

INTERSOL 2005

Reclaiming Polluted Sites and Soils

Sites et Sols Pollués: Comment se les réapproprier?

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Environmental Forensics Forum

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THE APPLICATION AND LEGAL ADMISSIBILITY OF ENVIRONMENTAL FORENSIC EVIDENCE IN THE
UNITED STATES

by

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About The Author

Allan Kanner

Allan Kanner (A.B., University of Pennsylvania; J.D., Harvard Law School) is the founding member of Allan Kanner & Associates, P.L.L.C. New Orleans, LA, which has a national practice in environmental, toxic tort, class action, and complex business litigation. Mr. Kanner's career includes a number of landmark cases, such as the *Three Mile Island Litigation*, the *Louisville Sewer Explosion Litigation*, the first successful private party case under Superfund, *Walls v. Waste Resources*, and *In re Cooper Tire Litigation*. His litigation successes have been featured in the New York Times, the Washington Post, Business Week, CNN and other national media. Currently, he is Special Counsel to the State of New Jersey pursuing natural resource damage claims along with his regular case load. He is a member of the bars of Louisiana, New Jersey, Pennsylvania, California, the District of Columbia and Puerto Rico (Federal). Since the 1990 school year, he has been an Adjunct Professor of Law at the Tulane Law School. In 2005, he will be teaching a course on Complex Litigation at Yale Law School. Previously he has been a Visiting Lecturer at Yale Law School, Duke Law School, Boalt Hall and the University of Texas Law Schools teaching complex litigation, consumer fraud, toxic torts and legal strategy. He is the author of *Environmental and Toxic Tort Trials* (Lexis Nexis) and scores of articles on a variety of subjects. His recent articles include *Measuring Loss of Use Damages in Natural Resource Damage Actions*, Columbia Journal of the Environment (February 2005); *Equity in Toxic Tort Litigation: Unjust Enrichment and the Poor*, Law and Policy, Vol. 26, No. 2, pp. 209-230 (2004); and, *New Opportunities for Native American Tribes to Pursue Environmental and Natural Resource Claims*, Duke Environmental Law & Policy Forum (Fall 2003). He is a member of the BNAs editorial board for the *Toxic Law Reporter* and *Class Action Reporter*.

“Forensic” is related to “forum” and refers to any public discussion or debate.

In the United States “forensic” most often refers to courtroom or litigation proceedings.

However, environmental forensics may also provide the fact basis for mediated or negotiated transactions or for any public inquiry related to environmental matters, common situations in many countries.

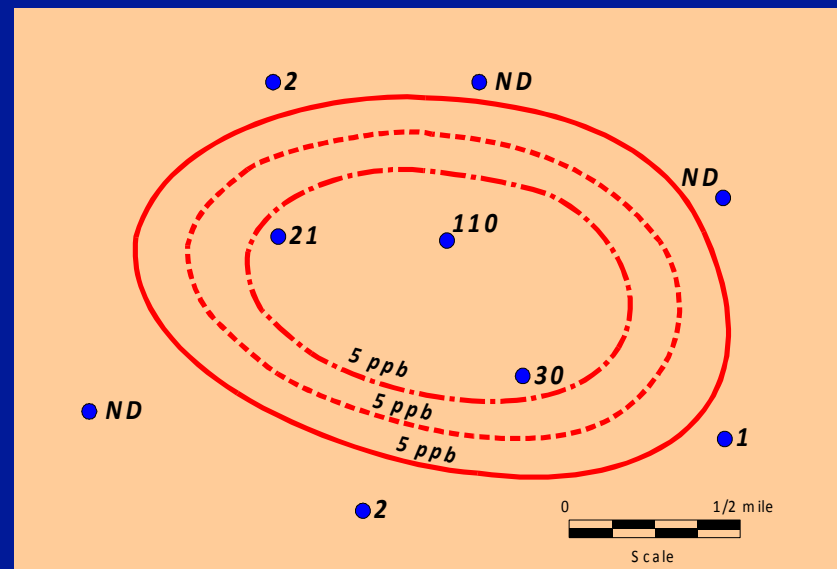
For our purposes, forensic proof is proof appropriate for a **reasoned discussion** of an environmental issue.

Issue Definition

- Potentially disputed questions that environmental forensics seek to answer are:
 - Who caused contamination?
 - When did contamination occur?
 - Where is it located and how did the contamination occur? (For example, was it an accidental spill or a series of routine operating releases?)
 - How extensive is the contamination now?
 - What are the concentrations or levels of contamination?
 - Are the test results valid? Is there evidence of fraud?
 - What levels of contamination have people been exposed to?
 - What impact will various remedial measures have on this contamination?
 - How to promote reasonable claims while avoiding exaggerated claims?
- This is just a partial list of issues, but does help us illustrate forensic issues.

Example - - How Extensive Is the Contamination Now?

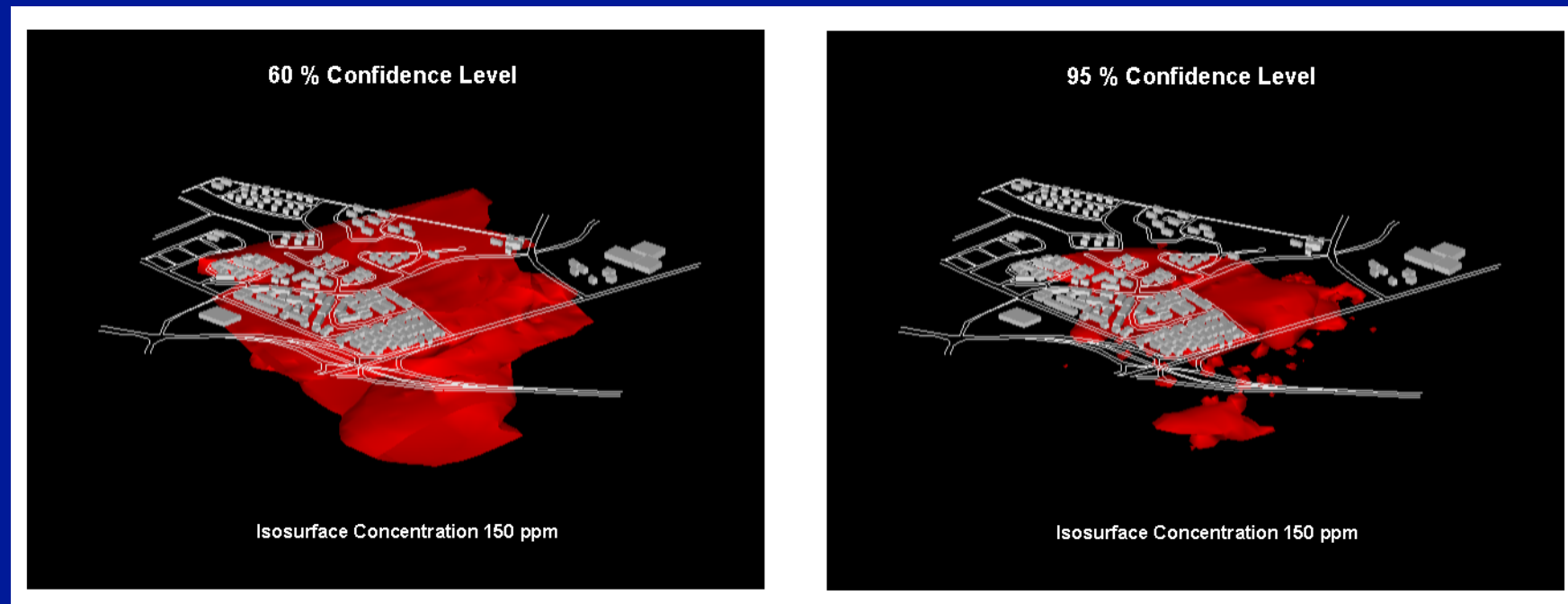
This is an issue in almost all pollution cases. Problem: Potential bias if contouring existing data is too subjective



There is no single right answer.
As a result, experts battle about
both how they exercised their
judgment relative to their
adversary, **and** who is a more
reliable expert.

The same sort of problem occurs in contouring or mapping the concentrations of contamination.

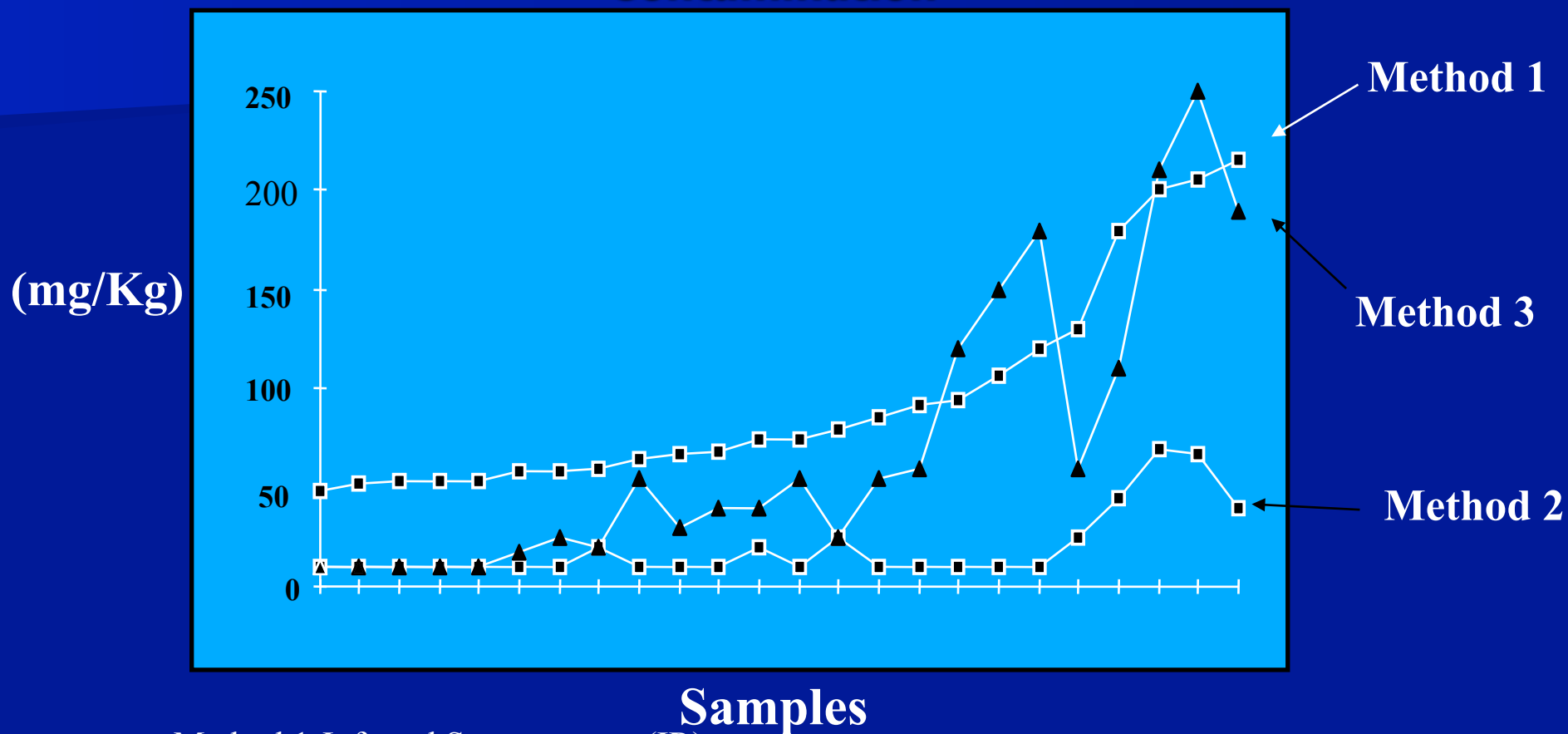
**Identical Data Set –Different Confidence Level Used for
Contouring
Resulting in Difference Estimated Volumes of Contamination**



Key Points: Same data, but selecting different confidence levels for computer simulation.

Petroleum Hydrocarbons

Three Labs, Same Method 418.1 (TPH) but Different Preparation Steps = Different Test Results Regarding Levels of Contamination



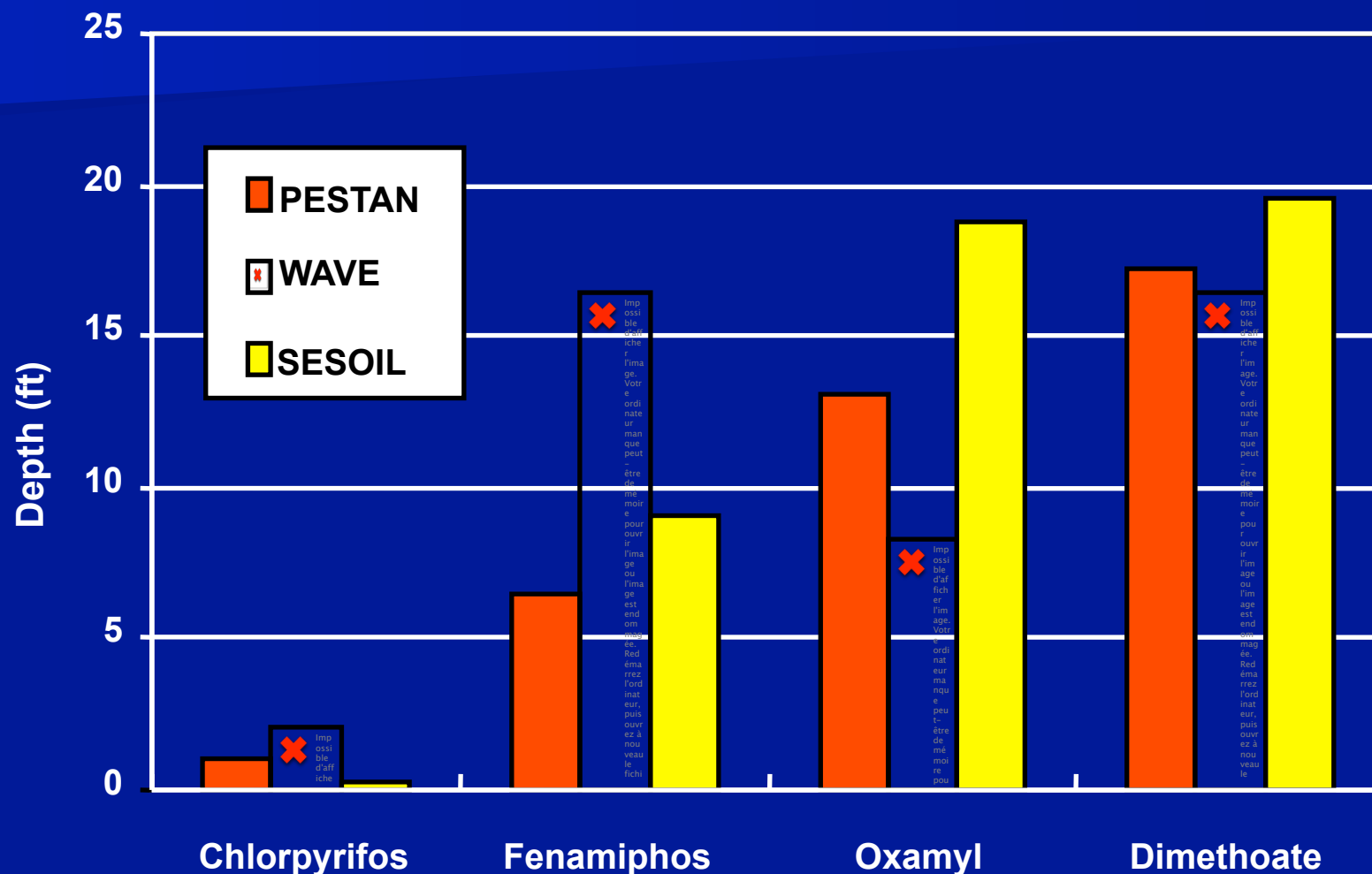
Method 1-Infrared Spectroscopy (IR)

Method 2-Gas Chromatography, Methanol Extract

Method 3-Gas Chromatography, Methylene Chloride/Acetone Extract

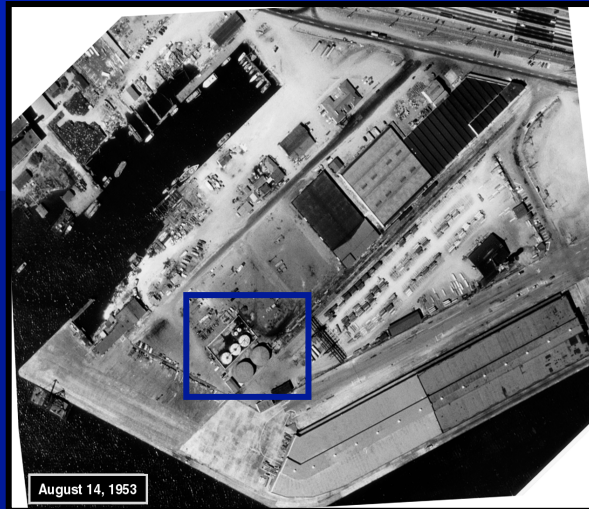
The point is that the same data combined with different assumptions or different interpretations produce different results. Because these results reflect the expert's choices, we have to carefully examine the expert.

Depth of Modeled Penetration of Four Pesticides Using 3 Different Contaminant Transport Models (Model Selection Results in a Prescribed Result Independent of the Data)

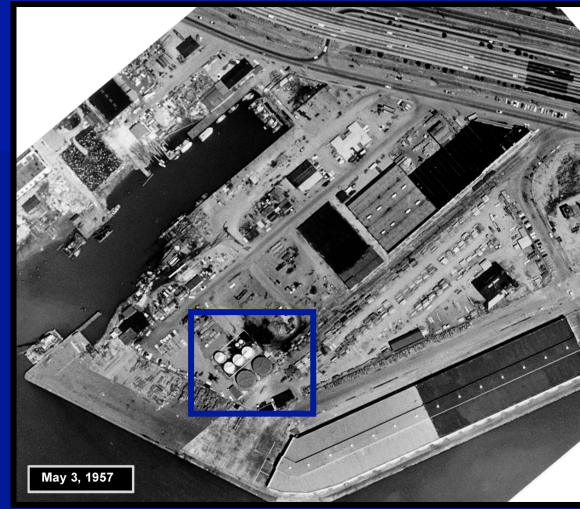


WAVE (Water and Agrochemicals in the Soil, Crop and Vadose Zone)
PESTAN (Pesticide Analytical Model)
SESOIL (Seasonal Soil Compartment Model)

Historical Changes and Sampling Locations



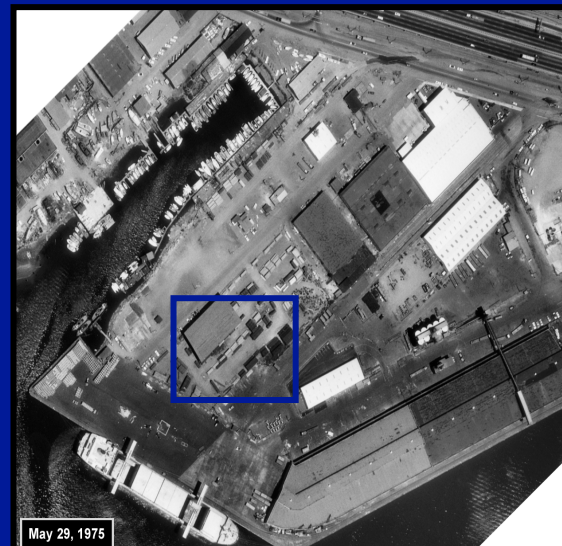
August 14, 1953. Five tanks on Parcel 7



May 3, 1957. Six tanks on Parcel 7



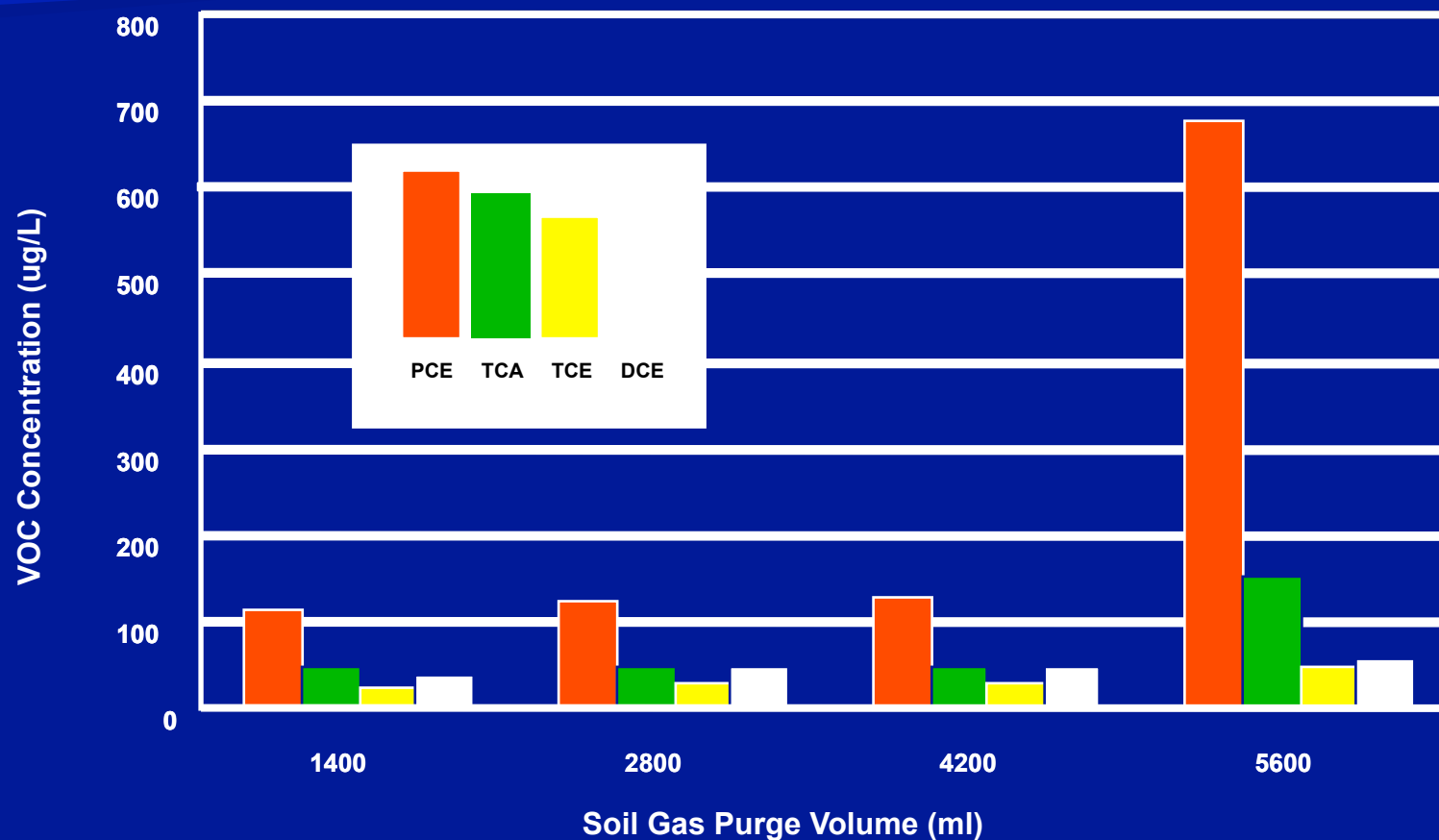
April 24, 1973. Five tanks on Parcel 7



May 29, 1975. No tanks on Parcel 7

Reliability of Soil Gas Data

Variance in the Soil Gas Purge Rate Results in Different Chemical Results



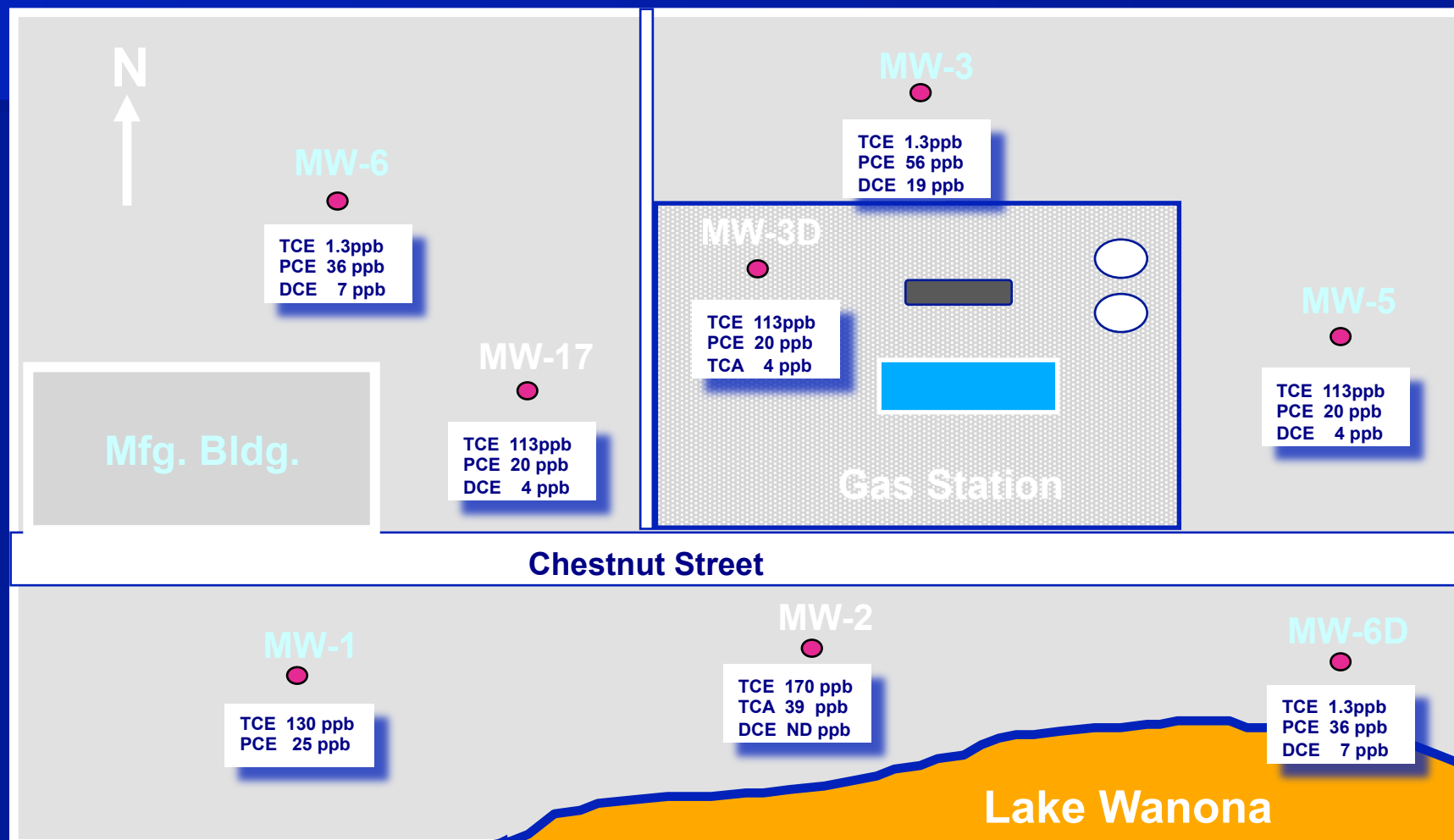
Color Coded Map

(Use of Test Result Intervals to Mask Data)



Not to Scale

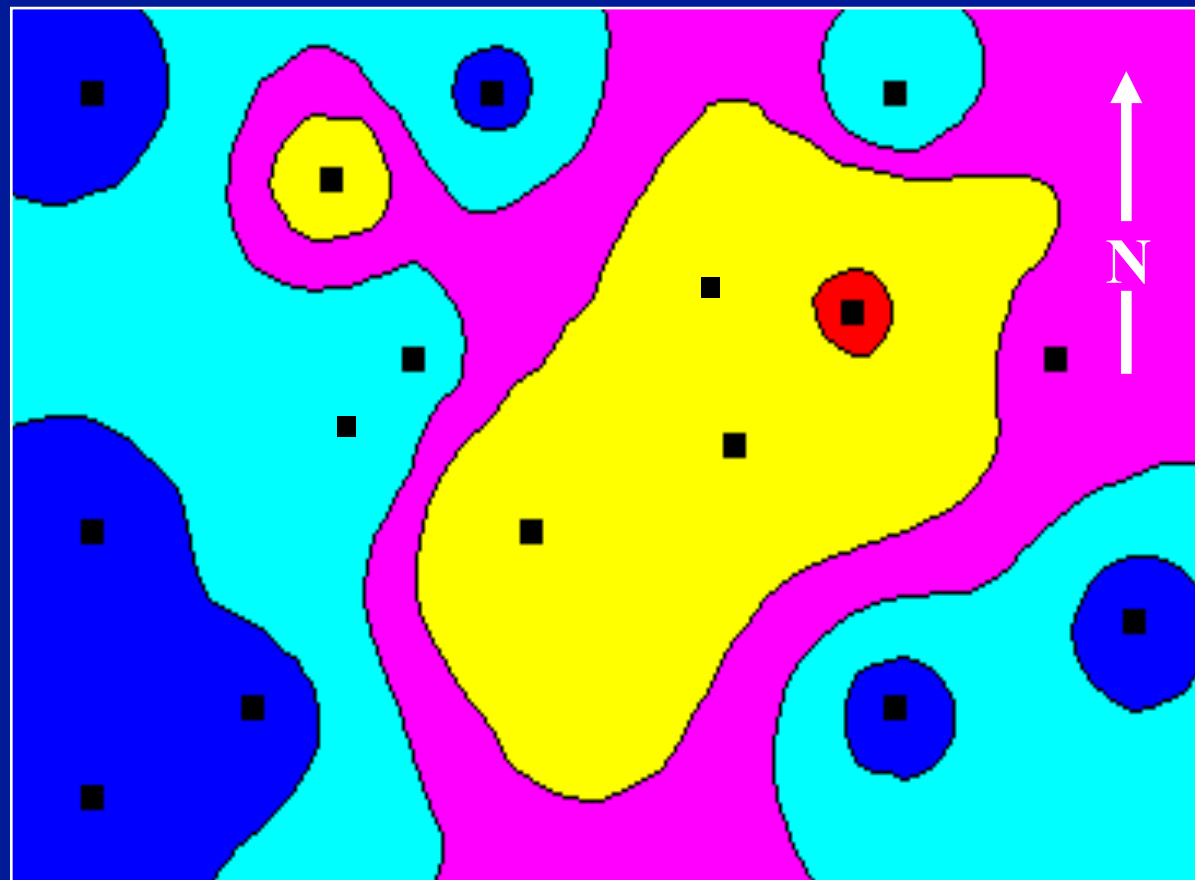
Map with Posted Data (No Data Masking)



Not to Scale

Contour Map

Selective Shading of Concentration Intervals to Mask Data



Tetrachloroethene
Concentration (ug/L)



> 1500



500 - 1500



300 - 500



100 - 300

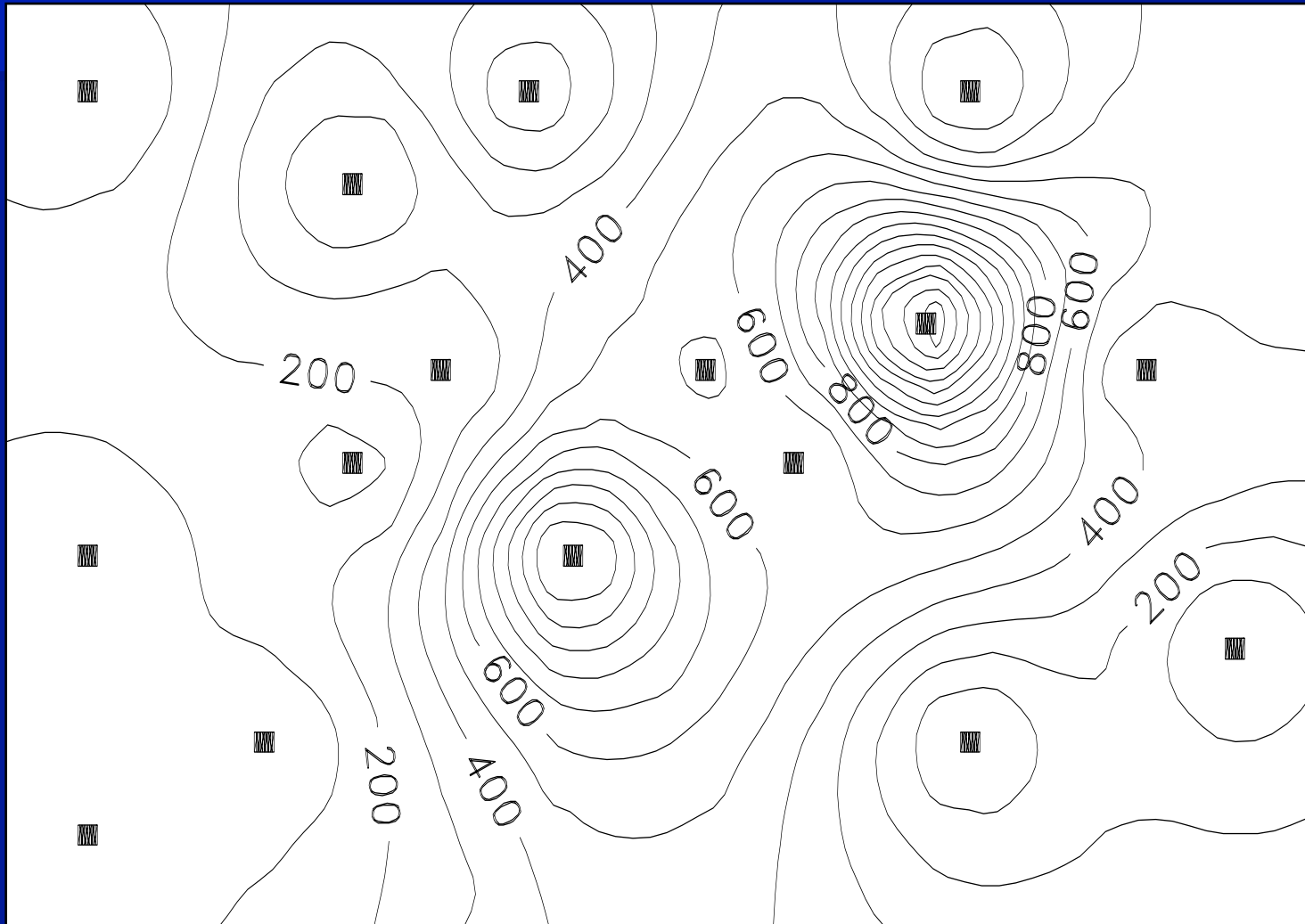


0 - 100

Contour Map

Constant Interval (100 ug/L)

(Tests Results Honored)



A reasoned discussion requires the assistance of (1) knowledgeable experts with sufficient qualifications and experience (2) who have properly investigated and researched the underlying issue (and anything else they rely upon) (3) to reach defensible opinions about those issues.

We also look at both **form** and **substance** in evaluating each of these three items, and in evaluating the expert.

FORM

includes both mode of presentation (e.g., graphics) and background to presentation (e.g., opportunity to review all pertinent and current data)

SUBSTANCE

refers to the quality of the opinion which may be assessed in numerous ways (e.g., internal logic; general acceptance in profession)

Form and Substance

Priorities and Persuasion

Lawyers who work with environmental forensic experts must (1) decide how to make the expert's presentation persuasive, (2) determine how to make that presentation consistent with the applicable rules of the proceeding in which the expert will appear, and (3) anticipate the challenges to the expert from the other side or finder of fact, or both.

Rules of Persuasion

- The side with the most credible and comprehensive story will generally win. A story is a vehicle for assimilating new facts.
- Credibility has positive and negative components: If a jury catches you or your witness lying or stretching the truth, your credibility suffers (negatively). Alternatively, if a jury understands the care, expertise and attention to detail behind presentation, your credibility is enhanced (positive).
- Information is better comprehended if it is simple, clear and familiar. Expressions like “keep it simple stupid” or “a picture is worth a thousand words” speak to this. The latter expression also reminds us of the value of imagery, especially as relates to forensic evidence.
- Stories are how we best assimilate new information. The use of themes helps organize and animate the meaning of our stories.
- In thinking about experts, the side with the smartest expert doesn't necessarily win. The expert plays a part in telling a larger story and helping the jury understand things outside their everyday experience.

Rules of Presentation

- Presentations have a positive and negative component.
- Positive stories are the facts told by your witnesses, or the other side's witnesses as of cross.
- Negative stories are facts that undercut the story or credibility of one's opponent. People tend to believe negative facts more quickly than positive facts. As a result cross examination is often used to attack, rather than to build.
- In thinking about an expert presentation, a fair question is how much ground should an expert cover (e.g., you may get admission as of cross to cover same issues) and whether the expert should cover positive and negative issue.

Applicable Rules of Law

- *Black's Law Dictionary* defines an expert as:

One who by reason of education or specialized experience possesses superior knowledge respecting a subject about which persons having no particular training are incapable of forming an accurate opinion or deducing correct conclusions.

- Essentially, an expert is someone who knows something beyond the common experience, and who can help you prove something you couldn't prove otherwise. Expert witnesses must possess specialized knowledge that will assist the jury in its search for the truth.

Is the Expert Truly an Expert?

- Think of an expert as the jury's teacher. The expert's testimony should add information the jurors - due to their lack of training or experience - otherwise could not draw from the facts. Like a good teacher, the expert should be qualified by virtue of background, education, or experience, and possess the necessary skills and knowledge to instruct his or her pupils in the subject at hand. The more persuasive the expert is, the better your client will fare.

Rule 702. Testimony by Experts

If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise, if (1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case.¹

¹Pub. L. 93-595, § 1, Jan. 2, 1975, 88 Stat. 1937; Apr. 17, 2000, eff. Dec. 1, 2000.

Is the Expert Behaving Like an Expert?

- An expert must conduct himself or herself in a certain way in investigating a case and in offering an opinion. The expert's opinion should be relevant to the facts of the case, and must be reasonably based on both appropriate facts and principles, methods and techniques that have been proven reliable.

Rule 703. Bases of Opinion Testimony by Experts

The facts or data in the particular case upon which an expert bases an opinion or inference may be those perceived by or made known to the expert at or before the hearing. If of a type reasonably relied upon by experts in the particular field in forming opinions or inferences upon the subject, the facts or data need not be admissible in evidence in order for the opinion or inference to be admitted. Facts or data that are otherwise inadmissible shall not be disclosed to the jury by the proponent of the opinion or inference unless the court determines that their probative value in assisting the jury to evaluate the expert's opinion substantially outweighs their prejudicial effect.

The *Daubert* Approach

The Supreme Court in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*¹ held that the Federal Rules of Evidence—specifically Rule 702—had superseded *Frye*'s “general acceptance” test,² because it was deemed at odds with the “liberal thrust” of the Federal Rules of Evidence. After reviewing Rule 702, the Court noted that “[n]othing in the text of this Rule establishes ‘general acceptance’ as an absolute prerequisite to admissibility.”³ When *Frye* provided the governing test, the standard for the admission of expert testimony focused upon the question of scientific consensus rather than the quality of the scientific method.

¹*Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 113 S. Ct. 2786, 125 L. Ed. 2d 469 (1993).

²*Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923).

³*Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 588, 113 S. Ct. 2786, 125 L. Ed. 2d 469 (1993); *Frye v. United States*, 293 F. 1013, 1014 (D.C. Cir. 1923). See also *Daubert-Joiner/Kumho: The Brave New World of Expert Evidence*, 15 *Tox. L. Rep. (BNA)* 1213 (Nov. 23, 2000); Leslie Lunney, *Protecting Juries From Themselves: Restricting the Admission of Expert Testimony in Toxic Tort Cases*, 48 *SMU L. Rev.* 103 (1994).

Faced with a proffer of expert scientific testimony, then, the trial judge must determine at the outset, pursuant to Rule 104(a), whether the expert is proposing to testify as to (1) scientific knowledge that (2) will assist the trier of fact to understand or determine a fact in issue. This entails a preliminary assessment of whether the reasoning or methodology properly can be applied to the facts in issue.¹

¹509 U.S. at 592-593 and n. 11.

The Supreme Court's articulation of general principles in *Daubert* was not a comprehensive blueprint for the district court's gatekeeper function. Indeed, *Daubert* was and remains the subject of voluminous commentary and vigorous debate. Few absolute rules apply to a process that is by its terms expert-specific, particularly when that process is governed by an abuse of discretion standard on appeal.

The Supreme Court at least established the following factors for admissibility in the context of the Bendectin issue before it - factors that became the framework of the *Daubert* test:

1. whether the theory or technique that the expert contends constitutes scientific knowledge has been tested;
2. whether the theory or technique has been subject to peer review and publication (but publication is not dispositive);
3. the known or potential error rate and the existence or maintenance of standards controlling the technique's operation; and
4. "'general acceptance' can yet have a bearing on the inquiry," in the sense that widespread acceptance can be an indicator of reliability, and "a known technique which has been able to attract only minimal support within the community ... may properly be viewed with skepticism."¹

¹Daubert, 509 U.S. at 593-94.

The Court in *Daubert* added that federal courts would also evaluate admissibility under other applicable federal rules. It specifically noted Rule 703, which limits facts or data upon which experts may rely to that “reasonably relied upon by experts in the particular field,”¹ and Rule 104, which permits the court to exclude relevant evidence if “its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading the jury.”²

¹Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579, 595, 113 S. Ct. 2786, 125 L. Ed.2d 469 (1993).

²Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579, 595, 113 S. Ct. 2786, 125 L. Ed. 2d 469 (1993).

In closing, the *Daubert* court addressed defendants' concern that abandonment of the general acceptance test would result in a "free-for-all" before the jury. Defendants would continue to have available the traditional means of attacking admissible evidence — "[v]igorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof."¹

¹*Daubert v. Merrell Dow Pharmaceuticals*, 509 U.S. 579, 591, 113 S. Ct. 2786, 125 L. Ed. 2d 469 (1993). Since *Daubert* was decided, several circuits have applied it in affirming district court exclusion of expert testimony under the *Frye* standard. In *re Paoli R.R. Yard PCB Litig.*, 35 F.3d 717 (3d Cir. 1994), not overruled, but called into question by *Amorgianos v. AMTRAK*, 137 F. Supp. 2d 147, 164 (E.D.N.Y. 2001); *United States v. Jones*, 24F.3d 1177 (9th Cir. 1994) (affirming exclusion of expert testimony concerning voice identification); *O'Conner v. Commonwealth Edison Co.*, 13 F.3d 1090 (7th Cir. 1994) (affirming exclusion of expert testimony that plaintiff's cataracts were caused by a radiation dose thousands of times less than that commonly believed by experts to be required to cause this condition). Some courts not following the Federal Rules of Evidence have declined to apply a *Daubert*-type analysis, instead opting for the more restrictive *Kelly/Fiestyle* general acceptance test. See, e.g., *People v. Leahy*, 882 P.2d 321 (Cal. 1994); *State v. Coon*, 974 P.2d 386, 395 (Alas. 1999).

The *Frye* Approach

It is worth noting that the *Frye* approach,^[1] which uses a general acceptance test, remains important and that *Daubert* is still the minority view nationally. About 98% of all civil and criminal cases are litigated in state courts. Only 16 states have expressly adopted the *Daubert* standard, while 19 states still adhere to the *Frye* standard. Among those 19 states, which encompass 55% of the nation's population are populated states like California, New York, Florida, Illinois, Pennsylvania, Michigan and New Jersey.^[2]

^[1]*Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923).

^[2] These jurisdictions include Alabama, Arizona, California, D.C., Florida, Illinois, Kansas, New Jersey (except for toxic torts), New York, North Dakota, Maryland, Michigan, Minnesota, Mississippi, Missouri, Pennsylvania and Washington. See *Courtland Fibers v. Long*, 779 So.2d 198 (Ala. 2000) (*Frye* followed except for DNA); *Logerquisz v. McVay*, 1 P.3d 113 (Ariz. 2000); *People v. Leahy*, 8 Cal.4th 589 (1994); *Jones v. U.S.*, 548 A.2d 35 (D.C. 1988); *Florida Power & Light Co. v. Tursi*, 729 So.2d 995 (Fla. Dist. App. 1999); *Donaldson v. Illinois Public Service Co.*, 767 N.E. 2d 314 (Ill. 2002); *Kuhn v. Sandoz*, 14 P.3d 1170 (Kansas 2000); *Hutton v. Store*, 663 A.2d 1289 (MD 1995); *People v. Davis*, 72 N.W.2d 269 (Mi. 1955); *Goeb v. Thoraldson*, 615 N.W.2d 800 (Minn. 2000); *Kansas City Southern Railway v. Johnson*, 798 So.2d 374 (Miss. 2001); *M.C. v. Yeargin*, 11 S.W.3d 604 (Mo. App. 1999); *Store v. Doriguzzi*, 760 A.2d 336 (N.J. Sup. A.D. 2000) (*Daubert* for toxic torts); *City of Fargo v. McLaughlin*, 512 N.W.2d 700 (N.D. 1994); *Blum ex. rel. Blum v. Merrell Dow*, 764 A.2d 1 (Pa. 2000); *Store v. Copeland*, 922 P.2d 1304 (Wash. 1996) (See also Bureau of National Affairs, Product Safety & Liability Reporter, Vol. 30, No. 15, pages 328—341.)

The Underlying Problem

Daubert came as a reaction to the proliferation of bad experts in the federal courts. It is true that some putative experts are not objective and neutral. Scientists, of course, work harder at being objective because of the limits and goals of their scientific disciplines, but this doesn't mean personal preference, greed or ideologies never get in the way of their research. The scientific community has its share of ambition, suppression of truth, prejudice, plagiarism, manipulation of data, etc.¹

¹This is illustrated by Tel Aviv Medical School's Professor of Urology Alexander Kohn in his *False Prophets: Fraud and Error in Science and Medicine* (1986), by Broad and Wade's *Betrayers of the Truth: Fraud and Deceit in the Halls of Science* (1982), and other books and articles.