Panattoni Development Company, ***LLC***

South Milliken Avenue Specific Plan

APPENDICES

A	**Legal Description**
B	**Phase I Environmental Site Assessment Report, May 2002, Phase One, Inc.**
C	**Phase II Subsurface Investigation, May 2000, K-Plus Environmental, Inc.**
D	**Phase I Environmental Site Assessment Report, August 1999, K-Plus Environmental, Inc.**
E	**2002 Biological Survey for the Delhi Sands giant flower-loving fly, September 2002, Agresearch, Inc.**
F	**2001 Biological Survey for the Delhi Sands giant flower-loving fly, September 2001, Agresearch, Inc.**
G	**2000 Biological Survey for the Delhi Sands giant flower-loving fly, September 2000, Agresearch, Inc.**

September 2003

APPENDIX A
Legal Description

Appendix A

LEGAL DESCRIPTION

All that portion of the southeast 1/4 of section 36, township 1 south, range 7 west, San Bernardino base and meridian, in the county of San Bernardino, sate of California, according to the official map of said land approved by the united states surveyor general's office, San Francisco, California, on April 16, 1837, described as follows:

Beginning at the northeast corner of said southeast 1/4; thence southerly along the easterly line of said section 36, 421.08 feet; thence westerly 1,113.10 feet; thence northerly 421.08 feet; thence easterly along the northerly line of said southeast 1/4, 1,113.10 feet to the point of beginning.

Excepting therefrom the east 30 feet, as conveyed to the county of San Bernardino, a body corporate and politic, by deed recorded November 28, 1952 in book 3063, page 13, official records.

Assessor's Parcel No. 0211-321-14-0-000

APPENDIX B

Phase I Environmental Site Assessment Report
May 2002, Phase One, Inc.

F-8.1

PHASE I ENVIRONMENTAL SITE ASSESSMENT

FOR

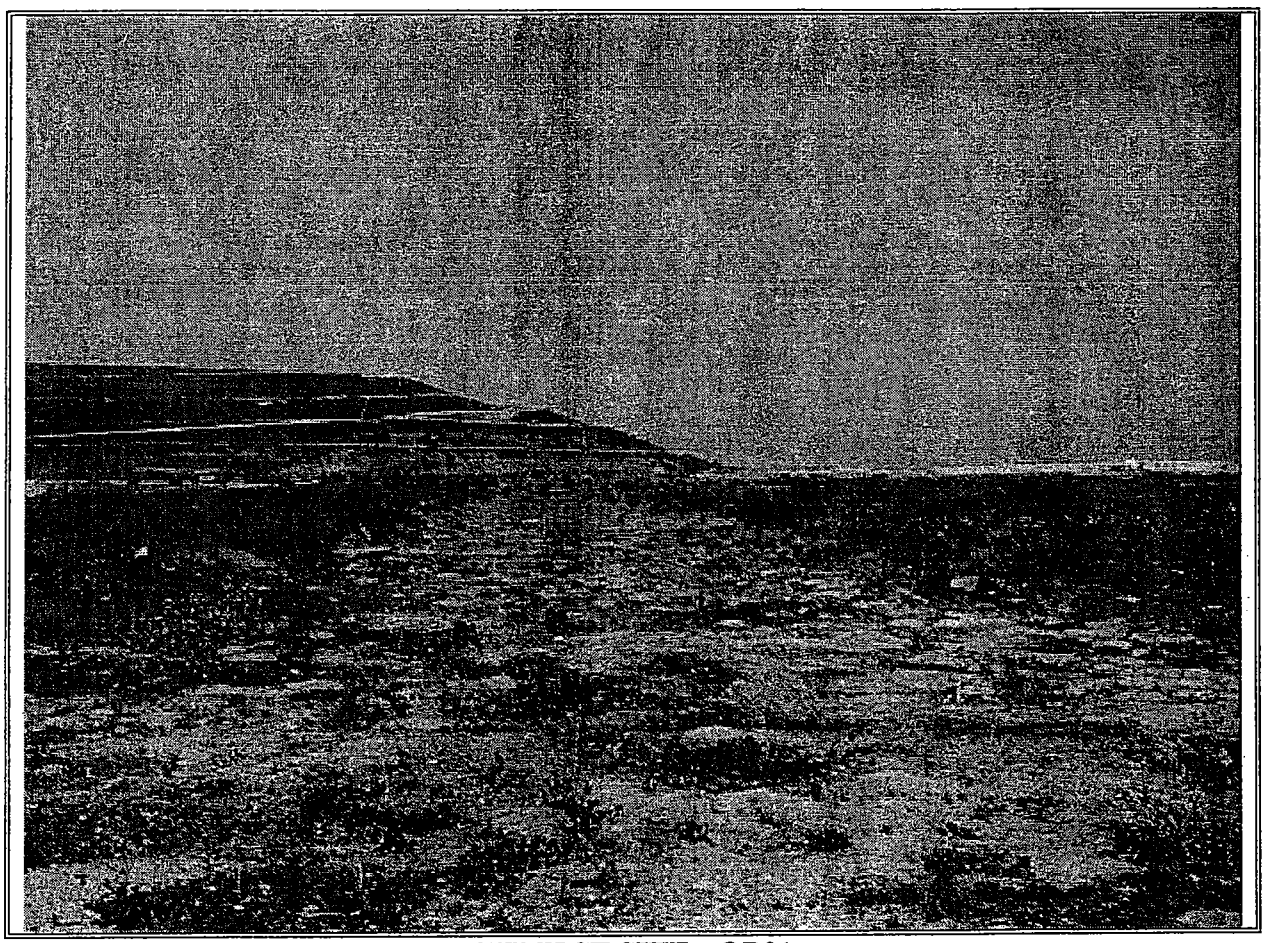
Panattoni

~~PANATONNI~~ **DEVELOPMENT COMPANY**

APN # 211-321-14

ONTARIO, CALIFORNIA

DATED: ***MAY 2002***



SUBJECT SITE - OP01

May 21, 2002

Taylor Gerry
Panattoni Development Company
19600 Fairchild
Suite 285
Irvine, CA 92612

RE: Phase I Environmental Site Assessment Report
Subject Site Location: APN # 211-321-14, Ontario, California
PHASE ONE INC. Project No. 4917

Dear Mr. Gerry:

Enclosed with this letter are copies of the Phase I Environmental Site Assessment Report completed by ***PHASE ONE*** INC. for the site referenced above. As you will note in the report, our conclusions regarding the environmental condition of the site are summarized both in Section 1.0, ***Executive Summary***, and Section 7.0, ***Conclusions and Recommendations***.

Please don't hesitate to contact us should you have any questions regarding the environmental assessment, or if we can be of additional assistance. We look forward to working with you again in the future.

Sincerely,

Diane Scioli-Ota
Operations Manager

Enclosure

PHASE I ENVIRONMENTAL SITE ASSESSMENT REPORT

MILLIKEN AVENUE PROPERTY
APN # 211-321-14
ONTARIO, CALIFORNIA

PROJECT NO. 4917

BY

***PHASE ONE* INC.**

THIS REPORT WAS PREPARED FOR THE SOLE USE AND BENEFIT OF OUR CLIENT, PANATTONI DEVELOPMENT COMPANY, AND IS BASED, IN PART, UPON DOCUMENTS, WRITINGS, AND INFORMATION OWNED AND POSSESSED BY OUR CLIENT. NEITHER THIS REPORT, NOR ANY OF THE INFORMATION CONTAINED HEREIN, SHALL BE USED OR RELIED UPON FOR ANY PURPOSE BY ANY PERSON OR ENTITY OTHER THAN OUR CLIENT. ALL STANDARD TERMS, CONDITIONS, AND LIMITATIONS BY ***PHASE ONE* INC.** APPLY AT ALL TIMES AND FOR THIS REPORT AND ALL REPORTS ISSUED BY ***PHASE ONE* INC.**

TABLE OF CONTENTS

LIST OF TABLES

SECTION 1.0

EXECUTIVE SUMMARY: FINDINGS AND CONCLUSIONS

1.1 FINDINGS

This report presents the results of the Phase I Environmental Site Assessment conducted by ***PHASE ONE*** INC. at the property identified by assessor's parcel number 211-321-14, Ontario, California (see Figure 1, ***Site Location Map***). The Phase I assessment was undertaken at the request of Taylor Gerry, Panatonni Development Company, in accordance with ***PHASE ONE*** INC.'s ***Standard Terms and Conditions***, as outlined in ***PHASE ONE*** INC.'s ***Letter of Intent/Authorization*** for Project Nº 4917. The findings and conclusions of this investigation are based upon a review of historic site-use activities, contact with and records from governmental regulatory agencies, regulatory database searches, as well as a site reconnaissance and interviews with the client, site personnel, and possibly others who may have knowledge of various aspects of the subject site.

At the time of this assessment, the site consisted of a vacant lot covered by vegetation including grape vines, enclosed by a chain-linked fence on three sides. The lot is approximately ten acres in size. Information gathered in the course of this assessment indicates that Cardinal Development Company currently owns the subject site.

The principal findings of ***PHASE ONE*** INC.'s Phase I Environmental Site Assessment for this site are as follows:

The subject site is currently affected by

- No major environmental concerns;
- No medium environmental concerns;
- No minor environmental concern; and
- No potential or possible environmental condition.
- The potential for soil or groundwater contamination of the subject property from either on- or off-site sources appears to be low.
- Given the findings and conclusions of ***PHASE ONE*** INC.'s Phase I Environmental Site Assessment, further investigation is not recommended at this time.
- ***PHASE ONE*** INC. has performed this Phase I Environmental Site Assessment of the subject site in conformance with the scope and limitations of ASTM Practice E 1527 of

the above-listed property. Any exceptions to, or deletions from, this practice are described in Section 1.4 of this report.

- This assessment has revealed no evidence of recognized environmental conditions in connection with the property.

1.2 CONCLUSIONS SUMMARY

Based on the findings of this Phase I Environmental Site Assessment, ***PHASE ONE*** INC. has identified no major, no medium, and no minor environmental concern currently associated with the subject site.

ITEMS OF ENVIRONMENTAL CONCERN
(MAJOR, MEDIUM, OR MINOR)

Concern #	Location Description	Description of Environmental Concern	Level of Env. Concern
N/A	N/A	No major, medium, or minor environmental concerns appear to currently affect the subject site.	N/A

Note: ***PHASE ONE*** INC. classifies an environmental concern as a major, medium, or minor concern when it is one that involves a recognized environmental condition for which, in the opinion of ***PHASE ONE*** INC., further investigation, action and/or remediation is recommended. The distinction among major, medium, and minor concerns is based solely on the relative estimated dollar-costs of completing any next-step recommended action.

Based on the findings of this Phase I Environmental Site Assessment, ***PHASE ONE*** INC. has identified no potential or possible environmental conditions currently associated with the subject site.

POTENTIAL OR POSSIBLE ENVIRONMENTAL CONDITIONS

Potential Condition #	Location Description	Description of Potential or Possible Environmental Condition
N/A	N/A	The subject site does not appear to be at risk from potential or possible environmental conditions.

Note: ***PHASE ONE*** INC. classifies an environmental condition as a potential or possible **condition**, as distinct from a major, medium, or minor **concern**, when it involves issues that appear to pose no immediate threat to the subject site given the current knowledge of site conditions or it is the current commercial or customary practice to do so. This **condition** with time, groundwater movement, demolition or other disturbances, or sometimes with the acquisition of further information, may come to pose a long-term, immediate or chronic environmental risk; and/or this condition may appear to have a negligible monetary/physical impact on the subject property, and therefore, does not require additional investigation at this time.

1.3 SITE FACTS

This report presents the results of the Phase I Environmental Site Assessment conducted by ***PHASE ONE*** INC. at the property identified by assessor's parcel number 211-321-14, Ontario, California (see Figure 1, ***Site Location Map)***. The Phase I Environmental Site Assessment was conducted at the

request of Panatonni Development Company in accordance with ***PHASE ONE*** INC.'s ***Standard Terms and Conditions***, as outlined in ***PHASE ONE*** INC.'s ***Letter of Intent/Authorization*** for Project Nº 4917.

Current Owner(s): Cardinal Development Company

Field Assessor: Michael Shields

Report Writer: Paolo Dizon

Parcel #: 211-321-14

Address(es) Provided by Client: APN # 211-321-14

Additional/Previous Address(es): None found

Total Acreage of Land: ~10

Date of Site Reconnaissance: May 2, 2002

Total # of Wells (water, oil, gas, other) observed on site: 2

Areas/Units that were inaccessible to the ***PHASE ONE*** INC. field assessor: None

The subject site will obtain its potable water from municipal sources.

The subject site will dispose of its sewage through use of the municipal sewage system.

Did the field assessor notice any unusual odors on or from the subject site or adjoining sites during the site reconnaissance? No

1.4 EXCEPTIONS AND/OR DELETIONS TO ASTM E 1527

There are exceptions to ASTM E 1527. No knowledgeable person(s) were available for an interview; required questions were not answered. In addition, historical information back to the property's obvious first developed use or 1940 (whichever is earlier) was not reasonably ascertainable.

SECTION 2.0

INTRODUCTION: PURPOSE AND SCOPE OF WORK

2.1 PURPOSE OF A PHASE I

The purpose of this Phase I Environmental Site Assessment is to assess (1) the likelihood of contamination of the subject site as a result of either past or present land-use practices; and (2) the potential for future environmental contamination which may occur as a result of current conditions or operations and maintenance activities at either the subject site or properties adjoining the subject site, thereby identifying real or potential environmental or economic impact to the subject site. In this way, the client may satisfy a requirement to qualify for the innocent landowner defense to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) liability by completing "all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial and customary practice." To meet these objectives, ***PHASE ONE*** INC. attempted to complete the tasks outlined in this section except as noted in Section 1.4.

2.2 SCOPE OF WORK

The Scope of Work followed by this assessment is designed to meet or exceed the standard practice set forth in the American Society for Testing and Materials (ASTM) Designation: E1527-00, "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process."

2.2.1 Site Description

Site photographs were taken during the site reconnaissance on May 2, 2002. Photographs of the subject site are provided and labeled in Appendix A. Descriptions of the photographs are included in Section 3.0.

PHASE ONE INC. reviewed pertinent, reasonably ascertainable information on the soil types and groundwater conditions in the vicinity of the subject site. For the purposes of this assessment, the depth from the ground surface and the direction (or gradient) of the groundwater flow are of particular significance. Such findings are used by ***PHASE ONE*** INC. report writers, in conjunction with additional information about environmental conditions on nearby sites, to assess the risk that is faced by the subject site from off-site sources of contamination.

It should be noted that ***PHASE ONE*** INC.'s geological and hydrological research does not include investigation of seismological concerns (i.e., fault lines) that may affect the area of the subject site. Although the existence of faults in an area may be of concern to property owners and residents in that area, it is not considered to be an environmental concern, and so is not usually a component of a Phase I Environmental Site Assessment. (However, in the event that it is required, ***PHASE ONE*** INC. can assist the client in completing a seismological investigation.)

2.2.2 Review of Existing (Historical) Information

For this assessment, ***PHASE ONE*** INC. may have reviewed reasonably ascertainable historical aerial photographs and United States Geologic Survey (U.S.G.S.) topographic maps of the subject site and vicinity. This review consisted of examining the reasonably ascertainable available photographs and topographic maps for evidence of activities on or development of the subject site and adjoining sites that may show an environmental condition or concern which may currently affect the subject site. The specific aerial photographs and U.S.G.S. maps that were reviewed for this assessment are identified and their environmentally relevant features are described in Section 4.1.

PHASE ONE INC. may have also reviewed any reasonably ascertainable Historic Maps of the subject site and vicinity. Such maps have been prepared by fire insurance companies in order to determine the potential risk of fire damage to buildings in metropolitan areas. These maps have been produced since the mid-1850s, and for some areas, they are still produced today. For the purposes of a Phase I Environmental Site Assessment, these maps may contain helpful information on the ages and past uses of buildings, as well as information about on the storage of hazardous and flammable substances. However, because it was only worthwhile for fire insurance companies to map metropolitan areas, the scope of coverage of these maps is somewhat limited. If Historic Maps have provided coverage of the subject site, and if the specific maps were reasonably ascertainable, then the specific maps that were reviewed for this assessment are identified, and their environmentally relevant features described, in Section 4.2.

One of the least known yet most complete and comprehensive historical sources is historical city or street directories. These texts may have been reviewed by ***PHASE ONE*** INC. to the extent that they have provided coverage of the subject site and were reasonably ascertainable. ***PHASE ONE*** INC. reviews historical city or street directories (also known as criss cross or reverse indexed directories) for information on the past occupants of and activities on the subject site and adjoining sites. These directories were prepared by companies that catered to the needs of salespeople by providing the names of the occupants at a given address (that is, unlike a traditional telephone book, the entries of a reverse directory are arranged by address, not by name). However, like Historical Maps, the scope of coverage of these directories is limited to mostly metropolitan areas. If they were reasonably ascertainable, they were reviewed and Section 4.3 contains listings of the current or past occupants of the subject site that were found by researching historical city or street directories.

PHASE ONE INC. has contacted various state, county, and municipal agencies having current or past jurisdiction over the subject site, in an attempt to review reasonably ascertainable records that contain specific information about environmental conditions on the subject site that these agencies may have on file, or to establish that no environmentally relevant records are on file for the subject site. The client should be aware that most regulatory agencies file their records by address or corporate name (as opposed to parcel number or site name). If no specific address has been assigned to a site, then, typically, no environmental records related to the site will be forthcoming from the state, county, or municipal regulatory agencies.

The findings of this records search are reported in Section 4.4, ***Agency Contacts***. The addresses, phone numbers, names of the persons contacted within the various agencies are listed on the Regulatory Contacts Sheet, which is included in Appendix B. Copies of any records obtained from regulatory

agencies can be found in Appendix C. In some instances, ***PHASE ONE*** INC. may not yet have received a reply from one or more of the agencies that were contacted. (Some agencies will take six weeks or longer to reply to a verbal or written request.) In the event of such delays in response, rather than delaying the issuance of the report, ***PHASE ONE*** INC. has indicated in the report that a response to the request for records is pending, and a copy of the regulatory request form has been included in Appendix B. Any pertinent information that is subsequently received from the pending agency will be addressed and forwarded to the client in the form of an addendum to this report.

PHASE ONE INC. has also reviewed a vendor-supplied, computer-generated federal, state, and regional one-mile regulatory database search in an effort to determine whether the subject site is listed on an agency environmental database and to identify possible regulatory-listed sites of concern within a one-mile radius of the subject site. In general, these documents list known or suspected hazardous-waste generators, release sites, landfills, unauthorized disposal sites, sites with registered underground storage tanks, and sites currently under investigation for known or suspected environmental violations or releases. In conjunction with the findings on the geological and hydrological conditions, information obtained from the database search can be used to assess the environmental risk faced by the subject site from past or present off-site sources of contamination. Additionally, the database search may provide information about on-site sources of contamination. The regulatory database review can be found in Section 4.5; a copy of the complete database search document and a detailed description of the databases that were searched are included in Appendix D.

When requested, ***PHASE ONE*** INC. will compile and review a chain-of-title abstract for the subject property. The chain-of-title abstract can help the client and ***PHASE ONE*** INC. to better understand the history of the use of the subject site. The chain-of-title abstract is typically compiled from documents obtained from the County Recorder's Office or Tax Assessor's Office. The chain-of-title abstract review, if completed for this report, can be found in Section 4.6. The County Assessor also may be contacted to determine whether the subject site has been assigned addresses in the past, which are different from its current address. It is the client's responsibility to supply ***PHASE ONE*** INC. with any records of environmental liens or other such documents.

On occasion, the client, the client's representatives, or on-site personnel will make available environmental documents pertaining to the subject site. These documents may be prior Phase I Reports, environmental site remediation reports, foundation soil reports, or occupancy records, among others. If these are made available prior to the issuance of the report, ***PHASE ONE*** INC. will review the conclusions of these documents, which may help to confirm or disprove any tentative findings that ***PHASE ONE*** INC. has developed independently. If the client has supplied environmental documents for review as part of this assessment, the findings are included in Section 4.7.

After the above information from existing historical records has been gathered, evaluated, and presented in separate subsections of the report, ***PHASE ONE*** INC. takes the separate findings and recompiles them into a single table, according to the chronology of the historical records. The reiteration of the historical material in this manner (called a ***Chronological Historic Summary***) can help the client, as well as the field assessors and reviewers, gain a clearer perspective of the history of the subject site. The ***Chronological Historic Summary*** is presented in Section 4.8.

2.2.3 Site Reconnaissance

A ***PHASE ONE*** INC. field assessor conducted a visual reconnaissance of the subject property on May 2, 2002, to identify observable signs of environmental impairments, including on-site operations and maintenance activities, which may lead to possible environmental impairment. As a part of the site reconnaissance, ***PHASE ONE*** INC. visually inspected the site for obvious indications of:

- Existing and previously existing storage tanks (aboveground and underground)
- Hazardous substances storage and handling
- Clarifiers, sumps, trenches, and industrial discharge sources
- Equipment which may contain polychlorinated biphenyls (PCBs) (fluorescent light ballasts are not inspected)
- Indications of spillage of hazardous substances, and the general condition of concrete, asphalt, soil, and other surfaces
- Indications of stressed vegetation as a result of on-site contamination

During the site reconnaissance, ***PHASE ONE*** INC. field assessors commonly make note of basic compliance issues that, may be environmental in nature, however, are not issues directly associated with the potential for site contamination (i.e., the specific objective of our assessment). However, as a service to our clients, and because these compliance issues may contribute to our overall understanding of site operations, ***PHASE ONE*** INC. completes a limited review of the site's basic compliance status. The review of the site's compliance status is not intended to be complete or comprehensive and may or may not include all items identified during the site reconnaissance.

Again, the compliance review is not intended as a comprehensive compliance audit. Rather, the compliance review is only intended to aid ***PHASE ONE*** INC. in determining the likelihood that the subject site may have been impacted by releases of hazardous substances.

When the storage or use of hazardous substances are encountered on a site, the ***PHASE ONE*** INC. field assessor will look for or inquire about the on-site presence of Material Safety Data Sheets (MSDS). The manufacturers of hazardous substances prepare MSDS (pursuant to OSHA's Hazard Communication Standard), and they detail the components, dangers, and proper handling procedures for the hazardous substance for which they have been prepared. The presence or absence of MSDS for on-site hazardous substances will be noted in 5.3, ***Hazardous Substances Storage and Handling***. However, some sites may use or store hundreds of various chemical compounds. In such cases, it is practically impossible for the field assessor to match-up each substance with its corresponding MSDS. Still, the field assessor will inquire about MSDS and copies of representative MSDS that were made available will be included in Appendix G.

PHASE ONE INC. inspected and reviewed information for the subject site regarding the presence of specific hazardous substances, which are relatively common sources of environmental concern. The substances in question include:

- Radon (at elevated levels)
- Agricultural chemicals (from past or present agricultural activities)
- Heavy metals and formaldehyde

PHASE ONE INC. also inspected the properties that adjoin the subject site. In general, this inspection included a "drive-by" survey to note the operations that may pose an imminent or potential environmental threat to the subject site.

2.2.4 Interviews

PHASE ONE INC. attempts to interview various individuals who may have knowledge of various aspects of the subject site. Typically, the interviewees might include:

- Current and previous owners
- Site and operations managers
- Tenants
- Local regulatory personnel

The interviews are summarized in Section 6.0 and interview notes are included in Appendix F.

2.2.5 Conclusions and Recommendations

Section 7.0, ***Conclusions and Recommendations***, provides detailed descriptions of the environmental concerns or possible or potential environmental conditions that, in the professional opinion of ***PHASE ONE*** INC., currently affect the subject site. Section 7.0 also recommends or suggests the next-step actions that may be required to begin addressing the concerns or conditions.

The essential information on a concern or condition at a given location is contained in the "Description of Concern" and the "Action Suggested" boxes of the table for that location. The identification, section, and page numbers refer to those sections in the report that describe the research tasks and findings behind the conclusions. This reporting method allows the reader to quickly go to those sections that are pertinent to the concern.

2.3 INTERPRETATION OF THE REPORT

Following the completion of the tasks outlined above, ***PHASE ONE*** INC. prepared this report to present our findings and conclusions clearly and consistently. In an attempt to aid the reader and bring organization to pieces of seemingly unrelated information, ***PHASE ONE*** INC. has developed a report format that is both innovative and concise. Each piece of information is described in the context of the research or assessment task under which it was found, and each is assigned an identification number. Typically, an environmental concern will incorporate a number of specific findings. So, in Section 7.0, ***Conclusions and Recommendations***, the various particular findings are grouped together and

collectively presented with the description of the environmental concern that is corroborated by those findings.

SECTION 3.0

SITE DESCRIPTION

The subject site is located within an area of predominantly industrial properties. On the date of the site reconnaissance, May 2, 2002, the subject site consisted of a vacant lot covered by vegetation including grape vines, enclosed by a chain-linked fence on three sides. The following subsections describe the physical characteristics of the subject site.

3.1 SITE PHOTOGRAPH DESCRIPTIONS

On May 2, 2002, a ***PHASE ONE*** INC. field assessor completed a reconnaissance of the subject site, at which time a number of photographs were taken to document the current condition and use of the site. Although the specific findings of the site reconnaissance are discussed in Section 5.0, ***Site Reconnaissance***, the photographs are described in the following table, and photographed areas or items of concern are noted. The photographs themselves are mounted and labeled with identification numbers in Appendix A except for photograph OP01, the cover photograph. Also, the viewpoints of the photographs are indicated on Figure 2, ***Plot Plan***.

SITE PHOTOGRAPH DESCRIPTIONS (OUTDOORS)

ID #	Description (If a concern, why?)	Level of Concern
OP01	**COVER PHOTO:** A west-facing view of the subject site, a vacant lot with assessor's parcel number 211-321-14, in Ontario, California. The subject site consists of approximately ten acres of land. This photograph was taken from Milliken Avenue. In view is vacant property covered by native vegetation and rows of grape vines. Dirt and paper trash were observed throughout the site. The west adjacent property, Milliken Landfill, is visible in the background. A large manufacturing plant is visible to the right of the field of view. The ***PHASE ONE*** INC. assessor was not accompanied on the site walk.	None
OP02	A west-facing view of the Milliken Avenue right-of-way, which is immediately east of the subject site. In view is a green utility box. A yellow 'Edison Pipeline & Terminal Company, Petroleum Pipeline' post is out-of-view but is located within the same right-of-way, approximately nine feet east of the subject property's eastern boundary. Given the distance between the pipeline and the subject site, and the depth to groundwater in the vicinity of the subject site, this does not appear to represent a concern. A 'Warning: Fiber Optic Cable' sign is also located in this right-of-way.	None
OP03	A west-facing view of the Milliken right-of-way, located east of the subject site. In view is the area below one of two steel plates on a 14' x 5' concrete pad. A ladder extends 20 feet below ground. Three unlabeled horizontal pipes are in the concrete enclosure. Apparently moist dirt lines the bottom of the enclosure. No staining was observed. These pipes may be related to the petroleum pipeline discussed in OP02.	None

ID #	Description (If a concern, why?)	Level of Concern
OP04	A north-facing view of the previously described concrete pad. Three circular, 6" in diameter pipes extending aboveground are to the left and right of the pad. The pipes are labeled 'DHS Water'. A three-foot tall orange post is further to the left. The post is labeled 'Fiber Optic Cables In Vicinity'. A circular concrete structure with a locked steel top extending 1.5 feet aboveground is located ten feet to the north of the pad. A circular steel pipe is visible in the foreground. A piece of the pipe has been cut off, and is lying in front of the piece extending aboveground. A circular pipe with a steel top labeled 'Water' is to the left of the pipe in the foreground. A steel cover surrounded by a concrete pad is to the right of the pipes and pad. This cover, which is along Milliken Avenue, could not be opened. Milliken Avenue is to the right and in the background. The vacant and undeveloped north adjacent property is also visible in the background. These features all appear to be utility/pipeline related, and as discussed in OP02 and OP03, are located off-site in the Milliken Avenue right-of-way.	None
OP05	A south-facing view along the northern site boundary. In view is vacant, undeveloped land covered by vegetation. The south adjacent Milliken landfill is visible in the background. A parking lot with storage sheds and cars is at the entrance to the landfill. Power and telephone lines traverse the parking lot. Grape vines are also visible. No staining was observed.	None
OP06	A west-facing view of the subject site. In view is a 20' x 20' portion of the dirt-covered ground. Tire tracks were observed here. No natural vegetation or staining was observed. A similar surface condition was observed near the area where OP05 was taken. A previous Phase II Subsurface Investigation, summarized in Section 4.7, indicated that soil piles observed on the property were tested and found to be clean.	None
OP07	A south-facing view of the subject site taken from the northwest corner of the site. In view is a soil pile where a previous Phase II Subsurface Investigation, summarized in Section 4.7, revealed that no contaminants of concern were noted. The landfill with a parking lot, telephone wires, equipment, and cars is visible in the background.	None
OP08	An east-facing view of an apparent well extending three feet aboveground. The well cover is locked. This apparent well requires abandonment in accordance with regulatory agency guidelines.	None
OP09	A west-facing view of another apparent well extending three feet aboveground. Gravel and native vegetation surround the well. Again, this apparent well requires abandonment in accordance with regulatory agency guidelines.	None
OP10	A northwest-facing view along the southern site boundary. In view is vacant, undeveloped land covered by vegetation. A large manufacturing plant, which is beyond the north adjacent property (vacant, undeveloped land), is visible in the background. Grape vines are also visible.	None

3.2 GEOLOGIC AND HYDROLOGIC CONDITIONS

The native soil type in the vicinity of the subject site is Delhi fine sand. It appears that fill materials may have been dumped on site. However, a previous Phase II Subsurface Investigation, summarized in Section 4.7, revealed that no contaminants of concern were noted; therefore, this material is not a concern for the subject site. The elevation of the subject site appears to be 870 feet above mean sea level.

Groundwater in the site vicinity is inferred from Ontario Public Services Agency, Public Works Department to flow towards the south-southwest at a depth of approximately 278 feet below ground surface. (Based on this information, a groundwater flow-direction arrow is marked on Figure 2, ***Plot Plan***.) However, it should be noted that the flow direction and depth of groundwater might be

influenced by rainfall, and local groundwater pumping operations. It should also be noted that shallower, unreported, perched groundwater zones might occur in the immediate site vicinity.

During the site reconnaissance and the review of historical maps and photographs, no waterways, no wetlands, no pits, no lagoons, and no ponds were seen to currently or previously exist on the subject site or on properties adjoining the subject site. According to FEMA Q3 Flood Data, the site is located within Zone X and Zone X-500, areas of minimal flooding and areas between the limits of the 100-year flood and 500-year flood. Storm water discharge across the site appeared to flow towards the south. There appeared to be no facility for handling storm water discharge. The direction and destination of storm water discharge do not appear to be a source of environmental concern to the subject site.

SECTION 4.0

REVIEW OF EXISTING (HISTORICAL) INFORMATION

4.1 HISTORICAL AERIAL PHOTOGRAPHS AND U.S.G.S. TOPOGRAPHIC MAP REVIEW

On May 2, 2002, ***PHASE ONE*** INC. contacted the Ontario Planning Department in an effort to review readily available historical aerial photographs of the area of the subject site. In addition, ***PHASE ONE*** INC. contacted the Riverside County Flood Control office in order to obtain other aerial photographs of this area. ***PHASE ONE*** INC. also reviewed the United States Geologic Survey (U.S.G.S.) topographic maps obtained from ***PHASE ONE*** INC.'s in-house library.* The following table contains descriptions of the reasonably ascertainable aerial photographs and topographic maps that were reviewed. Any environmentally relevant features or items of environmental concern that were observed in these aerial photographs and topographic maps are noted. (A copy of a U.S.G.S. map, if available, has been included in Figure 1.)

HISTORICAL AERIAL PHOTOGRAPHS AND U.S.G.S. TOPOGRAPHIC MAP REVIEW

ID #	Collection Reference #	Date of Document	Description (If a concern, why?)	Level of Concern
HP01	Aerial Photo 1430	1948	[Scale: 1" - 11,000'] The subject site and all adjacent properties appear to be used for agricultural purposes.	None
HP02	*Aerial Photo USDA Soil Conservation Service Sheet 6	1975	The subject site and adjacent sites appear to be used for agricultural purposes. To the south, the landfill is evident.	None
HP03	*USGS Topo Map Guasti Quad 7.5 min. series	1981	No structures, tanks, or wells are evident on the subject site or on any adjacent properties. The landfill to the south is depicted as an area of disturbed soil. The area is occupied by agricultural use. The subject site is situated at 870 feet above mean sea level and the topography slopes towards a southerly direction.	None
HP04	Aerial Photo 1780	1984	The subject site and all adjacent properties appear to be in their present-day configuration. However, the large manufacturing plant does not appear to be evident beyond the north adjacent property.	None
HP05	Aerial Photo 1-1	1990	[Scale: 1" – 1,600'] The subject site and all adjacent properties appear to be in their present-day configuration. Route 60 appears to be located to the south of the subject site. Route 15 appears to be located to the east of the subject site.	None
HP06	Aerial Photo 1-1	1995	[Scale: 1" – 19,200'] There are no significant changes from the 1990 aerial photograph description.	None
HP07	Aerial Photo EH	2000	{Scale: 1" – 500'] The subject site and all adjacent properties appear to be in their present-day configuration.	None

Please note: Each aerial photograph was reviewed for subject property and, where applicable, adjacent property use. In addition, each photograph was reviewed to identify the presence of areas of dumping, staining or aboveground storage tanks. Unless noted, such features were not identified from the review.

4.2 HISTORICAL MAP REVIEW

On May 1, 2002, ***PHASE ONE*** INC. contacted the reference librarian at the Los Angeles Public Library in an effort to review readily available historical maps with coverage of the subject site and vicinity that might be included in their collections. However, a search of the reasonably ascertainable historical maps found that none provide coverage of the area of the subject site.

4.3 HISTORICAL CITY OR STREET DIRECTORY REVIEW

PHASE ONE INC. was not able to review historical city or street directories for the subject site, because there is no assigned address.

4.4 AGENCY CONTACTS (RECORDS SEARCH)

4.4.1 Building Permits and Finish Schedule

No structures are known to have existed on the subject site; therefore, no building permits or plans pertaining to the subject property were available for review.

4.4.2 Fire Department Records: Ontario City Hall, Fire Prevention Department

On May 1, 2002, ***PHASE ONE*** INC. contacted Joyce Becker at the Ontario City Hall, Fire Prevention Department for the purpose of reviewing readily available records this agency has on file for the subject site pertaining to hazardous substances storage, underground storage tanks, and related environmental issues. However, ***PHASE ONE*** INC. was informed that all underground storage tank and hazardous materials records have been transferred to San Bernardino County Fire, Hazardous Materials Division.

4.4.3 Environmental Agency Records San Bernardino County Fire, Hazardous Materials Division

On May 1, 2002, ***PHASE ONE*** INC. contacted Elizabeth Parmenter at the San Bernardino County Fire, Hazardous Materials Division for the purpose of reviewing readily available environmental records that may be on file with this agency for the subject site. To date, this agency has not responded to this request, and, consequently, the review of these records (if there are any) is pending. Information subsequently received by ***PHASE ONE*** INC. will be forwarded to the client in the form of an addendum to this report. (A copy of the regulatory request is included in Appendix B.)

4.4.3 Sanitation Agency Records: Ontario Public Services Agency, Industrial Waste Permitting Department

On May 1, 2002, ***PHASE ONE*** INC. contacted Cari Dale at the Ontario Public Services Agency, Industrial Waste Permitting Department for the purpose of reviewing readily available records pertaining to industrial wastewater discharge permits, NPDES permits, and related documents on file with this agency for past and present businesses at the subject site. However, ***PHASE ONE*** INC. was informed that this agency cannot retrieve records without a street address and/or business name;

therefore, no records could be obtained from this agency.

4.4.4 Water Quality Agency Records: California Regional Water Quality Control Board, Region 8, SLIC & LUST Departments

On May 1, 2002, ***PHASE ONE*** INC. viewed the online geotracker database of the California Regional Water Quality Control Board, Region 8, SLIC & LUST Departments for the purpose of determining if past and present businesses at or close to the subject site are listed on regulatory lists (such as leaking underground tank lists, site cleanup lists, etc.). The following table summarizes the results of our review. (Copies of the reviewed records, if available, are included in Appendix C.)

SUMMARY OF WATER QUALITY AGENCY RECORDS

ID #	Description	Level of Concern
WQ01	Amer Metal Recycling Inc., located at 2202 S. Milliken Ave., is listed as the location of an underground storage tank; no leak incidents are reported for this property.	None
WQ02	Pick-A-Part Auto Dismantling, located at 2025 S. Milliken Ave., is listed as the location of an underground storage tank; no leak incidents are reported for this property.	None
WQ03	Nordstrom's District Center, located at 1600 S. Milliken Avenue, is listed as an underground storage tank site; no leak incidents are reported for this property.	None
WQ04	SCE Mira Loma Substation, located at 13568 Milliken Avenue, is the reported location of a leaking underground fuel tank. The leak was discovered and stopped on 10/20/99. Only the soil was impacted. Given that the depth to groundwater in the general vicinity is 278 feet, the likelihood of impact to groundwater from this listed site is low.	None

4.4.5 Oil and Gas Agency Records or Maps: State of California, Department of Conservation, Division of Oil & Gas (CDOG)

PHASE ONE INC. reviewed readily available oil and gas maps of the subject site and vicinity published by the State of California, Department of Conservation, Division of Oil & Gas (CDOG). These maps were obtained from ***PHASE ONE*** INC.'s in-house library. The following table summarizes the results of this review.

SUMMARY OF OIL AND GAS AGENCY RECORDS OR MAPS

ID #	Date of Document	Description	Level of Concern
OG01	01/04/92	Based on a review of CDOG Map W1-4, it appears that no oil or gas wells are depicted on or in the vicinity of the subject site.	None

4.4.6 Other Regulatory Records Searched or Requested

On May 7, 2002, ***PHASE ONE*** INC. contacted the California State Fire Marshall, Pipeline Division for the purpose of reviewing readily available environmental records that this agency may have on file for the pipeline adjacent to the subject site. The agency replied with a facsimile stating that three pipelines ranging from 8 to 12 inches in diameter are located in the Milliken Avenue right-of-way. Southern

California Edison, Edison Pipeline and Terminal Company (SCE-EPTC), owns the pipelines. The pipelines travel from Santa Fe Springs to the Etiwanda General Station and they contain No. 6 oil. ***PHASE ONE*** INC. has also contacted a representative of the SCE-EPTC for information regarding the status of the pipelines. However, to date, a response from this representative is pending.

On May 7, 2002, ***PHASE ONE*** INC. contacted Karl Francis from the San Bernardino County Solid Waste Management Division for the purpose of obtaining information regarding water quality and methane gas emissions associated with the west and south adjoining Milliken Sanitation Landfill. The following table summarizes the results of this review.

SUMMARY OF OTHER REGULATORY RECORDS SEARCHED OR REQUESTED

ID #	Date of Document	Description	Level of Concern
OR01	01/02	A fourth quarter (Fall) 2001 water quality monitoring report for 2050 South Milliken Avenue, the Milliken Sanitation Landfill, indicated that 14 groundwater monitoring wells, 14 piezometers, five soil-pore gas monitoring probes, four surface water monitoring stations, and one landfill gas condensate station are located on the aforementioned site. That report states that groundwater flows towards a south-southwest direction. Surface water samples were not obtained because no free water was evident at the surface water monitoring stations. Elevated concentrations of volatile organic compounds (VOCs) were identified from groundwater samples collected from the monitoring wells. However, a trend of decreasing concentrations was observed from the previous quarterly monitoring results. Also, given that the listed site appears to be downgradient of the subject site (with respect to the direction of groundwater flow), the likelihood of impact to groundwater at the subject site from this adjoining site is low. In addition, the report also noted that samples collected from soil-pore gas probes revealed no measurable concentrations of methane. Therefore, the risk of explosion from methane accumulation appears to be minimal.	None

4.5 ONE-MILE RADIUS REGULATORY DATABASE REVIEW

The ***PHASE ONE*** INC. review of the computer-generated, one-mile radius regulatory database search document (the complete database search document is included in Appendix D) found that the subject site is not a regulatory-listed site. The following tables lists sites that are either (1) located within a 1/4 mile of the subject site (that is, close enough, under certain conditions, to possibly constitute an environmental risk to the subject site), or (2) are sites that are further than 1/4 mile but still pose a concern to the subject site (that is, listed sites which may have experienced a release of hazardous substances of sufficient magnitude to constitute a regional threat or to have impacted the subject site).

REGULATORY DATABASE REVIEW

ID #	Map Location #	Site Name and Location	Distance from Site (Miles)	Listing Agencies	Site Status (If a concern, why?)	Level of Concern
RE01	2	Used Tire King Pick-A-Part Auto Dismantling 2025 S. Milliken Ave.	Southeast adjacent site	SWIS HWIS RCRA	The listed site is a reported as an active solid waste disposal site (tires). In addition, the site is listed as having movement and disposal of hazardous waste (waste & mixed oil). The listed site appears to be crossgradient of the subject site (with respect to the direction of groundwater flow). Therefore, the possibility of groundwater impact from this listed site to the subject site is low.	None
RE02	3	Milliken Landfill R.E. Wolfe Enterprises San Bernardino City / Solid Waste 2050 S. Milliken Ave.	South and west adjacent site	HWIS RCRA	The listed site is reported as having movement and disposal of hazardous waste; no violations were noted. Given that the listed site appears to be downgradient of the subject site (with respect to the direction of groundwater flow) the likelihood of groundwater impact from this listed site to the subject site is low.	None

Note: 1) Map Location #s match the Map ID numbers of the sites used in the document located in Appendix D. 2) RCRA large- and small-quantity generator sites and sites with registered above or underground storage tanks are not included in the above table. Unless they have also been identified in certain other databases, these are not sites that are known or suspected hazardous waste release sites, thereby do not pose an immediate concern to the subject site. These sites are listed in the document located in Appendix D. ERNS listings which are not on or adjacent to the subject site, Cal-sites with a "no further action" status and LUST sites with a "case closed" status are not summarized in the above table because they are not likely to represent a concern for the site. Listings of unmapped sites are reviewed to identify the subject site or any sites that are obviously adjacent to the subject property. Other unmapped sites are listed only in Appendix D.

4.6 CHAIN-OF-TITLE ABSTRACT AND/OR REVIEW

At the request of the client, a chain-of-title abstract was not requested or completed for this project.

4.7 CLIENT-SUPPLIED ENVIRONMENTAL DOCUMENTS

During the course of this assessment, ***PHASE ONE*** INC. was provided with additional documents regarding the environmental condition of the subject site by the client or the client's representatives. The conclusions of these materials were reviewed only. ***PHASE ONE*** INC. relies upon the author/and corresponding companies' conclusions and expertise. ***PHASE ONE*** INC. does not evaluate the methodology, interpretation of results, analysis type or results, or verify in any way the completeness or correctness of the conclusions or procedures. ***PHASE ONE*** INC. relies upon the report and associated

conclusions of the reports provided to ***PHASE ONE*** INC. The conclusions of these materials are described in the following table. (Copies of the records, if available, are included in Appendix G.)

SUMMARY OF CLIENT-SUPPLIED ENVIRONMENTAL DOCUMENTS

ID #	Date of Document	Document Type and Reference	Author Name and Company	Relevant Information	Level of Concern
DR01	08/25/99	Phase I Environmental Assessment	K-Plus Environmental, Inc.	The report noted the presence of dirt piles on the western and southern portion of the subject site. Furthermore, the report states that the dirt piles appear to have been dumped in the property from an off-site source. The report also noted the presence of groundwater monitoring wells and gas extraction wells along the adjacent landfill's boundaries. Previous groundwater monitoring at the landfill revealed traces of contaminants such as trichloroethylene, tetrachloroethylene, and trichloroethane. However, only one of the groundwater samples revealed levels of PCE and TCA, which were over the action level. In addition, a methane gas capture system was installed in the landfill since methane gas levels often exceeded legal concentrations.	None
DR02	05/00	Phase II Subsurface Investigation	K-Plus Environmental	The features on the subject property identified in the report as groundwater monitoring wells were probed, but groundwater was not encountered. K-Plus used previous environmental reports that noted that, although groundwater in the landfill has been impacted, groundwater flows towards a southwestern direction, and therefore does not significantly impact groundwater on the subject property. Ten soil borings were completed, mainly along the western and southern boundaries of the subject site. In addition, soil samples were collected from dirt piles observed from the previous Phase I Environmental Assessment. The samples collected were tested for VOCs and PNAs. Analytical results indicated that no contaminants of concern were noted in any of the samples collected.	None

4.8 CHRONOLOGICAL HISTORIC SUMMARY

The chronological historic summary of the reviewed photographs, maps, and regulatory agency files presented in the following table is a recompilation of the findings recorded in the preceding subsections of ***Section 4.0*** (with the exception of the regulatory database listings, all or most of which do not bear on the history of the subject site). Also, each entry may only represent part of the information contained in the original entry, please see the corresponding section for full details. No new findings

are introduced in this table. The rows of this table are organized in chronological order, according to the date of the document (which may diverge from the date of the event discussed in the document.) Information is reiterated in this recompiled format in order to assist the client as well as the ***PHASE ONE*** INC. field assessors and report writers in forming an overall picture of the environmental history of the subject site.

CHRONOLOGICAL HISTORIC SUMMARY

ID #	Date of Document	Type of Document	Description	Level of Concern
HP01	1948	Aerial or Topo	[Scale: 1" – 11,000'] The subject site and all adjacent properties appear to be used for agricultural purposes.	None
HP02	1975	Aerial or Topo	The subject site and adjacent sites appear to be used for agricultural purposes. To the south, the landfill is evident.	None
HP03	1981	Aerial or Topo	No structures, tanks, or wells are evident on the subject site or on any adjacent properties. The landfill to the south is depicted as an area of disturbed soil. The area is occupied by agricultural use. The subject site is situated at 870 feet above mean sea level and the topography slopes towards a southerly direction.	None
HP04	1984	Aerial or Topo	The subject site and all adjacent properties appear to be in their present-day configuration. However, the large manufacturing plant does not appear to be evident beyond the north adjacent property.	None
HP05	1990	Aerial or Topo	[Scale: 1" - 1,600'] The subject site and all adjacent properties appear to be in their present-day configuration. Route 60 appears to be located to the south of the subject site. Route 15 appears to be located to the east of the subject site.	None
OG01	01/04/92	Oil & Gas	Based on a review of CDOG Map W1-4, it appears that no oil or gas wells are depicted on or in the vicinity of the subject site.	None
HP06	1995	Aerial or Topo	[Scale: 1" - 19,200'] There are no significant changes from the 1990 aerial photograph description.	None
DR01	08/25/99	Client-Supplied	Phase I Environmental Assessment	Potential
DR02	05/00	Client-Supplied	Phase II Subsurface Investigation	None
HP07	2000	Aerial or Topo	{Scale: 1" - 500'] The subject site and all adjacent properties appear to be in their present-day configuration.	None
OR01	01/02	Other Reg.	Fourth quarter (Fall) 2001 Water Quality Monitoring Report for 2050 South Milliken Avenue, the Milliken Sanitation Landfill.	None
WQ01	2002	Water Quality	Amer Metal Recycling Inc., located at 2202 S. Milliken Ave., is listed as an underground storage tank site; no incidents were reported. Given that the listed site appears to be crossgradient of the subject site (with respect to the direction of groundwater flow), the possibility of groundwater impact of this listed site on the subject site is low.	None
WQ02	2002	Water Quality	Pick-A-Part Auto Dismantling, located at 2025 S. Milliken Ave., is a reported underground storage tank site; no incidents were reported. Given that the listed site appears to be crossgradient of the subject site (with respect to the direction of groundwater flow), the possibility of groundwater impact of this listed site on the subject site is low.	None

ID #	Date of Document	Type of Document	Description	Level of Concern
WQ03	2002	Water Quality	Nordstrom's District Center, located at 1600 S. Milliken Avenue, is listed as an underground storage tank site; no violations were reported. Given that the depth to groundwater in the general vicinity is 278 feet, the possibility of groundwater impact of this listed site on the subject site is low.	None
WQ04	2002	Water Quality	SCE Mira Loma Substation, located at 13568 Milliken Avenue, is the reported location of a leaking underground fuel tank. The leak was discovered and stopped on 10/20/99. Only the soil was impacted. Given that the depth to groundwater in the general vicinity is 278 feet, the possibility of groundwater impact of this listed site on the subject site is low.	None

SECTION 5.0

SITE RECONNAISSANCE

The current section of this report is a compilation of the observations made during the visual site inspection conducted by Michael Shields on May 2, 2002. (Résumés of the field assessor, report writer, and reviewers are included in Appendix I.)

5.1 EXISTING STORAGE TANKS

No evidence of any existing aboveground or underground storage tanks was observed on the subject site during the site reconnaissance or noted in the research conducted for this assessment.

5.2 PREVIOUSLY EXISTING STORAGE TANKS

No evidence of previously existing aboveground or underground storage tanks was observed on the subject site during the site reconnaissance.

5.3 HAZARDOUS SUBSTANCES STORAGE AND HANDLING

No storage or handling of hazardous substances was observed in the areas inspected during the site reconnaissance.

5.4 SPECIFIC HAZARDOUS SUBSTANCES RECONNAISSANCE

In addition to a general inspection of the subject site for evidence of the presence of hazardous substances or environmental concerns, a ***PHASE ONE*** INC. field assessor also conducted a reconnaissance for a set of specific hazardous substances. The results of this specific reconnaissance are given in the following table.

SPECIFIC HAZARDOUS SUBSTANCES

ID #	Substance	Sampled?	Description	Level of Concern
SHS01	Radon	No	The subject property is located in an area that is considered to have a low occurrence of radon; according to the California Department of Health Services' California Statewide Radon Survey-Interim Radon Survey, 0.5% of homes in this region are predicted to have radon levels in excess of 4 pCi/l, the EPA-recommended action level. However, the occurrence of radon is site-specific; only testing can determine the actual radon level at the site.	None
SHS02	Agricultural Chemicals	No	On the basis of the information reviewed for this assessment, and observations made during the site inspection, it appears that the site has been used for agricultural purposes. As long as the site is developed for commercial or industrial use (not residential), the potential presence of residual agricultural chemicals in surficial soil does not represent a concern for future site occupants. However, if the site will be developed residentially or for public use, soil sampling is recommended.	None
SHS03	Formaldehyde	No	Based on the information reviewed for this assessment, there is no indication that the material was used.	None
SHS04	Heavy Metals	No	Based on the information reviewed for this assessment, there is no indication of the on-site employment or occurrence of any industrial processes or other activities that involve or are associated with the use of heavy metals.	None

5.5 POLYCHLORINATED BIPHENYLS (PCBs)

No known or suspected PCB-containing equipment or materials were observed on site during the site reconnaissance.

5.6 CLARIFIERS, SUMPS, TRENCHES, FLOOR DRAINS, AND INDUSTRIAL DISCHARGE SOURCES

Research conducted for this assessment indicates that no clarifiers, no sumps, no trenches, no floor drains, and no industrial discharge sources are or were operated at the subject site.

5.7 SURFACE CONDITIONS

During the site reconnaissance, areas of staining or other unusual surface conditions were observed on site. These observations are detailed in the following table.

SURFACE CONDITIONS

ID #	I/O	Approx. Size (ft^2)	Suspected Substance	Description and Photo #	Level of Concern
SC01	O	Several, about 20' x 20' each	Soil piles	Soil piles of unknown origin were observed throughout the subject property. A previous Phase II Subsurface Investigation, summarized in Section 4.7, indicated that no contaminants were identified in the soil samples collected from the piles; OP06	None

5.8 STRESSED VEGETATION

No disfigured, discolored, dying, or otherwise stressed vegetation was observed on site during the site reconnaissance.

5.9 OTHER ENVIRONMENTAL CONCERNS OR CONDITIONS

During the site reconnaissance, further evidence of environmental concerns or conditions that were not already noted in this section, or that were not yet fully discussed in this section, were observed on the subject site. These observations are described in the following table.

OTHER ENVIRONMENTAL CONCERNS OR CONDITIONS

ID #	Location and Photo #	Description	Level of Concern
EC01	Western/southwestern areas of the subject property; OP08 and OP09	Two apparent groundwater wells were observed along the western site boundary. The purpose of these features is unknown, however, conversations between the client and Milliken Landfill representatives established that these are not associated with the landfill facility. They may be associated with the former agricultural use of the property. These wells require abandonment in accordance with regulatory agency guidelines.	None

5.10 VISUAL OBSERVATIONS, ADJOINING SITES

During the site reconnaissance, the ***PHASE ONE*** INC. field assessor also visually inspected and documented the use of those properties that adjoin the subject property. The observations of the adjoining properties made by Michael Shields on May 2, 2002 and these properties' past uses are summarized in the following table.

VISUAL OBSERVATIONS, ADJOINING SITES

ID #	Description		Level of Concern
VOA01	**Northern View:**		None
	Address:	None	
	Company Name:	N/A	
	Apparent Current Use of Property:	Vacant, undeveloped land	
	Previous Use of Property:	Agricultural	
VOA02	**Southern View:**		None
	Address:	Unknown	
	Company Name:	Milliken Landfill Property	
	Apparent Current Use of Property:	Landfill	
	Previous Use of Property:	Agricultural	
VOA03	**Eastern View:**		None
	Address:	None	
	Company Name:	N/A	
	Apparent Current Use of Property:	Vacant, undeveloped land	
	Previous Use of Property:	Agricultural	
VOA04	**Western View:**		None
	Address:	Unknown	
	Company Name:	Milliken Landfill Property	
	Apparent Current Use of Property:	Landfill	
	Previous Use of Property:	Agricultural	

SECTION 6.0

INTERVIEWS

As part of the Phase I Assessment, ***PHASE ONE*** INC. attempts to interview various individuals who may have knowledge of different aspects of the subject site as it pertains to environmental conditions. The following table summarizes the relevant portions of these notes.

SUMMARY OF INTERVIEWS

ID #	Date of Interview	Name of Interviewee	Title	Relevant Discussions	Level of Concern
PI01	N/A	N/A	N/A	No knowledgeable person(s) were available for an interview; required questions were not answered.	None

SECTION 7.0

CONCLUSIONS AND RECOMMENDATIONS

7.1 ENVIRONMENTAL CONCERNS

No major, medium, or minor environmental concerns have been identified as a result of the ***PHASE ONE*** INC. Phase I Environmental Site Assessment for the subject site. ***PHASE ONE*** INC. classifies a concern as a major, medium, or minor environmental concern (as opposed to a potential or possible condition) when it is one that involves a recognized environmental condition for which, in the opinion of ***PHASE ONE*** INC., further investigation and/or remediation is recommended. The distinction among major, medium, and minor concerns is based solely on the relative estimated dollar-cost of completing the next-step recommended action.

7.2 POTENTIAL OR POSSIBLE ENVIRONMENTAL CONDITIONS

No potential or possible environmental conditions have been identified in the ***PHASE ONE*** INC. Phase I Environmental Site Assessment for the subject site. ***PHASE ONE*** INC. classifies a concern as a potential or possible environmental condition (as opposed to a major, medium, or minor concern) when (1) it involves issues that appear to pose no immediate or imminent threat to the subject site, but which over time (with the occurrence of groundwater movement, demolition, disturbance, etc.) may come to pose an actual or present environmental concern for the subject site and/or when (2) it involves areas that currently appear to have a negligible impact on the subject property and which do not, therefore, require additional investigation at this time, but of which ***PHASE ONE*** INC. feels the client should be made aware.

SECTION 8.0

LIMITATIONS

To achieve the study objectives stated in this report, we were required to base *PHASE ONE* INC.'s conclusions and recommendations on the best information available during the period the investigation was conducted and within the limits prescribed by *PHASE ONE* INC.'s client in the contract/authorization agreement and standard terms and conditions.

PHASE ONE INC.'s professional services were performed using that degree of care and skill ordinarily exercised by environmental consultants practicing in this or similar fields. The findings were mainly based upon examination of historic records, maps, aerial photographs, and governmental agencies lists. The hazardous waste site lists represented in this report represent only a search of the specific government records as listed above. It should be noted that governmental agencies often do not list all sites with environmental contamination; the lists could be inaccurate and/or incomplete. Recommendations are based on the historic land use of the subject property, as well as features noted during the site walk. The absence of potential gross contamination sources, historic or present, does not necessarily imply that the subject property is free of any contamination. This report only represents a "due diligence" effort as to the integrity of the subject property. No other warranty or guarantee, expressed or implied, is made as to the professional conclusions or recommendations contained in this report. The limitations contained within this report supersede all other contracts or scopes of work, implied or otherwise, except those stated or acknowledged herewith.

This report is not a legal opinion. It does not necessarily comply with requirements defined in any environmental law such as the "innocent landowner defense" or "due diligence inquiry." Only legal counsel retained by the client is competent to determine the legal implications of any information, conclusions, or recommendations in this report. The compliance status, discussed in Section 5.0, is not intended for use as a guide to compliance for the present owner. Its intended use is to identify environmental impairments to the subject property and is not to be used as a guide to the legal compliance to regulations of any kind.

The findings, conclusions, recommendations, and professional opinions contained in this report have been prepared by the staff of *PHASE ONE* INC., in accordance with generally accepted professional practices. All cost estimates in Section 7.0, are purely estimates only, and may not represent the actual costs. Without further investigative assessment, exact, actual costs cannot be fixed. The costs associated with *PHASE ONE* INC.'s recommendations are for budgetary purposes only.

This report does not address, in any way, septic systems, leach fields, septic tanks, or related health hazards.

All asbestos, lead, or any other sampling is sampled in a good faith effort by *PHASE ONE* INC. assessors. Sample results should not be construed as conclusive and binding in any way. All sampling conducted is only for the purposes of general screening and does not imply that all materials, locations, or hazardous materials have been identified nor was the sampling intended to identify every instance of the materials sampled. No interpretation of the sample results is made or implied. *PHASE ONE* INC. only relays the information supplied by the laboratory conducting the analysis.

If any controversy or claim arises out of or relates to this contract, or breach thereof, and if said dispute cannot be settled through negotiation, the parties shall submit to binding arbitration in accordance with the Construction Industry Arbitration Rules of the AAA, and judgment upon the award rendered by the arbitrator(s) may be entered in any court having jurisdiction thereof.

APPENDIX C

Phase II Subsurface Investigation
May 2000, K-Plus Environmental, Inc.

APPENDIX D

Phase I Environmental Assessment
August 1999,
K-Plus Environmental, Inc.

APPENDIX E

2002 Biological Survey for the
Delhi Sands giant flower loving fly
September 2002,
Agresearch, Inc.

2002
Biological Survey
for the Delhi Sands giant flower-loving fly
Rhaphiomidas terminatus abdominalis
Millikin Avenue south of Jurupa Street

City of Ontario
San Bernardino County, California
for
Panattoni Development
19600 Fairchild Road
Suite 285
Irvine, CA 92612

Field Survey and Report

by

Rudi Mattoni, PhD

Agresearch, Inc.
9620 Heather Road
Beverly Hills, CA 90210
310 399 6016, email mattoni@ucla.edu

September 23, 2002

The listed investigator performed all the fieldwork reported herein and prepared this report independent of any outside influence. The investigator asserts that the data contained herein are correct and that the conclusions presented are his own.
Survey conducted under authorization by U. S. Fish and Wildlife Service permit TE-807303-4

Rudi Mattoni

METHODS AND MATERIALS

The Delhi Sands giant flower-loving fly survey

Field data collection was primarily a focused visual search for DSF adults and pupae, following FWS guidelines, which specify observations at least between 1000 and 1400 hours on clear days with low wind velocities. Sky conditions were noted with temperature, relative humidity and average wind speeds determined using a Kestrel 3000 hand-held monitor at the beginning and end of each sampling period.. Limited data for other large insect species are presented along with notes on vertebrates seen.

For each day surveyed, random walks were conducted across the property. The approximate path followed is delineated on the attached field maps.
In prior years the dense, mostly non-native horehound and grass growth served as obstacles limiting easy traverse so paths followed the more open sections of the vineyard section of the property. Walks concentrated around the disked periphery that was the most likely habitat for DSF although every section of the property was covered.

This year, grass was virtually absent as were all annuals with most of the horehound (*Marrubium*) collapsed. The whole area was unobstructed, excepting the surviving grpae vines. The walks each day covered all areas with special attention to the few small areas of highest native plant cover, mostly restricted to the open drainage basin on the western and southwestern corner. The vegetation was surveyed on the first day at the site.

Other insects and vertebrates

In prior years Rick Rogers recorded all insect sightings during his surveys. Although Mattoni is familiar with most insect species in addition to DSF, *Apiocera* spp, and *Nemomydas pantherinus*, he was unable to identify some of the smaller Diptera. Numbers of all insects was so reduced, however, the general conclusions are altered. Numbers of *Apiocera* spp (Apioceridae) and the more closely related mydid fly *Nemomydas pantherinus* (Mydidae) were noted. Sightings of familiar mammals, birds and reptiles were noted.

Soil survey

The soil substrate was evaluated by visual characterization based upon: 1) fine sand substrate without evidence of alluvial materials or imported material, 2) presence of cryptobiotic crusts indicating stable soil surfaces with no disturbance history for several years and 3) disturbance characteristics.

The plant community

Plant species present were noted during random walks across the entire site made by Mattoni. A semi-quantitative list of all species found during these surveys are in table 3, which for comparison lists all of the species presently known from all Delhi Sands

formations as previously determined across a number sites by Sanders and Mattoni (unpublished data).

RESULTS

Delhi Sands giant flower-loving fly census

Neither adults nor pupa cases of Delhi Sands giant flower-loving flies were seen across the property over the 19 days of two-hour observations conducted between 1000 and 1330 hours. Weather conditions were all within FWS guideline specifications for almost every moment in the field. Wind velocities on both July 18 and August 11 were marginally high at the termination time of the walks.

There is no evidence of DSF on the property, although DSF were reported "nearby" by FWS personnel. Rogers noted DSF on a Millikin Avenue site farther to the south several years earlier. This is the third year with negative findings. There is no evidence of any breeding population on the site.

Other insects, vertebrates, and the plant community

No Apiocera species were seen this year, although single males of the fly *Apiocera convergens* were sighted during each of the previous years surveys. *Apiocera*, although members of a different family, Apioceridae, tend to occupy similar plant community and substrate types and fly at the same times as rhaphiomidids, but with a flight period extending several weeks longer. Few were seen at the Colton core habitat this year although hundreds were observed in 2000.

Another possible surrogate/indicator species, *Nemomydas pantherinus*, in the family Mydidae, as *Rhapiomidas* were sighted. This year five individuals were seen, compared with three in 2001. The species has a different set of life history characteristics from DSF, as larvae are known predaceous on beetle larvae. At best *N. pantherinus* indicate some "natural" habitat conditions exist, although these conditions may be completely unrelated to DSF. Other flying insects noted were highly depauparate in comparison to prior years. Only about 30% of the species observed earlier were noted (Table 3). The low numbers of the target species at the Colton core habitat all correlate by inferring poor general conditions.

A third fly, the bombyliid *Lygira gasophylax*, is an excellent indicator of even poor sand dunes habitat. This sand obligate species has not been seen on the site at any time from the 2000 to 2002 surveys. The species is large and unmistakable.

Table 3 does not cite any vertebrates observed or their signs, but notes are included on the datasheets. The few vertebrates seen were commonplace species: cottontail rabbits and ground squirrels. No burrowing owls, known from region, were seen. There were also no signs of the Los Angeles pocket mouse, nor were any reptiles other than the common lizard *Uta stansburiana* seen.

The plant community, semi-quantitatively described from data given in Table 2, is depauperate. Relative density of all plant species across the site is compared between the first two surveys, 200 and 2001 and this year. Other than a patch of two common

buckwheat plants (*Eriogonum fasciculatum*) the only common indicator species of natural is croton (*Croton californicum*) with a very low density of telegraph weed. A small stand of one species, the rattlepod *Astragalus trichopodus*, remains in the southeast depressed section, the most undisturbed appearing portion of the site, although it may have been recontoured for drainage purposes at some time.

However, in 2002, there were as a highly visible change, likely a consequence of the extreme draught conditions following the lowest seasonal rainfall recorded in over 100 years. In this year grass was virtually absent as most other annuals. Even storksbill (*Erodioum spp.*) were almost absent. Both horehound (*Marrubium*) and burr bush (*Ambrosia acanthicarpus*) populations collapsed. This lack of vegetation left the whole area unobstructed, excepting the surviving grape vines.

An approximate 30 foot swath of disked substrate borders the north, south, and west sides of the site. The few plants that have re-established in this disturbed portion are mostly non-native annuals. The disturbance appeared took place in 1999. Dominant vegetation is now a senescing vineyard of grapes. It will be noted that an additional 30 foot swath was disked from Millikin to the southeast "native" section, approximately 200 feet north of the southern property boundary.

All plant species known from the Delhi Sands community are given in table 2. Of the 78 Delhi Sands associated native flora known, only 6 perennial species and 11 annuals were found on the Millikin Avenue property. Further, all were found in low frequency. By comparison, 15 non-native exotic plants invaded the site from a total of 43 invasive species known across the whole Delhi Sands dune system. As depauparate as the site is in species richness, actual species densities (cover) are even more deficient.

Habitat delineation

The status of the soil substrate is a definitive habitat characteristic for DSF. At present the only determination of suitable habitat is by correlation of DSF with certain physical and biotic variables. The definitive characteristics are presence of pure Delhi fine sand, low plant cover, and a few indicator plant species: Croton, telegraph weed, and common buckwheat. There are no data that define the determinants of DSF based on the life history requirements during the almost year long (or multiple year) fossorial larval stages. Since our observations indicate no extensive occurrence of free flowing sand at the site – which exhibits a high content of alluvial rock and geochemical consolidation of sand – and with few indicator plants and previously noted dense non-native grass cover, we consider the site as highly unlikely DSF habitat.

Since the site is located on the historic delineated Delhi Sands soil type, however, there remains restoration potential. Some native plant cover, with presence of harvester ants, combined with nearly potential habitat do not preclude a DSF may be found on the site. This is extremely unlikely.

CONCLUSIONS

The survey and study support the null hypothesis that Delhi Sands giant flower-loving flies do not occupy any part of the site as a breeding population. The results reiterate the survey of the past two years. There was no evidence of DSF migrants appearing from the nearest previously known occupied habitats, which lie at indeterminate distances and which may support viable populations only at very low density. Cursory inspection of surrounding sites implies that the mined pit to the south and the adjacent landscaped trash-dump cover would not now support DSF. The parcel to the east is an abandoned vineyard similar to the subject property, with land further to the north destroyed by development. Further abandoned vineyards to the west may support DSF as well as the powerline right-of-way across Millikin to the east. Any of these sites could have low density, long diapausing residual populations, but presence of such are completely conjectural and there are no data on life histories that might provide a probabilistic assessment of a scenario.

At present, with the major low cover areas the result of repeated clearing around the periphery by disking, the property is unsuitable as DSF habitat, possibly excepting the 0.5 acre northwest corner depression. In addition to the sparse and largely non-native plant cover, the remaining arthropod community is depauperate. The low density of harvester ants and absence of *Messor sp.* ants, species associated with DSF occurrence elsewhere, may be the result of the disturbance activities or the apparent high alluvial content of the substrate.

Even given the anecdotal sightings of DSF in the vicinity within the past decade, we believe the site is unsuitable for a population to establish even were dispersal to occur. The alluvial nature of the substrate, low general insect species richness, depauperate native flora and lack of low cover do not support the hypothesis of suitable DSF habitat.

The dispersive behavior of the DSF also remains unknown. Although most observations indicate the fly is relatively sedentary with high site fidelity, few individuals have been sighted in areas that do not appear suitable. All dispersants noted have been males. The low frequency of such events does not permit generalizations concerning individual movements. Since no DSF were seen the point remains moot.

Lastly, the value of habitat restoration and management at the site is questionable given high costs that would be required for a site would be low on a prioritized set of potential secondary sites for the DSF.

List of Tables, Figures, field notes

Tables

Figures

Attachments: (original report copy only)
Field notes and maps, 19 sheets..

Table 1

Millikin Avenue, Ontario, California. Summary and calendar of field work giving days sampled, July 18 - September 15, 2002. *Rhaphiomidas terminatus abdominalis* (R. t.), *Apiocera spp.* (A) and *Nemomydas pantherinus* (N) sightings and selected weather conditions for days surveyed. Average wind speed (mph) and Temperature (F) determined using a Kestrel 3000 meter. Days not surveyed, ns; no weather data, nd; N,. All observations by R. Mattoni

	Rt.	A.	N	Temp. °F	Wind	Sky
July						
18	0	0	1	76-87	4.9	clear
19						
20						
21	0	0	0	75-84	0.9	overcast
22						
23						
24						
25	0	0	1	91-98	2.2	clear
26						
27						
28	0	0	1	78-88	3.3	few clouds
29						
30						
31	0	0	0	79-89	2.0	few clouds
August						
1						
2						
3	0	0	2	81-87	2.3	clear
4						
5						
6	0	0	0	88-90	2.5	clear
7						
8						
9						
10						
11	0	0	0	85-92	3.7	clear
12						
13						
14						
15	0	0	0	87-94	2.9	clear
16						
17						
18	0	0	0	71-78	3.4	overcast

Table 1 (continued)

	Rt.	A.	N	Temp. °F	Wind	Sky
19						
20						
21	0	0	0	75-82	1.7	clear
22						
23						
24	0	0	0	82-87	2.9	clear
25						
26						
27						
28	0	0	0	74-89	3.5	clear
29						
30						
31						
September						
1	0	0	0	96-99	0.4	part cloudy
2						
3						
4						
5	0	0	0	82-84	3.5	cloudy
6						
7						
8	0	0	0	74-87	2.4	part cloudy
9						
10	0	0	0	85-92	2.0	few clouds
11						
12						
13						
14	0	0	0	83-92	5.1	few clouds
15						
16						
17	0	0	0	75-87	2.3	clear

Table 2

Plant species list and community composition by semi-quantitative cover estimates for year 2002 at Millikin Avenue, Ontario compared with the Colton core habitat. Species not seen (0), species present as 1 to few scattered individuals (1), species common in few clumps (2), species common throughout (3). Values for years 2000 and 2001 are given in parentheses (). NB the changes

	Millikin	Core Habitat
NATIVE PERENNIAL SPECIES		
Shrubs/subshrubs		
Rhus trilobata	0	1
Artemisia californica	1	1
A. dracunculus	0	2
Baccharis pilularius	1	2
B. salicifolia	1	1
Croton californicus	2	2
Encelia farinosa	0	2
Gnaphalium bicolor	0 (1)	2
G. californicum	0	2
G. microcephalum	0 (2)	2
Gutierriza californica	0	1
Haplopappus palmeri	0	3
Lepidospermum sp.	0	1
Lessingia filaginifolia	0	2
Senecio douglasii	0	1
Opuntia littoralis	0	2
O. prolifera	0	2
Sambucus mexicanus	0	0
Lotus scoparius	0	3
Salvia mellifera	0	1
Mirabilis californica	0	1
Eriogonum fasciculatum /polifolium	1	3
Ceanothus cuneatus	0	1
Rhamnus crocea	0	1
Adenostoma fascicularis	0	1
Prunus ilicifolia	0	1
Solanum douglasii	0	1
Stillingia linearifolius	0	3
Tetradymia sp	0	1
herbaceous perennials		
Malacothrix saxatilis	0	2
Astragalus trichopodus	1	0
Chenopodium californicum	0	1
Marah macrocarpus	0	1
Cucurbita foetidissima	0	1
Rumex hymenosepalum	0	1
Datura wrightii	(1)	2
Bloomeria crocea	0	1
Dicholstemma capitata	0	1
Penstemon spectablilis	0	0
NATIVE ANNUAL SPECIES		
Ambrosia acanthicarpa	2 (3)	3
Heterotheca grandiflora	1	2
Conyza canadensis	0 (1)	1
Crassula connata	0	3
Stephanomeria virgata	0 (1)	3
Hemizonia fasiculata	2	2
Chaenactis glabriuscula	0	2
Filago californica	0	1
Senecio californicus ?	0	1
Rafinesquia californica	0	0
Amsinckia menziesii	0 (3)	3
Cryptantha sp. 1	1 (3)	3
Cryptantha sp. 2	1	3
Cryptantha sp. 3	0	0

Table 2 (Continued)

	Millikin	Core Habitat
NATIVE ANNUAL SPECIES (CON'T)		
Cuscuta californica	0	0
Eriastrum sapphirinum	0 (1)	3
Gilia angelensis	0	0
Lepidium nitidum	0	0
Lotus purshianus	0 (2)	3
L. strigosus	0	0
Lupinus bicolor	0	2
L. sp. (hirsute)	0	0
Phacelia distans	0	2
P. minori	0	1
Camissonia bistorta	0	1
C. micrantha	0	2
C. hirta?	0	1
Oenothera	0	2
Plantago erecta	0	1
Eriogonum gracile	0 (3)	3
E. thurberi (blowouts)	0	2
Claytonia perfoliata	0	1
Festuca megalura	0	2
F. octoflora	0	1
NON-NATIVE PERNNIAL SPECIES		
Acacia spp	0	1
Ricinus communis	0	1
Oryzopsis miliacea	1	1
Foeniculum vulgare	0	1
Schinus spp.	0	1
Nicotiana glauca	1	1
Marrubium vulgare	3	1
Eucalyptus spp	0	1
Lobularia maritima	0	1
Convulvulus arvensis	0	1
Ariplex semibaccata	0	1
NON NATIVE ANNUALS		
Anagallis arvensis	?	1
Brassica spp	2 (3)	2
Centaurea miletensis	2 (3)	1
Chaemosyce maculata	?	1
Chenopodium murale+album	1	1
Conyza bornariensis	1	1
Erodium spp	1	1
Galium asparine	?	1
Hirschfeldia incana	2	3
Lactuca serriola	0	1
Malva parviflora+nicaeensis	0 (1)	1
Medicago & Melilotus spp	1	1
Oenothera laciniata	0 (1)	1
Oxalis pes caprae	?	2
Raphanus sativus	0	1
Silene gallica	?	1
Spergula arvensis	?	1
Salsola tragus	1	1
Sonchus oleracea	1	1
S. asper	1	1
Urtica urens	0	1
Tribulus terrestris	2	1
Avena barbata + fatua	2 (3)	2
Bromus diandrus+mollis+tectorum	3	2
Hordeum leporinum	0	1
Schismus barbata	2	1

Table 3
List of insect species observed at Millikin Avenue, Ontario, found during the 2000 by Rogers, George, and Mattoni. Orders all caps underlined, families boldface. Species seen this year (2002) are asterisked *

ODONATA
Aeshniidae
Anax junius
Aeshnia multicolor
Libellulidae
Sympetrum corruptum *
Libullela saturata *
Pantala hymenea

HEMIPTERA
Pentitomidae
Cholorchora sayi *
Largidae
Largus cinctus *

LEPIDOPTERA
Papilionidae
Papilio cresphontes
Pieidae
Pieris protodice *
Colias eurytheme
Nyphaliodae
Junonia coenia
Vanessa cardui
V, virginiensis
Lycaenidae
Strymon melinus
Plebejus acmon *
Brephidium exilis *
Hesperiidae
Hylephila phyleaus *

DIPTERA
Tabanidae
Tabanus punctifer *
Apioceridae
A. convergens
Mydidae
Nemomydas pantherinus *
Bombyliidae
Toxophora sp.
Paracosmus sp
Aphoebantus bilineatus *
Thyridanthrax atrata *
Villa molitor *
Rhynchanthrax caprae

Neodiplocampta mira *
Poecilognathus sp. 1
Syrphidae
Eristalis latifrons *
Tachinidae
Gymnosoma fuliginosa

HYMENOPTERA

Gasteruptiidae
Gasteruption sp.
Chrysididae
Argochrysis mesillae
Chrysis sp
Formicidae
Pogonomyrmex californicus *
Mutillidae
Dasymutilla californica *
Pompilidae
Anoplius sp. 1 *
Vespidae
Eumenes bollii
Polistes aurifer *
P. apachus *
P. exclamans
Sphecidae
Bembix americana *
Microbembix californica *
Tachytes distincta
Hoplisoides diversus
Haplomelinus lbitomentosis
Mimesa sp. 1
Lirius aequalis
Prionyx parkeri
P. Foxi
Sceliphron servilleii
Chalyon calironicum
Ammophila aberti *
A. sp. 1 black
A. sp. 2 red
Andrenidae
Perdita sp.
Colletidae
Colletis sp *
Megachilidae
Megachile sp. 1 *
M. sp 2
Anthophoridae
Anthophoris sp. 1
Melessodes sp. 1
Apidae
Apis mellifera *

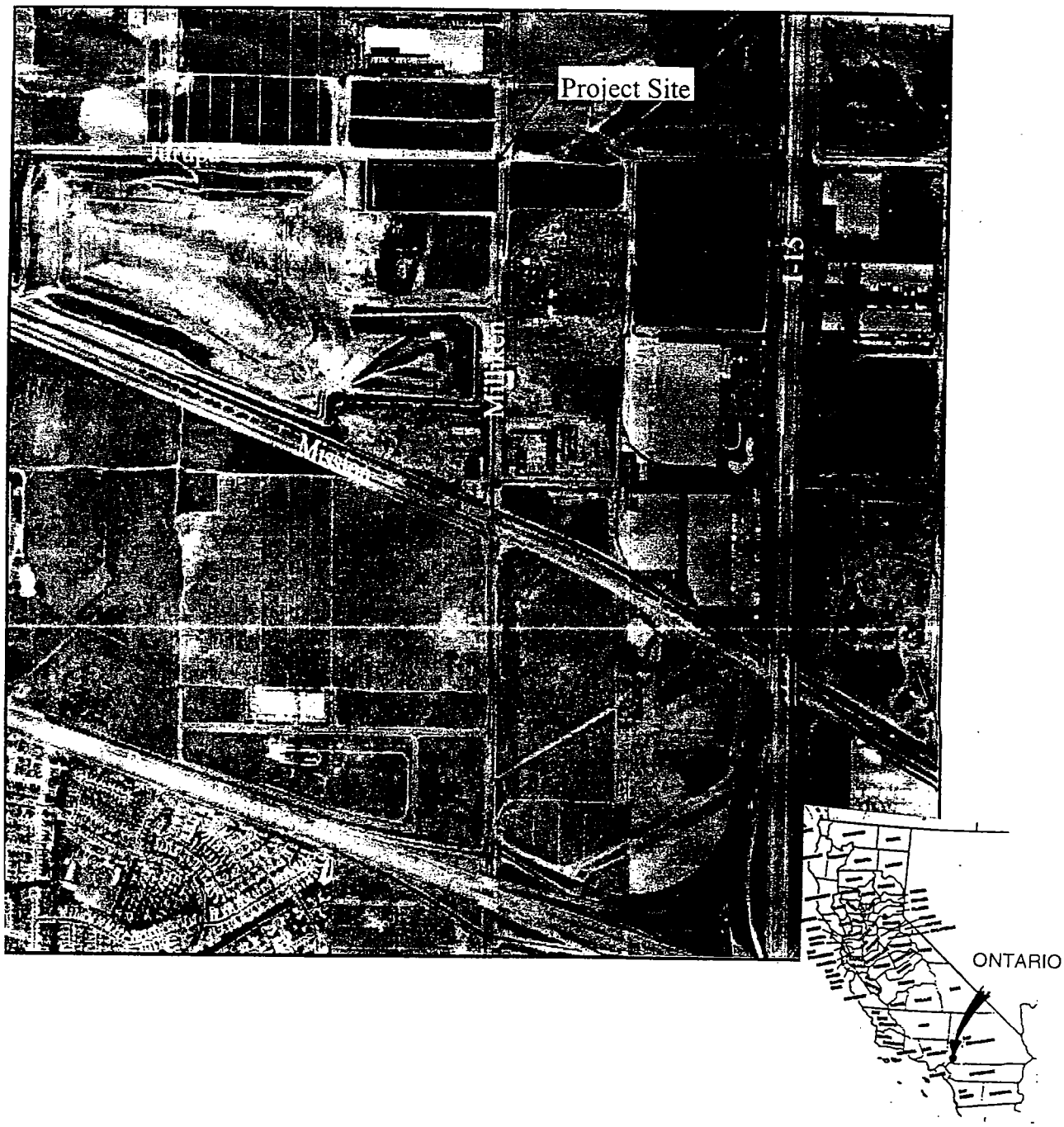


Figure 1.
Millikin Avenue site, City of Ontario. Regional map outlining subject surveyed property on the USGS Ontario aerial photograph, 1994. Inset locates Ontario on a map of California.

← JURUPA

few Dasymutilla
Rambus
...
(1) ...
(2) ...

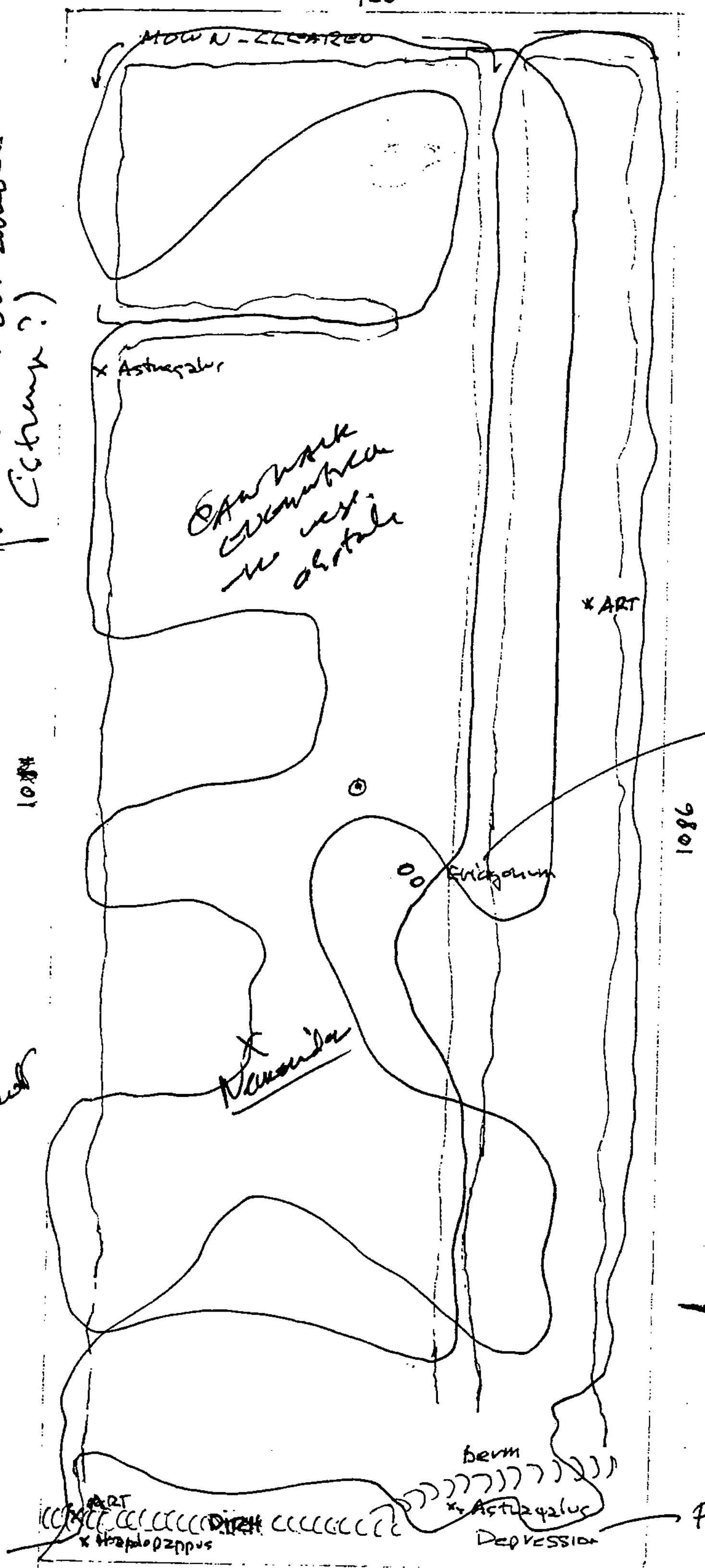
Tiny ...
1 TARANTULA ...!
Vespids
... few!

PANATTONI PROPERTY

← MILLIKIN AVE →

ABANDONED VINEYARD

426



Plants:
No E. GRACILE!
Grapes very green - few - dried early! ...?
3 ground squirrel
6 cottontails
Pogo ... colonies - small - ... ...
... ~ 20 (few!)

OPEN PIT

Jul 18 02 (1)

date time

WIND

MAX MIN
T

MAX MIN

76/87

clear

wind 2.1 - 4.9

10:00 : 12:10

← N

Few ... - small no blooms!

50
100 FT

P. ... (5)
few ... -
Almost no ...! Dry!
NO ... ...

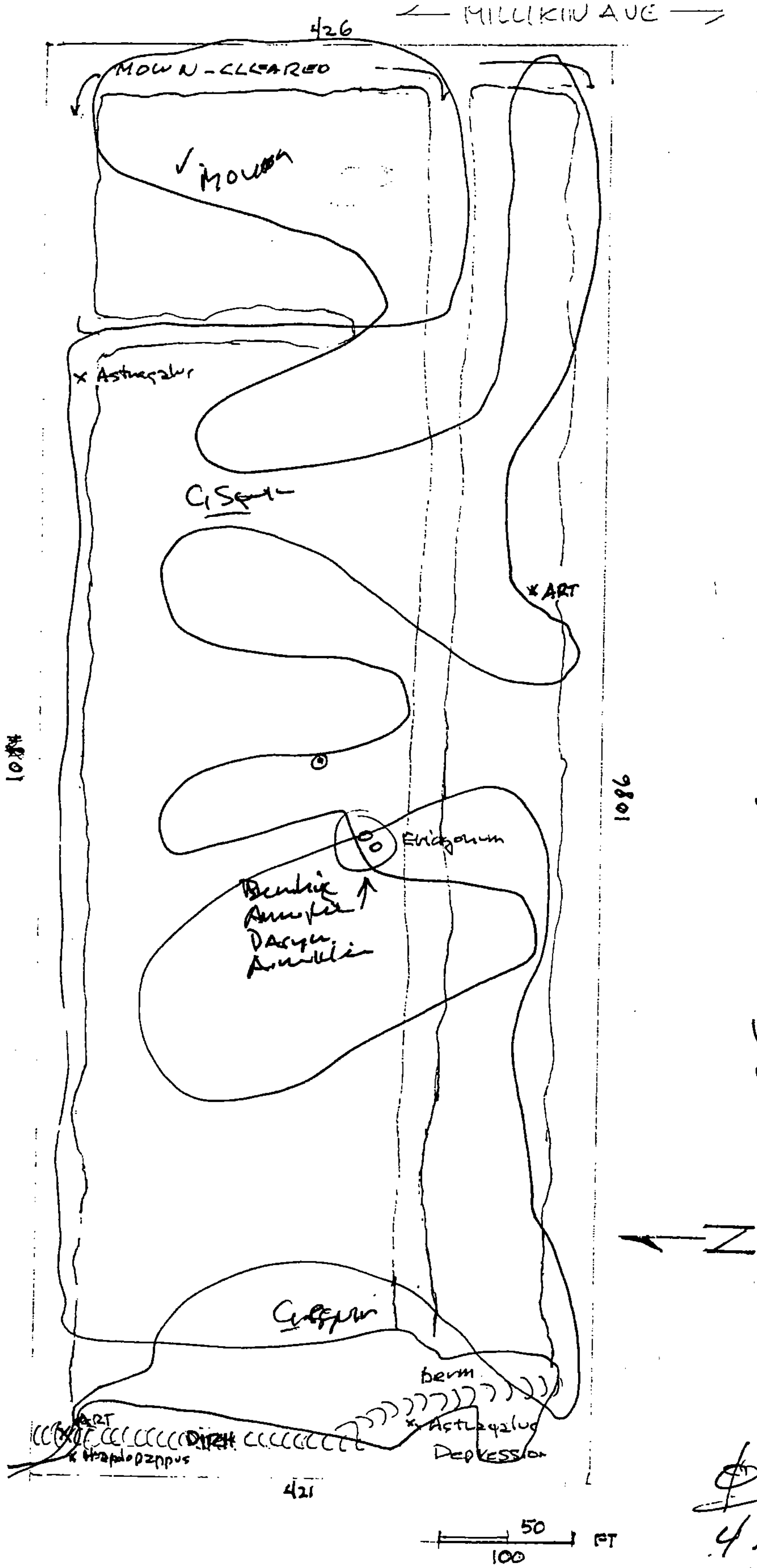
2 ... ...
1 ...
~ 12 Pogo

Jul 18 02 1

← JURUPA

PANATTONI PROPERTY

ABANDONED VINEYARD



5 cottontails
Squirrel "

OPEN PIT

July 21

date time

wind

MAX MIN
T

MAX MIN

11:00 – 1300
Cool overcast
75–84
No wind
0.2 – 1.1 mph

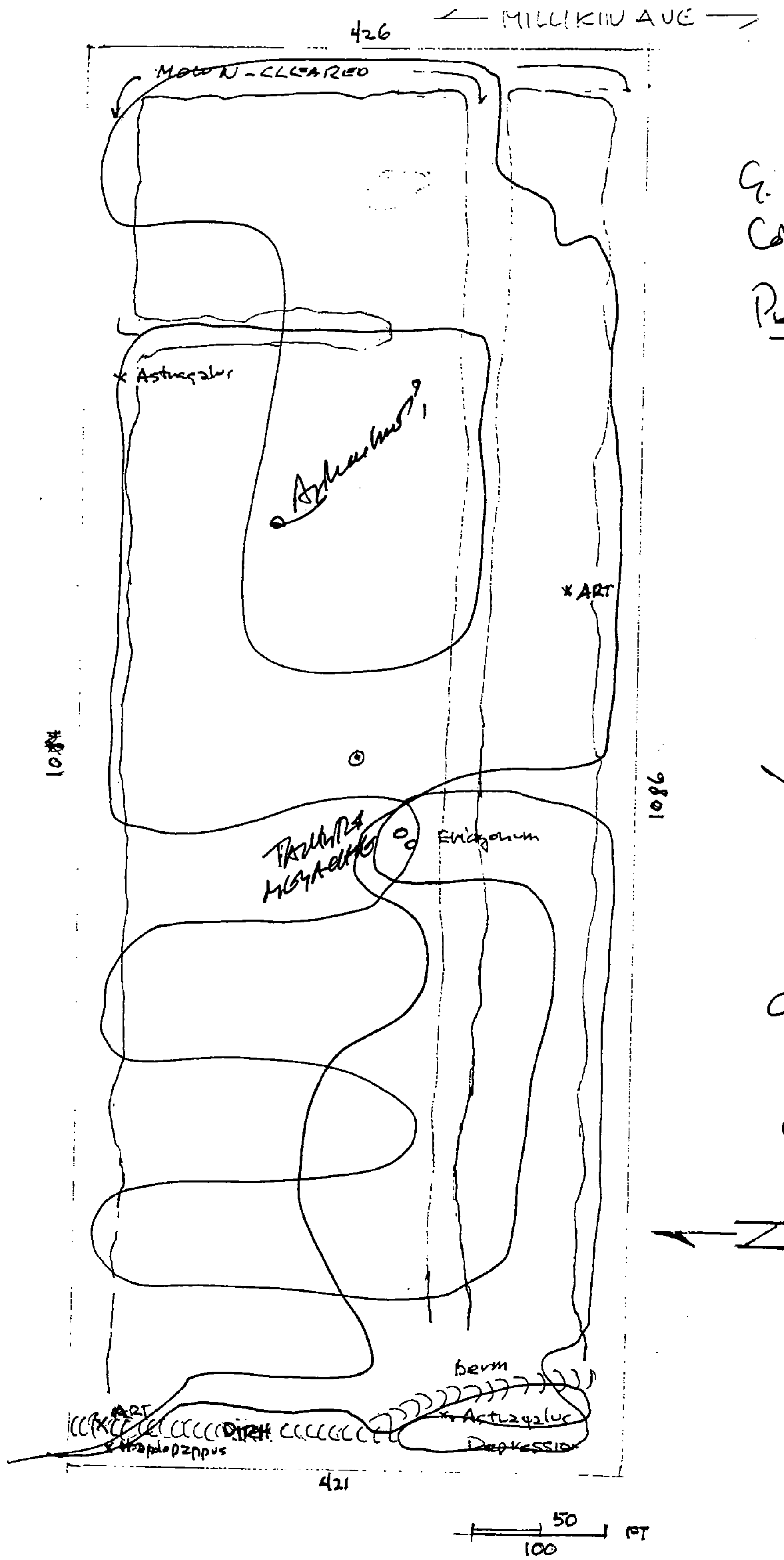
Ø – MEMO

4 .. ATRATA ////
~15 Poop Colonies
Nutshells – 6

July 21 '02 2

PANATTONI PROPERTY

ABANDONED VINEYARD



G. squirrel 3
Cottontail ||||| 5
Plepsis ? 1

OPEN PIT

July 25

date time

WIND

MAX MIN
T

MAX MIN

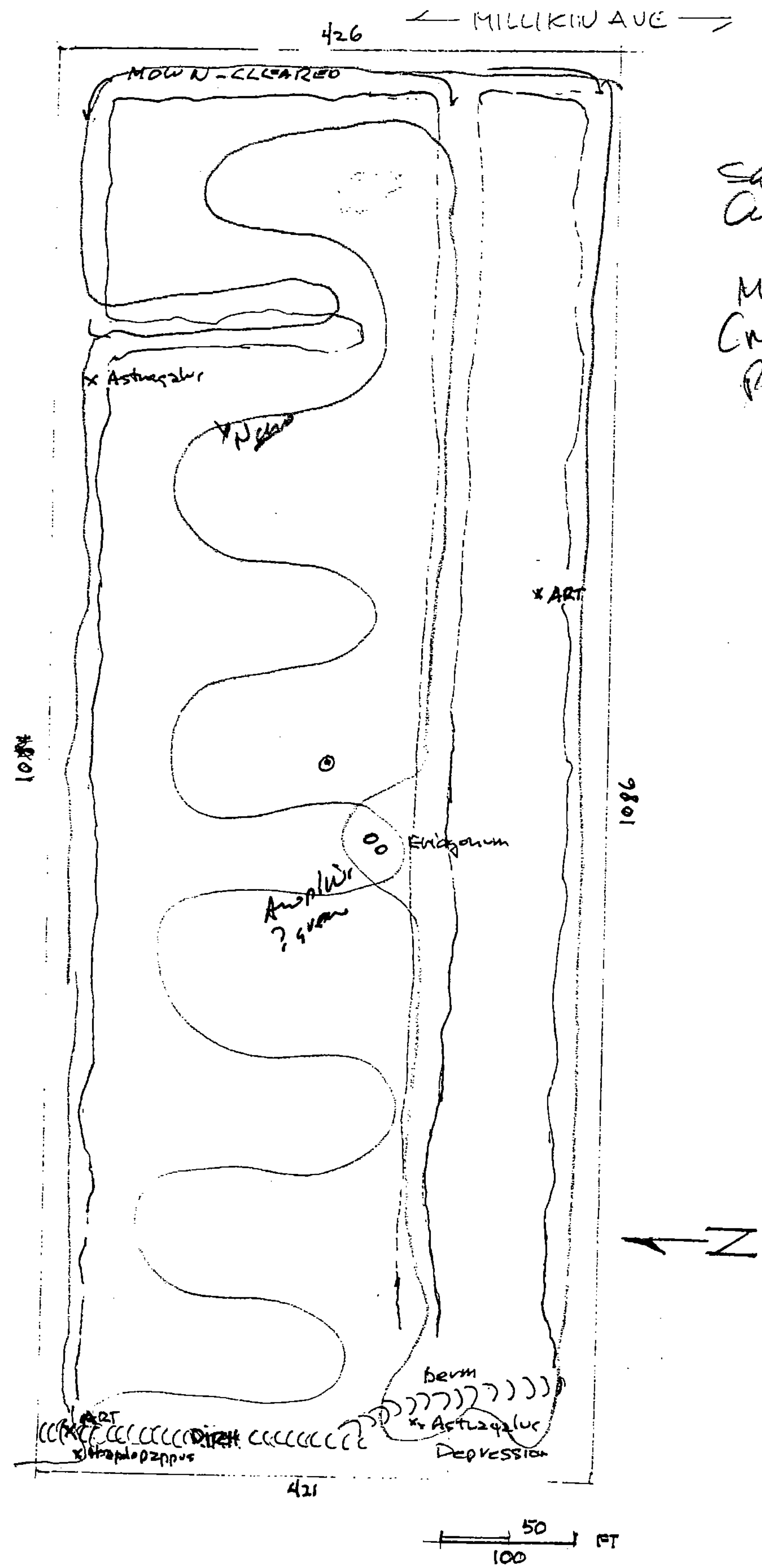
955 - 1205
91 / 98
0.1 1.8
Sunny
Warm

Athalia ||||
Nemo 1
Photos |||| ||

← JURUPA

PANATTONI PROPERTY

ABANDONED VINEYARD



Scanning show
Alt/wind 3-6

Mechanic ...
(NO Bird-?)
Pop N 15-20 color
few

OPEN PIT

JULY 28

date time

WIND

MAX T MIN

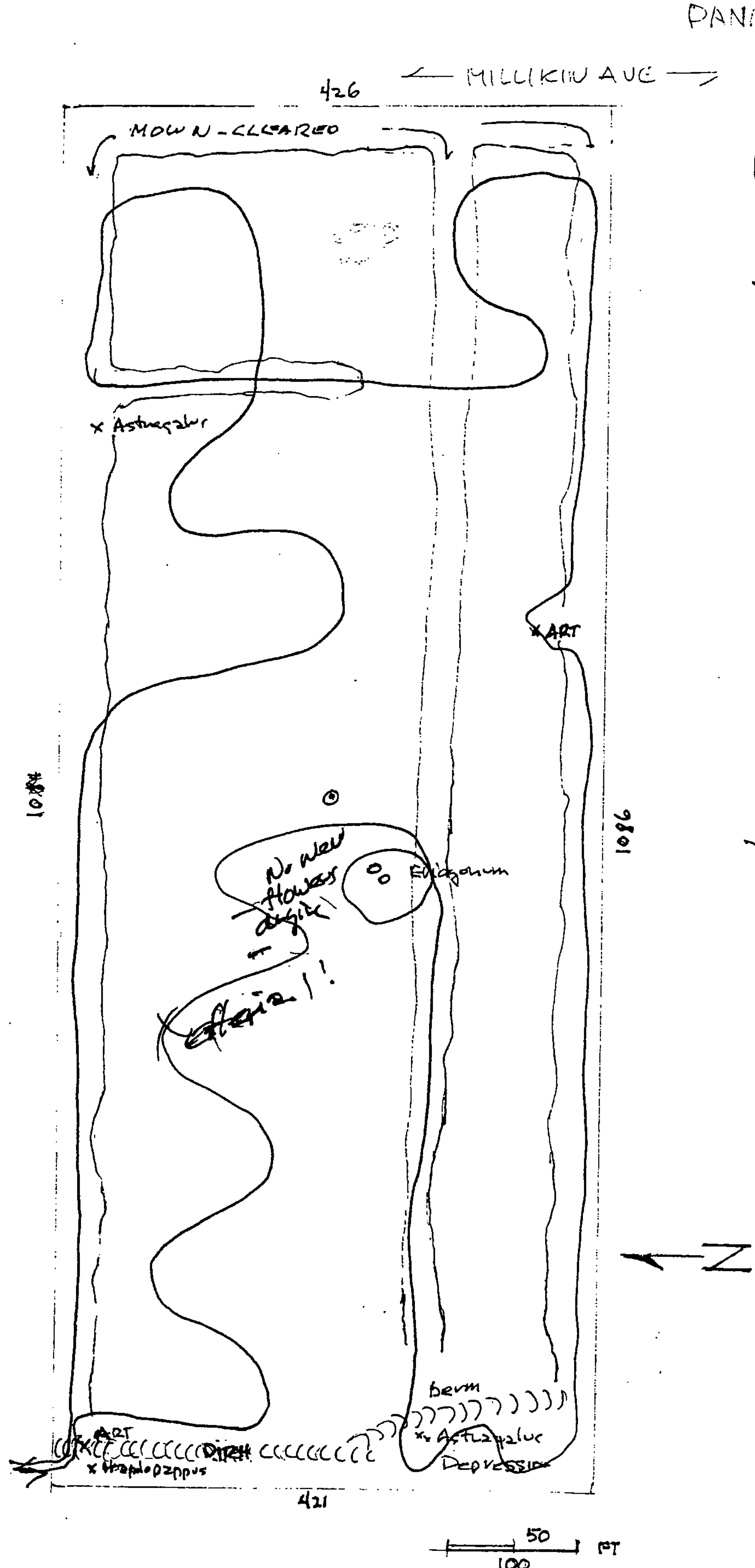
MAX 78 MIN 88
2.9 - 3.7
N cloudy - few
Nice

Name 1
ATHATA ||| 11 7

July 28/02 4

PANATTONI PROPERTY

ABANDONED VINEYARD



Bonnie - 2 burr.
3-6 G. squirrels
& Cottontail
few birds --

Jul 31 955-1205

date time

WIND

MAX MIN

T

MAX MIN

79 89

1.4 - 3.7

scattered clouds

little

DRY.

Nemo O

Athena HH III

Phaedra HHT III

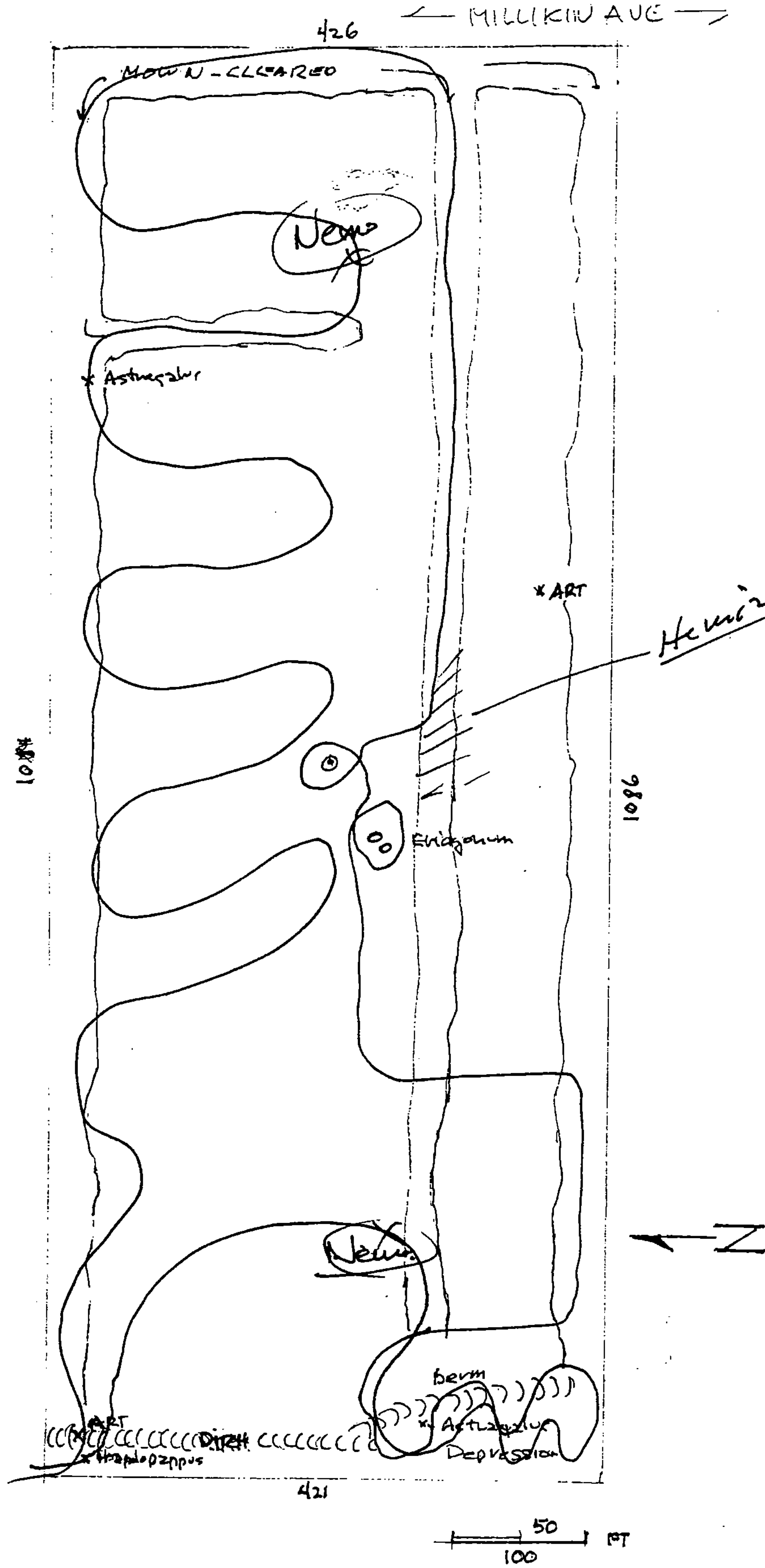
Bonnie:

Jul 31 02 5

← JURUPA

PANATTONI PROPERTY

ABANDONED VINEYARD



Hemizonia — 3-4" tall
[illegible]

OPEN PIT

AUG. 3 1100-1245

date time

WIND

MAX MIN

T

MAX MIN

81 77

1.8 2.9

CLEAR

NICE

DRY

[illegible]

Nemo || 2!

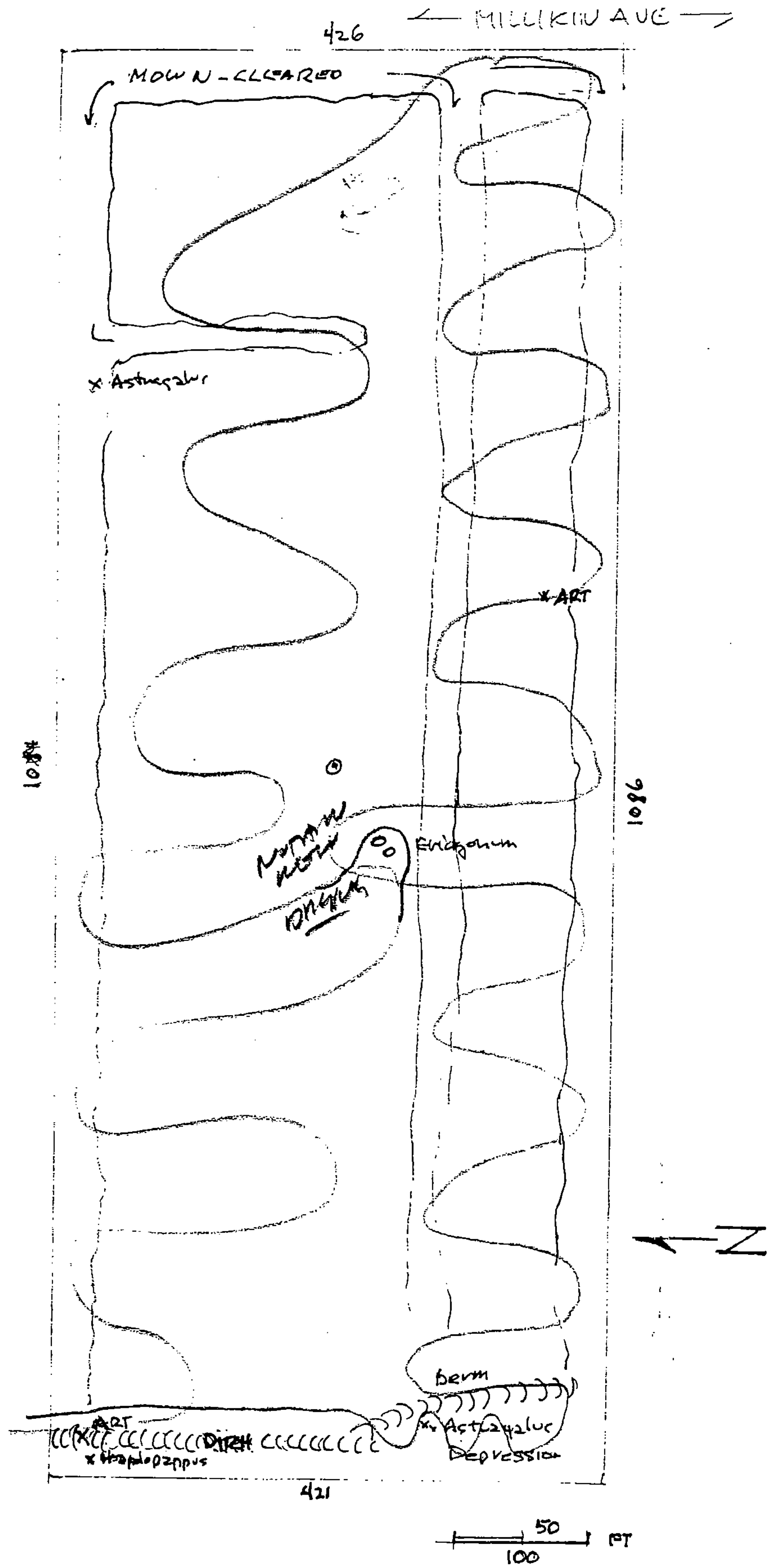
Athata ~~HHT HHT~~

[illegible] HHT ///

← JURUPA

PANATTONI PROPERTY

ABANDONED VINEYARD



OPEN PIT

Aug 6

88 90

1030 1220

1.0 - 4.1

CLEAR

Nemo 0

Atrata 9

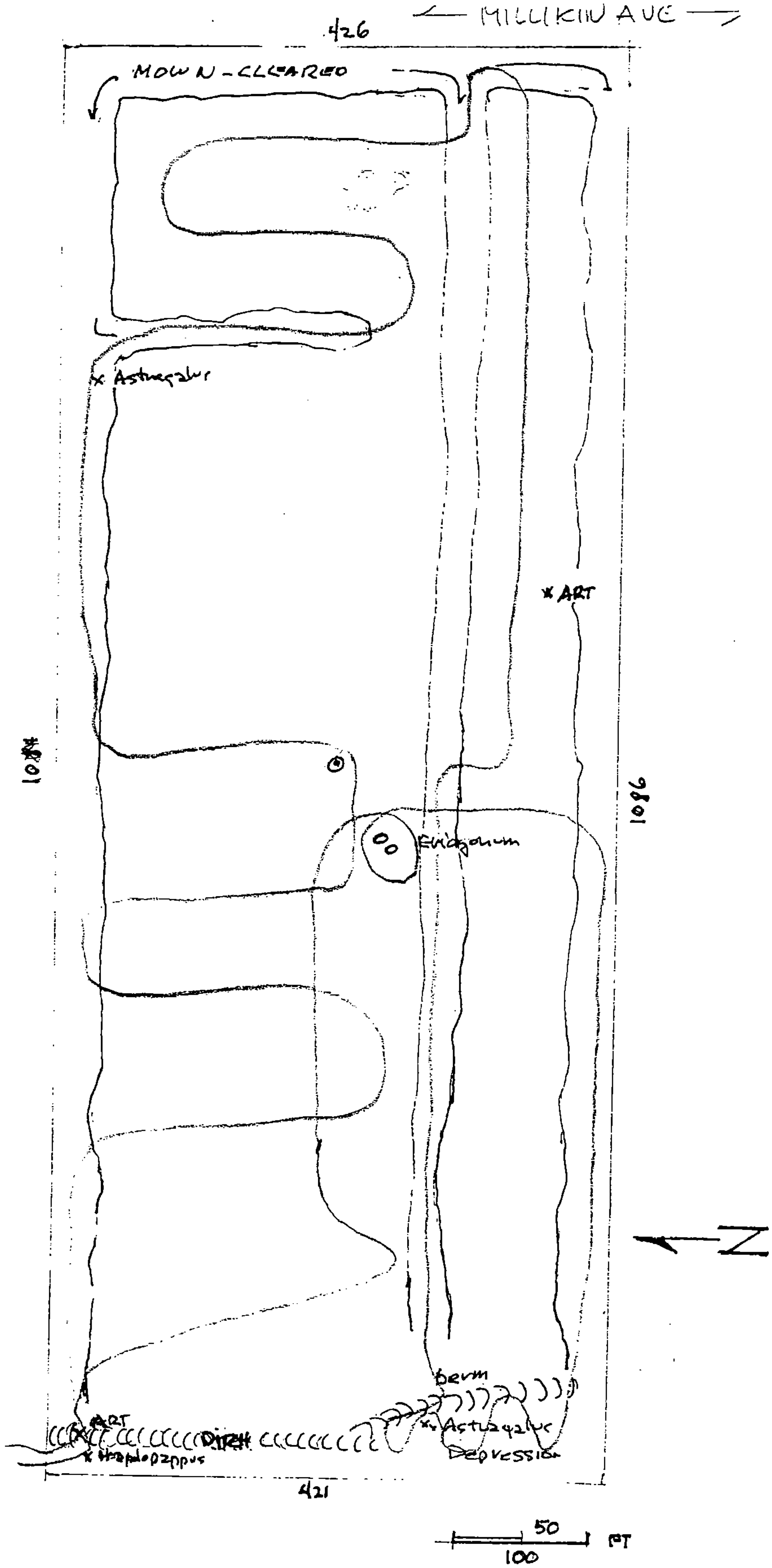
AUG. 6

7

← JURUPA

PANATTONI PROPERTY

ABANDONED VINEYARD



OPEN PIT

AUG. 11 600/1200

date time

WIND

MAX MIN

T

MAX MIN

85 92

CLEAR

1.8 5.4

NOMO Ø

ATHATA ~~HH~~ ~~|||~~ ||

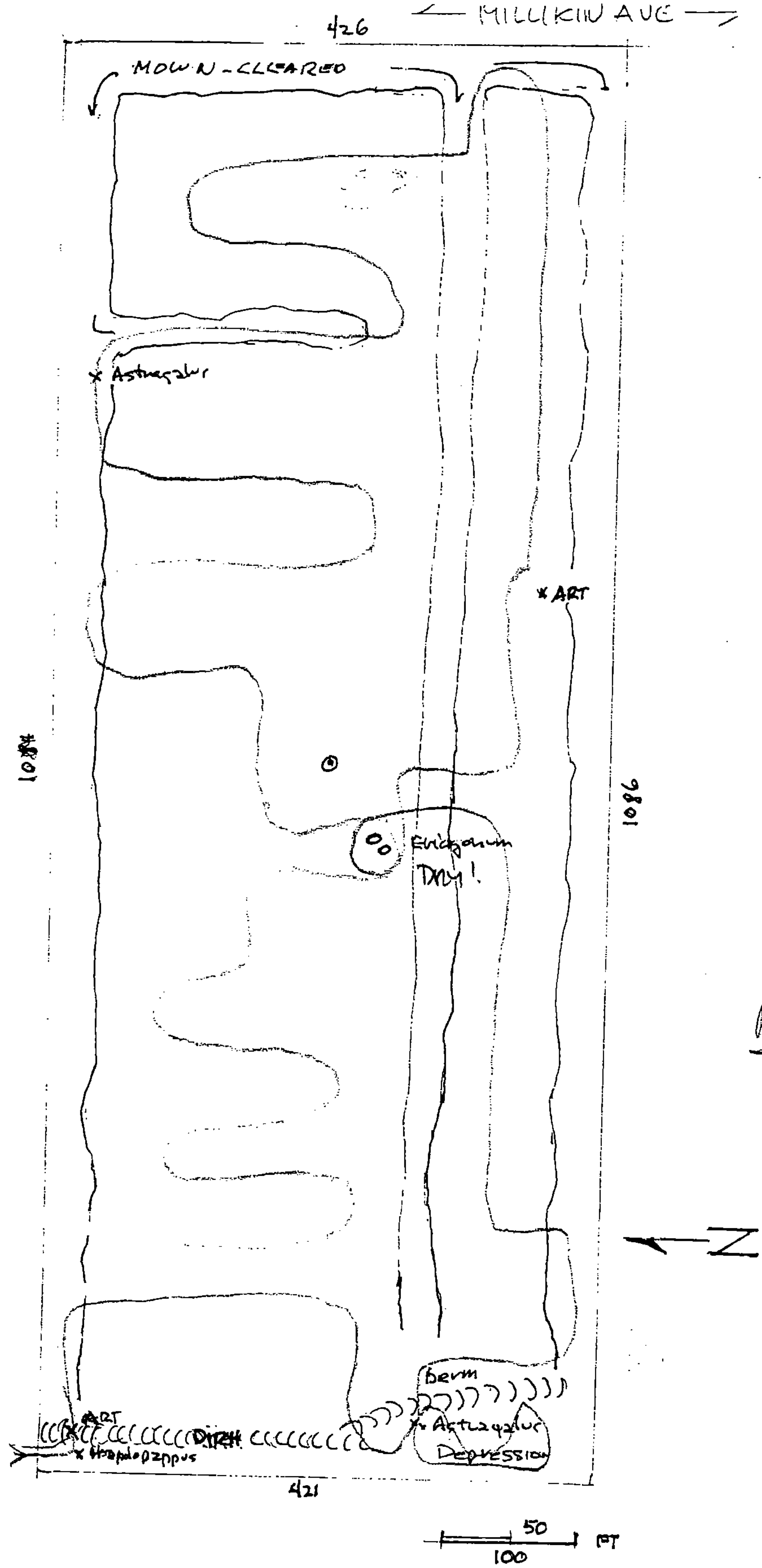
Aug. 11

AUG. 11 8

← JURUPA

PANATTONI PROPERTY

ABANDONED VINEYARD



OPEN PIT

date time

WIND

MAX T MIN

MAX MIN

AUG, 18 950-1200

71 78

OVERCAST - MCC

RH 40

2.0 - 4.7 wind

Nemo 4 (done?)

ATWATER ~~IIII~~ 11 7

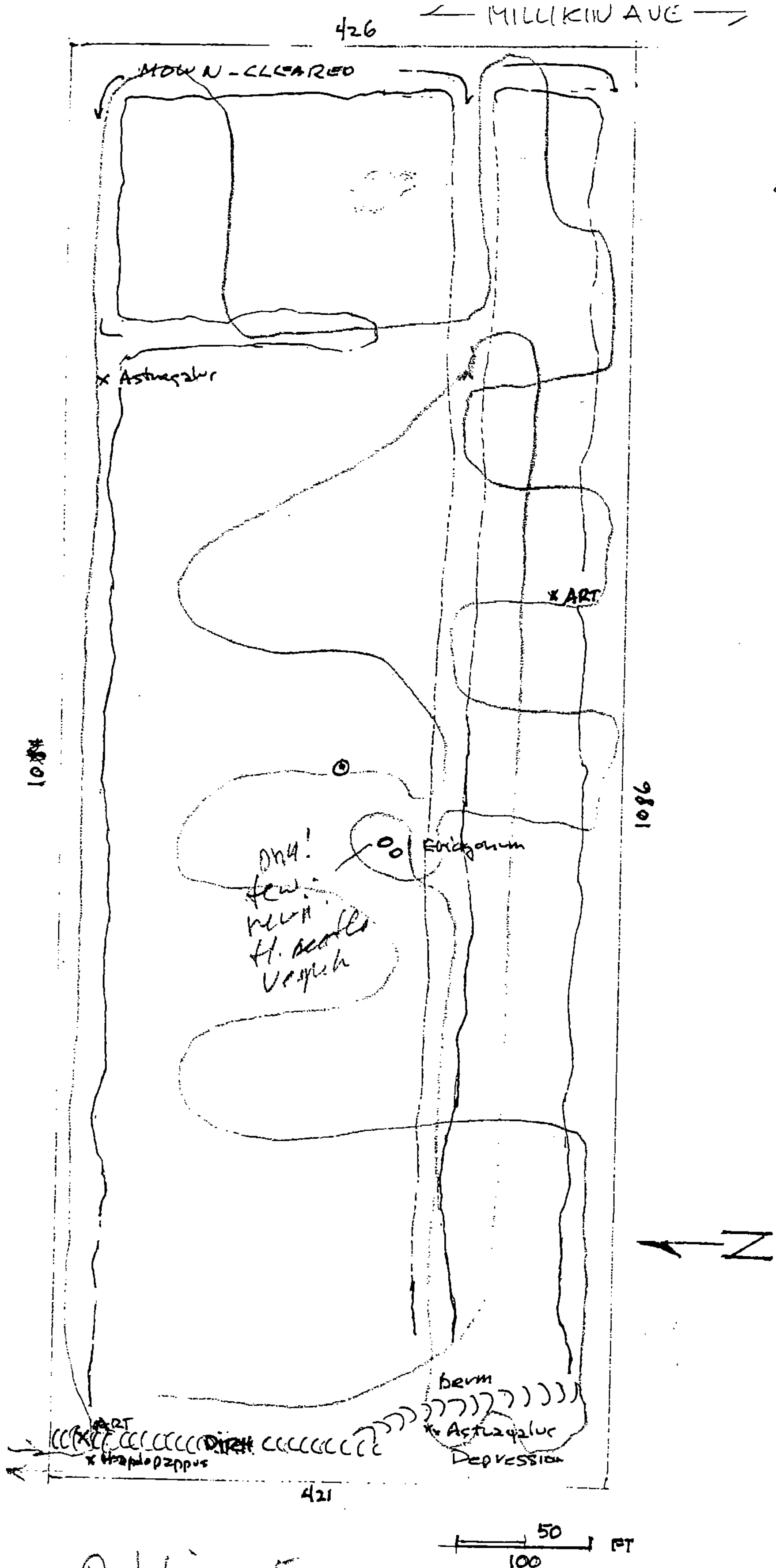
Pogon

Aug. 18 10

← JURUPA

PANATTONI PROPERTY

ABANDONED VINEYARD



SQUIRREL / COTTONTAIL ~
317
shows to
pr. Mockingbirds
1 meadowlark

Dry - even
A. millefolium grass
down

OPEN PIT

AUG. 21 1030-1235

date time

WIND

MAX MIN
T

MAX MIN

CLEAR ALL

DRY - COOL

75-82

1.2 - 2.1

Phrtidium 5
Anthidium ... 1

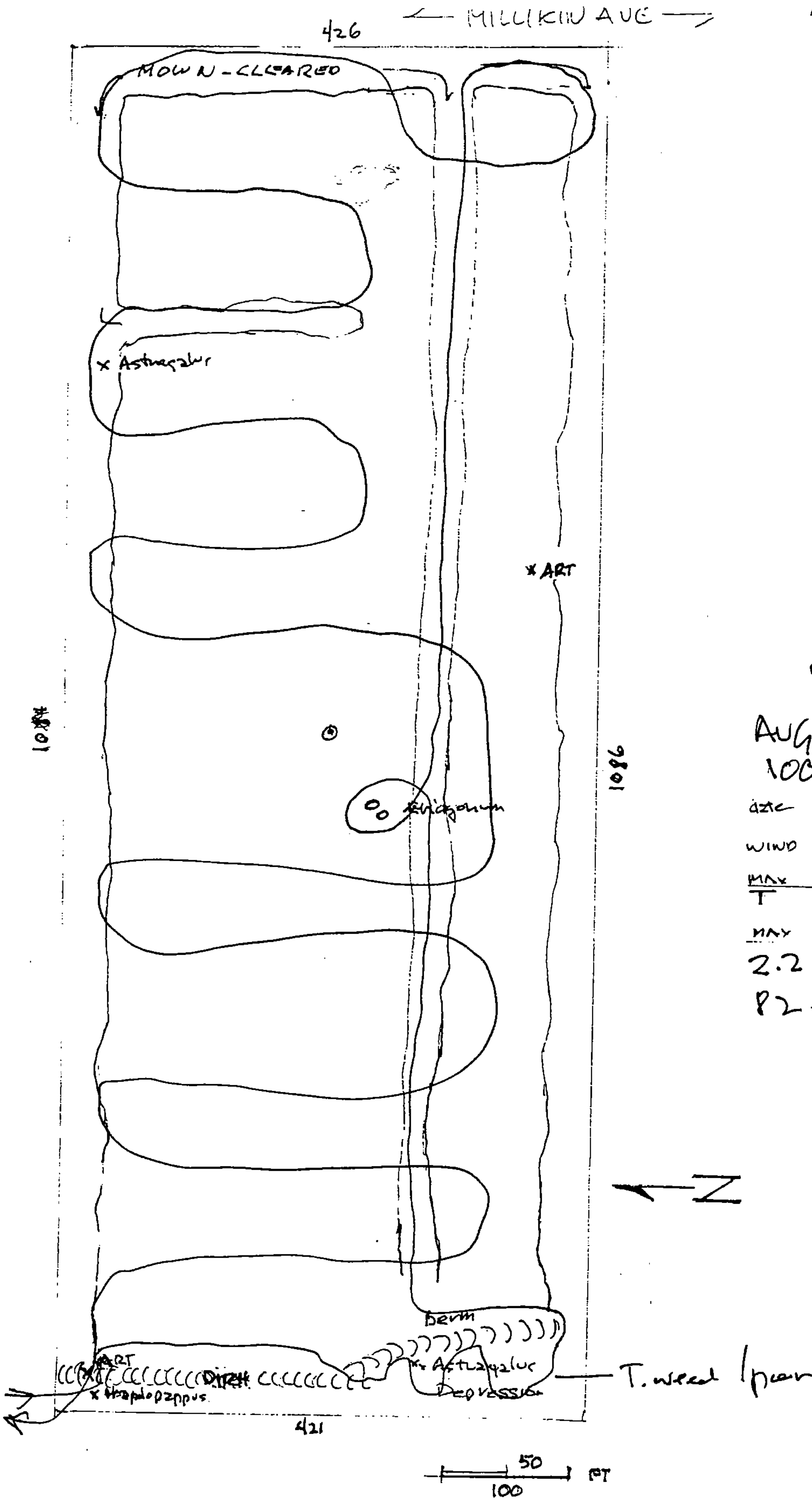
Nemo 4
Atwata III (3)!
Pogon few - 12

AUG 21 11

← JURUPA

PANATTONI PROPERTY

ABANDONED VINEYARD



OPEN PIT

AUG. 24 CLEAR
1000-1200

DATE   TIME

WIND

MAX T   MIN

MAX   MIN
2.2 - 3.7
82-87

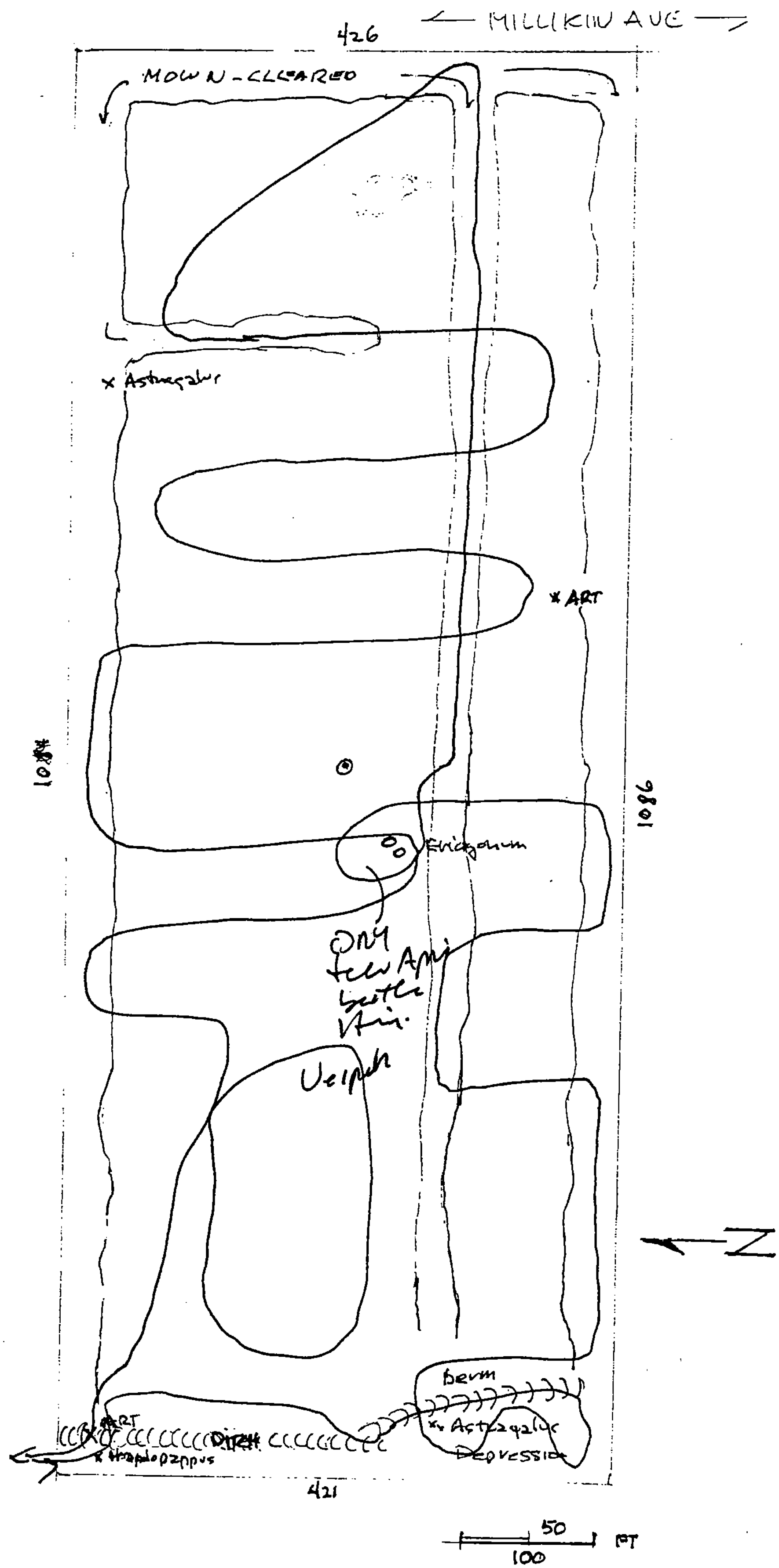
Dudleya still in same
Cow 7. Mustards dry

Nemo ⊘
Attacks 5

Aug. 24 12

PANATTONI PROPERTY

ABANDONED VINEYARD



Habitat 6 sq miles
~ 6.2

OPEN PIT

date time

WIND

MAX MIN
T

MAX MIN

AUG. 28 CLEAR
74 89
2.6 - 4.9
RH 25
DRY

Pogo n 15 colonies
all area - few -
foraging

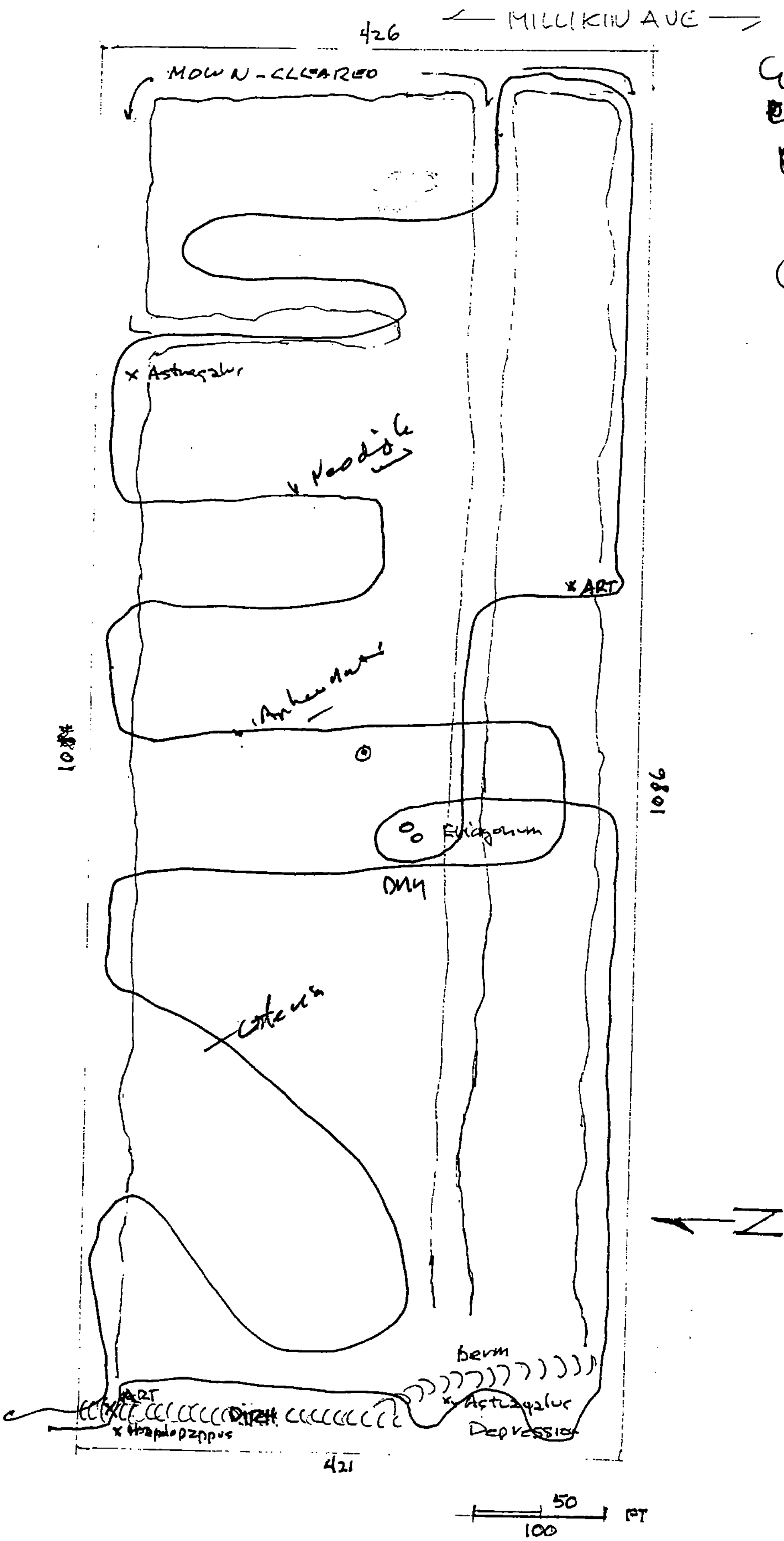
Nests 0
Artemisia ~~||||~~ ||| 8

AUG 28 13

← JURUPA

PANATTONI PROPERTY

ABANDONED VINEYARD



[illegible] [illegible]
[illegible] -
[illegible] [illegible]
[illegible]
4 / 2
([illegible] [illegible] [illegible]
[illegible] to [illegible])
NO birds
([illegible])

OPEN PIT

date time

WIND

MAX T MIN

MAX MIN

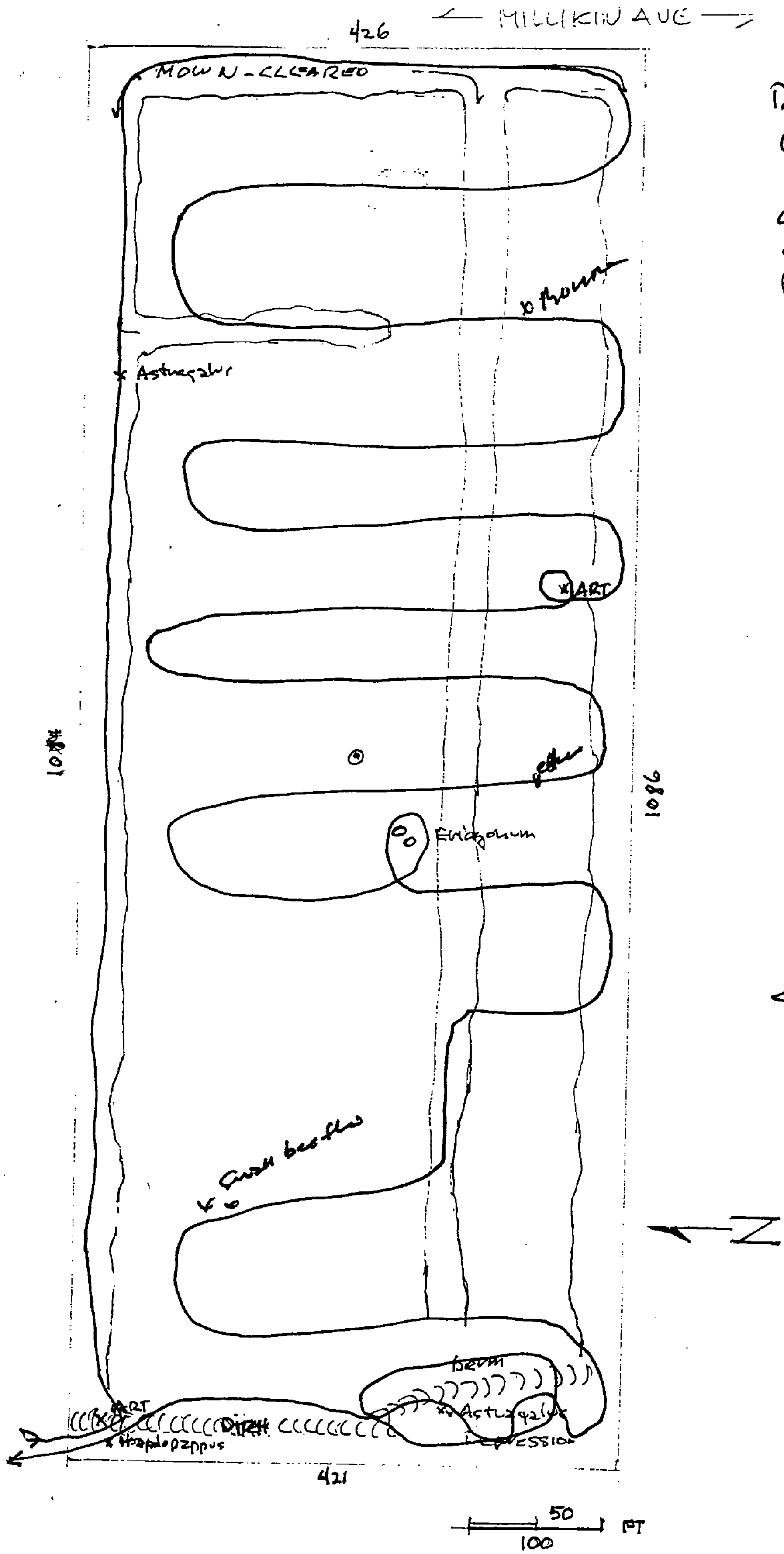
SEPT. 1
1040 - 1330
~~Few~~ CLOUDS
NO WIND
0.0 - 0.8 !
WARM / DRY

Nello 0
Atriplex ~~||||~~ (6)

← JURUPA

PANATTONI PROPERTY

ABANDONED VINEYARD



Dry
C. Tails 4
Sevinl 1
grapes bird shape
within leaves
Dogs 2
all color ~15,
but # < little
fungi
Again going down -
No Pollen.

OPEN PIT

date time

WIND

MAX MIN
T

MAX MIN

Sept. 5 1015:1215
cloudy windy
82-84
3.0-4.1

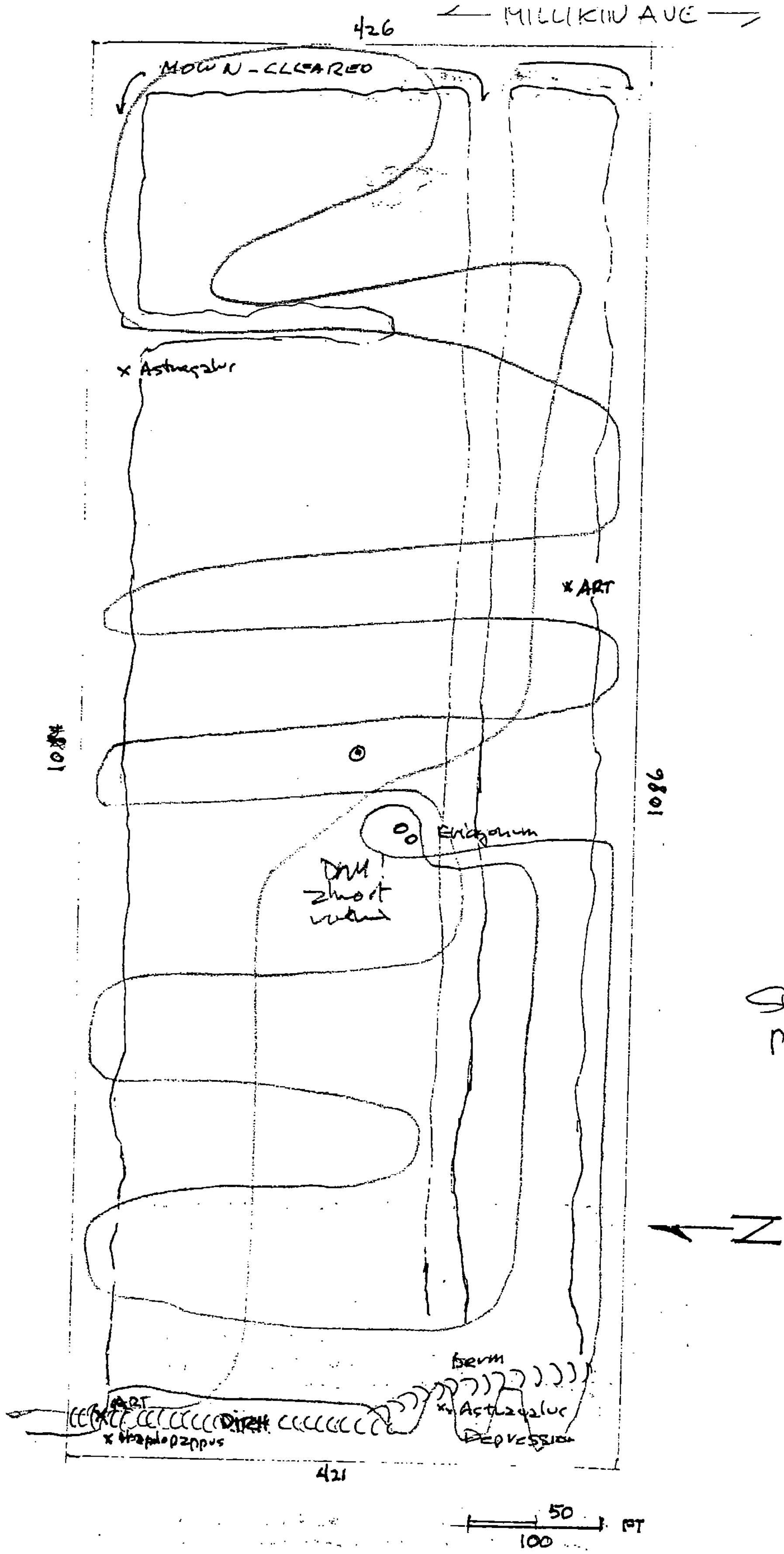
Nem 0
Atalanta 5
Pontidae 4

Sept. 5 15

← JURUPA

PANATTONI PROPERTY

ABANDONED VINEYARD



Dry !

OPEN PIT

date time

wind

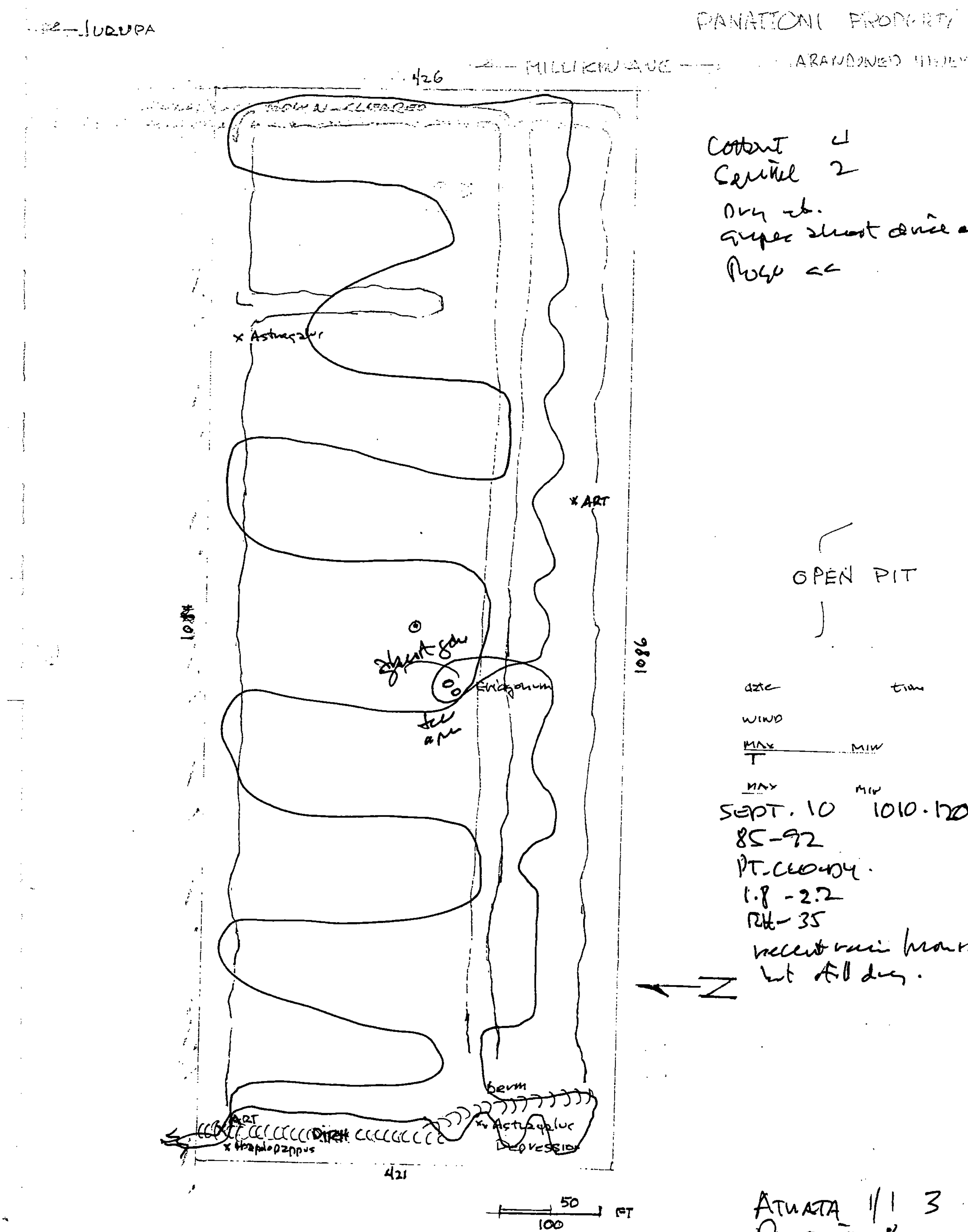
MAX T MIN

MAX MIN

Sept. 8 PT CLOUDY
pleasent
74 - 87
1,9 - 3.0
RH ~ 40

ATRATA ~~||||~~ ||| 8 !

Sept. 8 16



Cottont 4
Sentinel 2
Dry rb.
gopher [illegible] at
Rogo ac

OPEN PIT

date time
WIND
MAX MIN
T
MAX MIN

SEPT. 10 1010-1205
85-92
PT. CLOUDY.
1.8 - 2.2
RH - 35
recent rain [illegible]
but All day.

ATUATA 1/1 3
PANATTONI 8

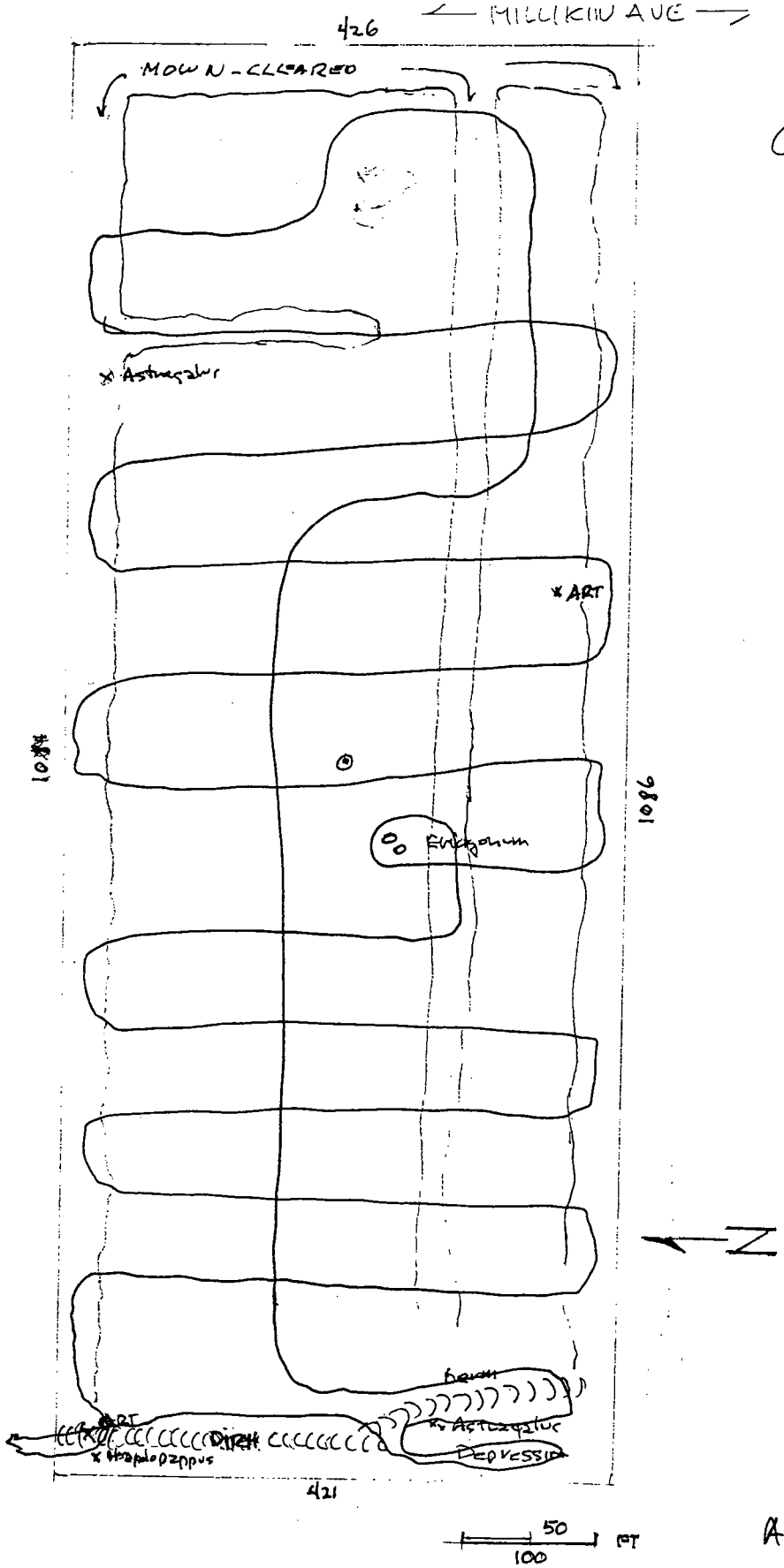
SEPT 10 17

← JURUPA

PANATTONI PROPERTY

ABANDONED VINEYARD

← MILLIKIN AVE →



COUNT / SQUIRREL
4/2

OPEN PIT

SEPT. 14
1000 - 1200
WINDY
4.5 - 5.5
82 - 92
SCATTERED CLOUDS
HOT / WINDY
[illegible]

Z

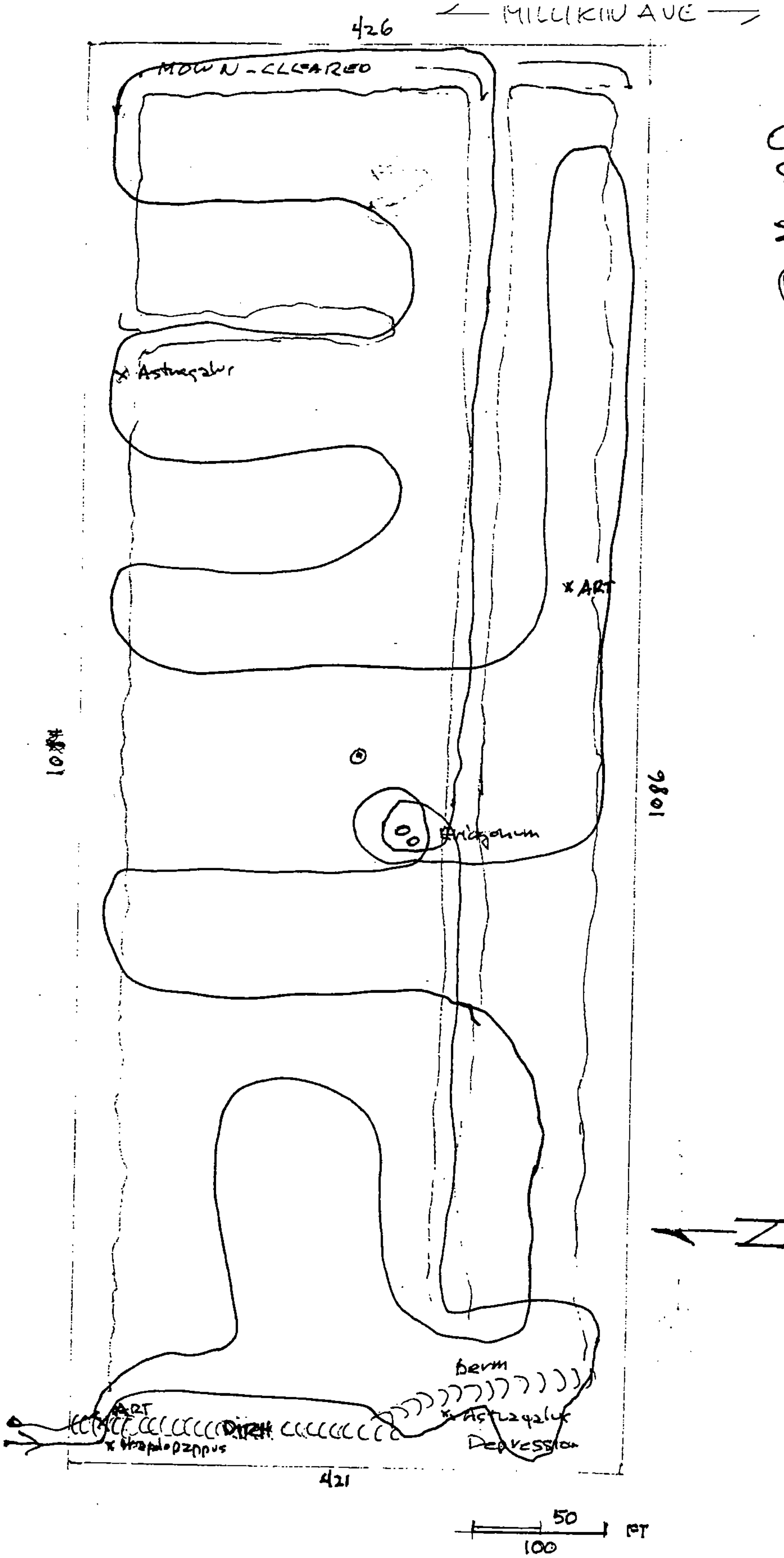
ATNATA 11 2

SEPT. 14 18

← JURUPA

PANATTONE PROPERTY

ABANDONED VINEYARD



Cottontail 5
Squirrel 1

almost no lizards

[illegible]
[illegible]
[illegible] lot of [illegible]
laying eggs
grasses short gone
- drying
no birds

OPEN PIT

PM - [illegible]

Sept. 17
1010 - 1200
CLEAR
75 - 87
1.8 - 2.7
pleasant in
U. Dry

ATRATA II 2

[illegible] Sept. 17 19

APPENDIX F

2001 Biological Survey for the
Delhi Sands giant flower loving fly
September 2001,
Agresearch, Inc.

F-8.3

2001
Biological Survey
for the Delhi Sands giant flower-loving fly
Rhaphiomidas terminatus abdominalis
Millikin Avenue south of Jurupa Street

City of Ontario
San Bernardino County, California

for ENSR
project number 8799-166-000

Field Research and Report

by

Rudi Mattoni, Rick Rogers, and Jeremiah George
Agresearch, Inc.
9620 Heather Road
Beverly Hills, CA 90210

September 30, 2001

The listed investigators performed all the fieldwork reported herein and prepared this report independent of any outside influence. These investigators assert that the data contained herein are correct and that the conclusions presented are their own
Survey conducted under authorization by
U. S. Fish and Wildlife Service permit TE-807303

Rudi Mattoni

Rick Rogers

Rick Rogers

Jeremiah George

2001
Biological Survey
for the Delhi Sands giant flower-loving fly
Rhaphiomidas terminatus abdominalis
Millikin Avenue south of Jurupa Street

City of Ontario
San Bernardino County, California

for ENSR
project number 8799-166-000

Field Research and Report

by

Rudi Mattoni, Rick Rogers, and Jeremiah George
Agresearch, Inc.
9620 Heather Road
Beverly Hills, CA 90210

September 30, 2001

The listed investigators performed all the fieldwork reported herein and prepared this report independent of any outside influence. These investigators assert that the data contained herein are correct and that the conclusions presented are their own
Survey conducted under authorization by
U. S. Fish and Wildlife Service permit TE-807303

Rudi Mattoni

Rick Rogers

Jeremiah George

Results of the 2001 Biological Survey for the Delhi Sands giant flower-loving fly across an approximate ten acre parcel located on Millikin Avenue south of the Jurupa Street, City of Ontario, San Bernardino County, California.

Rudi Mattoni, Rick Rogers, and Jeremiah George
Agresearch, Inc.
9620 Heather Road
Beverly Hills, CA 90210

INTRODUCTION AND BACKGROUND

The following report summarizes the second focused survey for the Delhi Sands Giant flower-loving fly, *Rhaphiomidas terminatus abdominalis*, hereafter referred to as DSF, across a proposed development site in the City of Ontario, San Bernardino County, California. The subject property is located on the west side of Millikin Avenue approximately0.3 miles south of Jurupa Street. The total area of the site covers approximately 10 acres. We surveyed the same property in 2000. That report should be in your files.

The survey was conducted by Rick Rogers, Jeremiah George, and Dr. Rudi Mattoni, individuals permitted (permit number TE-807303) by the Fish and Wildlife Service (FWS) to perform such work using a protocol established by the FWS. Location of the site is shown on the inset map of southern California, figure 1. Figure 1 also shows the site location outlined over the general features on a 1994 USGS aerial photograph.

Features of the both the physical and biological environment of the parcel most likely to be important in determining demographics of the DSF were noted to provide an evaluation of overall habitat quality. The plant community was assessed in semi-quantitative terms based upon plant species identifiable in August and September 2000, Repeated observations this year, 2001, show no essential differences. The plant listing compares species found against the background of all native plant species known from the Delhi Sands. Invasive non-native species are also listed with gross soil conditions noted. Figure 2 is a map we prepared that delineates our best estimate of general habitat values based on soil and plant community characteristics. The complete raw data of each survey day is included with the original copy of this report. Additional copies are available upon request.

METHODS AND MATERIALS

The Delhi Sands giant flower-loving fly survey

Field data collection was primarily a focused visual search for DSF adults and pupae, following FWS guidelines, which specify observations at least between 1000 and 1400 hours on clear days with low wind velocities. General weather conditions were noted. Temperature, relative humidity and average wind speeds were taken using a Kestrel 3000 hand-held monitor at the beginning and end of each sampling period on most days.. Information on other sightings of the DSF from nearby public lands that our team surveyed is also noted as part of this report. The latter data are all available public

information and serve as a control for time of DSF flight. Further data by Rogers included recording all large insect species present with notes on vertebrates.

For each day surveyed, random walks were conducted across the property. Because of dense, mostly non-native grass growth and other obstacles, the path followed the more open sections of the vineyard section of the property, with concentrated walks around the disked periphery that was the most likely habitat for DSF. Virtually every segment of the property was covered. The walks each day covered all areas with special attention to the small amount of higher native plant cover along the open drainage basin on the western and southwestern section. Rogers traced his walks on the field map we prepared. George walked in a random fashion, as did Mattoni on his days at the site. Mattoni noted the vegetation survey on his first day at the site, which was virtually unchanged from the prior year. All surveyors spent two to four hours on each day of the survey at the site.

Other insects and vertebrates

Rogers recorded data on all insect sightings during his surveys. Although George and Mattoni are familiar with a number of insect species in addition to DSF, *Apiocera* spp, and *Nemomydas pantherinus*, they did not possess the experience of Rogers for identification of the whole community of flying insects in the field. Numbers of *Apiocera* spp (Apioceridae) and the more closely related mydid fly *Nemomydas pantherinus* (Mydidae) were noted. Sightings of mammals, birds or reptiles that were familiar to the investigators were noted.

Soil survey

The soil substrate was evaluated by visual characterization based upon: 1) fine sand substrate without evidence of alluvial materials or imported material, 2) presence of cryptobiotic crusts indicating stable soil surfaces with no disturbance history for several years and 3) disturbance characteristics

The plant community

Plant species present were noted during random walks across the entire site made by Mattoni. A semi-quantitative list of all species found during these surveys are in table 3, which for comparison lists all of the species presently known from all Delhi Sands formations as previously determined across a number sites by Sanders and Mattoni (unpublished).

RESULTS

Delhi Sands giant flower-loving fly census

Neither adults nor pupa cases of Delhi Sands giant flower-loving flies were seen across the property in spite of 16 days of intensive observation by highly experienced biologists. Weather conditions were all within FWS guideline specifications for almost every moment in the field. In general, temperatures were cooler than last year. The sampling times completely encompassed control DSF flight at other localities.

There is no evidence of DSF being found on the property, although DSF were reported "nearby" by FWS personnel. Rogers noted DSF on a Millikin Avenue site farther to the south several years earlier. This is the second year with negative findings. There is no evidence of a breeding population on the site.

Other insects and vertebrates

A single male of the fly *Apiocera convergens* was sighted on the southwest on August 8 (nb a single male was seen last year). *Apiocera*, although members of a different family, Apioceridae, tend to occupy similar plant community and substrate types and fly at the same times as rhaphiomidids. Their flight period extends several weeks longer. By comparison, none were seen at the Colton core habitat where hundreds were observed in 2000. Another possible surrogate/indicator species, *Nemomydas pantherinus* is in the family Mydidae, the same as *Rhapiomidas*. Three individuals were sighted. The species has a different set of life history characteristics from DSF, as larvae are predaceous on beetle larvae. At best these fly species indicate some "natural" habitat conditions exist, although these conditions may be completely unrelated to DSF. Other flying insects noted were highly depauparate in comparison to last year. Only about 60% of the species observed then were found. The low numbers of the target species at the Colton core habitat all correlate by inferring poor general conditions.

The Table 3 does not cite any vertebrates observed or their signs. The few vertebrates seen were commonplace species: cottontail rabbits and ground squirrels. No burrowing owls, known from region, were seen. There were also no signs of the Los Angeles pocket mouse, nor were any reptiles other than *Uta* seen.

The plant community, semi-quantitatively presented from in Table 2 for the site, is depauperate. There is a notable absence of common buckwheat, *Eriogonum fasciculatum*, with only one of the dominant indicator species of natural Delhi formations present, *Croton californicum*. A small stand of one species, the rattlepod *Astragalus trichopodus*, remains in the southeast depressed section, the most undisturbed appearing portion of the site.

An approximate 30 foot swath of disked substrate borders the north, south, and west sides of the site. Few plants have re-established in this disturbed portion, mostly non-native annuals. The disturbance appeared to have taken place in 1999. Most of the remainder has a senescing vineyard of grapes with dense cover of mostly non-native annual grasses and perennial horehound (*Marrubium vulgare*). A depression across the southeast section is the most open area, about 0.5 acre, with no plantings, but signs of having been recontoured for drainage purposes in time past.

All plant species known from the Delhi Sands community are given in table 2. Of the 78 natives known, only 6 perennial species and 11 annuals were found on the Millikin Avenue property. Further, all were found in low frequency. By comparison, 15 non-native exotic plants invaded the site from a total of 43 invasive species known across the whole Delhi Sands dune system. As depauparate as the site is in species richness, actual species densities (cover) are even more deficient.

Habitat delineation

The status of the soil substrate is the most definitive habitat characteristic for DSF. At present the only determination of suitable habitat is by correlation of DSF with certain physical and biotic variables. The definitive characteristics are presence of pure Delhi fine sand, low plant cover, and a few indicator plant species: Croton, telegraph weed, and common buckwheat. There are no data that define the determinants of DSF based on the life history requirements during the almost year-long fossorial larval stages. Since our observations indicate no extensive occurrence of free flowing sand at the site – which exhibits a high content of alluvial rock and geochemical consolidation of sand – and with few indicator plants and dense non-native grass cover, we consider the site as highly unlikely DSF habitat.

CONCLUSIONS

The survey and study supports the null hypothesis that Delhi Sands giant flower-loving flies do not occupy any part of the site as a breeding population. The results reiterate the survey of last year. These results also indicate that no DSF migrants appeared from the nearest known occupied habitats, which lie at some indeterminate distance and which may also not represent viable populations. Cursory inspection of surrounding sites implies that the mined pit to the south and the adjacent landscaped trash-dump cover would not support DSF. The parcel to the east is an abandoned vineyard similar to the subject property, with land further to the north destroyed by development.

Under current conditions, with the major low cover areas the result of repeated clearing around the periphery by disking, the property is unsuitable as DSF habitat, possibly excepting the 0.5 acre northwest corner depression. In addition to the sparse and unnatural plant cover, the remaining arthropod community is depauperate. The low density of harvester ants and absence of *Messor sp.* ants, species associated with DSF occurrence may have resulted from the disturbance activities, or possibly a function of the apparent high alluvial content of the substrate.

Even given the anecdotal sightings of DSF in the vicinity within the past decade, we believe the site is unsuitable for a population to establish even were dispersal to occur. The alluvial nature of the substrate, low general insect species richness, depauperate native flora and lack of low cover do not support the hypothesis of suitable DSF habitat.

The dispersive behavior of the DSF also remains unknown. Although most observations indicate the fly is relatively sedentary with high site fidelity, few individuals have been sighted in areas that do not appear suitable. All dispersants noted have been males. The low frequency of such events does not permit generalizations concerning individual movements and with respect to females since they are simply not as frequently seen in the best of habitats. Since no DSF were seen the point remains moot.

List of Tables, Figures, field notes

Tables

Figures

Attachments: (original report copy only)
Field notes and maps, 16 pages.

Table 1

Millikin Avenue, Ontario, California. Summary and calendar of field work giving days sampled, August 2 - September 20, 2001. *Rhaphiomidas terminatus abdominalis* (R. t.), *Apiocera spp.* (A) and *Nemomydas pantherinus* (N) sightings and selected weather conditions for days surveyed. Average wind speed (mph) and Temperature (F) determined using a Kestrel 3000 meter. Comparative data given for *R. terminatus* sightings at two other localities for which data were collected. Days not surveyed, ns; no weather data, nd; N, Core habitat cites the number of DSF observed at the Colton Cement core habitat; N, SCE refers to number of DSF observed at the Southern California Edison R-O-W sites on Riverside Drive & Jurupa. Observers (Obs.) were R (Rick Rogers), M (Rudi Mattoni), and J (Jeremiah George).

	Obs.	Rt.	A.	N	Temp. °F	Wind	Sky	N, Core Habitat	N, SCE
August									
1	J	ns					clear	0	0
2	J	0	0	0	86.4	1.8	clear		
3		ns							
4	R	0	0	0	90.0-93.1	2.1-3.0	clear		
5	J	0	0	0	86.3	0.9	clear		
6		ns							
7		ns							
8	R	0	1	1	85.4 – 86.3	1.7-3.2	clear	3 Rt (J)	0
9		ns							
10		ns							
11		ns							
12	J	0	0	0	80.9	c2.0-3.0	clear		
13		ns							
14		ns							
15	R	0	0	1	94.7 – 96.4	1.6-2.8	clear	3 Rt	0
16		ns							
17		ns							
18		ns							
19	M	0	0	1	95.0-97.3	1.6-2.4	clear		
20		ns							
21		ns							
22	R	0	0	0	97.4-99.2	1.8-2.4	clear	6 Rt	0
23		ns							
24		ns							
25		ns							
26	M	0	0	0	97.9-98.6	1.8-3.1	clear		
27		ns							
28		ns							
29	R	0	0	0	99.4-99.8	1.2-1.8	clear	5 Rt	0
30		ns							
31		ns							

Table 1 (continued)

	Obs.	R.t.	A.	N	Temp. °F	Wind	Sky	N, Core Habitat	N, SCE
September									
1	M	0	0	0	95.7-97.6	2.3-3.6	hazy		
2		ns							
3		ns							
4		ns							
5	R	0	0	0	94.7-98.2	2.1-3.4	hazy	7 Rt 12 A	1 Rt
6		ns							
7		ns							
8	M	0	0	0	92.6-95.1	2.8-1.7	clear		
9		ns							
10		ns							
11		ns							
12	R	0	0	0	94.7-98.0	2.1-3.4	hazy	4 Rt	0
13		ns							
14		ns							
15	M	0	0	0	89.2-92.4	1.8-3.0	hazy		
16		ns							
17		ns							
18		ns							
19	R	0	0	0	93.7-96.2	2.8-3.2	clear	0	0
20		ns							

Table 2

Plant species list and community composition by semi-quantitative cover estimates, Millikin Avenue, Ontario site with the Colton core habitat area compared for year 2000. Species not seen (0), species present as 1 to few scattered individuals (1), species common in few clumps (2), species common throughout (3). Note that these values are identical to our observations this year, 2001

	Millikin	Core Habitat
NATIVE PERENNIAL SPECIES		
Shrubs/subshrubs		
Rhus trilobata	0	1
Atemisia californica	0	1
A. dracunculus	0	2
Baccharis pilularius	1	2
B. salicifolia	1	1
Croton californicus	2	2
Encelia farinosa	0	2
Gnaphalium bicolor	1	2
G. californicum	0	2
G. microcephalum	2	2
Gutierriza californica	0	1
Haplopappus palmeri	0	3
Lepidospermum sp.	0	1
Lessingia filaginifolia	0	2
Senecio douglasii	0	1
Opuntia littoralis	0	2
O. prolifera	0	2
Sambucus mexicanus	0	0
Lotus scoparius	0	3
Salvia mellifera	0	1
Mirabilis californica	0	1
Eriogonum fasciculatum /polifolium	0	3
Ceanothus cuneatus	0	1
Rhamnus crocea	0	1
Adenostoma fascicularis	0	1
Prunus ilicifolia	0	1
Solanum douglasii	0	1
Stillingia linearifolius	0	3
Tetradymia sp	0	1
herbaceous perennials		
Malacothrix saxatilis	0	2
Chenopodium californicum	0	1
Marah macrocarpus	0	1
Cucurbita foetidissima	0	1
Rumex hymenosepalum	0	1
Datura wrightii	1	2
Bloomeria crocea	0	1
Dichölstemma capitata	0	1
Penstemon spectablilis	0	0
NATIVE ANNUAL SPECIES		
Ambrosia acanthicarpa	3	3
Heterotheca grandiflora	1	2
Conyza canadensis	1	1
Crassula connata	0	3
Stephanomeria virgata	1	3
Hemizonia fasiculata	2	2
Chaenactis glabriuscula	0	2
Filago californica	0	1
Senecio californicus ?	0	1
Rafinesquia californica	0	0
Amsinckia menziesii	3	3
Cryptantha sp. 1	3	3
Cryptantha sp. 2	1	3
Cryptantha sp. 3	0	0

Table 2 (Continued)

	Millikin	Core Habitat
NATIVE ANNUAL SPECIES (CON'T)		
Cuscuta californica	0	0
Eriastrum sapphirinum	1	3
Gilia angelensis	0	0
Lepidium nitidum	0	0
Lotus purshianus	2	3
L. strigosus	0	0
Lupinus bicolor	0	2
L. sp. (hirsute)	0	0
Phacelia distans	0	2
P. minori	0	1
Camissonia bistorta	0	1
C. micrantha	0	2
C. hirta?	0	1
Oenothera	0	2
Plantago erecta	0	1
Eriogonum gracile	3	3
E. thurberi (blowouts)	0	2
Claytonia perfoliata	0	1
Festuca megalura	0	2
F. octoflora	0	1
NON-NATIVE PERNNIAL SPECIES		
Acacia spp	0	1
Ricinus communis	0	1
Oryzopsis miliacea	1	1
Foeniculum vulgare	0	1
Schinus spp.	0	1
Nicotiana glauca	1	1
Marrubium vulgare	3	1
Eucalyptus spp	0	1
Lobularia maritima	0	1
Convulvulus arvensis	0	1
Ariplex semibaccata	0	1
NON NATIVE ANNUALS		
Anagallis arvensis	?	1
Brassica spp	3	2
Centaurea miletensis	3	1
Chaemosyce maculata	?	1
Chenopodium murale+album	1	1
Conyza bornariensis	1	1
Erodium spp	1	1
Galium asparine	?	1
Hirschfeldia incana	2	3
Lactuca serriola	0	1
Malva parviflora+nicaeensis	1	1
Medicago & Melilotus spp	1	1
Oenothera laciniata	1	1
Oxalis pes caprae	?	2
Raphanus sativus	0	1
Silene gallica	?	1
Spergula arvensis	?	1
Salsola tragus	1	1
Sonchus oleracea	1	1
S. asper	1	1
Urtica urens	0	1
Tribulus terrestris	2	1
Avena barbata + fatua	3	2
Bromus diandrus+mollis+tectorum	3	2
Hordeum leporinum	0	1
Schismus barbata	2	1

Table 3
List of insect species observed at Millikin Avenue, Ontario, between August 5 and September 20, 2000 by Rogers, George, and Mattoni. Orders all caps underlined, families boldface.

ODONATA
Aeshniidae
Anax junius
Aeshnia multicolor
Libellulidae
Sympetrum corruptum
Libullela saturata
Pantala hymenea

HEMIPTERA
Pentitomidae
Cholorchora sayi
Largidae
Largus cinctus

LEPIDOPTERA
Papilionidae
Papilio cresphontes
Pieidae
Pieris protodice
Colias eurytheme
Nyphaliodae
Junonia coenia
Vanessa cardui
V, virginiensis
Lycaenidae
Strymon melinus
Plebejus acmon
Brephidium exilis
Hesperiidae
Hylephila phyleaus

DIPTERA
Tabanidae
Tabanus punctifer
Apioceridae
A. convergens
Mydidae
Nemomydas pantherinus
Bombyliidae
Toxophora sp.
Paracosmus sp
Aphoebantus bilineatus
Thyridanthrax atrata
Villa molitor
Rhynchanthrax caprae

Neodiplocampta mira
Poecilognathus sp. 1
Syrphidae
Eristalis latifrons
Tachinidae
Gymnosoma fuliginosa

HYMENOPTERA

Gasteruptiidae
Gasteruption sp.
Chrysididae
Argochrysis mesillae
Chrysis sp
Formicidae
Pogonomyrmex californicus
Mutillidae
Dasymutilla californica
Pompilidae
Anoplius sp. 1
Vespidae
Eumenes bollii
Polistes aurifer
P. apachus
P. exclamans
Sphecidae
Bembix americana
Microbembix californica
Tachytes distincta
Hoplisoides diversus
Haplomelinus lbitomentosis
Mimesa sp. 1
Lirius aequalis
Prionyx parkeri
P. Foxi
Sceliphron servilleii
Chalyon calironicum
Ammophila aberti
A. sp. 1 black
A. sp. 2 red
Andrenidae
Perdita sp.
Colletidae
Colletis sp
Megachilidae
Megachile sp. 1
M. sp 2
Anthophoridae
Anthophoris sp. 1
Melessodes sp. 1
Apidae
Apis mellifera

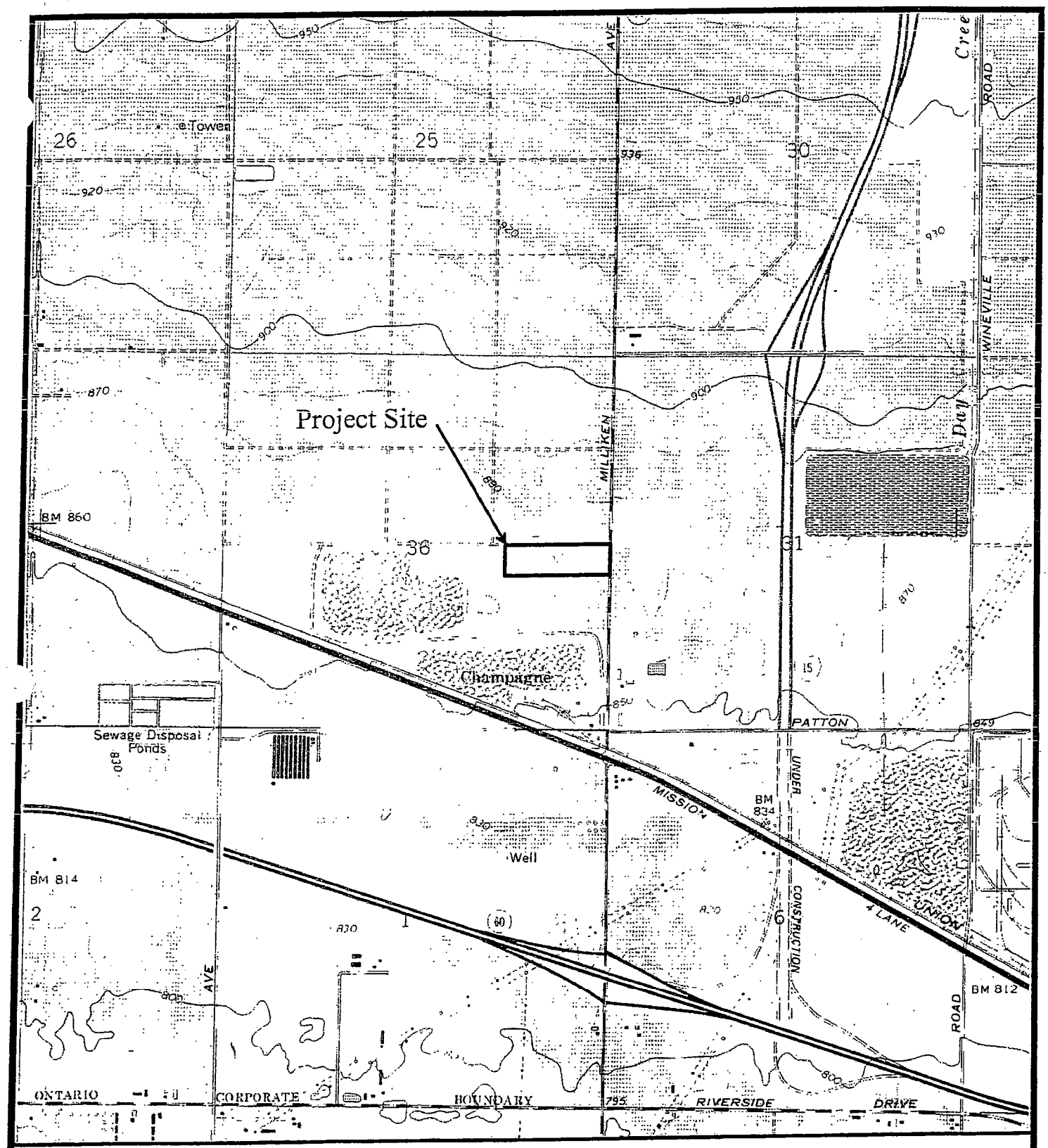


Figure 1
Milliken Avenue site, City of Ontario. Regional map outlining subject surveyed property on the USGS 7.5-minute topographic map, Guasti 1978. Inset locates Ontario on a map of California.

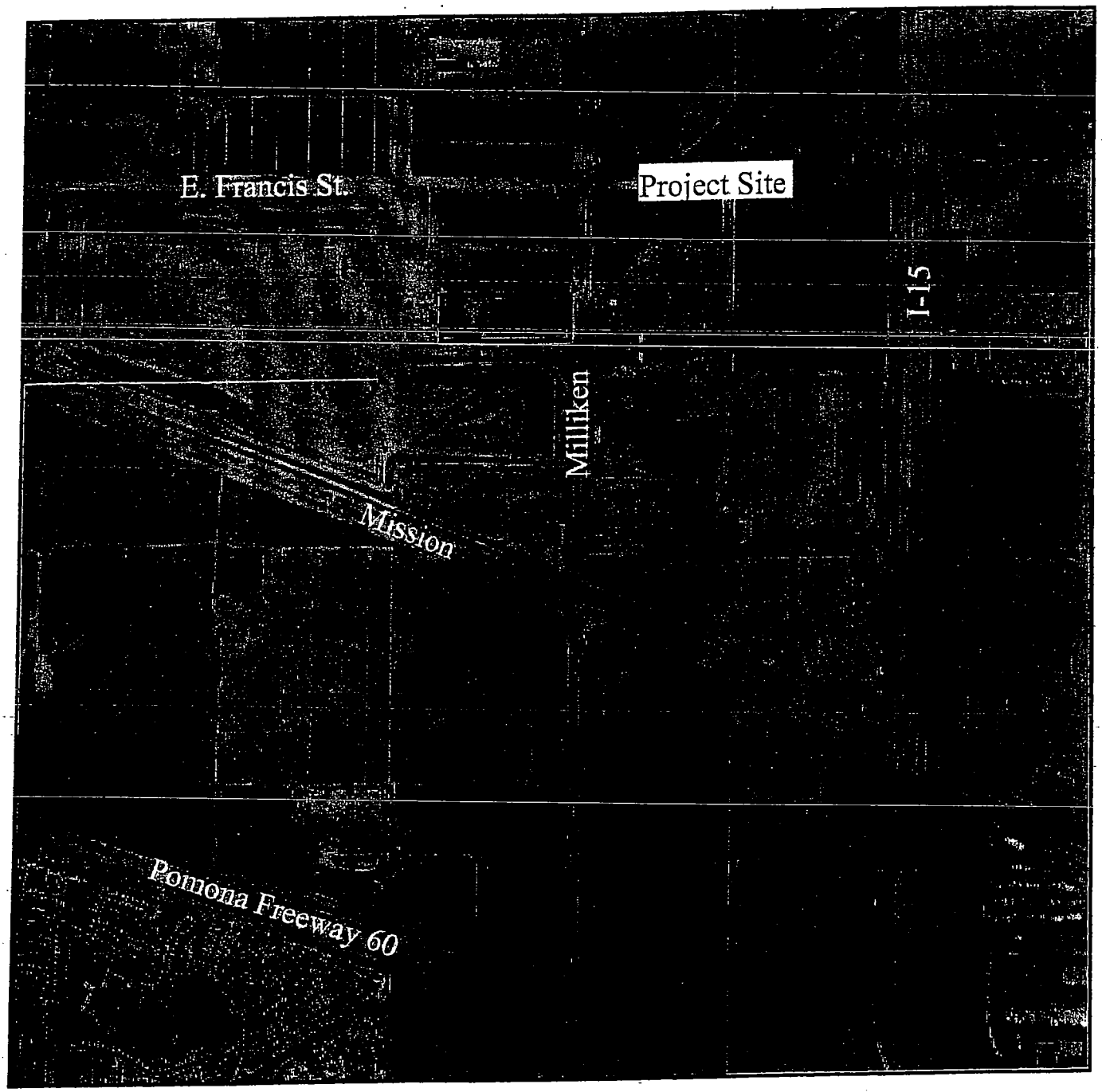
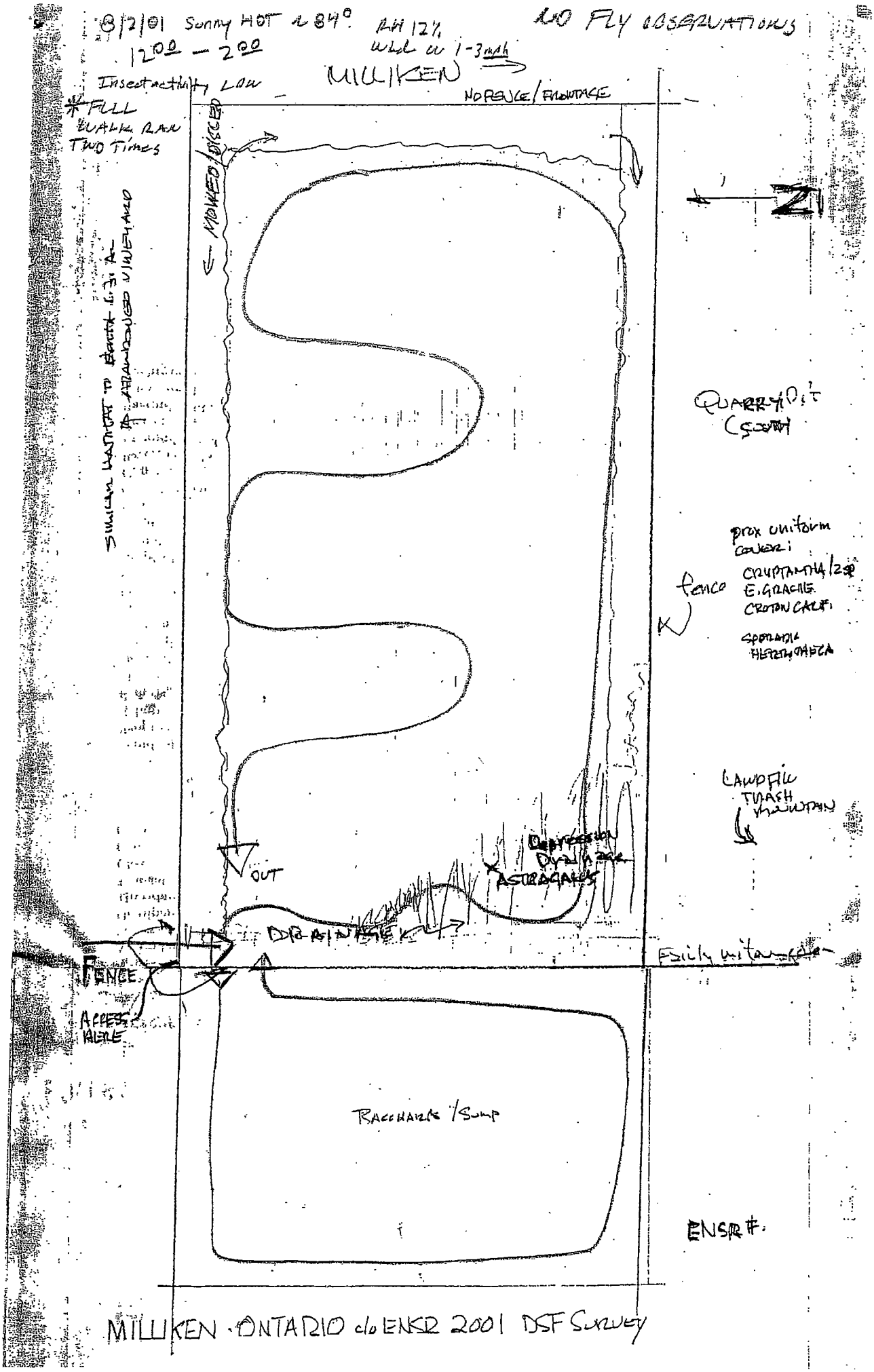
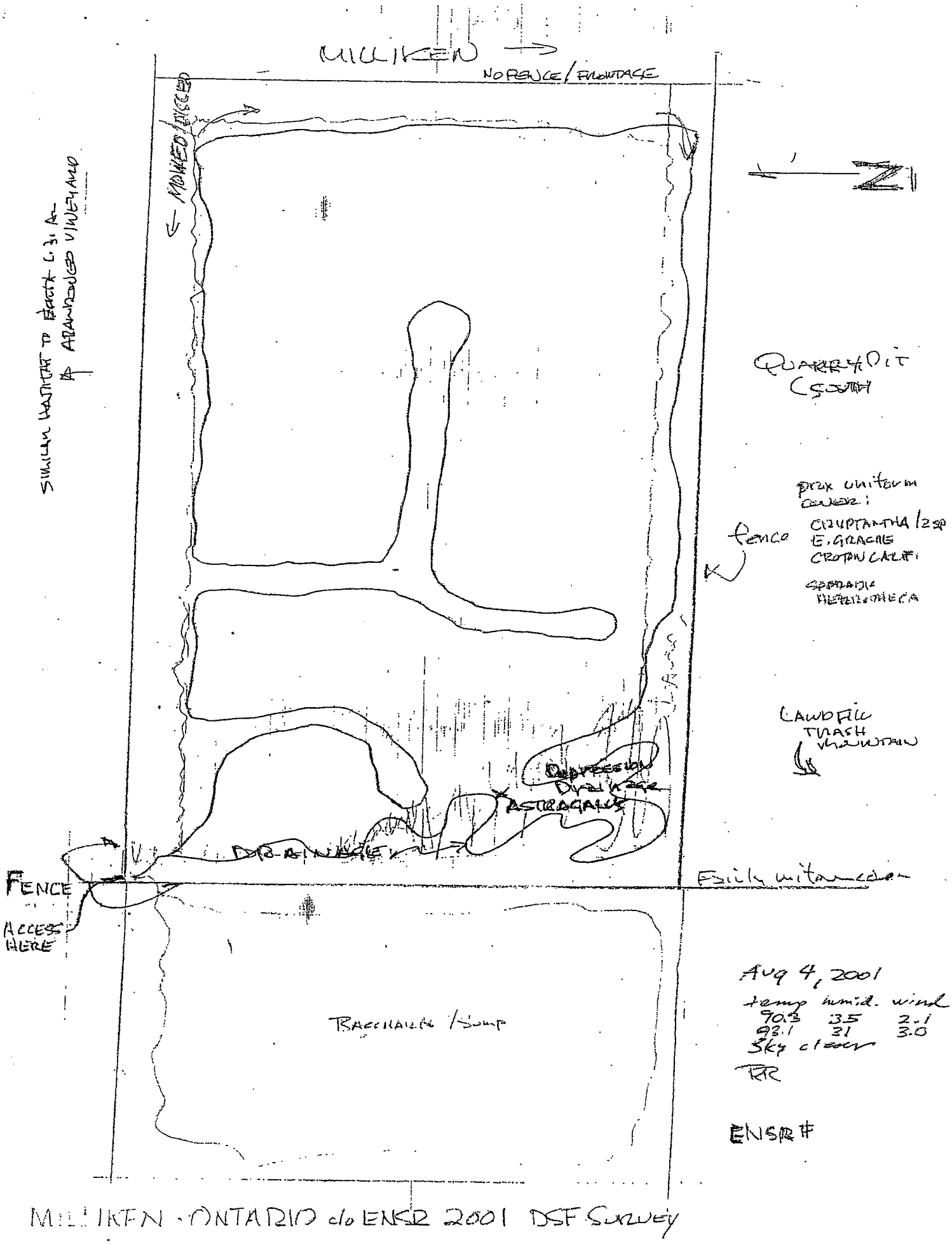


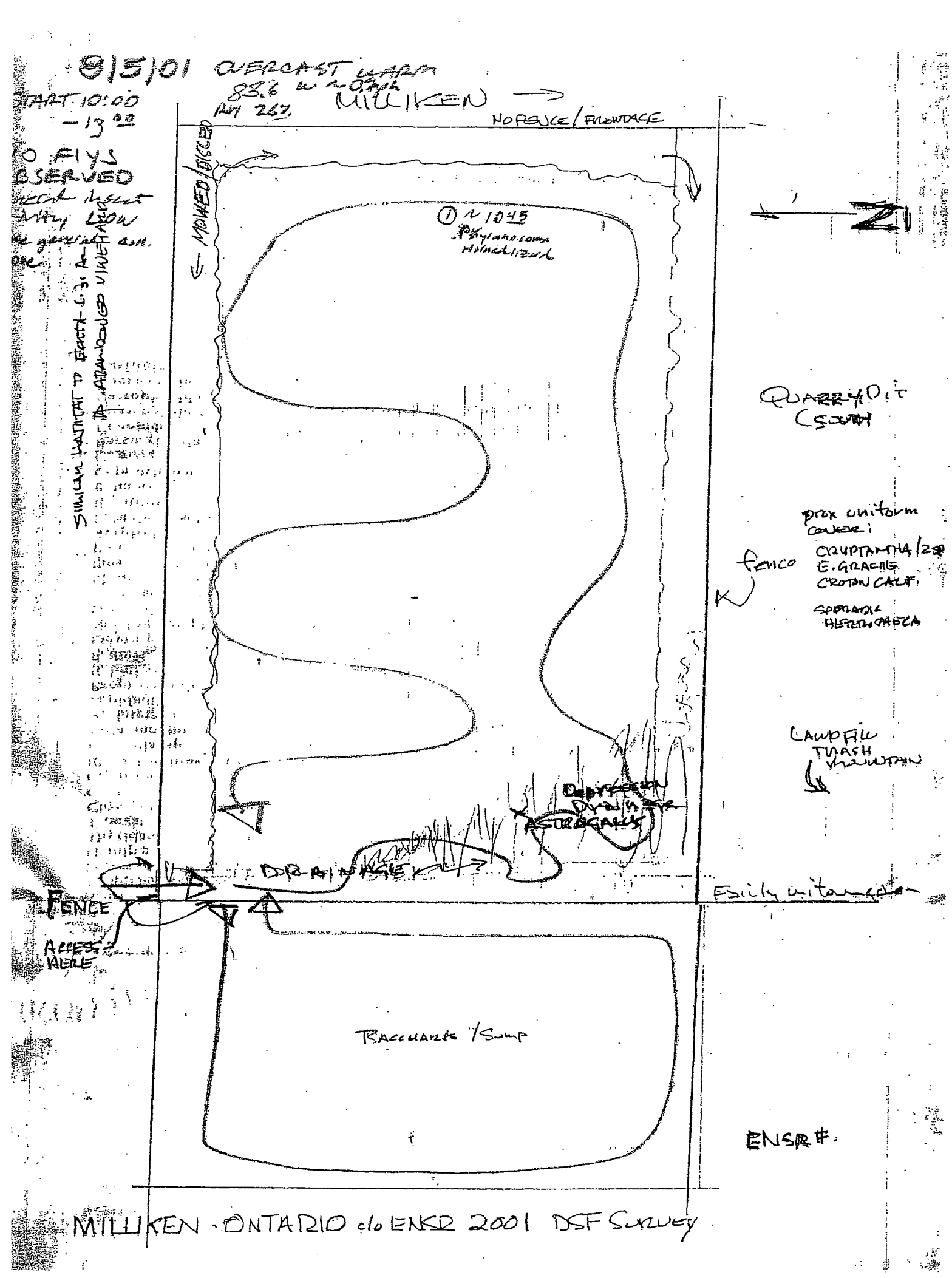
Figure 1
Milliken Avenue site, City of Ontario. Regional map outlining subject surveyed property on the USGS Guasti aerial photograph, 1994. Inset locates Ontario on a map of California.



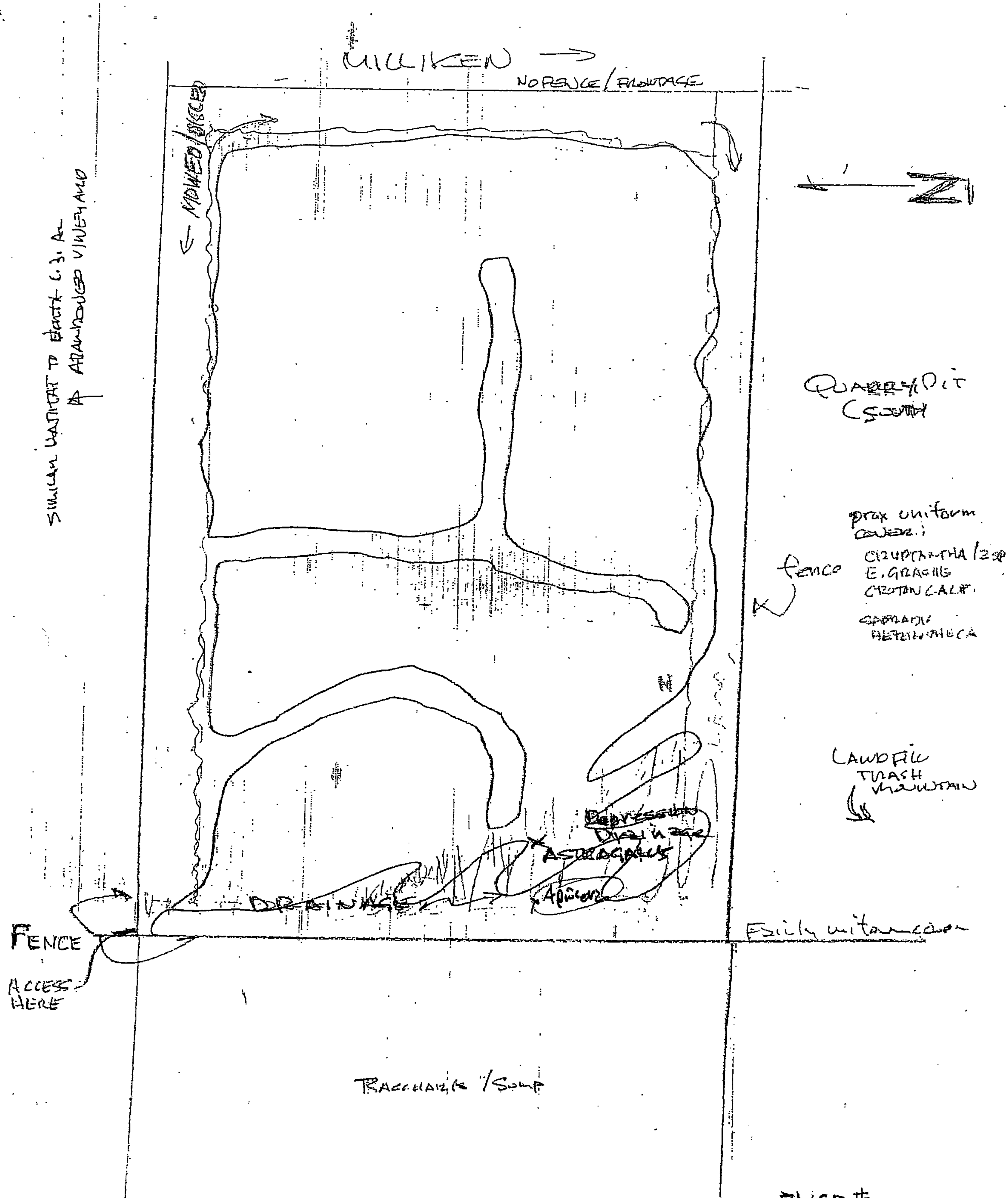
MILLIKEN ONTARIO c/o ENSR 2001 DSF SURVEY



MILLIKEN - ONTARIO c/o ENSR 2001 DSF SURVEY



MILLIKEN - ONTARIO c/o ENSR 2001 DSF SURVEY



ENSR #

Aug 8, 2001

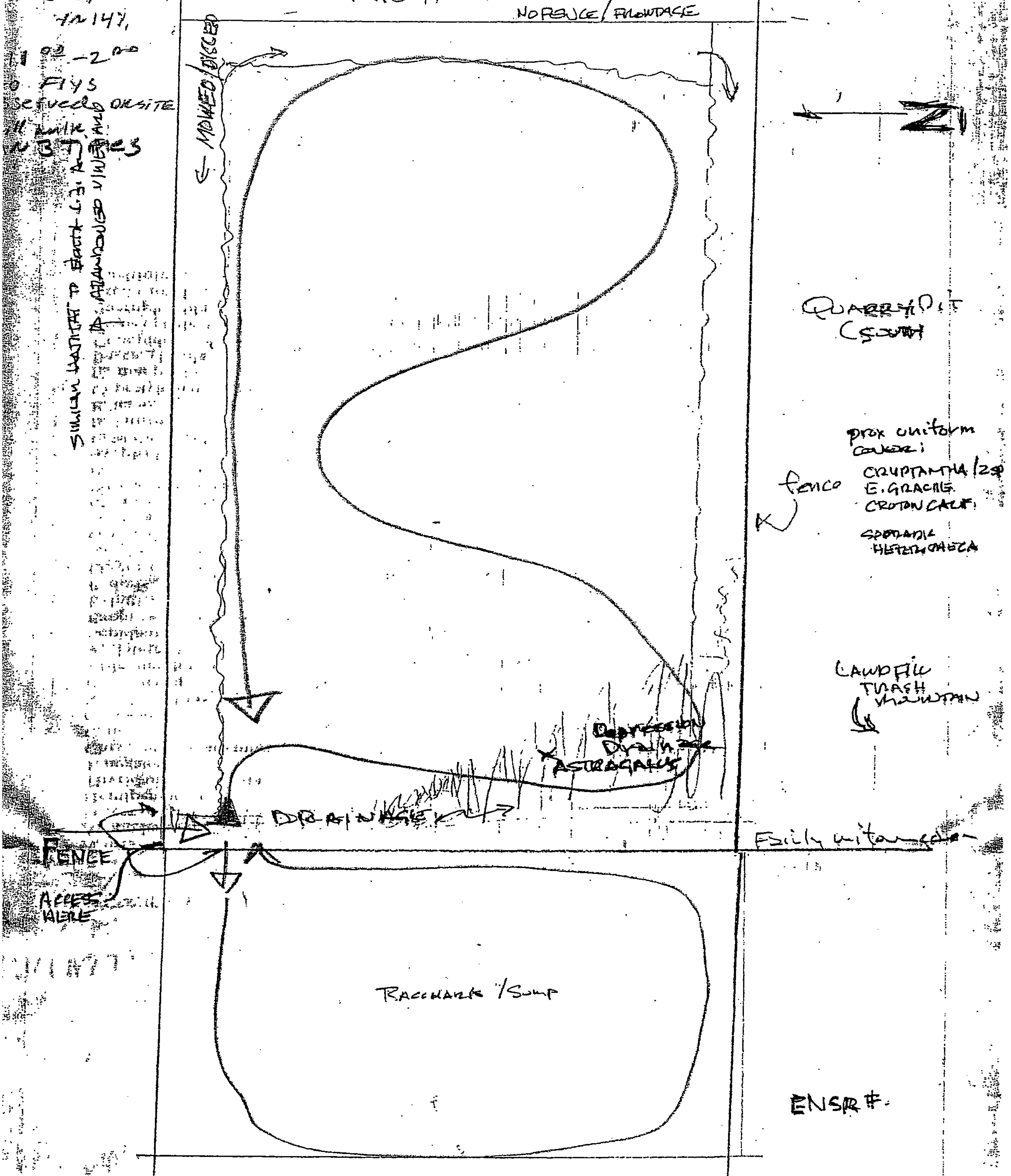
MILLIKEN ONTARIO c/o ENSR 2001 DSF SURVEY

	temp.	humid.	wind
12:00	85.4	37	1.7
2:00	86.3	3?	3.2

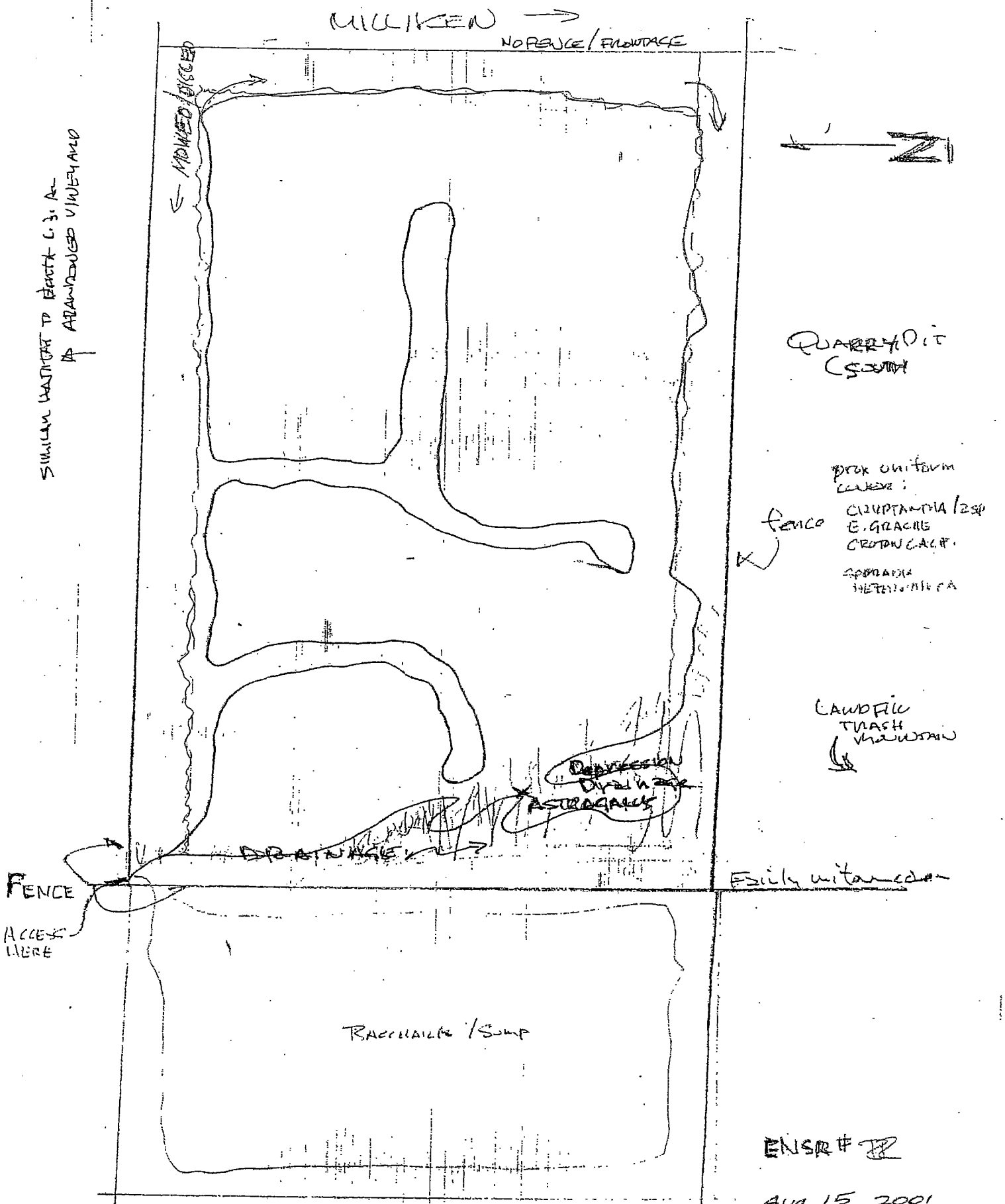
8/12/01 FIYS OUT @ Edison & cement Plant see other NOTES.

80.9° W 1-2mph

MILLIKEN →



MILLIKEN · ONTARIO c/o ENSR 2001 DSF SURVEY

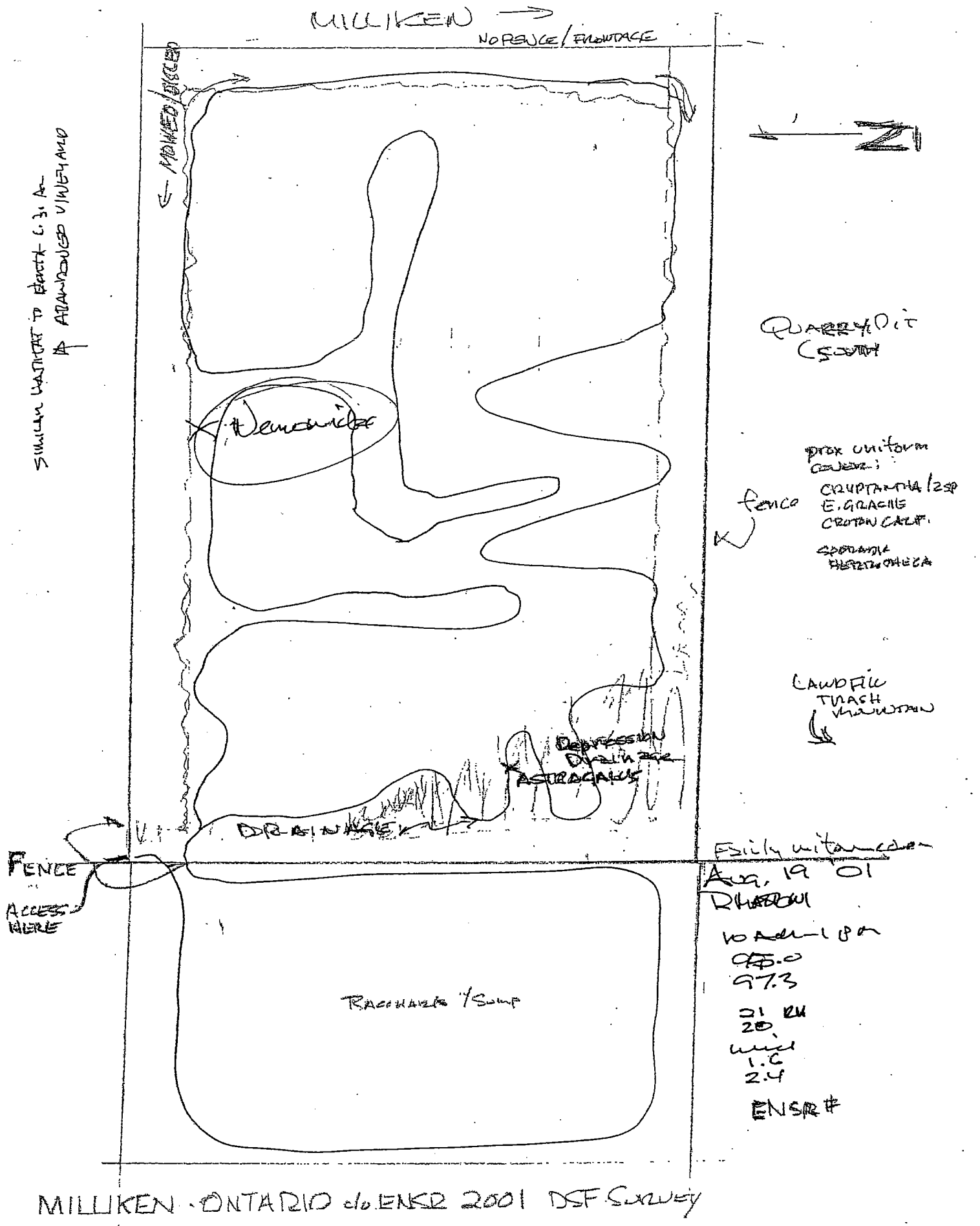


ENSR # [illegible]

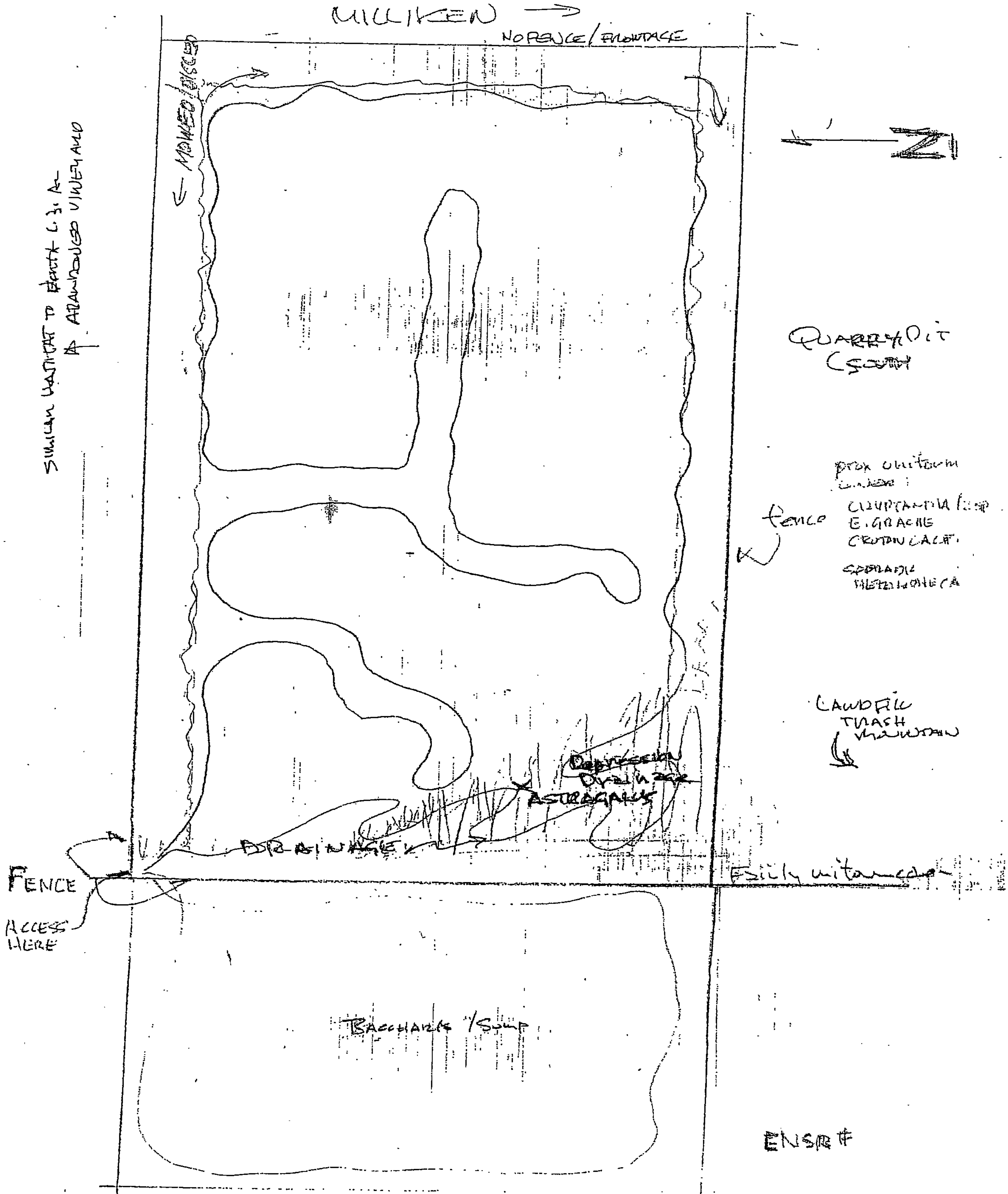
Aug 15, 2001

	temp.	humid.	wind
	94.7	22	1.6
	96.4	20	2.8

MILLIKEN - ONTARIO c/o ENSR 2001 DSF SURVEY



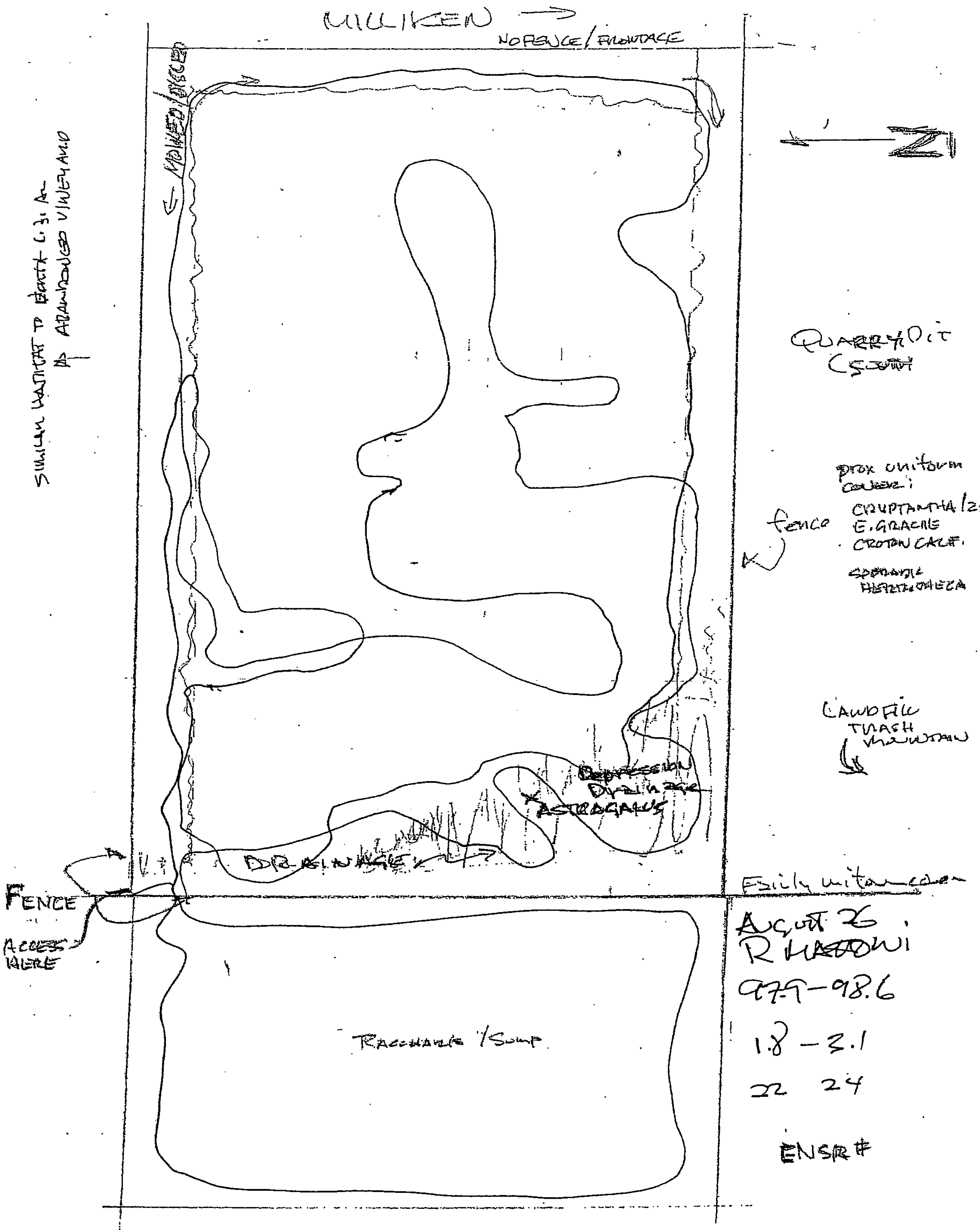
MILLIKEN - ONTARIO c/o ENSR 2001 DSF SURVEY



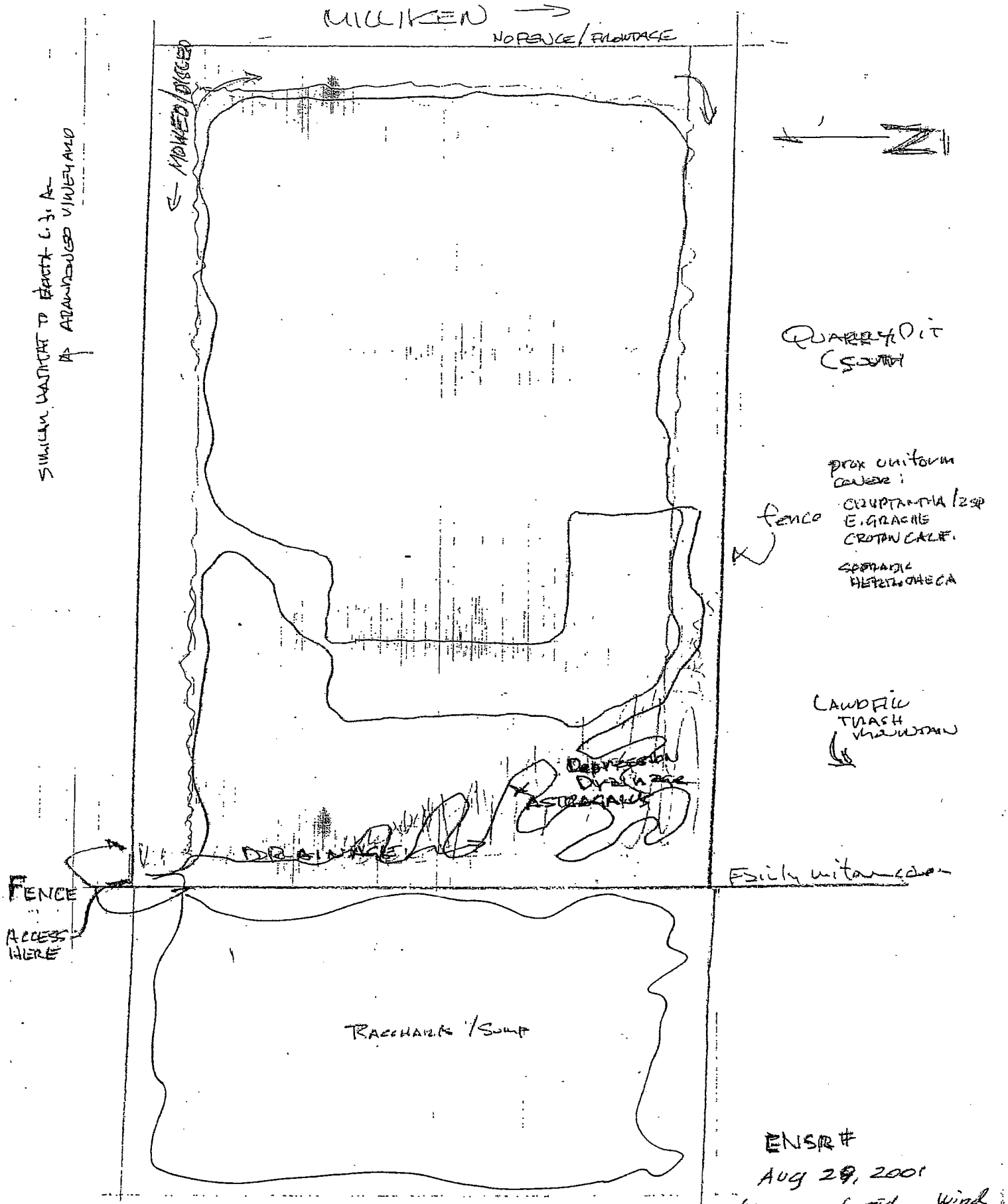
Aug 22, 2001

MILLIKEN · ONTARIO c/o ENSR 2001 DST Survey

temp.	humidity	wind
97.4	30	1.8



MILLIKEN · ONTARIO c/o ENSR 2001 DSF Survey



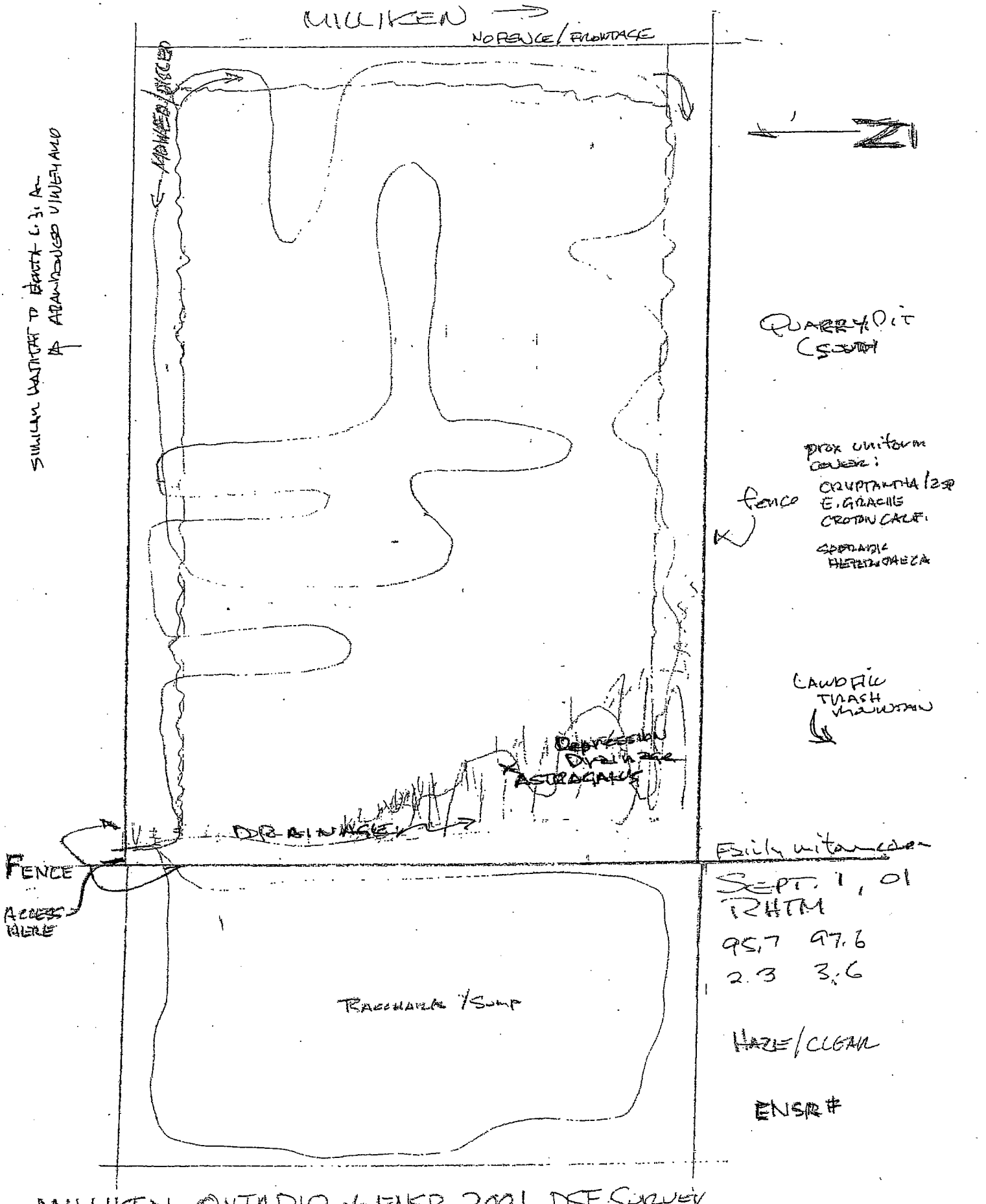
ENSR #

Aug 29, 2001

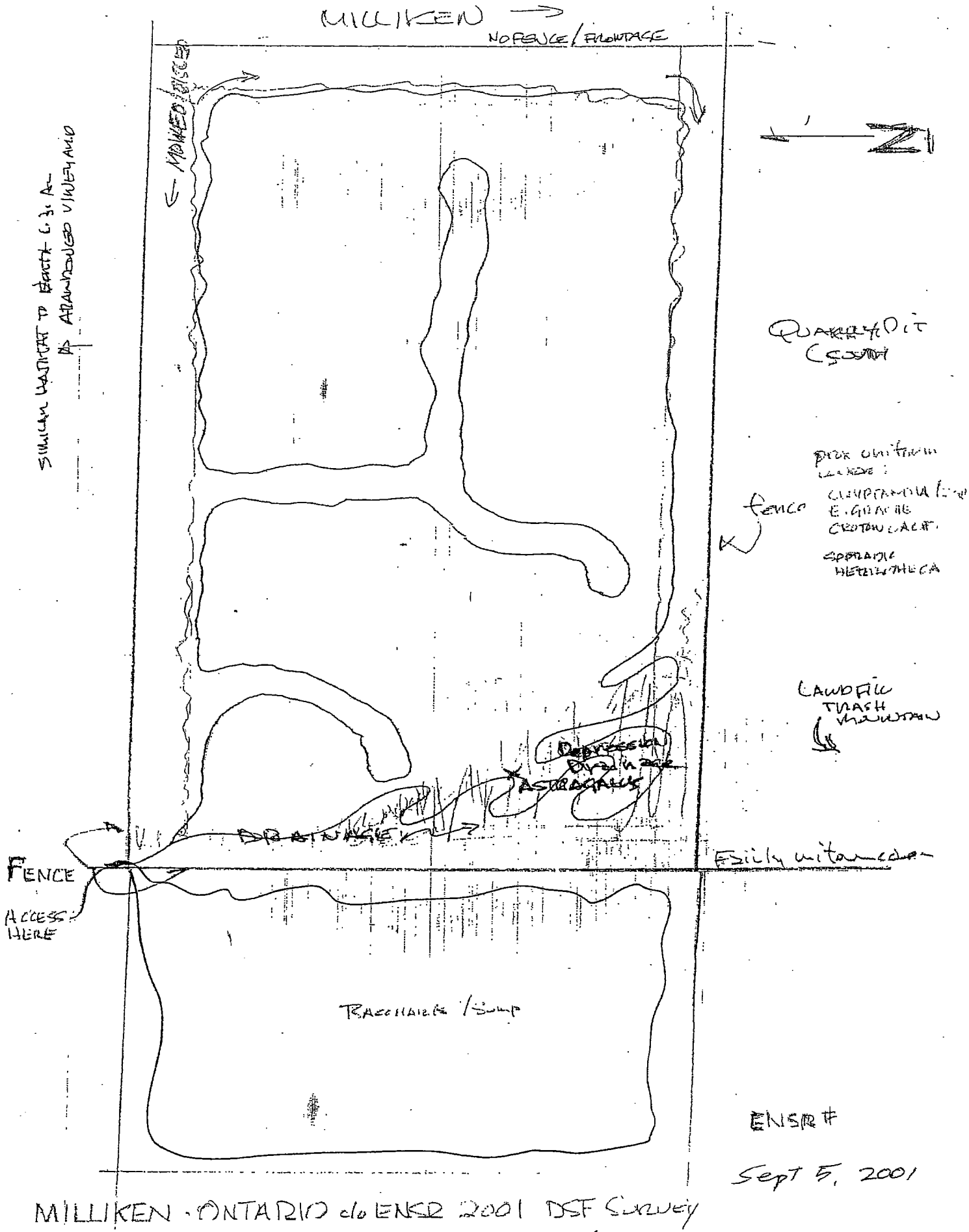
temp	humid.	wind
99.4	26	1.2
99.8	24	1.8

Sky clear

MILLIKEN - ONTARIO c/o ENSR 2001 DSF SURVEY



MILLIKEN - ONTARIO do ENER 2001 DSF SURVEY



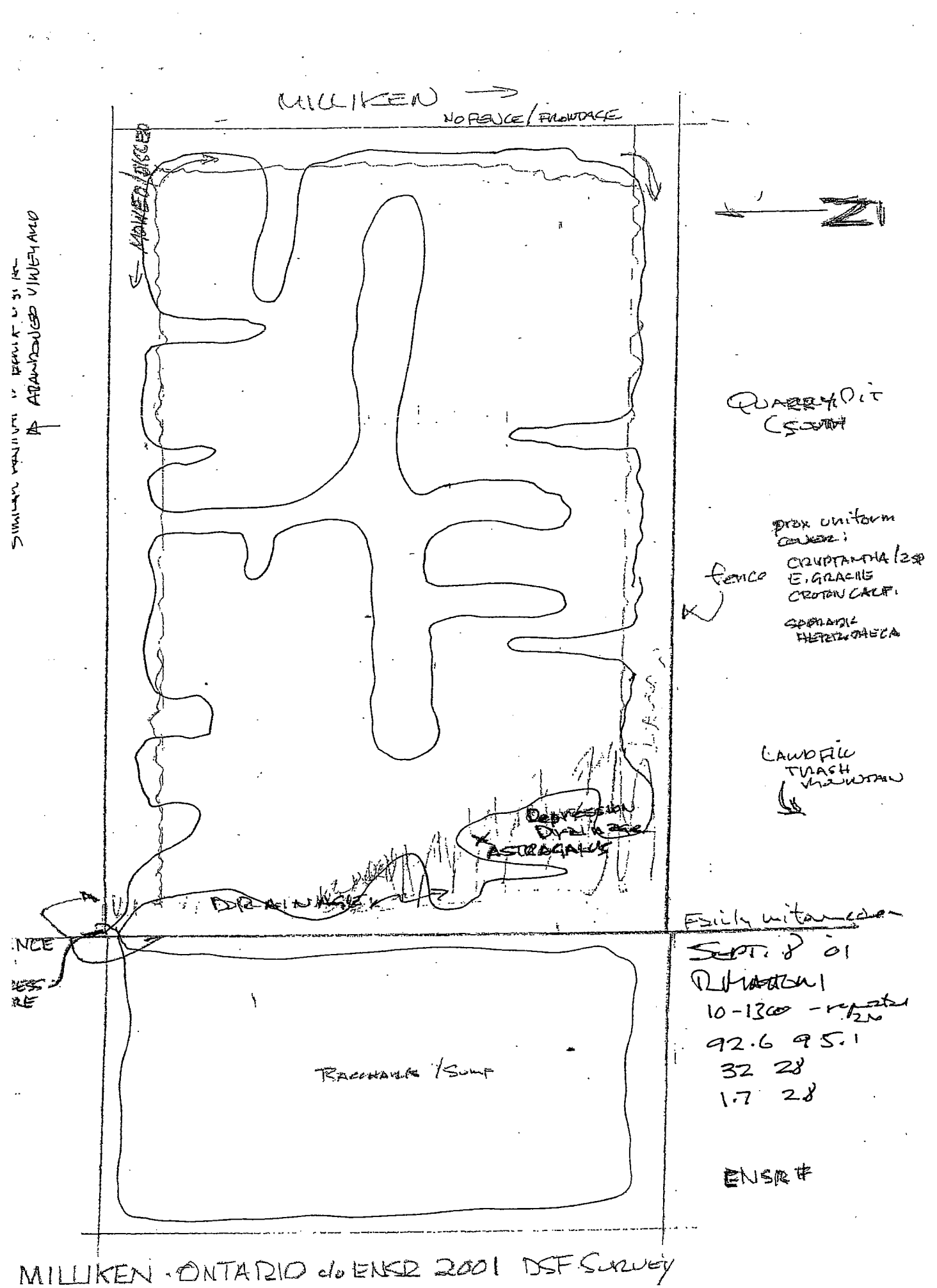
MILLIKEN - ONTARIO c/o ENSR 2001 DSF Survey

ENSR #

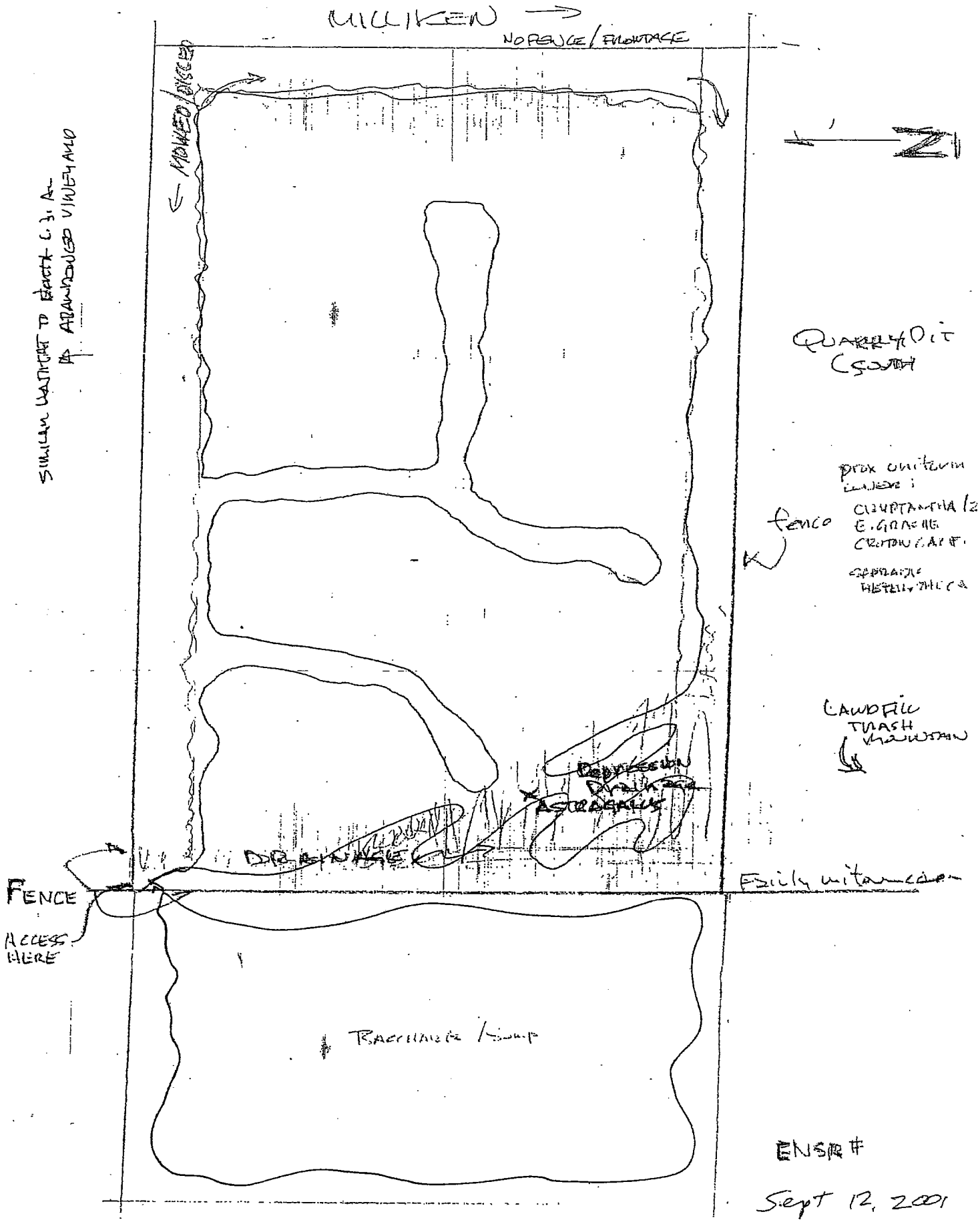
Sept 5, 2001

temp.	humidity	wind
95.1	25	2.4

sky clear

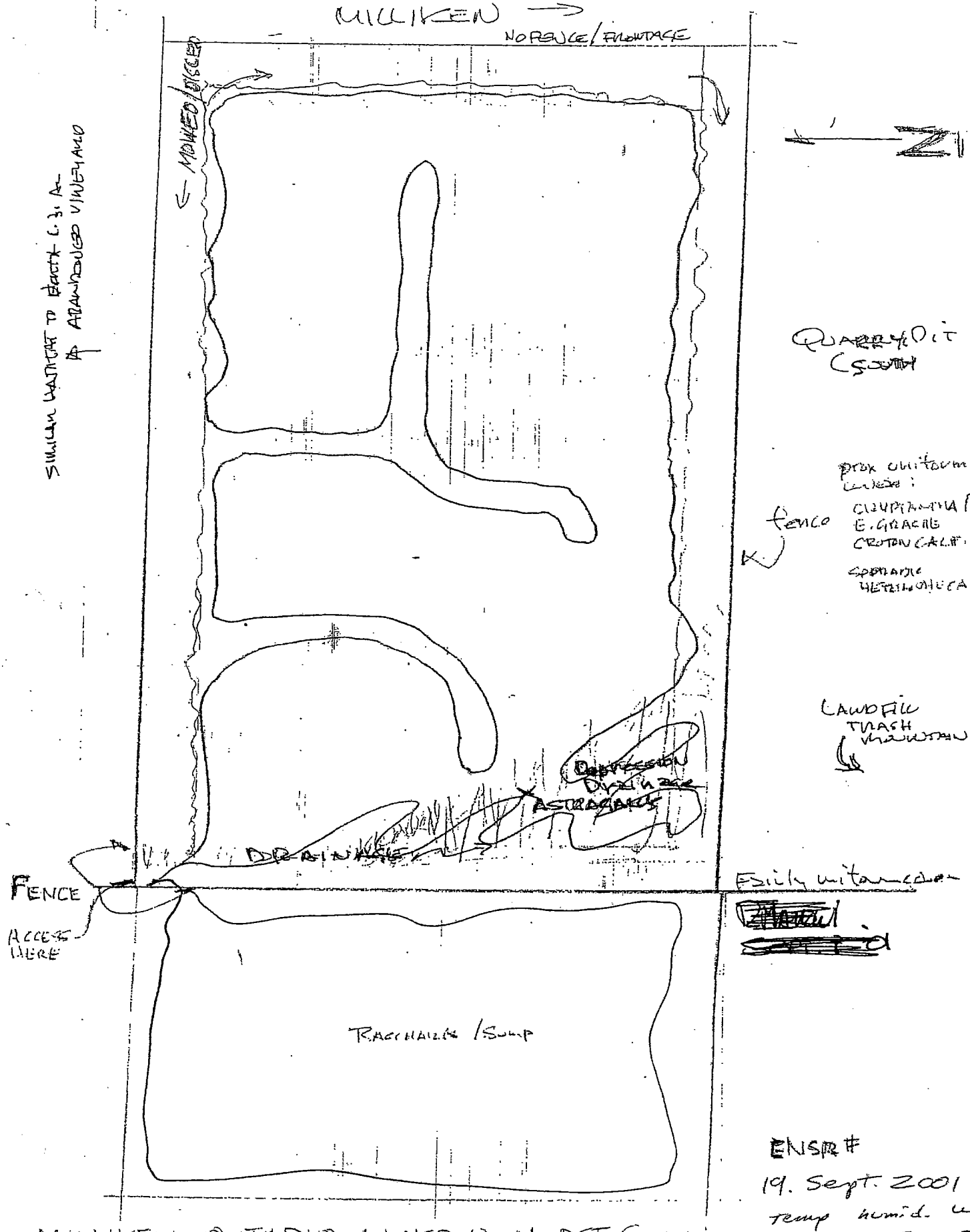


MILLIKEN - ONTARIO do ENSR 2001 DSF Survey



MILLIKEN - ONTARIO c/o ENSR 2001 DSF Survey

temp.	humidity	wind	
94.7	30	2.1 - 4	sky clear, but hazy



MILLIKEN - ONTARIO c/o ENSR 2001 DSF SURVEY

ENSR #

19. Sept. 2001

Temp	humid.	wind
93.7	27	2.8
96.2	25	3.1

Sky clear

APPENDIX G

2000 Biological Survey for the
Delhi Sands giant flower loving fly
September 2000,
Agresearch, Inc.

RET. to David

2000
Biological Survey
for the Delhi Sands giant flower-loving fly
Rhaphiomidas terminatus abdominalis
Millikin Avenue south of Jurupa Street

City of Ontario
San Bernardino County, California

for ENSR

project number 8799-166-000

Field Research and Report

by

Rudi Mattoni, Rick Rogers, and Jeremiah George
Agresearch, Inc.
9620 Heather Road
Beverly Hills, CA 90210

(310) 274-1052 (H)
(310) 399-6016 (W)

September 25, 2000

The listed investigators performed all the fieldwork reported herein and prepared this report independent of any outside influence. These investigators assert that the data contained herein are correct and that the conclusions presented are their own
Survey conducted under authorization by
U. S. Fish and Wildlife Service permit PRT-685022

Rudi Mattoni

Rick Rogers

Rick Rogers

Jeremiah George

Jeremiah George

Results of the 2000 Biological Survey for the Delhi Sands giant flower-loving fly across an approximate ten acre parcel located on Millikin Avenue south of the Jurupa Street, City of Ontario, San Bernardino County, California.

Rudi Mattoni, Rick Rogers, and Jeremiah George
Agresearch, Inc.
9620 Heather Road
Beverly Hills, CA 90210

INTRODUCTION AND BACKGROUND

The following report summarizes a focused survey for the Delhi Sands Giant flower-loving fly, *Rhaphiomidas terminatus abdominalis*, hereafter referred to as DSF, across a proposed development site in the City of Ontario, San Bernardino County, California. The subject property is located on the west side of Millikin Avenue approximately0.3 miles south of Jurupa Street. The total area of the site covers approximately 10 acres.

The survey was conducted by Rick Rogers, Jeremiah George, and Dr. Rudi Mattoni, individuals permitted (permit number PRT-685022) by the Fish and Wildlife Service (FWS) to perform such work using a protocol established by the FWS. Location of the site is shown on the inset map of southern California, figure 1. Figure 1 also shows the site location outlined over the general features on a 1994 USGS aerial photograph.

Features of the both the physical and biological environment of the parcel most likely to be important in determining demographics of the DSF were noted to provide an evaluation of overall habitat quality. The plant community was assessed in semi-quantitative terms based upon plant species identifiable in August and September 2000. The plant listing compares species found against the background of all the native plant species known from the Delhi Sands. Invasive non-native species are also listed with gross soil conditions noted. Figure 2 is a map we prepared that delineates our best estimate of general habitat values based on soil and plant community characteristics. The complete raw data of each survey day is included with the original copy of this report.

METHODS AND MATERIALS

The Delhi Sands giant flower-loving fly survey

Field data collection was primarily a focused visual search for DSF adults and pupae, following FWS guidelines, which specify observations at least between 1000 and 1400 hours on clear days with low wind velocities. General weather conditions were noted. Temperature, relative humidity and average wind speeds were taken using a Kestrel 3000 hand-held monitor at the beginning and end of each sampling period on most days. George did not have the instrument available for most of August and estimated wind velocities based on experience. Information on other sightings of the DSF from nearby public lands that our team surveyed is also noted as part of this report. The latter data are all available public information and serve as a control for time of DSF flight. Further data by Rogers included recording all large insect species present with notes on vertebrates.

For each day surveyed, random walks were conducted across the property. Because of dense, mostly non-native grass growth and other obstacles, the path followed the more open sections of the vineyard section of the property, with concentrated walks around the disked periphery that was the most likely habitat for DSF. Virtually every segment of the property was covered. The walks each day covered all areas with special attention to the small amount of higher native plant cover along the open drainage basin on the western section. Rogers traced his walks on the field map we prepared. George walked in a random fashion, as did Mattoni on his two days at the site. Mattoni prepared the vegetation survey on his first day at the site. All surveyors spent four hours on each day of the survey at the site.

Other insects and vertebrates

Rogers recorded data on all insect sightings during his surveys. Although George and Mattoni are familiar with a number of insect species in addition to DSF, *Apiocera* spp, and *Nemomydas pantherinus*, they did not possess the experience of Rogers for identification of the whole community of flying insects in the field. Numbers of *Apiocera* spp (Apioceridae) and the more closely related mydid fly *Nemomydas pantherinus* (Mydidae) were noted. Sightings of mammals, birds or reptiles that were familiar to the investigators were noted.

Soil survey

The soil substrate was evaluated by visual characterization based upon: 1) fine sand substrate without evidence of alluvial materials or imported material, 2) presence of cryptobiotic crusts indicating stable soil surfaces with no disturbance history for several years and 3) disturbance characteristics

The plant community

Plant species present were noted during random walks across the entire site made by Mattoni. A semi-quantitative list of all species found during these surveys are in table 3, which for comparison lists all of the species presently known from all Delhi Sands formations as previously determined across a number sites by Sanders and Mattoni (unpublished).

RESULTS

Delhi Sands giant flower-loving fly census

Neither adults nor pupa cases of Delhi Sands giant flower-loving flies were seen across the property in spite of 16 days of four-hour intensive. Weather conditions were all within FWS guideline specifications for almost every moment in the field, excepting one. September 19 presented higher wind velocities that were slightly above the 5 mph guidelines.

There is no evidence of DSF being found previously on the property, although DSF were reported "nearby" by FWS personnel. Rogers noted DSF on a Millikin Avenue site farther to the south several years earlier.

Other insects and vertebrates

A single male of the fly *Apiocera convergens* was sighted on the northwest corner of the site on September 5. *Apiocera*, although members of a different family, Apioceridae, tend to occupy similar plant community and substrate types and fly at the same times as rhaphiomidids. Their flight period extends several weeks longer. By comparison hundreds of *Apiocera* have observed at the Colton core habitat. Another possible surrogate/indicator species, *Nemomydas pantherinus* is in the family Mydidae, the same as *Rhapiomidas*. Four individuals were sighted. The species has a different set of life history characteristics from DSF, as larvae are predaceous on beetle larvae. At best these fly species indicate some "natural" habitat conditions exist, although these conditions may be completely unrelated to DSF.

The Table 3 does not cite any vertebrates observed or their signs. The few vertebrates seen were commonplace species: cottontail rabbits and ground squirrels. No burrowing owls, known from region, were seen. There were also no signs of the Los Angeles pocket mouse, nor were any reptiles other than *Uta* seen.

The plant community, semi-quantitatively presented from in Table 2 for the site, is depauperate. There is a notable absence of common buckwheat, *Eriogonum fasciculatum*, with only one of the dominant indicator species of natural Delhi formations present, *Croton californicum*. A small stand of one species, the rattlepod *Astragalus trichopodus*, occurs in the southeast depressed section, the most undisturbed appearing portion of the site.

An approximate 30 foot swath of disked substrate borders the north, south, and west sides of the site. Few plants have re-established in this disturbed portion, mostly non-native annuals. The disturbance appeared to have taken place in 1999. Most of the remainder has a senescing vineyard of grapes with dense cover of mostly non-native annual grasses and perennial horehound (*Marrubium vulgare*). A depression across the southeast section is the most open area, about 0.5 acre, with no plantings, but signs of having been recontoured for drainage purposes in time past.

All plant species known from the Delhi Sands community are given in table 2. Of the 78 natives known, only 6 perennial species and 11 annuals were found on the Millikin Avenue property. Further, all were found in low frequency. By comparison, 15 non-native exotic plants invaded the site from a total of 43 invasive species known across the whole Delhi Sands dune system. As depauparate as the site is in species richness, actual species densities (cover) are even more deficient.

Habitat delineation

The status of the soil substrate is the most definitive habitat characteristic for DSF. At present the only determination of suitable habitat is by correlation of DSF with certain physical and biotic variables. The definitive characteristics are presence of pure Delhi

fine sand, low plant cover, and a few indicator plant species: Croton, telegraph weed, and common buckwheat. There are no data that define the determinants of DSF based on the life history requirements during the almost year long fossorial larval stages. Since our observations indicate no extensive occurrence of free flowing sand at the site – which exhibits a high content of alluvial rock and geochemical consolidation of sand – and with few indicator plants and dense non-native grass cover, we consider the site as unlikely DSF habitat.

CONCLUSIONS

The survey and study supports the null hypothesis that Delhi Sands giant flower-loving flies do not occupy any part of the site as a breeding population. These results also indicate that no DSF migrants appeared from the nearest known occupied habitats, which lie at some indeterminate distance and which may also not represent viable populations. Cursory inspection of surrounding sites implies that the mined pit to the south and the adjacent landscaped trash-dump cover would not support DSF. The parcel to the east is an abandoned vineyard similar to the subject property, with land further to the north destroyed by development.

Under current conditions, with the major low cover areas the result of repeated clearing around the periphery by disking, the property is unsuitable as DSF habitat, possibly excepting the 0.5 acre northwest corner depression. In addition to the sparse and unnatural plant cover, the remaining arthropod community is depauperate. The low density of harvester ants and absence of *Messor sp.* ants, species associated with DSF occurrence may have resulted from the disturbance activities, or possibly a function of the apparent high alluvial content of the substrate.

Even given the anecdotal sightings of DSF in the vicinity within the past decade, we believe the site is unsuitable for a population to establish even were dispersal to occur. The alluvial nature of the substrate, low general insect species richness, depauperate native flora and lack of low cover do not support the hypothesis of suitable DSF habitat.

The dispersive behavior of the DSF also remains unknown. Although most observations indicate the fly is relatively sedentary with high site fidelity, few individuals have been sighted in areas which did not appear suitable. All dispersants noted have been males. The low frequency of such events does not permit generalizations concerning individual movements and with respect to females since they are simply not as frequently seen in the best of habitats. Since no DSF were seen the point remains moot.

List of Tables, Figures, field notes

Tables

Figures

Attachments: (original report copy only)
Field notes and maps, 8 pages.

Table 1

Millikin Avenue, Ontario, California. Summary and calendar of field work giving days sampled, August 4 - September 20, 2000. *Rhaphiomidas terminatus abdominalis* (R. t.), *Apiocera spp.* (A) and *Nemomydas pantherinus* (N) sightings and selected weather conditions for days surveyed. Average wind speed (mph) and Temperature (F) determined using a Kestrel 3000 meter. Comparative data given for *R. terminatus* sightings at two other localities for which data were collected. Days not surveyed, ns; no weather data, nd; N, Core habitat cites the number of DSF observed at the Colton Cement core habitat; N, SCE refers to number of DSF observed at the Southern California Edison R-O-W sites on Riverside Drive & Jurupa. Observers (Obs.) were R (Rick Rogers), M (Rudi Mattoni), and J (Jeremiah George).

	Obs.	Rt.	A.	N	Temp. °F	Wind	Sky	N, Core Habitat	N, SCE
August									
5	M	0	0	0	85.0-98.1	0.8-1.4	clear		
6		ns							
7	J	0	0	0	nd	c2.0-3.0	clear	5 Rt (J) 2 (J)	
8	R	0	0	1	87.8-97.2	2.5-3.2	clear		
9		ns							
10		ns							
11		ns							
12	J	0	0	1	nd	c2.0-4.0	clear		
13		ns							
14		ns						7 Rt (J)	
15	R	0	0	1	92.7-103.5	2.1-2.9	clear		
16	J	0	0	0	nd	c2.0-4.0	clear		
17		ns							
18		ns							1 (R/M)
19		ns							
20		ns							
21	J	0	0	0	nd	c1.0-2.0	clear		
22	R	0	0	0	86.3-93.6	1.4-2.6	clear		
23		ns							
24		ns							
25		ns						16 Rt (J)	
26		ns							
27		ns							1 (R)
28	J	0	0	0	nd	c2.0-4.0	clear		
29		ns							
30	R	0	0	0	82.5-88.5	1.1-1.5	clear		
31		ns							

Table 1 (continued)

	Obs.	R.t.	A.	N	Temp. °F	Wind	Sky	N, Core Habitat	N, SCE
September									
1		ns							
2		ns							
3		ns							
4	J	0	0	0	81.0-92.7	1.9-3.5	clear		
5	R	0	1	1	79.5-89.3	1.8-2.4	clear		
6		ns							
7		ns					rained		
8		ns							
9		ns							
10		ns							
11	J	0	0	0	87.0-104.3	1.5-3.4	clear		
12	R	0	0	0	89.8-101.0	1.3-1.6	20% cloud cover		
13		ns							
14		ns							
15		ns							
16		ns							
17		ns							
18	J	0	0	0	87.5-96.2	1.4-4.5	clear		
19	R	0	0	0	89.8-95.1	5.4-8.8	20% high clouds		
20		ns							

Table-2

Plant species list and community composition by semi-quantitative cover estimates, Millikin Avenue, Ontario site with the Colton core habitat area compared. Species not seen (0), species present as 1 to few scattered individuals (1), species common in few clumps (2), species common throughout (3)

	Millikin	Core Habitat
NATIVE PERENNIAL SPECIES		
Shrubs/subshrubs		
Rhus trilobata	0	1
Atemisia californica	0	1
A. dracunculus	0	2
Baccharis pilularius	1	2
B. salicifolia	1	1
Croton californicus	2	2
Encelia farinosa	0	2
Gnaphalium bicolor	1	2
G. californicum	0	2
G. microcephalum	2	2
Gutierriza californica	0	1
Haplopappus palmeri	0	3
Lepidospermum sp.	0	1
Lessingia filaginifolia	0	2
Senecio douglasii	0	1
Opuntia littoralis	0	2
O. prolifera	0	2
Sambucus mexicanus	0	0
Lotus scoparius	0	3
Salvia mellifera	0	1
Mirabilis californica	0	1
Eriogonum fasciculatum /polifolium	0	3
Ceanothus cuneatus	0	1
Rhamnus crocea	0	1
Adenostoma fascicularis	0	1
Prunus ilicifolia	0	1
Solanum douglasii	0	1
Stillingia linearifolius	0	3
Tetradymia sp	0	1
herbaceous perennials		
Malacothrix saxatilis	0	2
Chenopodium californicum	0	1
Marah macrocarpus	0	1
Cucurbita foetidissima	0	1
Rumex hymenosepalum	0	1
Datura wrightii	1	2
Bloomeria crocea	0	1
Dicholstemma capitata	0	1
Penstemon spectablilis	0	0
NATIVE ANNUAL SPECIES		
Ambrosia acanthicarpa	3	3
Heterotheca grandiflora	1	2
Conyza canadensis	1	1
Crassula connata	0	3
Stephanomeria virgata	1	3
Hemizonia fasiculata	2	2
Chaenactis glabriuscula	0	2
Filago californica	0	1
Senecio californicus ?	0	1
Rafinesquia californica	0	0
Amsinckia menziesii	3	3
Cryptantha sp. 1	3	3
Cryptantha sp. 2	1	3
Cryptantha sp. 3	0	0

Table 2 (Continued)

	Millikin	Core Habitat
NATIVE ANNUAL SPECIES (CON'T)		
Cuscuta californica	0	0
Eriastrum sapphirinum	1	3
Gilia angelensis	0	0
Lepidium nitidum	0	0
Lotus purshianus	2	3
L. strigosus	0	0
Lupinus bicolor	0	2
L. sp. (hirsute)	0	0
Phacelia distans	0	2
P. minori	0	1
Camissonia bistorta	0	1
C. micrantha	0	2
C. hirta?	0	1
Oenothera	0	2
Plantago erecta	0	1
Eriogonum gracile	3	3
E. thurberi (blowouts)	0	2
Claytonia perfoliata	0	1
Festuca megalura	0	2
F. octoflora	0	1
NON-NATIVE PERNNIAL SPECIES		
Acacia spp	0	1
Ricinus communis	0	1
Oryzopsis miliacea	1	1
Foeniculum vulgare	0	1
Schinus spp.	0	1
Nicotiana glauca	1	1
Marrubium vulgare	3	1
Eucalyptus spp	0	1
Lobularia maritima	0	1
Convulvulus arvensis	0	1
Ariplex semibaccata	0	1
NON NATIVE ANNUALS		
Anagallis arvensis	?	1
Brassica spp	3	2
Centaurea miletensis	3	1
Chaemosyce maculata	?	1
Chenopodium murale+album	1	1
Conyza bornariensis	1	1
Erodium spp	1	1
Galium asparine	?	1
Hirschfeldia incana	2	3
Lactuca serriola	0	1
Malva parviflora+nicaeensis	1	1
Medicago & Melilotus spp	1	1
Oenothera laciniata	1	1
Oxalis pes caprae	?	2
Raphanus sativus	0	1
Silene gallica	?	1
Spergula arvensis	?	1
Salsola tragus	1	1
Sonchus oleracea	1	1
S. asper	1	1
Urtica urens	0	1
Tribulus terrestris	2	1
Avena barbata + fatua	3	2
Bromus diandrus+mollis+tectorum	3	2
Hordeum leporinum	0	1
Schismus barbata	2	1

Table 3
List of insect species observed at Millikin Avenue, Ontario, between August 5 and September 20, 2000 by Rogers, George, and Mattoni. Orders all caps underlined, families boldface.

ODONATA
Aeshniidae
Anax junius
Aeshnia multicolor
Libellulidae
Sympetrum corruptum
Libullela saturata
Pantala hymenea

HEMIPTERA
Pentitomidae
Cholorchora sayi
Largidae
Largus cinctus

LEPIDOPTERA
Noctuidae
Schinia buta
Papilionidae
Papilio cresphontes
Pieidae
Pieris protodice
Colias eurytheme
Nyphaliodae
Junonia coenia
Vanessa cardui
V, virginiensis
Lycaenidae
Strymon melinus
Plebejus acmon
Brephidium exilis
Hesperiidae
Hylephila phyleaus

DIPTERA
Tabanidae
Tabanus punctifer
Scenopidae
Scenopus sp
Apioceridae
A. convergens
Mydidae
Nemomydas pantherinus
Asilidae
Efferia albibarbis
Bombyliidae
Toxophora sp.
Aphoebantus bilineatus
Thyridanthrax atrata
T. nugator
Paravilla fumosa
Villa molitor
Exoprosopa butleri
Geron p. 1
Neodiplocampta mira
Poecilognathus sp. 1
Syrphidae
Bacca clavata
Eristalis latifrons
E. tenax
Tachinidae
Gymnosoma fuliginosa

HYMENOPTERA
Gasteruptiidae
Gasterution sp.
Chrysididae
Argochrysis sp. 1
Leoucospidae
Leucopsis similis
Formicidae
Pogonomyrmex californicus
Formica sp.
Mutillidae
Dasymutilla californica
D. coccineohirta
D. clytinestra
Pompilidae
Tachypopilus unicolor
Anoplius sp. 1
Vespidae
Vespula pennsyvlanica
Pterocheilus mirandus
Eumenes bollii
Euodynerus sp.
Polistes aurifer
P. apachus
P. californicus
P. exclamans
Sphecidae
Bembix americana
Microbembix californica
Oxybelus pitanta
Tachytes distincta
Tachysphex sp. 1
Astata nubeula
Cerceris sextoides
C. femorrubrum
C. californicum
Philanthus multimaculata
Bicrytes ventralis
Hoplisoides diversus
Haplomelinus lbitomentosis
Mimesa sp. 1
Lirius aequalis
L. sp. 1
Prionyx parkeri
P. Foxi
Sceliphron servilleii
Chalyon calironicum
Ammophila aberti
A. sp. 1 black
Halictidae
Halictus sp. 1
Andrenidae
Perdita sp.
Megachildae
Megachile perihirta
M. sp 1
M. sp. 2
Anthophoridae
Mellesodes sp. 1
M. sp. 2
Epeolus minimus
Nomada sp. 1
Apidae
Apis mellifera

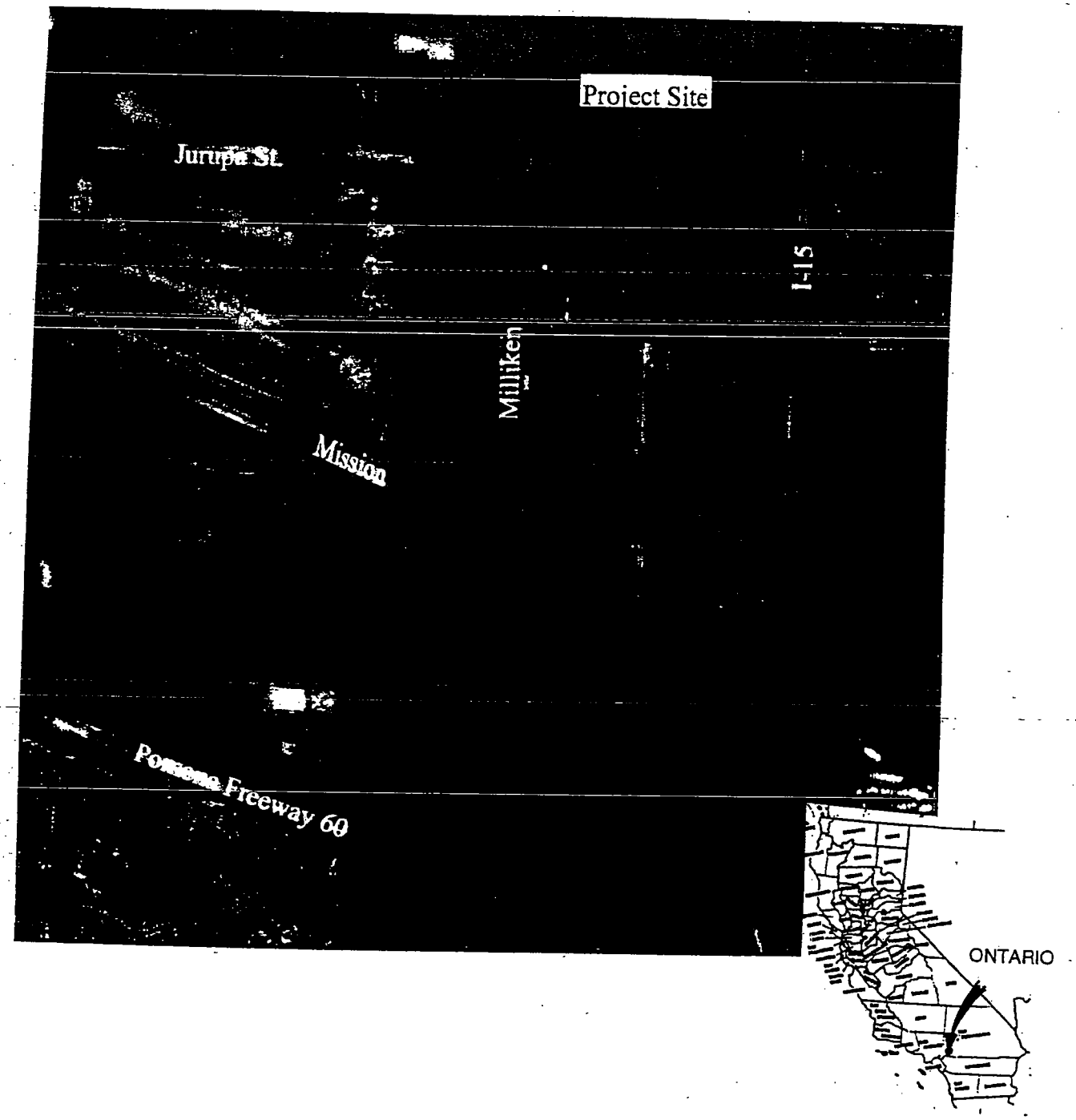


Figure 1.
Millikin Avenue site, City of Ontario. Regional map outlining subject surveyed property on the USGS Ontario aerial photograph, 1994. Inset locates Ontario on a map of California.

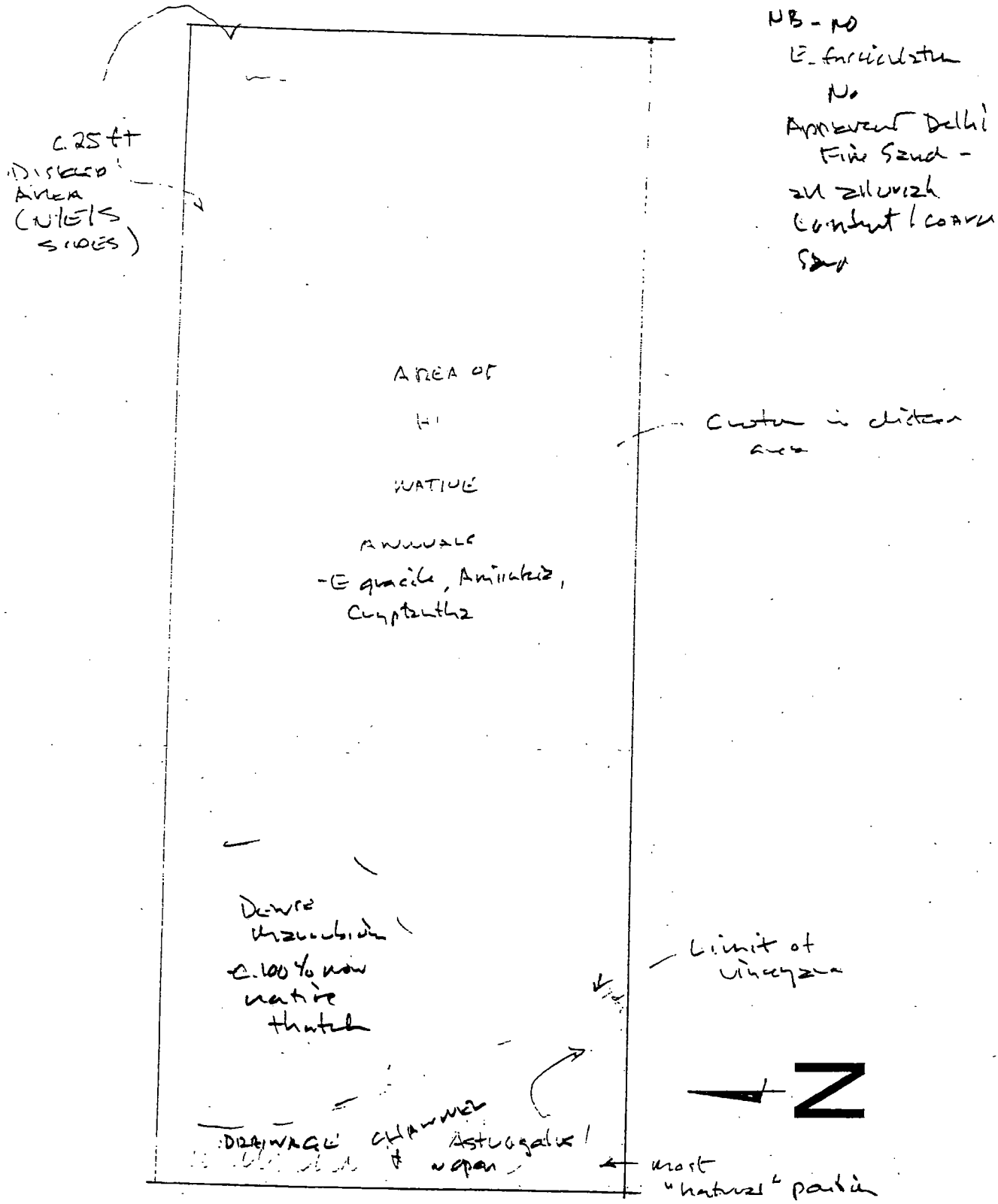
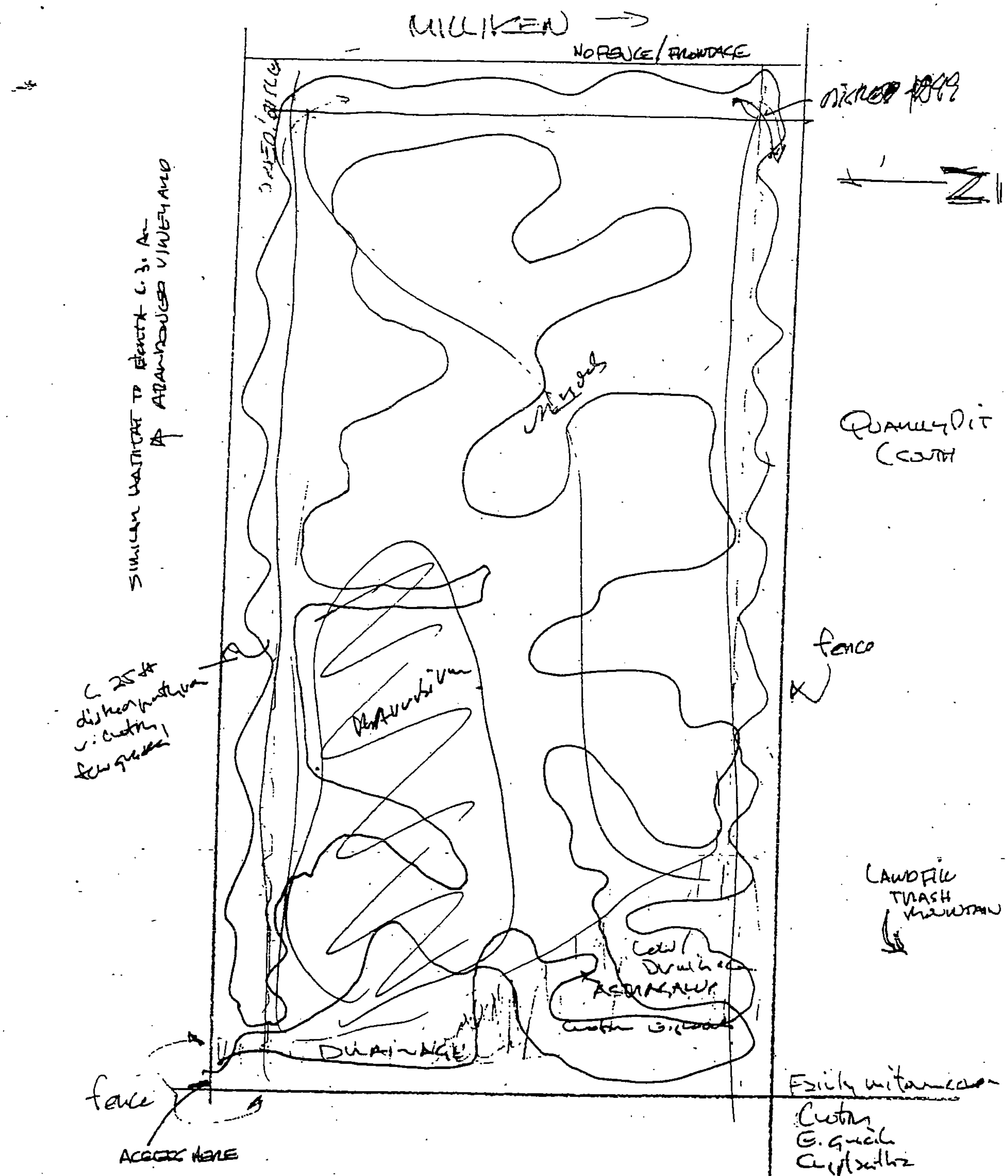


Figure 2.
Survey site map. Millikin Avenue, Ontario, showing major DSF habitat quality related characteristics.



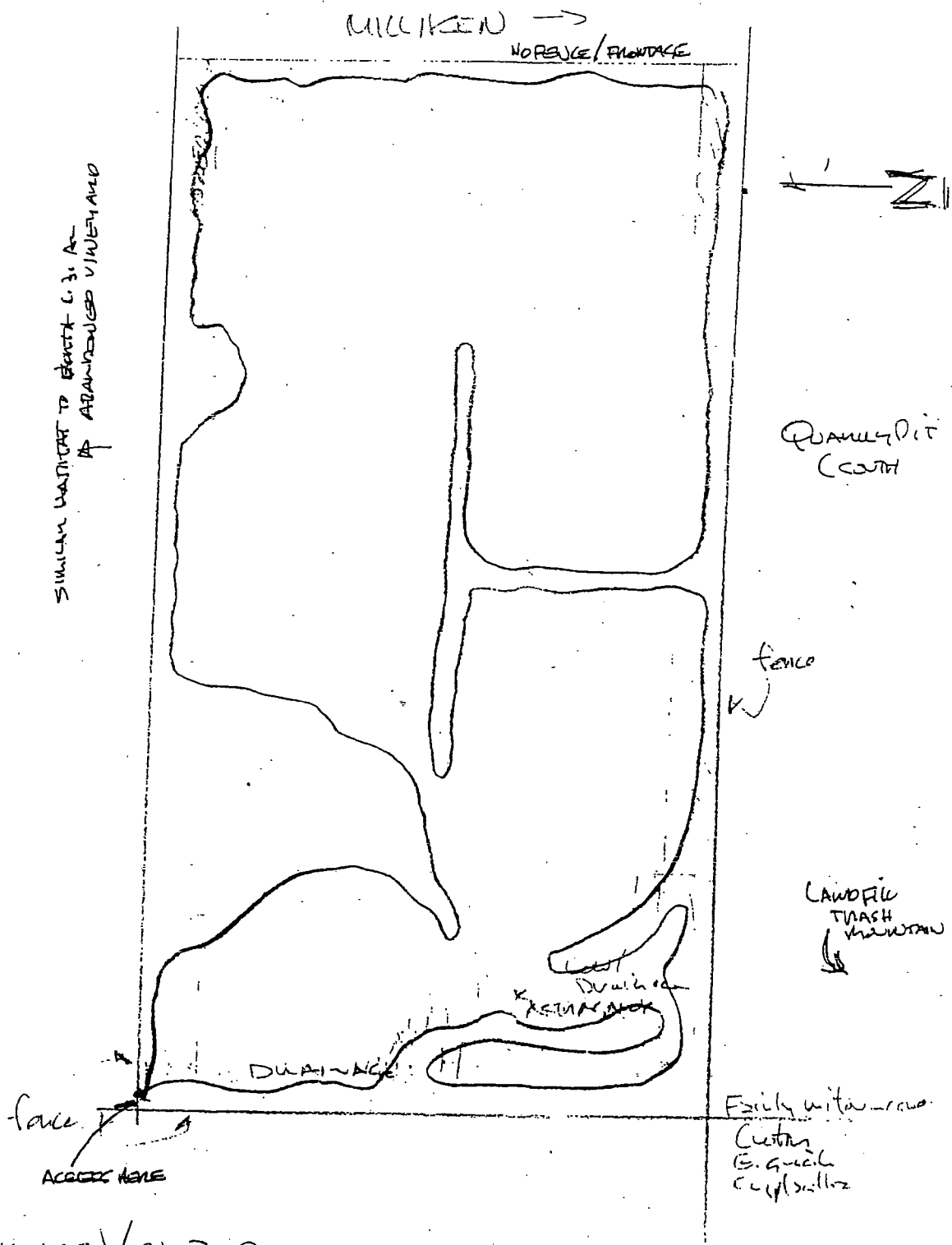
MILLIKEN/EWSR-2000

Ak. 5 t 1000

86.0

0.8

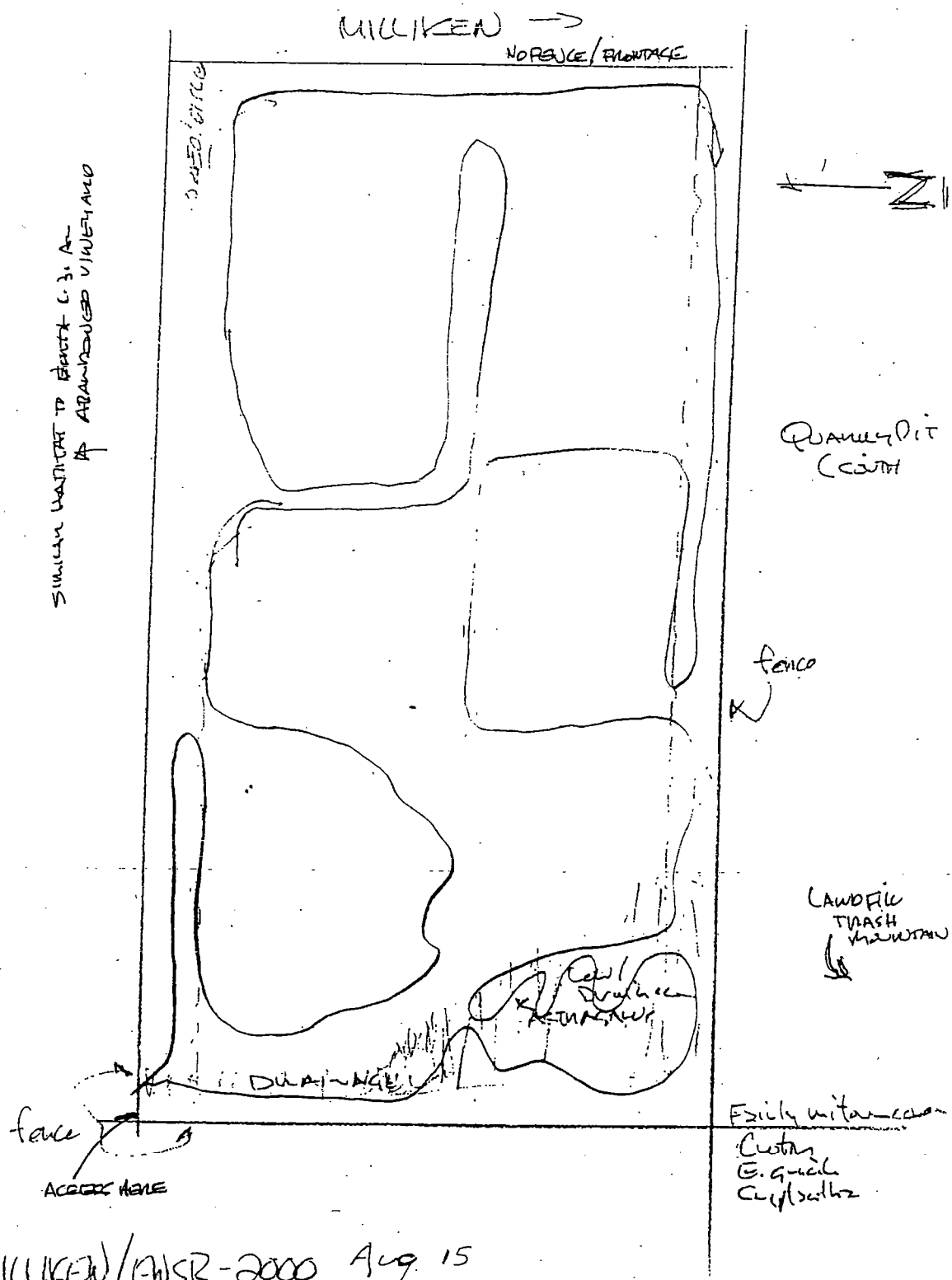
CLEAR



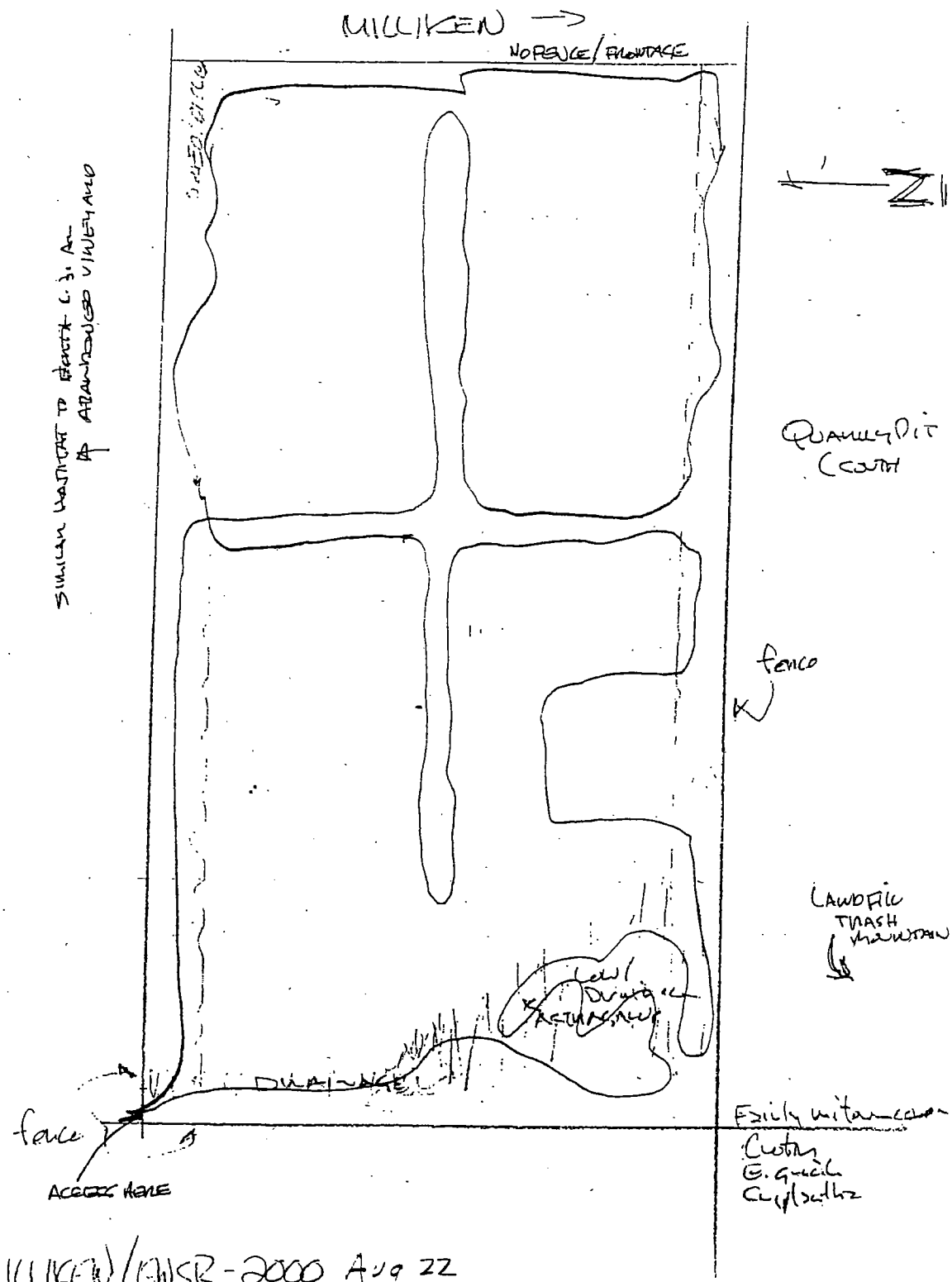
MILLIKEN/ENSR-2000 Aug 8, 2000

	10:00 am.	12:00	2:00
temp.	87.8	94.9	97.2
humidity	40	32	30
wind	2.9	2.5	3.2
wind max gust	3.5	3.1	4.7

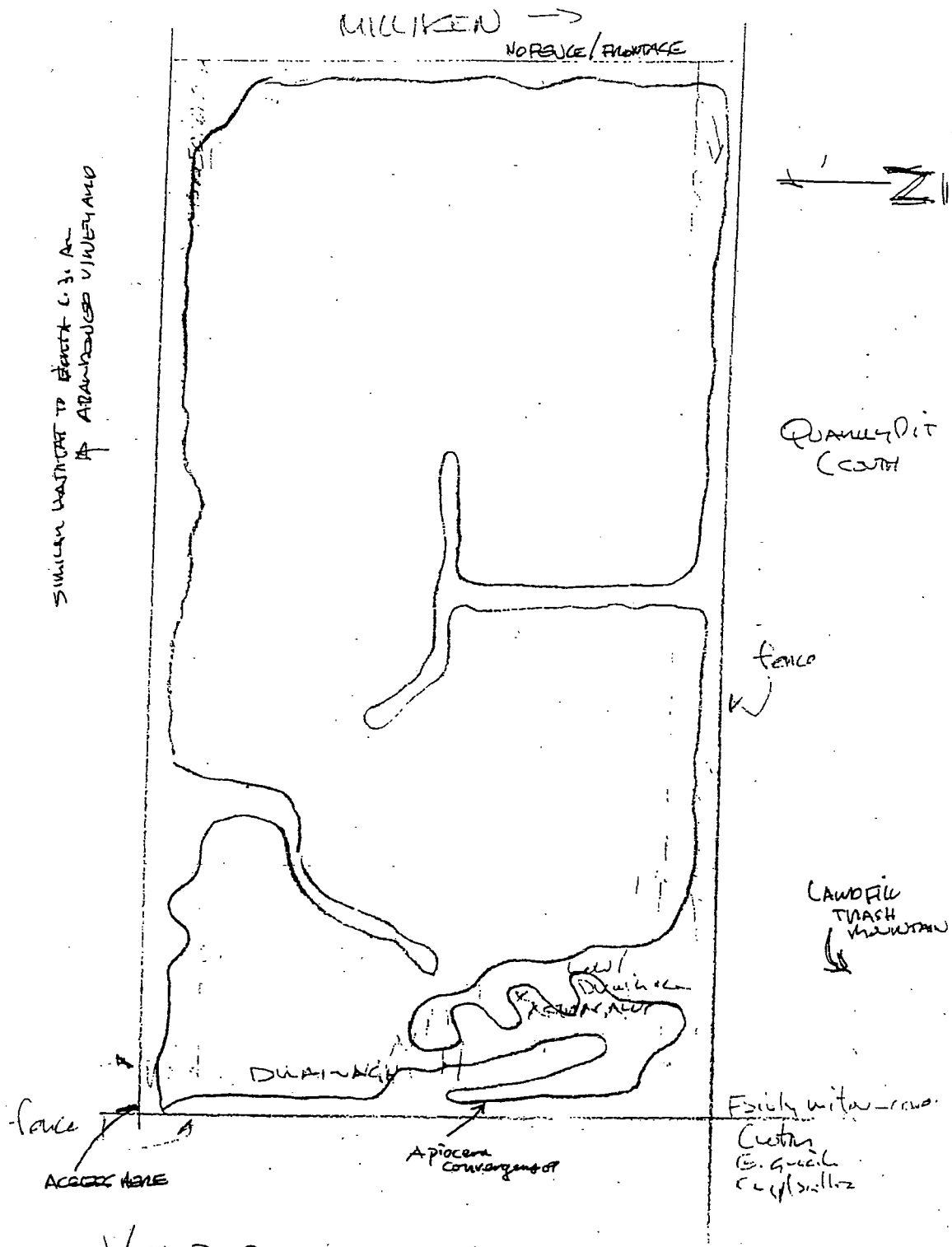
sky clear



MILLIKEN/ENSR-2000 Aug 15

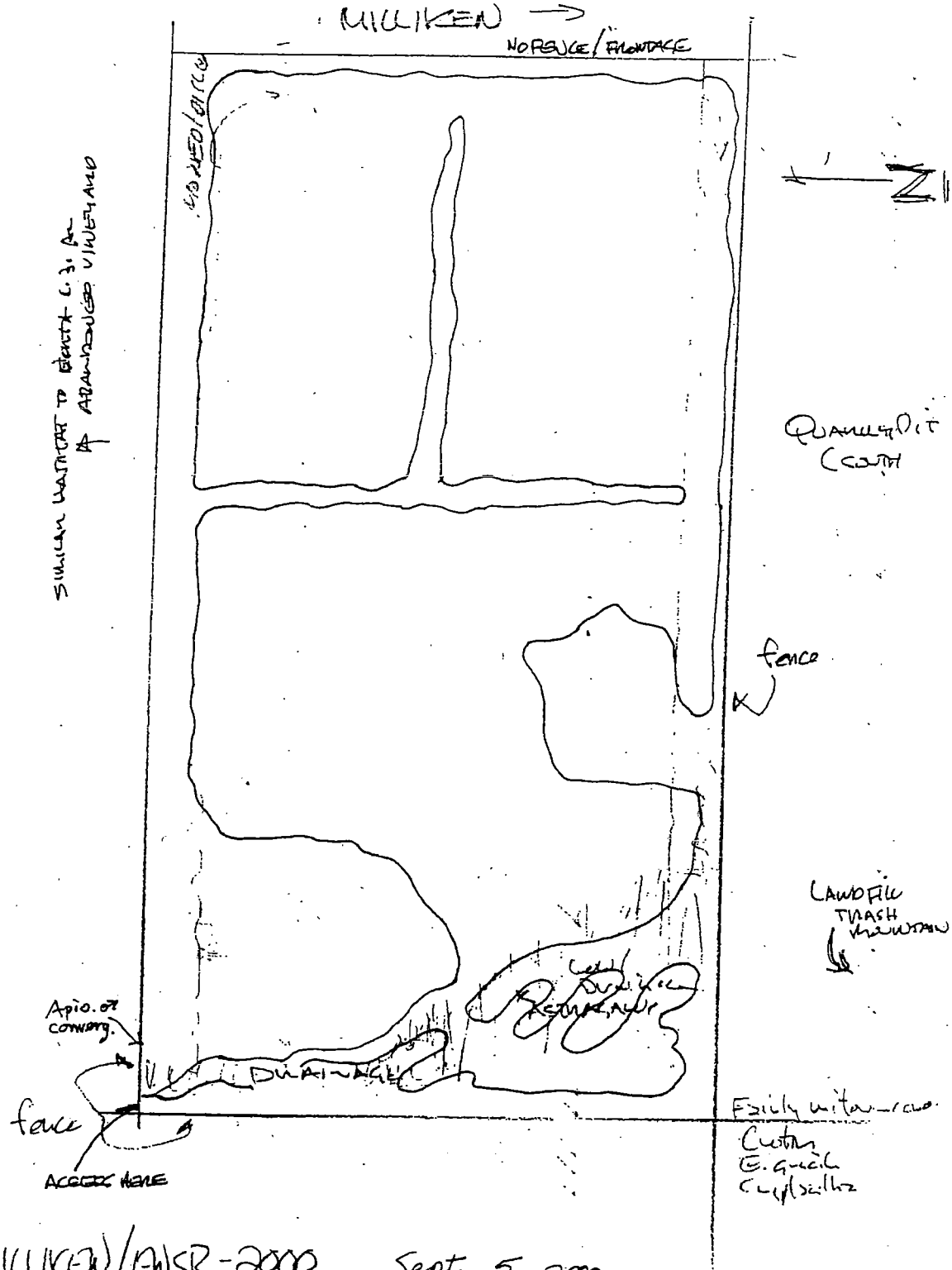


MILLIKEN/ENSR-2000 Aug 22



MILLIKEN/ENSR-2000 August 30, 2000 Rick Rogers

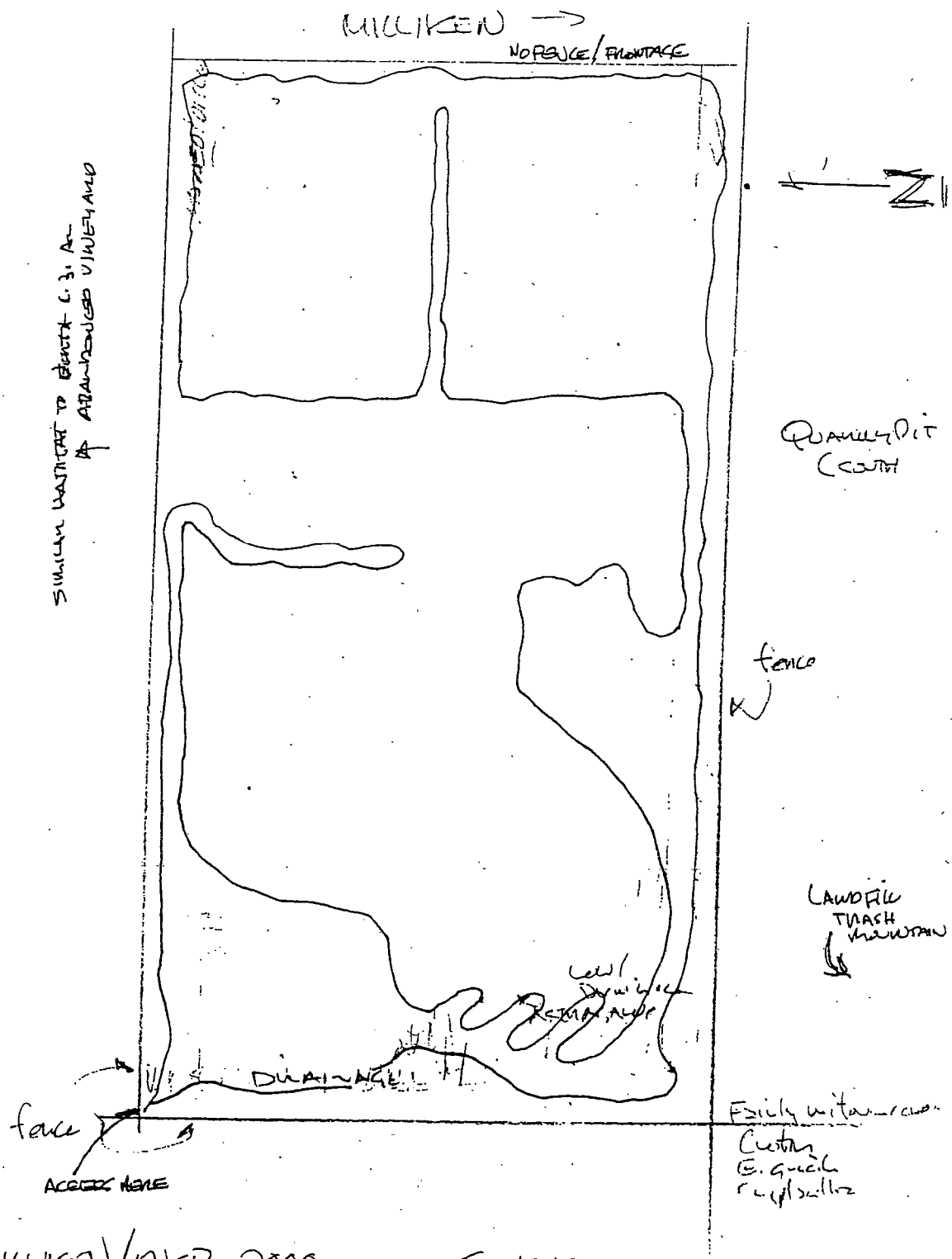
	10:00 am.	12:00	2:00
temp.	82.5	85.2	88.5
humidity	48	45	40
wind	1.5	1.2	1.1
max. gust	1.9	1.6	1.5
Sky	clear		



MILLIKEN/ENSR-2000 Sept. 5, 2000

Rick Rogers

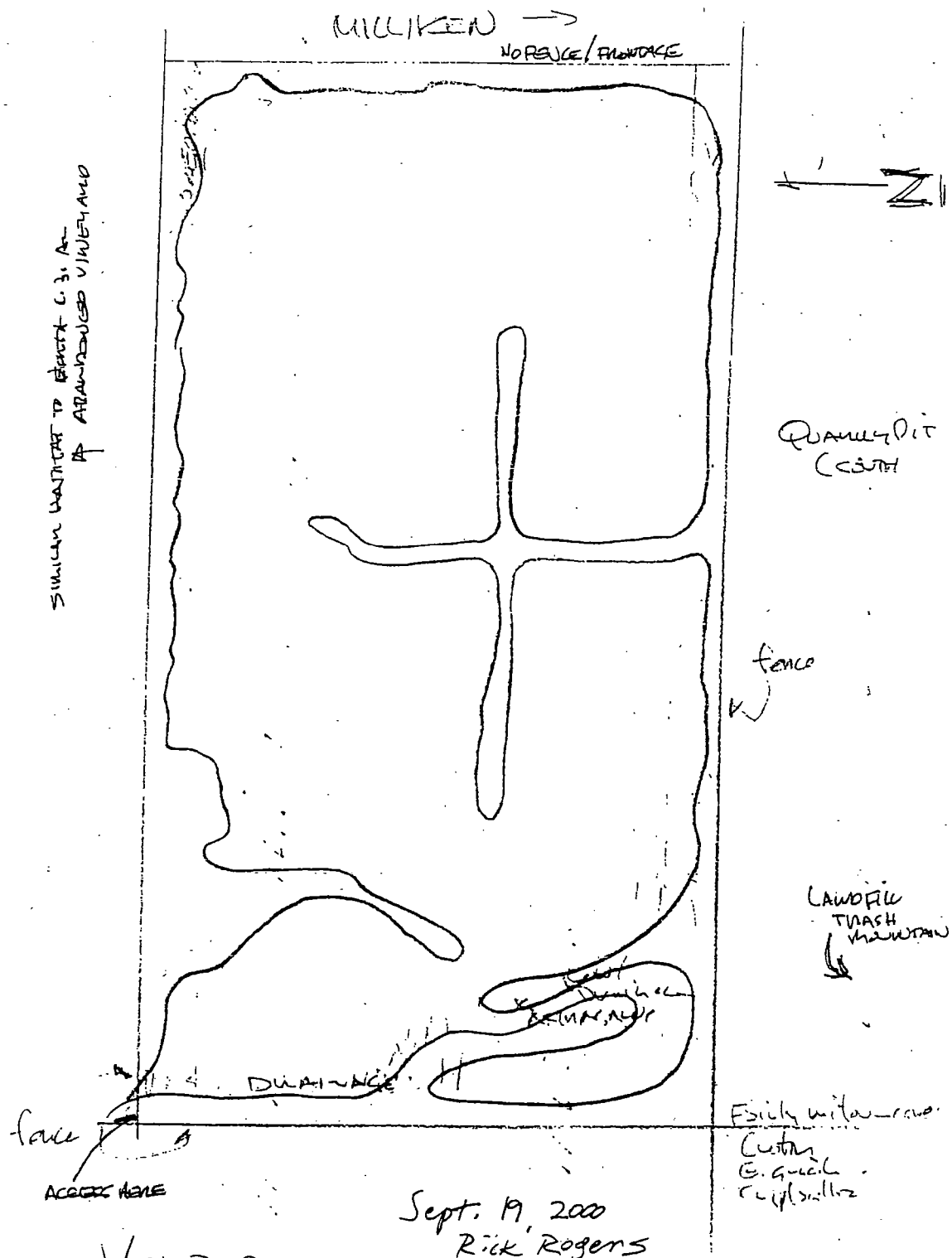
10:00 am.	12:00 noon	2:00 pm
temp. 79.5	82.1	89.3
humidity 33	30	27
wind 1.8	2.1	2.4
max 2.9	4.6	5.4
sky clear		



MILLIKEN/ENSR-2000 Sept 12, 2000

Rick Rogers

	10:00 am	12:00	2:00
temp	89.8	95.2	100.2
humidity	19	15	13
wind	1.3	1.3	1.6
MAX	1.8	2.1	2.9
Sky	20% (thin streaky clouds)		



MILLIKEN/ENSR-2000

	10:00 am	12:00	2:00
temp.	89.8	93.2	95.1
humidity	37	38	39
wind	5.4	5.9	8.8
wind max gust	6.0	7.5	9.7

Sky – thin streaky clouds 20%

DIPTERA

Stratiomyidae
Hermetia illucens
Tabanidae
Tabanus punctifer
Scenopidae
Scenopus sp
Apioceridae
Apiocera convergens
A. chrysolasia
Mydidae
Nemomydas pantherinus
Asilidae
Stenopogon brevisculus
S. sp.
Sarcopogon luteus
Malophora fautricoides
Efferia albibarbis
Bombyliidae
Toxophora sp.
Paracosmus sp.
Aphoebantus bilineatus
A. mus
A. spp large
Eucessa rubens
Hemipenthes lepidota
Phyridanthrax atrata
P. nugator
Chrysanthrax adymbrata
C. nivius
C. junctura
Rhynchanthrax caprea
Paravilla sp.
Villa molitor
V. lateralis
Lepidanthrax sp.
Exoprosopa divisa
E. butleri
E. doris
Ligyra gazophylax
Neodiplocampta mira
Geron sp. 1
Geron sp. 2
Mythicomyia sp.
Poecilognathus sp. 1
Poecilognathus sp. 2
Syrphidae
Eristalis obsoleta
E. latifrons.
E. tenax
Copestylum mexicanus
C. marginata
Bacca clavata
Conopidae
Physcophala texana
Sacrophagidae
Eumacronchia sp.
Tachinidae
Gymnsoma fulginosa
Peleteria sp.
Archytas californiae

HYMENOPTERA

Ichneumonidae
Ophion sp.
Crytus sp.
Gasteruptiidae
Gasteruption
Chalcidae
Spilochalcis sp
Brachymera sp.
Chrysididae
Parnopes edwardsii
Chrysis sp.
Argochryis mesillae
A. sp.
Leucospidae
Leucopis similis
Trigonalidae
Lycogaster sp.
Formicidae
Pogonomyrmex californicus
Formica sp.
Messor sp.
Pheidole sp.
Mutillidae
Dasymutilla californica
D. sackeni
D. coccineohirta
D. clytinestra
D. sp. (black)
Pseudometyhoca sp.
Tiphiidae
Typhia sp.
Myzineum maculatum
Scoliidae
Scolia alcione
Campsomeris tolteca
Pompilidae
Pepsis thisbe
P. chrysothemis
P. mexicanus
Trachypompilus unicolor
Ageniella sp.
Anoplius sp. 1 (small)
A. sp. 2 (large)
Vespidae
Vespula pennsyvlanica
Polistes aurifer
P. apachus
P. californicus
P. exclamans
Sphecidae
Bembix americana
B. melanaspis
Microbembix californica
Oxybelus uniglumnis
O. pitanta
Tachytes distincta
T. sp.
Tachysphex sp. 1
T. sp. 2 (black legs)
Astata nevadica
A. nubeula
Dryudella caerulea
Cerceris bicornata
C. sextoides
C. femorrubrum
C. californica
Eicercis insignis
Philanthus multimaculata
P. gibbosa
P. pacifica
Bicrytes ventralis
Hoplisoides diversus
H. sp.
Stizoides renicinctum
Haplomelinus albitomentosis
Mimesa sp.
Trypoxylon sp.
Liris aequalis
L. sp. 1 (small, black)
L. sp. 2 (large, red)
Spehx ichneumoneus
Isodonta elegans
Prionyx atrata
P. parkeri
P. Foxi
Chlorion cyaneum
Sceliphron servillei
Chalyion californicum
Ammophila aberti
A. sp. 1 (black)
A. sp. 2 (red)
Crabo sp.
Halictidae
Agapostemon texana
Lasioglossum sp.
Halictus sp.
Nomia nevadensis
Andrenidae
Perdita sp.
Colletidae
Colletes sp.
Megachildae
Megachile perihirta
M. sp. 1 (medium)
M. sp. 2. (small)
Coelioxys sp.
Dianthidium sp.
Apidae
Apis mellifera
Bombus sonorus
B. vosnosenskii
Anthophoridae
Anthophora urbana
A. sp. (small)
A. sp. (brown)
Diadasia sp.
Melessodes sp. 1 (medium0
M. sp. 2 (small
Melecta californica
Epeolus minimus
Zacasmia maculata
Triepeolus sp.
Nomada sp.
Xylocopa varipuncta