

## APPENDIX A

## **APPENDIX A: HEALTH AND ENVIRONMENTAL IMPACTS**

Appendix A is submitted in support of Chevron Corporation's March 6, 2012 Supplement to its February 22, 2012 *Memorial Amicus Curiae in Opposition to the Request for Precautionary Measures Indicated to the Republic of Ecuador, and Filed by Plaintiffs' Legal Representatives In Aguinda et al. v. Chevron Corp. on February 9, 2012.*

### **I. PRECAUTIONARY MEASURES ARE NOT JUSTIFIED BY THE SCIENTIFIC EVIDENCE ON HEALTH OR ENVIRONMENTAL IMPACTS NEAR LAGO AGRIO**

#### **A. The Plaintiffs Have Not Made Individual Health Claims**

1. The Plaintiffs assert in their letter to the Commission that residents in the former concession area face a threat to their "life, physical integrity, and health" as a result of TexPet's oil operations, which ended more than 20 years ago. But the Plaintiffs' health claims are unsupported by medical records documenting any diagnosis of cancer or disease for any plaintiff, or for anyone residing in the former concession area.<sup>1</sup>

2. One of the Plaintiffs' attorneys admitted that they had no actual proof of individualized cancer cases: "we do NOT have medical records." The Lago Agrio Judgment itself states that the individuals with impacted health "are undetermined"<sup>2</sup> and that "proof has not been presented of the existence of harm to the health of specific persons."<sup>3</sup>

#### **B. Extensive Environmental Testing During the Lago Agrio Litigation Demonstrates the Absence of Current Health Risks**

3. The Plaintiffs cite to the Commission the following statement from the Lago Agrio Judgment: "natural water sources throughout the Concession have been contaminated by the defendant's hydrocarbon activities, and in light of the dangerousness of the discharged substances and all the possible methods of exposure, the contamination puts at risk the health and lives of persons in general." That statement, however, contradicts all of the scientific evidence put before the Ecuadorian court.

4. During the litigation, there were more than 2,200 samples of soil, sediment and water taken in the former concession area by Chevron, the Plaintiffs, and other experts.<sup>4</sup>

<sup>1</sup> Rebuttal to Mr. Cabrera's Excess Cancer Death and Other Health Effects Claims, and His Proposal for a New Health Infrastructure (Sept. 8, 2008) at 4 ("Mr. Cabrera submits no medical diagnoses of cancer, death certificates, or any other type of medical evidence to support his health claims.")

<sup>2</sup> DONZ00053202 (emphasis in original).

<sup>3</sup> Judgment at 183.

<sup>4</sup> Judgment at 136.

<sup>5</sup> McHugh, Lack Of Evidence Of Health Risks Associated With Hydrocarbons And Metals In The Former Concession Area at 4 (June 2011).

5. That sampling demonstrates that the groundwater in the former concession area has not been impacted by petroleum hydrocarbons from TexPet operations. Hydrogeologist Dr. Charles Newell evaluated the analysis of groundwater samples from 206 sampling points, and concluded that “groundwater resources are not impacted by constituents associated with the past oilfield activities of Texpet.”<sup>6</sup> Sampling results from 145 household wells that utilize groundwater in the immediate vicinity of former oil operations also showed that well water met US EPA and WHO standards and guidance, respectively, for petroleum related compounds.<sup>7</sup>

6. In addition to the analysis of the historical and current condition of the groundwater, a study conducted in 2008 by Drs. Kirk O’Reilly and Waverly Thorsen analyzed the risk that groundwater could become contaminated in the future from residual Ecuadorian crude oil in soils. That study found that there were “no groundwater impacts from oily soil,”<sup>8</sup> because only the most water soluble compounds in the crude oil could dissolve in groundwater and “weathering reduces the risk of these compounds because of a decrease in their oil phase concentration and hence effective solubility.”<sup>9</sup> The same study, which was later peer-reviewed and published, concluded that “further weathering will not result in future groundwater impacts.”<sup>10</sup>

7. The Plaintiffs’ own experts have long concluded that their claim of groundwater contamination is unsupported by and contrary to the scientific evidence. In 2004, the Plaintiffs’ expert David Russell warned the Plaintiffs that, “To date I have seen no data which would indicate that there is any significant surface or groundwater contamination caused by petroleum sources in Ecuador.”<sup>11</sup> In 2007, the Plaintiffs’ expert Ann Maest said on film that “all the reports are saying it’s just at the pits and stations and nothing has spread anywhere at all.”<sup>12</sup> And in 2008, Stratus Consulting’s Doug Beltman wrote, “I do not think that contamination sufficient to impact the ecology extends very far beyond the pads, pits, and spills at the wells - there simply isn’t a migration pathway.”<sup>13</sup> In 2010, just two months before the Ecuadorian judgment issued, the Plaintiffs’ expert Douglas Allen testified under oath that he did *not* have “any independent basis to opine that there is groundwater contamination requiring remediation within the former concession area,” nor was he offering such an opinion.<sup>14</sup>

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<sup>6</sup> *Id.* at 5 (quoting Connor & Landazuri (2008)).

<sup>7</sup> *Id.* at 6.

<sup>8</sup> Newell Rep. (Sept. 2010) at 5 (citing O’Reilly & Thorsen’s publication in the *Journal of Soil and Sediment Contamination* (2008)).

<sup>9</sup> O’Reilly & Thorsen, *Impact of Crude Oil Weathering on the Calculated Effective Solubility of Aromatic Compounds: Evaluation of Soils from Ecuadorian Oil Fields*, *Journal of Soil and Sediment Contamination* (2008).

<sup>10</sup> *Id.*

<sup>11</sup> DONZ00082509.

<sup>12</sup> *Crude outtakes*, CRS-195-05-CLIP-01 (Tr. at 5).

<sup>13</sup> STRATUS-NATIVE067644 at 1.

<sup>14</sup> Allen Dep. Tr. at 374:22-24.

8. When told that there was no evidence of groundwater contamination “beyond the pits,” the Plaintiffs’ lead U.S. lawyer Steven Donziger stated:

This is Ecuador. Okay. You can say whatever you want and at the end of the day, there’s a thousand people around the courthouse, you’re going to get what you want. Sorry, but it’s true . . . . Therefore, if we take our existing evidence on groundwater contamination, which admittedly is right below the source and wanted to extrapolate *based on nothing other than our, um, theory, we can do it. And we can get money for it.*<sup>13</sup>

9. The Plaintiffs were told repeatedly by their experts that groundwater studies were needed to prove contamination, but they never submitted the studies. In 2004, expert David Russell discussed the Plaintiffs’ reluctance to conduct groundwater assessments, noting, “I distinctly recall saying that the groundwater contamination was the greatest link to proving damage to the court.”<sup>14</sup> In 2007, Stratus Consulting’s Ann Maest told the Plaintiffs’ counsel, “As quickly as possible, we will design and conduct a focused groundwater study. The purpose will be to confirm (potentially) our assumption that groundwater is contaminated.”<sup>15</sup> A 2007 groundwater report by the Plaintiffs’ expert 3TM warned, “In using the numbers presented in this Report, we caution that they are based on gross assumptions, and not site-specific groundwater data. Site-specific groundwater data could significantly affect the costs herein.”<sup>16</sup>

10. In April 2011, UBR (the Plaintiffs’ consultant on potable water systems who authored the sections of the Cabrera Report awarding groundwater damages) admitted that it “never conducted any studies of the quality of any of the water in the [concession] area at any time,” and that its “investigation” of the groundwater in the former concession area was limited to one tour guided by the Plaintiffs.<sup>17</sup> UBR further admitted that its report as originally written concluded that it was “imperative” that a groundwater study be conducted to assess the presence, if any, of groundwater contamination.<sup>18</sup> The Plaintiffs deleted this conclusion from the version of the UBR report submitted to the Ecuadorian court as Annex R to the Cabrera Report.<sup>19</sup>

11. The sampling evidence demonstrated that groundwater in the area had not been impacted by TexPet’s oil operations, but also that the Plaintiffs’ claims of drinking water contamination were baseless. All of the drinking water results in the Lago Agrio Record, more than 7,000 analyses from more than 250 drinking water sampling events, were evaluated by Dr. William Bellamy, an expert that has served on the US EPA National Drinking Water Council and has been appointed to the US EPA Board of Scientific Counselors for drinking water. Dr. Bellamy concluded that the sampling results prove that “there is no indication of public health

<sup>13</sup> *Crude* outtakes, CRS-195-05-CLIP-01 (Tr. at 5-6) (emphasis added).

<sup>14</sup> DONZ-HDD-0053542.

<sup>15</sup> STRATUS-NATIVE046486.

<sup>16</sup> 3TM-NATIVE0009952.

<sup>17</sup> Uhl Dep. Tr. at 107:5-9, 110:17-111:16.

<sup>18</sup> *Id.* at 111:24-113:2.

<sup>19</sup> *See id.* at 122:3-13.

concerns related to drinking water as a result of petroleum exploration and production activities in the former concession area.”<sup>22</sup> None of the samples exceeded the drinking water guidelines or standards established by WHO and US EPA for any chemical compound related to oil operations in the Oriente.<sup>23</sup>

12. The Plaintiffs’ lead Ecuadorian counsel Pablo Fajardo conceded when asked why the Plaintiffs were not even testing the drinking water that “the running drinking water in the river does not contain hydrocarbons . . . .”<sup>24</sup> The Plaintiffs’ expert Ann Maest testified under oath that she was not aware of any scientific data indicating that drinking water wells have been impacted in any way by hydrocarbons in the former concession area, and that she is not aware of any scientific data indicating that drinking water wells have been impacted in any way by TexPet’s operations in the former concession area.<sup>25</sup>

13. A health-based risk assessment of the environmental sampling results was conducted in 2008 by Dr. Thomas McHugh, a toxicologist and environmental scientist. The risk assessment (which he updated in 2011) evaluated any potential health risks for the local community.<sup>26</sup>

14. Dr. McHugh’s assessment of water samples showed no unsafe levels of hydrocarbons or metals in sources of water used for drinking (e.g., municipal water systems, hand-dug wells, and surface water). “Specifically, in a number of cases where local residents stated that they believed that their drinking water was contaminated, testing of the identified source of drinking water showed an absence of petroleum hydrocarbons.”<sup>27</sup>

15. In sum, all of the water sampling data and risk assessment evidence is inconsistent with the Plaintiffs’ claims of current harm to the health of local residents due to petroleum contamination “throughout the concession.” Both groundwater and drinking water sampling showed no impacts from TexPet’s oil operations, and the only risk assessment conducted in the case demonstrated that there was not a health risk to local residents from TexPet’s operations.

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<sup>22</sup> William D. Bellamy, Evaluation of Drinking Water Quality Related to Petroleum Exploration and Production Activities in the Oriente Region of Ecuador, at 7. The local water in the Oriente is heavily contaminated with fecal bacteria – in some samples at **400 times** the U.S. permitted levels – which no doubt causes health issues in the population utilizing this water. This fecal bacteria contamination is not related in any way to petroleum operations. As the Plaintiffs’ lead expert Douglas Beltman admitted, “[M]uch of the problem is caused by poor sanitation . . . .” STRATUS-NATIVE048254.

<sup>23</sup> William D. Bellamy, Evaluation of Drinking Water Quality Related to Petroleum Exploration and Production Activities in the Oriente Region of Ecuador, at 1.

<sup>24</sup> JB-NonWaiver00066577 at 4.

<sup>25</sup> Maest Dep. Tr. (Vol. 1) at 234:16-235:13.

<sup>26</sup> See McHugh, Lack Of Evidence Of Health Risks Associated With Hydrocarbons And Metals In The Former Concession Area at 4 (June 2011).

<sup>27</sup> *Id.* at 7.

**C. There Is No Evidence of Increased Incidence of Cancer or Other Disease Related to Petroleum Operations in the Oriente**

16. In their letter, the Plaintiffs represent to this Commission that “Dr. Daniel Rourke, formerly of the RAND corporation, concluded that more than 9,000 [local residents] could contract cancer due to exposure to oil contamination.” This is not what Dr. Rourke said. In fact, he testified that he did not reach the conclusion that oil production activities caused *anyone* to get cancer. The underlying premise that living near the oil production areas in Ecuador results in a higher incidence of cancer has been studied and debunked.

17. Dr. Rourke is a statistician whom the Plaintiffs asked to assume a “hypothetical” increase in cancer and calculate expected cancer deaths based on that hypothetical increase.<sup>28</sup> He is not an epidemiologist, toxicologist, or medical doctor, and he specifically testified that he was “not making any statement about causation.”<sup>29</sup> He testified under oath that he did not conclude that “anybody actually got cancer because they live near an oil production facility,” or that Chevron or Texaco “took any action that actually caused anybody to get cancer.”<sup>30</sup>

18. Because the Plaintiffs claim that exposure to crude oil has resulted in increased cancer incidence, Chevron requested that an epidemiologic study be conducted to evaluate that allegation. Epidemiologist Dr. Michael Kelsh designed a study “[t]o compare cancer mortality rates in Amazon cantons (counties) with and without long-term oil exploration and extraction activities.”<sup>31</sup> He used cancer mortality and census data from all cantons in the northern Amazon Region (Napo, Orellana, Pastaza, and Sucumbios) and Pichincha province, which he obtained from Ecuador’s Instituto Nacional de Estadística y Censos (INEC).<sup>32</sup> The study was peer-reviewed and published in the International Archives of Occupational and Public Health in February of 2009.<sup>33</sup>

19. Dr. Kelsh first reviewed prior epidemiological studies of crude oil exposure. He noted that “[i]n their extensive review of epidemiologic studies of over 350,000 petroleum workers, Wong and Raabe observed no increases in mortality from most cancers, including

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<sup>28</sup> Rourke Dep. Tr. at 61:5-22, 268:2-9 (Rourke conceding that his excess cancer estimate was purely “hypothetical” and based on a “risk assumption” concocted for the case).

<sup>29</sup> *Id.* at 122:22-123:5, 268:15-20, 293:5-9.

<sup>30</sup> *Id.* at 122:22-123:5, 268:15-20, 293:5-9.

<sup>31</sup> Kelsh, Cancer mortality and oil production in the Amazon Region of Ecuador, 1990-2005, *Int Arch Occup Environ Health*, 2009 Feb; 82(3):381-95.

<sup>32</sup> INEC is the Ecuadorian institution that collects, analyzes, and reports statistical information on health, economic, socio-demographic, population, and other topics (<http://www.inec.gov.ec>).

<sup>33</sup> Kelsh, Cancer mortality and oil production in the Amazon Region of Ecuador, 1990-2005, *Int Arch Occup Environ Health*, 2009 Feb; 82(3):381-95.

digestive, lung, bladder, kidney, and brain cancer.”<sup>34</sup> He further noted that “[r]esults from other occupational studies have produced similarly null findings.”<sup>35</sup>

20. Dr. Kelsh then analyzed the INEC mortality data, and found that “mortality in cantons with long-term oil extraction activities were similar, or lower, compared to those without such activities for overall mortality, overall cancer, circulatory disease, infectious disease, and respiratory diseases, and for many site-specific cancers.”<sup>36</sup> He also found that “[c]omparing mortality in the Amazon and Pichincha province, mortality rates from all causes, cancer, circulatory disease, and respiratory disease were lower in the Amazon than in Pichincha province, while death rates from infectious diseases were higher.”<sup>37</sup> Dr. Kelsh’s study concluded that “analyses of national mortality data of the Amazon Region in Ecuador does not provide evidence for an excess cancer risk in regions of the Amazon with long-term oil production.”<sup>38</sup>

21. Dr. Kelsh’s study results, as well as the studies of hundreds of thousands of petroleum workers that he cites, conflict with the reports of Dr. Miguel San Sebastian, who has authored a series of papers that the Plaintiffs have cited to the Commission. The San Sebastian papers were derived from data collected for Dr. San Sebastian’s doctoral thesis.<sup>39</sup> As San Sebastian explained in his thesis, the study was actually done in close collaboration with the Plaintiffs’ organization, known as the Amazon Defense Front or FDA. However, “[a]fter discussions between FDA and the epidemiologist, it was decided that the name of FDA would appear neither on the cancer cluster report nor on the ‘Yana Curi’ report [San Sebastian and

<sup>34</sup> Dr. Kelsh cited Wong O, Raabe GK (2000) A critical review of cancer epidemiology in the petroleum industry, with a meta-analysis of a combined database of more than 350, 000 workers. *Regul Toxicol Pharmacol* 32:78–98. doi:10.1006/rtp.2000.1410.

<sup>35</sup> Dr. Kelsh cited Divine BJ, Barron V (1987) Texaco mortality study: III. A cohort study of producing and pipeline workers. *Am J Indus Med* 11(2):189–202. doi:10.1002/ajim.4700110208; Gottlieb MS (1980) Lung cancer and the petroleum industry in Louisiana. *J Occup Med* 22(6):384–388; Gottlieb MS et al (1979) Lung cancer in Louisiana: death certificate analysis. *J Nat Cancer Inst* 63(5):1131–1137; Mills PK, Newell GR, Johnson DE (1984) Testicular cancer associated with employment in agriculture and oil and natural gas extraction. *Lancet* 1(8370):207–210. doi:10.1016/S0140-6736(84)92125-1; Sewell CM et al (1986) Testicular cancer and employment in agriculture and oil and natural gas extraction. *Lancet* (80):553. doi:10.1016/S0140-6736(86)90902-5; Siemiatycki J et al (1987) Associations between several sites of cancer and twelve petroleum-derived liquids. Results from a case-referent study in Montreal. *Scand J Work Environ Health* 13(6):493–504; Wong O, Raabe GK (1995) Cell-type-specific leukemia analyses in a combined cohort of more than 208,000 petroleum workers in the United States and the United Kingdom, 1937–1989. *Regul Toxicol Pharmacol* 21(2):307–321. doi:10.1006/rtp.1995.1044.

<sup>36</sup> Kelsh, Cancer mortality and oil production in the Amazon Region of Ecuador, 1990-2005, *Int Arch Occup Environ Health*. 2009 Feb, 82(3):381-95.

<sup>37</sup> *Id.*

<sup>38</sup> *Id.*

<sup>39</sup> Dr. John Christopher, Evaluation of the Doctoral Thesis of Plaintiffs’ Exprt Dr. Miguel San Sebastian (Sept. 29, 2010) (“Dr. San Sebastian’s thesis is of crucial importance, because it forms the basis for several reports and publications of his and his colleagues that have been relied upon by the plaintiffs in the case of Maria Aguinda y Otros v. Chevron Corporation, and submitted to the court (San Sebastian and Cordoba, 1999; San Sebastian *et al.*, 2001, 2002; San Sebastian and Hurtig, 2004, 2005)).”

Cordoba, 1999]. This decision was based on the thinking that the report would carry more weight and reach a broader audience if it was presented as an independent report.”<sup>40</sup>

22. The San Sebastian studies themselves state that they do not establish any causal link between oil operations and cancer (e.g., “this ecologic study cannot lead to causal inference”). Several epidemiologists and toxicologists evaluating the studies noted this lack of causation.<sup>41</sup> Other scientists confirmed that the San Sebastian study used incorrect population data, and if accurate population data were used, the study would show no increase in cancer.<sup>42</sup> Indeed, the highly regarded Canadian epidemiologist Dr. Jack Siemiatycki took the unusual step of publishing a precautionary note immediately after a San Sebastian article was published, describing San Sebastian’s work as:

a geographical correlation study with a real possibility of bias in ascertainment of the outcome between the two study areas, a real possibility of confounding by a plethora of ethnic and social factors, and the crudest of measures of exposure. While the overall cancer incidence was ostensibly higher in the ‘exposed’ area, the cancer site distributions did not exhibit a pattern that would obviously throw suspicion on etiological agents coming from the oil industry pollution.<sup>43</sup>

23. Dr. Siemiatycki would later write that it is “plausible that the ‘relationships’ observed in this study were the result of chance and/or bias.”<sup>44</sup>

24. In sum, there is no reliable scientific evidence of an increase in cancer or current risk to local residents’ health, from TexPet’s former oil operations.

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<sup>40</sup> *Id.* quoting Thesis at 125.

<sup>41</sup> Christopher, Evaluation of the Scientific Value of the Published Work of Plaintiffs’ Experts, Dr. Miguel San Sebastian and Colleagues (Sept. 9, 2010) (“They fail to show a causal connection between their analytical data and potential exposures near San Carlos and other communities in the former concession.”); Rebuttal to Mr. Cabrera’s Excess Cancer Death and Other Health Effects Claims, and His Proposal for a New Health Infrastructure (Sept. 8, 2008) at 17 (“These studies cannot be relied upon as evidence of adverse health impacts.”).

<sup>42</sup> Arana and Arellano, Cancer incidence near oilfields in the Amazon basin of Ecuador revisited, *Occupational and Environmental Medicine*, 2007;64:490–491 (“San Sebastian et al underestimated the population of San Carlos by almost 50%...Using data from the 2001 census and applying the Centers for Disease Control cluster guidelines yielded no excess of cancer or cancer mortality in the village of San Carlos.”).

<sup>43</sup> Siemiatycki, Commentary: Epidemiology on the side of the angels, *Int. J. Epidemiol.* (2002) 31 (5):1027-1029; Siemiatycki, Response, *Int. J. Epidemiol.* (2003) 32 (4):658-659 (stating that he approved the article for publication) at <http://ije.oxfordjournals.org/content/32/4/658.full>.

<sup>44</sup> *Id.*