



Naturvernforbundet
Friends of the Earth Norway

To: EFTA Surveillance Authority
Rue Belliard 35
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Belgium

18.03.2021

From: Naturvernforbundet (Friends of the Earth Norway)

Case number 86194

We refer to the e-mail sent by ESA on the 26th of January, and additional e-mail sent on the 24th of February, granting an extension of the deadline.

In the e-mail of 26th of January ESA presented a list of information and evidence needed for ESA to assess the potential infringements of the WFD by Norway vis-à-vis disposal of mining waste into fjords. Naturvernforbundet has provided this information to the best of our abilities. Some of the information has been available to us as we have collected this information through the years, working with the issue of mining waste disposal into fjords/water bodies. Some of the information requested was hard for us to provide, as answering them requires specialist knowledge. **We have therefore sought the help of the Institute of Marine Research (IMR)¹ on some topics.** We are also awaiting a report from Agnar Kvellestad, Prof. em. veterinary medicine, Norwegian University of Life Science, which also will be forwarded to ESA.

The Institute of Marine Research has agreed to provide further information pertaining to points 2 (specific substances, CAS numbers and PSs), 4 (impact on the water bodies/fjords), 6 (CLP/REACH), 7 and 8. IMR estimated, in an e-mail sent the 16th of March to Naturvernforbundet, that they will finish this work during week 15. This information will then be forwarded to ESA by Naturvernforbundet.

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¹ <https://www.hi.no/en/hi/about-us>

Table of content

Innhold

1	Case history	4
2	ESAs requested information	7
2.1	Point 1	7
2.2	Point 2	8
2.3	Point 3	9
2.4	Point 4	10
2.5	Point 5	10
2.5.1	Førdefjorden, Vestland	11
2.5.2	Repparfjorden, Troms and Finnmark	12
2.5.3	Bøkfjorden, Troms and Finnmark	13
2.5.4	Ranfjorden, Nordland	14
2.5.5	Elnesvågen/Frænfjorden, Møre and Romsdal	16
2.5.6	Lillebukt/ Stjernøysundet, Troms and Finnmark	17
2.5.7	Bergsfjorden, Troms and Finnmark	18
2.5.8	Tysfjord, Nordland	18
2.6	Point 6	19
2.6.1	Sodium Isobutyl Xanthate (SIBX)	19
2.6.2	Microplastic	20
2.7	Point 7	20
2.8	Point 8	20
2.8.1	Førdefjorden, Vestland	21
2.8.2	Repparfjorden, Troms and Finnmark	21
2.8.3	Bøkfjorden, Troms and Finnmark	22
2.8.4	Ranfjorden, Nordland	22
2.8.5	Frænfjorden, Møre and Romsdal	22
2.8.6	Stjernøysundet, Troms and Finnmark	22
2.8.7	Bergsfjorden, Troms and Finnmark	22
2.8.8	Tysfjord, Nordland	23
2.9	Point 9	23
3	Additional information	23
3.1	The use of SIBX in Førdefjorden - detailed description of the process leading to the approval of the use of the chemical	23
4	Attachments:	25

1 Case history

Naturvernforbundet, in association with nine other NGOs, contacted ESA on the 17th of November 2020. In this letter we present the latest developments in the proposed mining project that has gotten permission to dispose mining waste into the Førdefjorden. The letter also compiles information about the aforementioned NGOs earlier contact with ESA, regarding the Norwegian practice of disposing mining waste into fjords.

There are five ongoing disposal sites (Elnesvågen/ Frænfjorden, Ranfjorden, Tysfjorden, Bergsfjorden, Lillebukt/ Stjernøysundet). Two more have obtained permits (Førdefjorden and Repparfjorden) and one has applied for a renewal of disposal (Bøkfjorden).

For the ongoing disposal sites, no measures are planned to ensure that the environmental goals for the water bodies are reached. For the planned disposal sites, the status is going to deteriorate below «good» chemical and ecological status.

We claim that for both the ongoing and planned disposal sites, WFD is violated.

Article 1 of WFD states the purpose of WFD:

“prevents further deterioration and protects and enhances the status of aquatic ecosystems better the environmental status of all water bodies.”

- Norway does nothing to obtain enhancements of the environmental status water bodies for ongoing disposal sites.
- Norway does not prevent or protect deterioration of water bodies for planned disposal sites

We claim that Norway violates WFD article 1, and several others, by allowing continued disposal of mine waste in the fjords, in most places mixed with toxic chemicals and microplastic, and some places with high concentration levels of heavy metals.

We claim that Norway violates WFD article 4.7, by issuing permits to start new disposal of mine waste in three fjords. In all three cases mixed with toxic chemicals and microplastic. In one of the cases with very high levels of heavy metals concentration.

We claim that Norway has misused WFD article 4.7, first sentence *“new modifications to the physical characteristics of a surface water body”*, when issuing permits for disposal of mine waste, thus allowing no limit for the deterioration of the environmental status.

The non-stopping disposal of mine waste, with plumes of dust spreading, chemicals, microplastic, toxic chemicals etc, is much more than solely *“modifications to the physical characteristics of a surface water body”*.

WFD article 4.7, second sentence should be used for characterising such disposals. This part of article 4.7 limits the deterioration of the environmental status. It is only allowed to lower the status to “good”. Hence, permitting disposals where the grade of deterioration goes all the way down to “very bad” is a violation of WFD.

We further claim that it is a violation of the Mining waste directive to issue new disposal permits, without waste management plans as part of the applications. According to article 7.2(c) of the Mining Waste Directive, a waste management plan (article 5) should be in place as part of the application to establish a waste facility.

Waste management plans were not in place prior to granting:

- a) Nordic Mining ASA, a permit to dump 250 million tons of mining waste into Førdefjorden (19 April 2015 by the Norwegian Government).
- b) Nussir ASA, a permit to dump 25 million tons of mining waste into Repparfjorden (19 December 2016 by the Ministry of Climate and Environment).
- c) Rana Gruber AS a permit for increasing the yearly dumping of mining waste in Ranfjorden from 1.7 to 3 million tons (13 May 2015 by the Ministry of Climate and Environment).

Neither has Sydvaranger AS been asked for a waste management plan in their application (28.02.2020) for a renewal of their dumping permit in Bøkfjorden. Still evaluated by the Environmental Agency.

Repealing or changing permits

The Norwegian Pollution Control Act (forurensningsloven) gives the pollution authorities the right to repeal or change permits according to § 13 of the act. Our extracts from § 13, translated to English by us:

“§ 18. (change or remake of permit)

The pollution authority can repeal or change the terms of a permit issued according to this law or regulation connected to the law, or establish new terms, and if necessary, recall the permit, if:

- 1) *The damage or the disadvantage from the pollution is significantly larger or different than expected when the permit was issued,*
- 2) *-*
- 3) *New technology makes it possible to reduce the pollutions significantly,*
- 4) *--*

The permit can always be repealed or changed 10 years after it was issued.”

This means that Norwegian law states that it is possible to repeal or change old permits in conflict with new EU directives, as WFD and the Extractive Waste Directive (EWD).

The ongoing revision of Sydvaranger’s permit is based on the 10 year rule.

We claim that this process should be treated as a new application, based on WFD and EWD, but this is not done. Sydvaranger has not been asked to deliver a waste management plan as part of the application.²

Nordic Rutile (Nordic Mining) has been issued a revised permit (18.01.2021), based on a significantly changed mining project, including the introduction of an extremely toxic chemical, SIBX. The yearly amount of disposal in the fjord is dramatically reduced, and alternative methods for dealing with the tailings should therefore have been assessed. Another mining company, based on the same resource, claims that it is possible to run the mine without sea disposal, and a nearby community wants to use the tailings for establishing an industrial area.

We claim that this application should have been treated as a new application, according to the rules of WFD and EWD, but this has not been done.

Still, Nordic Rutile has not been asked to deliver a waste management plan as part of the application, and no new assessment of the need for sea disposal has been done.³

Some other permits are close to the 10 year limit, and should be repealed and the companies asked for new applications, based on the WFD and EWD regulations.

² We refer to the attached public hearing statement from Naturvernforbundet i Sør Varanger on the proposed mining plans from Sydvaranger AS

³ We refer to the attached complaint from Naturvernforbundet on Nordic Rutile’s permit from the Norwegian Environment Agency

2 ESAs requested information

We present the requested information in the following chapter using the outline that ESA presents in the letter of 26th of January for clarity and ease.

2.1 *Point 1*

A comprehensive list of: (i) the fjords/water bodies impacted, (ii) mines/mining companies who have obtained permits; (iii) the date permits were granted; and (iv) the duration/time-period permits endure.

Fjord/water body	Mines/mining companies	Product	The date permits were granted	Duration/time period of permit
Førdefjorden, Vestland	Nordic Rutile	Rutile and garnet	Revised permit granted 18.01.2021. Previous permit granted 05.06.2015.	Planned
Repparfjorden, Troms and Finnmark	Nussir	Copper	Revised permit applied for, but not yet processed. Permit for previous plans granted 15.01.2016.	Planned
Bøkfjorden, Troms and Finnmark	Sydvaranger	Iron	Ongoing revision of permit 2019-2021. New permit not given yet. Old permit: 23.04.2008 and 08.10.2014.	Planned restart of discontinued mine
Ranfjorden, Nordland	Rana gruber	Iron	Revised permit 26.06.2015. Old permit: 20.12.2012.	Ongoing
Elnesvågen/ Frænfjorden, Møre and Romsdal	Omya Hustadmarmor	Lime	Revised permit: 28.06.2018. Old permit: 20.11.2015	Ongoing
Lillebukt/ Stjernøysundet, Troms and Finnmark	Sibelco Nordic	Nepheline-syenite	Revised permit: 29.11.2000. Old permit: 29.01.1997	Ongoing
Bergsfjorden, Troms and Finnmark	Skaland Graphite	Graphite	Revised permit: 24.01.2002. Old permit: 22.02.1989.	Ongoing
Tysfjord, Nordland	The Quartz Corp Drag	Quartz	Revised permit: 23.06.2020. Old permit: 05.12.2011.	Ongoing

We note regarding sub-point iv (the duration/time-period permits endure) that permits granted does not have a specified time period, and presumably will be valid indefinitely, if not any of the conditions for revision or recalling of the permit mentioned in the law text (*Lov om vern mot forurensninger og om avfall (forurensningsloven)*) are met.

2.2 Point 2

The specific substances of concerns disposed of into each fjord/water body (i.e. names/identifiers/EINECS and CAS numbers – and whether the substances are Priority Substances (PSs), Priority Hazardous Substances (P(H)Ss), or River Basin Specific Pollutants);

Fjord/water body	Mines/mining companies	Substances disposed into the fjord/water body
Førdefjorden, Vestland	Nordic Rutile	<ul style="list-style-type: none"> ● Sodium Isobutyl Xanthate (SIBX) ● Magnafloc 5250 ● Dow Froth 400 ● Microplastic
Repparfjorden, Troms and Finnmark	Nussir	<ul style="list-style-type: none"> ● Sodium Isobutyl Xanthate (SIBX) ● Methyl Isobutyl Carbinol (MIBC) ● Carboxymethyl cellulose (CMC) ● Magnafloc 10 ● Microplastic
Bøkfjorden, Troms and Finnmark	Sydvaranger	<ul style="list-style-type: none"> ● Polyakrylamid ● polyDADMAC ● Microplastic
Ranfjorden, Nordland	Rana gruber	<ul style="list-style-type: none"> ● Lilafloc D817M, Diamin/diamin acetat ● Microplastic
Elnesvågen/ Frænfjorden, Møre and Romsdal	Omya Hustadmarmor	<ul style="list-style-type: none"> ● Polyakrylamid ● Fatty acids, C14–18 and C16–18 unsaturated fatty acids, products with adipic acid and triethanolamine, dimethyl sulfate quaternized ● Microplastic
Lillebukt/ Stjernøysundet, Troms and Finnmark	Sibelco Nordic	<ul style="list-style-type: none"> ● Microplastic
Bergsfjorden, Troms and Finnmark	Skaland Graphite	<ul style="list-style-type: none"> ● MIBC ● Sepco CE 3040 LH
Tysfjord, Nordland	The Quartz Corp Drag	<ul style="list-style-type: none"> ● Fluosilicic acid ● Petroleum sulphonate ● Diamin ● Microplastic

Additional information (*names/identifiers/EINECS and CAS numbers – and whether the substances are Priority Substances (PSs), Priority Hazardous Substances (P(H)Ss), or River Basin Specific Pollutants*) will be forwarded to ESA when received from The Institute of Marine Research (IMR).

2.3 Point 3

Amounts discharged into the fjords;

Fjord/water body	Mines/mining companies	Tailings to fjord	Substances and amounts
Førdefjorden, Vestland	Nordic Rutile	4 mill tons per year (amount granted in permit, revised company plans say around 1,2 mill tons per year)	<ul style="list-style-type: none"> ● SIBX - 4 tons per year (almost all SIBX will follow the tailings into the fjord) ● Magnafloc 5250 -2 tons per year ● Dow Froth 400 – 3 tons per year ● Microplastic - Not estimated
Repparfjorden, Troms and Finnmark	Nussir	2 mill tons per year	<ul style="list-style-type: none"> ● SIBX – 100 tons per year* (perhaps up to 5% of the amount will follow the tailings) ● Methyl Isobutyl Carbinol (MIBC) – 110 tons per year ● Carboxymethyl cellulose (CMC) – 110 tons per year ● Magnafloc 10 – 73 tons per year ● Microplastic – Not estimated
Bøkfjorden, Troms and Finnmark	Sydvaranger	4 mill tons per year	<ul style="list-style-type: none"> ● Polyacrylamide – 50 tons per year ● polyDADMAC – 10 tons per year <ul style="list-style-type: none"> ○ The company reports using 72 tons per year of these two combined ● Microplastic – Not estimated, but we estimate a probable amount of 1.3 tons per year, based on data from Rana Gruber.
Ranfjorden, Nordland	Rana gruber	3 mill tons per year	<ul style="list-style-type: none"> ● Lilafloc D817M, Diamin/diamin acetat – 40 kg per year ● Microplastic – the company has assessed the amount of microplastic discharged into the fjord to 935 kg per year.
Elnesvågen/ Frænfjorden, Møre and Romsdal	Omya Hustadmarmor	0.2 mill tons per year. Permit allows 0.7 mill tons per year.	<ul style="list-style-type: none"> ● Polyacrylamide – 12.5 tons per year ● Fatty acids, C14–18 and C16–18 unsaturated fatty acids, products with adipic acid and triethanolamine, dimethyl sulfate quaternized – 2.320 tons per year ● Microplastic – Not estimated

Lillebukt/ Stjernøysundet, Troms and Finnmark	Sibelco Nordic	0.3 mill tons per year	<ul style="list-style-type: none"> ● Microplastic – Not estimated, but probably little, due to process heating
Bergsfjorden, Troms and Finnmark	Skaland Graphite	40.000 tons per year	<ul style="list-style-type: none"> ● MIBC – 30.000 litres per year ● Sepco CE 3040 LH – 5.000 litres per year
Tysfjord, Nordland	The Quartz Corp Drag	37.000 tons per year is the amount allowed in the permit. Company reports say 4.400 tons per year (2019 data).	<ul style="list-style-type: none"> ● Fluosilicic acid – 8.500 tons per year ● Petroleum sulphonate – 25 tons per year ● Fiamin – 6 tons per year ● Microplastic – Not estimated

*Nussir has applied for permission for this amount of SIBX; the application has not yet been processed.

2.4 Point 4

Impact on the water bodies/fjords (whether (i) above EQSs or background levels; (ii) the actual amounts discharged in reality exceed the amounts allowed in the permits or reviewed in the initial risk assessment plans; and/or (iii) the substances of concern which are actually discharged of in practice are the same as the chemicals of concerns which have been permitted under the permits/approvals – or which were initially assessed under the risk assessments);

We await information from The Institute of Marine Research (IMR) on these topics.

Related to sub-point (ii), the proposed mining project in Førdefjorden has changed many times since the original permission was granted in 2015. The original permission was granted because the positive effects of the project were deemed to outweigh the negative consequences. After this weighting of the consequences, many aspects of the project have changed. These changes have reduced the benefits for the society as a whole, and aggravated the negative consequences:⁴

- Number of employees per year reduced from 170 to 105
- Operational time reduced from 50 til 34 years
- Mining volume/production reduced from 4 mill tons per year, to 1.5 mill tons per year

2.5 Point 5

Actual/potential impact on the chemical status of the water body concerned (i.e. whether there is evidence – in the river basin management plans or otherwise – of a ‘deterioration’ of the status of the water body in question);

⁴ We refer to the attached document, Påklaging av vedtak «Revidert tillatelse til virksomhet etter forurensningsloven for Nordic Rutile AS», from Naturvernforbundet and several other organisations, 15.02.2021

2.5.1 Førdefjorden, Vestland

2.5.1.1 Information from the Norwegian Water Information System "Vann-nett"

Water body: Førdefjorden-ytre

(<https://www.vann-nett.no/portal/#/waterbody/0281010202-C>)

Status

Ecological status: Good

Chemical status: Good

Environmental objectives

Ecological: good

Chemical: Good

Risk assessment states that Førdefjorden is at risk of not reaching the environmental objectives due to the issued permission for the Engebø-mine, as the running of the mine is expected to reduce the ecological status. Exemption is given according to the Norwegian Water Regulation §12 (WFD article 4.7).

Pressure:

Diffuse Mines or deposits with small degree of impact (County Governor: "since mining operations have not begun") - Altered habitats due to morphological changes (includes connectivity) and Other significant impact type

Measures: None

2.5.1.2 Expected impact

In the permit issued from the Norwegian Environment Agency, 18.01.2021⁵ it is written that they expect the ecological status in the fjord to deteriorate from "good" to "bad" because of the proposed plans to deposit mining waste into the fjord.

Using WFD article 4.7, first sentence; "*new modifications to the physical characteristics*" it is argued that disposal of mine waste in Førdefjorden is not a violation of WFD, as WFD 4.7, first sentence sets no limit to the deterioration of the ecological status.

We claim that WFD article 4.7, second sentence; "*failure to prevent deterioration from high status to good status of a body of surface water*" should be applied, as the disposal of mine waste in Førdefjorden has much wider impact to the fjord than solely "*modifications to the physical characteristics*". Using WFD 4.7, second sentence has "good" status as the lower limit. Lowering the ecological status to "bad", as admitted by the Norwegian Environmental Agency, implies a violation of WFD:

- Microplastic in unknown quantities will be disposed into the fjord along with the mine waste, spreading in unknown ways into the water body. This has never been assessed.
- The mining company's study on the predicted spread of particles from the mine waste disposal, has met serious critique for its assumptions. As an example, the smallest particles are

⁵ «Revidert tillatelse til virksomhet etter forurensningsloven for Nordic Rutile AS», ref. 2016/9641

excluded from the study. The Norwegian Institute of Marine research has performed studies showing much wider particle spreading. These studies have not been included in the processing of the case.

- The mine waste is going to be mixed with SIBX, a chemical extremely toxic to aquatic life. This chemical also functions as a “carrier” of heavy metals into aquatic life.

Our conclusion:

The status of the water body is going to be deteriorated from “good” to “bad”, and WFD will be violated if the disposal of mine tailings in Førdefjorden is allowed.

2.5.2 Repparfjorden, Troms and Finnmark

2.5.2.1 Information from the Norwegian Water Information System “Vann-nett”

Water body: Repparfjorden indre

(<https://vann-nett.no/portal/#/waterbody/0421010500-2-C>):

Status:

Ecological status: Good

Chemical status: Good

Environmental objectives

Ecological: Good - Environmental target reached 2022--2027

Chemical Good - Environmental target reached 2022--2027

Pressure:

Diffuse Mines or deposits, designated a medium degree of impact. Effect: Chemical pollution.

Has measure.

Parts of the water body are still affected by earlier mining activities, Folldal verk. There are elevated Cu-concentrations in the sediments in the old submarine tailings disposal. Ref. Akvaplan-niva AS Rapport 4973-02, chapter 6.4, “The reason behind the elevated levels is probably that these sampling plots are affected by runoff from the old Folldal verk”.

Measures:

<https://vann-nett.no/portal/#/measuredetails/1105-235-M>

(our translation)

Planning period 2016-2021, Problem mapping mines in inner Repparfjorden.

The measure is proposed by the Water Board of Finnmark and needs to be approved by the responsible authority.

Measure status: Refused

2.5.2.2 Expected impact

Using WFD article 4.7, first sentence; “*new modifications to the physical characteristics*” it is argued that disposal of mine waste in Repparfjorden is not a violation of WFD, as WFD 4.7, first sentence sets no limit to the deterioration of the ecological status.

We claim that WFD article 4.7, second sentence; “*failure to prevent deterioration from high status to good status of a body of surface water*” should be used, as the disposal of mine waste in Repparfjorden has much wider impact to the fjord than solely “*modifications to the physical characteristics*”. Using WFD 4.7, second sentence has “good” status as the lower limit.

- Microplastic in unknown quantities will be disposed into the fjord along with the mine waste, spreading in unknown ways into the water body. This has never been assessed.
- The mining company's study on the predicted spread of particles from the mine waste disposal, has met serious critique for its assumptions. As an example, the smallest particles are excluded from the study. The Norwegian Institute of Marine research has performed studies showing much wider particle spreading. These studies have not been included in the processing of the case.
- The mine waste is going to be mixed with SIBX, a chemical extremely toxic to aquatic life. This chemical also functions as a "carrier" of heavy metals into aquatic life.
- The Institute of Marine Research (IMR) has protested the proposed marine tailings disposal in Repparfjorden. The institute draws attention to the fact that the levels of copper in the tailings will be so high that it would classify as the worst condition as marine sediments could be classified as⁶. These levels of copper in the pore water, along with the toxicity of SIBX, means high risk of damage and death to benthic organisms.
- The mine waste also contains high levels of other heavy metals, as Nickel and Chromium.

Our conclusion:

The status of the water body is going to be deteriorated from "good" to "bad", and WFD will be violated if the disposal of mine tailings in Repparfjorden is allowed.

2.5.3 Bøkfjorden, Troms and Finnmark

2.5.3.1 Information from the Norwegian Water Information System "Vann-nett"

Water body: Bøkfjorden-midtre

(<https://vann-nett.no/portal/#/waterbody/0424030500-5-C>)

Status:

Ecological: Moderate

Chemical: Poor

Environmental objectives:

Ecological: Good - Environmental target reached 2027--2033 - Exemption registered - Article 4(4)

Technical feasibility

Chemical: Good - Environmental target reached 2027--2033 - Exemption registered - Article 4(4)

Technical feasibility

Pressure:

Diffuse Mines or deposits designated a large degree of impact.

- Altered habitats due to morphological changes (includes connectivity)
- Chemical pollution
- Other significant impact type

Comment (our translation): "Deposits of mine spillings from Sydvaranger Gruve AS leads to sedimentation of particles from the deposit across large areas of the Bøkfjorden. Effects will be monitored according to the terms in the permission from Klif." (Date: 23.11.2011)

⁶ «Høring av søknad om tillatelse – Nussir ASA i Kvalsund kommune», ref. 2010/462

Diffuse other sources designated unknown degree of impact.

Comment (our translation): "Deposits from AS Sydvaranger (planned to start up again in 08/09) and restart of oil transfer terminal in Bøkfjorden. Further more, there are oil spills registered off the harbour at Kimek. Unknown source." (Date 26.1.2012)

Measures:

<https://vann-nett.no/portal/#/measuredetails/1106-1182-M>

Assess impact MIN12, measure group: Research, improvement of knowledge base reducing uncertainty

The Norwegian Environment Agency will assess the impact.

Measure status: Proposed

Our conclusion:

Nothing is going to be done about the pollution from the old mine waste. When/if the mine restarts the dumping of mine tailings in Bøkfjorden, the situation gets worse. It is therefore impossible to reach the environmental goals.

Water body: Bøkfjorden-ytre

(<https://vann-nett.no/portal/#/waterbody/0424030500-3-C>)

Environmental objectives:

Ecological: Good - Environmental target reached 2027

Chemical: Good - Environmental target reached 2027

Status:

Ecological: Moderate

Chemical: Poor

Pressure:

Diffuse other sources with unknown degree of impact and unknown type of impact.

Comment (our translation): "Deposits from AS Sydvaranger and restart of oil transfer terminal in Bøkfjorden" Date: 30.04.2020

Measures: none

Our conclusion:

When/if the mine restarts the dumping of mine tailings in Bøkfjorden, it will be impossible to reach the environmental goals.

No actions are planned.

2.5.4 Ranfjorden, Nordland

2.5.4.1 Information from the Norwegian water information system "Vann-nett"

Water body: Ranfjorden - Mo

<https://vann-nett.no/portal/#/waterbody/0362011000-2-C>

The water body is designated as heavily modified (HMWB).

Status:

Ecological: Moderate ecological potential

Chemical: Poor

Environmental objectives

The environmental and chemical objectives are to reach “good” status, but with an extended deadline beyond the 2022-2027 planning cycle, due to disproportionate costs.

It is stated that the water body risks not meeting the environmental objectives.

Pressure:

Diffuse Mines or deposits with medium degree of impact due to chemical pollution. (Date 29.12.2004)

Diffuse Sludge disposal with large degree of impact. (Date 25.3.2008)

- Altered habitats due to morphological changes (includes connectivity)

Measures:

Updating knowledge status and clarifying need for measures.

Pressure: Diffuse contaminated sediment

Priority: Planning period 2022-2027

Our conclusion:

Nothing is going to be done about pollution from the mine waste. It is therefore impossible to reach the environmental goals.

2.5.4.2 Actual impact

Rana gruber AS was permitted a significant increase in the permitted amount of mine waste to be dumped in Ranfjorden. During the last years, 3 million tonnes of mine waste have been dumped in Ranfjorden each year.

The condition of Ranfjorden was examined in 2018, and this is the conclusion of the Directorate of Environment⁷ :

«The results from the surveillance in 2018 show moderate to bad condition of several components in Ranfjorden»

«As Ranfjorden is an active sea disposal area for Rana Gruber, and the disposal of suspended materials from Rana Gruber has increased significantly since 2013, the negative development is as expected.»

Our translation and underlining.

⁷ «Tilbakemelding på vannovervåkingen gjennomført i 2018 i Ranfjorden og Mobekken. Brev til bedrifter i Mo, Miljødirektoratet 29.05.2019.»

Rana Blad, 23.10.2019:

«According to WFD, it is a goal that all water bodies should reach good or very good condition by 2021. Ranfjorden has been given a prolonged deadline to 2027.»

Our translation.

When the dumping permit to Rana gruber AS was issued, the Norwegian Environment Agency (formerly KLIF) concluded that this would not give significantly negative consequences. Quotations from KLIF's assessment in connection with the permit⁸:

«Increased production and continued disposing in the fjord will lead to some increase the of the disposal area. Klif's opinion is nevertheless convinced that this will not have significantly negative effects on the biodiversity in the area.»

«Based on this, we think that the effects on the biodiversity of the fjord is limited, and should be accepted.»

«Given that the conditions that Klif has stated in the permit are complied, we conclude that the extra load from the increased disposals from Rana Gruber on the ecosystem, is limited. We think that the ecosystem of the fjord will withstand the extra load without too large consequences.»

«Our opinion is therefore that the ecological condition of the water bodies will not be deteriorated due to particles in the water phase.»

2.5.5 Elnesvågen/Frænfjorden, Møre and Romsdal

2.5.5.1 Information from the Norwegian water information system "Vann-nett"

Water body: Elnesvågen

<https://vann-nett.no/portal/#/waterbody/0302012400-2-C>

Status

Ecological status: Good

Chemical status: Poor

Environmental objectives

Ecological objective: Good (to be reached 2022-2027)

Chemical objective: Good (to be reached by 2027)

Risk: Risk assessment states a high risk that the chemical objective will not be met.

Pressure:

Hydromorphological alteration Physical loss Dumping or filling of masses

- Altered habitats due to morphological changes (includes connectivity)
- Other significant impact type

⁸ «Endret tillatelse til virksomhet etter forurensningsloven, ca 17.12.2012, Klima og Forurensningsdirektoratet.»

Comment from the County Governor in Norwegian below:

“27.8.2020, FMMR: Det er en stor risiko for ikke å nå målet om god kjemisk tilstand. Det kan likevel diskuteres om bløtbunnsundersøkelser er det som best gjenspeiler påvirkningen av dypvannsdeponiet til Hustadmarmor, (se Marine Pollution Bulletin 149 (2019) og Chemosphere 233 (20189, pp. 818-827 lenket til i arkivet under.) Om en i framtiden finner et kvalitetselement som gjenspeiler påvirkningen bedre, kan det potensielt også bli en risiko for ikke å nå målet om god økologisk tilstand.”

Measures:

<https://vann-nett.no/portal/#/measuredetails/1101-629-M>

Improving of knowledge status - type of measure: Research, improvement of knowledge base
reducing uncertainty

Measure status: Finished

Completed date: 2020.12.01

Our conclusion:

Nothing is going to be done about pollution from the mine tailings. It is therefore impossible to reach the environmental goals.

2.5.6 Lillebukt/ Stjernøysundet, Troms and Finnmark

2.5.6.1 *Information from the Norwegian Water Information System “Vann-nett”*

Water body: Lillebukta - Ytre Simavik

<https://vann-nett.no/portal/#/waterbody/0420030200-1-C>

Status:

- Ecological: moderate. Measure of soft bottom fauna and hard bottom fauna in 2004 show that the water body is influenced by the fjord disposal.
- Chemical: undefined

Environmental goals (reached 2022-2027):

- Ecological: good
- Chemical: good
- Risk: risk

Pressure:

Diffuse Mines or deposits with a large degree of impact.

- Altered habitats due to morphological changes (includes connectivity)
- Other significant impact type

Smoldering as a result of disposal of tailings from mining

Measures:

- Measures in polluted sediment - diffuse off run from mines/ disposal
(There is no description as to what is meant by measures. The disposal continues as before.)

Our conclusion:

Nothing is going to be done about pollution from the mine tailings. It is therefore impossible to reach the environmental goals.

2.5.7 Bergsfjorden, Troms and Finnmark

2.5.7.1 Information from the Norwegian Water Information System "Vann-nett"

Water body: Bergsfjorden

<https://www.vann-nett.no/portal/#/waterbody/0401011400-C>

Status:

- Ecological: good
- Chemical: good

Environmental goals:

- Ecological: good
- Chemical: good
- Risk: no risk

Pressure:

- Point emissions from industry designated a small degree of impact due to chemical pollution. Comment (our translation): "*Skaland Graphites. Disposal permit of 40,000 tpa. Heavy metals and process chemicals. Assessed 1994. The concentrations of Chromium, Copper and Nickel were above background levels for marine sediments. Chromium and Copper released from tailings could be traced at least 7 km from the outlet. In the surface layers this could be traced 0.5 km. No significant influence on bottom life 0.5-7 km from outlet. Effect on sediment biology was limited to < 500 m from outlet. Today, waste rock is placed on land at Trælen. Propose new surveillance.*"

Measures:

Skaland Graphite Emission Permit, Measure group: Upgrades or improvements of industrial wastewater treatment plants, Planning period 2016-2021.

Start date 2017-11-13: Skaland Graphite AS were instructed to conduct environmental investigations, and to apply for a new emissions permit.

Completed date 2019-07-01: Skaland Graphite AS got a new permit 1.7.2019 with environmental monitoring requirements.

Our conclusion:

It is unclear how affected the fjord is from the mine tailings, and the elevated levels of heavy metals concentration from the tailings. Nothing is going to be done.

2.5.8 Tysfjord, Nordland

2.5.8.1 Information from the Norwegian Water Information System "Vann-nett"

Water body: Tysfjorden

<https://vann-nett.no/portal/#/waterbody/0364020100-6-C>

Status:

- Ecological: moderate
- Chemical: bad

Environmental goals:

- Ecological: good
- Chemical: good
- Risk: no risk

Pressure:

Point Industry (IED)(The Quarz Corp) with a small degree of impact.

- Chemical pollution
- Other significant impact type

Comment (our translation):*“It is not probable that the outlet of acid at 30 meters represents an environmental problem. Outlet of water has frequent influences on the surface, due to fresh water in the outlet pipes and weak layers in the fjord, but the buffer capacity of the sea water, and good dilution gives small deviations of the pH values from normal values. Outlet of flotation chemicals and the modelling of influence area show concentrations that potentially could give toxic conditions limited to some meters from the outlet.”*

Measures:

- No measures

Our conclusion:

Nothing is going to be done about pollution from the mine tailings, nor pollution from other sources. It is therefore impossible to reach the environmental goals (especially the chemical environmental goal).

2.6 Point 6

Risks associated with the disposal given the known hazards associated with the chemicals of concern including, for example, their classification under the CLP Regulation (Regulation 1272/2008) and/or the REACH Regulation (Regulation 1907/2006).

2.6.1 Sodium Isobutyl Xanthate (SIBX)

SIBX and other Xanthates are widely used in mining, but the planned use in the mining projects in Førdefjorden and Repparfjorden is special, as the tailings are planned disposed of in the sea. SIBX and other Xanthates are highly toxic to aquatic life. We quote from a material safety data sheet for SIBX: *“Highly toxic to aquatic life. May form complexes with heavy metals, increasing their uptake, ie fish may accumulate heavy metals more readily”*.⁹ And *«This material is toxic to aquatic organisms and should be kept out of sewage and drainage systems and all bodies of water.»*¹⁰

The Norwegian Environment Agency based their decision to grant the permit to the use of SIBX on data procured by Nordic Mining, which ordered a study from the company DNV GL. The Marine Research Institute (IMR) has protested this study, which they find unrealistic in its assumptions and flawed in design¹¹. More about the process leading to the permit being given can be found in the “Additional information” in the end of this letter.

⁹ Cogee Chemicals. Material Safety Data Sheet, Sodium Iso-Butyl Xanthate Solution, 13 July 2009.

¹⁰ Safety Data Sheet, XANTHATES (Sodium Isobutyl Xanthate), Redox, 2013

¹¹ «HØRINGSUTTALELSE FRA HAVFORSKNINGSINSTITUTTET: «Nordic Rutile-søknad om endret utslippstillatelse for prosesskjemikalier knyttet til gruvedrift i Engebøfjellet»»

2.6.2 Microplastic

Blasting in the mine produces plastic waste. The “non-el” detonator is widely used in mines for security reasons, and results in a lot of plastic waste. When the rock is fed to the crushers and mills, the plastic waste is transformed to microplastic particles, and follows the tailings to be fed to the fjords. As plastic has low density, these particles will probably be widely spread in the fjords. This has never been assessed.

Additional information will be forwarded to ESA when received from The Institute of Marine Research (IMR).

2.7 Point 7

Whether the Norwegian authorities have re-assessed the risks to the water body from the disposal of chemicals of concern, in light of:

1. a change in status of the chemical of concern under the Water Framework Directive (for example from ‘River Basin Specific Pollutant’ to Priority Substance);

2. a change in status of the chemical under the REACH Regulation (for example – a listing on the Candidate List of Substances of Very High Concern/SVHC);

3. a change in the harmonised classification of the substance under the CLP (for example a decision to change the harmonised classification entry regarding a particular endpoint); and /or

4. new information on the chemical of concern generated under, for example, the CLP/REACH Regulation (for example a new study indicating a concern regarding aquatic toxicity).

To our knowledge the chemicals used, and proposed used, for these projects have not been re-assessed by Norwegian authorities, but we await additional information from The Institute of Marine Research (IMR).

Our experience from working with these cases is that proposed chemicals with which there is limited scientific research are approved based on small studies ordered by the mining companies.

Additional information will be forwarded to ESA when received from The Institute of Marine Research (IMR).

2.8 Point 8

Information on any heightened concerns or risks to, for example, human health. This should include impact of the disposal of mining waste on aquatic eco-systems as a whole – including the possibility of chemicals bioaccumulating and/or persisting cumulatively up the food web and potentially posing risks of adverse effects to humans. Information on the following points would be relevant: (i) the proximity of chemicals of concerns to salmon farms; (ii) the spread or dispersion of chemicals of concerns near salmon farms (iii) the uptake of chemicals of concerns

by benthic or other organisms forming part of the salmon food chains; and (iv) information on bioaccumulation and/or biomagnification.

Additional information will be forwarded to ESA when received from The Institute of Marine Research (IMR).

2.8.1 Førdefjorden, Vestland

One of the national salmon fjords, a program created to give special protection to some of the most important wild salmon populations in Norway. Spawning ground for coastal cod (key area for reproduction) mapped in "national programme for mapping of marine nature types". Classified as "regionally important" (score 5).

(i)(ii) There are three aquaculture farms in Førdefjorden

- 13711 Dyvika
- 12192 Skorva
- 13568 Storevik

And six more in close proximity to the fjord.

(iii)(iv)

SIBX is known to increase bio-accumulation of heavy metals (*"Highly toxic to aquatic life. May form complexes with heavy metals, increasing their uptake, ie fish may accumulate heavy metals more readily"*).¹²⁾

The degradation product of SIBX, CS₂, is documented to be toxic to freshwater fish and freshwater plankton, and so could also be toxic in saltwater.

We quote: «Xanthate is one of the commonly used collectors in froth flotation beneficiation of sulfide ores. It decomposes and generates toxic compounds such as carbon disulfide (CS₂) which is a concern in the mining industry.¹³⁾ ECHA's PNEC for carbon disulfide: «Marine water. 1 µg/L¹⁴⁾»

We argue that the concentration of SIBX will be substantially higher than the PNEC value in the pore water in the Nordic Mining/Nordic Rutile project. Even a thin layer of this sludge on the seafloor will therefore pose a big threat for benthic organisms.

2.8.2 Repparfjorden, Troms and Finnmark

One of the national salmon fjords, a program created to give special protection to some of the most important wild salmon populations in Norway.

Spawning ground for coastal cod (key area for reproduction) mapped in "national programme for mapping of marine nature types". Classified as "nationally important" (score 6).

(i)(ii) There are no salmon farms inside the fjord, but several outside the fjord entrance.

¹² Cogee Chemicals. Material Safety Data Sheet, Sodium Iso-Butyl Xanthate Solution, 13 July 2009.

¹³ Study of xanthate decomposition in aqueous solutions, Yang Shen et al, Minerals Engineering 93 (2016) 10–15.

¹⁴ ECHA, <https://echa.europa.eu/brief-profile/-/briefprofile/100.000.767>

(iii)(iv) SIBX is known to increase bio-accumulation of heavy metals (*“Highly toxic to aquatic life. May form complexes with heavy metals, increasing their uptake, ie fish may accumulate heavy metals more readily”*.¹⁵)

The degradation product of SIBX, CS₂, is documented to be toxic to freshwater fish and freshwater plankton, and so could also be toxic in saltwater.

We quote: «Xanthate is one of the commonly used collectors in froth flotation beneficiation of sulfide ores. It decomposes and generates toxic compounds such as carbon disulfide (CS₂) which is a concern in the mining industry.¹⁶» ECHA’s PNEC for carbon disulfide: «Marine water. 1 µg/L¹⁷»

2.8.3 Bøkfjorden, Troms and Finnmark

One of the national salmon fjords, a program created to give special protection to some of the most important wild salmon populations in Norway.

(i)(ii) Two aquaculture farms in proximity.

- 14855 Ropelv
- 19255 Blåsenborgneset

2.8.4 Ranfjorden, Nordland

One of the national salmon fjords, a program created to give special protection to some of the most important wild salmon populations in Norway. Spawning ground for coastal cod (key area for reproduction) mapped in “national programme for mapping of marine nature types”. Classified as “nationally important” (score 6).

(i)(ii) No aquaculture facilities in proximity.

2.8.5 Frænfjorden, Møre and Romsdal

Spawning ground for coastal cod (key area for reproduction) mapped in “national programme for mapping of marine nature types”. Classified as “locally important” (score 4).

(i)(ii) No inside the fjord, but three in proximity outside.

2.8.6 Stjernøysundet, Troms and Finnmark

(i)(ii) One aquaculture facilities in proximity:

- 37577 Davaluft

2.8.7 Bergsfjorden, Troms and Finnmark

(i)(ii) Two aquaculture facilities in proximity:

- 24175 Ytre lavollsfjord
- 24155 Ytre jøvik

¹⁵ Cogee Chemicals. Material Safety Data Sheet, Sodium Iso-Butyl Xanthate Solution, 13 July 2009.

¹⁶ Study of xanthate decomposition in aqueous solutions, Yang Shen et al, Minerals Engineering 93 (2016) 10–15.

¹⁷ ECHA, <https://echa.europa.eu/brief-profile/-/briefprofile/100.000.767>

2.8.8 Tysfjord, Nordland

Spawning ground for coastal cod (key area for reproduction) mapped in "national programme for mapping of marine nature types". Classified as "locally important" (score 2).

(i)(ii) Four aquaculture facilities in proximity:

- 31317 Bjørkvik
- 30637 Rahkasluokta
- 30957 Salaluokta
- 21516 Hulløyhamn Ø

2.9 Point 9

Information on whether the permit referred to in the information you provided on 17 November 2020, was granted before or after 1 May 2018.

The letter sent to ESA the 17th of November 2020 describes a permit issued to Nordic Mining AS, granting them the right to dispose of mining waste in Førdefjorden.

The 10th of July 2020 Nordic Rutile AS, daughter company of Nordic Mining AS, applied for a revised permit from the Norwegian Environment Agency. This permit was granted on the 18th of January 2021. The old permit, granted to Nordic Mining AS, was issued for the first time on the 5th of June 2015. The revised permit involves other chemicals than in the original permit. The revised permit has been appealed by Naturvernforbundet and is not processed yet.

3 Additional information

3.1 *The use of SIBX in Førdefjorden - detailed description of the process leading to the approval of the use of the chemical*

By Agnar Kvellestad, Prof. em. veterinary medicine, Norwegian University of Life Science.

(Abstract from a longer report. We are forwarding the full report later.)

Abstract

The 2016- plans from Nordic mining AS (from here on called "NM") include annual removal of 7.300 tonnes of the mineral pyrite (FeS₂) from rutile by reverse flotation applying up to 2 tonnes SIBX (collector) og 3 tonnes Dow Froth 400 (frother). Extracted pyrite plus parts of the two chemicals locate to the froth fraction, which will be mixed into the total tailing. This mineral fraction, amounting about 0.6% or more of the tailing, should with its chemicals rather be treated as harmful waste. To the tailing will be added annually 4 tonnes of the flocculant Magnafloc 5250, but the exact dosage site seems unclear.

The Norwegian Environment Agency (from here on called "MDIR") asked NM for six main assessments regarding the use of SIBX. The most recent assessments are found in five documents, which are summarized and evaluated by DNV GL. The six demanded assessments are addressed one by one below.

2 MDIR asked for a long-term toxicity test. Two species were exposed to SIBX of unknown purity in an open system at higher temperatures (19 and 25°C) than in the fjord. The open system allows the toxic

decomposition product CS₂ (carbon disulfide) to escape from the water phase, contrary to the situation in the deep.

1 MDIR asked for revision of PNEC. An estimated PNEC 3,4 µg/L is based on the two above-mentioned tests as well as one more.

3 MDIR asked for an analytical method for SIBX with improved sensitivity. DNV GL reports two laboratories but the results from one of these are not convincing. Sensitivity is, however, one of more criteria. New methods also need validation by analyzes of a number of realistic field samples and laboratories should participate in proficiency testing.

4 MDIR asked for a repeated test of leaking of SIBX by a method with increased sensitivity. SINTEF conducted an experiment with flotation feed that will amount about 12.2% of the total feedstock, and the design appears to simulate well the flotation process. However, neither flotation feed nor SIBX were documented, and the used tap water differed in composition from a process water. The industrial process after flotation was not well simulated because it was not produced complete tailing but instead was mixed flotation feed with seawater. The designation «*tailings*» is unfortunate. Otherwise, experimental conditions, and particularly temperature, pH and electrolyte concentrations, are poorly documented. pH values in flotation water clearly demonstrate a potential for leaking of heavy metals. SIBX stability was not tested under representative conditions. The experimental design does not allow to conclude (and certainly not with decimal) about percentage SIBX adsorption to particles' surfaces prior to discharge.

DNV GL concluded in a summary report – with misleading wording - about SIBX in the tailing before and after discharge, based on the experiment with undocumented material and with no well simulation of the industrial process. It was not included as total tailing but flotation feed without rutile extraction.

5 MDIR asked for modeling of SIBX spread in the water column. That requires an estimation of SIBX half-life time in water. The experiment for that purpose is incompletely documented, it appears unsuccessful due to lacking association between detection of reduced SIBX levels and the appearance of CS₂, and the analyses of the zero samples indicate challenges with the method and/or design and accomplishment. One cannot conclude a half-life time 7.5 days.

DNV GL summarized the experiment by first claiming an initial half-life time ca. 7 days, for thereafter to say «*SIBX may have a long half-life time in the Fjørdefjorden*», and finally «*it has not been possible to conclude*». SINTEF used 7 days in their modeling of spread of SIBX but given the very uncertain half-life time should these results be considered inconclusive.

6 MDIR asked about SIBX accumulation in plants and organisms in seawater, and whether SIBX may promote uptake of heavy metals also in seawater as demonstrated in freshwater. From the cited knowledge cannot be excluded the possibility of formation and uptake of complexes between heavy metals and SIBX (more correctly: IBX⁻) also in seawater. Such complexes, denoted LSMCs (liquid-soluble metal complexes), are more easily taken up by organisms. Of particular concern is formation of complexes between SIBX and cadmium.

4 Attachments:

1. Full and unedited information from Vann-nett (Excel). As an illustration, we have included information from two fjords, where the mine waste disposal was stopped many years ago. Still these fjords are heavily negatively affected, 35 years later.
2. The complaint from Naturvernforbundet and several other organisations on Nordic Rutile's permit from the Norwegian Environment Agency (15.02.2021)
3. Public hearing statement from Naturvernforbundet on the proposed use of SIBX (11.01.2021)
4. Public hearing statement from Naturvernforbundet i Sør Varanger on the proposed mining plans from Sydvaranger AS (23.11.2020)