

**INTERNATIONAL COURT OF JUSTICE**

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**DISPUTE CONCERNING  
CONSTRUCTION OF A ROAD IN COSTA RICA ALONG THE SAN JUAN  
RIVER  
(NICARAGUA v. COSTA RICA)**

**WHICH HAS BEEN JOINED WITH THE CASE CONCERNING  
CERTAIN ACTIVITIES CARRIED OUT BY NICARAGUA IN THE BORDER  
AREA  
(COSTA RICA v. NICARAGUA)**

**REPLY  
OF THE REPUBLIC OF NICARAGUA**



**VOLUME I**

**04 August 2014**



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## LIST OF ACRONYMS

- CACJ Central American Court of Justice
- CBD Convention on Biological Diversity
- CCAD (Spanish Acronym) Central American Commission for Environment and Development
- CFIA (Spanish Acronym) Association of Federated Engineers and Architects of Costa Rica
- CODEFORSA ((Spanish Acronym) Commission on Forest Development of San Carlos
- CONAVI (Spanish Acronym) Consejo Nacional de Vialidad (Spanish) or National Roads Authority
- CoP Conference of the States Parties
- CRCM Costa Rica Counter Memorial
- CRM Costa Rica Memorial
- EDA Environmental Diagnostic Assessment
- EIA Environmental Impact Assessment
- EMP Environmental Management Plan
- ICE (Spanish Acronym) Costa Rican Institute of Electricity
- ILC International Law Commission
- LANAMME (Spanish Acronym) National Laboratory of Materials and Structural Models of the University of Costa Rica
- NM Nicaragua Memorial
- NCM Counter Memorial of Nicaragua
- NOAA US National Oceanographic and Atmospheric Administration
- OAS Organization of American States
- P.C.I.J. Permanent Court of International Justice
- PROCUENCA-SAN JUAN Action Programme of Integrated Management of Water Resources and Sustainable Development of the San Juan River Basin and its Coastal Zones
- RAMSAR Convention on Wetlands of International Importance
- SABS Framework for Developing Suspended and Bedded Sediments Water Quality
- SI-A-PAZ (Spanish Acronym) International System of Protected Areas for Peace
- UCR (Spanish Acronym) University of Costa Rica
- U.S. United States
- U.N. United Nations.
- U.N.T.S. United Nations Treaty Section
- UNEP United Nations Environment Programme
- UNESCO-MAB Man and the Biosphere Program of the United Nations Educational, Scientific and Cultural Organization.
- UNITAR United Nations Institute for Training and Research



## **CHAPTER 1**

### **INTRODUCTION**

1.1 This Reply is filed pursuant to the Order of the Court of 03 February 2014 that directed the Republic of Nicaragua to submit a Reply in the case concerning the *Construction of a Road in Costa Rica along the San Juan River (Nicaragua v. Costa Rica)*, which has been joined with the case concerning *Certain Activities carried out by Nicaragua in the Border Area (Costa Rica v. Nicaragua)* and fixed 04 August 2014 as the time limit for the filing of this pleading. It addresses questions raised in the Counter-Memorial of Costa Rica filed on 19 December 2013.

#### **A. COSTA RICA'S COUNTER-MEMORIAL**

1.2 In Chapter 2 of its Counter-Memorial, Costa Rica addresses the “Circumstances leading to the Construction of the Road.” In it, Costa Rica throws out an array of unrelated “circumstances” that it tries to use to explain the inexplicable: its ill-considered decision to unleash at least thirty-five different construction companies<sup>1</sup> with no plans – or, it seems, even forethought – with instructions to bulldoze a 160-km-long road along its northern border, some 110-120 km of which follows the right bank of the San Juan River. The only prior “planning” revealed by Costa Rica was to divide the prospective “Border

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<sup>1</sup> *Crhoy.com*, Costa Rica “Path construction supervisors informed problems and the lack of oversight”, 11 June 2012 (Annex 111 to the Counter-Memorial of Nicaragua (NCM) in the *Dispute Concerning Certain Activities Carried out by Nicaragua in the Border Area (Costa Rica v. Nicaragua)*; see also *La Nación*, Costa Rica, E. Oviedo, “Conavi built a dirt road along the border without a single design plan,” 23 May 2012 (NM, Vol. II, Annex 31).

Road” into five sections, and to assign each of the sections to different contractors<sup>2</sup> – again, without providing them with any plans or blueprints.<sup>3</sup> Costa Rica was in such a hurry that it did not bother to conduct the environmental impact assessments required by international law or even by its own internal law.

1.3 Costa Rica describes the Road and some of its motivations for constructing it as follows:

“In light of the circumstances described in the following sub-section, and set out in greater detail in Chapter 2, Costa Rica commenced road works entirely within its own territory. Road works were first carried out so as to provide access to the area bordering Nicaragua along the San Juan River. These access routes leading to the border area comprise approximately 382.7 km of road. Costa Rica also undertook road works in the border area itself, so as to create a single road running parallel to the San Juan River and further inland called *Route 1856 Juan Rafael Mora Porras* . . . . This road . . . runs from Los Chiles to Delta Costa Rica, and is approximately 159.7 km in length. Much of it (101.5 km or 63.6%) was built on pre-existing rural roads or tracks. Of the 159.7 km, approximately 108.2 km of the Road runs between Marker II and Delta Colorado, i.e. the area where the right margin of the San Juan River marks the boundary between Costa Rica and Nicaragua. It is this part of the Border Road which is the object of the present dispute.”<sup>4</sup>

1.4 The statement that only the part of the “Border Road” that runs next to the River “is the object of the present dispute” is not correct. The totality of the road that runs next to the border is in dispute. But, by any measure, this is a

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<sup>2</sup> Cases concerning *Construction of a Road in Costa Rica along the San Juan River (Nicaragua v. Costa Rica)* and *Certain Activities Carried Out by Nicaragua in the Border Area (Costa Rica v. Nicaragua)*, Provisional Measures Hearing, CR 2013/29, 6 November 2013, p. 16, para. 14 (Brenes).

<sup>3</sup> NM, p. 27, para. 2.25.

<sup>4</sup> CRCM, pp. 6-7, para. 1.11 (footnotes omitted).

project of immense proportions. Sketch Map 4 contained in Costa Rica’s Counter-Memorial<sup>5</sup> shows the “Transport Network in the Area after Construction of Route 1856.” The “area” comprises much of northern Costa Rica, since, as described in the quotation above, the Road project consists not only of construction of the 160 km road along the border between Costa Rica and Nicaragua, but also the construction or improvement of “approximately 382.7 km of road” between the border area and the interior of Costa Rica. It defies comprehension that such a large and complex project could be undertaken without any prior planning or blueprints, let alone environmental impact assessments – both internal and transboundary – or prior notice to Costa Rica’s neighbor, Nicaragua. But Costa Rica, a country which in the words of the Central American Court of Justice “prides itself and sells itself internationally as ‘a model of eco-environmental management within its borders’”<sup>6</sup> did just that.

1.5 In an attempt to minimize the Road’s perceived impact, Costa Rica states of the Road that “[m]uch of it (101.5 km or 63.6%) was built on pre-existing rural roads or tracks.”<sup>7</sup> Costa Rica adds: “The fact that much of the Border Road was built on pre-existing rustic roads meant it had a reduced impact on those locations. . . . Therefore, the impact of the Border Road on the Costa

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<sup>5</sup> CRCM, Sketch Map 4, “Transport Network in the Area after Construction of Route 1856,” after p. 36.

<sup>6</sup> NM, Volume II, Annex 13, p. 372.

<sup>7</sup> CRCM, p. 6, para. 1.11.

Rican environment, ecology, soil erosion and sediment production along nearly three quarters of its length ranges between low and imperceptible.”<sup>8</sup>

1.6 Costa Rica is mistaken. It is well known that constructing roads for vehicular traffic on pre-existing “rustic roads” or “tracks” is not an environmentally sound practice. A 1996 Report on the San Juan River Basin published by the Organization of American States (OAS), explains:

“Many of the roads are built on paths, tracks, or animal trails, which are usually unsuitable for vehicular traffic. This makes the environmental impact even worse. A significant amount of the sediment going into the rivers comes from these roads, which are regularly washed by the rain, thereby polluting the rivers. Such informal roadways also lead to disorderly settlement of the basin.”<sup>9</sup>

Thus the use of “pre-existing rural roads or tracks” for the construction of the Road, which will have to accommodate heavy vehicle traffic, does not lessen the impact on the environment. In fact, it “makes the environmental impact even worse,” in part because “[a] significant amount of the sediment going into the rivers comes from these roads, which are regularly washed by the rain, thereby polluting the rivers.”<sup>10</sup> Thus, by Costa Rica’s own account, some 64% of the Road is constructed in a way that will exacerbate its environmental impact and contribute substantially to the delivery of sediment into the San Juan.

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<sup>8</sup> *Ibid.*, p. 7, para. 1.12 (footnote omitted).

<sup>9</sup> PROCUENCA SAN JUAN, Formulation of a Strategic Action Program for the Integrated Management of Water Resources and the Sustainable Development of the San Juan River Basin and its Coastal Zone, document; *Transboundary Diagnostic Analysis (TDA)* (Including Root Cause Analysis), available at <http://www.oas.org/sanjuan/english/documents/tda/information/overexploitation.html>

<sup>10</sup> *Ibid.*

1.7 The “circumstances” cited by Costa Rica in the above-quoted passage as its reasons for constructing the Road are either based on unsupported allegations or are due to Costa Rica’s own failure to provide infrastructure works for those living in the border area. Thus Costa Rica contends that Nicaragua:

- “(a) obstructed navigation on the San Juan by Costa Rican riparians and public service officials, thereby preventing communication with these remote communities to meet the necessities of everyday life;
- (b) occupied and claimed sovereignty over part of Costa Rica’s territory in Isla Portillos;
- (c) asserted rights of navigation on the Colorado River, a river running entirely within Costa Rican territory; and
- (d) in the context of all of the above, increased the presence of its soldiers along the San Juan River.”<sup>11</sup>

1.8 The “circumstance” (Costa Rica also refers to them as “incidents”<sup>12</sup>) described in paragraph (a) is baseless. If “communication with . . . remote communities to meet the necessities of everyday life” is so important, why has Costa Rica not previously provided the infrastructure to enable such communication by land? It has known since the 1858 Treaty of Limits<sup>13</sup> was concluded that the San Juan de Nicaragua River is available to Costa Rica only for commercial navigation. Nicaragua of course exercises police, customs and immigration authority over its sovereign territory, including the San Juan River, as any responsible sovereign would. Nicaragua does this in full compliance with

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<sup>11</sup> CRCM, pp. 8-9, para. 1.15 (footnotes omitted).

<sup>12</sup> *Ibid.*, p. 22, para. 2.3.

<sup>13</sup> Treaty of Limits between Nicaragua and Costa Rica, 15 April 1858, NM, Vol. II, Annex 5.

the governing law, including the 1858 Treaty of Limits,<sup>14</sup> the 1888 Cleveland Award<sup>15</sup> and 1897-1900 Alexander Awards,<sup>16</sup> and the Court’s judgment in the Navigational and Related Rights case.<sup>17</sup> Nicaragua does not “obstruct” navigation by anyone from Costa Rica, unless by “obstruct” Costa Rica refers to actions by Nicaragua in compliance with the governing law. This is yet another example of Costa Rica not being able to accept the fact that it does not have full navigation rights on the San Juan River.

1.9 Paragraph (b) refers to the dispute that is *sub judice* in the *Certain Activities* case. It is based on Costa Rica’s *allegation* that Nicaragua has “occupied and claimed sovereignty over part of Costa Rica’s territory in Isla Portillos,” an allegation that Nicaragua emphatically rejects. In any event, Costa Rica had brought this dispute to the Court on 18 November 2010,<sup>18</sup> before it

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<sup>14</sup> *Ibid.*

<sup>15</sup> Award of the Arbitrator, the President of the United States, upon the validity of the Treaty of Limits of 1858 between Nicaragua and Costa Rica (Cleveland Award), reprinted United Nations, *Report of International Arbitral Awards*, Vol. XXVIII (2006), pp. 207-211 Washington, D.C., 22 March 1888, NM, Vol. II, Annex 6(1).

<sup>16</sup> First Award of the Umpire EP Alexander in the boundary question between Costa Rica and Nicaragua, reprinted United Nations, *Reports of International Arbitral Awards*, Vol. XXVIII (2007) pp.215-221, San Juan del Norte, 30 September 1897; Second Award of the Umpire EP Alexander in the boundary question between Costa Rica and Nicaragua, reprinted United Nations, *Reports of International Arbitral Awards*, Vol. XXVIII (2007) pp.223-225, San Juan del Norte, 20 December 1897; Third Award of the Umpire EP Alexander in the boundary question between Costa Rica and Nicaragua, reprinted United Nations, *Reports of International Arbitral Awards*, Vol. XXVIII (2007) pp.227-230, San Juan del Norte, 22 March 1898; Fourth Award of the Umpire EP Alexander in the boundary question between Costa Rica and Nicaragua, reprinted United Nations, *Reports of International Arbitral Awards*, Vol. XXVIII (2007) pp.231-235, Greystown, 26 July 1899, NM, Vol. II, Annex 6 (2)(3)(4)(5).

<sup>17</sup> *Dispute regarding Navigational and Related Rights (Costa Rica v. Nicaragua), Judgment, I.C.J. Reports 2009*, p. 213.

<sup>18</sup> Application Instituting Proceedings, filed in the Registry of the Court on 18 November 2010, *Certain Activities Carried Out By Nicaragua In The Border Area (Costa Rica V. Nicaragua)*, available on the Court’s website, <http://www.icj-cij.org/docket/files/150/16279.pdf>.

commenced construction of the Road in the following month. The Court has in the past strongly disapproved of states' taking matters into their own hands after bringing the relevant dispute before it.<sup>19</sup> Moreover, the ostensible connection between events at and around what Costa Rica calls Isla Portillos and the new road are amply disproved by the fact that the road stops well short of that area. The road reaches only to the point where the San Juan and Colorado Rivers diverge, about 35 km. from the mouth of the San Juan, where the disputed territory is located.

1.10 The “circumstance” referred to in paragraph (c), that Nicaragua has “asserted rights of navigation on the Colorado River, a river running entirely within Costa Rican territory,” is puzzling, to say the least. How the assertion (Costa Rica also characterizes it as a “threat”<sup>20</sup>) of navigation rights in a branch of the San Juan River can necessitate the construction of a road along that river – not the branch – and ending at the branch, is not explained.<sup>21</sup> Moreover, the “threat” in question was, according to Costa Rica, made in an announcement by Nicaragua’s President on 13 November 2010. What President Ortega actually said was that Nicaragua would “request” the International Court to recognize the right of Nicaragua to navigate on the Colorado.<sup>22</sup> This Nicaragua did in its

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<sup>19</sup> See NM, pp. 157-158, para. 5.15, referring to the Court’s statement that such self-help actions are “of a kind calculated to undermine respect for the judicial process in international relations....” *United States Diplomatic and Consular Staff in Tehran (United States of America v. Iran)*, I.C.J. Reports 1980, p. 3, at p. 43, para. 93.

<sup>20</sup> CRCM, p. 30, para. 216.

<sup>21</sup> See CRCM, pp. 29-31, paras. 2.15-2.19.

<sup>22</sup> As quoted in CRCM, p. 29, para. 2.15.

Counter-Memorial in the *Certain Activities* case, filed on August 6, 2012.<sup>23</sup> It was hardly a “threat” and certainly cannot have justified construction of the Road, with or without an Emergency Decree.

1.11 The issue is treated in two sentences in Costa Rica’s Counter-Memorial: “The Colorado River runs entirely within Costa Rican territory. Nicaragua has no right of navigation on the Colorado River.”<sup>24</sup> (It received even briefer treatment in Costa Rica’s Memorial in the *Certain Activities* case.<sup>25</sup>) How the proposition in the second sentence follows from the fact stated in the first is not, and cannot be, explained. As shown in Nicaragua’s Counter-Memorial in the *Certain Activities* case, Nicaragua’s right to navigate on the Colorado is based on the 1858 Treaty of Limits itself.<sup>26</sup>

1.12 The final “circumstance” purportedly justifying construction of the Road in great haste and with neither prior planning nor notice to Nicaragua<sup>27</sup> is that Nicaragua allegedly, “(d) in the context of all of the above [i.e., (a) through (c)], increased the presence of its soldiers along the San Juan River.” It perhaps goes without saying that a State is sovereign over its own territory and is free to

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<sup>23</sup> Dispute concerning *Certain Activities Carried Out by Nicaragua in the Border Area (Costa Rica v. Nicaragua)*, NCM, Chapter 4, section C, “Nicaragua’s Right to Navigate on the Colorado Branch of the San Juan de Nicaragua River, p. 119. Costa Rica also cites a press account of an announcement by Nicaragua’s President on 13 November 2010.

<sup>24</sup> CRCM, pp. 29-30, para. 2.15.

<sup>25</sup> *Certain Activities* case, CRM, p. 80, para. 3.29: The Colorado is “a river belonging wholly to Costa Rica and over which Nicaragua has no navigational rights.”

<sup>26</sup> See *Certain Activities*, NCM, pp. 120-121, paras. 4.67-4.69.

<sup>27</sup> Costa Rica states that it “formally communicated with Nicaragua through official channels, promptly and in good faith, concerning the road infrastructure works on Costa Rican territory....” CRCM, p. 10, para. 1.17. However, no citation to any such communication accompanies this statement which is, in fact, false.

position its troops wherever it wishes within that territory. This should end the matter. But in fact, the only proof of this “reinforcement” cited by Costa Rica is a news story in *La Nación*, a Costa Rican newspaper.<sup>28</sup> To the extent that Nicaragua might have reinforced its troops “in the lower San Juan River”<sup>29</sup> and that this was of concern to Costa Rica, the normal course of action would be for Costa Rica to raise the matter with Nicaragua through diplomatic channels. It is certainly not a normal course of action to decide impulsively to order the construction of a road, nowhere near the lower San Juan, but stretching west 160 kilometers from the right (western) bank of the Colorado branch of the San Juan, to the great detriment of Nicaragua and the environment.

1.13 The result of Costa Rica’s bulldozing first and planning later<sup>30</sup> is predictably appalling, as Nicaragua showed in its Memorial<sup>31</sup> and shows again in the present Reply.<sup>32</sup> Costa Rica has laid waste to a vast stretch of the border area for no comprehensible reason.

1.14 The reckless manner in which Costa Rica proceeded with the construction of the Road made serious impacts upon Nicaragua’s territory, the San

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<sup>28</sup> CRCM, p. 30, para. 2.16 and footnote 90.

<sup>29</sup> CRCM, p. 30, para. 2.16.

<sup>30</sup> In November, 2013, Costa Rica stated before the Court that it was making efforts “to finalize contracts for the final design plans of the whole road,” work having begun in December, 2010. Cases concerning *Construction of a Road in Costa Rica along the San Juan River (Nicaragua v. Costa Rica)* and *Certain Activities Carried Out by Nicaragua in the Border Area (Costa Rica v. Nicaragua)*, Provisional Measures Hearing, CR 2013/29, 6 November 2013, p. 18, para. 17 (Brenes).

<sup>31</sup> Such photographic evidence appears throughout Nicaragua’s Memorial. For examples, see, e.g., NM, pp. 52-53, 55, 57 and 59.

<sup>32</sup> See, in particular, NR, Chapter 2.

Juan de Nicaragua River, inevitable, as shown in Nicaragua's Memorial.<sup>33</sup> It will be recalled that Costa Rica blundered ahead with its Road project before necessary engineering studies and designs were prepared. Costa Rica's own national professional association of engineers and architects, CFIA, came to this conclusion in a June, 2012 report.<sup>34</sup> The CFIA found that Costa Rica undertook the project "without a single plan to indicate the path that was to be opened, or what its characteristics should have been."<sup>35</sup> We now know that the CFIA was prophetic in concluding that constructing a road in this way will inevitably "cause increased costs, environmental problems, and a rapid deterioration of the project."<sup>36</sup>

1.15 The CFIA was not the only Costa Rican organization to find that the manner in which the Road was constructed was substandard. The National Laboratory of the University of Costa Rica ("LANAMME" by its Spanish acronym) concluded that "the project failed to follow basic engineering practices during planning and implementation, such as: land survey for road layout; critical point geotechnical assessment; drainage structure location, design, and construction; defining suitable and uniform technical standards; [and proper]

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<sup>33</sup> NM, Chapter 3, section B, pp. 47-87.

<sup>34</sup> Federated Association of Engineers and Architects of Costa Rica (CFIA), "Report on Inspection of the Border Road, Northern Area Parallel to the San Juan River," 8 June 2012 (NM, Vol. II, Annex 4, p. 257).

<sup>35</sup> *Ibid.*, p. 25, para. 5.3.

<sup>36</sup> *Ibid.*

inspection . . .”<sup>37</sup> These conclusions were confirmed in the Kondolf Report filed with Nicaragua’s Memorial in this case.<sup>38</sup> Professor Kondolf and his co-authors found that Costa Rica failed to follow international and Costa Rican standards and other “international road practices intended to minimize on-site and off-site impacts to water quality, channel morphology, navigation and riverine ecology, as well as national and international physical and biological resources,” and that this failure has resulted in the deterioration of the Road itself and adverse impacts on neighboring watercourses, including the San Juan River.<sup>39</sup>

1.16 Costa Rica evidently recognizes these problems as it has made much of the twenty categories of “maintenance,” “remedial” and “mitigation” works it has carried out on the Road.<sup>40</sup> Professor Kondolf, however, characterizes these works as “inept and failing erosion control efforts, undertaken on only the first 15 km of Rte 1856 below Mojon II.”<sup>41</sup>

1.17 Costa Rica’s Road project is appalling not only for these reasons. It is also appalling visually. The visual impacts of the Road project alone threaten Nicaragua’s fledgling tourism industry in the area.<sup>42</sup>

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<sup>37</sup> Laboratorio Nacional de Materiales y Modelos Estructurales, “Report on Reconnaissance Trip to Route 1856 – Juan Rafael Mora Porras Border Trail,” pp. 50-51, NM, Volume II, Annex 3.

<sup>38</sup> G. Mathias Kondolf, Danny Hagans, Bill Weaver and Eileen Weppner, “Environmental Impacts of Juan Rafael Mora Porras Route 1856, Costa Rica, on the Río San Juan, Nicaragua,” December 2012 (hereinafter the “2012 Kondolf Report”), Section 5.6 (NM, Vol. II, Annex 1).

<sup>39</sup> *Ibid.*, Appendix B, p. 1.

<sup>40</sup> See, e.g., CRCM, pp. 42-46, paras. 2.38-2.40 and accompanying photographs in Figures 2.3 and 2.4, p. 45, and Annexes 7 and 8.

<sup>41</sup> G. Mathias Kondolf, “Erosion and Sediment Delivery to the Rio San Juan from Route 1856,” July 2014 (hereinafter the “2014 Kondolf Report”), Section 6 (NR, Vol. II, Annex 1).

<sup>42</sup> See Chapter 2, Section B.4, “Visual Impacts.”

1.18 One of the most alarming aspects of the project is Costa Rica's heedless sedimentation of the San Juan River through the unplanned and uncontrolled – in a word, chaotic – manner in which the Road is being constructed. This sediment, which as discussed below, is above and beyond the massive volumes delivered into the San Juan River by Costa Rican tributaries due to irresponsible land-use practices in that country, is washed into the river in staggering quantities equivalent to over sixteen thousand dump-truck loads every year<sup>43</sup> as a result of nothing more than normal rainfall. This result was entirely foreseeable.

1.19 In this Reply, Nicaragua will show that none of the alleged “Circumstances leading to the Construction of the Road” cited by Costa Rica<sup>44</sup> necessitated proceeding in such blind haste, in a way that made substantial harm to Nicaragua virtually inevitable.<sup>45</sup> Costa Rica has in fact demonstrated itself, through its own conduct that it did not, and does not, regard completion of the Road as a pressing matter. Work on the Road was slowed or suspended in December 2011, Costa Rica having failed to allocate sufficient funds for its construction.<sup>46</sup> To date, some four years after construction began, the Road is

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<sup>43</sup> See 2014 Kondolf Report, Section 7 (NR, Vol. II, Annex 1). As explained in Chapter 2 below, Dr. Kondolf now estimates that the Road is contributing as much as 130,000 m<sup>3</sup> of sediment to the San Juan River per year, which is enough to fill 16,250 standard 8-m<sup>3</sup> dump trucks. This estimate does not account for erosion from the many kilometers of access roads that were also part of the project and contribute additional sediment to the River. *Ibid.*

<sup>44</sup> CRCM, Chapter 2, p. 21, et seq.

<sup>45</sup> NM, Chapter 3(B), pp. 47-87.

<sup>46</sup> In the Hearings on Provisional Measures held in November, 2013, Costa Rica stated that “funds [for the construction of the Road] were depleted by December 2011 . . . .” Cases concerning

still far from being complete and is impassable in significant sections due to serious failures.<sup>47</sup> As recently as November 2013, Costa Rica stated before the Court that it was making efforts “to finalize contracts for the final design plans of the whole road, before tendering for and concluding contracts for its construction.”<sup>48</sup> This is a classic case of putting the cart before the horse. Unfortunately, it is Nicaragua that has had to bear the brunt of the consequences of this malfeasance.

1.20 Costa Rica’s principal defenses to its failure to live up to its obligations owed to Nicaragua under international law consist of its “Emergency Decree,” issued on 21 February 2011,<sup>49</sup> and its contention that the Road project is not causing significant harm to Nicaragua.

1.21 As to the Emergency Decree, Costa Rica claims that, construction of the Road commenced in December 2010 (no notice having been given to Nicaragua).<sup>50</sup> It will be immediately evident that the Emergency Decree was

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*Construction of a Road in Costa Rica along the San Juan River (Nicaragua v. Costa Rica) and Certain Activities Carried Out by Nicaragua in the Border Area (Costa Rica v. Nicaragua)*, Provisional Measures Hearing, CR 2013/29, 6 November 2013, p. 17, para. 17 (Brenes). It also revealed that what it described as “irregularities concerning payments made in connection with the works,” i.e., corruption, had been exposed in May, 2012. *Ibid.*

<sup>47</sup> See 2014 Kondolf Report, Section 2, Figure 1: “Map of passable and impassable portions of Rte 1856 along the Rio San Juan from Mojon 2 to Boca San Carlos” (NR, Vol. II, Annex 1).

<sup>48</sup> Cases concerning *Construction of a Road in Costa Rica along the San Juan River (Nicaragua v. Costa Rica) and Certain Activities Carried Out by Nicaragua in the Border Area (Costa Rica v. Nicaragua)*, Provisional Measures Hearing, CR 2013/29, 6 November 2013, p. 18, para. 17 (Brenes).

<sup>49</sup> NM, Vol. II, Annex 11, p. 357.

<sup>50</sup> Cases concerning *Construction of a Road in Costa Rica along the San Juan River (Nicaragua v. Costa Rica) and Certain Activities Carried Out by Nicaragua in the Border Area (Costa Rica v. Nicaragua)*, Provisional Measures Hearing, CR 2013/29, 6 November 2013, p. 13, para. 6 and p. 14, para. 9 (Brenes). See also *Laboratorio Nacional de Materiales y Modelos Estructurales*

actually issued two months *after* construction of the Road had begun. Thus, the work on the Road project was not in fact authorized under Costa Rican law when it began, even according to Costa Rica's own evidence. The Emergency Decree was evidently an afterthought, a would-be legal fig leaf that was both too little and too late. It will be for Costa Rica to explain whether it is standard practice under its law to proceed with projects first and find legal justification later. But it is certainly not standard practice, or even permissible, under international law to do so.

1.22 The Emergency Decree cannot excuse Costa Rica from its obligations under international law. This follows from one of the most basic principles of international law, as shown in Chapter 6, section C, of this Reply. There being no general exception for "emergencies" under international law, Costa Rica would have to establish that the wrongfulness of its conduct was precluded by necessity, something Costa Rica admits not even having attempted to do,<sup>51</sup> as shown in Chapter 6, below.<sup>52</sup> Costa Rica's decision not to make such an attempt was in a sense well-advised, since it would not have been possible for

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(LANAMME), "Report on Reconnaissance Trip to Route 1856 – Juan Rafael Mora Porras Border Trail," May 2012 (hereinafter the "LANAMME Report"), p. 5: "Construction of the road . . . was announced in December 2010 by authorities of the Government of Costa Rica to protect national sovereignty and as a permanent solution allowing free traffic of both people and agricultural products in Costa Rica's north border region." (NM, Vol. II, Annex 3, p. 209).

<sup>51</sup> CRCM, p. 113, para. 5.15 ("Costa Rica has not invoked Article 25 of the ILC's Articles on State Responsibility ["Necessity"] as Nicaragua correctly points out, and it is not incumbent upon it to do so.")

<sup>52</sup> NR, Chapter 6, section C.

it to meet the exacting requirements for invocation of this circumstance precluding wrongfulness.

1.23 In any event, the main purpose of the Road evidently has very little, if anything, to do with the events in the area in dispute and thus was not precipitated by an “emergency.” The LANAMME Report referred to earlier states: “Construction of the road … was announced in December 2010 by authorities of the Government of Costa Rica to protect national sovereignty and as a permanent solution allowing free traffic of both people and agricultural products in Costa Rica’s north border region.”<sup>53</sup> A “permanent solution” to issues of transit for civilian purposes in the northern border area of Costa Rica may well be a need, but it is certainly not something that would occasion an “emergency” and necessitate dispensing with all relevant internal and international legal requirements attendant upon such major projects.

1.24 While the emptiness of its “emergency” argument is evident, particularly breathtaking is Costa Rica’s argument about the lack of significant harm caused to Nicaragua as a result of the tremendous volumes of sediment and other debris carried into the San Juan from Costa Rica’s Road project. Costa Rica’s argument is that none of the normal obligations concerning planned projects that may have harmful transboundary impacts apply to it because the quantities of sediment delivered into the river from the Road project are

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<sup>53</sup> LANAMME Report, p. 5 (NM, Vol. II, Annex 3, p. 209).

“relatively insignificant.”<sup>54</sup> But the term “relatively” is crucial here. What Costa Rica argues is that sedimentation of the river from the Road project is insignificant *in comparison with* what Costa Rica’s expert, Professor Colin Thorne, calls “the high and variable sediment inputs from the San Carlos and Sarapiqui basins [in Costa Rica], which supply the vast majority of sediment carried by the River.”<sup>55</sup>

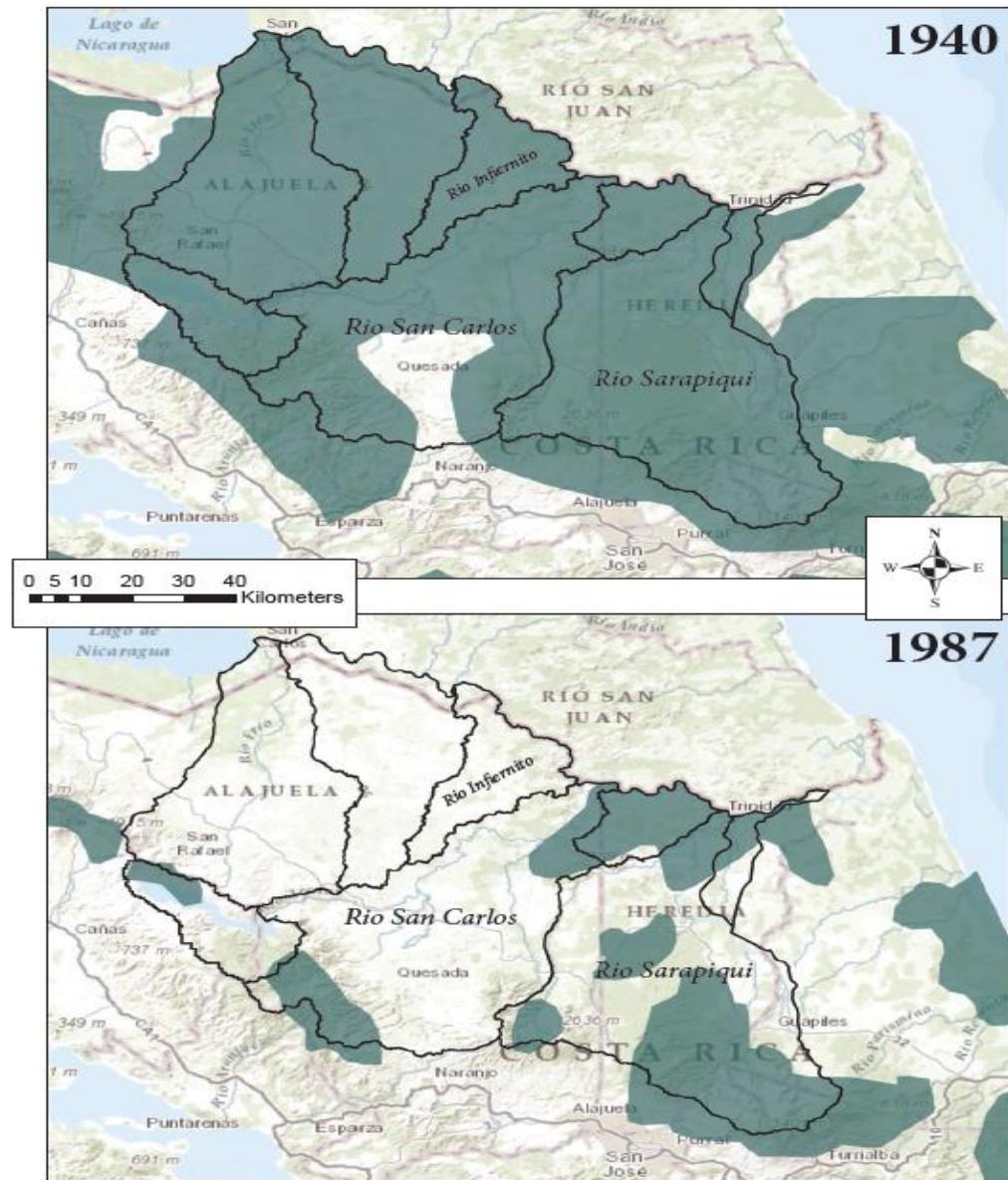
1.25 Thus Costa Rica says that even if the quantities of sediment delivered into the San Juan by the Road project are substantial, they pale into “insignificance” in comparison with other sediment in the River, the “vast majority” of which comes from Costa Rica itself. What Costa Rica fails to mention is why such vast quantities of sediment originate within its territory. The following figure depicting the amount of forested area in Costa Rica in 1940 and again in 1987 tells the story succinctly:

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<sup>54</sup> CRCM, p. 111, para. 5.12.

<sup>55</sup> Professor Colin Thorne, “Assessment of the Impact of the Construction of the Border Road in Costa Rica on the San Juan River,” para. 9.10, CRCM, Appendix A (hereafter “Thorne Report”).

**Figure 1.1.** General indication of forested areas in Costa Rica in 1940 and 1987. After Christoph Kleinn, et al., Forest Area In Costa Rica: A Comparative Study of Tropical Forest Cover Estimates Over Time, *Environmental Monitoring and Assessment* 73: 17–40, 2002, Figure 1, p. 20, overlaid on current map of Costa Rica.



1.26 The extent of the deforestation is alarming. The authors of the original graphic, which is overlaid on a current map of Costa Rica, explain:

“In the 1970s and 1980s Costa Rica was mainly in the negative environmental headlines for having one of the highest deforestation rates worldwide; in the 1970s an average deforestation of 50 000 ha yr<sup>-1</sup> is reported . . . , and for the period of 1950 to 1984 a deforestation rate of 3.9% per year . . . . The deforestation rates averaged consistently two to three times higher than the overall regional average for Latin America . . . .”<sup>56</sup>

1.27 As Professor Andrews explains in his report annexed to this Reply, deforestation in the tropics often leads to sedimentation of rivers in the affected basins.<sup>57</sup> This has unquestionably been true of the San Juan. Professor Andrews reviewed the available studies of forested tropical river basins, “includ[ing] basins that, like the Río San Juan basin, contain areas of volcanic soil and steep slopes and receive significant rainfall.”<sup>58</sup> He concluded from this comparative study that: “the sediment yields in the Rio San Juan Basin prior to appreciable forest clearing and landscape disturbance were likely to fall between 20 to 50 tons/km<sup>2</sup> per year, which would be 1/20<sup>th</sup> to 1/50<sup>th</sup> of Thorne’s estimated basin-wide value of 1080 tons/km<sup>2</sup> per year.”<sup>59</sup> Professor Kondolf agrees that the sediment load of the San Juan River is “much higher than would be expected from a forested landscape in this region.”<sup>60</sup> He adds: “The explanation is the uncontrolled

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<sup>56</sup> Christoph Kleinn, et al., Forest Area In Costa Rica: A Comparative Study of Tropical Forest Cover Estimates Over Time, *Environmental Monitoring and Assessment* 73: 17–40, 2002, at p. 19.

<sup>57</sup> Edmund D. Andrews, “An Evaluation of the Methods, Calculations, and Conclusions Provided By Costa Rica Regarding the Yield and Transport of Sediment in the Rio San Juan Basin,” July 2014 (hereinafter the “Andrews Report”), Section IV(B) (NR, Vol. II, Annex 3).

<sup>58</sup> *Ibid.*, Section IV(A).

<sup>59</sup> *Ibid.*, Section IV(B).

<sup>60</sup> 2014 Kondolf Report, Section 10 (NR, Vol. II, Annex 1).

deforestation and land conversion on highly erodible soils in the Costa Rican basins of the Rio San Carlos and Rio Sarapiqui.”<sup>61</sup>

1.28 Thus, the heart of Costa Rica’s argument is that any harm to Nicaragua from the Road project is not “significant” because massive and uncontrolled deforestation in Costa Rica, much of it on highly erodible slopes, has given rise to such a heavy sediment load in the San Juan River that thousands of additional cubic meters are, according to Costa Rica, “insignificant.”

1.29 For Nicaragua, however, the quantities of sediment delivered from the Road project into the river – which Costa Rica shows no sign of addressing in a responsible way – are very significant, as will be shown in Chapter 2 and in the Expert Reports annexed to this Reply. They are significant because of the harm they cause to aquatic ecosystems and to the morphology and navigability of the river, as demonstrated in Chapter 2. Because the sediment load of the receiving waters of the San Juan River is already very heavy as a result of Costa Rica’s substandard land use practices, Costa Rica should not be heard to argue that a lesser quantity contributed by its Road project is not “significant,” or does not cause Nicaragua significant harm.

1.30 The most obvious evidence of harm are the large deltas of Road-derived sediment that have come to occupy Nicaraguan territory, where water quality and aquatic life are exhibiting damage, and which make navigation impossible in certain sections of the River. These deltas represent a very small

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<sup>61</sup> *Ibid.*

percentage of the sediment the Road has contributed to the River. The rest, together with Costa Rica's other massive contributions of sediment, is causing impediments to navigation in the Lower San Juan through the creation and augmentation of sand bars, and the accumulation of sediment from Costa Rica where there used to be only water.

## **B. SUMMARY OF THE REPLY**

1.31 The balance of this Reply is organized as follows: Chapter 2 demonstrates that despite Costa Rica's claims to the contrary, significant harm was, and continues to be, caused to Nicaragua by Costa Rica's Road project. Chapter 3 shows there is also a significant risk of further harm in the future. Chapter 4 exposes Costa Rica's erroneous conception of the legal regime of the San Juan de Nicaragua river and the applicable law. Chapter 5 refutes Costa Rica's argument that its Road project does not breach the legal regime of the San Juan de Nicaragua River. Next, Chapter 6 shows why Costa Rica's claims that its Road project does not breach its obligations under international environmental law are without merit. Finally, Chapter 7 sets forth the remedies requested by Nicaragua. This Reply concludes with Nicaragua's Submissions.

## **CHAPTER 2**

### **HARM TO NICARAGUA**

2.1 In its Memorial, Nicaragua showed that large amounts of sediment are eroding into the River in amounts sufficient to cause significant environmental harm. Costa Rica denies this is the case. It claims on the basis of allegedly “solid scientific evidence” that only insignificant amounts of sediment are reaching the River and that “there has been no harm.”<sup>62</sup> It denies that it has violated any international obligations owed to Nicaragua.

2.2 In this Chapter, Nicaragua demonstrates that Costa Rica is wrong. *Section A* shows that the Road has caused, and is continuing to cause, massive amounts of sediment to erode into the River. This ongoing process is demonstrated by reference to aerial and satellite photographs of illustrative sites where the worsening erosion is demonstrated over the period October 2012 through May 2014. In *Section B*, Nicaragua shows that this has caused undeniable morphological changes to the River including, most visibly, the creation of large deltas of sediment in the River, as well as the deposit of significant quantities of sediment on the bed of the lower San Juan River. It has also seriously harmed the River’s ecological health, a fact which is proven by comparing the abundance and biodiversity of aquatic organisms in areas impacted by Road-related sediment with areas that have not been impacted. Finally,

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<sup>62</sup> CRCM, para. 5.26.

*Section C* exposes the methodological flaws in Costa Rica’s analysis that render its sediment calculations inherently unreliable.

## A. THE ROAD’S CONTRIBUTION OF SEDIMENT TO THE SAN JUAN RIVER.

### 1. *Worsening Erosion*

2.3 Costa Rica congratulates its experts -- many of whom are Costa Rican Government employees -- for having “produced” what it calls “comprehensive scientific and technical evidence” that “address[es] the question whether the Road is contributing sediment to the River, and if so, how much sediment.”<sup>63</sup> Based on their work, Costa Rica concludes that insignificant amounts of sediment are entering the River. But even a cursory visual inspection of the Road demonstrates that Costa Rica’s experts are wrong. In fact, erosion resulting from construction of the Road is causing massive amounts of sediment to enter the River.

2.4 Nicaragua annexed to its Memorial a report by Professor G. Mathias Kondolf, an expert on fluvial geomorphology at the University of California, Berkeley, and Mr. Danny Hagans and Dr. Bill Weaver, fluvial geomorphologists with decades of experience evaluating the environmental impacts of roads constructed near rivers.<sup>64</sup> Their report, which was submitted in December 2012, showed that, as of that date, dozens of sites on the Costa Rican bank of the River were experiencing severe erosion or were at risk of doing so,

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<sup>63</sup> CRCM, para. 3.7.

<sup>64</sup> 2012 Kondolf Report (NM, Vol. II, Annex 1).

with significant quantities of sediment eroding into the River. They provided a preliminary estimate that steep sections of the upper 41 km of the Road were contributing over 90,000 m<sup>3</sup> of sediment per year to the San Juan River.<sup>65</sup> Subsequent analysis has confirmed this estimate.<sup>66</sup> When the entirety of Route 1856 is considered, the contribution figure is substantially higher, probably closer to 130,000 m<sup>3</sup>. This does not include contributions from the long stretches of access roads that were altered or constructed as part of Costa Rica's project, which also contribute sediment to the River via Costa Rican tributaries. Dr. Kondolf now estimates that the full contribution of sediment to the San Juan River from Costa Rica's project is as high as 150,000 m<sup>3</sup> per year.<sup>67</sup>

2.5 Since their 2012 Report, Nicaragua's Experts have conducted follow-up visits to the River, in May 2013, October 2013, March-April 2014, and May 2014, during which they visually inspected by helicopter and boat the locations they had previously identified in order to evaluate whether the erosion of sediment into the River was continuing, and if so, to what extent. In addition, they supplemented the data gathered during these field inspections with high-resolution satellite images of the San Juan River area taken in December 2013.

2.6 Based on their first-hand inspection and analysis of satellite images, Nicaragua's Experts conclude that erosion of sediment is continuing unabated. In fact, the situation has become appreciably worse since 2012. Mr.

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<sup>65</sup> *Ibid.*, pp. 45-46.

<sup>66</sup> 2014 Kondolf Report, Section 7 (NR, Vol. II, Annex 1).

<sup>67</sup> *Ibid.*

Hagans and Dr. Weaver observe that “[n]umerous locations along Route 1856 between Mojon II and the Rio San Carlos are in a disastrous state of disrepair and exhibit severe instability since road construction began in 2011.”<sup>68</sup> As they detail in the Report included with this Reply as Annex 2: “Most all road reaches and stream crossings we observed are exhibiting varying degrees of active, ongoing erosion as a result of inadequate planning (location), design, construction, erosion control, and maintenance practices.”<sup>69</sup> They conclude that “[t]he extent of observed erosional impacts is extraordinary in scale, especially considering the very average rainfall patterns that the road has experienced over the three year period since construction began.”<sup>70</sup> In fact, the Road is in such a deteriorated state that “[i]mmediate emergency actions are needed to curtail ongoing and future erosion and sediment delivery to the Rio San Juan, and these emergency actions should be of the highest priority to all parties involved.”<sup>71</sup>

2.7 Dr. Kondolf reached the same conclusion. As he explains in his Report, which is included with this Reply as Annex 1, ongoing observation of the Road allowed him to “document changes over the period Oct 2012 – May 2014,” and “to make precise measurements of the horizontal dimensions of features at the eroding sites, allowing [him] to quantify with confidence the size of many

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<sup>68</sup> Danny Hagans & Bill Weaver, “Evaluation of Erosion, Environmental Impacts and Road Repair Efforts at Selected Sites along Juan Rafael Mora Route 1856 in Costa Rica, Adjacent to the Rio San Juan, Nicaragua,” July 2014 (hereinafter the “Hagans & Weaver Report”), Section I (NR, Vol. II, Annex 2).

<sup>69</sup> *Ibid.*

<sup>70</sup> *Ibid.*

<sup>71</sup> *Ibid.*

features and to document occurrence and magnitude of gullies and failures over this period.”<sup>72</sup> Based on this evidence, he is able to estimate “unstable fill volumes and erosion rates since late 2012, a period of only modest rains, for sites readily visible from satellite imagery and oblique aerial photographs.”<sup>73</sup>

2.8 Dr. Kondolf concludes that during this period of relatively low precipitation, the erosion problem along the Road has worsened significantly: “Erosion has visibly worsened since I first observed Rte 1856 in October 2012.”<sup>74</sup> He continues, “that so much erosion and landsliding has occurred, and that multiple culverts have washed out, in response to the modest rainfall since the land disturbance caused by construction activities for Rte 1856 only demonstrates the vulnerability of the areas disturbed by such construction.”<sup>75</sup>

2.9 The fact that the Road continues to be plagued by widespread erosion is undeniable and, in fact, undenied. Even Costa Rica’s own experts, Drs. Mende and Astorga, who authored the “Inventory of Slopes and Water Courses related to the Border Road” that is included with the Counter-Memorial as Annex 6, accept that only 2% of the slopes they inventoried are not experiencing erosion.<sup>76</sup> In other words, *98% of slopes they surveyed are eroding*. Although Drs. Mende and Astorga underestimate the magnitude of the erosion occurring

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<sup>72</sup> 2014 Kondolf Report, Section 3 (NR, Vol. II, Annex 1).

<sup>73</sup> *Ibid.*

<sup>74</sup> *Ibid.*

<sup>75</sup> *Ibid.*

<sup>76</sup> Andreas Mende & Allan Astorga, “Inventory of Slopes and Water Courses related to the Border Road N° 1856 between Mojon II and Delta Costa Rica,” September 2013 (hereinafter the “Mende & Astorga Inventory”), p. 29 (CRCM, Vol. II, Annex 6).

and mischaracterize it as “typical of a road under construction,”<sup>77</sup> even they are forced to concede that Costa Rica must undertake further work “to control the runoff and reduce sediment yields along Route 1856.”<sup>78</sup>

## 2. *Poorly Constructed Stream Crossings*

2.10 Some of the worst erosion is taking place where the Road crosses streams that debouche into the River. Costa Rica’s experts, Drs. Mende and Astorga, report that a total of 103 stream crossings have been constructed.<sup>79</sup> In all but one of these locations, Costa Rica has built crossings by depositing excavated dirt (known as “fill”) into the stream channels so that the Road can pass over. In many of these locations (48, according to Costa Rica’s experts), stream flows have been re-channeled through the fill to the River via man-made tubes called “culverts.”<sup>80</sup> At three other locations, “tree trunks rather than culverts have been installed [in the fill] to allow water to pass beneath the Road.”<sup>81</sup> And, at a further 16 locations, the stream crossing has been cut off entirely, with fill placed in the stream to block it from crossing the Road at all.<sup>82</sup> As Dr. Kondolf explained in his 2012 Report, all of these crossings are “inherently unstable features, because they involve placement of massive volumes of fill within the stream channel and valley, where it can easily be eroded and enter the river system.”<sup>83</sup>

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<sup>77</sup> *Ibid.*

<sup>78</sup> *Ibid.*, p. 30.

<sup>79</sup> See *ibid.*, p. 27.

<sup>80</sup> *Ibid.*

<sup>81</sup> *Ibid.*

<sup>82</sup> *Ibid.*

<sup>83</sup> 2012 Kondolf, p. 13; see also Figure and explanation on p. 14 (NM, Vol. II, Annex 1).

2.11 The problem has been made even worse because a great many of the stream crossings are not properly constructed. Drs. Mende and Astorga do not specify which of the 103 stream crossings they inventoried are “currently” in what they euphemistically call a “provisional state” and require “technical improvements” in “the near future,” but they accept this is the case for 42 of them.<sup>84</sup> Near-term improvements are also necessary, they concede, at a further 16 crossings that are “closed” and at nine more “where the crossing structure is broken.”<sup>85</sup> In fact, the Road’s stream crossings are in such widespread disrepair that Drs. Mende and Astorga characterize a mere ten of the Road’s 103 of them as “appropriate.”<sup>86</sup>

2.12 There is a serious risk to both to the integrity of the Road, which would be interrupted by a washed out crossing, and to the River, which would receive much of the washed out fill, in all of the places where Costa Rica has placed fill in the path of a stream bed.<sup>87</sup> Three defective stream crossings located in close proximity to one another in the stretch of River 18 km downstream of international border Marker II (also known as “Mojon II”) illustrate the point. These sites can be seen in **Figure 2.1**, which contains a satellite image taken in November 2012 (top) and another satellite image of the same location taken one year later, in December 2013 (bottom). The deterioration and attendant erosion

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<sup>84</sup> Mende & Astorga Inventory, p. 28 (CRCM, Vol. II, Annex 6).

<sup>85</sup> *Ibid.*

<sup>86</sup> *Ibid.*

<sup>87</sup> See 2014 Kondolf Report, Section 5 (NR, Vol. II, Annex 1).

into the San Juan River can be plainly seen when the two satellite image are compared.

2.13 As Mr. Hagans and Dr. Weaver observe, these examples of “actively failing and eroding hill slope, cut bank, fill slope and stream crossing areas ... illustrate the severe inadequacy and nearly total lack of erosion control efforts at failing road locations.”<sup>88</sup> In these places, which have significantly higher erosion rates and volumes of erosion than claimed by Costa Rica:

“the lack of any design and construction standards along the route has resulted in constructing extremely unstable road reaches that will be subject to continuing and future slope failures and erosional impacts to the Rio San Juan for decades to come. In their present state of disrepair, these sections of road are extremely unsafe for commercial and/or public transportation, and will require substantial financial resources to either properly close ... or redesign and reconstruct these specific road sections, as well as many other similar locations we have observed along Route 1856 in order to be suitable for public use, as well as protect Nicaraguan resources.”<sup>89</sup>

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<sup>88</sup> Hagans & Weaver Report, Section II (NR, Vol. II, Annex 2).

<sup>89</sup> *Ibid.*

**Figure 2.1.** Comparison of satellite images from November 2012 and December 2013 at Las Crucitas fill crossings, 18.0-18.2 km downstream from Mojón II, demonstrating increased gullying and failure of the road surface and slopes.



2.14 Site “C” in the satellite images above corresponds to Site 9.4 in the Inventory of Severely Eroding Sites included as Appendix A to Dr. Kondolf’s 2014 Report.<sup>90</sup> The progressive worsening of the site’s erosion can be seen in the following three images: **Figure 2.2** from October 2012; **Figure 2.3** from December 2013; and **Figure 2.4** from May 2014.

**Figure 2.2.** Severely Eroding Site 9.4, 18 km downstream of Mojon II.  
Oblique aerial view from October 2012.



<sup>90</sup> 2014 Kondolf Report, Appendix A (NR, Vol. II, Annex 1).

**Figure 2.3.** Severely Eroding Site 9.4, 18 km downstream of Mojón II.  
High-resolution satellite image of December 2013.



**Figure 2.4.** Severely Eroding Site 9.4, 18 km downstream of Mojón II.  
Oblique aerial view from May 2013.



2.15 When Dr. Kondolf inspected the site in October 2012, the fill prism blocking the stream that previously flowed into the River had a volume of approximately 21,900 m<sup>3</sup>.<sup>91</sup> Although the fill prism was then still intact, the fill face was visibly eroded by rills, gullies and sheet erosion. Consistent with these findings, Mr. Hagans and Dr. Weaver describe the site as of 2012 as follows:

“The oblique October 2012 aerial photograph illustrates the poorly constructed, unstable fill, and the absence of any serious effort to apply appropriate, effective erosion control measures at and near the crossing. The fill slope clearly displays rapid deformation following initial construction work and the road and adjacent cut and fill slopes lack any attempt at stabilization or erosion control.”<sup>92</sup>

2.16 This situation facilitated erosion of sediment into the River. They explain:

“Both road approaches to the crossing along Route 1856, and the associated high cut banks, can be assured to be delivering eroded sediment from the visible and unprotected bare soil areas by surface erosion, rill erosion, and gully erosion processes. Most all these sediments are transported to the stream crossing since it is the topographically low point seen in the images. Finally, the smaller road that has been constructed across the hill slopes below Route 1856 also appears to be a source of uncontrolled surface erosion, rill and gully erosion that is also being transported directly to the same natural stream channel, and then into the Rio San Juan. As a result, this tributary deposited a delta of eroded sediment in Nicaragua’s Rio San Juan.”<sup>93</sup>

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<sup>91</sup> 2014 Kondolf Report, Section 3 (NR, Vol. II, Annex 1).

<sup>92</sup> Hagans & Weaver Report, Section II.B (NR, Vol. II, Annex 2).

<sup>93</sup> *Ibid.*, Section II.B.

2.17 In an effort to allow the stream to pass under this poorly constructed crossing, Costa Rica installed an “undersized and/or poorly located” culvert to transfer the stream’s water from one side of the fill to the other.<sup>94</sup> The culvert, however, was so inadequate that it is not even visible in the October 2012 photograph (**Figure 2.2**). (One reason Nicaragua is aware there was a culvert is that parts of it later ended up in the River at this location.)

2.18 By December 2013, the stream crossing had failed, and newly formed gullies and slump failures are visible. Also visible is a small culvert, which is either the remainder of the initial inadequate culvert, or an equally inadequate temporary replacement.<sup>95</sup> Dr. Kondolf reports that the failure of the stream crossing created “a void space approximately 1,722 m<sup>3</sup> in volume,” corresponding to the amount of sediment that had made its way down the slope towards and into the River. This is a very large quantity of sediment, equaling approximately 215 standard dump truck loads. As can be seen in **Figure 2.2** (above), the path that the sediment traveled from the failed stream crossing to the River is plainly visible, where it accumulated in the River, forming a large delta.<sup>96</sup>

2.19 Mr. Hagans and Dr. Weaver elaborate that “[i]n the December 2013 satellite image, one can see the magnitude of the combination of gully erosion and landsliding that is uncontrolled and ongoing through and near the axis

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<sup>94</sup> 2014 Kondolf Report, Section 3 (NR, Vol. II, Annex 1).

<sup>95</sup> *Ibid.*

<sup>96</sup> *Ibid.*

of the stream crossing fill.”<sup>97</sup> They observe that “[a] large area of ponded water (a small lake) has formed at the inside edge of the road (Route 1856), clearly suggesting the culvert was either significantly undersized to convey even average rainfall events, or was poorly installed high in the fill, or both.”<sup>98</sup> Further, “[t]he downstream natural tributary channel is visibly impacted by recent deposits of transported and stored sediment,” and “the delta of eroded sediment that formed in the Rio San Juan has rapidly grown in size.”<sup>99</sup>

2.20 Portions of the initial inadequate culvert were transported to the River, and had to be removed by Nicaragua,<sup>100</sup> as shown in **Figure 2.5**.

**Figure 2.5.** Removal of culvert fragments from San Juan River adjacent to Severely Eroding Site 9.4, 18.0 km downstream of Mojón II. Photograph from October 27, 2013.



<sup>97</sup> Hagans & Weaver Report, Section II,B (NR, Vol. II, Annex 2).

<sup>98</sup> *Ibid.*

<sup>99</sup> *Ibid.*

<sup>100</sup> 2014 Kondolf Report, Section 3 (NR, Vol. II, Annex 1).

2.21 Mr. Hagans and Dr. Weaver conclude their analysis of the December 2013 satellite image by observing:

“In spite of the clearly visible ongoing erosion and downstream damage to the Rio San Juan, no apparent efforts to prevent or control erosion, landsliding (fill slope and cut slope failures), or potential future erosion at the crossing site had been undertaken between October 2012 and December 2013. If any interim erosion control or slope stabilization measures were attempted, they were obviously inappropriate and inadequate for controlling the type and magnitude of erosion that has occurred and continues to occur, and totally ineffective at protecting the Rio San Juan immediately downslope. There was no significant, visible attempt to limit impacts to the Rio San Juan.”<sup>101</sup>

2.22 As **Figure 2.4** shows, by May 2014, six months later, erosion into the San Juan River had become even worse, despite efforts that had been made to refill the failed portion of the crossing. Dr. Kondolf observes that the crossing is still “not properly drained, as water has ponded behind the crossing” and can be seen “flowing down across the face of the fill, which will erode and destabilize the fill.”<sup>102</sup> Further, the area remains subject to “continued landsliding on the slope below the road,” which has caused “trees” to “fall[] as a consequence.”<sup>103</sup> Sediment deposited in the River is present in the form of a large delta, which is even larger than in the December 2013 image.<sup>104</sup>

2.23 Based on their analysis of the May 2014 photograph, Mr. Hagans and Dr. Weaver conclude that “the large gully through the stream crossing present

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<sup>101</sup> Hagans & Weaver Report, Section II.B (NR, Vol. II, Annex 2).

<sup>102</sup> 2014 Kondolf Report, Section 3 (NR, Vol. II, Annex 1).

<sup>103</sup> *Ibid.*

<sup>104</sup> Hagans & Weaver Report, Section II.B (NR, Vol. II, Annex 2).

in the December 2013 image has been partially filled to permit limited vehicle passage on the road.”<sup>105</sup> However, “[a] large body of ponded water is still visible upstream of the road, suggesting the culvert now in place (whether the remnants of the original culvert or a replacement culvert) is plugged and deeply buried by sediments from the collapsing, rapidly eroding, and failing stream crossing fills.”<sup>106</sup> They further note the absence of any “Costa Rican efforts” to “effectively stabilize[] the failing, un-compacted stream crossing fills,” to “properly install adequate stream crossing drainage structures (culverts or bridges), or to address uncontrolled runoff and erosion from all the visible bare soil areas.”<sup>107</sup>

2.24 Mr. Hagans and Dr. Weaver conclude their assessment of the state of the site as of May 2014 by warning:

“The site is a construction disaster that has not been treated or stabilized, and it clearly threatens to fail catastrophically if a significant storm causes the ponded tributary to overtop the fill again, thereby eroding a larger portion of the entire stream crossing fill and delivering up to 21,900 m<sup>3</sup> of sediment (equivalent to 2,740 8-m<sup>3</sup> dump truck loads) directly into the Rio San Juan. The delta in the Rio San Juan appears significantly larger in the 2014 photo than in the 2012 photo … growth that will continue over the next rainy season, since no concerted efforts have been undertaken to properly redesign and reconstruct the crossing, and thereby to eliminate the active erosional processes occurring at the site.”<sup>108</sup>

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<sup>105</sup> *Ibid.*

<sup>106</sup> *Ibid.*

<sup>107</sup> *Ibid.*

<sup>108</sup> *Ibid.*

2.25 The site labeled “B” in **Figure 2.1** above, located 100 m downstream from site “C,” is plagued by similar problems. A photograph taken in October 2012 is reproduced below as **Figure 2.6**.

**Figure 2.6.** Severely Eroding Site 9.5, 18.1 km downstream of Mojon II.  
Oblique aerial view from October 2012.



2.26 This shows a substantially altered landscape. A large amount of excavated sediment -- approximately 12,000 m<sup>3</sup> -- has been placed in the path of a stream that used to feed directly into the San Juan River.<sup>109</sup> Unfortunately, as Dr. Kondolf explains, this fill “appears to have been simply dumped and pushed in place by trucks and bulldozers, and not compacted or otherwise engineered and its

<sup>109</sup> 2014 Kondolf Report, Section 3 (NR, Vol. II, Annex 1); Hagans & Weaver Report, Section II.C (NR, Vol. II, Annex 2).

slopes stabilized, as would be required by international standards.”<sup>110</sup> Once again, no culvert is visible, indicating that it too was significantly undersized (assuming one had been installed at all).<sup>111</sup>

2.27 By the time of the December 2013 satellite image, “large-scale failure of the fill is evident,”<sup>112</sup> as can be seen in the close-up reproduced at **Figure 2.7**, below.

**Figure 2.7.** Severely Eroding Site 9.5, 18.1 km downstream of Mojon II.  
High-resolution satellite image of December 2013.



<sup>110</sup> 2014 Kondolf Report, Section 3 (NR, Vol. II, Annex 1).

<sup>111</sup> *Ibid.*

<sup>112</sup> *Ibid.*

2.28 Dr. Kondolf estimates that at least 2,860 m<sup>3</sup> of sediment was deposited in the San Juan River when the fill failed.<sup>113</sup> Dr. Kondolf explains:

“most of the 2,860 m<sup>3</sup> of sediment from this failure (the equivalent of approximately 357 dump trucks) was carried into the river, with some contribution to the newly expanded delta deposit. ... [T]his failure is only one component of erosion from this crossing; the total erosion, which includes all sheet, rill, gully, and landslide erosion, is considerably more.”<sup>114</sup>

2.29 Mr. Hagans and Dr. Weaver agree. They observe that in 2012 “severe deformation and slumping is visible on both the upstream and downstream fill slope faces almost immediately after construction of the stream crossing.”<sup>115</sup> By the time of the 2013 satellite image (**Figure 2.7** above), the stream crossing fill had “failed (eroded) ... delivering over 2,860 m<sup>3</sup> of eroded sediment to the Rio San Juan.”<sup>116</sup> They attribute this failure to a “poorly designed (probably greatly under-designed and undersized) stream crossing culvert, combined with native hill slope failures triggered by the initial road construction work.”<sup>117</sup>

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<sup>113</sup> *Ibid.*

<sup>114</sup> *Ibid.*

<sup>115</sup> Hagans & Weaver Report, Section II.C (NR, Vol. II, Annex 2).

<sup>116</sup> *Ibid.*

<sup>117</sup> *Ibid.*

**Figure 2.8.** Severely Eroding Site 9.5, 18.1 km downstream of Mojon II.  
Oblique aerial view from May 2014.



2.30 As can be seen in the May 2014 photograph reproduced at **Figure 2.8** above, the failed crossing had by that time been reconstructed, with new fill having been placed in the void left by the prior failure.<sup>118</sup> However, this did not solve the problem. Erosion had begun anew and the stream crossing failed again.<sup>119</sup>

2.31 As Mr. Hagans and Dr. Weaver explain, the May 2014 photograph shows “two large landslides” that are located “on the hill slopes just upstream of the road crossing,” and these “may have caused the stream crossing failure by plugging the culvert, or they may have been triggered by saturation of the toe of the slopes when the new stream crossing culvert plugged and a small lake formed

<sup>118</sup> 2014 Kondolf Report, Section 3 (NR, Vol. II, Annex 1).

<sup>119</sup> *Ibid.*; Hagans & Weaver Report, Section II.C (NR, Vol. II, Annex 2).

behind the fill.”<sup>120</sup> These “landslides and stream crossing failure had a large impact on the Rio San Juan, as all the landslide debris and eroded sediment was transported the short distance to the river.”<sup>121</sup> The result is the “greatly enlarged delta in the river” that is clearly visible in the May 2014 photograph.<sup>122</sup>

2.32 Dr. Kondolf adds, “A small culvert is visible within the prism of the rebuilt crossing.”<sup>123</sup> However, the culvert is “grossly undersized and is improperly … perched far up in the fill prism.”<sup>124</sup> The placement of the culvert is “inherently unstable” because of the “likelihood that water will seep around the pipe and cause it to fail again. This poses a severe risk for any vehicles attempting to drive over the fill, let alone transport hazardous materials here.”<sup>125</sup>

2.33 Similar problems are evident in the third -- and largest -- of the three failed stream crossings depicted in **Figures 2.9-2.11** below. That site is located another 100 m downstream and is labelled “A” on those images. The photograph reproduced at **Figure 2.9** shows what the site looked like in October 2012.

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<sup>120</sup> Hagans & Weaver Report, Section II.C (NR, Vol. II, Annex 2). Mr. Hagans and Dr. Weaver note: “The plugged culvert caused stream flow to pond, overtop the road fill, and consequently erode a large portion of the fill crossing (clearly visible in the December 2013 satellite image).” *Ibid.*

<sup>121</sup> *Ibid.*

<sup>122</sup> *Ibid.*

<sup>123</sup> 2014 Kondolf Report, Section 3 (NR, Vol. II, Annex 1).

<sup>124</sup> *Ibid.*

<sup>125</sup> *Ibid.*

**Figure 2.9.** Severely Eroding Site 9.6, 18.2 km downstream of Mojon II.  
Oblique aerial view from October 2012.



2.34 Once again, a stream crossing has been blocked with fill to allow the Road to cross over. Mr. Hagans and Dr. Weaver explain that this image shows that the site is already “undergoing serious deformation and erosion of the downstream fill slope very soon after construction.”<sup>126</sup> The amount of fill blocking the stream is much larger than in the preceding two examples, totaling approximately 44,000 m<sup>3</sup> in volume.<sup>127</sup> In addition, the culvert, which is barely

<sup>126</sup> Hagans & Weaver Report, Section II.D (NR, Vol. II, Annex 2).

<sup>127</sup> *Ibid.*

visible in the lower right of the fill, is undersized and improperly placed.<sup>128</sup>

According to Mr. Hagans and Dr. Weaver:

“The culvert that is visible in the October 2012 photograph is poorly located, being far too high in the crossing fill. It is small and placed near the middle of the fill prism ... a practice that is inconsistent with modern engineering standards for proper road construction. Also present on the 2012 photo is a large debris landslide located upstream of the stream crossing that is likely compromising and/or plugging the culvert inlet with deposited sediment. It was likely triggered by initial road construction and/or ponding behind the culvert inlet caused by culvert plugging and subsequent saturation of the basal fill and hill slope.”<sup>129</sup>

2.35 Dr. Kondolf concurs, observing: “Normally a culvert would be larger for such a crossing and located at the base of the fill, along the grade of the original streambed. Already in the October 2012 photograph active erosion and slumping of the fill face are visible.”<sup>130</sup>

2.36 As shown in **Figure 2.10**, by December 2013, the fill prism at this crossing had substantially failed, with three large gullies having appeared.<sup>131</sup> Mr. Hagans and Dr. Weaver observe that by this time, “uncontrolled runoff on the fill slopes has resulted in significant enlargement of the immense gully network, where virtually all the eroded sediment has been delivered down slope to the Rio San Juan.”<sup>132</sup>

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<sup>128</sup> *Ibid.*

<sup>129</sup> *Ibid.*

<sup>130</sup> 2014 Kondolf Report, Section 3 (NR, Vol. II, Annex 1).

<sup>131</sup> *Ibid.*

<sup>132</sup> Hagans & Weaver Report, Section II.D (NR, Vol. II, Annex 2).

**Figure 2.10.** Severely Eroding Site 9.6, 18.2 km downstream of Mojon II.  
High-resolution satellite image of December 2013.



2.37 Dr. Kondolf reports that “the[se] gullies measure 80 m across (in the direction parallel to the river bank), and 50 m horizontally from the headcuts down to the foot of the fill slope.”<sup>133</sup> He calculates that “the volume represented by these three gullies – the volume of sediment already eroded from the stream crossing fill prism – totals about 6,600 m<sup>3</sup>, or about 15% of the original total fill volume. This is a truly massive quantity of sediment, the equivalent of about 825

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<sup>133</sup> 2014 Kondolf Report, Section 3 (NR, Vol. II, Annex 1).

dump truck loads.”<sup>134</sup> Moreover, Dr. Kondolf’s estimate does *not* include sediment from erosion taking place at the site outside of the three gullies.<sup>135</sup>

2.38 Subsequent inspection and photographs of the site in May 2014 reveal that it remains in a state of substantial disrepair and is unsafe for vehicular traffic.<sup>136</sup> Erosion continues unabated and there is no sign of meaningful mitigation efforts.<sup>137</sup> As Mr. Hagans and Dr. Weaver explain, the May 2014 photograph (**Figure 2.11** below) confirms that “no efforts have been made to control or prevent future erosion on the fill slopes, or to disconnect the adjacent road approaches from draining runoff and associated eroded sediment originating from the large expanses of bare soil visible in the photographs, directly to the stream crossing fill and ultimately to the Rio San Juan.”<sup>138</sup> In fact, they estimate that “approximately half the road prism width, and a large portion of the outer fill slope, had already failed and delivered sediment downslope and downstream to the Rio San Juan.”<sup>139</sup>

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<sup>134</sup> *Ibid.*

<sup>135</sup> *Ibid.*

<sup>136</sup> *Ibid.*

<sup>137</sup> *Ibid.*

<sup>138</sup> Hagans & Weaver Report, Section II.D (NR, Vol. II, Annex 2).

<sup>139</sup> *Ibid.*

**Figure 2.11.** Severely Eroding Site 9.6, 18.2 km downstream of Mojon II.  
Oblique aerial view from May 2014.

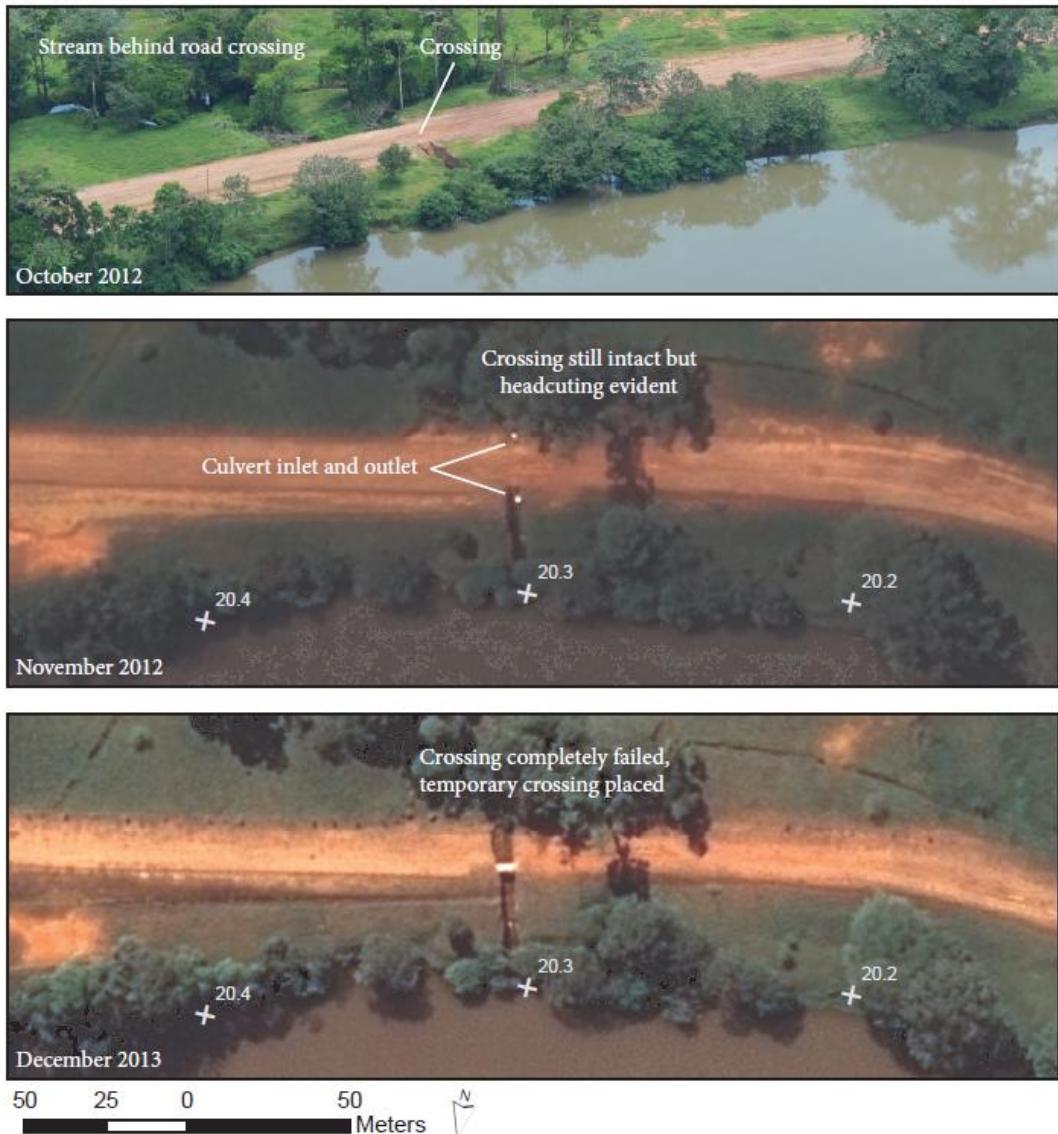


2.39 Steep slopes are not the only locations where defective stream crossings have caused ever-worsening erosion into the River. It is also occurring in flat areas where, Costa Rica insists, “there is nothing to say.”<sup>140</sup> Consider, for instance, the following stream crossing (**Figure 2.12**), which is located on level ground 2 km downstream from the three sites discussed above.

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<sup>140</sup> See CRCM, paras. 3.17, 3.19.

**Figure 2.12.** Helicopter and satellite imagery of failed fill crossing on flat land 20.3 km downstream of Mojon II.



2.40 When Dr. Kondolf first observed this site in October 2012, erosion was already evident at the edge of the stream crossing (top). By December 2013 (bottom), the crossing had failed completely, and both the fill and the culvert that

had been used to build the crossing had entered the San Juan River.<sup>141</sup> This failure alone produced a sediment pulse of approximately 480 m<sup>3</sup> – over 800 tons – of fill material, which has created a sizeable delta of sediment in the River (depicted in **Figure 2.13** below).<sup>142</sup>

**Figure 2.13.** Broken culvert pipes and fill material extending into the San Juan River at location of stream crossing failure on flat land. Photograph from March 31, 2014.



2.41 Since that failure, the crossing has been re-filled with fill material, only this time without the benefit any culvert at all, as can be seen in **Figure 2.14** below.<sup>143</sup> Consequently, water from the stream is flowing directly over the

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<sup>141</sup> 2014 Kondolf Report, Section 5 (NR, Vol. II, Annex 1).

<sup>142</sup> *Ibid.*

<sup>143</sup> *Ibid.*

loosely compacted fill material.<sup>144</sup> This construction practice all but guarantees further erosion of sediment into the River.<sup>145</sup>

**Figure 2.14.** Fill placed in channel with no culvert to provide temporary crossing, allowing water to flow over the fill. Photograph from March 31, 2014.



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<sup>144</sup> *Ibid.*

<sup>145</sup> *Ibid.*

### **3. *Slopes***

2.42 Large-scale sediment transfers to the River are also taking place along steep hillsides where shoddy construction has all but guaranteed this result.

2.43 Mr. Hagans and Dr. Weaver observe there “are many locations along Route 1856 where recently constructed cut slopes and fill slopes are experiencing uncontrolled and inordinately high rates of erosion following construction.”<sup>146</sup> In these places, “large bare soil areas are eroding and failing by all three erosional processes: landsliding, gullying and surface erosion.”<sup>147</sup> They note that “[w]hile some efforts have been undertaken to stabilize a few of the locations, at many it appears as if the road has been abandoned and no efforts have been made to control or curtail the ongoing erosion and slope failures, or to reduce potential impacts to the Rio San Juan, over the 20-month period of our photographic record.”<sup>148</sup>

2.44 The phenomenon is illustrated well at two such sites located 200 m from one another in a stretch of River located approximately 2 km upstream of the first severely eroding stream crossing discussed above. In both cases, worsening erosion and the consequent deposit of sediment into the River is clear from a comparison of images captured between October 2012 and May 2014. As Mr. Hagans and Dr. Weaver explain, these sites are “examples of poorly designed,

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<sup>146</sup> Hagans & Weaver Report, Section III (NR, Vol. II, Annex 2).

<sup>147</sup> *Ibid.*

<sup>148</sup> *Ibid.*

poorly constructed and unmaintained cut and fill slopes along Route 1856” and that “[b]oth image comparisons depict badly deteriorated and rapidly eroding and failing cut slopes and fill slopes located directly adjacent to the Rio San Juan.”<sup>149</sup>

Each site is characterized by:

“extensive fill slope landslide instabilities that are enlarging through time; active and large scale gullying associated with poor road drainage practices and highly erodible, uncompacted materials; sporadic cut slope failures associated with undercutting and constructing over-steepened slope cuts in fine grained soils during the attempts at road construction; and widespread surface erosion from the extensive and easily visible bare soil areas present in the photographs.”<sup>150</sup>

2.45 The first (Site 8.1 in the Inventory of Severely Eroding Sites included in Dr. Kondolf’s Report, depicted in **Figures 2.15-2.17** below) is a steeply sloped area where, as Mr. Hagans and Dr. Weaver explain, erosion has been caused by a “partially constructed (pioneered) reach of Route 1856 across a steep ridge between two adjacent tributary stream channels” sited within just “100 m of the Rio San Juan.”<sup>151</sup>

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<sup>149</sup> *Ibid.*, Section III.A.

<sup>150</sup> *Ibid.*

<sup>151</sup> *Ibid.*, Section III.B.

**Figure 2.15.** Severely Eroding Site 8.1, 16.1 km downstream of Mojon II.  
Oblique aerial view from October 2012.



**Figure 2.16.** Severely Eroding Site 8.1, 16.1 km downstream of Mojon II.  
High-resolution satellite image of December 2013.



**Figure 2.17.** Severely Eroding Site 8.1, 16.1 km downstream of Mojon II. Oblique aerial view from May 2014.



2.46 **Figure 2.15** is a photograph of the site taken from a helicopter in October 2012. **Figure 2.16** is a satellite image of the same site from December 2013. **Figure 2.17** is another helicopter-based photograph of the same site taken in May 2014. Comparison of the three images shows the effects of Costa Rica's failure to take erosion-control measures, causing sediment to erode into the River. As Mr. Hagans and Dr. Weaver explain: "The sequence of three images captured in 2012, 2013 and 2014 indicate initial construction activities were completed along the road reach by October 2012, and no visible or substantive work on the failing road has been done since 2012."<sup>152</sup> In fact, "the only visible changes during the 20 month time period are actively developing, uncontrolled and

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<sup>152</sup> Hagans & Weaver Report, Section III.B (NR, Vol. II, Annex 2).

enlarging gullies and landslides present on the un-compacted, sidecast fill slopes, and evidence of widespread surface erosion on the visible bare soil areas through time.”<sup>153</sup>

2.47 In particular, the October 2012 photograph reveals that, by that time, the site was characterized by a “smooth textured excavation surface” and that “[p]oor or non-existent fill compaction during construction could have easily led an experienced geologist or engineer in October 2012 to predict the resulting instabilities and extent of erosion now present on the fill slopes at this site.”<sup>154</sup>

2.48 Subsequent images from 2013 and 2014 demonstrate that Costa Rica ceased construction work without attempting to control the inevitable erosion. Mr. Hagans and Dr. Weaver observe that “the reach of road was just abandoned (walked away from) following the 2012 construction work, with no visible efforts to address and control surface erosion from the large expanse of exposed bare soil through seeding and/or mulching the surfaces to protect the soil from raindrop impact and sheet wash erosional processes.”<sup>155</sup> The result was “widespread and obvious gullies of varying dimensions,” which Mr. Hagans and Dr. Weaver observe, “are undermining and further contributing to the formation/incidence of fill slope failures observed and present on the 2014 photograph.”<sup>156</sup>

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<sup>153</sup> *Ibid.*

<sup>154</sup> *Ibid.*

<sup>155</sup> *Ibid.*

<sup>156</sup> *Ibid.*

2.49 Similar deficiencies are evident 100 m downstream at Site 8.2 in Dr. Kondolf's Inventory of Severely Eroding Sites, most of which is located within 100 m of the river.<sup>157</sup> Images captured in October 2012, December 2013, and May 2014 (reproduced at **Figures 2.18-2.20** below) demonstrate that, just as at the previously discussed site, Costa Rica abandoned its road construction and did not undertake any efforts “to perform post-construction site or slope stabilization or to implement pre-wet season temporary, permanent, or emergency erosion control measures.”<sup>158</sup> Visual inspection of the site reveals the “total absence of road design and construction plans or standards, and the lack of competent construction inspection and management,” which has “resulted in the immediate and progressive development of cut slope and fill slope instabilities over the 20 month period covered by these images of the site.”<sup>159</sup>

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<sup>157</sup> 2014 Kondolf Report, Section 3 (NR, Vol. II, Annex 1).

<sup>158</sup> Hagans & Weaver Report, Section III.C (NR, Vol. II, Annex 2).

<sup>159</sup> *Ibid.*

**Figure 2.18.** Severely Eroding Site 8.2, 16.2 km downstream of Mojon II.  
Oblique aerial view from October 2012.



**Figure 2.19.** Severely Eroding Site 8.2, 16.2 km downstream of Mojon II.  
High-resolution satellite image of December 2013.



**Figure 2.20.** Severely Eroding Site 8.2, 16.2 km downstream of Mojon II.  
Oblique aerial view from May 2014.



2.50 In particular, Mr. Hagans and Dr. Weaver observe that in October 2012, there was already a “cut slope landslide” that may be seen “in the center of the photo.”<sup>160</sup> Also present in the photograph is a “developing arcuate crown scarp system along the outer edge of the road”; this indicates “pending fill slope failures within the un-compacted, loose sidecast fill materials that had been bulldozed onto the steep hill slope during road building.”<sup>161</sup>

2.51 Analysis of the December 2013 image reveals that erosion had worsened by that time. Mr. Hagans and Dr. Weaver observe that “the scarp system continue[d] to be more pronounced and integrated along the outside edge of the road, as the unstable fill slopes continue[d] to deform” and that the “largest

<sup>160</sup> Hagans & Weaver Report, Section III.C (NR, Vol. II, Annex 2).

<sup>161</sup> *Ibid.*

gullies at Site 8.2 are coincidentally located along the lateral scarp margins that define the most unstable and actively failing fill slopes at the site.”<sup>162</sup>

2.52 These problems are even more evident in the May 2014 photograph, which also shows the development of “two more recent and larger cut slope failures” located at “either end of the cut bank.”<sup>163</sup> Mr. Hagans and Dr. Weaver explain:

“These features clearly suggest there was little or no pre-construction geotechnical analysis of the terrain and subsurface geology that would have indicated the unstable nature of the earth materials. This common-place and standard geotechnical and geologic analysis would have predicted the lack of soil and bedrock competency and strength, and subsequently would have been used to develop proper engineering designs for this and other sites along the road which are now exhibiting massive surface erosion and road failure.”<sup>164</sup>

2.53 In sum, with respect to the eroding hilly slopes located at Sites 8.1 and 8.2, Mr. Hagans and Dr. Weaver conclude:

“Over the 20 month period of our analysis of oblique aerial photographs and high-resolution satellite images, there is a clear lack of any significant or visible efforts to control, repair or prevent the very visible, ongoing and future landslide, gully and surface erosion that is apparent in the two cut and fill slope examples. The incompletely constructed road reach at Site 8.1 and 8.2 reveals a complete disregard for following even the most basic, well accepted road engineering and road maintenance principles normally applied during road construction. Even more egregious is the total disregard for site specific and cumulative environmental impacts that continue to be

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<sup>162</sup> *Ibid.*

<sup>163</sup> *Ibid.*

<sup>164</sup> *Ibid.*

experienced by Nicaragua, as well as to Costa Rican natural resources.”<sup>165</sup>

2.54 The six sites described above are just a few examples of the widespread erosion and failure of slopes and stream crossings that are taking place at many locations along the Road. The Inventory of Severely Eroding Sites that is included as Appendix A to Dr. Kondolf’s new Report documents the existence of many additional problem sites. In total, Dr. Kondolf and his team have identified at least 17 stretches where severe erosion is visible from the air or satellites, covering an area of over 788,000 m<sup>2</sup>, much of it in close proximity to the San Juan River.<sup>166</sup>

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<sup>165</sup> *Ibid.*, Section III.D.

<sup>166</sup> 2014 Kondolf Report, Section 3 (NR, Vol. II, Annex 1).

## B. THE ACCUMULATION OF SEDIMENT IN THE RIVER

### *1. Deltas*

2.55 Costa Rica denies that the significant sediment transfers into the River caused by these and other failures have had any appreciable impact.<sup>167</sup> This is plainly wrong. The most obvious impact is the huge accumulations of sediment, known as “deltas,” that have developed in the River itself (which, it must always be recalled, is entirely within Nicaragua’s sovereign territory).

2.56 The deltas caused by erosion from the sites just reviewed are a few examples. They are, by any measure, substantial in size. By 30 March 2014, when it was measured in the field, the easternmost of the two shown in **Figure 2.11** extended fully 15 meters into the River, and measured 21 meters across and 2 meters above the River’s surface.<sup>168</sup> Close-up images may be found at **Figure 2.21**. The western delta is of similar dimensions.<sup>169</sup>

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<sup>167</sup> E.g., CRCM, para. 3.76.

<sup>168</sup> 2014 Kondolf Report, Section 11, Appendix F (NR, Vol. II, Annex 1).

<sup>169</sup> *Ibid.* In light of size of this and the other deltas described above, Professor Thorne’s claim that the Road-related deltas have “small dimensions” and are of “morphological insignificance” is inexplicable. Dec. 2013 Thorne Report, para. 9.1 (CRCM, Vol I, Appendix A).

**Figure 2.21.** Delta deposit below Severely Eroding Site 9.6.  
Photographs and measurements from March 30, 2014.



2.57 The delta caused by sediment eroding into the River from the site shown in **Figure 2.4** is also large. **Figures 2.22** and **2.23** provide closer views. Measurements taken on 30 March 2014 reveal that the delta extends 10 meters into the River, is 25 meters wide, and is 1.8 meters above the surface of the River.<sup>170</sup>

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<sup>170</sup> 2014 Kondolf Report, Section 11, Appendix F (NR, Vol. II, Annex 1).

**Figure 2.22.** Delta deposit below Severely Eroding Site 9.4.  
Photograph from March 30, 2014.



**Figure 2.23.** Delta deposit below Severely Eroding Site 9.4.  
Photograph from March 30, 2014.



2.58 Similarly, as shown in **Figure 2.24**, a March 2014 inspection of the failed stream crossing on level terrain discussed at paragraphs 2.39-2.41 above, also reveals a large sediment delta reaching into the River that consists of approximately 40-80 tons of sediment (representing only a small percentage of what the full pulse had been), as well as fragments of the failed culvert.<sup>171</sup>

**Figure 2.24.** Delta deposit from fill material of failed crossing 20.3 km downstream of Mojón 2 extending into the San Juan River. Photograph from March 31, 2014.



2.59 There are other examples as well, including the delta visible in **Figures 2.25-2.27**, below, which relates to Dr. Kondolf's Severely Eroding Site 9.7 (not one of the sites discussed in detail above).

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<sup>171</sup> See *Ibid.*, Section 5.

**Figure 2.25.** Delta deposit from Severely Eroding Site 9.7.  
Aerial photograph from May 2, 2014.



**Figure 2.26.** Delta deposit from Severely Eroding Site 9.7.  
Photograph from March 30, 2014.



**Figure 2.27.** Delta deposit from Severely Eroding Site 9.7.  
Photograph from March 30, 2014.



## ***2. Sediment Accumulation in the Lower San Juan River***

2.60 Costa Rica argues that there are no significant impacts to the Lower San Juan River below its bifurcation from the Colorado River because “the average increase in the rate of aggradation of the bed would be less than 0.02 mm [per year] – less than the diameter of a single grain of sand.”<sup>172</sup> As Dr. Kondolf explains, “[w]hile perhaps a visually compelling image, this argument is a significant distortion and is fallacious on two important counts.”<sup>173</sup>

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<sup>172</sup> CRCM, para. 3.76(c).

<sup>173</sup> 2014 Kondolf Report, Section 11 (NR, Vol. II, Annex 1).

2.61 Costa Rica's argument (which is itself based on an unreasonably low estimate of how much road-derived sediment is making its way to the San Juan River<sup>174</sup>) betrays a fundamental misunderstanding of the dynamics of sediment distribution. As the Counter-Memorial explains, the 0.02 mm figure is based on two assumptions:

- That “only the sand fraction of the additional sediment would actually be likely to be deposited on the bed”,<sup>175</sup> and
- That it will be distributed over the entire Lower San Juan, which “has a bed area of 2.7 million m<sup>2</sup>. ”<sup>176</sup>

Both of these assumptions are incorrect and do not reflect the realities of sediment deposition in deltas.<sup>177</sup>

2.62 As Dr. Andrews explains, Costa Rica's assumption that 90-95% of the Road's contribution of sediment will be washed out to the Caribbean Sea<sup>178</sup> is at odds with well-established principles concerning how sediment behaves in deltaic regions.

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<sup>174</sup> See Section C of this Chapter, below. Costa Rica also incorrectly assumes that only 10% of the Road's contribution of sediment will end up in the Lower San Juan. Andrews Report, Section V(F) (NR, Vol. II, Annex 3).

<sup>175</sup> CRCM, para. 3.32.

<sup>176</sup> *Ibid.*

<sup>177</sup> Dr. Andrews observes that it is not only the underlying assumptions of Costa Rica's assertion that are erroneous, but the simple calculation itself. Andrews Report, Section V(I) (NR, Vol. II, Annex 3). The Counter-Memorial's assertion that “[a]dditional aggradation is therefore likely to be 0.02 mm y<sup>-1</sup>” is based on Professor Thorne's calculation that if all the sediment from the Road that enters the Lower San Juan (3,650 m<sup>3</sup> per year according to his estimate) were deposited across a bed area of 2,700,000 m<sup>2</sup>, “the average increase in the rate of aggradation of the bed would be less than 0.2 mm y<sup>-1</sup>.” CRCM, para 3.32; Thorne para 8.59. However, as Dr. Andrews observes, “3650 m<sup>3</sup> of sediment spread over 2.7 million m<sup>2</sup> would be 1.35 mm thick, not less than 0.2 mm as stated; (3650/2,700,000 = 0.00135).” Andrews Report, Section V(I) (NR, Vol. II, Annex 3).

<sup>178</sup> CRCM, para 3.32.

2.63 To begin with, the River’s bedload and coarse suspended sediments are deposited in the first few kilometers after the bifurcation because in that part of the River the flow slackens, leaving it unable to support the sediment and causing it to settle to the channel bed.<sup>179</sup> Thus, it is mistaken to assume, as Costa Rica does, that the coarser sediment will be deposited throughout the entire 32-km length of the Lower San Juan, with the remainder washed out to sea, since the River does not have the capacity to carry such coarse sediment for long distances. According to Dr. Andrews, nearly all of the coarse sediment (bedload and coarse suspended sand), 12 to 18 percent of the Lower San Juan’s total sediment load, will settle within the first three kilometers.<sup>180</sup> As a result, significant amounts of sediment will accumulate in this area.

2.64 Even this underestimates sediment accumulation because the sediment will not be distributed uniformly across the channel. In fact, as Dr. Kondolf explains, it is “implausible and unrealistic” to assume that road-derived sediment entering the Lower San Juan will be evenly distributed across the riverbed.<sup>181</sup> Rather, “[o]f the sediment that is deposited in the river channel, most of it will build up (or ‘aggrade’) on discrete bars, which can occur in the middle of the channel or along the margins, depending on local hydraulic conditions and other factors.”<sup>182</sup> Sediment will also “deposit (or ‘accrete’) along the edges of

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<sup>179</sup> Andrews Report, Section V(I) (NR, Vol. II, Annex 3).

<sup>180</sup> *Ibid.*

<sup>181</sup> 2014 Kondolf Report, Section 11 (NR, Vol. II, Annex 1).

<sup>182</sup> *Ibid.*

islands and/or the river bank,” which can result in islands increasing in size and the enlargement of the bank, even “causing the two features to join.”<sup>183</sup> The places where sediment is most likely to accumulate are those where the river’s flow is slow, “such as along the river bank and where velocities are slowed by islands or other features,”<sup>184</sup> including existing sand bars. This can also cause the clogging of small distributary channels, which will force the flow of water to move to a new location.<sup>185</sup>

2.65 Dr. Andrews concurs, explaining that a focus on “average thickness of deposition understates the magnitude of the potential problems, because the accumulating sediment won’t be distributed evenly across the delta channels.”<sup>186</sup> Rather, “accumulating sediment” will

“tend to form bars, which are evident along the delta channels, creating reach-wise instabilities and obstructions to navigation. River bars will grow over time and merge with the river banks; a process known as ‘accretion.’ Vegetation will gradually become established on the river bars, which will induce more sediment deposition and the channel will narrow. As the channel fills with sediment, the capacity of the channel will be reduced over time and eventually the flow will find a new course to the ocean. Thus, an increased supply of sediment to the head of the delta will tend to accelerate the rate of filling and abandonment of one channel and the diversion of flow to a new channel.”<sup>187</sup>

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<sup>183</sup> *Ibid.*

<sup>184</sup> *Ibid.*

<sup>185</sup> *Ibid.*

<sup>186</sup> Andrews Report, Section V(I) (NR, Vol. II, Annex 3).

<sup>187</sup> *Ibid.*

2.66 Thus, the danger is not that road-derived sediment reaching the Lower San Juan will distribute evenly across the riverbed and cause the entire bed to rise up in a uniform way. Instead, the sediment will exacerbate the existing problem of sand bars and other areas of localized sediment accumulation, making navigation on the Lower San Juan and its small distributary channels even more difficult than in the past, or, in some places, making the river impassable. As the Court is aware, these pre-existing problems are already the focus of Nicaragua's dredging program, which is aimed at ensuring the navigability of the lower reaches of the River.<sup>188</sup> From the Road alone, 1,270 to 2,340 m<sup>3</sup> of sediment are highly likely to remain in the upper 3 km of the Lower San Juan, where they will accumulate around these problem areas. When all the sediment related to construction of the Road is considered, *i.e.*, including sediment contributed from access roads, 1,390 to 2,700 m<sup>3</sup> of sediment will enter the upper 3 km each year to accumulate on sandbars and other areas of localized accumulation.<sup>189</sup> These new sediments make Nicaragua's challenge Sisyphean: because of the Road, more sediments enter the River than Nicaragua, using its present resources, is able to dredge out of it.

2.67 It is not only the coarser particles that settle and accumulate on the bed of the Lower San Juan. Finer suspended particles will also be deposited once they reach the "brackish" (*i.e.*, partially salty) water that exists in the stretches of

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<sup>188</sup> *Certain Activities*, NCM, Chapter 4, Section A.

<sup>189</sup> Andrews Report, Section V(I) (NR, Vol. II, Annex 3).

the River nearer to the Caribbean. In those reaches, a process called “flocculation” occurs, in which fine sediment particles such as silt and clay will clump together, and sink to the bottom of the channel. Dr. Andrews estimates that the “vast majority” of the finer portions of road-derived sediment will accumulate in the Delta, including in the Lower San Juan and its distributary channels.<sup>190</sup>

2.68 Where exactly this accumulation takes places will depend on such factors as tide and storm surges, which can push seawater farther into the Lower San Juan and related areas, and whether the River’s flow is high or low, because high flows have the capacity to push salty water back out to the sea. As Dr. Andrews explains, “[a] substantial portion of the sediment will be deposited, eroded, transported, and then re-deposited.”<sup>191</sup> Costa Rica’s claims regarding accumulation in the Lower San Juan ignores this process and what is likely to be the true destination of the great majority of the road-derived sediment that reaches the Delta. Between accumulation of coarser particles in the upper portion of the channel, and accumulation of the finer suspended particles in the lower reaches through flocculation, *almost all* of the sediment supplied by the Road to the Lower San Juan will remain there.

2.69 Costa Rica also wrongly assumes that only the sediment from the Road itself is relevant. In reality, the threat of aggradation and accretion in the Lower San Juan stems not only from Road-derived sediment, but also from what

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<sup>190</sup> *Ibid.*

<sup>191</sup> *Ibid.*

Professor Thorne describes as Costa Rica's other "massive"<sup>192</sup> contributions of sediment, which "dominate[]"<sup>193</sup> the River's sediment regime<sup>194</sup> and form the unnaturally elevated background condition against which the impacts of the Road must be assessed.<sup>195</sup> As can be seen for example in Andrews Report<sup>196</sup>, the sources of this sediment are the Costa Rican basins that supply much of sediment in the River. Those basins have experienced significant deforestation and changes in land use, increasing the amount of sediment they contribute to the River.<sup>197</sup> According to Dr. Andrews, the sediment yield Costa Rica currently reports for the basin is 20 to 50 times the basins' natural levels.<sup>198</sup>

2.70 Given its size, slope, and flow, the Lower San Juan River currently has the capacity to transport approximately 75,000 m<sup>3</sup> of relatively coarse sediment per year.<sup>199</sup> Costa Rica estimates that 71,000 tons of bedload (equivalent to roughly 43,000 m<sup>3</sup>) reach the Lower San Juan annually.<sup>200</sup> Dr. Andrews explains that this estimate is incomplete, as it does not include the coarse suspended sand that will be deposited in the upper part of the channel, and that

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<sup>192</sup> Thorne, para. 5.14, characterizing as "massive" the more than 4.5 million tons of sediment the San Carlos River contributes annually to the San Juan River, accounting for approximately 50% of Thorne's total load figure of around 9 million tons. The contribution from the Sarapiqui River is separate, and also "major" according to Professor Thorne, para. 5.15, totaling an additional one million tons of sediment, or more, per year (Table 16).

<sup>193</sup> Thorne, para. 9.10 (explaining that the River's sediment regime is "dominated by high and variable sediment inputs from the San Carlos and Sarapiqui basins, which supply the vast majority of sediment carried by the River.").

<sup>194</sup> Andrews Report, Section IV(D) (NR, Vol. II, Annex 3).

<sup>195</sup> Andrews Report (NR, Vol. II, Annex 3). See also 2014 Konfold Report (NR, Vol. II, Annex1) and para. 1.27 above.

<sup>196</sup> See paras 1.25-1.27 above.

<sup>197</sup> Andrews Report, Section IV(A) (NR, Vol. II, Annex 3).

<sup>198</sup> *Ibid.*, Section V(I).

<sup>199</sup> CRCM. para. 3.31.

when long-term average flows and sediment transport rates are taken into account, the true load of coarse sediment delivered to the Lower San Juan on an annual basis is 100,000 to 150,000 m<sup>3</sup> per year.<sup>200</sup> Either way, the fundamental point is the same: the Lower San Juan does not have the capacity to transport a large portion of the coarse sediment delivered to it (most of which comes from Costa Rica, as Costa Rica concedes). Anything the River cannot carry will be deposited; and because the river cannot carry this excess sediment far, it is highly likely that all of it will accumulate in the upper 3 km of the Lower San Juan.

2.71 If the excess coarse sediment delivered to the Lower San Juan were to be spread evenly over the first 3 kilometers where it will actually deposit, levels of accumulation would be somewhere between 10 and 30 centimeters per year, far greater than “a single grain of sand.” Once again, however, sediment will actually be worse in certain places where the flow is slower, as on sand bars, islands, and along the banks.

2.72 In this context, any new input from the Road will be deposited, and exacerbate existing problems largely attributable to poor land-use practices in Costa Rica. As sediment accumulates in the channel, it decreases the River’s ability to transport sediment, which, in a positive feedback loop, accelerates the process of accumulation.<sup>201</sup>

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<sup>200</sup> Andrews Report, Section V(I) (NR, Vol. II, Annex 3).

<sup>201</sup> *Ibid.*

2.73 In addition to the harms to navigation and additional costs to dredge the Lower San Juan, Costa Rica's excessive inputs of sediment pose serious environmental threats. Sedimentation in this amount can cause serious harm to coastal ecosystems. Dr. Andrews observes that “[a]s little as 3mm of freshly deposited sediment is sufficient to impair ecosystem structure and function” in estuarine and benthic ecosystems.<sup>202</sup> Not much more (around 2cm of sediment) can be fatal to bivalves, snails, worms and crustaceans.<sup>203</sup> Excessive sediment also chokes mangroves and damages coral reefs. The deleterious effects of sediment from excessively-laden rivers, similar to the Río San Juan, have already been observed in coral reefs off the coast of Costa Rica.<sup>204</sup> Indeed, as discussed in the next section, there is evidence that the sediment from Costa Rica's Road is already having measurable impacts on the riverine environment.

### ***3. Environmental Impact of Sediment from the Road***

2.74 Costa Rica's Counter-Memorial argues that the sediment deposited in the River from the Road is not causing any significant environmental harm. As detailed below, this argument is untenable.

2.75 Costa Rica's argument begins from a false premise. It makes the scientifically indefensible claim that “sediment is not a pollutant.”<sup>205</sup> While it is true that sediment exists naturally in the environment, it is a non sequitor to

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<sup>202</sup> *Ibid.*, Section VI.

<sup>203</sup> *Ibid.*

<sup>204</sup> *Ibid.*

<sup>205</sup> CRCM, para 3.4.

suggest that it does not pollute. It is for this reason that sediment, sand and dirt are frequently defined as pollutants in environmental laws,<sup>206</sup> are prohibited or restricted from being discharged into bodies of water,<sup>207</sup> and when discharged into water, meet the definition of pollution set out in still more environmental laws<sup>208</sup> and international agreements.<sup>209</sup>

2.76 The widespread understanding that sediment is a pollutant reflects the scientific consensus that it can harm the natural environment, including especially water quality and aquatic organisms. The United States Environmental Protection Agency's *Framework for Developing Suspended and Bedded Sediments (SABS) Water Quality Criteria* describe some of the many effects that sediments have on aquatic life, including:

- reducing the productivity of algae on which other organisms rely as a source of food;
- inducing adverse behavioral, physiological, and toxicological responses in invertebrates, thus reducing population diversity and growth;

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<sup>206</sup> E.g., E.g., 33 U.S.C. 1362(6) (Clean Water Act); 314 CMR 3.02 (Massachusetts); Va. Code Ann. § 62.1-44.15:24; CVIR 12-007-000, Sec. 184-2(87)(i)(B) (U.S. Virgin Islands).

<sup>207</sup> E.g., Ontario Regulation 242/08 §23.4(9); New Brunswick Regulation 2001-83 §6(a); Nova Scotia NS Reg 113/2006 §10(1); Newfoundland and Labrador Regulation 39/07 §15.3.

<sup>208</sup> E.g., EU Water Framework Directive 2000/60/EC, art. 2(33) ("'Pollution' means the direct or indirect introduction, as a result of human activity, of substances . . . into the air, water or land which may be harmful to . . . the quality of aquatic ecosystems . . . or which impair or interfere with amenities and other legitimate uses of the environment."); Resource Management Act 1991 (New Zealand), 1991 No. 69 §2(1) ("contaminant includes any substance . . . [that] when discharged into water, changes or is likely to change the physical, chemical, or biological condition of the water. . . .").

<sup>209</sup> E.g., UN Watercourses Convention, art. 21(1) (defining pollution of an international watercourse as "any detrimental alteration in the composition or quality of the waters of an international watercourse which results directly or indirectly from human conduct."); Helsinki Rules on the Uses of the Waters of International Rivers, art. IX (adopting a similar definition).

- causing a shift in the types of fish and other organisms present in a given area;
- filling in small spaces and crevices used by organisms for shelter;
- impairing the ability of fish to see sources of food;
- clogging the gills of fish;
- and poisoning fish that swallow toxic materials absorbed into sediment.<sup>210</sup>

2.77 Indeed, Costa Rica’s own Environmental Diagnostic Assessment (“EDA”) acknowledges, “high level of sedimentation in aquatic bodies [is one of] the main problems that lead[s] to the loss of aquatic diversity at a global level.”<sup>211</sup>

2.78 Nor is Costa Rica correct in suggesting that the aquatic organisms found in the San Juan River are adapted to high sediment loads and therefore immune to the deleterious effects of Road-related runoff. Professor Thorne claims that fish “in the Rio San Juan do not find high turbidity problematic because they are fully adapted to it,”<sup>212</sup> but he provides no support for this assertion. In fact, many of the fish that are prevalent in the San Juan River belong to families with documented vulnerabilities to elevated levels of sediment. Fish in the Cichlid family rely on vision for feeding and breeding; increased turbidity reduces visibility and interferes with the ability to maintain a feeding territory, obtain a mate, and defend offspring. Increased turbidity can also reduce growth

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<sup>210</sup> UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, FRAMEWORK FOR DEVELOPING SUSPENDED AND BEDDED SEDIMENTS (SABS) WATER QUALITY CRITERIA 6, 99–102 (May 2006).

<sup>211</sup> EDA, p. 111 (CRCM, Vol. II, Annex 10).

<sup>212</sup> Dec. 2013 Thorne Report, para. 6.45 (CRCM, Vol. I, Appendix A).

and survivorship, and causes higher concentrations of lysozyme in blood, an indication of stress. Dr. Kondolf discusses these examples, as well as documented vulnerabilities in the Poecilid and migratory Mugiliidae families, which are also common in the River, in his Report.<sup>213</sup>

2.79 Equally unsupportable is Costa Rica's claim that "the contribution of sediment to a river such as the San Juan is a natural process" that is "commonly regarded as beneficial."<sup>214</sup> While it is true that sediment may in limited amounts be naturally transferred to a river, this is distinctly *not* what is occurring in regard to the San Juan River. In Chapter 1, Nicaragua indicated that Costa Rica's poor land use practices, including especially its deforestation and agriculture, have caused very large quantities of sediment to erode into the River. Even before Costa Rica's recent road construction project, the San Juan River was already burdened by an excessive sediment load attributable to Costa Rica.<sup>215</sup> The River now must contend with the additional sediment eroding from another (Costa Rican) man-made source along its southern bank.

2.80 This is undeniably not a "natural process," much less one that is beneficial.<sup>216</sup> Not only are the steep slopes, unstable fills, and failing stream crossings discussed above contributing sediment to the River, but there are locations where Costa Rica has dug channels leading from the Road to the River

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<sup>213</sup> 2014 Kondolf Report, Section 8 (NR, Vol. II, Annex 1).

<sup>214</sup> CRCM, para. 3.4.

<sup>215</sup> This has been repeatedly claimed by Nicaragua as shown in its Counter Memorial in the *Dispute regarding Navigational and Related Rights (Costa Rica v. Nicaragua)*, 2009, p. 251 (3).

<sup>216</sup> CRCM, para. 4.9.

for the purpose of transferring water, carrying sediment from the Road, directly into the River. Examples may be seen at **Figures 2.28** and **2.29**.

**Figure 2.28.** Quarry site approximately 7.7 km downstream from Mojon II, where man-made ditches deliver sediment to the River. Photograph from 2012 Kondolf Report, Appendix B (October 2012).



**Figure 2.29.** Eroding man-made channel connecting the Road to the River, located approximately 11.3 km downstream from Mojon II. Photograph from 2012 Kondolf Report, Appendix B (October 2012).



2.81 Other channels have been created by the lack of drainage for large areas of exposed sediment close to the River. As Dr. Kondolf explains, poor drainage on unnaturally exposed areas has led to increased runoff and sediment transport from bare slopes, leading to the creation of channels that carry sediment from disturbed areas to the River.<sup>217</sup> **Figures 2.30** below, which includes two images of the same quarry site located 25.3 km downstream of Mojon II, provides an example of this phenomenon. As can be seen, uncontrolled drainage (already visible in October 2012) from the exposed site had led (by May 2014 or earlier) to the incision of a channel that transports eroded sediments into the River.<sup>218</sup>

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<sup>217</sup> 2014 Kondolf Report, Section 4 (NR, Vol. II, Annex 1).

<sup>218</sup> *Ibid.*

**Figure 2.30.** Comparison of October 2012 and May 2014 photographs taken by helicopter over Nicaraguan airspace. Site location: 25.3 km downstream from Mojon II.



2.82 In paragraphs 2.55-2.59, above, Nicaragua described some of the large sediment deltas that have formed in the River from sediment eroding from Road-related construction. These are not the only ones; there are further examples.<sup>219</sup> The creation of deltas of such size in a watercourse is, as the environmental engineers from Golder Associates describe in their Expert Report, “totally unacceptable” from an environmental impact perspective, and constitutes “environmental negligence.”<sup>220</sup> According to Dr. Kondolf:

“The fact that sediment from Rte 1856 has been permitted to enter the Rio San Juan in sufficient quantities to create large, visible deltas reflects the lack of planning for the project, the lack of even basic environmental safeguards and sound construction practices, and the lack of effective erosion control and slope stabilization. This does not constitute acceptable practice in any way.”<sup>221</sup>

2.83 There is well-documented evidence that the road-derived sediment is already harming the ecological health of the River, including in proximity to these deltas. Sampling from the River demonstrates statistically significant differences between algal and macroinvertebrate communities living on and near the deltas caused by the Road, on the one hand, and naturally occurring deltas on the Nicaraguan bank that have not received road-related sediment deposits, on the other.

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<sup>219</sup> See 2014 Kondolf Report, Section 11 (NR, Vol. II, Annex 1). These delta bear little resemblance to the natural deltas on the Nicaraguan bank of the River. *Ibid.*

<sup>220</sup> Golder Associates, Inc., “The Requirements of Impact Assessment for Large-Scale Road Construction Project in Costa Rica Along the San Juan River, Nicaragua,” July 2014 (hereinafter the “Golder Report”), Section 6 (NR, Vol. II, Annex 6).

<sup>221</sup> 2014 Kondolf Report, Section 11 (NR, Vol. II, Annex 1).

2.84 In this respect, it bears noting that the Parties agree that sampling algal and macroinvertebrates is the proper way to determine whether the Road has impacted the River's ecological health. Costa Rica's own domestic laws mandate using macroinvertebrates to determine surface water quality,<sup>222</sup> and its EDA specifically recognizes the importance of sampling macroinvertebrates:

“Aquatic macroinvertebrates are considered to be appropriate bio-indicators of the quality of water...due to the fact that they are sensitive to the contamination and respond fairly rapidly to changes in the structure of the community...and can be used to estimate biotic indexes.”<sup>223</sup>

2.85 Notably, the European Water Framework Directive (D.O.C.E., 2000) requires the use of algae and macroinvertebrates as indicators of water quality.<sup>224</sup>

2.86 As Dr. Blanca Rios, an expert in aquatic ecology at the Universidad Tecnológica Indoamérica in Quito, Ecuador, explains in her Expert Report included with this Reply at Annex 4, the algae and macroinvertebrates that Nicaragua sampled “are indicators of ecosystem health,” as “their composition, richness and abundance reflect the recent history of the river, providing

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<sup>222</sup> Blanca Ríos Touma, PhD, “Ecological Impacts of the Route 1856 on the San Juan River, Nicaragua,” July 2014 (hereinafter the “Ríos Report”) Section 1(b) (NR, Vol II. Annex 4), citing MINAE-S, 2007.

<sup>223</sup> See CRCM, Vol. II Annex 10, pp. 87-88. As explained in the report by Dr. Ríos, Costa Rica’s EDA falls far short of international standards. Ríos Report, Section 6(c). However, even the EDA accepts that “[t]he presence of a diverse and abundant fauna of aquatic macro-invertebrates is important for the river, due to the fact that they provide basic functions to the ecosystem.” These include “recycling of organic materials and nutrient cycles,” which are important for water quality and their place in the food chain, “both for aquatic species such as fish, and for terrestrial species (birds, bats, amphibians, some reptiles, spiders and other insects.)” CRCM, Vol. II, Annex 10, p. 109.

<sup>224</sup> Ríos Report, Section 4(c), citing D.O.C.E., 2000. (NR, Vol II. Annex 4),

information regarding its impairment.”<sup>225</sup> For these and other reasons, these species are “used worldwide in stream and river bio-monitoring programs.”<sup>226</sup>

2.87 Dr. Rios’s sampling of these aquatic species involved collecting samples from 16 deltas in the San Juan River – 8 along the north bank, and 8 along the south bank. She did so on three occasions: March 2014, April 2014, and May 2014. This monitoring programme is an expansion of the earlier study described in Dr. Kondolf’s Third Report<sup>227</sup> and discussed in November 2013 at the hearings on Nicaragua’s Request for the Indication of Provisional Measures.<sup>228</sup> At that time, Costa Rica’s expert, Professor Thorne, accepted that it would be “fair to compare” periphyton<sup>229</sup> and macroinvertebrate samples from the two sides of the River, as long as all samples were collected on deltas.<sup>230</sup> That is what was done previously,<sup>231</sup> and that is what has been done again, this time at more sites and on more occasions.<sup>232</sup>

2.88 The results of the sampling are consistent with those that Nicaragua previously presented to the Court: the aquatic life forms are healthier, more

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<sup>225</sup> *Ibid.*, Section 1(b).

<sup>226</sup> *Ibid.*

<sup>227</sup> Dr. G. Mathias Kondolf “Continued Impacts of Erosion from Rte 1856, Costa Rica to the Río San Juan, Nicaragua” 30 October 2013, p.13.

<sup>228</sup> *Ibid.*

<sup>229</sup> Periphyton are “algae and other organisms growing on the surfaces of gravel and rock.” 2014 Kondolf Report, Section 11; *see also* Section 8 (NR, Vol. II, Annex 1).

<sup>230</sup> CRCM, Vol. II, Annex 9, para. 82.

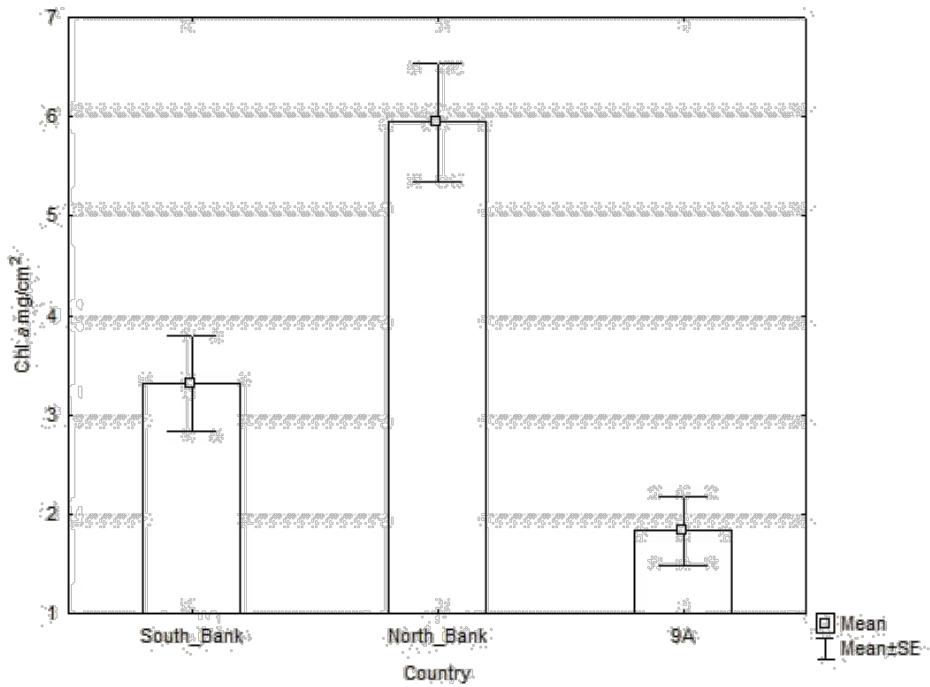
<sup>231</sup> 2014 Kondolf Report, Section 8 (NR, Vol. II, Annex 1).

<sup>232</sup> Rios Report, Section 2 (NR, Vol. II, Annex 4).

abundant, and more diverse on the deltas on the north bank; that is, where they have not been impacted directly by sediments from the Road.<sup>233</sup>

2.89 With respect to periphyton, sampling reveals “highly significant differences between the north and south-bank deltas,” with the “[d]eltas affected by road-derived sediment (south bank)” displaying “significantly lower periphyton biomass values.”<sup>234</sup> That “highly significant” difference between the biomasses of periphyton in the areas impacted by the Road and in the unaffected areas is shown in **Figure 2.31**.

**Figure 2.31.** Periphyton biomass on benthic substrate (pebbles and cobbles) at deltas along the south bank of the Rio San Juan (receiving sediments eroded from Rte 1856), along the north bank (formed by streams draining forest), and at Point 9A (La Chorrera).

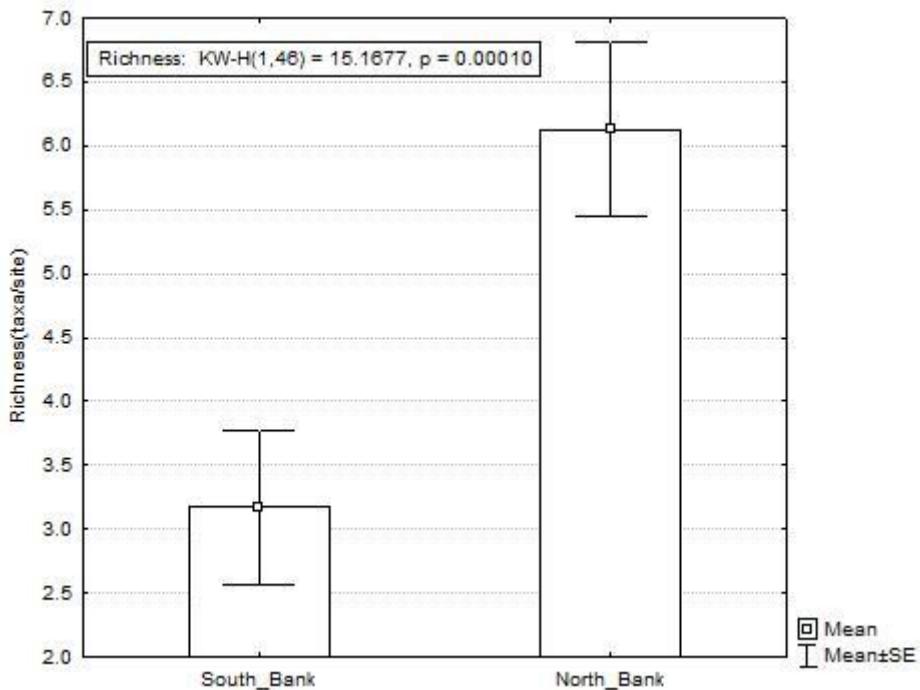


<sup>233</sup> *Ibid.*, Section 5.

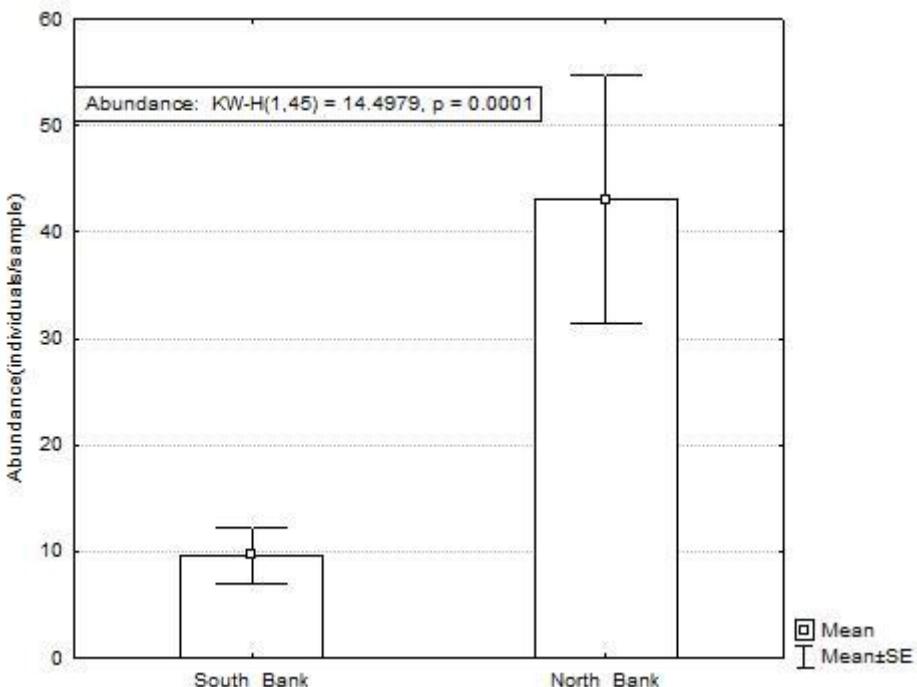
<sup>234</sup> *Ibid.*, Section 3(b).

2.90 The River's macroinvertebrate communities in areas impacted by the Road exhibit similar levels of degradation, both in terms of species richness, which is significantly lower than in comparable, non-impacted areas (**Figure 2.32**) and abundance, which is significantly lower as well (**Figure 2.33**).

**Figure 2.32.** Differences in benthic macroinvertebrate richness at deltas on the north bank and the south bank of the San Juan River.



**Figure 2.33.** Differences in benthic macroinvertebrate abundance at deltas on the north bank and the south bank of the San Juan River.



2.91 Dr. Rios concludes that these results demonstrate that “the aquatic communities of the streams draining the road are significantly degraded compared to those developed on the deltas of tributaries entering the north bank of the river, which are not affected by the road-derived sediment.”<sup>235</sup> This “strongly suggest[s] that the sediments eroded from the road are having negative effects on the aquatic communities of the deltas affected by the sediments.”<sup>236</sup>

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<sup>235</sup> *Ibid.*, Section 5.

<sup>236</sup> *Ibid.*, Section 4(a). These findings flatly contradict Professor Thorne’s assertion that “aquatic organisms in the Rio San Juan do not find high turbidity problematic because they are fully adapted to it.” Dec. 2013 Thorne Report, para. 6.45 (CRCM, Vol. I, Appendix A).

2.92 In short, sampling of the aquatic organisms that are used for evaluating the water quality and ecological health of a watercourse, using the methodology endorsed by Costa Rica, proves that sediment from the Road is causing significant harm to aquatic organisms in the River.

#### **4. Visual Impacts and Tourism**

2.93 The EDA acknowledges that “the San Juan River department” is one of Nicaragua’s “priority destinations “ for its developing nature tourism industry,<sup>237</sup> and that “[t]he tourism potential of the region is sufficient to justify attracting international visitors.”<sup>238</sup>

2.94 The area’s tourism potential, however, has been significantly impaired by the Road. As the Golder Report explains, “The visual impacts associated with the road construction have created a scar on the natural landscape that will have impact on national and foreign visitors along the river when viewing the Costa Rica landscape.”<sup>239</sup> Given that tourism in the area “is mostly associated with the natural beauty of this remote and non-highly commercialized region,”<sup>240</sup> the only reasonable conclusion is that Costa Rica’s project detrimentally impacts tourism in Nicaragua.

2.95 Costa Rica’s Counter-Memorial cavalierly dismissed in a single paragraph Nicaragua’s concerns regarding the Road’s impact on tourism. It

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<sup>237</sup> EDA, pp. 159-160 (CRCM, Vol. II, Annex 10).

<sup>238</sup> *Ibid.*, p. 159.

<sup>239</sup> Golder Report, Section 7 (NR, Vol. II, Annex 6).

<sup>240</sup> *Ibid.*

emphasizes that there are currently no facilities for tourists on either bank of the River in the 108-km stretch where the Road runs parallel to it.<sup>241</sup> Professor Thorne repeats the same argument.<sup>242</sup> But this ignores the possibility for the future development of such facilities in Nicaragua. It also disregards facilities that already exist nearby, on other stretches of the River. One example is the Rio Indio Lodge, located in San Juan de Nicaragua on the banks of the Lower San Juan River near the Caribbean Sea.<sup>243</sup> The fact that this, and other, hotels are not located directly across the River from Costa Rica's Road does not mean that they are not affected by reduced tourism to the area.

2.96 Costa Rica's EDA acknowledges the serious visual impact of the Road in the form of "exposed surfaces on slopes and road cuts on the terrain"<sup>244</sup> and accepts the need to "reforest in front of all road cuts that are visible from the right margin of the San Juan River ... in such a way that the density of the trees provide the necessary foliage cover,"<sup>245</sup> However, it inexplicably concludes: "The effect of the construction of Route 1856 has no direct impact on tourism in recent years."<sup>246</sup> The appendix to the EDA, however, suggests otherwise. It observes that "entrance through the different fluvial entry points in Nicaragua has suffered significant decreases during these years, starting with 25,502 in 2008 down to

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<sup>241</sup> CRCM, para. 3.64.

<sup>242</sup> Dec. 2013 Thorne Report, para. 10.21 (CRCM, Vol. I, Appendix A).

<sup>243</sup> Details about the Rio Indio Lodge are available on its website: <http://www.therioindiolodge.com/>.

<sup>244</sup> EDA, p. 150 (CRCM, Vol. II, Annex 10).

<sup>245</sup> *Ibid.*

<sup>246</sup> *Ibid.*, p. 160.

16,574 in 2012.”<sup>247</sup> The EDA is thus constrained to qualify its claim that, “[t]o date, there are no significant changes in the flow of visitors,” by observing that “[i]n some instances, the contrary is what is taking place, with important decreases in tourism being reported.”<sup>248</sup> In other words, tourism in Nicaragua has suffered.

### C. COSTA RICA’S FLAWED ANALYSIS OF SEDIMENTATION

2.97 In its Memorial, Nicaragua showed, based on the technical analysis presented by Dr. Kondolf, that the steep, eroding sites located in the upper 41 km of the Road are alone contributing an estimated 87,000 – 109,000 m<sup>3</sup> of sediment to the River annually.<sup>249</sup>

2.98 Costa Rica denies these numbers, although it concedes that a substantial quantity of sediment does, in fact, reach the River. According to Costa Rica, the annual average sediment contribution to the River from the Road is 36,500 m<sup>3</sup>.<sup>250</sup> Even this amount is the equivalent of approximately 4,560 standard

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<sup>247</sup> EDA Tourism Appendix, p. 9 (CRCM, Vol. II, Annex 10, p. 687).

<sup>248</sup> EDA Tourism Appendix, p. 18.(CRCM, Vol. II, p. 696).

<sup>249</sup> As explained in paragraph 2.4, above, Dr. Kondolf has updated his estimate to include the remainder of the River-adjacent Road, as well as the many km of access roads that were impacted through the project. He now estimates that Costa Rica’s road works are contributing as much as 150,000 m<sup>3</sup> of sediment to the River per year. 2014 Kondolf Report, Section 7 (NR, Vol. II, Annex 1).

<sup>250</sup> CRCM, paras. 3.25, 3.76(b). Nothing in Costa Rica’s Counter-Memorial or expert reports undermine Dr. Kondolf’s erosion estimate. In that regard, the Counter-Memorial contends that Dr. Kondolf estimates “that cut and fill slopes along the Road are eroding – i.e., the land surface is lowering – at an average of 1 m per year” and that this erosion rate “is occurring on 40% to 50% of the slopes.” CRCM, para. 3.15. Based on this understanding of Dr. Kondolf’s analysis, Costa Rica concludes that the estimated erosion rate “probably too high by a factor of ten” for the 108-km length of the Road. CRCM. para. 3.22, citing Thorne, para. 8.34. However, Dr. Kondolf did *not* suggest that the average lowering of 1 m per year applied throughout the entire course of the

8-m<sup>3</sup> dump truck loads of sediment being dumped into the River annually by Costa Rica. But it is wrong. Costa Rica dramatically underestimates the amount of road-related sediment that is reaching the River each year.

### ***1. Unreasonably Low Erosion Rates in the UCR Report***

2.99 Annex 1 to Costa Rica’s Counter-Memorial is a report prepared by a civil engineering professor and undergraduate students from the University of Costa Rica (henceforth the “UCR Report”) that purports to present erosion rates. It is based on reported findings from erosion studies at nine sites used to derive estimated annual erosion rates for different types of features: surface erosion of the road bed and cut slopes, landslide erosion on cut slopes, and gully and rill erosion on both cut slopes and fill slopes.<sup>251</sup> The erosion rates established in the UCR Report are presented in the Counter-Memorial.<sup>252</sup>

2.100 These rates are unrealistically low for a number of reasons. First and foremost, the report ignores many of the sites where erosion is most serious. All of the study’s nine sites are located in the uppermost 15 km of the Road. Costa Rica claims these are representative of erosion occurring in the upper

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Road. Instead, it was confined to the upper 41 km of the Road, and then only on the area of “steep disturbed land” within that upper stretch. 2012 Kondolf Report, p. 46 (NM. Vol. II, Annex 1). What Dr. Kondolf actually estimated was that landslides and gullying were taking place on 40-50% of the steep disturbed land within this upriver portion (excluding the road bed), with landslides and gullies measuring, on average, 1 meter in depth at the time of the estimate. *Ibid.* The same is true of Costa Rica’s statement that “Dr Kondolf’s estimate of land surface lowering of 1 m per year is probably too high by a factor of five for the stretch of Road between Marker II and Río Infiernito.” Nowhere did Dr. Kondolf claim that there is “land surface lowering of 1 m per year” for any particular stretch of the Road, including the 15-km stretch Costa Rica references.

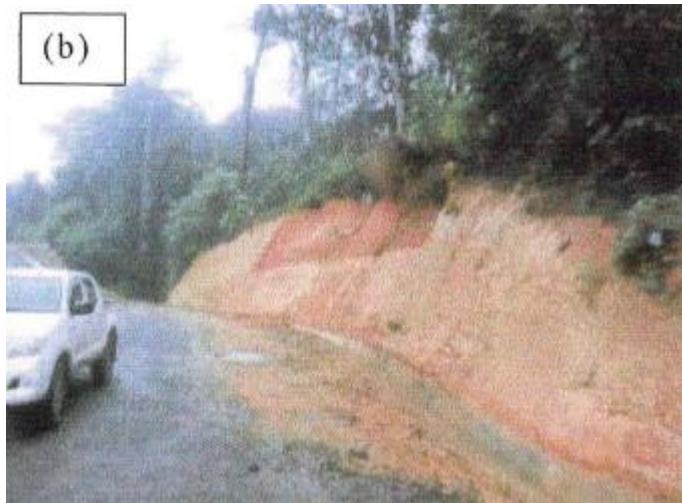
<sup>251</sup> CRCM, Vol. II, Annex I, pp. 2-18.

<sup>252</sup> CRCM, para. 3.21.

41.6 km of the Road, where much of the worst erosion is occurring.<sup>253</sup> It is mistaken: the 26 km stretch excluded from Costa Rica's study contains numerous sites with much more serious erosion than those studied in the 15 km upriver.<sup>254</sup>

2.101 The UCR Report's treatment of landslide and gully erosion is a good example. It considers landslide erosion at two locations (**Figures 2.34 and 2.35**) and gully erosion at three locations (**Figures 2.36, 2.37 and 2.38**).

**Figure 2.34.** Photograph of UCR Site 1: Landslide on cut slope.



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<sup>253</sup> CRCM, para. 3.20.

<sup>254</sup> 2014 Kondolf Report, Section 7 and Inventory of Severely Eroding Sites, Appendix A (NR, Vol. II, Annex 1).

**Figure 2.35.** Aerial image of UCR Site 2: Landslide on cut slope.



**Figure 2.36.** Aerial image of UCR Site 3: Gully on cut slope.



**Figure 2.37.** Aerial image of UCR Site 8: Gully on road fill.



**Figure 2.38.** Aerial image of UCR Site 9: Gully on road fill.



2.102 As these images make clear, although the erosion at these sites is significant, it is taking place on a much smaller scale than that occurring elsewhere, including at the sites described above in Section A of this Chapter, all of which were ignored by the authors of the UCR Report.

2.103 This raises the following questions: How can Costa Rica claim that the UCR Report's sites are "representative of the erosion which is likely to occur" in that stretch?<sup>255</sup> How can the Counter-Memorial claim that the UCR Report presents erosion rates "from nine of the most active sites"?<sup>256</sup> And, how can the UCR Report conclude, "The selected sites therefore represent 'worst case' examples of erosion by land sliding, sheet erosion, rilling and gullying that exist along Route 1856"?<sup>257</sup>

2.104 As Dr. Kondolf explains, there is no scientific justification for applying the erosion rates measured at small erosional features to larger ones.<sup>258</sup> However, that is exactly what the UCR Report does. Rather than gathering actual measurements at an adequate number of genuinely representative sites to develop scientifically defensible erosion rates, the UCR Report extrapolates from what Dr.

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<sup>255</sup> CRCM, para. 3.20.

<sup>256</sup> CRCM, para. 3.20.

<sup>257</sup> UCR Report, p. 2 (CRCM, Vol. II, Annex 1). The UCR Report is also incorrect when it claims that the erosion rates are "highly conservative" because most other slopes and fills have been the subject of meaningful mitigation measures "and are experiencing much less erosion than the sites selected for study." *Ibid.*, pp. 1-2.

<sup>258</sup> 2014 Kondolf Report, Section 7 (NR, Vol. II, Annex 1).

Kondolf calls an “absurdly small sample” of unrepresentative erosional features.<sup>259</sup> The result is unreasonably low rates.

2.105 The UCR Report contains other flaws that also resulted in an artificially low estimate of erosion rates. For instance, its authors estimated the size of erosion features (e.g., discrete gullies) and then calculated erosion rates based on those estimates. However, the erosion rates were then divided over the area of the entire exposed “slope” in which the particular erosion feature occurred.<sup>260</sup> This artificially reduced the rate because the size of the exposed slope on which the eroding feature occurred was unrelated to the eroding feature itself.<sup>261</sup>

2.106 In some instances, the authors of the UCR Report compounded this error by using exaggerated area figures, which drove the reported erosion rate down even further.<sup>262</sup> The UCR Report presents the resulting very small numbers as “average” erosion rates for the particular erosional features. As Dr. Kondolf explains, this flawed approach both reduces the true erosion rates for each feature and ignores other erosion taking place on the remainder of the bare, exposed slope. In reality, “the total erosion from [each] site would be the erosion measured in [each erosion feature, e.g., a gully] (without dividing it over the

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<sup>259</sup> *Ibid.*

<sup>260</sup> *Ibid.*, see also Dec. 2013 Thorne Report, paras. 8.27, 8.28, 8.30 (CRCM, Vol. I, Appendix A).

<sup>261</sup> 2014 Kondolf Report, Section 7 (NR, Vol. II, Annex 1).

<sup>262</sup> *Ibid.*

entire site area) plus the surface erosion estimated/measured over the rest of the exposed slope.”<sup>263</sup>

2.107 In short, the erosion estimates in the UCR Report are without solid scientific basis and are not credible.

## **2.      *The Erroneous Yield Estimates in the Mende and Astorga Inventory***

2.108 Although the UCR Report’s erosion rates are described in detail in both the Counter-Memorial and Professor Thorne’s report (which unjustifiably characterize them as “representative,”<sup>264</sup> “worst case,”<sup>265</sup> and “conservative”<sup>266</sup>), most of the erosion rates stated in the UCR Report do *not* appear to have actually formed the basis for Costa Rica’s estimate of how much sediment enters the River. As the Counter-Memorial notes,<sup>267</sup> that estimate comes from a report prepared by a Costa Rican government agency, the Costa Rican Institute of Electricity (ICE), included as Annex 4 to the Counter-Memorial (henceforth the “ICE Report”). Although the ICE Report refers to the UCR Report,<sup>268</sup> it specifies that it only applied the UCR Report’s erosion rate for sheet erosion of the road bed itself.<sup>269</sup> For erosion of cut slopes and fill slopes, *i.e.*, landsliding, gully erosion, and rill erosion, as well as sheet erosion of the slopes, the ICE Report

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<sup>263</sup> *Ibid.*

<sup>264</sup> CRCM, para. 3.20; Dec. 2013 Thorne Report, paras. 8.23, 8.36 (CRCM, Vol. I, Appendix A).

<sup>265</sup> Dec. 2013 Thorne Report, para. 8.24 (CRCM, Vol. I, Appendix A).

<sup>266</sup> CRCM, para. 3.21; Dec. 2013 Thorne Report, paras. 8.28-29, 8.31 (CRCM, Vol. I, Appendix A).

<sup>267</sup> CRCM, para. 3.24.

<sup>268</sup> ICE Report, p. 28 (CRCM, Vol. II, Annex 4).

<sup>269</sup> *Ibid.*, p. 30.

states that it relied instead on a still a different study,<sup>270</sup> an “Inventory of Slopes and Water Courses,” prepared by two Costa Rican scientists, Dr. Mende and Dr. Astorga (henceforth the “Mende and Astorga Inventory”).<sup>271</sup>

2.109 Drs. Mende and Astorga claim to have applied the UCR Report’s “data on erosion depths and rates of land surface lowering due to sheet, rill, landslide and gully erosion,” in “estimat[ing] the sediment yields from all the cut and fill slopes that exist along the border road between Mojon II and Delta Costa Rica.”<sup>272</sup> Upon careful examination, however, the erosion rates they actually used are, in many cases, *not* the UCR Report’s rates. As shown by Dr. Kondolf, they mixed-and-matched rates, applied unexplained and apparently arbitrary rate increases (one of which they call a “margin of safety”), and/or arbitrarily substituted other rates. They did not present “a coherent scientific justification for their seemingly random selection of rates to use in different contexts.”<sup>273</sup>

2.110 The Mende and Astorga Inventory claims to be “a complete inventory of all cut slopes, fill slopes, and watercourse intersections (crossings)

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<sup>270</sup> *Ibid.*

<sup>271</sup> Although the Mende and Astorga Inventory is dated October 2013 and was apparently relied upon in the preparation of the ICE Report that was submitted on 4 November 2013 in connection with the hearings on Nicaragua’s request for the indication of provisional measures, the Mende and Astorga Inventory was not submitted at that time.

<sup>272</sup> Mende & Astorga Inventory, p. 1 (CRCM, Vol. II, Annex 6).

<sup>273</sup> 2014 Kondolf Report, Section 7 (NR, Vol. II, Annex 1). A careful reading of the Thorne report reveals that he does not agree with the Astorga and Mende Inventory’s description of its own method: “For cut and fill slopes, ICE accepted the Mende and Astorga’s estimates (in the *Inventory of Slopes and Water Courses Report*) for the average annual volumes of erosion by landslides and gullies along the Road...which are based on areas recorded in their 2013 inventory of slopes and application of the erosion depths reported in the 2013 UCR Report” (emphasis in original). Dec. 2013 Thorne Report, pp. 78-79 (CRCM, Vol. I, Appendix A).

along Route 1856,” as well as sediment yield estimates for each slope.<sup>274</sup> Appendix A to the Inventory purports to set out the information used to arrive at these yield estimates, including: the area of each exposed “slope”; categorization of said slope as either “cut” or “fill”; and the dimensions for the erosional features appearing on each slope. However, as Dr. Kondolf explains, the areas reported in the Mende and Astorga Inventory are underestimated.<sup>275</sup> They are apparently based, at least in part, on visual estimates that the authors made by eyeballing the sites. This is an unreliable and inaccurate method that is much less precise than the approach of Nicaragua’s experts, who have used, *inter alia*, sophisticated computer software to calculate the relevant dimensions.<sup>276</sup> According to Dr. Kondolf, given that Drs. Mende and Astorga had ground access to the sites inventoried (unlike Nicaragua’s experts), they should have measured the actual dimensions of eroding features in order to produce a competent scientific study.<sup>277</sup> Their failure to do so is troubling, and it is likely to be one of the reasons the slope erosion estimates included in their Inventory (and incorporated into the ICE Report’s total yield estimate) are so unreasonably low.

2.111 The Mende and Astorga Inventory’s sediment yields, moreover, appear to be based on the mistaken assumption that all slopes are vertical. In reality, many slopes – particularly highly erodible fill slopes – are less steep and

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<sup>274</sup> Mende & Astorga Inventory, p. 1 (CRCM, Vol. II, Annex 6).

<sup>275</sup> 2014 Kondolf Report, Section 7 (NR, Vol. II, Annex 1).

<sup>276</sup> *Ibid.*, Sections 3 & 7; Hagans & Weaver Report (NR, Vol. II, Annex 2).

<sup>277</sup> 2014 Kondolf Report, Section 7 (NR, Vol. II, Annex 2).

have horizontal components. The resulting underestimation of “slope” areas is significant because Drs. Mende and Astorga multiplied these areas by the erosion rates discussed above to calculate the sediment yields for each location. Their inaccurately low areas thus resulted in inaccurately low estimates for each site. Because those estimates are summed and incorporated directly into ICE’s calculation of total erosion from the Road, the errors in the Mende and Astorga Inventory impact the accuracy of Costa Rica’s total erosion estimate.<sup>278</sup>

2.112 The Court need not take Nicaragua’s word for it. Drs. Mende and Astorga have submitted an additional report, found at Annex 5 to the Counter-Memorial, which disproves their own claim in Annex 6 that the total slope erosion estimates contained in the latter report represent the “*worst case ‘scenario.’*”<sup>279</sup>

2.113 For instance, the first stream crossing discussed in Section A of this Chapter is Dr. Kondolf’s Severely Eroding Site 9.4 (discussed at paragraphs 2.14-2.24, above). The same site is identified as slope T-68 in the Mende and Astorga Inventory, which estimates a total of 456 m<sup>3</sup> of erosion per year.<sup>280</sup> Using Costa Rica’s conversion factor of 1.67, this equals approximately 762 tons per year. However, in Annex 5, Drs. Mende and Astorga conclude that the “Maximum Sediment Production” for the same site is 2,250 tons (or approximately 1,347 m<sup>3</sup>)

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<sup>278</sup> See ICE Report, p. 30 (“cut and fill erosion is based on the findings of Mende and Astorga”) and Table 12 (incorporating directly the Mende & Astorga Inventory’s estimate for erosion from slopes: 36,580 m<sup>3</sup> per year) (CRCM, Vol. II, Annex 4); compare with the sum in Appendix A of the Mende & Astorga Inventory (36,587 m<sup>3</sup> per year) (CRCM, Vol. II, Annex 4, p. 408).

<sup>279</sup> Mende & Astorga Inventory, p. 31 (CRCM, Vol. II, Annex 6).

<sup>280</sup> CRCM, Vol. II, p. 407 (lines T-68a + T-68b).

per year, that is approximately three times worse than what Annex 6 described as the “worst case scenario.”

2.114 A similar discrepancy exists regarding Dr. Kondolf’s Severely Eroding Site 9.6, which Drs Mende and Astorga identify as slope T-72 and estimate in Annex 6 as having a “worst-case” annual erosion rate of 662 m<sup>3</sup> or 1,106 tons.<sup>281</sup> This is one-fourth the “Maximum Sediment Production” rate of 4,500 tons, or 2,695 m<sup>3</sup>, that the same authors assign to the site in Annex 5.<sup>282</sup>

2.115 In fact, even this significantly underestimates the true worst case scenario. As explained above, Costa Rica placed approximately 44,000 m<sup>3</sup> of fill directly in the channel of this stream crossing. Some 6,600 m<sup>3</sup> has already eroded, leaving more than 37,000 m<sup>3</sup> in place and at risk of falling into the River if the stream crossing washes out, as has already occurred at Site 9.5, 100 m upstream. If this were to happen at Site 9.6, the amount that would be transported to the River would be more than what Drs. Mende and Astorga estimate is the annual erosion from *all* slopes along the River (36,590 m<sup>3</sup> per year).<sup>283</sup>

2.116 Still other methodological flaws further belie Costa Rica’s contention that its experts have presented a “true picture” of sediment erosion.<sup>284</sup> *First*, Costa Rica acknowledges that it built or repaired access roads to connect the

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<sup>281</sup> CRCM, Vol. II, p. 407 (lines T-72a + T-72b).

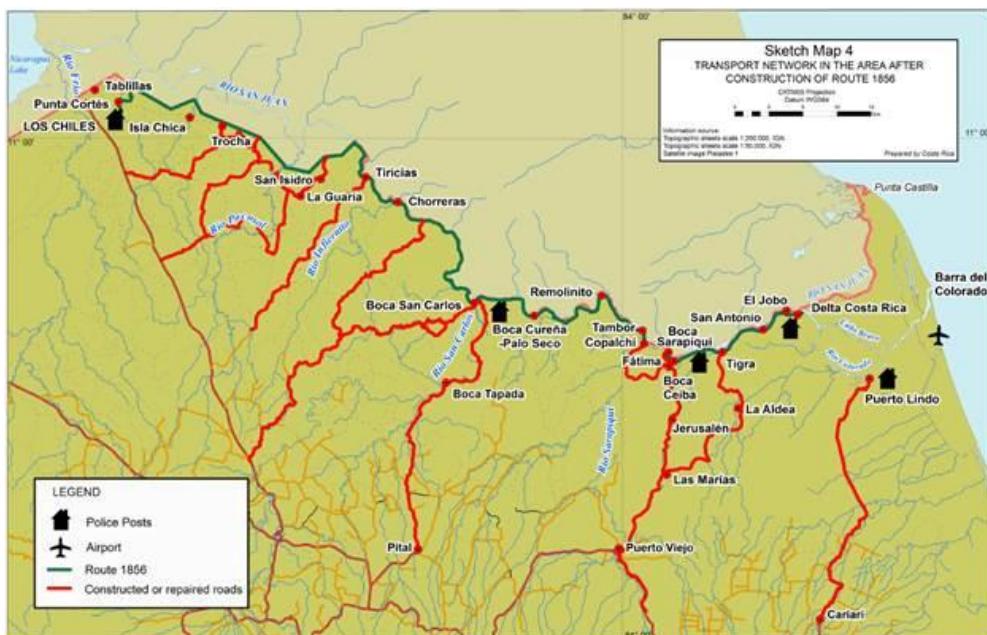
<sup>282</sup> CRCM, Vol. II, Annex 5, p. 44,

<sup>283</sup> Mende & Astorga Inventory, p. 31 (CRCM, Vol. II, Annex 6).

<sup>284</sup> See CRCM p. 48.

Road to populated areas.<sup>285</sup> According to published reports, these access roads cover as much as 440 kilometers.<sup>286</sup> The extent of the new construction or repairs -- involving stretches of “significant works”<sup>287</sup> -- is visible in Figure 2.39, which appeared as Sketch Map 4 in Costa Rica’s Counter-Memorial.

**Figure 2.39.** Costa Rica’s Sketch Map 4 from the Counter-Memorial: “Transport Network in the Area After Construction of Route 1856,” with access roads indicated in red.



2.117 Costa Rica’s erosion estimate does *not* consider the sediment contribution of any of these roads. This creates a misleading impression of the amount of Road-related sediment that enters the San Juan River. Since these access roads are located in catchments that drain into the River, sediment from

<sup>285</sup> CRCM paras. 2.25, 2.30.

<sup>286</sup> NM, Vol. II Annex 31 (Statement attributed to CONAVI in Costa Rican news)

<sup>287</sup> NM, Vol. II, Annex 34 (CONAVI Press Release)

them makes its way into streams that deliver sediment to the River.<sup>288</sup> To be sure, not all such sediment will reach the River in the near term, but the amount that ends up there is certainly much more than *none* -- the amount assumed by Costa Rica. Dr. Kondolf conservatively estimates that the access roads are contributing an additional 10,000-20,000 m<sup>3</sup> of sediment to the San Juan River per year.<sup>289</sup>

2.118 *Second*, Costa Rica's erosion estimate does not account for additional construction on the Road. As Dr. Kondolf explains, one cannot presently drive along the Road from Mojon II to Boca San Carlos because there are sections that do not yet exist.<sup>290</sup> Building these new sections -- especially if done with the lack of care that has characterized construction to date -- would create additional disturbances and contribute more sediment to the River, both during the construction period and in the future. This omission from Costa Rica's sediment estimate is especially significant in light of the fact that many of the missing segments are located in the steepest slopes along the River, precisely those areas most susceptible to erosion.<sup>291</sup>

2.119 *Third*, even within the areas considered by Costa Rica, critical sources of sediment are absent from its erosion estimate. The erosion estimate in the ICE Report, for example, is the sum of (a) road bed erosion estimates (based on the UCR Report), and (b) cut and fill slope erosion estimates (from the Mende

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<sup>288</sup> 2014 Kondolf Report, Section 7 (NR, Vol. II, Annex 1).

<sup>289</sup> *Ibid.*

<sup>290</sup> *Ibid.*, Section 2.

<sup>291</sup> *Ibid.*, Sections 2 & 7.

and Astorga Inventory). It thus ignores sediment contributed by failing stream crossings like the ones discussed in Section A of this Chapter. For example, the failed stream crossing located in the flat stretch of Road 20.3 km downstream from Mojon II, which contributed over 800 tons of fill material into the River and created a large delta (depicted in **Figures 2.13, 2.14** and **2.24** above) is excluded from Costa Rica's estimate.

### **3. Costa Rica's Flawed Sediment Load Estimate**

2.120 Equally unreliable are Costa Rica's claims regarding the total sediment load of the River, which it uses to suggest that the contribution from the Road is relatively minor. In that regard, the Counter-Memorial makes the remarkable assertion that “[t]he sediment load carried by the San Juan in the period since construction of the Road is actually *lower* than it was before the Road was constructed.”<sup>292</sup> This claim, which is based on a comparision of limited data collected in the 1970s with equally limited data from the post-construction period, is deeply flawed. The “detailed study” that purportedly forms the basis for Costa Rica’s remarkable contention is the ICE Report. However, as Dr. Andrews explains, this contains “numerous examples of insufficient and poor quality hydrologic information, incorrect and improper analysis, and unsupported or wrong conclusions.”<sup>293</sup>

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<sup>292</sup> CRCM, paras. 3.14 & 3.76(a) (emphasis in original).

<sup>293</sup> Andrews Report, Section V(B) (NR, Vol. II, Annex 3).

2.121 As an initial matter, the claim that the Road's sediment load is lower today than it was in the 1970s is immediately suspect because of the widespread deforestation and agricultural development that has occurred on the Costa Rican bank over the past several decades. As indicated in Chapter 1, this has resulted in a massive increase in sediment in the River, raising its sediment load approximately 20-50 times.

2.122 In any event, no meaningful conclusions can be drawn by comparing the datasets upon which Costa Rica relies. *First*, Costa Rica's claims regarding the sediment load of the San Juan River are based on:

- Data regarding river flow and suspended sediment concentrations collected at the La Trinidad sampling station, in the San Juan River close to the mouth of the Sarapiquí, from January 1974 to March 1976, during which 12 suspended sediment samples were collected.
- Data conducted by ICE at the Delta Colorado station, in the Colorado River, from 17 December 2010 to 31 June 2013, resulting in the collection of flow data and 31 suspended sediment samples.<sup>294</sup>

2.123 These are extremely limited data. As Dr. Andrews observes:

“[T]he common practices and standards applied by Costa Rican hydrologists and water managers are those that have been adopted worldwide. Two years of flow records and a few tens of suspended sediment samples are not sufficient to represent the magnitude and frequency of river discharge or calculate mean annual river sediment loads.”<sup>295</sup>

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<sup>294</sup> *Ibid*, Section V(C).

<sup>295</sup> *Ibid.*, Section V(C).

2.124 Such temporally limited flow records and so few suspended sediment samples, he concludes, are “insufficient and cannot be relied upon to make informed decisions.”<sup>296</sup>

2.125 *Second*, the data relied upon by Costa Rica cannot support its conclusions because river flows and suspended sediment loads vary considerably from year to year. Consequently, in comparing data from two short periods, one cannot determine whether differences indicate a change over time, or are the result of abnormal river flows and/or sediment loads during one or both periods. This is an especially relevant consideration where, as here, one sampled period may have been unusually rainy, while the other may have been unusually dry.<sup>297</sup> In that connection, Dr. Andrews observes that “hydrologic conditions in the Rio San Juan basin were quite different” in the 40 years that separated the operation of the “La Trinidad and the Delta Colorado gages.”<sup>298</sup> The ICE Report and Professor Thorne, however, fail to account for this variability, an omission that is surprising

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<sup>296</sup> *Ibid.*

<sup>297</sup> *Ibid.*, Section V(E).

<sup>298</sup> *Ibid.*, Section V(D). In fact, the much more robust and useful data provided in the ICE Report for other gages – those not on the San Juan River or its Colorado distributary – demonstrate that the period in the 1970s when the La Trinidad gage was operated was wetter than average, involving higher than average river flows (103%) and substantially higher sediment concentrations than the long-term mean (163%). The opposite is true with regard to the Delta Colorado station, which was operated at a time with below-average river flows (85%) and suspended sediment loads far below average (46%). *Ibid.*, Section V(E). Accordingly, these datasets “should not be compared directly or serve as the basis for conclusions.” *Ibid.*, Section V(D). As Dr. Andrews explains, their “apparent similarity” is “solely an artifact of the hydrologic conditions during the brief periods, nearly 40 years apart, when these gages were operated.” *Ibid.*, Section V(E).

in light of their emphasis elsewhere on other forms of variability in river conditions.<sup>299</sup>

2.126 *Third*, the data Costa Rica relies upon come from two different locations -- the San Juan River and the Colorado River -- that cannot be easily compared. The authors of the ICE Report appear to recognize this, since they had to apply a mathematical formula to revise the sediment data obtained from the Colorado in order to try to make it comparable with data from the San Juan. They did this by assuming that the sediment data from the Colorado River represents 91% of the sediment from the River proper.<sup>300</sup> As Dr. Andrews explains, this is not an appropriate assumption, as it is based on a comparison of records collected over a two year period at the La Trinidad gage with those collected over another two year period at the Delta Colorado gage. One thus cannot assume that the apparent difference in flows is not the result of annual variation in river flow.<sup>301</sup>

2.127 *Fourth*, ICE's suspended sediment samples from the Colorado River appear to have been collected improperly. For a river as wide as the Colorado, discharge-weighted samples need to be collected at 20 to 30 discrete points spaced out across the channel.<sup>302</sup> This is because accurate suspended sediment sampling requires the use of a methodology that accounts for the fact that "[t]he concentration of suspended sediment in a river cross-section at a given

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<sup>299</sup> E.g., Thorne, paras. 8.14-8.16, 8.62.

<sup>300</sup> CRCM, para. 3.13: "The suspended sediment load measured in the Rio Colorado at the Delta Colorado station may be adjusted to represent that in the Río San Juan upstream of the Delta by multiplying it by the reciprocal of 0.91"

<sup>301</sup> Andrews Report, Section V(F) (NR, Vol. II, Annex 3).

<sup>302</sup> *Ibid.*, Section V(K).

moment varies appreciably from bank to bank and from river bed to surface.”<sup>303</sup>

The appropriate methodology to account for this physical reality has been established for decades and is used worldwide.<sup>304</sup> It requires “collecting discharge-weighted samples of the flow at many verticals across the river channel,” which are combined to form one suspended sediment sample.<sup>305</sup> Thus, according to Dr. Andrews, “one and one-half to two hours will be required to collect a representative sample of suspended sediment at a channel as wide as exists near the Delta Colorado gage.”<sup>306</sup>

2.128 The data presented in the ICE Report, however, demonstrate that, on at least three occasions, ICE’s samples cannot have been properly collected. On each of those dates, two suspended sediment samples are reported as having been collected less than ten minutes apart. Dr. Andrews explains: “It is physically impossible to collect a representative sample of suspended sediment from a river cross-section that is several hundred meters wide in just a few minutes. The samples collected on these dates are invalid and cannot be relied upon.”<sup>307</sup>

2.129 Further, there is no basis for assuming that any of the other suspended sediment samples collected by ICE at the Delta station were properly collected, as no information has been provided regarding the methods or equipment used to carry out the sampling. Dr. Andrews observes:

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<sup>303</sup> *Ibid.*, Section V(B).

<sup>304</sup> *Ibid.*

<sup>305</sup> *Ibid.*

<sup>306</sup> *Ibid.*, Section V(K).

<sup>307</sup> *Ibid.*

“One suspects that the reported concentrations were determined from either a bucket full of surface water or, perhaps, a depth-integrated collected at a single vertical. Neither of these methods will provide a representative sample with which one can determine the amount of suspended sediment in the river. In the absence of evidence to the contrary, all of the reported values of suspended sediment collected at the Delta Colorado gage are suspect.”<sup>308</sup>

2.130 *Fifth*, even assuming *quod non* that the data did not have the flaws described above, they would not support Costa Rica’s conclusions. This is because the conclusions set out in the ICE Report and repeated in Professor Thorne’s report are built on a flawed statistical analysis. In that regard, Dr. Andrews describes ICE’s multiple technical errors in detail in his report.<sup>309</sup> In short, two fundamental mistakes in ICE’s analysis caused the trend lines plotting suspended sediment values at La Trinidad and at Delta Colorado to appear identical. Freed from those errors, the slopes diverge markedly. Thus, there is:

“only one chance in 100 that the observed suspended sediment concentrations at La Trinidad in 1974 to 1975 are the same as the concentrations that were observed at the Delta Colorado in 2011 to 2012. Prof. Thorne’s conclusion that the suspended sediment concentrations in the Rio San Juan Basin have not changed over the past forty years is demonstrably false.”<sup>310</sup>

2.131 *Sixth*, Costa Rica’s experts erred when calculating the River’s “bedload,” *i.e.*, the portion of a river’s total sediment load that hops, bounces, and

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<sup>308</sup> *Ibid.* Nicaragua repeatedly warned Costa Rica about precisely this error in response to Costa Rica’s proposal for a joint monitoring program. See letters from H.E. Carlos José Argüello Gómez to the Registrar of the ICJ, Ref: HOL-EMB-108, 14 June 2013 and Ref: HOL-EMB-167, 30 August 2013.

<sup>309</sup> Andrews Report, Section V(J) (NR, Vol. II, Annex 3).

<sup>310</sup> *Ibid.*

rolls along the river bed.<sup>311</sup> As Dr. Andrews explains, bedload “accumulate[s] on the river bed when the flow slackens” and is primarily responsible (together with the coarsest suspended sediment) for “the growth of sandbars and the restriction of navigation in the delta channels.”<sup>312</sup>

2.132 The ICE Report claims to have calculated the bedload in the Colorado River using a complicated equation, coming up with a value of 2,488,000 tons per year. However, this figure is unreasonably high given the normal behavior of sediment in rivers.<sup>313</sup> As Dr. Andrews explains, ICE’s calculations are substantially exaggerated because they assume an excessively steep river slope, a figure that is approximately 60% too high for the San Juan.<sup>314</sup> Slope is an important variable in river processes, because the steeper the slope, the greater the energy available to erode and transport sediment. When this error is corrected, bedload is closer to 330,000 tons per year, less than one-seventh of Costa Rica’s estimate.<sup>315</sup> This exaggeration of bedload means that Costa Rica’s total sediment load calculations, which incorporate its erroneous bedload figures,<sup>316</sup> are likewise exaggerated.

2.133 An additional point about slope values is important to appreciate. Professor Thorne presents what he says are river slopes in Table 1 of his report.

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<sup>311</sup> *Ibid.*, Section V(G).

<sup>312</sup> *Ibid.*

<sup>313</sup> *Ibid.*, Section V(H).

<sup>314</sup> *Ibid.*

<sup>315</sup> *Ibid.*

<sup>316</sup> CRCM. para. 3.27.

Those values are even more exaggerated than the slope values used in the ICE Report's bedload calculation.<sup>317</sup>

2.134 River slope is the drop in elevation over a particular "length" of river.<sup>318</sup> Professor Thorne provides values for the length and drop ("fall") in elevation of five stretches of the San Juan River. He also provides slope values, but those bear no relationship to the "length" and "fall in elevation" figures presented in the same table, which should form the basis for his slope calculations. This is made clear in the following table. The first four columns are reproduced from Professor Thorne's Table 1; the last three correct Professor Thorne's slope errors.

Reach	Length (km)	Fall in Elevation (m)	Thorne's Slope (m/m)	Correct slope calculation (m/m)	Correct slope (m/m)	Thorne's error
Rio Frio – Rio Pocosol	52.86	6.5	0.007	$6.5/52,860 =$	0.000123	56.9 times too high
Rio Pocosol – Rio San Carlos	52.67	7.7	0.008	$7.7/52,670 =$	0.000146	54.8 times too high
Rio San Carlos – Rio Sarapiqui	39.86	6.9	0.010	$6.9/39,860 =$	0.000173	57.8 times too high
Rio Sarapiqui – Delta	22.04	3.8	0.010	$3.8/22,040 =$	0.000172	58.1 times too high
Delta – Caribbean Sea	32.35	5	0.009	$5/32,350 =$	0.000154	58.4 times too high

<sup>317</sup> Professor Thorne incorporates these values, ignoring his own. Thorne, pp. 47-48.

<sup>318</sup> 2014 Kondolf Report, Section 9 (NR, Vol. II, Annex 1).

2.135 The “length” and “fall in elevation” values presented by Professor Thorne should lead to slope calculations between 0.000123 (0.0123%) and 0.000173 (0.0173%). Professor Thorne’s slope values, however, are exaggerated by a factor of 55-58. This leads Professor Thorne to the mistaken conclusion that the slopes are as high as one percent in two reaches, and just below one percent (0.7-0.9%) in the other three reaches. As Dr. Kondolf observes, “Experienced geomorphologists would recognize 1 percent as an extremely high slope for a large river.”<sup>319</sup>

2.136 The implications of Professor Thorne’s slope error are significant. The use of an exaggerated slope when calculating bedload produces not only an exaggerated bedload figure, but also an exaggerated total load figure. This is what has happened here: exaggerated slope values led to an exaggerated bedload figures in Costa Rica’s reports and, consequently, exaggerated total load estimates. This, in turn, led Costa Rica to underestimate the relative portion of sediment in the River that is attributable to the Road.<sup>320</sup>

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<sup>319</sup> *Ibid.*

<sup>320</sup> It is surprising that Professor Thorne incorporates so much the ICE Report’s flawed data and unjustified conclusions into his own report. But what is even more surprising is that Professor Thorne claims to have played a key role in the preparation of this deeply flawed document, as well as that of the equally flawed documents described above which form the basis for Costa Rica’s unreasonably low estimate of how much sediment from the Road is making its way into the San Juan River. Professor Thorne says that he “requested, formulated and supervised” the preparation of these “scientific and technical studies,” “participated in technical meetings” with the authors of those reports “during which [they] discussed approaches and methodologies to be employed in performing the work, reviewed progress and discussed the results,” and “reviewed the preliminary findings of the team, requesting additional analyses where appropriate.” He characterizes all of Costa Rica’s “scientific and technical” reports as being “the outcomes of this supervised research process.” Thorne, para. 3.3. Their many errors and inaccuracies are, accordingly, attributable not only to the government employees who authored them, but to him as well.

#### **D. CONCLUSION**

2.137 In sum, Costa Rica has caused, and is continuing to cause, significant harm to Nicaragua's San Juan River and its natural environment. Costa Rica's attempt to show otherwise is so permeated with methodological and factual errors as to render its conclusions meaningless.



## CHAPTER 3

### THE RISK OF HARM TO NICARAGUA

3.1 In the previous Chapter, Nicaragua showed the real and substantial transboundary harm already caused to it by Costa Rica's hasty and negligent construction of Route 1856. In this Chapter, Nicaragua responds to Costa Rica's claim that the Road does not pose a significant risk of further transboundary harm. *Section A* describes the risks to which Nicaragua has been exposed by Costa Rica's failure to comply with the relevant standards for the design, construction and maintenance of roads, including the Central American standards Costa Rica itself helped develop. *Section B* refutes the contention that Costa Rica has undertaken adequate mitigation measures. Finally, in *Sections C, D and E*, Nicaragua addresses additional risks posed by the Road, including from spills of toxic substances transported on the Road (C), from further development along the Costa Rican bank of the River (D), and from natural disasters, including hurricanes, tropical storms and earthquakes (E).

#### **A. THE RISKS POSED BY COSTA RICA'S CONTINUING FAILURE TO COMPLY WITH ROAD CONSTRUCTION STANDARDS**

3.2 Costa Rica acknowledges that many sections of the Road are currently in a "rudimentary condition,"<sup>321</sup> the Counter-Memorial's euphemistic description of the Road's failing slopes and stream crossings. The significant harms these deficiencies have caused to Nicaragua, and the serious risks they

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<sup>321</sup> CRCM, para. 2.26.

continue to pose are the direct result of Costa Rica's near total failure to abide by international, regional, and Costa Rican standards for how roads should be designed, constructed, and maintained. As Mr. Hagans and Dr. Weaver explain, Costa Rica has violated "the most basic, well accepted road engineering and road maintenance principles normally applied during road construction."<sup>322</sup> In their view:

"Costa Rica's poor (or absent) design and construction standards, and the apparent lack of construction engineering oversight during road building, are completely contrary to modern road construction standards found in any design manual in the last 30 years."<sup>323</sup>

3.3 Among the standards violated by Costa Rica are those agreed to by the Ministries of Transportation of the Governments of Nicaragua, Costa Rica, Guatemala, Honduras and El Salvador, which are set out in manuals developed by the Secretariat for the Economic Integration of Central America.<sup>324</sup> These manuals establish the regional standards for highway design, construction and maintenance, as well as environmental norms for the prevention, mitigation, and correction of road-related impacts. Costa Rica's continuing violation of them puts Nicaragua at risk.

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<sup>322</sup> Hagans and Weaver Report, Section III.D (NR, Vol. II, Annex 2).

<sup>323</sup> *Ibid.*, Section II.E.

<sup>324</sup> These include the following four manuals: Central American Manual of Environmental Norms for the Design, Construction and Maintenance of Roads (Nov. 2002); Central American Manual of Specifications for the Construction of Regional Roads and Bridges (2nd. Edition, Mar. 2004); Central American Manual on the Maintenance of Roads (2010 Edition); Central American Manual of Norms for the Geometric Design of Roads (3rd. Edition 2011). See Affidavit of Ana Isabel Izaguirre Amador, 18 July 2014 (NR, Vol. II, Annex 14).

3.4 At the most basic level, Costa Rica disregarded the simple but critical principle that a highway construction project must be planned and designed. This standard, which should be self-evident in any event, is set out in the Central American manual on road construction design, which states:

“After the project has been planned and programmed for implementation, the next phase is the development of the project (preliminary design). This phase consists of the following basic steps: • Refinement of the purposes and needs; • Development of a range of alternatives; • Evaluation of alternatives and their environmental impact; • Development of appropriate mitigation... Once the best alternative has been selected and the description of the project is expanded by the EIA, the project goes to the final design phase. The final product in this phase is represented in several plans, specifications and quantities of materials and work to be used and carried out.”<sup>325</sup>

3.5 Unsurprisingly, this requirement is not unique to highway projects in Central America. The Food and Agricultural Organization’s guidelines for forest road construction provides:

“Forest roads should be designed and laid out in the field by competent engineers who understand the need to minimize soil disturbance, maintain proper drainage and avoid stream crossings where possible. Construction and maintenance of forest roads is specialized work that should be supervised by engineers and carried out by specially trained work crews.”<sup>326</sup>

3.6 Costa Rica failed to abide by this most basic of standards, as confirmed by contemporaneous Costa Rican reports. In a 2012 report, the

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<sup>325</sup> Central American Manual of Norms for the Geometric Design of Roads (3rd. Edition 2011), p. 16 (NR, Vol. II, Annex 13).

<sup>326</sup> Dennis P. Dykstra & Rudolf Heinrich, Food and Agricultural Organization of the United Nations, “FAO model code of forest harvesting practice,” 1998, available at <http://www.fao.org/docrep/v6530e/v6530e00.HTM>, p. 21.

National Laboratory of the University of Costa Rica (“LANAMME”) concluded that the Road “was done without any basic geometric design,”<sup>327</sup> and it “failed to follow basic engineering practices during planning and implementation.” Costa Rica’s design omissions included, among other things that Costa Rica failed to perform: “land survey for road layout; critical point geotechnical assessment; drainage structure location, design, and construction; defining suitable and uniform technical standards; inspection deficiency.”<sup>328</sup> Other Costa Rican reports echoed these conclusions.<sup>329</sup>

3.7 Dr. Kondolf likewise highlights Costa Rica’s failure to design the Road, observing that “[i]t is apparent that bulldozer operators would simply ‘wing it,’ in many places attempting to put the road up steep slopes that in a normal road building project, with standard engineering and environmental safeguards, would never have been selected for a road in the first place.”<sup>330</sup> This often occurred very near the San Juan River,<sup>331</sup> despite Costa Rican regulations dictating minimum buffer zones.<sup>332</sup>

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<sup>327</sup> LANAMME Report, pp. 50-51 (NM, Vol. II, Annex 3).

<sup>328</sup> *Ibid.*, p. 50.

<sup>329</sup> CFIA Report, p. 25: “The project has no plans or preliminary studies.... The route was constructed without a single plan to indicate the path that was to be opened, or what its characteristics should have been. This situation causes increased costs, environmental problems, and a rapid deterioration of the project.” CONAVI, acknowledging that the project was not “subjected to the procedures for development of infrastructure projects that take into account, for example, stages of conceptualization, feasibility, design and management of the work.” (NM, Vol. II, Annex 4.)

<sup>330</sup> 2014 Kondolf Report, Section 4 (NR, Vol. II, Annex 1).

<sup>331</sup> 2012 Kondolf Report, p. 23 (explaining that nearly half of the Road is within 100 meters of the river bank, with 30% within 50 meters) (NM, Vol. I, Annex 1).

<sup>332</sup> See *ibid.*, p. 8.

3.8 The Road also violates the applicable standards regarding construction and maintenance, including those set out in the Central American manuals governing these aspects of highway projects. The standards imposed by the Central American manuals reflect regional consensus regarding the proper engineering of roads. Failure to comply with them creates risks of catastrophic failures. Dr. Kondolf explains that compliance with construction standards for “cut and fill” roads, like the one built by Costa Rica, is critical because “[t]he stability of the cutslope depends on the nature of the geologic material into which it is cut,” and the underlying material must have sufficient capacity to support the slopes cut into it.<sup>333</sup> Likewise, the stability of fills “depends largely on how [they are] constructed. If the underlying slope has been properly cleaned and the fill compacted to engineering standards, it may be stable for years or decades.” However, “[i]f the underlying slope is not cleared and scarified (prepared) before placing fill, and if the fill is not compacted to engineering standards, the fill prism will be highly unstable.”<sup>334</sup> Compliance with drainage standards is also vital

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<sup>333</sup> *Ibid.*, p. 10. See Central American Manual of Norms for the Geometric Design of Roads (3rd. Edition 2011) (NR, Vol. II, Annex 13), Section 4.2.2, at p. 145: “The stability of the cutslope depends on the nature of the material encountered and the construction method to be employed.” See also Central American Manual of Environmental Norms for the Design, Construction and Maintenance of Roads (2002) (NR, Vol. II, Annex 10), Section C.10.1, p. 40: “The cuts in most soils up to 10-15 meters tall (earth excavation), must be stabilized with slopes ¾: 1 to 1:1. In loose, gravelly and sandy soils, slope cuts of 1:1 to 1 ½: 1 is required.”

<sup>334</sup> 2012 Kondolf Report, p. 11 (NM, Vol. II, Annex 1). See Central American Manual of Specifications for the Construction of Regional Roads and Bridges (2nd. Edition 2004) (NR, Vol. II, Annex 11), Article 204.09, p. 200-12: *“Preparation of the foundation for the construction of the fillslope. (a) Fillslopes less than 1 meter above natural ground.* The clear soil surface shall be crumbled to a minimum depth of 150 mm, plowing or scarifying it. The ground surface shall be compacted according to Article 204.11.”; Article 204.11, p. 200-15: “The material placed in all layers of the fillslope and scarified material in cut sections should be compacted to at least 95% of

because roads “disturb pre-existing natural drainage patterns, increasing storm runoff from a given rainfall, and more importantly, concentrating surface runoff such that it is capable of eroding gullies and transporting sediment and contaminants to surrounding river systems.”<sup>335</sup>

3.9 The relevant standards preclude, among other things, “side casting.” This is where a “bulldozer blade simply push[es] material (removed from the cutbank) ‘over the edge’ so that it tumbles down the bank.”<sup>336</sup> Sidecasting rends a project prone to erosion and landsliding, especially if the underlying slope was not properly cleared or if debris is allowed to persist in the sidecast fill.<sup>337</sup> For that reason, LANAMME and Costa Rica’s professional association of engineers and architects (or “CFIA,” by its Spanish acronym) have

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the maximum density.”; Article 204.10, p. 200-13 “*Construction of fillslope*. Add in the fillslope only adequate material excavated from the track”; and Article 704.03, p. 700-33: “Use granular material and fine soil free of excess of moisture, mud, roots, seeds, and other deleterious materials. All particles of rock and hard soil lumps larger than 75mm must be removed”.

<sup>335</sup> 2012 Kondolf Report, p. 4 (NM, Vol. II, Annex 1). See Central American Manual of Norms for the Geometric Design of Roads (3rd. Edition 2011) (NR, Vol. II, Annex 13), Section 8.1.4, p. 305: “Water is one of the elements that causes major problems on the roads and paths because it decreases the resistance of soils, creating failures in fillslopes, cuts and bearing surfaces. This is why it is necessary to build efficient drainage to drain the water away from the project in the shortest amount of time.” See also Central American Manual of Specifications for the Construction of Regional Roads and Bridges (2nd. Edition 2004) (NR, Vol. II, Annex 11), Section 602, p. 600-5: Culverts and drainage; Article 602.03, p. 600-5: “General Requirements for Construction. Use the same materials and coatings on all the sections of continuous pipe extensions and special sections.” See also Central American Manual on the Maintenance of Roads (2010 Edition) (NR, Vol. II, Annex 12), Section 802.01, p 192: “Cleaning of Culverts and other drainage structures. This activity consists of the collection, extraction and removal of all materials which have been deposited in the section of the sewers, boxes and input and output channels, regardless of their respective dimension, including the cleaning and removal of all material found in other elements that make up the soil. It is necessary to keep in mind that these tasks are designed to achieve the fast channeling of the water through these systems.”

<sup>336</sup> 2012 Kondolf Report, p. 11 (NM, Vol. II, Annex 1).

<sup>337</sup> *Ibid.*

criticized the Road’s widespread use of sidecasting, castigating the project for creating loose, uncompacted fills.<sup>338</sup> The serious risk this poses to Nicaragua is compounded by lack of drainage, which allows the unprotected fills to be eroded by water.<sup>339</sup>

3.10 Dr. Kondolf singles out sidecasting as an especially egregious violation of construction standards. He notes that “[t]he material removed from the cut was simply ‘sidecast’, i.e., pushed down the slope by the blade, without first removing vegetation from the slope and with neither engineering the fill by compaction nor use of geotextiles.”<sup>340</sup> These still-uncorrected problems place Nicaragua at grave risk, since the resulting “fillslopes are inherently unstable, no more than loose piles of earth, easily eroded into rills and gullies by surface runoff, and prone to landsliding.”<sup>341</sup>

3.11 Costa Rica similarly disregarded the relevant standards governing construction of stream crossings, which are “[a]mong the most critical points in road design and planning.”<sup>342</sup> International best practices call for a well-constructed bridge over the stream, but when that is not possible, due care must be exercised in constructing a stream crossing, especially the earthen fill crossings with culverts that are ubiquitous along Costa Rica’s Road. Dr. Kondolf

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<sup>338</sup> LANAMME Report, pp. 15, 18, 21 (noting that a “mechanical layer compaction process” is “mandated by best engineering practices”), 24, 29, 41, 46, 49 (NM, Vol. II, Annex 3); CFIA Report, pp. 9, 26-27 (NM, Vol. II, Annex 4).

<sup>339</sup> LANAMME Report, pp. 15-17, 19, 25, 29, 46-49, 51 (NM, Vol. II, Annex 3); CFIA Report, pp. 5-10, 14, 16-17, 20-22, 25 (NM, Vol. II, Annex 4).

<sup>340</sup> 2014 Kondolf Report, Section 4 (NR, Vol. II, Annex 1).

<sup>341</sup> *Ibid.*

<sup>342</sup> 2012 Kondolf Report, p. 13 (NM, Vol. II, Annex 1).

explains, “[t]hese are inherently unstable features, because they involve placement of massive volumes of fill within the stream channel and valley, where it can easily be eroded and enter the river system, and depend on the culvert to successfully pass all flood flows through a constricting pipe.”<sup>343</sup> Proper construction of such crossings requires, among other things, a strong culvert that is large enough to allow high flows. This must be placed “on the original streambed, aligned with the natural stream channel above and below the crossing site,” and put in a location where it will not erode the fill, which itself must be “compacted to engineering standards so that it can bear the weight of the anticipated traffic.”<sup>344</sup>

3.12 LANAMME criticized Costa Rica’s defective stream crossings, and urged that they be “replaced as soon as possible with culverts properly designed according to ... each stream flow rate to prevent eventual road embankment damage during the rainy season.”<sup>345</sup> CFIA came to the same conclusion, recommending replacement of Costa Rica’s existing stream crossings because the “wooden logs, trailer containers and drainages that are being used as

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<sup>343</sup> *Ibid.*

<sup>344</sup> *Ibid.* See Central American Manual of Specifications for the Construction of Regional Roads and Bridges (2nd. Edition, 2004) (NR, Vol. II, Annex 11), Article 602.04, p. 600-6: “*Placement of concrete pipe and precast reinforced concrete boxes for culverts.* Start by placing on the site of the lower outlet and place the bell or groove upstream. Fill all joints of sections completely. Place the circular elliptical reinforcing steel tubing, with the minor axis of the reinforcement, vertical. Build boards according to one of the following methods.”

<sup>345</sup> LANAMME Report, p. 40 (NM, Vol. II, Annex 3).

bridges and water pathways under the road ... do not comply with minimal structural design and engineering mechanics requirements.”<sup>346</sup>

3.13 Mr. Hagans and Dr. Weaver agree, observing that “few, if any, of the fills were properly compacted,” reflecting “lack of care and attention to basic design and construction principles for stream crossing construction.”<sup>347</sup> They continue:

“[I]t does not appear that stream crossing drainage structures (e.g., culverts) were properly designed and sized for large, infrequent flood flows, or that they were installed and located correctly within the fill. Even by our remote visual inspection, culverts clearly appear unreasonably small for the drainage basins they are supposed to drain, and are often placed high in the fill with extensive erosion having already occurred where they release stream flow onto the new, unprotected, erodible fill materials. Workmanship on critically important stream crossings right next to the Rio San Juan ... is unreasonably poor and unprofessional. They were either poorly designed or poorly constructed, or both.”<sup>348</sup>

3.14 Nicaragua remains at risk because Costa Rica continues to ignore these recommendations. According to Dr. Kondolf, many of the stream crossings along the Road “consist of loose, unengineered fill dumped over what most commonly appear to be undersized culvert pipes, which are often not set at the base of the fill (along the original grade of the stream) but higher in the fill, where they are more prone to failure (as has occurred at many crossings).”<sup>349</sup> He

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<sup>346</sup> CFIA Report, p. 27 (NM, Vol. II, Annex 4).

<sup>347</sup> Hagans & Weaver Report, Section II.A (NR, Vol. II, Annex 2).

<sup>348</sup> *Ibid.*

<sup>349</sup> 2014 Kondolf Report, Section 4 (NR, Vol. II, Annex 1).

emphasizes the substandard nature of these works and the risk they create for Nicaragua:

“It is not ‘typical’ to have multiple stream crossings fail within the first few years after construction. It is not ‘typical’ to have multiple fill slopes fail within a year or two of construction, nor to have massive gullies develop on fill slopes and stream-crossing fills. In the US, such violations result in severe penalties for the perpetrators, and we would hardly consider these destructive actions ‘typical’. They represent a level of incompetence and blatant disregard for environment and safety that has already impacted the Río San Juan, and *poses even more significant threats from future contamination by chemical spills ... and massive failures triggered by future intense rains or earthquakes.*”<sup>350</sup>

3.15 Dr. Kondolf pointed out these problems in his 2012 Report,<sup>351</sup> and predicted that “[s]tream crossing failures will occur when storm flows cause culverts to plug or culvert capacity to be exceeded, and the fill is eroded or the stream is diverted onto adjacent, unprotected hillslopes leading to the Río San Juan,” causing “road and hillslope gullies that will result in additional volumes of gully erosion and sediment delivery to the receiving tributaries and to the Río San Juan.”<sup>352</sup> This is exactly what has happened, as described in Section A of this Chapter, above. It is bound to happen again (and again), unless and until necessary remediation is performed by Costa Rica at all vulnerable sites.

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<sup>350</sup> *Ibid.* (emphasis added).

<sup>351</sup> 2012 Kondolf Report, pp. 30-34 (NM, Vol. II, Annex 1).

<sup>352</sup> *Ibid.*, p. 30.

## **B. COSTA RICA'S FAILURE TO REMEDIATE THE ROAD'S DEFECTS**

3.16 As the Court observed in its Order of 13 December 2013, Costa Rica has “recognized the necessity of remediation works, in order to mitigate damage caused by the effects of poor planning and execution of the road works in 2011, and has indicated that a number of remediation measures to that end have already been undertaken.”<sup>353</sup> Indeed, Costa Rica has made numerous representations about the mitigation measures it claims to have undertaken or intends to undertake in the future,<sup>354</sup> going so far as to claim at the November 2013 hearings that Costa Rica’s remediation is broader in scope than the measures Nicaragua requested.<sup>355</sup> Costa Rica generally does not dispute that the Road was constructed without regard for the standards discussed above. Rather, it argues that “[w]hether or not the Road was initially constructed to such standards is beside the point” since Costa Rica can be trusted to “complet[e] the Road to the highest environmental and engineering standards.”<sup>356</sup> Costa Rica’s actions,

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<sup>353</sup> *Construction of a Road in Costa Rica Along the San Juan River (Nicaragua v Costa Rica), Request presented by Nicaragua for the Indication of Provisional Measures, Order*, 13 December 2013, para. 37.

<sup>354</sup> E.g., CRCM, paras. 1.24 (“Costa Rica has taken a series of measures designed to lessen the environmental impact of the Border Road (impacts that, insofar as they may be of some significance, are felt solely within Costa Rican territory”), 2.38-2.41 (“Since April 2012, in order to protect the work that has been carried out so far and to mitigate the effects of the road (primarily in respect of Costa Rican territory), Costa Rica has been carrying out additional maintenance and remedial works on the Border Road.”).

<sup>355</sup> CR 2013/29, p. 50, para. 26 (Kohen).

<sup>356</sup> CRCM, para. 3.45. Costa Rica also maintains that it “*had* to implement solutions of a temporary nature, such as installing small bridges and culverts using logs and metal containers” in light of the alleged emergent need to “provide provisional access to towns and locations along the border that had no other viable means of access” and “to create a continuous thoroughfare along the entire length of the border from Los Chiles to Delta Costa Rica.” CRCM, para. 2.31. Costa

however, belie its promises, and make plain that Nicaragua remains at serious risk because effective remediation is still not taking place.

3.17 The Counter-Memorial asserts that “Costa Rica has taken a series of measures designed to lessen the environmental impact of the Border Road,” but denies any remediation is needed to mitigate risks to Nicaragua because, it contends, the project’s impacts are felt exclusively in Costa Rica. This claim, however, is amply refuted by the facts presented in the previous Chapter showing the harm to Nicaragua that has already occurred. It is also disproven by the “Environmental Management Plan”<sup>357</sup> that Costa Rica produced in April 2012 (henceforth the “2012 EMP”<sup>358</sup>).

3.18 Although Nicaragua addressed the 2012 EMP in its Memorial,<sup>359</sup> Costa Rica’s Counter-Memorial conspicuously avoids any mention of it. Included in the 2012 EMP is a table of color-coded “Priority” remediation works<sup>360</sup> which

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Rica’s argument about a purported “emergency” is refuted in Chapter 6. For now, it suffices to note that, by implementing these “temporary” solutions – in violation of standard practices – and by leaving them in place for an extended period of time, Costa Rica has failed to meet even its own putative objectives since collapsed slopes and stream crossings *impede* safe access and *interrupt* the “continuous thoroughfare” Costa Rica claims to have needed to construct on an emergency basis.

<sup>357</sup> As the Golder Report explains, proper Environmental Management Plans (EMPs) are an offshoot of an EIA process, and they are “the framework to ensure that all issues identified during the [EIA] process are addressed through appropriate mitigation and monitoring.” Golder Report, Section 5 (NR, Vol. II, Annex 6). Costa Rica’s EMP was not the product of an EIA, as no EIA was ever conducted.

<sup>358</sup> Costa Rican Ministry of Environment, Energy and Telecommunications, National Conservation Area System, Ministry of Public Works and Transportation, National Road Council, and National Risk Prevention and Emergency Response Commission, “Environmental Management Plan: Juan Rafael Mora Porras Road,” April 2012 (hereinafter the “2012 EMP”) (NM, Vol. II, Annex 2).

<sup>359</sup> E.g., NM, paras. 3.12, 3.15, 3.23, 3.29, 3.39, 3.44, 3.52, 3.59, 5.28.

<sup>360</sup> 2012 EMP, Annex 2 (NM, Vol. II, Annex 2, pp. 191-194).

makes clear that there are risks *to Nicaragua* must be addressed. It states: “Green, yellow and red priorities are based on the risk that sediments could be transported by the channels located on Costa Rican soil *to the San Juan River channel* due to its proximity and to the exposure of sediments in the channels and on the road.”<sup>361</sup> The 2012 EMP further specifies that mitigation measures are needed to “minimiz[e] the transportation of sediments from the channels *to the San Juan River.*”<sup>362</sup>

3.19 Despite its recognition of these risks, Costa Rica has not implemented the necessary remediation measures. For instance, the 2012 EMP highlighted the need for Costa Rica to implement effective drainage and sediment control along the Road, not only to prevent the erosion of road works,<sup>363</sup> but also to “prevent sediments from leaving work areas and reaching nearby bodies of water,” the most important of which is, of course, the San Juan River.<sup>364</sup> Costa

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<sup>361</sup> *Ibid.* (NM, Vol. II, Annex 2, p. 194 (emphasis added)). Most of the entries have been coded red and yellow, apparently indicating high or medium priority (though no key or explanation is provided), with only three entries coded green. *Ibid.* (NM, Vol. II, Annex 2, pp. 191-193).

<sup>362</sup> *Ibid.* (NM, Vol. II, Annex 2, p. 194 (emphasis added)). The 2012 EMP further recommends that “[p]lantations with native local species should be established to protect river and brook banks, particularly in areas without any forest cover, on the entire strip between the road and the San Juan River.” *Ibid.*, p. 19 (NM, Vol. II, Annex 2, p. 181). This recommendation was made in response to “identified environmental impacts” to water resources, *ibid.*, indicating a recognition by the authors of the 2012 EMP that cleared, exposed areas pose a risk of harm to bodies of water, including the San Juan River (via both direct contribution from such exposed land and contribution from the rivers and brooks that empty into it). In November 2013, the authors of Costa Rica’s Environmental Diagnostic Assessment (“EDA”) were still recommending reforestation, stating that “Priority areas should be sites with undulating slopes … and in the border strand along the San Juan River, and other rivers or creeks in the area of Route 1856.” EDA, p. 145; repeated at p. 161 (CRCM, Vol. II, Annex 10).

<sup>363</sup> 2012 EMP, p. 22 (NM, Vol II, Annex 2).

<sup>364</sup> *Ibid.*, p. 20. The 2012 EMP also stressed that “[d]umping excavated or cut materials downhill into rivers and brooks is prohibited,” as is “[m]achinery washing and maintenance tasks in

Rica's failure to implement that measure made it necessary for the November 2013 EDA to recommend the improvement of drainage structures,<sup>365</sup> emphasizing that drainage systems are needed "as soon as possible, especially on unstable slopes to avoid sedimentation of aquatic media."<sup>366</sup> As Dr. Kondolf observes, this remains undone.<sup>367</sup>

3.20 The 2012 EMP also recognized the need for arranging for the proper disposal of debris,<sup>368</sup> and "soil conservation works,"<sup>369</sup> including covering exposed soils,<sup>370</sup> to limit the transfer of such materials to nearby bodies of water, a measure plainly relevant to the San Juan River. Relevant too are the EMP's recommendations that "hydrological studies should be made for all water crossings" to ensure that stream crossings are properly designed<sup>371</sup>; that related works "should not alter or change a waterbody['s] natural channel, to the extent possible"<sup>372</sup>; and that a "channel maintenance plan" to clean accumulated sediments from stream crossings should be enacted.<sup>373</sup> These recommendations were ignored as well, prompting the 2013 EDA to subsequently observe that plugged river crossings have the potential to cause environmental damage when

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streams," and that care needs to be taken "to make sure no oil or fuel leaks reach bodies of water." *Ibid.*

<sup>365</sup> EDA, p. 146; *see also* p. 162 (CRCM. Vol. II, Annex 10).

<sup>366</sup> *Ibid.*, pp. 148, 149.

<sup>367</sup> 2014 Kondolf Report, Section 6 (NR, Vol. II, Annex 1).

<sup>368</sup> 2012 EMP, pp. 20, 22-24 (NM, Vol II, Annex 2); *see also* 2012 EMP, Annex 3 (NM, Vol. II, Annex 2, pp. 195, 198).

<sup>369</sup> 2012 EMP, p. 22 (NM, Vol. II, Annex 2).

<sup>370</sup> *Ibid.*, p. 23.

<sup>371</sup> *Ibid.*, p. 19; *see also* 2012 EMP, Annex 3 (NM, Vol. II, Annex 2, p. 199).

<sup>372</sup> 2012 EMP, p. 20 (NM, Vol. II, Annex 2).

<sup>373</sup> *Ibid.*

the water backs up behind the clogged stream crossing, and that “drains” needed to be constructed “to avoid the accumulation of waters and alteration [i.e., erosion, or washing out] of the road itself.”<sup>374</sup> As Dr. Kondolf explains, these defects remain uncorrected.<sup>375</sup>

3.21 An effective remediation programme would, at a minimum, repair the worst eroding sites and ensure that the underlying cause of the erosion is addressed. Costa Rica, however, has ignored these areas. Based on his study of the Road in May 2014, Dr. Kondolf reports that, with regard to “the sites with the greatest ongoing erosion rates and greatest potential for future erosion, no erosion control has been attempted.”<sup>376</sup> At just Site 9.6 of Dr. Kondolf’s Inventory of Severely Eroding Sites (located 18.2 km downstream from Mojon II) over 6,600 m<sup>3</sup> of sediment eroded between October 2012 and May 2014, much of it deposited in the River. Yet, Costa Rica made “no visible efforts at performing preventative surface, rill and gully erosion control measures, or slope stabilization” on any part of the site.<sup>377</sup>

3.22 In fact, Dr. Kondolf reports that “[o]f the 41.6 km from Mojon II to Boca San Carlos, only the upper 15 km of the road have had erosion control attempts.”<sup>378</sup> A report by the Costa Rican agency *Consejo Nacional de Vialidad* (“CONAVI”), which describes all of Costa Rica’s remedial work (except for

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<sup>374</sup> EDA, p. 146 (CRCM, Vol. II, Annex 10).

<sup>375</sup> 2014 Kondolf Report, Sections 3 & 6 (NR, Vol. II, Annex 1).

<sup>376</sup> 2014 Kondolf Report, Section 6 (NR, Vol. II, Annex 1).

<sup>377</sup> Hagans & Weaver Report, Section II.D (NR, Vol. II, Annex 2).

<sup>378</sup> 2014 Kondolf Report, Section 6 (NR, Vol. II, Annex 1).

seedling-planting), confirms this. It states, “Work was carried out in the Tiricias sector, and the project spanned the approximate distance of 15 km.”<sup>379</sup> Thus, the remediation measures described in the Counter Memorial have not been taken with respect to any of the remaining 165 km of the Road.

3.23 Limiting its remedial work to the upper 15 km stretch is particularly problematic because the worst eroding sites are located elsewhere, along the steep, highly erodible terrain where gashes from failed and incomplete sections of the Road have been left to erode into the River, as described in Chapter 2.<sup>380</sup> Costa Rica’s remedial work has thus ignored the part of the highway in the most urgent need of attention.

3.24 Moreover, the remedial measures in the 15 km stretch where Costa Rica has taken action are insufficient to prevent erosion into the River. Dr. Kondolf observed sites where Costa Rica has done nothing more than drape geotextiles over exposed slopes.<sup>381</sup> Even when installed properly, this cannot prevent the erosion of steep slopes.<sup>382</sup> As LANAMME has noted, while sheeting may reduce wind and rain erosion, it “will not decrease the amount of

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<sup>379</sup> *Consejo Nacional de Vialidad* (CONAVI), “Program for the Consolidation and Continued Improvement of Route No 1856,” 25 October 2013, p. 3 (CRCM, Vol. II, Annex 8). An associated map then clarifies this location.

<sup>380</sup> See also 2014 Kondolf Report, Sections 3 & 6 (NR, Vol. II, Annex 1); Hagans & Weaver Report (NR, Vol. II, Annex 2).

<sup>381</sup> 2014 Kondolf Report, Section 6 (NR, Vol. II, Annex 1).

<sup>382</sup> Golder Report, Sections 6 & 7 (NR, Vol. II, Annex 6).

sedimentation.”<sup>383</sup> In fact, many of Costa Rica’s geotextiles have deteriorated and failed, as can be seen in **Figures 3.1** and **3.2**.<sup>384</sup>

**Figure 3.1.** Failing geotextile approximately 10.0 km downstream from Mojón II.



**Figure 3.2.** Failing geotextiles approximately 6.8 km downstream from Mojón II.



<sup>383</sup> LANAMME Report, p. 37 (NM, Vol II, Annex 3).

<sup>384</sup> 2014 Kondolf Report, Section 6 (NR, Vol. II, Annex 1).

3.25 Other “remediation” measures implemented by Costa Rica, Dr. Kondolf explains, are equally “superficial,” and “do nothing to prevent massive failures of cut slopes” or “un-engineered fillslopes and stream crossing fill prisms,” which are the problems that place Nicaragua at the greatest risk.<sup>385</sup> These include Costa Rica’s attempts to cover bare-earth roads with rock; line ditches adjacent to the road surface; install drains along the inside and outside portion of certain road segments; and cover some steep fill slopes with erosion control fabrics.<sup>386</sup> These measures do not reduce the most serious risks to Nicaragua because they cannot prevent the surface from cascading to the bottom of the hill in a landslide,<sup>387</sup> which has already happened in numerous locations, as detailed in Section A Chapter 2, above.<sup>388</sup>

3.26 In many places, Costa Rica’s post-construction work has been limited to reconstructing failed parts of the Road in the same flawed manner that caused the failure in the first place. For instance, as described in paragraphs 2.30-2.32, above, after the stream crossing failed at Site 9.5 in Dr. Kondolf’s Inventory of Severely Eroding Sites, Costa Rica refilled it with soil and improperly installed a culvert, which caused the failure to reoccur by May 2014, washing tons of

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<sup>385</sup> *Ibid.*

<sup>386</sup> *Ibid.*

<sup>387</sup> *Ibid.*

<sup>388</sup> *Ibid.*, Section 2; Hagans & Weaver Report (NR, Vol. II, Annex 2).

sediment into the River yet again.<sup>389</sup> Similarly, deficient construction techniques were repeated at Site 9.4, without any additional efforts at erosion control.<sup>390</sup>

3.27 In other places, Costa Rica's putative remediation efforts have made erosion *worse*. For example, at some point between May 2013 and May 2014, Costa Rica installed a road-side drain to channel water from the surface of the Road. Because it was so poorly designed and constructed, however, all it did was divert the water directly to the vulnerable fill underlying the road. The worsening erosion that resulted may be seen in the photographs reproduced at **Figures 3.3 and 3.4.**<sup>391</sup>

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<sup>389</sup> Hagans & Weaver Report, Section II.B (NR, Vol. II, Annex 2); 2014 Kondolf Report, Sections 3 & 6 (NR, Vol. II, Annex 1).

<sup>390</sup> *Ibid.*

<sup>391</sup> 2014 Kondolf Report, Section 6 (NR, Vol. II, Annex 1).

**Figure 3.3.** May 2013 photograph of road runoff directed from drainage structure into fill.



**Figure 3.4.** May 2014 photograph of erosion resulting from direct drainage from road onto fill.



3.28 Nicaragua can be brief regarding Costa Rica's remaining remediation efforts, which consist of a project to plant seedlings. The program, which is described in a report by the *Comisión de Desarrollo Forestal de San Carlos* ("CODEFORSA"), has apparently been successful at attracting volunteers, through promises of free T-shirts, pens, and lunches.<sup>392</sup> But it has achieved little else. As Dr. Kondolf explains, planting seedlings is, even in a best-case scenario, a purely cosmetic measure. It "can never stabilize slopes against most landslides, because the landslide failure planes are much deeper than the root depth of even successfully established trees."<sup>393</sup> In any event, Dr. Kondolf observed on his most recent field visit that many of the planted seedlings have died.<sup>394</sup>

3.29 In fact, the superficial measures Costa Rica has implemented are so inadequate that the best Costa Rica's expert, Professor Thorne, can bring himself to say in their defence is that:

"[T]hese are temporary works that mitigate but do not permanently solve erosion problems, and a permanent solution will not be achieved until design, planning and construction of [the] Road are completed. *In my opinion, the necessary work should proceed as soon as possible, with the work expedited to the greatest degree, and consistently with Costa Rican legal and contracting practices.*"<sup>395</sup>

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<sup>392</sup> *Comisión de Desarrollo Forestal de San Carlos* (CODEFORSA), "Consulting Services for the Development and Implementation of an Environmental Plan for the Juan Rafael Mora Porras Border Road," January 2013, p. 11 (CRCM, Vol. II, Annex 2, p. 42).

<sup>393</sup> 2014 Kondolf Report, Section 6 (NR, Vol. II, Annex 1).

<sup>394</sup> *Ibid.*

<sup>395</sup> Dec. 2013 Thorne Report, para 11.19 (emphasis added); *see also* para. 11.18 (CRCM, Vol I, Appendix A).

3.30 Thus, Professor Thorne recognizes that as of December 2013, Costa Rica had still not undertaken the “necessary work” in regard to “design, planning and construction” that would “permanently solve erosion problems,” and that this needs to be done “as soon as possible.” In so stating, Professor Thorne echoed the 2012 EDA, which likewise recognized the need to “stabilize slopes *as soon as possible*, especially those considered unstable, to avoid sedimentation of aquatic environments.”<sup>396</sup> Regretably, Costa Rica does not share this sense of urgency.

3.31 In some places, the deficiencies in the Road are so fundamental that the only way the risks to Nicaragua can be adequately mitigated is by relocating the Road further away from the River. Even Costa Rica’s EDA recognizes that at least one section of the Road – the portion containing the Severely Eroding Sites discussed above – is so problematic that relocation to the south, that is, farther from the River, should be evaluated. It recommends that Costa Rica:

“evaluate the technical possibility of modifying the route designated for Route 1856 at the point called Infiernillo [sic] to include the use of local roads built on less sloping terrain, tracing the road some km. to the south, where there are open areas and settlements with more favorable topographical conditions.”<sup>397</sup>

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<sup>396</sup> EDA, para 7.2.19 (emphasis added) (CRCM, Vol. II, Annex 10).

<sup>397</sup> *Ibid.*, pp. 147, 162; *see also* Map 1 of 6 (CRCM, Vol. II, Annex 10, p. 524) showing the location of “Infiernillo” [sic] immediately adjacent to “Crucitas,” which is the name for the stretch containing Severely Eroding Sites 9.4, 9.5, and 9.6. Severely Eroding Sites 8.1 and 8.2 are located between Crucitas and the Rio “Infiernillo”. Similarly, Costa Rica’s EMP determined that concerns over “project integrity” necessitated reviewing whether there is adequate distance between the Road and the River in the stretch between the Medio Queso River and Boca San Carlos. 2012 EMP, p. 10 (NM, Vol. II, Annex 2).

3.32 The CFIA report likewise states “there are stretches where the recess on the bank of the Río San Juan should be revised,” and the size of the existing buffer between the Road and River “re-evaluated.”<sup>398</sup> Dr. Kondolf, and Mr. Hagans and Dr. Weaver agree.<sup>399</sup>

3.33 In short, nothing Costa Rica has done comes close to mitigating the risk of significant future additional harm to Nicaragua resulting from Costa Rica’s inadequate highway design and shabby construction.

### C. THE RISK OF TOXIC SPILLS

3.34 Route 1856 not only puts Nicaragua at risk because of the sediment it continues to add to the River. It also creates a separate danger: the risk that a hazardous substance, transported along the Road, will spill into the River following an accident. The impact of such event, as Dr. Kondolf observes, “could be devastating.”<sup>400</sup>

3.35 The possibility is not remote; such accidents are well-documented and happen with disturbing regularity. A few examples suffice to make the point. Recent years have seen a truck carrying fuel fall from a bridge into the Rímac River in Perú,<sup>401</sup> a truck carrying oil overturn and spill 200 barrels of toxic cargo into the Villalobos River in Colombia,<sup>402</sup> and the Belén River in Argentina

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<sup>398</sup> CFIA Report, pp. 9, 13 (NM, Vol. II, Annex 4).

<sup>399</sup> 2014 Kondolf Report, Section 5 and Appendix E (NR, Vol. II, Annex 1); Hagans & Weaver Report, Sections II.A-D, III.B, IV and Figure 1 (NR, Vol. II, Annex 2).

<sup>400</sup> 2014 Kondolf Report, Section 5 (NR, Vol. II, Annex 1).

<sup>401</sup> “Accident in Chaclacayo: Rímac River Fuel Spill Causes Concern among Local Residents”, El Comercio, 31 December 2013), (NR, Vol. II, Annex 23).

<sup>402</sup> “Oil Spilled into the Villalobos River”, La Nación 19 June 2012, (NR, Vol. II, Annex 25).

contaminated by fuel from an overturned truck.<sup>403</sup> There are many more.<sup>404</sup> Even well-engineered roads are not immune, as evidenced by a spill that occurred in New Zealand in 2011 that left wildlife near the Awakino River coated in oil.<sup>405</sup> Even the security of rails is not a guarantee against toxic spills into a river: hundreds of thousands of fish and virtually all plant life along a 45 mile stretch of the Sacramento River in California were killed in 1991 when a train derailed, spilling pesticide into the river.<sup>406</sup>

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<sup>403</sup> “Ombudsman Investigates Mining Company Spillage into River”, Los Andes, 26 August 2009 (NR, Vol. II, Annex 26).

<sup>404</sup> See, e.g., “Oil Spill Contaminates Lake”, Perú21, 9 May 2012 (NR, Vol. II, Annex 27) (truck overturned, spilling petroleum into Lake Huachuccha in Perú); Drinking Water in Chinese Province Returning to Normal After Spill, N.Y. TIMES (June 7, 2011), available at <http://www.nytimes.com/2011/06/08/world/asia/08spill.html> (20 tons of carbolic acid spilled from truck and were washed downhill into the Xin'an River near Hangzhou, China after a collision); “Oil Truck Overturned near the Cruces River”, El Mercurio Online, 3 January 2009 (NR, Vol. II, Annex 28) (truck overturned on a small wooden bridge without guardrails, spilling about 100 liters of fuel directly into tributary to the Cruces River near Valdivia, Chile); “Truck Spilled 9,000 Gallons of Fuel into Rivers”, Enlace Nacional, 4 February 2008 (NR, Vol. II, Annex 29) (the Chiguilla and Huaracané Rivers in Perú were contaminated when truck overturned, spilling 9,000 gallons of fuel); China: Truck Spills 30 Tons of Sulfuric Acid, N.Y. TIMES (Feb. 14, 2008), available at <http://www.nytimes.com/2008/02/14/world/asia/14briefs-acid.html> (many fish killed when truck overturned, spilling 30 tons of sulfuric acid into a drainage ditch feeding the Xinsi River in Yunnan, China); Toxic Spill Fouls Water Supply for 2 Towns in China, WASHINGTON POST (Nov. 2, 2006), available at <http://www.washingtonpost.com/wp-dyn/content/article/2006/11/01/AR2006110103048.html> (33 tons of toxic creosote spilled into a river feeding the Yangjiapo Reservoir in China as a result of truck crash).

<sup>405</sup> Birds Affected by Awakino Oil Spill, OTAGO DAILY TIMES (June 24, 2011), available at <http://www.odt.co.nz/166288/birds-affected-awakino-oil-spill>; see also Crews Try to Contain Diesel Spill, SPOKESMANREVIEW.COM (Jan. 8, 2002), available at <http://www.spokesmanreview.com/news-story.asp?date=010802&ID=s1081581> (most of a truck’s cargo of 10,000 gallons of diesel fuel spilled into the Clearwater River in Idaho after the truck overturned along a highway).

<sup>406</sup> See, e.g., Keith Schneider, *California Spill Exposes Gaps in Rail Safety Rules*, N.Y TIMES (July 27, 1991), available at <http://www.nytimes.com/1991/07/27/us/california-spill-exposes-gaps-in-rail-safety-rules.html>. Train derailments that result in toxic spills are far from rare as well. See, e.g., *Oil Tanker Train Derails in Lynchburg, Va., Triggering Fire and Spill*, L.A. TIMES (Apr. 30, 2014), available at <http://www.latimes.com/nation/nationnow/la-na-nn-lynchburg-virginia-train-derailment-20140430-story.html> (derailment sent several train cars into the James River in Virginia, spilling the oil they carried); *Crude Oil Tank Cars Ablaze after Train Derails in Alabama*, REUTERS (Nov. 8, 2013), available at <http://www.reuters.com/article/2013/11/09/us>.

3.36 In short, the risk of a toxic spill is an ever-present danger along roadways sited near watercourses. The poor engineering and deteriorating condition of Costa Rica's Road only increase that risk, and they do so significantly.

3.37 Dr. Kondolf identifies particular hazards. First are the excessively steep slopes on which the Road was built. These include locations where the road runs up and down a steep grade, and those where it has a pronounced sideslope. Even in places where excessive slopes have not contributed to the total collapse of the Road, they increase the risk of an accident by making it more likely that a vehicle will lose control or overturn.<sup>407</sup> The LANAMME Report confirms the risk, noting that sections of the Road between the San Carlos and Infiernito Rivers “need to be travelled at slow speed and very cautiously because there is only one lane with steep grades and loose material.”<sup>408</sup>

3.38 The fact that the Road traverses inadequate stream crossings, prone to collapse under a heavy load, presents an additional risk.<sup>409</sup> Spills of hazardous materials into rivers occur even from well-constructed metal bridges augmented

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crude-train-explosion-idUSBRE9A70Q920131109 (train derailment spilled crude oil into marshland that feeds into the Tombigbee River in Alabama); *Railroad Fined for Diesel Spill into Salmon Stream*, Seattle Times (Oct. 7, 2010), available at [http://seattletimes.com/html/localnews/2013103122\\_aporrrailroadfine.html](http://seattletimes.com/html/localnews/2013103122_aporrrailroadfine.html) (train derailment spilled 4200 gallons of fuel into Cow Creek in Oregon, threatening fish populations); *Faulty Track Caused Derailment, Oil Spill in Lake Wabamun*: TSB, CBC News (Oct. 25, 2007), available at <http://www.cbc.ca/news/canada/edmonton/faulty-track-caused-derailment-oil-spill-in-lake-wabamun-tsb-1.646098> (train derailment spilled 700,000 liters of oil into Lake Wabamun in Alberta).

<sup>407</sup> 2014 Kondolf Report, Section 5 (NR, Vol. II, Annex 1).

<sup>408</sup> LANAMME Report, p. 28 (NM, Vol. I, Annex 3).

<sup>409</sup> 2014 Kondolf Report, Section 5 (NR, Vol. II, Annex 1).

with guardrails.<sup>410</sup> The Road's stream crossings, many of which are built from logs and other rudimentary materials, are already "in imminent danger of collapsing," making the risk all the more pronounced.<sup>411</sup> Reports on the Road by CFIA, LANAMME and Dr. Kondolf have all repeatedly criticised the project for its improperly constructed stream crossings, each a potential cause of a toxic spill.<sup>412</sup>

3.39 Although the poor condition of the Road is problematic on its own, the risk it poses is accentuated by the fact that Costa Rica sited it much closer to the River than is acceptable under internationally-accepted standards<sup>413</sup> and its own buffer requirements.<sup>414</sup> Seventeen percent of the Road -- that is, nearly 18 km of it -- is within fifty meters (and generally uphill) of the River,<sup>415</sup> and in some places it is much closer. As a result, any hazardous materials spilled from the

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<sup>410</sup> See, e.g., "*Truck Overturns - Severe Environmental Damage*", La Angostura Digital, 23 July 2009), (NR, Vol. II, Annex 30) (truck carrying 10,000 liters of fuel crashed through a guardrail and fell 50 meters into Nahuel Huapi Lake in Argentina).

<sup>411</sup> 2014 Kondolf Report, Section 5 (quoting CFIA Report) (NR, Vol. II, Annex 1).

<sup>412</sup> See CFIA Report, p. 9 (reporting the existence of "a bridge comprised of two trailers [sic] containers and wooden logs" with the containers "already bulging and in imminent danger of collapsing") (NM, Vol II, Annex 4); LANAMME Report, pp. 10, 49 (describing a bridge "in poor operating condition" and culverts "under risk of collapsing," respectively) (NM, Vol. II, Annex 3); 2012 Kondolf Report, para. 4.6 ("of approximately 60 recently constructed stream crossings, we observed that essentially all road-stream crossings exhibited some form of serious design and/or construction deficiency") (NM, Vol. II, Annex 1); 2014 Kondolf Report Sections 3 & 5 (NR, Vol. II, Annex 1).

<sup>413</sup> Golder Report, Section 6 (NR, Vol. II, Annex 6).

<sup>414</sup> The CFIA Report found that "there are doubts regarding the recesses of the road along the Río San Juan in some stretches where it is only a few meters from the bank" and that recesses (the gaps between the Road and River) in some areas should be "evaluated for compliance with the law." CFIA Report, pp. 18, 26; *see also* pp. 9, 10, 13, 16, 27 (NM, Vol. II, Annex 4).

<sup>415</sup> 2012 Kondolf Report, p. 22 (NM, Vol. II, Annex 1).

Road will inevitably enter the River. An accident at a stream crossing would give hazardous material a direct conduit to the River.<sup>416</sup>

3.40 The impact of a spill on life in and along the River could be devastating. Common hazardous materials, such as fuels, oil, pesticides, and fertilizers are all harmful to life in and around the River. Pesticides, for example, can harm fish and destroy macroinvertebrate populations,<sup>417</sup> which is why the transport of pesticides within 50 meters of a river -- a zone into which much of the Road falls -- is prohibited in Nicaragua.<sup>418</sup> Oil can kill by smothering animals and robbing them of their ability to regulate body temperature.<sup>419</sup>

3.41 The damage of a toxic spill extends beyond the immediate time and area of impact. Toxins may become lodged in the sediment at the bottom, poisoning the organisms there on which other species rely as sources of food.<sup>420</sup> Plants along the river are susceptible to oil, and their destruction deprives other

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<sup>416</sup> See 2014 Kondolf Report, Section 5 (NR, Vol. II, Annex 1).

<sup>417</sup> EUROPEAN ENVIRONMENT AGENCY, HAZARDOUS SUBSTANCES IN EUROPE'S FRESH AND MARINE WATERS: AN OVERVIEW, EEA Technical Report No. 8/2011, at 32 (2011), available at <http://www.eea.europa.eu/publications/hazardous-substances-in-europe-s-fresh>.

<sup>418</sup> See Nicaraguan Law 274 regarding the regulation and control of pesticides and toxic and dangerous substances, 1998, Art. 23(2) (NR, Vol. II, Annex 15).

<sup>419</sup> UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, UNDERSTANDING OIL SPILLS AND OIL SPILL RESPONSE 21 (1999), available at <http://www.epa.gov/osweroe1/content/learning/pdfbook.htm>.

<sup>420</sup> CALIFORNIA DEPARTMENT OF FISH & GAME, OFFICE OF SPILL PREVENTION AND RESPONSE, INLAND DIESEL SPILLS FACT SHEET (2012), available at <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=54677>; UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, UNDERSTANDING OIL SPILLS AND OIL SPILL RESPONSE 6 (1999), available at <http://www.epa.gov/osweroe1/content/learning/pdfbook.htm>.

creatures of vital habitat.<sup>421</sup> Hazardous substances can inhibit aquatic life-forms' ability to reproduce, damaging populations over the long term.<sup>422</sup>

3.42 All of this reinforces the conclusion that the Road's condition is such that any attempt to transport hazardous materials along it would create a significant risk of a toxic spill, with potentially devastating effects on Nicaragua's River.

#### **D. THE RISK POSED BY COSTA RICAN DEVELOPMENT**

3.43 The risk of harm to Nicaragua is heightened by the fact that the Road provides a platform for further development of the River's southern bank. Costa Rica's 2013 EDA recognizes this when it observes that “[t]he construction of Route 1856 could attract settlers to the region,”<sup>423</sup> and “could create development opportunities for local communities.”<sup>424</sup> Increased development, however, inevitably entails adverse impacts to the surrounding environment, including the River.

3.44 There is already evidence that such development is occurring. On their most recent visit to the San Juan River in May 2014, Nicaragua's experts observed that power lines have been installed along 14 km of Road (between

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<sup>421</sup> UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, UNDERSTANDING OIL SPILLS AND OIL SPILL RESPONSE 7, 21 (1999), *available at* <http://www.epa.gov/osweroe1/content/learning/pdfbook.htm>.

<sup>422</sup> EUROPEAN ENVIRONMENT AGENCY, HAZARDOUS SUBSTANCES IN EUROPE'S FRESH AND MARINE WATERS: AN OVERVIEW, EEA Technical Report No. 8/2011, at 31–32 (2011), *available at* [http://www.eea.europa.eu/publications/hazardous-substances-in-europe-s-fresh/at\\_download/file](http://www.eea.europa.eu/publications/hazardous-substances-in-europe-s-fresh/at_download/file).

<sup>423</sup> EDA, p. 65 (CRCM, Vol. II, Annex 10, p. 565).

<sup>424</sup> EDA Tourism Annex, “Impact Assessment of the Implementation of the Route 1856 Project on the Development of Tourism Activities in the San Juan River,” p. 20 (CRCM, Vol. II, Annex 10, p. 698).

Mojon II and Río Infiernito), where only 4 km had existed just 19 months earlier.<sup>425</sup>

3.45 One of the Road's impacts, identified in Costa Rica's 2012 EMP, is “[i]ncreased agricultural and commercial activities.”<sup>426</sup> These activities carry with them adverse environmental impacts, including land disturbance, production of waste, and applications of pesticides and fertilizers, all of which are likely sources of pollution of the River and the sensitive surrounding areas.<sup>427</sup> That prospect is confirmed by Costa Rica's 2013 EDA, which finds that increased settlement of the southern bank of the River could place “pressure on the existing services and infrastructure, as well as on the region's natural protected areas. . . . [N]atural segments in wild lands could suffer greater vulnerability due to the impact on natural connecting areas, and to contamination due to human activities.”<sup>428</sup>

3.46 Given these dangers, and the high sensitivity of the ecosystems of the River and its surroundings, it is essential that any future development along the River involve a proper -- and prior -- environmental impact assessment.

#### **E. THE RISK POSED BY NATURAL DISASTERS**

3.47 In its Memorial, Nicaragua expressed concern that the Road will not withstand a natural disaster like a hurricane, tropical storm, or earthquake, and that if such an event occurs while the Road is in its current state, it will wreak

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<sup>425</sup> In 2012, an electrical line was observed running along the Road between 4 and 7 km downstream of Mojon II. In May 2014, it was observed to extend from Mojon II to Río Infiernito - a total distance of 14.1 km. 2014 Kondolf Report, Section 6 (NR, Vol. II, Annex 1).

<sup>426</sup> 2012 EMP, p. 26 (NM, Vol. II, Annex 2).

<sup>427</sup> Golder Report, Sections 4 & 7 (NR, Vol. II, Annex 6).

<sup>428</sup> EDA, p. 65 (CRCM, Vol II, Annex 10, p. 565).

havoc on the San Juan River and its zone of influence.<sup>429</sup> Costa Rica's responses range from cavalier dismissal of this concern to statements that present a remarkably skewed view of the geography and meteorology of the region. Its dismissal of the risks posed by hurricanes and tropical storms would surely have seemed out of place in 2000, when Costa Rica joined other Central American countries that, taking account of the damage caused by Hurricane Mitch two years earlier, and taking notice that natural disasters do not abide by political boundaries, began working to standardize and modernize technical standards for roads to reduce the region's vulnerability to natural disasters, an effort which led to the formulation of the regional standards discussed above.<sup>430</sup>

3.48 Costa Rica does not deny that erosion from the Road, and its corresponding impact on Nicaraguan territory, would rise to even more dramatic levels when the inevitable happens again and a major storm strikes the River. Instead, it offers false assurances that such an event is unlikely. To that end, the Counter-Memorial incorrectly states that “[t]he region in which the Road is located has never been directly hit by a hurricane.”<sup>431</sup> This assertion is based on Professor Thorne's narrower statement that “the Río San Juan . . . [being] struck by a hurricane or tropical storm . . . would actually be unprecedented and it is therefore highly unlikely.” The only basis Professor Thorne offers for his

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<sup>429</sup> NM, paras. 3.80, 4.19.

<sup>430</sup> See generally, Resolution 03-99 (XXI COMITRAN), Guatemala, 18 Nov. 1999 (NR, Vol. II, Annex 9).

<sup>431</sup> CRCM, para. 3.34.

conclusion is that the US National Oceanographic and Atmospheric Administration (NOAA) website shows “no record of Costa Rica ever having been struck by a hurricane or tropical storm.”<sup>432</sup>

3.49 Professor Thorne is not a meteorologist, and his lack of expertise on storm occurrences in this part of Central America is understandable. In fact, a hurricane has struck the San Juan River. In 1971, the eye of Hurricane Irene-Olivia followed the north bank of the River.<sup>433</sup> It is also false that a tropical storm striking the river would be unprecedented. In fact, tropical storms are well-documented in the region.<sup>434</sup>

3.50 Moreover, an emphasis on “direct” strikes from hurricanes and tropical storms elides the fact they are very large phenomena, with wide areas of effect. Professor Thorne concedes this but, along with the Counter-Memorial, claims that the rainfall from three hurricanes that passed to the north of the River was “unexceptional.”<sup>435</sup> The details of those rainfalls can be found in Annex 68 to the Counter-Memorial, a letter from the General Director of the Costa Rican National Meteorological Institute. To consider but one of the storms, the letter indicates that between 20 and 23 October 1998, Hurricane Joan delivered 20 to 250 mm of rain to various areas of Costa Rica, for an average of up to 62.5 mm

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<sup>432</sup> Dec. 2013 Thorne Report, para. 6.20 (CRCM, Vol I, Appendix A).

<sup>433</sup> 2014 Kondolf Report, Section 12 (NR, Vol. II, Annex 1).

<sup>434</sup> *Ibid.*

<sup>435</sup> Dec. 2013 Thorne Report, para. 6.20 (CRCM, Vol I, Appendix A); *see also* CRCM, para. 3.35.

per day over the four day period.<sup>436</sup> By any measure, this is a significant amount of rainfall over a short span of time. Another of the hurricanes whose rainfall Costa Rica dismisses as “unexceptional” --- Hurricane Mitch in 1998 -- killed seven people by flooding and forced thousands from their homes in northeast Costa Rica.<sup>437</sup>

3.51 Costa Rica argues that this intense rainfall is somehow insignificant because it is “within the natural range of rainfall in the area, which is abundant.”<sup>438</sup> Costa Rica’s Annex 68 states that “[t]he average annual rain accumulation can reach 6,000mm” in “the north area of [Costa Rica].”<sup>439</sup> Regardless of whether annual rainfall can reach 6,000mm somewhere in “the north area” of the country, Costa Rica’s own EDA reports that “[i]n the project area the average annual rainfall varies between 2300 millimeters and 4400 millimeters.”<sup>440</sup> In this context, the effects felt in Costa Rica during hurricanes have been more exceptional than Costa Rica and Professor Thorne allow.

3.52 Professor Thorne also argues that the rainfall associated with a hurricane is unlikely to cause “widespread destruction because the basin of the Rio San Juan receives abundant rainfall in most years and the hydrology,

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<sup>436</sup> Letter from the General Director of the Costa Rican National Meteorological Institute to H.E. Edgar Ugalde Álvarez, 7 Nov. 2013 (CRCM, Vol. III, Annex 68).

<sup>437</sup> 2014 Kondolf Report, Section 12 (NR, Vol. II, Annex 1).

<sup>438</sup> CRCM, para. 3.35.

<sup>439</sup> Letter from the General Director of the Costa Rican National Meteorological Institute to H.E. Edgar Ugalde Álvarez, 7 Nov. 2013, p. 2 (CRCM, Vol. III, Annex 68).

<sup>440</sup> EDA, p. 36. Elsewhere the EDA states that the study area receives “annual rainfall that varies between 2300 and 2800 mm.” *Ibid.*, p. 42. The EDA also finds that, to the climate of the region, hurricanes are “influential . . . particularly those that come close to, or even penetrate, the Central American Isthmus.” *Ibid.*, at p. 35 (CRCM, Vol. II, Annex 10).

sediment dynamics, morphology and environment of the River are fully adjusted to the effects of frequent and heavy rainstorms.”<sup>441</sup> Whatever the condition of the basin generally, it cannot be said that the Road, which has been artificially grafted onto this natural environment and is already experiencing serious erosion and failing stream crossings, is adjusted to the intense rainfall of a hurricane or tropical storm, as it has not yet experienced one.

3.53 Costa Rica is similarly off the mark when it asks Nicaragua to take comfort in the fact that “even if a disastrous hurricane of the sort Nicaragua foretells did impact the region, the last thing people would be worrying about was sediment from the road,” and that there would be an “overall catastrophe.”<sup>442</sup> Maybe the “last thing” Costa Rica would worry about is the delivery of massive amounts of sediment to the San Juan River, but that is a much higher priority for Nicaragua. It is notable that Costa Rica again makes no attempt to argue that the Road would not deliver sediment to the River on a scale not yet seen, thus contributing to the resulting environmental harm. Its argument moreover ignores the fundamental issue: the damage that will be caused to Nicaragua’s territory -- whether by hurricane or tropical storm passing directly over the River or affecting the region from a greater distance -- will be worse because the Road exists, and exists in an unstable, unacceptable condition. As Dr. Kondolf explains:

“We can expect that intense rains will occur, and that when they do, the areas destabilized by the road will experience

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<sup>441</sup> CRCM, para 3.35, quoting Dec. 2013 Thorne Report, para 6.20.

<sup>442</sup> CRCM, para 3.35; *see also* Dec. 2013 Thorne Report, para 6.21 (CRCM, Vol. I, Appendix A).

far higher frequency and severity of landslides than areas not affected by the road construction, other factors being the same. If the massive fill piles along Rte 1856 (such as those documented at Severely Eroding Sites 9.4, 9.5, 9.6, and elsewhere) are not removed and the cutslope stabilized, there is a substantial risk of sudden, massive transfers of sediment into the Río San Juan during intense rains.”<sup>443</sup>

3.54 A hurricane is not the only potential source of the intense rains that would produce these effects. Other tropical storms are capable of supplying enough precipitation to trigger landslides, and contrary to Costa Rica’s assertions, are not unprecedented in the region.<sup>444</sup>

3.55 Heavy rains cause erosion, including from major, sudden failures of the Road’s slopes or stream crossings. Costa Rica’s experts acknowledge that recent years have been drier than average.<sup>445</sup> A return of heavier rain will only increase the sediment already being washed into the River in significant quantities.

3.56 Severe erosion from the Road can also be expected in the event of an earthquake. As Dr. Kondolf explains,

“Clearing and earth moving for road construction causes previously stable slopes to be destabilized, by removing vegetation cover, breaking up soil structure, and increasing slope steepness. Moreover, once the vegetation dies, deep roots begin to decay (which typically occurs over a couple of years), which further destabilizes the slope through the loss of root strength. Weakened slopes are subject to much greater frequency of landsliding than native slopes[ , and an]

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<sup>443</sup> 2014 Kondolf Report, Section 12 (NR, Vol. II, Annex 1).

<sup>444</sup> *Ibid.*

<sup>445</sup> Dec. 2013 Thorne Report, para 8.12 (“the post-Road period has been drier than usual”) (CRCM, Vol. I, Appendix A)..

important ‘trigger’ [for landsliding] is shaking during earthquakes, which can detach the landslide mass, causing it to move.”<sup>446</sup>

The UCR Report presented by Costa Rica recognizes as well that an earthquake would trigger landslides.<sup>447</sup>

3.57 The risk of an earthquake affecting the Road is very real, as Costa Rica’s own submissions illustrate. Professor Thorne recognized this in his 2011 report in the *Certain Activities* case, noting that the Costa Rican catchments that supply water and sediment to the San Juan River are “subject to extreme events including . . . earthquakes.”<sup>448</sup> Costa Rica’s EMP likewise notes that the tributaries to the San Juan River carry sediment originating from earthquakes.<sup>449</sup> Costa Rica even provides a recent example, noting in Annex 2 to the Counter-Memorial that a seedling-planting event scheduled to occur at part of the Road near Delta Colorado had to be relocated because “the bridge over Río Sucio fell due to the Sámara earthquake.”<sup>450</sup> Referring to the same earthquake, Costa Rica’s EDA highlights the damage earthquakes can cause to the River:

“[I]n 2012 and after the Sámara Earthquake of September 5, 2012, 9 earth tremors were recorded along the Colorado River, close to the Nicaraguan border. . . . The alignment of the epicenters of such seismic activity coincide with the Colorado River, with a northwestern to southeastern orientation, which suggests the presence of an active fault. This recent s[e]ismic activity could accelerate exogenous

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<sup>446</sup> 2014 Kondolf Report, Section 12 (NR, Vol. II, Annex 1).

<sup>447</sup> UCR Report, p. 14 (CRCM, Vol. II, Annex 1).

<sup>448</sup> 2011 Thorne Report, p. vi, *Certain Activities* case (CM, Vol. I, Appendix 1).

<sup>449</sup> 2012 EMP, p. 5 (NM, Vol. II, Annex 2).

<sup>450</sup> CODEFORSA Report, p. 14 (CRCM, Vol. II, Annex 2).

processes and increase the sedimentation rate towards the San Juan River.”<sup>451</sup>

3.58 Put simply, Costa Rica must be required to bring its Road into compliance with the standards necessary to ensure that it does not pose a threat to the San Juan River and its area of influence, both under ordinary conditions and in the event of a natural disaster such as a hurricane, tropical storm, or earthquake. These standards are reflected in the Central American standards, the very formulation of which is an expression of the need to prepare roads such as Costa Rica’s for natural disasters.<sup>452</sup> The condition of Costa Rica’s Road remains far short of those standards.

#### **F. CONCLUSION**

3.59 In sum, Costa Rica’s failure to construct the Road in conformity with the relevant design, construction and maintenance standards has placed Nicaragua at grave risk of continued harm, and nothing Costa Rica has done has mitigated this risk. The possibility of toxic spills, further development of the Costa Rican bank of the River, and the likelihood of natural disasters, all accentuate the risk to Nicaragua.

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<sup>451</sup> EDA, p. 33 (CRCM, Vol. II, Annex 10).

<sup>452</sup> RESOLUTION 03-99 (XXI COMITRAN), Guatemala, 18 Nov. 1999 (NR, Vol. II, Annex 9); *see also* Central American Manual of Specifications for the Construction of Regional Roads and Bridges (2nd. Edition, Mar. 2004), p. iii (NR, Vol. II, Annex 11); Central American Manual on the Maintenance of Roads (2010 Edition), p. 7 (NR, Vol. II, Annex 12).

## CHAPTER 4

### COSTA RICA'S ERRONEOUS CONCEPTION OF THE LEGAL REGIME OF THE SAN JUAN RIVER AND OF THE APPLICABLE LAW

4.1 The purpose of the present Chapter is to expose the fundamental flaws in Costa Rica's case. Its entire argument rests on two propositions:

- *First*, “the 1858 Treaty does not regulate road infrastructure works on Costa Rican territory”<sup>453</sup>; and
- *Second*, the construction work was “conducted exclusively within Costa Rica's territory.”<sup>454</sup>

4.2 Nicaragua has no quarrel with these propositions in the abstract. Likewise, Nicaragua does not contest that Costa Rica “is free to make its own appraisal of its own security and communicational needs, and the best means to implement those needs within its territory”<sup>455</sup> or that “[t]he reasons for improving infrastructure, as a sovereign decision, need not be explained or justified at the international level...”<sup>456</sup> These propositions only state the obvious. The difficulty with these declarations lies not in their abstract meaning but in their use in the context of Costa Rica's pleading. They betray Costa Rica's proclaimed conviction that it can do whatever it wishes within its territory, *regardless of the harm its activities may cause to Nicaragua or to internationally protected areas.*

4.3 However, while Costa Rica is free to build all the roads and other infrastructure works it wants on its territory, it can do so only insofar as the works

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<sup>453</sup> CRCM, para. 4.4.

<sup>454</sup> *Ibid.*

<sup>455</sup> *Ibid.*

<sup>456</sup> *Ibid.*

in question do not harm its neighbours' territory – in the present case, the waters of the San Juan River over which Nicaragua has “exclusively the dominion and sovereignty” (“*exclusivamente el dominio y sumo imperio*”) from its origin at the Lake to its mouth in the Caribbean, in accordance with the 1858 Treaty of Limits which remains the main applicable instrument in the present case. This dominion and sovereignty is only limited by the recognition, in favour of Costa Rica, of a “perpetual right of free navigation [...] for the purposes of commerce.”

4.4 As Nicaragua recalled in its Memorial, in the 2009 Judgment the Court considered that: “[t]he 1858 Treaty of Limits completely defines the rules applicable to the section of the San Juan River that is in dispute in respect of navigation.”<sup>457</sup> But this is only an exception, a treaty limitation, to the, for the rest *unlimited*, Nicaraguan sovereignty over the waters of the River. And it goes without saying that when it uses the River as a garbage dump, or builds infrastructure works in a way that impedes or endangers free navigation on the River, Costa Rica undermines Nicaragua’s territorial sovereignty.

4.5 Costa Rica accepts that “[o]bviously the 1858 Treaty of Limits is fundamental to the relations between the Parties in the matter of the River.”<sup>458</sup> Such an admission is hardly reconcilable with the other view expressed by Costa Rica according to which: “Costa Rica’s position is that the 1858 Treaty of Limits

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<sup>457</sup> I.C.J., Judgement, 13 July 2009, *Dispute regarding Navigational and Related Rights (Costa Rica v. Nicaragua)*, I.C.J. Reports 2009, p. 233, para. 36, quoted in NM, paras. 4.12, 4.28 or 5.5.

<sup>458</sup> CRCM, para. 4.2.

has no bearing on the present proceedings.”<sup>459</sup> Of course, Nicaragua never claimed that the 1858 Treaty of Limits precludes *per se* Costa Rica undertaking road construction works in its territory.<sup>460</sup> But the Treaty puts the River under Nicaragua’s sovereignty and, since the construction of the Road causes serious harm to the River, it is, indeed, crucially relevant for the present case.

4.6 The present case is not about the right of Costa Rica to build a road on the right bank of the San Juan River; it is about the harm caused by the construction of the road to the San Juan River and the breaches thus attributable to Costa Rica of its obligations stemming from the Treaty *vis-à-vis* Nicaragua; and it is about the determination of these breaches and the ensuing damage. The case is also about the damage the road and the roadworks cause and will continue to cause in its present state<sup>461</sup> and the potential catastrophic damage that may be caused by a road that does not meet the minimum technical requirements needed to avoid accidents in the future, including the risk of moving toxic material over a road in this condition<sup>462</sup>.

4.7 The proposition that a State may do anything it wishes within its territory regardless of the transboundary consequences for other States also contradicts the most basic principles of international environmental law and, indeed, more generally, the fundamental principles of international law, which

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<sup>459</sup> CRCM, para. 4.2.

<sup>460</sup> CR 2013/30, 7 November 2013 (morning), p. 28, para. 2 (A. Pellet).

<sup>461</sup> See Chapter 2 above.

<sup>462</sup> See Chapter 3 above.

remain applicable as long as they are not contradicted by the 1858 Treaty of Limits. In this respect, Nicaragua draws attention once more to the authorities referred to in Chapter 4 of its Memorial in the *Road* case,<sup>463</sup> beginning with the Award in the *Island of Palmas* case, in which the arbitrator considered that territorial sovereignty:

“has a corollary duty: the obligation to protect within the territory the rights of other States, in particular their right to integrity and inviolability in peace and in war, together with the rights which each State may claim for its nationals in foreign territory.”<sup>464</sup>

4.8 This Court itself confirmed the principle in the *Corfu Channel* case when it referred in its 1949 Judgment to the obligation of every State “not to allow knowingly its territory to be used for acts contrary to the rights of other States.”<sup>465</sup>

4.9 In the context of transboundary pollution, which is involved in the present case, the arbitral tribunal in the well-known 1941 *Trail Smelter Arbitration* applied this principle in the following terms:

“[U]nder the principles of international law, . . . no State has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another or the properties or persons therein, when the

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<sup>463</sup> *Dispute concerning Construction of a Road in Costa Rica along the San Juan River (Nicaragua v. Costa Rica)*, NM, Chapter 4, especially paras. 4.33-4.36.

<sup>464</sup> Arbitral Award, 4 April 1928, *Island of Palmas (Netherlands v. United States of America)*, UNRIAA, vol. II, P. 839.

<sup>465</sup> I.C.J., Judgment, 9 April 1949, *Corfu Channel (United Kingdom of Great Britain and Northern Ireland v. Albania)*, I.C.J. Reports 1949, p. 22.

case is of serious consequence and the injury is established by clear and convincing evidence.”<sup>466</sup>

4.10 More recently, the same principle was applied in another inter-State arbitration by the Court of Arbitration in the *Indus Waters Kishenganga Arbitration*. There the tribunal declared:

“There is no doubt that States are required under contemporary customary international law to take environmental protection into consideration when planning and developing projects that may cause injury to a bordering State.”<sup>467</sup>

4.11 Moreover, there is no necessity of an “injury to a bordering State” where a State has undertaken international obligations in respect of its territory in a particular treaty. In such case, the obligation not to harm the environment is *erga omnes partes*; in other words, all States Parties have an interest in the preservation of the environment as provided for in the convention. This is true of Costa Rica, which is a party to the Biological Diversity and Ramsar Conventions and has several Ramsar sites that stand to be affected by its Road project (the Humedal Caribe Noreste (1996), the Humedal Maquenque (2010) and the Caño Negro (1991))<sup>468</sup>.

4.12 The position of the Conference of the Parties (CoP) to the Ramsar Convention toward environmentally destructive activities that endanger Ramsar

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<sup>466</sup> Arbitral Award, 11 March 1941, *Trail Smelter Arbitration (United States of America v. Canada)*, UNRIAA, vol. III, p. 1965.

<sup>467</sup> Partial Award, 18 February 2013, *Indus Waters Kishenganga Arbitration (Pakistan v. India)*, available at [http://www.pca-cpa.org/showpage.asp?pag\\_id=1392](http://www.pca-cpa.org/showpage.asp?pag_id=1392).

<sup>468</sup> William R. Sheate, “Comments on the Lack of EIA for the San Juan Border Road in Costa Rica,” July 2014 (hereinafter the “Sheate Report”), Section 5 (NR, Vol. II, Annex 5).

sites, many of which are located entirely within the jurisdiction of a State, is illustrated by resolutions adopted by the CoP concerning Ukraine's Bystroe navigation canal. The Bystroe canal is a project located in Ukraine's portion of the Danube Delta, in a Ramsar protected area. This project, although wholly within Ukrainian territory, has caused the Ramsar CoP to adopt resolutions calling for Ukraine to:

- “a) suspend further works pending a full environmental impact assessment being conducted and its findings acted upon;
- b) make available full documentation including the findings of the environmental impact assessment for Phase II of the project to all stakeholders, including the government of Romania as a potentially affected State;
- c) ensure that compensatory provision is made for any damage to the ecological character of designated Ramsar sites and other wetlands caused by the works which have already been carried out;
- d) establish, in cooperation with relevant international organizations and the government of Romania, a programme of international monitoring of the ecological character of the Ramsar sites and Danube Delta Biosphere Reserve, in line with the Convention's guidance on wetland monitoring (Annex to Resolution VI.1; Ramsar Wise Use Handbook 8); and
- e) in line with Article 5 of the Convention, apply international norms in the provision of information, consultation and involvement in decision-making processes of all stakeholders concerning Phase II of the project; ”<sup>469</sup>

and to

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<sup>469</sup> Ramsar CoP Resolution IX.15, para. 27(iv) (Kampala, 2005), available at [http://www.ramsar.org/cda/en/ramsar-documents-resol-resolution-ix-15-the/main/ramsar/1-31-107%5E23476\\_4000\\_0\\_.](http://www.ramsar.org/cda/en/ramsar-documents-resol-resolution-ix-15-the/main/ramsar/1-31-107%5E23476_4000_0_.)

“provide without delay full and updated information concerning the development of the deep water Bystroe navigation channel in the Danube Delta, including information concerning works undertaken after the adoption of [the resolution quoted from above] . . . and report on progress of the transboundary cooperation with Romania and Moldova, [the neighboring States] . . .”<sup>470</sup>

4.13 The measures called for in these resolutions of the Ramsar CoP are largely reflective of requirements under customary international law, as shown in Chapter 6 below. They demonstrate once again that the fact that the Road project itself is entirely within Costa Rica’s territory does not free Costa Rica from its international obligations, and they shed important light on Costa Rica’s obligations regarding its Ramsar sites affected by the Road project. In substance, these measures called for by the Ramsar CoP encompass in general the basic claims contained in Nicaragua’s Submissions.

4.14 It must be noted that Costa Rica’s attitude resonates alarmingly with the Harmon Doctrine of absolute territorial sovereignty articulated by U.S. Attorney General Judson Harmon in 1895 in the context of a dispute between the United States and Mexico over the Rio Grande.<sup>471</sup> Mexico believed that increased upstream diversions in the U.S. states of Colorado and New Mexico had substantially decreased volumes of Rio Grande water available to Mexico at Ciudad Juarez. The Mexican Minister to the United States stated that the Mexican users of Rio Grande water had a “claim to the use of the water” that was

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<sup>470</sup> Ramsar CoP Resolution X.13, para. 27(II) (Changwon, 2008), available at [http://www.ramsar.org/pdf/res/key\\_res\\_x\\_13\\_e.pdf](http://www.ramsar.org/pdf/res/key_res_x_13_e.pdf).

<sup>471</sup> 21 Op. Att’y Gen. 274 (1895).

“uncontestable, being prior to that of the inhabitants of Colorado by hundreds of years...”<sup>472</sup> Harmon stated, in response to a request by the State Department for a legal opinion: “The fundamental principle of international law is the absolute sovereignty of every nation, as against all others, within its own territory.”<sup>473</sup> He concluded:

“The case presented is a novel one. Whether the circumstances make it possible or proper to take any action from considerations of comity is a question which does not pertain to the Department [of Justice]; but that question should be decided as one of policy only, because, in my opinion, the rules, principles, and precedents of international law impose no liability or obligation upon the United States.”<sup>474</sup>

In other words, in Attorney General Harmon’s opinion, the United States could do whatever it wished with the river within its own territory regardless of the consequences for Mexico. “[I]nternational law [would] impose no liability or obligation upon the United States” for any harm caused to the downstream State. The doctrine has been widely criticized and is today universally repudiated, including by the United States, and was not followed in the dispute that gave rise to it. That dispute was resolved by the conclusion in 1906 of the Convention between the United States of America and Mexico concerning the Equitable Distribution of the Waters of the Rio Grande for Irrigation Purposes.<sup>475</sup> The treaty provides for the United States to construct a storage dam in New Mexico from

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<sup>472</sup> As quoted in 21 Op. Att’y Gen. p. 277 (1895).

<sup>473</sup> *Ibid.*, p. 281.

<sup>474</sup> *Ibid.*, p. 283.

<sup>475</sup> Washington, 21 May 1906, United States Treaty Series, No. 455.

which the United States is to deliver 60,000 acre-feet of water to Mexico annually without cost to Mexico. For its part, Mexico waived all claims arising out of diversions in the United States. It is the kind of arrangement embodied in this treaty, as reflected in its title, not the Harmon Doctrine, that is consistent with modern international law. But it is the Harmon Doctrine that Costa Rica seems determined to follow.

4.15 To summarize:

- as a matter of principle, Nicaragua by no means challenges the right of Costa Rica to build whatever roads it wishes to on its territory south of the River;
- but this right must be exercised in conformity with Nicaragua's dominion and sovereignty recognized by the 1858 Treaty;
- this is not the case when the construction of the road has negative impacts on the River and on its navigability and, therefore infringes Nicaragua's sovereignty.

This first series of breaches are dealt with in the next Chapter.

4.16 “As for the rest,” Nicaragua stated in its Memorial, “the River is submitted to the usual rules applicable to State sovereignty.”<sup>476</sup> This seems to be accepted by Costa Rica, which stated in its Counter-Memorial that it accepts “the existence of three central obligations” identified by Nicaragua:<sup>477</sup> “an obligation to conduct an environmental impact assessment where there is a risk that works may have a significant impact in a transboundary context; an equivalent

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<sup>476</sup> NM, para. 4.2.

<sup>477</sup> See NM, para. 5.4.

obligation of notification; and an obligation not to cause significant transboundary harm.”<sup>478</sup> But clearly the recognition of these three principles by both Parties does not prevent them from having strong differences as to their application in the instant case. The breaches by Costa Rica of these remaining general rules, which have not been supplanted by the Treaty, are dealt with in Chapter 6 of this Reply.

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<sup>478</sup> CRCM, para. 5.6.

## CHAPTER 5

### COSTA RICA'S BREACHES OF THE LEGAL REGIME OF THE SAN JUAN RIVER

5.1 The purpose of the present Chapter is to answer Costa Rica's arguments on the applicable law presented in Chapter 4 of its Counter-Memorial according to which "The Treaty of Limits has no Bearing on the Present Proceeding,"<sup>479</sup> and, more precisely, to show that Costa Rica has breached the legal regime of the San Juan River established by the 1858 Treaty (as interpreted by the Cleveland and Alexander Awards and the 2009 Judgment of the Court in the *Navigational Rights* case).

5.2 Costa Rica's conduct engages its responsibility for internationally wrongful acts on three principal grounds:

- *first*, it violates Nicaragua's territorial sovereignty over the waters of the River;
- *second*, it breaches Nicaragua's right of navigation; and
- *third*, it ignores the obligation to notify Nicaragua stemming from the Treaty.

#### A. VIOLATION OF NICARAGUA'S TERRITORIAL SOVEREIGNTY

5.3 With a certain aplomb Costa Rica contends:

"As a matter of fact, no sediment is 'delivered' to the river by Costa Rica. The erosion of sediment into the river from both banks is a natural process that by no means can be

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<sup>479</sup> CRCM, pp. 95-105.

assimilated to an ‘invasion’ or violation of sovereignty or territorial integrity. Costa Rica has not exercised any State activity in the territory of Nicaragua by undertaking works on its road infrastructure entirely on its own territory. Nor has it proceeded to dump material into the San Juan River.”<sup>480</sup>

5.4 This is untrue. As Nicaragua explained in its Memorial<sup>481</sup> and reaffirmed in Chapter 2 of the present Reply, Costa Rica’s road construction has caused and continues to cause significant harm to the San Juan River – that is, to Nicaragua’s territory. By virtue of Article VI of the 1858 Treaty of Limits, Nicaragua has exclusively the dominion and sovereign jurisdiction over the River.

5.5 Far from decreasing since the Memorial was submitted, the harm has, in fact, increased. By no means is this a natural phenomenon. As clearly established in the experts reports annexed to this Reply, the harm results directly from the poor construction of the road and its defects. In his Report, Professor Kondolf concludes that “[e]rosion has visibly worsened since I first observed Rte 1856 in October 2012” and that “[t]he progression of erosion and delivery of large quantities of sediment to the Rio San Juan is obvious in sequences of aerial (helicopter) photographs and cloud-free satellite imagery that has become available.”<sup>482</sup> Similarly, Mr. Hagans and Dr. Weaver, two eminently qualified geomorphologists report that:

“A review of paired oblique aerial photographs taken from helicopters in October 2012 and May 2014 illustrates the

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<sup>480</sup> CRCM, para. 4.9.

<sup>481</sup> NM, Chapter 3, pp. 45-121.

<sup>482</sup> 2014 Kondolf Report, Section 3 (NR, Vol. II, Annex 1).

widespread, ongoing and persistent erosion occurring along portions of the route from a combination of landslide, fluvial (gully) and surface erosional processes.”<sup>483</sup>

And that:

“The extent of observed erosional impacts is extraordinary in scale, especially considering the very average rainfall patterns that the road has experienced over the three year period since construction began.”<sup>484</sup>

5.6 Examples of these impacts are provided in Chapter 2. Attention can be drawn, in particular, to the sector of La Crucitas (from km 17.8 to 18.3), including Sites 9.4,<sup>485</sup> 9.5,<sup>486</sup> and 9.6,<sup>487</sup> which are eroding spectacularly and have caused – and will continue to cause – significant harm to the River.

5.7 This dramatic erosion can by no means be characterized as “natural.”<sup>488</sup> As Professor Andrews explains in his Expert Report, “[c]ompared to the expected natural basin-wide contribution of sediment to the Rio San Juan the quantity of sediment associated with the construction of Route 1856 is quite substantial.”<sup>489</sup> The San Juan River “would have carried between 170,000 to 420,000 tons per year before appreciable deforestation and other changes in land-use. Estimates determined by Costa Rica and Nicaragua of the additional sediment supplied to the Rio San Juan by land degradation associated with Route

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<sup>483</sup> Hagans & Weaver Report, Section I (NR, Vol. II, Annex 2).

<sup>484</sup> *Ibid.*

<sup>485</sup> See paras. 2.14-2.24.

<sup>486</sup> See paras. 2.25-2.32.

<sup>487</sup> See paras. 2.33-2.38.

<sup>488</sup> CRCM, para. 4.9.

<sup>489</sup> Andrews Report, Section IV(D) (NR, Vol. II, Annex 3).

1856 range from 61,000 (Thorne) to 240,000 (Kondolf) tons per year.”<sup>490</sup>

Therefore, the “construction of Route 1856 has contributed a very substantial amount of sediment to the Río San Juan compared to the circumstances prior to deforestation.”<sup>491</sup>

5.8 This causal relationship between the road and the sedimentation of the River is accepted in barely veiled terms by Costa Rica’s own experts. Thus, Professor Thorne acknowledges that Costa Rica’s so-called mitigation measures “are part of ongoing efforts intended to reduce erosion risks stemming from the way the Road was constructed in 2011” but that “they are not intended to provide a permanent solution to erosion issues.”<sup>492</sup> The simple fact that “work has been carried out to protect the Road and to mitigate the effects of the Road”<sup>493</sup> is a clear recognition of its initial misconception and defects.

5.9 Costa Rica attempts to minimize the adverse impact of its conduct on the San Juan River.<sup>494</sup> Nicaragua disagrees and has established that the harm caused to the River by the road is far from negligible. But even accepting the absence of “long-term effect on the river by aggradations of the river channel … caused by additional sediment from the construction on the road” accepted *prima*

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<sup>490</sup> *Ibid.*

<sup>491</sup> *Ibid.*

<sup>492</sup> C. Thorne, Assessment of the Impact of the Construction of the Border Road in Costa Rica on the San Juan River, November 2013, p. 118, para. 11.18 (CRCM, Vol. I, Appendix A, p. 264; *see also* p. 242). *See also* C. Thorne, Report on the Risk of Irreversible Harm to the Río San Juan relating to the Construction of the Border Road in Costa Rica, 4 November 2013 p. 41, para. 90 (CRCM, vol. II, Annex 9, p. 495).

<sup>493</sup> CRCM, para. 3.45. *See also* para. 2.38.

<sup>494</sup> *See* CRCM, Chapter 3, pp. 47-86.

*facie* (“at this stage”) by the Court in its Order of 13 December 2013<sup>495</sup> – a finding disproved at this stage by the evidence Nicaragua offers in this Reply – the simple fact of the release of sediments and other discharge in the River is a violation of Nicaragua’s sovereignty.

5.10 Any artificial elements dumped on its territory is a violation of its territorial sovereignty. An unlawful overflight of a State or the pursuit of a criminal in the territory of a neighbouring State would, in most cases, not cause concrete or “financially assessable damage”; however, when attributable to a State, they indisputably entail State responsibility. In any case, as explained in Chapter 7 below,<sup>496</sup> the evaluation of the harm caused by Costa Rica’s internationally wrongful acts is a matter which, in Nicaragua’s view, should be left for a subsequent phase of this case.

5.11 In this respect, it is useful to recall that “[e]very internationally wrongful act of a State entails the international responsibility of that State,”<sup>497</sup> irrespective of any harm resulting from the said internationally wrongful act. As the ILC explained:

“Thus there is no exception to the principle stated in article 2 that there are two necessary conditions for an internationally wrongful act – conduct attributable to the State under international law and the breach by that

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<sup>495</sup> *Construction of a Road in Costa Rica Along the San Juan River (Nicaragua v Costa Rica), Request presented by Nicaragua for the Indication of Provisional Measures, Order*, 13 December 2013, para. 34.

<sup>496</sup> See para. 7.21. See also Submission 2 (iii) below.

<sup>497</sup> ILC Articles on the Responsibility of States for internationally wrongful acts annexed to resolution 56/83 of the General Assembly - Article 1. Responsibility of a State for its internationally wrongful act – *italics added*.

conduct of an international obligation of the State. The question is whether those two necessary conditions are also sufficient. It is sometimes said that international responsibility is not engaged by conduct of a State in disregard of its obligations unless some further element exists, in particular, ‘damage’ to another State. But whether such elements are required depends on the content of the primary obligation, and there is no general rule in this respect.”<sup>498</sup>

5.12 Clearly the principle established in Article VI of the 1858 Treaty is self-sufficient and does not incorporate any requirement of damage to be breached. As so clearly expressed by Arbitrator Max Huber in the *Island of Palmas* arbitration:

“Sovereignty in the relations between States signifies independence. Independence in regard to a portion of the globe is the right to exercise therein, to the exclusion of any other State, the functions of a State. [...]t may be stated that territorial sovereignty belongs always to one, or in exceptional circumstances to several States, to the exclusion of all others.”<sup>499</sup>

As a consequence, a State “may not exercise its power in any form in the territory of another State.”<sup>500</sup>

5.13 Finally, Costa Rica seems to argue that its responsibility is excluded because the harm caused to the River – that is to Nicaragua’s territory – was not intentional.<sup>501</sup> Costa Rica is mistaken about this too.

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<sup>498</sup> Commentary on the Articles on responsibility of States for internationally wrongful acts, *Yearbook of the International Law Commission*, 2001, vol. II, Part Two, p. 36, para. (9) of the commentary of Article 2.

<sup>499</sup> Arbitral Award, 4 April 1928, *Island of Palmas*, UNRIAA, vol. II, p. 838; see also I.C.J., Judgment, 9 April 1949, *Corfu Channel (United Kingdom of great Britain and Northern Ireland v. Albania)*, I.C.J. Reports 1949, p. 22: “[b]etween independent States, respect for territorial sovereignty is an essential foundation of international relations.”

<sup>500</sup> P.C.I.J., Judgment, 7 September 1927, *The Case of the S.S. “Lotus”*, Series A, No. 10, p. 18.

5.14 *First*, as shown in the Memorial, one of the sediment delivery mechanism[s] consists of *man-made* “drainage channels that Costa Rica has dug, intentionally connecting its Road to the San Juan River and ensuring that water carrying sediment from the Road will be transferred to the River.”<sup>502</sup>

5.15 *Second*, at the very least, Costa Rica should have known that significant quantities of sediment would be delivered to the San Juan River. The poorly-planned and large-scale earthmoving Costa Rica undertook near a vulnerable body of water rendered the delivery of sediment to it inevitable.<sup>503</sup> As Dr. Kondolf explains in his 2014 Report, “[c]onstruction of Rte 1856 involved multiple cut and fill roads across steep hillslopes, many underlain by weak rock types or with unfavorable orientation of geologic structure, resulting in inherently weak cutslopes. The material removed from the cut was simply ‘sidecast’, i.e., pushed down the slope by the blade, without first removing vegetation from the slope and with neither engineering the fill by compaction nor use of geotextiles. As a result, the fillslopes are inherently unstable, no more than loose piles of earth, easily eroded into rills and gullies by surface runoff, and prone to landsliding.”<sup>504</sup> The photograph reproduced at **Figure 5.1**, which depicts the

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<sup>501</sup> CRCM, para. 4.9.

<sup>502</sup> NM, para. 3.75.

<sup>503</sup> National Laboratory of Materials and Structural Models of the University of Costa Rica, “Report INF PITRA-014-12: Report from Inspection of Route 1856 - Juan Rafael Mora Porras Border Road”. May 2012. , pp. 31 and 39 (NM, Vol. II, Annex 3). *See also* 2012 Kondolf Report, p. 24, para. 4.4 (NM, Vol II, Annex 1).

<sup>504</sup> 2014 Kondolf Report, Section 4 (NR, Vol. II, Annex 1).

erosion at Dr. Kondolf's Severely Eroding Site 4.1, speaks for itself, as do all the others presented throughout this Reply.

**Figure 5.1.** Severely Eroding Site 4.1, located 8.2-8.7 km downstream of Mojon II.



5.16 Moreover, even if the harm caused to the San Juan was not intentional (*quod non*), Costa Rica's international responsibility would still be engaged. As explained by the ILC, fault does not constitute "a necessary element of the internationally wrongful act of a State":

"This is certainly not the case if by 'fault' one understands the existence, for example, of an intention to harm. In the absence of any specific requirement of a mental element in terms of the primary obligation, it is only the act of a State that matters, independently of any intention."<sup>505</sup>

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<sup>505</sup> Commentary of Article 2 of the ILC Articles on Responsibility of States for Internationally Wrongful Acts, *Yearbook of the International Law Commission*, 2001, vol. II, Part Two, p. 36, para. 10.

5.17 In the present case, whatever the intentions of Costa Rica may have been, the fact is that the construction of the road has caused harm to Nicaragua's territory. This has been acknowledged by Costa Rica's highest authorities, including the President of the Costa Rican Republic as recently as 24 May of this year:

“There is an important section that is indeed much deteriorated at a point where it comes too close to the San Juan River, and it might be important to redesign it because part of what had already been opened is already covered by vegetation.”<sup>506</sup>

5.18 Therefore, by having caused the release of significant quantities of stones, rubble, sediment, and other debris<sup>507</sup> into the River, all of which have hastened the sedimentation of the River, Costa Rica has violated Nicaragua's territorial sovereignty over the River recognised by Article VI of the 1858 Treaty of Limits, and thus entailed its responsibility *vis-à-vis* Nicaragua.

5.19 In addition, the formation of numerous “very visible” and “massive”<sup>508</sup> deltas, resulting from the road, changes the very configuration of the River. The photographs below, and others like them, show this impact:

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<sup>506</sup>“President Confirms Errors in Construction of Trail 1856,” *El País*, 24 May 2014 ([http://www.elpais.cr/frontend/noticia\\_detalle/1/92093](http://www.elpais.cr/frontend/noticia_detalle/1/92093)) ( NR, Vol. II, Annex 16).

<sup>507</sup> See para. 2.58.

<sup>508</sup> Hagans & Weaver Report, Section II.A (NR, Vol. II, Annex 2).

**Figure 5.2.** Delta deposit below Severely Eroding Site 9.4. Photograph from March 30, 2014.



**Figure 5.3.** Delta deposit below Severely Eroding Site 9.4. Photograph from March 30, 2014.



**Figure 5.4.** Delta deposit from fill material of failed crossing 20.3 km downstream of Mojon 2 extending into the San Juan River. Photograph from March 31, 2014.



**Figure 5.5.** Delta deposit from Severely Eroding Site 9.7. Photograph from March 30, 2014.



5.20 As Mr. Hagans & Dr. Weaver explain in their 2014 Report, these deltas will continue to enlarge in the absence of truly effective remediation measures.<sup>509</sup>

5.21 The territorial integrity of States is one of the most fundamental principles of contemporary international law. As the Court put it, in line with Article 2 (4) of the United Nations Charter:<sup>510</sup>

“Between independent States, respect for territorial sovereignty is an essential foundation of international relations.”<sup>511</sup>

## **B. BREACH OF NICARAGUA’S RIGHT OF NAVIGATION AND OF OTHER GENERAL RIGHTS**

5.22 Costa Rica is exclusively concerned with preserving its own limited right of navigation over the San Juan de Nicaragua River, which it describes as “one of the essential bases of the fundamental instrument between the two countries” and as “[t]he condition for Costa Rica’s acceptance of Nicaraguan sovereignty over the entire waters of the San Juan River.”<sup>512</sup> In focusing on its own limited right, Costa Rica overlooks Nicaragua’s unlimited right to navigation on the River over which it has “exclusively the dominion and sovereign jurisdiction.”<sup>513</sup> This oversight includes Nicaragua’s sovereign right to other uses

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<sup>509</sup> Hagans & Weaver Report, Section II (NR, Vol. II, Annex 2).

<sup>510</sup> See also Resolution 2625 (XXV), 24 October 1970, “Declaration on Principles of International Law concerning Friendly Relations and Co-operation among States in accordance with the Charter of the United Nations”.

<sup>511</sup> I.C.J., Judgment, 4 April 1949, *Corfu Channel case*, Reports 1949, p. 35.

<sup>512</sup> CRCM, para. 4.19. See also para. 4.4.

<sup>513</sup> 1858 Treaty of Limits, Article VI.

of the waters of the River that have been damaged and endangered by the road and the roadworks.

5.23 To the extent that Costa Rica's acts have a negative impact on the navigation of the River, they constitute internationally wrongful acts that violate Nicaragua's own right of free and unlimited navigation on its riverine territory. There can be no doubt that is exactly what they have done.

5.24 Professor Andrews notes in his 2014 Report that sediment accumulation "can create substantial difficulties for human activities and infrastructure" and is commonly associated with "[i]ncreased flooding" and the "loss of channel capacity, together with the need for more frequent dredging to maintain navigation."<sup>514</sup> In the same report, he further explains that "the average thickness of deposition understates the magnitude of the potential problems, because the accumulating sediment won't be distributed evenly along and across the ... channel" and that "[t]he accumulating sediment will tend to form bars... creating reach-wise instabilities and obstructions to navigation."<sup>515</sup> Professor Kondolf observes that "[a]long the south bank of the Rio San Juan there are multiple deltas that have built up from the large quantities of sediment eroded from Rte 1856. Some are pre-existing deltas of natural streams on which road-derived sediment has deposited, while some are completely new features built of sediment eroded from the road and now extending into the Rio San Juan from the

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<sup>514</sup> Andrews Report, Section V(I) (NR, Vol II, Annex 3).

<sup>515</sup> *Ibid.*

south bank.”<sup>516</sup> For instance, at Severely Eroding Sites 9.4 to 9.6, significant deltas of sediments are clearly visible.<sup>517</sup> These and other Road-derived deltas on the River have a clear negative impact on navigation, as it is no longer possible to navigate the River in the locations the deltas have come to occupy. The fragments of culverts that have been transferred to the River through the washing out of Costa Rica’s improperly constructed stream crossings have also created obstacles to safe navigation, and Nicaragua has incurred the cost of removing this debris.<sup>518</sup>

5.25 While Nicaragua has, by virtue of the 1858 Treaty, an obligation to respect Costa Rica’s limited right of navigation on the River, it goes without saying that this obligation is even more pressing in respect of Costa Rica. To be clear, Nicaragua is not suggesting that the 1858 Treaty of Limits prevents Costa Rica from carrying out road projects on its own territory. But it must do so in a way that does not result in the trespass of Nicaragua’s territory (including the River) or the impairment of the navigation or other uses of the River.

### C. BREACHES OF THE OBLIGATION OF NOTIFICATION

5.26 In paragraphs 4.13 to 4.17 of its Counter-Memorial, Costa Rica tries to demonstrate that it “is not obliged under the Treaty of Limits to ‘notify’ Nicaragua”. This argument can be dispatched briefly.

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<sup>516</sup> 2014 Kondolf Report, Section 11 (NR, Vol. II, Annex 1).

<sup>517</sup> See *supra* Figures 2.2-2.5, 2.9-2.11.

<sup>518</sup> See figures 2.5, 2.13.

5.27 “First of all,” according to Costa Rica, “the activity of Costa Rica which is the subject of the present case has no relation to navigation of the San Juan River, and this fact renders any analysis of such an alleged obligation moot.”<sup>519</sup> As shown in Section II above, Costa Rica is wrong: its activities do, in fact, have an effect on navigation of the River.

5.28 “Second,” Costa Rica argues, “the obligation binding on Nicaragua to notify Costa Rica of its regulations relating to navigation along the San Juan River corresponds directly to the perpetual right of free navigation of Costa Rica on the San Juan River.”<sup>520</sup> This was indeed what the Court was concerned about in its 2009 Judgment. But it holds true *a fortiori* when works on the Costa Rican bank have an impact on the waters of the River over which Nicaragua – much as Costa Rica might dislike it – has dominion. The two paragraphs of the 2009 Judgment discussed by Costa Rica<sup>521</sup> in this respect can be fully transposed to the present situation:

“94. Despite the lack of any specific provision in the Treaty relating to notification, the Court sees three factors as together imposing an obligation of notification of regulations in the circumstances of this case. The first is to be found in the 1956 Agreement under which the Parties agreed as follows:

‘The two Parties, acting in the spirit which should move the members of the Central American family of nations, shall collaborate to the best of their ability in order to carry out those undertakings and activities which require a common effort by both States and are of mutual benefit and, in

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<sup>519</sup> CRCM, para. 4.14.

<sup>520</sup> CRCM, para. 4.15.

<sup>521</sup> See CRCM, paras. 4.16 and 4.17.

particular, in order to facilitate and expedite traffic on the Pan American Highway and on the San Juan River within the terms of the Treaty of 15 April 1858 and its interpretation given by arbitration on 22 March 1888, and also in order to facilitate those transport services which may be provided to the territory of one Party by enterprises which are nationals of the other.'

It is difficult to see how the obligation, set out under the terms of the 1956 Agreement, to collaborate to facilitate traffic on the San Juan and to facilitate transport services being provided in the territory of one country by the nationals of the other could be met without Nicaragua notifying Costa Rica of relevant regulations which it adopts.

95. The second factor indicating that Nicaragua is obliged to notify the adoption of the regulations lies in its very subject-matter: navigation on a river in which two States have rights, the one as sovereign, the other to freedom of navigation. Such a requirement arises from the practical necessities of navigation on such a waterway. If the various purposes of navigation are to be achieved, it must be subject to some discipline, a discipline which depends on proper notification of the relevant regulations."<sup>522</sup>

5.29 Not only do these factors apply *mutatis mutandis* to the present case, they apply *a fortiori*, because:

- we are not in the presence of "regulations" only, but of actual concrete acts;
- these acts are not only detrimental to the navigation on the River, but on the very sovereignty of Nicaragua over its waters, guaranteed by Article VI of the 1858 Treaty.

5.30 In this respect, Nicaragua observes that Costa Rica does not even try to argue that it notified Nicaragua about the road project. The reason is

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<sup>522</sup> I.C.J., Judgement, 13 July 2009, *Dispute regarding Navigational and Related Rights (Costa Rica v. Nicaragua)*, I.C.J. Reports 2009, pp. 251-252, paras. 94-95.

simple: it never did. From its conception to its unfortunate realization, Route 1856 has always been – and remains – a pure *fait accompli*.

5.31 This situation is all the more unacceptable in that, at the time of this writing, Costa Rica appears to be preparing to undertake new construction works along the San Juan River – about which Nicaragua still has not been notified. On 29 November and 10 December 2011, Nicaragua expressed its concerns about the construction of Route 1856 in detail and requested information from Costa Rica.<sup>523</sup> Costa Rica, however, flatly refused: its then-President stated that there was “no reason to offer explanations to the Government of Nicaragua.”<sup>524</sup> In December 2013, Nicaragua sent a diplomatic note to Costa Rica explaining that it learned from the press that Costa Rica planned to restart the construction works as soon as March 2014.<sup>525</sup> Nicaragua expressed its surprise since, during the provisional measures hearings held in November 2013, the Representatives of Costa Rica “declared to the Court that constructions works for the road would not

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<sup>523</sup> Note from the Minister of Foreign Affairs of Nicaragua, to the Minister of Foreign Affairs of Costa Rica, Ref: MRE/DVM/AJST/500/11/11, 29 November 2011 (NM, Vol. II, Annex 14) and Note from the Minister of Foreign Affairs of Nicaragua, to the Minister of Foreign Affairs of Costa Rica, Ref: MRE/DVS/VJW/0685/12/11, Managua, 10 December 2011 (NM, Vol. II, Annex 16).

<sup>524</sup> *El País*, Costa Rica, “Chinchilla Defends Highway Criticized by Nicaragua, Rejects Dialogue”, 14 December 2011 (Source: EFE / 13 December 2011) (NM, Vol. II, Annex 24).

<sup>525</sup> Note from the Minister of Foreign Affairs of Nicaragua to the Minister of Foreign Affairs of Costa Rica, Ref: MRE/DM/645//12/13, 17 December 2013. (NR, Vol. II, Annex 7). See also “Trail Construction Will Restart at the End of the Chinchilla Administration”, crhoy.com, 13 December 2013 (<http://www.crhoy.com/precio-total-de-la-trocha-fronteriza-se-estima-en-mas-de-50-mil-millones/>) (NR , Vol. II, Annex 17).

be resumed until ‘*the end of 2014 or the beginning of the year 2015.*’”<sup>526</sup> Once again, Costa Rica refused to provide any information to Nicaragua, stating that “Costa Rica never said that it would suspend the works.”<sup>527</sup>

5.32 Any such works must be notified to Nicaragua. Such notification is the only means by which Nicaragua (and neutral experts who might be appointed by the Court) could be sure that the “remediation works” envisaged by Costa Rica actually work, unlike those it has already undertaken.

5.33 Finally, even if the obligation to notify does not stem from the 1858 Treaty, it would, as shown in the next Chapter<sup>528</sup>, nevertheless result from general international law. In either case, it plainly has not been respected by Costa Rica.

5.34 As shown in the present Chapter, Costa Rica has breached and continues to breach several of its obligations to Nicaragua derived from the 1858 Treaty of Limits. By executing ill-considered road works with no prior planning, the result of which has been the delivery of significant amounts of sediment and other materials to the River, Costa Rica has:

- (i) violated the territorial integrity and sovereignty of Nicaragua, as established by the 1858 Treaty of Limits;

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<sup>526</sup> Note from the Minister of Foreign Affairs of Nicaragua to the Minister of Foreign Affairs of Costa Rica, Ref: MRE/DM/645//12/13, 17 December 2013 – *italics in the original text.* . (NR, Vol. II, Annex 7)

<sup>527</sup> Note from the Minister of Foreign Affairs of Costa Rica, to the Minister of Foreign Affairs of Nicaragua, Ref.: DM-AM-704-13, 19 December 2013.(NR, Vol. II, Annex 8)

<sup>528</sup> See Chapter 6, Section D.

- (ii) violated Nicaragua's right of navigation stemming from Article IV of the 1858 Treaty of Limits (as interpreted by successive arbitral and judicial decisions), and defeated a key aspect of the object and purpose of that treaty by impairing the navigability of the San Juan de Nicaragua River; and
- (iii) failed to inform, notify or consult with Nicaragua concerning the construction of Road 1856 in violation of its obligation to do so stemming from the 1858 Treaty of Limits.



## **CHAPTER 6**

### **COSTA RICA'S BREACHES OF ITS ENVIRONMENTAL OBLIGATIONS**

#### **A. INTRODUCTION**

6.1 In Chapter 5 of its Counter-Memorial, “Alleged Breaches of Obligations in respect of the Environment,” Costa Rica denies that the reckless and unplanned manner in which it launched into construction of Route 1856 and the resulting sediment and debris delivered from the Road project into Nicaragua’s sovereign territory, the San Juan de Nicaragua River, breached any of its obligations under International Environmental Law. Costa Rica’s case comes down to this: it breached no international environmental obligations because (a) everything it did was in its own territory and therefore “need not be explained or justified at the international level, and still less to a neighbouring State;”<sup>529</sup> (b) it acted in response to an ostensible emergency created by Nicaragua; and (c) the amount of soil, sediment and other debris that the Road project has caused to be transported to the San Juan River is small in comparison to the already heavy sediment load carried by the river and therefore gives rise to no legal obligations *vis-à-vis* Nicaragua.

6.2 The present chapter will respond to these arguments. It will show that they have no merit, and reflect a misunderstanding and mischaracterization of Costa Rica’s obligations under International Environmental Law.

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<sup>529</sup> CRCM p. 107, para. 5.3.

6.3 *Section B* of the present Chapter will again<sup>530</sup> demonstrate that Costa Rica’s invocation of an “emergency” under its national law does not excuse its violations of international law. *Section C* will show that Costa Rica breached the obligation to prepare, in advance, an environmental impact assessment concerning its Road project. *Section D* will demonstrate that Costa Rica breached the obligation to notify Nicaragua prior to commencing construction on the Road project. *Section E* will show that Costa Rica breached the obligation not to cause significant transboundary harm. *Section F* will respond to Costa Rica’s contention that the manner in which the Road was constructed breaches no treaties to which both States are parties. Conclusions will be set forth in *Section G*.

**B. COSTA RICA’S INVOCATION OF AN “EMERGENCY” UNDER ITS NATIONAL LAW DOES NOT EXCUSE ITS VIOLATIONS OF INTERNATIONAL LAW.**

6.4 Costa Rica contends that the national emergency it declared exempts it from all otherwise-applicable obligations, not only under its own law but also under international law. Nicaragua has shown in its Memorial that this contention lacks merit.<sup>531</sup> In its Counter-Memorial, Costa Rica rehearses the same arguments it had made earlier in support of its position that the Emergency Decree issued by its President on 21 February 2011<sup>532</sup> exempts it from its international obligations in respect of the Road project. This section will respond to the

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<sup>530</sup> Nicaragua had addressed the emergency decree and its ineffectiveness to exempt Costa Rica from its international obligations in its Memorial, NM, Chapter 2, pp. 19-30, paras. 2.15-2.26; and Chapter 5, paras. 5.14-5.27.

<sup>531</sup> *Ibid.*

<sup>532</sup> NM, Annex 11.

arguments made in Costa Rica’s Counter-Memorial only briefly, since they have already been addressed in large part in the Memorial.

6.5 Before addressing Costa Rica’s arguments, it is useful to recall the reason Costa Rica has given for its Road project. “The road was built,” according to Costa Rica, as “a consequence of Nicaragua’s invasion and occupation of Costa Rica” in order “to facilitate the mobilization of Costa Rican police and riparians in case of armed conflict . . . .”<sup>533</sup> The facts show that if this was indeed the purpose of the Road, the project was entirely misguided and failed utterly to achieve its objective.

6.6 Before reviewing the facts, however, Nicaragua wishes to recall its position that whether there exists an “emergency” sufficient to exempt a State from its international obligations is not, and cannot be, a self-judging question.<sup>534</sup> Indeed, there is no general exception to a State’s obligations under international law for an “emergency” under the State’s internal law. If there were a bona fide emergency that required a State to act in a manner not in conformity with its international obligations in order to safeguard an essential interest against a grave and imminent peril, it could only invoke necessity (*état de nécessité*) in order to

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<sup>533</sup> Certain Activities Carried Out by Nicaragua in the Border Area (Costa Rica v. Nicaragua), Written Observations of Costa Rica on the Admissibility of Nicaragua’s Counter-Claims, 30 November 2012, para. 2.20. Other, similar, justifications have also been given, beginning with the Emergency Decree itself, which refers to a “military invasion and occupation of Costa Rica by Nicaragua.” Emergency Decree, 7 March 2011, NM, Vol. II, Annex 11.

<sup>534</sup> NM, pp. 162-164, paras. 523-527.

preclude the wrongfulness of its conduct.<sup>535</sup> According to the ILC, “necessity will only rarely be available to excuse non-performance of an obligation and . . . it is subject to strict limitations to safeguard against possible abuse.”<sup>536</sup>

6.7 There being no circumstance precluding wrongfulness recognized by international law for an “emergency” per se, necessity would be the circumstance that is closest to what Costa Rica is claiming as a ground for exempting itself from its international obligations – i.e., for precluding the wrongfulness of its breaches.<sup>537</sup>

6.8 Costa Rica responds that

“it would be appropriate as a matter of current international law (as articulated by the Court) to have recourse to domestic law. It follows that Nicaragua’s reference to customary international law rules concerning states of necessity is likewise inapposite.<sup>538</sup> Costa Rica has not invoked Article 25 of the ILC’s Articles on State Responsibility as Nicaragua correctly points out, and it is not incumbent upon it to do so. As with other States, Costa Rica’s domestic legislation does not require the conduct of an environmental impact assessment in an emergency situation, while international law comprises a *renvoi* to domestic law.”<sup>539</sup>

6.9 As shown in the following section, the “*renvoi* to domestic law” referred to by the Court in *Pulp Mills* has to do with the *content* of an

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<sup>535</sup> Articles on Responsibility of States for internationally wrongful acts, *Yearbook of the International Law Commission 2001*, Vol. II, Part Two, p. 26, Article 25, p. 80.

<sup>536</sup> *Ibid.*

<sup>537</sup> NM, p. 164, para. 5.27.

<sup>538</sup> Interestingly, Costa Rica has pointed out that a “state of emergency” is defined under its law as: “[A] [s]tatement made by the Executive Branch, by executive decree, based on a *state of necessity* and urgency . . .” CRCM, p. 37, para. 2.28 (emphasis added). (Footnote added).

<sup>539</sup> CRCM, p. 113, para. 5.15 (footnotes omitted).

environmental impact assessment (EIA), not with whether one should be prepared.<sup>540</sup> Thus “it would be appropriate as a matter of current international law (as articulated by the Court [in *Pulp Mills*]) to have recourse to domestic law,” but only as to the content of an EIA. Nothing in the passage cited by Costa Rica<sup>541</sup> would permit a State to invoke a self-declared “emergency” to preclude the wrongfulness of its conduct. If a State wished to do so, it would certainly have to show more than Costa Rica has offered in the present case, and such a showing would be required to correspond to what a State would have to establish in order to invoke successfully a state of necessity.<sup>542</sup>

6.10 In order to prevent States from invoking domestic law routinely to avoid their international obligations, the required showing would have to establish a “grave and imminent peril” in order to invoke necessity as a circumstance precluding wrongfulness. Thus, Costa Rica would have to prove that invoking an “emergency” “is the only way for the State to safeguard an essential interest against a grave and imminent peril . . . .”<sup>543</sup> This Costa Rica has not done, and could not do under the facts it has adduced.

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<sup>540</sup> This is clear from the passage from *Pulp Mills* quoted by Costa Rica on p. 112, para. 5.13, CRCM.

<sup>541</sup> CRCM, p. 112, para. 5.13, quoting from *Pulp Mills on the River Uruguay (Argentina v. Uruguay)*, Judgment, I.C.J. Reports 2010, pp. 83-84, para. 205.

<sup>542</sup> Articles on Responsibility of States for internationally wrongful acts, *Yearbook of the International Law Commission 2001*, Vol. II, Part Two, p. 26, Article 25, p. 80.

<sup>543</sup> *Ibid.*, Article 25, para. 1(a).

6.11 Costa Rica plainly could not satisfy even the requirement of imminence. A timeline will help to place Costa Rica's emergency declaration in context:

- On or about 18 October 2010, according to Costa Rica,<sup>544</sup> Nicaraguan workers began cleaning a *caño* leading from the San Juan River to Harbor Head Lagoon.
- On 18 November 2010 Costa Rica brought the *Certain Activities* case before the Court through an Application filed on that date, alleging that the *caño* being cleaned was in Costa Rican territory, - something Nicaragua denies- and certain works of dredging on the San Juan River.
- Also on 18 November 2010, having filed its Application, Costa Rica submitted a Request for the indication of provisional measures.
- According to Costa Rica (no notice having been given to Nicaragua), construction of the Road commenced in December 2010.<sup>545</sup>
- In January 2011, in the hearings on provisional measures sought by Costa Rica in the *Certain Activities* case, Nicaragua informed the

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<sup>544</sup> *Certain Activities Carried Out by Nicaragua in the Border Area (Costa Rica v. Nicaragua)*, Application, p. 4, para. 4.

<sup>545</sup> Cases concerning *Construction of a Road in Costa Rica along the San Juan River (Nicaragua v. Costa Rica)* and *Certain Activities Carried Out by Nicaragua in the Border Area (Costa Rica v. Nicaragua)*, Provisional Measures Hearing, CR 2013/29, 6 November 2013, p. 14, para. 9 (Brenes). See also LANAMME Report, p. 5: "Construction of the road . . . was announced in December 2010 by authorities of the Government of Costa Rica to protect national sovereignty and as a permanent solution allowing free traffic of both people and agricultural products in Costa Rica's north border region." (NM, Vol. II, Annex 3, p. 209).

Court that no Nicaraguan military or other governmental personnel had been in the disputed area since December 2010.<sup>546</sup>

- On 21 February 2011, Costa Rica’s President issued the Emergency Decree<sup>547</sup> that purportedly provided the legal basis for the construction of the Road without complying with normally applicable requirements under internal and international law.
- On 8 March 2011 the Court ordered provisional measures.<sup>548</sup>
- On 21 September 2011, the Costa Rican government promulgated regulations formally implementing the Emergency Decree.
- Road construction funds were depleted by December 2011.<sup>549</sup>
- “[In] May 2012 the Government of Costa Rica exposed and denounced apparent acts of corruption, involving government officials from CONAVI [Costa Rica’s National Roadway Council] in charge of the construction and supervision of the Border Road and some private contractors. ... As a consequence, the road works were suspended.”<sup>550</sup>
- Apart from some minor repairs, general work on the Road had not resumed as of July 2014.<sup>551</sup>
- As of July 2014, the Road is still far from complete, with major sections impassable and some failing due to landslides, slumping, erosion, and the like.<sup>552</sup>

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<sup>546</sup> *Certain Activities Carried Out by Nicaragua in the Border Area (Costa Rica v. Nicaragua)*, Provisional Measures Hearing, CR 2011/2, para. 28 (Argüello Gómez).

<sup>547</sup> NM, Annex 11.

<sup>548</sup> *Certain Activities Carried Out by Nicaragua in the Border Area (Costa Rica v. Nicaragua)*, Provisional Measures, Order of 8 March 2011, I.C.J. Reports 2011, p. 6.

<sup>549</sup> CRCM, p. 39, para. 2.32.

<sup>550</sup> *Ibid.*

<sup>551</sup> See Rebeca Madrigal, Works on the Trail Paralyzed while Waiting for Designs and Modular Bridges, *crhoy.com*, July 10, 2014. (NR, Vol. II, Annex 21).

<sup>552</sup> See 2014 Kondolf Report, Section 2 (NR, Vol. II, Annex 1).

- It is reported that Giselle Alfaro, Supervisory Engineer at CONAVI, does not exclude the possibility that the Road “may be completed during the [current] Solis-Rivera administration,”<sup>553</sup> which will end in 2018.

6.12 This timeline exposes several important points. First, it will be immediately evident that the “Emergency Decree,” by which Costa Rica claims to have authorized construction of the Road without complying with any of its internal or international obligations relating to the project, was actually issued two months *after* construction of the Road had begun. Moreover, the Decree was not implemented until some nine months after construction had commenced. Thus, the work on the Road project was not in fact authorized under Costa Rican law when it began, according to the evidence provided by Costa Rica. Even if this is normal procedure under Costa Rican law, which is *prima facie* doubtful, it is certainly not normal, or even permissible, under international law.

6.13 Second, the timeline also shows clearly that even if Costa Rica perceived that there was a grave and imminent peril – which Nicaragua has demonstrated it could not, in fact, reasonably have done<sup>554</sup> – the action it took bore no relation to the perceived peril that allegedly gave rise to the emergency. A State facing an imminent threat would respond with measures that could be put in place immediately, or at least quickly. The Road project is clearly not such a

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<sup>553</sup> Rebeca Madrigal, Works on the Trail Paralyzed while Waiting for Designs and Modular Bridges, *crhoy.com*, July 10, 2014. (NR, Vol. II, Annex 21).

<sup>554</sup> See, e.g., NM, p. 21, para. 2.17, recalling that in the hearings on provisional measures in January, 2011, the Agent of Nicaragua informed the Court that: “no Nicaraguan military or other governmental personnel have been present in the disputed area since December 2010.”

measure. In July 2014, some three and a half years after work on the Road commenced, the project remains far from complete, with current projections running into 2018.

6.14 What does not appear from the timeline is that it is not only impossible to consider the Road project as a response to an emergency from the standpoint of the time element. It is also impossible to square the project with its purported purpose from the standpoint of the space element: a State responding to an imminent threat by means of physical measures would not take those measures far from the location of the cause of the threat. Costa Rica explains:

“The National Security Council met on 24 November 2010 to analyse the threats posed by Nicaragua’s actions on Isla Portillos and had requested that the Ministers carry out the actions necessary to ensure access to the area.”<sup>555</sup>

6.15 Yet, the Road project is not remotely in the vicinity of “Isla Portillos” (Harbour Head) or the *caño* whose cleaning by Nicaraguan workers using hand tools gave rise to the dispute that caused Costa Rica to embark on the project. As illustrated by Sketch Map 4 in Costa Rica’s Counter-Memorial, the *caño* in question, and the disputed area of some 250 hectares, are located far to the east of the terminus of the Road project at the Colorado branch of the San Juan River.<sup>556</sup>

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<sup>555</sup> CRCM, p. 33, para. 2.22.

<sup>556</sup> CRCM, Sketch Map 4, after p. 36.

6.16 Moreover, it would have been impossible for the Road to reach what is referred to as the “disputed territory” in the *Certain Activities* case<sup>557</sup> because the Colorado River branches off from the San Juan at the Road’s terminus and would have to be spanned by a long bridge to allow traffic to reach the other side. Even if such a bridge were constructed – and there is no indication that one is planned – Costa Rica would still have to construct a road from the left bank of the Colorado River to the area in dispute, something that would be very difficult in the wetlands in the area. Thus, the Road bears no relationship whatsoever to the cause of Costa Rica’s dispute with Nicaragua.

6.17 Costa Rica’s Emergency Decree and the Road project it made possible under Costa Rican law not only bear no relation, in time or space, to the actions taken by Nicaragua that allegedly precipitated them; they also fly in the face of fundamental principles of international law, as noted in Nicaragua’s Memorial.<sup>558</sup> For present purposes, Nicaragua will recall only the foundational principle of international law that a State may not invoke its internal law as justification for its failure to perform obligations under international law. This principle is reflected in both Article 27 of the Vienna Convention on the Law of Treaties, “Internal law and observance of treaties,”<sup>559</sup> and Article 32 of the Articles on Responsibility of States for Internationally Wrongful Acts,

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<sup>557</sup> See the Court’s Order of 8 March 2011, *Certain Activities Carried Out By Nicaragua in the Border Area (Costa Rica V. Nicaragua), Provisional Measures, Order of 8 March 2011*, I.C.J. Reports 2011 (I), p. 19, para. 55, identifying the disputed territory.

<sup>558</sup> NM, pp. 156-165, paras. 5.14-5.27.

<sup>559</sup> Vienna Convention on the Law of Treaties, 23 May 1969, 1155 U.N.T.S. 331, Article 27.

“Irrelevance of internal law.”<sup>560</sup> Yet, this is precisely what Costa Rica has done in this case: it has invoked its internal law, the Emergency Decree, as justification for breaches of its international obligations. Moreover, it has refrained from invoking a circumstance precluding wrongfulness to excuse its breaches, no doubt because it realizes that none applies.

6.18 The timeline above also serves as a reminder of Costa Rica’s having taken matters into its own hands even after it had submitted the dispute to the Court and requested provisional measures, and after the Court had held hearings on Costa Rica’s Request for Provisional Measures.<sup>561</sup> This is precisely the kind of unilateral self-help measure, taken after a dispute has been submitted to the Court, of which the Court strongly disapproved in *United States Diplomatic and Consular Staff in Tehran*.<sup>562</sup> Nicaragua pointed this out in its Memorial, but Costa Rica failed to respond in its Counter-Memorial.

6.19 Organizations in Costa Rica itself have also recently denied that there was an “emergency” sufficient to justify the unplanned construction of a road through an environmentally sensitive area. In an article published on 4 June 2014, Alberto Cabezas, the founder of Fundación Mundial Déjame Vivir en Paz, said of the Road project:

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<sup>560</sup> Articles on Responsibility of States for Internationally Wrongful Acts, Article 32, *Yearbook of the International Law Commission*, 2001, vol. II (Part Two), p. 26, para. 77, p. 94; annexed to General Assembly resolution 56/83 of 12 December 2001.

<sup>561</sup> That the Road project was a response to what Costa Rica characterized as “an act of aggression on the part of the neighbor country of Nicaragua” is shown by the By-Laws and Regulations adopted by the Costa Rican Government on 21 September 2011. NM, pp. 153-154, para. 5.9.

<sup>562</sup> *United States Diplomatic and Consular Staff in Tehran (United States of America v. Iran)*, I.C.J. Reports 1980, p. 3.

“It is our opinion that no emergency, except cases where human life is in danger (which is not the case) justifies nowadays, an environmental risk such as the one posed by this project as a consequence of not having conducted necessary studies to prevent processes that at this point, are very difficult and costly to correct.”<sup>563</sup>

6.20 In sum, Costa Rica’s own actions demonstrate that it did not believe that there was an “emergency” that required initiating work on the Road project in a hasty, unplanned manner that was not in accordance with international law. The Emergency Decree was adopted on 21 February 2011; over three years later, in the summer of 2014, the Road remains far from being complete and some sections are impassable and require major remediation. In terms of geography, the Road is far removed from the area in dispute and thus bears no physical relation to that area. Furthermore, fundamental principles of international law prohibit Costa Rica from invoking its internal law – the Emergency Decree – as justification for failure to comply with its obligations under international law. And Costa Rica has not even attempted to justify its wrongful acts by invoking a circumstance precluding wrongfulness.

6.21 Nicaragua now turns to what Costa Rica characterizes as “three central obligations: an obligation to conduct an environmental impact assessment where there is a risk that works may have a significant impact in a transboundary context; an equivalent obligation of notification; and an obligation not to cause

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<sup>563</sup> Alberto Cabezas, Border Trail Case, published 4 June 2011, Revista Amauta ( NR, Vol. II, Annex 22).

significant transboundary harm.”<sup>564</sup> Costa Rica then states: “As is already evident from Costa Rica’s Memorial in the *Certain Activities* case, Costa Rica accepts the existence of these principles as a general matter so far as concerns its relations with Nicaragua (and other neighbouring states).”<sup>565</sup> However, Costa Rica then proceeds to argue that they are not applicable to it in the present case.

### **C. COSTA RICA BREACHED THE OBLIGATION TO PREPARE, IN ADVANCE, AN ENVIRONMENTAL IMPACT ASSESSMENT**

#### ***I. The International Acceptance of the Importance of Performing an Environmental Impact Assessment***

6.22 Since the enactment of the National Environmental Policy Act (NEPA) by the United States in 1969,<sup>566</sup> the importance of assessing the environmental impact of proposed development projects has increasingly been recognized by States. In its 2010 judgment in the *Pulp Mills* case, the Court referred to:

“a practice, which in recent years has gained so much acceptance among States that it may now be considered a requirement under general international law to undertake an environmental impact assessment where there is a risk that the proposed industrial activity may have a significant adverse impact in a transboundary context . . .”<sup>567</sup>

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<sup>564</sup> CRCM, p. 109, para. 5.6.

<sup>565</sup> *Ibid.*

<sup>566</sup> National Environmental Policy Act of 1969, Volume 42 United States Code §§ 4321-4347.

<sup>567</sup> *Pulp Mills on the River Uruguay (Argentina v. Uruguay)*, judgment of 20 April 2010, p. 83, para. 204.

6.23 Nearly twenty years earlier, in 1992, the United Nations Conference on Environment and Development, or Earth Summit, recognized in Principle 17 of the Rio Declaration that:

“Environmental impact assessment, as a national instrument, shall be undertaken for proposed activities that are likely to have a significant adverse impact on the environment and are subject to a decision of a competent national authority.”<sup>568</sup>

6.24 Costa Rica does not deny that it failed to follow the directives of either the Court in *Pulp Mills* or the Earth Summit in the Rio Declaration. It does not deny that it failed to prepare an environmental impact assessment (“EIA”) concerning possible impacts of the Road project within its own territory, as counseled by the Rio Declaration and required by its own national law;<sup>569</sup> and it also does not deny that it failed to prepare an EIA concerning possible impacts of the Road project on Nicaragua, as required by general international law. This notwithstanding Costa Rica’s insistence in the *Certain Activities* case on “[t]he necessity of a proper environmental impact assessment in order to prevent or minimize transboundary harm,” which it called “a well-recognized requirement of general international law . . .”<sup>570</sup> Given Costa Rica’s *prima facie* breaches of its obligations to conduct an EIA under both national and international law, how does

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<sup>568</sup> Rio Declaration on Environment and Development, adopted by the United Nations Conference on Environment and Development, Rio de Janeiro, June 14, 1992, 31 I.L.M. 874 (1992), Principle 17.

<sup>569</sup> Golder Report, Section 4 (NR, Vol. II, Annex 6).

<sup>570</sup> *Certain Activities carried out by Nicaragua in the Border Area (Costa Rica v. Nicaragua)*, CRM, p. 209, para. 5.23.

Costa Rica justify proceeding in haste on the Border Road project, without any prior planning, let alone assessments of national and transboundary environmental impacts?

## 2. *Costa Rica’s Attempts to Excuse Its Failure to Prepare an EIA*

6.25 Costa Rica deploys several arguments in an effort to defend its failures. As has already been seen, at the most fundamental level Costa Rica seeks to justify its haste to construct an unplanned Border Road by declaring that “the work [on the Road project] has been conducted exclusively within Costa Rica’s territory,” and therefore that “[t]he reasons for improving infrastructure, as a sovereign decision, need not be explained or justified at the international level.”<sup>571</sup> This argument, amounting to an assertion that absolute territorial sovereignty permits a State to do whatever it wishes within its territory regardless of transboundary consequences, has been shown to be without merit in section Chapter 4, above.

6.26 Costa Rica’s second argument is that “threshold requirements” in respect of the obligation to conduct an EIA were not satisfied.<sup>572</sup> In this regard Costa Rica relies on both Article 14(1) of the Convention on Biological Diversity (CBD) and the *Pulp Mills* case.

6.27 In the case of Article 14(1) of the CBD, Costa Rica focuses on the requirement that proposed projects be “likely to have significant adverse effects

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<sup>571</sup> CRCM, p. 107, para. 5.3.

<sup>572</sup> CRCM, p. 110.

on biological diversity” before an EIA must be conducted. It repeats its argument that “the Road was and is being constructed exclusively within Costa Rican territory”<sup>573</sup> and, relying on *post hoc* studies,<sup>574</sup> contends that the quantities of sediment discharged into the river by the Road project “in no sense risk having a significant adverse impact on the San Juan River . . . .”<sup>575</sup> However, as demonstrated in Chapter 2, the expert studies annexed to the present Reply show that the sediment delivered into the river from the Road are, in fact, having a significant adverse impact on the San Juan.

6.28 But of course the obligation to conduct an EIA is to conduct the study *prior* to initiation of work on a project, not to wait until work is well underway to assess its effects. As shown in this Chapter, Costa Rica had ample reason to believe that the Road project would have significant adverse effects on biological diversity and the aquatic ecosystem of the San Juan, given the sensitivity and protected status of those receiving environments.<sup>576</sup> Thus, the threshold requirement in respect of the obligation under the CBD to conduct an EIA for the Road project was met.

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<sup>573</sup> *Ibid.*, p. 111, para. 5.12.

<sup>574</sup> See, e.g., Professor Colin Thorne, Report on the Risk of Irreversible Harm to the Río San Juan relating to the Construction of the Border Road in Costa Rica, 4 November 2013, CRCM, Volume II, Annex 9, p. 453; and Costa Rican Institute of Electricity (ICE), SBU Projects and Associated Services, Centre for Basic Engineering Studies, Department of Hydrology, Report on Hydrology and Sediments for the Costa Rican River Basins draining to the San Juan River, August 2013, CRCM, Volume II, Annex 4, p. 133.

<sup>575</sup> *Ibid.*

<sup>576</sup> See paras. 6.47-6.51 below, and Sheate Report, Section 5 (NR, Vol. II, Annex 5); Golder Report, Section 4 (NR, Vol. II, Annex 6).

6.29 As to *Pulp Mills*, Costa Rica quotes the following passage from the Court's Judgment, which is now well known:

“... it may now be considered a requirement under general international law to undertake an environmental impact assessment *where there is a risk that the proposed industrial activity may have a significant adverse impact in a transboundary context*, in particular, on a shared resource. Moreover, due diligence, and the duty of vigilance and prevention which it implies, would not be considered to have been exercised, if a party planning works *liable to affect the régime of the river or the quality of its waters* did not undertake an environmental impact assessment on the potential effects of such works.”<sup>577</sup>

6.30 As with the CBD, Costa Rica argues that the “threshold” for the application of the EIA requirement under the *Pulp Mills* standard, “risk of significant adverse impact (in a transboundary context),”<sup>578</sup> is not met, because: “Construction of the Road did not and does not lead to the discharge of harmful substances or emissions into the San Juan River or otherwise into Nicaraguan territory.”<sup>579</sup> Remarkably, no evidence is cited in support of this contention.

6.31 Costa Rica then proceeds to draw the following conclusion:

“The highest Nicaragua can put its case is by reference to erosion or other loss of relatively insignificant quantities of sediment into the River which, as demonstrated in Chapter 3 above, in no sense risk having a significant adverse impact on the San Juan River, or are liable to affect the régime of the River or the quality of its waters.”<sup>580</sup>

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<sup>577</sup> CRCM, p. 110, para. 5.10, quoting from *Pulp Mills on the River Uruguay (Argentina v. Uruguay), Judgment, I.C.J. Reports 2010*, p. 83, para. 204 (emphasis Costa Rica's).

<sup>578</sup> CRCM, p. 111, para. 5.11.

<sup>579</sup> *Ibid.*, para. 5.12.

<sup>580</sup> *Ibid.*

6.32 Costa Rica's case thus rests on its conclusion that the Road has not had "a significant adverse impact on the San Juan River," and is not "liable to affect the régime of the River or the quality of its waters." But Nicaragua has shown, in Chapter 2 above, that expert studies conclude that significant harm has, in fact been caused by the Road project to the river, its régime – in particular, its ecosystem – and the quality of its waters.<sup>581</sup> This finding also refutes Costa Rica's argument that its Road project has not caused Nicaragua significant harm, as shown in section F, below.

6.33 Costa Rica's third argument is that although "[t]he *Pulp Mills* case does not address directly the issue of conduct of an environmental impact assessment in the context of an emergency[,] . . . as follows from the general principles as reflected in *Pulp Mills*, this issue must be approached by reference to the domestic law of the State concerned."<sup>582</sup> Costa Rica then reproduces the following passage from the *Pulp Mills* judgment:

"[I]t is the view of the Court that it is for each State to determine in its domestic legislation or in the authorization process for the project, the specific content of the environmental impact assessment required in each case, having regard to the nature and magnitude of the proposed development and its likely adverse impact on the environment as well as to the need to exercise due diligence in conducting such an assessment. The Court also considers that an environmental impact assessment must be conducted prior to the implementation of a project. Moreover, once operations have started and, where

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<sup>581</sup> NR, Chapter 2; 2014 Kondolf Report, Section 8 (NR, Vol. II, Annex 1); Rios Report (NR, Vol. II, Annex 4).

<sup>582</sup> CRCM, p. 112, para. 5.13.

necessary, throughout the life of the project, continuous monitoring of its effects on the environment shall be undertaken.”<sup>583</sup>

6.34 This passage actually supports Nicaragua’s case, rather than Costa Rica’s, specially in two ways. The first of these is that the Court addresses the *content* of an EIA, not whether one must be conducted. The paragraph begins with the following statement, omitted from Costa Rica’s quotation: “The Court observes that neither the 1975 Statute [involved in the *Pulp Mills* case] nor general international law specify the scope and content of an environmental impact assessment.”<sup>584</sup> The Court thus signals that what follows will concern those two aspects of EIA, the scope and content of such assessments, not whether one must be conducted, which it had already addressed in the immediately preceding paragraph of its Judgment, quoted in paragraph 6.29 above.<sup>585</sup>

6.35 The fact that the specific content of an EIA in each case is left to domestic law in no way affects the obligation to conduct one. Thus, the passage quoted by Costa Rica offers no support for its contention that where “domestic law establishes that there is no requirement to carry out an assessment because of an emergency, general international law must likewise recognise this aspect of

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<sup>583</sup> *Pulp Mills on the River Uruguay (Argentina v. Uruguay), Judgment, I.C.J. Reports 2010*, p. 14, pp. 83-84, para. 205.

<sup>584</sup> *Pulp Mills on the River Uruguay (Argentina v. Uruguay), Judgment, I.C.J. Reports 2010*, p. 14, p. 83, para. 205.

<sup>585</sup> Costa Rica recognizes this in the paragraph following the quotation: “It is thus left to domestic law to define the specific content of the assessment that is required in each individual case.” CRCM, p. 112, para. 5.14.

domestic law.”<sup>586</sup> The passage quoted has nothing to do with the obligation to “carry out” an assessment, only with its content.

6.36 The second way in which the passage assists Nicaragua’s case is that the Court makes clear the requirement that “an environmental impact assessment must be conducted *prior* to the implementation of a project.”<sup>587</sup> Costa Rica seeks to substitute its *post hoc* Environmental Diagnostic Assessment (“EDA”)<sup>588</sup> for a prior EIA, contending that if there is an obligation to conduct an EIA “on the very particular facts of this case, that obligation has been satisfied by completion of the Environmental Diagnostic Assessment.”<sup>589</sup>

6.37 It is difficult to see how what amounts to a *post-hoc* damage assessment can substitute for an *ex ante* analysis of the harm the project might cause. Assessment *ex ante* and monitoring *ex post* are two separate processes, with different rationales, as the Court recognized in the last sentence of the passage quoted by Costa Rica. There the Court said that not only must an EIA be conducted prior to the implementation of a project: “Moreover, once operations have started and, where necessary, throughout the life of the project, continuous monitoring of its effects on the environment shall be undertaken.”<sup>590</sup> Finally, the

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<sup>586</sup> *Ibid.*

<sup>587</sup> *Pulp Mills on the River Uruguay (Argentina v. Uruguay), Judgment, I.C.J. Reports 2010*, p. 14, p. 83, para. 205 (emphasis added).

<sup>588</sup> CRCM, Annex 10.

<sup>589</sup> CRCM, p. 114, para. 516.

<sup>590</sup> *Pulp Mills on the River Uruguay (Argentina v. Uruguay), Judgment, I.C.J. Reports 2010*, p. 14, pp. 83 -84, para. 205.

Costa Rican regulation describing the purpose and requirements for EDA includes a table showing how EDA and EIA are different.

6.38 This is particularly important with respect to Costa Rica's Road project in view of its magnitude and the sensitive environments through which it passes, since it continues to deliver sediment into the river, and because the reckless and unplanned manner in which it was constructed leave what are in effect ticking time bombs of future landslides and other catastrophic events waiting to happen. Such *post hoc* monitoring and mitigation is, of course, to be distinguished from the fresh EIA that Costa Rica must carry out before commencing further work on the project, discussed below.<sup>591</sup>

6.39 Costa Rica gives still other justifications for proceeding in a rash and reckless manner with its Border Road project. Thus, Costa Rica cites "the need to allow Costa Rican police direct and expeditious access to the border area, in order to provide the local population with essential services,"<sup>592</sup> the fact that "[d]ue to the lack of a reliable road network in the border area, . . . there existed no safe and efficient route of evacuation, and no means by which to provide the local population with essential services in the areas of security, health, and education,"<sup>593</sup> and the like.

6.40 It is clear that these conditions do not rise to the level of an "emergency." In fact, Costa Rica's citing them as reasons for constructing the

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<sup>591</sup> Paras. 6.55-6.56 below.

<sup>592</sup> CRCM, p. 21, para. 2.2.

<sup>593</sup> CRCM, p. 23, para. 2.4.

Road contradicts entirely its “emergency” pretext. Even assuming there was a need to improve delivery of governmental services to the local population, what made it so urgent in 2011 that, all of a sudden, it had to be satisfied on an “emergency” basis without proper planning or assessment of environmental impact? Certainly Costa Rica had not thought there was an emergency previously, before it inexplicably and without any warning or other hint of forethought contracted with thirty-five separate construction companies to build five different sections of the Road, without any blueprints or other plans.<sup>594</sup> The lack of plans virtually guaranteed the Road, if it could be built in the first place, would fail sufficiently to satisfy the achievement of Costa Rica’s purported objectives. It was guaranteed to be a self-destructing venture. There would be no route to “allow Costa Rican police direct and expeditious access to the border area, in order to provide the local population with essential services,”<sup>595</sup> there would still exist “no safe and efficient route of evacuation, and no means by which to provide the local population with essential services in the areas of security, health, and education.”<sup>596</sup> And this is indeed what has occurred.

6.41 In short, the manner in which the Road was ordered constructed by the Costa Rican Government begs the question whether that Government genuinely believed there was an emergency. It was entirely foreseeable that an unplanned, unengineered road that was constructed in an area with abundant

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<sup>594</sup> NM, p. 123, para. 4.1 and sources there cited.

<sup>595</sup> CRCM, p. 21, para. 2.2.

<sup>596</sup> CRCM, p. 23, para. 2.4.

rainfall by 35 different companies with little or no coordination would fail. No State facing a true emergency would conduct itself in this manner.

6.42 Other facts not cited by Costa Rica belie the idea that the construction of the Road was an emergency. Prominent among these is the fact that power lines are being installed along the Road.<sup>597</sup> There is no emergency-related reason for a power line. Costa Rica's police posts have their own generators and a civilian population being evacuated does not need them, either. This therefore falls more into the category of economic development – a laudable purpose, and maybe a real purpose of the Road, but one that should follow normal requirements under both internal and international law.

6.43 However, it should be noted that whatever the purpose of the Road, as Costa Rica's EDA recognizes, it will have the capacity “to attract settlers to the region, generating pressure on the existing services and infrastructure, as well as on the region’s natural protected areas,” including “greater vulnerability due to . . . contamination due to human activities.”<sup>598</sup> This should be fully taken into account in a fresh environmental impact assessment by Costa Rica concerning domestic and transboundary impacts of the Road.

6.44 However, even if, *quod non*, the conditions cited by Costa Rica do give rise to an “emergency,” it was one of Costa Rica’s own making. And since necessity is the only circumstance precluding wrongfulness available to Costa

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<sup>597</sup> See, *supra* Chapter 3, para. 3.44.above.

<sup>598</sup> CRCM, Volume II, Annex 10, p. 499, folio p. 65.

Rica in this case, Costa Rica would have to show that it had not “contributed to the situation of necessity,”<sup>599</sup> which it certainly could not do.

6.45 While Costa Rica, characteristically, blames Nicaragua for Costa Rica’s own failure to provide the necessary infrastructure to permit the local population to transit the border area,<sup>600</sup> that argument is fallacious, both factually and legally. Costa Rica contends that the Road is necessary because of Nicaragua’s alleged “obstruction . . . of the exercise of Costa Rica’s right to navigate the San Juan River . . .”<sup>601</sup> Nicaragua emphatically denies that it has “obstruct[ed] . . . the exercise of Costa Rica’s right to navigate the San Juan River” – a right which the Court has defined narrowly and which Nicaragua scrupulously observes.

6.46 In the relevant portions of its *dispositif* in the *Navigational and Related Rights* case, the Court held that “Costa Rica has the right of free navigation on the San Juan River for purposes of commerce,” that “the inhabitants of the Costa Rican bank of the San Juan River have the right to navigate on the river between the riparian communities for the purposes of the essential needs of everyday life which require expeditious transportation,” and that “Costa Rica has the right of navigation on the San Juan River with official vessels used solely, in specific situations, to provide essential services for the inhabitants of the riparian

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<sup>599</sup> Article 25 of the Articles on the Responsibility of States for Internationally Wrongful Acts provides in paragraph 2(b) that “necessity may not be invoked by a State as a ground for precluding wrongfulness if. . . (b) the state has contributed to the situation of necessity.” Articles on the Responsibility of States for Internationally Wrongful Acts, *op cit. supra*, Article 25(2)(b).

<sup>600</sup> See, e.g., CRCM, p. 23, para. 2.4.

<sup>601</sup> *Ibid.*

areas where expeditious transportation is a condition for meeting the inhabitants' requirements.”<sup>602</sup> It will be noted that the Court was quite specific, and limiting, in articulating Costa Rica's navigational rights. The rights found by the Court would certainly not include most of the uses Costa Rica refers to as being the *raison d'être* of the Border Road – e.g., “allow[ing] Costa Rican police direct and expeditious access to the border area . . . ,”<sup>603</sup> or “provid[ing] the local population with essential services in the areas of security, health, and education.”

### **3. *Costa Rica Should at Least Have Undertaken a Preliminary EIA***

6.47 More fundamentally, however, as already noted, the obligation to prepare an EIA is an obligation of conduct to be performed *ex ante*, not to wait to see whether significant harm is in fact caused by a project and if so, prepare a study *ex post*, as Costa Rica has done with its EDA.<sup>604</sup>

6.48 The need for a preliminary EIA was all the more obvious considering the prospective Road's proximity to the San Juan River,<sup>605</sup> and thus to the border. In addition, even though it was unplanned, it was obvious that the Road was to pass through internationally designated sites for rare and endangered species and habitats, sensitive wetlands, rivers and estuaries, and an environment whose wider cultural value has been recognized internationally. Costa Rica's *post hoc* Environmental Diagnostic Assessment confirms a number of times the

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<sup>602</sup> *Dispute regarding Navigational and Related Rights (Costa Rica v. Nicaragua)*, Judgment, I.C.J. Reports 2009, p. 213, at pp. 269-270.

<sup>603</sup> CRCM, p. 21, para. 2.2.

<sup>604</sup> *Ibid.*, Volume II, Annex 10, p. 499.

<sup>605</sup> See 2014 Kondolf Report, Section 2 (NR, Vol. II, Annex 1).

importance of conducting such an analysis in these situations.<sup>606</sup> Specifically, Costa Rica knew or should have known that the Road project would be constructed through or in the immediate vicinity of the following protected areas:

- **Nationally protected areas**
  - *Nicaraguan protected areas*
    - Indio Maíz Reserve (1990)
  - *Costa Rican protected areas*
    - Refugio de Vida Silvestre Corredor Fronterizo (1994)
- **Internationally protected areas**
  - *Ramsar Wetlands Convention*
    - Refugio de Vida Silvestre Rio San Juan (Nicaragua, 2001)
    - Humedal Caribe Noreste (Costa Rica, 1996)
    - Humedal Maquenque (Costa Rica, 2010)
    - Cano Negro (Costa Rica, 1991)
  - *UNESCO MAB Biosphere Reserve*
    - San Juan River – Nicaragua Biosphere Reserve (2003, incorporating Indio Maíz Reserve and Refugio de Vida Silvestre Rio San Juan).<sup>607</sup>

6.49 In addition, much of the Road – i.e., the entire stretch between the Infiernito River and the Delta – was to pass through what Costa Rica’s EDA classifies as “the life zone category of Very Humid Tropical Forest . . .”<sup>608</sup> The EDA says of this zone:

“It is a well known fact that the areas located within the Very Humid Tropical Forest life zone are very restrictive environments for the establishment of many different

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<sup>606</sup> CRCM, Volume II, Annex 10, folio pp. 18-19, 42, 47, 59, 60, 65-66, 67, and 106.

<sup>607</sup> This table is adapted from the Sheate Report (NR, Vol. II, Annex 5).

<sup>608</sup> CRCM, Volume II, Annex 10, p. 44.

activities of land use. They are fragile areas which at the same time are rich in bio-diversity.”<sup>609</sup>

Costa Rica must be charged with knowledge of this “well known fact” and with having had this knowledge before it decided to proceed with construction of the Road. The EDA also identifies species in the area of the Road that are under threat of extinction, including the Great Green Macaw, the jaguar, and the sea cow.<sup>610</sup> Costa Rica must likewise be held to have had knowledge that the route of its Road would pass through an area that is home to these species.

6.50 The fact that the Road was to be constructed in these sensitive, protected areas also bears on the “significance” of the adverse effects the project may have upon the environment. International practice indicates that factors to be taken into account in determining significance include the scale of the project (here, a 160 km-long road) and the geographical scope of its potential effects (when ecosystem disruption, effects on protected areas, deforestation, and effects on the aquatic environment are considered, a geographical scope of great proportions), and the sensitivity of the receiving environment (quite high, especially in the nationally and internationally protected areas indicated above).<sup>611</sup>

6.51 These factors leave little doubt that the possible adverse effects of the Road project on the environment were “significant,” even without considering the quantity of additional sediment delivered into the San Juan River.

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<sup>609</sup> *Ibid.*

<sup>610</sup> *Ibid.*, p. 39.

<sup>611</sup> Sheate Report, Section 5 (NR, Vol. II, Annex 5).

6.52 Moreover, Costa Rica has been on notice since the mid-1990s that this kind of project carries with it a high risk of environmental harm. A 1996 OAS study concluded:

“The construction of roads without proper drainage measures or in territories subject to penetration and settlement are high-stress factors for ecosystems, especially those which are highly fragile as a result of their weather conditions and the nature of their soil and water.”<sup>612</sup>

The study also found that:

“there is a heavy environmental impact caused [by] the mechanical process of road construction, especially on aquatic ecosystems and more specifically on rivers.”<sup>613</sup>

6.53 In the specific context of the obligation to conduct an EIA, the findings are of pivotal importance because they show that Costa Rica had long been on notice that the kind of project involved in this case would almost certainly have significant environmental impacts, not only in Costa Rica but in Nicaraguan territory, as well.

6.54 The foregoing establishes that Costa Rica breached its obligation to conduct a transboundary EIA prior to undertaking its Road Project. If and to the extent that Costa Rica’s declaration of an emergency constituted an internal and an international justification, *quod non*, it should have prepared a preliminary EIA at the very least. The fact that more than three years have passed since the

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<sup>612</sup> PROCUENCA SAN JUAN, Formulation of a Strategic Action Program for the Integrated Management of Water Resources and the Sustainable Development of the San Juan River Basin and its Coastal Zone, document; *Transboundary Diagnostic Analysis (TDA)* (Including Root Cause Analysis), available at <http://www.oas.org/sanjuan/english/documents/tda/information/overexploitation.html>.

<sup>613</sup> *Ibid.*, p. IV-45.

Emergency Decree was issued by its President on 21 February 2011 and the Road is still not complete, with significant sections remaining entirely impassable, demonstrates beyond any doubt that Costa Rica would have had ample time to conduct a serious EIA, as it should have done given the sensitive environment, including the San Juan River, that stood to be affected by the project.

#### **4. *Costa Rica has a Continuing Duty to Carry Out a Transboundary EIA for the Road Project***

6.55 Of course, the fact that Costa Rica breached its obligation to conduct a transboundary EIA does not make that obligation disappear. Costa Rica has a “continued duty of performance” of the obligation breached.<sup>614</sup> Costa Rica thus has an ongoing duty to carry out a transboundary EIA for the Road project, and especially for those sections of the Road on which construction is not complete or in which constructed portions have failed. These sections would include the ones as to which there is a significant risk of failure. As established in the Kondolf Report annexed to this Reply, “[a]t least 3 km of the uppermost 30 km of the road has failed or the attempts to build it appear to have been abandoned due to failures”<sup>615</sup> and that the road “is failed or incomplete in multiple places.”<sup>616</sup> Thus, in addition to its obligation to make full reparation for the injury

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<sup>614</sup> Articles on Responsibility of States for Internationally Wrongful Acts, Article 29, “Continued duty of performance,” *Yearbook of the International Law Commission*, 2001, vol. II (Part Two), para. 77.

<sup>615</sup> 2014 Kondolf Report, Section 2 (NR, Vol. II, Annex 1).

<sup>616</sup> *Ibid*, Section 1.

to Nicaragua that has already occurred<sup>617</sup> (including restitution, compensation and satisfaction<sup>618</sup>) as shown in Chapter 7 below, Costa Rica must conduct a transboundary EIA before recommencing work on the Road project and communicate it to the Court and to Nicaragua.

6.56 Moreover, because of the particular risk of grave and irreparable harm posed by the transport of hazardous materials in the vicinity of rivers and other bodies of water, Costa Rica is under an obligation not to transport such materials on its Border Road, as shown in section F below. Any plans Costa Rica may have to transport such materials, including chemicals, fertilizers, and fuel and other petroleum products, despite the high risk of doing so, must be subjected to a full and particularly rigorous environmental impact assessment, including with regard to transboundary impacts, with full notification to Nicaragua and opportunity for Nicaragua to express its views. Prior to this assessment and the execution of its recommendations, no transit with dangerous substances can be allowed.

**D. COSTA RICA BREACHED THE OBLIGATION TO NOTIFY NICARAGUA PRIOR TO COMMENCING CONSTRUCTION ON THE ROAD PROJECT**

6.57 Costa Rica has acknowledged “[t]hat States are under a procedural obligation to notify and consult in respect of those activities which carry a risk of

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<sup>617</sup> Articles on Responsibility of States for Internationally Wrongful Acts, *op. cit. supra*, Article 31.

<sup>618</sup> *Ibid.*, Article 34.

environmental harm to neighbouring States,”<sup>619</sup> calling it “an uncontroversial rule of general international law, extending from the *Lac Lanoux* arbitration to Principle 19 of the Rio Declaration . . .”<sup>620</sup> Nicaragua is in full agreement with this characterization. Yet, Costa Rica denies that it is subject to the obligation of prior notification in the present case, on two grounds that are now familiar: First, that in constructing the Road it was responding to a “state of emergency” caused by Nicaragua, and that this emergency exempted it from the duty to comply with the obligation to notify Nicaragua;<sup>621</sup> and second, that the obligation of prior notification only applies where planned measures may cause significant adverse effects to another State, which Costa Rica contends is not the case here since any effects of the Road project on the San Juan River are not “significant.”

6.58 The second of these arguments, concerning the “significance” of the harm from the Road project, has been addressed in the previous section on Costa Rica’s obligation to conduct an environmental impact assessment, as well as in Chapter 2, and will not be revisited here. Suffice it to say for present purposes that as shown in the previous section, Costa Rica had every reason to believe that a project such as its Border Road would entail a risk of significant transboundary environmental harm, which placed it under an obligation to provide prior notification to Nicaragua of its plans. Moreover, it is now clear from expert

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<sup>619</sup> *Certain Activities carried out by Nicaragua in the Border Area (Costa Rica v. Nicaragua)*, CRM, p. 200, para. 5.5.

<sup>620</sup> *Ibid.*

<sup>621</sup> CRCM, pp. 116-118, paras. 5.20-5.24.

studies that the project has, in fact, caused significant harm to the River and its ecosystems, and continues to do so.<sup>622</sup>

6.59 As to Costa Rica's first argument, that it is exempt from the notification requirement because of the emergency it had declared, the ineffectiveness of the Emergency Decree to exempt Costa Rica from its obligations under international law has been demonstrated in section C above and in Nicaragua's Memorial.<sup>623</sup> Costa Rica contends, however, that its failure even to notify Nicaragua of its intention to construct its Road is excused by the principle reflected in Article 19 of the 1997 Convention on the Law of the Non-Navigational Uses of International Watercourses.<sup>624</sup> Costa Rica selectively quotes paragraph 1 of that article.<sup>625</sup> The entire article reads as follows:

*Article 19  
Urgent implementation of planned measures*

1. In the event that the implementation of planned measures is of the utmost urgency in order to protect public health, public safety or other equally important interests, the State planning the measures may, subject to articles 5 and 7, immediately proceed to implementation, notwithstanding the provisions of article 14 and paragraph 3 of article 17.
2. In such a case, a formal declaration of the urgency of the measures shall be communicated without delay to the other watercourse States referred to in article 12 together with the relevant data and information.

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<sup>622</sup> See 2014 Kondolf Report (NR, Vol. II, Annex 1); Rios Report (NR, Vol. II, Annex 4). See also Chapter 2, above.

<sup>623</sup> NM, Chapter 5, pp. 152-165, paras. 5.6-5.29

<sup>624</sup> New York, 21 May 1997, U.N. Doc. A/RES/51/868, Annex, 36 I.L.M. 700 (1997) (hereinafter UN Watercourses Convention).

<sup>625</sup> CRCM, p. 117, para. 5.22.

3. The State planning the measures shall, at the request of any of the States referred to in paragraph 2, promptly enter into consultations and negotiations with it in the manner indicated in paragraphs 1 and 2 of article 17.<sup>626</sup>

6.60 The ILC's commentary to the draft article upon which Article 19 is based explains that Article 19 "concerns highly exceptional cases in which interests of overriding importance require that planned measures be implemented immediately, without awaiting the expiry of the periods allowed for reply to notification and for consultations and negotiations."<sup>627</sup> The commentary adds that "[i]n formulating the article, the Commission has endeavoured to guard against possibilities of abuse of the exception it establishes."<sup>628</sup>

6.61 Paragraph 2 of Article 19 requires the State proceeding to immediate implementation of the measures to provide other States "referred to in Article 12" with "a formal declaration of the urgency of the measures . . . together with the relevant data and information." The States "referred to in Article 12" are those upon which the measures "may have a significant adverse effect" (Article 12).

6.62 Paragraph 3 of Article 19 requires that the State implementing the measures enter promptly into consultations and negotiations with the other States if requested to do so by those states.

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<sup>626</sup> UN Watercourses Convention, *op. cit. supra*, Article 19.

<sup>627</sup> *Yearbook of the International Law Commission, 1994*, vol. II, Part Two, p. 118.

<sup>628</sup> *Ibid.*

6.63 Leaving aside for the moment the question of whether the circumstances in which Costa Rica commenced construction of the Road were of the “highly exceptional” kind referred to in the ILC’s commentary, Costa Rica failed entirely to comply with the conditions laid down in the article, which is based on State practice. Those conditions are:

- First, that urgent implementation of planned measures is “subject to articles 5 and 7” (Article 19(1)). These provisions reflect obligations that are firmly embedded in customary international law: Article 5, the obligation of equitable and reasonable utilization; and Article 7, the obligation of prevention of significant harm. While Costa Rica quoted Article 19(1) in its Counter-Memorial, it failed to note this condition for invoking the exception to the obligation to provide prior notification of planned measures. Costa Rica breached the rule embodied in Article 5 by proceeding to construct its Road in a manner that was not “consistent with adequate protection of the watercourse.” And it breached Article 7 by not “tak[ing] all appropriate measures to prevent the causing of significant harm” to Nicaragua. Costa Rica had ample reason to believe that the project would have a significant adverse effect upon Nicaragua, yet failed to exercise

due diligence to prevent such harm as the Court recognized in the *Pulp Mills* case to be required by customary international law.<sup>629</sup>

- Second, paragraph 2 of Article 19 requires that “a formal declaration of the urgency of the measures shall be communicated without delay to [other States upon which the measures may have a significant adverse effect] together with the relevant data and information.” Costa Rica did neither of these. It did not communicate a formal declaration of the urgency of the Road project to Nicaragua,<sup>630</sup> and it not only failed to communicate “the relevant data and information” concerning the project to Nicaragua, it refused to do so in response to Nicaragua’s repeated requests.<sup>631</sup>
- And third, paragraph 3 of Article 19 requires that the State undertaking the measures promptly enter into consultations and negotiations with the potentially (or actually, as in the present case) affected State at the request of the latter. These discussions are to be held “with a view to arriving at an equitable resolution of the

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<sup>629</sup> “The Court points out that the principle of prevention, as a customary rule, has its origins in the due diligence that is required of a State in its territory.” *Pulp Mills on the River Uruguay (Argentina v. Uruguay), Judgment, I.C.J. Reports 2010*, p. 14, p. 55, para. 101.

<sup>630</sup> See NM, p. 24, para. 2.32, noting that it was only after Nicaragua had sent two diplomatic notes to Costa Rica that the President of Costa Rica declared that the state had “issued an emergency decree due to national necessity and it is on that basis that we have developed the projects. We are not taking even one step back.” She concluded that Costa Rica has “no reason to offer explanations to the Government of Nicaragua.” *Ibid.*

<sup>631</sup> See NM, paras. 2.27-2.33.

situation,” and are to be “conducted on the basis that each State must in good faith pay reasonable regard to the rights and legitimate interests of the other State.”<sup>632</sup> Yet, Costa Rica repeatedly rebuffed all of Nicaragua’s requests for information about the Road project, including requests for an environmental impact assessment, and otherwise refused to consult with Nicaragua about Nicaragua’s concerns relating to the project. Costa Rica states that it “formally communicated with Nicaragua through official channels, promptly and in good faith, concerning the road infrastructure works on Costa Rican territory . . .”<sup>633</sup> However, no citation to any such communication accompanies this statement which is, in fact, untrue.

6.64 These conditions are aimed precisely at “guard[ing] against possibilities of abuse of the exception [Article 19] establishes.”<sup>634</sup> Put another way, a State may not simply issue a unilateral, self-judging declaration of emergency and thereby exempt itself from all of its relevant international obligations. Such a state of affairs would make a mockery of the principle expressed in both Article 27 of the Vienna Convention on the Law of Treaties,

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<sup>632</sup> The quotations are from paragraphs 1 and 2 of Article 17 of the Convention, which paragraph 3 of Article 19 refers to with regard to the manner in which consultations and negotiations are to be held.

<sup>633</sup> CRCM, p. 10, para. 1.17.

<sup>634</sup> *Yearbook of the International Law Commission, 1994, vol. II, Part Two, p. 118.*

“Internal law and observance of treaties,”<sup>635</sup> and Article 32 of the Articles on Responsibility of States for Internationally Wrongful Acts, “Irrelevance of internal law.”<sup>636</sup> Instead, a State believing in good faith that implementation of planned measures is of the utmost urgency in order to protect interest “of the highest order of importance”<sup>637</sup> must nonetheless observe its basic obligations owed to a bordering State upon which the measures may have a significant adverse effect, must communicate relevant data and information to that State, and must also enter into consultations and negotiations upon request. Again, Costa Rica did none of these.

6.65 Returning now briefly to the question of whether the circumstances in which Costa Rica commenced construction of the Border Road were of the “highly exceptional” kind referred to in the ILC’s commentary, they were obviously not, for the following reasons. Viewed most charitably, the order to begin construction of the Road was a reflexive reaction by Costa Rica to Nicaragua’s having asserted its right to clean a small *caño* located a considerable distance from what was – and is, from all that appears – envisaged to be the terminus of the Road.<sup>638</sup> In fact, it would have been impossible for the Road to

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<sup>635</sup> Vienna Convention on the Law of Treaties, 23 May 1969, 1155 U.N.T.S. 331, Article 27.

<sup>636</sup> Articles on Responsibility of States for Internationally Wrongful Acts, Article 32, *Yearbook of the International Law Commission*, 2001, vol. II (Part Two), p. 26, para. 77, p. 94; annexed to General Assembly resolution 56/83 of 12 December 2001.

<sup>637</sup> ILC’s commentary to paragraph 1 of Article 19, *Yearbook of the International Law Commission*, 1994, vol. II, Part Two, p. 118.

<sup>638</sup> See CRCM, Sketch Map 1, after p. 6, indicating the location and extent of “Route 1856 Juan Rafael Mora Porras.”

reach what is referred to as the “disputed territory” in the *Certain Activities* case<sup>639</sup> because as noted earlier a long bridge would have to be built to span the Colorado branch of the San Juan, which is the terminus of “Route 1856,” and a road would have to be constructed through wetlands from the left bank of the Colorado River to the area in dispute. Thus, the Road bears no relationship whatsoever to Costa Rica’s dispute with Nicaragua in the *Certain Activities* case.

6.66 Therefore, while Costa Rica is of course free to assert that the circumstances giving rise to the dispute in the *Certain Activities* case were “highly exceptional,” the construction of the Road bore, and bears, no relationship to those circumstances. Costa Rica’s failure and, in fact, refusal, to observe its international obligations of prior notification and consultation, and environmental impact assessment, in relation to the Road cannot, therefore, be wiped out by a declaration of an emergency relating to something else entirely.

6.67 On the question of whether the Road, regardless of its relation to the territorial dispute, was a project of “utmost urgency,” the facts speak for themselves. As noted earlier, it is now well over three years since the Emergency Decree was issued by Costa Rica’s President on 21 February 2011. The Road is still far from being complete, with significant sections remaining entirely impassable. Clearly, there would have been ample time to notify and consult with

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<sup>639</sup> See the Court’s Order of 8 March 2011, *Certain Activities Carried Out By Nicaragua in the Border Area (Costa Rica V. Nicaragua), Provisional Measures, Order of 8 March 2011*, I.C.J. Reports 2011 (I), p. 19, para. 55, identifying the disputed territory.

Nicaragua in these circumstances. Virtually any engineer or road construction crew could have told the Costa Rican government that such a project, however urgent the Costa Rican government considered it to be, would take a significant amount of time to complete (and even more time if it is done improperly and must constantly be repaired, as here). That period would have allowed more than enough time for not only the preparation of a prior EIA, but also the provision of notice and relevant information to Nicaragua concerning the Road.

6.68 In sum, nothing in the facts of the present case excuses Costa Rica from its obligation to provide Nicaragua with prior notification and full information concerning its Border Road project. Even if, *quod non*, the Road were a project of “utmost urgency” as contemplated by Article 19 of the U.N. Watercourses Convention, Costa Rica should have communicated to Nicaragua without delay a formal declaration of the urgency of the project, which it did not do. In addition, Costa Rica would still be bound by its obligations to conduct itself in an equitable and reasonable manner vis-à-vis Nicaragua, and to prevent the causing of significant harm to Nicaragua. It would also be obliged to communicate the relevant data and information concerning the Road project to Nicaragua.

## **E. COSTA RICA BREACHED THE OBLIGATION NOT TO CAUSE SIGNIFICANT TRANSBOUNDARY HARM**

6.69 The obligation not to cause transboundary harm is venerable, as shown in section B, above. From the 1941 *Trail Smelter* arbitral award<sup>640</sup> and the Court's 1949 judgment in *Corfu Channel*<sup>641</sup> to the Court's 1996 Advisory Opinion on the *Legality of the Threat or Use of Nuclear Weapons*,<sup>642</sup> the 2010 judgment in *Pulp Mills*<sup>643</sup> and the 2013 awards in the *Indus Waters Kishenganga Arbitration*,<sup>644</sup> the obligation not to cause transboundary harm has long been recognized by this Court and by international arbitral tribunals. In the words of the 1996 Advisory Opinion: "The existence of the general obligation of States to ensure that activities within their jurisdiction and control respect the environment of other States or of areas beyond national control is now part of the corpus of international law relating to the environment."<sup>645</sup>

6.70 Costa Rica does not challenge the existence of this obligation. In fact, in its Order of 13 December 2013 in the *Road* case, the Court observed that "Costa Rica acknowledged during the course of the oral proceedings that it has a duty not to cause any significant transboundary harm as a result of the

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<sup>640</sup> Arbitral Award, 11 March 1941, *Trail Smelter Arbitration (United States of America v. Canada)*, UNRIAA, vol. III, p. 1965.

<sup>641</sup> I.C.J., Judgment, 9 April 1949, *Corfu Channel (United Kingdom of Great Britain and Northern Ireland v. Albania)*, I.C.J. Reports 1949, p. 22.

<sup>642</sup> *Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion*, I.C.J. Reports 1996, p. 226.

<sup>643</sup> *Pulp Mills on the River Uruguay (Argentina v. Uruguay)*, I.C.J. Reports 2010, p. 14, p. 83, para. 204.

<sup>644</sup> Partial Award, 18 February 2013, *Indus Waters Kishenganga Arbitration (Pakistan v. India)*, available at [http://www.pca-cpa.org/showpage.asp?pag\\_id=1392](http://www.pca-cpa.org/showpage.asp?pag_id=1392).

<sup>645</sup> *Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion*, I.C.J. Reports 1996 (I), pp. 241-242, para. 29.

construction works on its territory . . .”<sup>646</sup> In its Counter-Memorial, Costa Rica recognizes that “Nicaragua may . . . complain if and to the extent that there has been significant transboundary harm.”<sup>647</sup> But again, Costa Rica contends that there has not been “significant” transboundary harm as a result of the Road project.

6.71 As discussed in Chapter 2<sup>648</sup>, relevant to the question of harm is Costa Rica’s remarkable statement that “it must be kept in mind that sediment is not a pollutant.”<sup>649</sup> This statement ignores the central consideration of how the sediment was caused to enter a river. Virtually all definitions of the term “pollution” require that that the substance or energy in question be introduced, directly or indirectly, by humans – i.e., that it be anthropogenic. For example, Article 1(4) of the 1982 United Nations Convention on the Law of the Sea defines “pollution of the marine environment” to mean:

“the introduction by man, directly or indirectly, of substances or energy into the marine environment, including estuaries, which results or is likely to result in such deleterious effects as harm to living resources and marine life, hazards to human health, hindrance to marine activities, including fishing and other legitimate uses of the sea, impairment of quality for use of sea water and reduction of amenities; . . .”<sup>650</sup>

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<sup>646</sup> *Construction of a Road in Costa Rica along the San Juan River (Nicaragua V. Costa Rica)*, Provisional Measures, Order of 13 December 2013, p. 10, para. 37. See also CRCM, p. 109, para. 5.6.

<sup>647</sup> CRCM, p. 2, para. 1.3.

<sup>648</sup> See paras. 2.74-2.92.

<sup>649</sup> CRCM, p. 48, para. 3.4.

<sup>650</sup> United Nations Convention on the Law of the Sea, Montego Bay, 10 December 1982, U.N. Doc. A/CONF.62/122, 21 I.L.M. 1261 (1982), Article 1(4) (hereafter UNCLOS).

6.72 The meaning of “pollution” in the context of fresh water is addressed in the 1997 Watercourses Convention, which defines “pollution of an international watercourse” as follows:

“any detrimental alteration in the composition or quality of the waters of an international watercourse which results directly or indirectly from human conduct.”<sup>651</sup>

6.73 Similar definitions, requiring some form of human involvement, are contained in a number of other instruments, such as the 1979 Convention on Long-range Transboundary Air Pollution<sup>652</sup> and the 1966 Helsinki Rules on the Uses of the Waters of International Rivers.<sup>653</sup>

6.74 The sediment contributed to the San Juan both by the Road project and by Costa Rica’s poor land use practices results or is likely to result in a “detrimental alteration in the composition or quality of the waters”<sup>654</sup> of the San Juan, producing “such deleterious effects as harm to living resources and [aquatic] life, hazards to human health, hindrance to [riverine] activities, including fishing and other legitimate uses of the [river, such as navigation], impairment of quality for use of [river] water and reduction of amenities; . . .”<sup>655</sup> The sedimentation of the river results indirectly because it is allowed to run off into the waters of the San Juan due to conditions created by Costa Rica. It also results directly from the

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<sup>651</sup> U.N. Watercourses Convention, *op. cit. supra*, Article 21(1).

<sup>652</sup> Convention on Long-range Transboundary Air Pollution, Geneva, 13 November 1979, 1302 U.N.T.S. 217, Article 1(a).

<sup>653</sup> Helsinki Rules on the Uses of the Waters of International Rivers, Helsinki, 1966, Article IX, International Law Association, *Report of the Fifty-second Conference, Helsinki, 1966* (London, 1967).

<sup>654</sup> U.N. Watercourses Convention, *op. cit. supra*, Article 21(1).

<sup>655</sup> UNCLOS, Article 1(4). See 2014 Kondolf Report, Section 8 (NR, Vol. II, Annex 1).

channels dug from the Road to the river, and possibly from the dumping of debris (which is not anywhere in view, nor has Costa Rica given any indication were it was dumped, suggesting it must have been dumped into the river by the contractors hired by Costa Rica).

6.75 In its Application in the *Road* case, Nicaragua noted that:

“Unlike Nicaragua, Costa Rica has permitted its side of the river to be largely deforested, and opened for agricultural development, leading not only to the destruction of natural habitat, but also to widespread erosion, sedimentation of the river, and contamination of its waters with the runoff of toxic pesticides used in farming and other activities.”

The Application continues:

“Costa Rica is a profligate user of these pesticides. The World Resources Institute has reported that Costa Rica uses 51 kilograms of pesticide per hectare, which is the highest level in the world. Colombia, which is in second place, uses 16 kilograms per hectare, or approximately 30 per cent of the amount used by Costa Rica.<sup>656</sup> The *Instituto Regional de Estudios en Sustancias Tóxicas* (Central American Institute for Studies on Toxic Substances) of the University of Costa Rica reported that consumption of pesticides increased by 340 per cent in the period 1977 to 2006.”<sup>657</sup>

6.76 The implications for the San Juan River of Costa Rica’s world-leading use of agricultural pesticides are obvious: most of them end up in the River. They wash down with the sediment that comes from Costa Rican watersheds, resulting in what Professor Thorne finds to be the San Juan’s “high

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<sup>656</sup> Application, Annex 25. Inside Costa Rica, “Study places Costa Rica among the largest consumer of pesticides in the world”, available at <http://www.insidecostarica.com/dailynews/2011/september/06/costarica110090607.htm>, 6 September 2011 (renumbered footnote).

<sup>657</sup> Central American Institute for Studies in Toxic Substances, Technical Reports Series 6, Imports of Pesticides in Costa Rica, Period 1977-2006, p. 11, October 2009 (renumbered footnote).

and variable sediment inputs from the San Carlos and Sarapiqui basins, which supply the vast majority of sediment carried by the River.”<sup>658</sup>

6.77 These chemicals are also an element of the transboundary harm that Costa Rica is inflicting on Nicaragua – harm that would occur to a far lesser extent if Costa Rica would at least moderate its use of pesticides to bring it within the world average.

6.78 In the surprisingly brief section of its Counter-Memorial devoted to “Alleged significant transboundary harm,”<sup>659</sup> Costa Rica states that Nicaragua’s “allegation of significant transboundary harm . . . was made without the detailed consideration of impact on the Rio San Juan’s existing sediment load that constitutes the obvious prerequisite to any serious case on harm.”<sup>660</sup> In other words, in Costa Rica’s view the determination of whether harm is “significant” can only be made by comparing the quantity of sediment and other debris delivered into the San Juan as a result of the Road project with the quantity that was carried by the river before any construction began. Thus, for Costa Rica, it is the relative quantity of sediment delivered by the Road project into the river that counts, not the absolute quantity.

6.79 This is not the international standard, however. For example, the “Principles of conduct in the field of the environment for the guidance of States in

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<sup>658</sup> Professor Colin Thorne, “Assessment of the Impact of the Construction of the Border Road in Costa Rica on the San Juan River,” para. 9.10, CRCM, Appendix A.

<sup>659</sup> CRCM, pp. 118-119, paras. 5.25-5.26.

<sup>660</sup> *Ibid.*, p. 118, para. 5.25.

the conservation and harmonious utilization of natural resources shared by two or more States”<sup>661</sup> adopted by the Governing Council of the United Nations Environment Programme (UNEP) define the expression “significantly affect” as “any appreciable effects on a shared natural resource and [excluding] *de minimis* effects.” As will appear below, the effects of the Road project on the river are unquestionably “appreciable.”

6.80 Before addressing these effects, Nicaragua wishes to state for the record that it maintains its position that the intentional<sup>662</sup> deposition by Costa Rica of sediment and other debris from the Road project onto Nicaraguan territory constitutes a trespass, an unlawful incursion into Nicaragua’s sovereign territory.<sup>663</sup> No State would tolerate the deliberate dumping of the quantities of sediment that are carried from the Road project into the San Juan if those quantities were deposited on dry land. The situation is no different where the sediment is intentionally deposited in water, either through deliberate conveyance of material to the river, as via the channels that have been dug from the Road to the river,<sup>664</sup> or through conduct from which delivery into the river of sediment or other material is substantially certain to follow. Costa Rica should be held internationally responsible for these continuing incursions.

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<sup>661</sup> UNEP Governing Council decision 6/14 of 19 May 1978, UNEP, *Environmental Law: Guidelines and Principles*, No. 2, *Shared Natural Resources* (Nairobi, 1978).

<sup>662</sup> “Intentional” here refers to the causing of consequences that a state knows, or should know, are substantially certain to follow from its acts.

<sup>663</sup> NM, pp. 7-8, paras. 1.10-1.11.

<sup>664</sup> See *supra*, Chapter 2, para. 2.80.

6.81 Turning now to Costa Rica's test contention that the harm to Nicaragua from the Road project is not significant, there are two answers. First, even considering only the absolute quantity of sediment, there has in fact been significant transboundary harm to Nicaragua in the form of increased levels of sedimentation of the San Juan. And second, even if, *quod non*, as Costa Rica argues, the test for "significance" is a relative one, comparing the sediment contributed by the Road project with the total sediment load carried by the river, the proportion contributed by the Road project is still significant.

6.82 As to the first point, expert studies show that the quantity of sediment contributed by the Road project to the river is, in fact, significant. Dr. Andrews notes that: "[e]stimates of the sediment contributed by Route 1856 to the Rio San Juan range from 61,000 (Thorne) to 240,000 tons per year (Kondolf)."<sup>665</sup> By any measure, these are significant quantities. They are certainly "appreciable," as are their effects.

6.83 This fact is particularly striking when the small pile of sediment complained of by Costa Rica in the *Certain Activities* case is contrasted with the thousands of tons of sediment the Road project is causing to be delivered into Nicaragua's sovereign territory, the San Juan River. As Nicaragua stated in its Counter-Memorial in the *Certain Activities* case:

"Leaving aside the fact that all dredged sediments have been deposited on Nicaraguan territory, the amount deposited in the disputed area is trivial and can hardly be

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<sup>665</sup> Andrews Report, Section IV (NR, Vol. II, Annex 3).

characterized as sufficient to cause irreparable harm. Those sediments are visible as a single grey pile . . .”<sup>666</sup>

And:

“The one small pile of sediments visible in both photographs . . . is what Costa Rica is alleging has caused ‘irreversible’ damage to the wetland.”<sup>667</sup>

Finally:

“Costa Rica argues that this single deposit has caused ‘the permanent loss of the ecological conditions existing before the deposit, reason for which it constitutes an irreversible damage.’”<sup>668</sup>

But Nicaragua is not complaining of such trivial quantities. If Costa Rica believes one small pile of sediment on land can lead to “permanent loss of the ecological conditions existing before the deposit,” surely it must understand Nicaragua’s position – which is backed up by scientific evidence, as shown in Chapter 2 – that the delivery from the Road project into the San Juan River of tens of thousands of tons of sediment causes harm to ecological conditions in the river.

6.84 As to the second point, Costa Rica’s case is based on the argument that the quantities of sediment delivered into the San Juan from the Road are insignificant when compared with the river’s existing sediment load:<sup>669</sup> “the impact of this estimated additional sediment can only be assessed in the context of

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<sup>666</sup> NCM, p. 256, para. 5.235.

<sup>667</sup> *Ibid.*, p. 257, para. 5.236.

<sup>668</sup> *Ibid.*, p. 258, para. 5.238.

<sup>669</sup> CRCM pp. 48-49, paras. 3.5-3.7.

the quantity and variability of the baseline sediment load – i.e., the sediment load of the River as it was before the Road was constructed . . .”<sup>670</sup>

6.85 The problem with this argument for Costa Rica is that most of the San Juan’s sediment load comes from Costa Rica. More significantly, most of the other sediment from Costa Rica results from poor land use practices, which add considerably to what would be the River’s natural load. A maxim referred to by Costa Rica, although not apposite in the context in which it was cited,<sup>671</sup> applies by analogy here: *ex turpi causa non oritur actio*. But rather than the applicant seeking to rely on an illegality, here it is the respondent. Put another way, a State should be precluded from benefiting from its own wrong, or from its unclean hands. Here, Costa Rica should be precluded from asserting that the quantity of sediment added to the river by the Road project is insignificant in comparison to the vast quantities contributed, and harm to Nicaragua done, as a result of Costa Rica’s own pre-existing substandard land use practices.

6.86 Professor Thorne’s report – which is heavily relied upon by Costa Rica – states that the San Juan’s sediment regime is “dominated by high and variable sediment inputs from the San Carlos and Sarapiqui basins, which supply the vast majority of sediment carried by the River.”<sup>672</sup> Referring to the Thorne Report, Dr. Andrews observes that Professor Thorne:

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<sup>670</sup> *Ibid.*, p. 49, para. 3.6.

<sup>671</sup> CRCM, p. 114, para. 5.18.

<sup>672</sup> Professor Colin Thorne, “Assessment of the Impact of the Construction of the Border Road in Costa Rica on the San Juan River,” para. 9.10, CRCM, Appendix A.

“states at numerous points throughout his report that his assumed basin-wide sediment yield represents the natural condition of the Rio San Juan. For instance, at paragraph 6.45, Thorne characterizes the Rio San Juan as having ‘naturally high concentrations of suspended sediment.’ At paragraph 12.2, Thorne clarifies that he is comparing the inputs of Route 1856 to what he calls the River’s ‘natural loads.’”<sup>673</sup>

6.87 However, what Professor Thorne characterizes as “the high and variable sediment inputs from the San Carlos and Sarapiqui basins, which supply the vast majority of sediment carried by the River,”<sup>674</sup> are not due to natural factors. Dr. Andrews, relying on published literature on the sediment yields of undisturbed tropical basins that are comparable to the San Juan Basin, concludes that:

“Thorne’s statement that the current basin-wide sediment yield to the Rio San Juan is, on average, about 1080 tons/km<sup>2</sup>-yr, is consistent with the scientific literature describing the expected sediment yields from disturbed [rather than natural] tropical river basins.”<sup>675</sup>

Concerning Professor Thorne’s position that the sediment yields in the San Juan basin are natural, Dr. Andrews concludes that the records presented by Costa Rica “cannot be relied upon to represent, even approximately, the natural condition” because:

“The first hydrologic observations at [the La Trinidad and Delta Colorado] gages were initiated in 1974, well after substantial deforestation, construction of roads and other landscape destabilization on the Costa Rican tributaries to

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<sup>673</sup> Andrews Report, Section IV (NR, Vol. II, Annex 3).

<sup>674</sup> Professor Colin Thorne, “Assessment of the Impact of the Construction of the Border Road in Costa Rica on the San Juan River,” para. 9.10, CRCM, Appendix A (hereafter “Thorne Report”).

<sup>675</sup> Andrews Report, Section IV(C) (NR, Vol. II, Annex 3).

the Rio San Juan. Furthermore, both river gage records are short - only about two years.”<sup>676</sup>

6.88 After reviewing published literature on sediment loads of rivers in undisturbed tropical basins comparable to that of the San Juan, Dr. Andrews finds that “sediment yields in the Rio San Juan Basin prior to appreciable forest clearing and landscape disturbance were likely to fall between 20 to 50 tons/km<sup>2</sup> per year, which would be 1/20<sup>th</sup> to 1/50<sup>th</sup> of Thorne’s estimated basin-wide value [of current sediment yields] of 1080 tons/km<sup>2</sup> per year.”<sup>677</sup> He therefore concludes that “the present sediment load of the Rio San Juan is unnaturally elevated due primarily to deforestation and associated land disturbance in the Costa Rican parts of the basin.”<sup>678</sup>

6.89 In Chapter 1, Nicaragua noted the alarming amount of deforestation that occurred in Costa Rica in the fifty years between 1940 and 1990 (Figure 1.1). Costa Rica’s Environmental Diagnostic Assessment (EDA) refers to a 1992 study:

“estimat[ing] that only 5% of the original forest in the region remained intact; forest extractive activities during the last decade have significantly reduced this percentage. The present use of the land in this area consists of a variety of non sustainable uses of the forests, alternating with cattle-raising and pineapple production, palm tree and root crops in small scale.”<sup>679</sup>

6.90 The expert evidence reviewed in the foregoing paragraphs shows that Costa Rica, through its acts and omissions, is responsible for the large-scale

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<sup>676</sup> *Ibid.*, Section IV(A).

<sup>677</sup> *Ibid.*

<sup>678</sup> *Ibid.*, Section IV(C).

<sup>679</sup> EDA, p. 46 (CRCM, Vol. II, Annex 10).

deforestation of the area adjacent to the San Juan River and its tributaries, and thus for much of what Professor Thorne has described as the “high and variable sediment inputs from the San Carlos and Sarapiqui basins, which supply the vast majority of sediment carried by the River.”<sup>680</sup> This sediment has caused, and continues to cause, substantial harm to Nicaragua. It is slowly strangling the San Juan River, particularly in its lower reaches, and is causing harm to navigation and aquatic ecosystems.<sup>681</sup>

6.91 Failure to regulate land use in a way that would prevent transboundary harm to its neighbour constitutes a breach of the obligation not to cause transboundary harm. As the tribunal put it in the *Trail Smelter* arbitration, “no State has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another or the properties or persons therein . . .”<sup>682</sup> As has been seen, this principle is now of general applicability. Costa Rica therefore does not have the right to “use or permit the use” of its territory in such a way as to cause transboundary harm to Nicaragua by delivering massive quantities of sediment across the international boundary onto Nicaraguan territory. Costa Rica has breached this obligation.

6.92 Given that the unnaturally high sediment yield from the Costa Rican tributaries is due to that State’s wrongful conduct, Costa Rica may not rely

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<sup>680</sup> Dec. 2013 Thorne Report, para. 9.10 (CRCM, Vol. I, Appendix A).

<sup>681</sup> Andrews Report, Sections V(I), VI (NR, Vol. II, Annex 3).

<sup>682</sup> Arbitral Award, 11 March 1941, *Trail Smelter Arbitration (United States of America v. Canada)*, UNRIAA, vol. III, p. 1965.

on the resulting sediment load of the San Juan, which is some 20 to 50 times greater than would be expected under natural conditions,<sup>683</sup> to make the quantity of sediment delivered into the San Juan by the Road appear to be minor, in comparison. To permit such a comparison would be to allow Costa Rica to benefit from its internationally wrongful conduct over many years. An analog of the maxim *ex turpi causa non oritur actio* applies here: one may not avail oneself of a defense that is unlawful. Costa Rica's unclean hands should bar it from using a "relativity" test even if such a test were appropriate (*quod non*).

6.93 Moreover, if a "relativity" test were appropriate (i.e., a test that compares the quantity of sediment for which the Road project is responsible to the river's sediment load), the proper comparison would be between what would be expected to be the river's natural sediment load and the sediment from the Road project. Dr. Andrews has made such a comparison:

"Compared to the expected natural basin-wide sediment yield the quantity of sediment associated with the construction of Route 1856 is quite substantial. . . . Based on [Professor Thorne and Dr. Kondolf's erosion estimates,] the quantity of sediment eroded from the Road corridor would have increased the total sediment load of the Rio San Juan to the head of the delta by 15 to 140 percent over the expected natural condition."<sup>684</sup>

6.94 Dr. Andrews' conclusions thus provide an unequivocal answer: the contribution of the Road project to the river's expected natural sediment load is

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<sup>683</sup> Andrews Report, Section IV(A) (NR, Vol. II, Annex 3).

<sup>684</sup> *Ibid.*, Section IV(D).

not only significant, but “very substantial” – in the range of “15 to 140 percent.”<sup>685</sup> This is certainly sufficient to meet even Costa Rica’s “threshold.”

6.95 Dr. Andrews also studied the possibility that the sediment added to the river due to Costa Rica’s poor land use practices over the course of more than half a century would cause Nicaragua problems in the San Juan River Delta area.

He concludes:

“Poor land-use practices in Costa Rica have greatly increased the supply of sediment to the Rio San Juan Delta area. . . . [S]ediment supplied by tributaries to the Rio San Juan have increased 20 to 50 times the expected natural rate. Using the estimated mean annual supply of sediment to the head of the delta of about 13.7 million tons of suspended and bedload sediment, as calculated above, the average annual quantity of relatively coarse sediment that will tend to accumulate in the upstream portion of the delta in excess of what was deposited when sediment yields were truly natural would be approximately 1.0 to 1.5 million m<sup>3</sup>. . . . This is a substantial quantity of sediment. The expected aggradation rate . . . within the first three kilometers of the Lower Rio San Juan is in the order of 10 to 30 centimeters per year.

. . .

“The average thickness of deposition understates the magnitude of the potential problems, because the accumulating sediment won’t be distributed evenly along and across the delta channels. . . . The accumulating sediment will tend to form bars, which are evident along the delta channels, creating reach-wise instabilities and obstructions to navigation.”<sup>686</sup>

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<sup>685</sup> *Ibid.*

<sup>686</sup> *Ibid.*, Section V(I).

6.96 This is real and significant harm, caused by Costa Rica's substandard and irresponsible land use practices. It is harm for which Costa Rica is responsible.

6.97 The following conclusions may be drawn from the foregoing: First, the obligation not to cause significant transboundary harm is well-established and is accepted by Costa Rica. Second, the Road project is responsible for the addition of significant quantities of sediment to the San Juan River, whether measured by the absolute or the relative quantity of sediment delivered to the river. Third, these additional quantities of sediment have caused Nicaragua significant harm, for which Costa Rica is responsible. And fourth, Costa Rica is also responsible to Nicaragua for the harmful effects of the substantial increases in sediment yields from Costa Rican tributaries due to poor land use practices.<sup>687</sup>

6.98 There is one further implication of the obligation not to cause transboundary harm that should be noted here. The obligation is one of prevention, as reflected in Article 7(1) of the U.N. Watercourses Convention:

“Watercourse States shall, in utilizing an international watercourse in their territories, take all appropriate

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<sup>687</sup> Costa Rica's responsibility for all the damages it has caused to Nicaragua due to irresponsible deforestation, enormous use of chemicals and general poor land use practices is not fully before the Court in the present case and Nicaragua reserves its rights on this issue in general. The purpose of the evidence filed on this point is to make clear that Costa Rica cannot justify as “minor” the damage caused by the road in comparison to the damage caused by Costa Rica's other environmental malfeasances.

measures to prevent the causing of significant harm to other watercourse States.”<sup>688</sup>

This principle is applied to pollution in Article 21 of the Convention, which requires that the parties “prevent, reduce and control the pollution of an international watercourse that may cause significant harm to other watercourse States or to their environment . . .”<sup>689</sup> Article 21 also provides that the parties are to consult, on request, concerning “[e]stablishing lists of substances the introduction of which into the waters of an international watercourse is to be prohibited, limited, investigated or monitored.”<sup>690</sup>

6.99 In the *Gabčíkovo-Nagymaros* case, the Court recognized that:

“in the field of environmental protection, vigilance and prevention are required on account of the often irreversible character of damage to the environment and of the limitations inherent in the very mechanism of reparation of this type of damage.”<sup>691</sup>

6.100 Vigilance and prevention are certainly required in respect of the San Juan River. This was in effect acknowledged by Costa Rica’s expert, Professor Thorne, who recognized the need for a complete overhaul of the Road.<sup>692</sup> It was noted earlier that even in the most developed countries incidents occur not infrequently involving spills of hazardous substances into rivers. Such an incident occurred recently in the United States when a train carrying crude oil

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<sup>688</sup> U.N. Watercourses Convention, *op. cit. supra*, Article 7(1).

<sup>689</sup> *Ibid.*, Article 21(2).

<sup>690</sup> *Ibid.*, Article 21(3)(c).

<sup>691</sup> *Gabčíkovo-Nagymaros Project (Hungary/Slovakia), Judgment, I.C.J. Reports 1997, p. 78, para. 140.*

<sup>692</sup> For references to Prof. Thorne’s statements, *see supra*, Chapter 3 paras. 3.29-3.30.

derailed in Virginia, “spilling oil into the James River and forcing hundreds to evacuate.”<sup>693</sup>

6.101 Incidents like the one just mentioned would seem to be even more likely to occur when trucks are carrying fuel or other hazardous substances along the Border Road, in view of its substandard nature and the strong possibility of landslides.<sup>694</sup>

6.102 As indicated in the *Gabčíkovo-Nagymaros* and *Pulp Mills* cases, vigilance and prevention are required to protect the environment. The Court in *Pulp Mills* explained:

“This vigilance and prevention is all the more important in the preservation of the ecological balance, since the negative impact of human activities on the waters of the river may affect other components of the ecosystem of the watercourse such as its flora, fauna, and soil.”<sup>695</sup>

6.103 For these reasons, and because of the particular risk of grave and irreparable harm posed by such materials, Nicaragua believes that it is imperative that Costa Rica be precluded from transporting hazardous substances on its Border Road, at least until such time as it can be proven that improvements to the

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<sup>693</sup> Selam Gebrekidan , “CSX oil train derails in Virginia, leaks into river,” April 30, 2014, available at <http://www.reuters.com/article/2014/05/01/us-railways-accident-virginia-idUSBREA3T0YW20140501>. “This is the sixth fiery derailment to occur in North America since a runaway train in Lac-Mégantic, Quebec, derailed and exploded, killing 47 people last July. Another CSX train carrying crude oil derailed in Philadelphia in January, nearly toppling over a bridge.” *Ibid.*

<sup>694</sup> See 2014 Kondolf Report, Section 5 (NR, Vol. II, Annex 1).

<sup>695</sup> *Pulp Mills on the River Uruguay (Argentina v. Uruguay)*, judgment of 20 April 2010, p. 77, para. 188.

Road sufficient to bring it into compliance with international standards have been made.

#### **F. THE MANNER IN WHICH THE ROAD WAS CONSTRUCTED BREACHES TREATIES TO WHICH BOTH STATES ARE PARTIES**

6.104 In its Counter-Memorial, Costa Rica denies that it has breached any of the treaties identified by Nicaragua in Chapter 5, section E of its Memorial.<sup>696</sup> Costa Rica's case in this regard is based for the most part on its position, which has been shown in this Chapter and in Chapter 2 to be incorrect, that the Road project did not portend, and has not caused, significant harm to Nicaragua. When this cornerstone of Costa Rica's case is removed, the entire edifice of the case collapses, though there are other aspects of Costa Rica's conduct not related to the causing of significant harm that were, and are, internationally wrongful.

6.105 This section will answer Costa Rica's contentions with respect to treaty breaches as briefly as possible, in an effort to avoid repetition of points that have already been made.

##### ***1. Convention on Biological Diversity***

6.106 Costa Rica summarily dismisses the charge that it has breached Articles 3 and 8 of the Convention on Biological Diversity (CBD) on the ground that it "has not caused any [damage to the environment of Nicaragua],"<sup>697</sup> which is prohibited by Article 3, and that "there is no basis for Nicaragua's allegation of

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<sup>696</sup> CRCM, p. 126, para. 5.41(d).

<sup>697</sup> *Ibid.*, p. 119, para. 5.28.

breach of Article 8, which is concerned with the promotion of protection of ecosystems, sustainable development and the rehabilitation of degraded ecosystems.”<sup>698</sup> The former contention has been refuted by expert reports annexed to this Reply,<sup>699</sup> as noted above and shown more fully in Chapter 2.

6.107 The latter statement is a mere assertion, having been made without reference to any supporting evidence.

6.108 Costa Rica also denies having breached Article 14 of the CBD,<sup>700</sup> which as Nicaragua pointed out in its Memorial “addresses the anticipatory measures that Costa Rica failed entirely to take: environmental impact assessment, planning to avoid adverse impacts on biological diversity, and notification, exchange of information and consultation regarding planned measures that may adversely affect biological diversity of other states.”<sup>701</sup>

6.109 With respect to environmental impact assessment, Costa Rica relies on its arguments already refuted above, which are again based on the contention that there was no reason for Costa Rica to anticipate that its project would entail the possibility of significant harm, and that in any event, Costa Rica’s Emergency Decree allows it to ignore all otherwise applicable domestic and international obligations. These arguments have been shown above to be without merit. If Costa Rica had considered its own EIA regulation it would have been provided

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<sup>698</sup> *Ibid.*

<sup>699</sup> E.g., 2014 Kondolf Report (NR, Vol. II, Annex 1).

<sup>700</sup> CRCM, pp. 120-121, paras. 5.30-5.31.

<sup>701</sup> NM, p. 195-196, para. 5.71.

with reason to anticipate that its project would entail the possibility of significant harm.<sup>702</sup>

6.110 As to planning, notification, exchange of information and consultation regarding planned measures that may adversely affect biological diversity of other States, Costa Rica does not deny having failed to do these things. Instead, it says that its project was not “likely to have significant adverse effects on biological diversity.”<sup>703</sup> This claim is patently false for the reasons shown above, including that Costa Rica must have known that its Road would pass through protected and other sensitive areas,<sup>704</sup> and that proceeding to construct the Road without any blueprints or other plans would be likely to have significant adverse effects on biological diversity in the area.

6.111 As to notification, exchange of information and consultation regarding planned measures that may adversely affect biological diversity of other States, Costa Rica again does not deny having failed to comply with these requirements in respect of its Road project. Instead, it relies on technical arguments based on its assumption that all of its claims concerning Nicaragua’s activities in the area in dispute in the *Certain Activities* case will be found good by the Court, and therefore the “reciprocity” referred to in sub-paragraph (1)(c) is lacking. It is noteworthy that Costa Rica makes no argument in the alternative to provide for the case in which the Court finds that its arguments in *Certain*

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<sup>702</sup> Golder Report, Section 4 (NR, Vol. II, Annex 6).

<sup>703</sup> CRCM, p. 121, para. 5.30.

<sup>704</sup> See Sheate Report, Section 5 (NR, Vol. II, Annex 5).

*Activities* are wrong. But even assuming they are correct, Nicaragua's activities in the area in dispute have nothing to do with reciprocity with respect to "notification, exchange of information and consultation on activities under [a party's] jurisdiction or control which are likely to significantly affect adversely the biological diversity of other States . . . ."<sup>705</sup> Nicaragua has shown in its Counter-Memorial in the *Certain Activities* case that it breached no obligations of notification or consultation with regard to its activities in the area in dispute.<sup>706</sup> Nicaragua's dredging was undisputedly conducted within its sovereign territory, the San Juan de Nicaragua River, and could not possibly have any appreciable effect, on biological diversity or otherwise, in Costa Rica;<sup>707</sup> and Nicaragua's cleaning of the *caño* was conducted in what Nicaragua believed, and continues to believe, is also part of its sovereign territory and would thus not affect Costa Rica; Nicaragua has shown that in any event these activities did not, in fact, cause harm to Costa Rica.<sup>708</sup> Therefore, reciprocity cannot possibly be found to be lacking.

## 2. *Ramsar Convention*

6.112 Costa Rica betrays a fundamental misunderstanding of its obligations under the Ramsar Convention. Thus Costa Rica states:

"The construction of the Road in no way touches upon protected Nicaraguan wetlands falling within the Ramsar Convention, while it leads to no risk of significant harm to the Río San Juan, let alone protected wetlands in

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<sup>705</sup> CBD, *op. cit. supra*, Article 14(1)(c).

<sup>706</sup> *Certain Activities carried out by Nicaragua in the Border Area (Costa Rica v. Nicaragua)*, NCM, Volume I, Chapter 5(C).

<sup>707</sup> *Ibid.*, Section E(1) and (2)(b).

<sup>708</sup> *Ibid.*, Section E(2)(a).

Nicaragua. For this reason, Nicaragua’s reliance on this Convention in the present case is misconceived.”<sup>709</sup>

This is the sum total of Costa Rica’s response to Nicaragua’s identification of breaches of the Ramsar Convention by Costa Rica.

6.113 Aside from the fact that the Road did, and does, in fact lead to a “risk of significant harm to the Río San Juan,” and therefore Nicaragua, there is nothing in the Ramsar Convention requiring that actions of a party within its territory have harmful transboundary effects on another party. It is enough that a party fails to observe obligations under the Ramsar Convention regarding wetlands within its own territory. Article 3, in particular, would apply to wholly internal wetlands. Yet Costa Rica did not observe this provision when it decided to build the Road through a protected wetland without “formulat[ing] and implement[ing] [its] planning so as to promote the conservation of wetlands included in the List [of Ramsar wetlands] . . . .”<sup>710</sup> Costa Rica in fact admits that “a 22 km section of the Road is constructed on a site declared by Costa Rica as a protected wetland.”<sup>711</sup> This might have been avoided had Costa Rica conducted an EIA and taken the trouble to plan the route of the Road so as to avoid the most sensitive and protected areas.

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<sup>709</sup> CRCM, pp. 121-122, para. 5.32.

<sup>710</sup> Convention on Wetlands of International Importance especially as Waterfowl Habitat, Ramsar (Iran), 2 February 1971, U.N. Treaty Series No. 14583, as amended by the Paris Protocol, 3 December 1982, and Regina Amendments, 28 May 1987, Article 3(1) (hereafter Ramsar Convention).

<sup>711</sup> CRCM, p. 122, para. 5.33.

6.114 With regard to Article 5, Costa Rica fails entirely to explain why it does not believe it has breached this provision. Article 5 requires the parties to:

“consult with each other about implementing obligations arising from the Convention especially in the case of a wetland extending over the territories of more than one Contracting Party or where a water system is shared by Contracting Parties.”<sup>712</sup>

As explained in Nicaragua’s Memorial, both situations mentioned in this provision are applicable in the present case: wetlands extend over the territories of Costa Rica and Nicaragua, and a “water system,” the San Juan River system, including the tributaries originating in Costa Rica and the distributaries flowing through that State, is shared by the two States. There is no requirement in this article that a party’s activities cause or risk causing significant harm to another party.

6.115 Costa Rica states that “Nicaragua’s reliance on this Convention in the present case is misconceived.”<sup>713</sup> On the basis of the foregoing it is clear that it is Costa Rica that misconceives its obligations under the Ramsar Convention.

### ***3. Central American Convention for the Protection of the Environment and Other Regional Instruments***

6.116 Costa deals summarily and dismissively with Nicaragua’s contentions that the manner in which the Road is being constructed breaches Costa Rica’s obligations under four regional agreements: the Central American

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<sup>712</sup> Ramsar Convention, *op. cit. supra*, Article 5.

<sup>713</sup> CRCM, p. 122, para. 5.32.

Convention for the Protection of the Environment,<sup>714</sup> the Tegucigalpa Protocol to the Charter of the Organization of Central American States ,<sup>715</sup> the Convention for the Conservation of Biodiversity and the Protection of Wilderness Areas in Central America,<sup>716</sup> and the Regional Agreement on the Transboundary Movement of Hazardous Wastes.<sup>717</sup>

6.117 Surprisingly, Costa Rica is also dismissive of the unanimous 21 June 2012 Judgment of the Central American Court of Justice (“CACJ”).<sup>718</sup> The Counter-Memorial states:

“[T]he CACJ Judgment should not be taken into account by the Court, because the CACJ did not have any jurisdiction, Costa Rica did not therefore participate in the proceedings, and what is more, the “Judgment” was based on no scientific evidence of harm whatever.”<sup>719</sup>

Nicaragua can make short work of these contentions.

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<sup>714</sup> Central American Convention for the Protection of the Environment, 12 December 1989, 2278 U.N.T.S. p. 151 (hereinafter CACPE).

<sup>715</sup> Tegucigalpa Protocol to the Charter of the Organization of Central American States (ODECA), Tegucigalpa, 13 December 1991, 1695 U.N.T.S. p. 382 (hereinafter Tegucigalpa Protocol).

<sup>716</sup> Convention for the Conservation of Biodiversity and the Protection of Wilderness Areas in Central America, Managua, 5 June 1992, (Annex 23 to the Memorial of Costa Rica (CRM) in the *Dispute concerning Certain Activities Carried Out by Nicaragua in the Border Area (Costa Rica v. Nicaragua)*), original Spanish text available at <http://www.ecolex.org/server2.php/libcat/docs/TRE/Multilateral/En/TRE001162.txt> (hereinafter Central American Biodiversity Convention).

<sup>717</sup> Regional Agreement on the Transboundary Movement of Hazardous Wastes, Panama City, 11 December 1992, U.N. Doc. UNEP/CHW/C.I/INF.2 (Oct. 1993), available in 3 YB. INT'L ENVTL. L., 1992, Doc. No. 10 (Appended Disk, Gunther Handl et al. eds., 1992), original Spanish text available in <http://www.ecolex.org/ecolex/ledge/view/RecordDetails?id=TRE-001167&index=treaties>.

<sup>718</sup> NM, Volume II, Annex 13, p. 355.

<sup>719</sup> CRCM, p. 87, para. 3.67.

6.118 First, the CACJ carefully examined the question of jurisdiction in its judgment.<sup>720</sup> The following jurisdictional findings of the Court are illustrative:

“[T]he Tegucigalpa Protocol is a treaty that obliges the State of Costa Rica, inasmuch as it establishes the compulsory jurisdiction and authority of the Central American Court of Justice, which constitutes an international obligation for Costa Rica that is fully enforceable by all SICA [Central American Integration System] State Parties . . . and in the case at hand, environmentalist organizations . . . The jurisdiction and competence established in Articles 12 and 35, second paragraph, of the Tegucigalpa Protocol are not optional or elective nor require further acts after the ratification and deposit of the Tegucigalpa Protocol by the States Parties to become a perfect international obligation, which is fully enforceable by all the State Members of the SICA, its bodies, institutions and individuals. . . . The State of Costa Rica has performed acts that recognize the jurisdiction and authority of the Central American Court of Justice, which prevent this State from claiming any legal basis for not recognizing them. . . . The Central American Court of Justice has reiterated in its jurisprudence its Compulsory Jurisdiction . . . The State of Costa Rica was served notice . . .”<sup>721</sup>

6.119 The principle of *compétence de la compétence* is a cornerstone of national and international adjudication and arbitration: unless a tribunal has authority to determine whether it has jurisdiction, a party could simply ignore with impunity proceedings legitimately brought against it. Here, the CACJ observed that Article 30 of its Statute provides that:

“the Court has the power to determine its jurisdiction in each particular case, interpreting treaties or conventions

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<sup>720</sup> NM, Volume II, Annex 13, pp. 376-380.

<sup>721</sup> *Ibid.*

relevant to the matter in dispute, and applying the principles of Integration Law and International Law.”<sup>722</sup>

The Court determined it had jurisdiction, in accordance with this provision.

6.120 At the request of the plaintiffs, the Court ordered protective measures, including an order that Costa Rica:

“immediately suspend the construction of the road that [it] is building parallel to the south bank of San Juan River, so that the situation does not escalate, thus protecting the rights of each of the parties and preventing the occurrence of irreversible and irreparable damage.”

6.121 In its Judgment, the Court observed that:

“These protective measures were not respected by the State of Costa Rica, violating Article 39 of the Convention on the Statute of the Central American Court of Justice . . .”<sup>723</sup>

6.122 The Court conducted an on-site inspection,

“to gain direct knowledge of the facts, summoning the Central American Commission for Environment and Development (CCAD) so that it may designate one or several specialized representatives to accompany the Central American Court of Justice to the place of the facts.”<sup>724</sup>

6.123 The Court held a hearing, in which Costa Rica failed to participate, and considered the voluminous evidence presented by the plaintiffs as well as that gathered during the site inspection.

6.124 In view of the foregoing, it is difficult to understand how Costa Rica can claim that “the CACJ did not have any jurisdiction . . . and, what is more

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<sup>722</sup> *Ibid.*, p. 378.

<sup>723</sup> *Ibid.*, p. 380.

the ‘Judgment’ was based on no scientific evidence of harm whatever.”<sup>725</sup> The Court found that it had jurisdiction over Costa Rica as it was authorized to do by its Statute and general principles of law, and it made its decision on the basis of plentiful evidence, much of it of a scientific and technical nature. Its Judgment is binding on Costa Rica.

6.125 If Costa Rica believed the Court lacked jurisdiction it should have appeared to contest it. And, not having appeared even to contest jurisdiction, Costa Rica cannot be heard to claim that the Court did not base its judgment on any “scientific evidence of harm whatever.” Again, had Costa Rica believed that the science was in its favor, it should have presented its case to the Court (it should have done so even if the scientific evidence was not clearly in its favor). This it decided not to do.

6.126 It is perhaps fitting to conclude the discussion of this point with another observation of the CACJ:

“It is inadmissible that these Central American purposes to unite conservation efforts among neighboring countries, such as the case of the Trifinio Plan, Gulf of Fonseca and others contemplated in the Central American Agreement on Biodiversity signed by the countries of the region, including SI A PAZ between Nicaragua and Costa Rica in 1992, have been contradicted, undervalued and, worst of all, ignored and violated by a country like Costa Rica, which prides itself and sells itself internationally as ‘a model of eco-environmental management within its borders’ . . .”<sup>726</sup>

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<sup>725</sup> CRCM, p. 87, para. 3.67.

<sup>726</sup> NM, Volume II, Annex 13, p. 372.

Nicaragua fully endorses the view of the Central American Court of Justice.

6.127 Turning now to the regional agreements themselves, the photographic evidence of the Road project presented with Nicaragua's Memorial<sup>727</sup> and the expert reports annexed to this Reply<sup>728</sup> alone raise grave doubts as to Costa Rica's commitment to the objectives of these agreements. As shown in Nicaragua's Memorial,<sup>729</sup> the object and purpose of these agreements, taken together, is precisely to promote rational and sustainable development that protects the environment and especially sensitive and wilderness areas. Costa Rica's Road project is not only inconsistent with these objectives, but appears calculated to be incompatible with them. It followed a peculiar route, a route that made the Road much more difficult to construct than it needed to be, and was much too close to the river.

6.128 With respect to the Central American Convention, Costa Rica refers to what it calls "Nicaragua's failure to set out and detail alleged breaches of any specific provision."<sup>730</sup> In fact, Nicaragua cites and sets forth in its Memorial the Convention's Preamble, Article I and a lengthy excerpt from Article II, showing how Costa Rica's conduct in relation to its Road project is contrary to the Convention's objectives and principles.<sup>731</sup> To take just one of these provisions, Costa Rica's conduct with respect to its Road project fails to "instill respect for

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<sup>727</sup> See especially NM, Chapter 3, *passim*.

<sup>728</sup> See especially 2014 Kondolf Report (NR, Vol. II, Annex 1).

<sup>729</sup> NM, pp. 201-215, paras. 5.80-5.101.

<sup>730</sup> CRCM, p. 122, para. 5.35.

<sup>731</sup> NM, pp. 201-204, paras. 5.80-5.84.

and protect the region's natural heritage, which is characterized by its high level of biological and ecological diversity; . . .”<sup>732</sup>

6.129 Costa Rica similarly denigrates the Tegucigalpa Protocol,<sup>733</sup> resorting to blanket denial (“Such assertions are frivolous”<sup>734</sup>), rather than engagement in argument, or showing how the Road project is consistent with the Protocol’s objectives and principles.

6.130 The 1992 Convention for the Conservation of Biodiversity and the Protection of Wilderness Areas in Central America comes in for similar treatment at the hands of Costa Rica. “To the extent that the provisions relied on by Nicaragua impose obligations on Costa Rica,” its argument begins, “Nicaragua’s case under this Convention fails for equivalent reasons to those identified above in relation to the Convention on Biological Diversity and the Ramsar Convention.”<sup>735</sup> That is the sum total of Costa Rica’s response. It does not take up the various specific provisions to which Nicaragua refers.<sup>736</sup> These include Article 33, which Costa Rica quoted in its Memorial in the *Certain Activities* case, then stated:

“The object and purpose of the Convention is to oblige the Central American parties to the Convention not only to physically preserve valuable natural resources, but also to notify and consult with neighboring States whose environment may be affected by potentially harmful

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<sup>732</sup> CACPE, *op. cit. supra*, Article II(a).

<sup>733</sup> CRCM, pp. 123-124, paras. 5.36-5.37.

<sup>734</sup> *Ibid.*, p. 124, para. 5.37.

<sup>735</sup> *Ibid.*, para. 5.38.

<sup>736</sup> NM, pp. 210-212, paras. 5.95-5.98.

actions. This permits those States affected to take the appropriate bilateral or regional measures in sufficient time to prevent harm from occurring. These measures encapsulate what Costa Rica understands to be the inherent right of each State to either mitigate potential harm, or to reject and oppose any activities that may place their [*sic*] national territories and natural resources at risk of serious harm.”<sup>737</sup>

6.131 Yet Costa Rica now denies that these obligations are binding upon it, and that the rights mentioned are held by Nicaragua, in respect of the Road project. Rather than attempting to explain how such a double standard is appropriate, Costa Rica merely lumps this treaty together with two very different universal agreements and says they all go down together. This type of argument has no merit.

6.132 The final regional treaty cited by Nicaragua is the Regional Agreement on the Transboundary Movement of Hazardous Wastes. Costa Rica summarily denies that this agreement is applicable, stating “there is no dumping by Costa Rica [of debris and other waste from its road project into the San Juan].”<sup>738</sup>

6.133 This oversimplifies the position and ignores the provision of the agreement quoted by Nicaragua, which is entitled “Adoption of Preventive Measures.” Costa Rica does not address this provision and thus does not explain how it is complying with the obligation to “adopt and implement the preventive

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<sup>737</sup> *Certain Activities Carried Out by Nicaragua in the Border Area (Costa Rica v. Nicaragua)*, CRM, para. 5.16.

<sup>738</sup> CRCM, p. 125, para. 5.39.

and precautionary approach to pollution problems.”<sup>739</sup> As made clear earlier, anthropogenic sediment is, in fact, “pollution.” Furthermore, while Costa Rica says there is no proof that hazardous substances have made their way across the border into the river from the Road project,<sup>740</sup> as the Court is aware the rains in the region, which have been only mild to date, have brought insufficiently moored culverts into the river.<sup>741</sup> Given the unstable condition of sections of the Road there is an unacceptable risk of a major spill into the river from a truck carrying hazardous materials. Yet, there is no indication that Costa Rica plans to take the kinds of preventive measures required by the Regional Agreement on the Transboundary Movement of Hazardous Wastes. For its part, Nicaragua prohibits the transport of hazardous materials on the San Juan River.<sup>742</sup>

#### **4. *Agreement on Border Protected Areas***

6.134 This bilateral treaty, known as the “SI-A-PAZ” agreement, was signed by the Presidents of Costa Rica and Nicaragua in 1990.<sup>743</sup> In its Memorial,

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<sup>739</sup> Regional Agreement on the Transboundary Movement of Hazardous Wastes, *op. cit. supra*, article 3(3).

<sup>740</sup> CRCM, p. 125, para. 5.39.

<sup>741</sup> See **Figure 2.5**, above, showing Nicaraguan civil servants attempting to remove a plastic culvert from the river, into which it had washed from the Road project. See also 2014 Kondolf Report, Section 3 (NR, Vol. II, Annex 1).

<sup>742</sup> See Article 70 (8) of the Decree 79/2009: “... *In relation to vessels, the following is forbidden: ... 8. Transport, trade and use on the San Juan River of the following pesticides as raw material, formulated products and any other mixture: 2,4,5-T (trichlorophenoxyacetic acid), aldrin, dieldrin, endrin, chlordane, chlordimeform, DBCP (Dibromochloropropane-Nemagon), DDT (Dichloride Diphenyl Trichloroethane), Dinoseb, EDB (Ethylene dibromide), ethyl parathion, HCB (hex chlorobenzene), heptachlor, Lindane, Pentachlorophenol, Perchloropentano cyclohexane (Dichloride or Mirex), toxaphene, Methyl parathion, methamidophos (MTD) and Monocrotophos. Without prejudice to the prohibitions and restrictions established in official documents.*” available in original language at [http://www.cancilleria.gob.ni/diferendos/Gaceta\\_RegRSJNCR.pdf](http://www.cancilleria.gob.ni/diferendos/Gaceta_RegRSJNCR.pdf).

<sup>743</sup> Agreement on Border Protected Areas, the “SI-A-PAZ” agreement, signed at Puntarenas, Costa Rica, 15 December 1990. (NM, Vol. II, Annex 7).

Nicaragua showed how Costa Rica has acted in contravention of what Costa Rica itself has stated is the object and purpose of the agreement, as reflected in the four paragraphs of its Preamble that Costa Rica quoted in its Memorial in the *Certain Activities* case.<sup>744</sup> Costa Rica's response is that "Nicaragua has identified no provision of the Agreement that Costa Rica's conduct is said to have breached."<sup>745</sup> Costa Rica explains: "If, as is understood, the allegation comes down to one of causing significant harm to an area of exceptional biodiversity, the allegation fails for the reasons given in Chapter 3 above."<sup>746</sup>

6.135 Again, Costa Rica misses the point. The title of Chapter 3 of its Counter-Memorial is "The Absence of Adverse Impact on the San Juan River."<sup>747</sup> While Nicaragua does contest the notion that there is an "absence of adverse impact on the San Juan River" from the Road project, the SI-A-PAZ agreement has to do with safeguarding the International *System* of Protected Areas for Peace, including portions within the territory of a party as well as those outside that territory. By contracting with thirty-five different companies to build a road along the border, without any plans and heedless of whether it would pass through internationally protected areas, Costa Rica violated the SI-A-PAZ agreement.

6.136 To conclude this section, as much as Costa Rica may not like to be confronted with the fact, there is no doubt that that the manner in which the road

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<sup>744</sup> *Certain Activities Carried Out by Nicaragua in the Border Area (Costa Rica v. Nicaragua)*, CRM, para. 5.41.

<sup>745</sup> CRCM, p. 125, para. 5.40.

<sup>746</sup> *Ibid.*

<sup>747</sup> CRCM, p. 47.

was, and continues to be constructed breaches treaties to which both States are parties. Costa Rica seems blind to the intent of many of these agreements, beginning with the Convention on Biological Diversity, to safeguard areas *within* a State party as well as those in other States. It is inescapable that Costa Rica's unplanned Road project ran roughshod not only over its legal obligations to protect the environment, but also over protected areas of exceptional value and sensitivity within its own borders. For this reason alone, Costa Rica cannot rely on its favorite defense: that its Road project did not cause significant harm to Nicaragua.

## **G. CONCLUSIONS**

6.137 The following conclusions may be drawn from the foregoing.

6.138 First, the fact that the Border Road is being constructed in Costa Rican territory has no bearing on its obligations addressed in this Chapter. The obligation of a State not to use or permit the use of its territory in such a way as to harm its neighbour is venerable. Costa Rica's insinuation that this is not the case is not supported in international law and thus without merit.

6.139 Second, Costa Rica's Emergency Decree is ineffective to release Costa Rica from its international obligations, including those owed to Nicaragua in respect of the Road project. By its own actions Costa Rica demonstrated that it did not believe that there was an "emergency" created by Nicaragua's activities in the disputed area that required initiating work on the Road project immediately,

without complying with its obligations under international law. In any event, Costa Rica may not invoke its internal law as justification for failure to comply with its obligations under international law.

6.140 Third, Costa Rica breached its obligation under international law to prepare, in advance, a transboundary EIA with regard to its Road project. The Road's route through sensitive protected areas as well as its proximity to the San Juan River<sup>748</sup> left no room for doubt that the project posed significant threats to the environment, both in Nicaragua and in Costa Rica itself. Even if, *quod non*, the project was an appropriate response to a *bona fide* emergency, international practice would require Costa Rica to prepare at least a preliminary EIA, with more detailed studies to follow concurrently with work on the Road. The EIA obligation under international law as explained in *Pulp Mills* also requires meaningful monitoring and responses to problems identified, obligations that Costa Rica has violated. In addition, Costa Rica is required to prepare a fresh EIA with resumption of work on the Road. And it should go without saying that Costa Rica is required to prepare a new EIA for any new projects that the existence of the Road makes possible, such as hotels or resource-extraction projects such as logging or mining.

6.141 Fourth, Costa Rica failed, and even refused upon request, to provide Nicaragua with prior notification and all relevant information concerning the Road project, breaching the obligation of prior notification under international

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<sup>748</sup> See Sheate Report, Section 5 (NR, Vol. II, Annex 5).

law. Costa Rica was on notice of the possibility that the project would cause significant adverse effects upon Nicaragua due to the magnitude of the project and its proximity to the San Juan River, and it is this possibility, not whether significant harm actually resulted from the project, that triggered the obligation to notify. Even if, *quod non*, the project qualified as one of “utmost urgency,” Costa Rica failed to comply with the requirements of communicating to Nicaragua (i) a formal declaration of the urgency, and (ii) the relevant data and information concerning the Road project. In addition, even in such a situation Costa Rica would remain under its other international obligations, including that of prevention of significant harm to Nicaragua.

6.142 Fifth, Costa Rica’s Road project breached, and continues to breach, the obligation to prevent the causing of significant harm to Nicaragua. The Road project has added significant quantities of anthropogenic sediment, a pollutant, to the San Juan River, whether measured in absolute or relative quantities. Costa Rica was obligated to prevent the introduction of these additional quantities into the San Juan River, Nicaragua’s territory. These additional quantities have caused, and continue to cause, significant harm to Nicaragua. Costa Rica is also responsible to Nicaragua for the harmful effects of the substantial increases in sediment yields from Costa Rican tributaries to the San Juan due to substandard land use practices in Costa Rica. Finally, Costa Rica’s obligation to prevent harm to Nicaragua requires that Costa Rica refrain from transporting or allowing the

transport of hazardous substances, such as petroleum, on the Border Road in its present condition.

6.143 Sixth, the manner in which Costa Rica has proceeded with its Border Road project has breached the letter and spirit of a number of multilateral, regional and bilateral agreements to which the two states are parties. These include:

- The Convention on Biological Diversity;
- The Ramsar Convention;
- The Central American Convention for the Protection of the Environment;
- The Tegucigalpa Protocol to the Charter of the Organization of Central American States;
- The Convention for the Conservation of Biodiversity and the Protection of Wilderness Areas in Central America;
- The Regional Agreement on the Transboundary Movement of Hazardous Wastes; and
- The Agreement on Border Protected Areas – SI-A-PAZ.

6.144 Costa Rica either dismisses these agreements outright or makes technical arguments in an effort to show why they do not apply. But it is simply impossible for Costa Rica to avoid the fact that its Road project runs roughshod over the objectives, principles and values these agreements were designed to further and protect.

6.145 Costa Rica is also dismissive of the Judgment of the Central American Court of Justice on the grounds that the Court lacked jurisdiction over it and based its Judgment on “no scientific evidence of harm whatever.” These claims have are without merit. The Court determined it had jurisdiction, as it is entitled to do, that the subject matter was entirely within its competence, and based its Judgment on scientific and technical evidence submitted by the plaintiffs.

6.146 For all of these reasons, Nicaragua requests that the Court hold Costa Rica responsible for its breaches of environmental obligations under international law.

## **CHAPTER 7**

### **REMEDIES**

7.1 The purpose of the present Chapter is to answer Costa Rica's arguments on the remedies requested by Nicaragua.<sup>749</sup> However, it is noticeable that Costa Rica has not answered several aspects of Nicaragua's requests. It is therefore in order to briefly reiterate Nicaragua's requests which are conspicuously ignored in Costa Rica's Counter-Memorial (I.), before rebutting Costa Rica's limited argument on Remedies (II.).

#### **A. THE IGNORED REMEDIES**

7.2 Since Costa Rica has chosen not to follow the order of Nicaragua's requests for remedies, it is difficult to detect among these requests those which are overlooked by the Respondent. However, this is very clear for at least three of them concerning Nicaragua's requests for:

- the cessation of Costa Rica's continuing internationally wrongful acts;
- the reestablishment of the *status quo ante*;
- guarantees and assurances of non-repetition to be given by Costa Rica.

##### ***1. Cessation of Costa Rica's continuing internationally wrongful acts***

7.3 Concerning the first aspect (cessation), it suffices to recall that, as stressed in the Nicaraguan Memorial,<sup>750</sup> under international law "the State

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<sup>749</sup> See NM, Chapter 6, pp. 127-142.

<sup>750</sup> NM, paras. 6.13-6.17.

responsible for an internationally wrongful act is under an obligation to cease that act, if it is continuing.”<sup>751</sup> In the present case, Costa Rica’s internationally wrongful acts are indeed continuing. This has been both noted by Nicaragua’s scientific experts and recognized by Costa Rica itself.

7.4 Thus, in his most recent report, Dr Kondolf has noted that: “Erosion has visibly worsened since I first observed Rte 1856 in October 2012.”<sup>752</sup> Similarly, Mr. Hagans and Dr. Weaver, two consulting geomorphologists, note that:

“A review of paired oblique aerial photographs taken from helicopters in October 2012 and May 2014 illustrates the widespread, ongoing and persistent erosion occurring along portions of the route from a combination of landslide, fluvial (gully) and surface erosional processes.”<sup>753</sup>

7.5 Interestingly, Costa Rica itself accepts that the effects on the River are continuing and that measures have not been taken in order to remediate it. As the Court observed in its Order of 13 December 2013 on the *Request Presented by Nicaragua for the Indication of Provisional Measures*, Costa Rica recognized the need for remediation and mitigation measures<sup>754</sup>, but, at the same time, “explained that, under the updated version of the schedule, the resumption of construction

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<sup>751</sup> I.C.J., Judgment, 3 February 2012, *Jurisdictional immunities of the State (Germany v. Italy: Greece intervening)*, Reports 2012, p. 153, para. 137. See also I.C.J., Judgment, 20 July 2012, *Questions relating to the obligation to prosecute or extradite (Belgium v. Senegal)*, Reports 2012, p. 461, para. 121; I.C.J., Judgment, 31 March 2014, *Whaling in the Antarctic (Australia v. Japan: New Zealand intervening)*, paras. 245-246 or ILC, Article 30 of the Articles on responsibility of States for internationally wrongful acts and its commentary, *Yearbook of the International Law Commission*, 2001, vol. II, Part Two, pp. 88-91.

<sup>752</sup> 2014 Kondolf Report, Section 3 (NR, Vol. II, Annex 1).

<sup>753</sup> Hagans & Weaver Report, Section 1 (NR, Vol. II, Annex 2).

<sup>754</sup> I.C.J., Order, 13 December 2013, *Construction of a Road in Costa Rica along the San Juan River (Nicaragua v. Costa Rica)*, para. 37.

works on the section of the road along the south bank of the San Juan River would not begin ‘before late 2014 or early 2015.’<sup>755</sup> During the November 2013 hearings on the *Request Presented by Nicaragua for the Indication of Provisional Measures*, Counsel for Costa Rica stated that “these works will not begin in days or weeks, or even months”<sup>756</sup> and they “will not recommence any time in 2013, nor in the first half of 2014.”<sup>757</sup>

7.6 In any case, Costa Rica has clearly announced its intent to resume the construction of Road 1856<sup>758</sup> and it has not committed itself to do it only when an appropriate Environmental Impact Assessment is provided to Nicaragua.<sup>759</sup>

## **2. *Re-establishing the status quo ante***

7.7 Costa Rica is also strangely mute concerning Nicaragua’s primary request, that is, the re-establishment of the *status quo ante* as far as possible.

7.8 As recalled in Nicaragua’s Memorial, it is generally accepted that restitution is the first form of reparation for internationally wrongful acts whenever it is not materially impossible.<sup>760</sup> In the present case, Nicaragua does not claim a complete re-establishment of the *status quo ante*, which would lead to a complete destruction of the road at least inasmuch as it has – or risks to have – a

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<sup>755</sup> *Ibid.*, para. 33. See also CR 2013/31, 8 November 2013, morning, p. 15, para. 22 (Ms Parlett).

<sup>756</sup> CR 2013/31, 8 November 2013, morning, p. 15, para. 22 (Ms Parlett).

<sup>757</sup> *Ibid.*, p. 27, para. 6 (Mr Ugalde). See also p. 28, para. 8.

<sup>758</sup> See para. 5.31 above.

<sup>759</sup> See para. 7.29 below.

<sup>760</sup> NM, paras 6.27-6.28 – see e.g.: P.C.I.J., Judgment, 13 September 1928, *Factory at Chorzów*, Jurisdiction, Series A, No. 17, p. 47, or Articles 34 and 35 of the ILC Articles on the Responsibility of States for Internationally Wrongful Acts.

negative impact on the River, but the reinstatement of a situation as proximate as possible to the one existing before the construction of the road.

7.9 As made clear in the Memorial, “[t]his implies that Costa Rica shall at least:

- plant trees in order to re-establish the ravaged vegetation and landscape [serious plantation made by qualified personnel and not by children<sup>761</sup>]
- rebuild the right bank of the San Juan River where it has been affected by construction works and
- compensate Nicaragua for restoring the natural flow of the waters that flow through the south basin to the San Juan River which has been modified as a consequence of the construction works which also have modified the drainage of the surrounding wetlands in the lower San Juan and its delta;
- and comply with the recommendations of the experts<sup>762</sup> on the works necessary for full restoration of the *status quo ante*.<sup>763</sup>

7.10 This of course includes the “mitigation” works which Costa Rica has pledged to undertake.<sup>764</sup> But, as shown above,<sup>765</sup> those announced by the Respondent are far from sufficient to permit a real re-establishment of the pre-existing situation. These measures should include all the recommendations made

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<sup>761</sup> See CODEFORSA Report, pp. 10, 15 (CRCM, Vol. II, Annex 2).

<sup>762</sup> See NM, paras. 3.96-3.98 and the 2012 Kondolf Report, Section 5.6 (NM, Vol. II, Annex 1).

<sup>763</sup> NM, para. 6.31.

<sup>764</sup> See CRCM, paras. 2.38-2.41.

<sup>765</sup> See para. 1.16 and Chapter 3 Section B.

by the experts<sup>766</sup>, including the relocation of the “section [s] that should be re-routed”<sup>767</sup> – they are feasible and reasonable. Costa Rica has not challenged this; Nicaragua fully maintains it.<sup>768</sup>

### **3.      *Guarantees and assurances of non-repetition***

7.11 Costa Rica’s Counter-Memorial only mentions once the Nicaraguan request for guarantees and assurances of non-repetition – when it summarizes Nicaragua’s submissions.<sup>769</sup> But at no point does it discuss or challenge this request.

7.12 Since Costa Rica has not rebutted Nicaragua’s argument concerning the necessity for such assurances and guarantees of non-repetition,<sup>770</sup> it is not necessary to say more than point out that they are all the more indispensable because, since the dates when the Nicaraguan Application and Memorial were filed, Costa Rica has persistently and continuously violated its obligations *vis-à-vis* Nicaragua:

- “Erosion has visibly worsened” since 2012 and “[t]he progression of erosion and delivery of large quantities of sediment to the Rio San Juan is obvious”,<sup>771</sup> and

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<sup>766</sup> See fn 762 above.

<sup>767</sup> E.g. Hagans & Weaver Report, Section II (NR, Vol. II, Annex 2). As Mr. Hagans & Dr. Weaver explain in their 2014 Report “[i]n addition to locating new and less environmentally destructive alternative routes, it will be necessary to stabilize (i.e. properly decommission) the partially constructed sites that will be abandoned”, *Ibid*.

<sup>768</sup> See Hagans & Weaver Report, Section IV (NR, Vol. II, Annex 2).

<sup>769</sup> CRCM, para. 6.7.

<sup>770</sup> NM, paras. 6.18-6.25.

<sup>771</sup> 2014 Kondolf Report, Section 3 (NR, Vol. II, Annex 1).

- despite the fact that Costa Rica indicated to the Court that the road construction works will not recommence “before late 2014 or early 2015,”<sup>772</sup> it would appear that they have never been suspended.<sup>773</sup>

For instance, Costa Rica announced to have awarded millions of colones for the construction of bridges<sup>774</sup> and President Chinchilla declared that “works are underway.”<sup>775</sup>

7.13 This corresponds precisely to a circumstance when such measures are required.<sup>776</sup>

7.14 In the letter transmitting the present Reply to the Registrar of the Court, Nicaragua suggests that the Court appoint an expert who could assist it “in evaluating the scientific evidence submitted by the Parties and, after the Judgment, to assist the Parties in its implementation. In Nicaragua’s view, such an expert should be a geomorphologist or geotechnical engineer with expertise on road construction and road impacts. If the Court appoints such an expert, Nicaragua further suggests that the Parties could be called to share his or her fees and expenses.” Such an appointment would provide the Court with valuable assistance in the pre-Judgment phase, and reinforce the guarantee to have the

<sup>772</sup> CR 2013/31, 8 November 2013, morning, p. 15, para. 22 (Ms. Parlett).

<sup>773</sup> Note from the Minister of Foreign Affairs of Costa Rica, to the Minister of Foreign Affairs of Nicaragua, Ref.: DM-AM-704-13, 19 December 2013. (NR, Vol. II, Annex 8).

<sup>774</sup> See “Trail Construction Will Restart at the End of the Chinchilla Administration”, *Diario Extra*, 13 December 2013 (<http://www.crhoy.com/precio-total-de-la-trocha-fronteriza-se-estima-en-mas-de-50-mil-millones/>) (NR, Vol. II, Annex 17) and ““Trail” Will Be a Project for the Next Governement”, *La Prensa*, 21 February 2014 (<http://www.prensaescrita.com/adiario.php?codigo=AME&pagina=http://www.prensalibre.cr>) (NR, Vol. II, Annex 19).

<sup>775</sup> “Visit by the President Two Days Before Delivering the Command”, La Nación (Costa Rica), 6 May 2014. (NR, Vol. II, Annex 20). See also R. Madrigal, “Works on the Trail Paralyzed while Waiting for Designs and Modular Bridges”, *crhoy.com*, 10 July 2014. (NR, Vol. II, Annex 21).

<sup>776</sup> See NM, para. 6.24.

Judgment effectively executed by Costa Rica. For its part, Nicaragua is willing to fully cooperate with such an expert, including facilitating on-site visits.

7.15 Such an appointment could be made on the basis of Articles 48 and 50 of the Statute and 67 of the Rules of Court in conformity with precedents.<sup>777</sup> It is Nicaragua's view that Judge Yusuf's Opinion joined to the Judgment in the *Pulp Mills* case is fully transposable in the present case:

“2. The Parties to the present case have submitted to the Court extensive and complex technical and scientific material related to effluent discharges, water quality, chemical substances, the capacity of the river to receive contaminants, its hydrodynamic and geomorphological characteristics, and the parameters used for determining the existence of pollution. In addition, they provided voluminous data, gathered by their respective experts and consultants, on the results of their monitoring before and after the start of the operation of the mill, using different methods and modelling approaches. This factual information relates to a wide range of scientific and technical fields including hydrology, hydrobiology, river morphology, water chemistry, soil sciences, ecology and forestry.

3. Furthermore, both in the written and oral pleadings, the Parties presented many contradictory assertions and divergent approaches in terms of data collection and scientific methodologies for their interpretation. Thus, for example as regards the flow of the river, the hydrodynamic data presented by the Parties proved very difficult to compare because they

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<sup>777</sup> See I.C.J., Order, 17 December 1948, *Corfu Channel case*, Reports 1948, p. 124; I.C.J., Judgment, 9 April 1949, *Corfu Channel case*, Reports 1949, p. 9, or I.C.J., Order, 30 March 1984, *Delimitation of the Maritime Boundary in the Gulf of Maine Area (Canada/United States of America), Appointment of Expert*, Reports 1984, p. 165.

were derived from monitoring at different stations, at different depths, and on different dates. Similarly, with respect to water quality, the Parties used different sampling techniques at different locations and depths, to obtain the data presented to the Court, thus complicating the comparability of the results submitted by them.

[...]

5. It is of course true that it is the responsibility of the Court to determine the facts and to assess their probative value, but this does not prevent it from taking advantage of its powers to order an enquiry or to seek expert opinion in the handling of the complex technical and scientific material submitted to it in this case. The Court, in order to exercise its function of resolving disputes, needs to ensure not only to be in possession of all the available facts relevant to the issues before it, but also to understand fully their actual meaning for the proper application of the law to those facts. The rationale behind the provisions on enquiry and the seeking of an expert opinion in the Statute and in the Rules of Court is to allow the Court to obtain the necessary assistance and support in acquiring such full knowledge of the facts.

6. This case offered a unique opportunity for the Court to use the powers granted to it by Article 50 of its Statute, as well as by Article 67 of the Rules of Court. It is a case where the decisions and conclusions of the Court largely depend on a correct appreciation of the scientific and technical facts. It is true that on many occasions in the past the Court was able to resolve complex and contested factual issues without resorting to Article 50 of the Statute. Yet, in a case such as this one concerning the protection of the environment and the prevention of pollution, specialized scientific expertise can provide the Court with the insights necessary to

make a thorough appraisal of the merits of the scientific and technical material submitted by the Parties.

7. It cannot be expected that expert opinions or scientific assessments commissioned by the Court will always arrive at uniform conclusions, but the adversarial process by which the Parties are given an opportunity to comment on such opinions provides the Court with further insight into the relevance and significance not only of the factual material presented by the Parties, but of the expert opinion as well. Moreover, the use of an enquiry or an expert report by the Court has the advantage of enhancing the confidence of the Parties in the technical evaluation by the Court of the factual and scientific information provided by them and ensuring transparency.”<sup>778</sup>

## B. THE CHALLENGED REMEDIES

7.16 Similarly, but for other reasons, there is no need to come back in detail on Nicaragua’s request for provisional measures (A.). But Costa Rica’s allegations concerning the other Nicaraguan requests deserve some rebuttal, whether they concern:

- what Costa Rica calls “Nicaragua’s remedial claims” that is the compensation due to Nicaragua for any financially assessable damage it has suffered (B.); or
- the declaratory relief requested from the Court (C.).

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<sup>778</sup> I.C.J., Judgment, 20 April 2010, *Pulp Mills on the River Uruguay (Argentina v. Uruguay)*, Declaration of Judge Yusuf, *Reports 2010*, p. 216, paras. 2-3 and p. 217, paras. 5-7.

## ***1. Nicaragua's former request for Provisional Measures***

7.17 Nicaragua had suggested that the Court order provisional measures *proprio motu* under Article 75 of its Rules. The Court declined to do it<sup>779</sup> and decided not to uphold Nicaragua's express request for provisional measures of 11 October 2013 by its Order of 13 December 2013. The Court based its ruling on the information available at the time and on the (late) announcement by Costa Rica that "the resumption of construction works on the section of the road along the south bank of the San Juan River would not begin "before late 2014 or early 2015."<sup>780</sup> However, "[h]aving concluded that no provisional measures should be indicated," the Court observed:

"nevertheless that Costa Rica acknowledged during the course of the oral proceedings that it has a duty not to cause any significant transboundary harm as a result of the construction works on its territory, and that it would take the measures that it deemed appropriate to prevent such harm. The Court further observes that Costa Rica has in any event recognized the necessity of remediation works, in order to mitigate damage caused by the effects of poor planning and execution of the road works in 2011, and has indicated that a number of remediation measures to that end have already been undertaken. Finally, the Court notes that Costa Rica announced, during the same oral proceedings, that, with its Counter-Memorial, due to be filed by 19 December 2013, it would submit what it described as an 'Environment Diagnostic' study covering the stretch of the road running along the bank of the San Juan River."<sup>781</sup>

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<sup>779</sup> See I.C.J., Order, 17 April 2013.

<sup>780</sup> Order, 13 December 2013, para. 33.

<sup>781</sup> *Ibid.*, para. 37.

7.18 Although, Costa Rica has not complied with this commitment<sup>782</sup> – which constitutes a clear recognition of the defects in the road project and of the need for remediation – Nicaragua can now only take note of the situation (and of its aggravation) and call upon the Court to draw the consequences from it. In drawing the consequences it should be taken into consideration that the Road is in such a deteriorated state that Mr. Hagans and Dr. Weaver conclude in their 2014 Report that “[i]mmediate emergency actions are needed to curtail ongoing and future erosion and sediment delivery to the Rio San Juan, and these emergency actions should be of highest priority to all parties involved”.<sup>783</sup>

## 2. *Compensation for financially assessable damage*

7.19 As said above,<sup>784</sup> Nicaragua is conscious that the complete re-establishment of the *status quo ante* is out of range and, in any case, it does not request the demolition of the road since it does not challenge the right of Costa Rica to build whatever road it deems useful on its territory. But this must be understood under the condition that the road in question and its construction do not harm the waters of the River over which Nicaragua has full sovereignty and dominion. Unfortunately, even with these limitations in mind, remediation measures are not capable of re-establishing the *status quo ante* if only because

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<sup>782</sup> See paras. 3.16 et seq. above.

<sup>783</sup> Hagans & Weaver Report, Section I (NR, Vol. II, Annex 2).

<sup>784</sup> Para. 7.8.

they cannot have a retroactive effect and, therefore, will not make good the harm already suffered.<sup>785</sup> As a consequence these damages must be compensated.<sup>786</sup>

7.20 Costa Rica's sole answer to this claim is that "[n]one of the paragraphs or documents cited by Nicaragua established that it has suffered any compensable loss."<sup>787</sup> As is apparent from Chapter 2 of this Reply, the damage caused to the San Juan River by the misconceived road works done by Costa Rica is all too well established:

- Road construction works have caused pollution to the San Juan River through massive delivery of road-derived sediments to the River;
- Road-derived sediments have caused morphological changes of the San Juan River (creation of or enlargement of existing deltas of sediments) and
- have affected San Juan River water quality and aquatic life;
- have significantly affected Nicaragua's dredging needs.

7.21 In accordance with a well-established practice,<sup>788</sup> Nicaragua requests that the amount of the compensation be assessed in a separate phase of the proceedings insofar as the Parties cannot reach an agreement in this respect.

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<sup>785</sup> See NM, para. 6.32.

<sup>786</sup> See *ibid.* and Article 36, para. 1, of the ILC Articles on the Responsibility of States for internationally wrongful acts: "The State responsible for an internationally wrongful act is under an obligation to compensate for the damage caused thereby, insofar as such damage is not made good by restitution."

<sup>787</sup> CRCM, para. 6.13.

<sup>788</sup> See NM, p. 243, fn. 610.

### **3. Declaratory Relief**

7.22 Besides its claims for cessation and restitution<sup>789</sup> and, inasmuch as restitution is not possible, for compensation,<sup>790</sup> Nicaragua also requests the Court to formally make several declarations, namely to declare that:

- (a) by its conduct, Costa Rica has breached a number of its obligations *vis-à-vis* Nicaragua;
- (b) Costa Rica is bound to prepare an appropriate transboundary Environmental Impact Assessment (EIA) and
- (c) Costa Rica must refrain from using Route 1856 to transport hazardous material until the road meets the conditions required for such use; and that
- (d) Nicaragua is entitled to dredge the San Juan de Nicaragua River as deemed necessary.

7.23 Costa Rica opposes all these requests<sup>791</sup> but does not contest that the Court may make declaratory judgments.<sup>792</sup> In the present case:

- the requested declarations are indispensable since Costa Rica obstinately denies its violations and takes shelter behind affirmations of sovereignty on its territory – which are beside the point;

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<sup>789</sup> See Sections A.1. and B above.

<sup>790</sup> See Section B above.

<sup>791</sup> CRCM, paras. 6.7-6.11.

<sup>792</sup> See NM, para. 6.10 and the case-law cited.

- these declarations are also necessary in order to regulate the future conduct of the Parties and
- the declarations are necessary to prevent further future irreparable harms to be caused to the River.

**(a) A Declaration Concerning the Violations of Costa Rica's Obligations *vis-à-vis* Nicaragua**

7.24 Nicaragua's first submission aims at obtaining a declaration from the Court "that, by its conduct, Costa Rica has breached

- (i) Its obligation not to violate the integrity of Nicaragua's territory as delimited by the 1858 Treaty of Limits, the Cleveland Award of 1888 and the five Awards of the Umpire EP Alexander of 30 September 1897, 20 December 1897, 22 March 1898, 26 July 1899 and 10 March 1900.
- (ii) Its obligation not to damage Nicaraguan territory;
- (iii) Its obligations under general international law and the relevant environmental conventions, including the Ramsar Convention on Wetlands, the Agreement over the Border Protected Areas between Nicaragua and Costa Rica (International System of Protected Areas for Peace [SI-A-PAZ] Agreement), the Convention on Biological Diversity and the Convention for the Conservation of the Biodiversity and Protection of the Main Wild Life Sites in Central America".<sup>793</sup>

7.25 Here again, Costa Rica's sole answer is that "Nicaragua has not demonstrated that any such internationally wrongful acts have occurred."<sup>794</sup>

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<sup>793</sup> NM, Submissions, p. 251, para. 1 (i), (ii) and (iii).

<sup>794</sup> CRCM, para. 6.8.

Nicaragua has demonstrated their existence superabundantly both in its Memorial<sup>795</sup> and in Chapters 2 to 5 of this Reply.

7.26 A declaration that Costa Rica has committed these breaches is all the more indispensable in that Costa Rica denies them, and a formal declaration by the Court will dissipate any ambiguity as to the respective rights of the Parties, by making clear that since the River is under Nicaragua's sovereignty, Costa Rica must respect this sovereignty including when it performs works on its bank of the River.

**(b) A Declaration that Costa Rica is Bound to Prepare an Appropriate EIA**

7.27 Nicaragua also requests the Court to declare that Costa Rica must not "continue or undertake any future development in the area without an appropriate transboundary Environmental Impact Assessment and that this assessment must be presented in a timely fashion to Nicaragua for its analysis and reaction."<sup>796</sup> This declaration should make it clear that this transboundary EIA must include Costa Rica's obligation to prohibit without a previous transboundary EIA any human development in the area that might come as a consequence of the road. There already are indications in the Costa Rican press that large agricultural

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<sup>795</sup> See NM, Chapters 4 and 5.

<sup>796</sup> NM, p. 252, para. 1 (iv).

industries are being established as well as petroleum concessions are being granted in this area.<sup>797</sup>

7.28 Costa Rica does not deny the fact that it has not prepared (and, as a consequence, not notified to Nicaragua) an environment impact assessment. Costa Rica argues: “Under Costa Rican law, the requirement to carry out an environmental impact assessment before commencing work on a project is displaced in circumstances where there is an emergency.”<sup>798</sup> Moreover, it adds that: “So far as concerns construction of the Road, neither of the [threshold requirements in respect of the obligation to conduct an environmental impact assessment] was met such as to require Costa Rica to carry out an environmental impact assessment.”<sup>799</sup>

7.29 Here again, Costa Rica’s sole defence is summary and beside the point.<sup>800</sup> It consists of invoking the Court’s Order on Provisional Measures of 13 December 2013 by which the Court held that “[a] decision by the Court to order Costa Rica to provide Nicaragua with such an Environmental Impact Assessment Study as well as technical reports at this stage of the proceedings would therefore amount to prejudging the Court’s decision on the merits of the case.”<sup>801</sup>

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<sup>797</sup> Information available at <http://www.semanariouniversidad.ucr.cr/index.php/noticias/pais/7356-construccion-de-trocha-fronteriza-favoreceria-a-grandes-empresarios-de-la-zona-y-a-petrolera-mallon-oil.html>

<sup>798</sup> CRCM, para. 2.34; *see also* NM, paras. 2.22-2.25 and 5.13-5.14.

<sup>799</sup> *Ibid.*, para. 5.12.

<sup>800</sup> *Ibid.*, para. 6.6.

<sup>801</sup> I.C.J., Order, 13 December 2013, *Construction of a Road in Costa Rica Along the San Juan River (Nicaragua v Costa Rica), Request presented by Nicaragua for the Indication of Provisional Measures, Order*, para. 39.

Obviously, this provisional decision by the Court leaves completely open its answer to the Nicaraguan request.

7.30 As shown both in the Memorial and in this Reply,<sup>802</sup> there can be no doubt that, in the circumstances, Costa Rica should have carried out an EIA and notified it to Nicaragua. Such an obligation remains fully opposable to the Respondent.

7.31 As made clear in Article 29 of the ILC Articles on the Responsibility of States for Internationally Wrongful Acts:

“The legal consequences of an internationally wrongful act under this Part do not affect the continued duty of the responsible State to perform the obligation breached.”

And in its commentary the Commission explains:

“As a result of the internationally wrongful act, a new set of legal relations is established between the responsible State and the State or States to whom the international obligation is owed. But this does not mean that the pre-existing legal relation established by the primary obligation disappears.”<sup>803</sup>

7.32 This applies in the present case: Costa Rica cannot base itself on the fact that “the harm is done” to escape its obligation to establish and notify an environmental impact assessment – to accept such an argument would mean to accept the *fait accompli*. And it is all the more important that the Court orders that

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<sup>802</sup> NM, paras. 5.6-5.41 and NR, Chapter 6, sections C-D.

<sup>803</sup> Commentary on the Articles on responsibility of States for internationally wrongful acts, *Yearbook of the International Law Commission*, 2001, vol. II, Part Two, p. 88, para. (2) of the commentary of Article 29.

Costa Rica produce and EIA and notify it to Nicaragua so that it does not conceal its intention to conduct new road construction works along the River.<sup>804</sup>

7.33 The situation is very similar to that met by the Arbitral Tribunal in the recent *Indus Waters Kishenganga Arbitration*. The Tribunal recalled:

“The International Court of Justice affirmed that ‘due diligence, and the duty of vigilance and prevention which it implies, would not be considered to have been exercised, if a party planning works liable to affect the regime of the river or the quality of its waters did not undertake an environmental impact assessment on the potential effects of such works.’<sup>805</sup> Finally, the International Court of Justice emphasized that such duties of due diligence, vigilance and prevention continue ‘once operations have started and, where necessary, throughout the life of the project.’<sup>806,,807</sup>

This also holds true in the present case.

7.34 This said, Nicaragua wishes to specify that Costa Rica cannot invoke the necessity to establish an adequate Environment Impact Assessment in order to delay the urgent/prevention/emergency remediation measures that are indispensable to mitigate the harm which has already occurred or which threatens to occur imminently if they are not undertaken.

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<sup>804</sup> CRCM, para. 2.41 (“Costa Rica will bring the road works to completion...”). See also “Trail Construction Will Restart at the End the Chinchilla Administration”, *CR Hoy*, 13 December 2013 (<http://www.crhoy.com/precio-total-de-la-trocha-fronteriza-se-estima-en-mas-de-50-mil-millones/>) (NR, Vol.II, Annex 17) and “‘Trail’ Will Be a Project for the Next Government”, *La Prensa*, 21 February 2014 (<http://www.prensaescrita.com/adiario.php?codigo=AME&pagina=http://www.prenslibre.cr>) (NR, Vol. II, Annex 19).

<sup>805</sup> Fn. 600: “*Pulp Mills on the River Uruguay (Argentina v. Uruguay)*”, Judgment, I.C.J. Reports 2010, p. 14, p. 83.”

<sup>806</sup> Fn. 661: “*Ibid.*, at pp. 83-84.”

<sup>807</sup> Partial Arbitral Award, 18 February 2013, *Indus Waters Kishenganga Arbitration (Pakistan v. India)*, para. 450 (available at [http://www.pca-cpa.org/showpage.asp?pag\\_id=1392](http://www.pca-cpa.org/showpage.asp?pag_id=1392)).

7.35 Nicaragua suggests that the Court could appoint a lead expert whose mission could be, among others,<sup>808</sup> to determine (i) the urgency of remediation measures and (ii) the appropriateness of the contemplated measures.

**(c) A Declaration that Costa Rica Must Refrain from Using Route 1856 to Transport Hazardous Material**

7.36 Nicaragua also requests the Court to decide that Costa Rica must refrain from using route 1856 to transport hazardous material until the road is repaired and completed in conformity with the highest international construction standards.

7.37 As explained by Dr. Kondolf:

“The documents submitted by Costa Rica could give the impression that the road is completed and there are some minor erosion problems, which are being fixed. This is not true. In reality, Rte 1856 is not complete, and it cannot be driven continuously from Mojon II to Boca San Carlos. There have been significant failures on some of the steep slopes across which the road was attempted. At least 3 km of the uppermost 30 km of the road has failed or the attempts to build it appear to have been abandoned due to failures.”<sup>809</sup> And that

“In its current state, Rte 1856 is unsafe to use, and would pose a significant threat to the Rio San Juan if any hazardous materials were transported on it.”<sup>810</sup>

As acknowledged by Costa Rica’s National Roads Authority, the project was not “subjected to the procedures for development of infrastructure projects that take

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<sup>808</sup> See above, para. 7.14.

<sup>809</sup> 2014 Kondolf Report, Section 2 (NR, Vol. II, Annex 1).

<sup>810</sup> *Ibid.*, Section 1.

into account, for example, stages of conceptualization, feasibility, design and management of the work.”<sup>811</sup> And Dr. Kondolf adds:

“Construction of Rte 1856 involved multiple cut and fill roads across steep hillslopes, many underlain by weak rock types or with unfavorable orientation of geologic structure, resulting in inherently weak cutslopes. The material removed from the cut was simply ‘sidecast’, i.e., pushed down the slope by the blade, without first removing vegetation from the slope and with neither engineering the fill by compaction nor use of geotextiles. As a result, the fillslopes are inherently unstable, no more than loose piles of earth, easily eroded into rills and gullies by surface runoff, and prone to landsliding. … Similarly, the stream crossings consist of loose, unengineered fill dumped over what most commonly appear to be undersized culvert pipes, which are often not set at the base of the fill (along the original grade of the stream) but higher in the fill, where they are more prone to failure (as has occurred at many crossings).”<sup>812</sup>

As a result, the road is extremely dangerous for the users.

7.38 Several “portions of the road are unsafe because of steep slopes” or because of substandard stream crossings which pose a risk of collapse.<sup>813</sup> “The problems with unsafe and unstable slopes and poor stream crossings are compounded by the extreme proximity to the Rio San Juan of most of the route.”<sup>814</sup> Given this proximity, “failure of these slopes and overturning of trucks carrying hazardous material would be very likely to result in immediate contamination of the Rio San Juan.”<sup>815</sup> Dr. Kondolf provides a map of potentially

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<sup>811</sup> CONAVI Press Release, 25 May 2012, para. 3 (NM, Vol. II, Annex 34, p. 481).

<sup>812</sup> 2014 Kondolf Report, Section 4 (NR, Vol. II, Annex 1).

<sup>813</sup> *Ibid.*, Section 5.

<sup>814</sup> *Ibid.*

<sup>815</sup> *Ibid.*

dangerous slopes, and another indicating potentially dangerous stream crossings.<sup>816</sup> In addition, he describes in detail a number of locations that are clearly not safe places for traffic, especially heavy trucks carrying potentially hazardous materials.<sup>817</sup> These include the Severely Eroding Sites described in detail in Chapter 2, above.

7.39 Mr. Hagans and Dr. Weaver have reached the same conclusion in their 2014 Report. The images captured in 2012, 2013 and 2014

“clearly document continued large scale and active erosional processes occurring on some road cuts, fill slopes and at several very large stream crossings along the route where the road should be classified as unsafe for public and commercial use.”<sup>818</sup>

7.40 The unsafe character of Road 1856 has been recently acknowledged by the newly elected President of the Republic of Costa Rica himself:

“The President of the Republic, Luis Guillermo Solis, recently toured this route and discovered that *much still remains to be solved*: passageways almost taken by the vegetation, impassable and narrow road spans, as well as evidence of the lack of planning of the initial tasks.”<sup>819</sup>

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<sup>816</sup> *Ibid.*, Section 5 and Appendices C, D.

<sup>817</sup> *Ibid.*, Section 3.

<sup>818</sup> Hagans & Weaver Report, Section I (NR, Vol. II, Annex 2).

<sup>819</sup> R. Madrigal, “Works on the Trail Paralyzed while Waiting for Designs and Modular Bridges”, *crhoy.com*, 10 July 2014 (emphasis added) (NR, Vol. II, Annex 21).

7.41 The danger of serious pollution by hazardous materials is all the more likely to materialize because, in spite of Costa Rican denials, there exists an important risk of hurricanes and earthquake.<sup>820</sup>

7.42 This all justifies the Court's Order banning any traffic of trucks or engines transporting hazardous material, at least as long as Costa Rica will not remediate and complete the works in accordance with the best standard practice in the field in order to avoid exceptional risks of pollution as they now stand.

7.43 Indeed, such an Order can be seen as going further than a pure declaration. But it is far from being unprecedented. Suffices it to recall at this stage that, in its recent Judgment in the *Whaling* case, the Court observed

“that JARPA II [the Japanese research programme declared unlawful by the Court] is an ongoing programme. Under these circumstances, measures that go beyond declaratory relief are warranted. The Court therefore will order that Japan shall revoke any extant authorization, permit or licence to kill, take or treat whales in relation to JARPA II, and refrain from granting any further permits under Article VIII, paragraph 1, of the Convention, in pursuance of that programme.”<sup>821</sup>

The purely preventive measures requested by Nicaragua in the present case are more modest in scope.

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<sup>820</sup> 2014 Kondolf Report, Section 12 (NR, Vol. II, Annex 1).

<sup>821</sup> See I.C.J., Judgment, 31 March 2014, *Whaling in the Antarctic (Australia v. Japan: New Zealand intervening)*, para. 244; see also para. 247(7). See also I.C.J., Advisory Opinion, 9 July 2004, *Legal Consequences of the Construction of a Wall in the Occupied Palestinian Territory*, Reports 2004, p. 201, para. 163(3)(B).

**(d) A Declaration that Nicaragua is Entitled to  
Dredge the San Juan de Nicaragua River**

7.44 In the third Submission of its Memorial, the Republic of Nicaragua requested the Court to adjudge and declare that:

- “(i) Nicaragua is entitled, in accordance with the 1858 Treaty as interpreted by the subsequent arbitral awards, to execute works to improve navigation on the San Juan River as it deems suitable, and that these works include the dredging of the San Juan de Nicaragua River to remove sedimentation and other barriers to navigation; and,
- (ii) In so doing, Nicaragua is entitled to re-establish the conditions of navigation that existed at the time the 1858 Treaty was concluded.”

7.45 Costa Rica complains in its Counter-Memorial that

“These requests are not elaborated in Nicaragua’s Memorial. They are duplicative of the submissions made by Nicaragua in the *Certain Activities* case and ought to be dealt with in the context of that case. Indeed, this is the third time Nicaragua has made this same request: it made the same requests in the *Navigational Rights* case and the Court definitively rejected them, noting that these issues were settled in the Cleveland Award. For the same reasons, Nicaragua’s requests for these declarations should be rejected.”<sup>822</sup>

7.46 Concerning the “duplication” argument, it must be recalled that, by its Orders of 17 April 2013, the Court decided to join the proceedings in the case

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<sup>822</sup> CRCM, pp. 133-134, paras. 6.10-6.11.

concerning *Certain Activities carried out by Nicaragua in the Border Area (Costa Rica v. Nicaragua)* with those in the case concerning *Construction of a Road in Costa Rica along the San Juan River (Nicaragua v. Costa Rica)*:

“Both cases are based on facts relating to works being carried out in, along, or in close proximity to the San Juan River, namely the dredging of the river by Nicaragua and the construction of a road along its right bank by Costa Rica. Both sets of proceedings are about the effect of the aforementioned works on the local environment and on the free navigation on, and access to, the San Juan River. In this regard, both Parties refer to the risk of sedimentation of the San Juan River.

In the present case and in the *Nicaragua v. Costa Rica* case, the Parties make reference, in addition, to the harmful environmental effect of the works in and along the San Juan River on the fragile fluvial ecosystem (including protected nature preserves in and along the river).<sup>823</sup>

There is therefore nothing abnormal about making the same submission in both cases.

7.47 As for the second argument advanced by Costa Rica, it is true that the Court rejected a similar Nicaraguan request in the *Navigational Rights* case for the reason that these issues were settled in the Cleveland Award.<sup>824</sup> But the fact is that Costa Rica persistently contests Nicaragua’s right to dredge the San Juan

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<sup>823</sup> I.C.J. Order, 22 November 2013, *Certain Activities carried out by Nicaragua in the Border Area (Costa Rica v. Nicaragua)*, Request for Provisional Measures, paras. 20 and 21, and I.C.J., Order, 13 December 2013, *Construction of a Road in Costa Rica along the San Juan River (Nicaragua v. Costa Rica)*, Request for Provisional Measures, paras. 14 and 15.

<sup>824</sup> I.C.J., Judgment, 13 July 2009, *Dispute regarding Navigational and Related Rights (Costa Rica v. Nicaragua)*, I.C.J. Reports 2009, p. 60, para. 155.

River to remove sedimentation and other barriers to navigation<sup>825</sup>. As Nicaragua pointed out in its Counter-Memorial in the *Certain activities case*: “The dredging program that has been executed is a very minor undertaking carried out with small, mostly artisanal, dredging equipment that has not even been able so far to come close to offsetting the increased silting of the River caused by Costa Rica’s construction of a road running along its right bank. In carrying out this program, Nicaragua plainly has been acting within its lawful right to maintain the navigability of the River, and has not caused any harm to Costa Rica.”<sup>826</sup> And yet, even this minor dredging program is being questioned by Costa Rica. Therefore, it seems crucial that the Court explicitly specify the rights of Nicaragua in this respect.

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<sup>825</sup> CRM in the case concerning *Certain Activities carried out by Nicaragua in the Border Area (Costa Rica v. Nicaragua)*, para. 7.11 and CRCM, para. 6.13.

<sup>826</sup> Dispute concerning *Certain Activities Carried Out by Nicaragua in the Border Area (Costa Rica v. Nicaragua)*, NCM, Chapter 1, pp.8-9, para.1.15. (footnote omitted).



## SUBMISSIONS

1. For the reasons given in its Memorial and in this Reply, the Republic of Nicaragua requests the Court to adjudge and declare that, by its conduct, the Republic of Costa Rica has breached:

- (i) Its obligation not to violate the integrity of Nicaragua's territory as delimited by the 1858 Treaty of Limits as interpreted by the Cleveland Award of 1888 and the five Awards of the Umpire EP Alexander of 30 September 1897, 20 December 1897, 22 March 1898, 26 July 1899, and 10 March 1900;
- (ii) Its obligation not to damage Nicaraguan territory;
- (iii) Its obligations under general international law and the relevant environmental conventions, including the Ramsar Convention on Wetlands, the Agreement over the Border Protected Areas between Nicaragua and Costa Rica (International System of Protected Areas for Peace [SI-A-PAZ] Agreement), the Convention on Biological Diversity and the Convention for the Conservation of the Biodiversity and Protection of the Main Wild Life Sites in Central America;

2. Nicaragua also requests the Court to adjudge and declare that Costa Rica must:

- (i) Cease all its continuing internationally wrongful acts that affect or are likely to affect the rights of Nicaragua.

- (ii) Inasmuch as possible, restore the situation to the *status quo ante*, in full respect of Nicaragua's sovereignty over the San Juan de Nicaragua River, including by taking the emergency measures necessary to alleviate or mitigate the continuing harm being caused to the River and the surrounding environment.
- (iii) Compensate for all damages caused insofar as they are not made good by restitution, including the costs added to the dredging of the San Juan de Nicaragua River, with the amount of the compensation to be determined in a subsequent phase of the case.

3. Furthermore, Nicaragua requests the Court to adjudge and declare that Costa Rica must:

- (i) Not undertake any future development in the area without an appropriate transboundary Environmental Impact Assessment and that this assessment must be presented in a timely fashion to Nicaragua for its analysis and reaction;
- (ii) Refrain from using Route 1856 to transport hazardous material as long as it has not given the guarantees that the road complies with the best construction practices and the highest regional and international standards of security for road traffic in similar situations;

4. The Republic of Nicaragua further requests the Court to adjudge and declare that Nicaragua is entitled:

- (i) In accordance with the 1858 Treaty as interpreted by the subsequent arbitral awards, to execute works to improve navigation on the San Juan River and that these works include the dredging of the San Juan de Nicaragua River to remove sedimentation and other barriers to navigation. And,
- (ii) In so doing, to re-establish the conditions of navigation foreseen in the 1858 Treaty.

5. Finally, if the Court has not already appointed a neutral expert at the time when it adopts its Judgment, Nicaragua requests the Court to appoint such an expert who could advise the Parties in the implementation of the Judgment.

The Hague, 04 August 2014.

Carlos J. Argüello Gómez  
Agent of the Republic of Nicaragua



## **CERTIFICATION**

I have the honour to certify that this Reply and the documents annexed in Volume II are true copies and conform to the original documents and that the translations into English made by the Republic of Nicaragua are accurate translations.

The Hague, 04 August 2014

Carlos J. Argüello Gómez

Agent of the Republic of Nicaragua



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