No. 09-10876

In The
Supreme Court of the United States

DONALD BULLCOMING,

Petitioner,

v.

NEW MEXICO,

Respondent.

On Writ Of Certiorari To The New Mexico Supreme Court

BRIEF OF THE *AMICUS CURIAE* STATE OF NEW MEXICO DEPARTMENT OF HEALTH SCIENTIFIC LABORATORY DIVISION IN SUPPORT OF RESPONDENT

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QUESTION PRESENTED

Whether admission into evidence of a form reporting a defendant's blood sample analysis result violated the Confrontation Clause when the machine's result can be verified with the machine's print-outs, and the defendant had the opportunity to cross-examine a qualified analyst about related issues such as the machine's operation, its analysis of the defendant's blood sample, analyst training, and the laboratory's standard operating procedures, and could have re-tested his blood sample at state expense.

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STATEMENT OF INTEREST OF *AMICUS CURIAE*[1]

The State of New Mexico Department of Health, Scientific Laboratory Division ("SLD"), is responsible for laboratory certification, breath alcohol testing instruments and instrument operators, and the methods of taking and analyzing samples for blood and breath testing for alcohol or other chemical substances, or both, under the New Mexico Implied Consent Act. N.M. Stat. Ann. §66-8-107 (2010); N.M. Admin. Code §7.33.2.2. SLD is the primary laboratory testing blood samples for alcohol and drugs for the entire state. It also tests biological samples for the New Mexico Office of Medical Investigator (OMI).

SLD is one of only 26 toxicological laboratories nationwide certified by the American Board of Forensic Toxicology ("ABFT"). ABFT Accredited Laboratories, *available at* http://www.abft.org/index.php?option=com_content&view=article&id=55&Itemid=64. Accreditation is based upon compliance with professional standards, which is assessed by peer review, annual inspections including random checks of sample files,

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[1] Pursuant to Rule 37.6, *amicus*' counsel of record states that she authored this brief in its entirety, and no person, other than the New Mexico Department of Health ("DOH"), made a monetary contribution to the preparation of this brief. DOH felt compelled to offer this brief on behalf of SLD because the impact of this decision will fall so squarely upon it, and no other person or any party would offer the same information or have the same interest as SLD. Both parties gave consent to the filing of any and all *amicus* briefs.

and successful achievement in proficiency testing. *Id.* The Innocence Network, Petitioner's *Amicus*, notes that "[b]ecause most states do not require that labs be accredited, labs face little pressure to standardize their protocols or ensure that individual analysts are conducting tests properly." Br., p.12. As an accredited lab, SLD does face those pressures.

SLD is independent of any law enforcement agency. Instead, it is part of the New Mexico Department of Health. It receives no funding from law enforcement for its testing. Like all New Mexico's state agencies, it is legally required to assist law enforcement without charging fees for its work "relating to or that would aid in controlling crime. . . ." N.M. Stat. Ann. §29-3-4 (2010). Without that proviso, it would undoubtedly charge for its services.

SLD tests thousands of blood samples for drugs, including alcohol, in driving while intoxicated (DWI) and driving under the influence of drug(s) (DUID) cases. From 2008 to 2010, test-related subpoenas requiring analysts to testify in DWI/DUID cases increased by 71%. New Mexico Department of Health Scientific Laboratory Division, *SLD Fall/Winter Newsletter*, 2 ed. (2010), http://www.sld.state.nm.us/documents/sldfallwinter2010newsletter.pdf. ("SLD Fall/Winter 2010 Newsletter"), p.2.

In 2010, SLD received approximately 1600 subpoenas requiring testimony, averaging eight or nine for each work day in the year. *Id*. The number of blood samples received for testing related to DWI/

DUID arrests increased 15% between 2008 and 2010. *Id*. At the same time, the number of analysts available to testify has fallen from five to four analysts for alcohol, and those testing or reviewing tests for drugs has fallen from ten to six analysts. *Cf., id.* Unfortunately, New Mexico is among those states suffering from catastrophic budget difficulties which have made hiring replacement analysts impossible due to a state hiring freeze. New Mexico State Personnel Office, *Suspension of Executive Hiring,* Nov. 8, 2010, *available at* http://www.spo.state.nm.us/NMState_Documents/Memorandum_docs/sus_hiring_110810; and New Mexico State Personnel Office, *Suspension of Executive Hiring – Guidelines*, Nov. 8, 2010, *available at* http://www.spo.state.nm.us/NMState_Documents/Memorandum_docs/sushiring_guide_110810. Adding to its dilemma is the fact that New Mexico is the fifth largest state in the union geographically, covering 121,593 square miles. City-Data.com, *New Mexico – Location, size, and extent, available at* http://www.city-data.com/states/New-Mexico-Location-size-and-extent.html. Historically, it has had one of the most serious DWI problems in the country. New Mexico Department of Transportation, *stopdwinm.com, available at* http://www.nmshtd.state.nm.us/stopdwi/PressRelease/PressRelease_dwi_10-16-09.pdf.

Every blood sample in DWI/DUID cases is tested for alcohol by SLD's Toxicology Bureau. Where the result is under .08 blood alcohol concentration ("BAC"), the blood is tested further for evidence of other drugs because it is presumed that the arresting officer observed evidence of impairment that is not

explained by the alcohol result. New Mexico Department of Health Scientific Laboratory Division, *SLD Fall/Winter 2008 Newsletter, Inaugural Newsletter, available at* http://www.sld.state.nm.us/documents/sldfallwinter2008newsletter.pdf. Overall, 8 to 10% of all blood samples which are tested show low or no evidence of either alcohol or drugs. *SLD Fall/Winter 2010 Newsletter*, p.2.

Each blood sample has original testing work by one, or as many as seven, analysts depending upon whether it is tested only for alcohol or additionally for drugs. *Id*. Then, each analysis is reviewed by a technical reviewer, and finally by an administrative reviewer (who may have also been the technical reviewer in some less complicated cases, generally involving only alcohol). At minimum, at least two analysts will work on or review a sample's analysis, as was true in Mr. Bullcoming's case. JA 58 & 62. One analyst did the original testing which showed a BAC of .21 (well over the *per se* impaired legal limit of .08), and his supervisor reviewed it. Unfortunately, the original analyst, Mr. Curtis Caylor, was on unpaid leave at the time of the trial. JA 58. Mr. Gerasimos Razatos, another SLD analyst, testified at Mr. Bullcoming's trial. JA 48.

Mr. Bullcoming's counsel made a Confrontation Clause objection to admission of the SLD 705 form[2]

[2] SLD 705 refers to the form's identification at the bottom. JA 62.

(JA 45) completed in part by Curtis Caylor. JA 62. The form stated the BAC results. *Id*. However, his counsel also stipulated that Mr. Bullcoming was drunk. JA 60. Bullcoming's defense related to *when* he got drunk, before or after the truck he was driving rear-ended another vehicle. *Id.* The jury evidently did not believe that it was after the accident, and Mr. Bullcoming was convicted, for the fifth time, of DWI. JA 29.

Since the decision in *Melendez-Diaz v. Massachusetts*, 129 S.Ct. 2527 (2009), and prior to the New Mexico Supreme Court's decision in Mr. Bullcoming's case, the responses to *Melendez-Diaz* by District Attorneys' offices across New Mexico ranged from subpoenaing every analyst with any connection to a blood sample, to just some of the potential witnesses, to only subpoenaing a reviewer on the case, to allowing any analyst to testify. The responses of magistrate, municipal or district courts likewise varied wildly, from dismissing cases where not all associated analysts were able to appear, to permitting any analyst to testify about DWI analysis. The result for SLD, where it is subject to a far greater number of subpoenas, and has fewer analysts than ever before, has been chaotic. This Court's decision here has the potential to clarify and provide guidance that will affect labs like SLD nationwide, and more to the point, will significantly impact SLD and its ability to perform the duties it is mandated by law to perform.

SUMMARY OF ARGUMENT

SLD firmly believes the New Mexico Supreme Court properly interpreted the Court's opinion in *Melendez-Diaz, supra* in this case. SLD does not quibble with the decision in *Melendez-Diaz* on Confrontation Clause grounds because no analyst at all testified in that case. An affidavit, standing alone with no competent witness available to question regarding its content, is constitutionally problematic.

Applying *Melendez-Diaz* in its carefully considered opinion, the New Mexico Supreme Court agreed with the defense that the 705 form could not be admitted as a business record. *State v. Bullcoming*, 2010-NMSC-7, 16, 147 N.M. 487, 494, 226 P.3d 1, 8. JA 11. But it also ruled that Bullcoming had ample opportunity to cross-examine the witness against him at trial, a witness who was fully apprised of the facts adduced by the gas chromatograph (GC) machine. JA 14. As will be discussed *infra*, it was the machine that computed the results showing that the Petitioner was seriously intoxicated at the time his blood sample was taken. The original GC operator simply transcribed the results reached by the machine onto a form. JA 13. SLD's witness at Mr. Bullcoming's trial was speaking, not on behalf of the analyst that wrote the BAC on the 705 form, but for the machine that performed the analysis. *Id.* An expert with respect to the GC, and SLD's standard operating procedures (SOPs) that delineate its analysts' work, the SLD witness was fully qualified to be questioned about the machine's results. JA 14.

The State of New Mexico's public policy against driving while impaired by alcohol or drugs was made clear by its adoption of the Implied Consent Act. The Petitioner's claim that only the original analyst may testify about a valid GC analysis thwarts the state's strong interest in roadway safety when each case has at least one, and as many as seven, original analysts. If any analyst is unavailable for any reason, valid test results will become inadmissible. An analyst leaving a laboratory's employ, and beyond court power, may cause many DWI cases to be dismissed, and allow multiple-time offenders like Mr. Bullcoming back behind the wheel. The Confrontation Clause does not require a result that yields no legally cognizable value to a defendant, and is likely to cause great harm to a state.

His counsel admitted Mr. Bullcoming was drunk. He just objected to admissibility of the 705 form that reported his BAC. The form's content is readily verified so, at most, any challenge must go to its evidentiary weight, not its admissibility. The testifying analyst was effectively a second reviewer to the results in Mr. Bullcoming's case. As such, his participation satisfied Confrontation Clause requirements because his opinion was based on facts or data of the type reasonably relied upon by experts in his field: the GC machine's analysis of Mr. Bullcoming's blood.

ARGUMENT

I. THE GAS CHROMATOGRAPH IS, INDEED, A WONDERFUL MACHINE.

In preparing to write this brief, SLD was concerned that the Court would lack important information regarding GCs, which SLD would need to describe in exhaustive detail. Upon review of the briefs filed on behalf of the defense, SLD is happy to report that other *amici* have provided significant information with which SLD does not disagree, at least as to the *general* GC process.

What SLD does feel necessary to bring to the Court's attention, and will discuss in greater detail *infra*, is that the specific information provided, particularly with regard to the brief filed by the National Association of Criminal Defense Lawyers, *et al*. ("NACDL"), either relates to a type of machine not used by SLD, or to a style of machine that was popular 20 or more years ago. Technological advances have changed laboratory landscapes nationwide. Today, SLD uses far more advanced instruments that eliminate the work which the NACDL and other *amici* characterize as "subjective," and likewise eliminates the associated concerns raised by them.

If one ignores the defects due to references to GC machines not used by SLD, the NACDL brief does offer a comprehensive, nearly ten page overview of the "GC process." SLD believes that process may also succinctly be described as follows, beginning at JA 53

[SLD notes for the Court's benefit are italicized, in brackets]:

> The SLD analyst removes:
>
> " . . . two aliquots [of small amounts] – two samples of the blood, two hundred micro-liters, so you're looking at point two mils, a very small amount that we use of the blood. We put it in a vial with an internal standard, which is used for the actual testing, as the identifying marks. We cap the sample in this particular vial, and put it on the instruments [*sic*] [141] for analysis."
>
> Q Okay. Now, what – what instru – what type of vials are we putting it [*the blood and internal standard*] in?
>
> A Little glass vials, about twenty mils.
>
> Q Okay. And, how do you cap them?
>
> A We have a Teflon septum [*looks like a thin rubbery cover*] and, then, we crimp them with an aluminum top [*i.e., a bottle cap*].
>
> Q Okay. And, what machine do you place them in?
>
> A We use a head space gas chromatograph with an auto[*matic*]sampler.
>
> Q Okay. Now, in layman's terms, would you please tell the jury what that means?
>
> A A gas chromatograph is an instrument – it's about the size of a microwave – and, what we're doing is, we're taking air space right

above this particular sample, and shooting it into this microwave-size instrument. Within it, we have two columns. These particular columns have a sticky nature to them. As the compounds are traveling through them, being pushed by air, it'll latch on to a particular – it will allow a particular compound to go according to size. So the smaller compounds come through first. Then the bigger ones, and progressively. So, it's a timed type of procedure. And, on the other end of this column, within the gas chromatograph, we have the detectors, which actually detect the compounds, and the computer notifies us which [142] compounds those are.

Q Okay. And does the machine itself indicate what the results are?

A Yes.

* * *

Q Once the – once the material is prepared and placed in the machine, you don't need any particular expertise to record the results, do you?

A No.

Q I mean, any human being could look and write and just record the results?

A Correct.

JA 53-54 & 56.

In other words, the blood is mixed with an internal standard, put in a vial suitable for the GC

machine, the vial's capped, put in the machine, and the machine does the rest. According to Mr. Razatos, the SLD analyst who testified under oath [JA 48] at the Bullcoming trial, any human being could read the result and write it on the form.

What seems noteworthy to SLD, since it was created long before the decision in *Melendez-Diaz*, is that this record is remarkably complete as to whether the work is intensive, subjective, readily influenced by the analyst, or anything more than letting the machine do its work. At the time this record was created, the New Mexico courts were following precedent that permitted the SLD 705 form, which states BAC test results, to be entered into evidence as a business record. JA 44-45 & 62-65. *State v. Dedman*, 2004-NMSC-037, 136 N.M. 561, 102 P.3d 628 (2004), which established that rule, was quite correctly overruled by the New Mexico Supreme Court in the instant case after applying *Melendez-Diaz*. The analyst testifying at trial had no idea that *Dedman* would be overruled, and was really only stating what he knew to be true about the process. He had no idea that his testimony would someday be reviewed applying a different standard. Essentially, he said he was speaking on behalf of a machine that did virtually all the work.

A. The Type of Gas Chromatograph and Associated Equipment Used At SLD Is More Advanced, and Eliminates Confrontation Clause Concerns.

As noted earlier, the brief filed by the NACDL *amici* references a multitude of concerns generally involving antiquated or unrelated machines and equipment. A brief review of the technical references used by the NACDL *amici* to substantiate their claims that the process is easily manipulated and subjective, where they cite a reference, reveals that those references were published in 1962, 1969, 1971, 1973, 1982, 1984, 1988 to no later than 1989. One cannot help but note that, generally, technological advances made even since 1989 have been tremendous (the Internet was not widely used then, the biggest law firms were just beginning to adapt to the PC age from giant word processing centers and typewriters, and cell phones were roughly the size of a brick), not to mention the changes that have taken place since 1962.

Happily, SLD has kept pace. The machine used at SLD is a Dual Column Capillary Headspace Gas Chromatograph with an autosampler. Gerasimos Razatos, BS; Curtis Caylor, BS; Ruth Luthi, BS; Sarah Kerrigan, Ph.D., *Validation of Volatile Analysis Using Dual Column Capillary GC*. 56th Annual Meeting of the American Academy of Forensic Sciences, Dallas, TX, February 2004, *synopsis available at* http://www.aafs.org/sites/default/files/pdf/dallas04.pdf, pp.347-348. This is the same instrument that was used to test Mr. Bullcoming's blood. JA 54.

There are two types of GC sampling methods: direct injection, in which a needle is injected into the blood in the vial, and indirect injection, in which the needle is injected into the "headspace" above the blood inside a vial. In the latter method the alcohol in the blood, which has been heated to 65 degrees centigrade, becomes a gas, and is thus sampled indirectly. *Accord,* NACDL Br., pp.18-19. The needle never touches the blood in indirect injection GC. SLD uses the indirect headspace method. *Validation of Volatile Analysis Using Dual Column Capillary GC*, *supra.*

Unfortunately, when discussing the GC, much of the NACDL brief discusses both direct injection and indirect injection GC, so issues which seem plausible are raised, but are not applicable. For example, there is concern that there could be contaminants in the instrument, with care to be taken in cleaning the syringe between injections. NACDL Br., p.19. This applies, however, to direct injection GC, which SLD does not use.

Much of the other information presented is likewise inapplicable. *Amici* refer to variations in amounts of salt which may be used to "force extra ethanol and internal standard into the headspace gas" which they believe can lead to invalid results. NACDL Br., p.18. SLD personnel have presented the results of their experiments regarding salt use, and concluded that the tests results were not statistically different during routine forensic analysis. Yazzie, J., Luthi, R., and Kerrigan, S., *Effects of Sodium Chloride on Headspace Blood Alcohol Analysis*

by GC-FID, Abstracts of FBI/Society of Forensic Toxicology/International Association of Forensic Toxicologists Joint Annual Meeting, Washington, DC, September 2004, Abstract A27, attached as Appendix A, at App. 1-2. Consequently, SLD does not use salt.

Much is also made of the difficulty of consistent and precise pipetting. The process is described as using something like a small turkey baster to suck blood out of the original test tube, and transfer it to a GC test vial. NACDL Br., p.14. The authors do acknowledge, in a footnote, that "[t]oday's pipettes are more sophisticated than turkey basters, and contain dials to specify the desired amount of liquid to be pipetted." That is correct. SLD uses a digital "Hamilton Auto Diluter ML503220 ML503A, non-programmable, 220V dual syringe diluter" which precisely measures the correct amount of internal standard and blood to be simultaneously extracted from their containers and squirted into the GC vial. It is specifically designated as appropriate for use in blood alcohol analysis. *See,* Hamilton Company product information, *available at* http://www.hamiltoncompany.com/products/diluters/c/246. The auto diluter measures the same way every time, and is never used for another process. The digital dials are precisely set for a specific amount, so generally in BAC cases every analyst extracts exactly 2 milliliters (mL) of internal standard to 200 micro liters (uL) of blood. *Cf.*, JA 53. There is no good or bad pipetting technique; the machine does the pipetting for you. Short of squirting the contents onto the floor instead of into the vial,

there is little you can do to impair its performance of the pipetting job.

B. SLD's Standard Operating Procedures Likewise Eliminate Concerns About Analysts' Techniques and Are Readily Verified by the Analysis Generated by the Gas Chromatograph.

Petitioner's various *amici* also make much of the potential for facts or variations in analyst techniques which they say cannot be discovered without the original analyst's testimony. But, at least at SLD, there is no toleration for individualized approaches to BAC testing. Everything must be reported. The analyst must note the condition of samples received. *See, e.g.,* Appendix B, Toxicology Bureau – Technical Procedures *Implied Consent Worksheet Entry,* part of SLD's SOPs, at App. 3, bullet 2. *Amici* state that without the original analyst, they cannot discover the selection of parameters that will be used to run the test. NACDL Br., p.20. But, at SLD, this selection is not made by an analyst. The SOPs dictate that the parameters will be the same for every blood sample tested because they are selected by the computer program. The parameters are automatically applied via the "BAC.M" method, or computer program, required to be used by the SOPs. This is as objective as it gets.

The fact that the BAC.M method is used can easily be verified because most, if not all, of this and

the other information the *amici* state they cannot obtain without cross-examining the analyst is actually shown on the GC print-out. *See* Appendices C & D, attached, a run-of-the-mill SLD BAC result print-out and the related chromatogram which the print-out describes numerically. No part of either has been redacted. The top portion of each is identical, and described in detail below.

The first line of both reports indicates the computer and its associated program, MSD ChemStation[3], which relate to the GC used for this sample. The date shown is the date the batch of blood samples began to be analyzed by the GC machine. A batch generally consists of 40 to 60 samples run at one time. *SLD Fall/Winter 2010 Newsletter*, p.2. The "0819" is the number assigned by the machine for this entire batch of samples via the Laboratory Information Management System (LIMS), the software program that manages all the GC data. The data file number at line two is this particular sample's file number, which is also created by LIMS. Line three identifies the two flame ionization detector columns utilized.

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[3] While SLD does use ChemStation, the screen shots which appear at NACDL Br., at App. C & E, look nothing like SLD's computer screen. If one reviews NACDL App. C carefully, it is a liquid chromatography (LC) screenshot, not a GC screenshot. LC is used for substances that do not easily reach gas form, and uses different techniques. The outdated GC shown in NACDL Br., at App. A, is also not applicable. Its autosampler seems accurate.

Amici NACDL posit that they cannot discover whether an analyst left the machine during a test. Br., p.24. First, SLD states that it is ridiculous to think that for a run of many, many hours, sometimes more than a day's duration, the analyst would not be able to leave the machine. Typically, the analyst turns the machine on, and leaves to do other work. In today's lab, the machine generally does the work without much supervision, something like a washing machine left to run through its cycles alone.

The report example shows how confident SLD is that the machine is fully capable of, and often does, work alone. At line four of the report, "Acq On," is the date and time the test results were generated by the GC, 20 Dec 2010 19:31. All lab personnel generally leave the lab by 5:00 p.m. The machine uses military time, so these results were generated on December 20, 2010 at 7:31 p.m. The operator, otherwise known as an analyst, was AnaIsabel Parra ("PARRAAN"). She works until 4:30 p.m. So the GC reached its conclusion about three hours after this analyst left, and two and a half hours after it is likely everyone else left the lab for the day. Should a problem occur, it will be reviewable on the chromatograms and their associated numerical representations generated by the GC. Any analyst, including a so-called surrogate, would be able to see it. All of this information can be discovered through any qualified SLD analyst's testimony and is readily available from the GC data.

The sample number on the report's next line is a barcode number which was placed on the donor's

blood sample kit, and on the gray-topped test tube containing the blood sample tested, immediately upon its arrival at SLD. Gray-topped "vacutainers" contents are standardized, and come prefilled with sodium fluoride as a preservative, and potassium oxalate as an anticoagulant. *See, e.g.*, UC-Irvine Pathology Services description of specimen collection tubes, *available at* http://www.pathology.uci.edu/PathologyServicesManual/SpecTubesContainers.html. They are included in the SLD-approved blood test kits, because they contain sodium fluoride, which is required by SLD rule. *See*, N.M. Admin. Code §7.33.2.15(A)(3).

Below that line is the test number, also assigned by LIMS, which allows the computer to link the test sample to the data file, *i.e.*, this gives the computer a "place" to put the test results generated at 19:31 on December 20, 2010.

The next line indicates that this sample was in vial position 81 when it was put into the autosampler that fed the sample into the GC. On that same line it states: "Sample Multiplier: 1." This shows that this sample was undiluted; therefore, the computer multiplied the results times one, *i.e.*, the results are reported without multiplication necessary.[4]

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[4] Blood samples with results above .40 BAC, and therefore beyond the range of comparison with the highest calibrator (which is .40 g/ 100 mL), are diluted and run through the GC again. *See*, App. B, at App. 4, bullet 2. In that case, the blood is diluted 1:1 with water, and the results would be multiplied by 2.

(Continued on following page)

The following line indicates the nickname for the machine used, which is Ethyl. The other GC sometimes used is called Fred.

Amici claim that the analyst "must interpret their results (called integration)." NACDL Br., p.14. That was true for GCs 20 years ago or so. Today, at least at SLD, the computer does that work. This is indicated at lines 10 and 11, which are the program identifiers for the integration work being done by the GC machine. Line 10, "Integration File signal: events.e" relates to GC Flame Ionization Detector (FID) 1. Line 11, "Integration File signal: events2.e" relates to GC FID 2. It always reads this way. If there were a manual override showing that the analyst did the integration (which is not permitted at SLD) per the key shown at the bottom of the page, an "m" indicating manual integration, would show up beside the results. So if, as supposed by NACDL *amici*, an analyst did manual integration, the report would show it. A different analyst would be able to see that, and be competent to testify about it.

"Quant Time" or quantitation time, is the time that Ms. Parra came back to the lab the next morning, printed out the report, and reviewed the GC's results for this sample. "Quant Method" shows that the GC used the "BAC.M" or blood alcohol concentration method software program to analyze the sample.

The computer does the calculations. All test results, including the original in excess of .40, would be in the file.

If BAC.M had not been used, the report would say something different. "Quant Title" is blood alcohol quantitation. "QLast Update," is the date that the GC machine had last been used for a run before this batch. "Response via: Initial Calibration" shows that all the results for this run were generated off the first five calibrators, which are always the first five vials tested in a batch. *See* Appendix E, BAC example worksheet, which is also part of SLD's blood alcohol testing SOPs, and specifies how the GC autosampler is loaded.

The next line of the report identifies that the software program used was ChemStation, and the machine performing the integration was an HP 6890. This line also states: "Scale Mode: Large solvent peaks clipped." This is never applicable to BAC runs, in which the solvent is always aqueous-based, and cannot produce large *solvent* peaks. Only solvents like methanol produce large solvent peaks. SLD's GC machines used for BAC testing are only used for BAC testing, but the report always states "Large solvent peaks clipped" as a default.

The results section appears as a table after the foregoing information. The results for the internal standard, N-Propanol, are listed first. Appendix C. Then, on the next line, the GC lists a number for a substance identified by it as ethanol. *Id.* Ethanol is in alcoholic drinks.

The numerical representation is the GC's calculation of the quantity of alcohol in this blood sample,

graphically illustrated by the chromatograms in Appendix D, at App. 7. The computer compares the chromatogram of the substance it finds in the sample with that of the internal standard to determine what the substance is. NACDL Br., p.9. Here, the computer noted the retention times of the substance were 1.539 and 2.299. The graphs differ because they are readings from the two different columns in the GC. They vary because the two columns are chemically distinct, and so have different retention times for ethanol and other substances. *Accord,* NACDL Br., p.21. Using two columns that will respond with different retention times operates as a cross-check of the results. *Id.*

Once the GC identified the ethanol, it then determined the concentration of that ethanol by determining the area under the chromatogram peaks, and comparing it to the area of chromatogram peaks for known quantities of ethanol.[5] *Accord,* NACDL Br., p.11. For this sample, the areas shown for each column (which appear on the report as Resp #1 and Resp #2) each related to .135 grams per 100 milliliters of blood, or over 1.6 times the *per se* limit of .08 g/100mL, at which point a person is deemed to be DWI. App. C. Per the SOPs, the two column results must be within that 5% range, or within .005 g/mL, of each other. *See* App. B, at App. 3, bullet 3. If they are

[5] "N.D." on the lines below ethanol shows the other substances listed were not detected.

within the 5% range, then the quantity reported is always the amount reported by column two. *Id.* The result is never rounded up, and is always truncated to two digits. *Id.,* at bullet 4. So for this sample, the result reported to the donor and the submitting agency on SLD's 705 form would be .13 g/100mL.

Everything stated regarding this sample's results can be reviewed and competently testified to by any SLD analyst. *Amici* claim that without cross-examining the analyst who worked on a particular sample, a defendant won't be able to tell whether the machine was making its calculations properly. But, if the GC isn't working right, it will read the calibrators and controls (for known amounts of ethanol) or blank solutions (100% water) incorrectly. These quality control (QC)[6] items for the entire run are scrutinized for a whole batch of samples. The test results for the QC controls and blanks reviewed on each side of a particular sample will be in the blood donor's file (which also contains the sample's quantitation report including the chromatogram) which analysts review to prepare for trial. The analyst or reviewer (or the defense should they choose to review the file) will be able to see any error in the GC's calculation of the controls or blanks. If these QC items are read incorrectly by the GC, SLD requires that the test be re-done. For purposes of argument only, if

[6] QC test results are just like the quantitation report for the blood sample explicated earlier, including both the chromatogram and analysis.

the test isn't re-done that, too, would show in the file, and the testifying analyst would see it. The so-called "surrogate analyst" is just as easily questioned on this subject as the original analyst, perhaps more so, having no incentive to gloss over such a mistake because he or she wasn't the one who made it.[7]

Likewise, NACDL *amici* are concerned that the "analyst can tell the computer how to draw the baseline of the peak," which *amici* describe as a wholly subjective task. That peak represents the concentration of the alcohol found, if any. NACDL Br., p.12. But, per its SOPs, SLD analysts are *not* permitted to "override the method and manually redraw the baseline." *Id.* The method is BAC.M, every time, and fully disclosed by the instrument. This is a wholly objective approach. The method used is shown in the Quantitation Report. App. C & D. Any testifying analyst can see it. The defense is always able to get a copy of defendant's file, pursuant to discovery, to verify the method used, and see what the chromatograms look like. Or to read the number that the computer reported was representative of the

[7] This is offered for purposes of argument only, because SLD vehemently denies that any of its analysts would "fudge" data, and no reviewer would countenance it. To do so would risk SLD's ABFT accreditation. Moreover, like lawyers, SLD toxicologists are subject to ethical rules that prohibit false reporting. American Board of Forensic Toxicology, *Code of Ethics, available at* http://abft.org/index.php?option=com_content&view=article&id=56&Itemid=65.

chromatogram, in Mr. Bullcoming's case .21, or more than two and a half times the legal limit.

Another example of items the NACDL *amici* believe would impact the BAC result is whether the GC columns have been clipped or replaced. NACDL Br., p.7, fn.7. Clipping column ends relates to older or direct injection GC. At SLD, GC columns are typically replaced every 6 to 8 months or whenever the results of the QC controls become inaccurately read by the GC. Those false results, if the column is not replaced before a sample is analyzed, would show in the QC for the sample's file, and any testifying analyst will be competent to answer questions regarding them.

Appendix E, the SLD worksheet which is part of SLD's SOPs, illustrates another matter that concerns NACDL *amici*: the loading of the autosampler carousel. This SOP dictates how the carousel is loaded, and what controls and water "blanks" are to be placed where. If there were a problem with the computer's calculations, these QC controls would show incorrect results. The carousel is loaded the same way every time per the SOPs, as shown in the worksheet.[8]

Analysts are all trained at SLD to do this SLD's way, to load the carousel one vial at a time, and re-check their work. Yes, it must be done carefully,

[8] For samples in excess of the number shown on the worksheet, the pattern for loading additional samples and controls follows that of the earlier iterations.

but so must a records custodian work carefully when certifying that a copy provided is complete and accurate. If somehow the problem is not disclosed by the controls (for example, if a blood sample vial is mislabeled and the original analyst did not immediately catch that mistake), the original analyst would no more be able to detect that problem than would any other analyst reviewing the file.

In that case, the only means of finding the error would be re-testing the blood sample, which a defendant may always do if he believes that the results are incorrect.[9] JA 52. Blood samples are retained for six months from the date of receipt to allow a defendant to make such a request. N.M. Admin. Code §7.33.2.15(A)(4-6). That did not happen in this case. JA 52. Of course, there was no reason for Mr. Bullcoming to do so because, as his counsel stipulated, he did not dispute being drunk at arrest. JA 60. Although no questioning of Mr. Razatos addressed it, Mr. Bullcoming's defense involved whether he got drunk before or after the truck accident which occasioned his arrest.

If a problem can be detected from the data, the analyst testifying at trial is effectively acting as an additional reviewer on the case. If it can't, the

[9] In the few cases of fraud or error cited by Petitioner's *amici* as the basis for reversing this case, the problem was generally only discovered by re-testing the sample. All the laboratories in question appear to be crime labs appended to a law enforcement agency, not independent laboratories like SLD.

original analyst is unlikely to know about it either. The Petitioner does not suggest, nor would it be reasonable to require, that every sample be tested multiple times to catch a problem about which even the original analyst would not have known. The best protection for any defendant believing that his or her BAC test result is wrong, is to have the blood timely re-tested at the lab of their choice. The State of New Mexico will even pay for that second test. N.M. Stat. Ann. §66-8-109(E).

II. ENORMITY OF NUMBERS AND ANONYMITY OF BAC TESTING ELIMINATE THE EFFICACY OR NECESSITY OF HAVING A PARTICULAR ANALYST TESTIFY.

Petitioner gives the impression that he thinks a run of blood test vials may be limited to a dozen samples at a time. Petitioner's Br., p.4. Not so. Each batch consists of about 40 to 60 samples identified only by a computer-generated number. *SLD Fall/Winter 2010 Newsletter*, p.2. Therefore, contrary to Petitioner's assertions (Br., p.30, fn.2), it would be unbelievable for an analyst to say they remember any particular run, or the region from which that sample came. Once a sample reaches SLD it is immediately assigned a number. It is not linked to an individual's file in which his or her name appears until all testing is completed. *See*, *SLD Fall/Winter 2010 Newsletter*, p.2 (cases are identified only by a computer assigned barcode number). Once the results are linked back to a file, they are reported both to the

individual tested and to the law enforcement agency. *See*, JA 65.

The lab tests thousands of samples annually, with the 15% increase from the total of over 2500 blood samples in 2008 resulting in nearly 3000 samples tested in 2010. New Mexico Department of Health Scientific Laboratory Division, *SLD Fall/Winter 2008 Newsletter*, p.4; *SLD Fall/Winter 2010 Newsletter*, p.2. Just dividing the samples evenly among the four analysts currently analyzing BAC for Implied Consent cases amounts to over 700 samples tested by each analyst each year. A reviewer may look at thousands of blood analyses. The sheer number of vials identified only by number essentially guarantees anonymity during testing.

The process' anonymity fully supports the New Mexico Supreme Court's position that any qualified analyst can testify about GC test results even if he or she was not the original analyst. The kind of photographic memory that would be required to remember all of the numbered vials one has tested over the course of a year would be so remarkable as to strain credulity. In other words, wouldn't a defendant's counsel be the first to cry foul were the analyst to say, "Oh yes, I remember testing the defendant's blood sample: Number 2351. I thought it was amazing that the fellow could walk, much less drive!" One speculates that the defense would be disinclined to believe that response, and say the same to the jury. Yet, Petitioner and his *amici* assert that certainly an

analyst could remember any particular sample tested so they might usefully be cross-examined.

Except, reading more carefully, it appears that the NACDL *amici* are not saying precisely that. Instead, they state it would be sufficient for an analyst to be questioned about how he or she "typically conducts the test," presumably because the analyst is so unlikely to remember any particular test. NACDL Br., p.23. As noted earlier, every SLD analyst is trained at SLD to meticulously follow its SOPs, so that any qualified analyst can reliably testify about how another analyst typically does the work. That is exactly what Mr. Razatos testified to at Mr. Bullcoming's trial.

Moreover, the GC reports show the method used, when it was used, and what the results were. By reviewing the individual's file, as every analyst does who testifies, the analyst can see if the work was performed properly.[10] They can review the data, and offer their opinion as to whether the analysis appears accurately reported. And they can accurately describe how any SLD analyst "typically conducts the test," which is what *amici* NACDL assert is constitutionally necessary.

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[10] The NACDL *Amici* raise the unusual test which may, "in their experience" be remembered. Br., p.23. Anything unusual must be documented in the individual's file per SLD SOPs and policy. *See, e.g.*, App. B, at App. 4, bullet 2. If the analyst didn't think it was unusual enough to note, he or she is unlikely to remember, or associate it with, any particular sample tested.

As reaffirmed in *Melendez-Diaz*, while the Confrontation Clause's ultimate goal may be to ensure the reliability of the evidence, it is a procedural, not a substantive, guarantee of reliability. *Melendez-Diaz*, 129 S.Ct. at 2536, *quoting Crawford v. Washington*, 541 U.S. 36, 61-62 (2004). The accepted procedure is cross-examination. The New Mexico Supreme Court agreed, and applying those principles decided:

> In this case, Razatos, an SLD analyst, was qualified as an expert witness with respect to the gas chromatograph machine and the SLD's laboratory procedures. Razatos provided live, in-court testimony and, thus, was available for cross-examination regarding the operation of the gas chromatograph machine, the results of Defendant's BAC test, and the SLD's established laboratory procedures. Additionally, Razatos could be questioned about whether the operation of the gas chromatograph machine required specialized skill that the operator did not possess, involved risks of operation that might influence the test results, and required the exercise of judgment or discretion, either in the performance of the test or the interpretation of the results. Because Razatos was a competent witness who provided live, in-court testimony, we conclude that the admission of Exhibit 1 did not violate the Confrontation Clause.

Bullcoming, JA 14.

In short, the New Mexico Supreme Court considered all of the arguments raised by Petitioner and his *amici* here, and determined that Mr. Bullcoming's right to confront the witness against him was fully protected. In reality, the witness against him was the GC and the analysis generated by it, which Mr. Razatos stated he reviewed. JA 49. Mr. Razatos was speaking on behalf of a machine that could not speak for itself. *Bullcoming,* JA 13. Applying the principles set forth in *Melendez-Diaz*, in light of the facts before it, the New Mexico Supreme Court correctly concluded that the rights protected by the Confrontation Clause were amply safeguarded.

III. PUBLIC POLICY CONSIDERATIONS MANDATE THAT ANY QUALIFIED ANALYST BE PERMITTED TO TESTIFY REGARDING THE GC'S BLOOD SAMPLE ANALYSIS.

SLD's analysts are impartial. The fact that about 10% of all test results show low or no evidence of drugs or alcohol, despite the arresting officer's report that the driver seemed impaired, strongly supports that view. But, SLD does not contend that no witness is necessary to testify on its behalf. Conversely, SLD does not believe that the Confrontation Clause requires that only the original analyst will suffice, because that amounts to a formalistic exercise offering nothing of value to a defendant, and creates a serious danger to New Mexican public safety on its roadways. The State of New Mexico's public policy against driving under the influence of alcohol or

drugs is clear. *See*, Implied Consent Act, N.M. Stat. Ann. §§66-8-105 through 66-8-112 (2010). It is a well-established principle that in some circumstances the right to confrontation must give way to considerations of public policy. *Mattox v. United States*, 156 U.S. 237, 243 (1895). All states have the same interest in regulating road safety. Likewise, they will have the same interest in preserving valid evidence for DWI trials which will be lost absent permitting any qualified analyst to testify regarding GC test results.

Unfortunately, as was true for Mr. Bullcoming's trial, many times the original analyst will not be available.[11] People retire, go on vacation, they're sick, move away, leave the lab's employ for another job, take maternity leave, you name it, and SLD, like any employer, experiences all kinds of employee absences.[12] One very troubling aspect of Petitioner's position that no analyst except the one who did the original

[11] The record reflects that the original analyst, Curtis Caylor, was on unpaid leave. As an employment matter, SLD may not disclose the reason, but states unequivocally that if Mr. Caylor's analytical work had been doubted, SLD policy is that it would have been rejected, and re-tested prior to trial. Were SLD to try to hide any analyst's poor performance, it would risk its accreditation. ABFT randomly checks files annually to review analysts' work, and should it discover the kind of misfeasance or malfeasance posed by Petitioner's *Amici*, SLD would suffer the consequences.

[12] Analyst Ruth Luthi reviewed Mr. Bullcoming's case, and also did not appear at his trial. JA 58 & 62. Her absence further illustrates the difficulties for SLD in maintaining an immutable workforce.

testing can testify about the GC's work is that if any analyst leaves the lab's employ, and is no longer subject to a court's subpoena powers, as a practical matter it is likely that DWI defendants' cases supported by perfectly valid test results will end up being dismissed.

SLD also encounters samples where the evidence shows that the individual may have been impaired by a number of drugs plus alcohol. If no one drug or intoxicant alone can explain the impairment observed, there could be as many as seven "original" analysts. *SLD Fall/Winter 2010 Newsletter*, p.2. SLD only has four analysts who testify in alcohol-related cases, and six in drug cases. *Id*. So, if the original analysts must testify, then SLD's Toxicology Bureau will be shut down almost completely for one case. Trials tend not to be completed in a day; drug or alcohol batch runs take four days, so the lab may well lose an entire week's work for one trial. *Id*.

Or what if, as is often happens these days, there is more than one trial for which any of those analysts is also subpoenaed? The likelihood of having all analysts available for one trial date seems slim. One or more cases may be dismissed because analysts

cannot be two places at once.[13] While some scoff at the notion that labs will receive that many subpoenas, or that numbers will increase, don't forget that from 2008 to 2010, the number of subpoenas SLD received for testimony in DWI/DUID cases increased by 71%. *SLD Fall/Winter 2010 Newsletter*. In 2010, SLD's Toxicology Bureau received about 1600 subpoenas for testimony, roughly half for alcohol and half for drug cases. *Id.* That amounts to over 200 subpoenas per alcohol analyst and over 133 for each drug analyst. There are only 52 weeks in a year.

IV. SLD'S 705 FORM STATEMENTS ARE READILY VERIFIABLE, SO THE ONLY ISSUE SHOULD BE THE WEIGHT OF THE FORM'S EVIDENTIARY VALUE, NOT ITS ADMISSIBILITY.

The Petitioner argues that allowing an analyst to write the test results he or she reads from the

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[13] SLD believes it an insufficient solution to say that if the defendant cross-examined the original analyst, and the analyst is later unavailable, then a different analyst may testify. *See*, *e.g.*, *Melendez-Diaz*, 129 S.Ct. at 2531, *citing Crawford*, 541 U.S. at 54 (2004). In New Mexico, analysts are often only questioned prior to trial in pre-trial interviews (PTIs). *See, e.g.*, N.M. R. Ann. 7-504(C)(1). These are not conducted under oath. They are informal, so their confrontation value is doubtful. Moreover, even if deemed to satisfy confrontation requirements, most PTIs occur immediately before trial. If the original analyst is unavailable then, it will be too late to do anything to rectify the problem. SLD does not control when the defense requests a PTI or how it is conducted.

computer print-out onto SLD's 705 report form (JA 62-65), which is sent to both the test subject and law enforcement agency, is really not different than allowing a person to submit a statement of a house number, or auto license plate they saw, or anything else that might be testified to in a criminal trial. Br., p.12. But, upon reflection, it really is quite different. In those cases, we are entirely dependent on the witnesses' clarity, presence of mind under what may have been frightening circumstances, and their memory to accurately report what they saw. That is not the case for SLD's analysts completing the 705 form.

Unlike the pressure-packed witnessing of a crime, a BAC analyst works in a controlled environment, just like a records custodian. The lighting is good, the environment is safe. Both Mr. Razatos' trial testimony, and the step-by-step review of an actual quantitation report *supra*, demonstrate it is a simple matter to review the GC's printed report and copy the result. The machine does all the work, memorializes exactly how it did it, and provides a numerical result. Twice.

For this reason, the New Mexico Supreme Court was perfectly justified in finding that the analyst who copied the BAC onto the 705 form " . . . was a mere scrivener, and the Defendant's true 'accuser' was the gas chromatograph machine which detected the presence of alcohol in the Defendant's blood, assessed Defendant's BAC, and generated a computer print-out listing its results." *Bullcoming*, JA 13. A defendant

or his attorney can even look at the print-out in the defendant's file, see the number recorded, and check if it corresponds to the number on the 705 form. The file is reviewed by the testifying analyst, and if requested, is provided to the DWI defendant as part of discovery per court rules. *See, e.g.,* N.M. R. Ann. 7-504.

Petitioner complains that the minimal certifications required for every analysis makes the form inadmissible. Br., p.36. SLD strongly disagrees. These statements are of a most routine sort, such as that the analyst conducted a chemical analysis using the GC method. The statements are so basic to the process that they are pre-printed on the form signed by the analyst. *Amicus* Richard D. Friedman states that " . . . Curtis Caylor did far more than transcribe the results indicated by the machine. He also asserted that he received sample [sic] in question with seal unbroken . . . " Br., p.14. Well, actually Mr. Caylor certified that the *laboratory* received the sample with seal unbroken. JA 62. But that was first certified by a different employee, Ms. Yvonne Hautzinger, who took the sample out of the mailbox. *Id*. So, we have that statement twice, from two different SLD employees, Ms. Hautzinger and Mr. Caylor. *Melendez-Diaz* acknowledged that not all uses of a form are prohibited, such as for proving some parts of a chain of custody (which the 705 form clearly provides). 129 S.Ct. at 2532, fn.1. The Court even asserted that something as important as a certification that an instrument is working properly may be

non-testimonial. *Id*. Here, what is important is that statements on the form about the BAC were readily verifiable, other parts could even be considered non-testimonial, and what required live testimony from SLD was competently testified to at Mr. Bullcoming's trial. Therefore, it must survive challenge on constitutional grounds.[14]

The form did not stand alone. It was accompanied by the testimony of a qualified analyst after reviewing the analysis. The jury was correctly allowed to see it. Any defendant may, as Mr. Bullcoming's counsel did, argue the supposed defects of the analyst's testimony. JA 60-61. SLD's 705 form is mailed to the defendant when the BAC results are determined. JA 65. The actual GC's analysis is available for review. If a defendant believes that the 705 form report, or the GC analysis, is wrong, that defendant can require the State to pay for a re-test at another lab. N.M. Stat. Ann. §66-8-109(E).

SLD does not contend that, like a records custodian, no analyst needs to testify to the accuracy of the

[14] If this Court were to consider the form's admission a violation of hearsay rules, as noted by the Court in *California v. Green*, 399 U.S. 149, 156 (1970), "merely because evidence is admitted in violation of a long-established hearsay rule, does not lead to the automatic conclusion that confrontation rights have been denied."

analytical work.[15] Instead, it is stating that between the ability of the defense to review the GC analysis, and the opportunity to cross-examine a qualified, SLD-trained analyst about the testing process and the data, the interests protected via the Confrontation Clause are amply preserved.

CONCLUSION

The beauty of the U.S. Constitution has been its ability to adapt to vast changes that have taken place since its adoption. SLD is convinced that the Framers could not have intended to impose formalistic constraints that yield no constitutionally cognizable benefit to a defendant, and are likely to cause real harm nationwide. SLD urges this Court not to take an approach to confrontation that disregards reality. SLD believes the GC machine used here eliminates the concerns raised by Petitioner. The work is really done by a machine, and can be reviewed by any qualified analyst just as well as the original. The advanced equipment used, uniformity ensured by SOPs which all SLD analysts must follow, and ability of the defense to cross-examine an analyst who can competently answer questions raised does not create

[15] In many ways this ability to review the data and check the work seems more reliable than a certification by a records custodian. Those statements are not verifiable. Yet, the *Melendez-Diaz* Court approved such certifications. 129 S.Ct. at 2538-2539.

an exception to the Confrontation Clause, but, in fact, satisfies it.

The long-range implications of a contrary opinion must also be understood. Each case should be considered on its merits, as the New Mexico Supreme Court did here. SLD is not expert in other technologies. It does not purport to know whether other methods of forensic analyses are subject to error or manipulation. SLD does know that the GC analysis described here should not be lumped in with forensic methods found untrustworthy. But like the GC used by SLD today, which is much different than that of 20 years ago, other technologies may change as well. Then those technologies may also avoid the pitfalls Petitioner says he fears. This Court should not reach any decision that precludes consideration of that possibility.

For the foregoing reasons, *Amicus Curiae* SLD requests the Court to affirm the New Mexico Supreme Court's decision in this case.

Respectfully submitted,

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APPENDIX A

App. 1

EFFECT OF SODIUM CHLORIDE ON HEADSPACE BLOOD ALCOHOL ANALYSIS BY GC-FID

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Sodium chloride is frequently utilized as an additive for headspace alcohol analysis. The addition of salt to the mixture in the headspace vial increases the partial pressure of volatile compounds including alcohol and the internal standard. This is advantageous because the concentration of alcohol in the vapor phase is a function of both the temperature and the concentration of alcohol in the liquid phase.

The effect of salt was investigated in a series of experiments in which sodium chloride was added to the internal standard solution containing *n*-propanol and *r*-butanol. Ethanol was quantitatively determined using an Agilent HP 6890 GC equipped with dual capillary columns and a flame ionization detector (FID).

In-house and external whole blood controls were used for comparison purposes. When no salt was added, CVs ranged from 1.3 to 4.0% for alcohol concentrations between 0.04 and 0.30 g/dL. By comparison, CVs using the salt solution ranged from 1.2 to 4.2%. Accuracy was 100-105% and 99-109%, when either

[Continued On Next Page]

salt or no salt was added, respectively. A comparison of quantitative values obtained by both methods showed that the results were not statistically different. A total of 80 antemortem and postmortem casework samples were included in the study. These ranged in concentration from 0 to 0.567 g/dL ethanol. Linear regression analysis showed an R^2 value of 0.996 and a mean difference of 0.001 g/dL between methods.

Keywords: Ethanol, Sodium chloride, GC-FID

TOXICOLOGY BUREAU –
TECHNICAL PROCEDURES

Discipline: Blood Alcohol Analysis
Method: Blood Alcohol Analysis by Dual Column Capillary Headspace GC
Method #: 803.8

Implied Consent Worksheet Entry

- After the data is printed, enter the alcohol concentrations on the worksheet.
- As you prepare each sample, record any irregularities, conditions, and type of sample (blood, urine, etc.) on the worksheet. Make a notation if the sample is not preserved.
- A single aliquot of sample will be used for all unknown case samples. For all sample results, concentrations should be within 5% of each other on both columns or ± 0.005 g/100mL. Quantitative values are determined using column RTX®-BAC2. The other column (RTX®-BAC1) is used for qualitative confirmation, but may be used for quantitation if necessary. If a control is out of range, the samples on either side of that control will be reanalyzed, unless the sample result is "negative".
- The result is truncated to two digits and recorded on the worksheet. Implied Consent results are reported to 2 decimal places.

[Continued On Next Page]

APPENDIX B

App. 4

- The reporting limit for ethanol, methanol, acetone and isopropanol is 0.01 g/100mL.
- Samples with ethanol concentrations below the reporting limit (0.01 g/100mL) on either column are reported as “negative”.
- Samples with concentrations in excess of the high calibrator (0.400 g/100mL) on either column are diluted and reanalyzed.
- Results are entered on the SLD 705 form in two digits. For samples containing no alcohol, enter zero in results section and under comments enter “no alcohol detected, drug results to follow.”
- Submit all case folders to the reviewer for approval.

EXAMPLE CALCULATIONS

1. To determine if results from the two columns are within 5% of each other, you may divide the higher BAC value by the lower BAC.

e.g. 0.121/0.111=1.09 Is greater than 5%

APPENDIX C

App. 5

Quantitation Report (Not Reviewed)

Data Path : C:\msdchem\1 ATA\2010_Dec_20_0819\
Data File : 122010081.D
Signal(s) : Signal #1: FID1A.CH Signal #2: FID2B.CH
Acq On : 20 Dec 2010 19:31
Operator : PARRAAN
Sample : 2010207895
Misc : 328497
ALS Vial : 81 (Sig #1); 0 (Sig #2) Sample Multiplier: 1

InstName : ETHYL
Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Dec 21 07:42:53 2010
Quant Method : C:\MSDCHEM\1\METHODS\BAC.M
Quant Title : Blood Alcohol Quantitation
QLast Update : Wed Dec 15 13:15:37 2010
Response via : Initial Calibration
Integrator : ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal #1 Phase : Signal #2 Phase :
Signal #1 Info : Signal #2 Info :

	Compound	RT#1	RT#2	Resp#1	Resp#2	Conc#1	Conc#2
	Internal Standards						
1)	n-Propanol	2.300	3.852	5035353	4954503	1.000	1.000
	Target Compounds						
2)	Ethanol	1.539	2.234	2325727	2321560	0.135	0.135
3)	Methanol	0.000	0.000	0	0	N.D.	N.D.
4)	Acetone	0.000	0.000	0	0	N.D.	N.D.
	Isopropanol	0.000	0.000	0	0	N.D.	N.D.
	SemiQuant Compounds – Not Calibrated on this Instrument						

(f) = RT Delta > ½ Window (#) = Amounts differ by > 25% (m) = manual int.

APPENDIX D

App. 6

Quantitation Report (Not Reviewed)

Data Path : C:\msdchem\1 DATA\2010_Dec_20_0819\
Data File : 122010081.D
Signal(s) : Signal #1: FID1A.CH Signal #2: FID2B.CH
Acq On : 20 Dec 2010 19:31
Operator : PARRAAN
Sample : 2010207895
Misc : 328497
ALS Vial : 81 (Sig #1); 0 (Sig #2) Sample Multiplier: 1

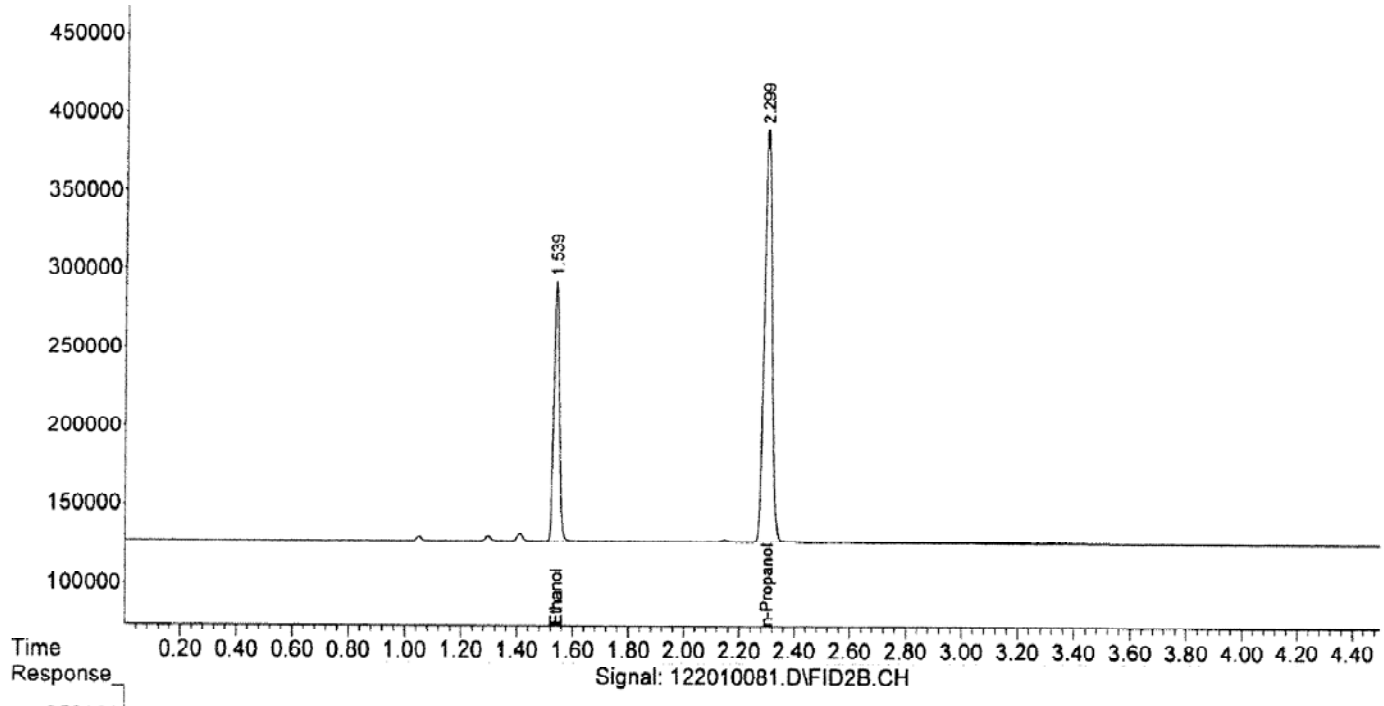
InstName : ETHYL
Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Dec 21 07:42:53 2010
Quant Method : C:\MSDCHEM\1\METHODS\BAC.M
Quant Title : Blood Alcohol Quantitation
QLast Update : Wed Dec 15 13:15:37 2010
Response via : Initial Calibration
Integrator : ChemStation 6890 Scale Mode: Large solvent peaks clipped

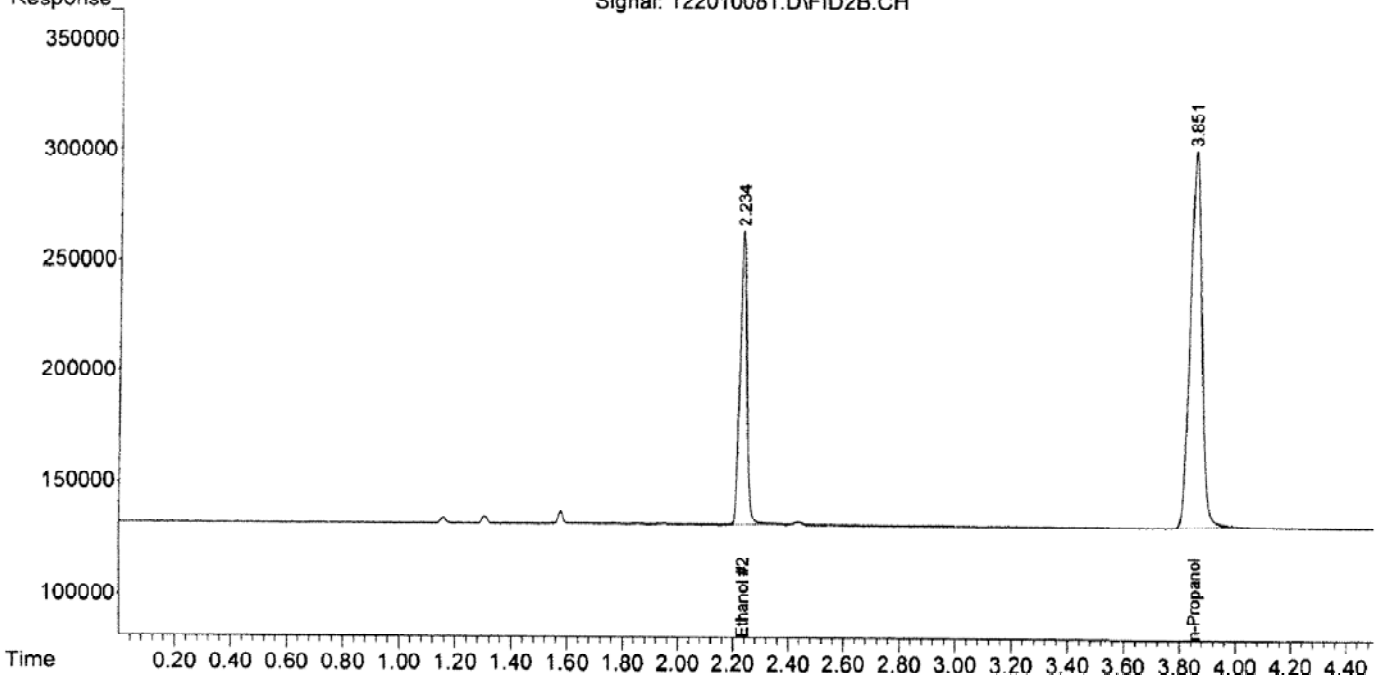
Volume Inj. :
Signal #1 Phase :
Signal #1 Info :
Signal #2 Phase :
Signal #2 Info :

[Quantitation Report Continued On Next Page]

APPENDIX D

App. 7





TOXICOLOGY BUREAU – TECHNICAL PROCEDURES

Discipline: Blood Alcohol Analysis
Method: Blood Alcohol Analysis by Dual Column Capillary Headspace GC
Method #: 803.8

Example Worksheet for IC blood alcohol analysis:

Position Number	Sample Type	Description
1	Calibrator	0
2	Calibrator	0.010
3	Calibrator	0.050
4	Calibrator	0.100
5	Calibrator	0.400
6	**Control**	**WB**
7	**Control**	**Cerilliant 0.100**
8	**Control**	**Cerilliant 0.300**
9	**Control**	**Cerilliant 0.300**
10	**Control**	**Blank 1**
11	**Control**	**0.030**
12	**Control**	**0.350**
13	**Control**	**Cerilliant 0.040**
14	**Control**	**Cerilliant 0.080**
15	**Control**	**Blank 2**
16	Unknown	Case 1
17	Unknown	Case 2
18	Unknown	Case 3
19	Unknown	Case 4
20	Unknown	Case 5

[Continued On Next Page]

APPENDIX E

21	**Control**	**Cerilliant 0.100**
22	**Control**	**Blank 3**
23	Unknown	Case 6
24	Unknown	Case 7
25	Unknown	Case 8
26	Unknown	Case 9
27	Unknown	Case 10
28	**Control**	**Cerilliant 0.200**
29	**Control**	**Blank 4**
30	Unknown	Case 11
31	Unknown	Case 12
32	Unknown	Case 13
33	Unknown	Case 14
34	Unknown	Case 15
35	**Control**	**Cerilliant 0.300**
36	**Control**	**Blank 5**
37	Unknown	Case 16
38	Unknown	Case 17
39	Unknown	Case 18
40	Unknown	Case 19
41	Unknown	Case 20
42	**Control**	**Cerilliant 0.100**
43	**Control**	**Blank 6**
44	Unknown	Case 21
45	Unknown	Case 22
46	Unknown	Case 23
47	Unknown	Case 24
48	Unknown	Case 25
50	**Control**	**Cerilliant 0.200**
51	**Control**	**Blank 7**
52	Unknown	Case 26
53	Unknown	Case 27
54	Unknown	Case 28

[Continued On Next Page]

55	Unknown	Case 29
56	Unknown	Case 30
57	**Control**	**Cerilliant 0.300**
58	**Control**	**Blank 8**
59	Unknown	Case 31
60	Unknown	Case 32
61	Unknown	Case 33
62	Unknown	Case 34
63	Unknown	Case 35
64	**Control**	**Cerilliant 0.100**
65	**Control**	**Blank 9**
66	Unknown	Case 36
67	Unknown	Case 37
68	Unknown	Case 38
69	Unknown	Case 39
70	Unknown	Case 40
71	**Control**	**Cerilliant 0.200**
72	**Control**	**Blank 10**