Alachua County
Environmental Protection Department

SITE ASSESSMENT REPORT TECHNICAL REVIEW

Ted Goodman, P.G.
LP-01 Alachua
Presented by Ken Busen

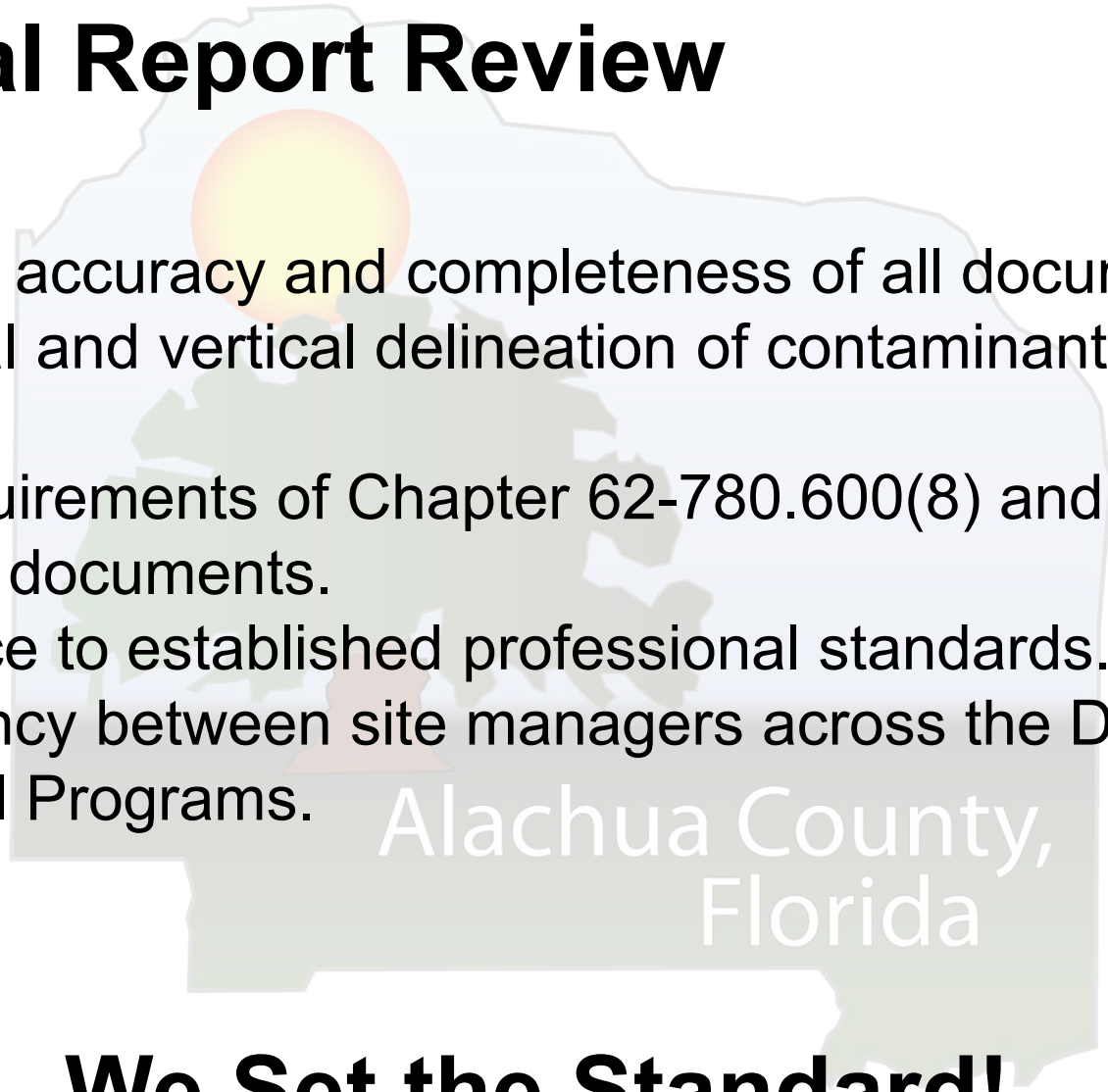
Tallahassee, FL | April 28-30, 2026

SITE ASSESSMENT

Technical Report Review

Goals

- Technical accuracy and completeness of all documents.
- Horizontal and vertical delineation of contaminants in all media.
- Meet requirements of Chapter 62-780.600(8) and associated guidance documents.
- Adherence to established professional standards.
- Consistency between site managers across the Department and Local Programs.

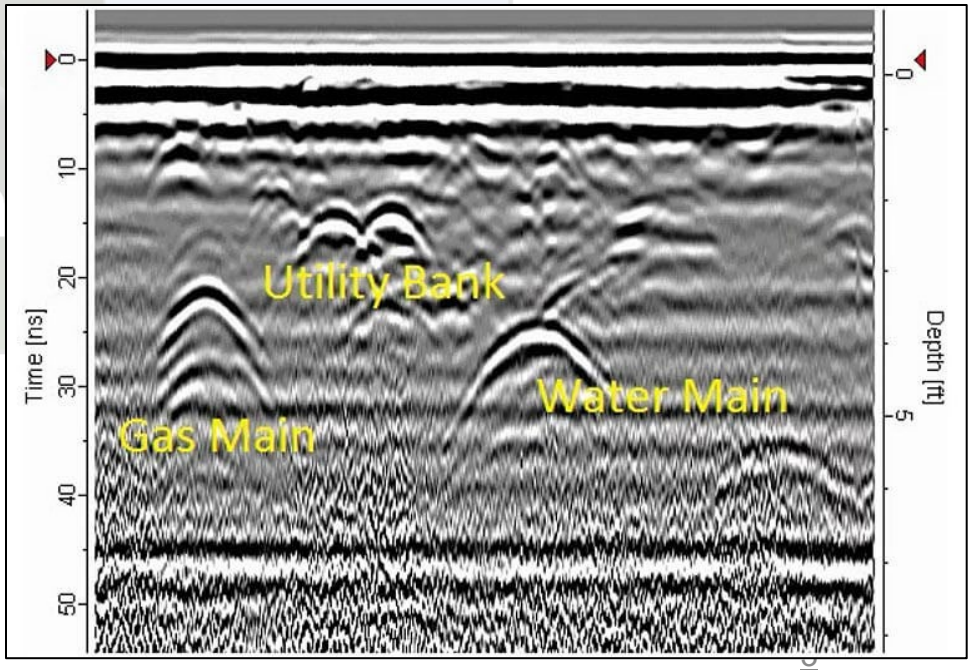


We Set the Standard!

SITE ASSESSMENT

Chapter 62-780.600(8) Site Assessment Report (SAR) Requirements

- Chapter 62-780.600(80) lists up to 28 items that should be included in a SAR.
- There are a few items that may be used only infrequently:
    - Environmental permits
    - Enforcement actions
    - Geophysical methods



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Chapter 62-780.600(8) Site Assessment Report (SAR) Requirements

SAR Contents

- Complete site history
- Summary of tasks completed
- Descriptions of investigative methods
- Site-specific geology/stratigraphy
- Site-specific hydrogeology
- Results of testing and data collection
- Data analysis and interpretation
- Summary of findings
- Recommendations

SITE ASSESSMENT

Chapter 62-780.600(8) SAR Requirements

Site History Summary

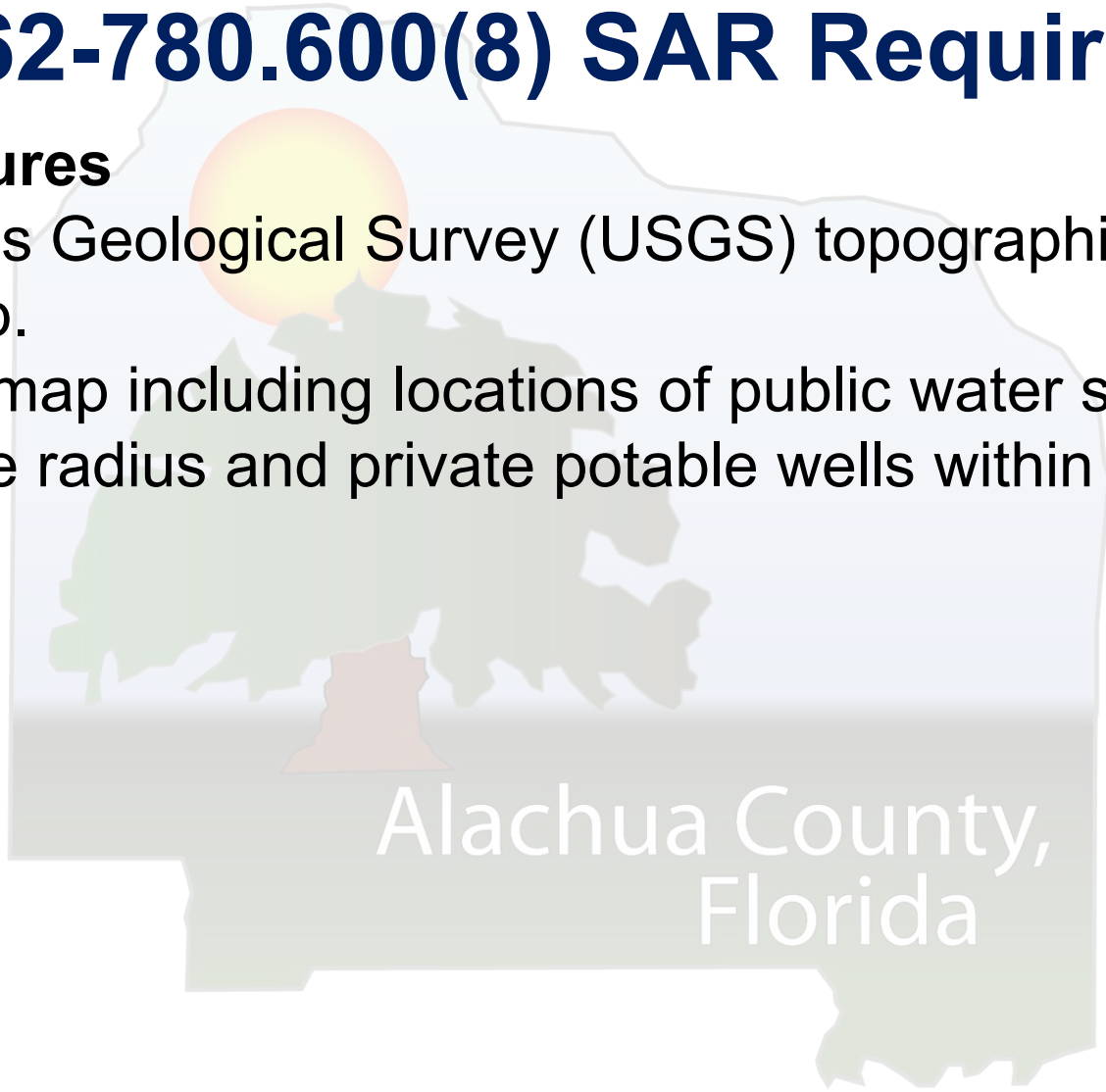
- Property and facility owners
- Past and present operations, including tank history
- Description of known products used, stored, or manufactured
- Summary of environmental permits and enforcement actions
- Discharge history
- Prior assessment and remediation history
- Free product recovery
- Interim source removals/Initial Remedial Action (IRAs)

SITE ASSESSMENT

Chapter 62-780.600(8) SAR Requirements

Required Figures

- United States Geological Survey (USGS) topographic site location map.
- Site vicinity map including locations of public water supply wells within ½ mile radius and private potable wells within ¼ mile radius.



SITE ASSESSMENT

Chapter 62-780.600(8) SAR Requirements

Required Figures

- Scaled site plan(s) showing relevant surface and subsurface features (current/former tanks, product piping & dispensers; buildings & structures; utilities; sewers; floor drains; stormwater facilities; previous source removal areas; monitoring & remediation wells; potable wells; driveways/access points; paved, unpaved & landscaped areas).
- Scaled site map(s) showing water-level elevations at each monitoring point, estimated groundwater elevation contours, and estimated direction of groundwater flow.
    - Use separate maps for different aquifer zones (e.g., shallow, intermediate, deep).

SITE ASSESSMENT

Chapter 62-780.600(8) SAR Requirements

Required Figures - Continued

- At least two geologic cross sections (structural or stratigraphic).
- Well construction diagram(s) – typical shallow and deep.
- Scaled site map(s) showing soil sample locations and horizontal **and** vertical extent of vadose soil contamination.
- Scaled site map showing horizontal extent of free product.
- Scaled site map(s) showing groundwater and surface water sampling locations and the extent of contamination.
    - Separate maps for each constituent > Groundwater Cleanup Target Levels (GCTLs).
    - Use separate maps for different aquifer zones (shallow, intermediate, deep, etc.).

SITE ASSESSMENT

Chapter 62-780.600(8) SAR Requirements

Required Tables

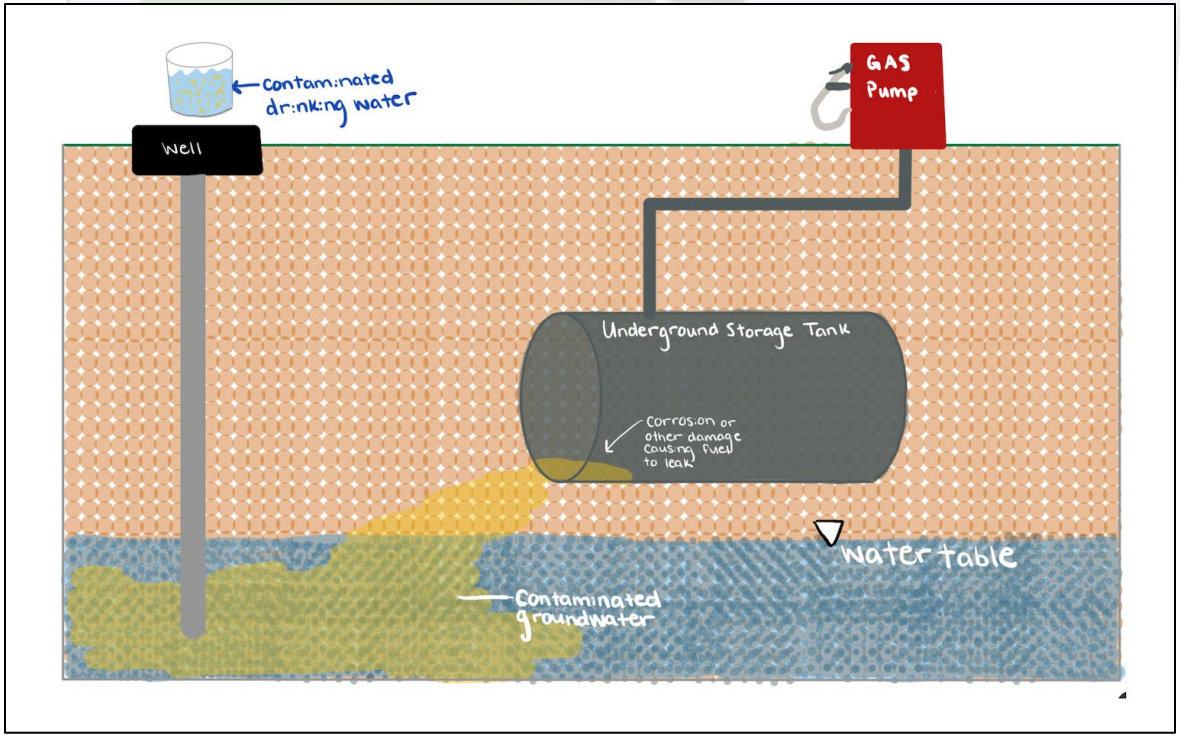
- Well construction details
- Soil screening summary (Organic Vapor Analyzer [OVA] data)
- Groundwater elevation summary
- Soil analytical summary
    - Volatile Organic Aromatics (VOAs), Total Recoverable. Petroleum Hydrocarbons (TRPH) & Metals
    - Non-carcinogenic Polynuclear Aromatic Hydrocarbons (PAHs)
    - Carcinogenic PAHs
    - Total Recoverable Petroleum Hydrocarbons (TRPH fractionation)

SITE ASSESSMENT

Chapter 62-780.600(8) SAR Requirements

Required Tables - Continued

- Groundwater analytical summary
  - Volatile Organic Compounds (VOCs) & Metals
  - PAHs & TRPH



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Technical Report Review

Report Review Process Flow

- Appendices
  - Field notes, boring logs, sampling logs, lab reports complete
  - Verify Schedule of Pay Items (SPI) quantities.
  - Verify required documents from SPI.
- Tables
  - Match field notes, boring logs, sampling logs, and lab reports.

SITE ASSESSMENT

Technical Report Review

Report Review Process Flow - Continued

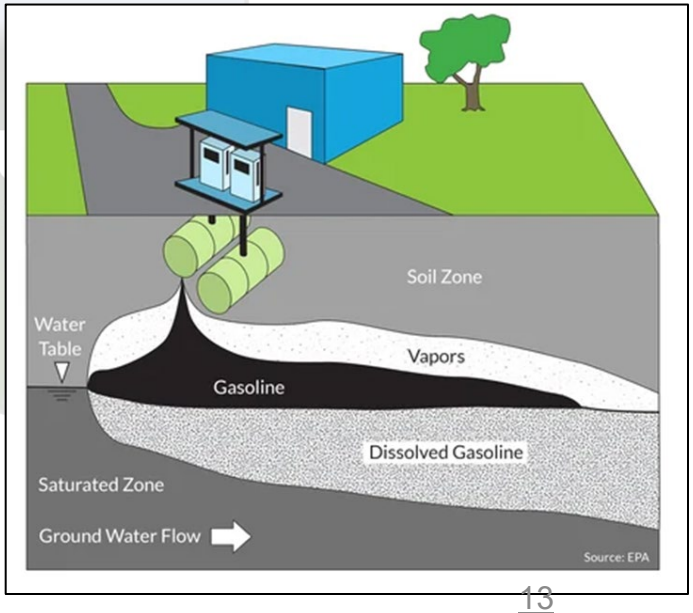
- Figures
  - Match tables.
  - Technically correct
  - Borings and monitoring wells (MWs) located and spaced to assess all potential source areas and complete horizontal delineation
  - Vertical extent well location in/near most likely source area(s)

SITE ASSESSMENT

Technical Report Review

Report Review Process Flow - Continued

- Text
  - Summarizes work completed.
  - Present data and analysis.
- Conclusions supported by data in the tables, figures, and appendices.
- Recommendations are reasonable and appropriate.



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Technical Report Review

Appendices

- Field notes
  - Personnel, vehicle(s)/equipment, start/stop times
  - Important for evaluating requests for per diem fees
  - Static depth to water
  - Top-of-casing survey
- Groundwater sampling logs
  - Proper purge method – partially or fully submerged well screen
  - Purge rate, including during sample collection
  - Purge volumes
  - Drawdown
  - Stabilization parameters within established criteria

SITE ASSESSMENT

Technical Report Review

Appendices - Continued

- Equipment calibration records
  - Calibration type (Initial Calibration (IC), Initial Calibration Verification (ICV), Continuing Calibration Verification (CCV))
  - Lot numbers/expiration dates for standards
  - Results, including Standard Deviation where required
- Lab reports
  - Sample temperature & hold times
  - Quality Assurance (QA) issues – refer to case narrative.
  - Method Detection Limits (MDLs) met.

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Technical Report Review

Appendices - Continued

- Boring logs
  - Header information
  - Blow counts (if standard penetration tests [SPTs] used for sample collection)
  - Field screening data
  - Water levels
  - Unified Soil Classification System (USCS) codes (SC ≠ sandy clay!!)

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Technical Report Review

Appendices - Continued

- Well construction and development logs
    - Well construction info complete and tables match.
    - Well development times
- Photo-documentation
    - Drum fill photos
    - Special or unusual circumstances

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Technical Report Review – Figures & Tables

Why It's Important

- Tables summarize all data in chronological order.
- Critical for evaluating temporal trends
- Figures provide a visual presentation of the data.
- Vital to understanding the spatial distribution of contaminants
- Evaluate the movement of groundwater and contaminants in the environment.
- Critical for good decision making

Accurate Figures and Tables Are Essential for Making Sound Remediation Decisions and for Site Rehabilitation Completion Order (SRCO)!

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Technical Report Review - Tables

Tables - General

- Use most current formats from the Department of Environmental Protection.
- Must be cumulative – include ALL historical data.
- Confirm transcription of data against field notes, boring logs, and lab reports.

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Technical Report Review - Tables

Groundwater Elevation Tables

- Confirm groundwater elevation calculations.
- If free product is present, groundwater elevations must be corrected for the thickness and density of free product.

$$\mathbf{CGWE = (TOC\text{-}DTW) + [(DTW\text{-}DTP) * \rho_{(LNAPL)}]}$$

Where:

CGWE = Corrected Groundwater Elevation
DTP = Depth to Product Below TOC
TOC = Top of Casing Elevation
$\rho_{(LNAPL)}$ = Density of Product (0.79 g/ml)
DTW = Depth to Water Below TOC

$\rho_{(Gasoline)}$ = 0.755 avg

$\rho_{(Diesel)}$ = 0.85 avg

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Technical Report Review - Tables

Analytical Data Tables

- Identify units of measure.
- Show cleanup target levels.
- Include lab qualifiers.
  - Include description in the table notes/footnotes section.
- Confirm unit conversions (µg to mg).
- Significant figures, especially trailing zeroes
- Soil analytical data tables should not be used to report field OVA data.

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Technical Report Review - Tables

Analytical Data Tables - Cautions

- Pre-1996, common practice was to sum the concentrations of naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene and report as Total Naphthalenes.
  - 1-methylnaphthalene and 2-methylnaphthalene reported as "NA" or left blank in historic data tables.
  - Individual concentrations are shown in lab reports.
  - ATC's should update historical tables to show these data.
- Also, pre-1996, the standard analytical suite for groundwater samples was EPA Method 601 (VOHs), EPA Method 602 (VOCs), EDB by EPA Method 504.1, and Pb.
  - 1,2-Dichloroethane (ethylene dichloride or EDC) is included in the EPA Method 601 parameter list.

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Technical Report Review - Tables

Analytical Data Tables - Cautions

- Watch for unnecessary rounding of data.
  - May be used for determining Cleanup Target Levels (CTL) exceedances and evaluating closure eligibility.
  - Should not be applied to data tables.
- Watch for unit conversion errors – most often seen with TRPH data, metals, and inorganic compounds.

More info on analytical data rounding for site closure is available here: https://floridadep.gov/waste/petroleum-restoration/documents/rounding-analytical-data-site-rehabilitation-completion

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Technical Report Review - Figures

Site Plans

- Drawn to scale.
- Detailed – should include site boundaries; current and historical tank, piping, and dispenser locations; buildings and structures; driveways; utilities; location(s) of any source removals; paved and unpaved areas; large trees including canopy drip edge; objects that have the potential to restrict or obstruct access; etc.
- Site plan using only an aerial photo is NOT acceptable.

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Technical Report Review – Figures

Why no Aerials?

2011

2018

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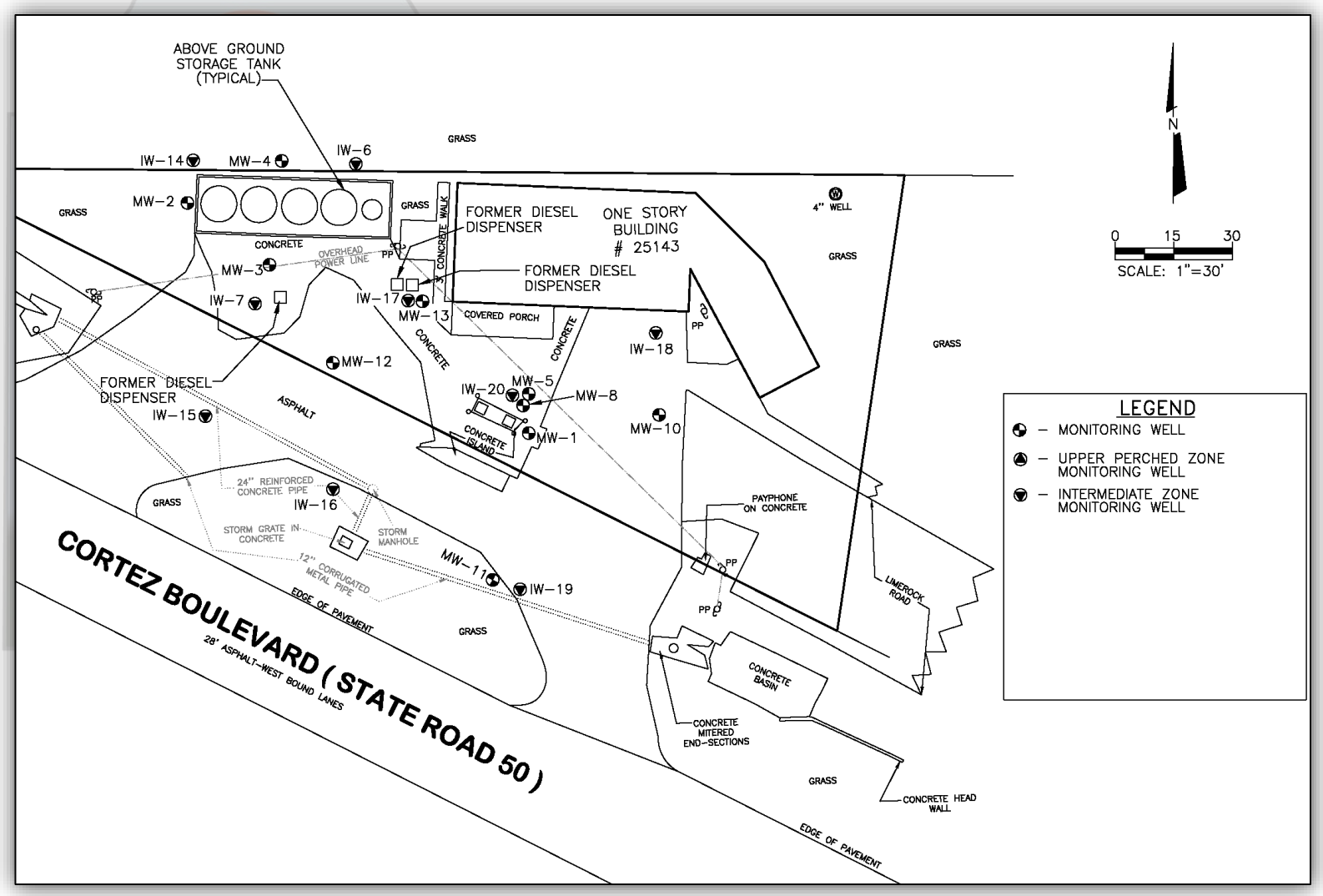
Good Site Plan

- Site boundary
- Properly scaled
- Good details
- Structures
- Monitoring wells
- Utilities



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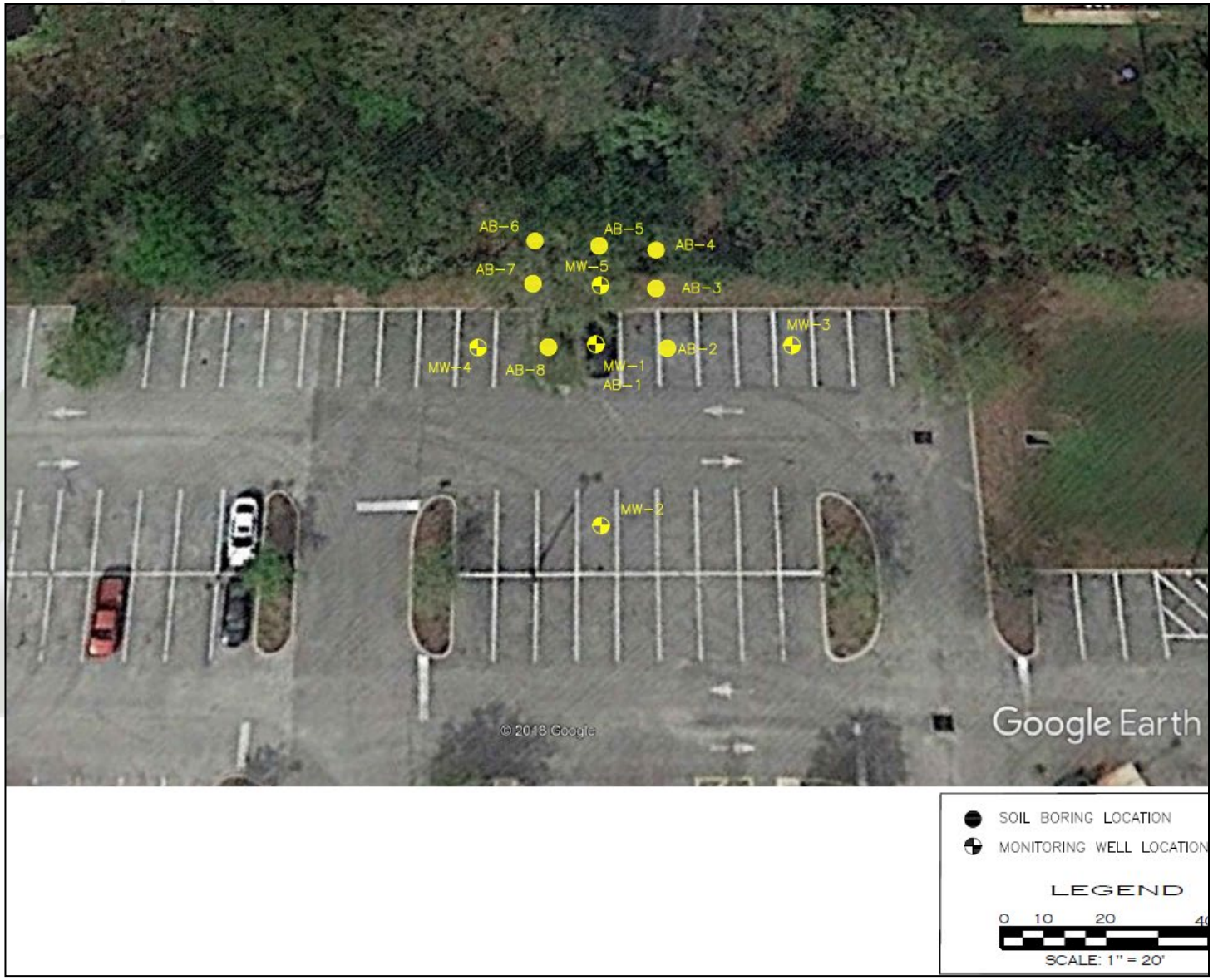
Poor Site Plan

- Site boundary of questionable accuracy
- Uses an aerial photo for the base map.
- No site details

SITE ASSESSMENT

Poor Site Plan

- Uses an oblique aerial photo.
- Cannot be properly scaled.
- No site boundaries
- No site details



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Technical Report Review - Figures

Geologic Cross Sections

- Soil/rock types
- Contaminant concentrations (soil OVA, soil analytical, and groundwater analytical, including isoconcentration contours where possible)
- Depict soil borings & monitoring wells (including screened intervals).
- Water table
- Structural and stratigraphic cross sections are both acceptable; structural is preferred.

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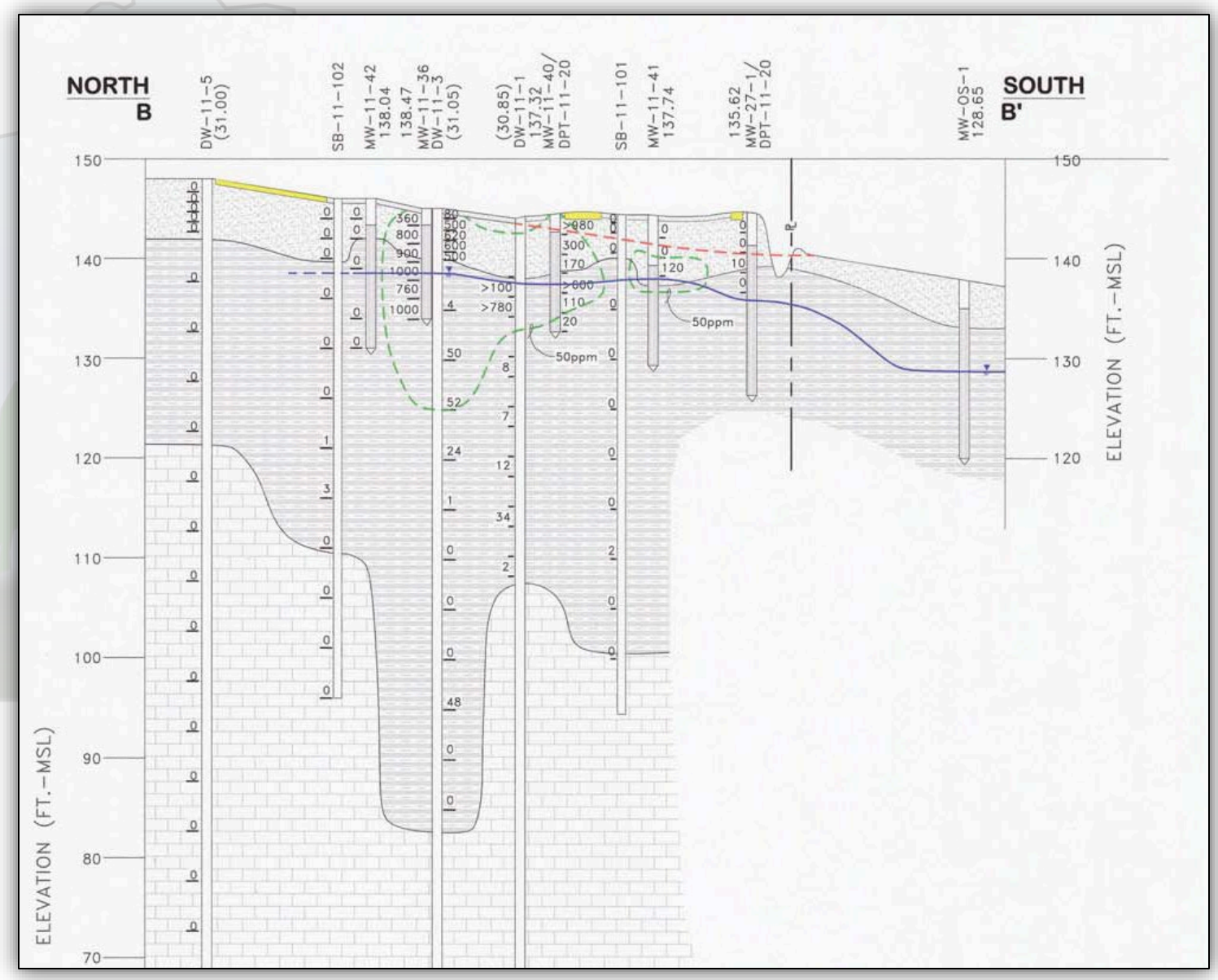
Geologic Cross Section

- Ground surface elevation
- Soil/rock types
- Monitoring wells with screened intervals
- Soil borings
- OVA data and contours
- Water table



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Technical Report Review - Figures

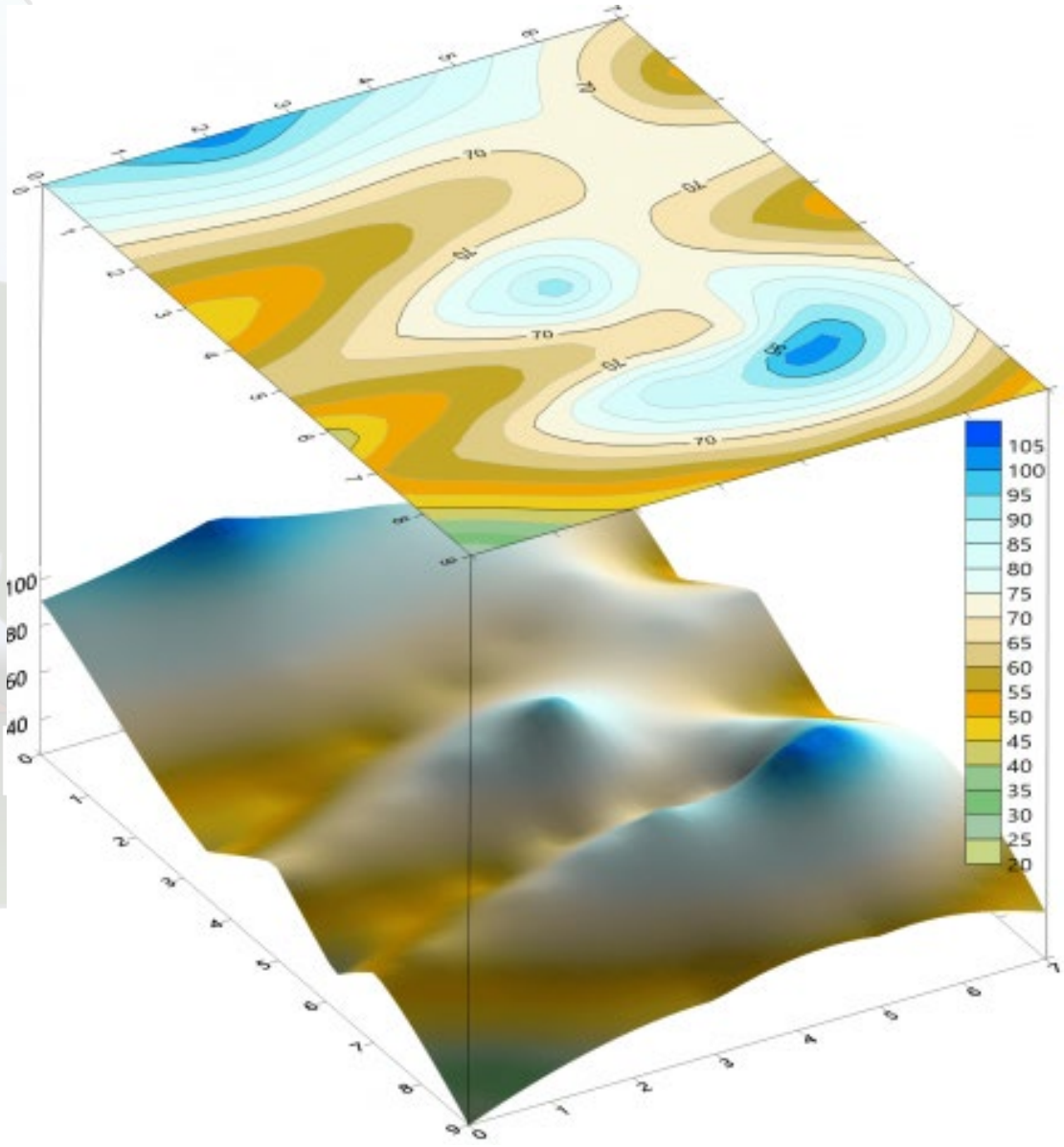
Groundwater Elevation Maps

- Minimum of three data points
- Data points spread out – i.e. NOT in a straight line.
- Depth-to-water measurements collected on same date.
- Data all from same aquifer zone – don't mix shallow and deep.
- Follow contouring rules.
- Contour lines extending outside of the data envelope are inferred and should be dashed.

Basic Geometry of Contouring

- Two points in space define a line.
- Cannot contour
- Three points in space define a plane.
- Contours should be straight and evenly-spaced.
- >3 points needed to define a complex surface.

Remember: Two Points Define a Line, Three Points Define a Plane



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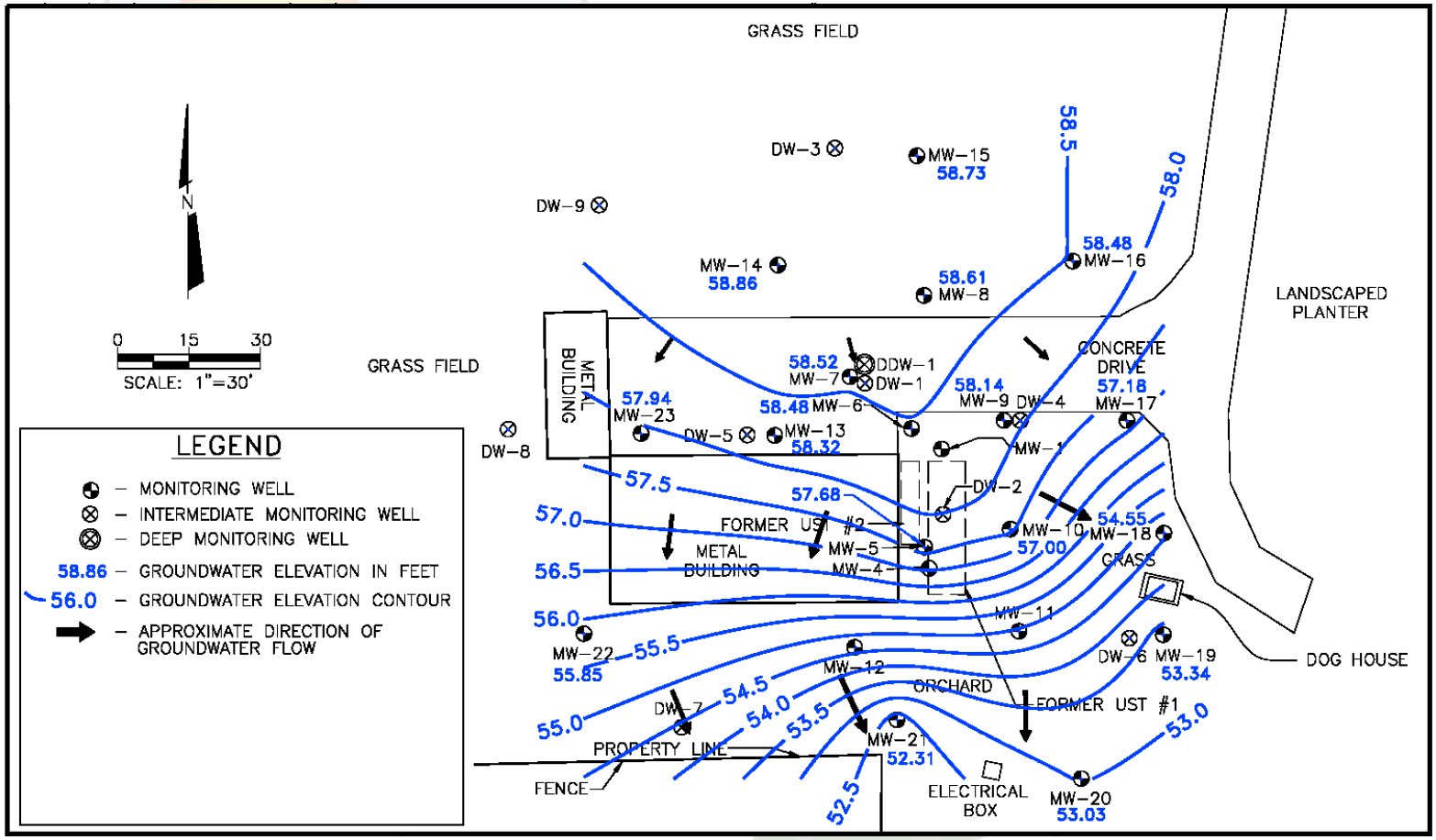
Good GW Elevation Map

- Good base map
- Constructed with ≥3 well-spaced data points.
- Follows contouring rules.
- Arrows showing groundwater flow.
- Contours within data envelope

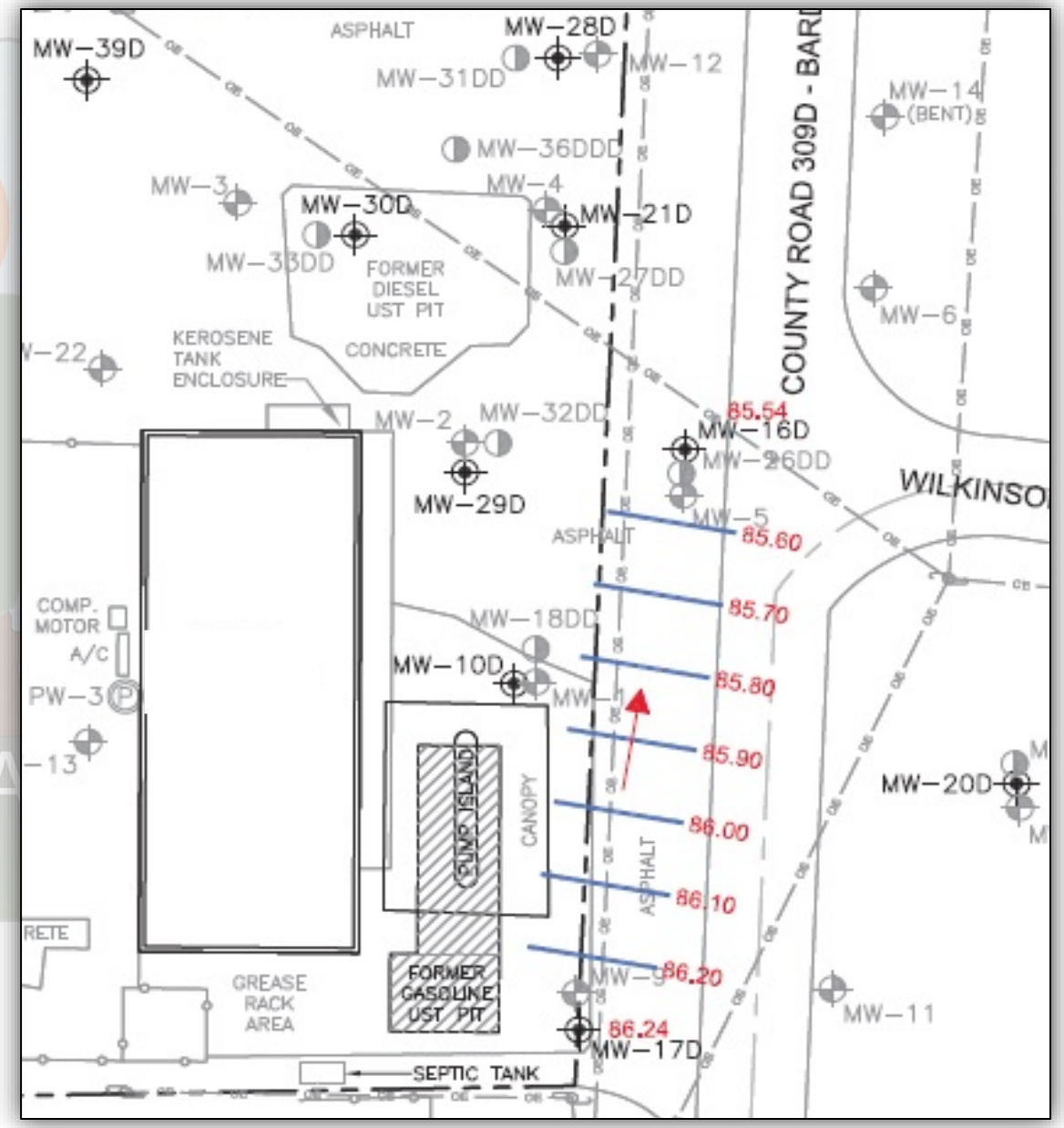


SITE ASSESSMENT

Poor GW Elevation Map

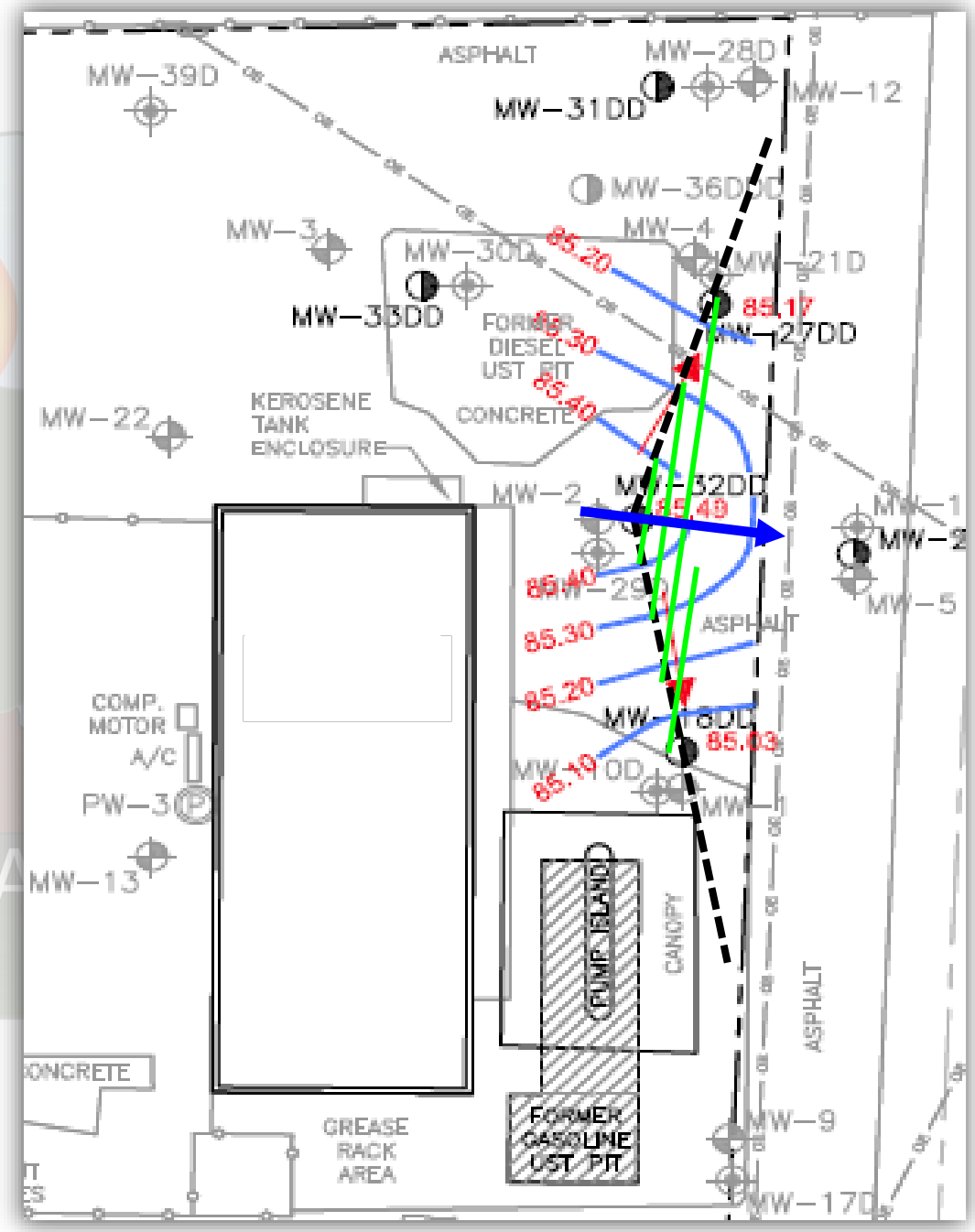
- Good base map
- Constructed with only two data points
- Cannot be contoured!!
- **Not a valid map!**

Two Points Define a Line!



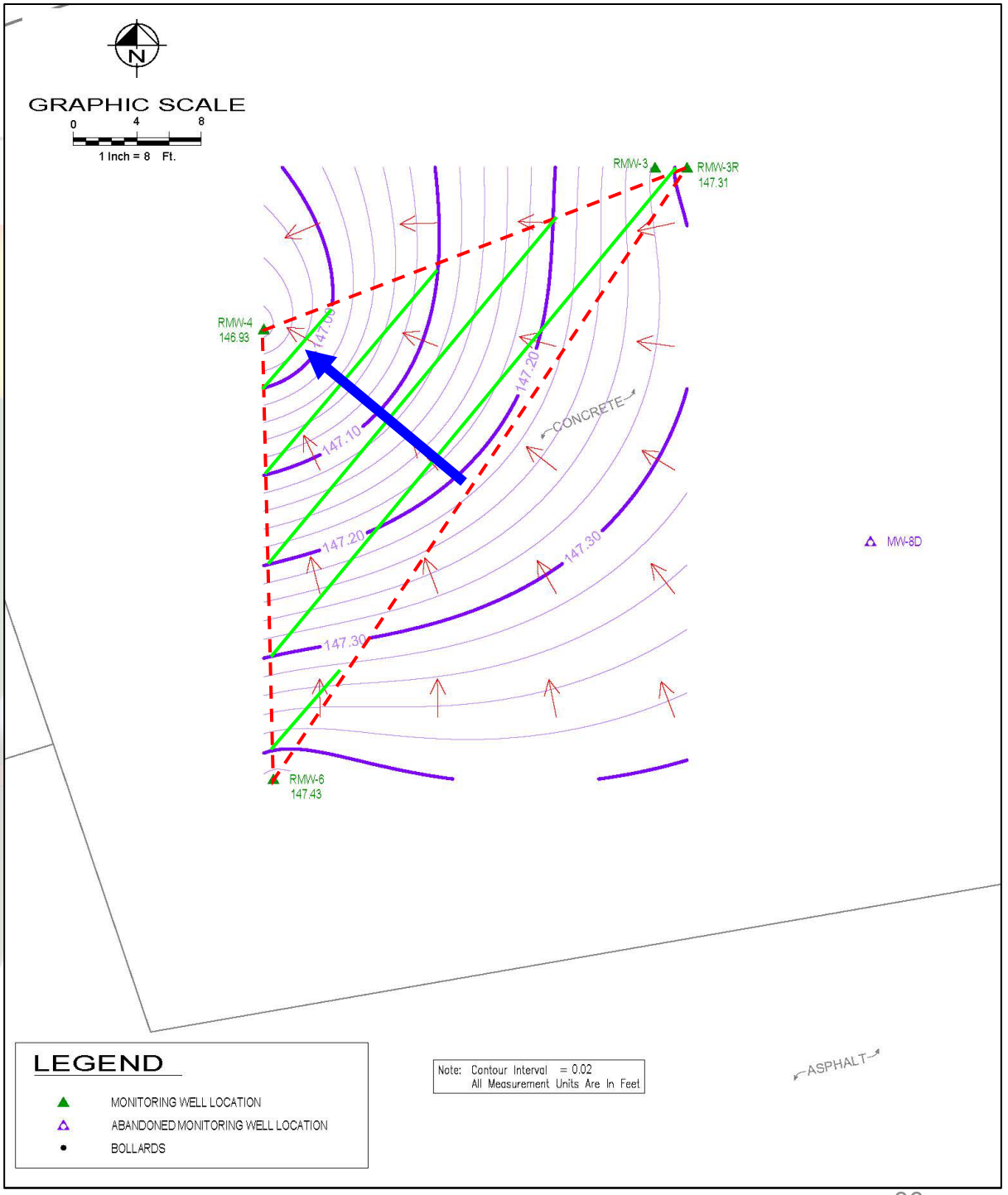
Poor GW Elevation Map

- Good base map
- Minimum 3 data points
- But…data points are nearly in a straight line.
- Three points define a plane, so contours may only be straight, equally spaced lines.



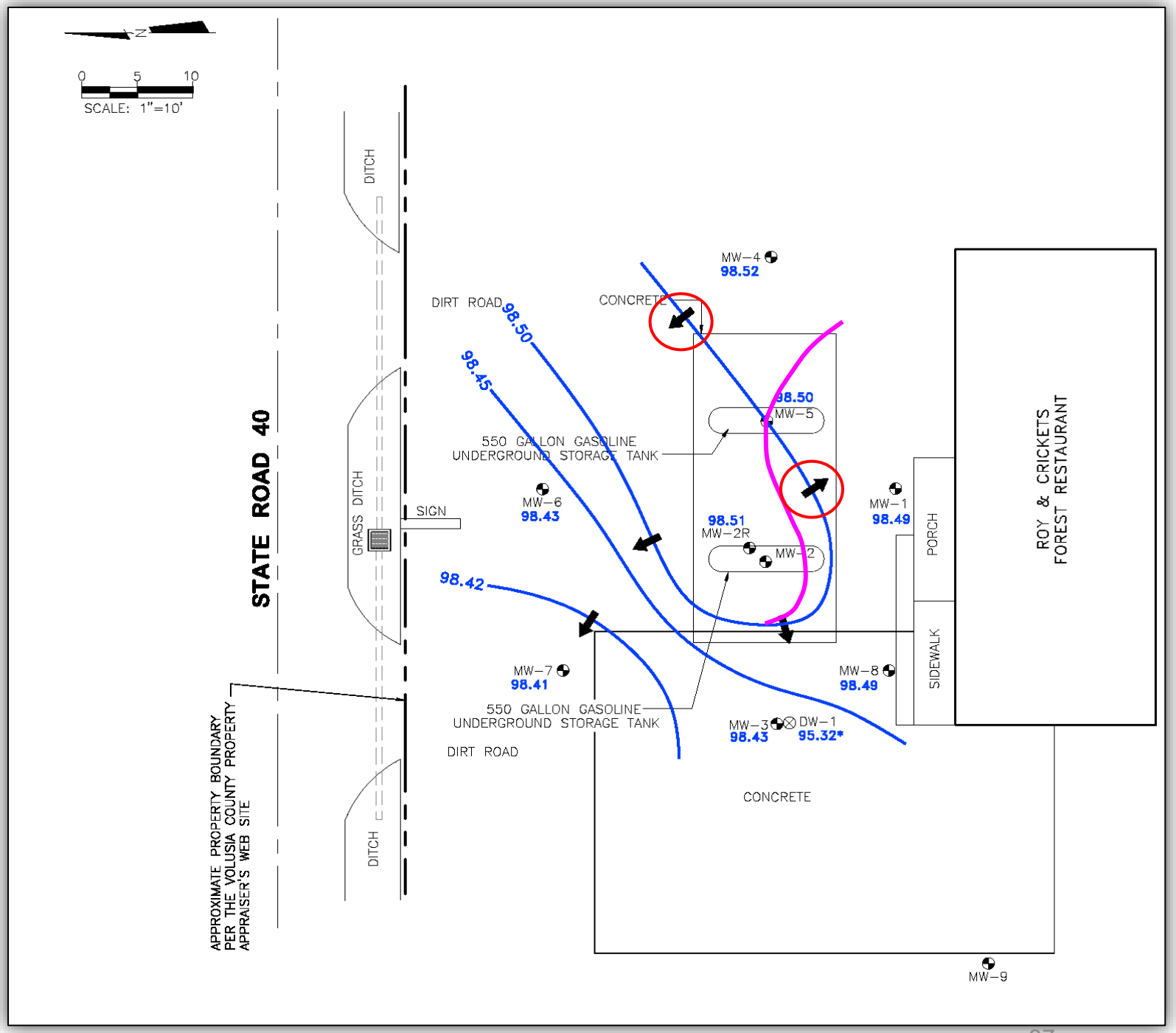
Poor GW Elevation Map

- Minimum 3 data points
- Contours extend well outside the data envelope
- Three points define a plane, so contours may only be straight, equally spaced lines.



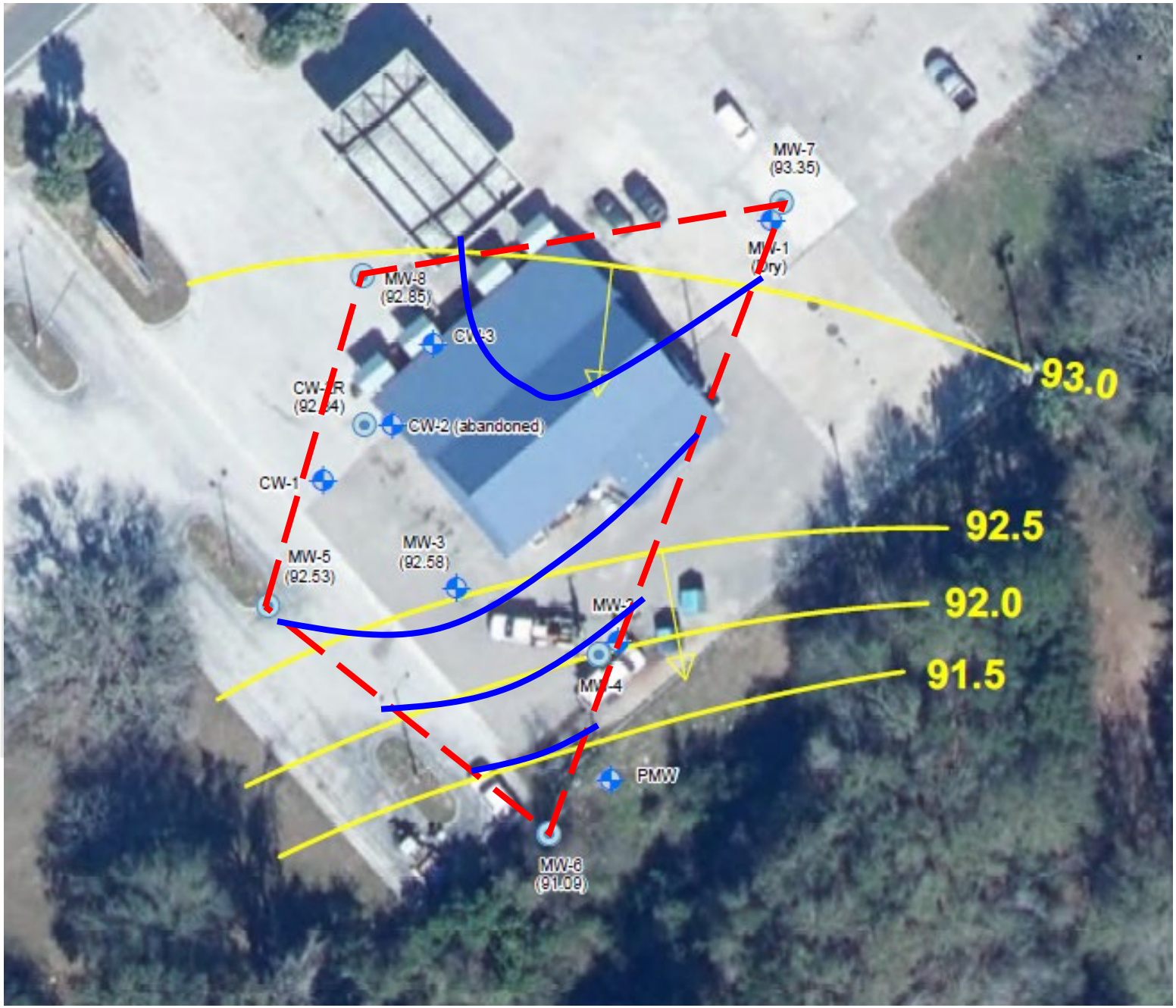
Poor GW Elevation Map

- Good base map
- Constructed with ≥3 well-spaced data points
- Arrows showing groundwater flow.
- Followed contouring rules…mostly!

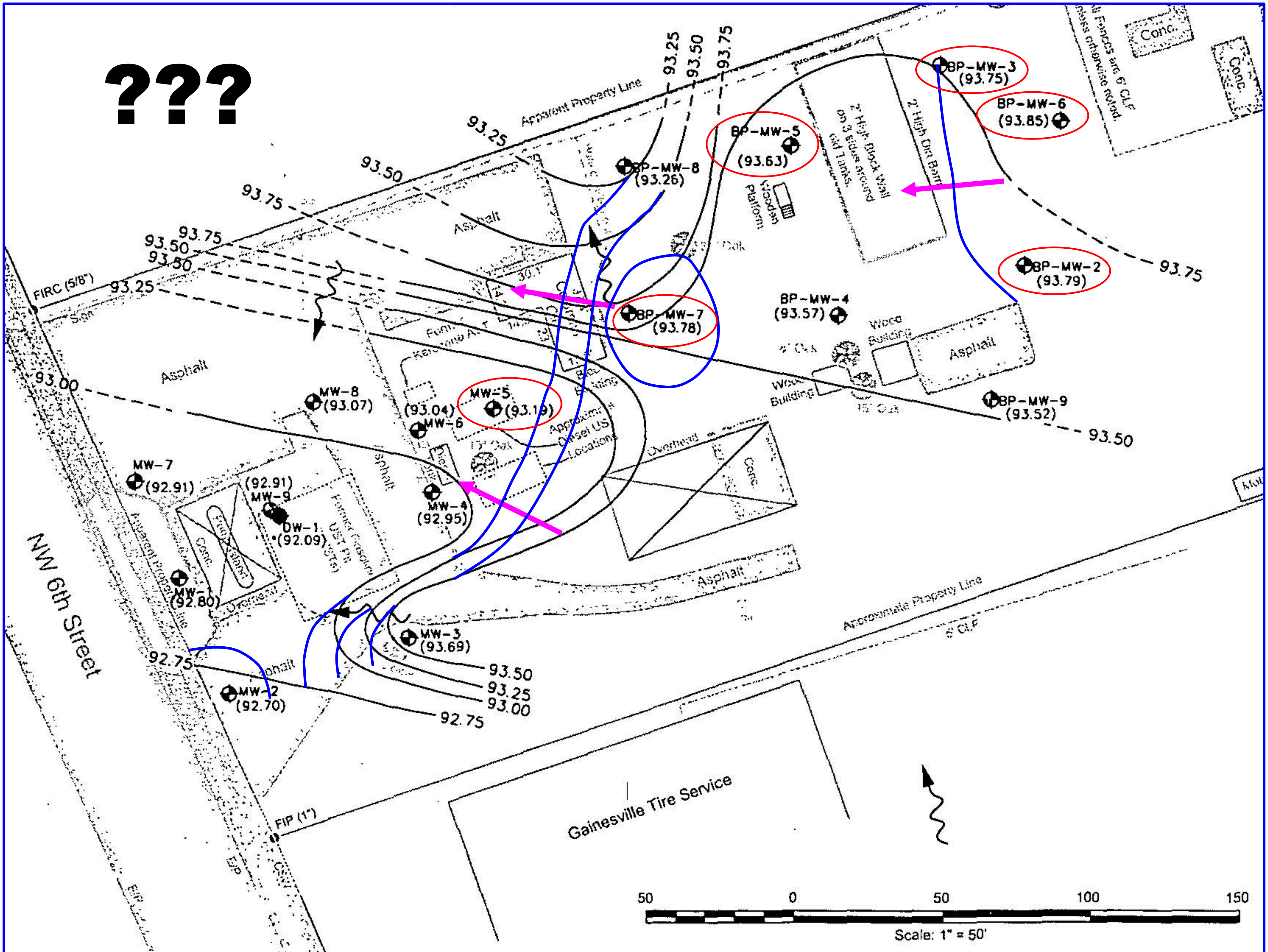


Poor GW Elevation Map

- Improper base map
- Does not follow contouring rules.
- Contours extend well beyond the data envelope.



???

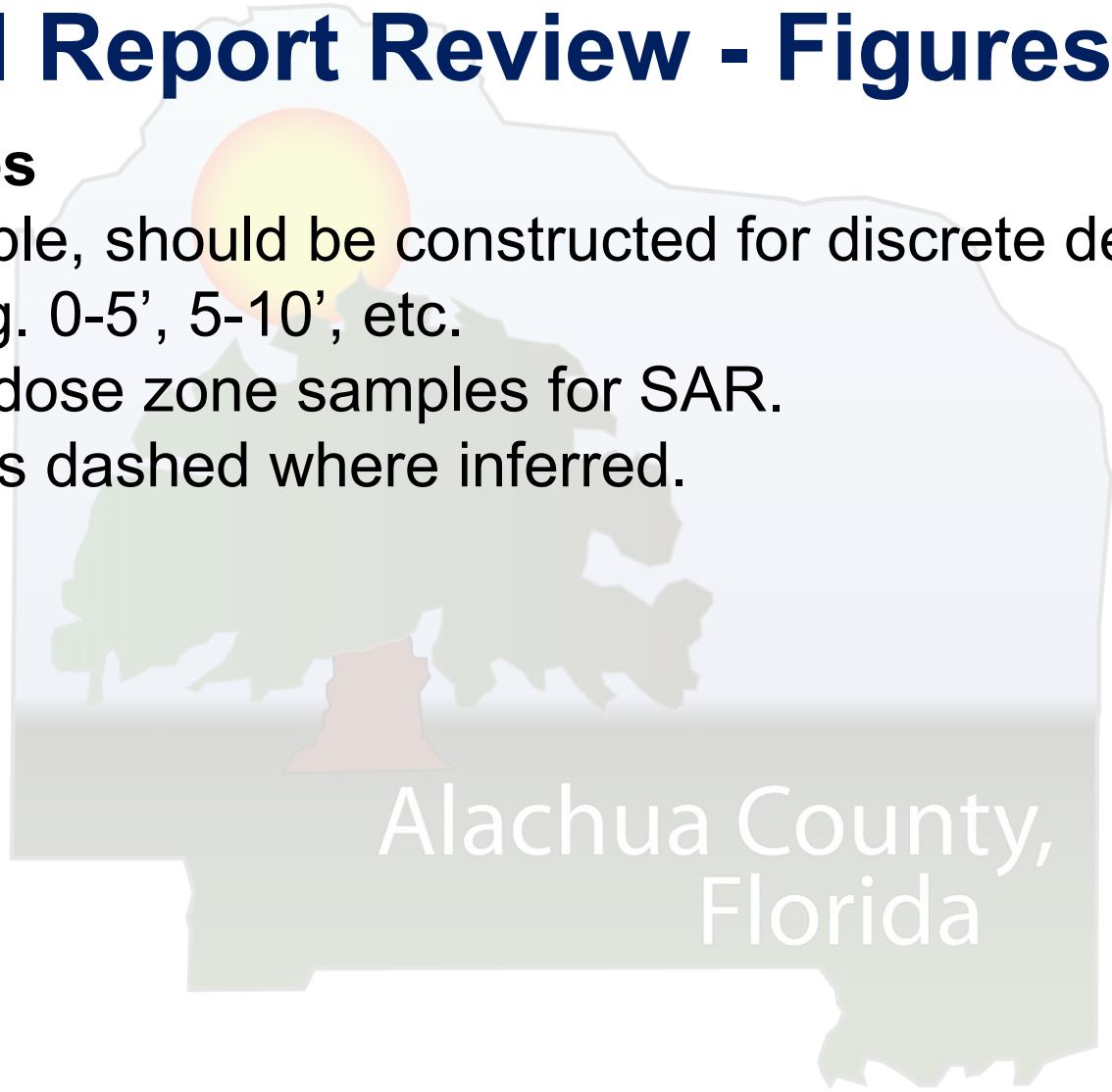

BP-MW-3 (93.75)
BP-MW-6 (93.85)
BP-MW-5 (93.63)
BP-MW-8 (93.26)
BP-MW-7 (93.78)
BP-MW-4 (93.57)
BP-MW-2 (93.79)
BP-MW-9 (93.52)
MW-8 (93.07)
MW-5 (93.19)
MW-6 (93.04)
MW-4 (92.95)
MW-7 (92.91)
MW-9 (92.91)
DW-1 (92.09)
MW-3 (93.69)
MW-2 (92.70)
93.25
93.50
93.75
93.00
92.75
Apparent Property Line
Approximate Property Line
NW 6th Street
Gainesville Tire Service
Asphalt
Conc.
FIRC (5/8")
FIP (1")
Scale: 1" = 50'
50 0 50 100 150

SITE ASSESSMENT

Technical Report Review - Figures

Soil OVA Maps

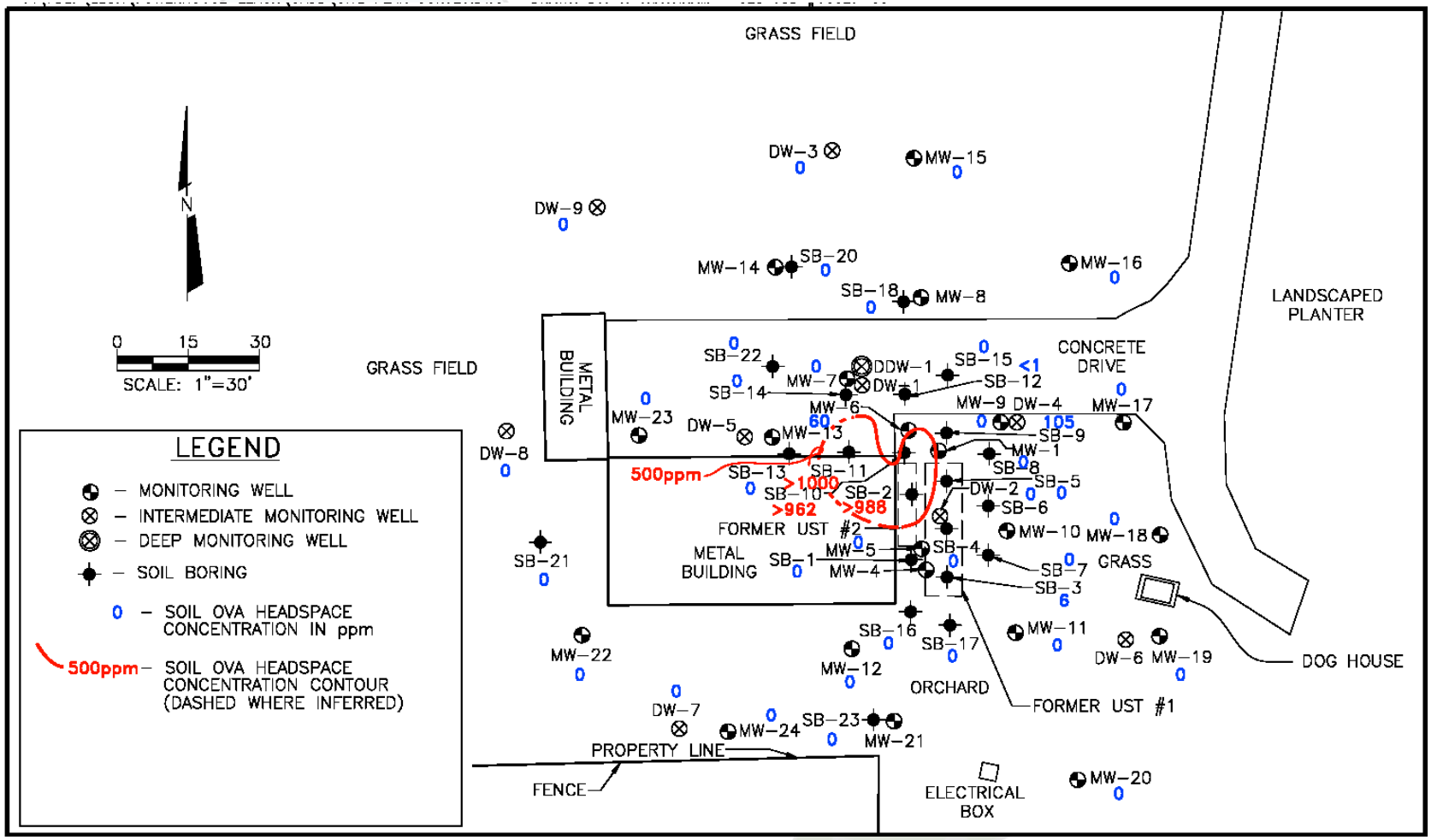
- When possible, should be constructed for discrete depth intervals, e.g. 0-5', 5-10', etc.
- Only use vadose zone samples for SAR.
- Contour lines dashed where inferred.



SITE ASSESSMENT

Soil OVA Map

- Single depth interval
- Only data for that interval posted.



SITE ASSESSMENT

Technical Report Review - Figures

Soil Isoconcentration Contour Maps

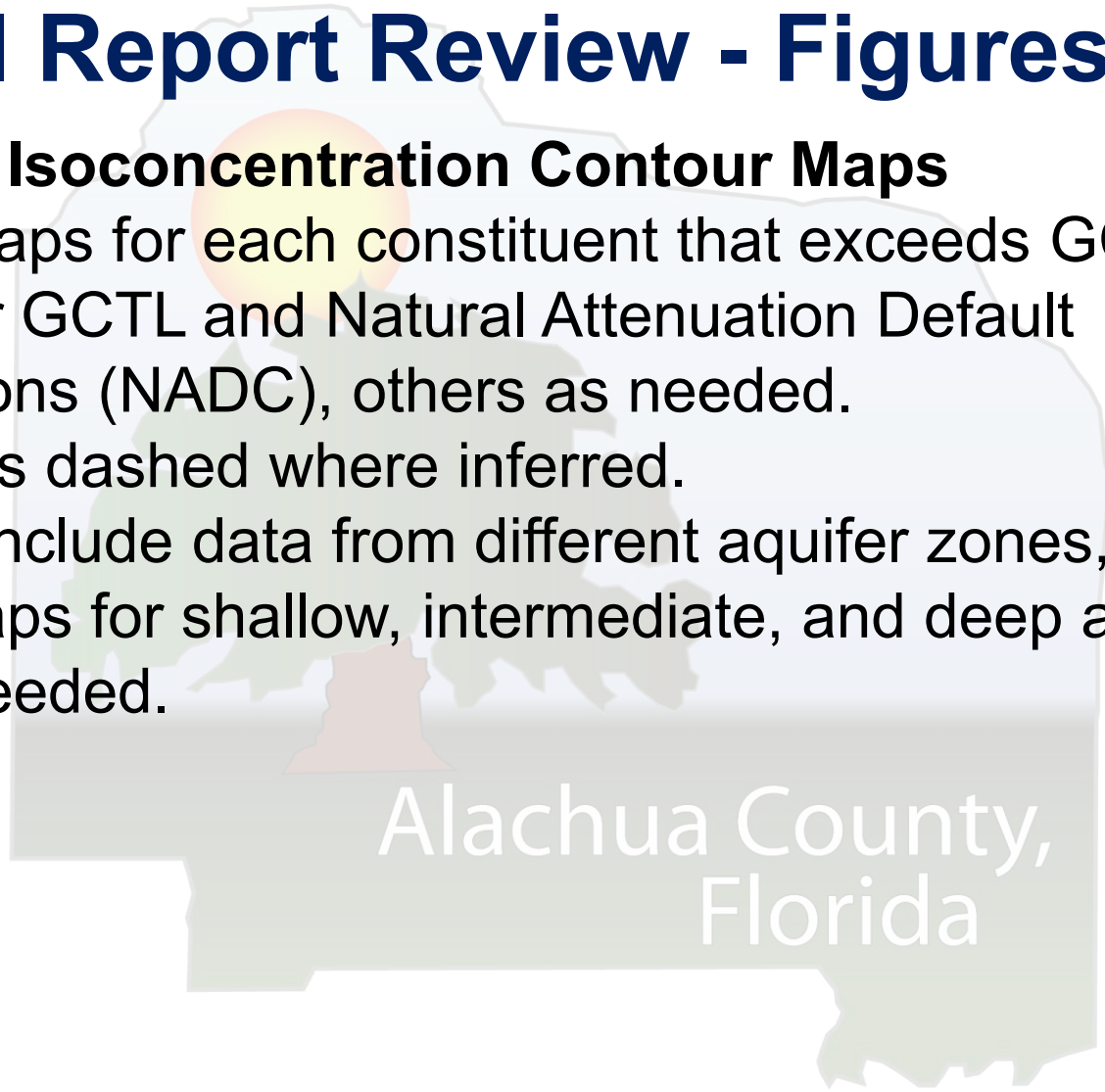
- Where possible, individual maps for each constituent that exceeds SCTLs should be prepared.
- Constructed for discrete depth intervals, e.g. 0-5', 5-10', etc.
- Contours for Groundwater Leachability (GWL), Residential Direct Exposure (RDE), and Commercial/Industrial Direct Exposure (CIDE) SCTLs, as applicable.
- In most cases, only use vadose zone samples.
- Contour lines dashed where inferred.
- A data post map is acceptable when limited data is available.

SITE ASSESSMENT

Technical Report Review - Figures

Groundwater Isoconcentration Contour Maps

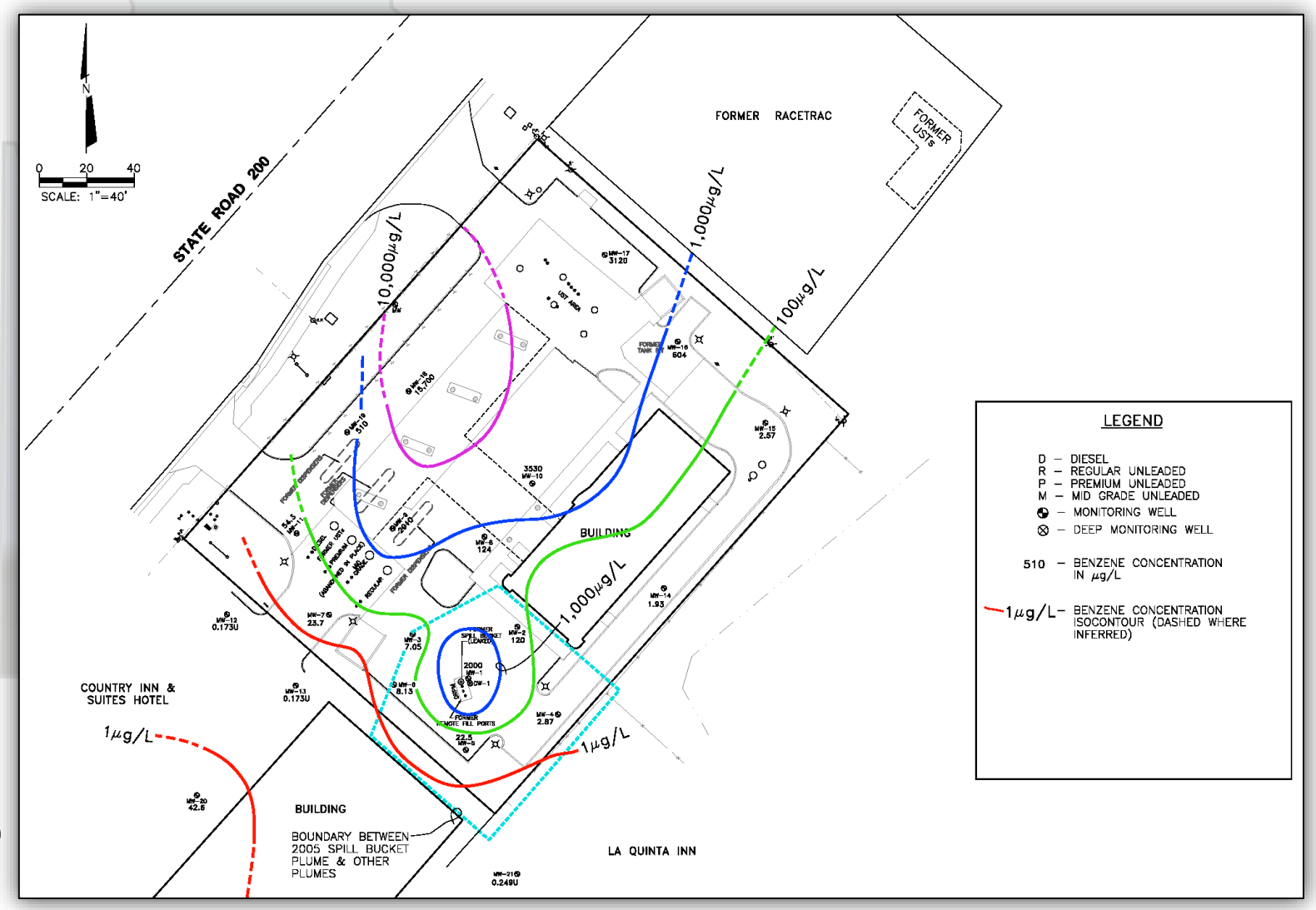
- Individual maps for each constituent that exceeds GCTLs.
- Contours for GCTL and Natural Attenuation Default Concentrations (NADC), others as needed.
- Contour lines dashed where inferred.
- Should not include data from different aquifer zones, i.e. use separate maps for shallow, intermediate, and deep aquifer zones, as needed.



SITE ASSESSMENT

Best Map

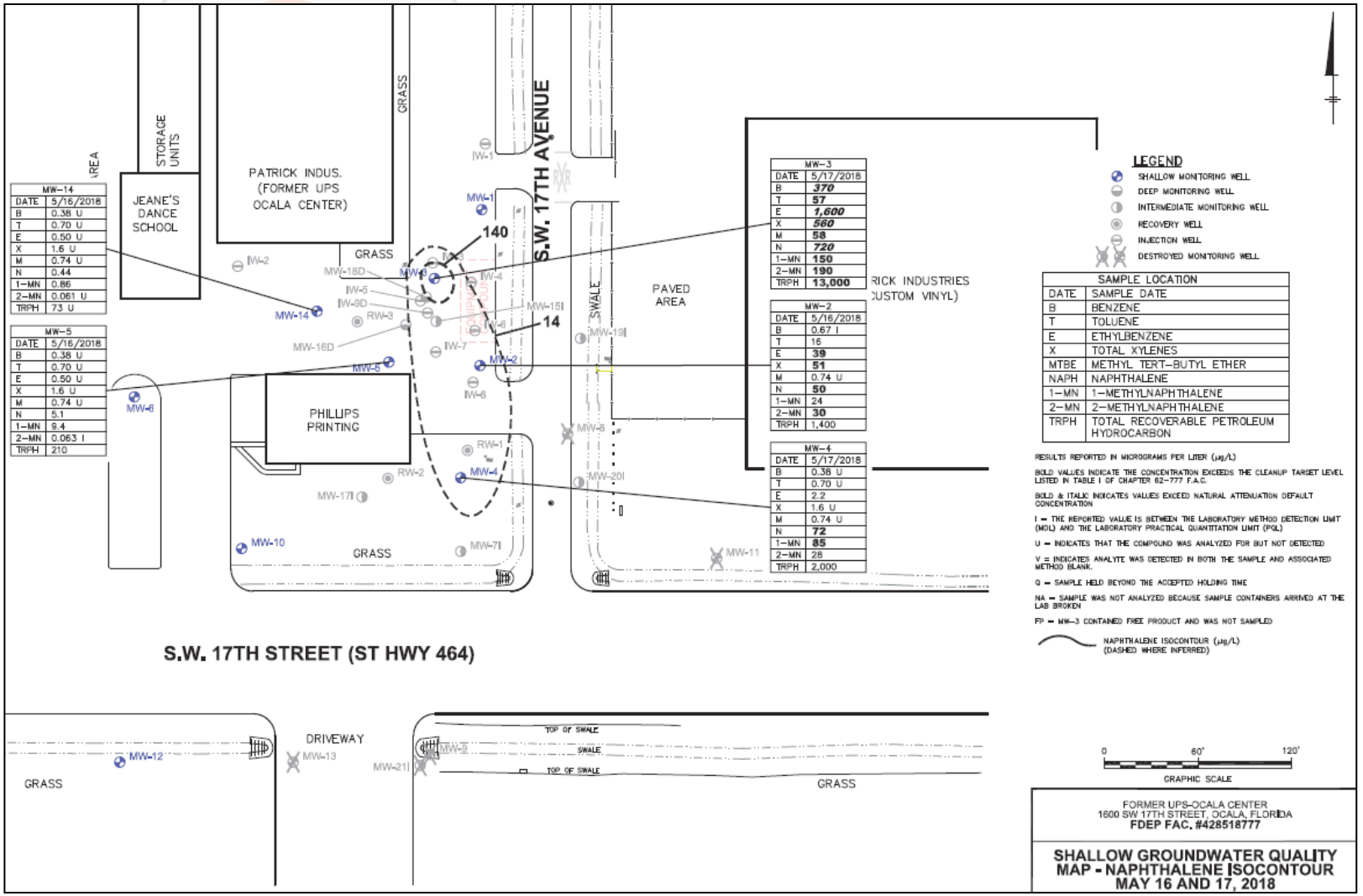
- Uncluttered and easy to read
- Wells easy to identify.
- Map is for a single analyte.
- Contours for GCTL & NADC.
- Displays only data specific to this analyte.



SITE ASSESSMENT

Good Map

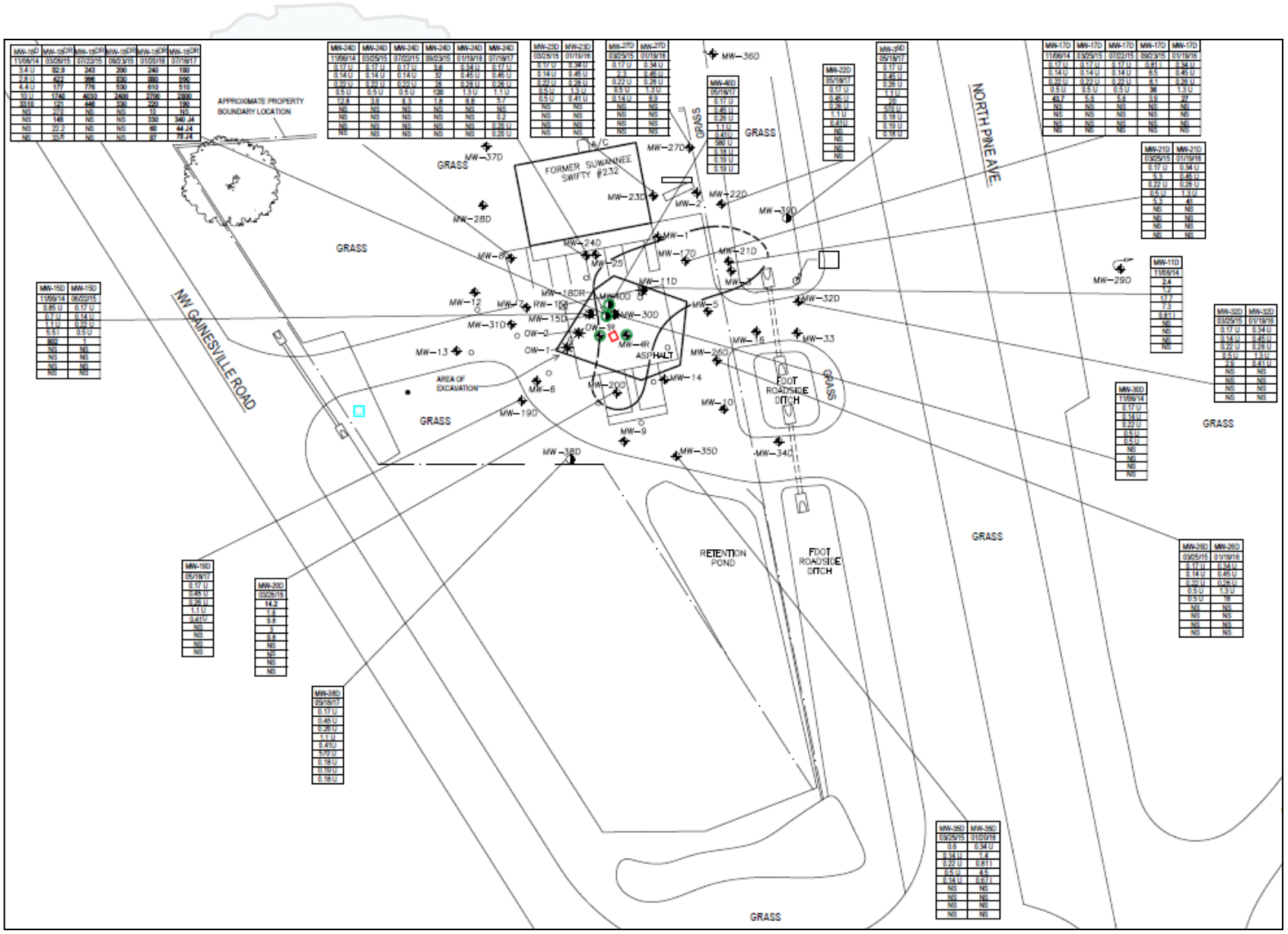
- Uncluttered and easy to read.
- Wells easy to identify.
- Map is for a single analyte.
- Contours for GCTL and NADC
- Uses data blocks.



SITE ASSESSMENT

Poor Map

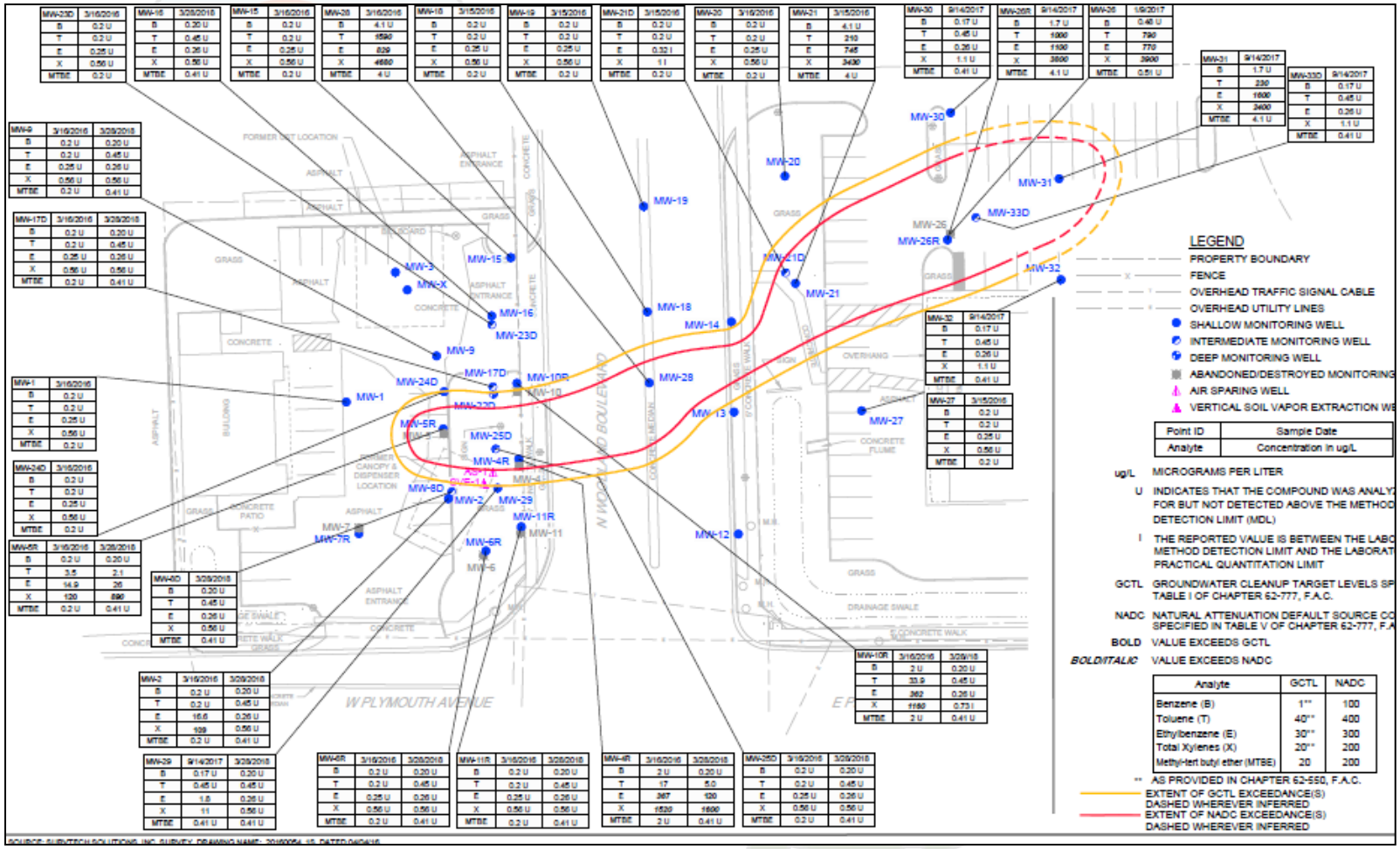
- Data from multiple depth intervals.
- Data blocks
- Contours based on mixture of current and old data.
- Small font - VERY difficult to read.
- Wasted space.



SITE ASSESSMENT

Poor Map

- Most site features identifiable.
- Wells easy to identify.
- Data blocks
- Individual contaminants not contoured.

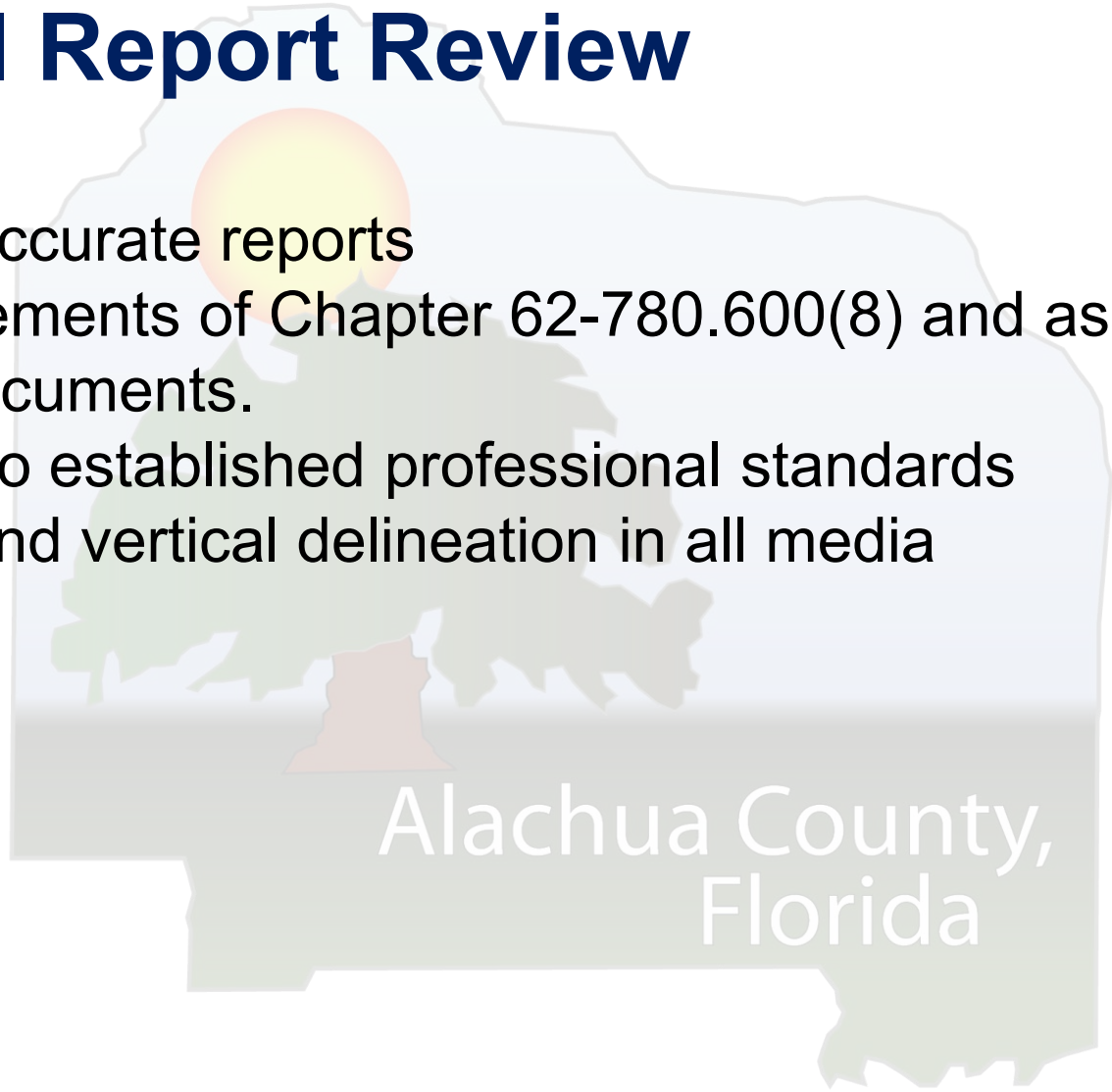


SITE ASSESSMENT

Technical Report Review

Summary

- Complete, accurate reports
- Meet requirements of Chapter 62-780.600(8) and associated guidance documents.
- Adherence to established professional standards
- Horizontal and vertical delineation in all media

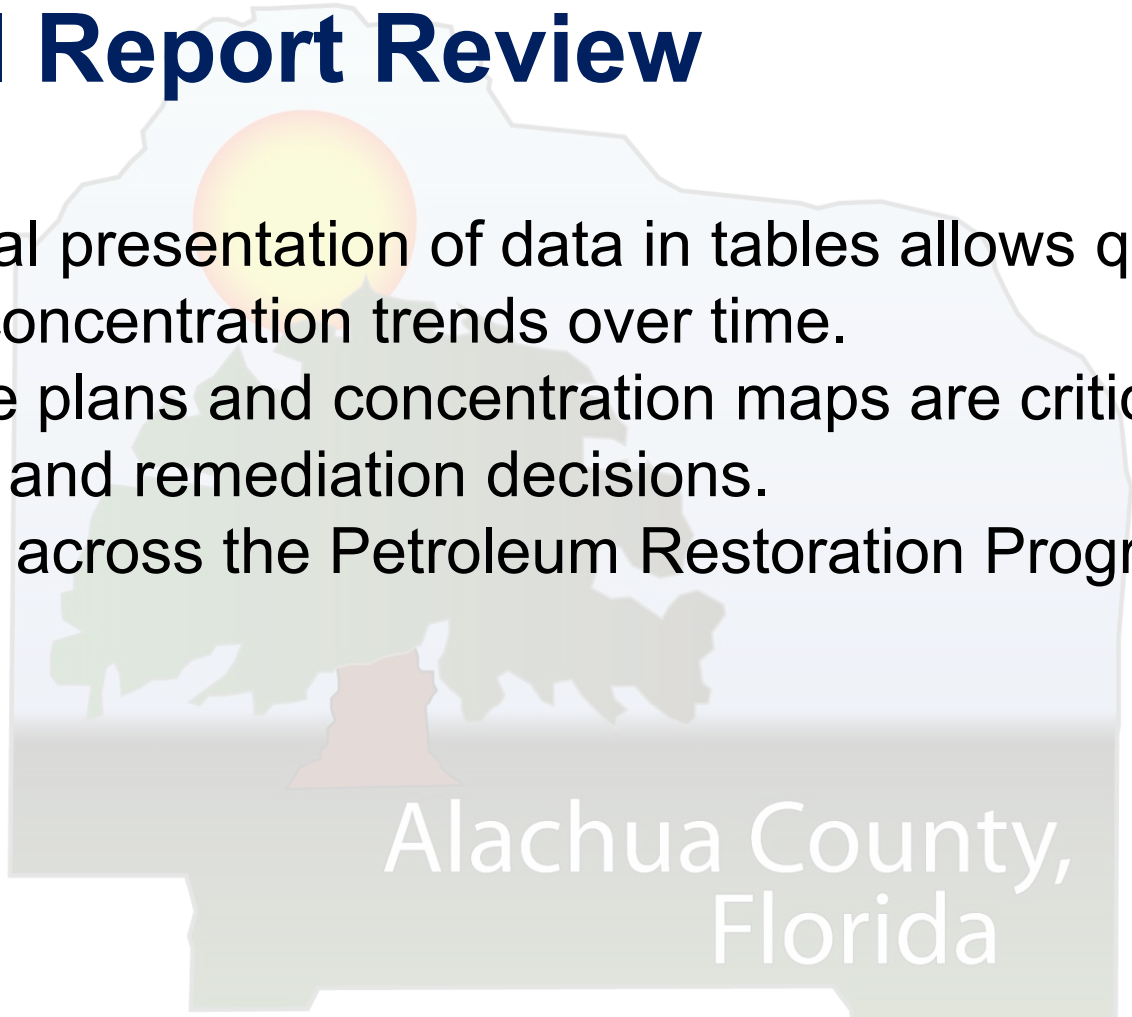


SITE ASSESSMENT

Technical Report Review

Summary

- Chronological presentation of data in tables allows quick analysis of concentration trends over time.
- Accurate site plans and concentration maps are critical for good assessment and remediation decisions.
- Consistency across the Petroleum Restoration Program



Remember: We Set the Standard!

Alachua County
Environmental Protection Department

THANK YOU!!

Ted Goodman, P.G.
LP-01 Alachua

Contact Information:
352-264-6843
tgoodman@alachuacounty.us