

EXECUTIVE SUMMARY: SCOPING REPORT

VOLWATERBAAI DESALINATION PLANT AND ASSOCIATED INFRASTRUCTURE, NORTHERN CAPE

NCDENC Reference Numbers: NC/EIA/07/NAM/KAM/KOT1/2013
NCP/EIA/0000225/2013

1 INTRODUCTION

Sedex Minerals proposes to develop the Zandkopsdrift Rare Earth Element mine on the remainder of Farm Zandkopsdrift 537, and portion 2 of Zandkopsdrift 537 in the Northern Cape Province. The development of the mine is subject to a separate Environmental Impact Assessment (EIA) process (NCDENC Ref: NC/EIA/NAM/KAM/ZAN/2012).

Due to the shortage of water resources in the area, Sedex Desalination, a subsidiary of Sedex Minerals, was established to develop a 4 million m³/annum seawater desalination plant to provide water for the mine.

The desalination plant will be located at Volwaterbaai on Farm Strandfontein 559, on the west coast of the Northern Cape Province. From there, water will be pumped via pipeline to the mine with a reservoir at Kotzesrus.

The pipeline as well as overhead power lines and an access road servicing the plant will follow a combination of 4 x 4 tracks and dirt roads between the desalination plant and the Zandkopsdrift Mine. Two alternative routes have been identified to bypass Kotzesrus. These alternative routes are aligned on existing tracks and previously undisturbed land on privately owned farmlands (see Figure 1).

SRK Consulting (South Africa) Pty Ltd (SRK) has been appointed by Sedex Desalination to undertake Scoping and Environmental Impact Reporting (S&EIR, also referred to as EIA) process required in terms of the National Environmental Management Act 107 of 1998, as amended (NEMA).

See page 7 for details on how you can participate in the process.


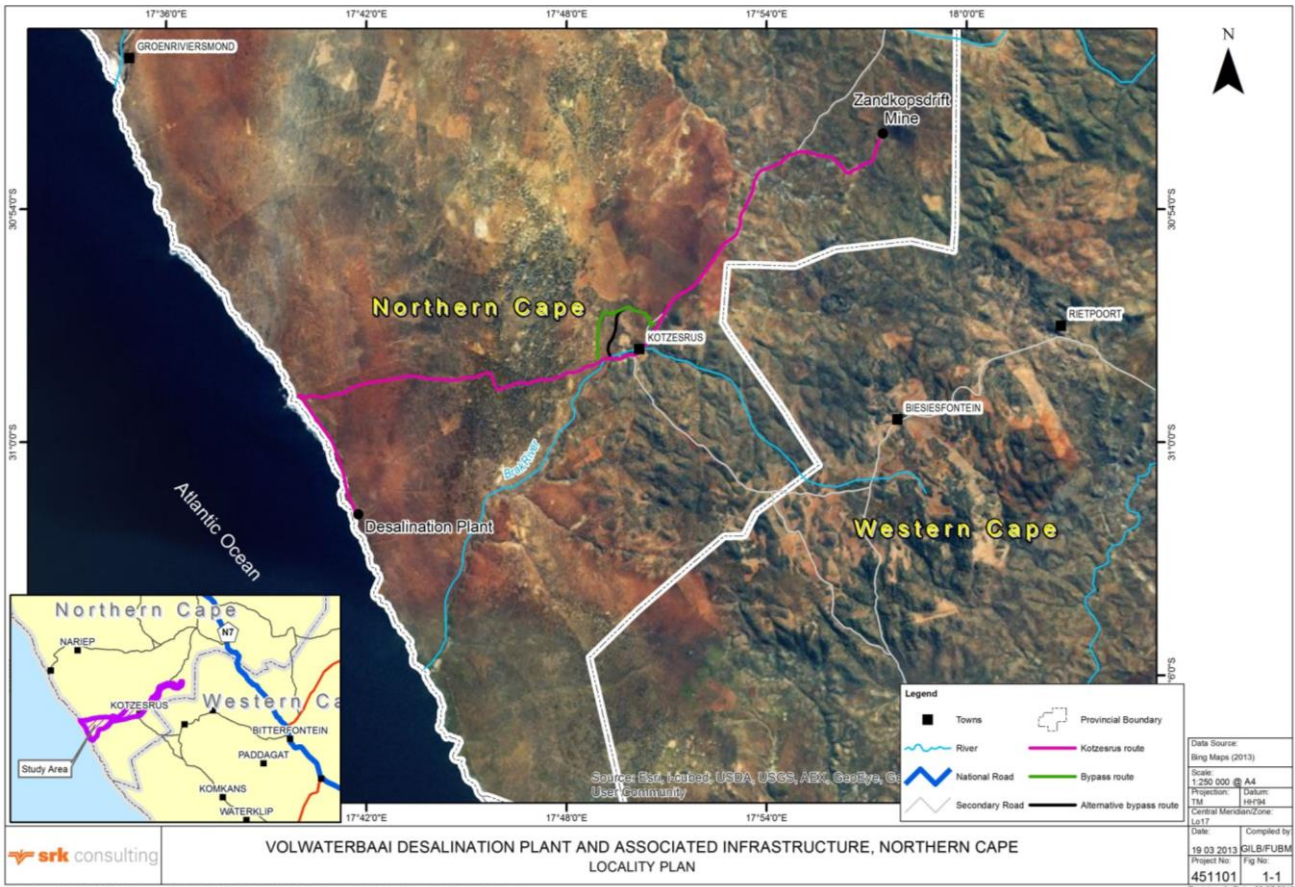



Figure 1: Locality Plan

2 GOVERNANCE FRAMEWORK

Sections 24 and 44 of NEMA make provision for the identification of activities which may not commence without an Environmental Authorisation (EA), and stipulate the requirements for the assessment of such activities. The EIA Regulations, 2010 are contained in four Government Notices (GN) issued in terms of NEMA. GN R543 sets out two alternative procedures for authorisation processes: depending on the type of activity that is proposed, either a Basic Assessment (BA) process or a S&EIR process is required to apply for EA from the competent authority – in this case the Northern Cape Department of Environment and Nature Conservation (NCDENC).

SRK has determined that the proposed desalination plant and associated infrastructure trigger activities listed in terms of GN R544, GN R545 and GN R546 of the EIA Regulations, 2010 (Table 1).

Table 1: Listed activities triggered by the project

No	Description
GN R544 (requiring BA)	
9	The construction of infrastructure longer than 1 000 m for the bulk transportation of water.
11	The construction of 50 m ² of infrastructure or structures within a watercourse or within 32 m of a watercourse.
14	The construction of structures bigger than 50 m ² in the coastal public property.
15	The construction of facilities for the desalination of sea water with a design capacity to produce more than 100 m ³ of treated water per day.
16	Construction or earth moving activities in the sea, or within the littoral active zone or a distance of 100 m inland of the High Water Mark (HWM).
17	The planting of vegetation or placing of any material on dunes and exposed sand surfaces, within the littoral active zone for the purpose of preventing the free movement of sand, erosion or accretion.
18	The infilling or depositing of more than 5 m ³ of any material into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock from a watercourse, the sea, the seashore, the littoral active zone, or 100 m inland of the HWM.
22	The construction of a road, outside urban areas, with a reserve wider than 13.5 m.
23	The transformation of undeveloped land to industrial use, outside an urban area and where the total area to be transformed is bigger than 1 ha but less than 20 ha.
37	The expansion of infrastructure for the bulk transportation of water.
39	The expansion of bridges, within a watercourse or within 32 metres of a watercourse.
47	The widening of a road by more than 6 m, or the lengthening of a road by more than 1 km where the existing reserve is wider than 13.5 m.
GN R545 (requiring S&EIR)	
5	The construction of facilities or infrastructure for any process or activity which requires a permit or license in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent.

No	Description
14	The construction of an island, anchored platform or any other permanent structure on or along the sea bed.
GN R546 (requiring BA in the sensitive areas)	
2	The construction of reservoirs for bulk water supply with a capacity of more than 250 m ³ .
4	The construction of a road wider than 4 m.
12	The clearance of an area of 300 m ² or more of vegetation where 75% or more constitutes indigenous vegetation within a Critical Biodiversity Area or within 100m inland from the HWM.
13	The clearance of an area of 1 ha or more of vegetation where 75% or more constitutes indigenous vegetation within CBAs and within 1km of the HWM.
14	The clearance of an area of 5 ha or more of vegetation where 75% or more constitutes indigenous vegetation in all areas outside urban areas in the Northern Cape.
16	The construction of buildings with a footprint exceeding 10 m ² in size; or infrastructure covering 10 m ² or more, where such construction occurs within a watercourse or within 32 m of a watercourse.
19	The widening of a road by more than 4 m, or the lengthening of a road by more than 1 km.
24	The expansion of infrastructure by 10 m ² or more within a watercourse or within 32 m of a watercourse.

Consequently, the proponent is obliged to apply for EA for the project. Since activities listed under Regulation GN R545 apply to the project, an S&EIR process is required.

It is also anticipated that a Water Use Licence in terms of sections 21 of the National Water Act 36 of 1998 (NWA) will be required from the Department of Water Affairs. Water use activities that may be applicable to the project are listed in Table 2.

Table 2: NWA water use activities for the project

No	Description
a	Taking water from a water resource.
b	Storing water.
c	Impeding or diverting the flow of water in a watercourse.
f	Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit.
i	Altering the bed, banks, course or characteristics of a watercourse.

Permits may also be required from the Department of Environmental Affairs in terms of the NEM: Integrated Coastal Management Act 24 of 2008 for the development of infrastructure in the coastal zone (associated with the desalination plant) as well as the discharge of effluent to the sea.

3 ENVIRONMENTAL PROCESS

The EIA Regulations, 2010 define the detailed approach to the S&EIR process, which consists of two phases: the Scoping Phase (the current phase) and the Impact Assessment Phase (see Figure 2).

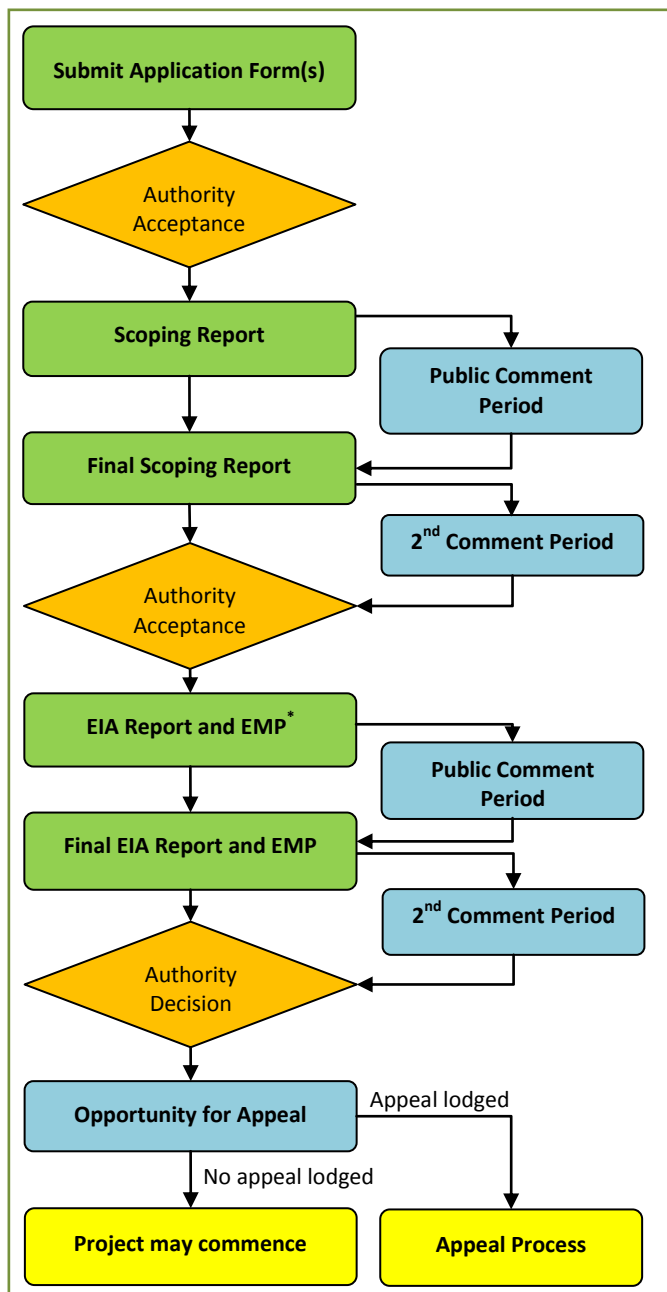


Figure 2: S&EIR Process

*Note: EMP = Environmental Management Programme

The objectives of the Scoping Phase are to:

- Identify stakeholders and inform them of the proposed activity, feasible alternatives and the S&EIR process;
- Describe the affected environment and potential environmental issues and benefits arising from the proposed project that may require further investigation in the Impact Assessment Phase;
- Develop terms of reference for specialist studies to be undertaken in the Impact Assessment Phase;
- Provide stakeholders with the opportunity to participate in the process and identify any issues or concerns; and
- Produce a Scoping Report for submission to the relevant authorities.

Once the Scoping Phase has been completed, the Impact Assessment Phase will commence, in which the significance of potential impacts will be assessed and measures to avoid and /or mitigate negative impacts and enhance benefits will be determined.

4 DESCRIPTION OF THE SITE AND ENVIRONMENT

The site is located in Namaqualand, known for its unique, isolated arid environment. The desalination plant will be constructed at Volwaterbaai, approximately 15km west of the town of Kotzesrus and will be located on a typical stretch of the Namaqualand coastline, comprising rocky coastal outcrops interspersed with sandy beaches.

From the desalination plant, water supply pipelines, overhead power lines and an access road servicing the plant (linear infrastructure) will be routed along a combination of 4 x 4 tracks and dirt roads to the Zandkopsdrift Mine, a distance of approximately 42km. The route will pass through, or in close proximity to Kotzesrus (depending on the selected route alternative).



Figure 3: The Namaqua Coastline near Volwaterbaai

The surrounding area is mostly used for agricultural purposes (sheep grazing). A number of small settlements are located in the vicinity, including Kotzesrus, Lepelsfontein, Stofkraal, Rietpoort, Molsvlei and Garies.

According to the Namakwa Bioregional Plan, the project infrastructure traverses terrestrial and aquatic CBAs and Ecological Support Areas.

Although a water scarce semi-arid region, the Brak River, tributaries to the Brak and Groen Rivers and some wetland features (mostly considered to be in a *moderately modified condition*) occur in the project area.

The vegetation in the study area falls within the *Central Namaqualand Coast* region (which is listed as a *geographic priority area* by the Succulent Karoo Ecosystem Programme) and the *Succulent Karoo Region of Endemism* (which is listed as a *biodiversity priority area* according to the National Spatial Biodiversity Assessment). However, the study area does not fall within the remaining extent of any threatened ecosystem and the vegetation in the area is listed as *Least Threatened*.



Figure 4: Natural Vegetation in the Vicinity of Kotzesrus

The Kamiesberg Local Municipality, in which the site is located had a population of 10 187 in 2011, having declined by approximately 5% between 2001 and 2011, due to out-migration associated with a lack of economic opportunities. The Municipality is characterised by high levels of unemployment, low education levels and a resultant high incidence of poverty.

5 PROJECT AND PROCESS DESCRIPTION

5.1 Project Infrastructure

The project will include the following:

- **Marine infrastructure**, comprising seawater intake below the high water mark of the sea and brine discharge works below the low water mark, both situated in existing gulleys. Underground pipelines to the desalination plant would traverse the intertidal zone;
- **Desalination plant**, situated close to the coast, with a footprint of 15 000 m². The plant building and surrounding infrastructure will be designed to reduce visual impacts;
- **Bulk water supply and storage infrastructure**, including **pipelines**, following the same alignment as the roads to the mine, **pump stations** at the desalination plant and along the pipeline route and **reservoirs** at the desalination plant and at Kotzesrus;
- **Overhead power lines**, fed directly from Zandkopsdrift mine to supply the desalination plant with electricity. Power lines will follow the route of the roads; and
- **Roads** (approximately 42km in length) to provide access from the mine to the desalination plant, transfer pipeline and power lines. Road would be 4m wide with a 15m servitude and would be unpaved (gravel).

5.2 Desalination Process

Desalination refers to a water treatment process whereby salts are removed from saline water to produce fresh water. The proposed desalination process will make use of Reverse Osmosis (RO) technology to remove salt from sea water, thereby producing fresh product water as well as high salinity brine.

The main elements in the desalination process are:

- **Seawater intake** of approximately 30 000 m³/day, over a time period of 24 hours;
- **Pre-treatment of feedwater**, which would include screening and filtration to remove suspended solids;
- **Desalination**, making use of RO technology, in which pressurised feedwater passes through a series of membranes which allow only water (low saline permeate) to pass through and salts and organic matter to accumulate in brine;
- **Post-treatment** (remineralisation and disinfection) of process water; and
- **Discharge of brine** from the desalination process.

The desalination plant will produce approximately 4 million m³/annum. Of the approximately 30 000 m³/day of the sea water passing through the desalination plant, on average 60% will be returned to the sea as brine from the plant. Brine has higher salinity and a slightly increased temperature compared to the incoming feedwater. Brine may also contain small amounts of chemicals used on cleaning of the plant and preservation of the membranes.

6 ALTERNATIVES

The EIA Regulations, 2010, require that all S&EIR processes must identify and describe feasible and reasonable alternatives. Alternatives considered during screening phases of the project, include:

Alternative Water Sources: Surface and ground-water resources are insufficient to meet the mine’s water requirements. **Seawater desalination** is considered the only feasible option for secure and reliable water supply.

Seawater Intake Alternatives: Beach wells were eliminated as a viable option due to unsuitable bedrock conditions. A small scale **open water intake** is considered to be the only feasible option.

Alternative Locations for Brine Discharge: 22 potential discharge sites were identified. The selected site was considered most suitable from an ecological and technical perspective, based on initial input by marine engineers and marine ecologists.

Alternative Locations for Seawater Intake: Based on marine conditions, land side characteristics, constructability, brine outfall options and operational and maintenance requirements, **Volwaterbaai** was selected from 4 alternative sites.

Alternative Positions for Desalination Plant: Based on the selected seawater intake site, five alternative positions for the desalination plant were identified. The exact position of the desalination plant at Volwaterbaai has not yet been determined.

Power Supply Alternatives: Wind turbines and diesel generators were eliminated as options and **Grid power** supplied by overhead line from the mine is considered the only feasible alternative.

Route Alternatives: Ten alternative routes for linear infrastructure between the mine and desalination plant were identified. A number of options were eliminated based on technical feasibility and ecological constraints. A preferred route was identified (**Kotzesrus Route**), along with two potential routes bypassing Kotzesrus (**Bypass Route** and **Alternative Bypass Route**).

Various **process and design alternatives** are also being investigated.

The No Go alternative will be considered in the EIA in accordance with the requirements of the EIA Regulations, 2010. The No Go alternative entails no change to the status quo, in other words the proposed desalination plant site will remain vacant and no linear infrastructure will be built. Due to the lack of water in Namaqualand it is unlikely that the Zandkopsdrift Mine would be developed.

7 STAKEHOLDER ENGAGEMENT

Stakeholder engagement is a key component of the S&EIR process and is being undertaken in accordance with the requirements of the EIA Regulations, 2010. The stakeholder engagement activities related to the Scoping Phase are summarised in Table 3 below.

Relevant local, provincial and national authorities, conservation bodies, local forums and surrounding landowners and occupants have been directly notified of the S&EIR process and the release of the Scoping Report for comment.

Table 3: Stakeholder Engagement during Scoping

Activity	Date
Release Scoping Report to the Public	29 August 2013
Comment period	2 September – 14 October 2013
Public Open Days	27- 28 September 2013

8 POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS

The project infrastructure traverses CBAs associated with sensitive vegetation and freshwater resources. The construction of infrastructure in some previously undisturbed areas may impact on terrestrial ecology (including flora and fauna).

The coastal and marine environment is considered to be rich in biodiversity and relatively pristine. Seawater extraction, the discharge of treated brine effluent and the construction of infrastructure in the coastal zone and below the HWM may impact upon marine biota.

The Namaqualand coastline is considered to be rich in archaeological and paleontological resources. A number of these heritage resources have been identified in the surrounding area and the town of Kotzesrus contains a number of historic buildings.

The project area is remote and only a limited number of receptors will be affected by the construction of the desalination plant, including tourists and residents in the area, while a small number of landowners in the vicinity of Kotzesrus will be impacted by the construction of the associated infrastructure.

The project may create some employment opportunities in the short term, while the operation of the desalination plant may create only a limited number of long term employment opportunities.

The following key environmental issues – potential negative impacts and potential benefits – have been identified:

Terrestrial and wetland ecology – potential impact on threatened species and habitats;

Terrestrial fauna – potential impact on faunal habitats during construction. In addition linear infrastructure could create barriers to the migration of certain faunal species;

Marine and coastal ecology – potential impacts on marine biota and coastal ecosystems, including the entrainment and impingement of biota (fauna and flora) and impacts on marine biota as a result of increased salinity levels and the presence of co-discharge; and

Heritage – potential impacts on sites of archaeological or palaeontological significance.

Certain impacts, while important, are considered likely to be less significant, including air quality, noise, socio-economic, traffic and visual (or sense of place) aspects.

9 PLAN OF STUDY FOR THE IMPACT ASSESSMENT

To address the potential issues and impacts identified thus far, the following **specialist studies** are proposed:

- Terrestrial and Wetland Ecology (including terrestrial fauna) Assessment;
- Marine Hydrodynamic Modelling;
- Marine and Coastal Ecology Assessment;
- Heritage Assessment; and
- Palaeontology Assessment.

Specialist input, rather than a full specialist study, is recommended for air quality, noise, socio-economic, traffic and visual (or sense of place) aspects.

Specialists will be required to provide detailed baseline information and to identify and assess the potential impacts of the proposed project within their particular field of study. In addition, specialists will be required to identify practicable mitigation and optimisation measures to avoid or minimise potential negative impact and/or enhance any benefits. SRK's standard impact rating methodology will be employed in the assessment of impacts.

Once specialist studies have been completed, the results will be collated into an EIA Report and EMP. The EIA Report and EMP will be released for public comment through notifications to registered Interested and Affected Parties (IAPs). Key authorities will also be consulted as part of the process.

All comments received will be incorporated into a Comments Report which will be appended to the EIA Report. The EIA Report and EMP will then be submitted to the NCDENC for their consideration in decision-making.

HOW YOU CAN YOU PARTICIPATE IN THE EIA PROCESS

The Scoping Report is not a final report and can be amended based on comments received from stakeholders. Issues and concerns identified in the Scoping Study will assist in focussing the EIA and will be used to refine the terms of reference for specialist investigations. Stakeholders are therefore urged to participate:

REVIEW THE REPORT

Copies of the complete report are available for public review at the following locations:

- Kotzesrus Cash Store;
- Municipal Service Points in:
 - Lepelsfontein;
 - Stofkraal;
 - Rietpoort; and
 - Molsvlei.
- Garies Public Library;
- Security office at Zandkopsdrift Mine;
- SRK’s Cape Town office; and
- SRK’s website: www.srk.co.za – click on the ‘Recent Publications’ and then ‘Public Documents’ links.

IAPs are invited to comment, and/or to register on the project database. IAPs should refer to the NCDENC reference number, and must provide their comments together with their name, contact details (preferred method of notification, e.g. email), and an indication of any direct business, financial, personal or other interest which they have in the application, to the contact person below, by **14 October 2013**.

REGISTER OR PROVIDE YOUR OPINION

Register or send written comment to:

Larissa Heyns

SRK Consulting

Postnet Suite #206, Private Bag X18,
Rondebosch, 7701

Tel: + 27 21 659 3060

Fax: +27 21 685 7105

Email: lheyns@srk.co.za

Comments must reach SRK no later than **14 October 2013** to be included in the Final Scoping Report. Only registered IAPs will be notified of future opportunities to provide comments.

ATTEND A MEETING

A number of **Public Open Days** will be held where the project will be discussed and additional concerns or issues can be raised:

Public Open Day:

Venue: Lepelsfontein Community Hall

Date: Friday 27 September 2013

Time: 09h00 to 12h00

Public Open Day:

Venue: Kotzesrus Church Hall

Date: Friday 27 September 2013

Time: 14h00 to 17h00

Public Open Day:

Venue: Garies Town Hall

Date: Saturday 28 September 2013

Time: 09h00 to 12h00

Relevant Organs of State have been automatically registered as stakeholders. According to the EIA Regulations, 2010 all other **persons must request in writing to be placed on the register, submit written comments or attend meetings in order to be registered as stakeholders** and be included in future communication for the project.

