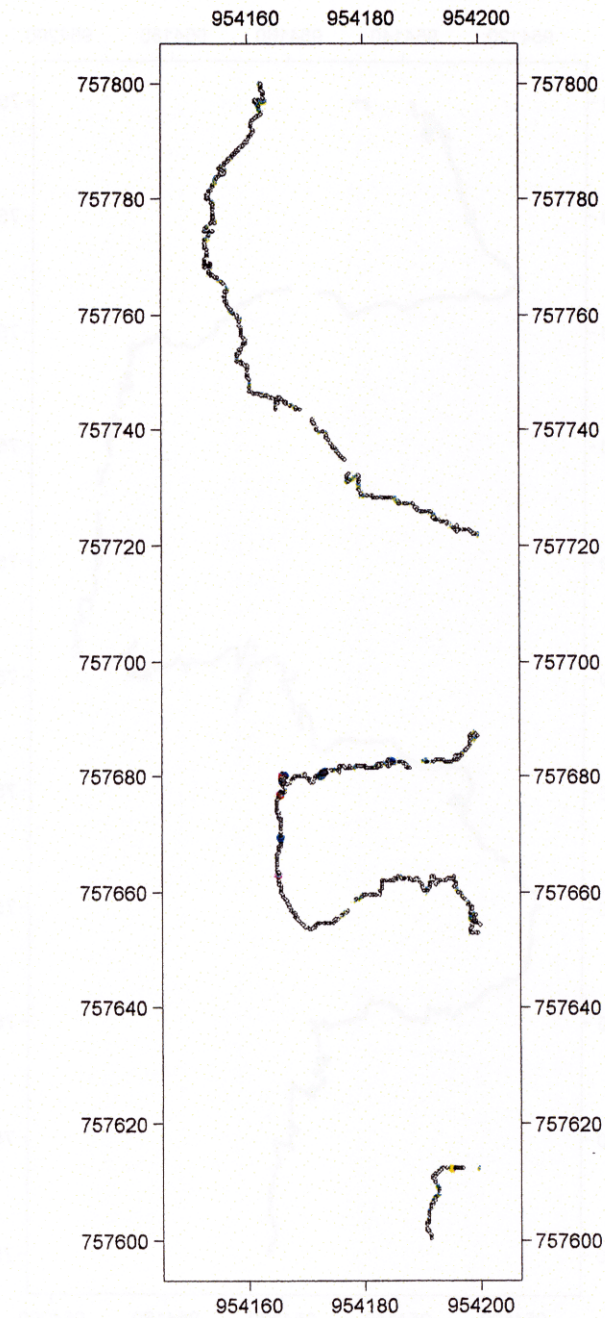
11456.7341

LOGGER Analyze v1.54m Track Map

Site: mpw_e6 () **Signal: Whites (cps)** **Time:**

Threshold:
> 60

< 50
50 to 60
60 to 70
70 to 80
80 to 90
90 to 100
> 100



LOGGER Analyze v1.54m Track Map

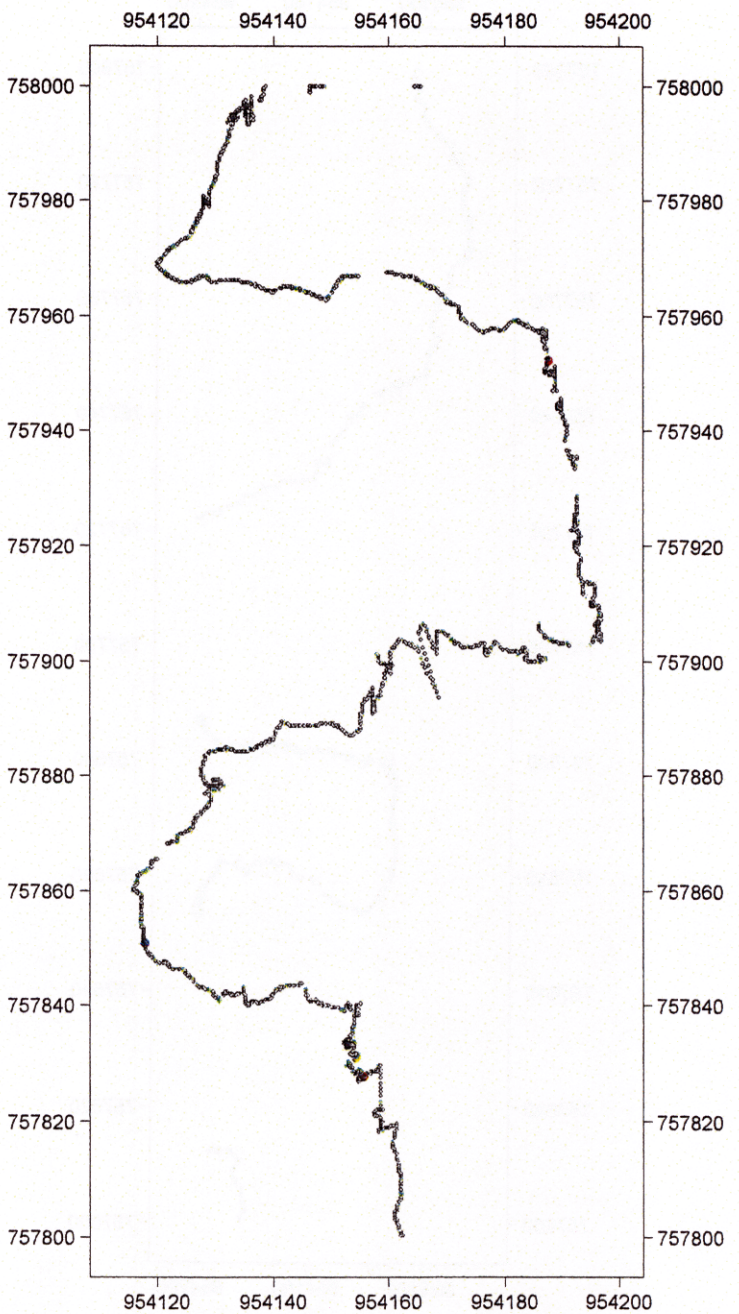
Site: mpw_e7 ()

Signal: Whites (cps)

Time:

Threshold:
> 60

< 50
50 to 60
60 to 70
70 to 80
80 to 90
90 to 100
> 100



11456.7346

LOGGER Analyze v1.54m Track Map

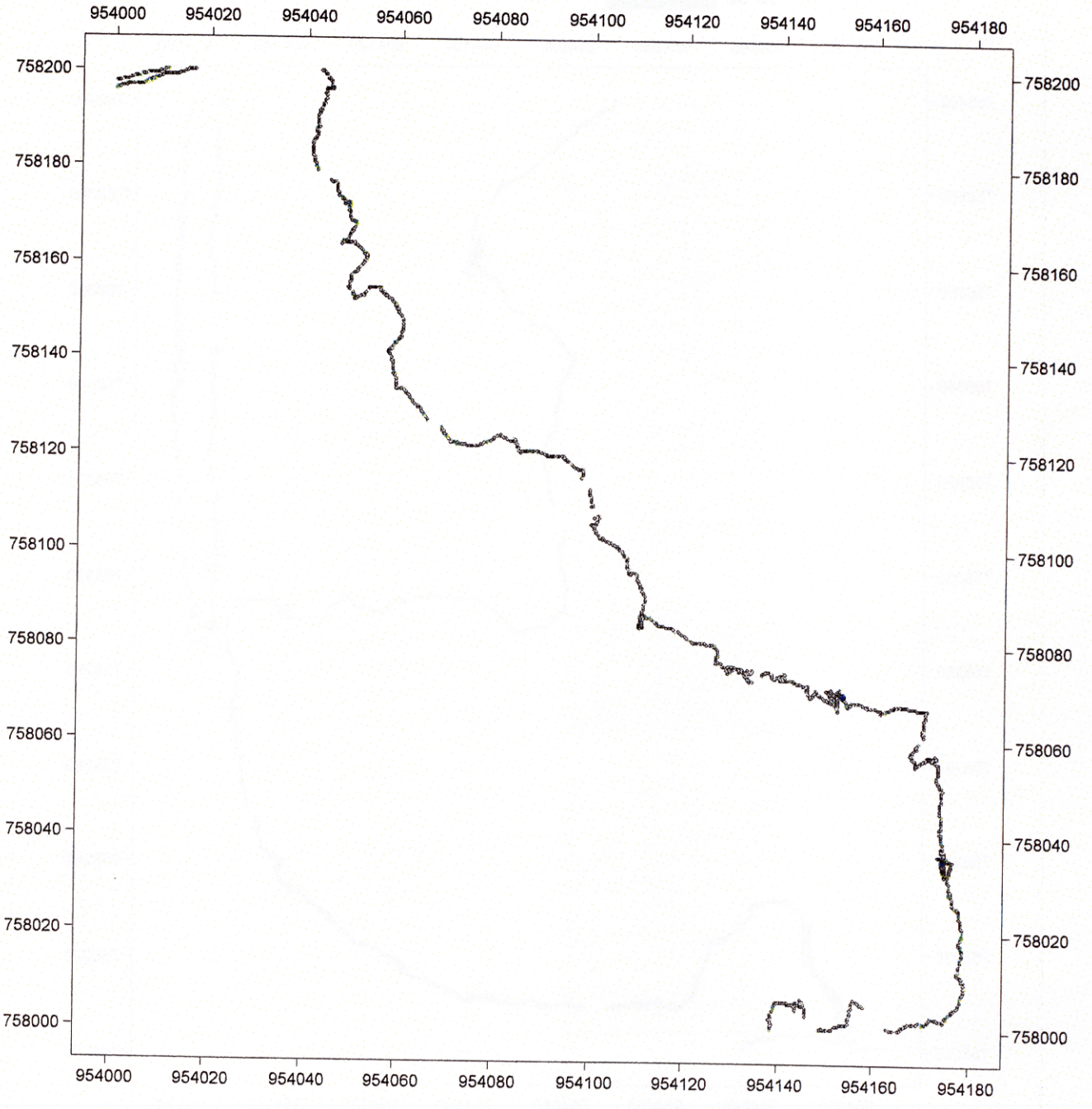
Site: mpw_e8 ()

Signal: Whites (cps)

Time:

Threshold:
> 60

< 50
50 to 60
60 to 70
70 to 80
80 to 90
90 to 100
> 100



11456.7348

LOGGER Analyze v1.54m Track Map

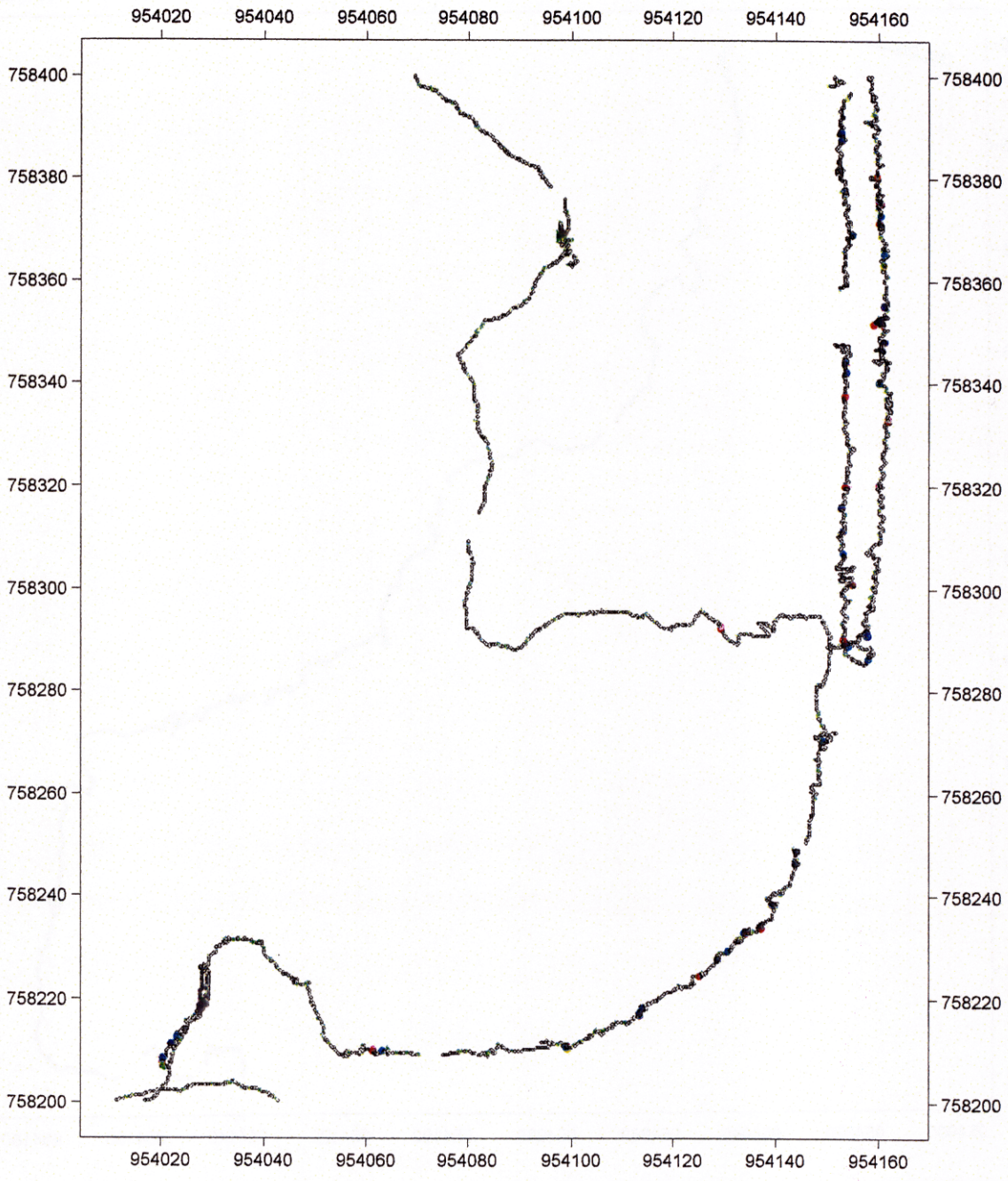
Site: mpw_e9 ()

Signal: Whites (cps)

Time:

Threshold:
> 60

< 50
50 to 60
60 to 70
70 to 80
80 to 90
90 to 100
> 100



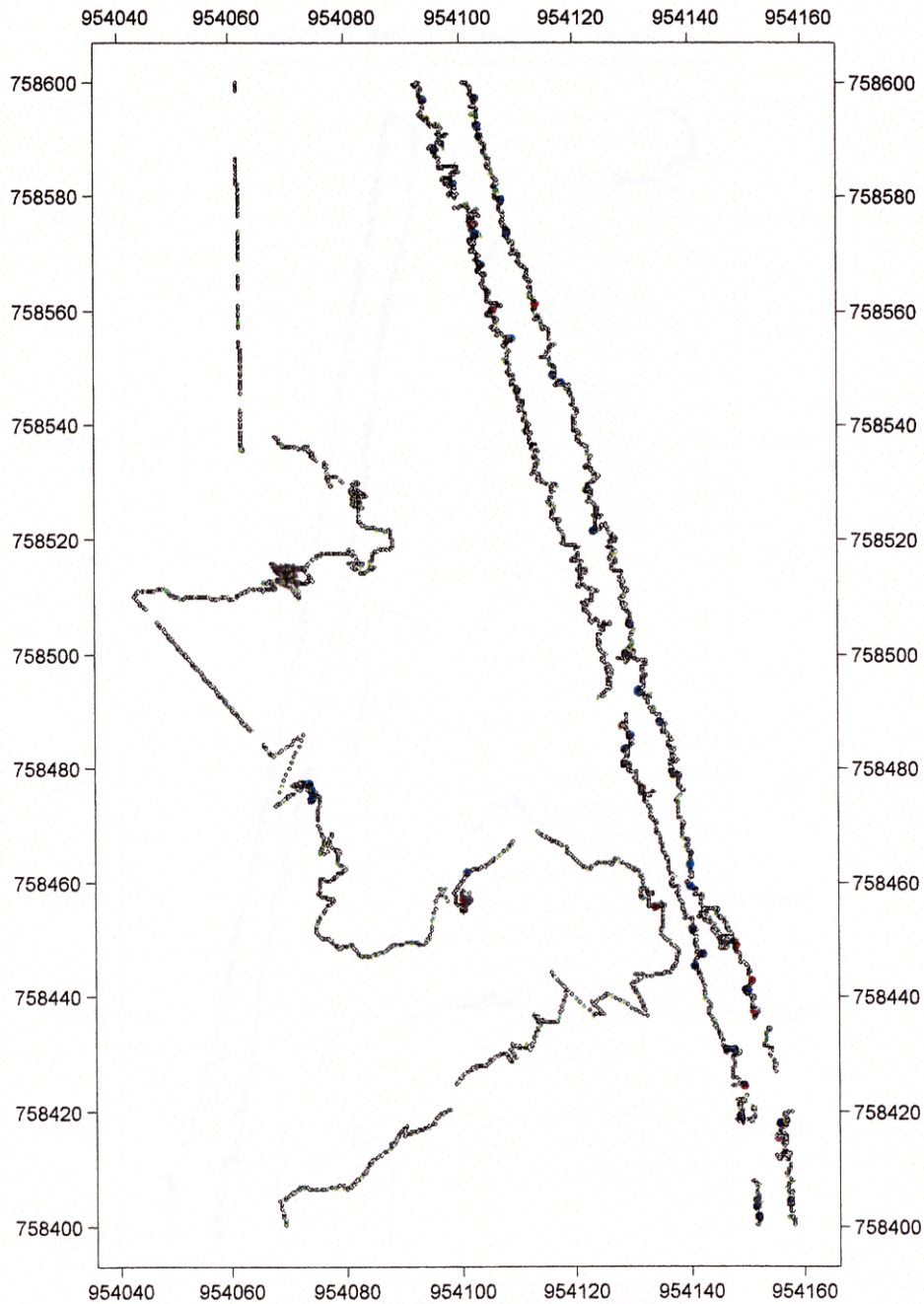
11456.7353

LOGGER Analyze v1.54m Track Map

Site: mpw_e10 () **Signal: Whites (cps)** **Time:**

Threshold:
> 60 •

< 50
50 to 60
60 to 70
70 to 80
80 to 90
90 to 100
> 100



LOGGER Analyze v1.54m Track Map

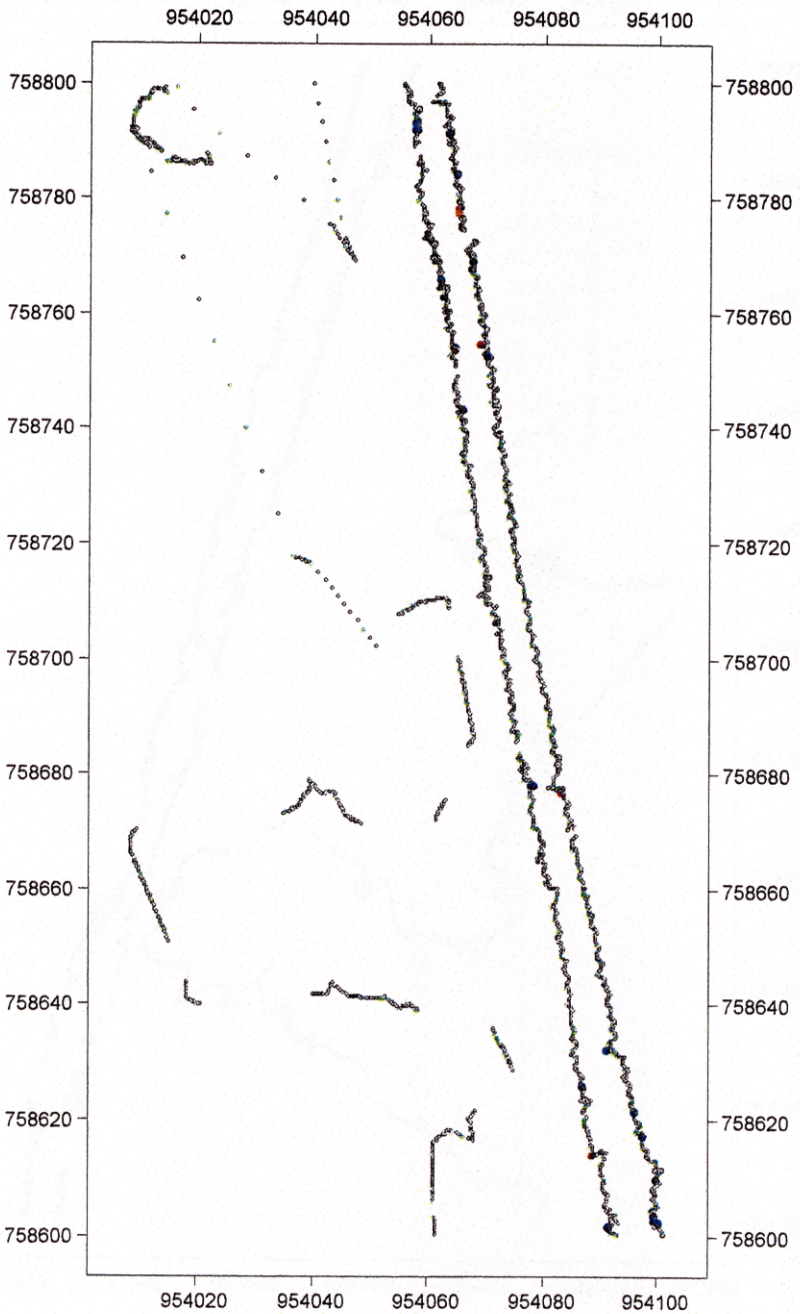
Site: mpw_e11 ()

Signal: Whites (cps)

Time:

Threshold:
> 60

< 50
50 to 60
60 to 70
70 to 80
80 to 90
90 to 100
> 100



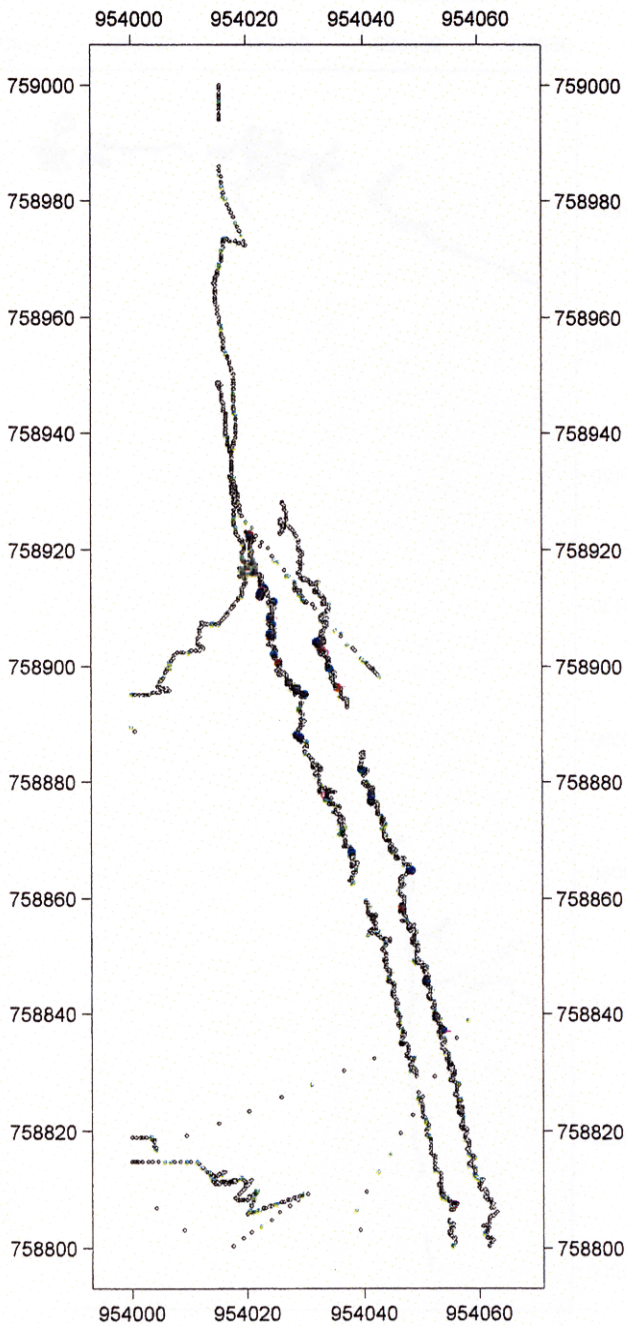
11456.7314

LOGGER Analyze v1.54m Track Map

Site: mpw_e12 () **Signal: Whites (cps)** **Time:**

Threshold:
> 60 •

< 50	**80 to 90**
50 to 60	**90 to 100**
60 to 70	**> 100**
70 to 80	



LOGGER Analyze v1.54m Track Map

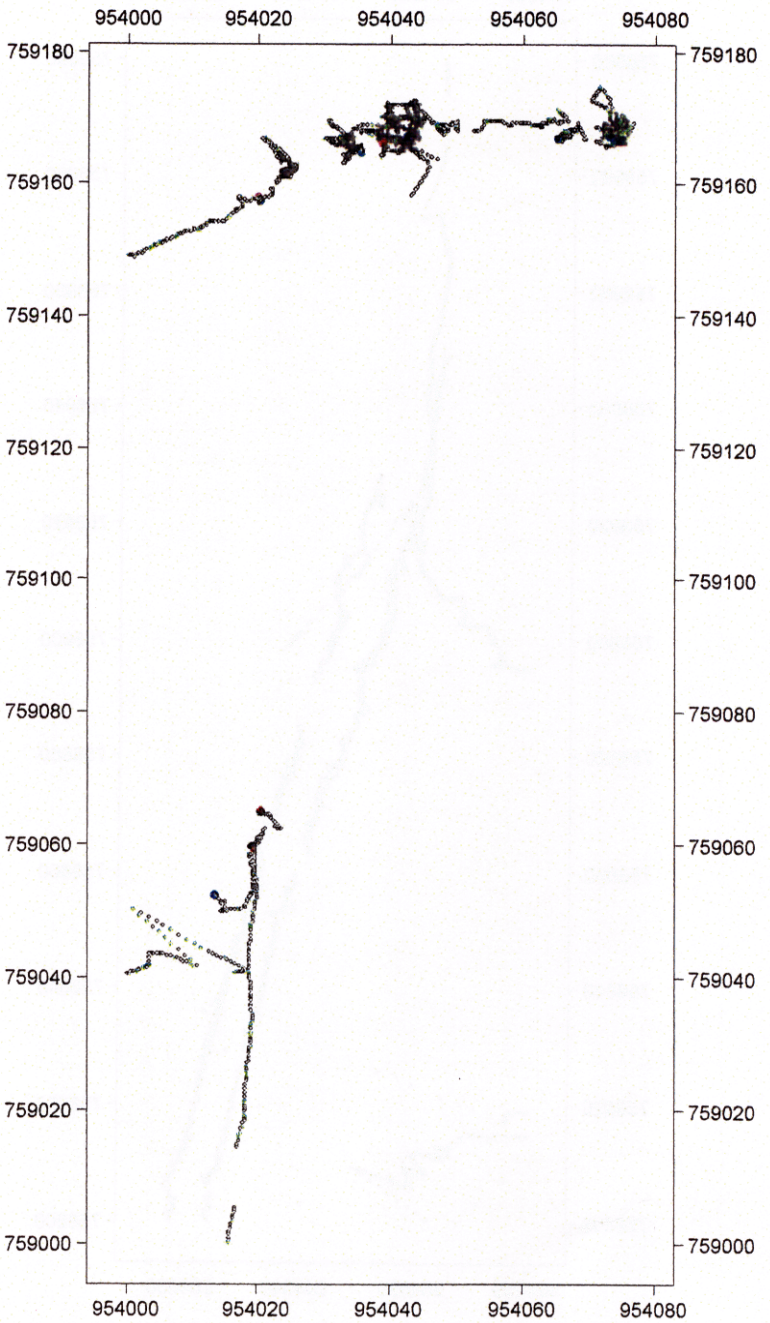
Site: mpw_e13 ()

Signal: Whites (cps)

Time:

Threshold:
> 60

< 50
50 to 60
60 to 70
70 to 80
80 to 90
90 to 100
> 100

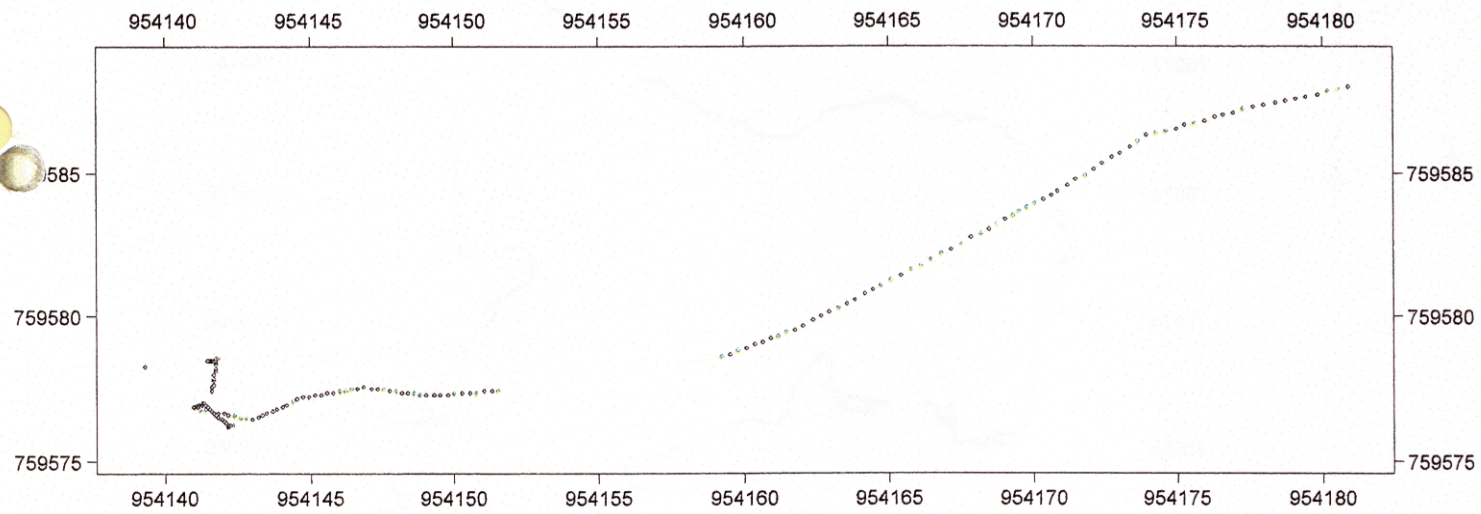


LOGGER Analyze v1.54m Track Map

Site: mpw_e15 () **Signal: Whites (cps)** **Time:**

Threshold:
> 60

< 50	80 to 90
50 to 60	90 to 100
60 to 70	> 100
70 to 80	



LOGGER Analyze v1.54m Track Map

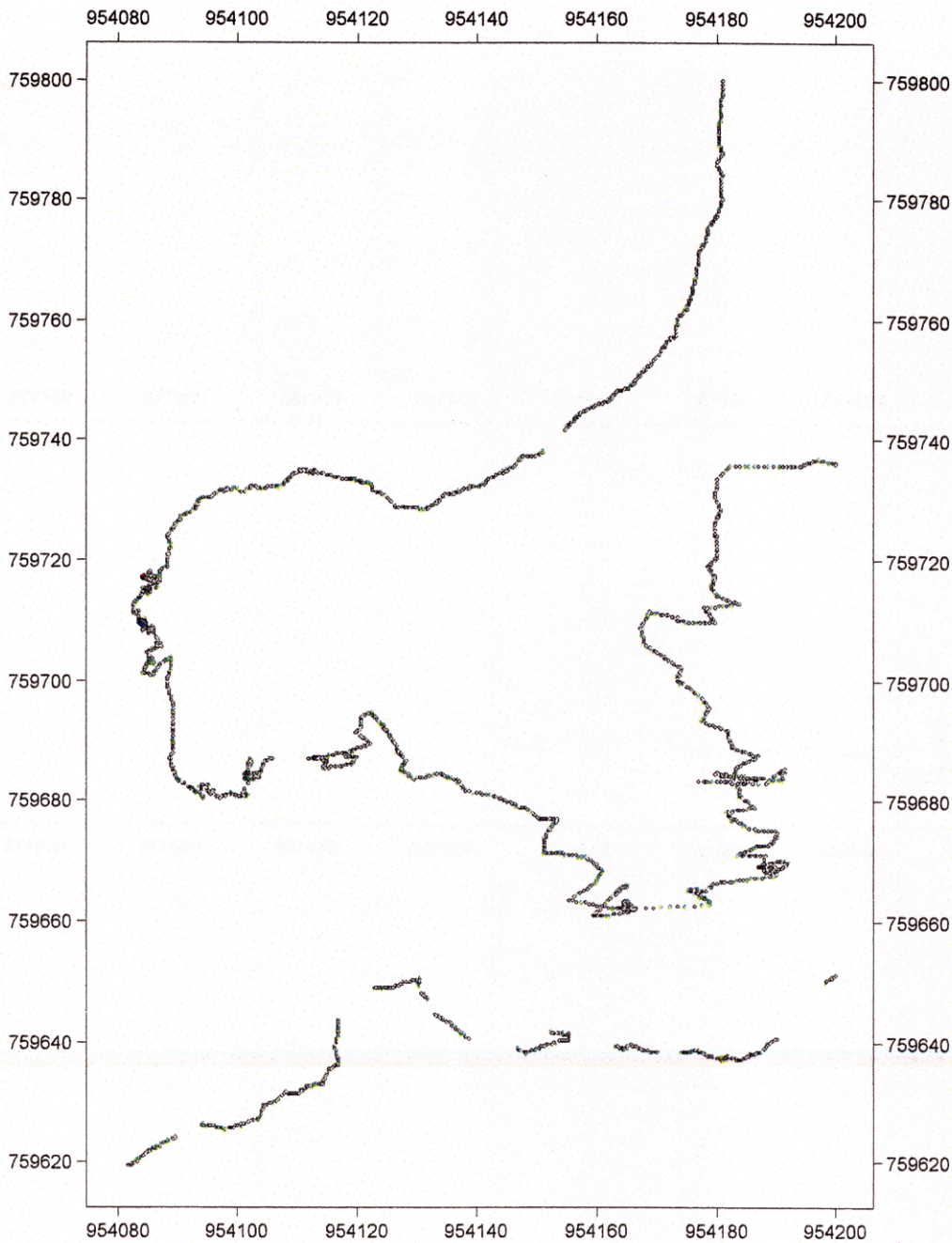
Site: mpw_e16 ()

Signal: Whites (cps)

Time:

Threshold:
> 60

< 50
50 to 60
60 to 70
70 to 80
80 to 90
90 to 100
> 100



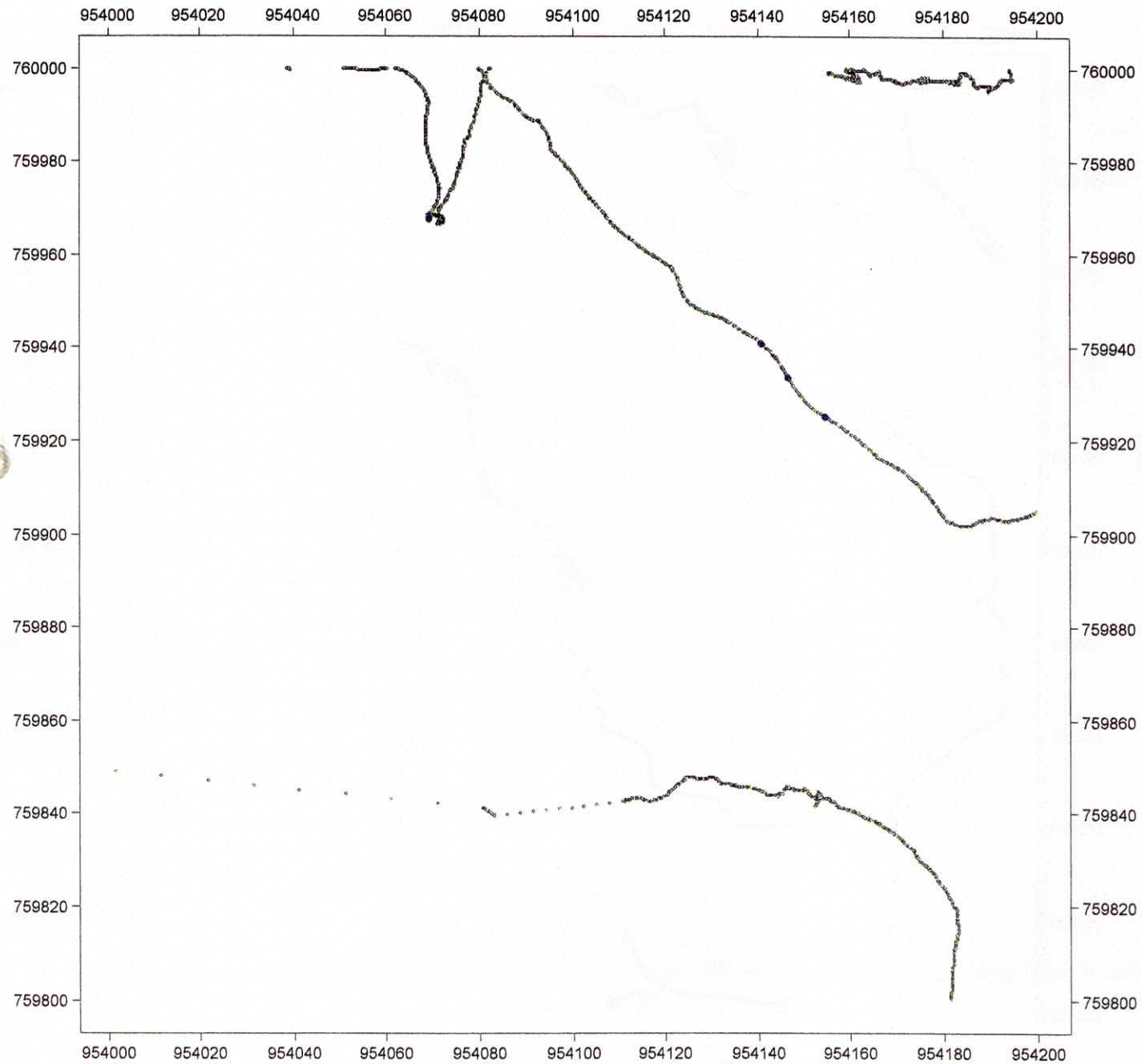
11456.7324

LOGGER Analyze v1.54m Track Map

Site: mpw_e17 () **Signal: Whites (cps)** **Time:**

Threshold:
> 60

< 50	80 to 90
50 to 60	90 to 100
60 to 70	> 100
70 to 80	



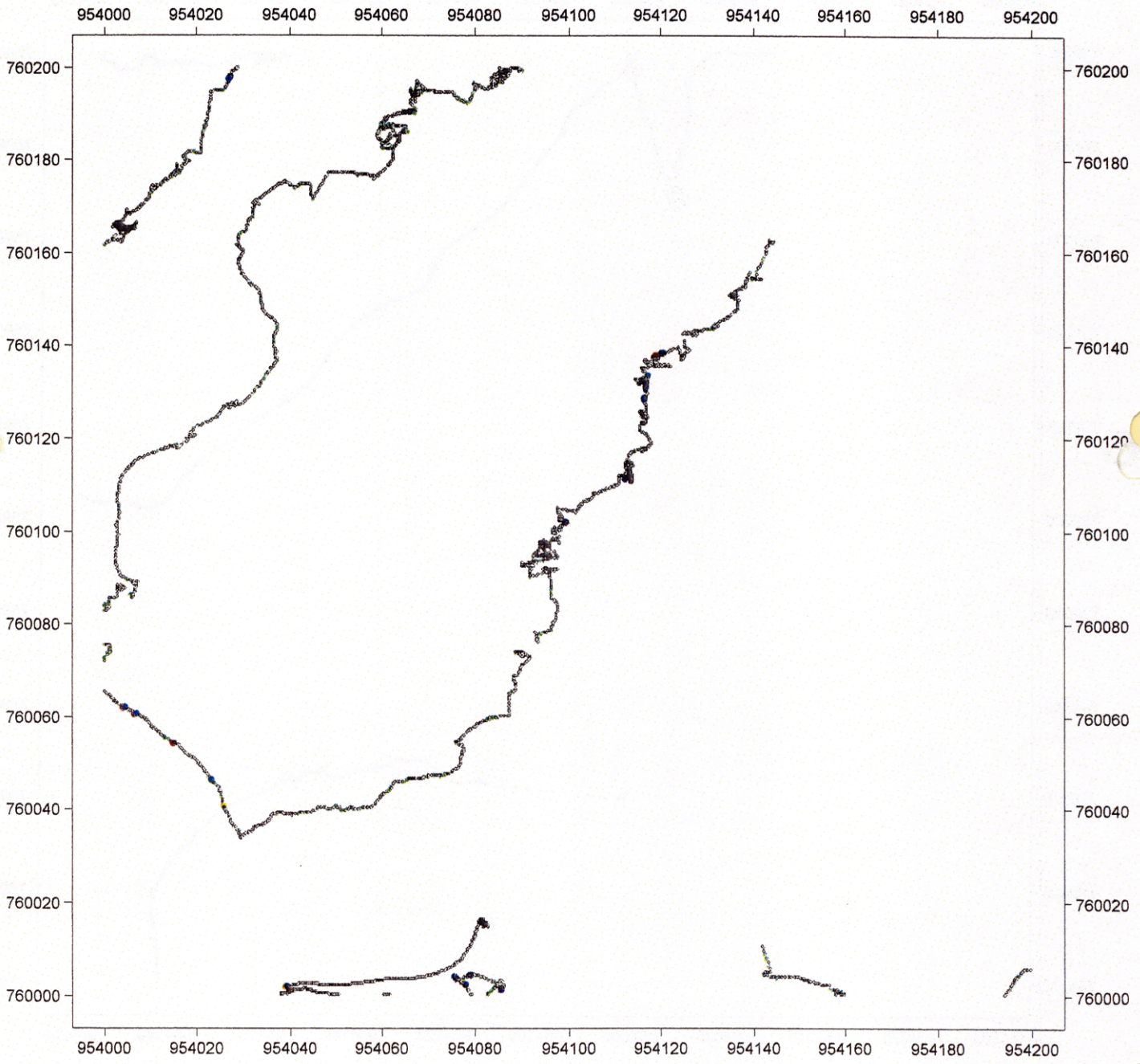
11456.7326

LOGGER Analyze v1.54m Track Map

Site: mpw_e18 () **Signal: Whites (cps)** **Time:**

Threshold:
> 60

< 50	80 to 90
50 to 60	90 to 100
60 to 70	> 100
70 to 80	

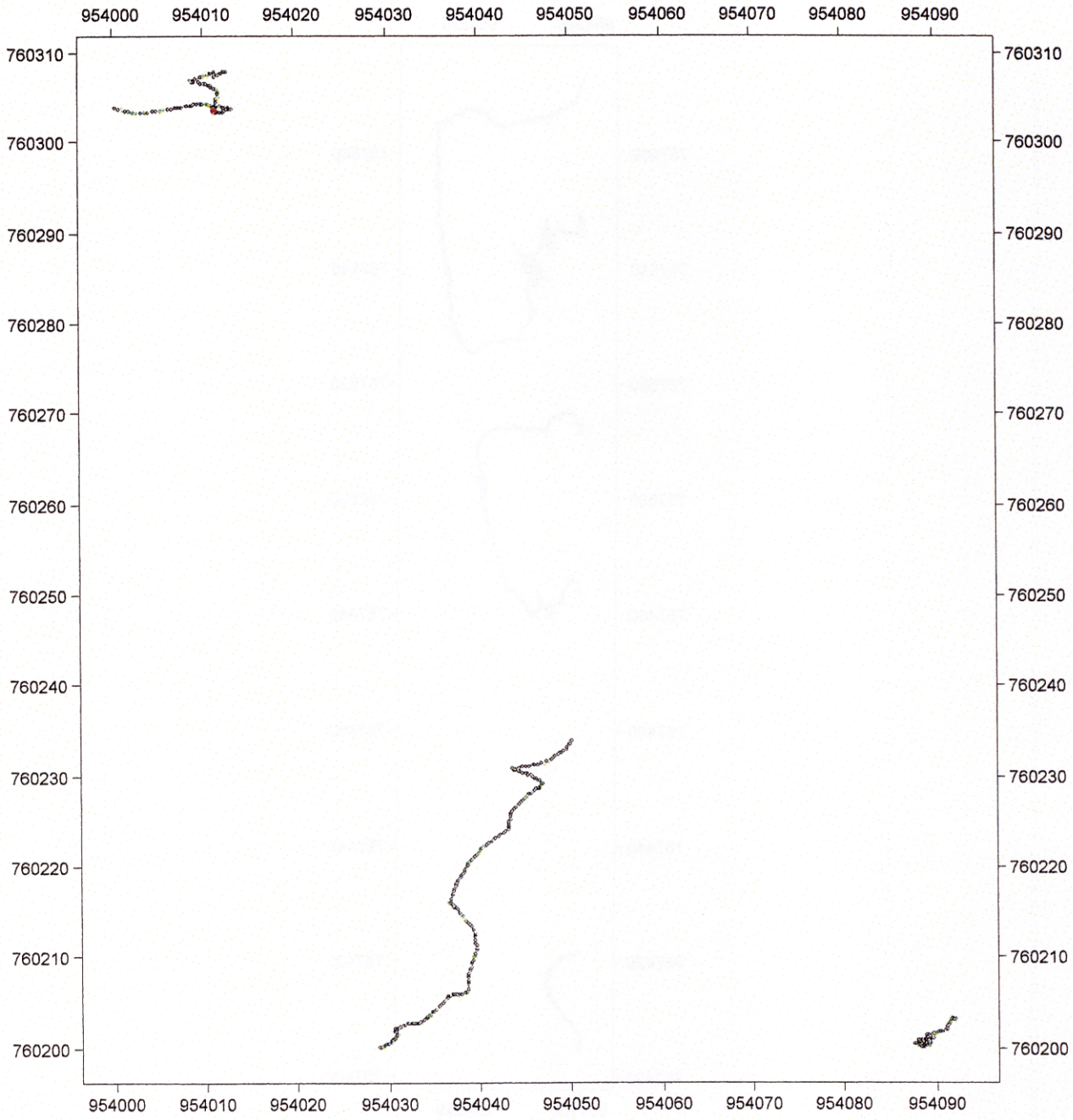


LOGGER Analyze v1.54m Track Map

Site: mpw_e19 () **Signal: Whites (cps)** **Time:**

Threshold:
> 60

< 50	80 to 90
50 to 60	90 to 100
60 to 70	> 100
70 to 80	



LOGGER Analyze v1.54m Track Map

Site: mpw_f5 ()

Signal: Whites (cps)

Time:

Threshold:
> 60 •

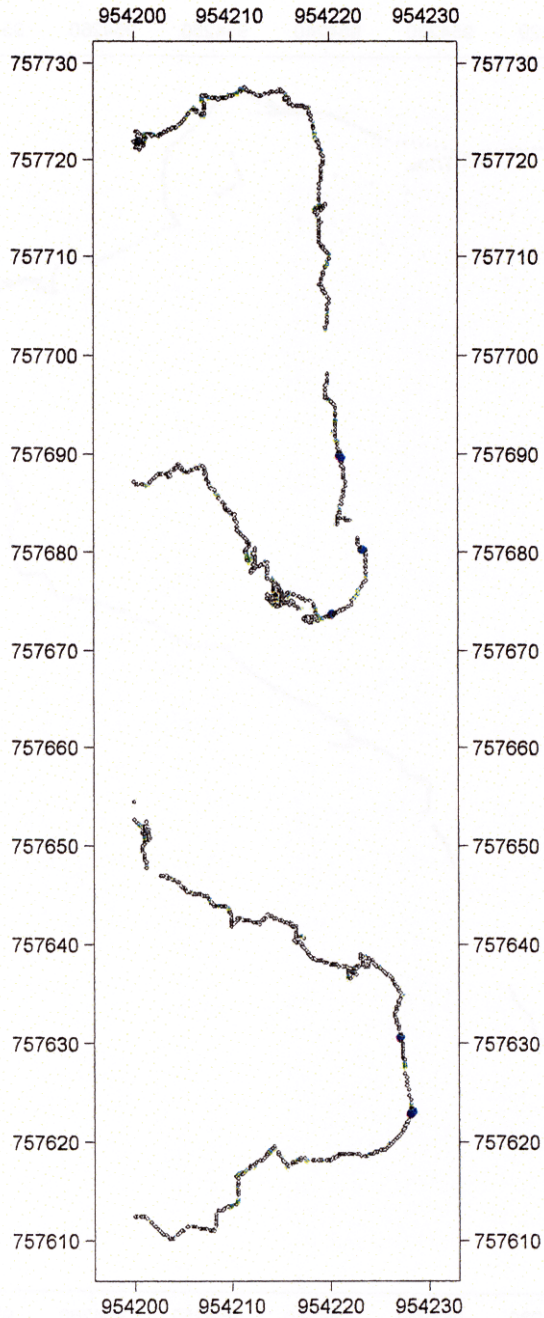
< 50	80 to 90
50 to 60	90 to 100
60 to 70	> 100
70 to 80	

LOGGER Analyze v1.54m Track Map

Site: mpw_f6 () **Signal: Whites (cps)** **Time:**

Threshold:
> 60 •

< 50	**80 to 90**
50 to 60	**90 to 100**
60 to 70	**> 100**
70 to 80	



11456.7362

LOGGER Analyze v1.54m Track Map

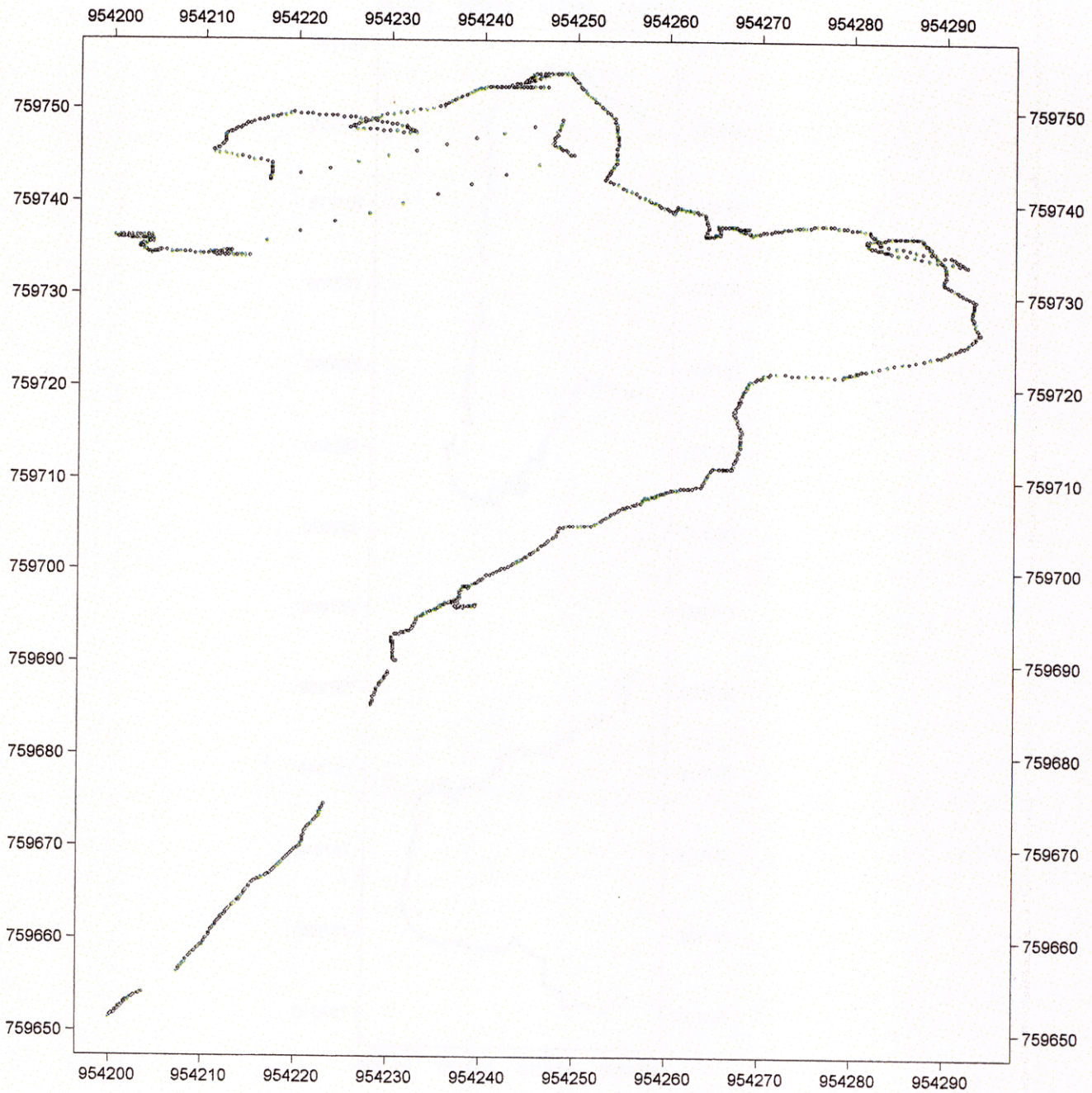
Site: mpw_f16 ()

Signal: Whites (cps)

Time:

Threshold:
> 60

< 50	80 to 90
50 to 60	90 to 100
60 to 70	> 100
70 to 80	



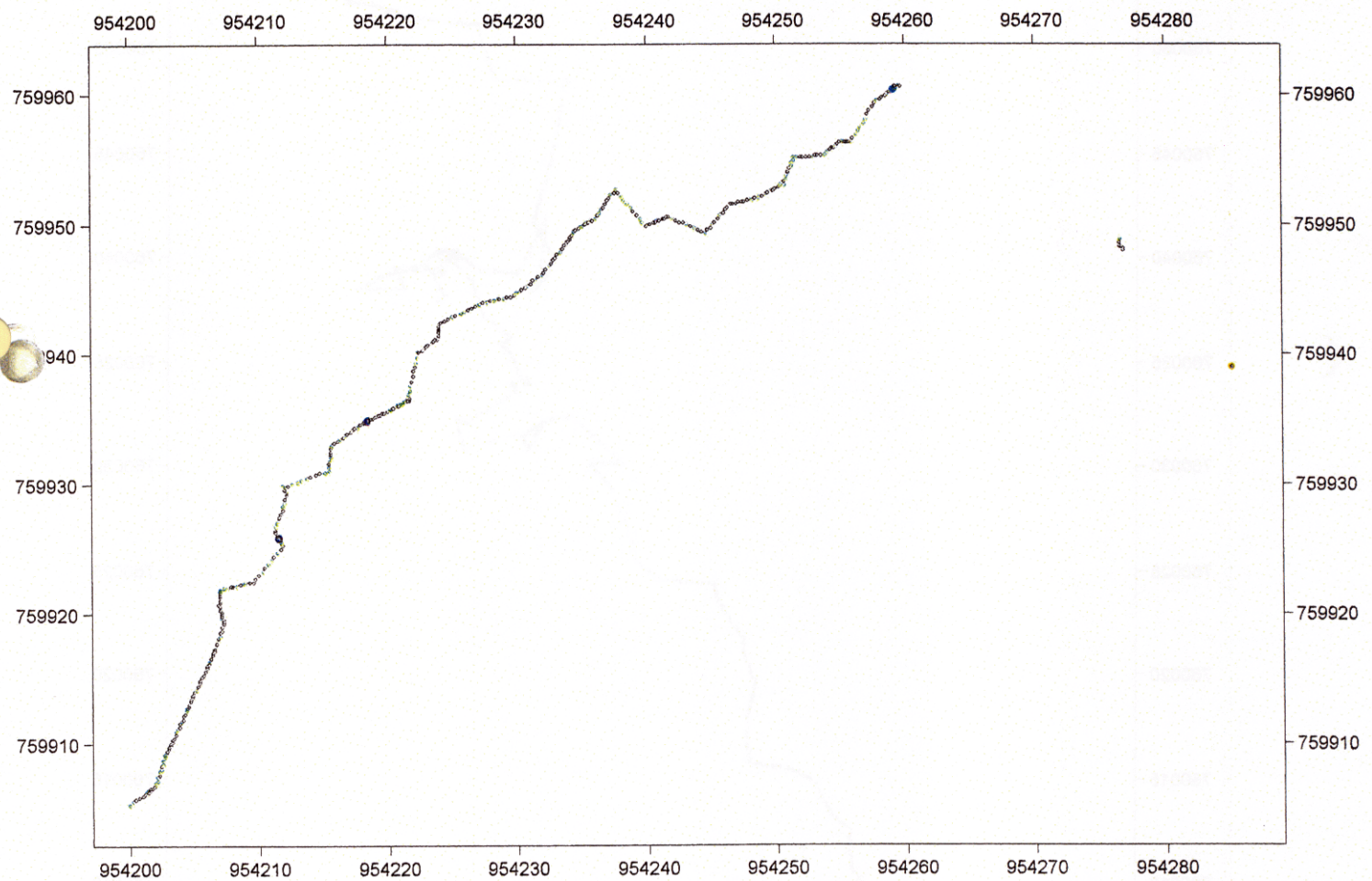
11456.7355

LOGGER Analyze v1.54m Track Map

Site: mpw_f17 () **Signal: Whites (cps)** **Time:**

Threshold:
> 60

< 50	80 to 90
50 to 60	90 to 100
60 to 70	> 100
70 to 80	



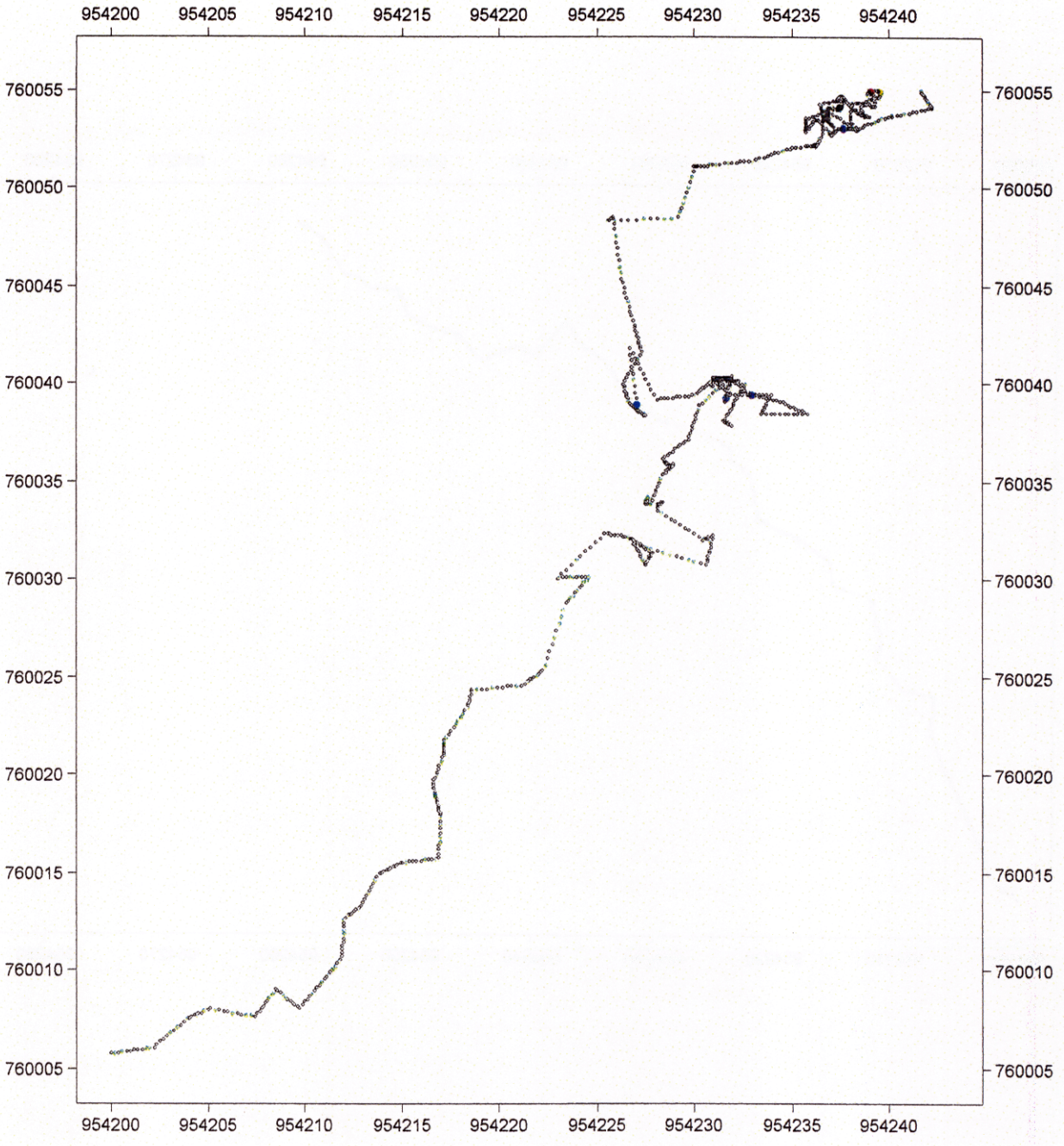
11456.7356

LOGGER Analyze v1.54m Track Map

Site: mpw_f18 () **Signal: Whites (cps)** **Time:**

Threshold:
> 60 •

< 50
50 to 60
60 to 70
70 to 80
80 to 90
90 to 100
> 100



LOGGER Analyze v1.54m Track Map

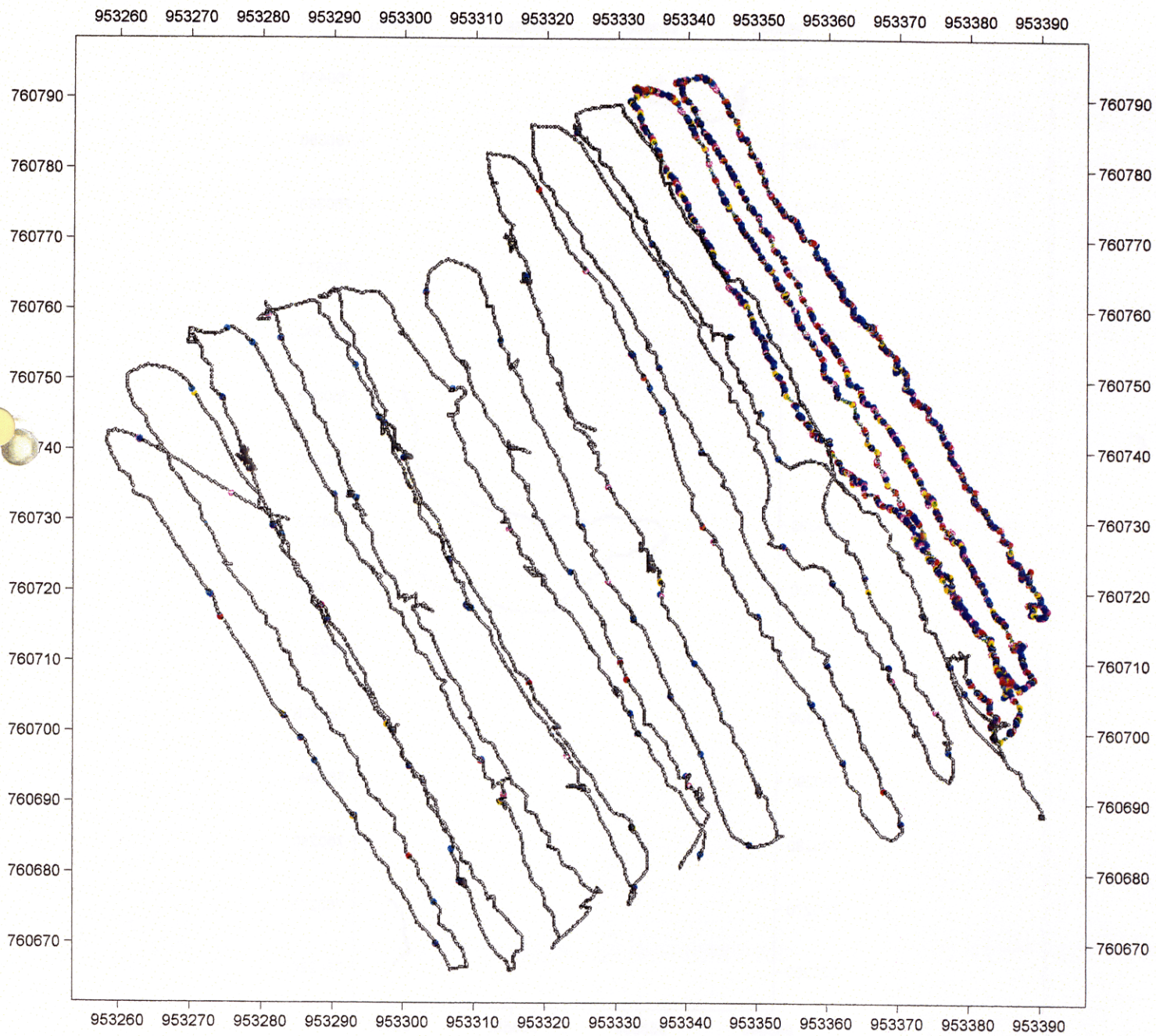
Site: w_a21 ()

Signal: Whites (cps)

Time:

Threshold:
> 60 •

< 50	80 to 90
50 to 60	90 to 100
60 to 70	> 100
70 to 80	



11456.7367

LOGGER Analyze v1.54m Track Map

Site: w_b19 ()

Signal: Whites (cps)

Time:

Threshold:
> 60

< 50
50 to 60
60 to 70
70 to 80
80 to 90
90 to 100
> 100

11456.7370

LOGGER Analyze v1.54m Track Map

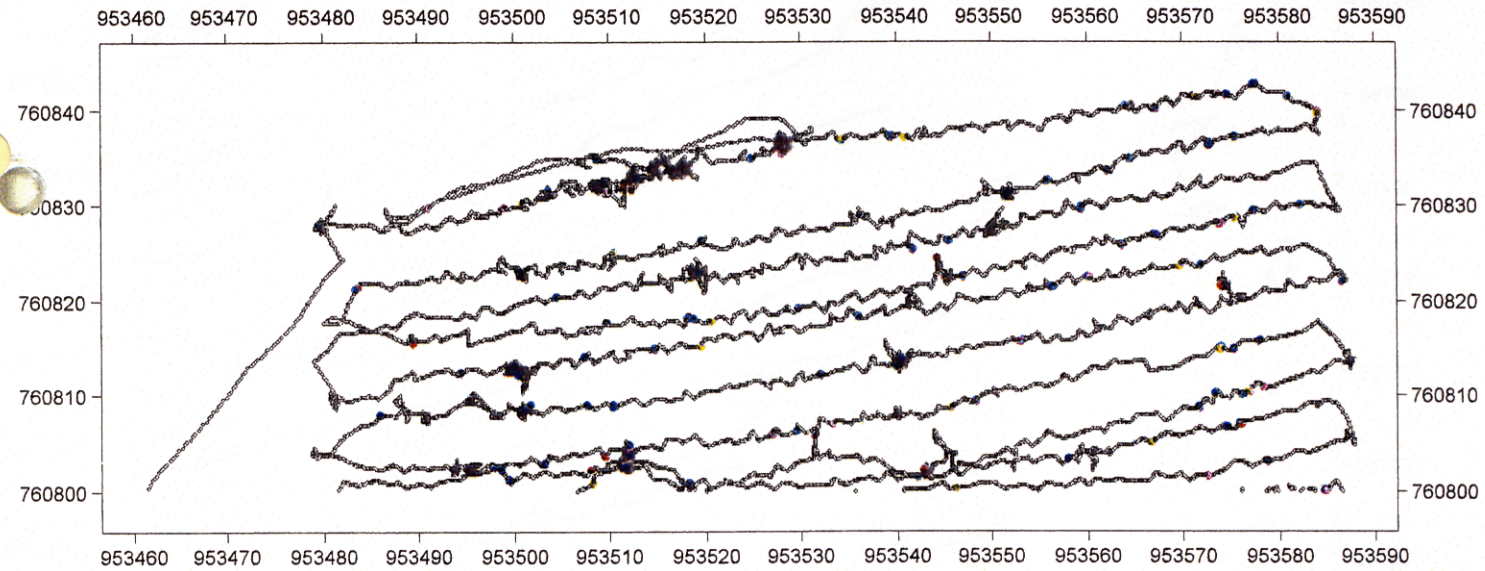
Site: w_b22 ()

Signal: Whites (cps)

Time:

Threshold:
> 60

< 50	80 to 90
50 to 60	90 to 100
60 to 70	> 100
70 to 80	

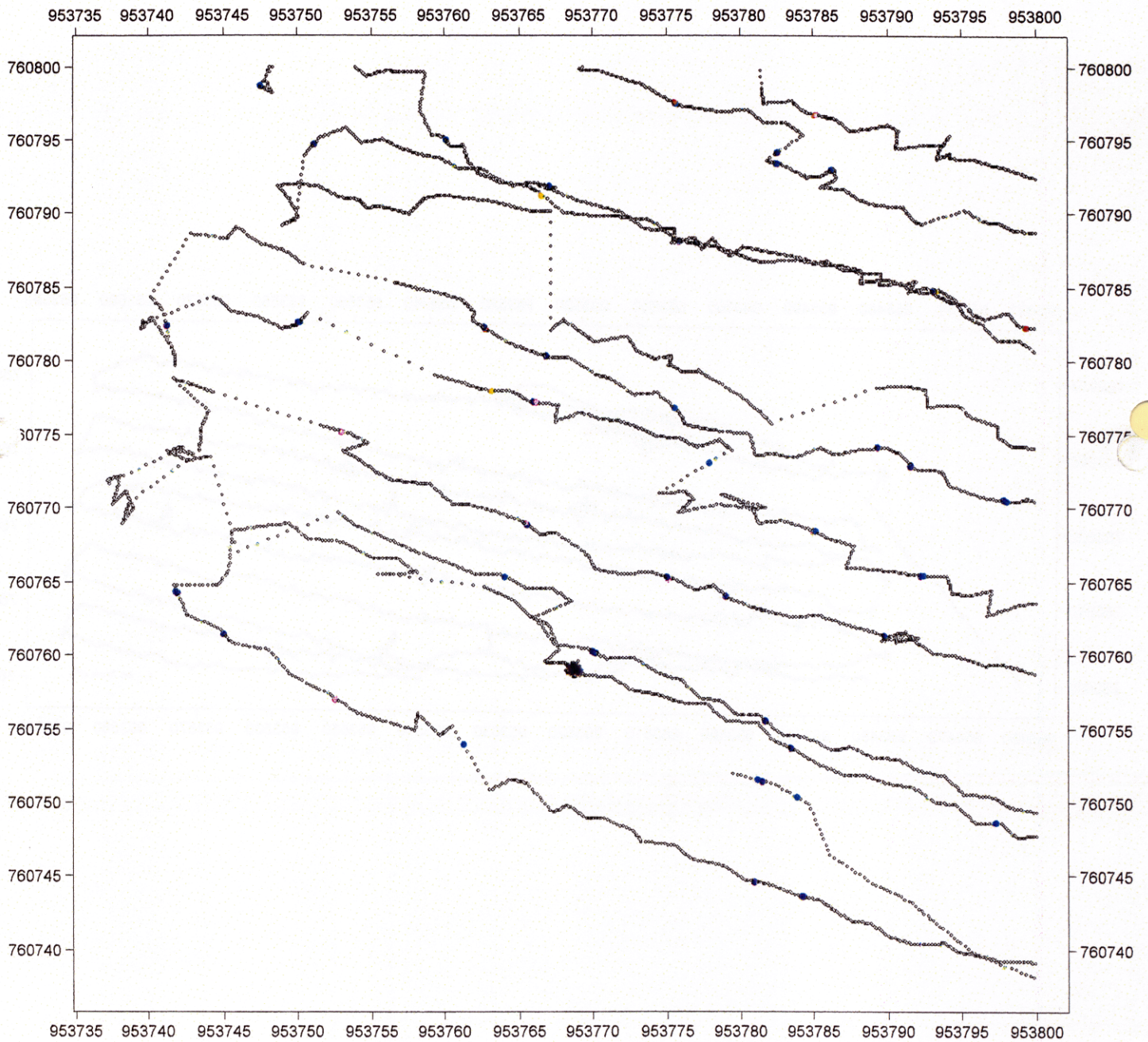


LOGGER Analyze v1.54m Track Map

Site: w_c21 () **Signal: Whites (cps)** **Time:**

Threshold:
> 60

< 50	80 to 90
50 to 60	90 to 100
60 to 70	> 100
70 to 80	



LOGGER Analyze v1.54m Track Map

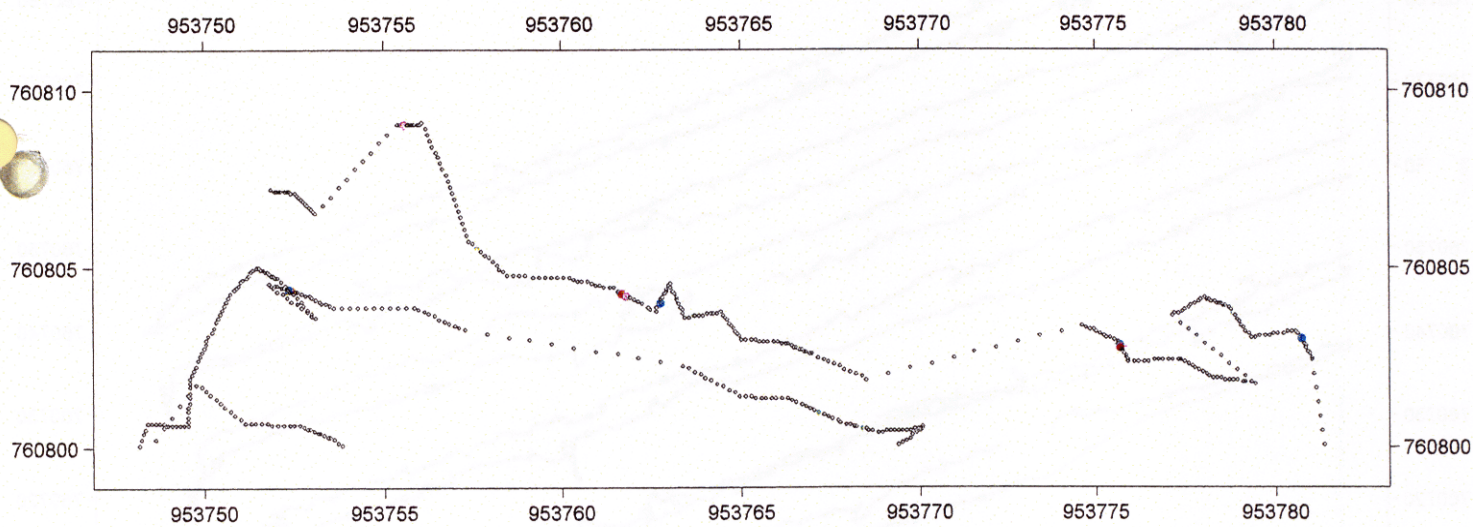
Site: w_c22 ()

Signal: Whites (cps)

Time:

Threshold:
> 60 •

< 50	80 to 90
50 to 60	90 to 100
60 to 70	> 100
70 to 80	



LOGGER Analyze v1.54m Track Map

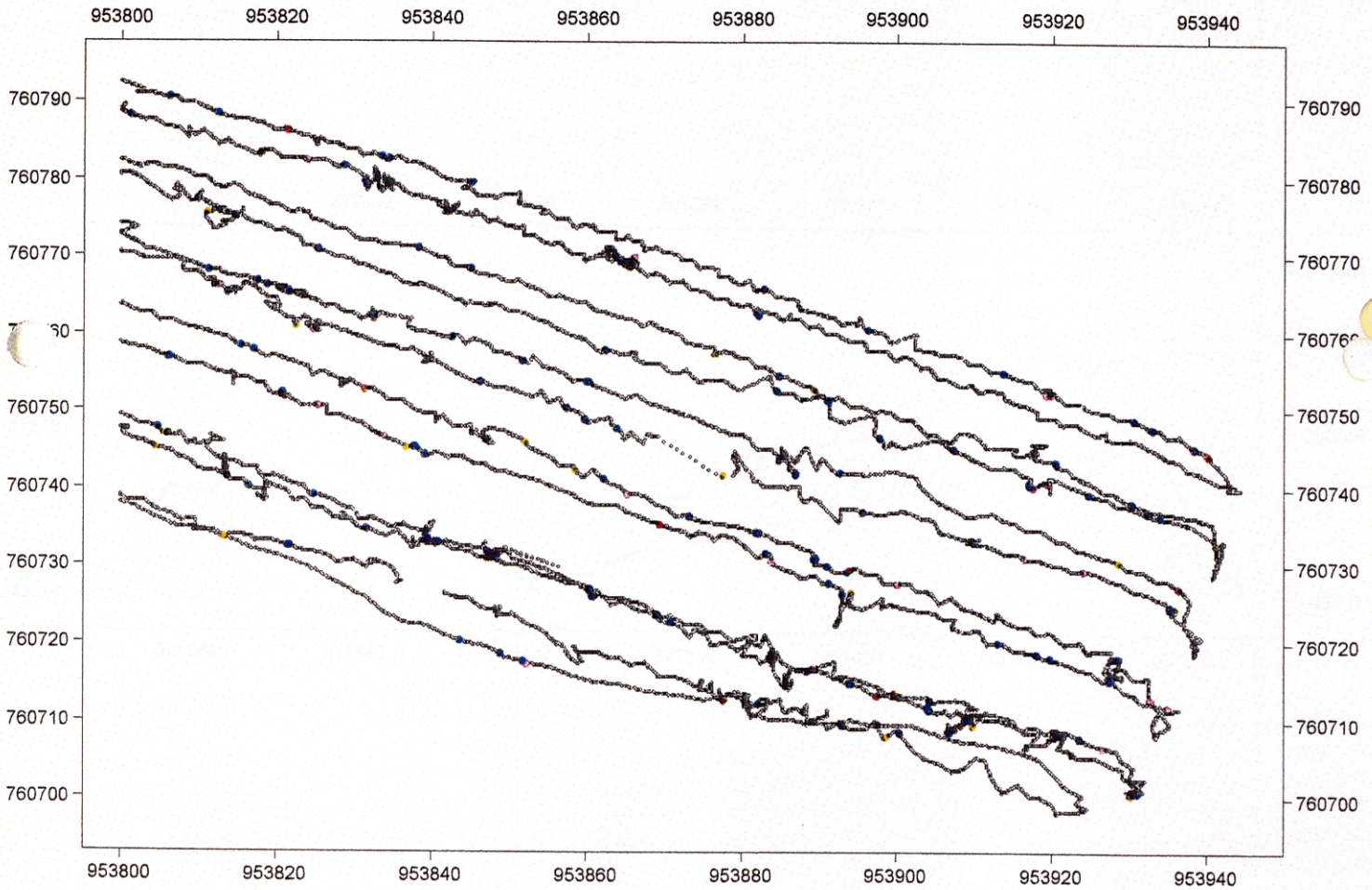
Site: w_d21 ()

Signal: Whites (cps)

Time:

Threshold:
> 60

< 50	80 to 90
50 to 60	90 to 100
60 to 70	> 100
70 to 80	



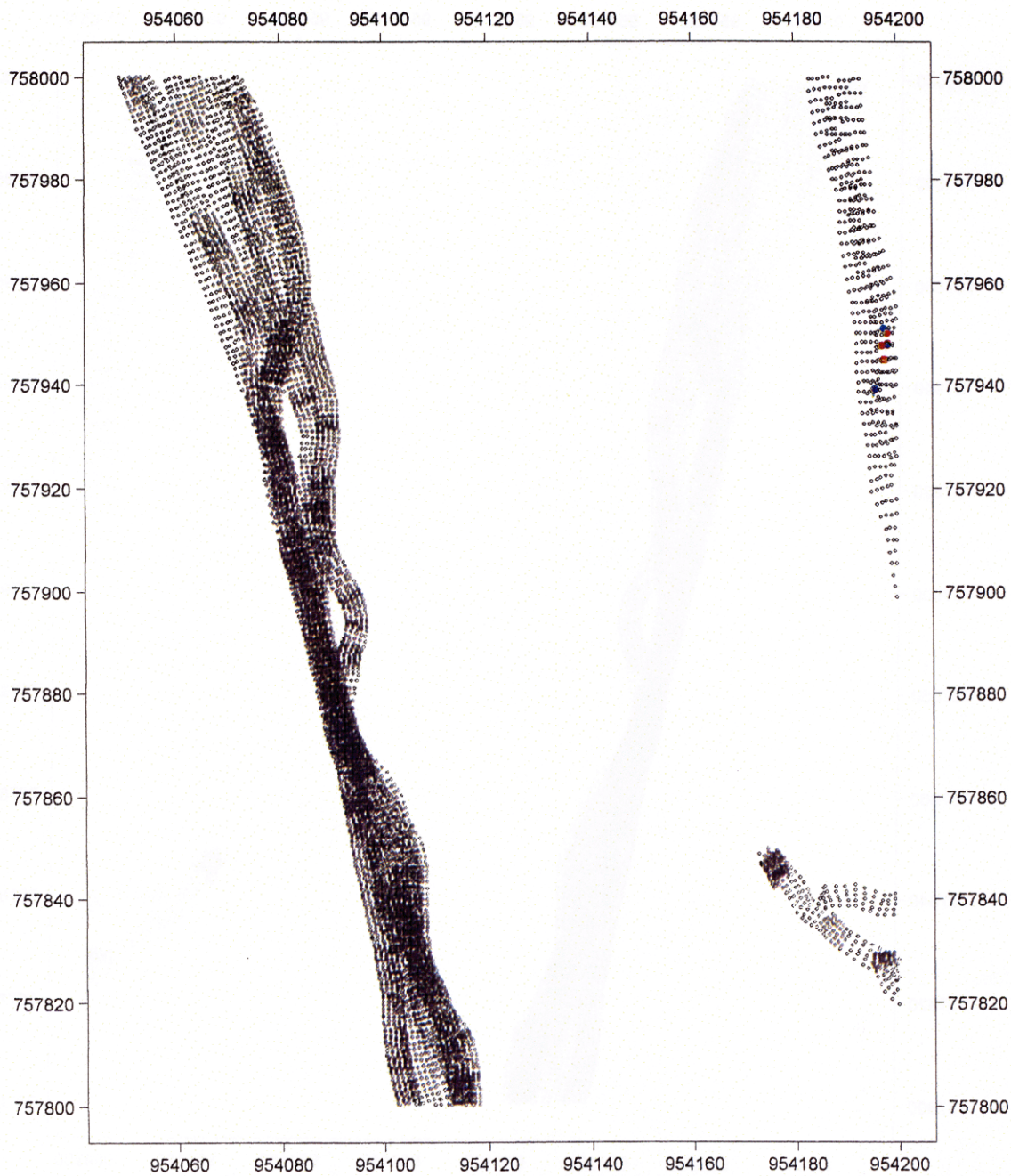
11456.7386

LOGGER Analyze v1.54m Track Map

Site: SA_e7 () **Signal: Array Signal (cps)** **Time:**

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



LOGGER Analyze v1.54m Track Map

Site: SA_e7 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140

LOGGER Analyze v1.54m Track Map

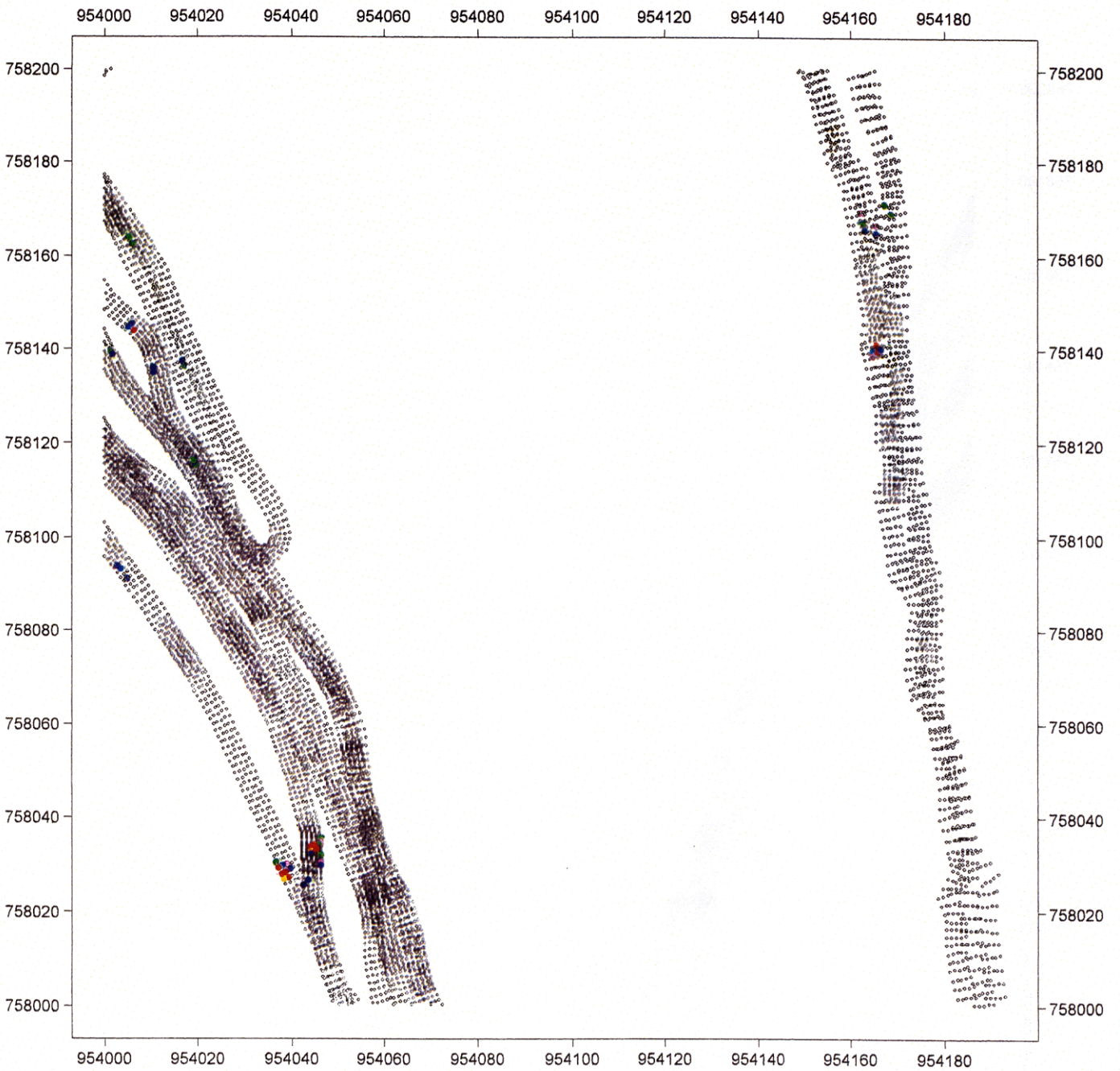
Site: SA_E8 ()

Signal: Array Signal (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



11456.7029

LOGGER Analyze v1.54m Track Map

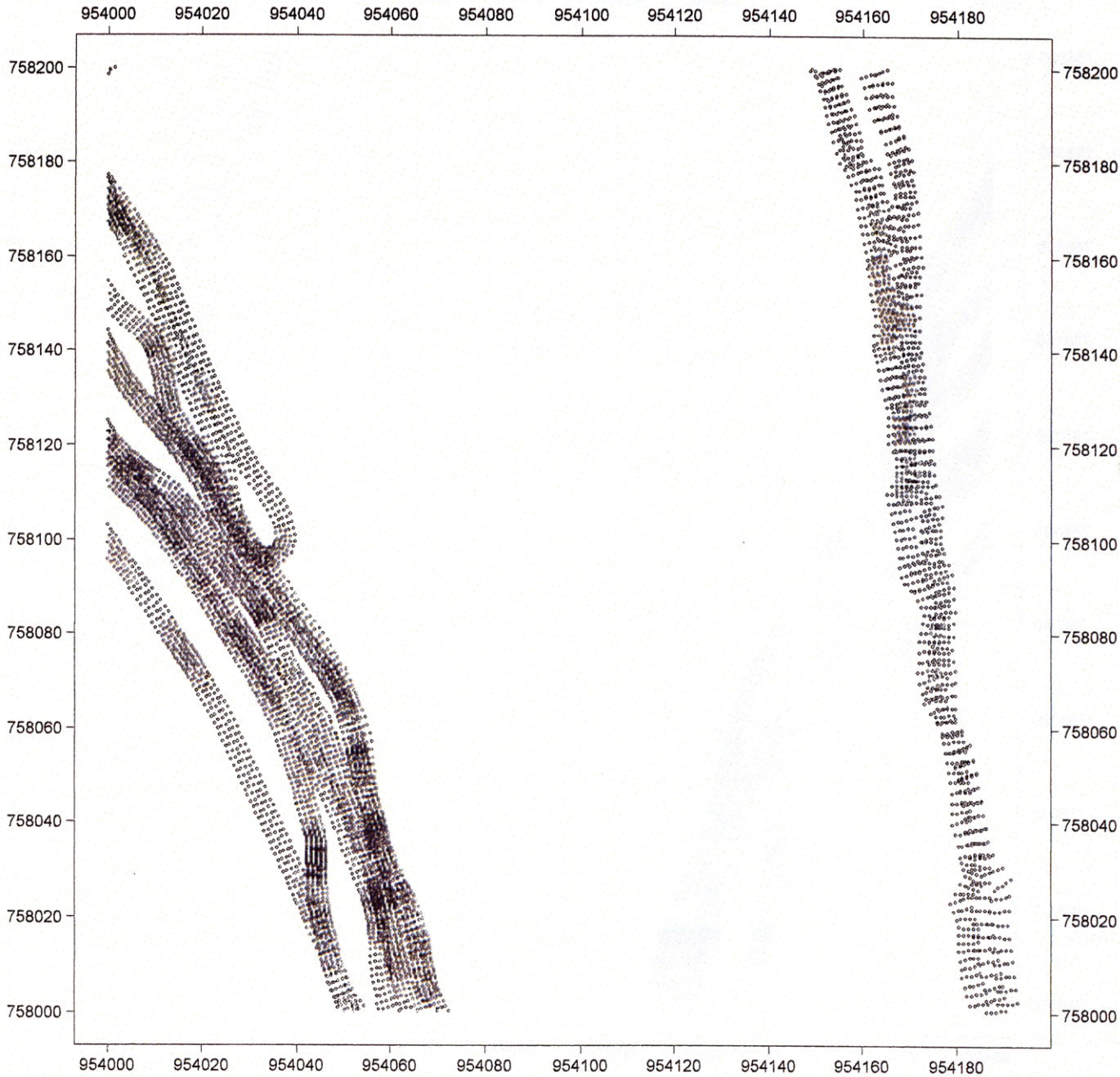
Site: SA_E8 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



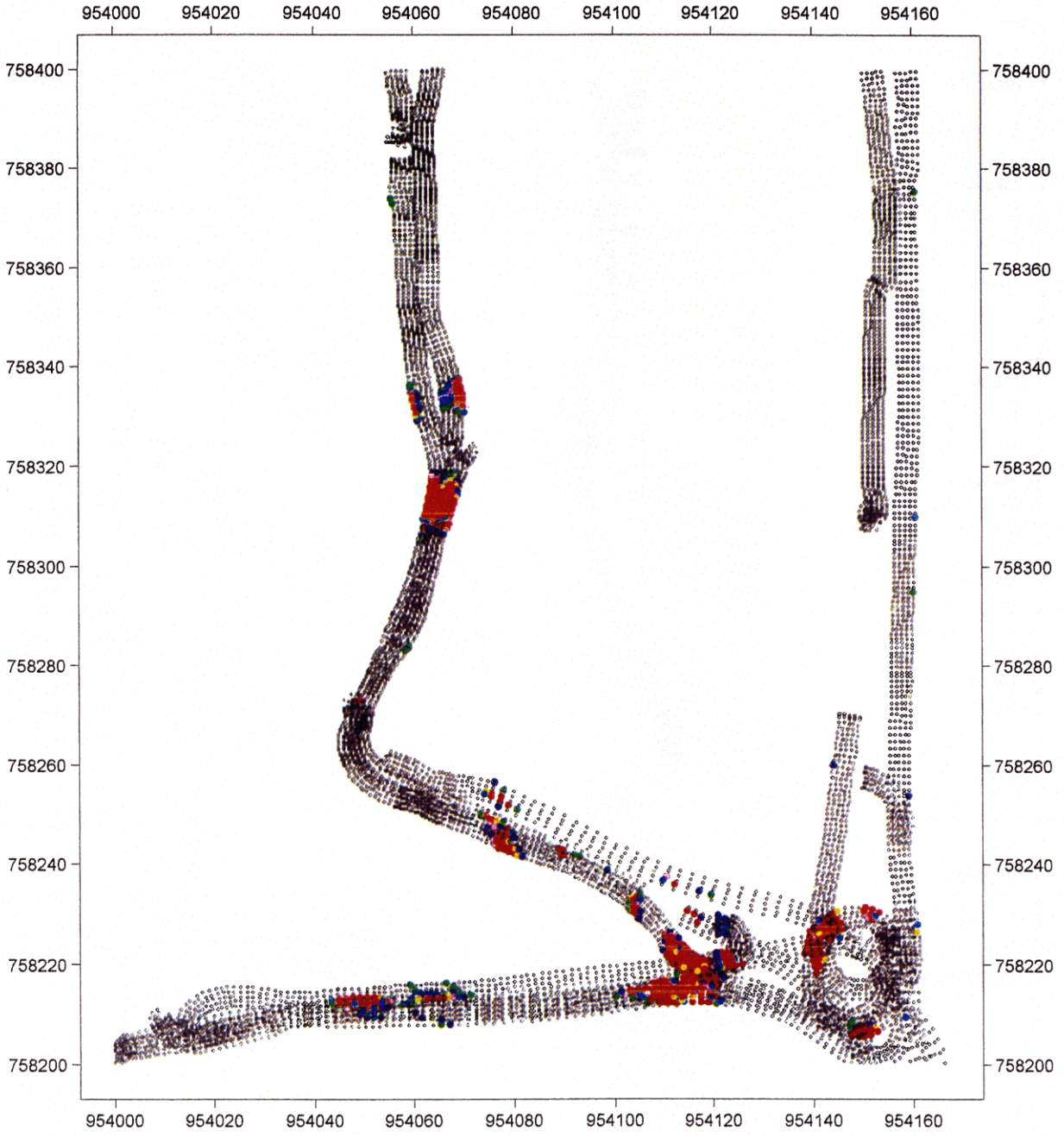
11456.7029

LOGGER Analyze v1.54m Track Map

Site: SA_e9 () **Signal: Array Signal (cps)** **Time:**

Threshold:
> 50

< 40	**100 to 120**
40 to 60	**120 to 140**
60 to 80	**> 140**
80 to 100	



LOGGER Analyze v1.54m Track Map

Site: SA_e9 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

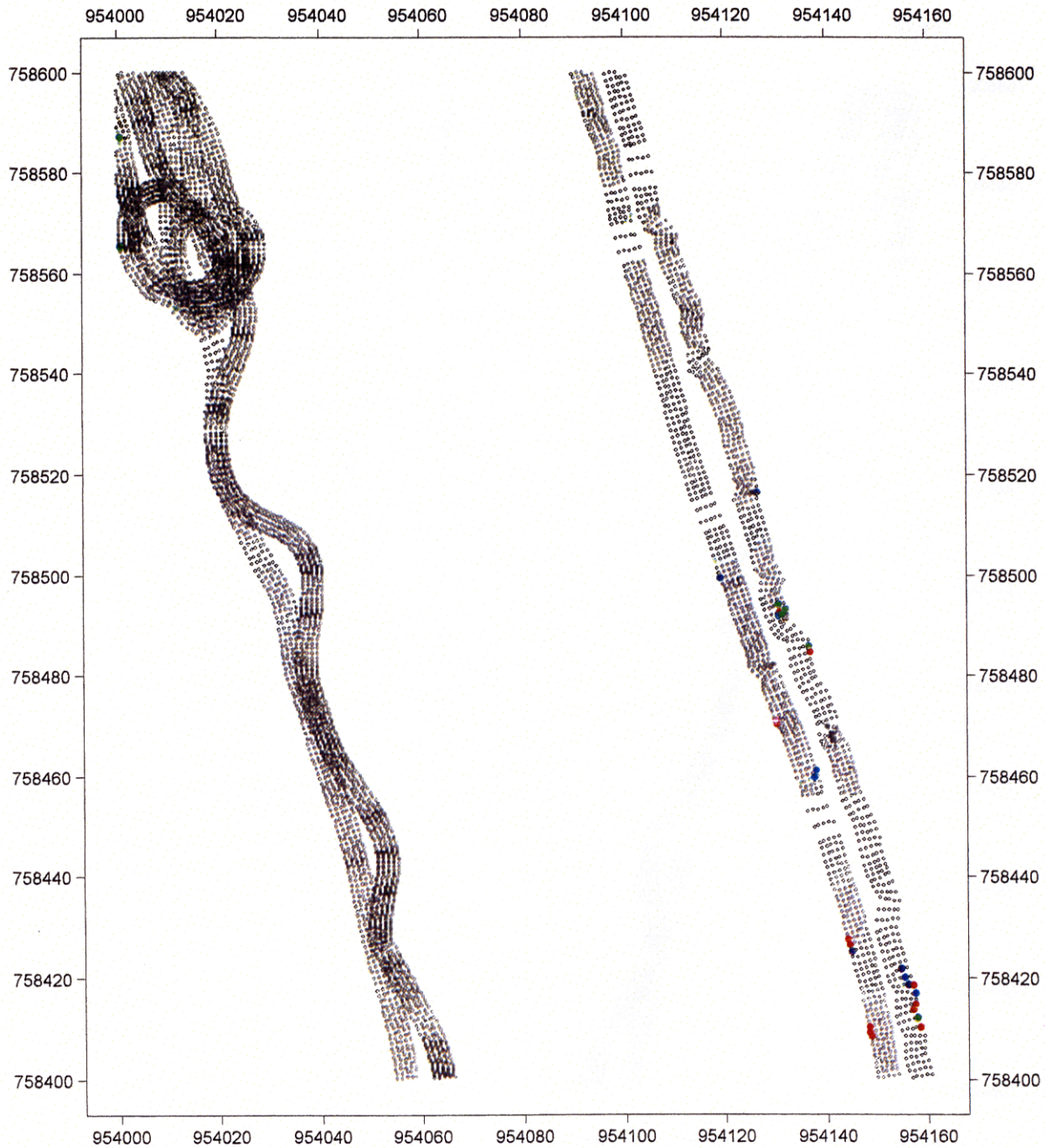
< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	

LOGGER Analyze v1.54m Track Map

Site: SA_e10 () **Signal: Array Signal (cps)** **Time:**

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



11455.8233

LOGGER Analyze v1.54m Track Map

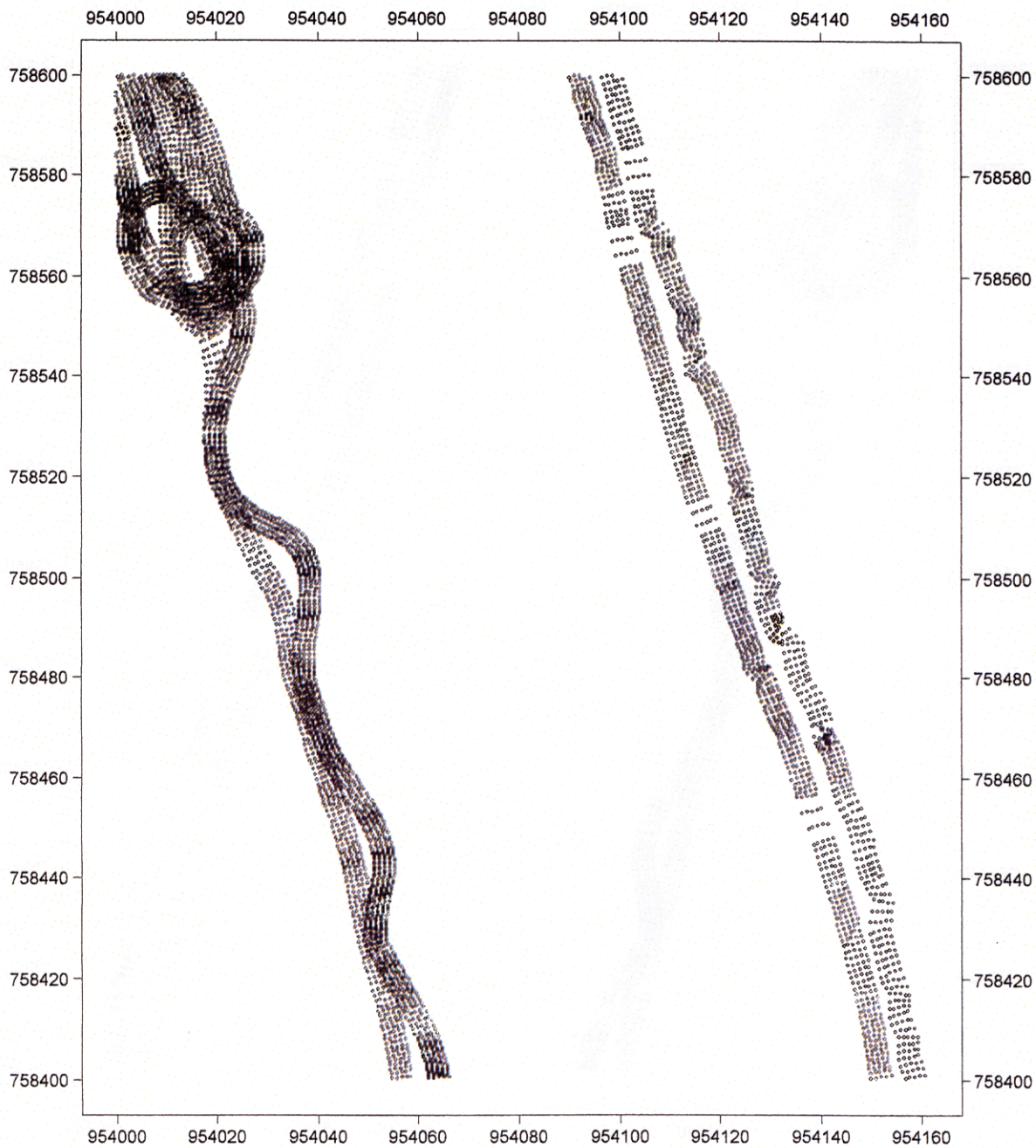
Site: SA_e10 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



11455.8233

LOGGER Analyze v1.54m Track Map

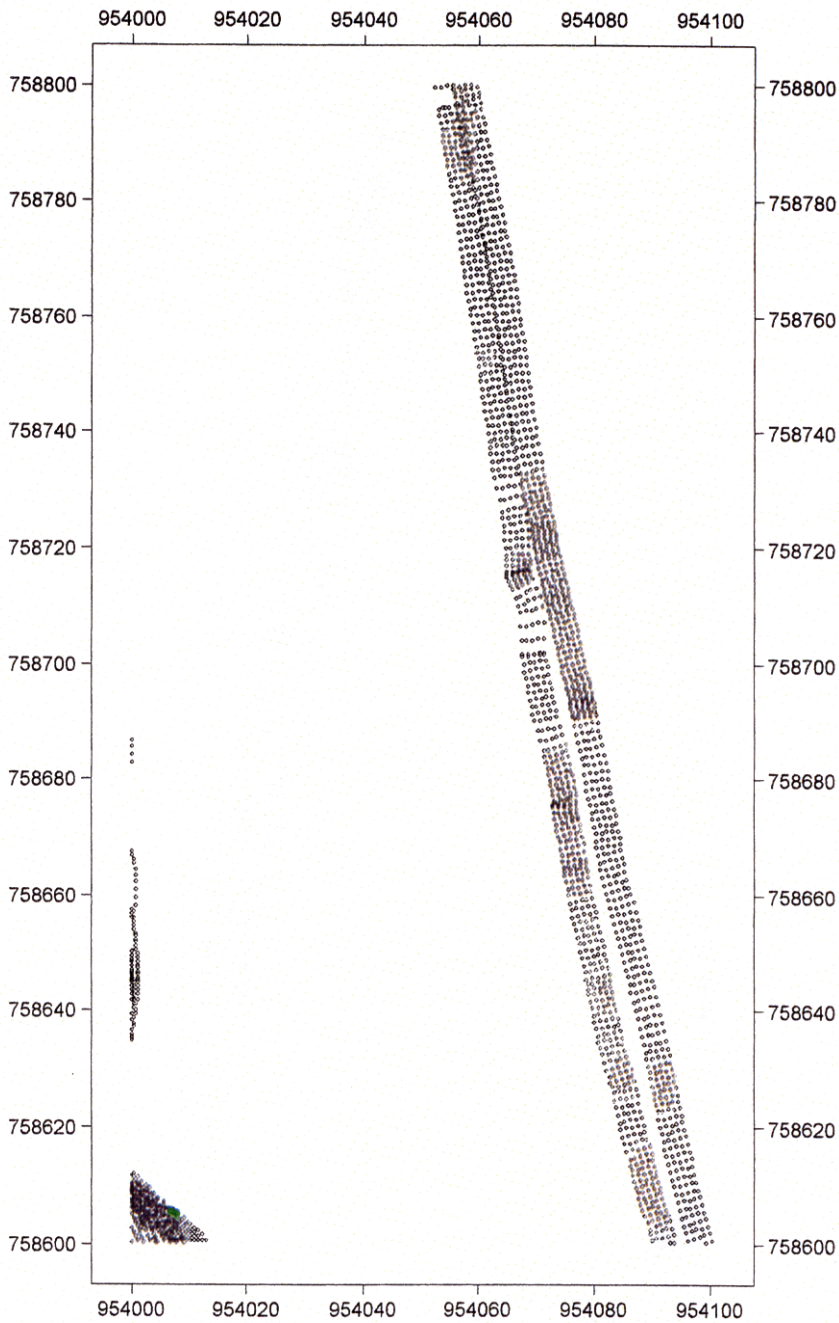
Site: SA_e11 ()

Signal: Array Signal (cps)

Time:

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



11455.8237

LOGGER Analyze v1.54m Track Map

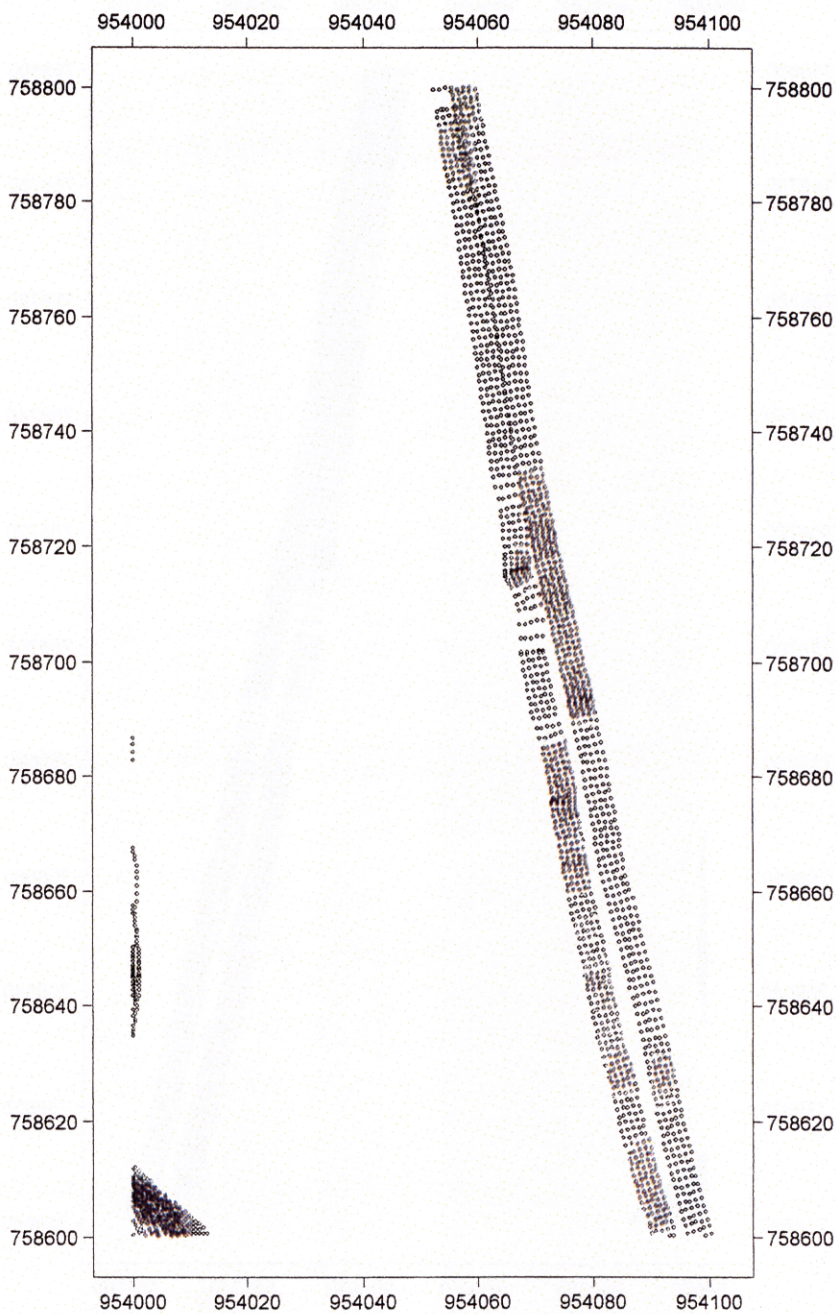
Site: SA_e11 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



11455.8237

LOGGER Analyze v1.54m Track Map

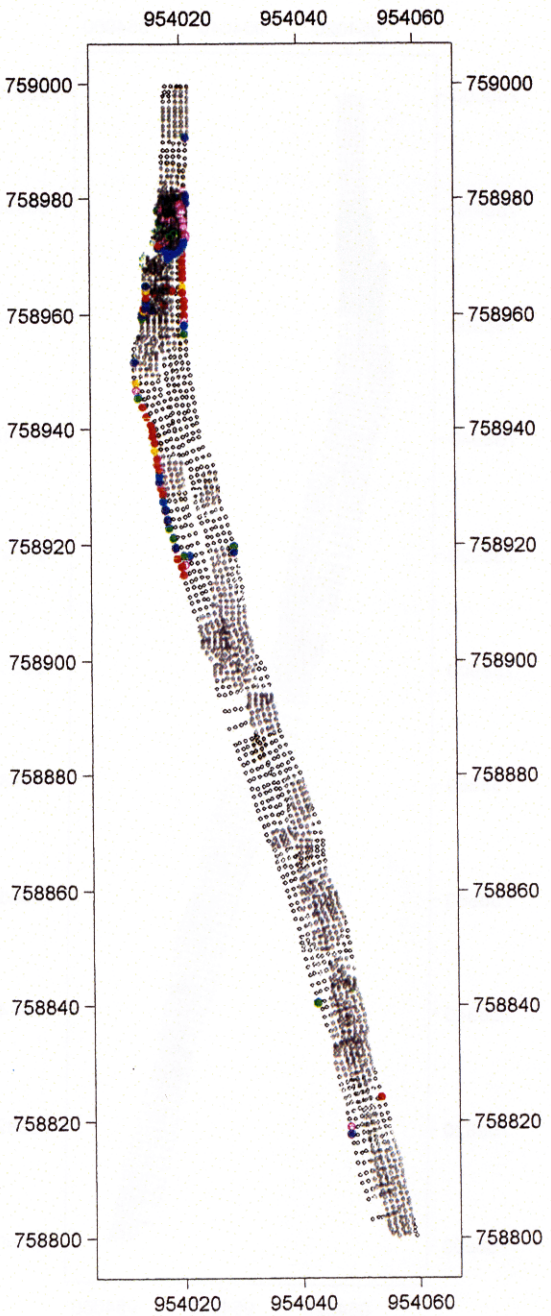
Site: SA_e12 ()

Signal: Array Signal (cps)

Time:

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



LOGGER Analyze v1.54m Track Map

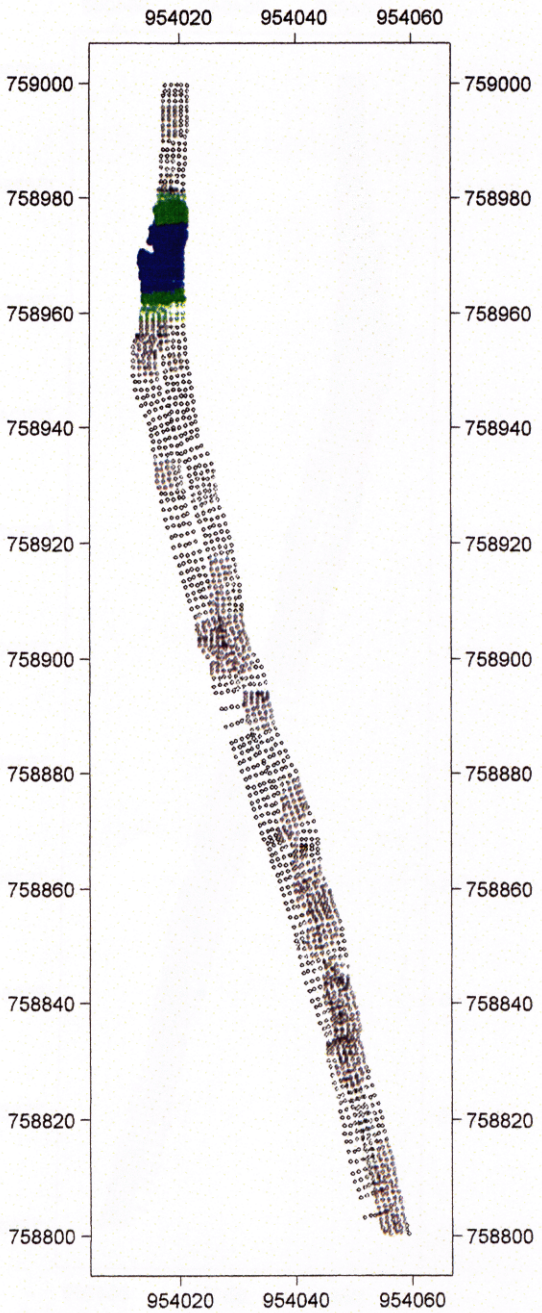
Site: SA_e12 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



LOGGER Analyze v1.54m Track Map

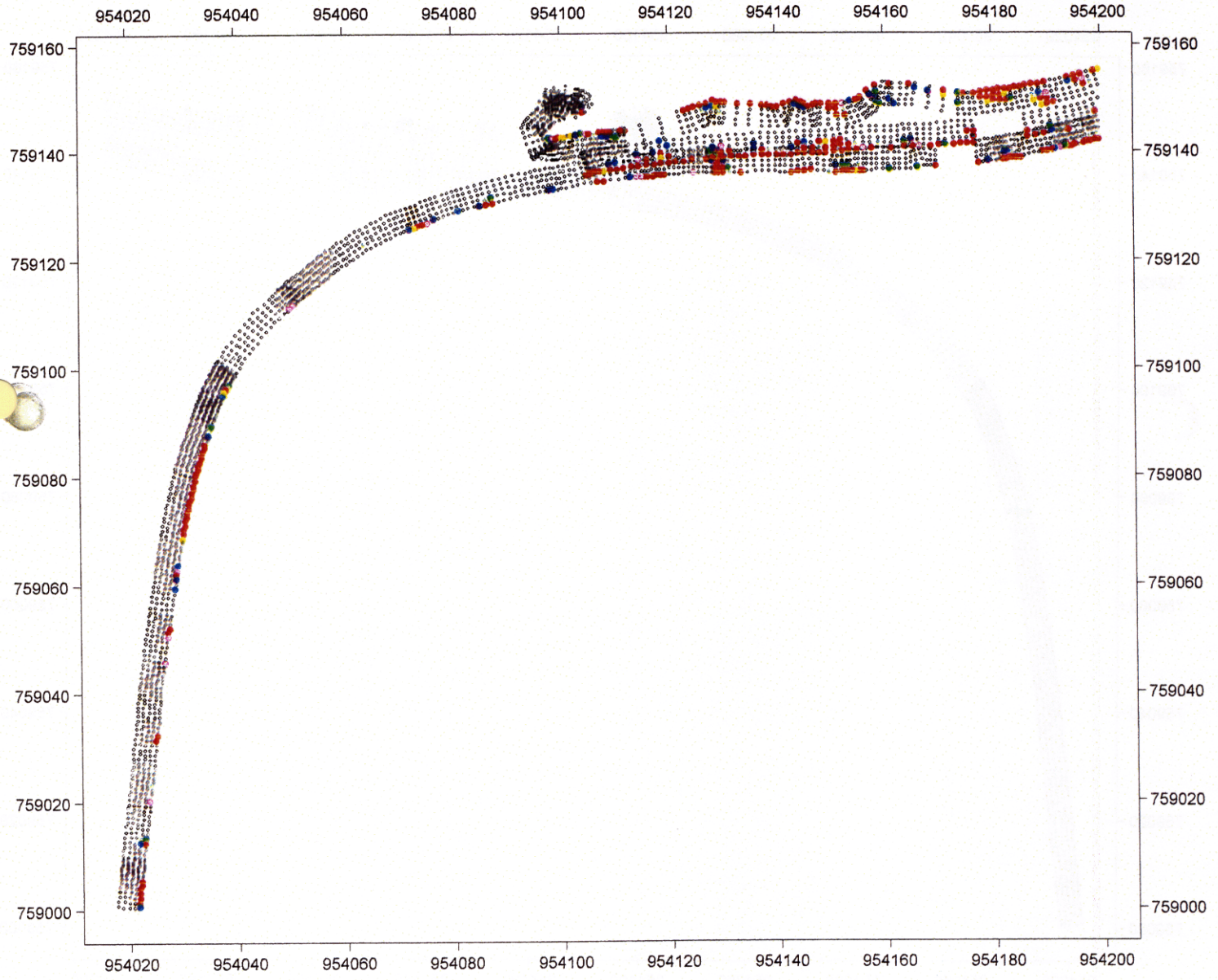
Site: SA_e13 ()

Signal: Array Signal (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



LOGGER Analyze v1.54m Track Map

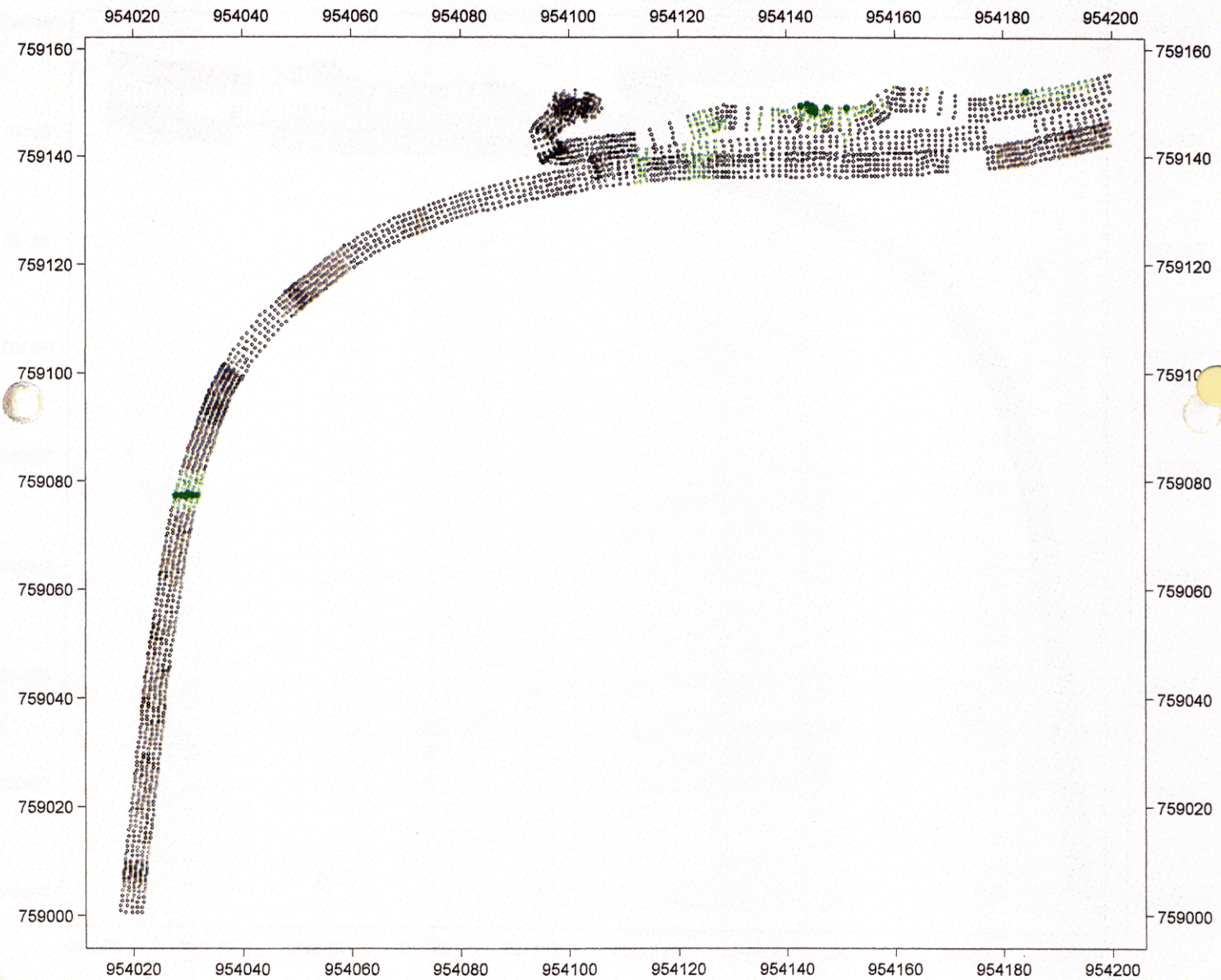
Site: SA_e13 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50 •

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	

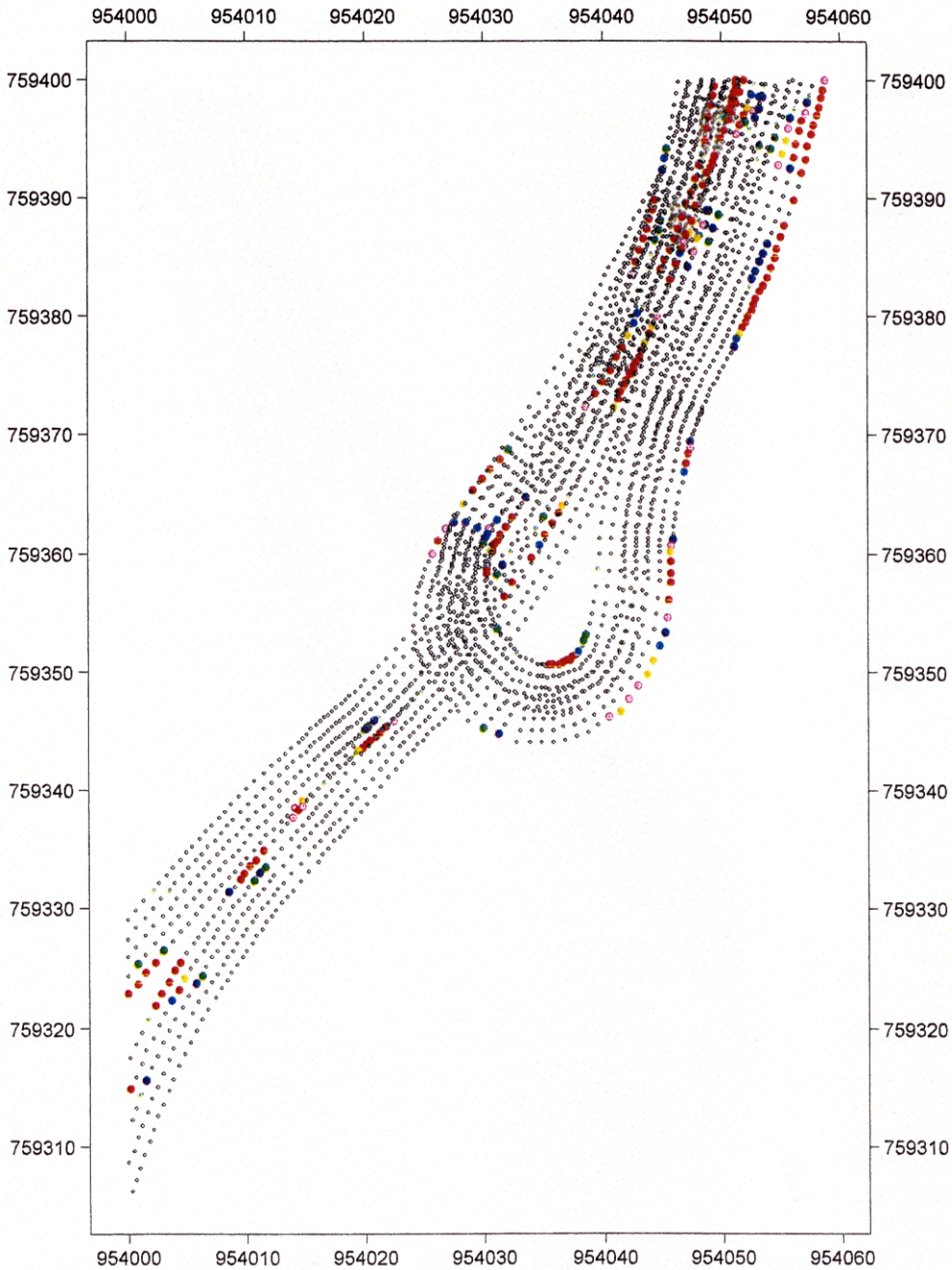


LOGGER Analyze v1.54m Track Map

Site: SA_e14 () **Signal: Array Signal (cps)** **Time:**

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



LOGGER Analyze v1.54m Track Map

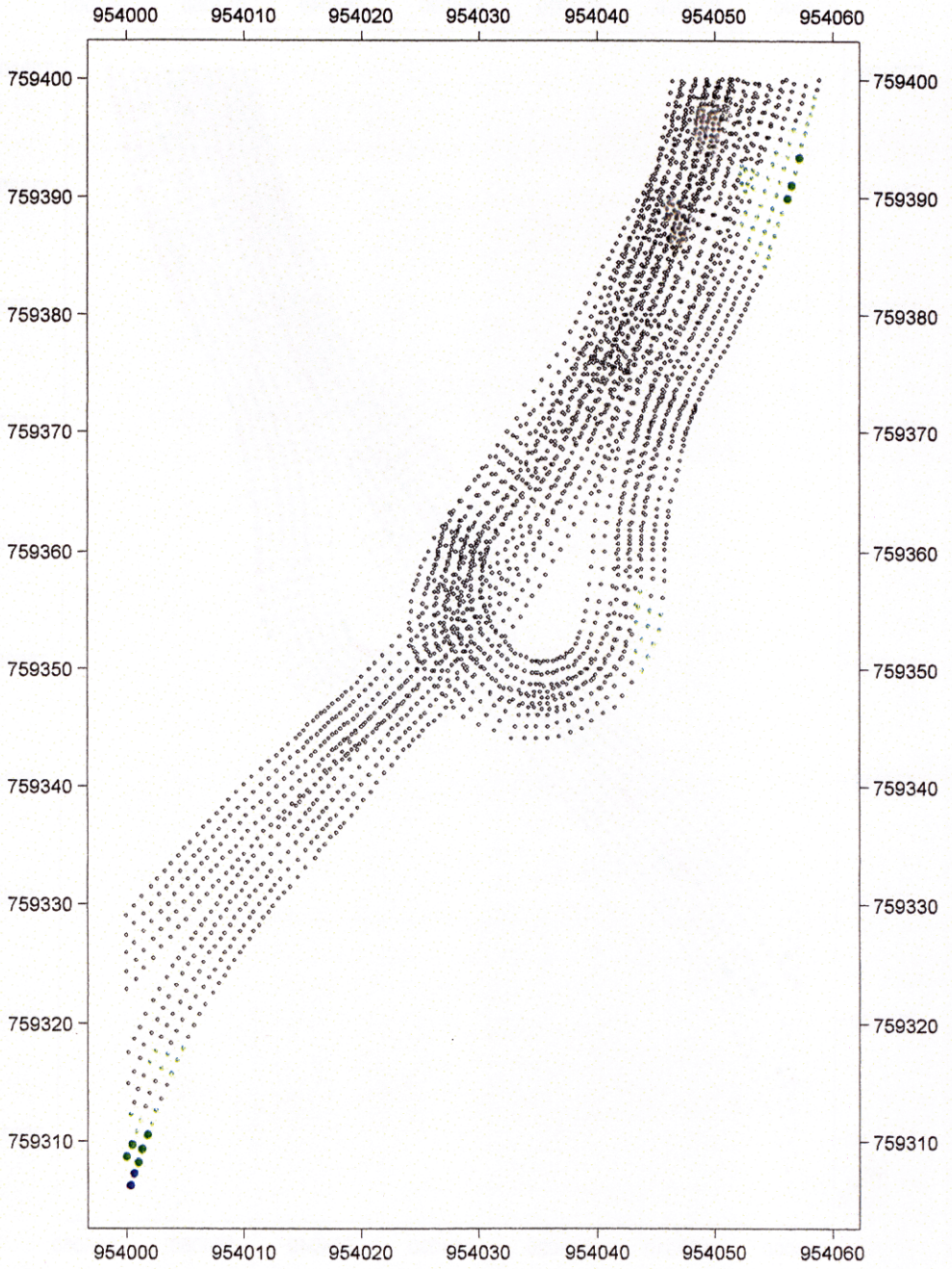
Site: SA_e14 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



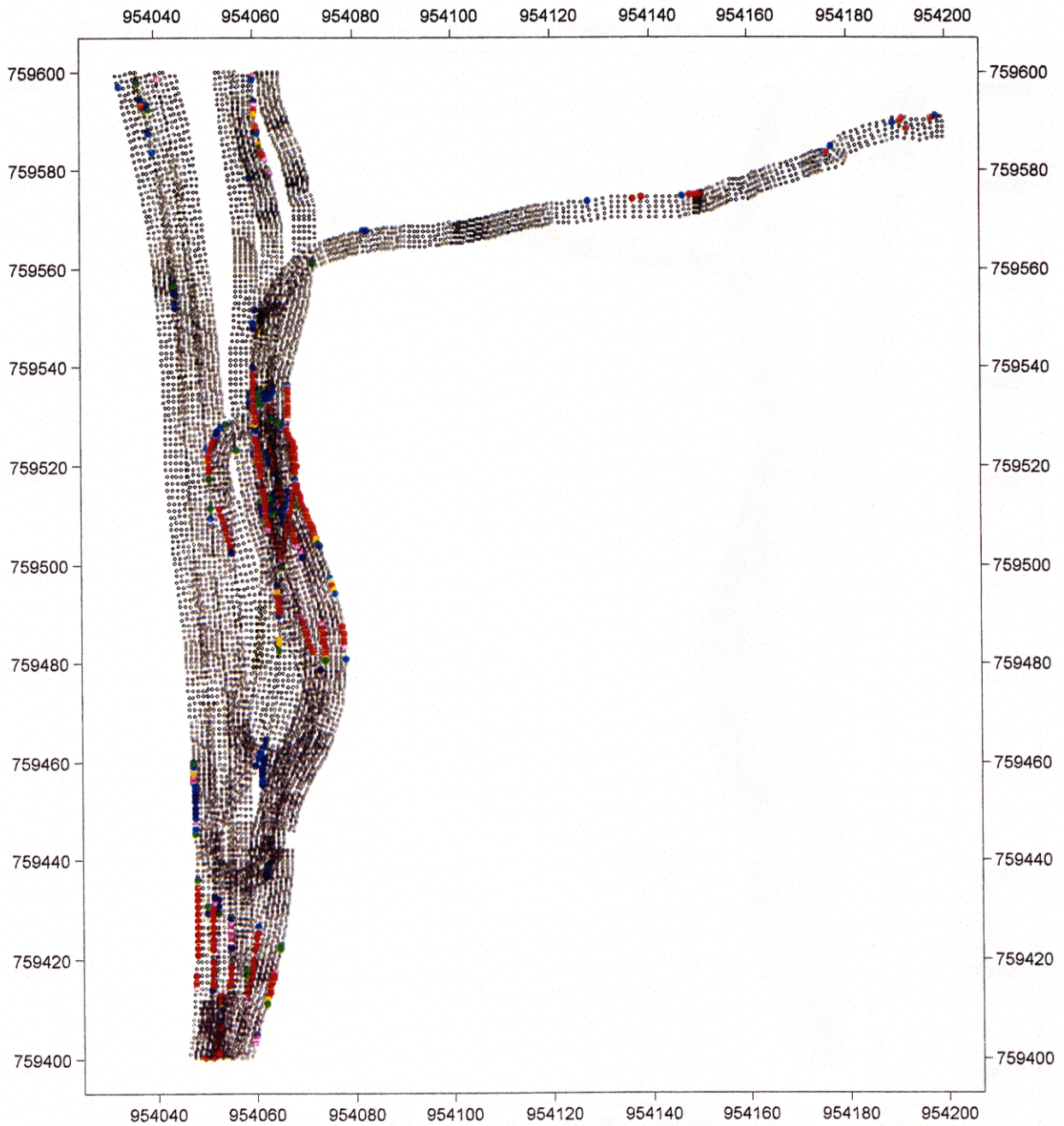
11455.8247

LOGGER Analyze v1.54m Track Map

Site: SA_e15 () **Signal: Array Signal (cps)** **Time:**

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



11455.8252

LOGGER Analyze v1.54m Track Map

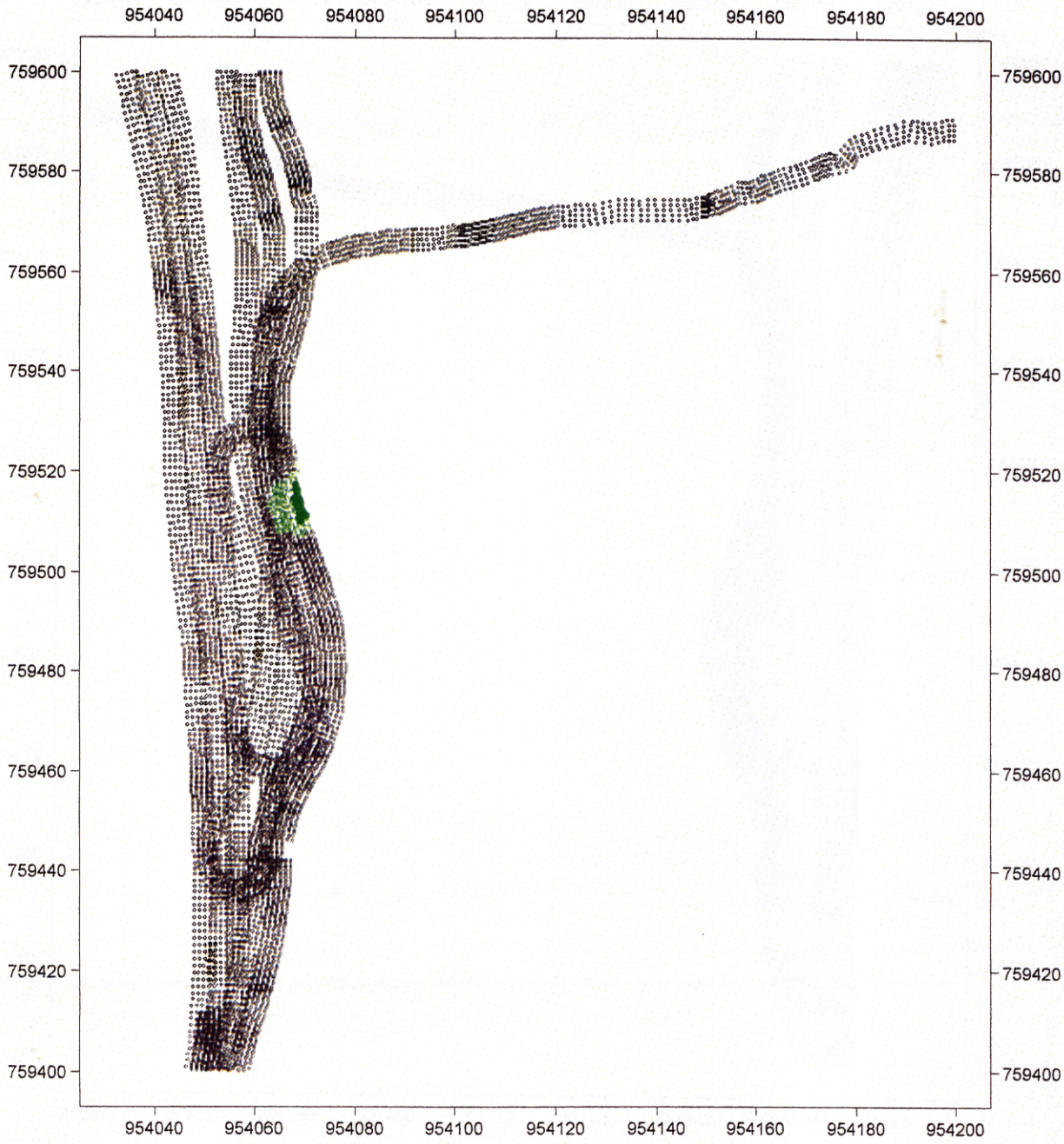
Site: SA_e15 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



11455.8252

LOGGER Analyze v1.54m Track Map

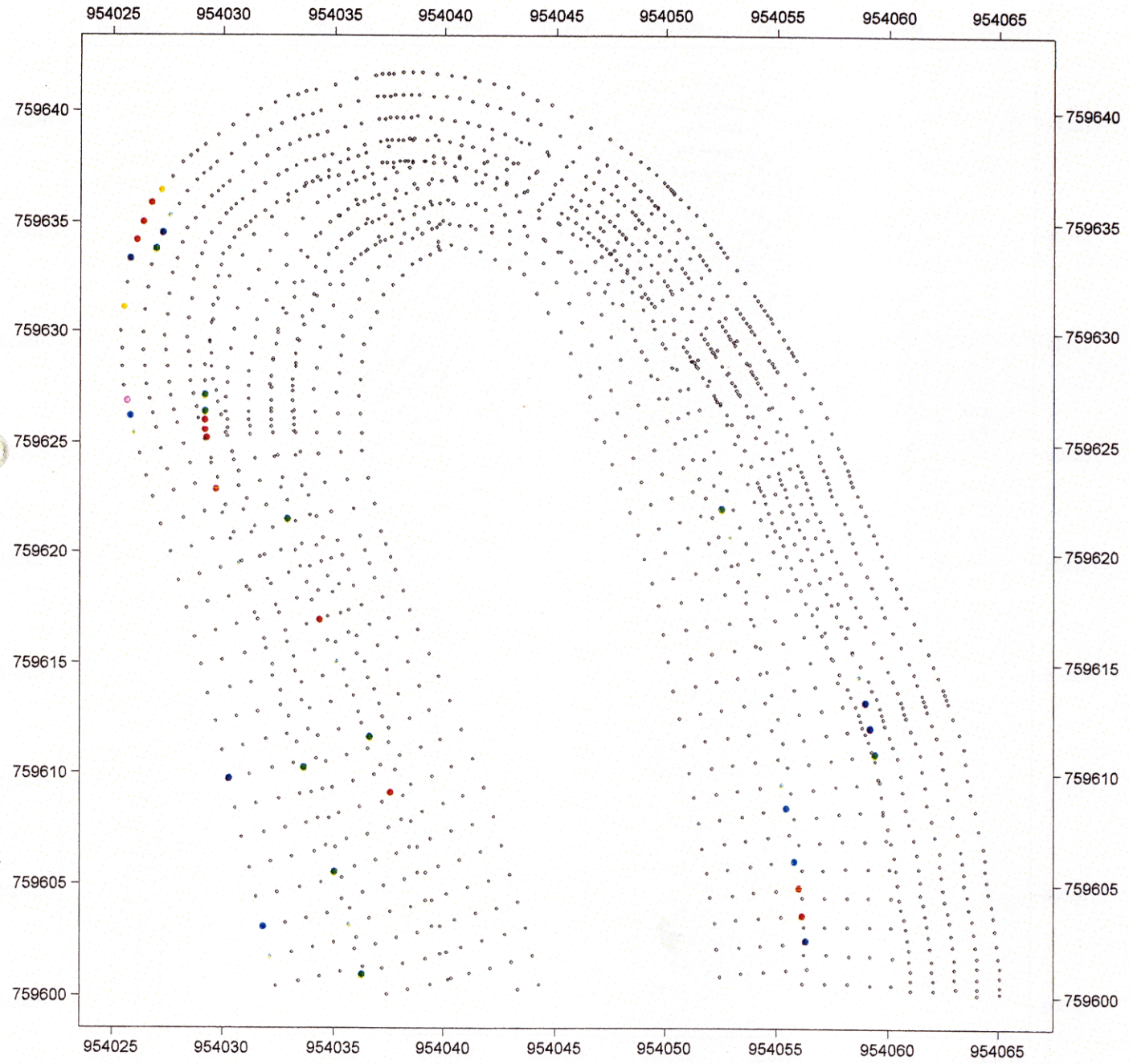
Site: SA_e16 ()

Signal: Array Signal (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



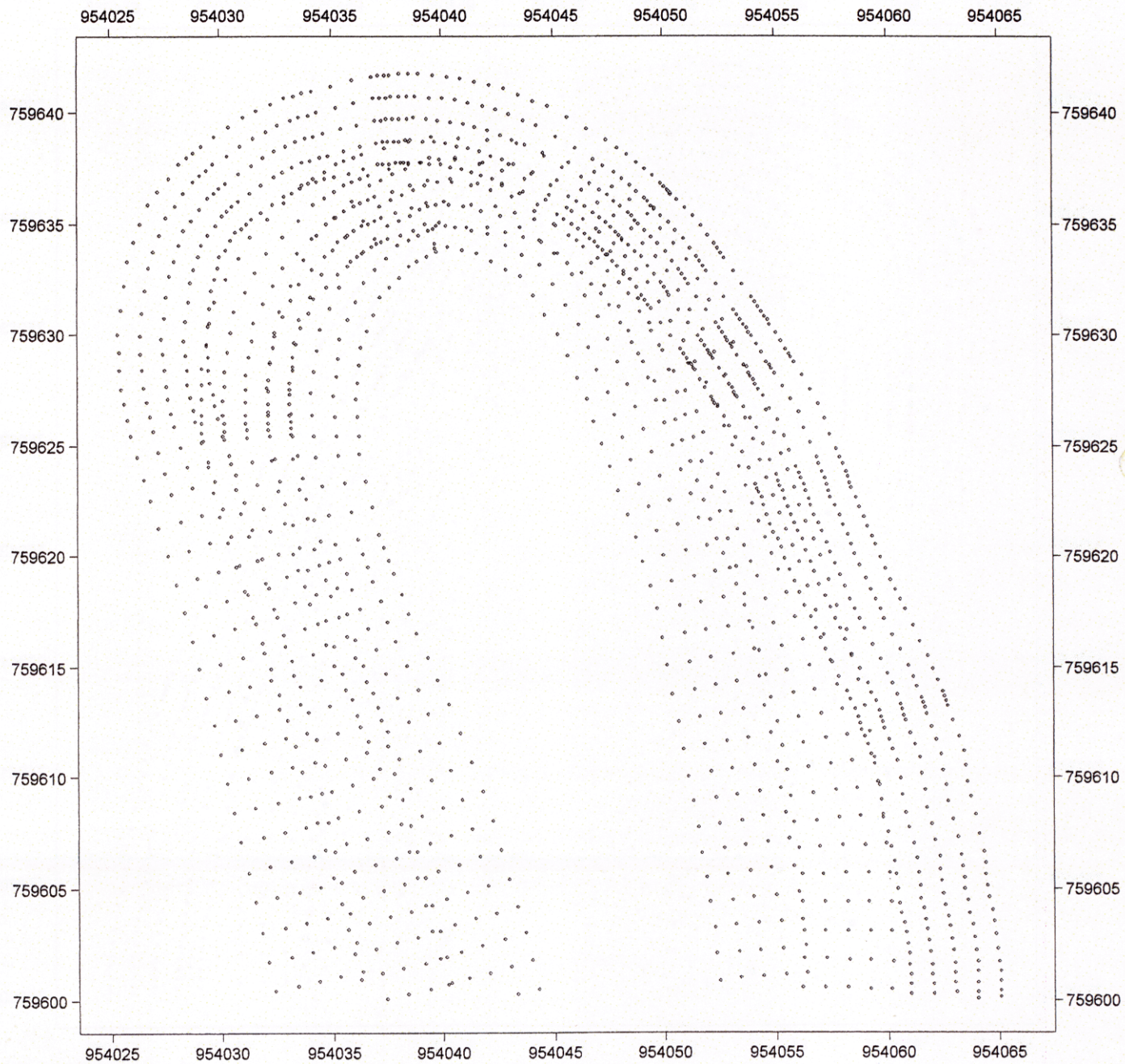
11455.8258

LOGGER Analyze v1.54m Track Map

Site: SA_e16 () **Signal: Array Background (cps)** **Time:**

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140

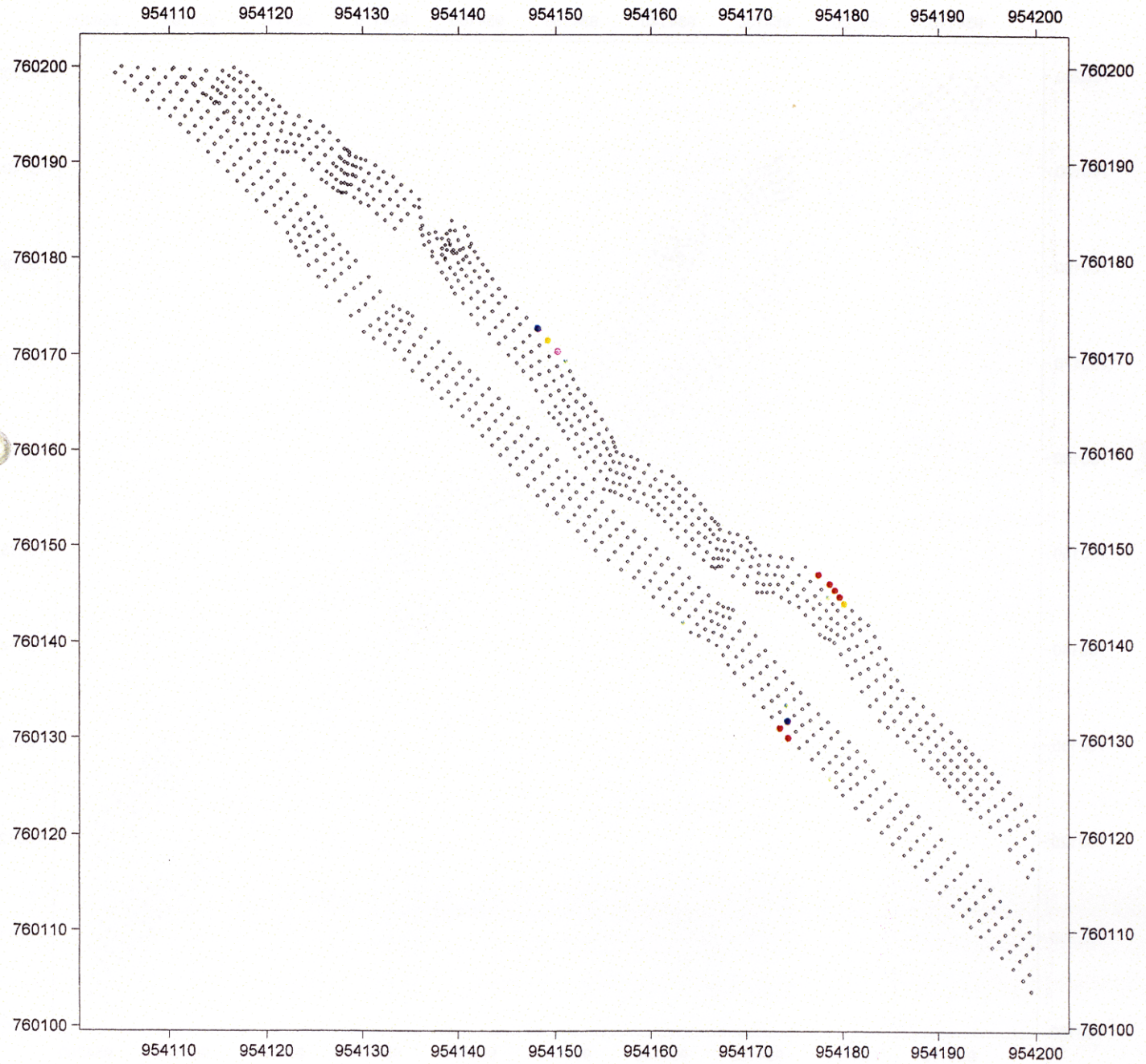


LOGGER Analyze v1.54m Track Map

Site: SA_e18 () **Signal: Array Signal (cps)** **Time:**

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



11455.8260

LOGGER Analyze v1.54m Track Map

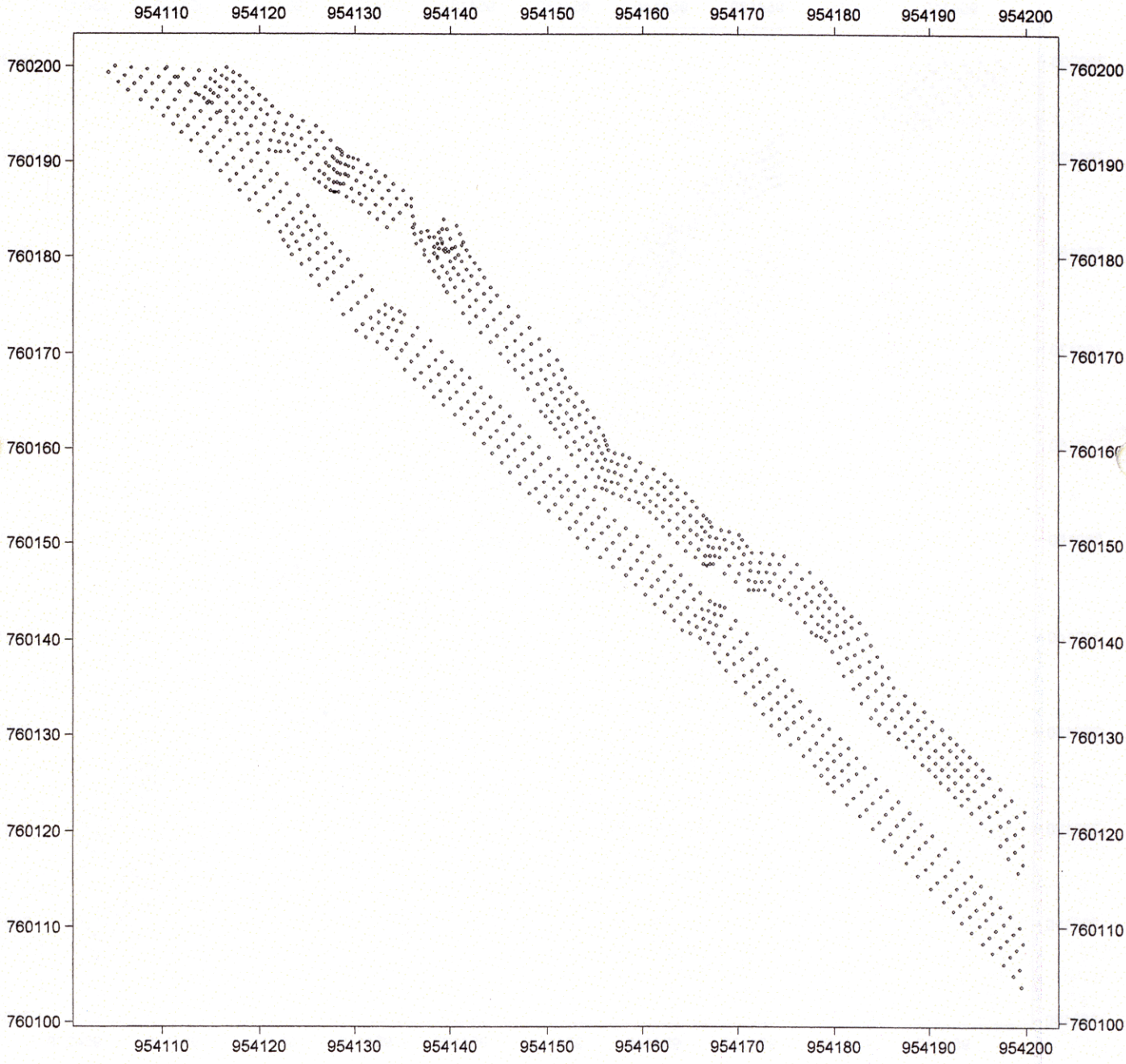
Site: SA_e18 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



11455.8260

LOGGER Analyze v1.54m Track Map

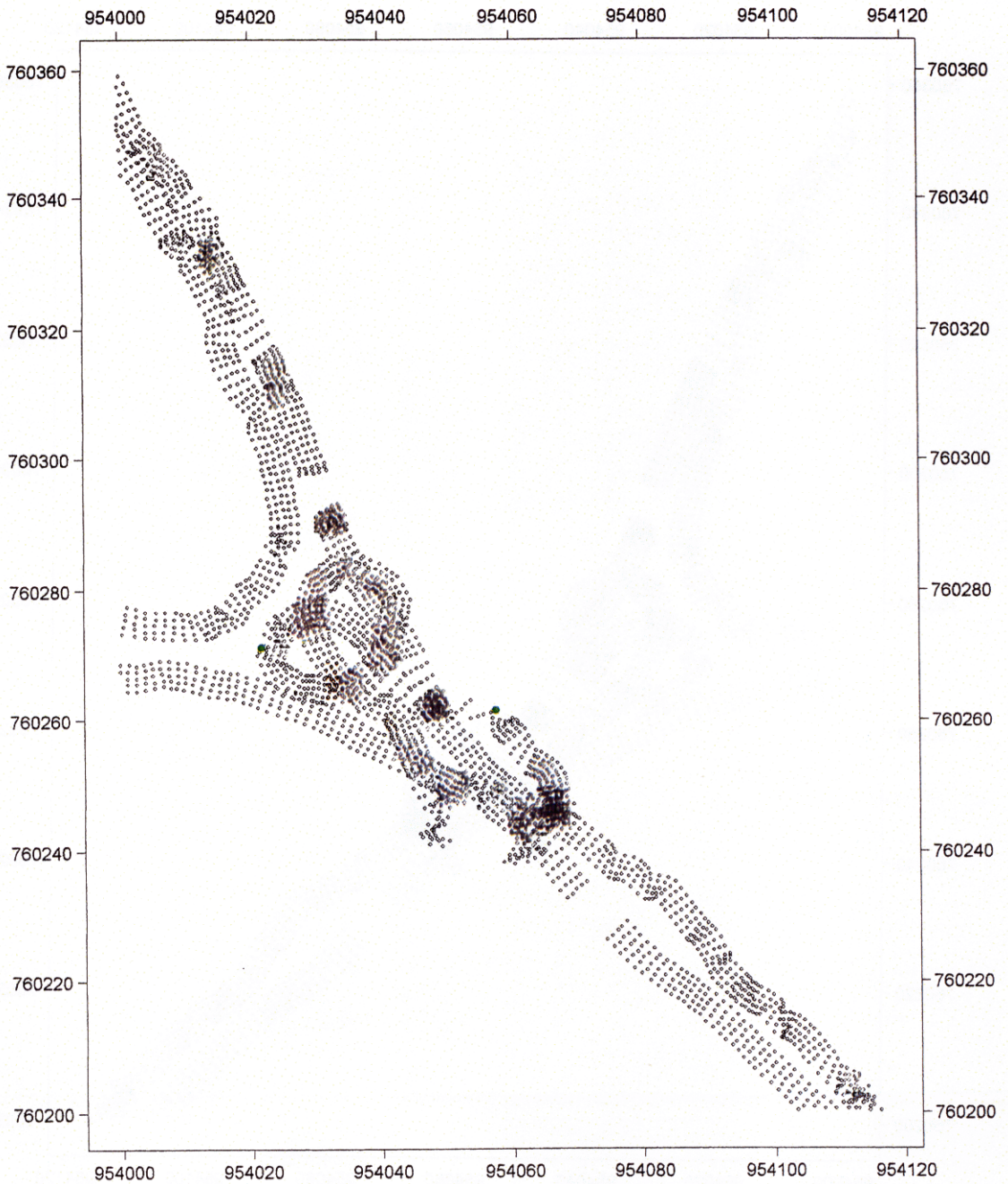
Site: SA_e19 ()

Signal: Array Signal (cps)

Time:

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



LOGGER Analyze v1.54m Track Map

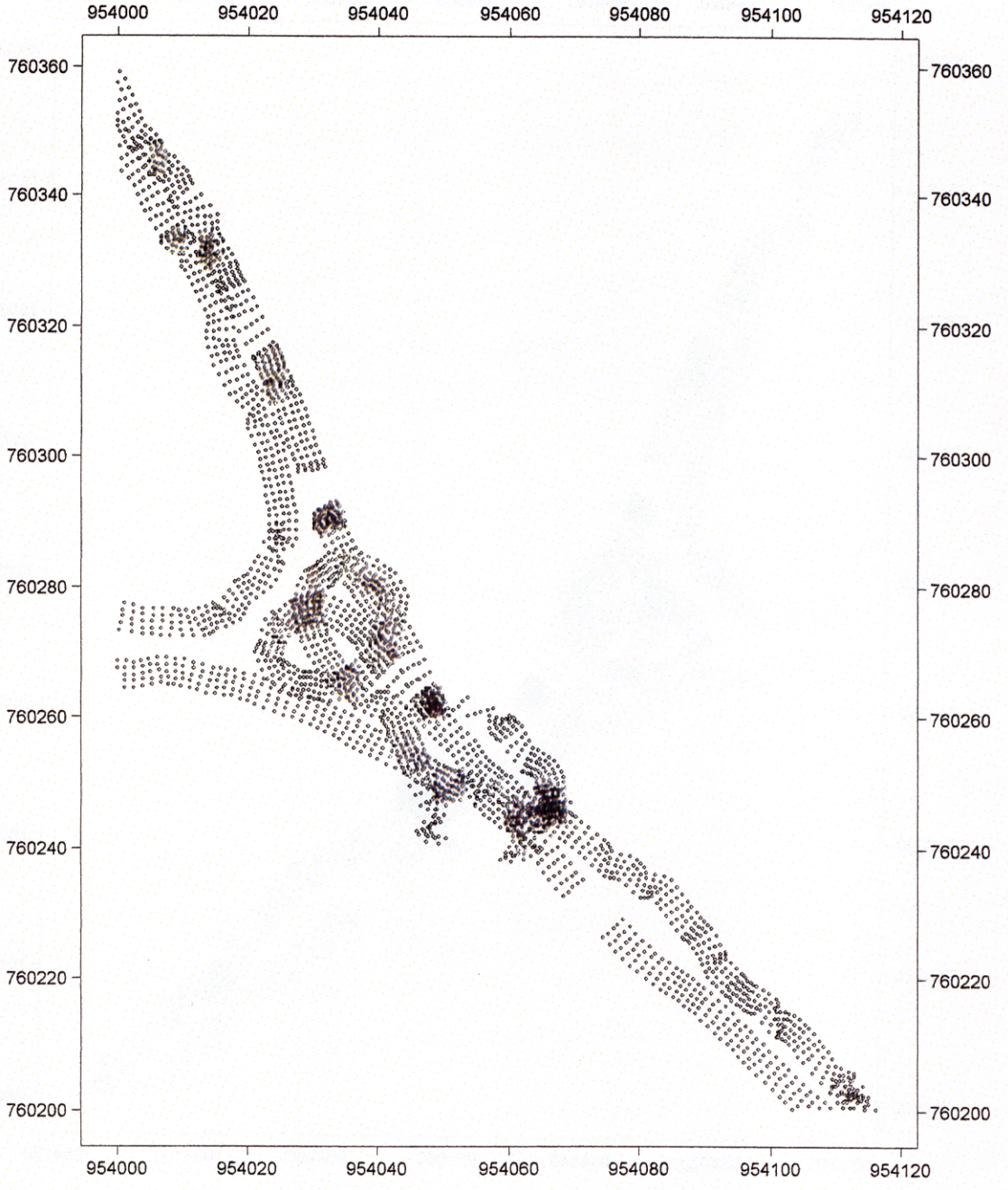
Site: SA_e19 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



11455.8263

LOGGER Analyze v1.54m Track Map

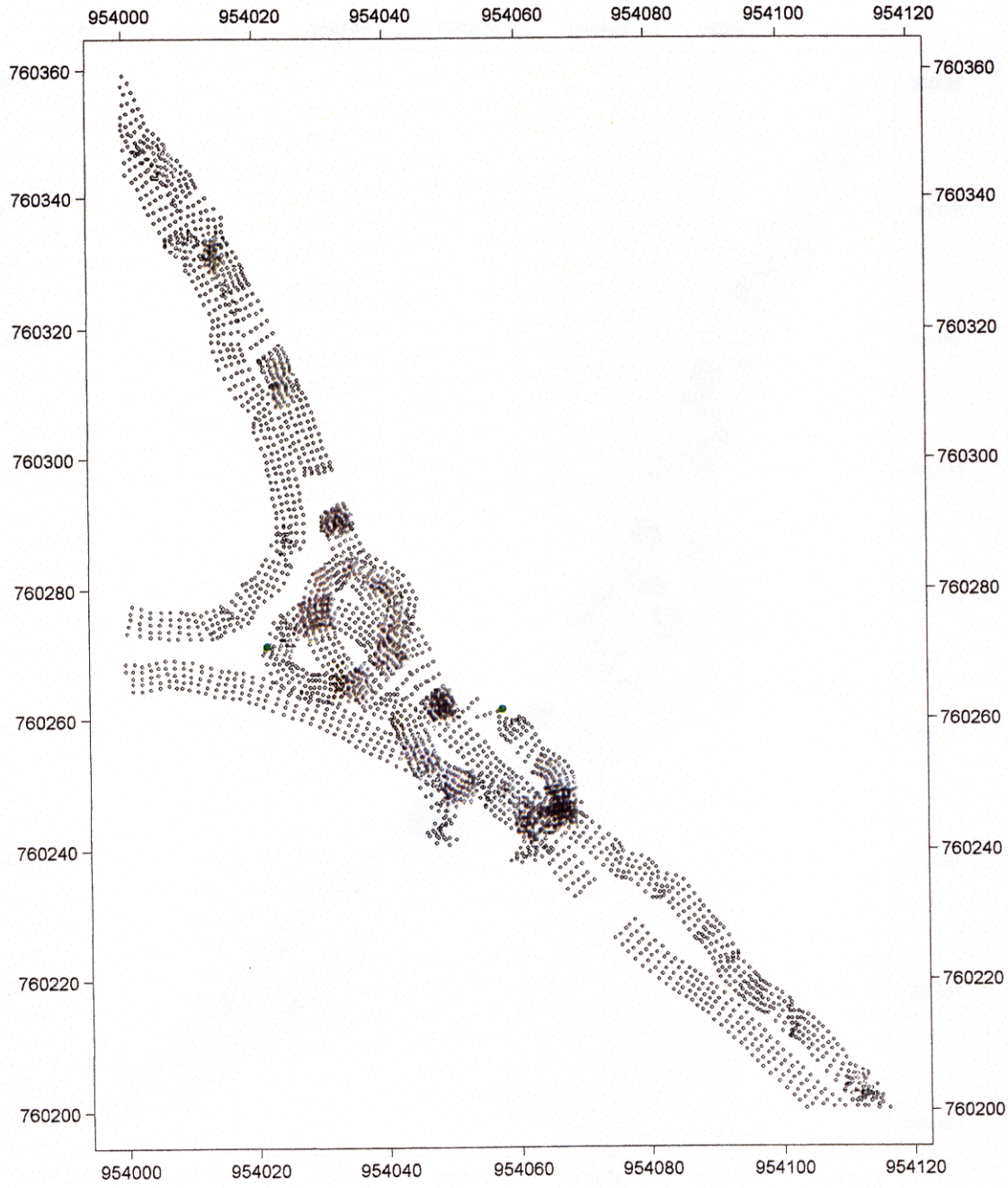
Site: SA_e19 ()

Signal: Array Signal (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



11455.8263

LOGGER Analyze v1.54m Track Map

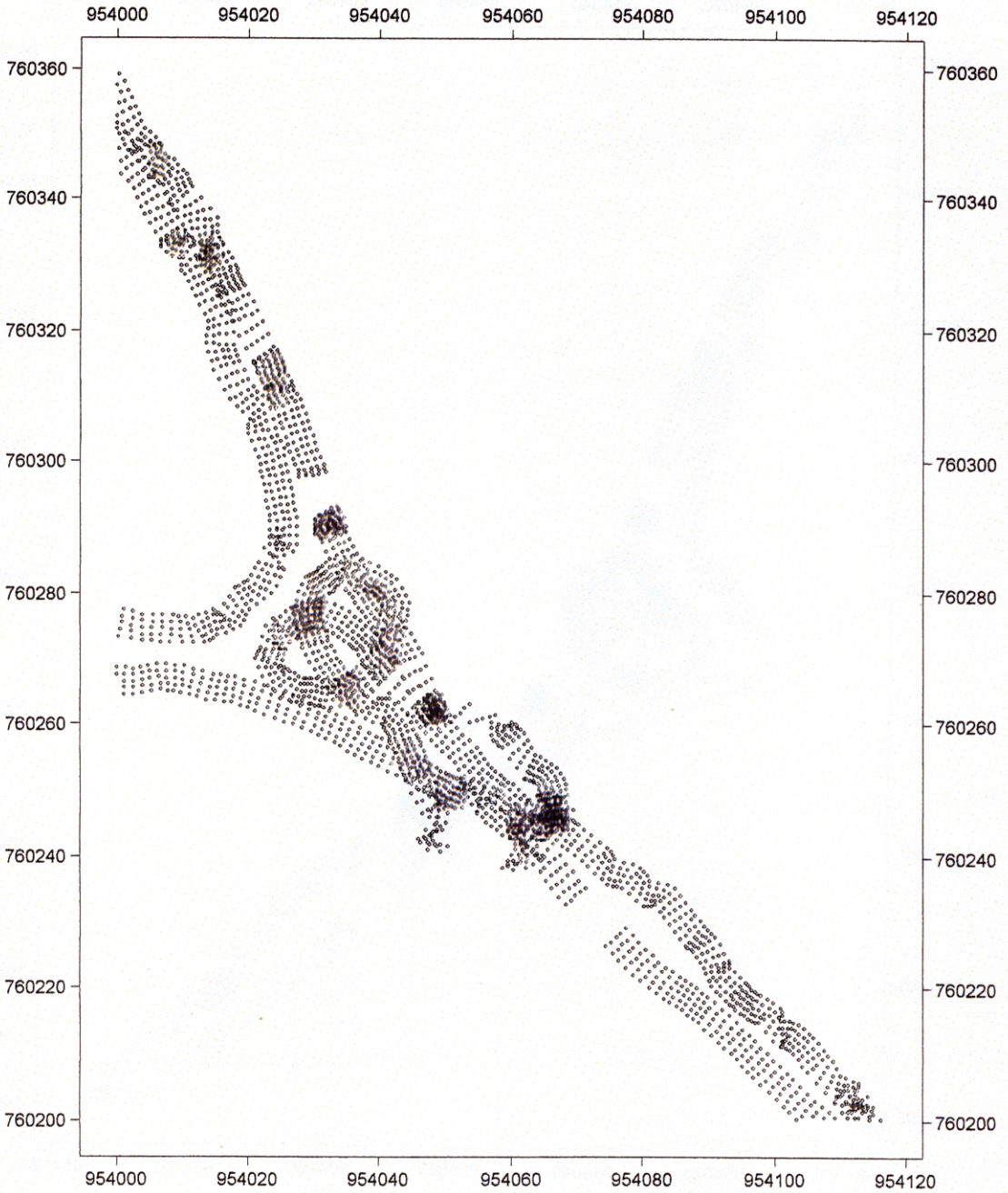
Site: SA_e19 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



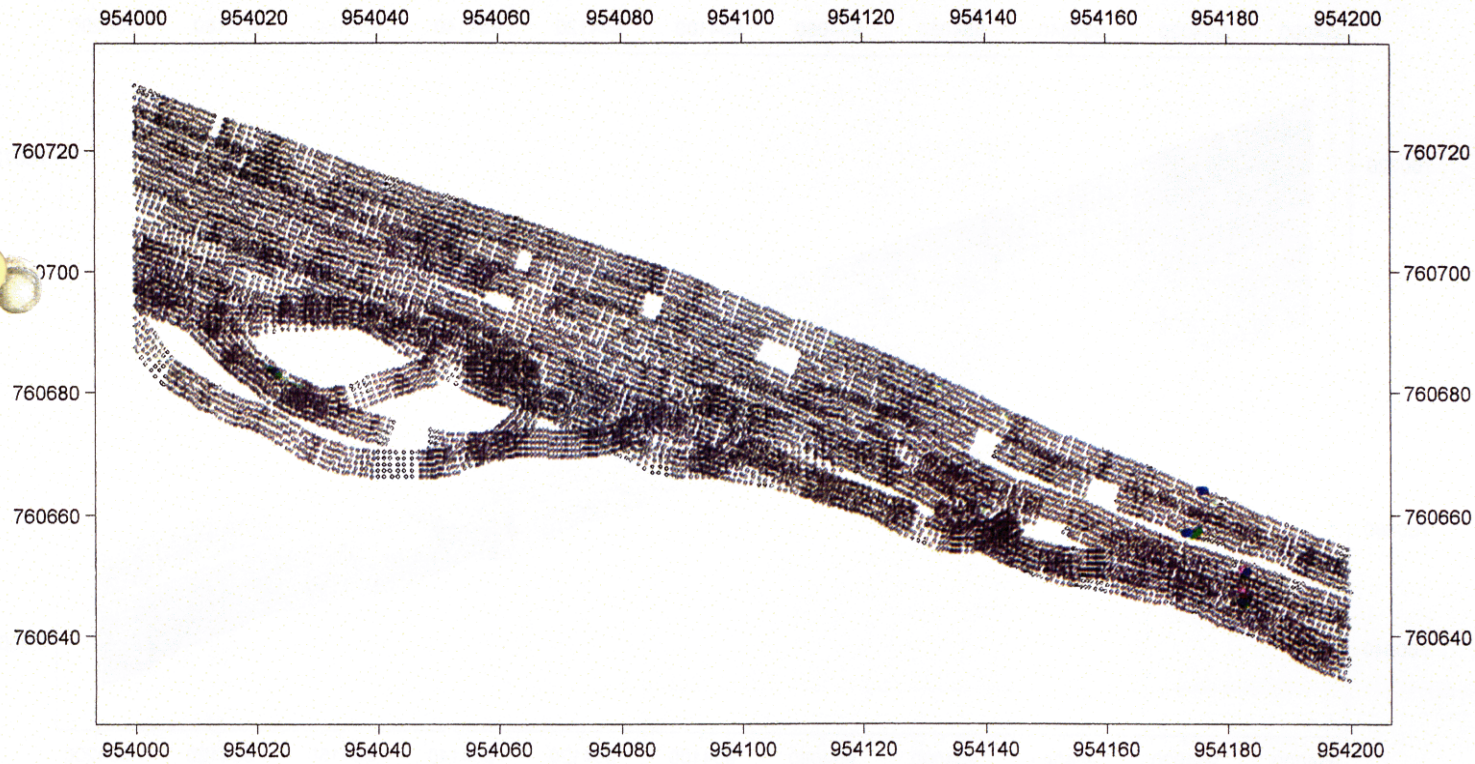
11455.8263

LOGGER Analyze v1.54m Track Map

Site: SA_e21 () **Signal: Array Signal (cps)** **Time:**

Threshold:
> 50 •

< 40	**100 to 120**
40 to 60	**120 to 140**
60 to 80	**> 140**
80 to 100	



LOGGER Analyze v1.54m Track Map

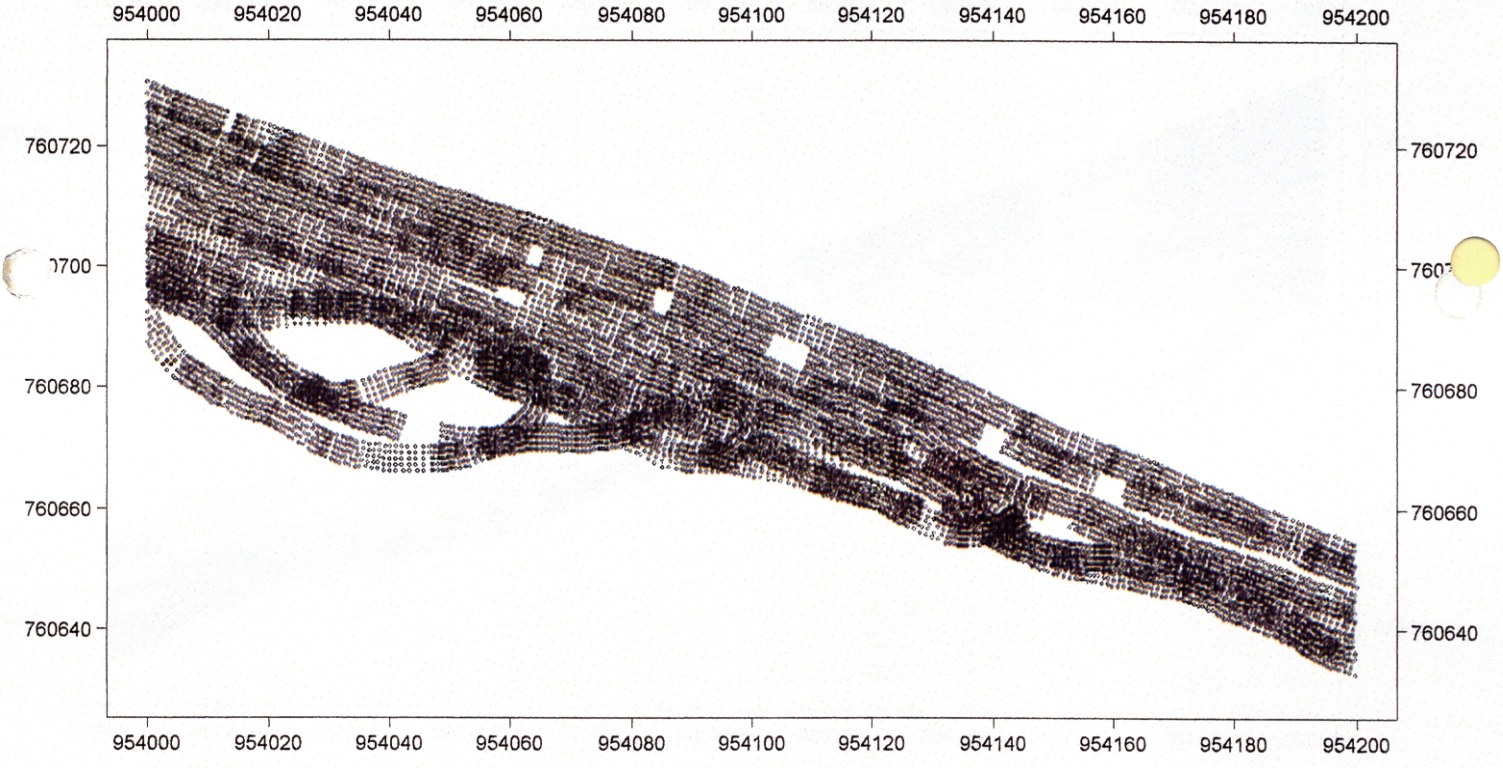
Site: SA_e21 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



11455.8273

LOGGER Analyze v1.54m Track Map

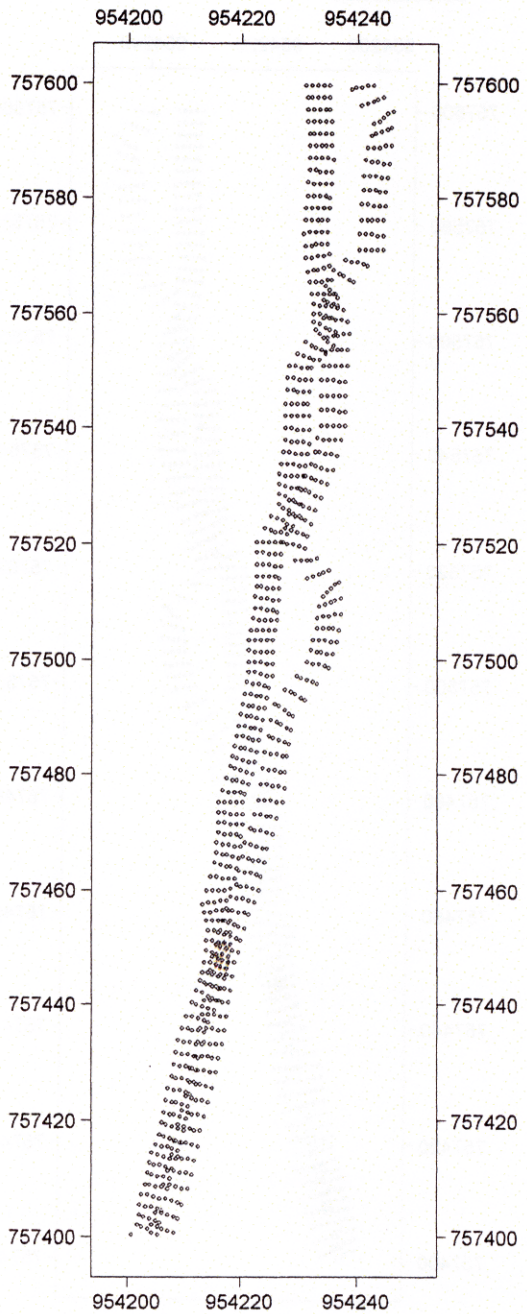
Site: SA_f5 ()

Signal: Array Signal (cps)

Time:

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



11455.8339

LOGGER Analyze v1.54m Track Map

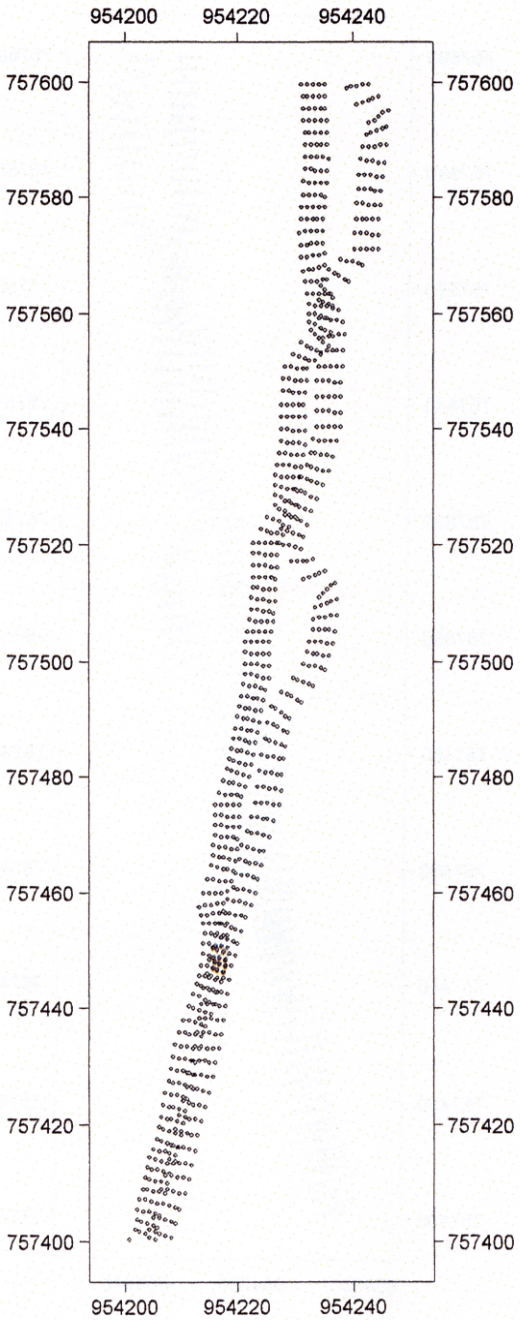
Site: SA_f5 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



LOGGER Analyze v1.54m Track Map

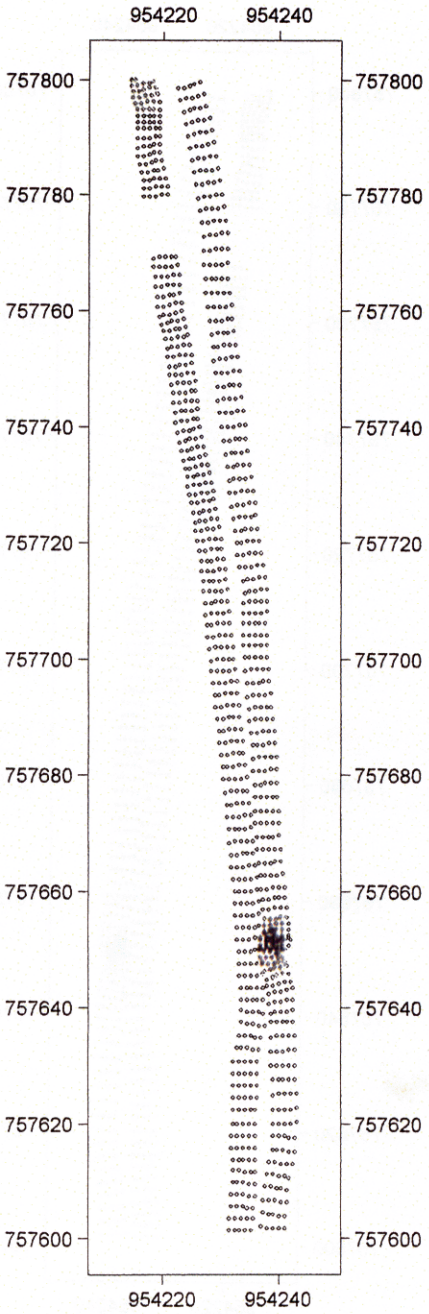
Site: SA_f6 ()

Signal: Array Signal (cps)

Time:

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140

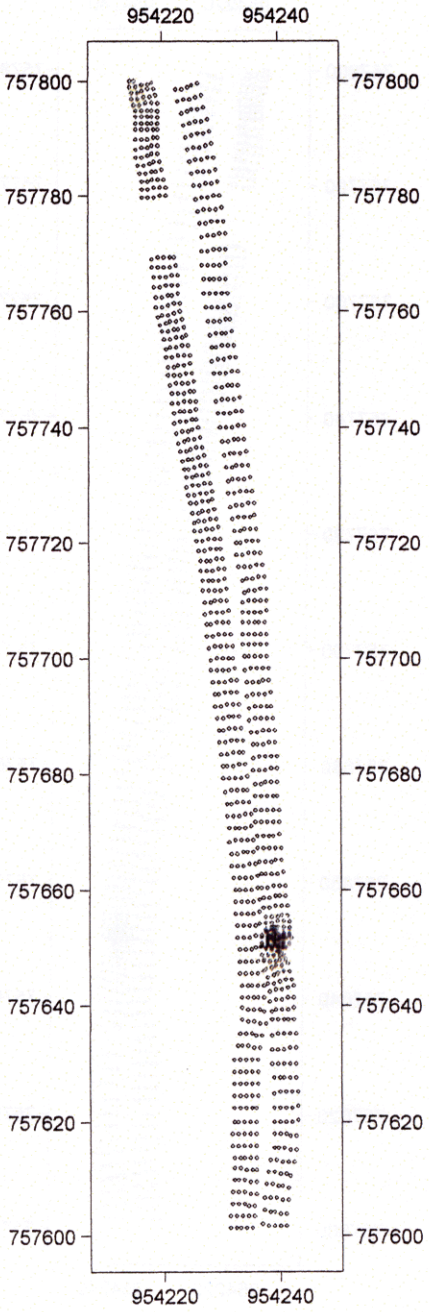


LOGGER Analyze v1.54m Track Map

Site: SA_f6 () **Signal: Array Background (cps)** **Time:**

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	

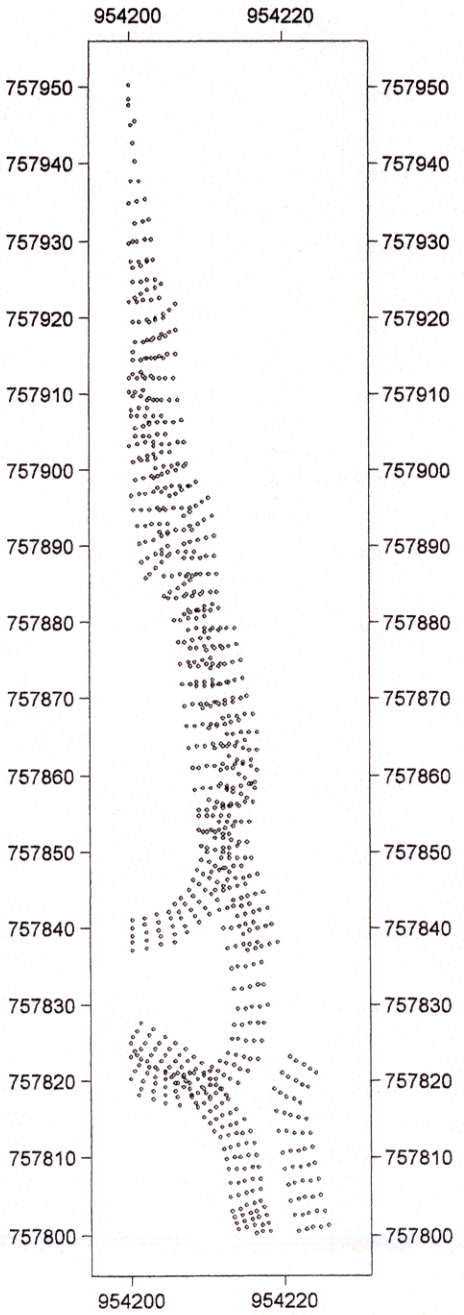


LOGGER Analyze v1.54m Track Map

Site: SA_f7 () **Signal: Array Signal (cps)** **Time:**

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



LOGGER Analyze v1.54m Track Map

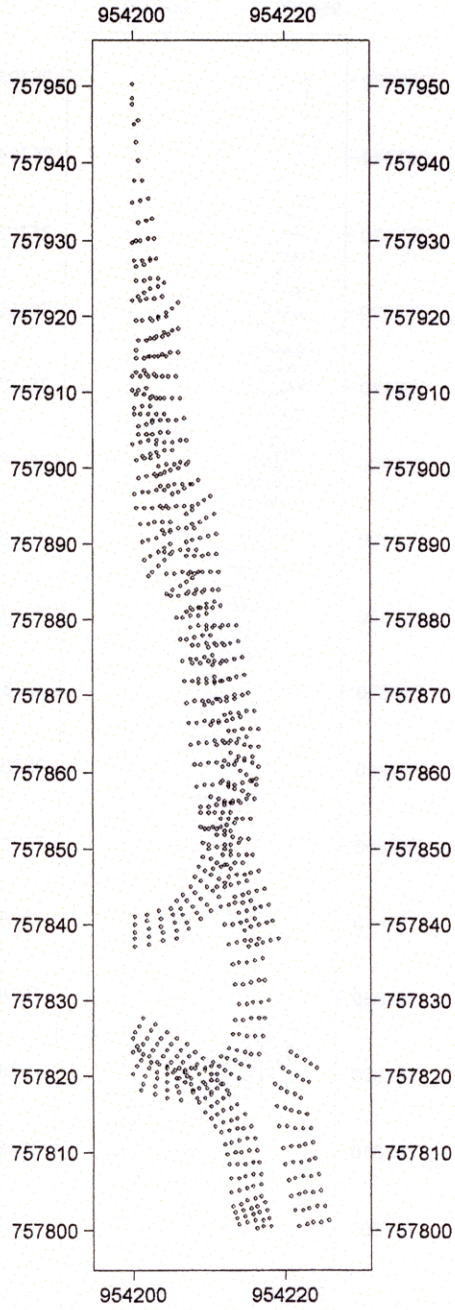
Site: SA_f7 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



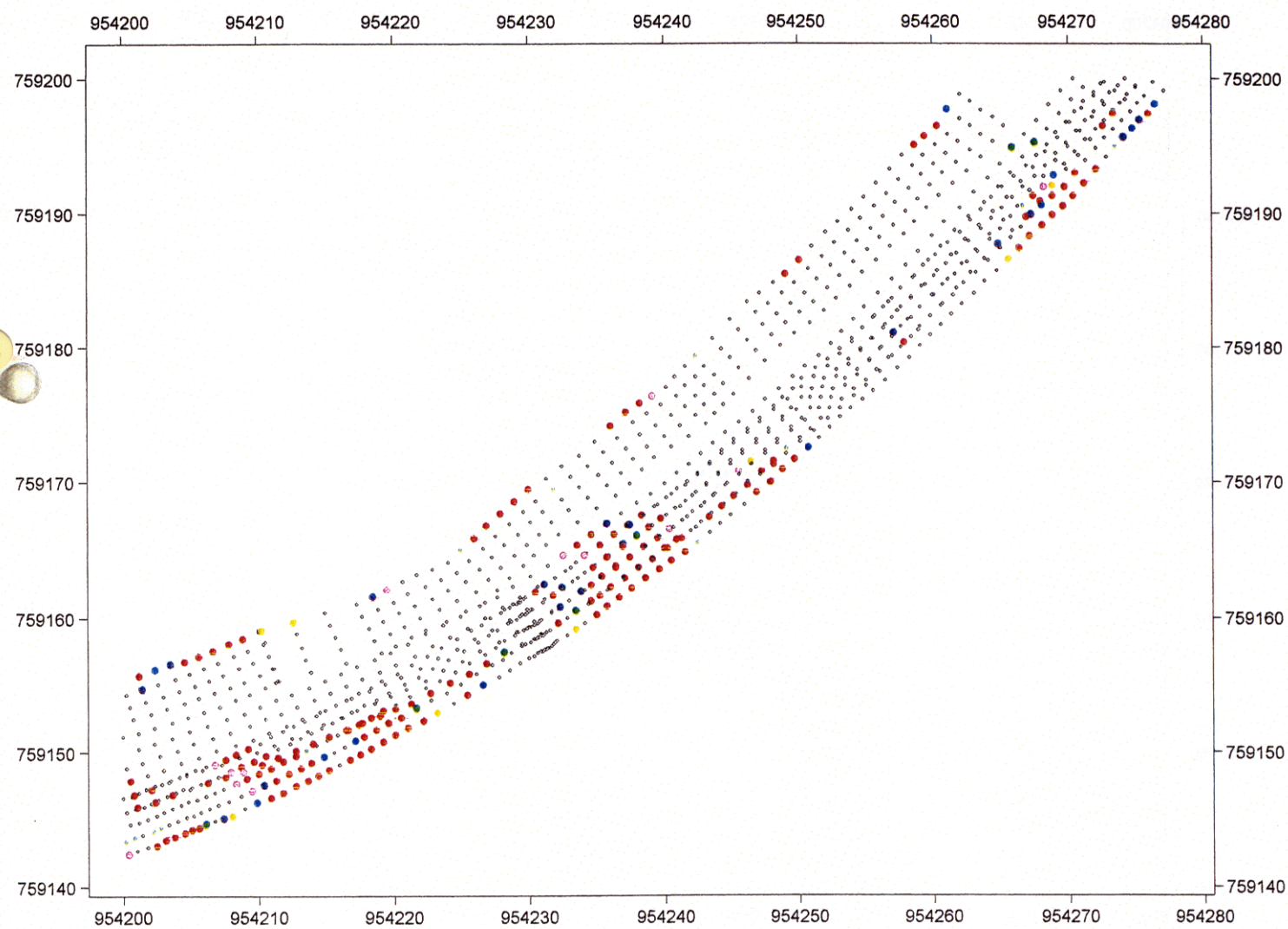
11455.8343

LOGGER Analyze v1.54m Track Map

Site: SA_f13 () **Signal: Array Signal (cps)** **Time:**

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



LOGGER Analyze v1.54m Track Map

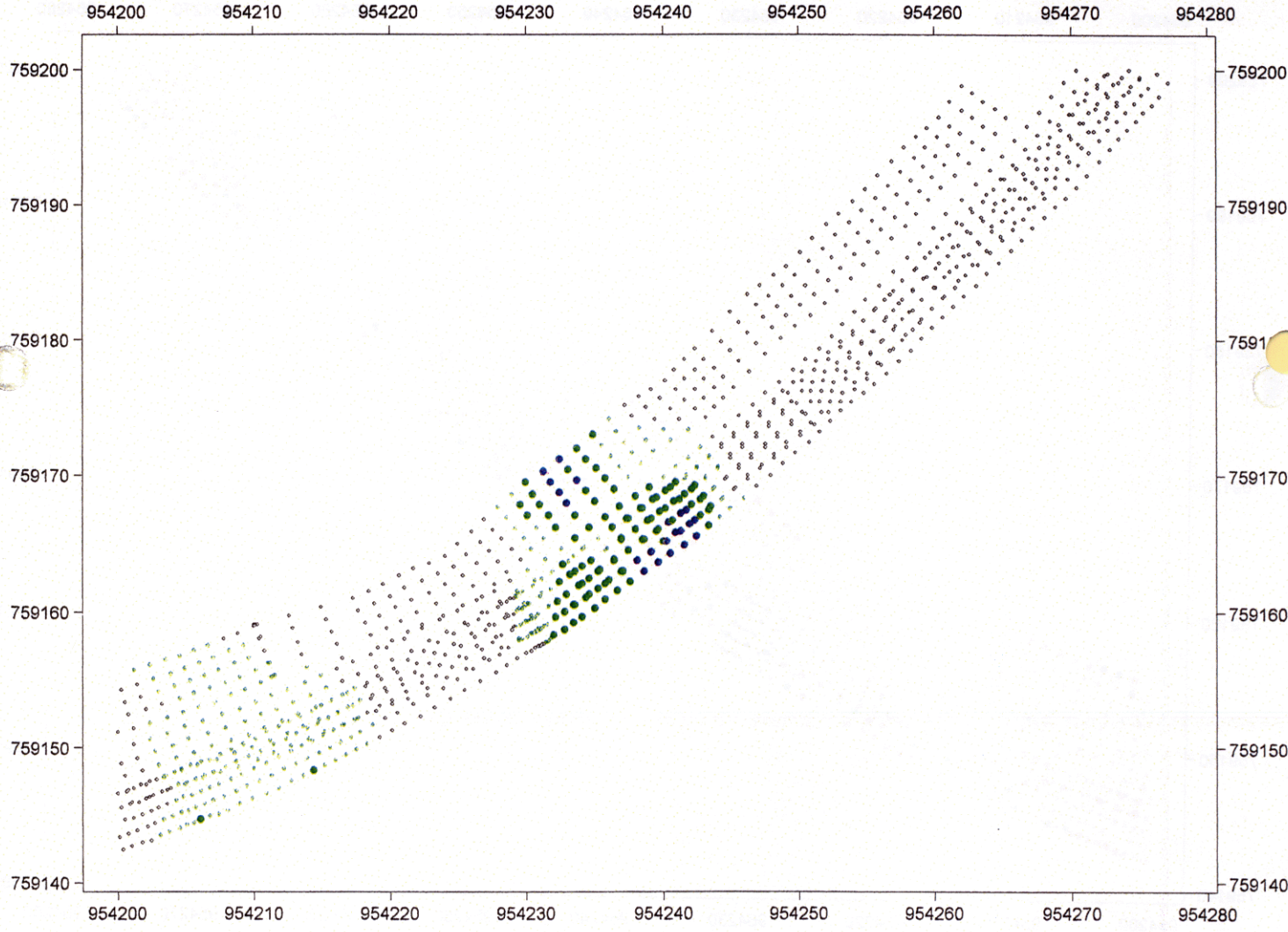
Site: SA_f13 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



LOGGER Analyze v1.54m Track Map

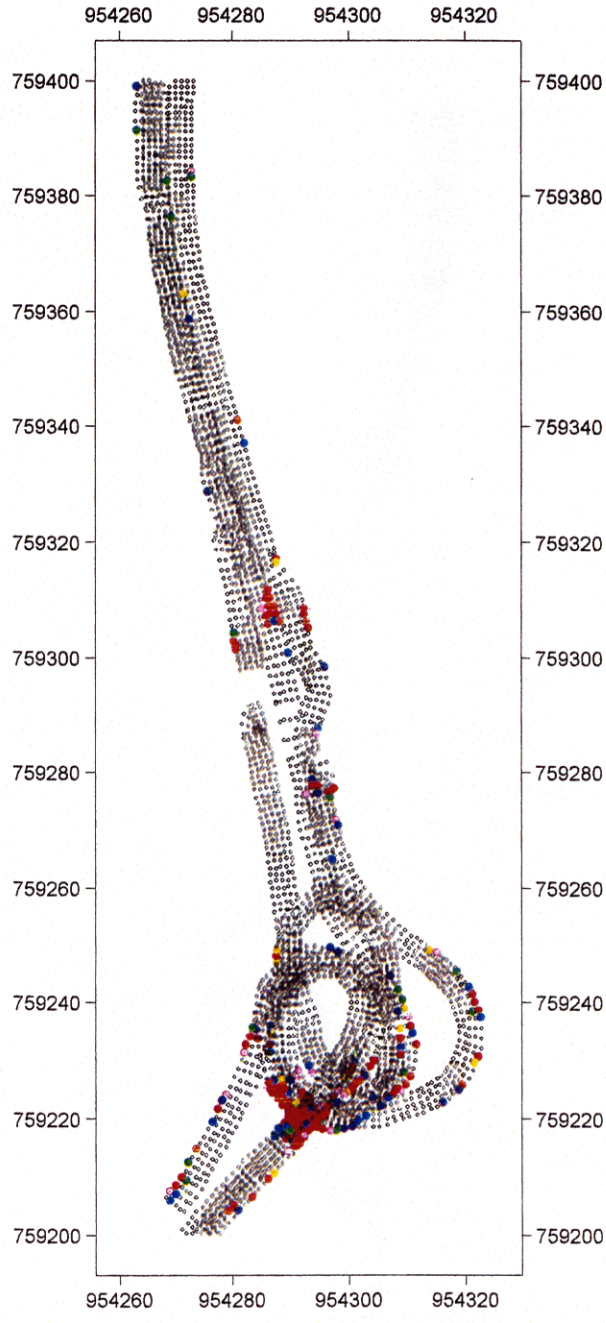
Site: SA_f14 ()

Signal: Array Signal (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



11455.8312

LOGGER Analyze v1.54m Track Map

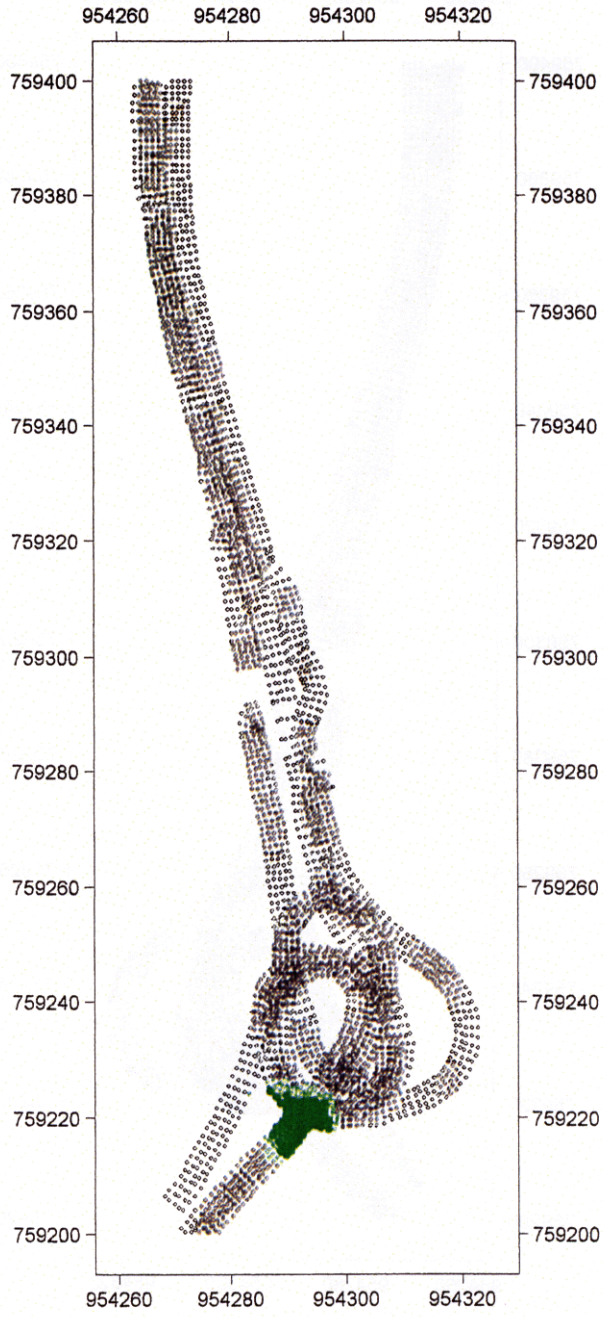
Site: SA_f14 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	

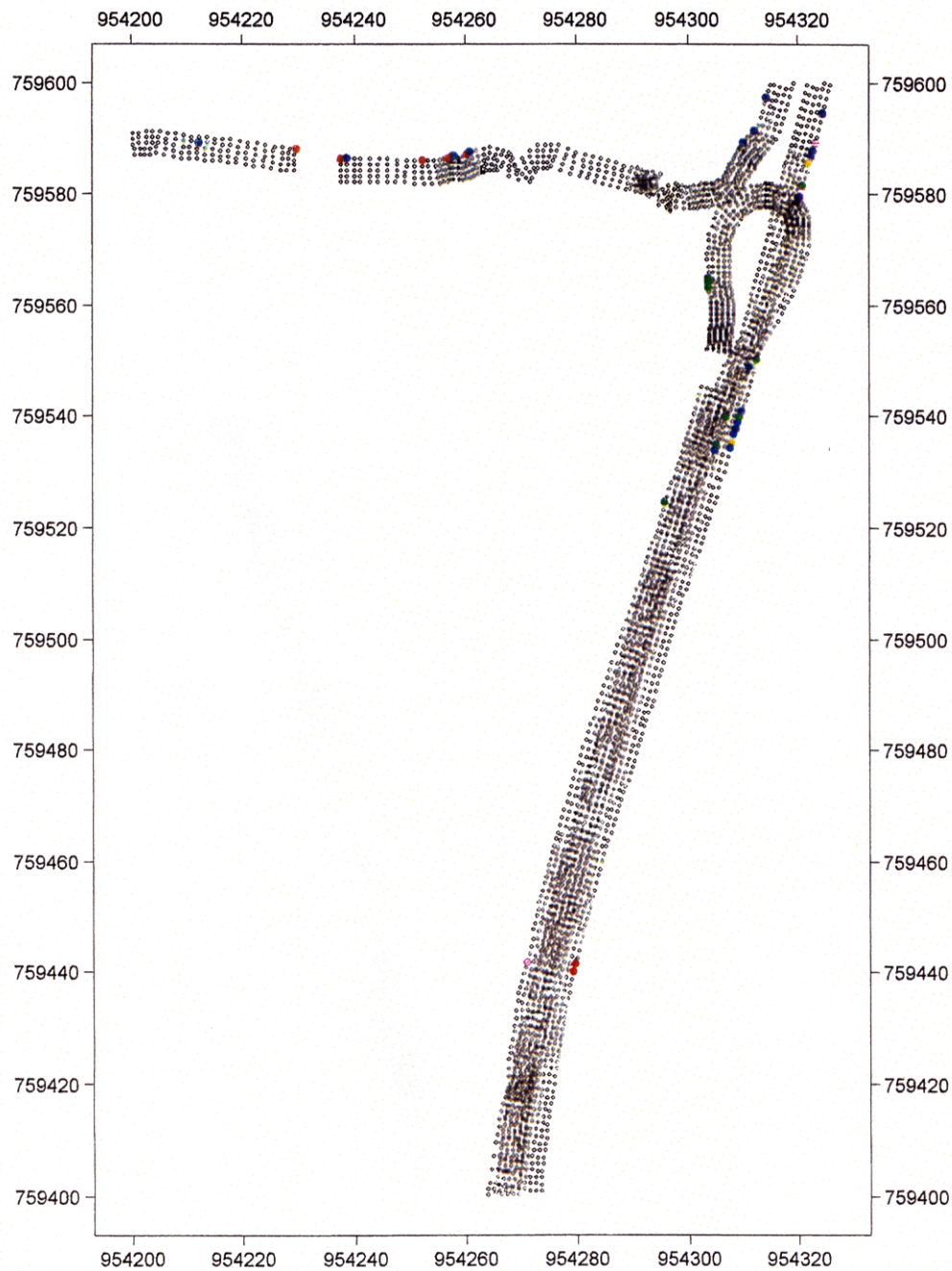


LOGGER Analyze v1.54m Track Map

Site: SA_f15 () **Signal: Array Signal (cps)** **Time:**

Threshold:
> 50 •

< 40	**100 to 120**
40 to 60	**120 to 140**
60 to 80	**> 140**
80 to 100	

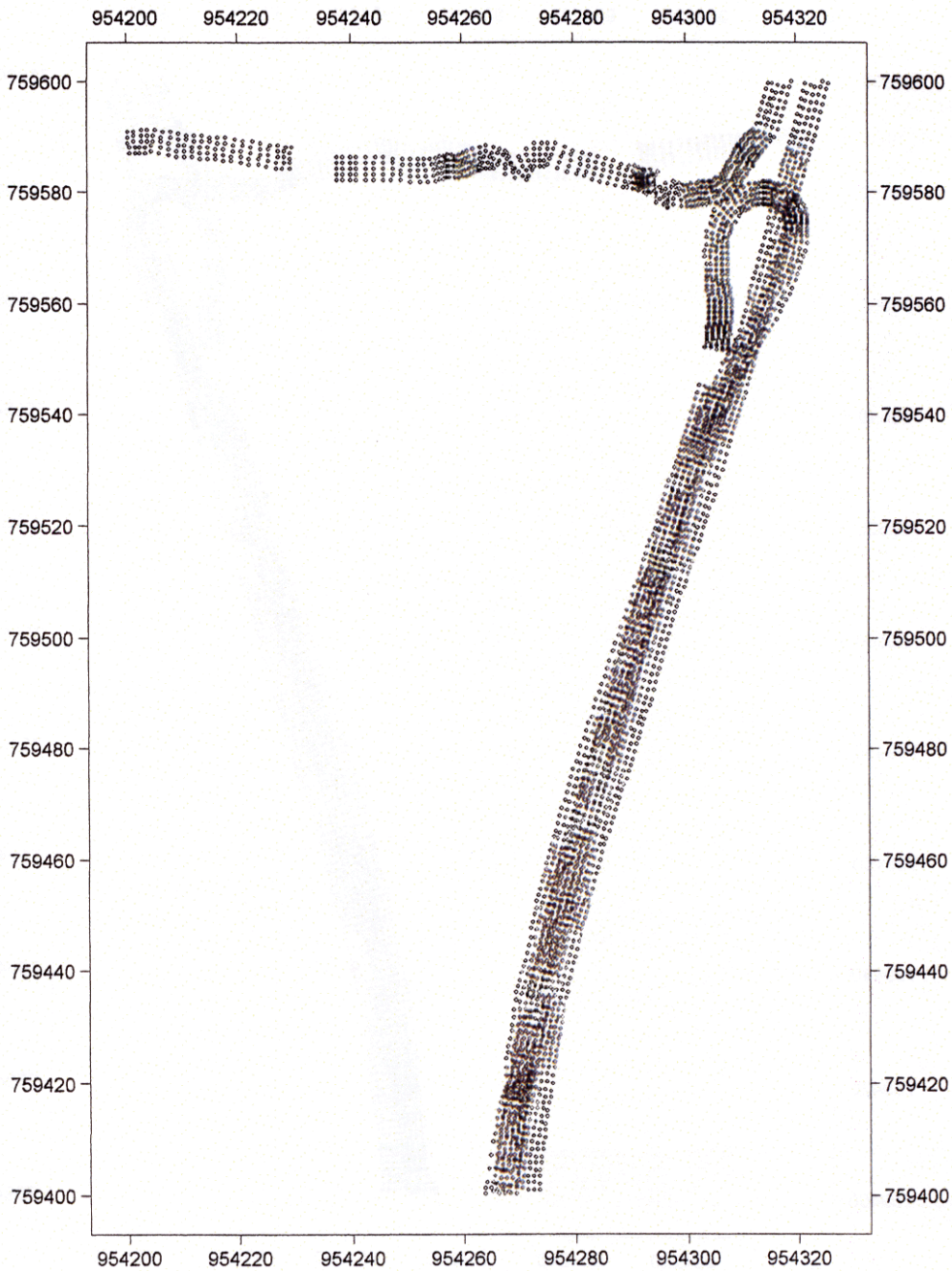


LOGGER Analyze v1.54m Track Map

Site: SA_f15 () **Signal: Array Background (cps)** **Time:**

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140

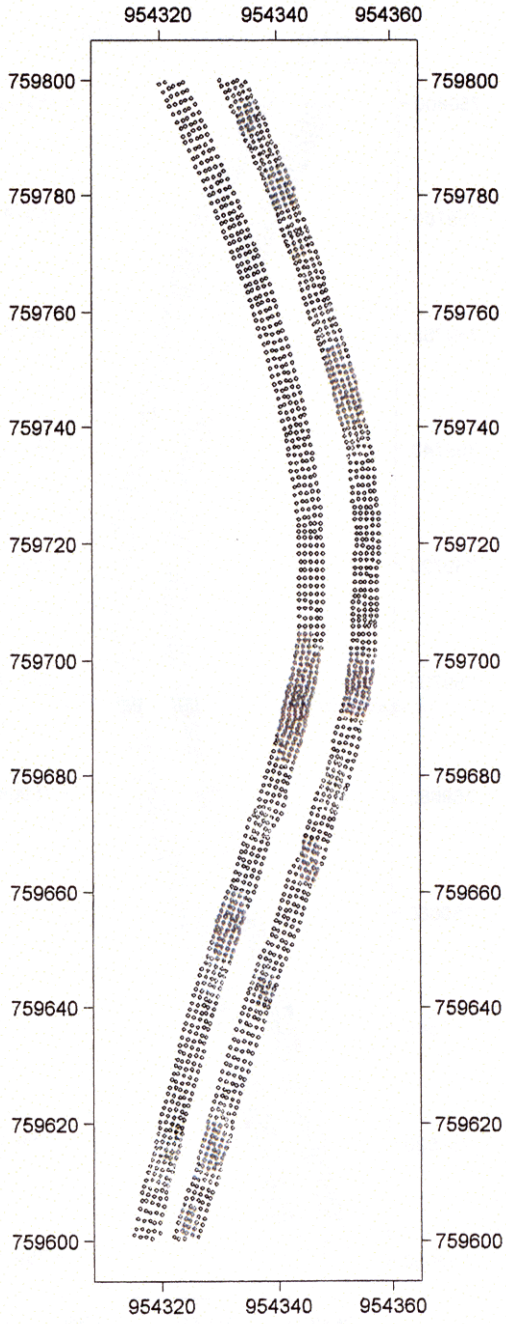


LOGGER Analyze v1.54m Track Map

Site: SA_f16 () **Signal: Array Background (cps)** **Time:**

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



LOGGER Analyze v1.54m Track Map

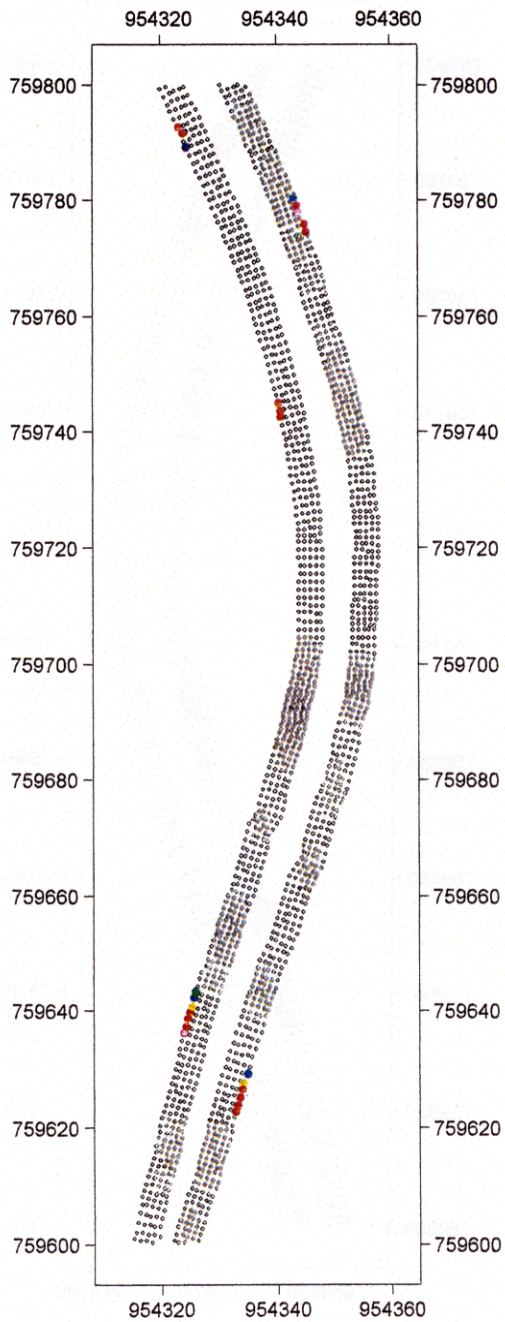
Site: SA_f16 ()

Signal: Array Signal (cps)

Time:

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



LOGGER Analyze v1.54m Track Map

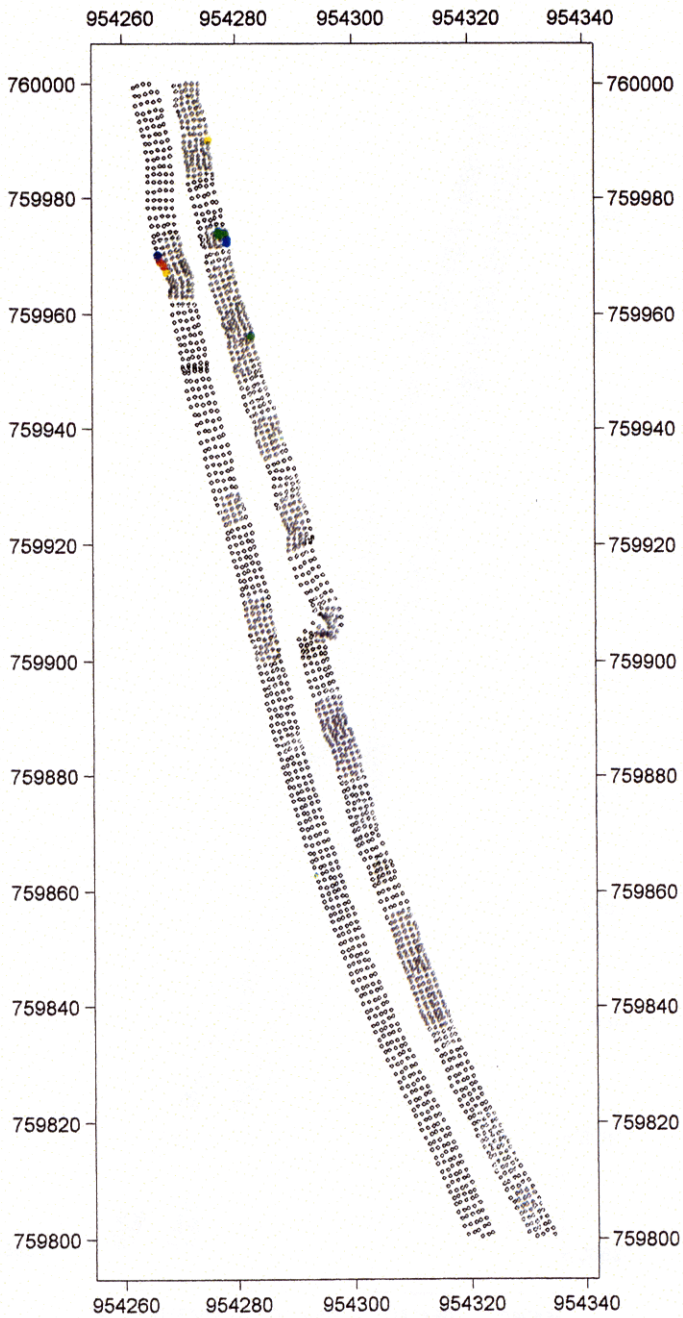
Site: SA_f17 ()

Signal: Array Signal (cps)

Time:

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



LOGGER Analyze v1.54m Track Map

Site: SA_f17 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

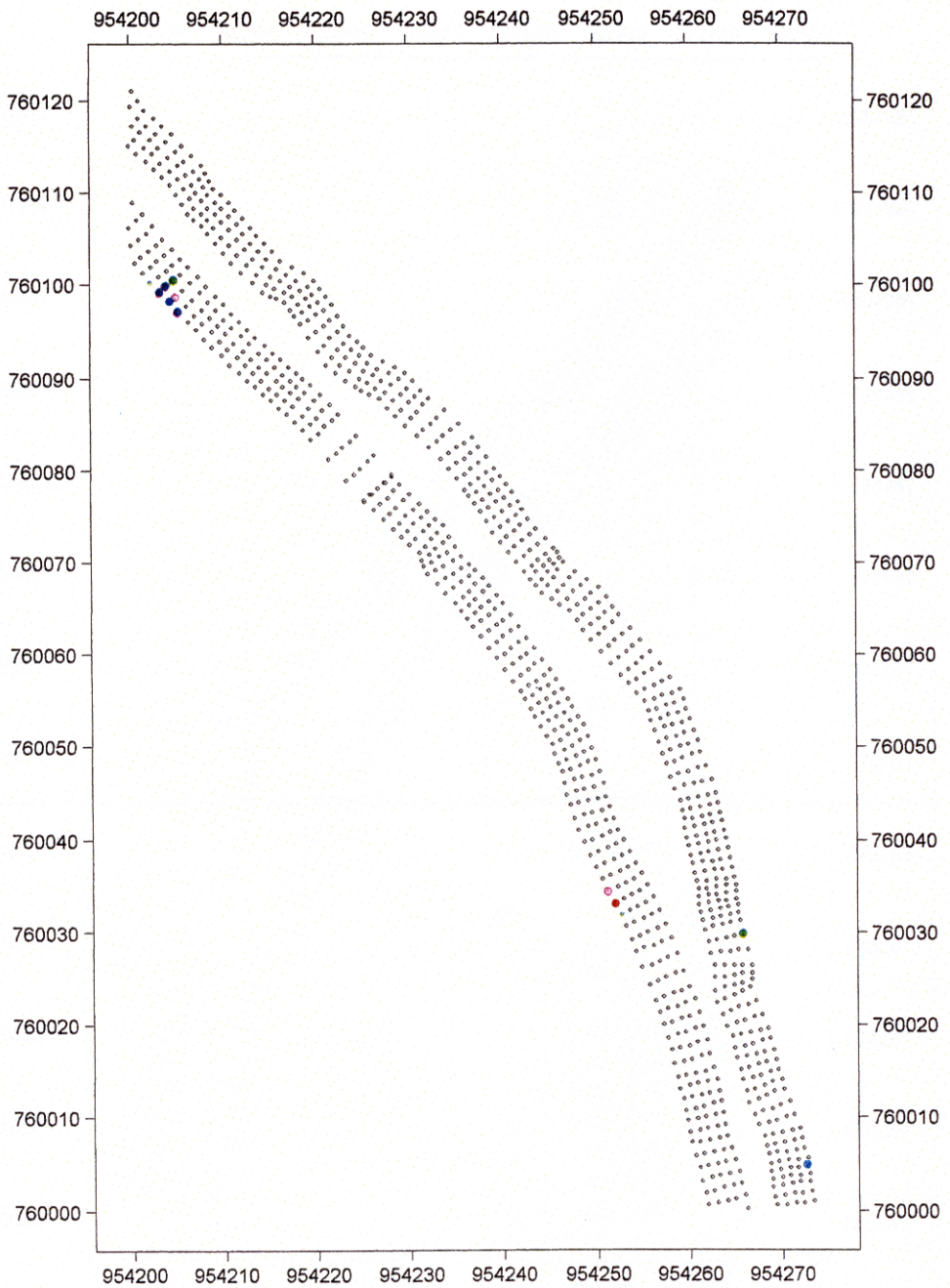
< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140

LOGGER Analyze v1.54m Track Map

Site: SA_f18 () **Signal: Array Signal (cps)** **Time:**

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



LOGGER Analyze v1.54m Track Map

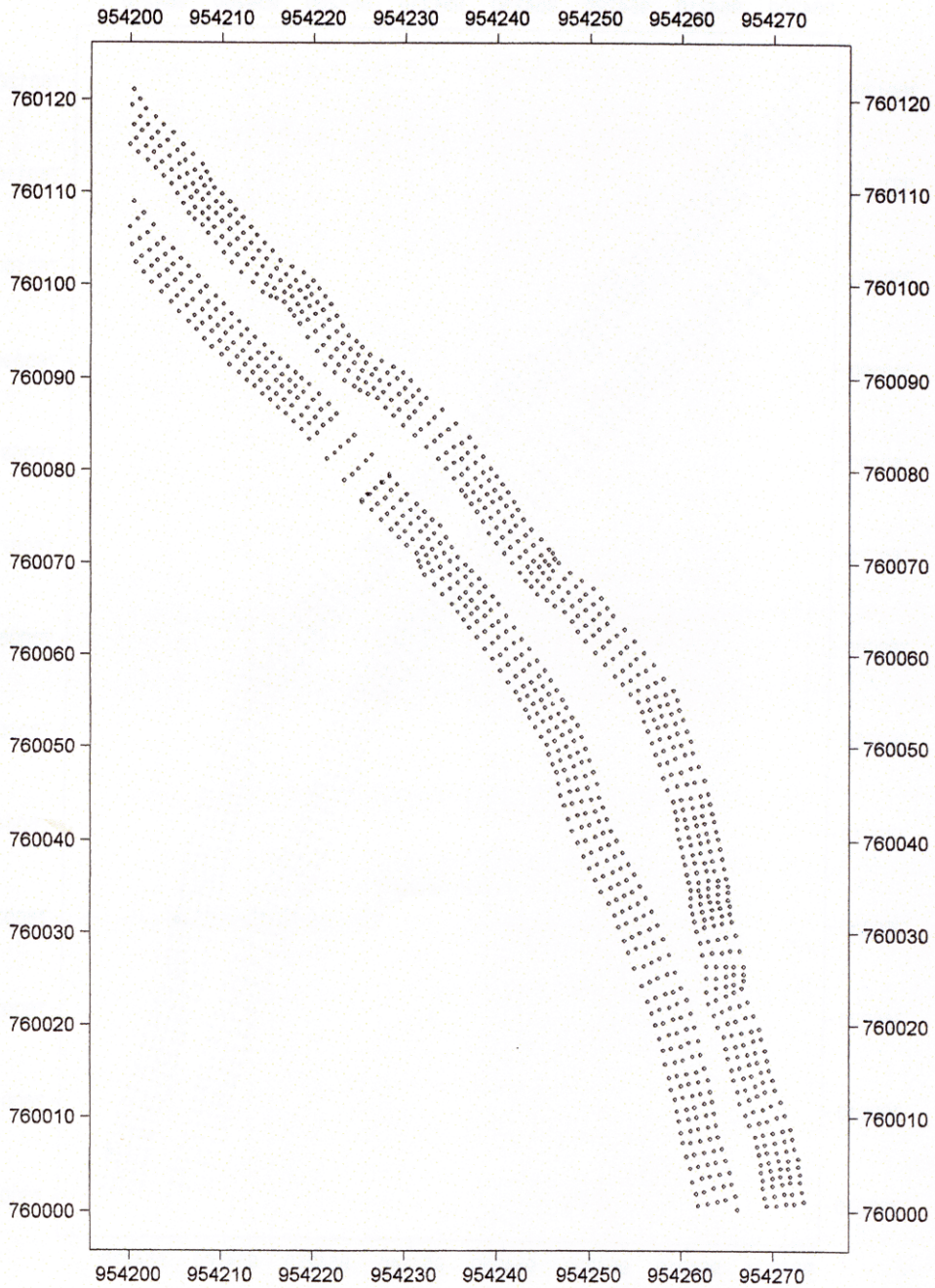
Site: SA_f18 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40
40 to 60
60 to 80
80 to 100
100 to 120
120 to 140
> 140



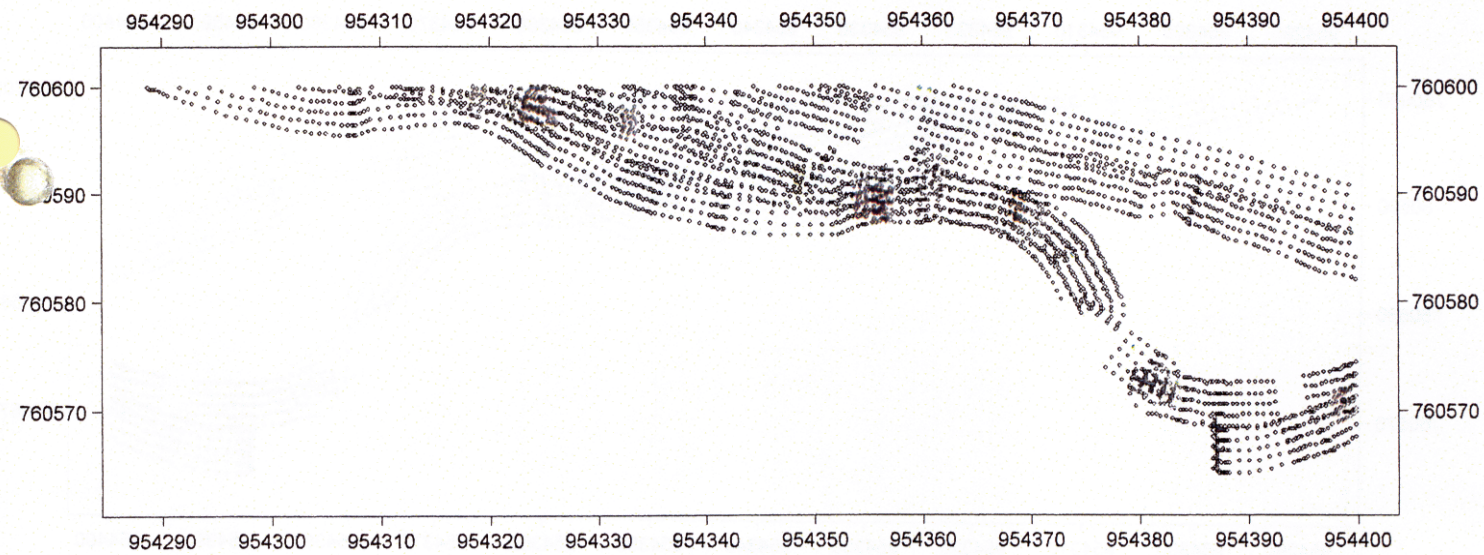
11455.8323

LOGGER Analyze v1.54m Track Map

Site: SA_f20 () **Signal: Array Signal (cps)** **Time:**

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



LOGGER Analyze v1.54m Track Map

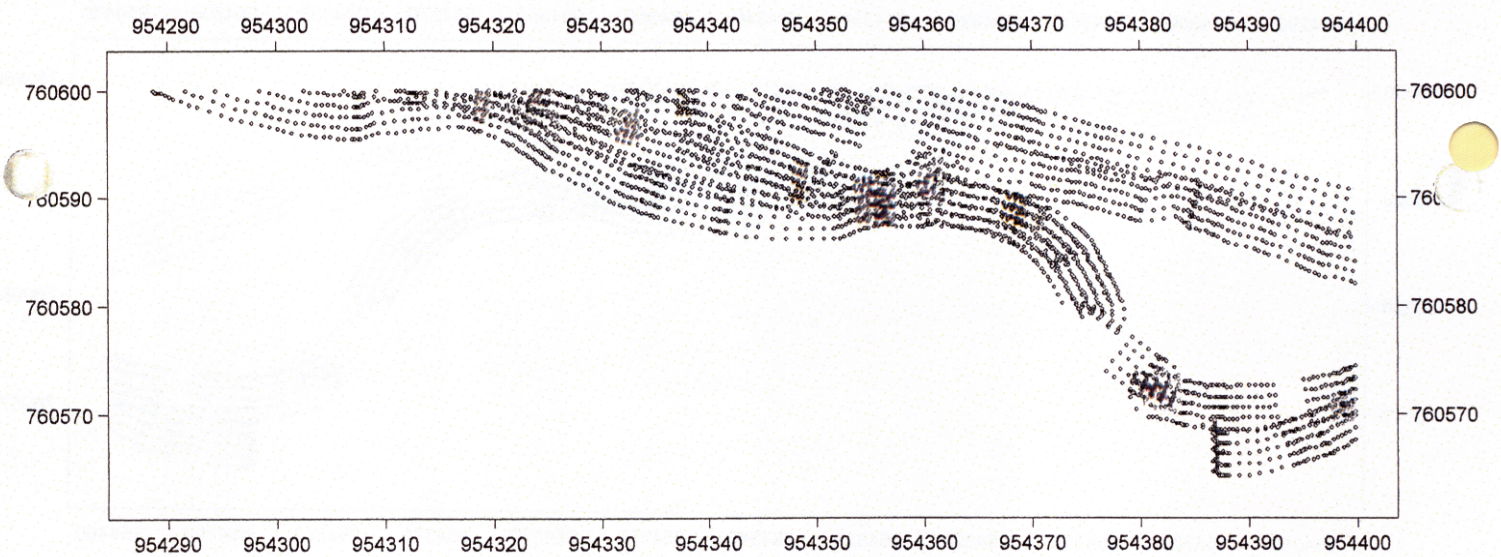
Site: SA_f20 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



LOGGER Analyze v1.54m Track Map

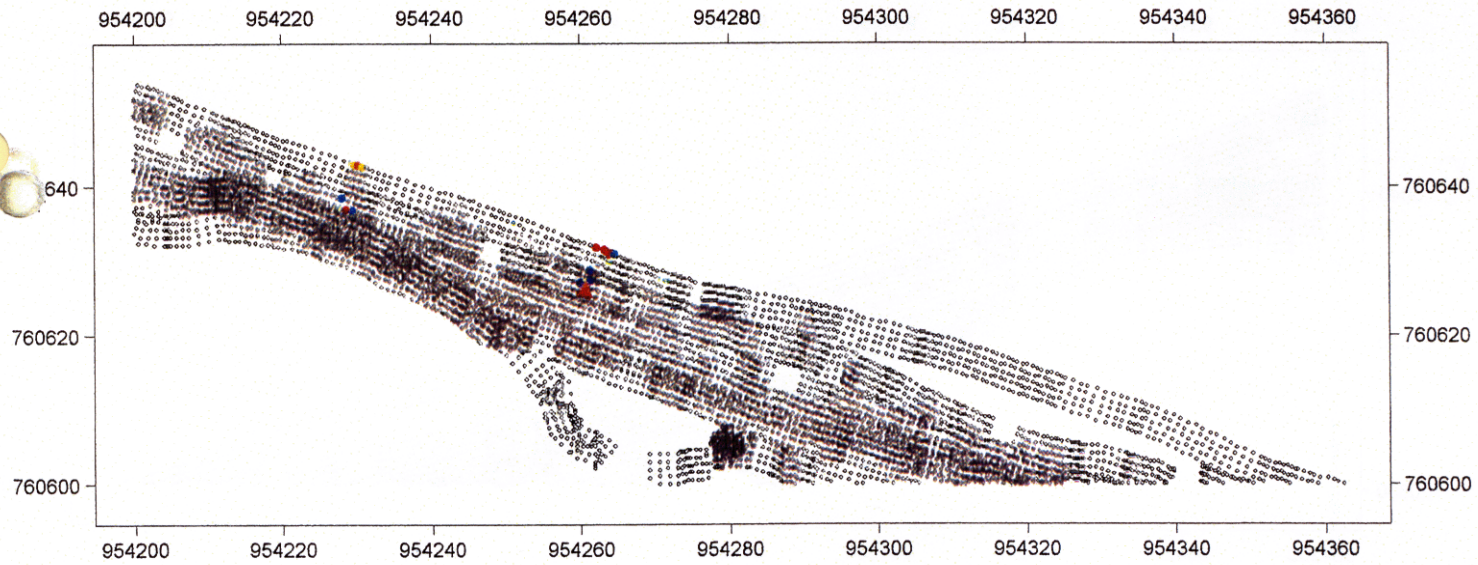
Site: SA_f21 ()

Signal: Array Signal (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



11455.8334

LOGGER Analyze v1.54m Track Map

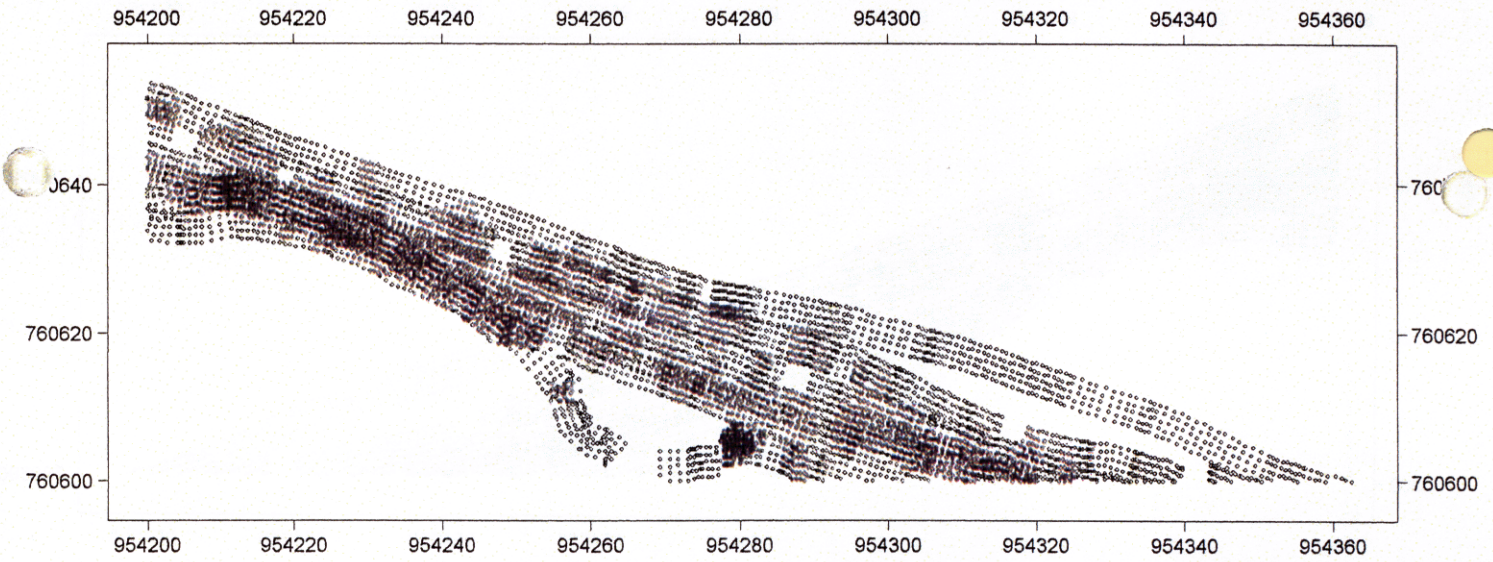
Site: SA_f21 ()

Signal: Array Background (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



LOGGER Analyze v1.54m Track Map

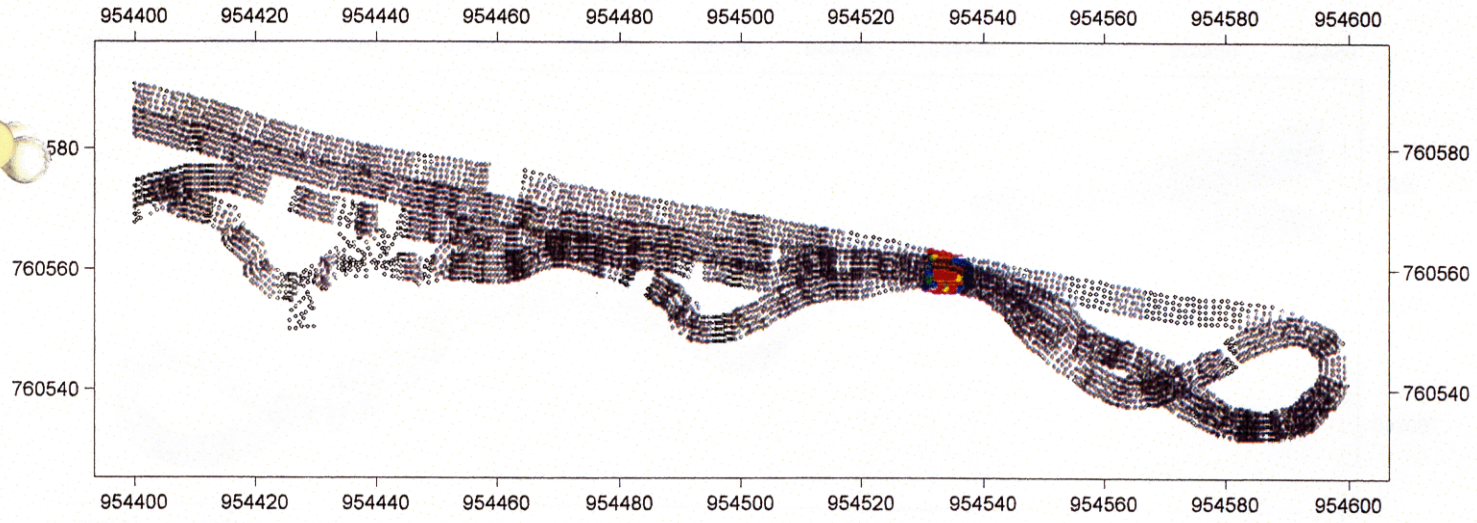
Site: SA_g20 ()

Signal: Array Signal (cps)

Time:

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



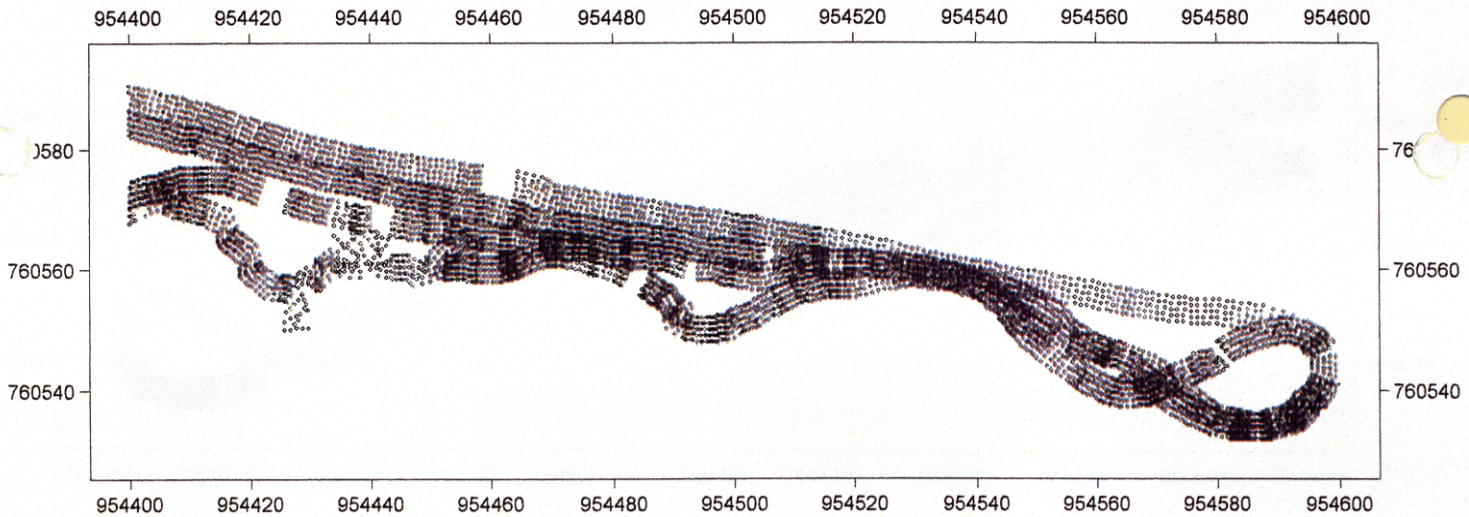
11455.8347

LOGGER Analyze v1.54m Track Map

Site: SA_g20 () **Signal: Array Background (cps)** **Time:**

Threshold:
> 50

< 40	100 to 120
40 to 60	120 to 140
60 to 80	> 140
80 to 100	



Geophysical Anomalies

Site Vieques, P. R.
Green Beach Area

Survey Date
Started 5 April 2001
Completed 13 April 2001

False Positives 30/591 = 5.08%

Survey Team
Michael Blair
Gary Turner

Target ID	Easting	Northing	Description
VGB-1	967172.1	764912.4	Metal object
VGB-2	966898.8	764949.4	Cement with rebar
VGB-3	966899.1	764977.4	Cement with rebar
VGB-4	966867.1	764989.4	Aluminum aerosol can
VGB-5	966811.1	765000.4	Pliers
VGB-6	966812.1	765014.4	Pliers
VGB-7	966663.2	765027.7	Nothing found
VGB-8	966599.2	765044.7	Wire
VGB-9	966585.2	765055.7	Wire
VGB-10	966577.2	765059.7	Wire
VGB-11	966536.2	765057.7	Paint Pail
VGB-12	966520.2	765094.7	Aluminum aerosol can
VGB-13	966483.2	764950.7	Top of aluminum can
VGB-14	966492.2	765089.7	Wood with screws
VGB-15	966363.2	765164.7	Board with nail
VGB-16	966220.2	765199.7	Aluminum can
VGB-17	966196.2	764996.7	Piece of metal (small)
VGB-18	966110.2	765004.7	Piece of metal (small)
VGB-19	966072.2	765034.7	Part of Coleman stove
VGB-20	965995.2	765051.7	Mini piece of metal
VGB-21	965943.2	765082.7	Black piece of metal 7"
VGB-22	965962.2	765139.7	Large piece of metal
VGB-23	965881.2	765099.7	Piece of metal (small)
VGB-24	965876.2	765071.7	Nothing found
VGB-25	966051.2	764939.7	Small piece of fence wire
VGB-26	966056.2	764938.7	Large cement block with metal handle
VGB-27	966071.2	764936.7	Knife blade, piece of metal
VGB-28	966067.2	764921.7	Piece of metal
VGB-29	966075.2	764855.7	Piece of wire
VGB-30	966065.2	764810.7	Aluminum drink cap
VGB-31	966099.2	764792.7	Piece of cable
VGB-32	966106.2	764768.7	Hot cable line
VGB-33	966134.2	764726.7	Small piece of metal
VGB-34	966019.1	765057.2	Aluminum can (10 ounce)
VGB-35	965951.6	765119.7	Aluminum can (10 ounce)

VGB-36	965961.5	765095.7	Sterno can
VGB-37	965970.1	765076.5	Vienna sausage can
VGB-38	965977.4	765043.9	Piece of aluminum
VGB-39	965961.3	765027.7	Aluminum can (10 ounce)
VGB-40	965958.1	765043.3	Aluminum can (10 ounce)
VGB-41	965948.3	765043.8	Aluminum can (10 ounce)
VGB-42	965950.7	765073.2	Sterno can
VGB-43	965938.0	765069.8	Aluminum can (10 ounce)
VGB-44	965951.6	765093.3	Aluminum pull tab
VGB-45	965942.9	765100.0	Aluminum can (10 ounce)
VGB-46	965937.8	765090.5	Aluminum pull tab
VGB-47	965929.7	765083.9	Cable 6' long copper
VGB-48	965915.0	765089.0	Aluminum pull tab
VGB-49	966123.0	765158.4	Aluminum foil
VGB-50	966130.2	765160.1	Aluminum packet
VGB-51	966133.2	765159.7	Board with nail
VGB-52	966136.2	765164.6	Aluminum can (10 ounce)
VGB-53	966132.7	765173.6	Aluminum can (10 ounce)
VGB-54	966155.1	765175.1	Aluminum can (10 ounce)
VGB-55	966171.3	765179.6	Aluminum can (10 ounce)
VGB-56	966177.3	765174.5	Aluminum pull tab
VGB-57	966172.8	765165.2	Aluminum can (10 ounce)
VGB-58	966165.2	765155.7	Aluminum can
VGB-59	966178.3	765154.8	Aluminum piece
VGB-60	966195.6	765155.8	Aluminum can (10 ounce)
VGB-61	966208.3	765171.6	Aluminum can
VGB-62	966216.4	765154.0	Aluminum can
VGB-63	966210.2	765148.6	Aluminum can
VGB-64	966225.0	765131.3	Aluminum foil
VGB-65	966223.7	765127.5	Aluminum can
VGB-66	966197.1	765090.2	Aluminum foil
VGB-67	966400.2	765110.5	Aluminum can
VGB-68	966415.5	765122.7	Aluminum can (10 ounce)
VGB-69	966442.1	765129.3	Aluminum pull tab
VGB-70	966445.3	765125.6	Aluminum pull tab
VGB-71	966447.0	765117.4	Food can top
VGB-72	966461.3	765111.8	Aluminum foil
VGB-73	966475.3	765109.9	Aluminum can (10 ounce)
VGB-74	966468.0	765130.6	Condom package
VGB-75	966477.4	765127.1	Aluminum pull tab
VGB-76	966496.7	765121.3	Aluminum pull tab
VGB-77	966481.7	765098.9	Can top / tile
VGB-78	966514.6	765095.8	Aluminum foil
VGB-79	966520.8	765095.4	Metal bottle cap
VGB-80	966551.7	765097.4	Cigarette package
VGB-81	966563.5	765068.3	Aluminum can
VGB-82	966553.5	765058.3	Aluminum can (10 ounce)
VGB-83	966534.2	765051.3	End light
VGB-84	966525.5	765063.8	Aluminum can (10 ounce)
VGB-85	966520.7	765067.6	Aluminum can (10 ounce)
VGB-86	966517.3	765064.1	Aluminum can (10 ounce)
VGB-87	966518.7	765069.6	Aluminum cans (2)

VGB-88	966517.0	765071.7	Aluminum can
VGB-89	966528.3	765076.3	Aluminum can (10 ounce)
VGB-90	966494.0	765071.2	Aluminum can (10 ounce)
VGB-91	966483.9	765084.4	Rum bottle metal top
VGB-92	966469.7	765080.0	Aluminum cans (2)
VGB-93	966452.2	765089.6	Part of aluminum can
VGB-94	966461.2	765098.1	Top of aluminum can
VGB-95	966813.1	762583.0	Ferrous rock
VGB-96	966817.0	762551.5	Railroad spike
VGB-97	966816.6	762606.7	Nail
VGB-98	966811.2	762609.1	Large bolt
VGB-99	966816.3	762606.5	Piece of metal
VGB-100	966820.1	762645.7	Wire
VGB-101	966817.1	762650.4	Banding material
VGB-102	966814.2	762760.4	Large bolt
VGB-103	966810.8	762773.3	Spike
VGB-104	966800.9	762810.8	Piece of metal
VGB-105	966794.8	762823.1	Spike
VGB-106	966802.4	762826.6	Ferrous rock
VGB-107	966799.7	762836.7	Railroad spike
VGB-108	966795.9	762841.9	Railroad spike
VGB-109	966789.1	762847.2	Bayonet *
VGB-110	966792.3	762859.7	Nail
VGB-111	966763.2	762917.0	Piece of metal (huge)
VGB-112	966719.1	763166.9	Nail
VGB-113	966726.1	763171.2	Piece of metal
VGB-114	966714.2	763193.4	Ferrous rock
VGB-115	966691.0	763261.8	Bolt
VGB-116	966932.0	763708.3	Piece of metal
VGB-117	966931.4	763733.4	Ferrous rock
VGB-118	966936.1	763761.4	Piece of metal
VGB-119	966935.5	763786.5	Piece of metal
VGB-120	966947.0	763810.2	Nothing found
VGB-121	966966.2	763875.0	Nothing found
VGB-122	966988.5	763977.2	Sand (ferrous)
VGB-123	967010.8	764039.0	Ground rod
VGB-124	967006.0	764097.6	Chunk of metal
VGB-125	967005.3	764116.5	Piece of metal
VGB-126	966989.6	764143.0	Nothing (layer)
VGB-127	966957.1	764214.7	Piece of metal
VGB-128	966935.4	764310.0	No contact
VGB-129	966931.2	764316.5	No contact
VGB-130	966935.3	764319.6	Railroad spike
VGB-131	966935.3	764319.6	Ferrous rock
VGB-132	966750.9	764582.4	Ferrous rock
VGB-133	966780.4	764545.4	Ferrous sand layer
VGB-134	966851.8	764480.7	Ferrous sand layer
VGB-135	966849.1	764484.1	Nothing found
VGB-136	966808.5	764514.2	Nothing found
VGB-137	966699.6	764648.3	Nothing found
VGB-138	966695.4	764620.6	Nothing found
VGB-139	966690.8	764647.6	Iron bolt (6")

VGB-140	966619.7	764617.4	Ferrous rock
VGB-141	966611.6	764618.8	Ferrous rock
VGB-142	966570.5	764599.3	Barb wire
VGB-143	966495.6	764574.4	Power line
VGB-144	966471.2	764560.9	Small nail
VGB-145	966425.8	764533.2	Tin can
VGB-146	966410.3	764512.1	Piece of wire
VGB-147	966380.6	764506.2	Piece of wire
VGB-148	966372.7	764487.0	Piece of wire
VGB-149	966395.6	764537.4	Piece of welding rod
VGB-150	966922.6	763938.2	Iron spike (3")
VGB-151	966919.9	763940.4	Barb wire, metal wire
VGB-152	966916.4	763939.8	Nothing found
VGB-153	966906.3	763938.5	Iron spike (3"), metal scrap
VGB-154	966900.7	763940.1	Bottle cap
VGB-155	966899.6	763939.0	Car jack, leaf spring
VGB-156	966875.3	763940.8	Nail (5")
VGB-157	966863.5	763940.0	Scrap metal 2" diameter
VGB-158	966853.2	763937.4	Metal scrap 2", lap joint
VGB-159	966839.9	763934.0	Metal scrap
VGB-160	966831.6	763928.4	Metal ring
VGB-161	966810.7	763923.4	Bolt (10") with nut
VGB-162	966805.6	763919.9	Bolt (10") with nut
VGB-163	966806.0	763922.5	Ferrous sand layer
VGB-164	966723.4	763898.3	Small piece of metal
VGB-165	966725.0	763887.4	Layer of rust
VGB-166	966727.0	763873.7	Small piece of metal
VGB-167	966729.3	763861.1	Small piece of metal 1"
VGB-168	966733.8	763848.5	Small piece of metal 1"
VGB-169	966735.9	763835.3	Small piece of metal
VGB-170	966722.6	763818.1	Small piece of metal
VGB-171	966721.4	763791.2	Small piece of metal
VGB-172	966719.9	763773.8	Small piece of metal
VGB-173	966721.5	763747.0	Small piece of metal
VGB-174	966716.1	763748.0	Small piece of metal
VGB-175	966703.9	763724.7	Small piece of metal
VGB-176	966705.3	763712.5	Small piece of metal
VGB-177	966703.8	763696.1	Small piece of metal
VGB-178	966683.4	763694.7	Small piece of metal
VGB-179	966673.2	763680.1	Small piece of metal
VGB-180	966663.2	763664.8	Concrete wall with rebar
VGB-181	966658.9	763656.8	Concrete wall with rebar
VGB-182	966725.1	763772.8	Small 1/2" piece of metal from molasses tank
VGB-183	966720.2	763857.6	Small 1/2" piece of metal from molasses tank
VGB-184	966722.2	763936.3	Small 1/2" piece of metal from molasses tank
VGB-185	966716.3	763954.0	Small 1/2" piece of metal from molasses tank
VGB-186	966712.5	763965.7	Small 1/2" piece of metal from molasses tank
VGB-187	966712.5	763972.0	Small 1/2" piece of metal from molasses tank
VGB-188	966705.8	763979.0	Small 1/2" piece of metal from molasses tank
VGB-189	966611.1	763513.9	Small 1/2" piece of metal from molasses tank
VGB-190	966629.7	763489.6	Small 1/2" piece of metal from molasses tank
VGB-191	966634.3	763517.0	Deeper than 1.5'

VGB-192	966609.8	763540.4	Deeper than 1.5'
VGB-193	966616.3	763572.7	Deeper than 1.5'
VGB-194	966589.4	763444.9	Deeper than 3'
VGB-195	966609.7	763446.5	Deeper than 3'
VGB-196	966614.7	763444.5	Deeper than 3'
VGB-197	966578.9	763358.7	Deeper than 1.5'
VGB-198	966581.8	763354.2	Deeper than 1.5'
VGB-199	966589.9	763362.5	Piece of metal (3")
VGB-200	966603.0	763383.2	Anchor bolt (3")
VGB-201	966663.6	762941.4	Deeper than 1.5'
VGB-202	966721.8	762726.0	Deeper than 1.5'
VGB-203	966722.9	762683.9	Deeper than 1.5'
VGB-204	966729.8	762684.6	Deeper than 1.5'
VGB-205	966726.3	762664.5	Deeper than 1.5'
VGB-206	966718.4	762650.9	Deeper than 1.5'
VGB-207	966712.9	762621.4	Small u-bolt
VGB-208	966732.6	762598.7	Ferrous rock
VGB-209	966741.5	762593.2	Ferrous rock
VGB-210	966741.5	762593.2	Ferrous rock
VGB-211	966741.5	762593.2	Ferrous rock
VGB-212	966741.5	762593.2	Ferrous rock
VGB-213	966741.5	762593.2	Ferrous rock
VGB-214	966618.8	762543.6	Deeper than 1.5'
VGB-215	966627.3	762514.6	Deeper than 1.5'
VGB-216	966637.6	762510.3	Deeper than 1.5'
VGB-217	966636.9	762487.7	Deeper than 1.5'
VGB-218	966660.7	762477.9	Deeper than 1.5'
VGB-219	966656.4	762507.2	Deeper than 1.5'
VGB-220	0.0	0.0	No flag
VGB-221	966664.0	762499.8	Nothing found
VGB-222	966661.1	762493.9	Rebar
VGB-223	966673.1	762433.9	Ferrous rock
VGB-224	966649.4	762470.4	Small piece of metal
VGB-225	966681.0	762457.5	Deeper than 1.5'
VGB-226	966747.2	761564.4	Deeper than 1.5'
VGB-227	966709.1	762371.9	Metal bar (24")
VGB-228	966866.5	762267.1	Deeper than 1.5'
VGB-229	966832.4	762475.6	Metal wire
VGB-230	966785.9	761710.3	Metal rod (9")
VGB-231	966747.2	761564.4	Ferrous rock
VGB-232	966530.4	760961.4	Piece of aluminum
VGB-233	966537.3	760994.9	Barb wire
VGB-234	966535.9	761063.7	Aluminum can top
VGB-235	966607.5	761123.2	Aluminum fence tie
VGB-236	966611.5	761071.1	Iron band, aluminum can
VGB-237	966620.3	761109.1	45 caliber slug * (a)
VGB-238	966620.9	761118.7	Aluminum fence tie
VGB-239	966628.4	761143.0	Nothing found
VGB-240	966633.8	761156.8	Nothing found
VGB-241	966626.4	761163.3	Aluminum pull tab
VGB-242	966627.7	761170.9	Aluminum foil
VGB-243	966629.9	761210.1	Aluminum can (10 ounce)

VGB-244	966608.7	761230.4	Nothing found
VGB-245	966648.7	761254.9	Nothing found
VGB-246	966681.9	761275.3	Lead sinker
VGB-247	966681.6	761278.2	Piece of metal
VGB-248	966682.8	761279.0	Penny
VGB-249	966682.0	761278.7	Aluminum pull tab
VGB-250	966675.8	761311.5	Aluminum can top (Vienna sausage)
VGB-251	966679.4	761313.7	MRE wrapper
VGB-252	966699.0	761313.3	Aluminum can
VGB-253	966707.5	761310.3	Aluminum can
VGB-254	966746.1	761354.1	Piece of tin (4" x 18")
VGB-255	966770.1	761461.5	Aluminum can (10 ounce)
VGB-256	966757.0	761440.1	Brass belt clip for military belt
VGB-257	966791.4	761452.0	Aluminum foil
VGB-258	966817.9	761493.3	Aluminum can top
VGB-259	966817.6	761501.8	Bottle cap
VGB-260	966818.2	761514.1	Aluminum tie wire
VGB-261	966779.5	761522.9	Deeper than 1.5'
VGB-262	966776.3	761518.9	Deeper than 1.5'
VGB-263	966810.7	761574.8	Aluminum ring top 4" dia
VGB-264	966843.4	761659.9	30.06 brass cartridge casing for M-1 *
VGB-265	966850.4	761690.9	Aluminum foil
VGB-266	966853.4	761700.5	Aluminum pull tab
VGB-267	966853.7	761704.9	Aluminum can top
VGB-268	966832.0	761731.4	Aluminum wrapper
VGB-269	966832.6	761731.9	Aluminum can top
VGB-270	966854.6	761732.9	Aluminum can (10 ounce)
VGB-271	966818.5	762307.3	Deeper than 1.5'
VGB-272	966809.4	762310.7	Metal bar (8" iron)
VGB-273	966739.9	762356.9	Metal bar (8" iron)
VGB-274	966738.4	762354.6	Metal bar (2') with bolt
VGB-275	966727.5	762460.1	Metal spike (8")
VGB-276	966851.2	762249.0	Deeper than 1.5'
VGB-277	966848.5	762247.9	Metal bar (10" iron)
VGB-278	966838.1	762251.2	Iron bar (18")
VGB-279	966835.6	762256.7	Iron anchor bolt (24")
VGB-280	966820.4	762244.3	Iron anchor bolt (24")
VGB-281	966822.6	762242.7	Iron anchor bolt (24")
VGB-282	966790.2	762333.6	Iron anchor bolt (24") also 24" iron bar
VGB-283	966791.9	762342.5	Iron anchor bolt (24")
VGB-284	966821.2	762415.7	Iron anchor bolt (24"), also 30.06 blank cartridge casing
VGB-285	966818.9	762412.2	Deeper than 1.5'
VGB-286	966816.7	762412.9	Iron bar (18")
VGB-287	966791.1	762417.1	Iron bar (3")
VGB-288	966790.9	762401.1	Iron bar (18")
VGB-289	966801.9	762388.1	Iron bar (12")
VGB-290	966806.3	762383.2	Iron rebar (24")
VGB-291	966802.9	762374.8	Iron bolt (12")
VGB-292	966774.5	762356.1	Iron bar
VGB-293	966771.9	762352.6	Iron bar (3' long)
VGB-294	966769.6	762346.4	Railroad track
VGB-295	966729.9	762391.0	Iron plate 6"x6"

VGB-296	966773.6	762438.7	Iron anchor bolt (24")
VGB-297	966771.4	762442.5	Deeper than 1.5'
VGB-298	966711.0	762550.3	Concrete with rebar
VGB-299	966691.9	762560.8	Metal post
VGB-300	966710.3	762570.9	Scattered trash pile
VGB-301	966714.4	762567.3	Scattered trash pile
VGB-302	966716.4	762559.1	Concrete with rebar
VGB-303	966656.1	762545.3	Deeper than 1.5'
VGB-304	966624.2	762545.4	Ferrous rock
VGB-305	966766.2	762634.6	Deeper than 1.5'
VGB-306	966751.9	762699.9	Deeper than 1.5'
VGB-307	966760.9	762710.0	Deeper than 1.5'
VGB-308	966738.8	762819.9	Steel pipe (4")
VGB-309	966741.2	762985.8	Large bolt 6"
VGB-310	966721.7	763052.6	Steel pipe(10"wide/6' long)
VGB-311	966678.2	763249.5	Steel banding
VGB-312	966716.5	763511.8	Shovel head
VGB-313	966765.7	763518.7	Concrete with rebar
VGB-314	966783.8	763526.6	Concrete and steel structure
VGB-315	966796.6	763560.5	Steel rod
VGB-316	966818.8	763575.9	Steel girder
VGB-317	966837.6	763599.6	Railroad spike
VGB-318	966869.0	763655.7	Steel post
VGB-319	966857.2	763671.4	Steel scrap
VGB-320	966845.9	763670.4	Deeper than 1.5'
VGB-321	966799.6	763698.6	Concrete with rebar
VGB-322	966789.0	763721.9	Big chunk of concrete on surface
VGB-323	966783.3	763729.3	Big chunk of concrete on surface
VGB-324	966822.3	763785.4	Steel rod
VGB-325	966831.3	763781.3	Scrap metal
VGB-326	966921.6	763788.4	Steel cable
VGB-327	966940.3	763862.4	Steel bolt 12"
VGB-328	966910.2	763877.6	Steel case part
VGB-329	966875.0	763864.7	> 1ft Deep under roots
VGB-330	966838.4	763879.5	Steel bar (12")
VGB-331	966739.3	763957.6	Steel sign post
VGB-332	966520.0	764451.6	Steel rod (18")
VGB-333	0.0	0.0	Misnumbered void
VGB-334	966534.4	764562.9	Pallet with nails
VGB-335	966760.2	764437.5	Piece of steel metal (12")
VGB-336	966766.1	764447.0	Twisted wire (6")
VGB-337	966785.9	764481.6	Metal banding
VGB-338	966900.0	764384.9	Scrap metal
VGB-339	966124.1	764858.3	Nothing found to 1 foot
VGB-340	966192.6	764901.3	Nothing found
VGB-341	966843.8	761716.5	Aluminum pull tab
VGB-342	966848.3	761719.4	Aluminum pull tab
VGB-343	966815.8	761733.2	Aluminum can
VGB-344	966825.2	761744.8	Aluminum can
VGB-345	966833.6	761746.5	Aluminum can
VGB-346	966863.7	761861.5	MRE heater pad aluminum
VGB-347	966863.9	761891.4	Iron bolt (12")

VGB-348	966871.8	761884.1	Iron nut (2")
VGB-349	966886.2	761981.6	Small piece of metal iron
VGB-350	966841.4	762026.8	Nothing found to 1 foot
VGB-351	966849.0	762027.2	Nothing found to 1 foot
VGB-352	966862.5	762032.3	Small piece of tin
VGB-353	966817.7	762175.8	Aluminum foil 3"
VGB-354	966819.0	762184.5	Dime (1)
VGB-355	966809.5	762188.1	Nothing found to 1 foot
VGB-356	966799.3	762187.3	Grill grate
VGB-357	966822.1	762243.9	Iron bolt (18")
VGB-358	966850.6	762247.5	Metal banding
VGB-359	966858.7	762250.5	Aluminum can
VGB-360	966856.0	762267.6	7.62 mm blank cartridge casing *
VGB-361	966855.0	762282.4	Metal hook 6"
VGB-362	966852.4	762291.9	Aluminum can
VGB-363	966851.8	762297.9	Aluminum pull tab
VGB-364	966801.6	762343.3	MRE foil, bottle
VGB-365	966810.7	762346.1	MRE foil
VGB-366	966838.7	762381.7	Iron nail
VGB-367	966836.1	762407.3	Iron plate
VGB-368	966763.5	762451.8	MRE foil
VGB-369	966699.3	762576.3	Deeper than 1.5'
VGB-370	966712.8	762568.2	Aluminum can top
VGB-371	966722.5	762554.7	Deeper than 1.5'
VGB-372	966728.6	762554.4	Deeper than 1.5'
VGB-373	966749.2	762554.8	Concrete with rebar
VGB-374	966763.1	762555.7	Concrete with rebar
VGB-375	966769.8	762558.5	Aluminum foil
VGB-376	966785.8	762567.1	Ferrous rock
VGB-377	966789.5	762569.5	Copper wire
VGB-378	966794.9	762574.2	Ferrous rock
VGB-379	966798.2	762577.9	Ferrous rock
VGB-380	966801.2	762579.0	Nothing found to 1 foot
VGB-381	966804.4	762585.3	Aluminum pull tab
VGB-382	966807.8	762593.9	30.06 cartridge casing blank *
VGB-383	966812.0	762611.3	Chunk of metal
VGB-384	966814.8	762615.9	Nothing found to 1 foot
VGB-385	966762.5	762711.9	Aluminum can
VGB-386	966796.4	762803.1	Nothing found to 1 foot
VGB-387	966760.2	762802.8	7.62 mm cartridge casing blank *
VGB-388	966741.3	762813.4	7.62 mm cartridge casing blank *
VGB-389	966734.2	762824.2	Pipe (4")
VGB-390	966741.9	762874.9	Aluminum foil
VGB-391	966726.7	762985.2	Deeper than 1.5'
VGB-392	966681.0	763132.9	Aluminum can
VGB-393	966646.3	763149.6	Aerosol can
VGB-394	966658.8	763388.8	Deeper than 1.5'
VGB-395	966642.4	763397.0	Aluminum foil
VGB-396	966683.4	763404.8	Not checked (molasses tank)
VGB-397	966685.3	763263.6	Not checked (molasses tank)
VGB-398	966685.9	763262.3	Ferrous sand
VGB-399	966687.1	763256.9	Not checked (molasses tank)

VGB-400	966688.9	763255.8	Not checked (molasses tank)
VGB-401	966688.8	763249.7	Piece of iron
VGB-402	966689.9	763243.4	Not checked (molasses tank)
VGB-403	966692.7	763240.4	Not checked (molasses tank)
VGB-404	966694.3	763239.9	Not checked (molasses tank)
VGB-405	966693.0	763232.8	Not checked (molasses tank)
VGB-406	966696.3	763226.0	Iron nail (2")
VGB-407	966697.8	763222.0	Iron nail (3")
VGB-408	966700.9	763216.2	Not checked (molasses tank)
VGB-409	966702.3	763207.6	Iron bolt
VGB-410	966705.2	763204.6	Not checked (molasses tank)
VGB-411	966706.0	763199.1	Not checked (molasses tank)
VGB-412	966708.4	763197.8	Not checked (molasses tank)
VGB-413	966713.0	763175.2	Not checked (molasses tank)
VGB-414	966719.8	763152.5	Not checked (molasses tank)
VGB-415	966722.3	763140.0	Iron bar (3")
VGB-416	966721.3	763134.4	Nail
VGB-417	966723.3	763130.0	Not checked (molasses tank)
VGB-418	966723.6	763118.4	Not checked (molasses tank)
VGB-419	966724.7	763114.9	Carbine cartridge casing 5.56 mm (2) *
VGB-420	966726.3	763112.3	Not checked (molasses tank)
VGB-421	966727.0	763105.4	Copper wire
VGB-422	966728.1	763099.5	Not checked (molasses tank)
VGB-423	966729.7	763080.5	Not checked (molasses tank)
VGB-424	966733.3	763055.8	Railroad spike (3")
VGB-425	966736.5	763049.1	Not checked (molasses tank)
VGB-426	966742.0	763023.8	Not checked (molasses tank)
VGB-427	966746.7	763005.0	Not checked (molasses tank)
VGB-428	966752.2	762968.4	Not checked (molasses tank)
VGB-429	966751.3	762966.3	Not checked (molasses tank)
VGB-430	966755.3	762959.3	Not checked (molasses tank)
VGB-431	966755.2	762946.6	Not checked (molasses tank)
VGB-432	966757.8	762938.9	Not checked (molasses tank)
VGB-433	966760.5	762937.2	Not checked (molasses tank)
VGB-434	966759.3	762933.5	Disintegrating link steel for machine gun ammo *
VGB-435	966763.7	762930.4	Not checked (molasses tank)
VGB-436	966761.8	762928.1	Not checked (molasses tank)
VGB-437	966763.2	762925.4	Not checked (molasses tank)
VGB-438	966767.2	762922.7	Not checked (molasses tank)
VGB-439	966766.5	762916.9	Ferrous rock
VGB-440	966777.3	762876.8	Not checked (molasses tank)
VGB-441	966781.0	762874.4	Not checked (molasses tank)
VGB-442	966785.0	762863.6	Iron bar (10")
VGB-443	966786.0	762859.4	Not checked (molasses tank)
VGB-444	966788.4	762855.8	Not checked (molasses tank)
VGB-445	966790.1	762850.4	Ferrous rock
VGB-446	966790.5	762841.8	Not checked (molasses tank)
VGB-447	966789.3	762837.3	Not checked (molasses tank)
VGB-448	966793.3	762834.4	Not checked (molasses tank)
VGB-449	966793.8	762830.6	Ferrous rock
VGB-450	966792.6	762826.1	Not checked (molasses tank)
VGB-451	966797.6	762820.7	Not checked (molasses tank)

VGB-452	966805.0	762796.5	Not checked (molasses tank)
VGB-453	966807.2	762785.3	Not checked (molasses tank)
VGB-454	966812.4	762775.7	Not checked (molasses tank)
VGB-455	966813.3	762769.6	30.06 blank cartridge casing 8" deep *
VGB-456	966815.3	762765.6	Ferrous rock
VGB-457	966813.3	762761.3	Aluminum can
VGB-458	966815.7	762753.1	Not checked (molasses tank)
VGB-459	966816.0	762750.1	Not checked (molasses tank)
VGB-460	966815.2	762742.9	Not checked (molasses tank)
VGB-461	966816.5	762731.1	Not checked (molasses tank)
VGB-462	966818.7	762713.9	Not checked (molasses tank)
VGB-463	966816.9	762703.5	Not checked (molasses tank)
VGB-464	966816.2	762693.3	Not checked (molasses tank)
VGB-465	966817.7	762682.6	2 - 7.62 mm blank cartridges *
VGB-466	966817.0	762655.4	Not checked (molasses tank)
VGB-467	966819.3	762645.8	Deeper than1.5 ft
VGB-468	966821.9	762651.8	Not checked (molasses tank)
VGB-469	966824.4	762685.0	Deeper than1.5 ft
VGB-470	966825.1	762695.5	Not checked (molasses tank)
VGB-471	966825.5	762698.9	Not checked (molasses tank)
VGB-472	966825.2	762710.2	Not checked (molasses tank)
VGB-473	966821.4	762746.5	Not checked (molasses tank)
VGB-474	966821.1	762750.7	Not checked (molasses tank)
VGB-475	966820.4	762757.5	Part of 30.06 blank cartridge case *
VGB-476	966821.2	762764.8	Not checked (molasses tank)
VGB-477	966819.3	762771.7	Not checked (molasses tank)
VGB-478	966817.5	762779.2	Piece of metal
VGB-479	966814.6	762788.0	Not checked (molasses tank)
VGB-480	966811.1	762796.4	Ferrous rock
VGB-481	966803.9	762804.2	Not checked (molasses tank)
VGB-482	966800.8	762826.2	Not checked (molasses tank)
VGB-483	966797.1	762835.5	Not checked (molasses tank)
VGB-484	966795.0	762837.7	Not checked (molasses tank)
VGB-485	966793.1	762844.6	Aluminum can
VGB-486	966793.0	762855.9	Ferrous rock
VGB-487	966787.4	762866.3	Iron bar (10")
VGB-488	966788.0	762875.7	Not checked (molasses tank)
VGB-489	966787.0	762879.3	Not checked (molasses tank)
VGB-490	966784.5	762887.6	Not checked (molasses tank)
VGB-491	966781.0	762891.9	Not checked (molasses tank)
VGB-492	966780.6	762899.1	Not checked (molasses tank)
VGB-493	966777.6	762903.3	Not checked (molasses tank)
VGB-494	966776.3	762909.3	Part of 30.06 cartridge case *
VGB-495	966769.7	762929.5	Not checked (molasses tank)
VGB-496	966767.4	762937.0	Not checked (molasses tank)
VGB-497	966763.6	762946.4	Not checked (molasses tank)
VGB-498	966764.1	762954.0	Not checked (molasses tank)
VGB-499	966761.3	762962.1	Not checked (molasses tank)
VGB-500	966755.4	762977.0	Not checked (molasses tank)
VGB-501	966749.5	763014.5	Not checked (molasses tank)
VGB-502	966745.0	763022.4	Aluminum pull tab
VGB-503	966733.2	763099.4	Nail

VGB-504	966731.6	763117.5	Not checked (molasses tank)
VGB-505	966728.3	763129.4	Not checked (molasses tank)
VGB-506	966724.6	763141.7	Wire (3")
VGB-507	966726.8	763150.9	Not checked (molasses tank)
VGB-508	966721.0	763167.6	Not checked (molasses tank)
VGB-509	966713.5	763193.7	Nail
VGB-510	966711.2	763201.2	Not checked (molasses tank)
VGB-511	966710.7	763204.7	Not checked (molasses tank)
VGB-512	966712.2	763209.7	45 caliber slug * (a)
VGB-513	966708.2	763217.6	Not checked (molasses tank)
VGB-514	966704.2	763225.3	Not checked (molasses tank)
VGB-515	966703.8	763229.8	Not checked (molasses tank)
VGB-516	966702.2	763237.1	7.62 mm cartridge - unfired blank *
VGB-517	966698.1	763254.8	Not checked (molasses tank)
VGB-518	966693.4	763259.5	Small piece of metal
VGB-519	966659.3	763496.2	Aluminum can
VGB-520	966687.9	763504.1	Metal wire
VGB-521	966689.5	763507.4	Aluminum foil
VGB-522	966698.8	763514.7	Concrete with rebar
VGB-523	966700.6	763512.7	Bottle cap
VGB-524	966701.4	763506.3	Aluminum can
VGB-525	966708.1	763502.7	Aluminum foil
VGB-526	966706.1	763519.3	Aluminum foil
VGB-527	966714.1	763515.8	Aluminum can
VGB-528	966730.8	763514.1	Concrete with rebar
VGB-529	966733.1	763512.6	Aluminum pull tab
VGB-530	966741.9	763513.5	Iron spike
VGB-531	966803.1	763922.5	Roots under tree
VGB-532	966794.1	763995.2	Deeper than 1 foot
VGB-533	966894.4	764037.5	Conch shell @ 1 foot
VGB-534	966772.4	764031.3	Aluminum can
VGB-535	966766.3	764029.4	Aluminum can
VGB-536	966765.9	764027.8	Aluminum can top
VGB-537	966758.3	764026.7	Aluminum can top
VGB-538	966747.8	764054.9	Aluminum can top
VGB-539	966749.7	764061.8	Aluminum can top
VGB-540	966750.9	764061.7	Nothing found to 1'
VGB-541	966777.2	764079.4	30.06 blank cartridge casing blank *
VGB-542	966742.9	764192.5	Aluminum foil
VGB-543	966551.9	764414.2	Aluminum foil
VGB-544	966545.5	764421.1	Aluminum pull tab
VGB-545	966526.1	764443.4	Aluminum can top
VGB-546	966506.2	764476.5	Aluminum pull tab
VGB-547	966529.6	764564.8	Nails
VGB-548	966610.6	764597.0	Aluminum can
VGB-549	966603.9	764492.0	7.62 mm blank cartridge *
VGB-550	966659.3	764497.8	Nothing found to 1'
VGB-551	966753.6	764548.1	Aluminum can
VGB-552	966729.6	764531.0	Aluminum can
VGB-553	966668.9	764430.8	Aluminum foil
VGB-554	966755.6	764420.5	Nothing found to 1'
VGB-555	966755.5	764437.4	Iron scrap metal

VGB-556	966764.0	764443.0	Scrap metal (2")
VGB-557	966777.6	764459.8	Metal cap
VGB-558	966782.9	764483.1	Iron metal band
VGB-559	966787.8	764487.6	Nothing found to 1'
VGB-560	966805.3	764503.5	Aluminum can top
VGB-561	966895.5	764393.5	Nothing found to 1'
VGB-562	966891.9	764378.7	Iron metal 4"x18"
VGB-563	966210.7	764740.3	Aluminum foil
VGB-564	966300.3	764767.7	Metal bolt (12")
VGB-565	966269.2	764702.4	Aluminum can
VGB-566	966315.0	764632.0	Aluminum can top
VGB-567	966573.1	764633.4	Aluminum can top
VGB-568	966672.4	764651.3	Aluminum foil
VGB-569	966481.8	764633.5	Aluminum can top
VGB-570	966460.8	764691.9	Aluminum foil
VGB-571	966414.8	764717.2	Aluminum light bulb base
VGB-572	966411.0	764710.2	Aluminum wire
VGB-573	966331.8	764933.4	Aluminum foil
VGB-574	966267.2	764896.7	Light bulb
VGB-575	966240.6	764883.7	Aluminum foil
VGB-576	966237.6	764881.1	Aluminum foil
VGB-577	966153.2	764840.9	Aluminum foil
VGB-578	966165.2	764857.1	Aluminum can
VGB-579	966185.8	764906.0	Aluminum can
VGB-580	966188.4	764907.7	Aluminum foil
VGB-581	966200.0	764906.2	Aluminum pull tab
VGB-582	966200.0	764917.7	Aluminum can top
VGB-583	966226.3	764978.8	Aluminum can
VGB-584	966270.6	764996.9	Nothing found to 1'
VGB-585	966331.9	765000.0	Aluminum foil
VGB-586	966430.1	764909.1	30.06 blank cartridge *
VGB-587	966487.9	765020.8	Nail
VGB-588	966583.7	764921.3	Tin can top
VGB-589	966604.2	764920.1	1984 Nickel
VGB-590	966597.2	764966.0	Aluminum can
VGB-591	966610.1	764983.4	Aluminum foil

Note:
* Items related to military training.
(a) 45 caliber slugs may have been from civilian target shooting.
(b) A total of 8 - 7.62 mm cartridges were found. One cartridge was found on the road during the visual sweep.

April 30, 2001

CH2MHILL
Attn: Mr. Martin J. Clasen
4350 West Cypress
Suite 600
Tampa, Florida 33607

Subject: Final Removal Report, for Ordnance and Explosives (OE) Support Services at the Western Training Area and Green Beach, NASD, Vieques Island, Puerto Rico

Dear Mr. Clasen,

USA Environmental, Inc. (USA) has completed the Ordnance and Explosive (OE) support during OE surface clearance, UXO escort during geophysical surveys, and anomaly validation at the Western Training Area and Green Beach.

USA mobilized three UXO qualified personnel to Vieques Island on April 1, 2001. Due to delayed airline connections the fourth UXO person arrived on Monday, April 2, 2001. Two UXO Technicians demobilized on April 8 and the remaining two demobilized on April 14, 2001. On April 2, 2001 USA's Senior UXO Supervisor (SUXOS), Mr. Edward Komac, coordinated with the CH2MHill Project Manager (PM) and assessed the site and assembled and tested the equipment. The entire team received a safety briefing from the Navy and Mr. Komac provided an initial UXO safety briefing for all team members. Daily, prior to the day's operations, Mr. Komac provided a tailgate safety briefing to re-emphasize UXO precautions and other site specific safety issues.

Operations began on the April 2, 2001 and were completed on April 13, 2001h. USA performed a surface clearance prior to geophysical surveys. A total of 591 targets identified by the geophysical contractor were investigated in accordance with the Statement of Work (SOW). No UXO was encountered and several expended small arms cartridges were recovered.

During the week of April 2, 2001 USA personnel performed a surface visual survey of Green beach and performed hand clearance of vegetation for the vegetated area. Beginning on Friday the 6th, a vegetation crew was on site and USA provided them a UXO escort during their operations and continued UXO support to the geophysical contractor. All anomalies (targets) identified for investigation by CH2MHill were excavated by USA UXO personnel. No UXO was encountered at the target locations.

Lessons Learned:

The meandering path survey in the 18 acre vegetated area was extremely difficult and required extensive vegetation clearance to perform. Initially the clearance was performed by the UXO team using machetes. Any future surveys planned in this type of vegetation should include a vegetation clearance crew and mechanical equipment with a UXO escort.

Sincerely,

George R. Spencer
Operations Manager

Attachments:
Attachment 1 – Daily Journals

DAILY OPERATIONS JOURNAL

DATE: 2 April 2001

LOCATION: Vieques Is. P.R.

WEATHER CONDITIONS: 88° C Clear

1. WORK SUMMARY:

a. Work Planned Prepare Equip. In Briefing CH2M Hill. Safety Briefing By US Navy EOD. USA Briefing. Sweep Beach (Green) Visual. Clear Areas in Jungle for Sweeps.

b. Work Accomplished: Sweep Beach (Green). To clear areas required us to cut our way into cleared areas for sweeps

c. Discrepancies:

d. Inspection Results:

2. INSTRUCTIONS RECEIVED FROM CUSTOMER REPRESENTATIVE(S):

CH2M said we would be working 6/10's

3. UXO SUMMARY

a. UXO Located:

TYPE	QUANTITY	LOCATION	DISPOSITION

b. Demolition Supplies Expended:

TYPE	QUANTITY

c. Scrap Generation/Deposition:

QUANTITY	WEIGHT	TYPE (OE/NON-OE)
6	1.5 lbs	scrap

4. PERSONNEL/EQUIPMENT UTILIZATION:

a. Personnel On-Site:

NUMBER	MAN-HOURS	DESCRIPTION
		Project Manager
		Site Safety/Quality Control Officer
1	10	Senior UXO Supervisor
		UXO Supervisor
2	20	UXO Specialist
		UXO Assistant
		Laborers
		Administrative Personnel
		Security Guard
		Visitors
		Sub-Contractor Personnel (List By Category)

b. Equipment Utilization:

QUANTITY	HOURS	DESCRIPTION
		Backhoe
		Front End Loader
		Magnetometers:
		Schonstedt
		Other
		Radio (Hand held)
		Radio (Mobile)
		Truck (Heavy)
1	10	Truck (Light)
		Rental Cars
		GPS
		Other Equipment (List)
4	30	

5. REMARKS:

LAST MEMBER OF TEAM ARRIVED ON ISLAND AT 1530 HRS

6. SIGNATURE/DATE:

Project Manager C J Kane Date: 2 April 2001

DAILY OPERATIONS JOURNAL

UXO SUMMARY, CONTINUATION SHEET: Page 6 of 6 Pages

UXO Located:

TYPE	QUANTITY	LOCATION	DISPOSITION

USA Environmental, Inc.

Tailgate Safety Briefing

Date: 2 / Apr / 2000 **Location:** Vieques Is

Time: 0830 AM PM **Team #:** _____

1. Reason for Briefing:

✓	Daily Safety Briefing		New Site Procedure
✓	Initial Safety Briefing		New Site Information
	New Task Briefing		Review of Site Information
	Periodic Safety Meeting		Other: (Specify)

2. Personnel Attending:

Name	Signature	Position
E. Komac	E Komac	UXO 3
R. Reisgies		UXO 2
C Trout	Charles Trout	UXO 2

Briefing Given By:

Name	Signature	Position
E Komac	E Komac	

3. Topics: (Check All That Apply)

✓	Site Safety Personnel		Decontamination Procedures
✓	Site/Work Area Description	✓	Emergency Response/Equipment
✓	Physical Hazards		On-Site Injuries/Illnesses
	Chemical/Biological Hazards	✓	Reporting Procedures
✓	Heat/Cold Stress		Directions to Medical Facility
	Work/Support Zones		Drug and Alcohol Policies
✓	PPE		Medical Monitoring
✓	Safe Work Practices	✓	Evacuation/Egress Procedures
	Air Monitoring		Communications
	Task Training		Confined Spaces
	OE Precautions		Other:

4. Remarks:

DAILY OPERATIONS JOURNAL

DATE: 3 April 2001 Page 1 of 6 Pages

LOCATION: Vieggues Is. PR.

WEATHER CONDITIONS: 89° Clear Humid

1. WORK SUMMARY:

a. Work Planned Continue cutting paths.

b. Work Accomplished: Cut sweeping paths for Chem Rad. Built SHA

c. Discrepancies:

d. Inspection Results:

2. INSTRUCTIONS RECEIVED FROM CUSTOMER REPRESENTATIVE(S):

3. UXO SUMMARY

a. UXO Located:

TYPE	QUANTITY	LOCATION	DISPOSITION

b. Demolition Supplies Expended:

TYPE	QUANTITY

c. Scrap Generation/Deposition:

QUANTITY	WEIGHT	TYPE (OE/NON-OE)

4. PERSONNEL/EQUIPMENT UTILIZATION:

a. Personnel On-Site:

NUMBER	MAN-HOURS	DESCRIPTION
		Project Manager
		Site Safety/Quality Control Officer
1	10	Senior UXO Supervisor
		UXO Supervisor
3	30	UXO Specialist
		UXO Assistant
		Laborers
		Administrative Personnel
		Security Guard
		Visitors
		Sub-Contractor Personnel (List By Category)

b. Equipment Utilization:

QUANTITY	HOURS	DESCRIPTION
		Backhoe
		Front End Loader
		Magnetometers:
		Schonstedt
		Other
		Radio (Hand held)
		Radio (Mobile)
		Truck (Heavy)
1	10	Truck (Light)
		Rental Cars
		GPS
		Other Equipment (List)

5. REMARKS:

6. SIGNATURE/DATE:

Project Manager C J K Date: 3 Apr 2001

DAILY OPERATIONS JOURNAL

UXO SUMMARY, CONTINUATION SHEET: **Page 6 of 6 Pages**

UXO Located:

TYPE	QUANTITY	LOCATION	DISPOSITION

USA Environmental, Inc.

Tailgate Safety Briefing

Date: 3 / Apr / 2001 **Location:** Viegques Is

Time: 0700 AM PM **Team #:** _____

1. Reason for Briefing:

✓	Daily Safety Briefing		New Site Procedure
✓	Initial Safety Briefing		New Site Information
	New Task Briefing		Review of Site Information
	Periodic Safety Meeting		Other: (Specify)

2. Personnel Attending:

Name	Signature	Position
E Komac	E Kom	UXO 3
R. Reisgies		UXO 2
C. Trout		UXO 2
E. Carraballo		UXO 2

Briefing Given By:

Name	Signature	Position
E F Komac	E F K	UXO 3

3. Topics: (Check All That Apply)

✓	Site Safety Personnel		Decontamination Procedures
✓	Site/Work Area Description	✓	Emergency Response/Equipment
✓	Physical Hazards		On-Site Injuries/Illnesses
	Chemical/Biological Hazards	✓	Reporting Procedures
✓	Heat/Cold Stress		Directions to Medical Facility
	Work/Support Zones		Drug and Alcohol Policies
✓	PPE		Medical Monitoring
✓	Safe Work Practices	✓	Evacuation/Egress Procedures
'	Air Monitoring		Communications
	Task Training		Confined Spaces
	OE Precautions		Other:

4. Remarks: Initial Safety Brief for Carraballo

DAILY OPERATIONS JOURNAL

DATE: 4 Apr 01 Page 1 of 6 Pages

LOCATION: VIEGQUIES

WEATHER CONDITIONS: 85° RAIN SHOWERS

1. WORK SUMMARY:

a. Work Planned CONTINUE CLEARING SEARCH AREAS IN JUNGLE.

b. Work Accomplished: HAND CHOP PATHS THRU JUNGLE.

c. Discrepancies:

d. Inspection Results:

2. INSTRUCTIONS RECEIVED FROM CUSTOMER REPRESENTATIVE(S):

3. UXO SUMMARY

a. UXO Located:

TYPE	QUANTITY	LOCATION	DISPOSITION

b. Demolition Supplies Expended:

TYPE	QUANTITY

c. Scrap Generation/Deposition:

QUANTITY	WEIGHT	TYPE (OE/NON-OE)

4. PERSONNEL/EQUIPMENT UTILIZATION:

a. Personnel On-Site:

NUMBER	MAN-HOURS	DESCRIPTION
		Project Manager
		Site Safety/Quality Control Officer
1	10	Senior UXO Supervisor
		UXO Supervisor
3	30	UXO Specialist
		UXO Assistant
		Laborers
		Administrative Personnel
		Security Guard
		Visitors
		Sub-Contractor Personnel (List By Category)

b. Equipment Utilization:

QUANTITY	HOURS	DESCRIPTION
		Backhoe
		Front End Loader
		Magnetometers:
		Schonstedt
		Other
		Radio (Hand held)
		Radio (Mobile)
		Truck (Heavy)
1	10	Truck (Light)
		Rental Cars
		GPS
		Other Equipment (List)

5. REMARKS:

6. SIGNATURE/DATE:

Project Manager EBL Date: 4 Apr 06

DAILY OPERATIONS JOURNAL

UXO SUMMARY, CONTINUATION SHEET:

UXO Located:

TYPE	QUANTITY	LOCATION	DISPOSITION

USA Environmental, Inc.

Tailgate Safety Briefing

Date: 4 / Apr / 01 **Location:** VIEGQUES

Time: 0715 HRS AM PM **Team #:** _____

1. Reason for Briefing:

✓	Daily Safety Briefing		New Site Procedure
	Initial Safety Briefing		New Site Information
	New Task Briefing		Review of Site Information
	Periodic Safety Meeting		Other: (Specify)

2. Personnel Attending:

Name	Signature	Position
E Komac	E Komac	UXO 3
R Reisgies		UXO 2
EA Caraballo	Edgar A Caraballo	UXO 2
Charles Trout	Charles Trout	UXO2

Briefing Given By:

Name	Signature	Position
E F Komac	E F Komac	UXO 3

3. Topics: (Check All That Apply)

	Site Safety Personnel		Decontamination Procedures
	Site/Work Area Description		Emergency Response/Equipment
✓	Physical Hazards		On-Site Injuries/Illnesses
	Chemical/Biological Hazards		Reporting Procedures
✓	Heat/Cold Stress		Directions to Medical Facility
	Work/Support Zones		Drug and Alcohol Policies
	PPE		Medical Monitoring
	Safe Work Practices		Evacuation/Egress Procedures
	Air Monitoring		Communications
	Task Training		Confined Spaces
	OE Precautions		Other:

4. Remarks:

DAILY OPERATIONS JOURNAL

DATE: 5 Apr 01 Page 1 of 6 Pages

LOCATION: Vieques Is

WEATHER CONDITIONS: 85° Sunny

1. WORK SUMMARY:

a. Work Planned Continue Hand cutting trails for survey. Observer workers with chainsaw when the show up!!

b. Work Accomplished: Clear Jungle paths by Hand. Crew for chainsaw observing. Dig for hits on beach

c. Discrepancies:

d. Inspection Results:

2. INSTRUCTIONS RECEIVED FROM CUSTOMER REPRESENTATIVE(S):

3. UXO SUMMARY

a. UXO Located:

TYPE	QUANTITY	LOCATION	DISPOSITION

b. Demolition Supplies Expended:

TYPE	QUANTITY

c. Scrap Generation/Deposition:

QUANTITY	WEIGHT	TYPE (OE/NON-OE)
VGB 1	—	METAL OBJECT UNK
VGB 2	10 lbs	CEMENT PIECE W/ REBARS
VGB 3	10 lbs	CEMENT PIECE W/ REBARS
VGB 4	3 OZ	SPRAY CAN
VGB 5/6	1 lb	PLIERS
VGB 7	—	NOTHING FOUND
VGB 8	1 oz	CHICKEN WIRE FENCE
VGB 9	2 OZ	CHICKEN WIRE FENCE
VGB 10	2 OZ	CHICKEN WIRE FENCE
VGB 11	1 oz	PAINT CAN HANDLE
VGB 12	3 oz	SPRAY CAN
VGB 13	1/2 oz	TOP OF CAN
VGB 14	—	PIECE OF WOOD W/ 4 SCREWS
VGB 15	—	BOARD W/ NAIL
VGB 16	1/2	SARDINE CAN

4. PERSONNEL/EQUIPMENT UTILIZATION: Page 4 of 6 Pages

a. Personnel On-Site:

NUMBER	MAN-HOURS	DESCRIPTION
		Project Manager
		Site Safety/Quality Control Officer
1	10	Senior UXO Supervisor
		UXO Supervisor
3	30	UXO Specialist
		UXO Assistant
		Laborers
		Administrative Personnel
		Security Guard
		Visitors
		Sub-Contractor Personnel (List By Category)

b. Equipment Utilization:

QUANTITY	HOURS	DESCRIPTION
		Backhoe
		Front End Loader
		Magnetometers:
		Schonstedt
		Other
		Radio (Hand held)
		Radio (Mobile)
		Truck (Heavy)
1	10	Truck (Light)
		Rental Cars
		GPS
		Other Equipment (List)

5. REMARKS:

6. SIGNATURE/DATE:

Project Manager CB K Date: 5 Apr 01

DAILY OPERATIONS JOURNAL

UXO SUMMARY, CONTINUATION SHEET: **Page 6 of 6 Pages**

UXO Located:

TYPE	QUANTITY	LOCATION	DISPOSITION

USA Environmental, Inc.

Tailgate Safety Briefing

Date: 5 / APR / 01 **Location:** VIEQUES

Time: 0700 AM PM **Team #:** _____

1. Reason for Briefing:

✓	Daily Safety Briefing		New Site Procedure
	Initial Safety Briefing		New Site Information
	New Task Briefing		Review of Site Information
	Periodic Safety Meeting		Other: (Specify)

2. Personnel Attending:

Name	Signature	Position
E Komac	E Komac	UXO 3
R REISDIES	R Reisdies	UXO 2
Charles Trout	Charles Trout	UXO 2
EA CARABALLO	Edwin A Caraballo	UXO 2

Briefing Given By:

Name	Signature	Position
E F Komac	E F Komac	UXO 3

3. Topics: (Check All That Apply)

	Site Safety Personnel		Decontamination Procedures
	Site/Work Area Description		Emergency Response/Equipment
✓	Physical Hazards		On-Site Injuries/Illnesses
	Chemical/Biological Hazards		Reporting Procedures
✓	Heat/Cold Stress		Directions to Medical Facility
	Work/Support Zones		Drug and Alcohol Policies
	PPE		Medical Monitoring
	Safe Work Practices		Evacuation/Egress Procedures
	Air Monitoring		Communications
	Task Training		Confined Spaces
	OE Precautions		Other:

4. Remarks:

DAILY OPERATIONS JOURNAL

DATE: 6 Apr 01 Page 1 of 6 Pages

LOCATION: Vieques Is.

WEATHER CONDITIONS: 89° Clear / Rain Showers

1. WORK SUMMARY:

a. Work Planned Dig Hits. Observer cutting crew

b. Work Accomplished: Dig Hits for ChemRad. Observered cutting crew.

c. Discrepancies:

d. Inspection Results:

2. INSTRUCTIONS RECEIVED FROM CUSTOMER REPRESENTATIVE(S):

CH2M Hill said to send to Pers'l Home Monday 9 Apr 01

3. UXO SUMMARY

a. UXO Located:

TYPE	QUANTITY	LOCATION	DISPOSITION

b. Demolition Supplies Expended:

TYPE	QUANTITY

c. Scrap Generation/Deposition:

QUANTITY	WEIGHT	TYPE (OE/NON-OE)
VGB 17		PIECE OF METAL
18		PIECE OF METAL
19		PART OF COLEMAN STOVE
20		PIECE OF METAL
21		7" PIECE OF METAL
22		LARGE PIECE OF METAL
23		PIECE OF METAL
24		NOTHING FOUND
25		SMALL PIECE OF FENCE WIRE
26		LARGE CEMENT BLOCK STEEL HANDLE
27		KNIFE BLADE / PIECE OF METAL
28		PIECE OF METAL
29		PIECE OF WIRE
30		SNAPPLE CAP

CONT. PAGE 6

4. PERSONNEL/EQUIPMENT UTILIZATION:

a. Personnel On-Site:

NUMBER	MAN-HOURS	DESCRIPTION
		Project Manager
		Site Safety/Quality Control Officer
1	10	Senior UXO Supervisor
		UXO Supervisor
3	30	UXO Specialist
		UXO Assistant
		Laborers
		Administrative Personnel
		Security Guard
		Visitors
		Sub-Contractor Personnel (List By Category)

b. Equipment Utilization:

QUANTITY	HOURS	DESCRIPTION
		Backhoe
		Front End Loader
		Magnetometers:
2	20	Schonstedt
		Other
		Radio (Hand held)
		Radio (Mobile)
		Truck (Heavy)
1	10	Truck (Light)
		Rental Cars
		GPS
		Other Equipment (List)

5. REMARKS:

6. SIGNATURE/DATE:

Project Manager CP Kuna Date: 6 Apr 01

DAILY OPERATIONS JOURNAL

UXO SUMMARY, CONTINUATION SHEET:

[redacted] **Located:**

TYPE	QUANTITY	LOCATION	DISPOSITION
31	CABLE LIVE		
32	HOT CABLE LIVE		
33	SMALL PIECE OF METAL		
34	BEER CAN		
35	BEER CAN		
36	STERNO CAN		
37	V. SAVAGE CAN		
38			
39			
40	BEER CAN		
41	BEER CAN		
42	STERNO CAN		
43	BEER CAN		
44			
45	BEER CAN		
46			
47	PIECE OF CABLE 6"		
48.			

USA Environmental, Inc.

Tailgate Safety Briefing

Date: 6 / Apr / 01 **Location:** Vieques

Time: 0700 AM PM **Team #:** _____

1. Reason for Briefing:

✓	Daily Safety Briefing		New Site Procedure
	Initial Safety Briefing		New Site Information
	New Task Briefing		Review of Site Information
	Periodic Safety Meeting		Other: (Specify)

2. Personnel Attending:

Name	Signature	Position
E Komac	E Blc	UXO 3
Charles Trout	Charles Trout	UXO 2
ROB [illegible]	[illegible]	UXO 2
EA Canabella	EA Canabella	UXO2

Briefing Given By:

Name	Signature	Position
E Komac	E Blc	UXO 3

3. Topics: (Check All That Apply)

	Site Safety Personnel		Decontamination Procedures
✓	Site/Work Area Description		Emergency Response/Equipment
✓	Physical Hazards		On-Site Injuries/Illnesses
	Chemical/Biological Hazards		Reporting Procedures
✓	Heat/Cold Stress		Directions to Medical Facility
	Work/Support Zones		Drug and Alcohol Policies
	PPE		Medical Monitoring
✓	Safe Work Practices		Evacuation/Egress Procedures
	Air Monitoring		Communications
	Task Training		Confined Spaces
	OE Precautions		Other:

4. Remarks:

DAILY OPERATIONS JOURNAL

DATE: 7 Apr 01

LOCATION: Vieques Is P.R

WEATHER CONDITIONS: 89° Sunny / Rain Showers

1. WORK SUMMARY:

a. Work Planned DIG SURVEY HITS

b. Work Accomplished: DUG SURVEY HITS FROM CHEMRAD ON BEACH AND ON ROAD. INFORMATION ON ITEMS FOUND TRANSFERED TO CHEMRAD FOR DATA LOGGING. CH2M HILL REP AND NAVY REP. REQUESTED WE SURVEY FUTURE WORKSITE FOR UXO WORK AND PROVIDE INPUT.

c. Discrepancies:

d. Inspection Results:

2. INSTRUCTIONS RECEIVED FROM CUSTOMER REPRESENTATIVE(S):

3. UXO SUMMARY Page 2 of 6 Pages

a. UXO Located:

TYPE	QUANTITY	LOCATION	DISPOSITION

b. Demolition Supplies Expended:

TYPE	QUANTITY

c. Scrap Generation/Deposition:

QUANTITY	WEIGHT	TYPE (OE/NON-OE)

4. PERSONNEL/EQUIPMENT UTILIZATION:

a. Personnel On-Site:

NUMBER	MAN-HOURS	DESCRIPTION
		Project Manager
		Site Safety/Quality Control Officer
1	13	Senior UXO Supervisor
		UXO Supervisor
3	36	UXO Specialist
		UXO Assistant
		Laborers
		Administrative Personnel
		Security Guard
		Visitors
		Sub-Contractor Personnel (List By Category)

b. Equipment Utilization:

QUANTITY	HOURS	DESCRIPTION
		Backhoe
		Front End Loader
		Magnetometers:
2	24	Schonstedt
		Other
		Radio (Hand held)
		Radio (Mobile)
		Truck (Heavy)
1	12	Truck (Light)
		Rental Cars
		GPS
		Other Equipment (List)

5. REMARKS:

6. SIGNATURE/DATE:

Project Manager CB Kuma Date: 7 April

DAILY OPERATIONS JOURNAL

UXO SUMMARY, CONTINUATION SHEET:

UXO Located:

TYPE	QUANTITY	LOCATION	DISPOSITION

USA Environmental, Inc.

Tailgate Safety Briefing

Date: 7 / Apr / 01 **Location:** Vieques

Time: 0630 **AM PM** **Team #:** _____

1. Reason for Briefing:

✓	Daily Safety Briefing		New Site Procedure
	Initial Safety Briefing		New Site Information
	New Task Briefing		Review of Site Information
	Periodic Safety Meeting		Other: (Specify)

2. Personnel Attending:

Name	Signature	Position
E Komac	E Komac	UXO 3
EA CARABALLO	EA Caraballo	UXO 2
Charles Trout	Charles Trout	UXO 2
R PETERSEN	R Petersen	UXO 2

Briefing Given By:

Name	Signature	Position
E F Komac	E F Komac	UXO 3

3. Topics: (Check All That Apply)

	Site Safety Personnel		Decontamination Procedures
	Site/Work Area Description		Emergency Response/Equipment
	Physical Hazards		On-Site Injuries/Illnesses
	Chemical/Biological Hazards		Reporting Procedures
	Heat/Cold Stress		Directions to Medical Facility
	Work/Support Zones		Drug and Alcohol Policies
	PPE		Medical Monitoring
	Safe Work Practices		Evacuation/Egress Procedures
	Air Monitoring		Communications
	Task Training		Confined Spaces
	OE Precautions		Other:

4. Remarks:

DAILY OPERATIONS JOURNAL

DATE: 9 Apr 01 Page 1 of 6 Pages

LOCATION: Vieques Is P.R.

WEATHER CONDITIONS: 85° Clear Sunny

1. WORK SUMMARY:

a. Work Planned Continue digs on ChemRads hits

b. Work Accomplished: Dug hits on beach and roads. No OE/UXO found. Transferred data to ChemRad. Two Pers'l Departed

c. Discrepancies:

d. Inspection Results:

2. INSTRUCTIONS RECEIVED FROM CUSTOMER REPRESENTATIVE(S):

3. UXO SUMMARY

a. UXO Located:

TYPE	QUANTITY	LOCATION	DISPOSITION

b. Demolition Supplies Expended:

TYPE	QUANTITY

c. Scrap Generation/Deposition:

QUANTITY	WEIGHT	TYPE (OE/NON-OE)

4. PERSONNEL/EQUIPMENT UTILIZATION:

a. Personnel On-Site:

NUMBER	MAN-HOURS	DESCRIPTION
		Project Manager
		Site Safety/Quality Control Officer
1	12	Senior UXO Supervisor
		UXO Supervisor
1	12	UXO Specialist
		UXO Assistant
		Laborers
		Administrative Personnel
		Security Guard
		Visitors
		Sub-Contractor Personnel (List By Category)

b. Equipment Utilization:

QUANTITY	HOURS	DESCRIPTION
		Backhoe
		Front End Loader
		Magnetometers:
1	12	Schonstedt
		Other
		Radio (Hand held)
		Radio (Mobile)
		Truck (Heavy)
1	12	Truck (Light)
		Rental Cars
		GPS
		Other Equipment (List)

5. REMARKS:

6. SIGNATURE/DATE:

Project Manager [signature] Date: 9 April

DAILY OPERATIONS JOURNAL

UXO SUMMARY, CONTINUATION SHEET: Page 6 of 6 Pages

UXO Located:

TYPE	QUANTITY	LOCATION	DISPOSITION

USA Environmental, Inc.

Tailgate Safety Briefing

Date: 9 / Apr / 01 **Location:** Vieques

Time: 0630 AM PM **Team #:**

1. Reason for Briefing:

✓	Daily Safety Briefing		New Site Procedure
	Initial Safety Briefing		New Site Information
	New Task Briefing		Review of Site Information
	Periodic Safety Meeting		Other: (Specify)

2. Personnel Attending:

Name	Signature	Position
E Komac		UXO 3
EA Carabello	Elbert A Carabello	UXO 2

Briefing Given By:

Name	Signature	Position
E F Komac	E F K	UXO 3

3. Topics: (Check All That Apply)

✓	Site Safety Personnel		Decontamination Procedures
✓	Site/Work Area Description		Emergency Response/Equipment
✓	Physical Hazards		On-Site Injuries/Illnesses
	Chemical/Biological Hazards		Reporting Procedures
✓	Heat/Cold Stress		Directions to Medical Facility
	Work/Support Zones		Drug and Alcohol Policies
	PPE		Medical Monitoring
	Safe Work Practices		Evacuation/Egress Procedures
	Air Monitoring		Communications
	Task Training		Confined Spaces
	OE Precautions		Other:

4. Remarks:

DAILY OPERATIONS JOURNAL

DATE: 10 APR01 Page 1 of 6 Pages

LOCATION: VIEQUES IS P.R.

WEATHER CONDITIONS: 88° CLEAR HUMID

1. WORK SUMMARY:

a. Work Planned DIG CHEMRAD HITS TURN DATA OVER TO THEM.

b. Work Accomplished: DUG HITS. NON/UXO/OE TURNED OVER TO NAVY REP.

c. Discrepancies:

d. Inspection Results:

2. INSTRUCTIONS RECEIVED FROM CUSTOMER REPRESENTATIVE(S):

3. UXO SUMMARY

a. UXO Located:

TYPE	QUANTITY	LOCATION	DISPOSITION

b. Demolition Supplies Expended:

TYPE	QUANTITY

c. Scrap Generation/Deposition:

QUANTITY	WEIGHT	TYPE (OE/NON-OE)

4. PERSONNEL/EQUIPMENT UTILIZATION:

a. Personnel On-Site:

NUMBER	MAN-HOURS	DESCRIPTION
		Project Manager
		Site Safety/Quality Control Officer
1	11	Senior UXO Supervisor
		UXO Supervisor
1	11	UXO Specialist
		UXO Assistant
		Laborers
		Administrative Personnel
		Security Guard
		Visitors
		Sub-Contractor Personnel (List By Category)

b. Equipment Utilization: Page 5 of 6 Pages

QUANTITY	HOURS	DESCRIPTION
		Backhoe
		Front End Loader
		Magnetometers:
1	11	Schonstedt
		Other
		Radio (Hand held)
		Radio (Mobile)
		Truck (Heavy)
1	11	Truck (Light)
		Rental Cars
		GPS
		Other Equipment (List)

5. REMARKS:

6. SIGNATURE/DATE:

Project Manager Edward J Kuc Date: 10 Apr 01

DAILY OPERATIONS JOURNAL

UXO SUMMARY, CONTINUATION SHEET: Page 6 of 6 Pages

UXO Located:

TYPE	QUANTITY	LOCATION	DISPOSITION

USA Environmental, Inc.

Tailgate Safety Briefing

Date: 10 / Apr / 01 **Location:** VIEQUES

Time: 0600 AM PM **Team #:** _____

1. Reason for Briefing:

✓	Daily Safety Briefing		New Site Procedure
	Initial Safety Briefing		New Site Information
	New Task Briefing		Review of Site Information
	Periodic Safety Meeting		Other: (Specify)

2. Personnel Attending:

Name	Signature	Position
E Komac	E Komac	UXO 3
EA Caraballo	EA Caraballo	UXO 2

Briefing Given By:

Name	Signature	Position
E Komac	E Komac	UXO 3

3. Topics: (Check All That Apply)

	Site Safety Personnel		Decontamination Procedures
	Site/Work Area Description		Emergency Response/Equipment
	Physical Hazards		On-Site Injuries/Illnesses
	Chemical/Biological Hazards		Reporting Procedures
✓	Heat/Cold Stress		Directions to Medical Facility
	Work/Support Zones		Drug and Alcohol Policies
	PPE		Medical Monitoring
✓	Safe Work Practices		Evacuation/Egress Procedures
	Air Monitoring		Communications
	Task Training		Confined Spaces
	OE Precautions		Other:

4. Remarks:

DAILY OPERATIONS JOURNAL

DATE: 11 Apr 01 Page 1 of 6 Pages

LOCATION: Vieques Is P.R.

WEATHER CONDITIONS: 89° Very Humid.

1. WORK SUMMARY:

a. Work Planned Continue digs on ChemRad Survey

b. Work Accomplished: Continued digging hits found by ChemRad Took pictures of purposed clear up site in July. Data from digs turned over to ChemRad. Scrap turned over to Navy Rep

c. Discrepancies:

d. Inspection Results:

2. INSTRUCTIONS RECEIVED FROM CUSTOMER REPRESENTATIVE(S):

3. UXO SUMMARY

a. UXO Located:

TYPE	QUANTITY	LOCATION	DISPOSITION

b. Demolition Supplies Expended:

TYPE	QUANTITY

c. Scrap Generation/Deposition:

QUANTITY	WEIGHT	TYPE (OE/NON-OE)

4. PERSONNEL/EQUIPMENT UTILIZATION:

a. Personnel On-Site:

NUMBER	MAN-HOURS	DESCRIPTION
		Project Manager
		Site Safety/Quality Control Officer
1	12	Senior UXO Supervisor
		UXO Supervisor
1	12	UXO Specialist
		UXO Assistant
		Laborers
		Administrative Personnel
		Security Guard
		Visitors
		Sub-Contractor Personnel (List By Category)

b. Equipment Utilization:

QUANTITY	HOURS	DESCRIPTION
		Backhoe
		Front End Loader
		Magnetometers:
1	12	Schonstedt
		Other
		Radio (Hand held)
		Radio (Mobile)
		Truck (Heavy)
1	12	Truck (Light)
		Rental Cars
		GPS
		Other Equipment (List)

5. REMARKS:

6. SIGNATURE/DATE:

Project Manager CJ Kuen Date: 11 April

DAILY OPERATIONS JOURNAL

UXO SUMMARY; CONTINUATION SHEET:

UXO Located:

TYPE	QUANTITY	LOCATION	DISPOSITION

USA Environmental, Inc.

Tailgate Safety Briefing

Date: 11 / Apr / 01 **Location:** VIEQUES

Time: 0700 AM PM **Team #:** _____

1. Reason for Briefing:

✓	Daily Safety Briefing		New Site Procedure
	Initial Safety Briefing		New Site Information
	New Task Briefing		Review of Site Information
	Periodic Safety Meeting		Other: (Specify)

2. Personnel Attending:

Name	Signature	Position
E Komac	E K	UXO 3
EA Carabello	Elbat Alcarabello	UXO 2

Briefing Given By:

Name	Signature	Position
E Komac	E K	UXO 3

3. Topics: (Check All That Apply)

	Site Safety Personnel		Decontamination Procedures
	Site/Work Area Description		Emergency Response/Equipment
	Physical Hazards		On-Site Injuries/Illnesses
	Chemical/Biological Hazards		Reporting Procedures
✓	Heat/Cold Stress		Directions to Medical Facility
	Work/Support Zones		Drug and Alcohol Policies
	PPE		Medical Monitoring
✓	Safe Work Practices		Evacuation/Egress Procedures
	Air Monitoring		Communications
	Task Training		Confined Spaces
	OE Precautions		Other:

4. Remarks:

DAILY OPERATIONS JOURNAL

DATE: 12 Apr 01 Page 1 of 6 Pages

LOCATION: VIEQUES Is P.R.

WEATHER CONDITIONS: 89° HUMID RAIN SHOWERS

1. WORK SUMMARY:

a. Work Planned CONTINUE DIG CHEMRAD HITS

b. Work Accomplished: DUG HITS RECORDED DATA, PASSED TO CHEMRAD. SCRAP RECOVERED TURNED OVER TO NAV REP

c. Discrepancies:

d. Inspection Results:

2. INSTRUCTIONS RECEIVED FROM CUSTOMER REPRESENTATIVE(S):

3. UXO SUMMARY

a. UXO Located:

TYPE	QUANTITY	LOCATION	DISPOSITION

b. Demolition Supplies Expended:

TYPE	QUANTITY

c. Scrap Generation/Deposition:

QUANTITY	WEIGHT	TYPE (OE/NON-OE)

4. PERSONNEL/EQUIPMENT UTILIZATION:

a. Personnel On-Site:

NUMBER	MAN-HOURS	DESCRIPTION
		Project Manager
		Site Safety/Quality Control Officer
1	10	Senior UXO Supervisor
		UXO Supervisor
1	10	UXO Specialist
		UXO Assistant
		Laborers
		Administrative Personnel
		Security Guard
		Visitors
		Sub-Contractor Personnel (List By Category)

b. Equipment Utilization:

QUANTITY	HOURS	DESCRIPTION
		Backhoe
		Front End Loader
		Magnetometers:
1	10	Schonstedt
1	10	Other White
		Radio (Hand held)
		Radio (Mobile)
		Truck (Heavy)
1	10	Truck (Light)
		Rental Cars
		GPS
		Other Equipment (List)

5. REMARKS:

6. SIGNATURE/DATE:

Project Manager E B Kuz Date: 12 April

DAILY OPERATIONS JOURNAL

UXO SUMMARY, CONTINUATION SHEET: Page 6 of 6 Pages

UXO Located:

TYPE	QUANTITY	LOCATION	DISPOSITION

USA Environmental, Inc.

Tailgate Safety Briefing

Date: 12 / Apr / 01 **Location:** Vieques

Time: 0700 AM PM **Team #:** _____

1. Reason for Briefing:

✓	Daily Safety Briefing		New Site Procedure
	Initial Safety Briefing		New Site Information
	New Task Briefing		Review of Site Information
	Periodic Safety Meeting		Other: (Specify)

2. Personnel Attending:

Name	Signature	Position
E Komac	E Komac	UXO3
		UXO2

Briefing Given By:

Name	Signature	Position
E Komac	E Komac	UXO3

3. Topics: (Check All That Apply)

	Site Safety Personnel		Decontamination Procedures
	Site/Work Area Description		Emergency Response/Equipment
✓	Physical Hazards		On-Site Injuries/Illnesses
	Chemical/Biological Hazards		Reporting Procedures
✓	Heat/Cold Stress		Directions to Medical Facility
	Work/Support Zones		Drug and Alcohol Policies
	PPE		Medical Monitoring
	Safe Work Practices		Evacuation/Egress Procedures
	Air Monitoring		Communications
	Task Training		Confined Spaces
	OE Precautions		Other:

4. Remarks:

DAILY OPERATIONS JOURNAL

DATE: 13 Apr 01 Page 1 of 6 Pages

LOCATION: Vieques Is. P.R.

WEATHER CONDITIONS: Rain Showers

1. WORK SUMMARY:

a. Work Planned Continue Digging ChemRads Hits. Prepare Equip for Demob.

b. Work Accomplished: Finished digging all hits for operation. A total of 591 were investagated. Data was turned over to ChemRad. Assisted CH2M Hill in sorting and photograph ing item and disposing of the scrap. Demobed.

c. Discrepancies:

d. Inspection Results:

2. INSTRUCTIONS RECEIVED FROM CUSTOMER REPRESENTATIVE(S):

3. UXO SUMMARY

a. UXO Located:

TYPE	QUANTITY	LOCATION	DISPOSITION

b. Demolition Supplies Expended:

TYPE	QUANTITY

c. Scrap Generation/Deposition:

QUANTITY	WEIGHT	TYPE (OE/NON-OE)

4. PERSONNEL/EQUIPMENT UTILIZATION:

a. Personnel On-Site:

NUMBER	MAN-HOURS	DESCRIPTION
		Project Manager
		Site Safety/Quality Control Officer
1	8	Senior UXO Supervisor
		UXO Supervisor
1	8	UXO Specialist
		UXO Assistant
		Laborers
		Administrative Personnel
		Security Guard
		Visitors
		Sub-Contractor Personnel (List By Category)

b. Equipment Utilization:

QUANTITY	HOURS	DESCRIPTION
		Backhoe
		Front End Loader
		Magnetometers:
1	8	Schonstedt
1	8	Other WHITE
		Radio (Hand held)
		Radio (Mobile)
		Truck (Heavy)
1	8	Truck (Light)
		Rental Cars
		GPS
		Other Equipment (List)

5. REMARKS:

6. SIGNATURE/DATE:

Project Manager E B K Date: 13 Apr 01

DAILY OPERATIONS JOURNAL

UXO SUMMARY, CONTINUATION SHEET: Page 6 of 6 Pages

UXO Located:

TYPE	QUANTITY	LOCATION	DISPOSITION

USA Environmental, Inc.

Tailgate Safety Briefing

Date: 13 /APR /01 **Location:** VIEQUES

Time: 0600 AM PM **Team #:** _____

1. Reason for Briefing:

✓	Daily Safety Briefing		New Site Procedure
	Initial Safety Briefing		New Site Information
	New Task Briefing		Review of Site Information
	Periodic Safety Meeting		Other: (Specify)

2. Personnel Attending:

Name	Signature	Position
E Komac	E Komac	UXO3
EA CARABALLO	[signature]	UXO2

Briefing Given By:

Name	Signature	Position
E Komac	E Komac	UXO3

3. Topics: (Check All That Apply)

	Site Safety Personnel		Decontamination Procedures
	Site/Work Area Description		Emergency Response/Equipment
✓	Physical Hazards		On-Site Injuries/Illnesses
	Chemical/Biological Hazards		Reporting Procedures
✓	Heat/Cold Stress		Directions to Medical Facility
	Work/Support Zones		Drug and Alcohol Policies
	PPE		Medical Monitoring
	Safe Work Practices		Evacuation/Egress Procedures
	Air Monitoring		Communications
	Task Training		Confined Spaces
	OE Precautions		Other:

4. Remarks: