

"A River of Death"

How oil pollution is impacting health and livelihoods in conflict-affected north east Syria.



Colophon

June 2020

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Authors	Wim Zwijnenburg and Yifang Shi
Contact	zwijnenburg@paxforpeace.nl
Images	Abdullah Mohammed
Graphic Design	Frans van der Vleuten
Editor	Neil Hauer
GIS Analysis	Yifang Shi

We are grateful for the help and support of: Our partners in north east Syria PEL-Civil Waves for conducting interviews and contribution to this report, Twitter user Samir @obretix, Sinergise's Sentinel Hub, Planet Labs, Peter Schwartzstein, Abdullah Mohammed, Vedeng News Agency, Marjolein Wijninckx, Benoite Martin, Maha Yassin Alghareeb, Brittany Roser, Ian Goodacre (RSK Consulting) & Skye Boag.

Cover photo: The Wadi Rmeila flows through the oil fields in north east Syria. Small creeks coming from the Gir Zero Oil Facility are connected to this river and are used to dump crude oil and waste products. April 26, 2020 @Abdullah Mohammed

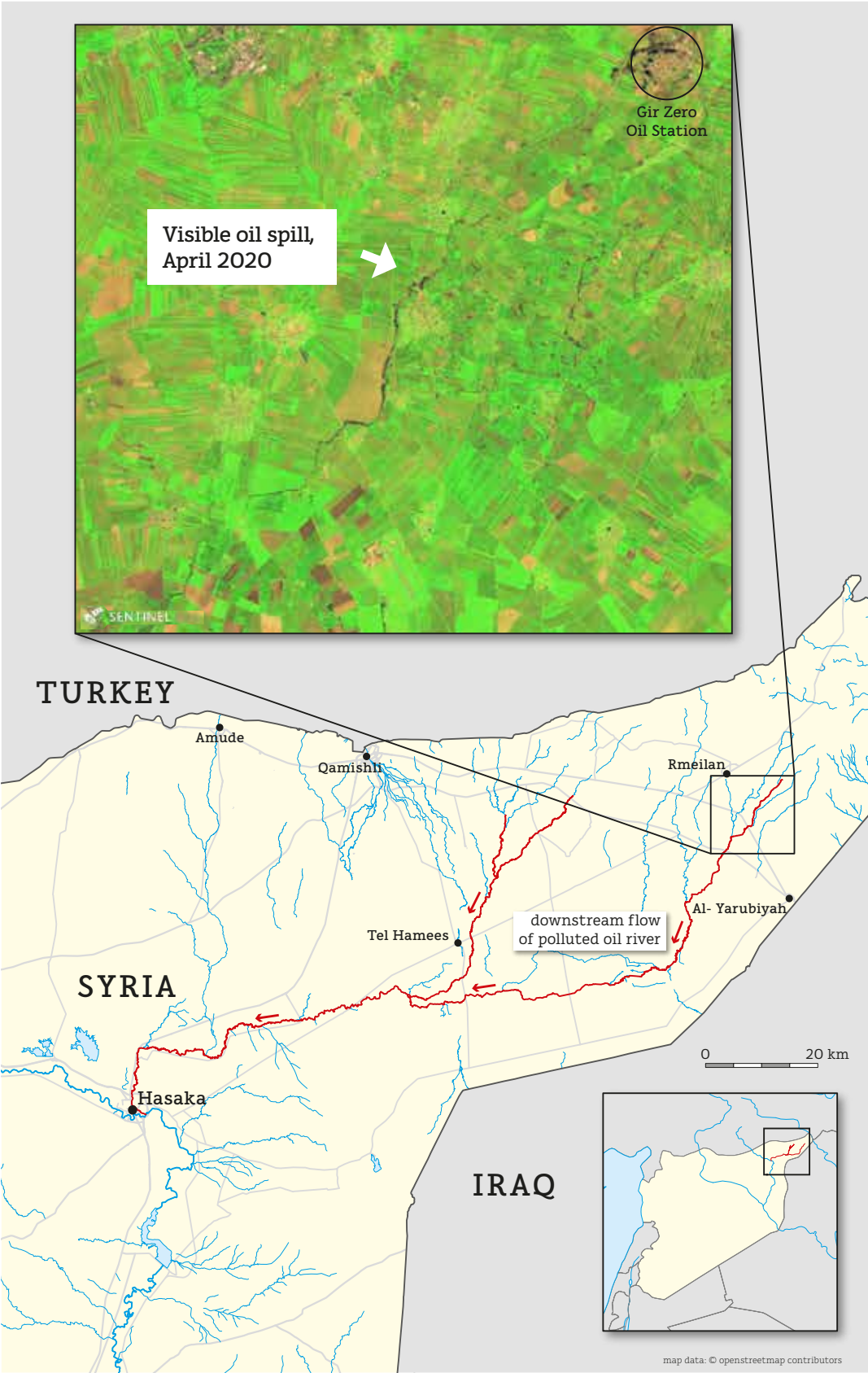
This report was made possible with financial support from Development and Peace Canada.



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Overview polluted oil river, north east Syria



1. Introduction

It was a sunny day in March when crude oil began to gush through a tiny village in northeastern Syria. The tar-rich black stream slowly oozed across roads, through fields and into houses. By the time locals realized the scale of the disaster, the damage was done. For many of these people, oil pollution from the large oil storage tanker facility at nearby Gir Zero was already an all too familiar threat. Small streams of oil waste were meandering through the landscape and clouding their communities with a thick, pervasives tench. But in recent years, unusually fierce rains and a further deterioration of the oil infrastructure have inflicted unprecedented damage on the area's waterways. PAX and its local partner, PEL- Civil Waves, have documented the impact of these spills on the health and environment of the communities that depend on these water resources. Using environmental visual investigation techniques through satellite imagery, open-source information, photos from local sources and interviews with residents in villages along the polluted river, we highlight how conflict-driven oil pollution has combined with weakened environmental governance to destroy lives and livelihoods in this energy-rich part of Syria. This is a story of how dependency, infrastructural neglect and an economic blockade have led to debilitating 'conflict pollution' in communities that are unlikely to see any relief or assistance any time soon. Even after much of the fighting has relented in this part of Syria, civilians still face toxic violence of a different sort.

Absent priorities and a neglected environment

While Trump is claiming the oil fields of eastern Syria and Russian patrols are trying to gain access to this area, Syrian civilians in this part of the country are struggling with the polluted fallout of the oil production creeping through their backyards. Recent leaks in oil pipelines from the Rmeilan oil fields, under control of the Kurdish-led Syrian Democratic Forces (SDF), resulted in renewed pollution as crude oil and oil waste ended up in the surface water, flowing through creeks and rivers in this region, all the way down to Hasakah city, where it ends up in the Jaghjagh and Al-Khabour rivers. Recent remote sensing research indicates¹ that these rivers already face severe environmental pollution from dumped industrial and household waste and wastewater from agricultural practices, including pesticides.

The 160 km-long small river meanders south-westwards through the lush agricultural rich areas that form part of Syria's famous 'bread basket'. Close to a hundred tiny villages and towns are located along its river beds, providing water sources to the farmers and the many sheep roaming the landscape.



Oil waste flows from a broken pipeline at Gir Zero Oil Facility, April 26, 2020.

In the north east corner of Syria, the local authorities of the Autonomous Administration of North and East Syria, dominated by the Kurdish Democratic Union Party (PYD), are relying on the oil to keep the region afloat. The oil fields² under their control in Rmeilan are still pumping up heavy, sulphur-rich crude oil, albeit at a lower rate than prior to the conflict, roughly 15-20,000 barrels a day. But the Syrian war left a heavy toll³ on the capacity to store and refine the oil, with damaged storage tanks, crumbling pipelines and makeshift refineries⁴ spitting up flames and fumes over the green fields.



Dark clouds from burning oil waste rise up at a makeshift refinery near the village Al Qarrayah, north east Syria. May 7, 2020.

Through open-source investigation, remote sensing and local partners, this research demonstrates how the years-long pollution of the river has serious health and environmental implications for the thousands of Syrian families spread across 200 communities living along the riverbed, affecting tens of thousands of hectares of agricultural lands and bringing severe risk to drinking water sources through groundwater contamination, as well as potential effects on livestock. The continued leaks, spills and storage problems are contributing to slow and toxic violence⁵ in Syria, as local communities fear for their health and future.

Environmental pollution and health risks from oil products

The impact of oil pollution on the soil and water sources on health and ecosystems can be long-term and far-reaching. There are several relevant factors for quantifying the risks, including the type of oil, the type of soil, local geological conditions, the groundwater level, and possible avenues of exposure to oil products for both people and livestock.

Crude oil and its by-products contain polycyclic aromatic hydrocarbons (PAHs), monocyclic aromatic hydrocarbons (MAHs), and heavy metals that are known human carcinogens. In order to determine the human health risk through, what is called in risk-assessments, the source–pathway–receptor, detailed information is needed on the specific environmental conditions and oil characteristics. The health of people living nearby can be affected through ingestion, inhalation or skin contact with oil and oil waste products in the water, soil and air.⁶ In particular, the continuous flow of oil over the last several years in this area risks contaminating groundwater sources⁷, which are also used for drinking water as every town and village is using water wells. Communities also have livestock such as sheep and goats that eat the vegetation and drink the water, and as such, are at risk of contamination and forming an exposure pathway for people from consumption of dairy products and meat. At the time of writing, specific information on the type and level of groundwater and locations of wells is not available, but this should be included in any future risk assessment.

2. Methodology

Throughout the monitoring period of March to June 2020, various open-source tools provided insights in the scale and intensity of the pollution problems. Open-source reporting by local news agencies and messages posted on social media provided locations of potential spills. We used searches in both Arabic and English with relevant keywords for 'petrol', 'oil' and names of areas and villages, as well as reports from various international organisations and humanitarian groups working in this area.

We also used high-resolution satellite imagery, obtained either Google Earth Pro, ESRI Maps or provided by European Space Imaging, all courtesy of MAXAR. Medium resolution imagery from Planet Labs satellite constellation was also used, both in true-colour and Near-Infrared composition for contrast with healthy vegetation. For larger areas, we used NASA's Landsat 8 and ESA's Sentinel-2 imagery to analyze affected flooded areas. To identify oil contamination, we applied experimental methods developed by researchers with different colour bands. We first calculated the normalized difference water index (NDWI) from Sentinel-2 imagery using equivalent $(B8 - B11)/(B8 + B11)$; secondly, we eliminated the vegetation- and land-covered area by removing areas where the NDWI value was higher than 0.5; then we combined the threshold of NDWI and the ratio $B2/B11$ to ultimately determine the total oil-polluted area ($NDWI > 0.5$ and $B2/B11 > 13$).⁸ Though we should apply a disclaimer for the results, as this is merely an attempt to utilize Sentinel-2 for calculating potential oil contaminated land, and the results are not verified on the ground. Lastly, we used Sentinel-1 Synthetic Aperture Radar (SAR) to look at flooded land in various locations if cloud coverage from other sources hampered visual imagery.

This report is part of a wider research project PAX is undertaking in north east Syria to understand the wider environmental health risks born from the armed conflict. The research will dive further into the wider problems with the oil industry in Hasakah and Deir ez Zor, as there are many areas affected by oil spills from refineries, oil storage facilities, broken pumping jacks and makeshift refining. There will also be a focus on solid waste management, agriculture, water and other environmental topics of concern. In our follow-up work we will include a cross-section of voices from different communities and have a balanced gender representation in our consultations, as each group is affected differently by the problems related to conflict-pollution and environmental degradation.

3. A History of Pollution

Understanding the scope and impact of oil pollution in this part of Syria required identification of the sources of oil flows, the ways of downstream river flows, the numbers of communities near the rivers and where the oil was flowing towards. With the help of remote sensing and local sources, we documented the source and the history of spills and other incidents that continue to contribute to pollution of rivers and lands.

The Source

Roughly 15km southwest of Derik, or al-Malikiyah as it is known in Arabic, a large oil storage facility, previously owned by the Syrian Petroleum Company, collects all the crude oil coming from the Suwaydiyah (also known as the Jazeera or Rmeilan) oil field. Under ideal circumstances, the facility can store up to 2.4 million barrels of oil, according to experts from renowned oil tracking website TankerTrackers.com we consulted for this report. But the story on the ground is far from ideal. The looming environmental disaster started early on after the outbreak of the conflict in 2011, when the Kurdish-led PYD took over most of the area from the Syrian regime and later established the Autonomous Administration. Using satellite imagery from NASA's Landsat 8, in orbit since February 2013, we can see that the facility struggled with containing oil waste in summer 2013. Open-air reservoirs were expanding on the perimeter in July and August 2013.



Soon after, however, the reservoirs began to leak, and a significant part of the facility's grounds turned black as oil and/or oil waste spilled over. LANDSAT 8 and MAXAR satellite imagery from Google Earth Pro shows that a canal was dug from the southwest side of the oil facility to connect with a local river sometime in September 2014, as crude oil spills from leaking ponds were rising on the facility grounds. This likely functioned as a sort of valve to release the pressure from on-site spills, as local authorities did not have sufficient resources or capacity to deal with the problem. Sentinel-2 satellite imagery visually confirms oil flowing from the site in December 2015, though smaller, less visible releases of crude oil or oil waste could have occurred before that date. Google Earth Pro high-resolution imagery was used to clearly show the constructed canal.



Oil waste flowing through a creek from Gir Zero's oil facility. April 26, 2020.

The rivers

The oil waste and crude ended up in the small creek at the west side of the facility, which flows southwards, as visible on the earlier image. This creek flows into the Wadi Rumaila, a tributary of the larger Wadi Awarid seasonal river. Since the outbreak of the conflict, concerns over river pollution from solid waste and oil have been a recurring problem in humanitarian response planning. For example, in 2014, a needs assessment by ACAPS, based on open-source reporting, already reflected these concerns:⁹

“A percentage of crude oil has also been refined by primitive methods which produce low-quality gasoline and diesel fuel. These primitive methods and lack of safety precautions carries a high risk of explosions and are expected to lead to dangerous soil and water pollution”

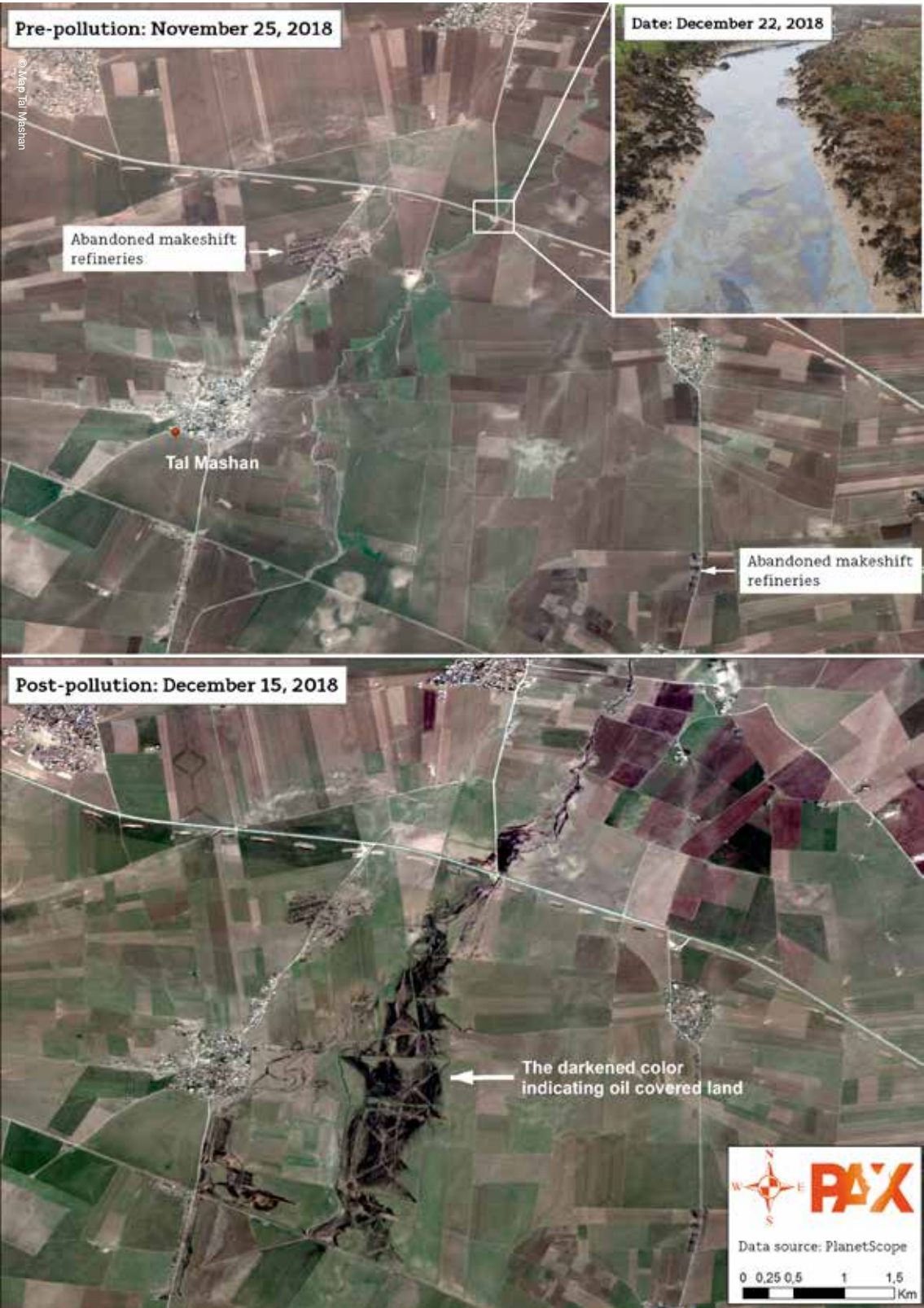
These problems were also documented by local media. In March 2018, Smart News reported¹⁰ concerns from citizens living at Tal Hamis, roughly 70km downstream from the Gir Zero facility, that oil coming from this and other oil facilities near the city of Qamishli were flowing downstream, polluting the river and the local environment.



Oil waste can be seen in the al-Rad valley. Residents in the city of Tel Hamis suffer from environmental problems that harm civilians' health and economy the oil waste pumped into the economically important al-Rad valley. Hasakah, March 15, 2018

Large clusters of makeshift refineries north of Tal Hamis that are still operational today are blamed for dumping oil waste in nearby rivers, causing downstream water pollution. PAX visited these clusters of refineries in November 2018, and could confirm the ongoing problem with lack of proper oil waste management at these clusters. Based on our remote sensing analysis of makeshift oil clusters in these areas, there are still at least over 300 makeshift refineries operational, spread over at least a dozen clusters. In 2017, the Autonomous Administration closed down thousands of these refineries due to ongoing community concerns over health and environmental concerns, with only a limited number of clusters still operational to provide benzine, gasoline and diesel for the local market.¹¹

The oil waste continued to affect the local environment throughout these years. A major incident occurred in December 2018, which we have detailed in our Bellingcat article ‘Heavy Rains in Hasakah’¹², showing how the flooded, oil-contaminated creek polluted large swaths of agricultural land in Rmeilan.



The Seasonal floodings

Flooding continues to have a huge impact on the local civilian population, displacing thousands of families and affecting crops and agricultural land.¹³ The International Federation of the Red Cross (IFRC) put out an emergency appeal in April 2020 addressing these concerns, warning in particular of the impact in the areas with oil operations. According to the figures released by the IFRC, over 85,000 acres of agricultural land around Tel Hamis has been flooded, 20,000 acres at Jezaah and 10,000 acres in Rmeilan, noting that that oil pollution was a major concern for WASH services.

“A WASH assessment was completed, and results analysed by SARC’s Al-Hasakah branch and SARC’s headquarters proved contamination of crude oil into water sources. (...) In the third week of April there was further destruction of houses, farmland and road infrastructure resulting from the high water levels which submerged farmland, caused overflows of rivers and contamination of the soil with oil, particularly in Tal Hamis”¹⁴

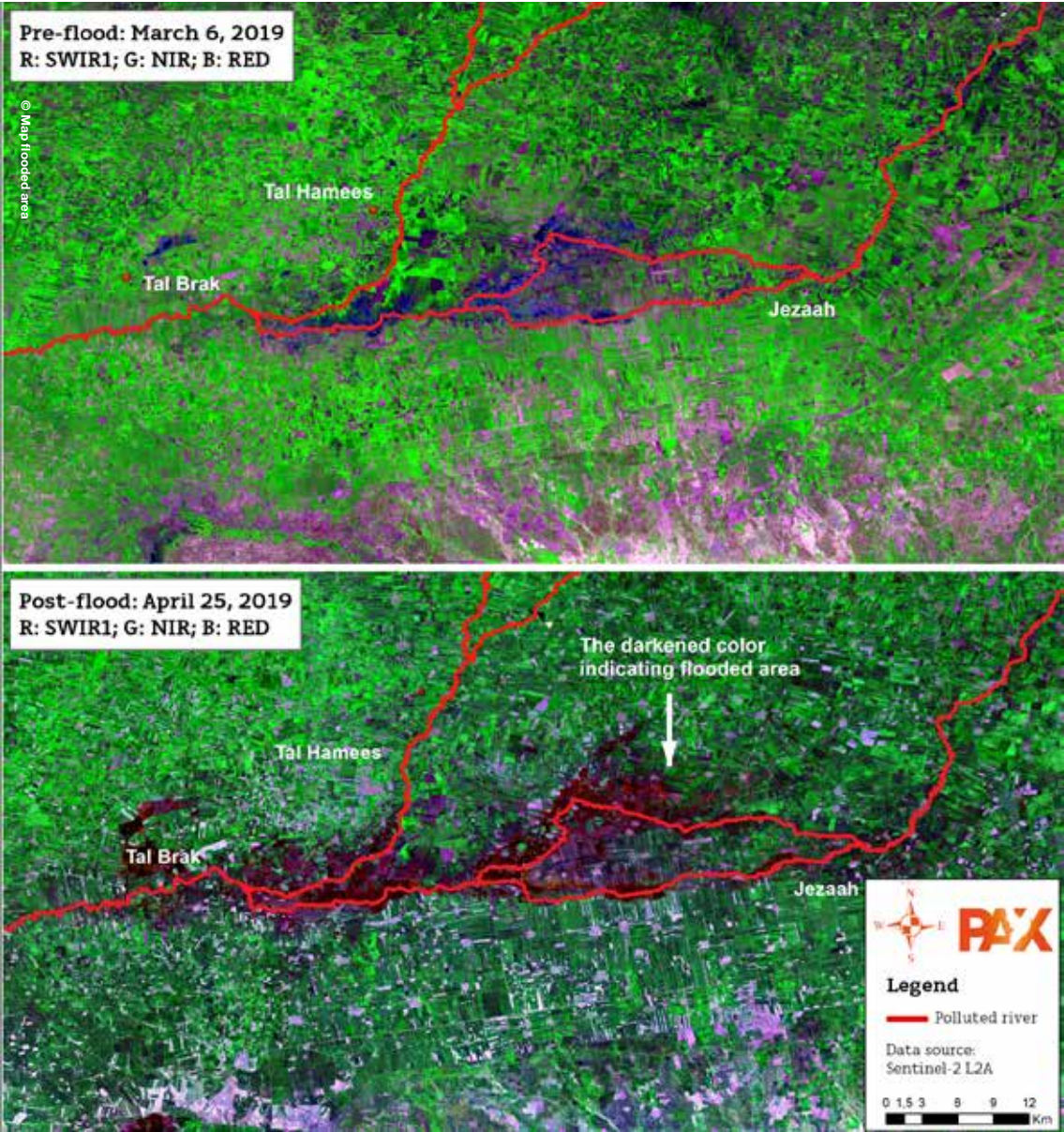
As part of their WASH response, the IFRC distributed aquatabs, jerry cans for clean water and family hygiene kits to 4000 families as a result of the oil contamination in Tal Hamis alone, and a total of 29.500 in all areas of operation, serving close to 130.000 people.

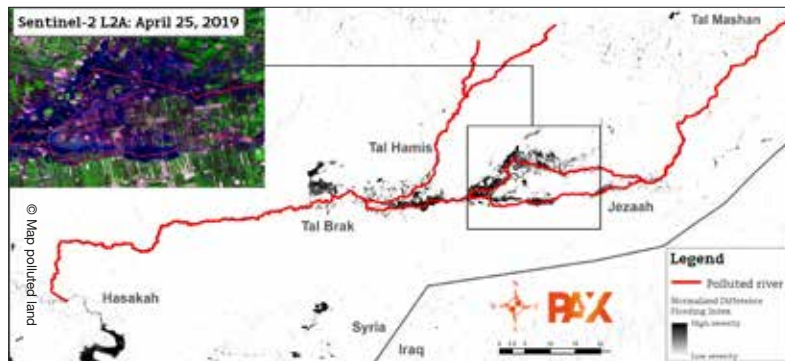
Local reporting helps to underscore the seriousness of the oil pollution that affected farmers and their families. In one video by Syria TV¹⁵, local farmers from the village of Jeezah describe how rising water levels flooded their lands along the riverside, negatively impacting their cumin, wheat and lentil crops.



Crude oil flooded over agricultural lands near Jezaah, north east Syria. Screenshot from Syria TV news item, April 10, 2019

The footage shows films of oil on the water that flooded the land. We used satellite imagery to look at the flooded area in this region, both the optical Sentinel-2 images and Synthetic Aperture Radar (SAR) imagery form Sentinel-1, which gives the following result of the flooded area and the potential oil remaining on the land. Based on analysis of Sentinel-2 imagery from 25 April, 2019, around 71.9 km2 of land was flooded along the river, with 19.3 km2 of this was potentially contaminated by oil.





The village of Jeezah, where the video interview was shot, is located near the Iraqi border in the southeast part of Hasakah, and north of Mount Sinjar. The flooded area near the villages is also clearly visible on Sentinel-2 imagery, with a False Colour Index showing vegetation and an inset image from Planet Labs highlighting oil on the banks of the river.



Fortunately, there is also high-resolution imagery of this area, as ESRI has uploaded a tile from MAXAR (dated May 27, 2019) in their online maps section. This date was verified with preview imagery from MAXAR's acquisition systems. For comparison, an image from Google Maps, dated October 24, 2013 was used for contrast. The high-resolution image clearly shows the flooded land, along with what indicates to be loss of soil during the process of oil removal.



The Spring 2020 oil incident

A new wave of crude oil flooded the fields and villages in Rmeilan following an incident in late March 2020, reported by a local news agency.¹⁶ An apparent explosion in a corroded pipeline system resulted in a significant oil spill into nearby rivers, contaminating agricultural land over a wide area and flowing into the nearby village of Kharab Abu Ghalib. The size of the affected area is visible on satellite imagery. Sentinel-2 imagery, with a false colour index for contrast, shows the spill coming from north of the village, where the pipeline rupture likely occurred.



PAX was provided with 40cm high-resolution satellite imagery by the European Space Imaging (dated April 17, 2020), showing the spill at the village of Kharab Abu Ghalib and blackened riverbanks flooded with crude oil. A smoke cloud indicates that local residents tried removing the oil by burning it.



We calculated that the land affected by the oil spill in this area alone totaled 18,000 m², though this likely to be a fraction of the total amount. Contamination from the spill continues to pose a health hazard to local communities and livestock and requires effective clean-up to prevent long-term environmental damage.



Oil flooded lands in the village of Kharab Abu Ghalib. April 17, 2020

4. Community Concerns over Environmental Health Risks from Oil Pollution

Soon after the spring 2020 incident occurred, a local reporter visited the town to document the oil pollution and talk with villagers over their concerns. In this video, which can be seen on the Facebook page of Vedeng, a regional news agency, the villagers explain how oil pollution is an ongoing problem that they have addressed with the local municipality and that the current spill was caused by an explosion of an old pipeline. The authorities sent aid, but didn't have the capacity to properly clean up and remediate the area, and so left the oil waste. One man tells how they feel that local people's lives have no value. "We asked for a solution, in particular now that the coronavirus is going around. They asked us to wash our hands and houses, but the street became more dangerous than the virus. The oil causes thousands of diseases. Our children cannot go out and we cannot sleep because of the smell and waste caused by the oil."¹⁷

To better understand the consequences, PAX asked a local photographer to document the spill at the villages and refinery, and our local partner PEL- Civil Waves interviewed local residents about the spills¹⁸. A disturbing picture emerges of desperate people living in a toxic and polluted environment, but with no place to go.

Jaber Hussein is a 21-year old truck driver, who lives with his family in the village of **Kharab Abu Ghalib** for his whole life. He describes how the river has been polluted with oil waste discharge coming from the Gir Zero facility for years, even before the conflict, but then the Syrian government managed to put a stop to it and started reusing the oil waste instead of dumping it, and the problem seemed solved. But this was only for a short period: after the war broke out, polluted wastewater began being dumped in the river again. During heavy rains, this contaminated water floods the land.

Hussein and his friends documented the spills and tried to raise awareness of the spills, but have had little success in getting attention for the problems and to find a solution. He feels his future is bleak.

"Today, as a young man, I am looking for a better future to live and start a family, but I am struck by the fact that I will not be able to live in the village, even though I own a house in it, for fear that my family will get sick from this pollution. [The pollution] means there are few opportunities to invest in farmland in the village, so I am forced to look for work elsewhere. Today I feel desperate; I have no future."



Oil waste is flowing into the Wadi Rmeila river near the village of Se Gira, in the Rmeilan oil fields. April 26, 2020

South of his village is the town of **Tal Mashan**, where Ibrahim, a 35-year old teacher, lives with his family. The agricultural area east of the village was hit with oil spills in December 2018, as documented earlier in this article. He tells us how pollution has always been an issue in this area, but that over the last two years the situation has worsened due to contaminated water from the Gir Zero facility. Heavy rainfall flooded the land with oil waste, rendering the harvest in these years useless. The flooding can spread oil as far as one kilometre from the river's banks.

His wife fears illnesses from the pollution; the couple has already had many miscarriages and knew of other miscarriages in the villages too, which they think are connected with the pollution. Locals have begun referring to the Wadi Rumeila river as the 'River of Death', a reference to the health issues its contaminated waters are suspected of causing in the more than 30 villages it runs through.

"Like most villagers, I live in constant fear of the impact of this pollution on us. If I had the chance to live somewhere else, I would not hesitate to leave this place immediately."

Local residents are worried about the health and environmental effects of the oil industry on their health. Prior to 2017, there were thousands of makeshift oil refineries in use throughout the region. People organized protests in the streets and on social media against these refineries, expressing fear for their health and the environment and called for closing them down. But as Ibrahim tells us, "there are still a lot of them in the neighbouring villages. The smoke covers a huge distance, sometimes up to 30 km, and the sky is often covered with black clouds." These wells do not only affect the local human population: Ibrahim says he sees their effect on the livestock, as the sheep's wool is turning black and chickens have begun to lay eggs with darkened shells, something not seen before.



A young boy is herding sheep near the village of Kharab Abu Ghaleb near the oil-polluted stream. April 26, 2020

Another local resident in **Tal Mashan**, 30-year old teacher Yasser Mahmoud al-Ali, corroborates Ibrahim's story. Between oil pollution in the river and air pollution from the refineries, life in the town has become almost unbearable, in particular during the hot summers as the smell and smoke forces people to stay inside.

Al-Ali is dependent on the land as a farmer, having also invested a large amount of money in it:

"In the past, this land was considered the best because it was the closest to the river. But last year we stopped irrigation due to the pollution of the river with toxic materials from oil refining. The past two years, the region was exposed to a wave of torrential rains that caused the river to flood severely, up to a kilometre from the banks, which destroyed all my agricultural crops during the years 2019 and 2020. The soil on this land has been contaminated by oil and I will no longer be able to cultivate it in the coming years."

Al-Ali said that he was once considered a wealthy man, able to support his family, but he has now given up farming and taken a teaching job to pay off his debts. He goes on to say that there are likely contaminated wells in the village that people still use but the water has not been tested, and there are no alternatives.

The 'black gold' flowing through their villages is a scene residents are used to, as the seasonal rains flushes the oil waste further south through the rivers and creeks in this part of Hasakah province. South of Tal Mashan is the tiny village of **Al-Dardara**, where Bashir al-Majdal, a 60-year old teacher, has been living his whole life. He reminisces of the old days when the village was built and was considered one of the region's most beautiful. Approximately 1,500 hectares of wheat were planted using irrigation from the rivers, and the village used water pumps to flow the lands. But soon after the establishment of the Rmeilan Oil Company about 40 years ago, industrial waste began polluting the river, causing farmers to avoid using it, says al-Majdal. The village's drinking water well was only 150 metres from the river, and tests showed it was highly polluted and not suitable for consumption. The

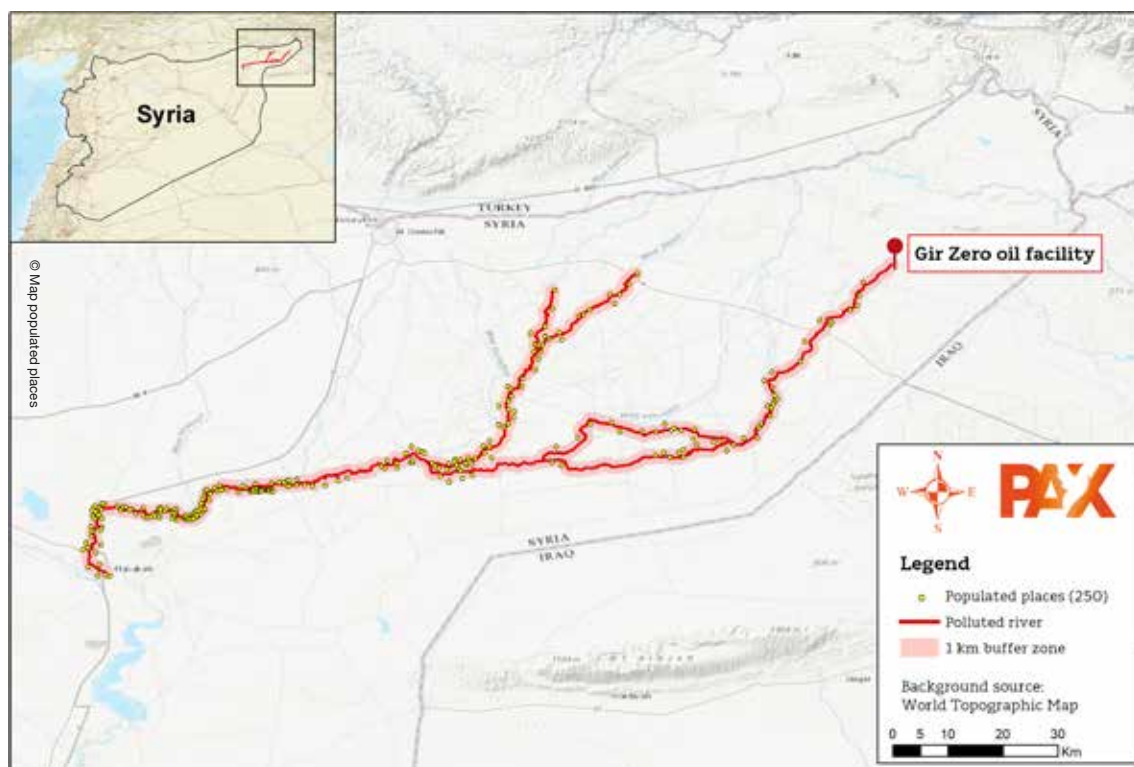


Sheep are grazing on the oil cover riverbank near the village of Kharab Bunyan, April 26, 2020

Rmeilan Oil Company dug another well, 100 metres deep and a full kilometre from the river, but al-Majdal says it still has a noticeably polluted taste”. But they have no other choice. Now, the majority of the 100 families in the village suffer from health problems, ranging from cancer and skin diseases to leishmaniasis. “Oil spills are the biggest problem in our region, because they directly affect our health,” says al-Majdal.

No solution in sight for Syrian civilians

Ongoing problems with a broken oil industry continue to put the lives, livelihoods and future of people in northeast Syria at risk. Through this visual investigation and on-the-ground verification, we have shown that an antiquated oil facility capable of storing 2.4 million barrels of crude oil and crumbling associated infrastructure continues to cause pollution incidents that directly affect the health of local people. Oil spills are polluting the entire 160km-long river, and seasonal floods spread the oil into agricultural areas, affecting both the income generation and food security of farming communities. Our current numbers indicate that up to 20km² of land may have been affected by the crude oil spills in 2019 alone. The river pollution itself may affected tens of thousands of people, as there are roughly 250 towns, villages and small settlements in a 1km radius from the 160km long river, based on data from UNOCHA and additional earth observation through satellite imagery.



The remaining oil waste can also affect livestock grazing in these areas and ground water resources, which will likely have long-term consequences. According to local sources, this is already impacting the quality of drinking water from local wells.

Furthermore, the polluted river feeds into the larger Jaghjagh river, worsening the already troublesome quality of the water of that river due to the dumping of household and industrial waste over a much larger area.

5. Environment, Peace and Security in Word and Deeds

Addressing the impact of conflict pollution and responsibilities for clean-up and remediation of conflict-polluted areas is underrepresented in many conflict analyses and reconstruction programs. This is particularly the case when the pollution is not the result of a direct attack by a warring party. The UN Environment Assembly's 2016 and 2017 resolutions 2/15 and 3/1 dealing with protection of the environment in armed conflict¹⁹ and conflict-pollution²⁰ call upon states to "support, where appropriate, the development and implementation of programmes, projects and development policies aimed at preventing or reducing the impacts of armed conflicts on the natural environment" (2016) and "[s]tresses the importance of preventing the pollution of rivers and water reserves with harmful substances as a result of armed conflict or terrorism," as well as urging "all States affected by armed conflict or terrorism, to encourage all actors at the national level to participate in the preparation of the national plans and strategies aiming at setting the priorities for environmental assessment and remediation projects" and calling for better data collection for health and risk awareness (2017).

The UN is limited in its ability to address issues in these areas, as the UN Environment Programme can only do an environmental assessment on the request of an affected government and with sufficient funding made available for this type of work. As this area is not under control of the Syrian government, UN agencies are not permitted to operate in the area. However, this should not stop other actors or donors in searching for opportunities to make preliminary environmental assessments, including identifying and addressing pollution in collaboration with relevant local authorities and/or international and local NGOs and local communities. Questions remain under international humanitarian law as to who is liable for environmental pollution, as was discussed by the International Law Committee in its Draft Principles on *'Protection on the Environment in Relation to Armed Conflicts'*.²¹ Unfortunately, the role of non-state armed groups, a category which includes the local Autonomous Administration and the linked SDF, was not properly addressed in the ILC's Draft Principles.²²

Further questions remain regarding liability for environmental damage and its subsequent consequences by both non-state armed groups and corporations in (post) conflict settings. Applied to the situation in Syria, this is further complicated by the unclear ownership status of the Gir Zero oil facility: primarily, whether it is still controlled by the Syrian Petroleum Company with tacit support of the Syrian government, that has a local expert still working there, as was the case with other critical infrastructure such as dams and power-plants in non-regime controlled areas, or is fully under control of the Autonomous Administration? If it is the latter, what are their responsibilities to deal with the oil pollution and remediation of affected areas?

Regarding reconstruction and remediation efforts, there are limited options. A blockade of a resolution by Russia and China in the UN Security Council to open the border crossing with Iraq hinders UN humanitarian support to northeast Syria.²³ Turkey has labelled the PYD-led Autonomous Administration a terrorist group, and has closed its border and blocked trade with the area. This seriously limits the potential for repair and reconstruction of local oil infrastructure, ensuring future oil spills and continued environmental damage.



On May 13th SOJTF-OIR forces patrolled near critical petroleum infrastructure near Hasakah. OJTF-OIR forces support the Syrian Democratic Forces in securing oil fields in eastern Syria to deny Daesh access to resources that could allow them to gain strength.

Although on paper the ‘communalism’ ideology²⁴ of the Autonomous Administration states its inspiration as the radical ecology of Murray Bookchin²⁵, the reality is that the Autonomous Administration is heavily dependent on oil revenues for income to pay wages and public services. Hardly any funding seems to be made available to deal with the pollution stemming from dilapidated oil infrastructure, or with the resultant worsening environmental conditions and physical health of local communities. This is exacerbated by limited expertise, equipment and capacity for identification, clean-up, remediation and monitoring.

At the same time, there are numerous other issues the region is struggling with, from solid waste problems to recurring crop fires that impact food security, as well as water security issues linked to the actions of Turkish-backed armed groups, and wider problems due to a rapidly degrading water infrastructure.

The Autonomous Administration's political experiment will face significant pressure from the local population without the ability to restore critical infrastructure and reconstruction efforts. With closed borders limiting the import of equipment and expertise, oil funding going towards paying salaries for both civil servants and the armed forces of the SDF, lack of funding for reconstruction due to sanctions and Turkey pressuring EU states, as well as pressing other reconstruction needs, the options are limited. In the end, Syrians and the environment they live in are left to face the consequences, and already are looking for ways out of the toxic landscape they face on a daily basis, with no sustainable future in sight.



An oil worker at a makeshift refinery close to Tal Hamis, north east Syria. Small cluster of these refineries are still operational, with unsafe working conditions and oil waste often dumped in nearby rivers. May 7, 2020.

6. Recommendations

Based on our research findings, PAX and PEL-Civil Waves have formulated the following call to action to address oil pollution and associated environmental health risk to communities.

To the US-led International Coalition:

- ◆ **Provide capacity and equipment to the Self-Administration to halt oil pollution.** As a significant amount of resources are spent on defeating ISIS and ‘safeguarding oil’, addressing the negative environmental outputs of the oil industry, which the US claims it is protecting, is urgently needed.
- ◆ **Share data on relevant oil pollution-affected areas.** Targeting data from the US-led campaign against oil infrastructure when it was under ISIS control is useful to rapidly identify potential environmental hotspots and help speed post-conflict environmental assessments.

To the international community:

- ◆ **Support data collection and analysis from relevant sources,** including UN agencies, to monitor environmental damage and associated health risks on communities and share this with relevant authorities and international organisations
- ◆ **UN Security Council Member States should authorize** the reopening of the al-Yarubiyah border crossing with Iraq to allow UN aid to northeast Syria to assist remediation of affected areas and ensure specialized humanitarian support to affected communities
- ◆ **Support local civil society to address conflict-related environmental health risks** through risk awareness materials, citizen science tools for identification and monitoring of environmental risks, and sampling of soil and water sources.
- ◆ **Support, where appropriate, the development and implementation of programmes, projects and development policies** aimed at preventing or reducing the impacts of armed conflicts on the natural environment, as called for by UN Environmental Assembly resolution 2/15 (2016) 3/1 (2017).

To the Autonomous Administration of North and East Syria:

- ◆ **Develop plans and strategies aiming at setting the priorities for environmental assessment and remediation projects.** This should include sampling ground and surface water sources, soil and air quality; long-term planning for clean-up of polluted soil and water sources and ensure subsequent monitoring; inclusion of affected communities in the process of developing these strategies to ensure all concerns are incorporated; build partnerships with local civil society groups to ensure engagement of expertise and representation of different groups which to foster transparency and accountability.
- ◆ **Invest in reparation and safe production of oil and gas in areas under the control of the Autonomous Administration.** Restoration and maintenance of outdated oil production and storage is key to preventing leaking and future incidents, and would require additional external expertise. The Administration should reach out to the partners of the International Coalition for financial and practical support in addressing these concerns.
- ◆ **Provide risk awareness training through community outreach on water and soil pollution.** Preventing and addressing health and environmental concerns should be undertaken among affected communities, and the authorities should ensure community groups have a focal point to reach out in case of renewed incidents related to oil contamination.



Two horseman cross the oil polluted river at the village of Al Junaydiyah, Rmeilan. April 26, 2020

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