Appendix F

Photographic Collection from 2013 and 2014 Site Investigations

Photo 1
Overview of hidden pit at SSF-34

Photo 2

Crude at an undocumented pit at SSF-34. Photoionization detector (PID) measurement of volatile organic vapors emanating from oil is 46.5 ppm

Photo 3
SSF-34

Liquid crude just beneath the surface at an undocumented TexPet pit that was discovered after a farmer expanded his fields. Petroleum contamination at this location exceeded all thresholds, including over **a thousand times** the Judgment cleanup standard.

Photo 4

Crude at an undocumented pit at SSF-34 from different location than Photo 2.

Photo 5

House and papaya trees near hidden pit at SSF-34; note fruit on trees away from pit, but none/underdeveloped on trees near pit

Photo 6

Metal placard at SSF-34 well head documenting abandonment date of September 22, 1983

Photo 7
AG-06
Photo of foot path used by local residents that leads to wetland contaminated with crude oil.

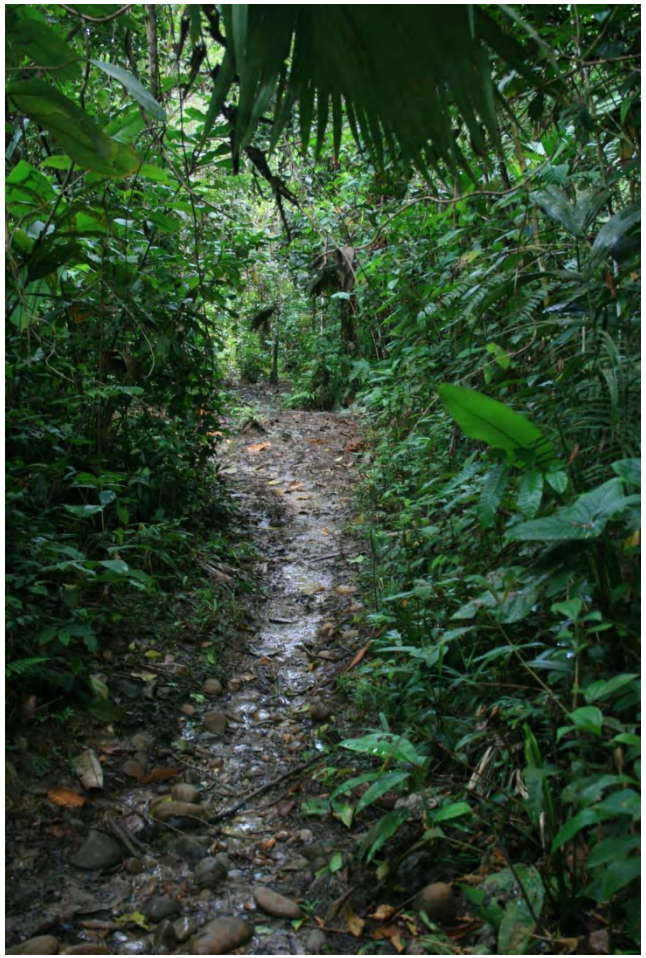

Photo 8
Spring at AG-06

Photo 9

Crude oil on water beneath soil revealed in probe hole at AG-06

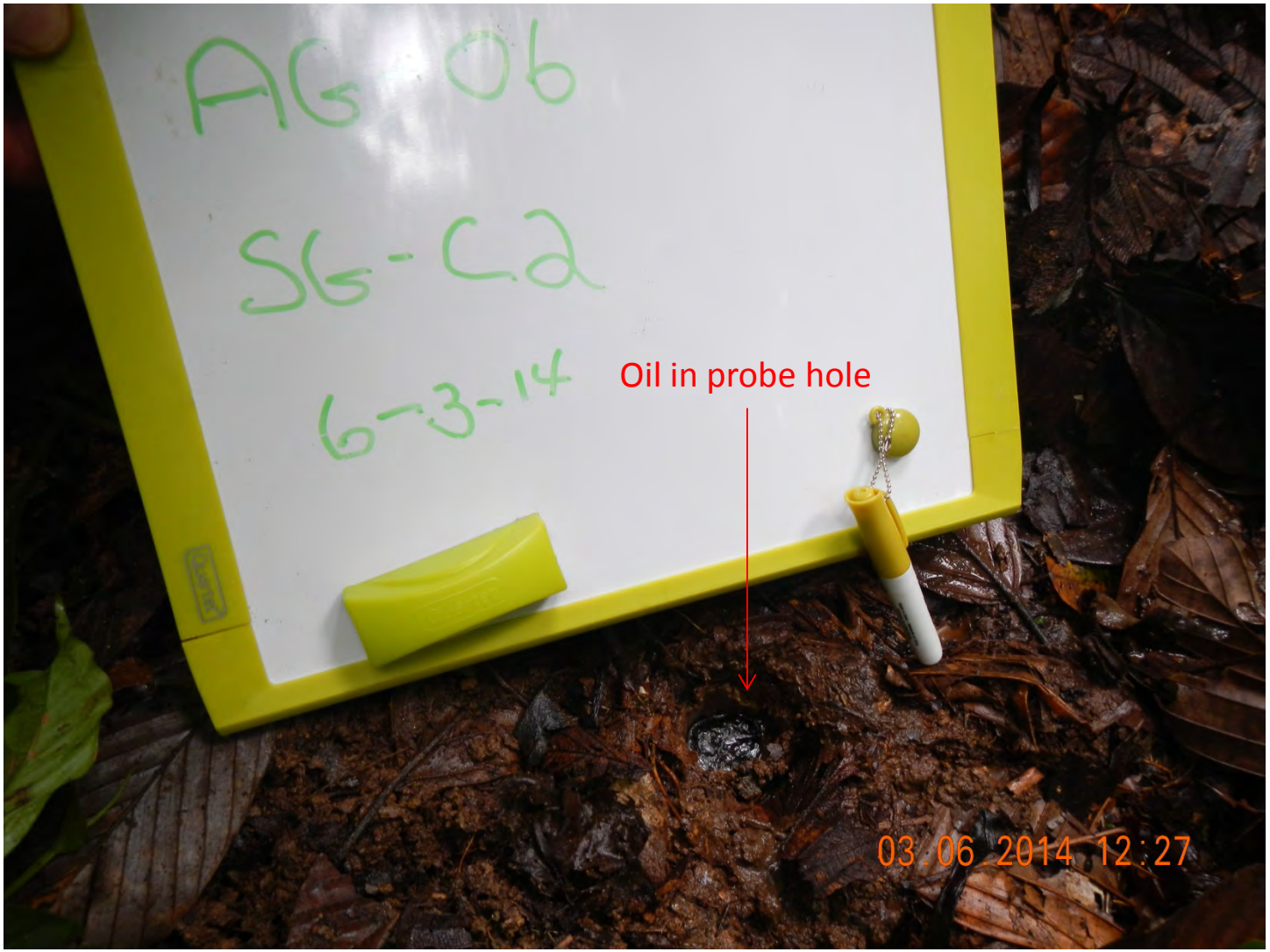

Photo 10
AG-06
Oil droplets in water that had collected in a tree stump in AG-06 wetland.

Photo 11

Smear of crude oil from inside stump where oil droplets were observed at AG-06

Photo 12

AG-06

Tar covered oil seep in wetland. The groundwater seep carries contamination from the uphill TexPet pits to the wetland below. Crude oil collects in the wetland and forms a tar cover over liquid crude oil soaked sediments. The soil and sediments in this wetland are contaminated with petroleum in excess of Ecuadorian regulations and as much as **140 times** the Judgment clean-up standard.

Photo 13

AG-06

Dr. Garvey using a PID to test the oil seep in the wetland. The PID reading of 164.6 ppm indicates that there is unweathered, liquid crude oil beneath the tar cover. This crude oil has migrated down from the TexPet pits uphill to the wetland area.

Photo 14

Oil contaminated soil and PID measurement of volatile organic vapors (21.6 ppm) indicative of oil contamination emanating from soil in the seep area at AG-06

Photo 15

Crude oil and tar beneath leaf litter in the seep area at AG-06

Photo 16
Oil contaminated sediment beneath leaf litter at AG-06

Photo 17
Oil contaminated soil beneath leaf litter at AG-06

Photo 18

AG-06

Contaminated wetland with LBG's monitoring well (yellow tube). The monitoring wells in the wetland discovered elevated levels of petroleum up to **twelve times** higher than Ecuadorian regulations permit. LBG's sampling also found napthenic acids present in the groundwater. Napthenic acids are components of crude oil that are soluble in water — their presence means there is crude in the water itself not from any sediment or soil particles in the water.

Photo 19
House and residents next to hand dug water supply well at LA-16

Photo 20

LA-16

Marker for location of well site LA-16, which was closed in 1981

Photo 21

Hand dug family water well with crude that flowed from pits about 50 m to left in picture at LA-16

Photo 22

Location where petroleum evident in soil and water next to hand dug well at LA-16

Photo 23

LA-16

Girl bathing her little brother from water from a domestic well at LA-16. Napthenic acids were found present in this domestic well, indicating the presence of crude oil in the water.

Photo 24

LA-16

Area downgradient from TexPet pits with domestic water well in the background. In the foreground are two LBG monitoring wells (yellow pipes). LBG found groundwater contamination **four times** the Ecuadorian regulations.

Photo 25

Oil in soil and water next to hand dug well at LA-16 (location shown in Photo 22)

Photo 26
Smear of crude oil at LA-16 from location in Photo 25

Photo 27

LA-16

Cleared cornfield that is east of two TexPet pits. PetroEcuador employee is using a digging bar to visually examine the soil as local residents look on. Samples collected in this area were **twenty-five times** the Judgment clean-up standard.

Photo 28
Injection well SSF-13

Photo 29

Shushufindi 13 ("SSF-13")

Overview of TexPet pit closed in 1976, labeled Pit 3, with PetroEcuador employees examining the pit. View from northwest corner. On the east side of the pit (left in the photo) is a cut in the berm which drains the pit contents to a stream. LBG's soil samples taken outside of this pit's boundary exceeded thresholds by as much as **eight times**.

Photo 30
Pit 3 at SSF-13

Photo 31
Breach in pit berm at Pit 3 at SSF-13

Photo 32

SSF-13

LBG using a PID to measure the amount of organic vapors coming out of a freshly dug hole in Pit 3. PID reading in the photo of 76.2 ppm, indicative of crude oil contamination. At this pit, PID readings were as high as 100 ppm.

Photo 33

SSF-13

LBG's site investigation revealed that sediments in the stream where the cattle are grazing exceeds the Judgment cleanup standard more than **twenty times**.

Photo 34
Oil sheen on sediment at LA-02

Photo 35

Oil sheen on sediment, tar, and groundwater seep at LA-02

Photo 36
Oil sheen on sediment and groundwater seep at LA-02

Photo 37

Oil sheen on sediment and groundwater seep at LA-02 with PID reading (10.7 ppm)

Photo 38
Contaminated sediment at LA-02

Photo 39
Poking stick into oil contaminated sediment at LA-02

Photo 40
Oil on stick withdrawn from sediment at LA-02

Photo 41
Siphon from Pit 3 at LA-02 (July, 2013)

Photo 42
Oil and water leaking from siphon (behind and above log) from buried, undisclosed Pit 3 at LA-02 (August 2014)

Photo 43
Oil contaminated sediment and child's ball at LA-02

Photo 44

Area adjacent to stream impacted by Pit 3 at LA-02 – Area is being cleared for use.

Photo 45
SSF-55 - Pit 1 PID reading (3.2)

Photo 46
Oil-contaminated wetlands at SSF-55

Photo 47

Crude oil on hand auger and oil-saturated sediment from contaminated wetland at SSF-55

Photo 48
Oil contaminated wetland at SSF-55

Photo 49
Petroleum sheen on water in wetland at SSF-25

Photo 50

Oily sediment and oil smears on hand auger and glove at access point to stream at SSF-25

Photo 51

Collecting oil contaminated sediment from stream at SSF-25, note sheens and oil droplets

Photo 52
Asphalt from stream downstream of pit at LA-35

Photo 53
Oil and petroleum sheen on a stream at YU-02

Photo 54
Petroleum sheen and oil droplets in wetland at YU-02

Photo 55
Petroleum sheen in stream at YU-02

Photo 56
Petroleum droplets on the water surface in wetland at YU-02

Photo 57
Oil sheen and droplets on water at YU-02

Photo 58
Hand dug well at house adjacent to YU-02

Photo 59
Oil-soaked sediment from wetland at YU-02

Photo 60

Oil droplets in hand-auger sample of clay from a wetland at YU-02

Photo 61

Siphon pipe protruding from Pit A berm at GU-06 indicating pit was designed to contain oil. Note the highest concentrations of barium detected by LBG in soil (5080 mg/kg) were from inside Pit A

A

Photo 62

Oil droplets in hand auger sediment sample from GU-06

Photo 63

Petroleum sheen on flowing stream at GU-06, same location as cover photo of the *LBG December 2013 Rejoinder Report*

Photo 64

Petroleum sheen on flowing stream, same location as cover photo of the *LBG December 2013 Rejoinder Report*

Photo 65
Petroleum sheen on flowing stream at GU-06

Photo 66
Oil droplets on water at GU-06

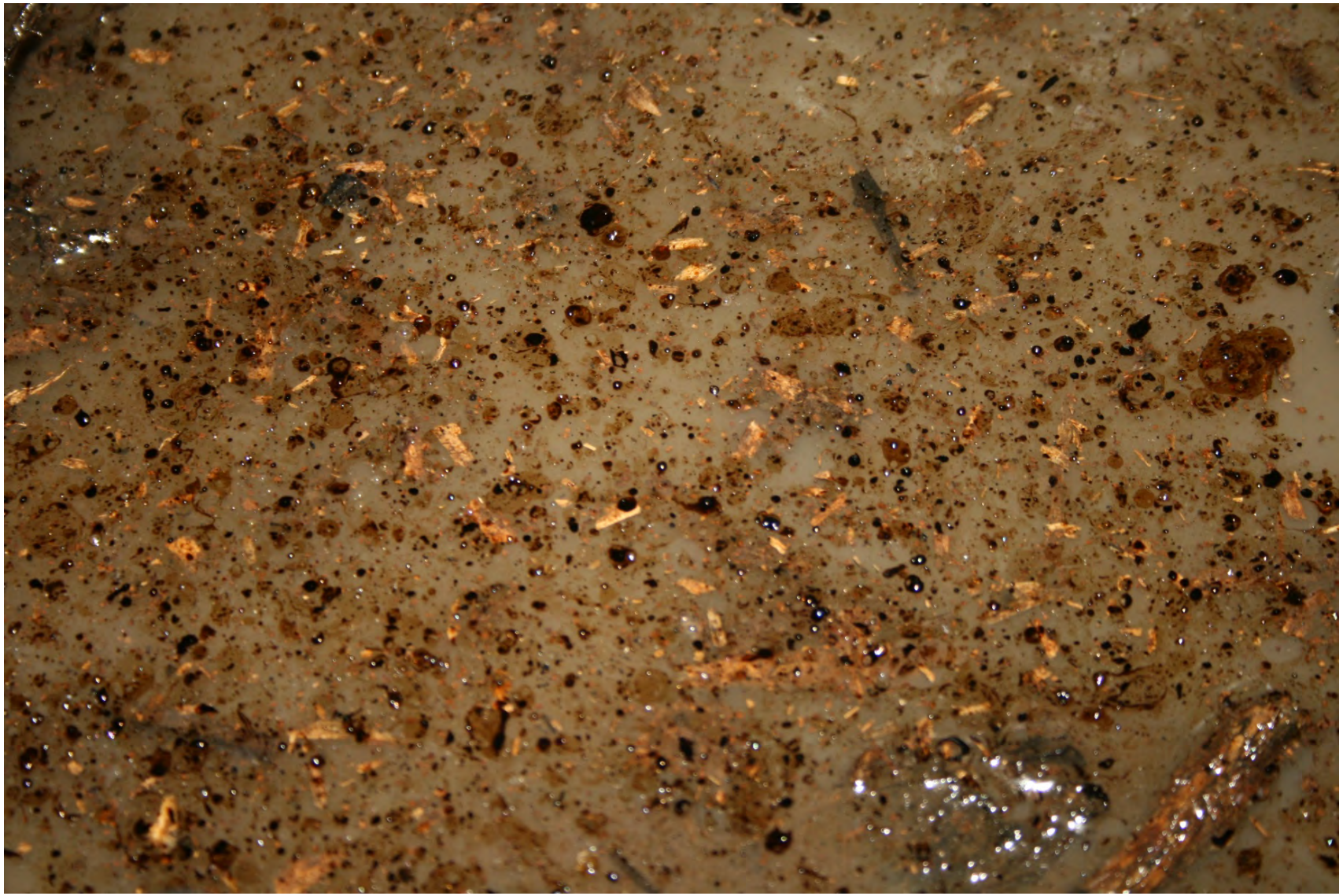

Photo 67
Petroleum sheen and oil droplets in a wetland at GU-06

Photo 68
Sheens in path through oil contaminated wetland at GU-06

Photo 69

Sheens appearing in footprint just after stepping on the wetland sediment at GU-06

Photo 70
Petroleum sheen on water at AG-09

Photo 71
Degraded pond and wetland inside “RAP Remediate” Pit 1 at AU-19

Photo 72
Side of undisclosed Pit 3 exposed by slope failure at AU-19

Photo 73

Oil seeping from side wall of slope failure at undisclosed Pit 3 in AU-19 (Photo 72)

Photo 74

Land owner excavated into old pit without knowing former pit's location at SA-15

Photo 75
Overview of farmer's excavation that exposed old pit at SA-15

Photo 76
Oil in sediment of marshy stream from spring at SA-15

Photo 77
Oil in sediment of marshy stream from spring at SA-15

Photo 78
Oil contaminated marshy stream from spring at SA-15

Photo 79
Side of second excavation that hit another pit at SA-15

Photo 80

Side of second excavation that hit another pit at SA-15 with house in background

Photo 81
Petroleum in an re-excavated pit during the rain at SA-53; pit was previously remediated during the RAP

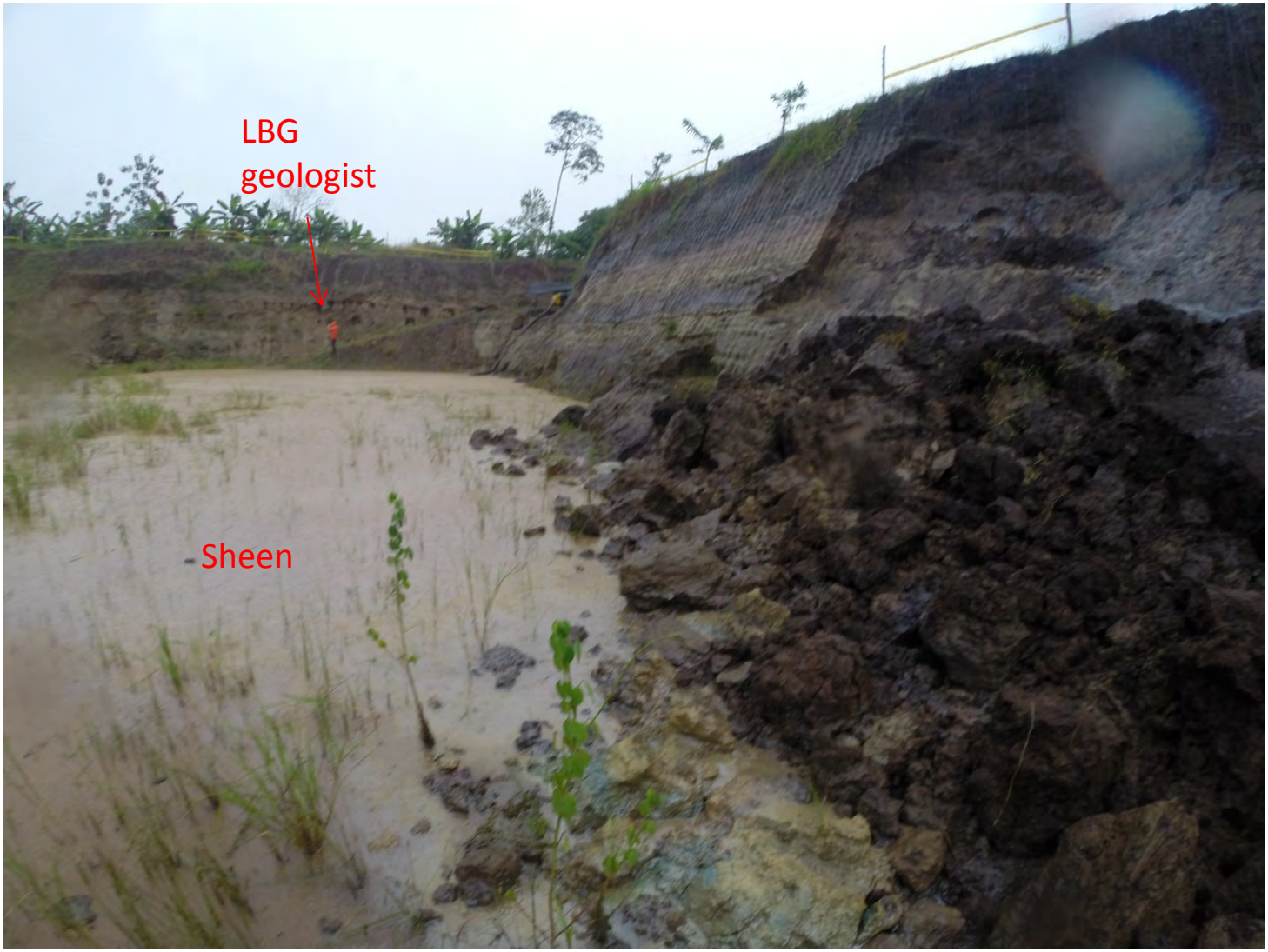

Photo 82

Petroleum sheen emanating from native soil in excavated pit during rain at SA-53

Photo 83

Ongoing remediation (>3 years) of Texpet “RAP remediated” pit at SA-54; sheen is observable on water

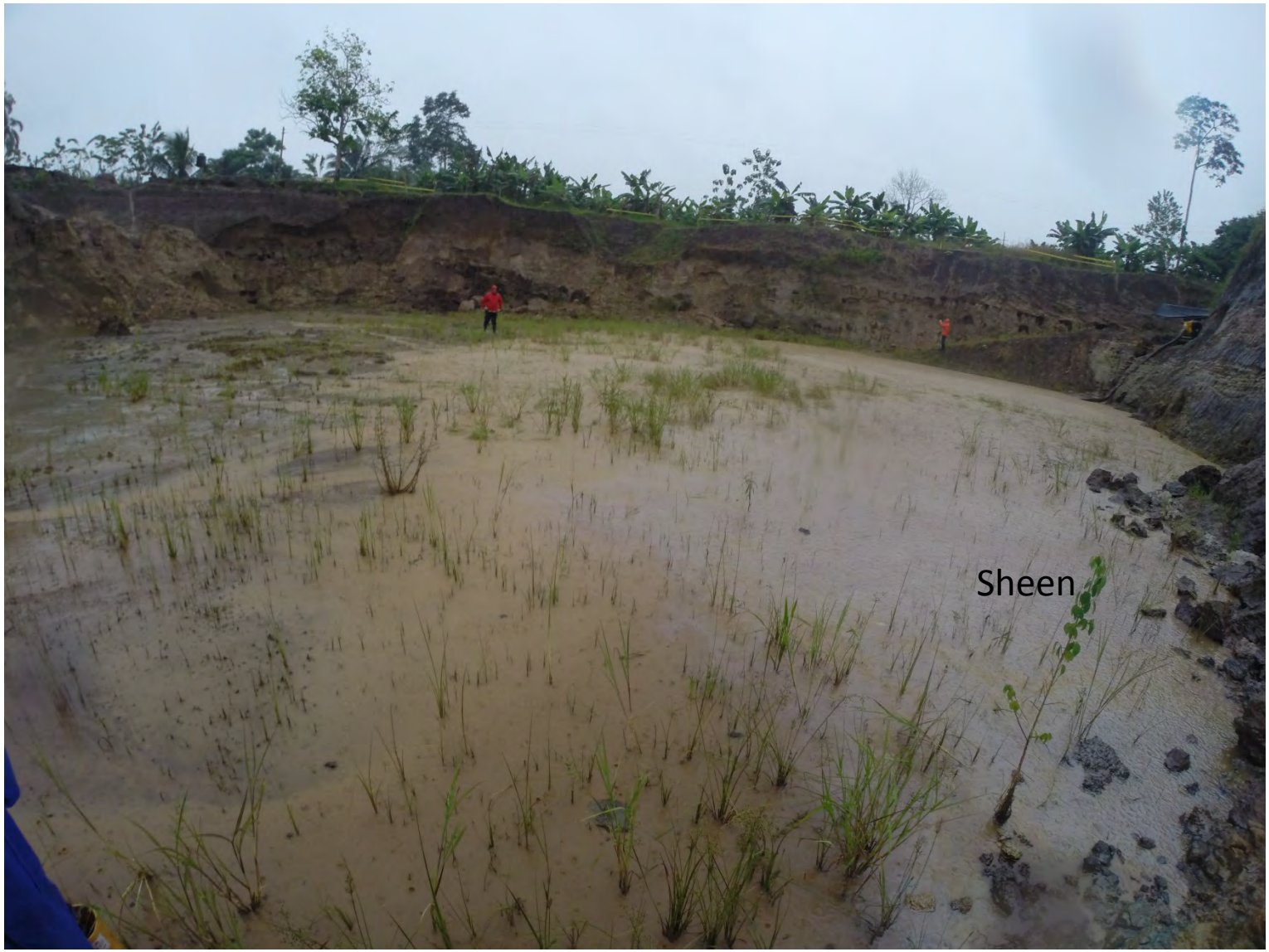

Photo 84
Groundwater flowing into excavated pit with sheens on water at SA-54; hose connected to pump used to dewater the pit is in the foreground

Photo 85
Ongoing remediation (>3 years) of RAP remediated pit at SA-54; sheens on water surface emanating from soil

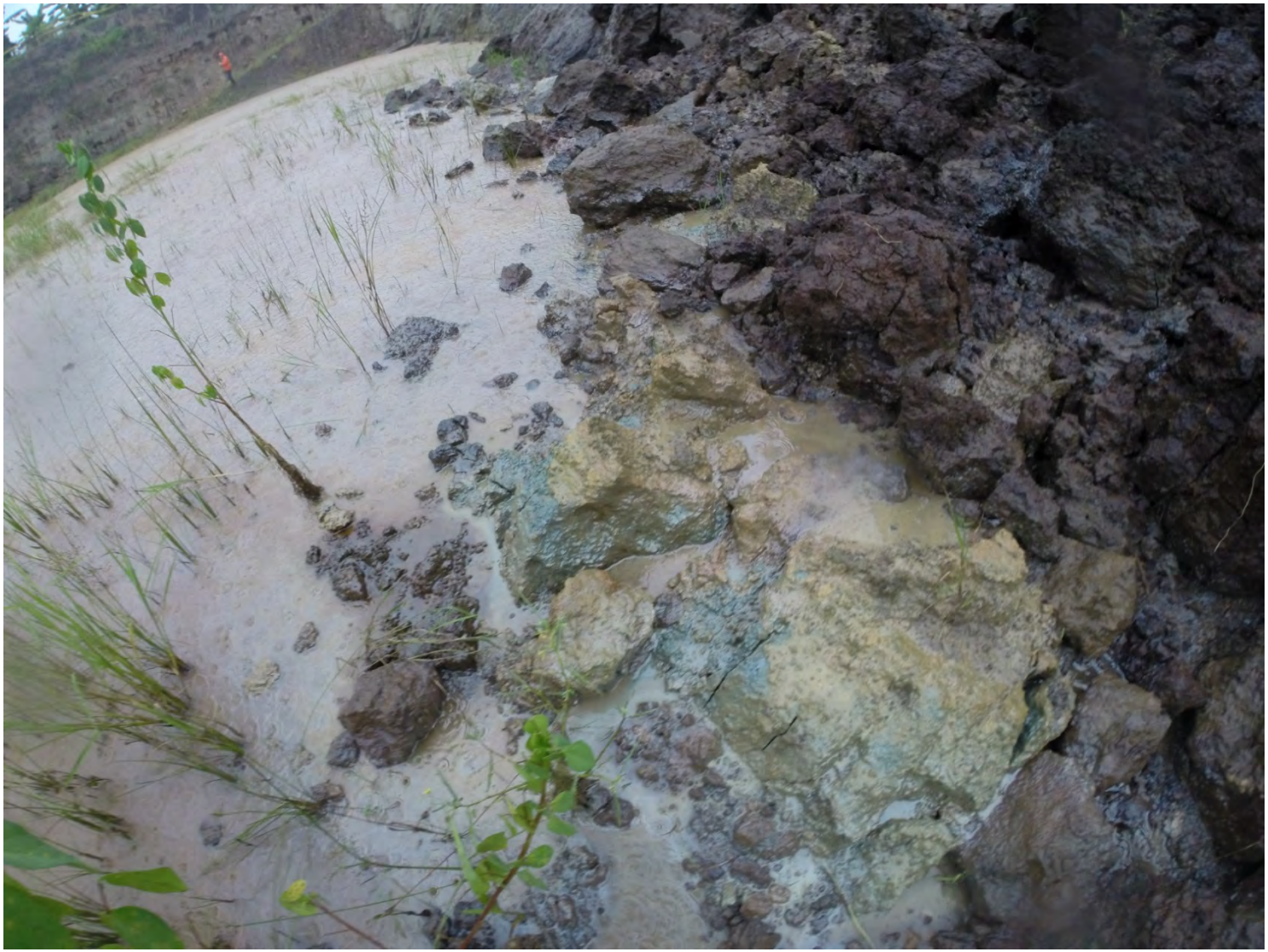

Photo 86
Ongoing remediation (>3 years) of RAP remediated pit at SA-54

Photo 87

Oil on stream being remediated by PetroAmazonas at SA-86; oily sediment was exposed after the stream bank was stripped away

Photo 88

Oil on stream and oil contaminated sediment being remediated at SA-86

Photo 89

Stream remediation overview at SA-86. Stream water is diverted to oil-water separators before being discharged downstream

Photo 90

Exposed dark black sediment contains obvious petroleum impacts at SA-86

Photo 91
Looking downstream over stream remediation

Photo 92
Looking farther upstream from middle of remediation at SA-86

Photo 93

Stream remediation showing exposed contaminated sediment at SA-86

Photo 94
Looking upstream from bridge at SA-86

Photo 95

Petroleum sheen in an undocumented pit with a PID reading of 97 ppm at SA-56

Photo 96
Oil seep at undocumented pit at SA-56

Photo 97
Hard asphalt under plants at SA-56

Photo 98
Petroleum sheen in creek adjacent to piling foundations at SA-89

Photo 99
Petroleum sheen on degraded stream at SSF-42A

Photo 100
Degraded stream adjacent to remediated pit at SSF-42A

Photo 101
Bats in a culvert for the degraded stream at SSF-42A

Photo 102
Small soil-filled (buried oil) pits at AU-24

Photo 103
Soil covered but un-remediated pit at AU-24, next to school

Photo 104

Un-remediated pit full of water used by local residents at YU-06, house in background

Elevated PID readings were measured in the sediment from this pit

Photo 105
Un-remediated oil (oil on water) pit SSF-Suroeste Production Station

Photo 106
Tip of digging bar was black from oil at SA-85

Photo 107
Showing depth of cover (<0.5 m) and oil at SA-85

Photo 108
New wood mill over pit at SA-6

Photo 109
Plants for PetroAmazonas remediation/revegitation projects

Photo 110
Pit 1 crude oil at CH-01

Photo 111

Pit 1 crude oil at CH-01; plants are growing on leaf litter covering 1 meter thick layer of oil

Photo 112
Oil in pit 1 at AG-04

Photo 113
Drainage pipe (siphon) on the pit side at AG-04

Photo 114
Crude oil leaking from undocumented pit at AG-04

Photo 115
Community water well next to wetland with petroleum sheens and elevated PID measurements at AG-08

Photo 116

Oily groundwater seep at AG-02 – TPH_{e8015} analysis of a sediment sample collected here detected 31,310 mg/kg

Photo 117
Smear from oily groundwater seep at AG-02

Photo 118

People washing clothes and playing in a stream where petroleum drains at AG-02

Photo 119
Oil in soil

Photo 120
Remnants of old spill at SSF-37

Photo 121
Laundry area at SSF-37

Photo 122
Unremediated Pit 4 at YU-05

Photo 123
Unremediated Pit 4 at YU-05

Photo 124
Remediated Pit 3 at YU-05

Photo 125
Oil contaminated soil

Photo 126
Oily sediment and water

Photo 127
Oily sand that smells strongly of oil from YU-02

Photo 128
Sheen in footprint at YU-02

Photo 129
Oil from stream on leaf

Photo 130
Cattle by pit berm at SSF-04

Photo 131

Oil droplets and blebs in water and sediment

Photo 132

Oil contaminated sandy sediment in stream at LA-02

Photo 133
Small un-remediated pit exposed in sand pit at SA-65

Photo 134

Oil contaminated sand beneath un-remediated pit exposed in sand pit at SA-65

Photo 135

Sheen emanating from excavated soil at Dureno 01