

**Foretaksnavn** NORSK POLARINSTITUTT

**Kontaktperson**

**Navn:** Ingeborg G Hallanger

**Utfyller**

**Navn:** Carolin Philipp

**Mottaker:** Svalbards miljøvernfond - Sysselmasteren på Svalbard

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**SØKNAD**

**REFERANSEN.R.:** 23/56

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## Find the trace – Analysis of environmental samples for snowmobile residues

### Om tiltaket/prosjektet

**Søknadskategori:** Forskning og undersøkelser

**Beskrivelse av tiltaket/prosjektet:**

This project will look at the impact of snowmobile driving on the environment of Svalbard. We focus on wear and tear particles, from the snowmobile belt and the skiers. The outcome of this study will reveal the risk of potential pollution in the snow and top layer (vegetation and soil) with plastic particles originating from snowmobiles. The emission emerging by snowmobiles is already well studied, though knowledge on the wear and tear, the abrasive particles, is still lacking. To best of our knowledge, this project is unique in detecting the potential burden on a local basis regarding our aims:

- i) get first insights into the potential burden of wear and tear particles originating from snowmobiles
- ii) gain knowledge on the storage of abrasives within deeper and older snow layers
- iii) detection of differences between varying locations (degree of anticipated snowmobile traffic)
- iv) ascertain if wear and tear particles are resistant and can still be found in the summer

The utilization of snowmobile vehicles in Svalbard has increased in the recent decade mainly due to the expanded tourist sector. Especially in Longyearbyen, the fascination and, thus the supply of guided snowmobile tours for tourists have highly increased. As a counterpart only residents and operating researchers drive snowmobiles in Ny-Ålesund. Therefore, differences in traffic and the presence of snowmobiles are obvious. Also, in both areas, designated snowmobile routes are present. Hence, a gradient of pollution between different locations can be assumed.

All samples are already collected in Longyearbyen and Ny-Ålesund (2023). The sample locations were chosen by the relative traffic giving samples with different burden levels. The samples consist of 48 environmental samples from 8 different locations and inherent 16 field blank samples to ensure a reliable evaluation. All found particles will be analyzed and compared with an already established polymer library to

avoid misidentifications or overestimations.

Please see the attached project description for more detailed information.

### **Miljøeffekt av tiltaket/prosjektet:**

This project will give an overview of the potential particle pollution from the usage of snowmobile vehicles in Svalbard. The comparison of different places with varying degrees of traffic and the inclusion of snow and top layer/vegetation samples will outline this specific pollution in the Svalbard environment. Moreover, identifying a local source of anthropogenic particles in the Arctic is important so measures can be taken if considered, as necessary. Thus, the upcoming results will set a baseline for future monitoring programs.

Our project will achieve new knowledge towards two of the priorities of Svalbards miljøvernfond for 2023: "øker kunnskapen om klimaendringenes virkning og/eller den samlede belastningen av menneskelig aktivitet på naturmiljøet og kulturminner" and "bidrar til forebygging og reduksjon av forurensning, avfall og marin forurensning".

### **Forvaltningsrelevansen i prosjektet:**

Human activity and traffic in the Arctic are nowadays especially focused. Knowledge of local pollution sources needs to be acquired to protect the environment as applicable. Our project will be able to determine the possible local pollution impacts originating from snowmobile traffic in Svalbard. The presence of bigger abrasive particles is obvious in some places. However, the occurrence of smaller objects and the association of the toxicological impact is unknown. This new knowledge on abrasive occurrence can be used alongside studies considering snowmobile impact on vegetation or harmful emissions. Accordingly, we provide another puzzle piece in the holistic understanding of the local effects of human activity on the Arctic environment.

**Ris ID:** 12139

**Forskningsinstitusjon:** Norsk Polarinstitut

**Har det tidligere vært utført tilsvarende prosjekt innenfor samme type hovedkategori eller lignende prosjekter?** Nei

**Trengs det særskilt teknisk og/eller faglig kompetanse?** Ja

**Beskriv hvilken kompetanse søker besitter i forhold til oppgaven som skal løses og hvilken metode som skal anvendes:**

Carolin Philipp works on microplastic pollution in environmental samples from Svalbard at the Norwegian Polar Institute for two years. Her investigation includes the processing of environmental samples to gain clean replicates facilitating polymer identification (Philipp et al. in prep.). Philipp will be responsible for the daily follow-up of the project, the teaching, and supervision of the hired person, and will have the responsibility for evaluating the results and writing both management and scientific papers from this project.

Ingeborg G. Hallanger is a highly experienced researcher regarding the Arctic environment and ecotoxicology. She has in recent years build up NPI's microplastic group focusing on environmental samples. Her knowledge will enhance the evaluation of identified anthropogenic particles and will play a major role in the assessment of the potential effect and burden by found abrasives. She will be active in evaluating the results and assist Philipp in writing both managemental and scientific papers from this project.

Methods to be used:

All methods from clean up procedures and analytical Raman identification have tried protocols and require

training that will be organized by Carolin Philipp. The cleanup will be done following the "oleo extraction method" which NPI uses regularly on environmental samples. The identification with the Raman spectroscope will follow the protocol developed in-house for environmental samples.

All equipment and chemicals are provided by NPI for this project.

**Inngår det flere faglige og/eller økonomiske samarbeidspartnere i tiltaket/prosjektet?** Nei

## Gjennomføring av tiltak/prosjekt

**Varighet:** 01.03.2024 - 31.10.2023

Fremdriftsplan		
Navn på aktivitet	Startdato	Sluttdato
find and hire a master student (CP & IGH)	01.01.2024	29.02.2024
train the student in the laboratory (CP)	01.03.2024	31.03.2024
train the student at the $\mu$ Raman spectroscope (CP)	01.03.2024	31.03.2024
processing of samples in the laboratory	01.04.2024	30.06.2024
investigation of samples at the $\mu$ Raman	15.04.2024	15.09.2024
evaluation of the results (CP & IGH)	01.09.2024	31.10.2024
write the report (CP & IGH)	01.09.2024	31.10.2024

## Budsjett

Kostnader	Beløp 2023
Dugnadsinnsats - Dugnadstimer frivillige (0 x kr 300 per time)	0
Timekostnader egne ansatte - Carolin Philipp (246 x kr 500 per time)	123 000
Timekostnader egne ansatte - Employee (805 x kr 500 per time)	402 500
Timekostnader egne ansatte - Ingeborg G Hallanger (156 x kr 500 per time)	78 000
Kjøp og leie av utstyr - aluminum oxide filter	15 577
Andre kostnader - Field work & Sample collection	91 000
Andre kostnader - Overhead Carolin Philipp	50 000
Andre kostnader - Overhead employee	175 000
Andre kostnader - Overhead Ingeborg G Hallanger (covered by NPI)	25 000
<b>Sum kostnader</b>	<b>960 077</b>

Finansiering	Beløp 2023
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Dugnadsinnsats - Dugnadstimer frivillige (0 x kr 300 per time)	0
Egne midler	0
Egne midler - Overhead employee	175 000
Egne midler - Overhead Ingeborg G Hallanger	25 000
Egne midler - Salary Ingeborg G Hallanger (1 month)	78 000
Annen finansiering - Field work & sample collection (AFG, RiS ID: 12139)	91 000
Annen finansiering - Overhead Carolin Philipp (covered by Plastpoll (NFR, Funding.Nr.322191)	50 000
Omsøkt støtte - Støtte fra Svalbards miljøvernfond	541 077
<b>Sum finansiering</b>	<b>960 077</b>






**Omsøkt tilskudd:** 541 077

**Kan tiltaket/deler av tiltaket gjennomføres med mindre tilskudd enn omsøkt? Nei**

**Eventuelle merknader:**

Please, have a closer look at the here attached budget\_find the trace.pdf file. In fact, we are only seeking 541,077 NOK, which is given in detail in this file. We tried to adjust the expenses in your given scheme as close as possible.

**Vedlegg**

-  short project description\_find the trace.pdf (Prosjektbeskrivelse)
-  Find the Trace\_SMF\_confirmation letter\_NPI IH HSTsign.pdf (Annet)
-  Contract\_TRACES.pdf (Kontrakter)
-  budget\_find the trace.pdf (Annet)
-  cv\_cp.pdf (Annet)

 **Carolin Philipp** for **NORSK POLARINSTITUTT**

Leveret 14.09.2023