

Air Force Civil Engineer Center



Wurtsmith Restoration Advisory Board Meeting

24 April 2019
Matt Marrs
AFCEC/CIB



Wurtsmith RAB Agenda



Welcome

- Introductions
- Stakeholder Updates



Presentations

- EGLE: GSI
- AF: Mission Street PTS



BREAK

- UXO & MMRP overview
- Wurtsmith Hydrogeology

AF Presentations



- Review Action Items
- Highlight OP changes

RAB Business



- Participants provide three-minute verbal comments

Public Comment





Wurtsmith RAB Ground Rules



- 01** | Respect one another and maintain an atmosphere of open dialogue and exchange of ideas.
- 02** | Use our time together efficiently, wisely and respectfully.
- 03** | Speak clearly and succinctly one person at a time; avoid interrupting others.
- 04** | Listen and remain open to differing points of view.
- 05** | Maintain a propensity for progress: prepare, discuss, document and move forward.
- 06** | Share information early, openly and honestly
- 07** | Accurately and objectively relay to others the discussions that occur at board meetings.



Stakeholder Updates



Wurtsmith RAB Stakeholder Updates



Completed

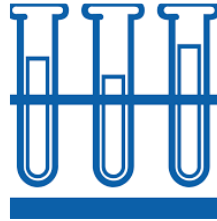


Conducted biennial MMRP, UXO stakeholder training

Sampled **15** private DW wells



Sampled **54** Monitoring Wells



Submitted proposed plan for full-scale Biowall at **SS-72**



Monitored transducers recently installed at **16** MWs

CTS treated more than **62M** gallons of GW = **0.7lbs** of PFOS/PFOA



In progress

- Amending the DSMOA Cooperative Agreement (2018-20) Joint Execution Plan
- Collaborating with new Wurtsmith PM to ensure EGLE receives funding for expedited reviews of AF documents



Wurtsmith RAB Stakeholder Updates



- Welcome to new district ranger, Clint Emerson.
- Memorandum of Understanding with AF
- Initiation of PA/SI work by USFS on land in and around Clark's Marsh
- Beginning discussions on a Natural Resource Damage Assessment



- Discussions with EGLE regarding testing in Township



- EGLE: Michigan Department of Environment, Great Lakes and Energy
- Ongoing dispute resolution discussions
- Evaluating data collected from GW surface water pathway along west side of VE Lake; collecting water elevation info from MW transducers
- Compiling Remedial Investigation Report

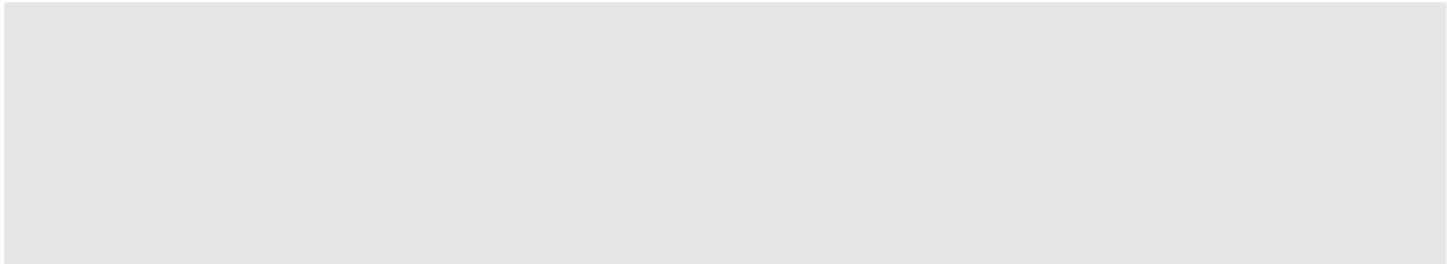


Community
RAB Members

- Community RAB events, activities and plans
- Improved transparency, timely info sharing w/ Community RAB & public
- D.C. highlights: State of the Union, meetings w/ Deputy Assistant Secretary of Defense for Environment, EPA & legislators
- Community work with MPART



Wurtsmith RAB Stakeholder Updates





Presentations



MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY

Groundwater Surface Water Interface an Introduction

Matt Baltusis

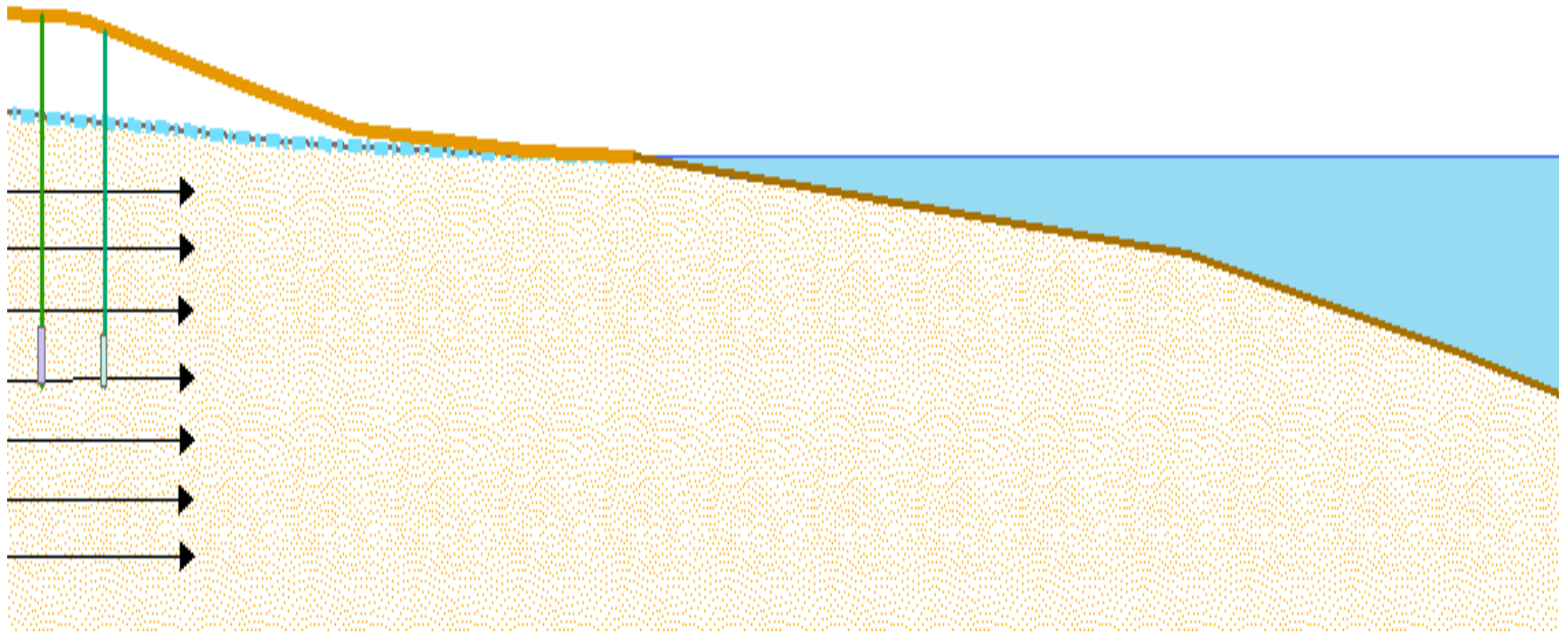
Remediation and Redevelopment

517-897-7524 | mbaltusis@michigan.gov

Groundwater Surface Water Interface

- What is GSI?
 - GSI is the location where groundwater enters (vents) to a surface water body.

Groundwater-Surface Water Interface – Conceptual Site Model



Groundwater-Surface Water Interface – An Introduction

“The GSI pathway is relevant when a remedial investigation or application of best professional judgment leads to the conclusion that a hazardous substance in groundwater can be reasonably expected to vent to surface waters of the state in concentrations that exceed the generic GSI criteria currently or in the future.”

Groundwater-Surface Water Interface – An Introduction

Criteria used for determining GSI at Van Etten Lake:

- Horizontal flow direction
- Groundwater concentrations above the GSI criteria
 - 12 parts per trillion for PFOS



Example of Monitoring Wells Used for Horizontal Flow Determination

Michigan Department of
Environment, Great Lakes, and Energy

800-662-9278

www.Michigan.gov/EGLE



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Wurtsmith RAB Mission Street



Ion Exchange Resin Treatment System

The Air Force selected an ion exchange resin system to treat GW discharged from Mission Street.

- ✓ Preserves additional treatment capacity at the CTS
- ✓ Quicker installation timeframe = treatment begins sooner
- ✓ Water chemistry allows smaller treatment system to be installed
- ✓ Reuse of existing building reduces construction footprint
- ✓ Ion exchange resin is predicted to last two years before change out



Treatment

200 gallons
per minute



Cost

\$1.5 million



Timeline

2019 Summer
Construction



Wurtsmith RAB



 **Break**

Munitions Are Dangerous

Follow the 3Rs of
Explosives Safety

Recognize - when you may have encountered a munition.

Retreat - do not touch, move or disturb it, but carefully leave the area.

Report - call 911!

What are Munitions?

Munitions include:



Artillery
& Mortar
Rounds

Grenades



Bombs

Small Arms Ammunition



What are UXO?

What are Unexploded Ordnance?

- Munitions (ammo) that failed to function properly;
- Can be of any type;
- May just be a component of a munition (e.g., fuze or exposed explosive fill).



Some Munitions are Hard to Identify

Explosives may be encountered anywhere on an installation from previous military training.



Munitions Vary in Appearance

Munitions are dangerous regardless of appearance:

- ▶ Mmunition type, shape, size, age, or condition don't matter.
- ▶ Flares, simulators, and blasting caps are all dangerous.
- ▶ War souvenirs can be dangerous.



Artillery Projectile



New



Used

Rockets

New



Used



Recent Munitions Accidents

Men Ignored Warning Signs on Fort Bragg

Two people injured following projectile explosion at McGregor Range

By Adriana M. Chavez / El Paso Times
POSTED: 10/12/2013 12:24:17 AM MDT

Two civilians were injured Thursday evening at Fort Bliss' McGregor Range following a projectile explosion, Fort Bliss officials said today. Fort Bliss spokesman Maj. Joe Buccino said military police are currently investigating the incident, which took place about 6 p.m. Thursday. The civilians were airlifted to University Medical Center in El Paso for treatment.

Airman dies in an accident at White Sands

WDBD
3 ON YOUR SIDE
NEWS WEATHER VIDEO SPORTS WHAT'S ON

Gulfport man admits to taking explosives from Camp Shelby

Posted: Feb 03, 2012 6:52 PM EST
Updated: Feb 03, 2012 7:05 PM EST
By Karrie Leggett-Brown, Reporter [CONNECT](#)



CAMP SHELBY, MS (WDAM) - One of the four men arrested in the investigation of stolen military grade ammunition says he has been going to Camp Shelby to collect projectiles for scrap for 25 years.

This comes after the four men from Gulfport were arrested by federal agents after finding some military grade ammunition. According to the testimony of a federal agent, the men went to Camp Shelby to obtain the explosive devices along with the man who was injured January 19th when a shell exploded.

One of the men, Jimmy Wilson showed federal agents a hole he cut in a fence at Camp Shelby to drive trucks through to pick up the rounds. According to a published source, bond was denied for Wilson and David Bangs, the evidence shows they exhibited reckless disregard for the safety of others.

Retired Lieutenant Colonel Tim Powell says with military bases being as large as thousands of it is hard to keep constant watch, but with ample signage there is no reason for the public to be unaware of the dangers military impact areas pose.

beyond that regulatory guidance. We place more signage than is required to let them know the dangers of when we have had some public campaigns to let the public know the dangers of when an unexploded ordinance on places like the impact area and other places on Camp Shelby or any other installation where they may be a firing range or an impact area," said Powell.

Wilson's statements in court, Camp Shelby officials say they were unaware of any of their fences.

Examples of Warning Signs

Trespassing on areas with warning signs or gates:

- ▶ may result in injury or death.
- ▶ is hazardous and prohibited by law.
- ▶ may result in substantial fines.



What to Do if You Encounter Munitions

- **Recognize** that munitions are dangerous

Munitions may:

- ▶ not look like a bullet or bomb.
- ▶ look harmless, but they are dangerous.
- ▶ be shiny or rusty.
- ▶ be clean or dirty.

Regardless of whether a munition has been moved, it may still explode. In fact, used munitions can be more dangerous than new.

What to Do if You Encounter Munitions

Retreat

- ▶ Do not approach, touch, move, or disturb; carefully leave area the same way you entered.
- ▶ In remote surroundings, mark general area where you encountered a munition so local authorities can locate. DO NOT go closer to munition when marking.

Report what you saw and where you saw it.

- ▶ Call 911
- ▶ Authorities will clear area and contact trained Explosives Ordnance Disposal (EOD) personnel to dispose of items.



DENIX Resources



What Is DENIX?

The DoD Environment, Safety & Occupational Health Network and Information Exchange (DENIX) is a collaborative cloud platform used to share and report DoD-specific environment, safety & occupational health (ESOH) information with the public and DOD communities.

3Rs Explosives Safety Education Program website:

<https://www.denix.osd.mil/uxo/?p=home>

Resources

Coloring Books	Fact Sheets	Foreign Language Translations	Logos
Magnets	Pocket Cards	Posters	Presentations
Safety Guides	Signs	Site Specific Education Resources	Stickers
Temporary Tattoos	Videos		

Air Force Civil Engineer Center

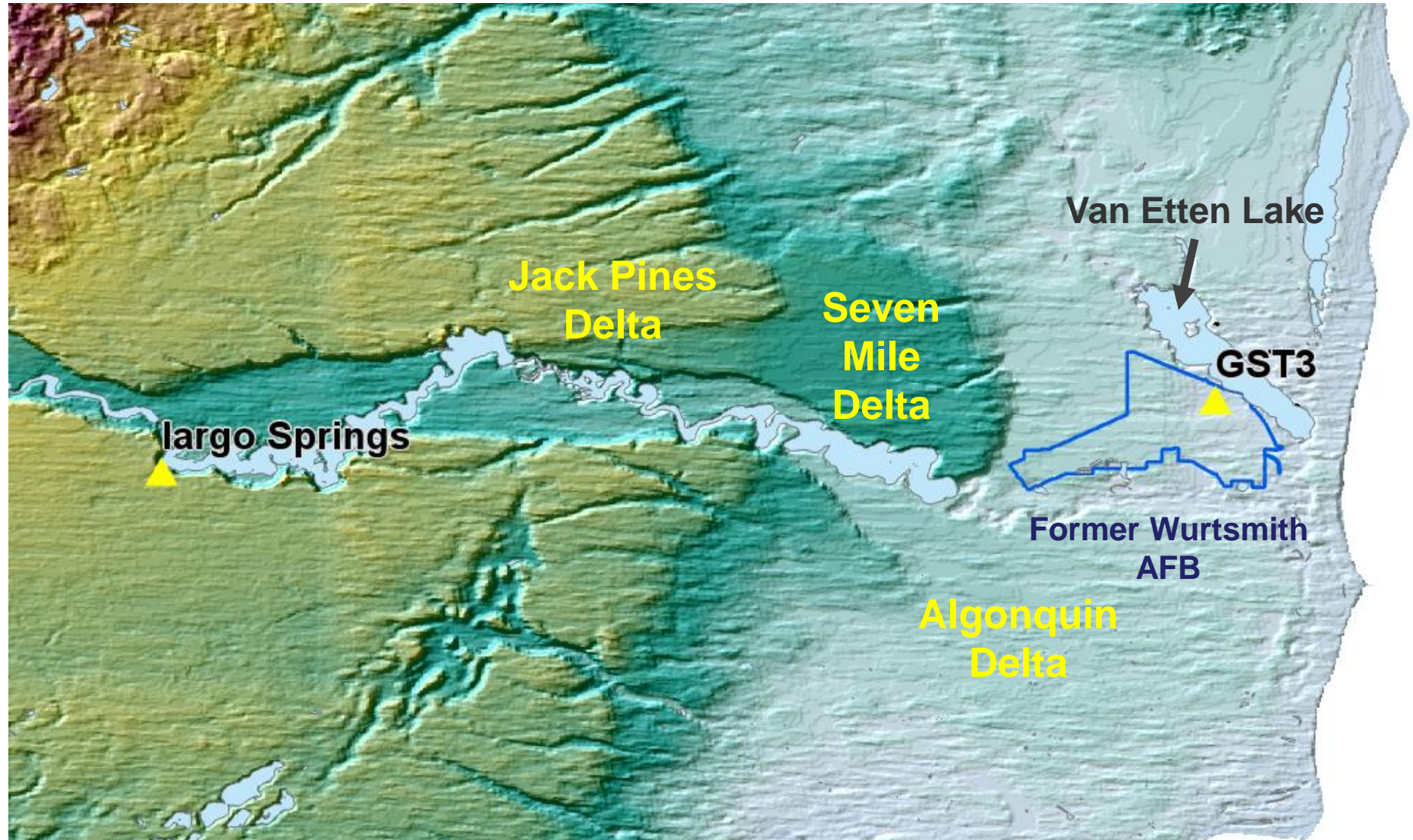


Hydrogeology Near Former Wurtsmith AFB

John Gillespie
AFCEC/CZTE
24 APR 19

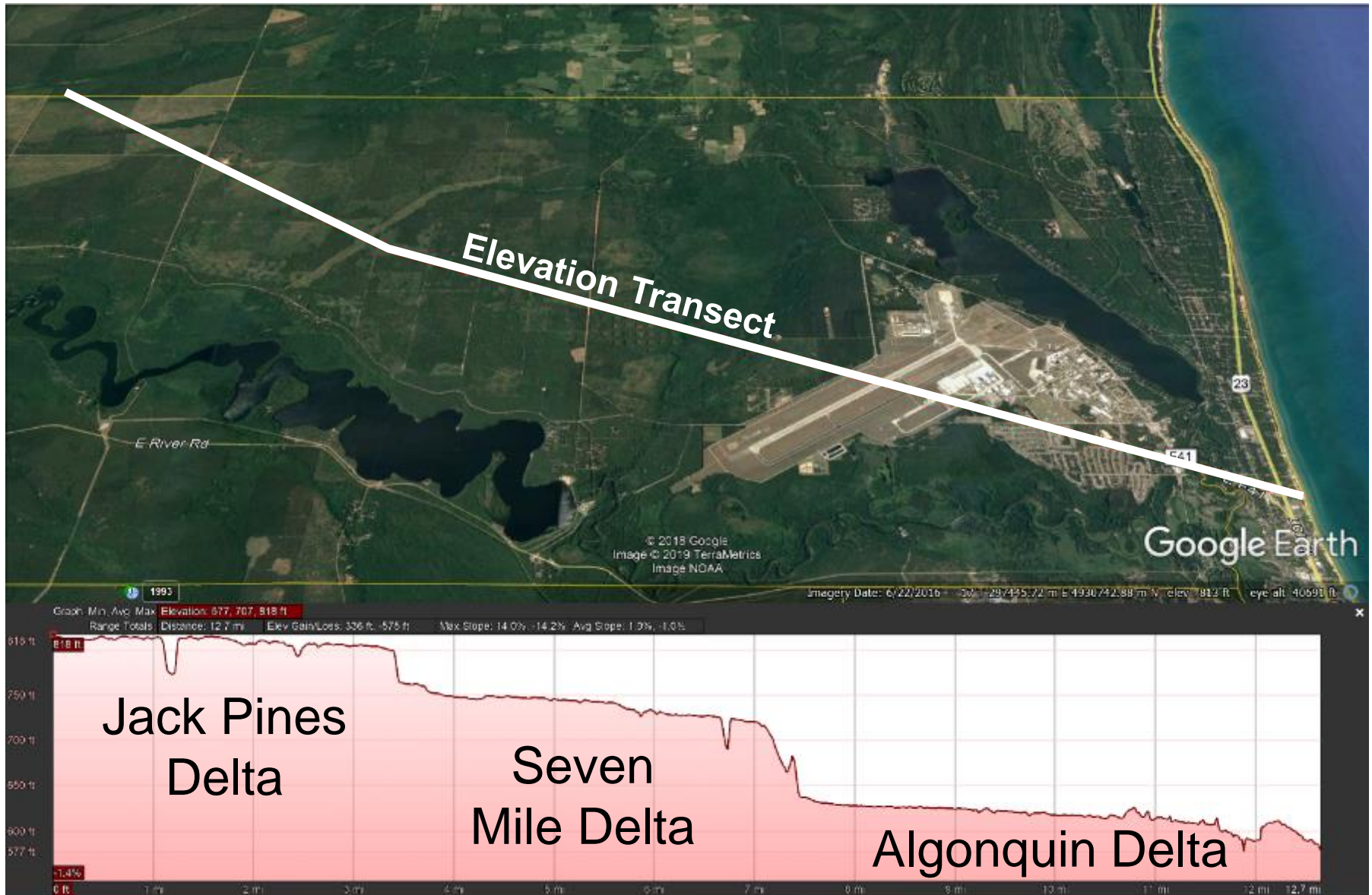


Pleistocene Deltaic Formations Near Iosco County, MI





Wurtsmith RAB Elevation of Deltaic Formations





Key USGS Wells Installed in 1979

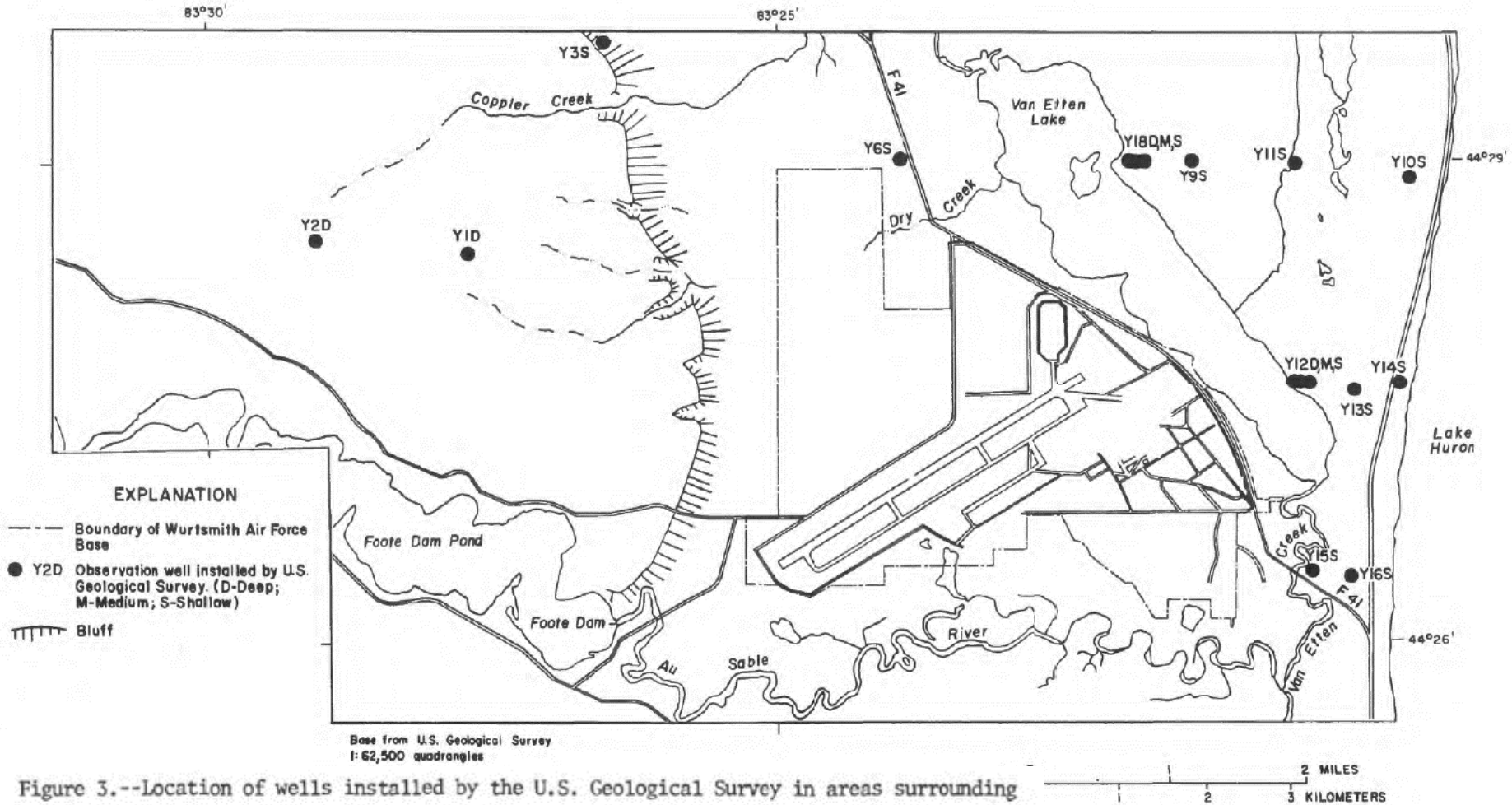


Figure 3.--Location of wells installed by the U.S. Geological Survey in areas surrounding Wurtsmith Air Force Base.

Stark, J.R., Cummings, T.R. Twenter, F.R., 1983, Ground-water contamination at Wurtsmith Air Force Base, Michigan: U.S. Geological Survey Water-Resources Investigations Report 83-4002, 93 p., 1 pl., 43 figs.



Altitude of Water Table and Direction of Groundwater Flow, September 1980

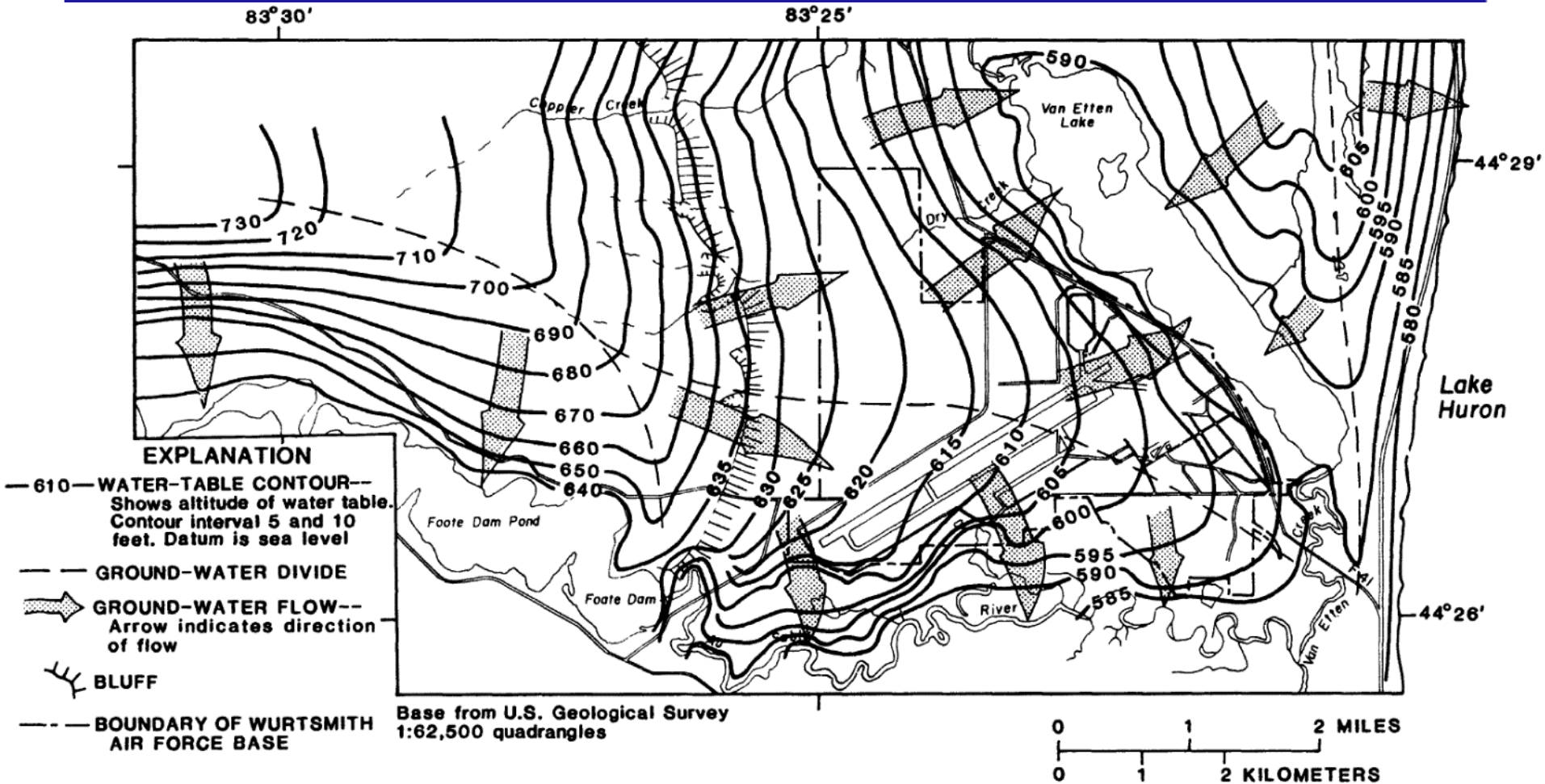


Figure 5.--Altitude of water table and direction of ground-water flow, September 1980.

Cummings, T.R., and Twenter, F.R., 1986, Assessment of ground-water contamination at Wurtsmith Air Force Base, Michigan, 1982-85: U.S. Geological Survey Water-Resources Investigations Report 86-4188, 120 p., 3 pls., 55 figs.



Subsurface Geology near Former Wurtsmith AFB



Published by
USGS in 1983

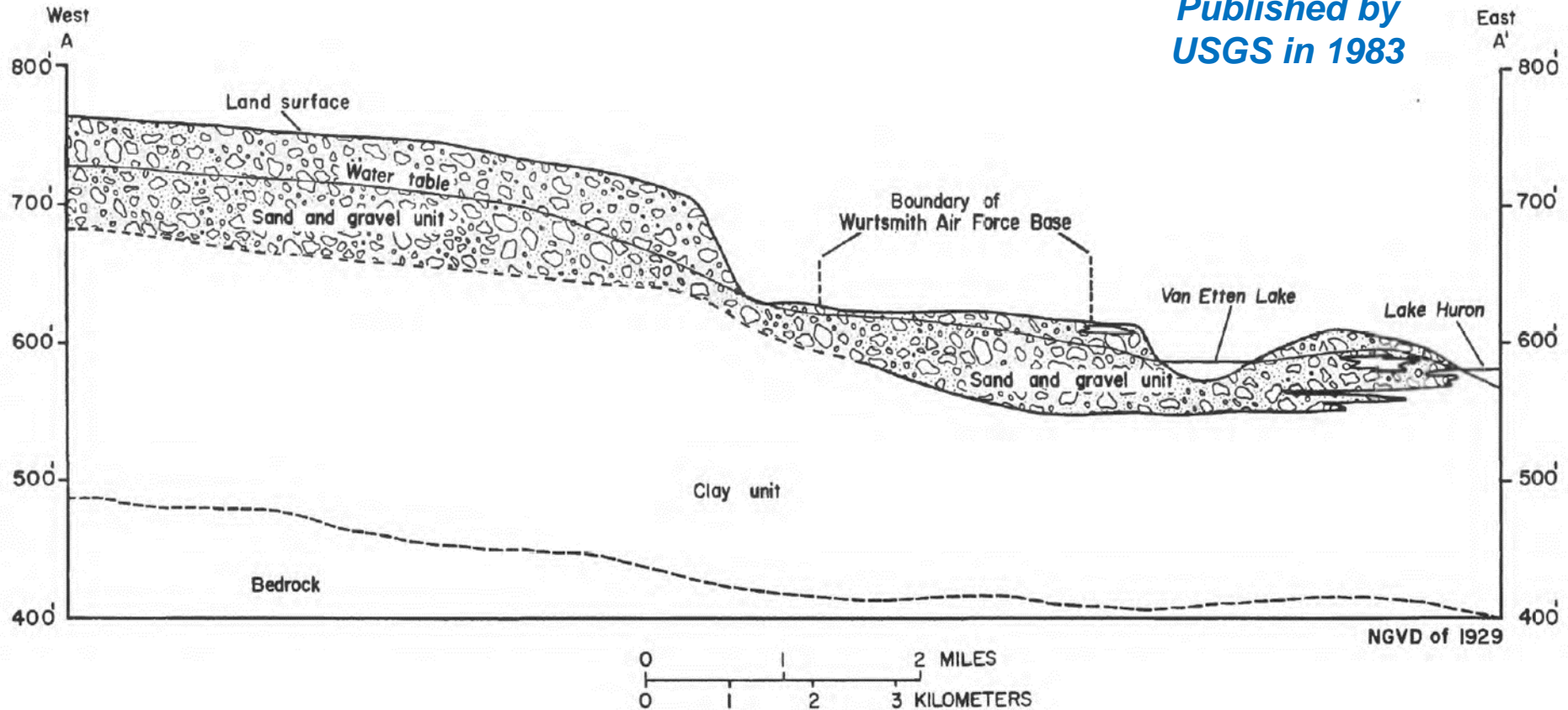
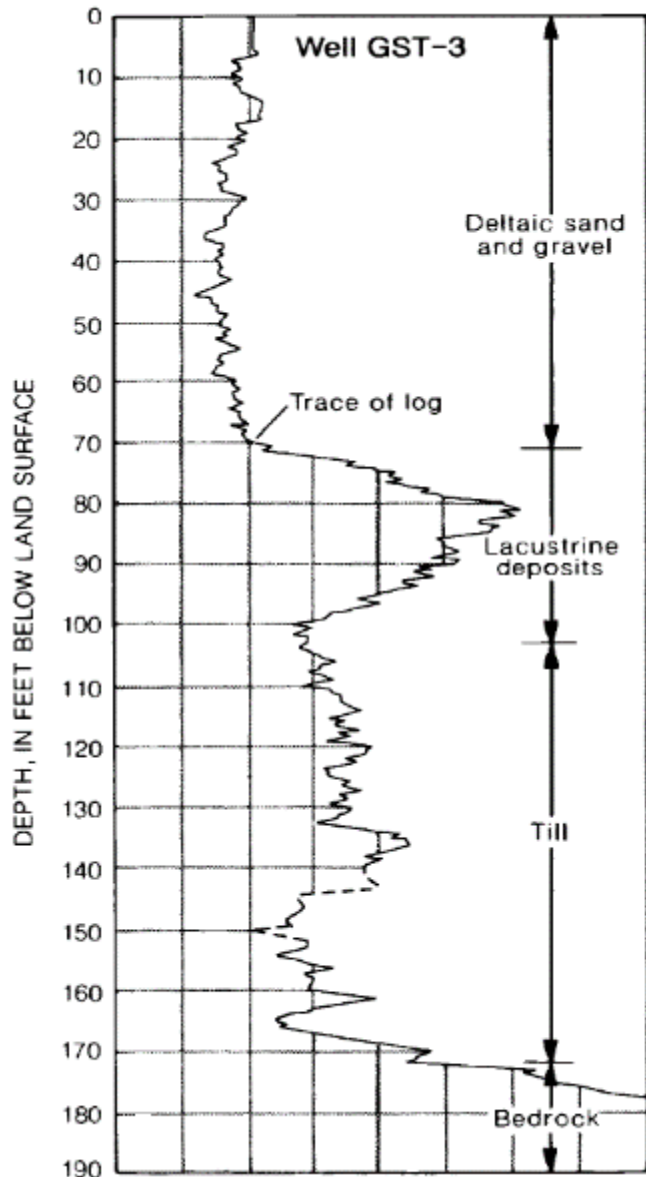


Figure 5.--Generalized geohydrologic section showing relation of sand and gravel unit to clay unit. Line of section shown in figure 4.

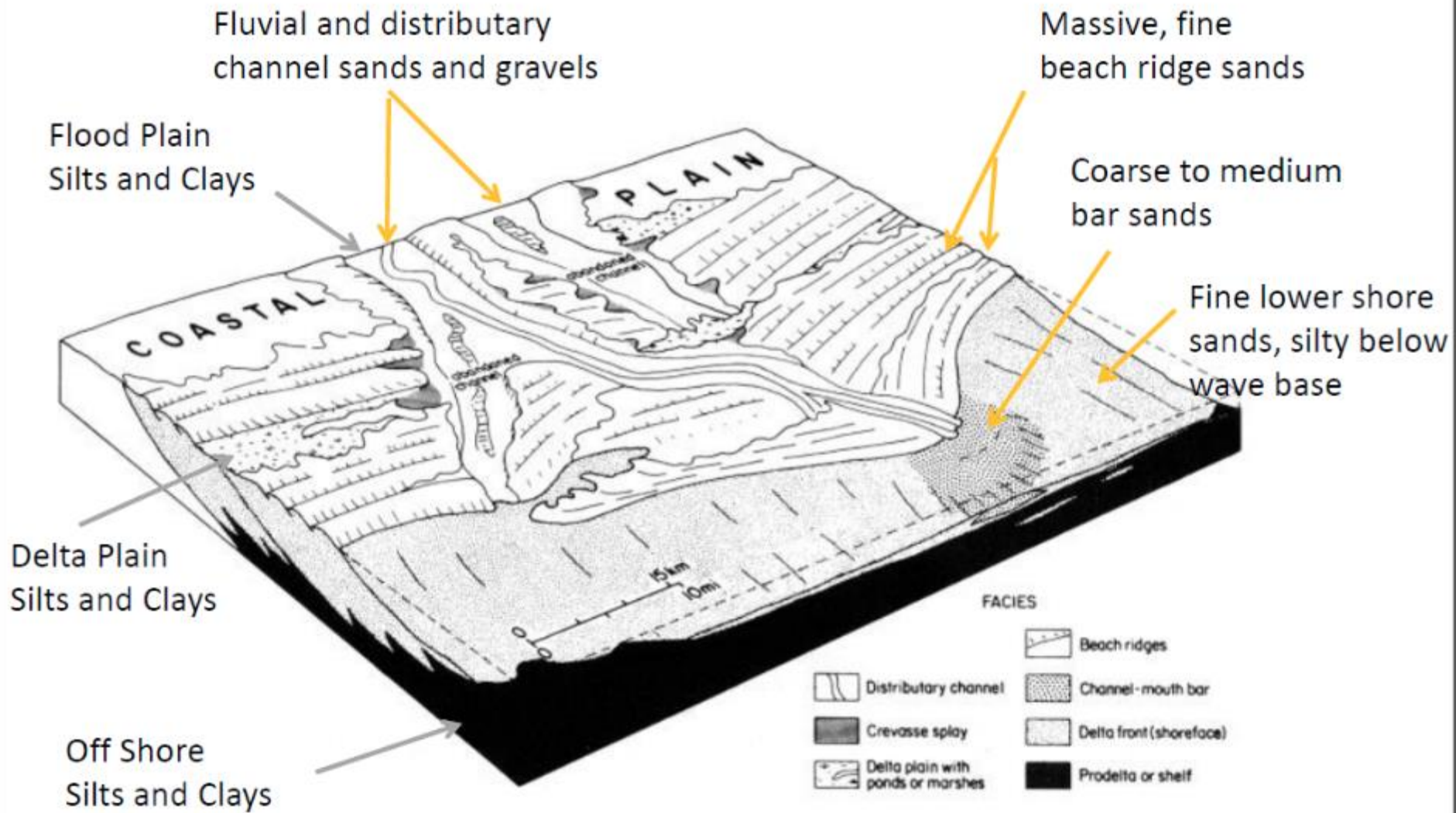
Wurtsmith RAB Geophysical Log for Well GST-3



- **Total Dissolved Solids (TDS) >7000 $\mu\text{S}/\text{cm}$**
- **Water level 10 feet higher than water level in surficial aquifer**

Figure 8. - Gamma-ray log of well GST-3 showing stratigraphic breaks between geologic units. (Modified from Cummings and Twenter, 1983, fig. 54.)

Figure 2 -Delta: Facies Components



Distribution of Surficial Deposits Near Former Wurtsmith AFB

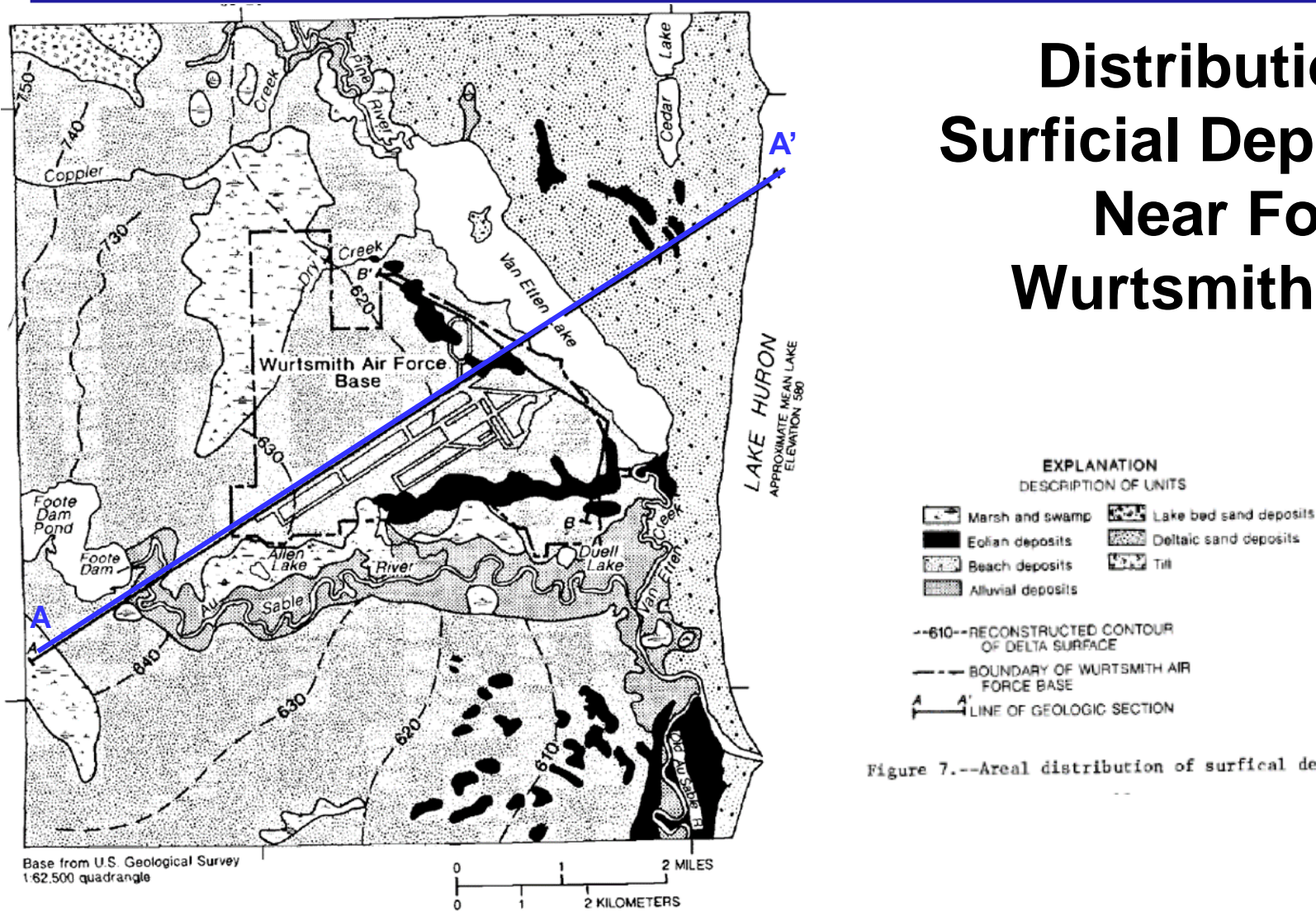


Figure 7.--Areal distribution of surficial deposits.



Geologic Section A-A'

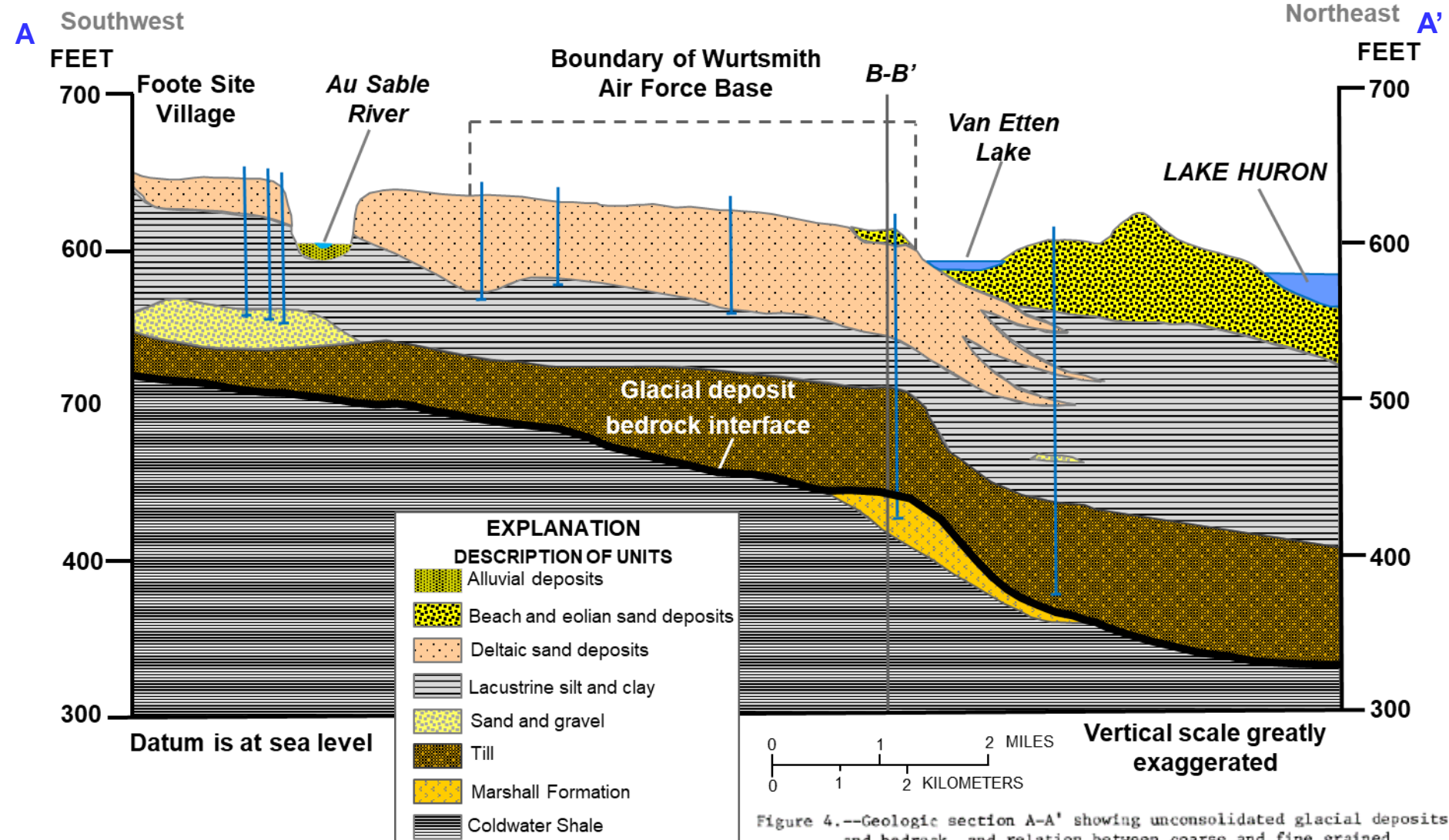
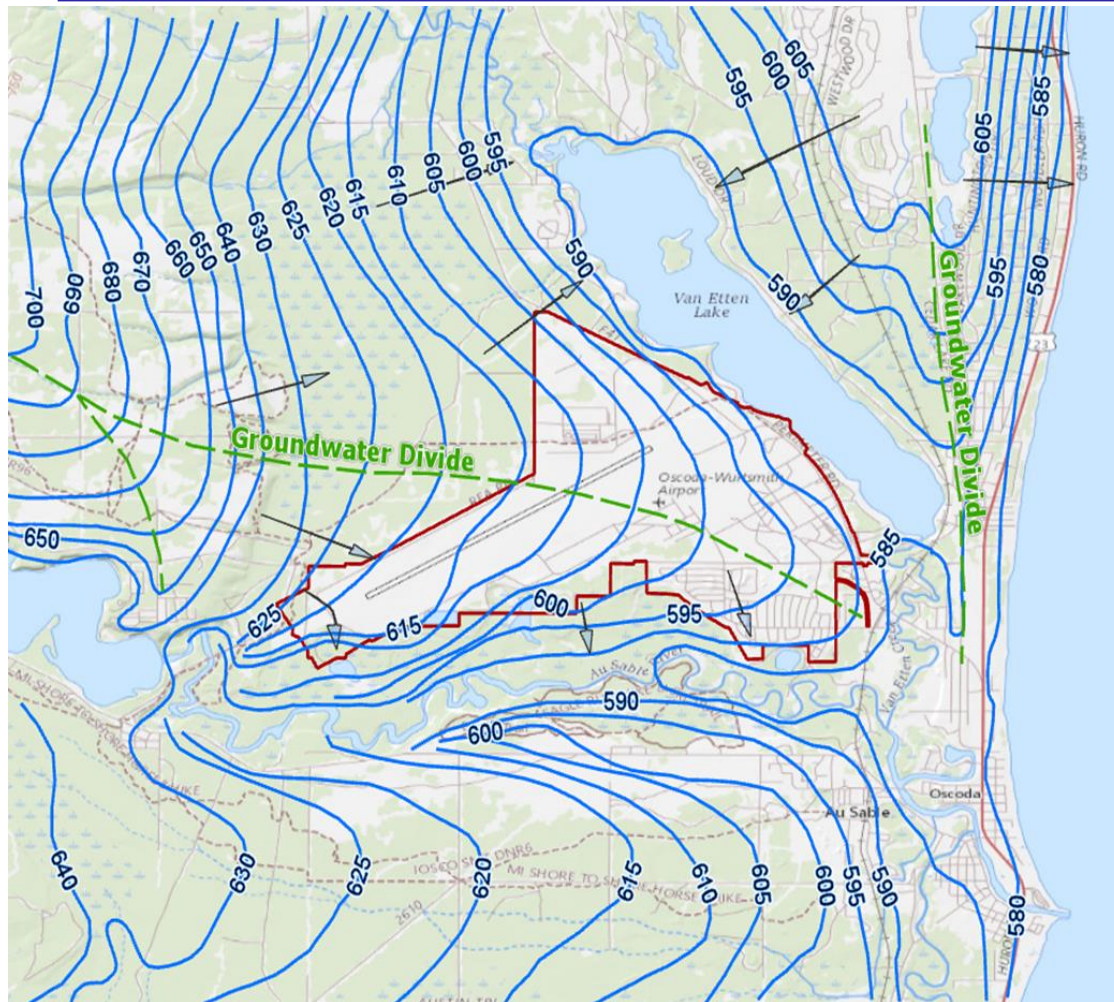


Figure 4.--Geologic section A-A' showing unconsolidated glacial deposits and bedrock, and relation between coarse and fine grained glacial deposits in the study area. (Line of section shown on fig. 7.) (Digitized)



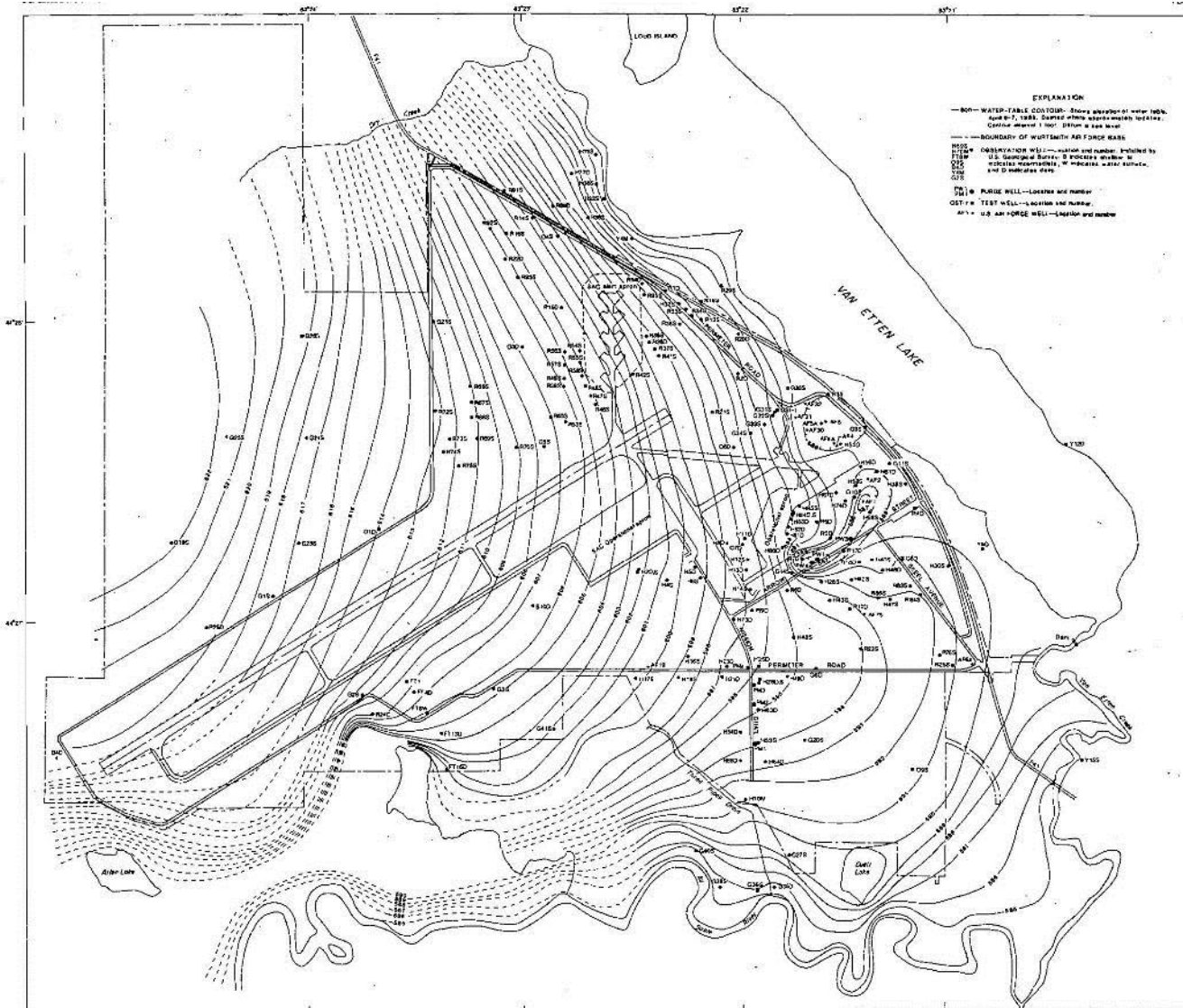
**USGS generalized
groundwater flow in
vicinity of Former
Wurtsmith AFB
(published in 1990
report)**

- EXPLANATION**
- 600— WATER-TABLE CONTOUR—Shows elevation of water table. Contour interval 5 and 10 feet. Datum is sea level
 - - - GROUND-WATER DIVIDE
 - >— GROUND-WATER FLOW—Arrow indicates direction of flow

Figure 11.--Generalized water table and direction of ground-water flow in study area. (Modified from Stark and others, 1983, fig. 6.) (Digitized)



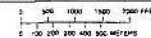
Wurtsmith RAB Hydrogeology



**Hand-drawn
water table
using data
measured
during USGS
1989 synoptic
event**

Gillespie, J.L., 1990, Hydrogeology near Wurtsmith Air Force Base, Michigan, 1987-89: U.S. Geological Survey

MEASURED WATER TABLE OF THE SURFICIAL SAND AND GRAVEL AQUIFER, APRIL 6-7, 1989, WURTSMITH AIR FORCE BASE, MICHIGAN.

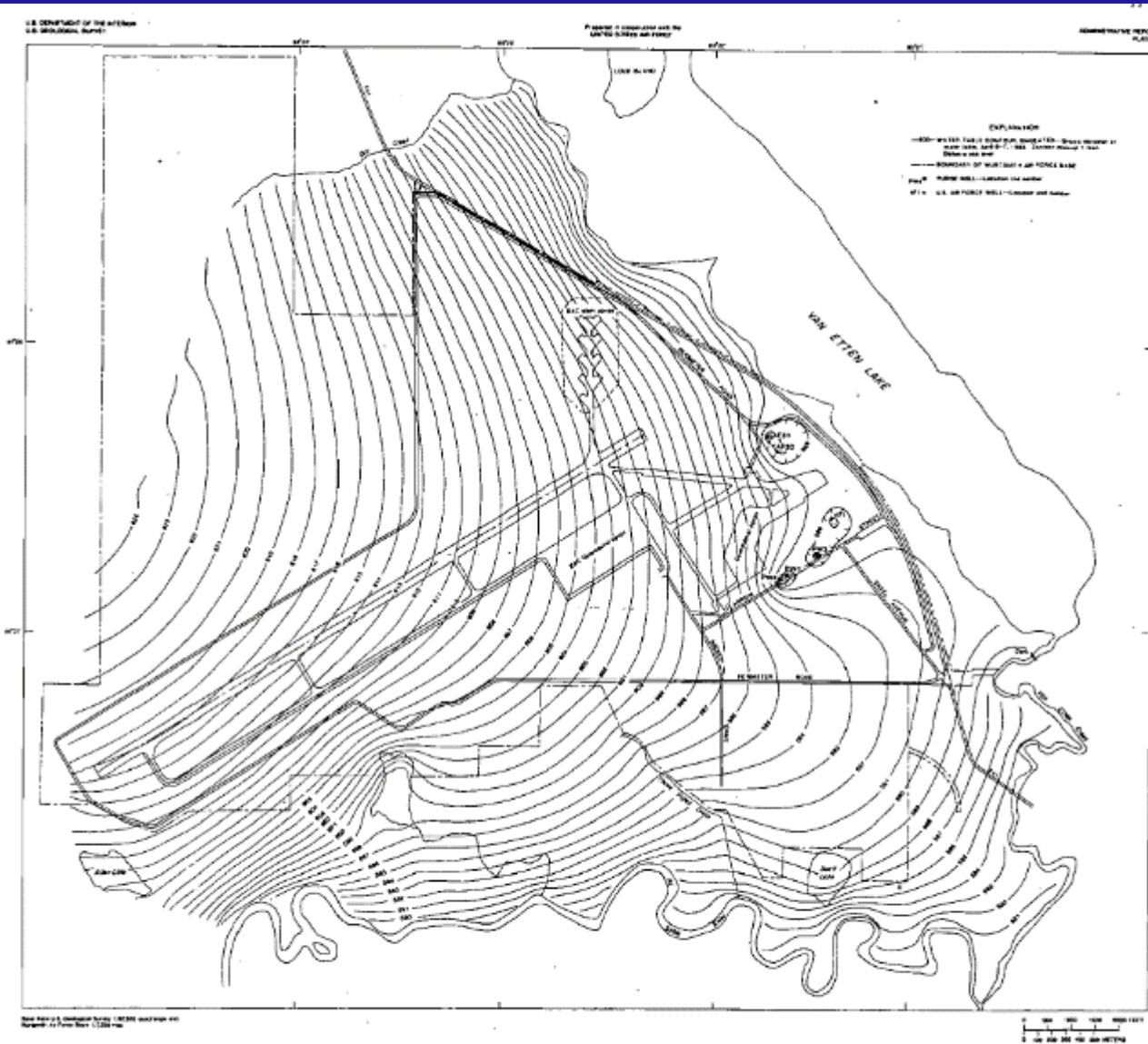




Wurtsmith USGS Modeled Water table



Gillespie, J.L., 1990, Hydrogeology near Wurtsmith Air Force Base, Michigan, 1987-89: U.S. Geological Survey



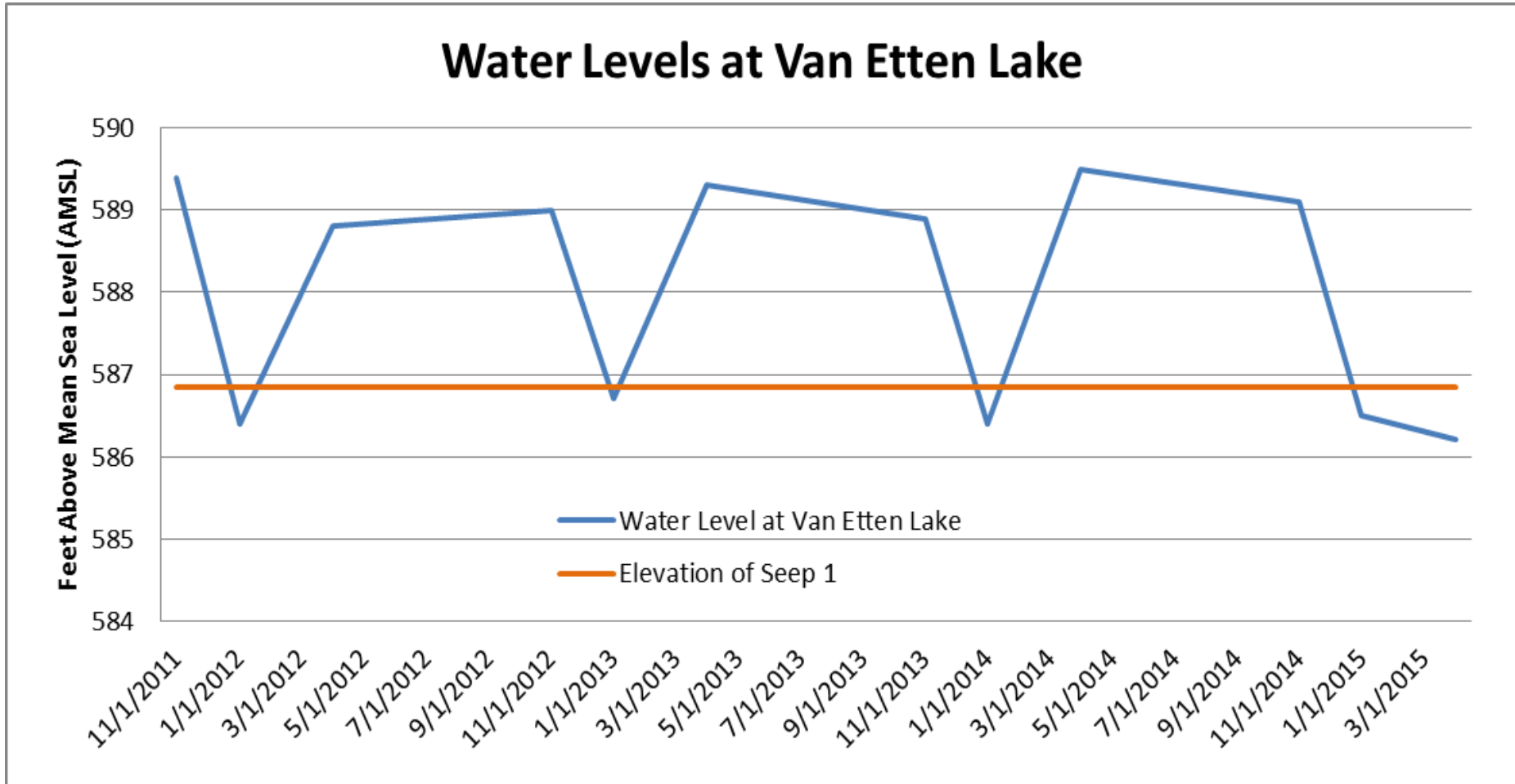
SIMULATED WATER TABLE OF THE SURFICIAL SAND AND GRAVEL AQUIFER, APRIL 6-7, 1989.
WURTSMITH AIR FORCE BASE, MICHIGAN.

**Modeled
water table
using data
measured
during USGS
1989
synoptic
event**

Gillespie, J.L., 1990, Hydrogeology near Wurtsmith Air Force Base, Michigan, 1987-89: U.S. Geological Survey



Water Levels at Van Etten Lake Showing Seasonal Lowering of Lake





Geophysical Logs Showing Fine Grain Layers Near Van Etten Lake Coastline

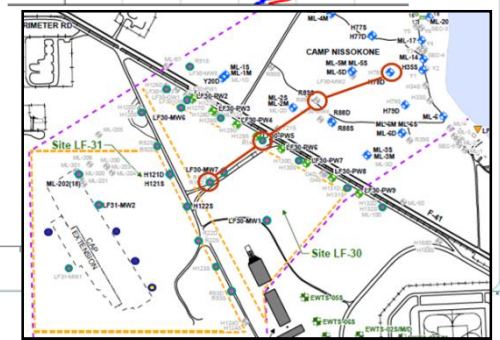
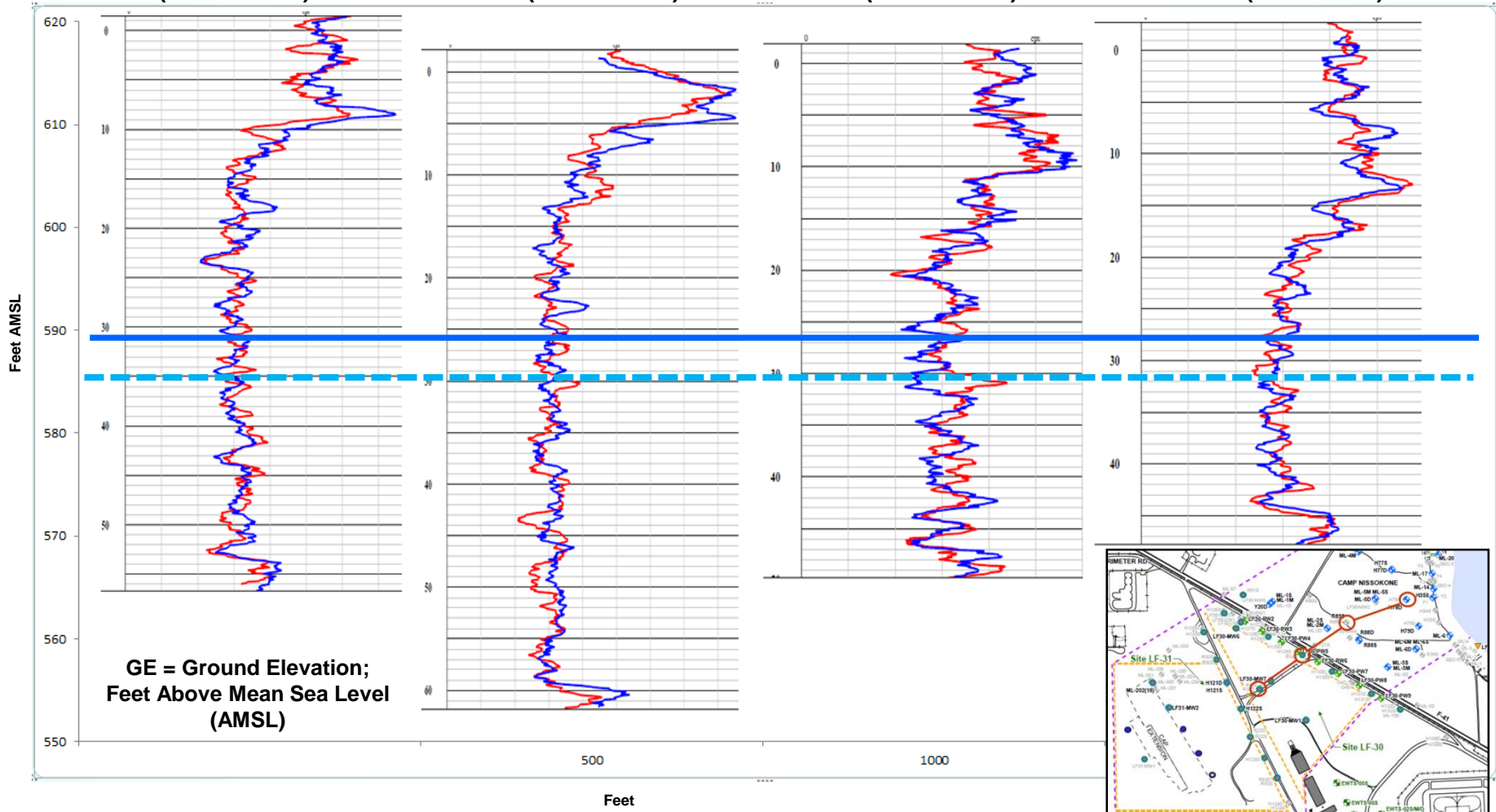


R16D
(GE 619.07 ft)

R14D
(GE 615.07 ft)

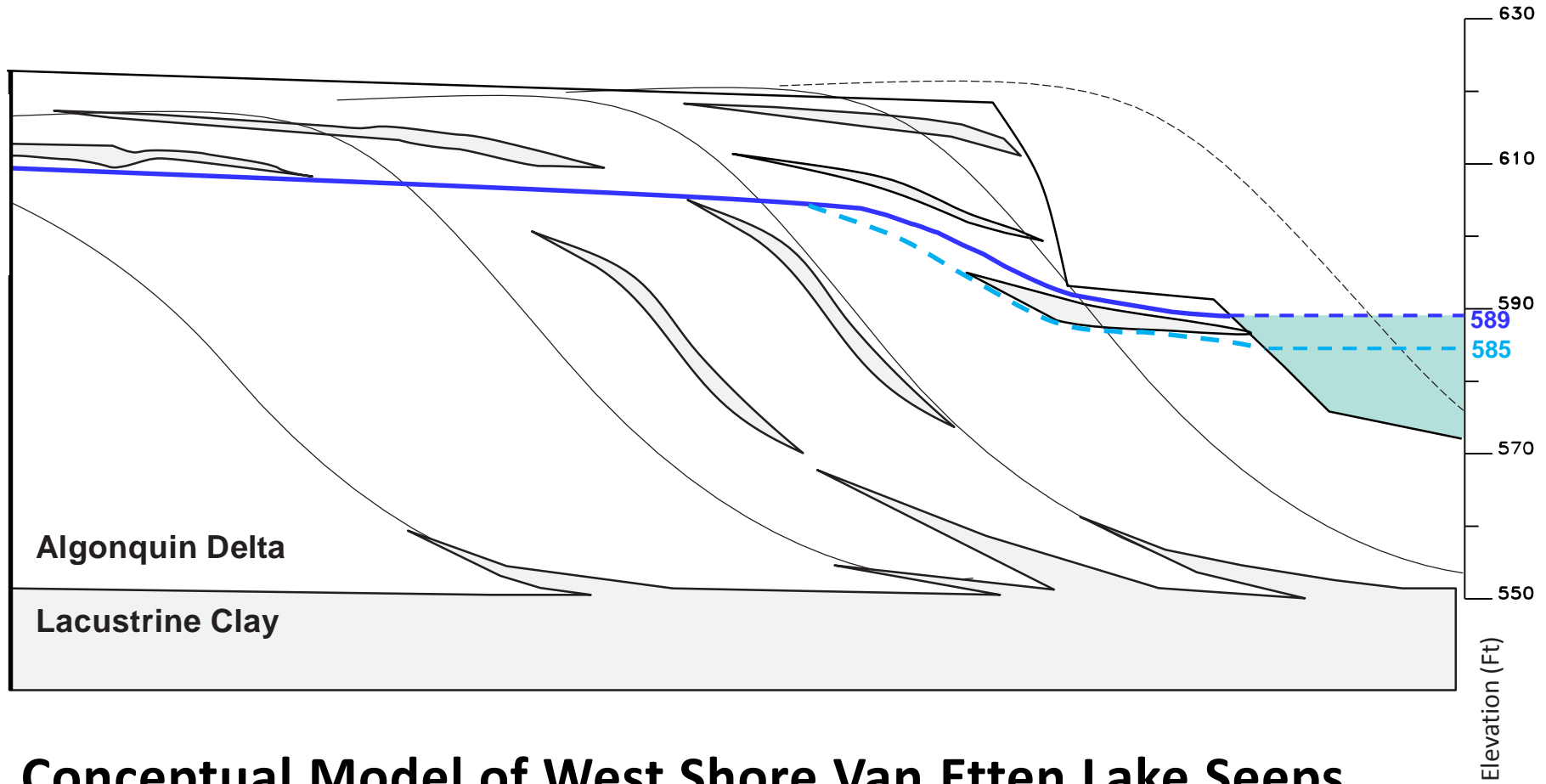
R89D
(GE 615.63 ft)

H78D
(GE 617.0 ft)





Conceptual Model Showing Fine Grain Layers Causing Seeps During Seasonal Lowering of Van Etten Lake



Conceptual Model of West Shore Van Etten Lake Seeps

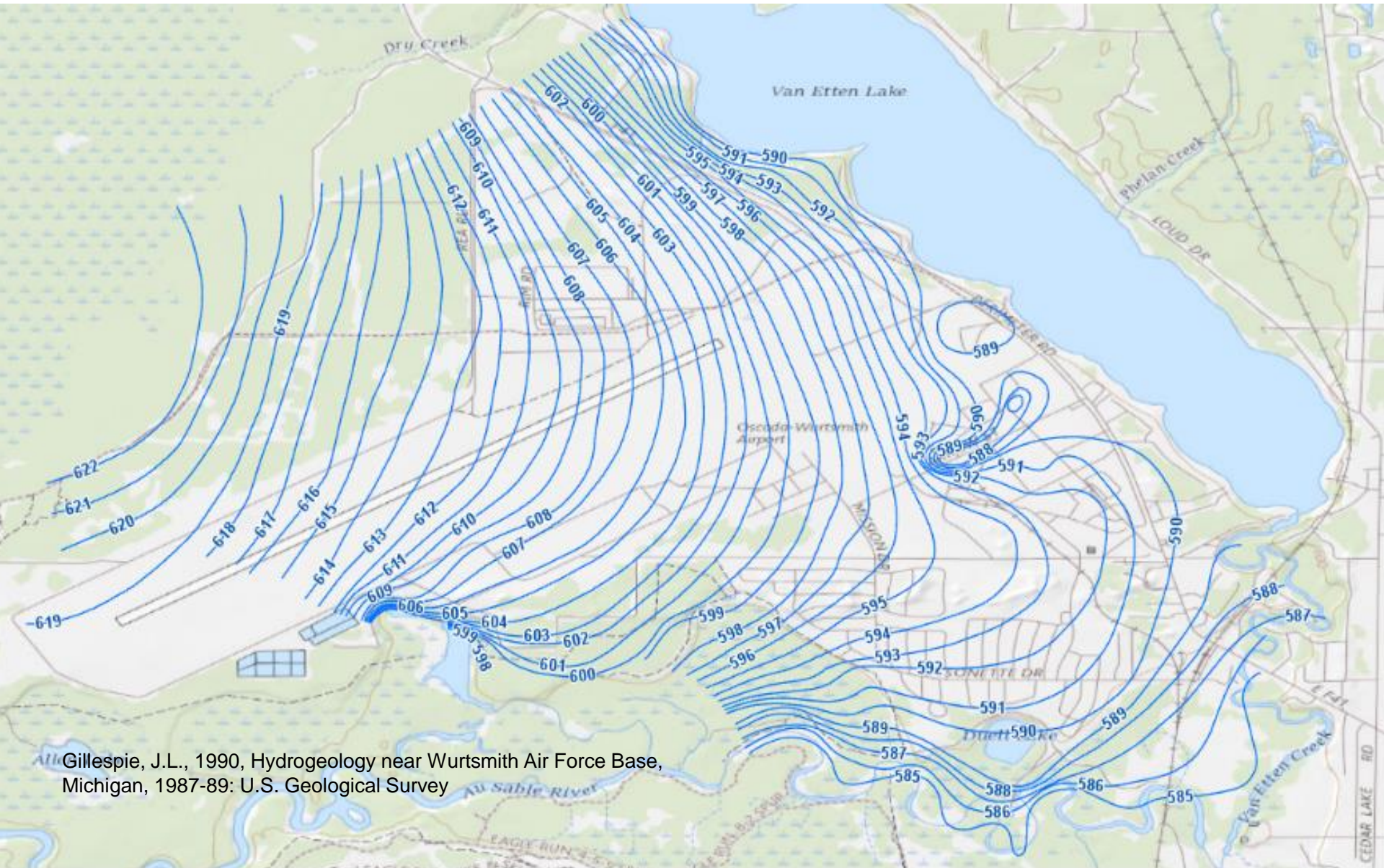


Hydrogeology: Key Points

- 1. Quaternary glacial deposits are well defined and mapped in the vicinity of Former Wurtsmith AFB**
- 2. Aquifer materials and confining layers are well defined in the vicinity of Former Wurtsmith AFB**
- 3. Hydrogeology showing direction of groundwater flow is well defined and documented near Former Wurtsmith AFB**
 - a) Groundwater flows from Former Wurtsmith AFB east to Van Etten Lake**
 - b) Groundwater on the east side of Van Etten Lake flows west towards Van Etten Lake**
 - c) Groundwater along the southern boundary of AFB flows to the alluvial deposits of ancestral Au Sable River and eventually enters the modern Au Sable River.**
 - d) Seasonal water level controls on Van Etten Lake expose seeps that are caused by finer grain layers within the deltaic deposits**
 - e) Alluvial deposits in the ancestral Au Sable River would need better definition to understand groundwater flow through those deposits**



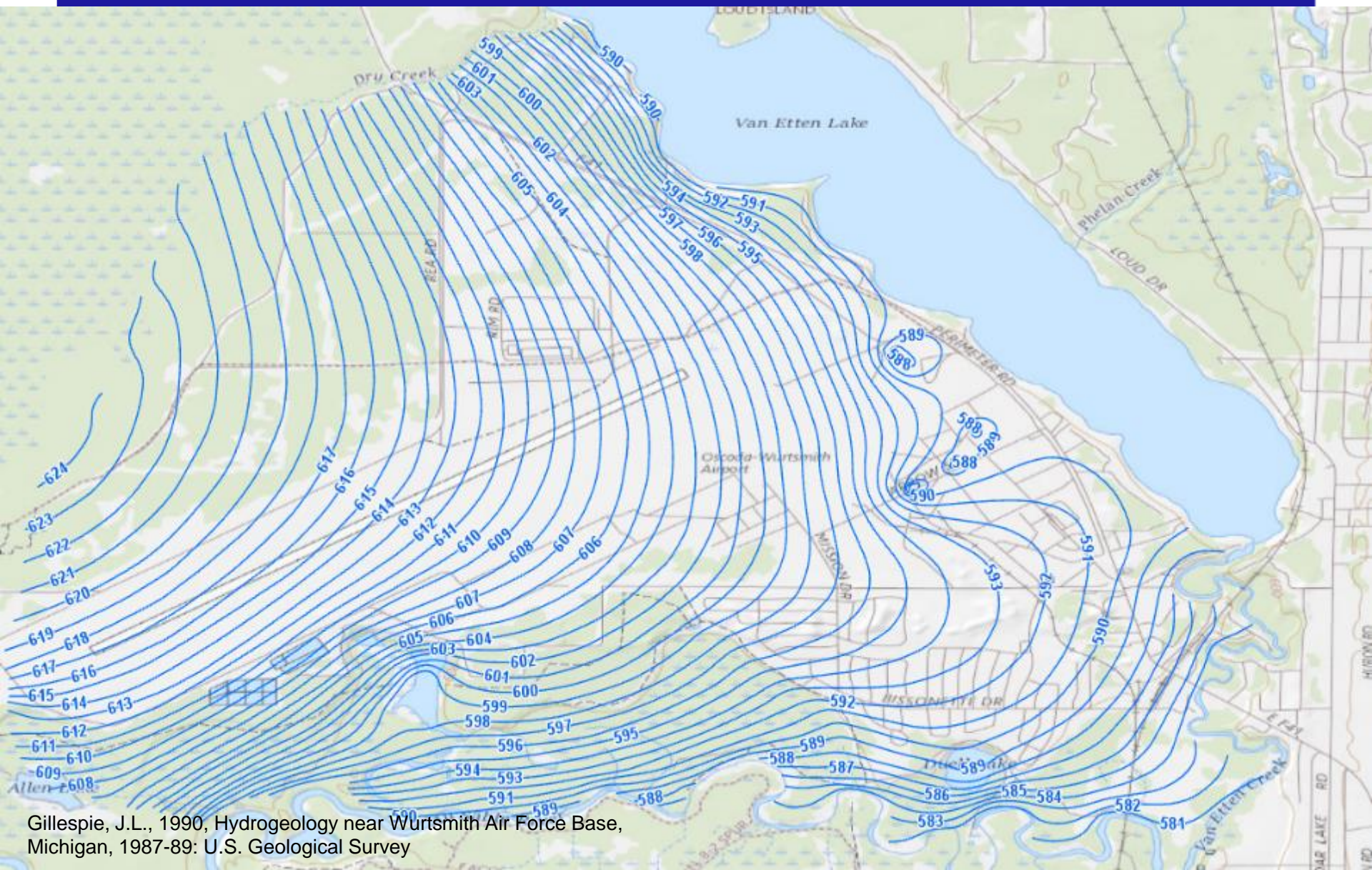
Hand Drawn Water Table Using Data Measured During USGS 1989 Synoptic Event



Gillespie, J.L., 1990, Hydrogeology near Wurtsmith Air Force Base, Michigan, 1987-89: U.S. Geological Survey



USGS Modeled Water Table Using Data Measured During USGS 1989 Synoptic Event



Gillespie, J.L., 1990, Hydrogeology near Wurtsmith Air Force Base, Michigan, 1987-89: U.S. Geological Survey



Wurtsmith RAB



RAB Business



Wurtsmith RAB RAB Business



- Action Item Review
- RAB Community Member(s) Appointment Terms
 - ▶ Two-year terms end August 2, 2019
 - ▶ Current members may serve additional terms
 - ▶ Membership Applications: see public affairs or visit <https://www.afcec.af.mil/Home/BRAC/Wurtsmith.aspx>
- Highlight RAB operations, procedure changes



Public Comment



Public Comment Period

- 01** | Sign in and write your name on a card
- 02** | Deliver your comments from the front of the room
- 03** | Three minute time limit
- 04** | RAB members will confer after your comment to see if a follow-up action is needed



Conclusion & Adjournment

