

Office of Deputy Undersecretary for Operations
National Oceanic and Atmospheric Administration
1401 Constitution Avenue, NW
Washington, DC 20230

January 23, 2011

ALLEGATIONS OF SCIENTIFIC AND RESEARCH MISCONDUCT:

FALSIFICATION OF THE SCIENTIFIC PRODUCT OF THE FLOW RATE TECHNICAL GROUP'S PLUME TEAM IN ORDER TO PRODUCE UNDERESTIMATES OF THE OIL LEAK RATE FROM THE DEEPWATER HORIZON

SUMMARY

Complainant, the undersigned of Public Employees for Environmental Responsibility (PEER), hereby submits allegations of Scientific and Research Misconduct¹ by NOAA Senior Scientist, Dr. William Lehr, in his capacity as Leader of the Plume Analysis Team (Plume Team) of the National Incident Command's Flow Rate Technical Group (FRTG). Evidence uncovered by PEER shows that Dr. Lehr engaged in coercive manipulation of the Plume Team's scientific activities, fabricated² and falsified³ the scientific findings of the Plume Team, and prevented members of the Plume Team with conflicting findings from communicating their findings to key decision makers.

The result of Dr. Lehr's misconduct was a final estimate from the Plume Team that underestimated the oil leak rate by 50%. The 50% underestimate was reported to key decision makers, while other accurate estimates by members of the Plume Team in the range of 50,000 to 60,000 barrels per day (bpd) were withheld from key decision makers.

The Presidential Commission⁴ concluded that underestimates of the oil leak rate caused an inadequate response to the oil spill, and contributed to the failure of several attempts to cap the well. In late May, June, and most of July, the government's official estimate of the oil leak rate relied heavily on the underestimates supplied by the Plume Team.

PEER believes that Dr. Lehr falsified the Plume Team's findings in order to accommodate the desires of those who commissioned the FRTG, namely, the White House and the National Incident Command. Evidence of pressure from the White House and from the National Incident Command to keep estimates low by falsifying the Plume Team's estimates is found in an email from Marcia McNutt,

¹ Defined as "fabrication, falsification, or plagiarism in proposing, performing, or reviewing scientific and research activities, or in the products or reporting of these activities" in NOAA Administrative Order § 8.01.

² Fabrication is defined as "Making up data or scientific results and recording or reporting them for the purposes of deception." (Federal Policy on Research Misconduct, 65 FR 76260-76264, December 6, 2000.)

³ Falsification is defined as "Manipulating research materials, equipment, or processes; or changing or omitting data or results such that the research is not accurately represented in the research record." (Federal Policy on Research Misconduct, 65 FR 76260-76264, December 6, 2000.)

⁴ National Commission on the BP Horizon Oil Spill and Offshore Drilling, Final Report, available at <http://www.oilspillcommission.gov/final-report>.

Leader of the FRTG, to the Plume Team on May 29, 2010,⁵ which was uncovered by a Freedom of Information Act (FOIA) lawsuit brought by PEER. On May 27, 2010, the Plume Team finished a report in which they estimated the minimum amount of oil leaking. Lehr and McNutt refused to release the report to the public. Instead, McNutt released a “Summary” of the report in which she misrepresented the Plume Team’s estimates of the minimum oil leak rate as estimates of the maximum oil leak rate.⁶ Emails obtained by PEER show that several members of the Plume Team complained that their findings had been misrepresented and that their report was not being released to the public.

In response to the Plume Team’s complaints, McNutt explained that she was under pressure from the White House and National Incident Command to misrepresent the minimum leak rate as the maximum. In the May 29 email from McNutt to the Plume Team, McNutt writes:

“I cannot tell you what a nightmare the past two days have been dealing with the communications people at the White House, DOI, and the NIC who seem incapable of understanding the concept of a lower bound...Let me give you a flavor of some of the “suggestions” I was getting from the NIC and from the communications people at the White House and DOI as recently as yesterday afternoon as to how to ‘simplify’ our bottom line:”

BACKGROUND

On April 20, 2010, the Deepwater Horizon failed catastrophically, killing 11 workers and releasing a river of 60,000 bpd of crude oil into the Gulf of Mexico. On April 22, the government and BP said the oil leak was just 1,000 bpd. A week later, as the size of the visible oil slick grew to the size of Delaware, BP and the government increased the estimate to 5,000 bpd. However, outside scientists soon proclaimed that the evidence pointed to a much larger oil spill. The public, the scientific community, and the Congress began to suspect that BP and the Obama administration were “lowballing” the size of the oil spill.

On May 19, 2010, a month after the spill began, the White House announced creation of a group of experts from academia, industry and government to generate an independent, unbiased estimate of the oil leak rate. This group, called the Flow Rate Technical Group (FRTG), was led by Dr. Marcia McNutt, Director of the U.S. Geologic Survey (USGS) and Scientific Advisor to the Department of Interior. The FRTG was created in response to allegations from scientists, the public, and the Congress that the government and BP were grossly underestimating the oil leak rate.

The FRTG was divided into several teams using different technologies to estimate the oil leak rate. Dr. Lehr was put in charge of the Plume Team, which was given the only direct evidence of the oil leaks, namely, videos of the leaks from Remotely Operated Vehicles (ROVs). The Plume Team was charged with using the ROV videos to produce the first estimates of the oil leak rate by analyzing videos of the oil leaks. The estimates of the Plume Team were used by the National Incident Command to guide the level of response in the Gulf.

In December of 2010, the National Commission on the Deepwater Horizon Oil Spill⁷ concluded that underestimates of the oil leak rate caused an inadequate response in the Gulf of Mexico, and caused efforts to cap the well to fail. The environmental damages caused by underestimates of the oil leak rate

⁵ See May 29 email from McNutt, subject “Pending developments” in the attachment “???”

⁶ See CBS News report of June 4, 2010, “How much oil is really gushing into the Gulf,” at <http://www.cbsnews.com/stories/2010/06/04/eveningnews/main6549077.shtml>

⁷ National Commission on the BP Horizon Oil Spill and Offshore Drilling, Final Report, available at <http://www.oilspillcommission.gov/final-report>.

could be vast and have a monetary value in the tens of billions of dollars. The damage to the public's confidence in the science caused by government officials "lowballing" the size of the oil spill is immeasurable.

Ironically, one of the main reasons for creating the FRTG was to restore the public's confidence in the estimates of the size of the Deepwater Horizon oil spill. Yet PEER has had to engage in a 14-month battle with the Obama Administration in federal court in a FOIA lawsuit to make even a small portion of the Plume Team's documents available for public scrutiny. Because of the Obama Administration's efforts to conceal the Plume Team's documents, PEER has been able to obtain only a fraction of the Plume Team's emails and documents. PEER has obtained about one hundred emails of the Plume Team, but PEER estimates that the Plume Team generated at least five hundred emails. Of the one hundred or so emails and documents obtained by PEER, many are heavily redacted.

Under the PEER federal lawsuit, rolling document production continues in this case until January 20, 2012.

ALLEGATIONS

Several of Dr. Lehr's actions clearly violate NOAA's Scientific Integrity Policy described in NOAA Administrative Order 202-735D. Below is a list of specific violations:

ALLEGATION 1. FALSIFICATION OF SCIENTIFIC FINDINGS: In violation of NAO 202-735D, §6.01(a), §6.01(b), §6.01(c), §7.01, and §7.02,⁸ Dr. Lehr intentionally falsified the Scientific Product of the Plume Team⁹ by naming his Final Report "*Deepwater Horizon Release Estimate of Rate by PIV*" and by reporting that the majority of the thirteen members of the Plume Team used a technology called Particle Image Velocimetry (PIV) and estimated an oil leak rate of 25,000 to 30,000 bpd. The truth is that only three of the thirteen members of the Plume Team used PIV for their official estimates of the oil leak rate.

ALLEGATION 2. FAILURE TO OBJECTIVELY CONSIDER CONFLICTING FINDINGS: In violation of NAO 202-735D, §6.01(a), §6.01(b), §6.01(c), §7.01, and §7.02, Dr. Lehr intentionally omitted any discussion in his Final Report and Final Presentation about the use of a different technology called FTV by three other members of the Plume Team. The accurate estimates by FTV were in the range of 50,000 to 60,000 bpd, but Dr. Lehr did not report the estimates to key decision makers or to the public. Dr. Lehr failed to "objectively consider conflicting data" and failed to "accurately report results" to key decision makers.

ALLEGATION 3. PREVENTION OF CONFLICTING VIEWS FROM BEING REPORTED TO KEY DECISION MAKERS: In violation of NAO 202-735D, §6.01(a), §6.01(b), §6.01(c), §7.01, §7.02 and NOAA's Code of Ethics for Science Supervision and Management, Dr. Lehr prevented members of the Plume Team who used FTV from communicating their findings to key decision makers. On July 30, 2010, Dr. Lehr gave the Plume Team's Final Presentation to the team of key decision makers (including DOE Sec. Chu, DOI Sec. Salazar, USGS Dir. McNutt, the Directors of three DOE National Labs, etc.) who were determining the government's final estimate of the oil leak rate. Only the three members of the Plume Team who used PIV and underestimated the oil leak rate were informed of the Final Presentation and allowed to meet with the key decision makers. Members of the Plume Team using FTV were not informed of the Final Presentation. Thus, Dr. Lehr prevented the members using FTV from meeting with

⁸ See definitions of the specific violations from NAO 202-735D in the next section of this complaint

⁹ NAO 202-735D, § 6.01(a) states that NOAA staff will "Approach all scientific activities objectively and completely, and accurately report results in a timely manner without allegiance to individuals, organizations, or ideology."

the key decision making team, and prevented “the timely communication of scientific findings” to key decision makers.

ALLEGATION 4. FABRICATION OF FINDINGS AND FAILURE TO PROVIDE TRACEABILITY OF DATA: In violation of NAO 202-735D, §6.01(a), §6.01(b), §6.01(c), §7.01, §7.02, Dr. Lehr added an additional estimate by PIV from a scientist who was not a member of the Plume Team to his Final Report and Final Presentation. Lehr did not reveal to the Plume Team’s members, to peer reviewers, to key decision makers, or to the public that he added an estimate from a scientist who was not a member of the Plume Team. It appears that Dr. Lehr also altered the values of the estimates by PIV to make them appear identical and more “consistent.”

ALLEGATIONS DETAILED

ALLEGATION 1. FALSIFICATION OF SCIENTIFIC FINDINGS: *In violation of NAO 202-735D, §6.01(a), §6.01(b), §6.01(c), §7.01, and §7.02,¹⁰ Dr. Lehr intentionally falsified the Scientific Product of the Plume Team¹¹ by naming his Final Report “Deepwater Horizon Release Estimate of Rate by PIV” and by reporting that the majority of the thirteen members of the Plume Team used a technology called Particle Image Velocimetry (PIV) and estimated an oil leak rate of 25,000 to 30,000 bpd. The truth is that only three of the thirteen members of the Plume Team used PIV for their official estimates of the oil leak rate.*

The work of the Plume Team began in the latter part of May, and by mid June of 2010, the Plume Team ended up divided between two different groups using two different technologies: three members¹² used PIV, and three other members¹³ used a different technique, manual feature tracking velocimetry (FTV), to generate an accurate estimate in the range of 50,000 bpd to 60,000 bpd.¹⁴ Six of the thirteen Plume Team members did not submit estimates.

The three members using FTV first tried to use PIV, but concluded that PIV was inappropriate for an oil leak and was significantly underestimating the oil leak rate.¹⁵

The fact that the Plume Team was equally divided between members using PIV and FTV, and that estimates by PIV were 50% too low, is confirmed in a recently published paper authored by the overall leader of the FRTG, Dr. Marcia McNutt, and other distinguished scientists who accurately estimated the oil leak rate during the crisis. The peer reviewed paper, “*Review of Flow Rate Estimates of the Deepwater Horizon Oil Spill*,” was recently published on December 20, 2011, by the National Academy of Sciences as part of a Special Feature Perspective issue on the Deepwater Horizon.¹⁶ The paper reveals publicly for the first time that three of the Plume Team members used FTV instead of PIV, and the paper concludes that:

¹⁰ See definitions of the specific violations from NAO 202-735D in the next section of this complaint

¹¹ NAO 202-735D, § 6.01(a) states that NOAA staff will “Approach all scientific activities objectively and completely, and accurately report results in a timely manner without allegiance to individuals, organizations, or ideology.”

¹² PIV was used by Aliseda of Univ. of Washington, Lasherus of UCSD, and Wereley of Purdue for their official estimates. See the Plume Team Final Report of July 21, 2010.

¹³ FTV was used by Leifer of UCSB, Savas of U.C. Berkeley, and Shaffer of NETL for their official estimates. See the Plume Team Final Report of July 21, 2010

¹⁴ Leifer’s official estimate was 62,500 bpd; Savas’s official estimate was 46,000 bpd; Shaffer’s official estimate was 61,000 bpd. See the Plume Team Final Report and the December 2011 paper by McNutt et al. published by the National Academy of Sciences. The paper is available at <http://www.pnas.org/content/early/2011/12/19/1112139108.full.pdf+html>.

¹⁵ See Shaffer’s email of June 23, subject “problems with PIV analysis of oil leak jets;” the section of Savas’s Appendix 4 of the Plume Team Final Report, “Limitations of Conventional PIV” beginning on page 47; and Shaffer’s Appendix 7 of the Plume Team’s Final Report “Reasons for not using Automatic PIV/FTV Software in the Analysis” beginning on page 112

¹⁶ The paper is available at <http://www.pnas.org/content/early/2011/12/19/1112139108.full.pdf+html>.

“1. The method of automated Particle Image Velocimetry (PIV), used by several groups of experts during the spill to analyze video segments, was inappropriate for this application and resulted in oil flow rates that were biased too low by a factor of two.

2. Except for the PIV estimates, there is remarkable agreement for the discharge rate for the well, regardless of whether the estimate was derived from ROV video, acoustic Doppler data, pressure measurements during well shut in, reservoir modeling, or trends in gas-to-oil ratio during surface collection. Flow rates fall between 50,000 and 70,000 barrels per day.”

The Plume Team’s Final Report of July 21, written by Dr. Lehr, was titled “*Deepwater Horizon Release Estimate of Rate by PIV*” [ATTACHMENT I]. The title itself is deceptive. The title is indicative of Dr. Lehr’s intent, which was to deceive key decision makers and the public, leading them to believe that the Plume Team adopted PIV as its official technology and that the majority of the Plume Team used PIV for their estimates. This was not true.

NOAA’s Scientific Integrity Policy requires NOAA employees to report scientific results in a traceable and transparent manner. It would have been easy for Dr. Lehr to simply state the truth: that there was an honest scientific disagreement on the Plume Team, with three Plume Team members using one technology, PIV, and three Plume Team members concluding that PIV was inappropriate and using a different technology, FTV. Instead, Dr. Lehr chose to use his authority as Leader of the Plume Team to promote the PIV technology and its underestimates of the oil leak rate, and to quash the FTV technology and its accurate estimates. Dr. Lehr, rather than simply and directly stating the truth, used “smoke and mirrors” (obfuscation and lack of traceability) to report a mistruth.

At the beginning of the Final Report and Final Presentation, Dr. Lehr shows a table listing 13 members of the Plume Team. The list is shown below. Above the list, it says “Prepared by the Plume Calculation Team.” This gives the impression that the thirteen members of the Plume Team authored the Final Report and Final Presentation. The truth is that Dr. Lehr alone wrote the body of the Final Report.¹⁷ The Final Presentation [ATTACHMENT II] was authored by Dr. Lehr and the members of the Plume Team who used PIV.

¹⁷ The technical reports of members of the Plume Team who estimated the oil leak rate were attached as appendices to the Plume Team Final Report. But the appendices are 156 pages of highly technical documents that were written hastily. It is impossible for a reader to trace the scientific activities of the Plume Team, as will be explained later in this complaint.

Prepared by
Plume Calculation Team

Aliseda, Alberto	Assistant Professor of Mechanical Engineering, University of Washington
Bommer, Paul	Senior Lecturer, Petroleum and Geosystems Engineering, University of Texas at Austin
Espina, Pedro	National Institute of Standards and Technology
Flores, Oscar	Department of Mechanical Engineering at University of Washington
Lasheras, Juan C.	Penner Distinguished Professor of Engineering and Applied Sciences, University of California at San Diego
Lehr, Bill (Lead)	Senior Scientist, National Oceanic and Atmospheric Administration Office of Response and Restoration
Leifer, Ira	Associate Researcher, Marine Science Institute and Institute for Coastal Studies, University of California, Santa Barbara
Possolo, Antonio	National Institute of Standards and Technology
Riley, James	PACCAR Professor of Mechanical Engineering, University of Washington
Savas, Omer	Professor of Mechanical Engineering, University of California at Berkeley
Shaffer, Franklin	Department of Energy National Energy Technology Laboratory
Wereley, Steve	Professor of Mechanical Engineering, Purdue University
Yapa, Poojitha	Professor of Civil and Environmental Engineering, Clarkson University

Immediately after showing this table of thirteen members of the Plume Team, on page 2 of the Final Report, Dr. Lehr writes:

“The main method used by to make estimates was a common fluid dynamics method called Particle Image Velicometry (PIV)”

and

“Most of the experts, using limited data available and with a small amount of time to process the data, concluded the best estimates for the average flow rate for the leakage prior to the insertion of the RITT was between 25,000 and 30,000 bpd”

This intentionally leads the reader to conclude that at least 7 of the 13 members of the Plume Team used PIV and estimated 25,000 to 30,000 bpd. A reader must wade through 156 pages of highly technical appendices to learn that only three members of the Plume Team used PIV. Three of thirteen is far from “most” of the Plume Team members. Even 3 of the 7 members who submitted estimates are not “most” of the experts.

Nowhere in the Final Report or Final Presentation does Dr. Lehr reveal the truth that an equal number of Plume Team members, three, tried to use PIV, but concluded that PIV was inappropriate for an oil leak jet. Nowhere does Dr. Lehr reveal that three other Plume Team members resorted to a different technology, called FTV,¹⁸ and accurately estimated a leak rate of 50,000 to 60,000 bpd. The members using FTV argued that PIV grossly underestimated the flow rate—a fact that was left out of his Final Report and Final Presentation altogether.

¹⁸ There were actually a total of 13 members on the Plume Team. However, only 7 members produced oil leak estimates—3 PIV, 3 FTV, and 1 other method.

Rather than giving a straightforward and accurate report of the Scientific Product of the Plume Team, Dr. Lehr let the truth be buried in 156 pages of hastily written, highly technical appendices. As one of the peer reviewers of the Plume Team Final Report wrote (see Attachment 1, page 193):

“I found the report itself to be very weak. Basically, it relies on the reader to sort through all of the appendices to understand the numbers presented. Specifically, it is not clear where the numbers presented in the Executive Summary and in the body of the report come from nor what they mean. Furthermore, the numbers presented in the report are not consistent with one another. Had the report presented a coherent summary of the work presented in the appendices it would have been a lot easier to read and a lot more believable.”

By falsely reporting that most of the Plume Team used PIV, Dr. Lehr violated the following sections of NAO 202-735D:

§6.01(a) All NOAA employees will

- Clearly differentiate between facts, personal opinions, assumptions, hypotheses, and professional judgment in reporting the results of scientific activities and characterizing associated uncertainties in using those results for decision-making, and in representing those results to other scientists, decision makers, and the public.
- Approach all scientific activities objectively and completely, and accurately report results in a timely manner without allegiance to individuals, organizations, or ideology.
- Disclose any apparent, potential, or actual non-financial conflicts of interest of their own and others.
- Objectively consider conflicting data and/or studies.

§6.01(b) All NOAA employees will

- Disclose all research methods used

§6.01(c) All NOAA employees will

- Neither unfairly hinder the scientific activities of others nor engage in dishonesty, fraud, deceit, misrepresentation, coercive manipulation

§7.01 NOAA science supervisors and managers (employees identified in Section 2.02 of NAO 202-735D) will ensure that ensure that:

- the scientific or technological findings, conclusions, and methodologies considered or relied on in policy decisions will be made available to the public in a timely manner.

§7.02 All individuals identified in Section 2.02 of NAO 202-735D, must not:

- Suppress, alter, or otherwise impede the timely release of scientific or technological findings or conclusions

ALLEGATION 2. FAILURE TO OBJECTIVELY CONSIDER CONFLICTING FINDINGS: *In violation of NAO 202-735D, §6.01(a), §6.01(b), §6.01(c), §7.01, and §7.02, Dr. Lehr intentionally omitted any discussion in his Final Report and Final Presentation about the use of a different technology called FTV by three other members of the Plume Team. The accurate estimates by FTV were in the range of 50,000 to 60,000 bpd, but Dr. Lehr did not report the estimates to key decision makers or to the public. Dr. Lehr failed to “objectively consider conflicting data” and failed to “accurately report results” to key decision makers.*

The Plume Team’s Final Report of July 21, 2010, and the Final Presentation given to the team of high level decision makers (DOE Secretary Chu, DOI Secretary Salazar, etc.), both authored by Dr. Lehr, omit any discussion of FTV and its higher, accurate estimates. Not only were the estimates by FTV not reported, but the fact that the three Plume Team members using FTV reported that PIV was inappropriate for oil leaks and was underestimating the oil leak rate was omitted from the Final Report and Final Presentation.¹⁹

On July 30 and 31, 2010, a team of high level government officials, including Department of Energy Secretary Chu, Department of Interior Secretary Salazar, and USGS Director McNutt, was convened to produce the government’s final official estimate of the size of the oil spill. Dr. Lehr gave the Plume Team’s Final Presentation to this team of key decision makers on July 30, 2010.²⁰

Lehr's Final Presentation makes no mention that three members of the Plume Team used a different technology, FTV. The Final Presentation makes no mention of the fact that the three members of the Plume Team who used FTV first tried to use PIV, but concluded that PIV was inappropriate for an oil leak jet and that PIV was significantly underestimating the oil leak rate.

Rather than accurately reporting the Plume Team’s Scientific Product in a transparent manner, Dr. Lehr intentionally obscured the true scientific activities and scientific findings of the Plume Team in order to promote the underestimates by PIV. An example of a deceptive tactic used by Lehr is the chart shown in the last slide of the Final Presentation titled “Results.” This is purportedly a list of estimates by experts using PIV. The chart in the slide is shown below.

EXPERT	LOW (BBL/DAY)	HIGH (BBL/DAY)	CONFIDENCE
A	24 000	40 000	Medium-High
B	24 000	40 000	Medium-High
C	24 000	40 000	Medium-High
D	42 000	49 000	Very High
E	30 000	40 000	Medium-High

This chart was copied from the original chart on page 15 of the Plume Team Final Report, shown below.

Expert	Low (bbl/Day)	High (bbl/Day)	Confidence
A	24 000	40 000	Medium-High
B	24 000	40 000	Medium-High
C	24 000	40 000	Medium-High
D	42 000	49 000	Very High
E	30 000	40 000	Medium-High
F	4 375	120 625	Medium-High
G	46 000	76 000	Medium-High

¹⁹ See Shaffer’s email of June 23, subject “problems with PIV analysis of oil leak jets;” the section of Savas’s Appendix 4 of the Plume Team Final Report, “Limitations of Conventional PIV” beginning on page 47; and Shaffer’s Appendix 7 of the Plume Team’s Final Report “Reasons for not using Automatic PIV/FTV Software in the Analysis” beginning on page 112.

²⁰ See attachment July 30 presentation by Lehr

Notice that Dr. Lehr removed the higher estimates of Expert F (Leifer of UCSB) and Expert G (Shaffer of NETL) from the table presented in the July 30 Final Presentation of the Plume Team. The chart above does not show the actual estimates of Plume Team members, rather they show the uncertainty range of the estimates. The actual estimate is a midpoint between the Low and High number in the charts. So Expert F's official estimate was 62,500 bpd and Expert G's official estimate was 61,000 bpd. *Lehr omitted the only estimates from the Plume Team that correctly estimated the true oil leak rate.*

It would have been easy for Dr. Lehr to simply provide a list of the members who used PIV and a list who used FTV. However, it appears that Dr. Lehr intentionally used deceptive tactics to make the Final Report and Final Presentation opaque instead of transparent, and to make it difficult to trace where the estimates came from. The Final Report and Final Presentation amount to a deliberate delivery of misinformation to key decision makers and to the public in order to promote underestimates of the oil leak rate from the Deepwater Horizon.

By omitting any discussion of the use of a different technology, FTV, by an equal number of members who used PIV, Dr. Lehr violated the following sections of NAO 202-735D:

SECTION 6. CODE OF SCIENTIFIC CONDUCT.

§6.01(a) All NOAA employees will

- Clearly differentiate between facts, personal opinions, assumptions, hypotheses, and professional judgment in reporting the results of scientific activities and characterizing associated uncertainties in using those results for decision-making, and in representing those results to other scientists, decision makers, and the public.
- Approach all scientific activities objectively and completely, and accurately report results in a timely manner without allegiance to individuals, organizations, or ideology.
- Objectively consider conflicting data and/or studies.

§6.01(b) All NOAA employees will

- Disclose all research methods used

§6.01(c) All NOAA employees will

- Neither unfairly hinder the scientific activities of others nor engage in dishonesty, fraud, deceit, misrepresentation, coercive manipulation

§7.01 NOAA science supervisors and managers (employees identified in Section 2.02 of NAO 202-735D) will ensure that:

- the scientific or technological findings, conclusions, and methodologies considered or relied on in policy decisions will be made available to the public in a timely manner.

§7.02 All individuals identified in Section 2.02 of NAO 202-735D, must not:

- Suppress, alter, or otherwise impede the timely release of scientific or technological findings or conclusions
- Implement institutional barriers to cooperation and the timely communication of scientific findings or technology.

ALLEGATION 3. PREVENTION OF CONFLICTING VIEWS FROM BEING REPORTED TO KEY DECISION MAKERS: *In violation of NAO 202-735D, §6.01(a), §6.01(b), §6.01(c), §7.01, §7.02 and NOAA's Code of Ethics for Science Supervision and Management, Dr. Lehr prevented members of the Plume Team who used FTV from communicating their findings to key decision makers. On July 30, 2010, Dr. Lehr gave the Plume Team's Final Presentation to the team of key decision makers (including DOE*

Sec. Chu, DOI Sec. Salazar, USGS Dir. McNutt, the Directors of three DOE National Labs, etc.) who were determining the government's final estimate of the oil leak rate. Only the three members of the Plume Team who used PIV and underestimated the oil leak rate were informed of the Final Presentation and allowed to meet with the key decision makers. Members of the Plume Team using FTV were not informed of the Final Presentation. Thus, Dr. Lehr prevented the members using FTV from meeting with the key decision making team, and prevented "the timely communication of scientific findings" to key decision makers.

As noted above, on July 30, 2010, a second meeting of high level decision makers was held to generate the government's final estimate of the size of the oil spill. The members using FTV were not informed of the Plume Team's Final Presentation to the team of decision makers. Only the members using PIV were informed and allowed to make the presentation. The presentation is authored by Dr. Lehr, Aliseda, and Wereley. Aliseda and Wereley used PIV for their estimates.

By not informing the members using FTV of the Final Presentation, Dr. Lehr prevented them from attending and presenting their findings to key decision makers during the July 30, 2010 meeting. Dr. Lehr effectively removed the members using FTV from the Plume Team before the Final Presentation.

Following the July 30 meeting, Secretary Chu announced that the government's official and final estimate of the oil leak rate was 53,000 to 62,000 bpd.²¹ The leak rate had been accurately measured in the final well capping system using an improvised orifice meter. The estimates of around 50,000 to 60,000 bpd by the three Plume Team members using manual FTV were correct. The estimates using PIV were low by about 50%. Yet for almost two months during the Deepwater Horizon crisis, while several members of the Plume Team were accurately estimating a leak of 50,000 to 60,000 bpd, Dr. Lehr consistently portrayed the PIV estimate of around 25,000 bpd as the only estimate by the Plume Team.

Not only did Dr. Lehr fail to report estimates of members who did not use PIV, but email and documents obtained by PEER under the FOIA case, show that Dr. Lehr also tried to discredit and remove members from the Plume Team who reported that PIV was making mistakes and underestimating the leak rate [ATTACHMENT III]. While PEER only received a handful of emails regarding the removal of dissenting members, there must be more documentation of this in other emails that the agency has withheld and refused to produce.

By preventing members using FTV from attending the July 30, 2010, meeting with key decision makers, Dr. Lehr violated the following sections of NAO 202-735D:

§6.01(a) All NOAA employees will

- Approach all scientific activities objectively and completely, and accurately report results in a timely manner without allegiance to individuals, organizations, or ideology.
- Objectively consider conflicting data and/or studies.

§6.01(b) All NOAA employees will

- Disclose all research methods used

§6.01(c) All NOAA employees will

- Neither unfairly hinder the scientific activities of others nor engage in dishonesty, fraud, deceit, misrepresentation, coercive manipulation

²¹ See the *New York Times* story discussing the government's final estimate, August 2, 2010, available at <http://www.nytimes.com/2010/08/03/us/03spill.html>.

§7.01 NOAA science supervisors and managers (employees identified in Section 2.02 of NAO 202-735D) will ensure that:

- the scientific or technological findings, conclusions, and methodologies considered or relied on in policy decisions will be made available to the public in a timely manner.

§7.02 All individuals identified in Section 2.02 of NAO 202-735D, must not:

- Suppress, alter, or otherwise impede the timely release of scientific or technological findings or conclusions, unless explicitly required by a Department or government-wide statute, regulation, Executive Order, Presidential Memorandum, or other legal authority.
- Implement institutional barriers to cooperation and the timely communication of scientific findings or technology.

ALLEGATION 4. FABRICATION OF FINDINGS AND FAILURE TO PROVIDE TRACEABILITY OF DATA: *In violation of NAO 202-735D, §6.01(a), §6.01(b), §6.01(c), §7.01, §7.02, Dr. Lehr added an additional estimate by PIV from a scientist who was not a member of the Plume Team to his Final Report and Final Presentation. Lehr did not reveal to the Plume Team’s members, to peer reviewers, to key decision makers, or to the public that he added an estimate from a scientist who was not a member of the Plume Team. It appears that Dr. Lehr also altered the values of the estimates by PIV to make them appear identical and more “consistent.”*

Evidence that Dr. Lehr added an estimate by PIV from a person who was not a member of the Plume Team, and that he altered data, or coerced members to alter their data, is found in the chart shown in the last slide of the Final Presentation titled “Results.” This is purportedly a list of estimates by experts using PIV. The chart in the slide is shown below.

EXPERT	LOW (BBL/DAY)	HIGH (BBL/DAY)	CONFIDENCE
A	24 000	40 000	Medium-High
B	24 000	40 000	Medium-High
C	24 000	40 000	Medium-High
D	42 000	49 000	Very High
E	30 000	40 000	Medium-High

This chart was copied from the original chart on page 15 of the Plume Team Final Report, shown below.

Expert	Low (bbl/Day)	High (bbl/Day)	Confidence
A	24 000	40 000	Medium-High
B	24 000	40 000	Medium-High
C	24 000	40 000	Medium-High
D	42 000	49 000	Very High
E	30 000	40 000	Medium-High
F	4 375	120 625	Medium-High
G	46 000	76 000	Medium-High

Nowhere in the Final Report or Final Presentation are the Experts identified. There is no scientifically justifiable reason to withhold the identity of the experts and their estimates. The estimates of the members of the Plume Team are in the appendices of the Final Report, so they are not anonymous,

nor did they ask to be anonymous. But Dr. Lehr chose not to report the identity of the experts in this table.

The table on the last slide of Lehr’s Final Presentation is deceptive in a number of ways. The table purportedly shows estimates by PIV, but one of the estimates shown in the table is not from PIV, it is from FTV. Expert D is Professor Savas of U.C. Berkeley.²² Savas did not use PIV for his estimate, he used FTV. Furthermore, Savas reported that PIV was inappropriate for oil leaks and was underestimating the leak rate.²³

The table in Lehr's presentation shows estimates by four more experts (A,B,C,E), but only three members of the Plume Team used PIV. No explanation is given of where the fourth estimate came from. PEER believes that Dr. Lehr added an estimate by PIV from an outside scientist’s estimates to pad the numbers.

The additional estimate is not documented in either the Final Report or Final Presentation. There is only one sentence on page 152 of an appendix of the Final Report describing the estimate from a person who was not a member of the Plume Team: *“To remove operator bias, the same sequence was analyzed, using a different PIV software and operator and a different mask, yielding the same result (see Figure 11).”* Figure 11 on page 153 shows one result of the second PIV analysis from UCSD.

The “operator” of the second PIV analysis is not identified, so his/her qualifications are unknown. No details of the second PIV analysis are given. UCSD submitted only one final estimate, given on page 165.

Each of the Plume Team members submitted only one estimate. Why did Dr. Lehr add a second estimate? Nowhere in the Final Report or Final Presentation did Dr. Lehr reveal that an additional estimate was added from a person who was not on the Plume Team. So there is no way that peer reviewers could know and evaluate this important fact. There is no way that key decision makers could know that Dr. Lehr allowed only one of the members of the Plume Team to submit a second estimate from an anonymous someone not on the Plume Team.

Furthermore, it appears that the actual numerical values of estimates in the table presented by Dr. Lehr in his Final Presentation have been changed to make them appear more “consistent.” The table shows identical estimates of 24,000 to 40,000 bpd from Experts A-C. However, the numerical values of the estimates in this table are nowhere to be found in the Final Report, including the appendices to the Final Report submitted by the experts. The table below summarizes the actual estimates from the three Plume Team members using PIV from their reports in the appendices of the Final Report:

**Plume Team member
using PIV**

Final reported official estimate

Lasherus, UCSD	<i>“The most plausible value of the flow rate, $Q=35,000$ bbl/day” (see page 165 of the Plume Team Final Report)</i>
Aliseda, Univ. of Washington	<i>“FINAL ESTIMATE = Best estimate of 34,000 bbl/day with a range of between 22,000 to 54,000 bbl/day” on page 170 of the Plume Team’s Final Report.</i>
Wereley, Purdue	<i>“The oil flow can be calculated as 30,000 to 40,000 bpd, with an expected value of 35,000 bpd” see page 64 of the Plume Team</i>

²² See Savas’s estimate of 7100 ± 3700 m³/day on page 53 and 56 of the Plume Team Final Report. Since 1 barrel of oil = 0.156 m³/day, Expert D’s estimate was 46000 bpd, which is the midpoint between 42000 and 49000.

²³ Savas’s Appendix 4 to the Plume Team Final Report beginning on page 47 titled “Limitations of Conventional PIV”.

The estimates reported by Dr. Lehr from UCSD and Univ. of Washington seem to have been changed slightly so that they are identical. Nowhere in the Final Report or Final Presentation does Dr. Lehr explain why these numbers were changed. This is a very important fact because Dr. Lehr argued that the estimates by PIV were accurate because they were "more consistent." This kind of manipulation of data to make it "better" is simply unconscionable.

By secretly adding a second estimate from a person who was not on the Plume Team, Dr. Lehr violated the following sections of NAO 202-735D:

§6.01(a) All NOAA employees will

- Not fabricate or delete raw data
- Approach all scientific activities objectively and completely, and accurately report results in a timely manner without allegiance to individuals, organizations, or ideology.

§6.01(b) All NOAA employees will

- Disclose all research methods used

§6.01(c) All NOAA employees will

- Neither unfairly hinder the scientific activities of others nor engage in dishonesty, fraud, deceit, misrepresentation, coercive manipulation

§7.01 NOAA science supervisors and managers (employees identified in Section 2.02 of NAO 202-735D) will ensure that:

- When scientific or technological information is considered in policy decisions, the information will be subject to well-established scientific processes, including peer review where appropriate
- the scientific or technological findings, conclusions, and methodologies considered or relied on in policy decisions will be made available to the public in a timely manner.

§7.02 All individuals identified in Section 2.02 of NAO 202-735D, must not:

- Suppress, alter, or otherwise impede the timely release of scientific or technological findings or conclusions
- Intimidate or coerce employees, contractors, recipients of financial assistance awards, or others to alter or censor scientific findings.

REQUESTED RELIEF

Upon a finding that Dr. Lehr engaged in scientific misconduct in violation of NOAA's scientific integrity rules, PEER requests that NOAA issue public statements that

- Retract the Final Report and Final Presentation of Dr. Lehr as being misrepresentations of the Plume Team's Scientific Product;
- Publicly disavow all public statements and documents authored by Dr. Lehr in the name of the FRTG Plume Team; and
- Refer the public, decision makers, and litigators to the National Academy of Science paper by the overall leader of the Flow Rate Technical Group, Dr. McNutt, as an accurate description of the findings of the FRTG Plume Team

PEER also requests that Dr. Lehr be appropriately disciplined for his misconduct.

Furthermore, because of the importance of ongoing litigation by the Department of Justice and others against BP, PEER asks that NOAA address this matter expeditiously. NOAA should inform the U.S. Department of Justice of the scientific misconduct of Dr. Lehr, the lack of credibility of the statements made by Dr. Lehr, and the lack of credibility of the Plume Team Final Report and Final Presentation.²⁴

CONCLUSION

Dr. Lehr was entrusted with leading a scientific team to produce an independent, objective oil leak estimate that was free from political influence. However, emails and documents received through PEER's FOIA request and lawsuit demonstrate the exact opposite. Lehr discouraged Plume Team scientists from using the FTV technique that accurately estimated the oil leak rate. Lehr only reported Plume Team estimates by those using PIV, and did not report the estimates by those using FTV, thereby effectively suppressing the work done by half of the team. Far from being a simple scientific disagreement, emails suggest Dr. Lehr bowed to pressure from the Obama Administration to report a lower oil leak rate, despite the lack of consensus within the Plume Team. These machinations allowed Dr. Lehr to falsely promote underestimates of the oil leak rate as the consensus conclusions of the FRTG Plume Team.

The Presidential Commission concluded that underestimates of the oil leak rate caused an inadequate response to the oil spill, and contributed to the failure of several attempts to cap the well. During the Plume Team's work, from May through July of 2010 during the Deepwater Horizon crisis, the government's official estimate of the oil leak rate heavily relied on misrepresentations of the Plume Team's Scientific Product by Dr. Lehr.²⁵ It is possible that the underestimates promoted by Dr. Lehr, and the concealment of accurate estimates by Dr. Lehr, contributed to an inadequate response and contributed to failures to cap the well. The damages caused by Dr. Lehr's intentional lowballing of the Plume Team's estimates could be vast.

Not only did Dr. Lehr know that the Plume Team's estimates would influence the level of resources responding to the crisis, but Dr. Lehr knew that the FRTG Plume Team's estimates could influence damages and penalties under future litigation. Dr. Lehr and the FRTG Plume Team did not know that the actual oil leak rate would be accurately measured in the final well capping system. They believed that their estimate would become the official estimate of the government, or heavily influence the official estimate of the government.

If the 50% underestimates of the Plume Team were used to assess penalties and damages in future litigation, the penalties and damages would be cut in half. This would result in reductions in the fines and penalties by tens of billions of dollars. It is concerning that BP's legal representatives have reported to the National Commission that they believe the government's official estimates are 20% to 50% too high. As concluded in the National Academy of Sciences paper by McNutt et al., the only official estimates that support this claim are the underestimates by PIV that were erroneously promoted by Dr. Lehr as the consensus of the Plume Team.

²⁴ The DOJ suit against BP seeks fines in direct proportion to the oil leak rate. In a letter to the Presidential Commission, BP's legal representatives stated that they believe the government's official estimate is 20% to 50% too high. A 50% underestimate could change the fine levied against BP by tens of billions of dollars. As reported in the recent paper by McNutt et al., the estimates by PIV have been found to be inaccurate and should not be used to base damages from.

²⁵ DOI Press Release, May 27, 2010, "Flow Rate Group Provides Preliminary Best Estimate Of Oil Flowing from BP Oil Well" May 27, 2010, available at <http://www.doi.gov/news/pressreleases>; DOI Press Release, June 10, 2010, "Admiral Allen, Dr. McNutt Provide Updates on Progress of Scientific Teams Analyzing Flow Rates from BP's Well, available at <http://www.doi.gov/news/pressreleases>; DOI Press Release, June 15, 2010, "U.S. Scientific Team Draws on New Data, Multiple Scientific Methodologies to Reach Updated Estimate of Oil Flows from BP's Well," available at <http://www.doi.gov/news/pressreleases>; National Commission on the BP Deepwater Horizon Oil Spill: THE AMOUNT AND FATE OF THE OIL, Staff Working Paper No. 3, www.oilspillcommission.gov.

PEER believes that Dr. Lehr falsified the Plume Team's Scientific Product in order to accommodate the desires of those who commissioned the FRTG, namely, the White House and the National Incident Command. Evidence of pressure from the White House and from the National Incident Command to keep estimates low by falsifying the Plume Team's estimates is found in an email uncovered by PEER lawsuit from Marcia McNutt on May 29, 2010 [ATTACHMENT IV].

Senior scientists acting on the basis of politics is the antithesis of scientific integrity and flies in the face President Obama's directive that agencies institute policies that prevent manipulation and suppression of science for political purposes. If NOAA's Code of Scientific Conduct is to be enforced, the agency should invoke its Scientific Integrity Policy to investigate the allegations contained in this complaint.

Respectfully submitted,

Jeff Ruch
Executive Director

Enclosures: Attachments I–IV.