Extended consultations according to the Environmental Code

Compilation 2004

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ISBN-91-975606-1-8
EnaInfo/Edita June 2005
Photo: Curt-Robert Lindqvist, Lasse Modin, SKB's archive.

Contents

Another year of consultations

We Swedes have enjoyed the benefits of electricity produced by means of nuclear power for more than 30 years. Operation of the nuclear power plants also produces radioactive waste. SKB's mission is to dispose of the spent nuclear fuel in a safe manner which ensures long-term protection of human health and the environment.

We work with final disposal according to the KBS-3 method, where the fuel is encapsulated in copper and emplaced deep down in the bedrock. SKB's proposal is that the encapsulation plant should be built adjacent to Clab in Oskarshamn, where all spent nuclear fuel is stored today. We have been conducting investigations and carrying on a dialogue for several years regarding the possibilities of siting the final repository at Forsmark or Oskarshamn. An important part of SKB's work with the environmental impact assessment (EIA) for the planned activities is the formal consultations provided for by the Environmental Code. The intention of the consultations during the past year was to gather viewpoints from citizens, organizations, municipalities and government agencies regarding the scope of the studies that need to be conducted and comprise a basis for the environmental impact statement (EIS). These consultations have mainly taken place at meetings, but also in writing.

Many meetings have been held during the past year, and I am pleased that the discussions have continued to be open and lively. It is clear that the concerned parties are interested in sharing their experience and local expertise. We have received many constructive viewpoints; some were concerned with technology, environment and safety, while others addressed the form and execution of the consultations. There has, for example, been criticism that SKB takes up too much time at the meetings with its own presentations, which doesn't leave enough time for discussion. We believe that time for discussion is important, so we have heeded this criticism. At the meetings we have had in Östhammar during the year we have therefore held few and short presentations. Many of SKB's experts have then been present at the meetings to discuss and answer questions posed by the consultation parties concerning final disposal of spent nuclear fuel. All questions that were raised in the consultations during 2004 – whether orally or in writing – and SKB's responses are presented in this annual compilation.

Finally, I would once again like to stress my conviction that the sum total of everyone's knowledge and commitment is important for SKB's work of managing and disposing of the radioactive waste from the nuclear power plants in the best manner. The consultations will continue up until a few months before the permit applications for the encapsulation plant and the final repository are submitted. According to current plans, this will take place in 2006 and 2008, respectively. Everyone can and should become involved in this work and help us in Sweden achieve a safe disposal of our radioactive waste. To all of you who are already involved, let me just say: Keep up the good work!

Saida Laârouchi Engström
Head of EIA and Public Information

Background

SKB, Svensk Kärnbränslehantering AB (the Swedish Nuclear Fuel and Waste Management Co), which is owned by the companies that operate the Swedish nuclear power plants, has been assigned the task of managing and disposing of the spent nuclear fuel from the reactors.

Managing of the radioactive waste generated by the operation of the nuclear power plants began to be discussed early in the build-out of the nuclear power programme. Three fundamental questions need to be answered: *how* and *when* should the waste be disposed of and what will the *consequences* be? Another important question is where the facilities needed can be built. These questions are interlinked and must be addressed in parallel in such a way that increasingly detailed knowledge is acquired and decisions are made in a step-by-step process.

It is Sweden's collective responsibility to dispose of the waste. We must do this now and not pass on the responsibility to future generations. SKB's proposal is that the spent nuclear fuel be disposed of according to the KBS-3 method, which involves encapsulating the fuel in copper canisters which are embedded in bentonite clay at a depth of 400–700 metres in the bedrock. The KBS-3 method was formally examined by the regulatory authorities and the Government in the early 1980s and comprised the basis for the permits to commission the nuclear power reactors Oskarshamn 3 and Forsmark 3.

The scientific and technical basis for the method has been continuously developed and reported to the regulatory authorities and the Government every third year in the RD&D programmes. At the same time, SKB has followed, and will continue to follow, the development of other strategies and methods. The regulatory authorities and the Government have repeatedly approved the focus of the RD&D programmes on geological disposal according to the KBS-3 method with parallel evaluation of alternative methods.

With a final repository according to the KBS-3 method as a planning premise, a stepwise siting process has been under way since 1992. By means of general siting studies, SKB explored

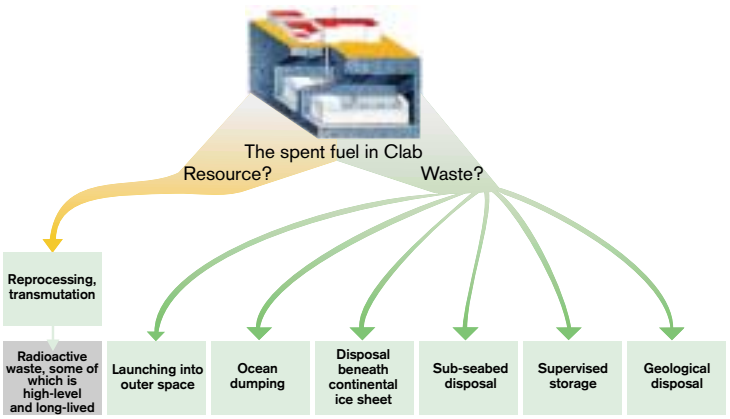
the general prospects in different parts of the country. These studies show that good prospects exist for finding suitable sites for the final repository at many places in the Swedish crystalline bedrock. In the feasibility studies conducted during the period 1993–2000, the siting prospects were evaluated in a total of eight municipalities: Storuman, Malå, Östhammar, Nyköping, Oskarshamn, Tierp, Älvkarleby and Hultsfred. In 2002, SKB initiated site investigations on two sites for siting the final repository: The Simpevarp area in Oskarshamn and the Forsmark area in Östhammar. The investigations are expected to take 5–6 years. After that the intention is to select one of the sites and apply for a permit to build a final repository according to the KBS-3 method on that site.

SKB's proposal is to site the encapsulation plant next to Clab in Oskarshamn. An alternative siting is adjacent to the nuclear installations in Forsmark. This alternative will only be considered if the final repository is also sited at Forsmark. According to current plans, SKB will submit a permit application under the Nuclear Activities Act for the encapsulation plant in 2006 and applications under the Environmental Code for both the encapsulation plant and the final repository in 2008. An application under the Nuclear Activities Act for the final repository will also be submitted in 2008.

Consultations and EIA/EIS

The supporting material for the permit applications includes an environmental impact statement (EIS) and a consultation report. The EIS will describe what consequences the planned activity is expected to have for man and the environment and how they can be prevented or mitigated. The form and content of the EIS are being developed in consultation.

The consultation process prior to the applications for permits for the final repository and the encapsulation plant was begun in 2002. Early consultations have been completed and extended consultations are under way. Consultations carried out during 2003 are compiled in *Extended consultations according to the Environmental Code 2003*. This is the compilation of the 2004 consultations.



SKB has examined different strategies for disposing of the spent nuclear fuel. The KBS-3 method is a form of geological disposal where the fuel is encapsulated in copper canisters which are embedded in bentonite clay at a depth of 400–700 metres in the bedrock.

Consultation – What is it?

Consultation gives all interested parties an opportunity to influence the design of the encapsulation plant and the final repository in order to mitigate damage and detriment for humans and the environment. Consultation is also SKB's opportunity to benefit from the knowledge and viewpoints of the participants.

In SKB's opinion, the main purpose of consultations is to give different actors an opportunity to influence:

- The design and layout of the facilities with a view towards human health and the environment as well as the landscape, recreational interests, and natural and cultural values in the area.
- What studies and investigations need to be conducted in order to obtain a comprehensive EIS.
- The scope and content of the EIS.

Consultation also gives SKB an opportunity to benefit from the knowledge and viewpoints of the participants. The consultations should be regarded as a forum for a mutual exchange of knowledge and ideas. The ambition is that the consultations should result in a carefully conceived and solidly underpinned environmental impact statement.

Consultations regulated by the Environmental Code

The consultation procedure, for applications under both the Environmental Code and the Nuclear Activities Act, is regulated by Chapter 6 of the Environmental Code. In the case of an activity that requires a permit pursuant to the Environmental Code, early consultation shall be held with the County Administrative Board and with citizens likely to be affected. Early consultations are being conducted for both the encapsulation plant and the final repository, in both Oskarshamn and Forsmark. The extended consultations started in 2003.

Extended consultations must be held with the County Administrative Board, other government agencies, citizens and those organizations that are likely to be affected. The consultations shall relate to the location, scope, design and environmental impact of the activity or measure and the content and structure of the EIS.

If an activity is likely to have a significant environmental impact in another country, the Swedish Environmental Protection Agency shall, according to the Espoo Convention, "inform the competent authority in that country about the planned activity or measure and give the country concerned and the citizens who are likely to be affected the opportunity to take part in a consultation procedure concerning the application and the environmental impact assessment." SKB has brought up the question with the Swedish Environmental Protection Agency and is waiting for notification as to whether consultations are to be held with other countries and, if so, which ones and in what form.

Lively discussions at the consultation meeting in Östhammar's Mission Church.

Scope of EIA

Important phases of the consultations are scoping, studies and reconciliations.

During 2004 we have been in the scoping phase and the consultations have mainly concerned the contents of the report entitled "Scope, delimitations and studies for environmental impact assessments (EIAs) for encapsulation plant and final repository for spent nuclear fuel" (in Swedish only). The goal of the work has been to gather viewpoints from citizens, organizations, municipalities and government agencies regarding the scope of the studies that will comprise a basis for the environmental impact statement. Viewpoints and proposals have emerged from the consultations concerning:

– Presentation of alternatives for both repository siting and disposal method.

– Scope of the system, which facilities and activities are to be included?

– Define certain study areas, for example cultural environment and societal impact.

– Questions concerning the consultation and licensing process.

SKB will describe the point of departure for the study work in version 1 of the "scoping report", where the viewpoints and proposals that have emerged in the consultations have been taken into consideration. Then both the structure and content of the EIS will be progressively defined and adjusted in response to what has emerged in the consultations, as well as from design, investigations and studies for the planned facilities.

Coming consultation meetings

A consultation meeting will be held in the spring of 2005 in Oskarshamn where SKB will present the construction and operation of a final repository and an encapsulation plant and the disturbances that may occur in conjunction with e.g. rock excavation and haulage. A meeting with similar content was held in Forsmark in November 2004.

A dialogue with part-time residents is planned for the summer of 2005 in both Forsmark and Oskarshamn, and the next consultation meeting with citizens for the late autumn of 2005. That meeting is intended to deal primarily with the encapsulation plant in preparation for the application under the Nuclear Activities Act that is planned to be submitted in 2006. Another meeting is planned during the spring of 2006, when we intend to discuss the reporting of alternative methods and alternative sitings of the final repository.

After that we plan to hold 1–2 consultation meetings per year in Oskarshamn and Forsmark. It is also possible to meet with individual groups to discuss specific questions. The consultations will continue up until a few months before the applications are submitted, in other words up until 2008 for the final repository and the encapsulation plant.

Prior to the consultation meetings SKB proposes a topic, but ample provision is also left for information and discussion of study results and activities pertaining to the encapsulation plant and the final repository.

General planning of consultation activities 2005–2008 includes meetings with:

- >> Citizens and organizations in Oskarshamn and Forsmark, once a year in each municipality.
- >> The municipality and the County Administrative Board, as well as the regulatory authorities SKI and SSI, around four times a year within the Oskarshamn EIA Forum and the Forsmark Consultation and EIA Group.
- >> Government agencies once in 2006 and once in 2008, prior to the submission of the permit applications.
- >> National organizations, that will receive regular information on results and planned consultations, up until a reconciliation meeting in 2008.
- >> Other countries. These consultations take place via the Swedish Environmental Protection Agency.

Local information

In addition to the formal consultations, there are extensive information activities in both Oskarshamn and Forsmark. The information work spans a broad field – from daily spontaneous meetings with people who live in the area to receiving visitors from other parts of the world. Maintaining a local dialogue is vital in order to build a democratic consensus on the nuclear waste issue.

The site investigations for the final repository include a close dialogue with everyone who is in any way affected by our activities. We have regular contact with the landowners where the investigations are conducted. In addition, different types of nearby resident meetings are held for the purpose of information and goodwill, along with field visits to present and get viewpoints on suggested locations of the final repository's above-ground facilities. A Newsletter telling about activities in the field is sent regularly to everyone living in Misterhult parish in Oskarshamn, as well as to nearby and part-time residents in the Forsmark area.

SKB also tries to meet with other municipal residents as often as possible in various constellations (for example municipal employees, school personnel, business organizations) to provide information on and discuss the nuclear waste programme and ongoing site investigations.

Publications and the web

Four issues of the information magazine Lagerbladet were published during the year. It is distributed to all households in the concerned municipalities and other interested persons can subscribe to it free of charge. In this magazine we discuss our activities and subjects that have a bearing on us, particularly on the local level. Websites for Oskarshamn and Forsmark can be accessed via SKB's website. They are updated regularly with information on SKB's activities and events that have been held in the two municipalities.

Study trips and visits

The best way to spread knowledge on our activities is by talking about and showing SKB's facilities. All municipal residents in Oskarshamn and Östhammar are welcome to participate in the study trips arranged by SKB. Study trips, with between 40 and 50 persons on each trip, were arranged to Forsmark for the inhabitants of Oskarshamn Municipality. From Östhammar, around 350 persons went on one of the trips that give the participants a thorough look at SKB's activities in Småland.

In Oskarshamn visitors can visit the Äspö HRL, Clab and the Canister Laboratory, while in Forsmark they can visit SFR, and in both places some of the site investigation's drilling sites. The number of visitors from other parts of Sweden and abroad is great, and altogether we had nearly 25,000 visitors at both sites during 2004.

Sigyn on summer tour

SKB's big information event during the summer was the exhibition tour by m/s Sigyn – the ship that normally transports spent nuclear fuel and radioactive waste. The cargo hold was turned into an exhibition hall where we showed our activities and offered seminars and conference facilities to visitors. In Uppland the ship called at the ports of Forsmark, Öregrund and Hargshamn, and in Kalmar she visited the ports of Simpevarp, Oskarshamn, Kalmar and Västervik.

Documentation of the consultations

The final documentation of completed consultations consists of the consultation reports that are to be appended to the permit applications for the encapsulation plant and the final repository. The annual compilations are published to provide an overview of questions and answers from the previous year's consultations.

All consultations, whether in the form of meetings or correspondence, are documented. All minutes, notes and offered viewpoints are available on SKB's website, and hard copies can be obtained on request.

Documentation of meetings

Minutes are kept of the meetings with the Oskarshamn EIA Forum and the Forsmark Consultation and EIA Group, which are subsequently checked and signed by the participants. After other consultation meetings, notes are written. After these meetings it is possible to submit questions and viewpoints regarding the meeting for another two weeks.

The questions and viewpoints discussed during a consultation meeting and received within the appointed period after the meeting are presented in the notes of the meeting. There SKB also answers those questions that can be answered immediately. Some questions may lead to supplementary studies and further discussion. Some questions are judged to lie beyond the scope of the EIA work and are dismissed from the consultations. Reasons are given for this.

Written viewpoints

The viewpoints that come in between consultation meetings and in the written consultations are made available on SKB's website and in the annual compilations. Whenever possible, SKB responds to questions and viewpoints.

In the break at the consultation meeting in Figeholm (Oskarshamn), there was an opportunity to learn more.

Annual compilation

The consultations for the encapsulation plant and the final repository are coordinated. The annual compilations contain excerpts from the minutes and notes of the year's meetings grouped in the following categories:

– Encapsulation plant.
– Final repository for spent nuclear fuel.
– Common issues.

The excerpts consist mainly of the questions and viewpoints that have come up during the consultation meetings, and SKB's replies and comments. These questions and answers will be compiled in the consultation report, which will be appended to the application.

The consultation report for the encapsulation plant in 2006 will contain questions and viewpoints from "encapsulation plant". The consultation report for the final repository and the encapsulation plant in 2008 will present all questions and viewpoints.

The consultation reports will explain how SKB has taken submitted viewpoints into account.

Completed consultations

Consultations have been under way for three years now. The early consultations were conducted in separate meetings for the encapsulation plant and the final repository. In the extended consultations, joint meetings are being held. SKB held thirteen consultation meetings in 2004, five of which were for citizens and conservation and environmental organizations.

Early consultations

Early consultations regarding the final repository and the encapsulation plant in Forsmark and in Oskarshamn were held during the period 2002–2003. Invitations were sent out to more households than just those who belonged to the category "likely to be affected". The invitation included specially produced background material describing the project and the purpose of the meeting.

The background material compiled prior to the early consultations is described in the section "If you would like to read more" at the end of this booklet. The background material and the consultation reports, as well as the County Administrative Board's decision, are available on SKB's website, and hard copies can be obtained on request.

Extended consultations

The extended consultations began in 2003. Joint meetings for the encapsulation plant and the final repository are being held in both Oskarshamn and Forsmark. An important feature of the consultations is the meetings being held with the EIA Forum in Oskarshamn and the Consultation and EIA Group in Forsmark. These groups include representatives from the relevant municipality and County Administrative Board as well as SKI, SSI and SKB.

Previously held consultations

Besides the meetings with the EIA Forum and the Consultation Group, extended consultations were held during 2003 with citizens in Oskarshamn Municipality and with government agencies.

Completed consultations 2004

During 2004, thirteen meetings about the final repository and the encapsulation plant were held in accordance with the provisions of the Environmental Code concerning extended consultation, four of which were held with the Oskarshamn EIA Forum and four with the Forsmark Consultation and EIA Group.

Written consultations were also held during the first quarter of 2004 with regional actors in Kalmar and Uppsala counties.

The consultations with the municipalities of Oskarshamn and Östhammar about the "scoping report" were also concluded during the autumn of 2004 with written replies from both municipalities.

Previous years' consultations

Early consultations		Place
Final repository	10 January 2002	Oskarshamn
Encapsulation plant	8 March 2003	Oskarshamn
Final repository	15 June 2002	Forsmark
Encapsulation plant	29 October 2003	Forsmark

Extended consultations	Target group
25 May 2003	Oskarshamn
17 Sept. 2003	Forsmark Consultation and EIA Group
30 Sept. 2003	Oskarshamn EIA Forum
12 Nov. 2003	Citizens in Oskarshamn Municipality
11 Dec. 2003	Oskarshamn EIA Forum
17 Dec. 2003	Government agencies

Consultations during 2004

19 Jan. 2004	Forsmark Consultation and EIA Group
5 Feb. 2004	Citizens in Östhammar Municipality
24 March 2004	Oskarshamn EIA Forum
22 Apr. 2004	Local conservation and environmental organizations in Oskarshamn Municipality
4 May 2004	National conservation and environmental organizations
13 May 2004	Local conservation and environmental organizations in Östhammar Municipality
14 May 2004	Forsmark Consultation and EIA Group
26 May 2004	Oskarshamn EIA Forum
1 Oct. 2004	Forsmark Consultation and EIA Group
6 Oct. 2004	Oskarshamn EIA Forum
25 Nov. 2004	Citizens in Östhammar Municipality
8 Dec. 2004	Oskarshamn EIA Forum
10 Dec. 2004	Forsmark Consultation and EIA Group
2004 January – March	Regional actors in Kalmar County
2004 January – March	Regional actors in Uppsala County
Autumn 2004	Oskarshamn Municipality
Autumn 2004	Östhammar Municipality

Excerpts from minutes and notes of meetings

This section contains excerpts from the documentation from the extended consultations held in 2004. In each excerpt, questions, viewpoints and topics have been grouped in the following categories:

– Encapsulation plant.

– Final repository for spent nuclear fuel.

– Common issues.

The excerpts also show the purpose and target group of the meeting, as well as how invitations took place and what background material was provided.

Meeting with Forsmark Consultation and EIA Group

Date	19 Jan. 2004, 13.00–16.00 hrs
Place	Assembly Hall, County Administrative Board in Uppsala County
Target group	Östhammar Municipality, County Administrative Board in Uppsala County, SKI and SSI.
Invitation	The date of the meetings is decided on jointly. SKB sends out e-mail invitations to each meeting.
Purpose	To discuss matters related to an encapsulation plant and a final repository for spent nuclear fuel. Furthermore, each participating party gives a status report on the work they are taking part in that has a bearing on the disposal of spent nuclear fuel.
Background material	—
Present	
County Administrative Board in Uppsala County	*Ulf Henricsson, chairman, Mats Lindman*
Östhammar Municipality	*Margareta Widén Berggren, Bertil Alm, Bengt Johansson, Sten Huhta, Gunnar Lindberg, Virpi Lindfors, Carl-Johan Nässén*
SSI	*Björn Hedberg, Tomas Löfgren*
SKB	*Saida Laârouchi Engström, Kaj Ahlbom, Gerd Nirvin, Olle Olsson, Claes Thegerström, Kristina Vikström, Sofie Tunbrant, secretary*

1 Encapsulation plant

No questions or viewpoints were expressed pertaining solely to the encapsulation plant.

2 Final repository for spent nuclear fuel

2.1 The County Administrative Board wondered about the agreement with the landowners in Oskarshamn.

Olle Olsson said that the agreement called for SKB to pay rent during the site investigation phase. They must also pay compensation for any damage. If the deep repository is sited in Oskarshamn, the principles for compensation in the event of easement or acquisition are agreed on.

2.2 Östhammar Municipality asked how big the investigation area on the Simpevarp Peninsula is – if it is too small?

Olle Olsson said that the investigation area on the Simpevarp Peninsula is about 5 km^2, half as big as the areas in Laxemar and Forsmark, which are both around 10 km^2.

2.3 The municipality wondered if the rock stresses in Forsmark could be decisive.

Kaj Ahlbom replied that the rock stresses influence the design and construction of the deep repository and the transport roads down to the repository. Excessively high rock stresses, especially in combination with low strength of the bedrock, could lead to instability, resulting in collapse. This can be counteracted by rock support, but the problems must not be so great that they cannot be overcome.

3 Common issues

3.1 The County Administrative Board wondered when "Scoping report, Version 0" would formally be circulated for comment.

Saida L. Engström replied that it will be sent to the County Administrative Board together with the mailing to regional actors at the end of January.

3.2 The municipality asked what "the region" thinks about the decision process.

The County Administrative Board did not have a quick reply, but asked for time to think. Kristina Vikström said that the local/regional decision process is not an SKB matter, but that SKB can help to shed light on various questions.

3.3 Östhammar Municipality pointed out that the municipality has bad experience from the establishments of the nuclear power plant and Sandvik. A longer lead time is needed between decision and execution so that schools and infrastructures can be adapted to the new conditions.

Claes Thegerström said that this is a relevant viewpoint. One purpose of the societal programme is to highlight issues of this type in good time. Then SKB will show in 2008 where we want to build the facilities. This will leave a few years before construction starts.

Meeting with citizens in Östhammar Municipality

Date	5 Feb. 2004, 19.00–21.00 hrs
Place	The Forsmark Nuclear Power Plant's information building, Forsmark
Target group	Citizens
Invitation	Written invitation to approximately 300 households plus advertisement in Upsala Nya Tidning (17 and 28 January), Östhammars Nyheter (22 and 29 January) and Annonsbladet (21 January and 4 February).
Purpose	To discuss which questions should be explored as a basis for EIA.
Background material	The report "Scope, delimitations and studies for environmental impact assessments (EIAs) for encapsulation plant and deep repository for spent nuclear fuel. Version 0 – basis for extended consultation in Forsmark" (in Swedish only). In this report, SKB presented proposals for which types of studies will be conducted for applications and environmental impact assessments (EIAs) under the Environmental Code and the Nuclear Activities Act. The report was available at SKB's site investigation office in Forsmark, from Östhammar Municipality and via SKB's website.
Present	Approximately 60 persons in all. *Citizens* Approximately 35 persons. *Representatives from* SKI, the County Administrative Board, Östhammar Municipality, Forsmarks kraftgrupp, the Nature Conservation Society in Uppsala County, Oss – Opinionsgruppen för säker förvaring ("Opinion group for safe disposal"). *SKB* Saida Laârouchi Engström, Kaj Ahlbom, Niklas Heneryd, Anders Nyström, Roland Johansson, Kristina Vikström and others.

1 Encapsulation plant

1.1 Is there one transport cask for every canister?
Yes.

1.2 If the encapsulation plant is sited at Oskarshamn, how will the fuel be transported from Clab to the encapsulation plant?

The fuel will be transported from Clab via a fuel elevator to a water pool in the encapsulation plant.

2 Final repository for spent nuclear fuel

2.1 How are rock stresses measured? Are they measured on the surface or at depth?

Rock stresses are measured at depth, in boreholes. There are two methods for measuring rock stresses: hydraulic fracturing and overcoring. In overcoring, a number of strain gauges are installed in a smaller pilot hole. They are used to measure how the strains change when the pilot hole is overcored. In hydraulic fracturing, a borehole section is sealed off, after which the rock is fractured by water pressure. By measuring the water pressure that is required to keep the crack open, the rock stress can be calculated.

2.2 How will you proceed to determine the effects of, for example, groundwater lowering?

At present SKB is performing inventories to get descriptions of what the area looks like before the activities begin. These descriptions will then serve as a basis for assessments of expected consequences for the environment and human health. A central aspect of the EIA work is to identify consequence-mitigating measures, based on these expected consequences.

2.3 What characterizes a key habitat?

A key habitat is a more or less uniform and delimitable living environment of crucial importance (with a key role) for red-listed species, i.e. endangered or threatened species. A key habitat can be everything from a single giant tree to an area of virgin forest measuring tens of hectares.

The term "key habitat" does not have any legal status. There is thus no legal protection for key habitats.

2.4 What is a red-listed species?

A red-listed species is one whose survival is in doubt. ArtDatabanken (the Swedish Species Information Centre) in Uppsala has assessed the species and classified it in a red-list category which summarizes the species' situation in Sweden. This assessment is made based on a number of criteria concerning the size and range of the Swedish population.

2.5 Nuclear waste disposal can be compared with the mining industry, and there environmental issues are well documented. Is the same process gone through to assess the consequences for human health when a new mining operation is being planned?

The mining industry and the deep repository are subject to the same legislation to some extent. An environmental impact statement (EIS) prepared in accordance with the Environmental Code must be submitted with an application for a new mining operation, just as for the deep repository. The EIS must contain an overall assessment of the impact the planned activity may have on human health.

2.6 The deep repository is a long-term threat to human health. How is this brought out in the health studies?

These health studies focus on the period of construction and operation of the encapsulation plant and the deep repository. The long-term aspects are dealt with in the safety assessments. The regulatory requirements are formulated with a view towards the long-term safety of the biosphere.

2.7 What are the geographic boundaries of the investigation area?

Most inventories on the ground surface are conducted between highway 76 and the coast, an area of 30–40 km^2. The inventory of moose, for example, is done within an even larger area comprising the whole of Östhammar Municipality. The candidate area for the deep repository is about 10 km^2.

2.8 How will rock muck from the excavation work be handled? This will give rise to both noise and dust.

This is a central issue for the environmental impact assessment for the construction and operating phases and is currently being studied. The results of these studies will be presented in upcoming consultation meetings.

2.9 What does the landowner situation look like on the two sites?

In Oskarshamn there are around 50 landowners with whom agreements have been signed. In Forsmark there are four major landowners with whom agreements have been signed.

2.10 The Environmental Code requires an account of alternatives. The Code's rules of consideration say that the site for an activity should be chosen in such a way as to minimize damage or detriment to human health and the environment. This means that all of Sweden should be included in the search for a site; why has this not been so?

The primary purpose of the siting process has been to find bedrock that satisfies the regulatory authorities' safety requirements. During the period 1985 to 1995, investigations were made of study sites involving deep drilling and measurement of the properties of the rock at some ten places in Sweden. These investigations showed that the geological prospects for hosting a deep repository are good at many places in the country. SKB has also conducted county-specific general siting studies in all counties, except Gotland. Long-term safety was the most important issue in these studies, but they also included general surveys of nature and culture protection areas, industrial areas, roads, railways and possible harbours.

General siting studies aimed at weighing the advantages and disadvantages of siting in northern versus southern Sweden and on the coast versus inland have also been conducted, as have general siting studies in municipalities with nuclear installations (Varberg, Kävlinge, Oskarshamn, Nyköping and Östhammar).

These general siting studies showed that:
– good prospects exist of finding suitable sites for a final repository at many places in Swedish crystalline bedrock,
– it is not possible to recommend either the northern or the southern parts of the country with respect to siting prospects,
– it is not possible to recommend either coast or inland with respect to siting prospects.

There are several reasons why nationwide studies have not been conducted:
– it would not be practically feasible, since it would probably entail compulsory measures by society (SKB would force landowners to give them access to different test drilling sites),
– it would have few, if any, advantages from a safety point of view,
– it would require unreasonable costs without any real benefit,
– it would take a long time.

SKB has therefore focused its siting work on municipalities that have shown an interest in cooperating. SKB is neither able nor willing to act against the will of a municipality. SKB attaches great importance to the viewpoints and attitudes of nearby residents. We also know that most municipalities support our outlook.

After the requirements on the safety-related properties of the rock and voluntary participation have been met, the environmental requirements on the siting have to be addressed. The site investigations include surveying e.g. areas of interest for nature conservation, outdoor recreation and preservation of the cultural environment in order to minimize encroachment on this environment in the event of an establishment.

The Environmental Code also requires an account of alternative designs together with the reasons why a certain alternative was chosen. In its decision regarding the early consultation, the County Administrative Board also had an opportunity to require that other ways of achieving the same purpose should also be described. The County Administrative Board found no reason to make such requirements in its decision that the deep repository is likely to have a significant environmental impact.

2.11 It is difficult to determine from reading the preliminary version of the "scoping report" what SKB plans when it comes to alternative reporting. What alternative sites will be reported? Are there other alternatives besides the two sites now being investigated?

The permit application for the deep repository will be for either Forsmark or Oskarshamn, provided they meet the requirements. The other of these two sites will be the alternative. No other sites are currently being investigated. In the application, the material that already exists from previously investigated sites in Sweden (around 10 sites) and in Finland (4 sites) will be utilized for comparison with the selected site.

2.10 Although the County Administrative Board has not required a report on "rail transport as an alternative to air transport", the requirements in the Environmental Code on alternative reporting must still be met.

Through the years, SKB has studied a number of alternatives for management and disposal of spent nuclear fuel. SKB has followed, and will continue to follow, the development of some of these alternatives. All this will be reported.

2.12 To facilitate the coming assessment of alternative reporting, the objective of the siting process should be described more clearly from an environmental impact viewpoint and from an environmental law perspective, which should pave the way for previously expressed requirements from the Government and the regulatory authorities regarding comparable reporting of the inland alternative.

The Government has on several occasions stated that the applications for a permit to build a final repository for spent nuclear fuel should contain material for comparable assessments showing that feasibility studies have been conducted on between five and ten sites in the country and that site investigations have been conducted on at least two sites – as well as the reasons for the choice of these sites.

SKB has conducted feasibility studies in eight municipalities – Malå, Storuman, Tierp, Älvkarleby, Östhammar, Nyköping, Hultsfred and Oskarshamn. After the feasibility studies, Storuman and Malå said no to further investigations. In the remaining six municipalities, SKB prioritized eight sites of potential interest for the deep repository. In the choice between these alternative sitings, SKB's reasoning was in brief as follows:

As far as the rock is concerned, all selectable alternatives met the requirements that could be checked in the feasibility studies. The alternatives could not be ranked in this respect based on the available background material.

As far as other siting factors are concerned (infrastructure, land availability, operation etc.), there were three alternatives with clear advantages: the Forsmark area in Östhammar Municipality, the Simpevarp area in Oskarshamn Municipality and an area in the northern part of Tierp Municipality. Östhammar and Oskarshamn municipalities have taken a positive stand on allowing SKB to conduct site investigations. The municipality of Tierp has declined to participate.

In the Finnish site selection process there were two inland alternatives and two coastal alternatives. It was not possible to rank one siting above the other in terms of safety.

2.13 The concept of "retrievability" should be addressed in the description of the premises for the method work and be related to the requirements in the environmental legislation.

The final repository is designed to allow deposited waste to be retrieved. One reason for retrieval could be that future generations may for some reason want to modify or improve the design or function of the repository or to use the waste for other purposes.

There are no formal requirements for retrievability. SKI does not consider it to be disadvantageous, as long as measures to facilitate retrieval do not diminish long-term safety.

3 Common issues

3.1 How will quality assurance of the consultation process take place if the meetings are not taped?

SKB keeps notes. The idea is that everyone should be able to find their questions in the notes. They are posted on SKB's website and can also be obtained as hard copy on request. If someone can't find their question in the notes, or if SKB has misunderstood the question, we can discuss it again.

3.2 Where in the programme is a total evaluation and who does it?

A total evaluation is done above all in the environmental impact statement, but also in the safety assessment. The EIS is supposed to describe the direct and indirect effects of a planned activity or measure on people, animals, plants, land, water, air, the climate, the landscape and the cultural environment, as well as on the management of land, water and the rest of the physical environment and on other management of materials, raw materials and energy. A further purpose is to permit an overall assessment of these effects on human health and the environment. SKB makes an overall assessment, but the background material should enable others to make their own assessment.

3.3 It is not possible to specify the exact scope of the study work now, since results from studies can give rise to new questions.

As we obtain more knowledge we incorporate it in the work. Publication of the final version of the "scoping report", version 1, does not mean it is no longer possible to influence the study work. It is possible to ask new questions up until the time the application is submitted.

3.4 Where are the answers to all the questions posed in connection with the feasibility studies and the handling of the RD&D programmes?

Questions linked to the RD&D programmes are addressed by SKB in its ongoing work and overseen by the regulatory authorities. Questions from the feasibility studies are addressed in the site investigations and the consultations.

3.5 It is good that viewpoints can be submitted two weeks after this meeting. But many important viewpoints are also offered in RD&D contexts. SKB should therefore also include viewpoints presented to SKI in RD&D contexts in the consultation process.

No RD&D reports have been published since the formal consultations began. The viewpoints that have been submitted in statements of comment on RD&D reports have been compiled by SKI and turned over to SKB. SKB has then dealt with these viewpoints in the planning of its upcoming work, for example the site investigations and studies within different disciplines.

Now the formal consultations have begun. Issues which a party wants to have discussed in the consultations should be brought up within the framework of the consultations. In parallel, the RD&D reports that are published will be circulated for comment. As previously, SKB will address viewpoints offered in RD&D statements in the planning of upcoming research and development work.

3.6 SKB is planning to submit an application for the encapsulation plant in 2006. The encapsulation plant is an important facility for disposal of spent nuclear fuel according to the KBS-3 method. The Government has said that the KBS-3 method can be used as a planning premise for the site investigations. At the same time, the Government has stated that they will not take a decision on the KBS-3 method until SKB has submitted a permit application for final disposal according to this method, i.e. a permit application for the deep repository, which SKB plans to submit in 2008. The Environmental Code says that an activity may not be commenced until a permit has been obtained. Does this mean that SKB plans to begin an activity associated with the KBS-3 method (the encapsulation plant) before they have received a permit?

SKB's timetable calls for a permit for the encapsulation plant to be granted after SKB has submitted permit applications for the deep repository, but before a decision on the deep repository has been taken. This means that both applications, with associated EISs and background reports, will be available when a decision is to be made regarding permission to commence construction of the encapsulation plant.

The reason the applications for the encapsulation plant and the deep repository are submitted at different times is that the encapsulation plant takes a long time to build and commission and furthermore needs a lengthy trial period before it can deliver canisters to the deep repository. In view of this, SKB deems it appropriate to begin construction of the encapsulation plant a year or so before construction of the deep repository.

3.7 Site remediation after closure of the encapsulation plant will generate radioactive waste that will probably need to be placed in the repository for long-lived waste (SFL 3-5). A description of this waste management should thus be included in the EIA for the encapsulation plant, along with the siting of this repository.

SKB knows that this type of waste will be generated and has planned for how it will be managed. The problem will not arise for another 30 years. Siting will take place in a separate process.

3.8 How will the results of the societal studies be used? Can they be accorded so much importance as to be decisive?

All knowledge is useful, and it is particularly important for the affected municipalities to have a complete body of information for their decisions, where societal aspects comprise an essential element. A holistic assessment is to be done in the EIA, and societal impact comprises an important part of this holistic assessment.

3.9 The Environmental Code is only concerned with environmental consequences. Will the societal studies be included as background material for the EIA?

Yes, the societal studies comprise background material for the EIA. According to the Environmental Code, an EIA should permit an overall assessment to be made of the effects of an activity on human health and the environment. Human health is greatly affected by the prevailing societal climate and prospects for development.

3.10 Economic aspects are important for the municipality. Does SKB believe that the Environmental Court will weigh these aspects into its assessment?

The Environmental Court will take into account all impact which the planned activity has on the community. Above all, SKB believes that the societal studies will contribute to giving the municipality a good body of material for its decisions.

3.11 Has it been decided which persons or organizations will conduct the studies? The studies are of great interest for the municipality, and it is important that the investigators are independent.

It has not been determined who will conduct which studies. It depends on which studies will be needed. This will be determined after consultations with the municipality in particular. The investigators that are engaged must of course be highly qualified in their field and have a good reputation. Their assignment also includes presenting the results of the studies to the consultation parties at regular intervals.

3.12 Each individual study may show acceptable consequences. Will they then just be ticked off one by one, or will a holistic assessment be made?

SKB will make a holistic assessment. Furthermore, all the different consequences will be presented individually. This will enable all parties to make their own holistic assessment.

3.13 Are the shipments from Clab to Forsmark included in the background material for environmental impact assessment?

Yes. These shipments will be examined in the system analysis and in the EIS.

3.14 All contributions should be traceable. A chronological record should be established. All written contributions should be posted on SKB's website.

The intention is that all documentation pertaining to the consultations will be available on the website. There is, however, a time lag involved.

3.15 Who assumes responsibility for the deep repository once SKB has completed its mission? Will this be described in the EIA?

Responsibility passes over to the state. This is not an EIA matter, however.

3.16 SKB says that an account of alternative methods for achieving the purpose is not required. Does this mean that you will not give an account of alternatives?

SKB will publish a special report on alternative methods. It will describe the alternative methods and also contain a systematic evaluation and assessment of them.

In their replies to the RD&D programmes, the Government and the regulatory authorities have stated that the KBS-3 method should comprise the planning premise for the site investigations. The method has not been approved for implementation yet; SKB must show that it meets the requirements stipulated by the authorities for the selected site. This is precisely the purpose of the ongoing site investigations. SKB will open the discussion of alternatives and receive viewpoints at the meetings with local and national conservation and environmental organizations that are planned in the spring.

3.17 The draft scoping report should be further developed in several regards and limited to questions that focus on what is required by laws, directives and conventions that regulate EIA processes.

This is SKB's ambition.

3.18 We would like to point out that it is to us legally illogical that a permit application for the encapsulation plant should be submitted before the choice of method is approved by the Government. In our opinion SKB should specify what support in law and what formal decisions its planning of the EIA process for the encapsulation plant is based on.

There is no formal support in law or formal decisions, taken by others than SKB, for the plan to first submit a permit application for the encapsulation plant and then for the deep repository. Nor is such support required. The background material for a decision on method will be available when the permit application for the encapsulation plant is submitted. At that point background material on encapsulation technology, the canister and a system analysis covering the different parts of the deep repository system (encapsulation, deep repository, transportation) as well as an alternative report, including the zero alternative, will be submitted.

SKB's timetable calls for a permit for the encapsulation plant to be granted after SKB has submitted permit applications for the deep repository. This means that both applications, with associated EISs and background reports, will be available when a decision is to be made regarding permission to commence construction of the encapsulation plant.

3.19 The description of the purpose of the EIA process must be elaborated and harmonized with the intentions of the environmental legislation so that it is clearer that it is primarily the possible environmental consequences of the project that are to be addressed.

SKB is of the opinion that this is what is described.

3.20 This particular EIA process should be subject to particularly strict demands, and it should therefore be in everyone's interest, including SKB's, that the credibility of the background material is beyond question. It is reasonable that SKB should elaborate on its reasons why they have chosen to assume responsibility for and carry out the EIA process themselves.

SKB refers to the requirements in the Environmental Code, which assign total responsibility for the EIA to the operator of the activity. We take our responsibility very seriously and intend to do a thorough job that will stand up to society's scrutiny and insight.

3.21 We would like to propose that the description of the premises for the EIA process be elaborated on so that the link to the relevant regulatory framework is clearer. A clear definition should also be given of what fundamental performance criteria should be included to facilitate the work with the questions concerning alternative methods and siting.

The remark is noted and clarifications can be made in the description of the premises for the EIA process.

3.22 The company's description of the Environmental Code's requirements on alternative siting as "if such are possible" is far too vague and misleading. We would like to urge SKB to raise the objective for the siting and EIA process so that it can live up to the Environmental Code's objectives section and siting rule.

All statutory requirements will be met, and this is checked in connection with the regulatory review of the application. See also replies to questions concerning alternative reporting.

3.23 The presentation of the premises for the EIA process must be extremely correct. It must be made very clear that the proposed KBS-3 method has not been approved and that the environmental legislation requires comparable alternative reporting.

SKB considers that the premises for EIA have been presented and are presented in this way.

3.24 We believe that SKB must develop its discussion of the premises for alternative reporting to include BAT (Best Available Technology).

The viewpoint is noted and will be taken into account.

3.25 The zero alternative must be described so that it is clearly evident that it is about permitting a comparative analysis of the possible long-term environmental effects of the zero alternative.

SKB concurs.

3.26 The scoping report must also include the possibility of co-siting with SFL 3-5, and SKB should give an account of possible direct and indirect environmental effects that can result from such co-siting. Alternatively, SKB must convincingly demonstrate that such co-siting will never occur.

The question of siting of SFL 3-5 will arise in about 30 years and will be settled in a separate process. The work with SFL 3-5 will be described in the RD&D programmes.

3.27 Scenarios should be presented of various future possibilities that include both acceptance of foreign waste and continued operation of Swedish nuclear power plants.

SKB's mission is to manage and dispose of the Swedish nuclear waste from our Swedish nuclear power plants in accordance with the programme that is in effect today.

3.28 Issues that cannot be related to "direct and indirect effects on man and the environment" and which are explored in future RD&D programmes should be taken away from the EIA process.

SKB does not know what is referred to here. The background material for the EIA should make it easier for decision-makers and citizens to make their own judgements. Everything that can facilitate an assessment of safety, environmental, health and societal aspects will be included.

3.29 SKB must present its reasons for considering the KBS-3 method to be best from an environmental point of view and compare it with other comparably reported alternatives.

Through the years, SKB has studied a number of alternatives for management and disposal of spent nuclear fuel. These alternatives will be compared with KBS-3 from a safety and environment viewpoint, among other things, in coming consultation meetings and in permit applications for the encapsulation plant and the deep repository.

3.30 SKB says that it is keeping close track of the alternatives transmutation and Very Deep Holes, and we would like to propose that alternative solutions with dry storage also be studied and comparably reported. The purpose of this is to live up to the Environmental Code's requirements regarding BAT – Best Available Technology.

According to Swedish law, a final repository for spent nuclear fuel must be safe even without supervision. Dry storage requires supervision in the form of functioning operation and maintenance to meet the safety requirements, and therefore does not meet the statutory requirements. Accordingly, dry storage is not an alternative for final disposal, but rather an alternative to present-day interim storage.

3.31 In the report on the encapsulation plant, there is no description of the management, interim storage and disposal of the radioactive waste. The encapsulation plant's connection to and dependence on SFL 3-5 should be described and discussed in system analyses and the EIA process.

This question has been answered above. Connections between different parts of the Swedish nuclear waste system will be dealt with in the system analysis.

3.32 In order to stimulate engagement and interest, and to promote an exchange and overview of information, joint consultation meetings should be held for citizens, organizations and other stakeholders.

This is in keeping with the plans which SKB has presented and is following. This meeting is an example of such a joint meeting. Besides joint meetings, meetings on special issues will be held with different consultation parties to give everyone an opportunity to have the kind of in-depth discussion they might want.

3.33 As a basis for the documentation, all minutes from all meetings should be made accessible to everyone.

This is in keeping with SKB's intentions and plans.

3.34 A dream scenario would be that scientists come up with a way to extract even more energy from the spent nuclear fuel. In that case would it be permissible for Sweden to sell the fuel?

No, Swedish law prohibits this.

Meeting with Oskarshamn EIA Forum

Date	24 March 2004, 9:00–16:00 hrs
Place	Åkers International, Åkers Styckebruk
Target group	Oskarshamn Municipality, County Administrative Board in Kalmar County, SKI and SSI
Invitation	The date of the meetings is decided on jointly. SKB sends out e-mail invitations to each meeting.
Purpose	To discuss matters related to the expansion of Clab, as well as the encapsulation plant and the final repository for spent nuclear fuel. Furthermore, each participating party gives a status report on the work they are taking part in that has a bearing on the disposal of spent nuclear fuel.
Background material	—
Present	
County Administrative Board in Kalmar County	*Ulf Färnhök, chairman, Sven Andersson*
Oskarshamn Municipality	*Kjell Anderson, Elisabeth Englund, Rigmor Eklind, Charlotte Liliemark, Kaj Nilsson, Lars Tyrberg, Peter Wretlund, Harald Åhagen*
SKI	*Magnus Westerlind, Christina Lilja*
SSI	*Björn Hedberg, Åsa Pensjö*
SKB	*Claes Thegerström, Claes-Göran Andersson, Saida Laârouchi Engström, Anders Nyström, Olle Olsson, Kristina Vikström, Peter Wikberg, Lars Birgersson, secretary*

1 Encapsulation plant

1.1 SKI's work with canister and encapsulation

Over the next few years, SKI will undertake several reviews associated with the canister and encapsulation. Besides the permit application for the encapsulation plant, which is expected to be submitted in mid-2006, the interim report for SR-Can and RD&D 2004 will be submitted in August and September 2004, respectively. The reviews of all these reports require planning and preparation on SKI's part.

Discussion

The municipality wondered if there were any requirements that SKB should have to demonstrate that serial production of copper canisters is possible at the time the permit application for the encapsulation plant is submitted in mid-2006. SKI's standpoint is that the application must show how future serial production will be carried out. SKB said that they were working with the goal of having fabricated about 20 canisters when the application is submitted.

2 Final repository for spent nuclear fuel

2.1 News from site investigation in Oskarshamn

As a result of discussions with the landowners and their attorney, SKB has signed agreements with virtually all landowners in the Laxemar area. This means that site investigations will be conducted in both the Simpevarp and Laxemar areas. During 2004, the investigations in the Laxemar area will be prioritized. In mid-2005, a preliminary safety evaluation is planned to have been completed for both areas, after which one will be chosen for complete site investigation.

There are two previously drilled boreholes in the northeastern part of the Laxemar area, KLX01 and 02. At present drilling is under way of KLX04 in the central part of the Laxemar area and KAV04 on Ävrö. When the drilling of KAV04 is finished, the drilling machine will be moved to the Laxemar area to drill KLX03 in the southern part of the area. Drilling of KBH03 on Hålö has been stopped to free resources for the drilling in the Laxemar area. Drilling of KBH03 may be resumed at a later date.

So far, two possible locations for the surface facilities have been identified: at Clab and on Hålö. Even if it is decided to site the underground facility in the Laxemar area, the possibility of locating the above-ground parts at Clab or Hålö and connecting the underground and above-ground parts with a tunnel will be considered.

Discussion

The municipality asked whether SKB could arrange a presentation of the results obtained so far from the site investigations, in the same way as was recently done in Forsmark. SKB replied that the reporting of results from the site investigations in Oskarshamn lies somewhat later than for Forsmark, but the model report that describes the Simpevarp area will be ready just before summer. A presentation right after summer would therefore be suitable. The presentation could take the form of a half-day meeting for all who are interested.

3 Common issues

3.1 Societal studies and social research

At the preceding meeting with the EIA Forum on 11 December 2003, SKB presented the general outline of the societal programme. A week later, on 18 December, SKB held a workshop in which representatives of the municipality's working groups participated. The questions and viewpoints that were put forward at this workshop have been incorporated into SKB's study package for societal issues. The study package was sent to LKO (Local Competence Building in Oskarshamn Municipality – Nuclear Waste Project) on 17 February for comments. SKB intends to carry out procurements of investigators and researchers during April-May.

Discussion

The Society Group presented LKO's viewpoints on SKB's societal programme. SKB's programme proposal for societal issues concerns not only the Society Group, but also the Municipality Group and the Misterhult Group. The municipality's proposal for continued work entails a joint meeting for the three groups and SKB. SKB's programme proposal for societal issues will be discussed at the meeting. Afterwards the Society Group will compile LKO's viewpoints and comments on SKB's programme proposal. The compilation will result in a memorandum, which should be ready by the end of August. SKB said that it is important that the start of the work not be delayed. Moreover, the societal programme is by nature flexible, which means it can be modified as needed.

The municipality wondered how the research projects RICOM-II and COWAM have affected the societal programme. These projects, in which both national and local authorities as well as SKB have participated, have given recommendations on how decision processes regarding nuclear waste should be made transparent and how they should meet municipal needs. SKB said that they are now implementing the results of these projects in the practical programme.

Decision

SKB and the municipality need to coordinate their work. This will take place via oral contacts in April and May, which should result in agreement between the municipality and SKB on the main features of the programme proposal. Then SKB can start to plan the procurements. LKO's memorandum can, as planned, be prepared by the end of August.

3.2 Scoping report – status report and planning of continued work

SKB presented the current status and planned work for the "scoping report".

Discussion

SKB wants the municipality's comments on the report so that work on the final version can begin. The municipality emphasized the importance of doing a thorough job during the scoping phase in order to achieve a good result in the form of a comprehensive EIS.

Decision

SKB and the municipality will meet in mid-April to discuss the continued work on the "scoping report".

Meeting with local conservation and environmental organizations in Oskarshamn Municipality

Date	22 April 2004, 19:00–21:00 hrs
Place	Figeholms Fritid och Konferens (Figeholm Leisure and Conference), Hägnad, Figeholm.
Target group	Local conservation and environmental organizations.
Invitation	Written invitation to some 50 local conservation and environmental organizations, plus advertisement in Oskarshamns-Tidningen (10 and 17 April) and Nyheterna (10 and 17 April).
Purpose	Discuss the form and content of the environmental impact statements that will be prepared for the encapsulation plant and the final repository.
Background material	The report "Scope, delimitations and studies for environmental impact assessments (EIAs) for encapsulation plant and deep repository for spent nuclear fuel. Version 0 – basis for extended consultation in Oskarshamn" (in Swedish only). In this report, SKB presented proposals for which types of studies will be conducted for applications and environmental impact assessments (EIAs) under the Environmental Code and the Nuclear Activities Act. The report was available at SKB's site investigation office on the Simpevarp Peninsula, at Oskarshamn Municipality and via SKB's website.
Present	23 persons in all *Citizens* 2 persons. *Invited local conservation and environmental organizations* Representatives from the Döderhult nature conservation society and Oskarshamn southern hunting district. *Representatives from* the County Administrative Board in Kalmar County and Oskarshamn Municipality *SKB* Saida Laârouchi Engström, Peter Wikberg, Lena Morén, Anders Nyström, Erik Wijnbladh, and others

1 Encapsulation plant

Why have you chosen to make the canister of copper?

Before choosing the canister material, SKB also considered other materials, for example stainless steel, titanium, various alloys and ceramics, but finally settled on copper for a number of reasons. Steel corrodes (rusts) slowly, giving the canisters a limited lifetime. As far as ceramics are concerned, it can't be proved that they won't crack in time. Copper is a widely occurring element that is very resistant to corrosion under the conditions assumed to prevail in a final repository. Furthermore, the canister will be thick enough to stand up to whatever corrosion could occur in the worst possible case.

1.2 Isn't copper in great demand?

There is no shortage of copper at present.

1.3 How thick will the copper shell be?

In the reference design of the canister, the copper thickness is 50 mm, but a solid copper thickness of about 15 mm is really enough to meet the requirement of long-term corrosion resistance. The results of trial weldings and post-welding testing will be essential in the final choice of copper thickness. Technology development in this field may also influence the choice of copper thickness.

1.4 How large a land area will the encapsulation plant occupy?

The encapsulation plant will be located directly adjacent to Clab and will, according to current plans, be accommodated within the existing industrial area.

2 Final repository for spent nuclear fuel

2.1 There are microorganisms at great depth in the bedrock. Are studies of these microorganisms included among the investigations being conducted in the discipline of "surface ecosystems"?

In the discipline of "surface ecosystems", the area is being studied from the bedrock up. Studies of microorganisms in the bedrock are included in the chemistry programme for the boreholes.

2.2 SKB is drilling a number of deep boreholes. Is the water saline at great depth? Can salt water seep up from boreholes and harm the surrounding environment?

The salinity of the water at the bottom of the 1,000 metre deep boreholes is high. Water can only come up out of the boreholes as long as we pump.

2.3 Has any country decided how they will carry out final disposal?

Finland has settled on a site for the final repository. It will be located at the nuclear power plant in Olkiluoto, and deposition of waste is projected to start in 2020.

Finland's system is very reminiscent of the Swedish KBS-3 system. SKB and Posiva Oy, its Finnish equivalent, are also cooperating on many technical issues associated with the repository system, for example the canisters.

3 Common issues

3.1 Is a repository in the bedrock beneath the sea a repository in deep-sea sediment (sub-seabed disposal)?

No. Disposal in deep-sea sediment involves, for example, placing the fuel in torpedo-like containers which are dropped into the water. The containers are designed to penetrate about 50 metres into the uppermost soft bottom sediments, which close around the container. The seabed sediments are stable and the spent fuel is thereby assumed to remain isolated for a long time.

3.2 Why does SKB continue to support the work on transmutation? It doesn't appear to be a realistic alternative. A better alternative is Very Deep Holes!

Many people have great hopes for transmutation. In its evaluation of RD&D 2001, SKI requires that SKB continue to keep track of the development of technology for transmutation and Very Deep Holes.

SKB invests about SEK 5 million annually in following technological developments in the transmutation field. For this money, SKB gains access to a lot of knowledge and experience.

The conclusions SKB has drawn regarding Very Deep Holes will not be changed by more research. The long-term safety of Very Deep Holes will rest more or less solely on the rock and the great depth.

3.3 Transmutation is regarded as very interesting in France and Japan. It can be very interesting in Sweden as well if the energy situation changes, which can happen quickly.

SKB's judgement is that reprocessing and transmutation is not a solution for Sweden in the present situation. The technology for transmutation is still in the research stage. It will be several decades before it could possibly be ready for full-scale use. Even if the method is developed and implemented, there will always be long-lived waste left that requires the same management and final disposal as spent nuclear fuel.

SKB has to work with present-day premises and the mission it has been given. The transmutation method would require an expansion of nuclear power, which goes against the political decisions that have been made in Sweden.

3.4 Agenda for extended consultations. We don't believe the system of having separate consultation meetings with different actors promotes an exchange of viewpoints and ideas, but rather contributes to isolating different groups from each other.

On 12 November 2003, a consultation meeting was held with citizens in Oskarshamn Municipality. Invitation to the meeting took place via ads in the local press aimed at everyone (organizations, decision-makers and citizens). With this meeting, SKB met the requirements of the Environmental Code.

Besides meeting the requirements of the Environmental Code, SKB wants to solicit as many viewpoints as possible. We know from before, for example from the feasibility studies, that different groups are interested in different issues. We therefore invited nearly 50 local conservation and environmental organizations to this meeting in order to get viewpoints on which conservation and environmental issues are considered to be the most urgent. Invitation to the meeting also took place via ads in the local press. The ads made it clear that the meeting was mainly intended for the invited organizations, but was naturally open to anyone who was interested.

3.5 Agenda for extended consultations. The agenda is so full that it doesn't provide time for elaboration of viewpoints.

At consultation meetings it is important to furnish enough basic information to permit a good discussion, while at the same time there should be enough time for discussions. Striking a balance between these two aims is difficult, and there was too little time for discussion. We will reduce the scope of the presentations at the next meeting and leave more time for discussions.

3.6 "Scoping report" – purpose and content. We find the report to be unclear and vague in its presentation, making it difficult to grasp the purpose and message of the report. We believe the report should contain a kind of "table of contents" of the studies, research, reports, analyses and impact assessments that are necessary for SKB to obtain a comprehensive EIS for its application.

The report aims at presenting SKB's proposals for principal topics for studies serving as supporting material for permit applications under the Environmental Code and

the Nuclear Activities Act, as well as the EIS for the encapsulation plant and the final repository for spent nuclear fuel. It is intended to serve as a basis for discussions in the consultations, where more detailed proposals should emerge regarding investigation topics and studies.

3.7 "Scoping report" – purpose and content. We find it difficult to see the connection between the report and the extended consultations.

The report presents SKB's proposals for principal topics for studies for the encapsulation plant and the final repository for spent nuclear fuel. Unfortunately, it is not possible at a meeting to present in detail the contents within all topics; rather, we chose to highlight a few topics which we judged would be of interest, but we expect viewpoints on the whole report. This explains the generous time allowed to get back to SKB with viewpoints.

3.8 "Scoping report" – purpose and content. We would like to know how SKB intends to analyze and describe the impact on biological life and the environment in general.

The analyses and descriptions of the impact on biological life and the environment in general that will be done will vary depending on which aspect is being studied. The work will take into account local, regional and national environmental objectives and environmental quality standards, as is evident from the report.

3.9 "Scoping report" – purpose and content. We believe that the alternative research should be focused on the Very Deep Holes method and presented as an adequately researched alternative to KBS-3 in the EIS.

The research that must be carried out in order for the Very Deep Holes alternative to achieve a state of knowledge comparable to that of KBS-3 is described in SKB report R-00-28. SKB draws the conclusion that whatever advantages the great depth might offer do not justify either the costs or the risks entailed by deposition in very deep holes. SKB is nevertheless following and supporting the development of technology for Very Deep Holes.

3.10 "Scoping report" – purpose and content. On a few occasions SKB has constructed a few scenarios of possible future courses of events. Some of these scenarios have been very extreme. We believe it is necessary that SKB continue to construct more scenarios of a varying nature with a higher probability of occurring.

Over the course of the years, SKB has performed several assessments of the long-term safety of the deep repository. The most recent safety assessment was published in 1999 and called SR 97. A base scenario was presented there, along with a number of scenarios concerning possible canister defects, future earthquakes and climate change, and an intrusion scenario. Together, the various scenarios provide a reasonable picture of what could happen in the future and what the consequences would be for the repository. In the coming safety report SR-Can, the scenario analysis will be even more comprehensive.

3.11 Two different facilities and two different applications with EISs. SKB is conducting extended consultations for the encapsulation plant and the final repository at the same time. As a result, the process for the encapsulation plant is not getting enough attention. We question whether it is really a correct treatment according to the Environmental Code.

The encapsulation plant and the final repository are part of the same system. More-

over, many issues are similar for the two facilities, for example as regards transportation and noise. We therefore consider it an advantage to deal with both facilities at the consultation meetings. However, the meetings planned for the beginning of 2006 will focus on the preliminary environmental impact statement for the encapsulation plant in order to fully illuminate and discuss SKB's descriptions and judgements. Oskarshamn Municipality has also said that such coordination of these two facilities is necessary.

3.12 Two different facilities and two applications with EISs. It may also be questioned whether it is reasonable to apply for a permit for an encapsulation plant before it is known which method will be used and which site will be chosen for the final repository.

SKB's timetable calls for a permit for the encapsulation plant to be granted after SKB has submitted permit applications for the deep repository, but before a decision on the deep repository has been taken. This means that both applications, with associated EISs and background reports, will be available when a decision is to be made regarding permission to commence construction of the encapsulation plant.

The reason the applications for the encapsulation plant and the deep repository are submitted at different times is that the encapsulation plant takes a long time to build and put into operation and furthermore needs a lengthy trial period before it can deliver canisters to the deep repository. In view of this, SKB deems it appropriate to begin construction of the encapsulation plant a year or so before construction of the deep repository.

A written invitation was sent to the following organizations:

Döderhult nature conservation society
Figeholm cyclists
Kalmarsund Northern Marine Hunting District
Oskarshamn Animal Protection Society
Oskarshamn Shooting Club
Oskarshamn northern hunting district
Oskarshamn southern hunting district
Oskarshamn district birding club
The lifeboat service association in Simpevarp
Simpevarp home guard company
The Women's Voluntary Defence Service and Home Guard Foundation
The Youth Centre Association
Solstadström riding and driving club
Calypso Sport Divers Club
Fisken Anglers Club
Oskarshamn rowing club
Oskarshamn scouts association
Oskarshamn yacht club
Oskarshamn hunting and game preservation
Oskarshamn canoe and physical culture
Oskarshamn riding club
Oskarshamn 4H club
Kristdala NSF scouts
Figeholm scouts association
Swedish Association for the Promotion of Outdoor Life
Swedish Association of Field Biologists
Fagereke riding club
Figeholm boat club
Kalmar County Historical Federation
Figeholm historical society
Bockara Historical and Community Society
Oskarshamn-Döderhult historical society
Tunalän historical society
Kristdala historical society
Bråbygden association
Kristdala historical society
Bråbygden association
Misterhult historical society
Figeholm historical society
Friends of the harbour warehouse
Oskarshamn-Döderhult historical society
OKG AB
Local safety committee, OKG
Döderhult moose preservation

Meeting with national conservation and environmental organizations

Date	4 May 2004, 18:30–21:00 hrs
Place	IVA, Grev Turegatan 16, Stockholm
Target group	National conservation and environmental organizations
Invitation	Written invitation to ten national conservation and environmental organizations.
Purpose	Discuss the form and content of the environmental impact statements that will be prepared for the encapsulation plant and the final repository, with a special focus on reporting of alternative methods for the disposal of spent nuclear fuel.
Background material	The report "Scope, delimitations and studies for environmental impact assessments (EIAs) for encapsulation plant and deep repository for spent nuclear fuel. Version 0 – basis for extended consultation in Forsmark" (in Swedish only). In this report, SKB presented proposals for which types of studies will be conducted for applications and environmental impact assessments (EIAs) under the Environmental Code and the Nuclear Activities Act. The report was available via SKB's office and website.
Present	19 persons in all. *Representatives from national organizations* 6 persons representing the Friends of the Earth Sweden, the Waste Network and Environmentalists for Nuclear Power. *Representatives from* SKI, Oskarshamn Municipality and the County Administrative Board in Uppsala County *SKB* Saida Laârouchi Engström, Lena Morén, Allan Hedin, Peter Wikberg, Kaj Ahlbom and others

1 Encapsulation plant

No questions or viewpoints were expressed pertaining solely to the encapsulation plant.

2 Final repository for spent nuclear fuel

2.1 Now two sites are being investigated simultaneously for the deep repository. Investigate one site instead, and if it is rejected the other site can be investigated.

Others say vice versa, that SKB should investigate many sites and choose the best one. Considering resources, timetable etc., SKB has opted to investigate two sites

simultaneously. If neither of these sites is suitable for the deep repository, other sites will have to be investigated.

3 Common issues

3.1 Isn't there well-developed technology, for example in France, for reprocessing?

It's true that technology exists for reprocessing spent fuel and thereby recovering the plutonium and uranium present in the fuel. But even after such reprocessing, the remaining waste has a high content of radioactive substances, some of which are long-lived.

3.2 Will the description we have now heard serve as a basis for future EISs?

Yes. In parallel with further development of the KBS-3 method, SKB is following the international development of Very Deep Holes and invests about SEK 5 million annually to keep track of the development of the technology for transmutation. Much of the basic research in geology, groundwater movements, copper corrosion etc. provides knowledge that is equally applicable to alternative methods such as deep boreholes, WP-Cave and dry storage (DRD).

3.3 Will safety assessments for the alternative methods be included in the EIS?

An assessment of the long-term safety has been done for the different methods and is included in the material that has been compiled and will be included in the EIS.

3.4 What is the relationship between final storage and retrieval?

The Nuclear Activities Act contains requirements on final disposal of nuclear waste, but no requirements that the waste has to be retrievable. It is, however, possible to retrieve deposited waste from a repository designed in accordance with the KBS-3 method.

The retrieval aspect during the operating period is important from a safety point of view. One reason for retrieval could be to use the spent nuclear fuel again, which is possible after reprocessing. Future technological development or scientific discoveries could make this more attractive. Another possibility is that future generations may for some reason want to modify or improve the design or function of the repository and therefore need to get at the waste.

3.5 There are weaknesses in the KBS-3 method that are not described in the scoping report, for example as regards corrosion and future ice ages.

What happens for example due to corrosion and future ice ages has been described in SKB's safety assessments. Updated safety assessments will be presented in conjunction with the permit applications for the encapsulation plant and the final repository. The question of corrosion and future ice ages will be addressed in these as well.

3.6 Has SKB decided on the KBS-3 method?

SKB has studied and evaluated several methods for geological disposal in Sweden. We believe that KBS-3 is the alternative that best satisfies the requirements on a repository for spent nuclear fuel in Sweden – and that there is no other feasible alternative within the foreseeable future.

3.7 Is there a conflict between retrievability and non-proliferation?

We can never protect ourselves completely against the actions of future generations. If for some reason they wish to retrieve the spent nuclear fuel from a KBS-3 repository, it will be possible. However, it will be difficult and expensive and will not be able to be done without the knowledge of society.

3.8 How can you perform reliable assessments covering such long spans of time?

The bedrock that will be used for the repository is approximately 2 billion years old. By studying the changes that have occurred previously, we can understand and predict what is expected to occur in the future. There will of course always be some uncertainty, but compared with other alternatives – such as near-surface disposal – deep geological disposal provides much more stable conditions and slower processes and thereby greater safety in future scenarios.

The safety assessment is supposed to show how the repository withstands different stresses. In order to be on the safe side, the repository will be designed with large margins, for example as regards thickness of the copper canister and distance to large fractures.

3.9 Why don't you talk about fracture-free rock nowadays?

"Fracture-free" rock does not exist, nor is it needed for the long-term safe function of the repository. None of the safety assessments conducted within the framework of the Swedish nuclear waste programme have assumed availability of fracture-free rock. During the first years of the nuclear waste programme, there was great interest in finding "fracture-free rock". Geologists claimed there was plenty of such fracture-free rock where a deep repository could be located. Studies and analyses show that a deep repository in good but moderately fractured rock and surrounded by fracture zones that take up movements in the bedrock ensures a safe final disposal.

3.10 The focus of the investigations is misplaced. There are no descriptions of the long-term environmental consequences that could be caused by releases of radioactive substances.

The long-term aspects are dealt with in the safety assessments. The regulatory requirements have been set with a view to the long-term safety of the biosphere.

3.11 SKB should not bind itself to the KBS-3 method, but should seek an optimal environmental solution.
SKB should conduct safety assessments for the alternative methods as well, not just for the KBS-3 method.

Through the years, SKB has studied a number of alternatives for management and disposal of spent nuclear fuel. These alternatives will be compared with KBS-3 from a safety and environment viewpoint, among other things, in coming consultation meetings and in the permit applications for the encapsulation plant and the deep repository.

3.12 We believe that the agenda for the meeting should have provided more time for elaboration of viewpoints instead of focusing on information from SKB. We would like to see more give and take in the consultations. The agenda of this meeting does not allow time for such give and take. Furthermore, we find it strange that SKB alone can set the agenda for the meeting.

At consultation meetings it is important to furnish enough basic information to permit a good discussion, while at the same time there should be enough time for discussions. Striking a balance between these two aims is difficult, and there was too little time for discussion. We will reduce the scope of the presentations at the next meeting and leave more time for discussions. Any viewpoints you haven't had time to express at this meeting, or that you think of after the meeting, you can always send to SKB.

3.13 SKB has dismissed some of the alternative methods on legal grounds. However, the methods should be investigated on technical and environmental grounds, since the legal premises may change.

The alternatives of sub-seabed disposal and launching into outer space have been investigated as far as the technical aspects are concerned. Partitioning & transmutation is not being considered, but SKB is nevertheless keeping track of the development of P&T technology.

The alternatives have also been compared with regard to environmental factors. Among the conclusions can be mentioned that launching into outer space would require huge quantities of rocket fuel to transport the spent nuclear fuel to a distant place in the universe.

3.14 The Waste Network says that the lack of clear performance and selection criteria, as well as the lack of systematics in the selection of method and site, is so crucial that the nuclear waste project and the EIA process should be stopped until necessary and clear political directives are obtained as to the purpose and goal of waste management.

Systematic efforts to choose a site and a method have been under way for a long time.

A milestone in the method selection process was reached in June 1984 when the Government found that the KBS-3 method "as a whole has essentially been found to be acceptable with respect to safety and radiation protection". Since then, eight research reports (R&D and RD&D programmes), including two supplementary reports, have been submitted in accordance with the Nuclear Activities Act. The reports, and associated reviews and decisions by the Government, have strengthened the case for KBS-3 as the main alternative. SKB has given a thorough account of both performance criteria for the method and selection criteria for site selection in the R&D and RD&D programmes and in their background reports.

A stepwise process has been under way since 1992 aimed at finding a site for the deep repository. The general siting prospects in different parts of the country were determined by general siting studies. The prospects in a total of eight municipalities were evaluated in the feasibility studies. In 2000, SKB presented a site selection and a programme prior to the site investigation phase. In 2002, site investigations were commenced in the Simpevarp area in Oskarshamn Municipality and the Forsmark area in Östhammar Municipality.

3.15 The Waste Network is of the opinion that the Swedish nuclear waste project must undergo an environmental review based on current environmental legislation, conventions and environmental objectives.

According to SKB's plans, a permit application with supporting environmental impact statement will be submitted in 2006 for the encapsulation plant for consideration under the Nuclear Activities Act and the Environmental Code. The equivalent permit application for the final repository will be submitted at the end of 2008. Both applications will be reviewed in the light of relevant environmental legislation, conventions and environmental objectives.

3.16 The Waste Network says that SKB must focus its EIA work more clearly on identification and description of the project's environmental impact and must then also include scenarios with different degrees of leakage from the final repository.

Over the course of the years, SKB has performed several assessments of the long-term safety of the deep repository. The most recent safety assessment was published in 1999 and called SR 97. Scenarios with different degrees of leakage from the final repository were studied already there. The scenario analysis will be even more extensive in future safety reports. The results of the safety assessments will serve as a basis for the environmental impact assessment for the final repository.

3.17 The Waste Network says that there are well documented shortcomings in the Swedish nuclear waste project that must be addressed in the EIA process. It is our opinion that it lies in everyone's interest, including SKB AB's, to ensure that the credibility of the background material is beyond question, which is why responsibility for the EIA process must rest with an independent actor.

Friends of the Earth expressed a similar viewpoint.

SKB refers to the requirements in the Environmental Code, which assign responsibility for the EIA to the operator of the activity. We take our responsibility very seriously and intend to do a thorough job that will stand up to society's scrutiny and insight. In the EIA work, SKB engages various experts whose work is based on the best available knowledge and scientific practice.

3.18 The Waste Network regards the encapsulation plant as a component in the proposed final repository system, which is based on the KBS-3 method and can therefore not be dealt with separately. We find it remarkable that SKB AB intends to apply for a permit for one component of the system before the method has been approved and therefore demands that SKB AB specify in the consultations and the EIS what legislation supports their position.

Friends of the Earth expressed a similar viewpoint.

There is no formal support in law or formal decisions taken by anyone other than SKB either for or against the plan to first submit a permit application for the encapsulation plant and then for the deep repository. Nor is such support required. SKB plans to submit a permit application for the encapsulation plant in mid-2006, and at the end of 2008 for the deep repository. Besides a detailed description of the plant, its safety and environmental impact, the permit application for the encapsulation plant will also include:

– An account of alternative methods for spent fuel disposal,

– A comprehensive system analysis for encapsulation, transportation and deep disposal,

– An analysis of the long-term safety of encapsulated fuel in a deep repository.

It is assumed that the decision on the encapsulation plant will not be able to be made until some time (around nine months) after the application for the deep repository has been submitted, at which point SKB's choice of site and a complete safety assessment for this site will be available. According to SKB, the review of the deep repository application should be greatly facilitated by the fact that the review of the encapsulation plant (which delivers the product that will be emplaced in the deep repository) will have been under way for two years when the licensing process for the deep repository is begun.

Furthermore, it should be noted that according to the reasons given for the Government's decision regarding SKB's integrated account of method, site selection and programme prior to the site investigation phase (RD&D-K), the KBS-3 method is a planning premise for the site investigations, while final approval of a specific method for final disposal will not be given until a final decision is announced on the permit applications. In order to provide the necessary supporting material for such a decision, SKB will, as is explained above, include in the permit application for the encapsulation plant and associated environmental impact statement a description and evaluation of alternative methods for management and final disposal of spent nuclear fuel. This means that the regulatory authorities and the Government will be able to take a standpoint on SKB's choice of method when they consider the application for the encapsulation plant.

3.19 It is the view of the Waste Network that SKB AB must accord greater importance to the consultations and increase opportunities for organizations and interested and engaged citizens to meet for an active exchange of information. Furthermore, we are of the opinion that responsibility for the documentation in the consultation procedure must be transferred to independent minutes-keepers and checkers.

SKB is interested in the viewpoints of, for example, organizations and interested and engaged citizens.

A consultation meeting was held with citizens in Oskarshamn Municipality in November 2003. An equivalent meeting was held in Östhammar in February 2004. With these two meetings, SKB had satisfied the requirements of the Environmental Code. Besides meeting the requirements of the Environmental Code, SKB wants to solicit as many viewpoints as possible. As a part of this work we have furthermore arranged separate meetings with national and local conservation and environmental organizations to get their viewpoints on which conservation and environmental issues are considered to be most urgent. Furthermore, extensive dialogue activities are being pursued in both Östhammar and Oskarshamn municipalities with nearby residents, organizations and interested and engaged citizens.

As far as "independent minutes-keepers and checkers" are concerned, the Environmental Code assigns responsibility for the consultation process to the operator of the activity, who in this case is SKB.

3.20 The Waste Network is of the view that SKB AB must present a comprehensive picture of the possible environmental impact of a co-siting of the encapsulation plant and the final repository, a picture that also includes SFL 3-5 (the final repository for long-lived low- and intermediate-level waste). Furthermore, SKB AB must present background material that also includes the possibility of expanded capacity in the final repository.

Friends of the Earth expressed a similar viewpoint.

A comprehensive picture of the environmental impact of a possible co-siting of the encapsulation plant and the final repository will be included in the material appended to the application. The siting of SFL 3–5 will take place in a separate process. The problem will not arise for another 30 years.

SKB's mission is to manage and dispose of the Swedish nuclear waste from our Swedish nuclear power plants in accordance with the programme that is in effect today. Since it is not possible to stipulate exactly how much nuclear waste will be generated, a number of different scenarios regarding capacity will be dealt with in the EIS.

3.21 The Waste Network takes the view that SKB must explain on what grounds they believe that a method based on the principle of dilution is the best final disposal method from an environmental viewpoint. As a consequence of SKB's wrong choice of method, it is our opinion that development of the KBS-3 method must be halted immediately and that a new selection process must be started aimed at finding a method that meets today's environmental standards.

The KBS-3 method aims to achieve safety by means of isolation and retardation. Dilution is not credited as a safety feature. But in order to calculate the consequences quantitatively, for example of releases to a well or a stream, dilution effects must be taken into account.

3.22 The Waste Network takes the view that SKB's ambition level in the reporting of alternative methods is not high enough. The company must request new political directives the can serve as a basis for clear performance criteria and then formulate comparable and quantifiable specifications for the KBS-3 method and alternative methods so that it is possible to choose BAT – Best Available Technology.

SKB has given a thorough account of performance criteria for the method in the R&D and RD&D programmes and in their background reports. See for example SKB report R-00-32 (in Swedish only).

3.23 Since the EIS must permit an overall assessment and quantification of Clab's environmental prospects compared with KBS-3, other final disposal alternatives and other forms of supervised interim storage, SKB must present background material that makes it possible to identify the possible short- and long-term environmental consequences of the "zero alternative", Clab.

SKB will present such material in together with the permit application for the encapsulation plant.

3.24 The Waste Network would once again like to point out that it is unreasonable and illogical to look for a site before an environmentally examined and approved final disposal method exists, since the choice of site should be dependent on the performance criteria for method approval.

Friends of the Earth expressed a similar viewpoint.

In their replies to the RD&D programmes, the Government and the regulatory authorities have stated that the KBS-3 method should comprise the planning premise for the site investigations. The method has not been approved for implementation yet; SKB must show that it meets the requirements stipulated by the authorities for the selected site. This is precisely the purpose of the ongoing site investigations.

3.25 The Waste Network does not consider that SKB's ambition when it comes to reporting of alternative siting meets the requirements of the environmental legislation. The company must explain why the selected site is best from an environmental point of view and why it is not reasonable to expect that another site exists that is better from the environmental viewpoint. This must be done with reference to the recharge and discharge issue as well as the importance of the saline groundwater for long-term safety. SKI, SGU and a number of other reviewing bodies have previously expressed the wish that SKB should include at least one inland alternative in the site investigation work as a reference.

SKB has conducted studies of what importance the groundwater's flow pattern has for the siting of the deep repository (SKB-R-03-01, R-03-23, R-03-24).

Important conclusions are that:
– the flow paths are longer under a local recharge area than under a discharge area,
– simplified analyses give longer flow paths for inland siting than for coastal siting, but careful analyses show that it is primarily the local topography that determines the locations of the flow paths.

The conclusions SKB draws regarding the siting of the repository are that:
– it is generally an advantage if the repository is located beneath a local recharge area,
– local conditions determine the suitability of the site.

Both SKI and SGU accept SKB's conclusions.

3.26 Environmentalists for Nuclear Power say that robust, simple and reliable instrumentation that lasts a long time and does not require care is required to monitor the repository and the surrounding environment. Nothing is suggested about this in the report.

The scoping report provides an overview of the material SKB judges to be needed for a comprehensive EIS. Questions pertaining to, for example, monitoring of the repository and the surrounding environment will be addressed in the draft monitoring programme that will be appended to the application.

3.27 Environmentalists for Nuclear Power point out that the only realistic option for final disposal in Sweden appears to be a deep repository in granite. The canisters are surrounded by bentonite clay. Any radioactive particles that escape from the canister in the event it is breached will be retained in the clay. Some other countries, for example France, are considering disposing of the canisters in clay at a depth of several hundred metres for the very reason that any leaking radioactive particles would be retained in the clay and never reach the surface. The USA intends to build a "dry" repository in a volcanic rock (tuff) high above the ground-water. There is no comparison of the different solutions in the report. Citizens in the proposed areas may be surprised when they find out there are other methods than SKB's.

The alternative report that will be appended to the applications for the encapsulation plant and the deep repository will include a comparison of the different methods for disposal of spent nuclear fuel that are being studied by SKB. There are no requirements on comparing how different countries solve their waste problems in the EIS. There is, however, an extensive international exchange of knowledge regarding all these technical and scientific questions.

3.28 Friends of the Earth have always been, and still are, critical of Sweden's nuclear power policy. It is a policy that rests on a serious system error, namely the "dependent" research: The party that is dependent on finding a "solution" to a problem for its existence is given the responsibility of leading the research. To put it plainly: The nuclear power industry is given the mission of finding a waste disposal method in order to be able to continue operating the nuclear power reactors. This dependency is unhealthy and precludes a critical stance, which is a prerequisite for free and objective research.

But what about producer responsibility? The problem is that producer responsibility only works when it comes to a relatively limited responsibility, not a responsibility for the lives of many generations for centuries to come. On the other hand, it is important that the producers assume financial responsibility and do not try to run away from the impact and the injuries caused by their activity/products.

Under the law the reactor owners bear full technical and financial responsibility for the waste from nuclear power. Together, they have formed Svensk Kärnbränslehantering AB, SKB (the Swedish Nuclear Fuel and Waste Management Co), which has been given the mission of managing the country's spent nuclear fuel. One of the prerequisites for SKB to obtain permits to build the encapsulation plant and the deep repository is that they meet the regulatory requirement on long-term safety.

SKB engages scientists and consultants with the best scientific qualifications. The work these scientists do is subjected to regulatory review as well as review by international peer groups formed by SKI and SSI for e.g. safety assessments.

3.29 Friends of the Earth point out that the Government and the Riksdag make the final decision regarding nuclear waste disposal, isn't that right? Certainly, but in order for elected politicians and citizens to make a decision, comprehensive information and diversified background material are needed.

The Government decides on permissibility under the Environmental Code and issues permits under the Nuclear Activities Act. Prior to making these decisions, the Government solicits comments from the authorities and other experts who have reviewed the applications. The Government is well-acquainted with the nuclear waste issue as a result of the Government decisions that have been made every third year regarding SKB's RD&D programmes.

3.30 Friends of the Earth are of the opinion that comprehensive information and diversified background material are not available today. There is only KBS-3. The alternative reports produced by SKB are inadequate and incomplete. SKB then makes use of this inadequacy and incompleteness when they want to demonstrate the superiority of KBS-3. Almost no one independent of the nuclear power industry is involved in the research on nuclear waste disposal. SKB has a virtual monopoly. This also means that SKB assumes sole right to interpret and evaluate its own work and can decide what is important and what is less important. For example, SKB has invested a great deal of money and prestige in the KBS-3 method. This has long been criticized by Friends of the Earth and other environmental organizations, who have demanded thorough studies of alternative methods.

SKB has on a number of occasions compared different alternative methods with the KBS-3 method. These reports have been reviewed by the regulatory authorities and the Government. In their replies to the RD&D programmes, the Government and the regulatory authorities have stated that the KBS-3 method should comprise the planning

premise for the site investigations. The method has not been approved for implementation yet; SKB must show that it meets the requirements stipulated by the authorities for the selected site. This is precisely the purpose of the ongoing site investigations.

3.31 Friends of the Earth wish to stress the acute need of slowing down and revising the ongoing final/deep repository process, of considering and doing something about the unsatisfactory conditions we are pointing out here, and of making sure that the responsible authorities exercise their mandates and not just follow SKB. Carrying out site investigations at a point when there is no approved method or even a reasonable and fairly planned process for finding one is unwise and a provocation and sets the stage for bigger conflicts in the future. The best way to avoid conflicts is always to build trust from the ground up by participation and responsiveness.

Competent authorities are working intensively to review and formulate requirements on SKB's work. Friends of the Earth has access to their review comments under the principle of public access to official documents.

It is true that neither the KBS-3 method nor any other method has been approved for final disposal of spent nuclear fuel. In order for a method to be approved, an application must be submitted. The permit application for the deep repository is planned to be submitted in 2008. The method will not be approved until the Government grants SKB's application.

3.32 Friends of the Earth say that being firmly bound to KBS-3 in the manner that is done in these scoping reports is not acceptable in an EIA process. Other alternatives must also be evaluated more thoroughly and not be dismissed after a cursory examination.

The alternatives have been compared at a fairly general level. The alternatives that have proved unsuitable on this general level do not improve when compared on a more detailed level. On the other hand, the method cited in the application, i.e. KBS-3, will be described in detail.

SKB is convinced that geological disposal is the best way to dispose of the spent nuclear fuel. The coming reviews of SKB's permit applications will determine whether SKB's judgement is correct or not.

Broad international agreement exists that geological disposal is the strategy that is best-suited for disposal of long-lived radioactive waste. For example, Finland has already selected a site and a method for its waste. KBS-3 is the method which Finland has decided on.

3.33 Friends of the Earth point out that the reports lack a system analysis that treats scenarios for events and incidents that can occur during the long span of time the nuclear waste is life-threatening.

The safety assessments will treat, among other things, the importance of different scenarios for the repository's long-term safety.

3.34 The whole nuclear waste issue, including the EIA process, is of such gravity that it must be raised to a higher plane and turned into a much more national issue, rather than being a matter for the proposed municipalities as it is today.

The nuclear waste is a national issue that requires a local solution. Consultations and other activities are therefore being held on local, regional and national levels.

3.35 The fragmentation of the consultations into consultations for different groups creates further confusion and makes it more difficult to seriously consider alternative sites, methods and strategies.

A consultation meeting was held with citizens in Oskarshamn Municipality in November 2003. An equivalent meeting was held in Östhammar in February 2004. With these two meetings, SKB had satisfied the requirements of the Environmental Code.

Besides meeting the requirements of the Environmental Code, SKB wants to solicit as many viewpoints as possible. We know from before, for example from the feasibility studies, that different groups are interested in different issues. We therefore invited a dozen or so local conservation and environmental organizations to this meeting in order to get viewpoints on which conservation and environmental issues are considered to be the most urgent.

3.36 The terms "final repository" and "deep repository" are used alternately in a confusing manner in the reports. This must be rectified. But above all, the confusion behind the terms must be examined and straightened out.

The terms "final repository" and "deep repository" are both used for the facility for final disposal of spent nuclear fuel. The designation "final repository" is the only one used in legal and regulatory texts.

3.37 Friends of the Earth wonder what the purpose of today's nuclear waste research is? Is it to find an ultimate repository or a temporary storage place, and how does the purpose influence how safe the disposal will be? Or is it so that the required safety must influence the purpose of the repository? What is the point of departure for disposal? Risk mitigation or management pragmatism? Freedom from nuclear waste or a waste industry? These questions must be problematized more objectively than is the case today so that we can have a serious and clarifying process for nuclear waste management. According to Friends of the Earth, a first step in such a process is to accord the EIA process the importance and broad participation demanded by this huge future issue.

SKB's would like to see as many people engaged in the ongoing consultation process as possible. One way we encourage this is by holding more meetings than is required by the Environmental Code, for example this meeting and meetings with local conservation and environmental organizations in the two site selection municipalities.

A written invitation was sent to the following organizations:

The Waste Network
Swedish Anti Nuclear Movement
Swedish Association for the Promotion of Outdoor Life, National Organization
Swedish Association of Field Biologists, National Office
Swedish Nuclear Society
Greenpeace
Friends of the Earth
Environmentalists for Nuclear Power
The Swedish Society for Nature Conservation
The World Wide Fund for Nature WWF

Meeting with local conservation and environmental organizations in Östhammar Municipality

Date	13 May 2004, 19:00–21:30 hrs
Place	Mission Church in Östhammar
Target group	Local conservation and environmental organizations
Invitation	Written invitation to more than 50 local environmental and conservation organizations plus advertisement in Upsala Nya Tidning (24 April and 13 May), Östhammars Nyheter (29 April and 13 May) and Annonsbladet (28 April and 12 May).
Purpose	Discuss the form and content of the environmental impact statements that will be prepared for the encapsulation plant and the final repository.
Background material	The report "Scope, delimitations and studies for environmental impact assessments (EIAs) for encapsulation plant and deep repository for spent nuclear fuel. Version 0 – basis for extended consultation in Forsmark" (in Swedish only). In this report, SKB presented proposals for which types of studies will be conducted for applications and environmental impact assessments (EIAs) under the Environmental Code and the Nuclear Activities Act. The report was available at SKB's site investigation office in Forsmark, Östhammar Municipality, and via SKB's website.
Present	33 persons in all. *Invited local conservation and environmental organizations* Representatives from the Opinion Group for Safe Final Disposal (Oss), Energy for Östhammar and the Östhammar nature conservation society. *Citizens* 10 persons. *Representatives from* Forsmarks Kraftgrupp, the local safety committee, the County Administrative Board in Uppsala County and Östhammar Municipality. *SKB* Saida Laârouchi Engström, Kaj Ahlbom, Lena Morén, Sara Karlsson, etc.

1 Encapsulation plant

2 Final repository for spent nuclear fuel

2.1 Who can say anything about what will happen in ten thousand or a hundred thousand years?

The bedrock that will be used for the repository is about two billion years old. By studying the changes that have occurred in the past we can understand and predict what can be expected to happen in the future. There will of course always be some uncertainty, but compared with other alternatives – such as near-surface disposal –

deep geological disposal provides much more stable conditions and slower processes and thereby greater safety in future scenarios.

The barriers are based on natural materials, and by studying their historical behaviour we can also predict their expected development.

2.2 Won't the continental ice sheets expose the radioactive substances?

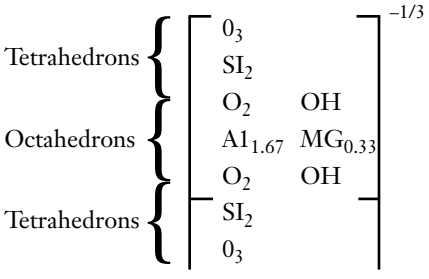
A continental ice sheet scrapes off no more than ten metres of the rock. By measuring the thickness of the till, we can find out how thick the rock was to start with. Ice ages have come and gone fairly regularly, and by studying previous ice ages we can make a prediction for future ones. Major earthquakes are not common in Sweden. The most recent major earthquake occurred during the melting of the previous continental ice sheet.

SGU has looked at the occurrence of major earthquakes in Sweden and has so far not found any traces in Uppland. The repository will nevertheless be designed to withstand earthquakes.

2.3 What does bentonite clay consist of? What substances does it contain?

Bentonite is a strongly water-absorbing and swelling natural clay with low permeability. The main component is the mineral montmorillonite, whose generic formula can be written: $(Si_8)(Al_{4-x}Mg_x)O_{20}(OH)_4$, M^+x.

Montmorillonite is a three-layer clay mineral made up of an infinite number of stacked silicate layers in two dimensions. See the picture below for a schematic diagram of how such a layer is constructed. Na^+ ions are sandwiched between the layers.



2.4 Don't let the question and the discussions become a legal problem of processes and formalities where the "green conservationist" aspect is lost. SKB's choice of Forsmark as an alternative for the siting of a final repository is unfortunate. Forsmark contains very special natural values, shallow seabeds, lime-rich areas with a distinct vegetation, and other unique features. North, east and south of the area are nature reserves that are also now Natura 2000 sites.

All areas have natural values or other values worth preserving from some aspect. One purpose of the site investigations is to survey the various values that exist so that the work can then be located and the facility designed so that the consequences are acceptable.

2.5 It isn't credible to claim that there won't be any impact. There are conflicting interests in the area: industrial interests versus conservation interests. As usual, the conservation interests will draw the short straw.

Certainly there will be an impact, what's important is to make sure it is acceptable. Existing interests will be weighed against each other. Disposing of the spent nuclear fuel in a safe manner is also an important environmental goal.

3 Common issues

3.1 Will SKB also consult with the Government and the Riksdag? After all, they're the ones who make the final decision in this matter.

Consultations under Chapter 6 of the Environmental Code are not held with the Government or the Riksdag. The Government is kept informed and controls the direction of SKB's continued work via its decisions regarding the RD&D reports. SKI prepares these matters by circulating the reports for further commentary, after which the responses are compiled and included in the statement of comment to the Government.

3.2 Is the question discussed in the Riksdag?

No, perhaps not to the extent some would like. The municipalities want to have political support in their work and their decisions. The Prime Minister inaugurated the Canister Laboratory, which can be seen as an indication that the work with the final disposal issue is regarded as important and is on the right track.

3.3 Is there any exchange with other countries? Cooperation with the USA?

Yes, SKB cooperates with research institutes in several countries. There is widespread agreement on the general principle of geological disposal, but conditions are different in different countries. In the USA, for example, they are looking at disposal in tuff (a volcanic mineral), while Germany has so far focused its interest on salt formations. SKB's site investigations are being conducted with KBS-3, disposal in granitic bedrock, as a planning premise. Finland is also opting for disposal in bedrock.

3.4 Is a repository in the bedrock beneath the sea a repository in deep-sea sediment (sub-seabed disposal)?

No, disposal in deep-sea sediment involves, for example, placing the fuel in torpedo-like containers which are dropped into the water. The containers are designed to penetrate about 50 metres into the uppermost soft bottom sediments, which close around the container. The seabed sediments are stable and the spent fuel is thereby assumed to remain isolated for a long time. In the case of ocean dumping, the spent fuel is dumped in the ocean under the assumption that the radioactive substances will be diluted to harmless concentrations.

3.5 Does nuclear fission take place in the spent fuel?

No, there is no nuclear fission, but the waste is radioactive. It gives off excess energy in the form of radiation.

3.6 SKB talks about an acceptable radiation dose at the same time as they say burdens should not be passed on to future generations. Isn't that contradictory?

SSI sets limits for what is an acceptable additional radiation dose. The limit goes at around an additional 1% of the background radiation.

3.7 Does the same limit value apply in all countries?

Yes, in principle, but Sweden has slightly tougher requirements.

3.8 In view of the contents of the waste, wouldn't it be best to launch it up to the sun?!

That has been considered, although not to the sun. American scientists have examined the possibility of launching it into an orbit around Venus.

3.9 What is the temperature of the containers that were shown to exemplify supervised storage? Is ventilation required? What do the containers weigh?

The picture shows so-called Castor containers for dry supervised storage. The containers weigh 30–40 tonnes. They emit heat radiation that is comparable to the heat radiation from a light bulb, and no ventilation is needed.

3.10 Who stipulates requirements on retrieval?

There are no formal requirements from any authority regarding retrievability, but KASAM has stated that the possibility of retrieval should not be hindered in any way. SKI does not see any problem with this, as long as measures to facilitate retrieval do not compromise long-term safety.

3.11 Why should the fact that retrieval is so difficult be a disadvantage for the alternative Very Deep Holes?

An example of problems that can arise is what to do if something goes wrong during canister deposition, for example if a canister gets stuck on the way down in the deep hole. Then it's important to be able to get it up again, and such an operation would be complicated and difficult.

3.12 How do you know the answers before you've investigated? It's unfair to make technical comparisons between two methods (KBS-3 and Very Deep Holes) when the state of knowledge is at such different levels. SKB has only focused its development work on the KBS-3 method. If SKB had devoted resources to research and development of Very Deep Holes, the technical solutions may have existed today.

The alternatives have been compared at a fairly general level. The alternatives that have proved unsuitable on this general level do not improve when compared on a more detailed level. On the other hand, the method cited in the application, i.e. KBS-3, will be described in detail.

The research that must be carried out in order for the Very Deep Holes alternative to achieve a state of knowledge comparable to that of KBS-3 is described in SKB report R-00-28. SKB draws the conclusion that whatever advantages the great depth might offer do not justify either the costs or the risks entailed by deposition in very deep holes. Very Deep Holes requires more land and is technically more difficult to execute, and long-term safety will rest almost solely on the rock and the great depth. SKB is nevertheless following the development of the technology for Very Deep Holes.

3.13 KBS-3 is dependent on the assumption that the canister remains intact, and we can't be sure that it will. If a canister fails during deposition according to the Very Deep Holes method, there is no risk of radioactive substances being spread by the groundwater, since it is stagnant at such great depths.

You can't assume that the groundwater is completely stagnant, even at such great depths. The KBS-3 method is not completely dependent on the assumption that the canister remains intact. If a canister fails, both the buffer and the rock will isolate and retard radionuclide transport. The buffer plays a big role.

3.14 How high are the rock stresses at a depth of 3,000 metres?

The rock stresses are very high at such great depths. The oil industry has experience of working in deep boreholes. They fill their holes with a thick, heavy liquid during drilling so that the rock won't collapse. The deepest borehole is in Russia. Experi-

ence from this and other boreholes is described in an SKB report:
SKB R-04-09, Recent geoscientific information related to deep crustal studies.

3.15 Why does SKB continue to support the work on transmutation? It doesn't appear to be a realistic alternative. A better alternative is Very Deep Holes!

Many researchers believe strongly in transmutation. In its evaluation of RD&D 2001, SKI requires that SKB continue to keep track of the development of technology for transmutation and Very Deep Holes. SKB invests about SEK 5 million annually in following technological developments in the transmutation field. For this money, SKB gains access to a lot of knowledge and experience.

3.16 Transmutation is regarded as very interesting in France and Japan. It can be very interesting in Sweden as well if the energy situation changes, which can happen quickly.

SKB has to work with present-day premises and the mission it has been given. The judgement is that reprocessing and transmutation are not a solution for Sweden in the present situation. The technology for transmutation is still in the research stage. It will be several decades before it could possibly be ready for full-scale use. Even if the method is developed and implemented, it does not provide a complete solution to the problem. There will always be long-lived waste left that requires the same management and final disposal as spent nuclear fuel.

The transmutation method would require an expansion of nuclear power, which is in conflict with the political decisions that have been made in Sweden.

3.17 It's important that the environmental impact be quantified!

Yes, this is required by the Environmental Code and it is SKB's goal to do this in the EIS.

3.18 The KBS-3 method seems reliable. What happens if it is so good that other countries also want to put their waste in Sweden's repository?

There are laws that govern and prohibit both export and import of radioactive waste. All countries in the EU with nuclear power have programmes for how the waste is to be disposed of. Laws are amended and improved all the time and the premises change, but this is a political process in which we can all participate.

3.19 Radioactive waste is already bought and sold every day.

No, not waste, but radioactive materials that are used and become waste.

3.20 Devise scenarios for the continued operation of nuclear power.

SKB's mission is to manage and dispose of the Swedish nuclear waste from our Swedish nuclear power plants in accordance with the programme that is in effect today.

3.21 Issues that are not directly environmentally related should not be dealt with in the EIA. For example, societal issues and issues relating to infrastructure and technology are dealt with in the RD&D programmes.

All knowledge is useful, and it is particularly important for the affected municipalities to have a complete body of information for their decisions, where societal aspects comprise an essential element. A holistic assessment is to be done in the EIA, and societal impact comprises an important part of this holistic assessment.

The purpose of the Environmental Code is to promote sustainable development, ensuring that present and future generations have a healthy and good environment. To achieve this purpose, environmental issues must be addressed in combination with societal and economic issues. Environmental issues are uniquely important, but other aspects must be considered as well so that a coordinated approach is adopted.

3.22 How does SKB explain the fact that a method based on the dilution principle is the best method from an environmental viewpoint and best satisfies current environmental requirements and objectives?

The KBS-3 method aims to achieve safety by means of isolation and retardation. Dilution is not credited as a safety feature. But in order to calculate the consequences quantitatively, for example of assumed releases to a well or a stream, dilution effects must be taken into account.

3.23 When and how does SKB plan to present calculations of the risk of leakage in the final repository? When and how does SKB plan to present scenarios and thorough analyses of the environmental consequences when various numbers of canisters fail and radioactivity contaminates the groundwater and the Baltic Sea?

Over the course of the years, SKB has performed several assessments of the long-term safety of the deep repository. The most recent safety assessment was published in 1999 and called SR 97. Scenarios with different degrees of leakage from the final repository were studied already there. The scenario analysis will be even more extensive in future safety reports. The results of the safety assessments will serve as a basis for the environmental impact assessment for the final repository.

The safety report SR-Can will be appended to the permit application for the encapsulation plant that is planned to be submitted in 2006. The application for the final repository, which is planned to be submitted in 2008, will also be accompanied by a safety report.

3.24 How does SKB plan to treat "retrievability" in the EIS?

The consequences of a possible retrieval following initial operation will be described in the EIS accompanying the application for the deep repository.

3.25 How does SKB plan to identify, describe and report the environmental consequences of the "zero alternative" so that an overall environmental assessment is possible of the prospects of Clab compared with KBS-3, other final disposal alternatives and other forms of supervised interim storage?

The consequences of continued storage in Clab – the zero alternative – will be described and compared to the consequences of final disposal according to the KBS-3 method. The consequences of other forms of supervised interim storage will not be described as this is not being considered, since under Swedish law a final repository for spent nuclear fuel must be safe without supervision.

3.26 How does SKB justify a waste strategy based on disposal of the waste at accessible depth in groundwater-bearing rock, where it is also accessible for intrusion (retrievability), as being the best solution for final disposal from a long-term environmental perspective?

The possibility of retrieval is important from a viewpoint of handling safety during the operating period. Another reason for retrieval could be to use the spent nuclear

fuel again, which is possible after reprocessing. Future technical developments or scientific discoveries could make this more attractive. Another possibility is that future generations may for some reason want to modify or improve the design or function of the repository and therefore need to get at the waste.

Retrieving the waste after closure of the repository is not possible without the knowledge of society.

3.27 What material will SKB present that permits comparative analysis of the environmental effects of different method alternatives and interpretation of whether Swedish environmental quality objectives, environmental quality standards and the Environmental Code's rules of consideration have been met?

Through the years, SKB has studied a number of alternatives for management and disposal of spent nuclear fuel. These alternatives have been compared from a safety and environment viewpoint, among other things, and the KBS-3 method has been chosen as the planning premise for the site investigations.

The permit application for the final repository will be based on the KBS-3 method and the projected environmental impact of the KBS-3 method will be described and judged in relation to the Environmental Code's rules of consideration, Swedish environmental quality objectives and environmental quality standards.

A written invitation was sent to the following organizations:

Alunda Walking Club
Andersbo Local Arts and Crafts Society
Building Conservation Association, Östhammar Municipality
Dannemora Historical Society
Dannemora JUF Local Arts and Crafts Museum
Dannemora Riding Club
Argos Diving Club
EFÖ – Energy for Östhammar
Ekeby Local Arts and Crafts Society
Swedish Anti Nuclear Movement
Forsmarks Kraftgrupp AB
Swedish Association for the Promotion of Outdoor Life, Alunda
Swedish Association for the Promotion of Outdoor Life, Gimo
Swedish Association for the Promotion of Outdoor Life, Östhammar
Frösåker Historical Society
Frösåker Horseback Riding Society
Swedish Association of Field Biologists, Salamander Club
Gimo Historical Society
Gimo IF Skiing Club
Gimo Fly Fishing Society
Gimo Walking Club
Gimo Women's Voluntary Defence Service
Gimo Riding Club
Granhälla Local Arts and Crafts Society
Gräsö Historical Society
Gräsö Norra Local Arts and Crafts Society
Kelinge Local Arts and Crafts Society
Local safety committee at Forsmark nuclear power plant
Morkarla Local Arts and Crafts Society
Norrskedika Historical Society
Norrögården Local Society
Oland Historical Guild
Oland Riding & Driving Society
Opinion Group for Safe Final Disposal – Oss
Rodhen Orienteering Club
Raggarö Historical Society
STF (Swedish Tourist Association) Northern Uppland Chapter
Sanda Local Arts and Crafts Society
Söderögården Local Arts and Crafts Society
Tyvärnö Historical Society
Uppsala County Fishermen's Association
Valö-Forsmark Historical Society
Älgmossen Moose Preservation Area
Öregrund BGF Societetshuset
Öregrund Historical Society
Öregrund Boat Club
Öregrund Racer Club
Öregrund Sea Scouts Association
Östhammar Yacht Club
Österby Anglers Club
Östhammar Sea Scouts Association
Östhammar Shooting Club
Östhammar Nature Conservation Society

Meeting with Forsmark Consultation and EIA Group

Date	14 May 2004, 9:00–12:00 hrs
Place	Assembly Hall, County Administrative Board in Uppsala County
Target group	Östhammar Municipality, County Administrative Board in Uppsala County, SKI and SSI.
Invitation	The date of the meetings is decided on jointly. SKB sends out e-mail invitations to each meeting.
Purpose	To discuss matters related to an encapsulation plant and a final repository for spent nuclear fuel. Furthermore, each participating party gives a status report on the work they are taking part in that has a bearing on the disposal of spent nuclear fuel.
Background material	—
Present	
County Administrative Board in Uppsala County	*Ulf Henricsson, chairman, Mats Lindman*
Östhammar Municipality	*Margareta Widén Berggren, Sten Huhta, Gunnar Lindberg, Virpi Lindfors, Carl-Johan Nässén*
SKI	*Josefin Päiviö Jonsson*
SSI	*Åsa Pensjö*
SKB	*Saida Laârouchi Engström, Kaj Ahlbom, Olle Olsson, Claes Thegerström, Kristina Vikström, Sofie Tunbrant, secretary*

1 Encapsulation plant

No questions or viewpoints were expressed pertaining solely to the encapsulation plant.

2 Final repository for spent nuclear fuel

2.1 How high are the rock stresses actually? How high stresses are too high, providing cause for termination of the investigations?

Rock stresses of 40 MPa have been measured at a depth of 400 metres in Forsmark. In Oskarshamn, the same level of rock stresses is found at a depth of 700 metres. Atomic Energy of Canada Ltd's underground rock laboratory (URL) has experience of work in rock with high stresses. Building in such rock is no problem, but the high stresses must be taken into account when designing the repository. High water flows can cause great problems.

3 Common issues

3.1 The County Administrative Board wondered what provision is made for offering viewpoints on the "scoping report". When will version 1 be printed?

The work has been under way for nearly one and a half years, and it has been possible to offer viewpoints throughout this time. The contents of version 0 were discussed with both Oskarshamn and Östhammar municipalities, and with SKI and SSI, before it was printed and distributed. Oskarshamn Municipality is last in line to submit viewpoints on the contents. The municipal council in Oskarshamn will make a decision in October, but keeps SKB continuously informed of its viewpoints. Version 1 will not be circulated for comment, but is planned to be printed as soon as it is finished, probably in early 2005.

3.2 The municipality wondered if there was any difference between the consultation meetings in Oskarshamn and Östhammar. It's important to know how engaged the citizens are for planning of the information work.

At the most recent consultation meeting in Forsmark, there were both more participants and greater engagement than in Oskarshamn. One reason for the greater engagement may be that there were fewer and shorter presentations from SKB in Forsmark and that this left more room for questions and discussion.

3.3 The municipality also wondered how SKB will show what impression the expressed viewpoints has made on them.

The form and content of version 1 will naturally reflect what viewpoints have influenced the EIA work. The viewpoints that have not influenced version 1 will be presented in the consultation reports that accompany the permit applications for the encapsulation plant and the final repository. But offered viewpoints and SKB's responses to them are also reported in the annual compilation of the consultations.

3.4 The County Administrative Board brought up the question the municipality asked at the previous meeting, about what the "region" thinks about the decision process.

The studies in the societal programme have links to both the work of C-Framåt (C-Ahead) and to the neighbouring municipalities. The County Administrative Board still has no direct answer. There are already established forms for cooperation between the municipalities, for example with regard to infrastructure projects.

Sten Huhta is bringing up the question in C-Framåt (C-Ahead) and calling the municipalities of Älvkarleby and Tierp to an initial meeting.

Meeting with Oskarshamn EIA Forum

Date	26 May 2004, 9:30–16:00 hrs
Place	Assembly Hall, County Administrative Board in Uppsala County
Target group	Oskarshamn Municipality, County Administrative Board , SKI and SSI.
Invitation	The date of the meetings is decided on jointly. SKB sends out e-mail invitations to each meeting.
Purpose	To discuss matters related to the expansion of Clab, as well as the encapsulation plant and the final repository for spent nuclear fuel. Furthermore, each participating party gives a status report on the work they are taking part in that has a bearing on the disposal of spent nuclear fuel.
Background material	—
Present	
County Administrative Board in Kalmar County	*Ulf Färnhök, chairman for part of meeting, Sven Andersson, Stefan Svenaeus, part of meeting*
Oskarshamn Municipality	*Kjell Anderson, Elisabeth Englund, Rigmor Eklind, Charlotte Liliemark, Kaj Nilsson, Göte Pettersson, Lars Tyrberg, Harald Åhagen*
SKI	*Magnus Westerlind, chairman for part of meeting, Judith Melin, Josefin Päiviö*
SSI	*Carl-Magnus Larsson, Åsa Pensjö*
SKB	*Saida Laârouchi Engström, Anders Nyström, Katarina Odéhn, Olle Olsson, Peter Wikberg, Lars Birgersson, secretary*

1 Encapsulation plant

No questions or viewpoints were expressed pertaining solely to the encapsulation plant.

2 Final repository for spent nuclear fuel

2.1 Status report from the site investigations in Oskarshamn

As a result of discussions with the landowners and their attorney, SKB has signed agreements with virtually all landowners in the Laxemar area. This means that site investigations will be conducted in both the Simpevarp and Laxemar areas. During 2004, the investigations in the Laxemar area will be prioritized.

In mid-2005, a preliminary safety evaluation is planned to have been completed for both areas, after which one will be chosen for complete site investigation. No comparison is made between the sites in the preliminary safety evaluations; rather, the sites are compared with the criteria presented in report TR-02-28.

So far, two possible locations for the surface facilities have been identified: at Clab

and on Hålö. The work of identifying possible locations within the Laxemar area was recently begun. At the beginning of June, SKB will arrange excursions in the area with landowners and the municipality to discuss how the facilities could be positioned in the Laxemar area.

3 Common issues

3.1 SKB presents viewpoints offered regarding the "scoping report"

SKB has held consultations on the scoping report with:

– citizens,

– government agencies,

– national conservation and environmental organizations,

– local conservation and environmental organizations,

– Oskarshamn EIA Forum,

– Forsmark Consultation Group,

– regional actors.

Discussion

It is important for SKB's work with the EIAs for the encapsulation plant and the final repository that central government agencies, as well as organizations, submit their viewpoints early in the process. Neither the Swedish Environmental Protection Agency nor the Swedish Society for Nature Conservation have offered comments on the scoping report. Since both of these are important actors in the consultations, they will be contacted again by SKB. An important question to discuss with the Swedish EPA is how they view the division of labour between themselves and the concerned county administrative boards.

3.2 The method issue

SKB has held consultations with local and national conservation and environmental organizations in April/May. Oskarshamn Municipality, in collaboration with Östhammar Municipality, held a seminar regarding alternative methods on 21 April. The viewpoints obtained at these and other meetings regarding the method issue are presented below.

On 12 November 2003, a consultation meeting was held with citizens in Oskarshamn Municipality. No viewpoints with a bearing on the method issue were offered at the meeting.

On 17 December 2003, a consultation meeting was held with government agencies. SSI observed that alternative reporting is needed to verify the main alternative and that the term "alternative" does not refer to variations within KBS-3, but rather a completely different concept where the weight in safety is distributed differently than for KBS-3. In SSI's judgement, a safety evaluation of the Very Deep Holes alternative could correspond to the alternative in alternative reporting. Furthermore, the National Board of Housing, Building and Planning said that it is important that method selection be so well developed in the application for a permit for the encapsulation plant that it can serve as a basis for judging the final repository.

Consultations with regional actors were held at the turn of the year 2003/2004. No viewpoints were offered regarding the method issue.

On 5 February a consultation meeting was held with citizens in Östhammar Municipality. Viewpoints presented at the meeting included the following:

– SKB must present its reasons for considering the KBS-3 method to be best from an environmental point of view and compare it with other comparably reported alternatives.
– Besides transmutation and Very Deep Holes, SKB should also study and compare alternative solutions involving dry storage.

At the consultation meeting with conservation and environmental organizations in Oskarshamn Municipality on 22 April, SKB's support of the work on transmutation was questioned, since it doesn't appear to be a realistic alternative for Sweden. It was proposed that SKB should instead devote its resources to Very Deep Holes, and that this alternative should comprise an adequately researched alternative to KBS-3 in the EIS.

The following viewpoints were presented at the consultation meeting with national conservation and environmental organizations on 4 May:

– the alternative report should be based on a completely objective and unbiased review of alternatives
– SKB should seek an environmentally optimal solution,
– the alternatives should be compared on technical and environmental grounds, and not be dismissed for legal reasons.

At the consultation meeting with conservation and environmental organizations in Östhammar Municipality on 13 May, it was suggested that the alternative research should be focused on the Very Deep Holes method. This method should be put forward as an adequately researched alternative to KBS-3 in the EIS.

Discussion

The viewpoints received can be summarized as follows: Since transmutation doesn't seem to be a viable solution for Sweden, what is the use of SKB's investments in keeping track of developments in the transmutation field? Moreover, the Very Deep Holes alternative is held up by SSI and the environmental movement, among others. SKB will contact SSI to discuss what a safety evaluation of the Very Deep Holes alternative should contain.

The municipality asserted that transmutation is not a realistic alternative for Sweden, at least not in the short term. However, transmutation technology may have been developed much further when it comes time for the deep repository to be closed, in about 50 years according to plan.

Meeting with Forsmark Consultation and EIA Group

Date	1 October 2004, 13:00–16:00 hrs
Place	Big conference room, SFR, Forsmark
Target group	Östhammar Municipality, County Administrative Board in Uppsala County, SKI and SSI
Invitation	The date of the meetings is decided on jointly. SKB sends out e-mail invitations to each meeting.
Purpose	Field visit to the site investigation area in Forsmark and to discuss matters related to an encapsulation plant and a final repository for spent nuclear fuel. Furthermore, each participating party gives a status report on the work they are taking part in that has a bearing on the disposal of spent nuclear fuel.
Background material	—
Present	
County Administrative Board in Uppsala County	*Ulf Henricsson, chairman, Mats Lindman*
Östhammar Municipality	*Margareta Widén Berggren, Bertil Alm, Eino Honkamäki, Sten Huhta, Hans Jivander, Bengt Johansson, Gunnar Lindberg, Virpi Lindfors, Carl-Johan Nässén*
Oskarshamn Municipality	*Kaj Nilsson, co-opted*
SKI	*Josefin Päiviö Jonsson*
SSI	*Åsa Pensjö, Anders Wibert*
SKB	*Saida Laârouchi Engström, Kaj Ahlbom, Gerd Nirvin, Anders Nyström, Olle Olsson, Claes Thegerström, Sofie Tunbrant, secretary*

1 Encapsulation plant

1.1 The municipality is interested in where canister fabrication will take place. According to the municipality, Österby Gjuteri AB in Österbybruk in Östhammar Municipality has the capability to fabricate canisters.

It costs a great deal to invest in the equipment needed to fabricate full-size canisters, so trial fabrication is being done at plants that have the capacity today.

Claes Thegerström has met with the managing director of Österby Gjuteri AB. They do not have equipment for fabricating full-size components for the canister today, but have been given information on what SKB needs and can decide on possible future investments.

Foundries that work with cast iron inserts today are Åkers International, Guldsmedshytte Bruks AB and Metso Foundries.

2. Final repository for spent nuclear fuel

2.1 The municipality noted that it can be confusing that SKB uses both terms "deep repository" and "final repository" for the facility where the spent nuclear fuel will be disposed of. This can give rise to misunderstandings.

SKB explained that one of the reasons "deep repository" began to be used was that there was already a final repository for radioactive waste – SFR in Forsmark – and that they didn't want there to be any confusion between the two. The term "deep repository" also suggests that even though the disposal is designed so that it can be final, it is not irrevocable; it is possible to retrieve the fuel.

"Deep repository" began to be used by SKB in RD&D-Programme 1992 and is also used in RD&D-Programme 2004. The two terms are now used synonymously by SKB. The designation "final repository" is the only one used in legal and regulatory texts. SKB will use "final repository" in permit applications and EISs.

2.2 The County Administrative Board asked what the slope of the fracture zone on Ävrö is.

The answer is 50 to 60 degrees towards the southeast.

2.3 The municipality wondered how the tracer tests fit in the timetable for CSI.

SKB said that the tracer tests involve injecting tracers between packers and pumping them back. Letting the tracers spread naturally takes far too much time.

3 Common issues

3.1 SKB's timetable for submission of the permit applications for the encapsulation plant and the final repository was discussed. The municipality wondered why the applications won't be submitted simultaneously.

SKB said that the application for the encapsulation plant will include a review of the disposal method, as well as the alternatives, and thereby a description of the whole system.

The County Administrative Board pointed out that in connection with consideration of the permit application under the Environmental Code "attention shall be paid to other activities or special facilities that are likely to be necessary for efficient operations" (Chapter 16 Section 7 of the Environmental Code). In this respect, a connection can be seen between e.g. the encapsulation plant, the canister factory and the final repository.

3.2 The County Administrative Board asked what will happen if SKB fails to submit a permit application for the encapsulation plant by 2006.

SKB replied that a delay of up to six months doesn't matter, but a longer delay, of a year or more, would not be good. The consequences of a longer delay are difficult to assess. SKB concludes that it is vital that there be enough time for thorough trials of the encapsulation technology in the actual facility.

3.3 The municipality pointed out that it is important that consultations be held concerning a possible encapsulation plant in Forsmark, even if SKB's proposal is that it should be located in Oskarshamn Municipality. It is also important that the PBL (Planning and Building Act) process has been started when the permit application is submitted, since the alternative siting of the encapsulation plant is at Forsmark.

SKB stressed that the ongoing consultations concern both the final repository and the encapsulation plant, both in Oskarshamn Municipality and in Forsmark. The PBL process should start now. Meetings are planned for the beginning of October in Oskarshamn Municipality and mid-October in Östhammar Municipality. The land next to Clab is industrial land, according to the relevant detailed development plan.

3.4 The municipality wondered if there won't be any consultation or discussion concerning the final wordings in version 1 of the "scoping report".

SKB answered that this is not planned. The contents of version 1 show what viewpoints SKB has taken to heart, and the consultation and discussion will continue until the relevant permit application has been submitted. It is possible to influence the study phase as long as it lasts.

3.5 The County Administrative Board asked how the compilation of offered viewpoints takes place.

SKB replied that a compilation of offered viewpoints will be provided as an appendix to the "scoping report". (After the meeting, however, SKB has found that making a separate compilation of the viewpoints on the "scoping report" is not a good idea. It's better that they be reported according to the procedure SKB uses to collect viewpoints that are offered during the consultation process. In this procedure, the viewpoints that have emerged at and in connection with consultation meetings can be found in the notes from the meetings, which are in turn posted on SKB's website. All questions and viewpoints received during the year will be reported in the annual compilation of completed consultations (this document). Written viewpoints offered outside the framework of any meeting will also be found there, for example the ones submitted by the municipality and the County Administrative Board regarding the "scoping report".)

3.6 The municipality wondered how Sveaskog's plans to create an ecopark affect SKB's work and the coming work associated with the PBL process.

SKB said that there are no conflicts between Sveaskog's plans to create an ecopark and SKB's work to find a suitable site for the final repository (see the most recent issue of Lagerbladet, for example). The above-ground portion of the final repository is planned to be located in the area where the barracks are located or, as an alternative, at SFR, i.e. outside the planned ecopark. The only buildings planned in the ecopark are small buildings for ventilation. The actual repository at a depth of 400–500 metres beneath the ecopark is not expected to significantly affect conditions on the ground surface, but this will be examined in the environmental impact assessment.

Meeting with Oskarshamn EIA Forum, open meeting

Date	6 October 2004, 14:30–20:30 hrs
Place	Lilla Atrium, Forum, Oskarshamn
Target group	Oskarshamn Municipality, County Administrative Board in Kalmar County, SKI and SSI. The meeting was open to the public.
Invitation	The date of the meetings is decided on jointly. SKB sends out e-mail invitations to each meeting. Citizens had been invited to the meeting via ads in local newspapers.
Purpose	To discuss matters related to the expansion of Clab, as well as the encapsulation plant and the final repository for spent nuclear fuel. Furthermore, each participating party gives a status report on the work they are taking part in that has a bearing on the disposal of spent nuclear fuel.
Background material	Prior to the meeting, Oskarshamn Municipality had posed two "EIA questions" to SKB. EIA question no. 4 – Alternative methods EIA question no. 5 – The coast road
Present	
County Administrative Board in Kalmar County	*Ulf Färnhök, chairman, Sven Andersson*
Oskarshamn Municipality	*Kjell Anderson, Elisabeth Englund, Rigmor Eklind, Charlotte Liliemark, Kaj Nilsson, Göte Pettersson, Lars Tyrberg, Harald Åhagen*
SKI	*Magnus Westerlind*
SSI	*Björn Dverstorp, Tomas Löfgren*
SKB	*Claes Thegerström, Saida Laârouchi Engström, Anders Nyström, Katarina Odéhn, Olle Olsson, Peter Wikberg, Lars Birgersson, secretary*
Private citizens	*Catharina Lihnell Järnhester, Johanna Snygg, Jean Norrby, Ros-Marie Karlsson, Johnny Rönnfjord, Nils-Åke Leo, Lindy Newlove, Lena Nordenskjöld, Hanna Sofia Johansson, Annika Sjölander, Kerstin Sternell*

1 Encapsulation plant

1.1 Is either of the two welding methods preferable?

SKB replied that the choice of welding method will be made in early 2005. The choice will concern which method SKB will propose in the application intended to be submitted during 2006. It is possible that both methods will continue to be developed.

2 Final repository for spent nuclear fuel

2.1 What waste quantities does SKB assume when designing the final repository?

SKB replied that it is difficult to predict how much spent nuclear fuel will have to be disposed of, since the future of nuclear power is partly a political question. In considering possible designs of the final repository, we have assumed that 4,500 canisters, equivalent to about 9,300 tonnes of spent nuclear fuel, will be disposed of. A larger number of canisters is included within the margins of uncertainty provided for in the programme.

2.2 The site investigations will be concluded in mid-2007, and SKB plans to submit an application only 1.5 years after that. This seems to be a tight timetable in view of all the analyses and assessments that need to be done!

It is a tight timetable, but SKB deems it to be quite realistic. Moreover, we will not wait for all measurements and investigations to be finished before assessments of e.g. long-term safety and environmental impact are done. We gather information up until a given point in time, so-called "data freeze", after which the information is used for analysis. The results of this analysis are used to improve our understanding of the site and to update the investigation programme.

2.3 The groundwater's regional flow pattern

SKB has previously given an account of geoscientific factors of importance for repository safety. Important conclusions from this study are:

– the recharge area is one of many factors of importance for repository safety

– a holistic judgement is made in the safety assessment

The aspects the authorities hold up which could be advantageous for an inland siting, for example at Hultsfred, compared with sites nearer the coast have to do with the groundwater flow patterns and the lower salinity of the groundwater.

As far as the groundwater's flow paths are concerned, SKB's studies have shown that:

– short flow paths exist inland as well

– regional flow models are associated with great uncertainties

– low groundwater permeability is more important

As far as groundwater salinity is concerned, SKB's studies have shown that:

– high/low salinity entails both advantages and disadvantages

– the backfill material must be adapted to the site

– higher salinity requires a higher proportion of bentonite in the backfill material

SKB's conclusions are that Hultsfred is not judged to offer any significant advantage that would warrant a site investigation there. Accordingly, SKB intends to finish the ongoing investigations.

By further analyses of factors that can affect the groundwater flow on a regional scale, SKB will meet the authorities' request for a supplementary account. An evaluation of the properties of the buffer and backfill materials and their dependence on the salinity of the groundwater will be presented in SR-Can.

Discussion

The subsequent discussion dealt mainly with the transparency of future background material. Oskarshamn Municipality pointed out that the question of the groundwater's regional flow pattern and composition is one factor among many. Is it possible to produce transparent background material when a single issue is so complex in itself? In the end, the background material and the overall assessment made based on it must be transparent.

SKB agreed that it will be a challenge to clarify the assessments that are made. Furthermore, the overall picture may be obscured if there is too much focus on individual factors.

SSI said that they are aware that a number of geoscientific, societal and political factors must be weighed together in order to judge the suitability of a site. However, questions pertaining to groundwater recharge and discharge are examples of factors that can and should be further studied to lend credibility to SKB's site selection.

Both SKI and SSI said that greater transparency can be achieved by highlighting and discussing in detail individual issues such as the groundwater's regional flow pattern and composition.

SKB observed that it is important to clarify the requirements for the selection of a site for the deep repository.

2.4 Will radioactive substances leak out into the groundwater?

SKB's work is aimed at ensuring that no radioactive substances will leak out from the final repository. The ambition is zero release, in other words. It is assumed in the safety assessment that such release nonetheless occurs, and assessments are made of what the consequences of this would be for man and the environment.

2.5 SKB says that the bedrock has "low permeability", but can't new fractures be created that change this?

SKB replied that yes, new fractures can be formed in the bedrock. The bedrock we have today in Oskarshamn and Forsmark is around 1,800 million years old. This means that the fractures we see have evolved over a long period of time, which shows that changes in the bedrock occur very slowly.

2.6 Who has responsibility for the final repository after closure?

SKI explained that the question of post-closure responsibility is not addressed explicitly in the Nuclear Activities Act. However, the legislative history of the Act and statements made in the Riksdag make it clear that responsibility for the final repository rests with the state. This standpoint is also expressed in the international waste convention which Sweden has ratified.

2.7 New legislation was recently passed in Sweden regarding three-dimensional property subdivision. How does this affect the deep repository, which will be located about 500 metres under ground?

SKB previously made a legal study of three-dimensional property subdivision. The study was done before the new law was passed, however, and will therefore be updated.

3 Common issues

3.1 Why isn't the Special Advisor on nuclear waste included in EIA Forum?

The Special Advisor on nuclear waste was included in EIA Forum until mid-2002, when his mandate expired. The reason for this is that the Special Advisor is no longer needed, since SKB's site selection process for the final repository is focusing on two specific sites, Oskarshamn and Forsmark. The Special Advisor, Olof Söderberg, is now active in KASAM.

3.2 EIA question no. 4 – Alternative methods

The municipality's question to SKB

Question:

The municipalities of Oskarshamn and Östhammar held a joint seminar on alternative methods during the year. The seminar particularly dealt with Very Deep Holes, Transmutation and the DRD method. After the seminar, LKO's safety group concluded that transmutation with reprocessing is not viable at present, but can be a good reference as a strategic alternative in EIA. However, the group finds that the Very Deep Holes method needs to be more thoroughly examined than has so far been the case.

The municipality's view in the matter and of the need for a study:

LKO's safety group finds that SKB has too low an ambition level in their reporting of alternative methods. Alternative methods should be presented with greater breadth and depth. In particular, the Very Deep Holes method should be analyzed in greater depth. SSI in particular has called for a safety assessment of this method, and SKB ought to be able to give an answer as to how and when such an assessment will be done.

The municipality would also appreciate a statement from SKB as to how it will be decided in the EIA consultation which alternatives are to be described in the EIS, as the Government has called for. If the consultation is to live up to expectations on an EIA process, the alternatives should be an integral part of the EIA process and not just dealt with in separate reports appended to the EIS report.

SKB's reply:

SKB's standpoint regarding alternative methods is made clear in the "scoping report", which has been the point of departure for the past year's consultations. The issue of alternative methods has been given a great deal of attention at consultation meetings with national and local conservation and environmental organizations. Thus, SKB does not take the reporting of alternative methods lightly.

The viewpoints that have been received in the consultations can be summarized as follows: Since transmutation doesn't seem to be a viable solution for Sweden, what is the use of SKB's investments in keeping track of developments in the transmutation field? At the same time, Very Deep Holes is held up as a possible alternative by SSI, Oskarshamn Municipality and the conservation and environmental organizations.

In 2000, SKB conducted a study of Very Deep Holes. Important conclusions from this study are:

– the technology for drilling and deposition do not exist today,
– it would take more than 30 years and cost more than SEK 4 billion to bring knowledge of Very Deep Holes to a level where the method can be compared with the KBS-3 method.

SKB has continued its work on Very Deep Holes. In early 2004, SKB published a literature review to supplement previously gathered geoscientific information on con-

ditions at depth in the earth's crust. The emphasis in the review was on crystalline rock. On 29 October, SKB will meet SSI to discuss what a safety assessment of the alternative Very Deep Holes could contain.

Decision

SKB will invite a lawyer to a future meeting with the EIA Forum to give his view on how alternative reporting can be done and what level it should have. The municipality said that alternative reporting should take place at a meeting that is open to the public.

3.3 EIA question no. 5 – The coast road

The municipality's question to SKB

Question:

On 10 May 2004 a general meeting was held for the residents of Misterhult parish to gather viewpoints on the road traffic system in the area. The National Road Administration presented the current traffic situation and the plans for a bypass at Fårbo. Otherwise there are no measures planned within the next 12-month period.

The municipality's view in the matter and of the need for a study:

The municipality considers that SKB should initiate a feasibility study for highway 743 in consultation with the National Road Administration so that an application can contain a detailed study and proposal for how the road problem should be solved.

SKB's reply:

SKB said that the road question is urgent, but how it will be solved largely depends on which area is chosen for the deep repository. At present both the Simpevarp and Laxemar areas are being considered, and they will not be ranked in order of preference for another year or so. If the deep repository is sited at the Laxemar area, a new road will have to be built in the area.

SKB takes a positive view of the municipality's proposal and intends to begin preparations in good time so that a new road can be built and stand ready if and when construction of a deep repository is commenced in Laxemar. Furthermore, the intention is to avoid hauling large volumes of crushed rock through the village of Övrahammar. SKB will, together with the municipality, prepare the road question within the framework of the PBL process. This work will be started immediately.

Discussion

The municipality pointed out that it is important that the National Road Administration enter the process at an early stage, since the planning process will take a long time. Moreover, SKB may need to assist with financing in the same way as the bypass at Figeholm was financed by OKG and the Fårbo bypass is intended to be financed by several stakeholders.

3.4 Does for example LKO's societal issues group work with issues with an international perspective?

SKB replied that in accordance with the municipality's wishes, one of the studies included in SKB's study package for societal issues will consider the nuclear waste question in an international perspective.

3.5 Why does SKB continue to support research on transmutation if they don't consider it to be a realistic alternative for Sweden?

SKB replied that the current judgement is that transmutation is not a realistic alternative for Sweden, but that it is nonetheless important to keep track of the technology development taking place in the field. Transmutation technology may have been developed much further when it comes time for the deep repository to be closed, in about 50 years according to plan.

SKB currently invests about SEK 6–10 million annually in keeping track of technological development in the field. For this investment we get access to international expertise.

3.6 SKB supports research on transmutation. Is it legal to do research on transmutation technology?

SKI explained that according to the Nuclear Activities Act, no one may "prepare design drawings, calculate costs, order equipment or take other such preparatory measures for the purpose of erecting a nuclear power reactor in Sweden." Supporting research on transmutation is not against the law.

3.7 Does SKB invest as much in Very Deep Holes as in transmutation?

No, SKB invests more in transmutation than in Very Deep Holes. No country is pursuing the development of Very Deep Holes for the purpose of disposing of spent nuclear fuel.

3.8 KASAM recently came out with a report that describes the current state of knowledge in the nuclear waste field. The report observes that transmutation is not an alternative today, but may comprise an alternative in the future, for example when the time comes to close the final repository. Very Deep Holes, on the other hand, is an alternative to KBS-3 in a shorter time perspective.

SKB agrees that different alternatives have different time frames. Within a few years, the KBS-3 method will have been developed to the point that it can be used for final disposal of spent nuclear fuel. Very Deep Holes will not be an alternative within that time frame. Nor is transmutation expected to comprise an alternative for many years to come.

3.9 How will Finland dispose of its spent nuclear fuel?

SKB replied that Finland has settled on a site for the final repository. It will be located at the nuclear power plant in Olkiluoto, and deposition of waste is projected to start in 2020. Finland's system is very reminiscent of the Swedish KBS-3 system. SKB and Posiva Oy, its Finnish equivalent, are also cooperating on many technical issues associated with the repository system, for example the canisters.

3.10 How will the knowledge and experience gained within the final repository project benefit others? For example, the methods being developed for nondestructive testing and welding.

SKB replied that there is a great deal of cooperation between different countries. For example, SKB's subsidiary, SKB International, sells knowledge to other countries, for example in eastern Europe. Moreover, SKB openly shares its knowledge and find-

ings; for example, SKB's reports can be downloaded on the Internet. Much of the research and development that is being done has a narrow area of application, however, such as welding and nondestructive testing of 50 mm thick copper.

The municipality said that they recently initiated a project to identify ways of making use of the know-how that is being built up.

3.11 How many answers are required in SKB's upcoming health questionnaire surveys to obtain a sufficiently good statistical base?

SKB replied that based on previous experience, we expect to get a response rate of about 60%, which would provide a good statistical base. However, we cannot provide an exact answer here and now to how many answers are needed to obtain a sufficiently good statistical base. That question should be answered by the investigator in question, preferably at an upcoming meeting with the municipality.

3.12 One of the questions SKB has planned to include in the questionnaire has to do with one's attitude to nuclear power. How does this question relate to human health?

One's attitude to nuclear power is probably important in view of the anxiety which the final repository project arouses in some people. If you have a positive attitude to nuclear power, you probably won't be worried about the final repository project, and vice versa.

3.13 Many factors influence how people feel. How can the influence of a single issue such as the final repository project be distinguished?

SKB replied that it's true that it can be difficult to draw conclusions regarding an isolated issue. In order to get as good results as possible, we will compare with control groups, i.e. groups that have not been influenced by the final repository project to the same extent, and conduct questionnaire surveys on several occasions.

Meeting with citizens in Östhammar Municipality

Date	25 November 2004, 19:00–21:00 hrs
Place	Societetshuset in Öregrund
Target group	Citizens in Östhammar Municipality
Invitation	Written invitation via the Newsletter from *The Site Investigation in Forsmark* to all residents within about ten kilometres of the Forsmark Nuclear Power Plant (approximately 300 households) plus advertisement in Upsala Nya Tidning (3 and 24 November), Östhammars Nyheter (4 and 25 November) and Annonsbladet (3 and 24 November). A written invitation was also sent to eight local conservation and environmental organizations.
Purpose	To discuss SKB's first proposal of where a final repository and an encapsulation plant could be placed in Forsmark, and what disturbances can be expected in conjunction with e.g. rock excavation and haulage during construction and operation.
Background material	Specially produced brochure: "Final disposal and encapsulation in Forsmark. Extended consultation on 25 November 2004" (in Swedish only.)
Present	35 persons in all. *Citizens* Approximately 20 persons. *Representatives from* SKI, Östhammar Municipality, Östhammar Nature Conservation Society, Oss – Opinion Group for Safe Final Disposal *SKB* Saida Laârouchi Engström, Kaj Ahlbom, Eva Widing, Bengt Leijon, Tommy Zetterling and others

1 Encapsulation plant

No questions or viewpoints were expressed pertaining solely to the encapsulation plant.

2. Final repository for spent nuclear fuel

2.1 Nighttime noise levels have been reported here. What does the noise situation look like in the daytime?

The figures show a survey of noise from stationary sources, which occurs 24 hours a day. So the same noise levels are generated at night as during the day. The Swedish Environmental Protection Agency has established guidelines for different noise-generating activities, and the standards are stricter at night. The calculations of noise levels and noise range have therefore been reported against the stricter standards, those that apply at night.

2.2 You admit some noise impact during construction of the final repository, but don't mention anything about planned measures. Won't the activities require targeted measures to be taken?

As far as traffic noise is concerned, the interesting aspect is how many people are affected by the higher level or the greater range. If the traffic goes west from Forsmark, there will be no changes in the number of permanent residents that are affected. But if the traffic goes south, the number of persons affected during the second part of the construction phase will increase. Measures may be adopted to reduce the number of persons affected, for example noise barriers and restrictions on the hours of the day during which the heavy vehicle traffic is allowed.

2.3 The heavy vehicle traffic increases by 100%, isn't three decibels a doubling of the sound volume?

No, the ear can perceive a sound volume increase of three decibels, but it is an increase of ten decibels that is perceived as a doubling of the sound level. However, in this case it is the number of events that will double, not the noise level.

2.4 Will the hours of traffic be restricted?

Two shifts are planned. The hours for the traffic can be regulated, and no heavy shipments are planned to take place at night.

2.5 The heavy vehicle traffic will generate dangerous traffic situations; what improvements will be made on highway 76?

Purely technically the roads can take the increased load, their bearing capacity is sufficient. SKB naturally sees only advantages in a good infrastructure, for example for transportation, but it isn't SKB's road or SKB's responsibility to improve the road. The National Road Administration is responsible for the road, but we are happy to take part in discussions of whether and if so how the road can be improved.

2.6 So SKB will not take the initiative for a discussion with the National Road Administration regarding improvements to highway 76?

We intend to present our calculations to the National Road Administration as regards the expected transport increase.

2.7 Regarding the sound level, where does a low-flying helicopter register on the decibel scale? There have been helicopter surveys in the area, so we are familiar with that sound level.

The levels we are talking about are 30–35 decibels for an industrial facility. The sound level from a low-flying helicopter is around 100 decibels, which is far from the 35 decibels generated by activities at the final repository.

2.8 Isn't Österbyvägen being considered for haulage?

Probably not for heavy goods haulage, but some people who work with the final repository and commute from Uppsala might choose that route. About 40 of the 750 or so employees at the Forsmark plant live in Uppsala today.

2.9 How big an area will be occupied compared with today?

All planned facilities for the final repository on the ground surface are accommodated in the area between the roundabout and the power station on the south side of the entrance road. In the event more land is needed, there is additional space in the area.

2.10 Approximately three million cubic metres of rock muck have to be hauled out. How will you handle the drainage water that is released?

A general study has been made of the nitrogen content of the drainage water, among other things. A more site-specific study will be made to estimate the quantity and content of contaminants in the water from the underground facility and the leachate from a possible rock heap. There are guideline values and limit values we will take into consideration. If necessary the water will be treated before it is released.

2.11 Is there a three-dimensional model of the facility?

No, not yet. We will devise a model later on.

2.12 Are there any plans for use of the one-third of the rock muck that is not needed for the final repository?

The rock muck is a resource, a building material, and we believe there will be a demand for it.

2.13 I want the rock muck to be used for the pier here in Öregrund, is that possible?

Yes, as far as SKB is concerned that's fine, if a final repository is built here in Forsmark.

2.14 Has SKB received an inquiry from Östhammar Municipality concerning whether the Öregrund development group could have the rock muck? The municipality was going to study how the pier and the harbour can be protected from storms. It is of interest for both residents and tourists.

No, SKB has not received such an inquiry from the municipality.

The municipality replied that a request for rock muck for the pier in Öregrund was noted in conjunction with the construction of the Forsmark Nuclear Power Plant.

2.15 What will be the impact on the groundwater level? What will you do to mitigate the effects on the groundwater level? The groundwater question is only mentioned briefly in the brochure you distributed prior to the meeting.

The size of the impact on the groundwater level will depend partly on the water flow rate in the rock and partly on how the rock is sealed during tunnelling. We are collecting measurement data from the rock and will devise models to calculate the impact on the groundwater. All data we have obtained thus far suggest that the water flow rate in the bedrock in Forsmark is low and that there would therefore be relatively little lowering of the groundwater level, but more will be known in six months. The people who may be affected will be compensated.

2.16 It is of the utmost importance that highway 288 be improved. There is no good entrance ramp to the E4. Can SKB arrange for an entrance ramp? It may be possible to cooperate with Sandvik.

As mentioned previously, the infrastructure is not SKB's responsibility. But we will be happy to pass on these viewpoints and discuss them with the National Road Administration.

2.17 The Environmental Code requires a siting meeting, when will it be? The Swedish Radiation Protection Authority, SSI, has taken up the question of recharge and discharge areas and questioned SKB's choice of only a coastal alternative for siting of the final repository. For the encapsulation plant, SKB plans to submit a permit application already in 2006.

It's true that SKB plans to submit an application for a permit to build the encapsulation plant adjacent to Clab in 2006.

The Environmental Code does not require a special meeting about siting. The Environmental Code says that the extended consultations should deal with the siting, scope, design and environmental impact of the activity, as well as the form and content of the environmental impact statement.

The siting question has to do with the proposed method for disposal of the spent nuclear fuel and alternative methods. We feel that we have those discussions at all consultation occasions, for example the one here tonight. Furthermore, we recently had a meeting with SSI on the scope of the account of alternative methods.

As far as recharge and discharge areas are concerned, SKB has previously published a report on geoscientific factors of importance for the safety of the repository. Important conclusions from this report show that the recharge area is one of many factors of importance for the safety of the repository.

The aspects the authorities hold up which could be advantageous for an inland siting, for example at Hultsfred, compared with sites nearer the coast, have to do with the groundwater flow patterns and the lower salinity of the groundwater.

As far as the groundwater's flow paths are concerned, SKB's studies have shown that:
– short flow paths exist inland as well,
– regional flow models are associated with great uncertainties,
– low groundwater permeability is more important.

SKB's conclusions are that Hultsfred is not judged to offer any significant advantage that would warrant a site investigation there. Accordingly, SKB intends to finish the ongoing investigations in Forsmark and Oskarshamn.

By further analyses of factors that can affect the groundwater flow on a regional scale, SKB will also meet the authorities' request for a supplementary account. SKB has commenced the work of looking at regional groundwater flow conditions. This work will be completed during the autumn of 2005. The question of the impact of salinity will be addressed in the safety evaluation that will be produced in conjunction with the submission of the permit applications for the encapsulation plant.

2.18 How will the method question be handled? It is supposed to be addressed in the application for the encapsulation plant, which is planned to be submitted in 2006. Will it then be dismissed? What alternatives are being discussed? If other methods are found for disposing of the nuclear waste that are judged to be better, what will happen then?

SKB's mission is to solve the waste problem today, and through the years we have studied a number of alternatives for management and disposal of spent nuclear fuel. These alternatives will be compared with KBS-3 from a safety and environment viewpoint, among other things, in coming consultation meetings and in permit applications for the encapsulation plant and the deep repository. It is highly unlikely that a completely unknown method will be found in the foreseeable future that is better than those being studied today.

The alternative methods that SKB is actively studying are Very Deep Holes and reprocessing and transmutation. SKB's judgement is that reprocessing and transmutation is not a solution for Sweden in the present situation. The technology for trans-

mutation is still in the research stage. It will be several decades before it could possibly be ready for full-scale use. Even if the method is developed and implemented, some long-lived waste will be left that requires the same management and final disposal as spent nuclear fuel.

Furthermore, it is SKB's view that a repository in Very Deep Holes entails many difficulties, but does not have any obvious advantages over a KBS-3 repository. For example, it is difficult to deposit waste at great depth in boreholes, which means that a new technology must be developed. Due to the stresses to which the buffer and canister are exposed at that great depth, they cannot be expected to remain intact for such a long period of time. After that, safety rests more or less solely on the rock and the great depth. Even though the rock is a good barrier, it can be difficult to show that it alone can meet the safety requirements.

After discussions with SSI, SKB is working to develop a work plan for what an alternative report on Very Deep Holes could contain. It could, for example, contain a barrier-by-barrier comparison of KBS-3 and Very Deep Holes. It is quite possible to discuss individual factors of importance for isolation or retardation, but trying to make an integrated assessment of these factors is not meaningful in view of the large uncertainties it would involve. The goal is that the work should be included in a permit application for the encapsulation plant.

3 Common issues

3.1 Do we have two weeks after the consultation tonight to come in with questions and viewpoint?

Yes, it is possible to submit questions and viewpoints regarding this meeting up until 9 December, for example directly to SKB's office for the site investigations in Forsmark or by e-mail.

3.2 Don't we need more time to finish the scoping work to make sure we have included everything?

There isn't any rush, viewpoints and questions can be submitted to SKB during the entire consultation process up until SKB submits its permit applications. According to SKB's plans, the applications for the encapsulation plant will be submitted in 2006 and for the final repository at the end of 2008.

It is of course always possible to submit viewpoints between the consultation occasions as well.

3.3 Does what has been said here tonight count officially?

Yes. The questions that have been discussed during the evening will be presented in the notes of the meeting (this document) and taken into account in the continued planning and design of the encapsulation plant and the final repository.

3.4 The interesting subjects are those judged to lie outside of SKB's area. Do you want other areas to be taken up as well?

Yes, we want all relevant issues to be taken up. SKB's ambition is to take responsibility for those issues that relate to the encapsulation plant and the final repository.

3.5 What does the societal study look like?

SKB's societal programme consists of research and studies. The studies are divided into general studies, which are common for the municipalities of Oskarshamn and Östhammar, and municipality-specific studies.

SKB's aims with the societal studies are to deepen the common knowledge base and get a broader perspective on the societal aspects of the nuclear fuel programme. This will facilitate evaluation and assessment of the programme in a larger context.

Östhammar Municipality is deeply involved in the study work. What happens in a small municipality where several billion kronor are to be invested? Will Östhammar Municipality be regarded as a refuse dump or a tourist attraction? These are examples of questions that will be addressed in the societal studies.

The purpose of the Environmental Code is to promote sustainable development, ensuring that present and future generations have a healthy and good environment. A holistic assessment is to be done in the EIS, and societal impact comprises an important part of this holistic assessment.

3.6 There are too few consultation occasions scheduled for citizens, and it is problematic that the company has chosen the subjects and set the agenda for the consultation meetings in advance. This is not in line with the Swedish Environmental Protection Agency's general advice. The background material for the consultations has been inadequate, and the study or report referred to by the company is often lacking. What does SKB plan to do about the problem that the participants don't have the necessary background material to discuss the subjects chosen in advance by the company for the consultations? Does the company intend to postpone the consultations until the necessary reports and studies are available? If not, why not?

It is SKB's judgement that roughly one joint formal consultation meeting per year is enough. In between these meetings there are local meetings and information activities so that interested persons can follow the site investigations. Beyond this, SKB has about four meetings per year with the Forsmark Consultation and EIA Group – in which representatives from Östhammar Municipality, the County Administrative Board in Uppsala County, SKI and SSI participate – plus regular meetings with the municipality's reference groups.

SKB proposes a topic for discussion at the consultation meeting, based on the status of ongoing studies. We have previously been criticized for the fact that too much time has been taken up at consultation meetings by SKB's presentations, and there has not been enough time for discussion. We have taken this criticism to heart and tried to rectify the situation. At the previous meeting in the Mission Church in Östhammar (13 May), and above all at this meeting, we have had few and short presentations. Moreover, many of SKB's experts are present at the meeting so that questions about final disposal of spent nuclear fuel can be asked and discussed.

The extended consultation began by discussing the scope of the EIA work. As a basis for the consultations, SKB had produced the so-called "scoping report", version 0. For this particular consultation, 25 November 2004, SKB had produced a brochure as background material. The objective was to provide a clear and instructive presentation of the subject. In view of the viewpoints that have now been received, SKB will reconsider the level of detail in the background material for future consultations.

The intention with the choices of subjects at the consultation meetings is to present the latest results of ongoing studies. This requires that the studies have come so far that there are some solid results to discuss. In order to be able to profit from the viewpoints of the consultation parties, it is important to be able to have consultations about prelim-

inary material as well. This makes it possible for the consultation parties to influence the direction of the continued study and the solutions SKB subsequently chooses.

3.7 Questions concerning the environmental consequences of method and site selection are central in the EIA work and must have higher priority in the consultations than questions relating to influence. The consultation process risks becoming solely symbolic, which is a very unsatisfactory situation in view of the fact that great weight is attached in the EIA legislation to the quality of the consultations and their importance for the credibility of the project. How does SKB justify devoting one of the few remaining consultations to presentation of the company's own societal studies, at the expense of consultations on environmental impact? How will SKB change the plans for the consultation procedure up to 2006 so that interested private persons and organizations can be sure that the focus of the EIA work lies more on identification and description of the long-term environmental consequences of the project than on its short-term impact?

The purpose of the Environmental Code is to promote sustainable development, ensuring that present and future generations have a healthy and good environment. To achieve this purpose, environmental issues must be addressed in combination with societal and economic issues. Environmental issues are uniquely important, but other aspects must be considered as well so that a coordinated approach is adopted. It is particularly important for the affected municipalities to have a complete body of information for their decisions, where societal aspects comprise an essential element.

A prerequisite for SKB's getting a permit from the authorities to build a final repository according to the KBS-3 method is that there are no long-term (thousands of years) environmental consequences. Construction and operation of the final repository will take a long time, around 40 years, and it is important to determine the possible environmental consequences of haulage and handling of rock muck and groundwater lowering, and it is primarily regarding these aspects that private individuals have questions.

3.8 SKB intends to commence construction of the encapsulation plant before the final repository project has undergone environmental examination and obtained approval, which is without legal basis and conflicts with the Environmental Code and SKI's requirements in reviews of previous RD&D programmes. What legal support does SKB have for the subdivision of the applications and for commencing construction of one system component before the whole system has been subjected to environmental examination and obtained approval?

SKB will erect two nuclear installations – an encapsulation plant and a final repository – which may be built on two different sites and thereby fall within the jurisdiction of two different environmental courts. The erection of the facilities will be examined under both the Environmental Code and the Nuclear Activities Act. It is for these reasons that there will be several applications. From a legal point of view there is no obstacle to submitting an application for the encapsulation plant before an application for the final repository. SKB's timetable calls for a permit for the encapsulation plant to be granted after SKB has submitted the permit applications for the deep repository, but before a decision on the deep repository has been taken. This means that both applications, with associated EISs and background reports, will be available when a decision is to be made regarding permission to commence construction of the encapsulation plant. Preparation of the two permit matters takes a long time. Being able to start the processing of the permit application for the encapsulation plant early ought to facilitate the work for all involved authorities as well as for the environmental court.

Since the encapsulation plant takes a long time to build and commission, and furthermore needs a lengthy trial period before it can deliver canisters to the deep repository, SKB deems it appropriate to begin construction of the encapsulation plant before construction of the deep repository.

3.9 The company has postponed the method report until 2006, which provides far too little time for review and reconciliation of the EIS. But above all it is an unreasonably short time if the company intends to produce an adequate body of material for the assessment of the chosen method and the alternative methods. If the company believes that a well executed EIA process provides better background material and boosts confidence in the project, why is SKB rescheduling the method report from 2008 to 2006 and thereby rushing the EIA process unnecessarily? How does SKB plan to make use of the remaining time up until applications are submitted in 2006 to develop the method report so that it meets the requirements of the environmental legislation on comparable alternatives and choice of BAT?

Since permit applications for the encapsulation plant in 2006 are a part of management and disposal in accordance with the KBS-3 method, the regulatory authorities – e.g. the National Board of Housing, Building and Planning – have pointed out that the applications in 2006 should also stipulate the chosen method.

Alternative methods have been studied thoroughly on a number of occasions, for example in conjunction with the supplement to RD&D-98. Thorough analyses of the advantages and disadvantages of different methods have been done and compared with those of the KBS-3 method. In these comparisons, the KBS-3 method has been judged to be superior. SKB is following the development of alternative methods, especially Very Deep Holes and reprocessing and transmutation, and their status is described in the RD&D programmes. So far, nothing has emerged to alter the conclusion that the KBS-3 method is the most suitable for disposal of spent nuclear fuel in Sweden.

In order to establish whether the alternative question has been sufficiently well explored, SKB has held up the alternative reporting at consultation meetings, for example with conservation and environmental organizations during 2004 (Oskarshamn 22 April, Stockholm 4 May and Forsmark 13 May). Viewpoints have then been offered that the alternative reporting should be deepened, and that it should be discussed at future consultations. In response to these viewpoints, SKB will conduct further studies of the Very Deep Holes alternative and further analyses of factors that can affect groundwater flow on a regional scale, with a view towards the siting of the final repository. The plan is that these studies should be finished by the autumn of 2005 so that they can serve as a basis for consultations, in late 2005 or early 2006, on how these matters should be reported.

The precautionary principle, BAT (Best Available Technology) etc. are incorporated in a number of international conventions and have been adopted in Sweden in the Environmental Code's general rules of consideration. The Environmental Code's requirements and the technical requirements on the final repository in the Nuclear Activities Act comprise the basis for SKB's work with the method for final disposal of spent nuclear fuel. The arguments for why the method SKB is basing its permit application on entails the best available technology from the environmental and safety viewpoints will be given in the applications.

3.10 Questions from consultation meetings have not been documented in the notes from the meetings, which shows that independent moderators and minutes keepers must be appointed at the consultation meetings. Will SKB in any way improve the procedures for the documentation of the consultations so that everyone can be sure that all the questions brought up at the meetings are included in the documentation? Does SKB intend to reconsider an earlier decision not to have independent moderators and minutes keepers in order to boost confidence in the consultation procedure?

It is SKB's responsibility to document the consultations, and the notes are available to everyone, either via our website or we can send them on request. It is SKB's ambition that the notes should objectively reflect what is said at the consultations. It is also in SKB's interest that all questions brought up during the meetings be documented, and no question has been deliberately excluded because SKB doesn't want to discuss it.

SKB has previously used an independent moderator at some consultations and will consider doing it again. To raise confidence in the notes of the meetings, SKB will also consider inviting one of the participants to confirm the minutes.

3.11 Finding the best site from an environmental point of view is vital and crucial to public confidence in the project. But the company does not want this issue to be dealt with in the consultations with citizens, which is completely unacceptable and contrary to the intentions of the EIA process. How does SKB explain the fact that site selection and the siting alternative are not questions which citizens and local organizations will be given an opportunity to discuss in the consultation process? How will SKB re-plan the consultation procedure so that the issues which citizens and local organizations consider urgent are prioritized in the consultations and so that these issues are addressed with the same high level of ambition in the form of participation of external and internal SKB experts as the issues prioritized by the company?

As has been said above, SKB plans to take up the question of the siting of the final repository for spent nuclear fuel as a topic for consultation at the end of 2005 or beginning of 2006.

3.12 What does SKB mean by "reconciliation"?

By "reconciliation" SKB means that the compiled background material is presented to the consultation parties to obtain viewpoints on whether it is complete and sufficient, or whether something is lacking. Based on these viewpoints, SKB judges whether supplementary work or studies are needed, so it is good to get many viewpoints at an early stage.

A written invitation was sent to the following organizations:

Building Conservation Association, Östhammar Municipality
EFÖ – Energy for Östhammar
Swedish Association of Field Biologists, Salamander Club
Opinion Group for Safe Final Disposal – Oss
Rodhen Orienteering Club
Valö-Forsmark Historical Society
Älgmossen Moose Preservation Area
Östhammar Nature Conservation Society

Meeting with Oskarshamn EIA Forum

Date	8 December 2004, 9:30–16:00 hrs
Place	Äspö HRL, Oskarshamn
Target group	Oskarshamn Municipality, County Administrative Board in Kalmar County, SKI and SSI.
Invitation	The date of the meetings is decided on jointly. SKB sends out e-mail invitations to each meeting.
Purpose	To discuss matters related to the expansion of Clab, as well as the encapsulation plant and the final repository for spent nuclear fuel.
Background material	Prior to the meeting, Oskarshamn Municipality had posed two "EIA questions" to SKB.
	EIA question no. 6 – Waste quantities
	EIA question no. 7 – Recharge and discharge
Present	
County Administrative Board in Kalmar County	*Ulf Färnhök, chairman, Sven Andersson*
Oskarshamn Municipality	*Kjell Anderson, Elisabeth Englund, Rigmor Eklind, Charlotte Liliemark, Kaj Nilsson, Göte Pettersson, Lars Tyrberg, Peter Wretlund, Harald Åhagen*
SKI	*Josefin Päiviö Jonsson*
SSI	*Björn Hedberg*
SKB	*Claes Thegerström (part of meeting), Kristina Dahlström (part of meeting), Saida Laârouchi Engström, Monica Granberg, Anders Nyström, Katarina Odéhn, Olle Olsson, Peter Wikberg, Lars Birgersson, secretary*

1 Encapsulation plant

No questions or viewpoints were expressed pertaining solely to the encapsulation plant.

2 Final repository for spent nuclear fuel

2.1 EIA question no. 6 – Waste quantities

The municipality's question to SKB

Question:

The first paragraph in the municipal council's condition 2 for the site investigation decision reads:
Only spent nuclear fuel produced in the country, in the volumes specified by SKB in RD&D-K, is dealt with in the siting process.

There is, however, an opinion within the power industry that the reactors should be able to generate electricity for 60 years. RD&D-Programme 2004 confirms that SKB's planning is based on a reference scenario with 40 years of operation of the reactors, which gives rise to 4,500 canisters, equivalent to 9,300 tonnes of uranium.

The municipality's view in the matter and of the need for a study:

The municipality considers that the possibility of extended reactor operating time must influence SKB's application with EIS in two ways:

1. The account should cover the consequences of an extended operating time for the encapsulation plant and the final repository.
2. The account of the zero alternative must also take into account the future lifetime of nuclear power. In particular, we would like to see an account of how the safety assessment for the zero alternative is affected if Clab has to receive more waste than planned.

SKB should also clarify the consequences of the planned power increases at the nuclear power plants as far as the quantity of spent nuclear fuel and the fuel's decay heat are concerned.

SKB's reply:

SKB said that the questions posed by the municipality will be explored in the EIA work.

Discussion

The municipality said that SKB must be clear about what the reference alternative is, not least because the municipality's condition is linked to a given waste quantity.

SKB said that they do not know today how the nuclear waste programme will be designed. Nor does SKB know how well the rock volume can be utilized with regard to fractures etc. These factors are taken into account in the design work, however. Moreover, the power increase results in fuel with different properties, which is also taken into account in SKB's work.

SKB noted that a main alternative will be included in the application. SKB will, in consultation with the municipality, define the studies that need to be done to explore the consequences of different waste quantities.

Moreover, SKB stressed that they want to build a repository, regardless of the number of canisters.

2.2 EIA question no. 7 – Recharge and discharge

The municipality's question to SKB

Question:

The question of recharge and discharge areas has long been one of SSI's main points in its reviews of SKB's programmes. It is closely related to the question of a coastal or inland siting of the final repository, and also to SSI's regulations. An SKI report (consultant Voss) put the question on the agenda in the media as well when the municipalities were to make decisions on site investigations in 2002. New results from SKB show that regional topography is of less importance for groundwater flow at the relevant repository level than local variations in topography. However, SSI questioned SKB's conclusions in a memorandum dated 30 August 2004.

The municipality has long been tracking the issue, especially after the debate occasioned by the SKI report. It is also on the special list drawn up by SKI and SSI in cooperation with the municipality for follow-up of condition 7. Many factors influ-

ence the consequences of an inland siting of the repository compared with a coastal siting, of which Voss's project, as well as SKB's, only shed light on some. A comprehensive picture is still lacking.

The municipality's view in the matter and of the need for a study:
The municipality is particularly concerned with two points with a bearing on the environmental impact assessment:

1. A clear and distinct account of the regional groundwater model for Småland, including on which points SKB's experts come to the same conclusions as the authorities' experts, on which points they come to different conclusions, and what the uncertainties are.
2. A coherent description of all factors that influence the siting of a final repository to the interior versus on the coast, and how SKB weighs these factors together in selecting a site.

SKB's reply:

The aspects the authorities hold up which could be advantageous for an inland siting compared with sites nearer the coast have to do with the groundwater flow patterns and the lower salinity of the groundwater.

As far as the groundwater's flow paths are concerned, SKB's previous studies have shown that:

– short flow paths exist inland as well,

– regional flow models are associated with great uncertainties,

– low groundwater permeability is more important.

By further analyses of factors that can affect the groundwater flow on a regional scale, SKB will meet the authorities' request for a supplementary account. SKB has commenced the work of looking at regional groundwater flow conditions. This work will be completed during the autumn of 2005.

As far as the groundwater's salinity is concerned, SKB's studies have shown that:

– high/low salinity entails both advantages and disadvantages,

– the backfill material must be adapted to the site,

– higher salinity requires a higher proportion of bentonite in the backfill material.

An evaluation of the properties of the buffer and backfill materials and their dependence on the salinity of the groundwater will be presented in SR-Can.

Discussion

In the subsequent discussion, the municipality said that they feel some concern for the groundwater question, since SKB's and the authorities' experts seem to have different opinions. SKB stated that a number of assumptions must be made to be able to calculate groundwater flow. Different assumptions can lead to different results, which explains why different experts come to different conclusions.

SKB noted that the groundwater question falls outside of the actual RD&D process, since a complete body of material is lacking from SKB. According to SKB's plans, supplementary material will be available after the summer of 2005.

2.3 Areas of national interest for final disposal of spent nuclear fuel and nuclear waste

SKI recently decided to create areas of national interest for final disposal of spent nuclear fuel and nuclear waste in the municipalities of Oskarshamn and Östhammar.

Discussion

The municipality wondered whether it is possible to abolish the designated areas of national interest for final disposal of spent nuclear fuel and nuclear waste. SKI replied that if an area of national interest is not needed, for example as a result of SKB's priorities, it will be abolished. The area of national interest may also be further delimited if the results of SKB's site investigations indicate that a smaller area is of interest for siting.

3 Common issues

3.1 The municipality's statement of comment on the scoping report

Oskarshamn Municipality presented LKO's statement of comment on SKB's scoping report version 0.

Discussion

The municipality said that certain sections in the scoping report do not generate interest, for example the chapter on transportation (Chap. 4.6). It's important to get people interested, to find ways to get out the questions.

SKB agreed that it is difficult to generate broader interest in the nuclear waste issue. Nor was there any great interest at the consultation meeting in Östhammar on 25 November. Six people came to the open house and twenty or so to the meeting itself. When it comes to generating interest, it can be mentioned that the local meeting on the coast road Fårbo-Simpevarp that was held on 10 May was well-visited and appreciated. On 5 April 2005, SKB will have a consultation meeting with citizens. This meeting, which like the consultation meeting in Östhammar on 25 November, will be about construction and operation of the facilities and the disturbances that can occur in conjunction with e.g. rock excavation and haulage, will be held in Figeholm in order to get those people who live in the Simpevarp/Laxemar area and along the planned transport route involved.

However, experience shows that even if "only" twenty or so people come to a meeting, all kinds of questions are asked. SKB meets many inhabitants of both municipalities in the course of the ongoing dialogue and gets many questions this way as well. In summary, the formal consultations are by no means the only way to find out about the viewpoints and questions that exist in the municipalities.

The municipality wondered how SKB handles the fact that different bodies expressed different viewpoints on the scoping reports. SKB explained that in some cases quite different viewpoints had been obtained from the reviewing bodies, for example regarding the scope of the account of Very Deep Holes and transmutation. Some bodies do not believe these methods need to be studied or developed anymore, since they will not comprise an alternative to KBS-3 in the foreseeable future. Others think that SKB should try to develop these methods much more so that they will eventually be comparable with KBS-3. SKB emphasized that, according to the law, they must themselves decide what must be done and prepared for the applications.

Meeting with Forsmark Consultation and EIA Group

Date	10 December 2004, 9:00–12:15 hrs
Place	Assembly Hall, County Administrative Board in Uppsala County
Target group	Östhammar Municipality, County Administrative Board in Uppsala County, SKI and SSI.
Invitation	The date of the meetings is decided on jointly. SKB sends out e-mail invitations to each meeting.
Purpose	To discuss matters related to an encapsulation plant and a final repository for spent nuclear fuel. Furthermore, each participating party gives a status report on the work they are taking part in that has a bearing on the disposal of spent nuclear fuel.
Background material	—
Present	
County Administrative Board in Uppsala County	*Ulf Henricsson, chairman, Mats Lindman*
Östhammar Municipality	*Margareta Widén Berggren, Sten Huhta, Hans Jivander, Bengt Johansson, Gunnar Lindberg, Virpi Lindfors, Carl-Johan Nässén*
SKI	*Josefin Päiviö Jonsson*
SSI	*Björn Hedberg*
SKB	*Saida Laârouchi Engström, Kaj Ahlbom, Monica Granberg, Gerd Nirvin, Olle Olsson, Sofie Tunbrant, secretary*

1 Encapsulation plant

No questions or viewpoints were expressed pertaining solely to the encapsulation plant.

2 Final repository for spent nuclear fuel

No questions or viewpoints were offered concerned solely with the final repository for spent nuclear fuel.

3 Common issues

3.1 The process for planning and building matters coincides in part with the licensing process, but other persons are involved to some extent. It is urgent to get the planning process going. The question of a possible final repository in Östhammar Municipality has not become a formal matter with the municipality yet, so the building committee cannot start working with the matter.

It was decided to hold a start-up meeting as soon as possible. Mats Lindman of the County Administrative Board was appointed convener. Participants from SKB are Saida L. Engström and Bengt Leijon. (SKB's contact person in Oskarshamn is Olle Zellman.) The contact person for Östhammar Municipality is Virpi Lindfors.

3.2 Östhammar Municipality proposed that a representative from the Oskarshamn EIA Forum should be free to participate in the meetings with the Forsmark Consultation and EIA Group, and vice versa.

It was decided that the secretary of the Consultation Group should invite a representative from the EIA Forum to the Consultation Group's meetings via Kaj Nilsson, Oskarshamn Municipality.

3.3 Östhammar Municipality said that Kävlinge Municipality has appealed the Riksdag's decision to close the Barsebäck nuclear power plant. The municipality wants to start site remediation earlier than has been decided in order to build housing. How does that tally with plans for the management and disposal of the long-lived radioactive waste after decommissioning?

SSI said that speeding up the dismantling of the nuclear power plants can cause problems from a radiation protection point of view. But it can go faster than SKB's current planning.

SKB pointed out that dismantlement and demolition is the responsibility of the plants. The planning for the decommissioning has not started yet. First inventory and monitoring must be done, and that takes several years. Reactor B1 cannot be decommissioned as long as B2 is in operation, and an EIA must be done for the decommissioning.

It was noted that several nuclear power plants have been taken out of service in Europe, so experience of decommissioning does exist. The decommissioning in Germany is proceeding faster than is planned in Sweden.

SKB is responsible for management and disposal of the radioactive waste. Used components from the reactor core and reactor internals are stored today in pools at Clab. SFR will be expanded to be able to receive the short-lived decommissioning waste. The construction phase will start in around 2015, and the repository will be ready for operation in 2020.

3.4 SKB announced that the salinity of the water in one of the wells included in SKB's monitoring programme has become elevated.

The well lies only a few metres from the sea, so salt water intrusion is not unexpected. SKB has said that all properties within the area are to be held harmless and SKB will therefore drill a new well. This has not been possible yet, however. The whole plot is located too close to the sea for well drilling. Just beyond the plot boundary is the Kallriga reserve, and no incursions may be made there without a permit. Now a permit has been obtained from the Uppland Foundation and the County Administrative Board, so drilling will start in a week or so.

3.5 The municipality wondered why SKB is now talking so much about how important the engineered barriers are when it is clear that the rock is so good in Forsmark.

SKB replied that all the barriers are important. The rock will protect the canister and the bentonite. The rock will also retard and filter radionuclides in the event of a canister failure.

3.6 SSI raised the question of how desirable it is that the regulatory authorities are present at the consultation meetings for citizens.

SKB contends that they see it as a strength of the democratic system if the authorities attend. Now and then questions are posed to the authorities, and then it's good if they are present and can answer. The municipality also wants to have the regulatory authorities there. This enhances security and ensures that everything is done right. The municipality does not pretend to be an expert, but feels this is the concern of the regulatory authorities. The municipality would like to see the authorities be given a point on the agenda at the consultation meetings to present themselves and their role in the process. The County Administrative Board says that it would be good if SKB would state at the meetings that the authorities are invited and are present.

SKI has participated at all meetings and believes this gives them a good sense of what issues are topical and what the mood is. SKI is supposed to issue a statement on the consultation report, and then it helps for them to have first-hand experience.

Consultations with regional actors in Kalmar County

Date	January – March 2004
Place	Written consultation
Target group	Regional actors in Kalmar County
Invitation	Written invitation to 9 regional actors who are likely to have viewpoints on and/or interests in the final repository project.
Purpose	To present and receive viewpoints regarding which issues should be studied as a basis for EIA.
Background material	The report "Scope, delimitations and studies for environmental impact assessments (EIAs) for encapsulation plant and deep repository for spent nuclear fuel. Version 0 – basis for extended consultation in Oskarshamn" (in Swedish only). In this report, SKB presented proposals for which types of studies will be conducted for applications and environmental impact assessments (EIAs) under the Environmental Code and the Nuclear Activities Act.
Replies from	County Administrative Board in Kalmar County, National Board of Fisheries, Kalmar County Museum, Regional Council in Kalmar County and National Road Administration. The National Board of Fisheries has no viewpoints on the material.

1 Encapsulation plant

No questions or viewpoints were expressed pertaining solely to the encapsulation plant.

2 Final repository for spent nuclear fuel

No questions or viewpoints were expressed pertaining solely to the final repository.

3 Common issues

SKB agrees with all offered viewpoints and remarks below.

3.1 The County Administrative Board regards SKB's background material as a suitable point of departure for SKB's consultations under Chapter 6 of the Environmental Code. They also note that the initial chapters in the Environmental Code and the Nuclear Activities Act comprise an important premise for the choice of method and the siting of the facilities and infrastructure that is needed for an acceptable long-term disposal of the spent nuclear fuel. They further point out the need for clarification of how the integrated description of the final repository system is handled in a procedure where permit application and licensing take place at different points in time for the encapsulation plant and the final repository.

3.2 The Kalmar County Museum points out that it should be clarified in the "scoping report" that the current status of the site and effects should be described for the cultural environment (not just the natural environment) and that the inventory of archaeological and historical remains should be of the same import as the inventories of flora and fauna. Any consequences for archaeological and historical remains must be included in the EIS.

3.3 The National Road Administration points out that SKB should also examine whether there is a need to strengthen or broaden public roads or build new roads.

3.4 The Regional Council feels that SKB should include and explore/analyze the following areas:

- **The social and cultural aspects.**
- **Public image aspects.**
- **Infrastructure and labour market.**
- **Competency management.**
- **Spin-off effects for the surrounding community (university and industry).**
- **Effects on human health.**
- **How the measures together contribute to sustainable development.**

All the mentioned areas have been discussed within the framework of SKB's societal programme. It is the individual municipality which then decides which studies are to be done.

List of recipients

County Administrative Board in Kalmar County
National Board of Fisheries
Public Health Centre
Kalmar County Museum
Federation of Swedish Farmers, Southeast
County Council in Kalmar County
Regional Council in Kalmar County
Regional Forestry Board, Eastern Götaland
National Road Administration, Southeast Region

Consultations with regional actors in Uppsala County

Date	January – March 2004
Place	Written consultation
Target group	Regional actors in Uppsala County
Invitation	Written invitation to 11 regional actors who are likely to have viewpoints on and/or interests in the final repository project.
Purpose	To present and receive viewpoints regarding which issues should be studied as a basis for EIA.
Background material	The report "Scope, delimitations and studies for environmental impact assessments (EIAs) for encapsulation plant and deep repository for spent nuclear fuel. Version 0 – basis for extended consultation in Forsmark" (in Swedish only). In this report, SKB presented proposals for which types of studies will be conducted for applications and environmental impact assessments (EIAs) under the Environmental Code and the Nuclear Activities Act.
Replies from	County Administrative Board in Uppsala County, National Board of Fisheries, Mälar Valley Council, Mälar Valley Regional Forestry Board and National Road Administration. The National Board of Fisheries has no viewpoints on the material and the Mälar Valley Council refrains from offering viewpoints.

1 Encapsulation plant

No questions or viewpoints were expressed pertaining solely to the encapsulation plant.

2 Final repository for spent nuclear fuel

No questions or viewpoints were expressed pertaining solely to the final repository.

3 Common issues

SKB agrees with all offered viewpoints and remarks below.

3.1 The County Administrative Board thinks that SKB's background material can serve as a suitable point of departure for SKB's consultations under Chapter 6 of the Environmental Code. They also note that the initial chapters in the Environmental Code and the Nuclear Activities Act comprise an important premise for the choice of method and the siting of the facilities and infrastructure that is needed for an acceptable disposal of the spent nuclear fuel.

3.2 The regional forestry board considers that their interests are protected since they have been commissioned by SKB to conduct a natural value inventory in the area in question.

3.3 The National Road Administration points out that SKB should, in its transportation studies, also study whether there is a need to strengthen or broaden roads or build new roads.

List of recipients:

County Administrative Board in Uppsala County
University Hospital
National Board of Fisheries
Federation of Swedish Farmers, Mälar Valley
County Council in Uppsala County
Mälar Valley Council
C-Framåt (C-Ahead), liaison body in Uppsala County
Mälar Valley Regional Forestry Board
Uppland Museum
Uppland Foundation
National Road Administration, Mälar Valley Region

Consultations with Oskarshamn Municipality regarding the "scoping report"

In the spring of 2003, the parties in the Oskarshamn EIA Forum offered viewpoints on a working version of the "scoping report".

Viewpoints offered at consultation meetings were presented at the meeting with the EIA Forum on 26 May 2004.

The municipality's formal reply was received on 31 October 2004.

Other meetings	Presentation and discussion with representatives from the municipality's working groups on 5 November 2003.
Target group	The LKO project's working groups who are following SKB's work with the final repository project in Oskarshamn Municipality.
Purpose	To present and receive viewpoints regarding which issues should be studied as a basis for EIA.
Background material	The report "Scope, delimitations and studies for environmental impact assessments (EIAs) for encapsulation plant and deep repository for spent nuclear fuel. Version 0 – basis for extended consultation in Oskarshamn" (in Swedish only). Handed over at the meeting on 5 November 2003. In this report, SKB presented proposals for which types of studies will be conducted for applications and environmental impact assessments (EIAs) under the Environmental Code and the Nuclear Activities Act.

SKB maintains a close dialogue with Oskarshamn Municipality, not least through the meetings held with the EIA Forum and through the local information meetings arranged with regard to the road question. Many of the questions raised by the municipality in its statement of comment on the "scoping report" have therefore been brought up and discussed in the EIA Forum, where the municipality has in some cases particularly highlighted certain questions, so-called EIA questions. The main viewpoints offered by the municipality in its statement of comment on the "scoping report" are presented and commented on below.

1 Encapsulation plant

No questions or viewpoints were expressed pertaining solely to the encapsulation plant.

2 Final repository for spent nuclear fuel

2.1 The layout of the final repository has changed significantly between the feasibility study phase and the site investigation. We would like SKB to elaborate on the reasons for the change in the layout of the final repository.

SKB is constantly developing the layout of the final repository with respect to e.g. geological conditions and in order to achieve an efficient technical solution. SKB's

work with the layout of the final repository is presented at consultation meetings with citizens and at meetings with the EIA Forum.

3. Common issues

3.1 The municipality wants SKB to describe its mission after the final repository has been put into operation. What are SKB's plans for continued research and development in the nuclear waste field, and more concretely, what activities are planned in the Äspö HRL and the Canister Laboratory?

Initial operation of the final repository is planned to start in 2017 and regular operation in 2023. It is difficult to foresee at this time what the scope and thrust of the research in the Äspö HRL and the Canister Laboratory will be so far in the future. However, SKB thinks that there will be a need for research and development at both of these facilities even after the final repository has been put into operation.

3.2 The municipality would like alternative methods to be reported with greater breadth and depth. For example, the Very Deep Holes method should be given a more thorough treatment.

SKB has carried on a dialogue with e.g. SSI regarding coming alternative reports, with a focus on the Very Deep Holes alternative. As a result of this dialogue, an in-depth alternative report is currently being planned and should be ready in the autumn of 2005.

3.3 The zero alternative is described in the "scoping report" as continued storage in Clab. SKB refers to a previously written report, R-00-31, about extended interim storage in Clab. In light of the power industry's view that the reactors can be operated for 60 years, the consequences of an extension of the operating time from 40 to 60 years must be studied during the consultations.

SKB does not know today how the nuclear waste programme will be designed. Nor does SKB know how well the rock volume can be utilized with regard to fractures etc. These factors are taken into account in the design work, however. Moreover, the power increase results in fuel with different properties, which is also taken into account in SKB's work. Thus, the questions raised by the municipality are being addressed by SKB.

Consultations with Östhammar Municipality regarding the "scoping report"

During the spring of 2003, the parties in the Forsmark Consultation and EIA Group presented their viewpoints on a working version of the "scoping report".

Viewpoints offered at consultation meetings were presented at the meeting with the Forsmark Consultation and EIA Group on 14 May 2004.

The municipality's formal reply was received on 17 August 2004.

Other meetings	Information for municipal council – 28 November 2003, presentations and discussions with representatives of the municipality's working groups – 16 May 2003, 13 June 2003, 10 October 2003 and 2 February 2004.
Target group	The working groups who are following SKB's work with the final repository project in Östhammar Municipality.
Purpose	To present and receive viewpoints regarding which issues should be studied as a basis for EIA.
Background material	The report "Scope, delimitations and studies for environmental impact assessments (EIAs) for encapsulation plant and deep repository for spent nuclear fuel. Version 0 – basis for extended consultations in Forsmark" (in Swedish only). Handed over at the meeting on 10 October 2003. In this report, SKB presented proposals for which types of studies will be conducted for applications and environmental impact assessments (EIAs) under the Environmental Code and the Nuclear Activities Act.

In its reply (Dnr 2004KS040), Östhammar Municipality asked to receive a separate reply to the questions posed in the municipal council's statement of comment (dated 16 November 1999) on the preliminary final report after the feasibility study. Issues which the municipality thinks should be raised and are not answered by the feasibility study:

1. Determination of the character, exact size and depth of the Singö Zone, which is important for the long-term safety of a deep repository.
2. Survey of tectonic lenses with regard to:
   – horizontal extent and boundary conditions,
   – character and depth of surrounding deformation zone,
   – indications of reactivation in surrounding deformation zones,
   – three-dimensional shape, rock mechanics.
3. Survey of the ore potential at repository depth.
4. Survey of marine geology.
5. Impact on groundwater lowering.
6. Restoration plan for rock muck.
7. Modern methods for indicating uncertainty in modelling of groundwater flows and levels and transport velocities of various substances, plus determination of plutonium's ability to migrate up to the ground surface and range of spread in the event of a canister failure, plus the time aspect.

8. With regard to population and employment forecasts, sensitivity analyses should be used to shed light on how changes in premises in the forecasts affect the final results.
9. Without a proper explanation, SKB has changed the planned repository depth from 700 metres to 500 metres.
10. Without a proper explanation, SKB has proposed a reduction in canister thickness from 50 millimetres to 30 millimetres.

SKB will reply to all questions as soon as possible. Some of the questions will be answered by the ongoing site investigations.

Other questions that have emerged at meetings and in written replies are presented in the following compilation.

1 Encapsulation plant

1.1 Östhammar Municipality should have insight into the EIA process for the encapsulation plant in Oskarshamn, since we may receive the product from it.

Invitations to EIA consultations for the encapsulation plant in Oskarshamn will be sent to the municipality from now on.

1.2 Is an EIA being done for a possible siting of the encapsulation plant in Östhammar Municipality?

Yes, an environmental impact assessment is being done.

1.3 If the encapsulation plant is to be located in Östhammar Municipality, it will be difficult finishing the municipal planning work in time to meet SKB's timetable.

If for some reason a decision is made to locate the encapsulation plant at Forsmark, SKB figures that the process will be delayed 1–2 years since they will then have to design for the plant.

1.4 Is work under way to describe in detail a siting of the encapsulation plant in Östhammar Municipality?

Design work is not under way, but the supporting material for an EIA will be compiled. In conjunction with the extended consultation for the final repository, extended consultation was also carried out for the encapsulation plant.

2 Final repository for spent nuclear fuel

2.1 The design of SFL 3-5 can affect the final repository. How is SKB dealing with this? Can the boreholes that have been made affect the final repository?

A project is under way to study how the boreholes should be sealed so that they do not affect the final repository.

2.2 Where might possible discharges of leaking water from the final repository end up (Chap. 4.5 of the "scoping report")?

This will be studied in the safety assessment.

2.3 When can SKB tell us how much water must be present in the final repository for the bentonite to function as intended? Could the repository be filled with water manually?

This is addressed in the interim report for SR-Can, which came out in the autumn of 2004.

3 Common issues

3.1 Östhammar Municipality assumes that the municipal building committee and SKB will soon start a dialogue regarding the planning work and will try to agree on the work forms so that the municipality will have enough time for the planning work.

SKB concurs, and this dialogue has begun.

3.2 SKB has announced that Östhammar Municipality will receive invitations to consultations for the encapsulation plant in Oskarshamn. In addition, Östhammar Municipality should receive oral information from SKB on the process at meetings in Östhammar Municipality.

SKB concurs, and this information is provided at the meetings with the Forsmark Consultation and EIA Group.

3.3 Östhammar Municipality has given SKB a statement of comment regarding the municipality's prioritization of SKB's proposals for societal studies. The prioritization is intended to get the necessary studies started and does not entail a final decision on SKB's proposals. The municipality would like to have a dialogue with SKB regarding the forms of further participation as far as the prioritization of future studies and the forms for following prioritized studies are concerned.

SKB concurs, and the forms for dialogue and the municipality's participation have been established in accordance with the municipality's wishes.

3.4 The study topic "Effects on human health" is a topic into which Östhammar Municipality would like to have greater insight. This entails further communication regarding both which studies SKB intends to have done and how the municipality will follow them.

SKB concurs, and the forms for the municipality's participation have been established in accordance with the municipality's wishes.

3.5 Why are the societal issues being incorporated in the EIA work?

The Environmental Code talks about sustainable development. Sustainable development includes environmental, societal and economic aspects. Some of the societal studies are not included in the EIS, but will be submitted as supporting material together with the permit application for the final repository.

3.6 Will the same EIS be used for the planning work? There is a risk that information will be deemed to be "old" when the planning process starts.

Most information will not be old. It is the municipality's responsibility to conduct an EIS, as well as to carry out the consultations in accordance with PBL (the Planning and Building Act). If necessary, the EIS will be updated.

3.7 A permit application for the final repository should be submitted before a permit application for the encapsulation plant so that an approval of the method exists before a permit is applied for to build the plant.

The supporting material that describes the method (KBS-3) is being submitted along with the application for a permit to build the encapsulation plant. A decision on the encapsulation plant is expected in about 2009. The industry will take the risk of starting to build the encapsulation plant before the decision on the final repository has been made (decision expected in 2010).

3.8 The canister factory is not included in the system analysis. Shouldn't it be included?

SKB will have a look at this. The canister factory will include optimizing the purchases of the parts and putting them together.

3.9 An application for final disposal requires a credible alternative. How will SKB demonstrate a credible alternative?

The Environmental Code requires an alternative to be specified. It doesn't require presenting an equivalent feasible alternative. SKB intends to demonstrate that alternatives have been investigated in a credible way and present them. Very Deep Holes has been presented as an alternative that is feasible, but very expensive. SSI has asked for an extended safety evaluation for Very Deep Holes. SKB and SSI will discuss how SSI wants this safety evaluation to be done.

3.10 The municipality wants SKB to provide the municipality with information on what requirements SSI has made regarding an extended safety evaluation of Very Deep Holes. The municipality also wants to invite SKB to an information meeting/seminar on Very Deep Holes, so that interested persons can get a better understanding of the method.

SKB would be happy to provide this information. The municipality takes the initiative and promises to return in the matter.

3.11 The municipality should lend its backing to the National Board of Housing, Building and Planning's statement of comment (dated 30 January 2004).

This question concerns the same subject as is answered in point 3.6.

3.12 It would be good for the municipality to prepare a programme for the planning work so that we can identify what needs to be done at different stages of the siting of a final repository. It is important that we convey this information to SKB, since it is vital for them that the planning process should not be too lengthy.

This question concerns the same subject as is answered in point 3.6.

3.13 Figure 1.2 (in the "scoping report") does not give a timetable for building permits and detailed development plans. This can take years and should be included in the planning.

This question concerns the same subject as is answered in point 3.6.

3.14 The municipality observes that the question of how national interests etc. should be handled should be taken up at a general planning level so that this can be taken into account in the comprehensive plan.

This question concerns the same subject as is answered in point 3.6.

3.15 The municipality would also like SFL 3-5, the canister factory with subcontractors and the head office to be included in a complete system analysis so that different outcomes are clarified.

SKB notes the question and it will be addressed, although probably not in the system analysis.

3.16 The safety report (SR 97) which the Nuclear Energy Agency read and which was reviewed by the IRT (International Review Team) dealt with the KBS-3 method. Are there any other methods that have been reviewed by independent experts?

No, there are no other methods that have undergone a safety assessment that has been reviewed by independent experts, comparable to KBS-3 and SR 97. Research and development on other methods is mainly being conducted outside of Sweden, and that research is reviewed and evaluated regularly by independent experts, if by independent one means "non-SKB".

3.17 Will SKB require a clarification of the Riksdag's previous decision occasioned by the debate about transmutation?

No. SKB's plan is to submit a permit application for a final repository according to KBS-3. This will be followed by a review process where the KBS-3 method will be examined.

3.18 Can the EIA process continue without a strategy decision having been taken by the Riksdag?

Yes.

3.19 What consequences would follow from a decision to locate the deep repository in Oskarshamn? The municipality has invested resources in plans etc.

This is a question suitable for study within the framework of the societal programme.

3.20 Transportation of "non-radioactive materials" to and from, as well as within, the municipality is a very important question for the municipality.

This is also a central issue for SKB. The shipments will entail environmental impact, for example in the form of noise and emissions, which will be described in the EIS.

3.21 There must be time for supplementary studies if a study reveals they are necessary. This is important to bear in mind when it comes to plans for construction, transportation etc.

SKB concurs.

3.22 A development project with business groups in conjunction with the procurement study would be desirable.

This is quite possible within the framework of the societal studies. It is the municipality who prioritizes what should be included.

If you would like to read more

Some brochures and reports from SKB with a bearing on the ongoing consultations and site investigations are shown below. All are available at www.skb.se or can be obtained on request.

Background material for extended consultation

"Scope, delimitations and studies for environmental impact assessments (EIAs) for encapsulation plant and deep repository for spent nuclear fuel, version 0" – for Oskarshamn and Forsmark (in Swedish only). The reports contain SKB's proposals for what the EIA work should include and how its scope can be defined.

"Final disposal and encapsulation in Forsmark – Extended consultation on 25 November 2004" (in Swedish only). Background material for the meeting that discussed construction and operation of the facilities and the disturbances that might occur.

Annual reporting

Site investigations are being conducted in Oskarshamn and Forsmark. Since 2002, each site publishes its own annual report describing the past year's activities (available in English).

Completed consultations are compiled each year (starting in 2003).

Other reports

The report "Deep repository and encapsulation plant for spent nuclear fuel – consultation and environmental impact assessment under the Environmental Code and the Nuclear Activities Act" (in Swedish only) describes how the consultations can be conducted and who participates. SKB Report R-02-39.

"RD&D-Programme 2004". Programme for research, development and demonstration of methods for the management and disposal of nuclear waste, including social science research.

Consultation reports from early consultations

Early consultation regarding a possible deep repository for spent nuclear fuel at Simpevarp. Dated 24 January 2002, the meeting was held on 10 January 2002.

Early consultation regarding a possible deep repository for spent nuclear fuel at Forsmark. Dated 28 June 2002, the meeting was held on 15 June 2002.

Early consultation regarding possible encapsulation plant for spent nuclear fuel at Clab, Oskarshamn. Dated 14 April 2003, the meeting was held on 8 March 2003.

Early consultation regarding possible encapsulation plant for spent nuclear fuel at Forsmark. Dated 17 November 2003, the meeting was held on 29 October 2003.

Laws and regulations stipulate requirements on final disposal of spent nuclear fuel.

SKB uses both terms “deep repository” and “final repository” for the repository for spent nuclear fuel. Both designations refer to the same thing.

A final repository for radioactive operational waste, SFR, already exists in Forsmark.

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