SCREENING REPORT

ALBERTA SULPHUR TERMINALS LTD.
PROPOSED SULPHUR MANAGEMENT FACILITY

GIBBONS, ALBERTA

Issued by: Alberta Environment
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ALBERTA SULPHUR TERMINALS LTD.
PROPOSED SULPHUR MANAGEMENT FACILITY

Alberta Sulphur Terminals Ltd. (AST), a wholly owned subsidiary of HAZCO Environmental Services Ltd. (HAZCO), has proposed to construct a sulphur management facility to deal with excess sulphur generated by various resource and refining operations in Alberta. The proposal indicates that the facility will only handle and store elemental sulphur generated from (or transported through) the Fort Saskatchewan area. The proposed site is located on lands (NW ¼ 18-56-21 W4M), which are east of Gibbons and southwest of Redwater.

The proposal was referred to the Director of the Regulatory Assurance Branch (the Director) to determine whether AST should be required to prepare an Environmental Impact Assessment (EIA) report. The Director decided that further assessment would be required to make such a determination through the preparation of a Screening Report. AST was directed to disclose the Project to the public and invite the public to provide input to the Director about the need for an EIA report.

The Screening Report is a summary of information available on the proposal from AST, Statements of Concern filed by the public, and advice from government agencies. The Screening Report demonstrates that sufficient information with respect to environmental issues has been provided for the Director to determine if AST needs to prepare an EIA report.

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1.0 INTRODUCTION

Alberta Sulphur Terminals Ltd. (AST), a wholly owned subsidiary of HAZCO Environmental Services Ltd. (HAZCO), has proposed to construct a sulphur management facility to deal with excess sulphur generated by various resource and refining operations in Alberta. The proposal indicates that the facility will only handle and store elemental sulphur generated from (or transported through) the Fort Saskatchewan area. The proposed site is located on lands (NW ¼ 18-56-21 W4M), which are east of Gibbons and southwest of Redwater (Figure 1).

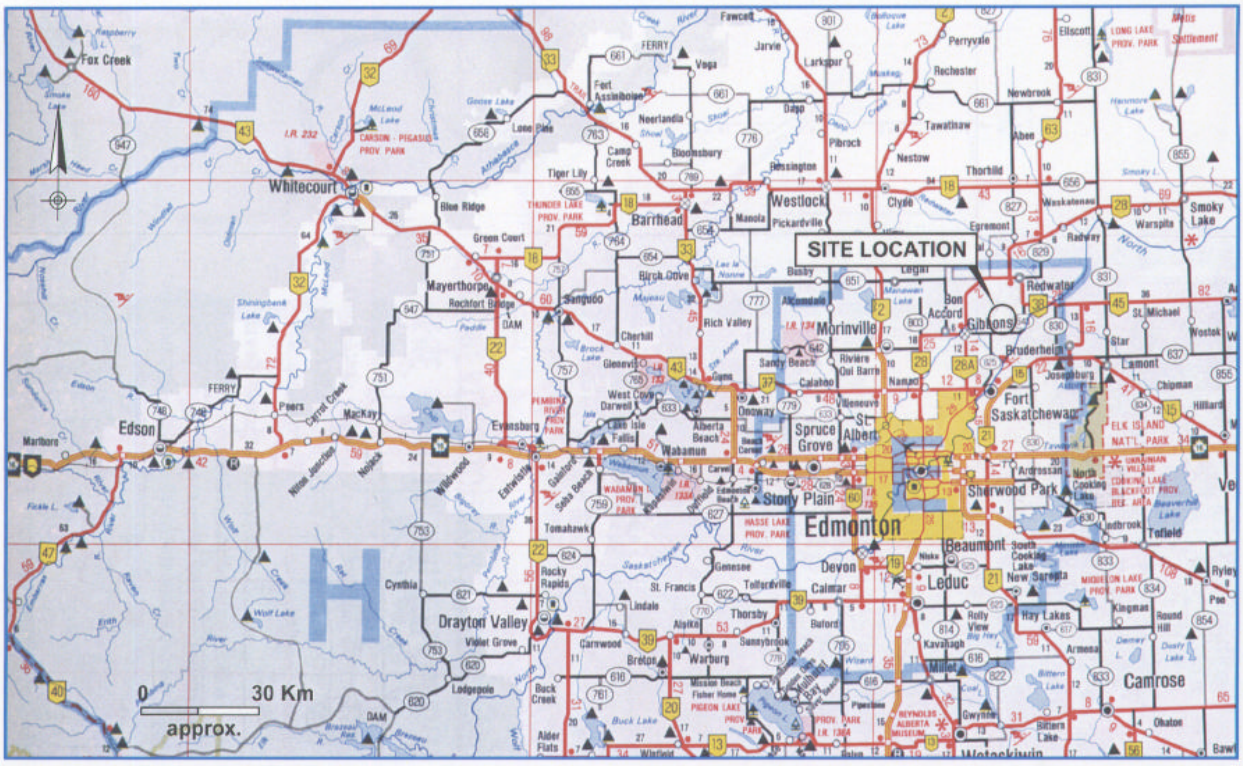

Figure 1 - Site Location Map

In April 2002, the Approvals Manager for the Northern Region, Environmental Service (Approvals Manager) requested that the Director of the Regulatory Assurance Branch (the Director) determine whether AST needs to prepare an Environmental Impact Assessment (EIA) report prior to applying for an Approval under the Environmental Protection and Enhancement Act (EPEA).

1.1 Purpose of Screening Report

A Screening Report assists the Director in determining whether an EIA report is needed to provide information to make the regulatory decisions that will prevent, minimize or mitigate adverse effects from a proposed activity or project.

Under Section 44(1)(b) of the EPEA, the Director has determined that further assessment is required to determine if an EIA report is required for this proposed activity. This Screening Report has been prepared to gather information related to AST's proposed sulphur management facility and to provide advice to the Director concerning the need for AST to prepare an EIA report.

Information is needed to understand the nature of an activity or project and its setting, its potential effects, and proposed mitigation of adverse effects. Some types of information are best obtained and considered through the preparation of an EIA report. Typically this includes information about large, complex activities occurring in sensitive environments that may have a broad range of environmental, health, socio-economic and infrastructure effects requiring management or mitigation. An EIA report is also valuable for decision-makers when there is a substantial lack of technical and/or environmental information associated with a proposed project. On the other hand, other types of information, such as those associated with less complex activities with well understood effects that can be managed through normal regulatory processes, can be obtained and reviewed in an Approval application under the EPEA. Some kinds of information such as air and water quality modelling are part of both information-gathering processes.

1.2 Information Sources

The following information sources were considered in the preparation of this Screening Report: Letter from Hazco dated February 13, 2002, responding to additional information request from AENV;

- Disclosure Document entitled Sulphur Storage and Loading Facility Gibbons Revision #3 submitted by AST dated April 2002;
- Additional information submitted by Komex dated April 18, 2002;
- Public comments and Statements of Concern (Appendix);
- Referral comments from government agencies; and
- Advice from Alberta Environment staff.

2.0 BACKGROUND INFORMATION

2.1 Sulphur Production in Alberta and Abroad

2.1.1 Sulphur Supply

Sulphur is a by-product of natural gas processing, heavy oil upgrading and petroleum refining operations and is generated by a variety of facilities located throughout Alberta. In 2001, Alberta produced 6.9×10^6 tonnes of sulphur, of which 6.1×10^6 tonnes was derived from sour gas, 0.8×10^6 tonnes from upgrading of bitumen to synthetic crude oil (SCO), and just 0.01×10^6 tonnes from oil refining [Alberta Energy and Utilities Board (EUB), 2002]. Sulphur production from these sources is depicted in Figure 2.

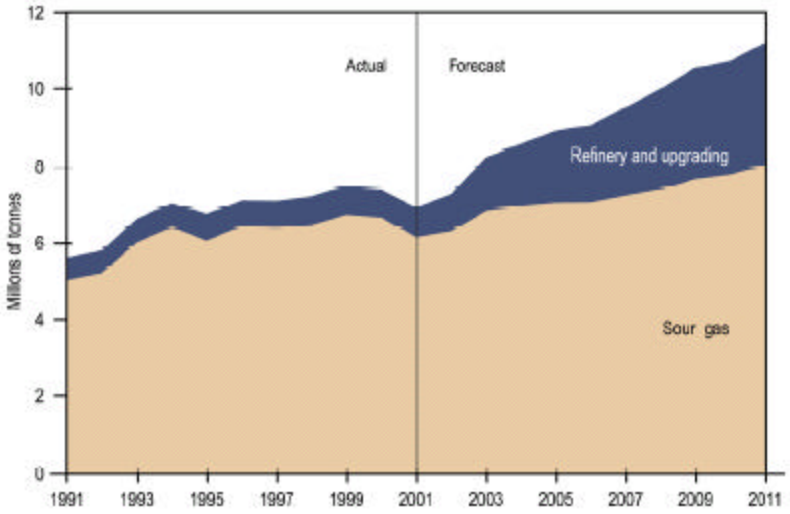

Figure 2 – Sources of Alberta Sulphur Production.

According to the EUB's forecasts, sulphur production from sour gas is expected to increase to 8.0×10^6 tonnes from 6.1×10^6 tonnes in 2001 and sulphur recovery in bitumen upgrading will increase fourfold to 3.2×10^6 tonnes by the end of the forecast period (2011). No significant change is expected in sulphur recovery at refineries (EUB, 2002).

2.1.2 Sulphur Demand

According to statistics provided by the EUB, demand for sulphur within the province in 2001 was only about 0.3×10^6 tonnes. It was used in production of phosphate fertilizer and kraft pulp and in other chemical operations. Some 96% of the sulphur marketed by Alberta producers was shipped outside the province, primarily to Florida, Asia, and North Africa (EUB, 2002).

In the early 1990's, a number of traditionally sulphur-importing countries installed sulphur recovery equipment in oil refineries and other sulphur-emitting facilities, largely for environmental reasons. Consequently, many of these countries became self-sufficient in sulphur and the price of sulphur on the world market declined significantly. Under such low-price conditions, many of Alberta's competitors ceased production of sulphur, enabling Alberta's market share to rise throughout the late 1990's. According to the EUB's forecast, demand for Alberta sulphur, both domestic and export, is expected to rise slowly, leveling off at 7.5×10^6 tonnes per year. Figure 3 depicts the Alberta sulphur production and demand over the next decade.

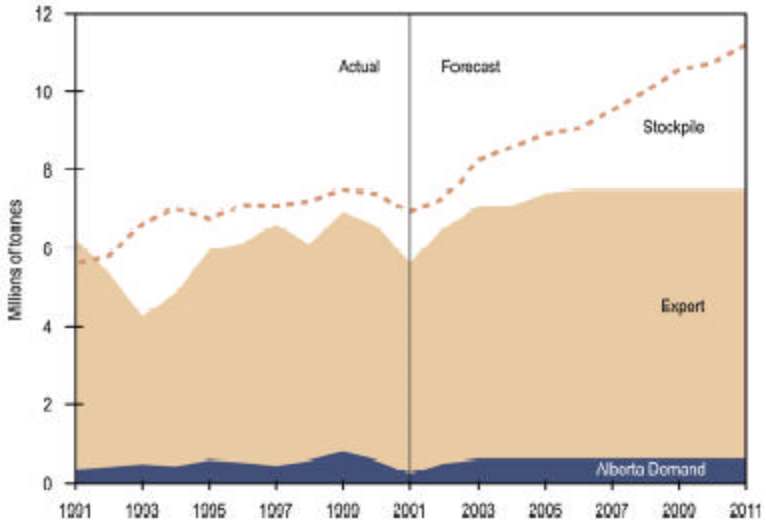

Figure 3 – Alberta Sulphur Production and Demand

2.1.3 Imbalances between Sulphur Supply and Demand

The worldwide trend is for a steady increase in the supply of sulphur with no corresponding increase in demand. Consequently, industry is looking for solutions to the impending problem of storing excess sulphur. Historically, because elemental sulphur (in contrast to sulphuric acid) is easy to store, imbalances between production and disposition have traditionally been accommodated through net additions to or removals from sulphur stockpiles. If demand exceeds supply, as was the case over the period 1985-1991, sulphur is withdrawn from stockpiles; if supply exceeds demand, as has been the case since 1992, sulphur is added to stockpiles. The EUB and industry anticipate that sulphur stockpiles will grow until markets recover from the current oversupply. Expected changes to the provincial sulphur inventory are illustrated in Figure 3 as the difference between total supply and total demand (EUB, 2002).

3.0 PROJECT DESCRIPTION

AST's proposed project includes facilities for sulphur forming and shipping, as well as, facilities for the long-term storage of excess sulphur that cannot be sold. The sulphur-forming component of the proposal includes:

- Road and rail access for receiving and shipping sulphur;
- Sulphur unloading and transfer facilities;
- Sulphur forming facilities to produce a more marketable sulphur product; and
- Loading and shipping facilities for formed sulphur.

The long-term storage facilities consist of a buried engineered containment cell having the following design features:

- Total capacity for 10 million tonnes of sulphur;
- A primary synthetic liner;
- Neutralization and discharge systems to manage water that accumulates in the active storage cells;
- A secondary clay-soil liner to provide additional protection in the event the integrity of the primary liner is compromised;

- A leak detection system to assess the performance of the primary liner and to collect any leachate;
- Perimeter berms to provide sight and sound barrier and prevent site run-on and run-off;
- Progressive cover and reclamation to minimize infiltration of water, potential for sulphur acidification and return the land to an agricultural land use; and
- Appropriate security systems, operating and monitoring procedures.

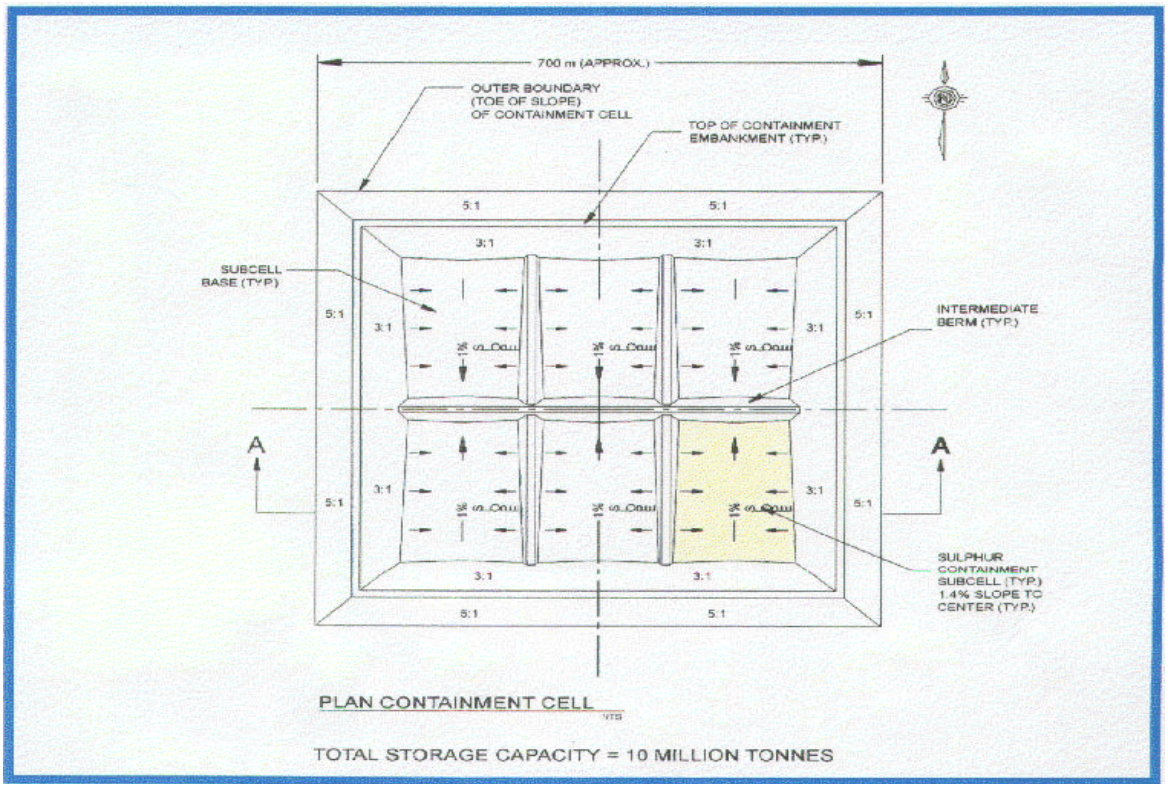

Figure 4 - AST's conceptual design of the containment cell.

AST's objective is to block and store sulphur in the cell during periods of low market prices and to form market sulphur during periods of higher or stable prices. The storage cell would be progressively reclaimed to minimize the potential environmental impacts. Once reclaimed, the storage area will be returned to agricultural use.

4.0 DETAILED PROJECT INFORMATION

4.1 Location

The proposed site is located in an industrial and petro-chemical processing area northeast of Edmonton near the towns of Gibbons and Redwater. The proposed site is located in the NW ¼ 18-56-21 W4M and located immediately north of Degussa Canada Inc.'s (Degussa) hydrogen peroxide manufacturing facility and approximately two kilometres west of Agrium's fertilizer manufacturing facility. Williams Energy Services' petroleum liquids storage facility is also located approximately three kilometres south of the proposed site. In addition to industrial development, residences are also in the vicinity (within two kilometres) of the proposed site.

Two Secondary Highways 643 & 825 and Primary Highway 38, as well as, an existing Canadian National (CN) rail spur service the site. According to AST, the proposed site is strategically

located near Fort Saskatchewan, where sulphur production is scheduled to increase dramatically through the construction and commissioning of additional heavy oil upgrading capacity (i.e., Shell's Scotford and Petro-Canada's Upgrader).

4.2 Land Use

The proposed Project is located on land within the Alberta Industrial Heartland Association's (AIHA) area structure plan. The AIHA is an organization consisting of Sturgeon County, Strathcona County, Lamont County and the City of Fort Saskatchewan whose purpose is to integrate their area structure plans to ensure that future growth in the region occurs in a coordinated and responsible manner. The proposed Project is situated on lands that have been zoned as heavy industrial, but are presently used for agriculture. Besides other industrial developments, agricultural activity also occurs in the vicinity of the proposed site. Figure 5 shows the project location and illustrates the land use zones for Sturgeon County's Complementary Area Structure Plan (CASP).

4.3 Preliminary Geology and Hydrogeology

AST's preliminary results from boreholes tests indicated that weathered shale bedrock (Wapiti Formation) was present at an average depth of 34 metres. Surficial deposits of silty clay till, with trace pebbles, overlaid the bedrock formations. During testing, AST encountered a few sand and silty sand zones at depths between 9 to 30 metres below ground surface. The thickness of these zones varied between 0.3 to 3 metres. During testing, groundwater was encountered in the sand intervals; however, based on the minimal volume of water that was circulated to the surface during drilling, AST described the yield as negligible.

AST's preliminary results from peizometers sampling indicated that depth to groundwater of the quarter section was approximately three metres below surface and confined. Provincial records indicated 14 water wells within 1.5 kilometres of the site for domestic, agricultural and industrial use. Most of the wells were completed in the underlying bedrock unit.

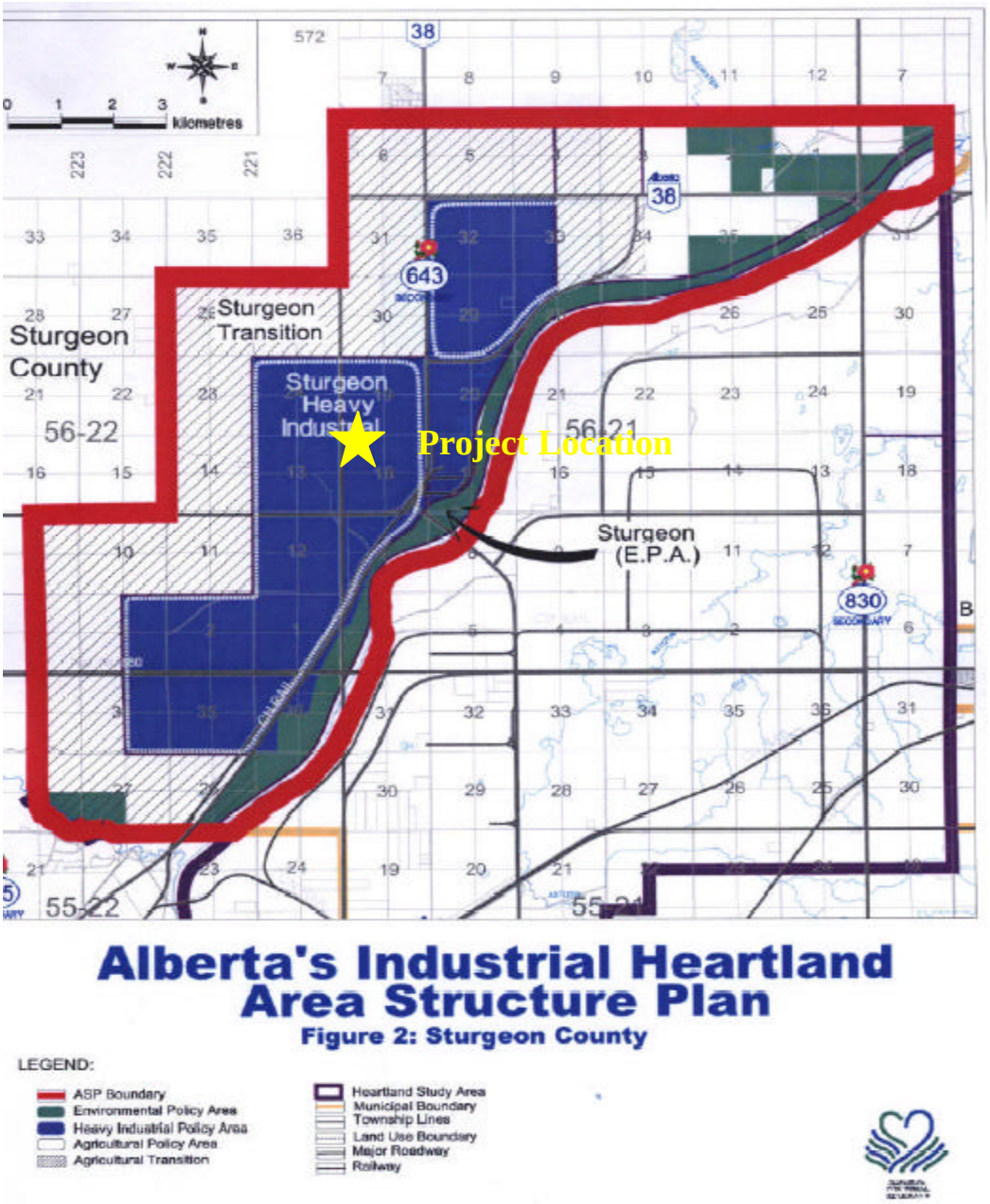

Figure 5 – County of Sturgeon's Complimentary Area Structure Plan

4.4 Preliminary Hydrology

The North Saskatchewan River is located approximately three kilometres to the east and eight kilometres to the south of the site. An unnamed, seasonal drainage course to the North Saskatchewan flows to the southeast from the site. The watercourse is partially natural and artificially directed. AST indicated in their Disclosure Document that rerouting of this drainage feature will be required as part of the development of the Project.

4.5 Site Evaluation

A preliminary evaluation of the site was conducted by AST to verify the suitability of the site from an environmental and natural containment perspective. The evaluation included a review of regional and local geology and hydrogeology, local groundwater use, topography and drainage. As well, nine boreholes and five peizometers were completed on the site by AST to gain an initial understanding of the site conditions and identify the potential presence of buried valley aquifer. Preliminary site investigations and published data confirmed the absence of a buried valley aquifer.

5.0 CONSULTATION

5.1 Government Consultation

5.1.1 Alberta Environment (Northern Region)

AST initially presented the proposal to Alberta Environment (AENV) Northern Region in December 2001. Based on the discussions during this meeting, AST prepared a Disclosure Document and submitted a copy to the Approvals Manager on December 21, 2001. Based on his review, a letter was sent to AST on February 1, 2002, stressing the need for effective public consultation and advising AST to ensure that adequate public consultation was completed to support the application. Specific information requests made by AENV in this letter included:

- Clarifying ownership of the sulphur;
- Specifying sulphur generators in the area;
- Clarifying the capacity of the facility;
- Discussing alternatives that are/may be available;
- Describing the funding mechanism to address potential future liabilities;
- Providing details regarding the public consultation process; and
- Clarifying the term of storage be it temporary or permanent.

Following the Region's review of the additional information, a letter dated March 26, 2002, was sent to AST. This letter advised AST that an Approval under EPEA would be required, Approval by the EUB would likely not be required, and that screening to determine the potential need for an EIA report may be required under EPEA. The Approval Manager formally referred the project to the Director on April 2, 2002, for consideration under the Environmental Assessment process.

On April 4, 2002, approximately 60 people attended a public meeting initiated by Imperial Oil in Redwater to discuss issues related to oil and gas operations in the area. Regional staff from AENV (Northern Region) also attended the meeting. Although oil and gas operations were the focus, one landowner at the end of the meeting asked departmental staff if they knew anything about AST's proposed sulphur management facility. After departmental staff made the attendees aware of the proposed Project, several member of the public expressed an interest in it.

5.1.2 Alberta Environment (Regulatory Assurance Branch)

Regulatory Assurance Branch (RAB) staff met with AST/Komex on April 12, 2002, to discuss the environmental review process. At the meeting, AST informed RAB staff that the original Disclosure Document had been revised to reflect a request made by the Sturgeon County to move the facility to the adjacent lands at NW ¼ 18-56-21 W4M. AST provided RAB staff with copies of the revised Disclosure Document for review. AST also provided additional information to

RAB on April 17, 2002, answering some additional questions that were raised at the meeting. The questions focused on past public consultation and alternatives to the proposed Project.

On May 2, 2002, RAB staff attended AST's open house in Gibbons to obtain public feedback on environmental issues and discern the public's overall reaction towards the Project. Approximately 55 individuals attended. Attendees included area landowners, representatives of Sturgeon and Strathcona County and AIHA and news reporters. On May 30, 2002, AST provided RAB staff with a summary of the concerns expressed by attendees at the Open House.

The Director advised AST on May 6, 2002, that further assessment would be required to determine if an EIA report would be necessary for this Project. AST was directed to publish a Notice that the Director was considering the need for an EIA report for the Project and inviting public input on the matter. AST was also directed to make the project Disclosure Document available to the public.

On May 7, 2002, RAB staff met with representatives of Sturgeon County and the AIHA to explain the regulatory processes associated with the Director's decision for further assessment under the Environmental Assessment process, as well as, discuss the regulatory responsibilities of the Province and the County.

5.1.3 Energy and Utilities Board

On February 1, 2002, AENV sent a letter and Disclosure Document to the EUB for their review and comments. Issues outlined for the EUB's consideration were 1) the determination of public interest with regards to where the sulphur will be stored (onsite vs. offsite) and 2) whether the EUB has an interest from a resource conservation standpoint. The EUB replied that since the proponent's plan is to dispose of sulphur in a landfill (i.e., secondary facility) therefore, treating it as waste, and since the criteria for landfills are already established, the Project falls within AENV's mandate and approval by the EUB would not be required. The EUB also indicated that it is participating in a multi-stakeholder group seeking to involve sulphur producers, government agencies and other parties having an interest in sulphur management. The purpose of the initiative is to determine the feasibility of alternative handling methods for the anticipated growth of sulphur inventories within the Province.

5.1.4 Alberta Transportation

On April 16, 2002, a Long Range Planner from Alberta Transportation (AT) called RAB staff inquiring about the specific location of the proposed Project. He indicated that he was involved in meeting with municipal officials from the Project Area and the group was not sure of the exact location of the proposed Project.

After referring the Disclosure Document to AT, AT responded by stating that they had no major concerns at the time and that the Project should not produce an extensive truck movement.

5.2 PUBLIC CONSULTATION AND STATEMENTS OF CONCERN

Public input is an important component of the EPEA decision-making process. The review process for all but the most routine of applications provides an opportunity for persons directly affected by a project to provide their comments about the project early in the process. With this in mind, industry has generally recognized the value in obtaining input from the public early in the project planning and development process. Proponents often hold information sessions and

open houses to gauge the public acceptability of projects and to determine what kinds of information will be needed to address public concerns.

5.2.1 AST's Consultation Activities

AST implemented a public consultation initiative to describe the proposal and to solicit feedback regarding the Project, how it may be improved and to identify stakeholder concerns. The following public consultation activities were completed by AST:

- Meetings were held with Sturgeon County and the Industrial Heartland to get initial feedback regarding the compatibility of the Project with the County's and Region's development plans;
- Personal meetings were held with area residents and landowners within two kilometres of the proposed site;
- Discussions and meetings were held with area industries to obtain their comments as to the compatibility of the proposed Project with other industrial plans and operations;
- A presentation was made to the community advisory panel operated by Degussa/Agrium/Williams Energy Services;
- Copies of the Disclosure Document were provided to other individuals and groups; and
- An Open House meeting was held during the afternoon and evening of May 2, 2002, at the Gibbons Community Hall. The objective of the meeting was to obtain feedback from the public on the environmental issues and continue the consultation process in preparation for submitting applications to both the Province and County. Approximately 55 individuals attended. Attendees included area landowners, representative of Sturgeon and Strathcona County and Alberta Industrial Heartland, and news reporters.

5.2.2 AST's Feedback

According to AST, the company received the following feedback from various stakeholders during its public consultation process. AST provided RAB staff with a summary on April 16, 2002 of the feedback it had received from their consultation process at that time. The following points describe the feedback:

Sturgeon County

Sturgeon County expressed an interest in the proposed Project and requested additional information in the following three areas: 1) public consultation, 2) science behind process and regulatory requirements, and 3) a business case for the County to be supportive. The County also requested that AST move its proposed facility to the adjacent quarter section to the east (NW ¼ 18-56-21 W4M) to allow more orderly (i.e., less fragmented) development to the west.

Alberta Industrial Heartland Association

The AIHA has been very supportive of the Project and was acting as an intermediary with the County. They were offering advice and help in all areas of getting the Project approved.

Neighbouring Industries

Agrium was interested in the Project and originally suggested the area near their plant. Degussa was also interested and was waiting to see how the process develops. Degussa indicated that it was concerned that sulphur dust may affect their air intake systems. Williams Energy Services was casually interested in the Project and has not raised any concerns. Williams Energy Services was also helping AST identify local residents and interest groups that may be interested in the regulatory process.

Area Residents and Landowners

Initially, the reaction from interviews of landowners in the area was one of concern. However, after several hours of discussions and explanations of the science and safeguards that will be implemented, some of the residents were open to further discussion. The primary concerns raised by residents included: 1) potential odours, 2) appearance of the facility, and 3) potential impact on land values. A group of four local landowners and occupants voiced a preference that the facility be constructed elsewhere.

Sulphur Producers

Shell Scotford (Fort Saskatchewan) was interested in the facility as an option for managing its sulphur since it does have sulphur coming on stream in early 2003. Husky (Lloydminster) expressed interest in a backup location for sulphur when market conditions or transportation logistics fail them. PetroCanada (Strathcona County) was also interested in the facility for their upgrader coming on stream in 2005 or 2006. Several producers from the Fort McMurray area also contacted AST to discuss potential siting options for a similar sulphur storage facility in the Fort McMurray area for their new heavy oil recovery operations.

5.2.3 Statements of Concern

AST published a Notice in the Redwater Review, Morinville Free Press, Edmonton Journal and Sun on May 27th, and the Fort Saskatchewan Record, Morinville Mirror, and Redwater Tribune on May 28th, 2002, advising that the Director was considering the need for AST to prepare an EIA report on their proposed sulphur management facility. Persons directly affected by the Project were advised to submit their Statements of Concern about the need for an EIA report to the Director by June 28th, 2002.

Alberta Environment received six submissions in the form of letters and petitions concerning the Project. Two letters were received from individual residents in nearby communities, 2 petitions containing 112 and 9 signatures, respectively, were also received from residents in nearby communities, and a single letter was received from an individual from a community (Calahoo) outside the immediate area, but still within the County. A follow-up letter was sent by the Director to this individual to determine how he/she is directly affected by the Project. This individual did not respond. Besides residents, RAB received submissions from Degussa, an industrial neighbour to the proposed Project, as well as, Sturgeon County.

In summary, two submissions clearly stated that an EIA report should be required to address the concerns identified, two submissions outlined individual's concerns with the Project and two submissions clearly opposed the Project. The submissions opposing the Project were from residents in nearby communities (petition with 112 signatures) and the County. Table 1 provides a summary of all the concerns identified in the submissions. All submissions were placed on the Register of Environmental Assessment Information and are available to the public. Copies of all submissions were also sent to AST as information.

Table 1: Summary of Issues from Public Input

Name	Unproven Technology	Long-Term Liability	Overall Need/ Economics	Dust and Odours	Acidification	Surface and Groundwater Protection	Increased Traffic	Fires	Emergency Response Capabilities	Only Expressed Concerns	EIA report Needed	Opposed Project
Sturgeon County		√	√					√	√			√
Anne Brown			√				√	√	√	√		
Darwin Serink (Plus 111 signatures)	√		√	√		√	√	√	√			√
Degussa Canada					√	√		√	√		√	
Maureen Johnston						√				√		
Tia Barlett (Plus 8 signatures)	√	√			√	√					√	

5.3 Government Agency Advice

In conjunction with the Notice of the Director to the public requiring further assessment, the Director provided information about the Project to the following provincial agencies and requested their advice:

- Alberta Environment
  - Northern Regional Directors,
  - Environmental Operations Division,
  - Integrated Resource Management Division, and
  - Sciences and Standards Division.

- Sustainable Resource Development
  - Land and Forest Service,
  - Fish and Wildlife Division, and
  - Land Administration Division.

- Energy and Utilities Board,
- Community Development,
- Economic Development,
- Learning,
- Energy,
- Human Resources and Employment,
- Aboriginal Affairs and Northern Development,
- Health and Wellness, and
- Transportation.

5.4 Evaluation of Issues and Concerns

The main issues and concerns raised by the public and by government agencies are summarized in the following sections.

5.4.1 Technical Feasibility of Long-Term Storage and Recoverability of Sulphur

Since provincial forecasts indicate that additional sulphur storage capabilities will be required in the future, AENV, EUB, and Alberta Energy (AE) have begun to work collaboratively with industry and other stakeholders to deal with anticipated applications for increased sulphur storage capacity. Consequently, a multi-stakeholder group consisting of two committees (i.e., Technical

and Regulatory) was formed to assess potential regulatory changes and technical research related to sulphur storage options.

Currently, the Technical Committee is assessing potential options for long-term sulphur storage. No individuals on the Committee, including industry, are aware of any existing/approved projects similar to the one proposed by AST. This lack of awareness extends outside the province. Moreover, no proponent has previously applied to AENV to store uncontaminated sulphur below ground with the intent to recover it in the future. AST's proposal is the first of its kind for this type of facility.

Because of the lack of information on long-term sulphur storage and recovery, the Technical Committee is considering proposals from consultants to review potential options for short and long-term sulphur storage in Alberta, evaluate the technical feasibility of each option and make recommendations based on issues such as sulphur conservation and environmental impacts. A key component of the review is the evaluation of the transformation processes related to sulphur blocks in above ground and below ground environments. The evaluation is an initial step in gathering the information necessary to make informed recommendations on the optimal sulphur storage option(s) applicable for Alberta conditions.

AST provided some information to RAB describing alternative sulphur management options to below ground storage. Options such as above ground storage at an existing site, below ground storage at an alternate location or in salt caverns were briefly described; however, the assessment provided by AST was not as in depth and exhaustive as the one anticipated to be undertaken by the Technical Committee. AST concluded that their proposed option was the most feasible based on siting and economics.

Since very little information and experience is available on long-term sulphur storage and recovery, the technical evaluation of any storage facility will likely have to be based primarily on theoretical considerations. Reliable data from field trials of below ground storage of sulphur will not be available for some time. Syncrude Canada (Syncrude) and Alberta Sulphur Research Ltd. (ASRL) are currently in the third year of a five-year study into bacterial oxidation of two 100 tonne sulphur blocks buried under different conditions. These results will be used to support a commercial scale project in the future. According to Dr. Peter Clark (ASRL), it is too early to use this information to draw conclusions (personal communications with Bob Chandler, Science and Standards Branch of AENV). Public comments from local residents (i.e., a petition with 112 signatures) alluded to the lack of substantive research and information to support a sulphur management project of this scale. They felt that the three-year pilot study in Fort McMurray conducted by ASRL was inadequate.

Recognizing the lack of information on long-term sulphur storage, the onus rests on AST at this time to demonstrate that its proposed sulphur management facility, which includes below ground storage, is technically feasible and that the environmental effects due to the Project are manageable. The lack of information on this proposed activity coupled with the size of the proposed Project, the storage of 10 million tonnes of sulphur, warrants AST to provide a comprehensive assessment of the technical feasibility of the Project, as well as, alternative options to below ground disposal. Such information is necessary for decision-makers to make an informed decision regarding the Approval of such a project.

5.4.2 Government Policy and Future Liability

The Regulatory Committee is dealing with the issue of how to define and treat sulphur. The question is should sulphur be treated as a waste rather than a by-product? Another question the Committee is addressing is how long does the sulphur have to be stored before it is considered to be a waste? Historically, regulators have treated sulphur as a resource that has a value in world markets. Consequently, industry has stored sulphur above ground with the intent of selling it in the future. With the forecast of increased sulphur production and a flat sulphur market in the next decade, the Regulatory Committee is re-evaluating government's position on long-term sulphur management. Until the 1990's, above ground sulphur blocks were utilized as interim storage during periods of low prices. Recent forecasts by the EUB predict that prices will remain low with no indication of future increases.

The Regulatory Committee is also addressing how to define the activity of burying sulphur below ground. The definition of the activity is very dependent on how the by-product is defined (i.e., waste vs. resource). Presently, there are several definitions in the Activities Designation Regulation of the EPEA that may apply to this proposed Project. First, the Project could be defined as both a sulphur manufacturing and processing facility (sulphur forming facility) and sulphur storage facility (below ground sulphur storage). These activities are listed under Division 2 of Schedule 1 of the Activities Designation Regulation. On the other hand, if sulphur is treated as a waste, the activity could be defined as a landfill (Division 1 of Schedule 1 of Activities Designation Regulation). The importance of how AST's proposed activity is defined has implications toward the ability for regulators to address potential liabilities associated with the Project and collect security. Only certain activities defined within the Activities Designation Regulation require security.

Sturgeon County raised the issue of whether this proposal will be short-term storage or long-term land filling. They also raised the issue of who is responsible for the long-term environmental liabilities of the project and where would the resources come from to address or cover any unforeseen incident that has a negative impact on the environment.

AENV raised this question with AST and it responded by proposing to establish a fund independent of the project ownership to fund any potential liabilities over the long-term. Based on a $0.50/tonne levy, a total fund of approximately $5 million dollars would be established. Some local residents have indicated that this amount of security may not be adequate if a major incident (i.e., leak in the liner or fire) was to occur.

5.4.3 Incompatibility with Industrial Development in the Area

In its submission, Sturgeon County informed the Director that council did not support AST's proposed Project. Council felt that AST's proposal, while representing a progressive method of handling long-term sulphur storage, was inconsistent with its vision for the industrial development of the land in this location. Council felt that the proposed activity has the potential to fragment prime industrial land. Council also felt that there is a risk of industrial land within the County becoming a dumping ground for industrial by-products with little market value. Council expressed concern that such land intensive storage could well preclude industrial activity that would have a greater contribution to the economy of its communities.

A local resident also questioned the need for this facility in Sturgeon County. The resident does not believe that sulphur produced from areas outside the County (i.e., Strathcona County, Fort McMurray and Bonnyville) should be disposed within Sturgeon County. Other residents

indicated that they support industrial development in the area provided it adds value to the local economy by providing jobs, improving infrastructure and maintaining market value of farm lands in the area. They felt the Project does not provide adequate economic benefits to local communities and would lower land values in the vicinity of the development.

5.4.4 Dust and Odours

Several residents in areas surrounding the proposed facility have indicated that they are concerned with dust and odours generated from both the sulphur blocking and forming facilities. Within their Disclosure Document, AST recognized air quality to be one of the significant environmental or public relations issues. AST committed to conducting an evaluation of potential air quality issues with an emphasis on fugitive dust and odour issues. AST indicated that mitigative measures would be proposed where nuisances or potentially adverse effects are identified. AST indicated in its Open House summary that sulphur would be degassed at the point of its origin mitigating the fugitive emissions of hydrogen sulphide (H_2S) and sulphur dioxide (SO_2). AST also believes that sulphur stored in a crystalline block would not be prone to fugitive dust emissions and that the sulphur granulating process associated with the forming facility will have conventional controls for dust emissions.

Since the proposed Project has the potential for emitting sulphur dust, several stakeholders have expressed their concerns with the adverse impact the dust may have on their operations. Degussa, an industrial neighbour, is extremely concerned that sulphur dust from the proposed facility will have a significant impact on their hydrogen peroxide plant. The plant is located immediately south of the proposed facility. Degussa is concerned that sulphur dust will be vacuumed into their cooling towers, and cycle up to 10-12 times as part of their chemical manufacturing process. Degussa expressed concern that sulphur will bond with magnesium and calcium ions in the cooling water, forming precipitates of magnesium and calcium sulphate. These sulphates will form a scale on all of their internal heat exchanges and plates. This reduction in cooling capacity will reduce the overall production capability of their facility, resulting in losses of production, shipping and incurred cost of additional chemical treatment to clean the cooling towers. Degussa has estimated that even a loss of production of 5% capacity would result in a fiscal loss of over $ 1 million (US) annually.

Air quality issues including dust and odours can be dealt with effectively through the EPEA Approval process. Acceptable limits on various air emissions can be stipulated within an Approval to ensure the protection of the environment and health of local residents. AENV has developed standards and guidelines that regulate air emissions in order to protect the environment and health of Albertans.

5.4.5 Acidification

Degussa is also concerned that air borne sulphur emissions will combine with moisture to form acid rain which could potentially impact the longevity and structural integrity of the vessels and process towers. Degussa also indicates that corrosion will occur in their process columns, extractors and pumps. According to Degussa, this will negatively affect their process chemistry and result in an increase of product decomposition and overall product quality. Degussa is also concerned that sulphur emissions will be in direct contact with their existing storm pond and water effluent holding pits. Degussa feels that the addition of sulphur dust may affect their ability to meet its Approval requirements for release of these waters.

Degussa states that it has sought information from AST concerning their proposed facility; however, AST has yet to provide the necessary information to assure them that AST's proposed sulphur management facility will not impact their plant and ponds.

Local landowners also expressed their concern that acidifying emissions generated from both the sulphur blocking and forming facilities will adversely impact farmland downwind from the development.
To date, AST has not provided any information that recognizes or addresses the specific issue of acidifying emissions. However, AST did commit to conducting an evaluation of potential air quality issues in their Disclosure Document and indicate that air emissions will be evaluated as part of their Approval application under EPEA.

Similar to other air issues, acidification can be dealt with effectively through the EPEA Approval process. AENV has established critical, target and monitoring loads for acid deposition throughout the Province (AENV, 1999). Impacts due to acid deposition on the environment including other industrial facilities will also have to be included in AST's evaluation.

5.4.6 Surface and Groundwater Protection

Overall, the protection of surface and groundwater quality was the major issue cited by Statement of Concern filers. Some stakeholders indicated that AST did not provide sufficiently detailed plans on how it plans to handle surface runoff onsite and from the cells. Although detailed plans were not provided, AST indicated that it plans to engineer its containment cell to include neutralization and discharge systems to manage water that accumulated in the active storage area. The lack of detail provided by AST is not an issue since it would not be expected that detailed plans would be available for the purpose of public disclosure, but would be required later in AST's EPEA Application.

AST also proposes to reroute an unnamed seasonal watercourse that drains into the North Saskatchewan River in order to develop the facility. Sustainable Resource Development (SRD) raised issues about the impacts on fish habitat within the unnamed watercourse as a result of proposed rerouting and maintenance of water quality/fish habitat in the downstream receiving watercourse.

Besides surface water protection, several stakeholders want assurances that groundwater will not be negatively impacted by the proposed Project. In order to protect groundwater, AST plans to construct two liners beneath the sulphur storage block. The primary liner will be synthetic and according to AST will be designed and chosen to withstand heat produced from the pouring of molten sulphur. Some stakeholders expressed concern that the liner may melt during pouring operations. Field-testing by AST has demonstrated that the liner they selected, VLDPE, will maintain its integrity even having molten sulphur formed against it. AST also plans to construct a secondary liner composed of natural clay-soil that would provide additional protection in the event the integrity of the primary liner is compromised. AST's Disclosure Document indicated that the naturally occurring glacial till (clay) could act as a buffer neutralizing any leachate that potentially could leak through the primary liner. AST also planned to install a leak detection system to assess the performance of the primary liner and to contain and collect any leakage that may occur. Stakeholders expressed concern that AST has not developed any mitigative strategies in the event that the liners are compromised.

Stakeholders also expressed concern that the weight of the block sulphur storage pits on the surrounding water may impact the surrounding hydrogeology. AST's response to this concern

was that the weight of the sulphur will cause the glacial till to compress slightly when loaded, but not enough to influence groundwater flow patterns. AST's response alluded to the fact that the till was previously loaded by glaciers and therefore is not prone to further settlement and consolidation.

From AST's preliminary hydrogeological tests, it still remains unclear if the sand zones are interconnected. It is anticipated that further investigations would be necessary. Likewise, potential long-term environment impacts cannot be discounted by AST saying that soil and groundwater provide natural buffering capacity when the lifetime of the storage facility cannot be predicted. Given the technical uncertainty associated with the long-term below ground storage of sulphur and the life and size of the Project, AST will need to provide a detailed assessment on the potential impacts and mitigation of the project on groundwater resources in the area.

5.4.7 Traffic

Several local residents expressed concern that the Project will increase traffic in the area. According to some residents, they feel that the highways in the area are already overburdened given the level of industrial activity in the area and pose a real threat to the safety of area residents. Specifically, a local resident eluded to the traffic volumes on Secondary Highway 825 as being extensively high.

AST's consultation indicates their initial business plan is based on 37 truckloads a day. Dialogue between AST and some residents has suggested that if business was good, the number could double. In their Disclosure Document, AST identified traffic as an issue that would need to be examined. AST states that the volume of truck and rail traffic associated with the proposed facility construction and operation will need to be estimated and compared to existing volumes associated with the main routes to the site. After evaluation, potential traffic and noise issues will have to be mitigated.

Alberta Transportation indicated that they had no major concerns at the time and that the Project should not produce an extensive truck movement.

On September 2, 2002, RAB staff contacted AT to discuss traffic concerns expressed by the public, as well as, obtain traffic statistics associated with the secondary highways servicing the proposed site. According to its 2001 statistics, Secondary Highway 825 north of Highway 37 averages around 3500 – 4000 vehicles/day with single unit vehicles and tractor trailers constituting approximately 15% of the traffic volume. Secondary Highway 643 east of Secondary Highway 825 averages around 2300–2600 vehicles/day with single unit vehicles and tractor trailers also constitute 15% of the volume. According to AST numbers, an increase of 74 truckloads or 148 trips (i.e., highest volume) would constitute an approximate 3-4% and 5-6% increase of traffic volume on Secondary Highways 825 and 643 respectively. Likewise, this also equates to a 25% and 38% increase in single unit and tractor trailer volumes along Secondary Highways 825 and 643 respectively.

5.4.8 Fires and Emergency Response Plans

Another concern that was raised by several Statement of Concern filers was the issue of fires and the detail of emergency response plans provided by AST. First, local residents are concerned that AST has not outlined in enough detail the management plan to prevent potential sulphur fires. Moreover, local residents have expressed that AST does not have an emergency response plan, equipment or contingency water supply to deal with a sulphur fire or related emergency.

In its Disclosure Document, AST states that sulphur is not prone to spontaneous combustion, and proper storage and management, as well as vigilant fire detection can control the risk of sulphur combustion. Nowhere in its Disclosure Document did AST identify the potential of sulphur fires as a major environmental or public relations issue. According to one resident's submission, AST advised her that personnel would remain on site for half an hour after operations for the day were completed in the event of possible accidental ignition.

Besides identifying the risk of fire, local residents, Degussa Canada and Sturgeon County have identified the need to assess the potential risks to resident and neighbouring industries due to the potential of a sulphur fire. Each submission expressed the uncertainty associated with the manageability if such an event (worse case scenario) were to occur. Several residents have expressed that the County has limited resources to address fires and that the County has stretched their emergency response and financial resources to the limit and should not accept any further development that adds risk to its resident or existing industry.

6.0 SUMMARY AND RECOMMENDATIONS

Alberta Environment has carefully considered the advice provided by the public and government agencies and information provided by AST. The Screening Report has identified the following items:

1. The environmental impacts associated with the proposed Project are not understood adequately at this time to permit AST to proceed to the Approval process. The technical uncertainty associated with below ground storage, the lack of information examining alternative options, and the size of sulphur storage proposed below ground (10 million tonnes) lends to the conclusion that the proposed activity is unique and of such large scale to warrant the need for an EIA report to fully understand the environmental impacts of the Project.

2. The lack of knowledge on long-term sulphur storage options including below ground storage are currently being addressed by a multi-stakeholder group composed of sulphur producers, government agencies and other parties having an interest in sulphur management. The knowledge and recommendations from this group will assist government and industry in dealing with future proposals related to long-term sulphur storage. AST's proposal to landfill sulphur is the first of its kind and is a technical and philosophical shift in how sulphur is managed in the Province. There is some uncertainty regarding the long-term effects that land filling sulphur will have on the environment and the quality of recovered sulphur after storage. Approval of this type of facility will be a precedent and if approved would likely lead to future proposals to dispose of sulphur via land-filling.

3. Recognizing the lack of information on long-term sulphur disposal below ground, AENV recommends that a subsurface storage facility be evaluated in the same way a landfill site is evaluated. AENV recommends that the Code of Practice and Standards and Guidelines for Landfills be used in the interim to guide the applications for and review of such projects. Similar to a landfill, AST's proposal is to store sulphur below ground for an undefined period of time, perhaps permanently, since industry experts cannot predict when sulphur markets will rebound. The proposed storage cell will be slightly less than a quarter section in size, or about the size of most regional landfills approved or registered by AENV. The site investigation, cell design and long-term monitoring will have to be compatible with

requirements for landfills. Appropriate cell design and maintenance will be critical if the sulphur is to be maintained as a future product.

4. With regards to an overall public interest decision, socio-economic analyses are a typical component of the Environmental Assessment process and are not dealt with in the Approval process. The County has stated that it does not support the Project based on economic and not environmental considerations. Local residents have also expressed concern that the Project does not provide adequate economic benefits to local communities and would lower land values in the vicinity of the development. An EIA report would provide AST with an opportunity to present its business case to garner support from the County and provide decision-makers with the information necessary to determine if the Project is in the public interest from a socio-economic perspective.

5. Air quality issues including dust, odours and acidification can be dealt with effectively through the EPEA Approval process. Acceptable limits on various air emissions would be stipulated within any Approval issued by AENV. AENV has developed industry standards and guidelines that regulate air emissions in order to protect the environment and health of Albertans.

6. Several residents expressed concerns with the increase in traffic volumes that the Project will generate on roadways. Many residents already believe that the capacity of the roadways in the area is maximized given the current level of industrial activity in the area. The issues associated with impacts to transportation due to the Project are outside the scope of the EPEA Approval process and can be dealt with through the Environmental Assessment process.

7. The issue of emergency response planning could effectively be dealt with through the EPEA Approval process. At the public disclosure stage, AENV would not expect AST to provide a detailed Emergency Response Plan (ERP). Notwithstanding, the responsibility of developing an ERP rests with AST, which will have to consider some of the issues raised regarding the availability of resources that Sturgeon County may have to cooperatively participate in an emergency situation.

7.0 RECOMMENDATIONS

AST should be advised that due to lack of knowledge regarding the environmental impacts associated with its proposed sulphur management facility, as well as, the potential socio-economic and transportation impacts associated with its Project, it is required to prepare and submit to the Director an EIA report according to Section 45(1)(b) of EPEA.

8.0 REFERENCES

AENV. 1999. Application of Critical, Target and Monitoring Loads for the Evaluation and Management of Acid Deposition. Target Loading Subgroup. Clean Air Strategic Alliance. Environmental Sciences Division. Alberta Environment Publication No.: T/472. ISBN: 0-7785-0912-5.

AEUB. 2002. Alberta's Reserves 2001 and Supply/Demand Outlook 2002-2011. Statistical Series 2002-98. ISSN 1499-1179.

9.0 APPENDIX