Russell, Veronica A ENV:EX

From: Haberl, Kevin J FLNR:EX
Sent: Saturday, November 9, 2013 2:26 PM
To: Kreye, Ross A FLNR:EX; Rosenboom, Remko FLNR:EX; Barrett, Scott FLNR:EX
Subject: FW: Comments deadline approaching -- EIA report and appendices pertaining to Fraser Surrey Docks

Gents, I also did nothing with this one. I don't expect that anyone can, by the end of Tuesday...other than perhaps to contact Carrie Brown and let her know that we will not be responding (or if I have that all wrong, that we will be responding late?). I feel badly that Julia has been asking for some support on this and I have not been able to get her an answer...perhaps have a little side conversation on this one while you connect on the CEMP...sorry to dump, and thanks,

Kevin

From: Berardinucci, Julia F FLNR:EX
Sent: Wednesday, November 6, 2013 3:30 PM
To: Haberl, Kevin J FLNR:EX
Subject: Comments deadline approaching -- EIA report and appendices pertaining to Fraser Surrey Docks

---

From: Patterson, Michelle [mailto:Michelle.Patterson@portmetrovancouver.com] On Behalf Of Desjardin, Darrell
Sent: Wednesday, November 6, 2013 3:21 PM
To: Chatwell, Ian; Hall, Karen; XT:HLTH Lu, James; Berardinucci, Julia F FLNR:EX; roger.quan@metrovancouver.org; XT:Dr.Paul Van Buynder HLTH:IN; Nutton, Byron; 'Laura.Maclean@ec.gc.ca'; 'Carl.Alleyne@hc-sc.gc.ca'
Cc: Brown, Carrie
Subject: Comments deadline approaching -- EIA report and appendices pertaining to Fraser Surrey Docks

Good afternoon,

Just a reminder that comments on the Fraser Surrey Docks draft report "Environmental Impact Assessment for the Direct Transfer Coal Facility" are due by 4:00 pm on Tuesday, November 12, 2013. Please submit your comments on the draft EIA to carrie.brown@portmetrovancouver.com. If you are having difficulty accessing the document via the FTP site, or if you have any questions, please feel free to contact me.

A final EIA report will be posted to Port Metro Vancouver's website later in November for a 30-day public comment period. You are also invited to provide comments during that comment period.

Regards,

DARRELL DESJARDIN, B.Sc.
Director, Environmental Programs

PORT METRO VANCOUVER
100 The Pointe, 999 Canada Place
Vancouver, BC Canada V6C 3T4
direct: 604.665.9334 cell: 778.231.6983
main: 604.665.9000 fax: 1.866.284.4271

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Port Metro Vancouver and Canada Place Corporation integrated on December 1, 2012.
Canada Place, an inspiring national landmark, welcomes you to Canada's Pacific Gateway.

From: Patterson, Michelle On Behalf Of Desjardin, Darrell
Sent: Monday, October 28, 2013 4:10 PM
To: 'ian.chatwell@tc.gc.ca'; 'Hall, Karen'; 'James.Lu@vch.ca'; 'Berardinucci, Julia F FLNR:EX'; 'Roger Quan'; 'paul.vanbuynder@fraserhealth.ca'; 'Byron.Nutton@dfo-mpo.gc.ca'; 'Laura.Maclean@ec.gc.ca'; 'Carl.Alleyne@hc-sc.gc.ca'
Subject: FTP access to EIA report and appendices re: Fraser Surrey Docks

Good afternoon,

At the FTP link below, please find the October 24th draft of the Fraser Surrey Docks EIA and appendices for download. You are invited to send your comments on this draft by 400pm November 12th to carrie.brown@portmetrovancouver.com. Comments will be provided to FSD before the final version is provided for public and further agency comment, starting on November 15th or 18th.

Using your Internet browser, access the ftp site below:
ftp.vfpa.ca
Login: cbrown
Password: C8Ut9C3@

Please ensure you disable pop-up blockers or click Yes if asked to 'trust this site'.

Regards,

DARRELL DESJARDIN, B.Sc.
Director, Environmental Programs

PORT METRO VANCOUVER
100 The Pointe, 999 Canada Place
Vancouver, BC Canada V6C 3T4
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Canada Place, an inspiring national landmark, welcomes you to Canada's Pacific Gateway.

Russell, Veronica A ENV:EX

From: Communities.and.Coal [communitiesandcoal@gmail.com]
Sent: Thursday, January 2, 2014 10:54 PM
To: Rosenboom, Remko FLNR:EX
Subject: Fraser Surrey Docks Project

Follow Up Flag: Follow up
Flag Status: Completed

Hello Mr. Rosenboom,

I am contacting you regarding the Fraser Surrey Docks US Thermal Coal proposal. I am a resident of South Surrey who started the community group, Communities and Coal, in order to help raise awareness on this issue from White Rock to Texada Island. We have been successful in this process, and as a result have been able to get Delta, Surrey, Richmond, and Langley to either oppose the proposal or call for a Health Impact Assessment.

I have become aware that under the 'Water Act' an approval would be required from the Ministry of Forests, Lands and Natural Resource Operations.

Would you have some time to discuss this issue a bit further so that I may have a better understanding of the Water Act and the role this plays in Fraser Surrey Docks' proposal? If a meeting is possible, it would be greatly appreciated.

Kind regards,

Paula Williams

--
COMMUNITIES AND COAL
www.communitiesandcoal.com
facebook.com/communitiesandcoal
@NoUSThermalCoal

Russell, Veronica A ENV:EX

From: Kreye, Ross A FLNR:EX
Sent: Tuesday, January 7, 2014 10:23 AM
To: Rosenboom, Remko FLNR:EX
Cc: Haberl, Kevin J FLNR:EX
Subject: RE: Fraser Surrey Docks Project

s.13

There is no 'blanket' approval required under the Water act for the proposed project.
Should the project proceed, the types of approvals required would be related to any activities that are in or near streams (stream is defined in the act)
Relevant section is Sec 9 "works in and about a stream" (and any other sections/regulations that you think may potentially apply)
These approvals are typically site specific and technical in nature and are considered through an application by the proponent.
The technical review would consider potential impacts to .... and may propose mitigation or other conditions to the approval.
You may also want to reference C&E sections that are available.

I am not sure about including the compensation reference as this is not likely to apply much here (thought this was more DFO territory? I think DFO already indicated that no approvals were required from them) May just indicate that other approvals may be required if fish habitat is deemed to be potentially impacted.

Hope this helps.

From: Rosenboom, Remko FLNR:EX
Sent: Monday, January 6, 2014 4:52 PM
To: Kreye, Ross A FLNR:EX
Cc: Haberl, Kevin J FLNR:EX
Subject: RE: Fraser Surrey Docks Project

Hi Ross,

Thanks for your digging into this file.

s.13

Thanks,
Remko

Section Head Water Allocations, South Coast Region
Ministry of Forests, Lands and Natural Resource Operations

Office: 604-586-5629
Fax: 604-586-4444
Email: remko.rosenboom@gov.bc.ca
Website: http://www.env.gov.bc.ca/wsd/
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---

From: Kreye, Ross A FLNR:EX
Sent: Monday, January 6, 2014 10:47 AM
To: Rosenboom, Remko FLNR:EX
Cc: Haberl, Kevin J FLNR:EX
Subject: RE: Fraser Surrey Docks Project

The report identified that there would be potential impacts to 4 streams on site, but it did not provide specific details as to the construction activities that were involved (at least I did not come across that level of detail in my review). I am not sure if that info was available in the report or not. It did not identify any construction on the Fraser itself, however I note below that they are proposing the installation of 12 steel piles along the existing Berth 2 (these would be in the Fraser?). They indicated they would apply for Sec 9 approvals as required. Given the info as below from Kevin, the assumption is (in the absence of reviewing actual construction diagrams), that there may be construction that requires crossing or working in streams or involves stream riparian areas that could possibly require the Sec 9 permitting.

Might be helpful to have a more detailed understanding, if possible at this stage, of what construction is proposed where. I did not see that in the report, but perhaps there is other info available that I did not access? Also not sure that a meeting would be required to communicate the nature of the permits and approval processes that are potentially involved.

Ross

From: Haberl, Kevin J FLNR:EX
Sent: Friday, January 3, 2014 12:28 PM
To: Rosenboom, Remko FLNR:EX; Kreye, Ross A FLNR:EX
Subject: RE: Fraser Surrey Docks Project

I didn't understand that they will impact the stream? My understanding was that it was existing dock only, as per the following:

The project proposal consists of the following:

- Installation (includes relocation, realignment, and extension) of approximately 3.6 km of rail within existing FSD terminal and Port Authority Rail Yard (PARY).
- Installation of rail switches, rail leads and associated rail remediation maintenance works within FSD terminal and PARY.
- Installation of a covered rail car receiving shed 600 m² (6,460 sq. ft.) on concrete blocks, two shallow bottom dump rail pits, and one rail indexer and associated utilities. Excavations will be no deeper than 3.0 m (10 ft.).
- Installation of eight (8) fully covered conveyer segments with water sprayers at transfer points, to transfer coal from rail car receiving shed to barges at existing Berth 2.

- Installation of 100 metric tonne surge bin, mobile conveyor system with a hopper feeder, and a covered barge loader.
- Installation of electrical and water distribution systems around the emergency stockpile area, barge berthing and loading area, and within rail car receiving shed (i.e. sprinklers, dust control & fire suppression systems).
- Installation of two (2) electrical control rooms housed within 19 m² (200 sq. ft.) modular buildings to the east of the receiving shed and east of the barge loader.
- Installation of a waste water management system (collection and treatment) comprising of an oil/water interceptor, two stage settling sump with overflow pumps for waste water collection and treatment for the site (primary and secondary settlement ponds).
- Installation of an asphalt berm emergency stockpile area 10,000 m² (2.47 acres) in front of existing Berth 2 to handle a capacity of up to 30,000 metric tonnes of coal (to be utilized in emergency situations). The berm will be approximately 2.6 m (8.5 ft.) high.
- Installation of twelve (12) steel piles of 24 inches in diameter along the wharf at existing Berth 2.
- Installation of one winch and warping/mooring with pivot fairlead and two (2) sheaves at existing Berth 2 to facilitate barge moorage.
- Demolition and removal/relocation of existing non-commercial vehicle access gate at Elevator Road.
- Realignment of existing Bekaert Canada access on Elevator Road. Currently two options are proposed.
- Replanting of native species in riparian area on Elevator Road.

KH

From: Rosenboom, Remko FLNR:EX
Sent: Friday, January 3, 2014 12:13 PM
To: Anderson, Keith FLNR:EX; Haberl, Kevin J FLNR:EX; Kreye, Ross A FLNR:EX; Johnsrude, Allan N FLNR:EX
Subject: RE: Fraser Surrey Docks Project

Keith, OK, that's clear.

Kevin, A Water Act approval is required as they will impact a stream and the banks of the Fraser. Even if this federal land, the Water Act still applies....

Keith/Allan, I'll keep you informed on the progress when I have the feeling that things might blow up, which I do not expect to be the case as the Water Act Approval would be an easy file from a technical point of view.

Thanks,
Remko

Section Head Water Allocations, South Coast Region
Ministry of Forests, Lands and Natural Resource Operations

Office: 604-586-5629
Fax: 604-586-4444
Email: remko.rosenboom@gov.bc.ca
Website: http://www.env.gov.bc.ca/wsd/
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From: Anderson, Keith FLNR:EX
Sent: Friday, January 3, 2014 11:59 AM
To: Rosenboom, Remko FLNR:EX; Haberl, Kevin J FLNR:EX; Kreye, Ross A FLNR:EX; Johnsrude, Allan N FLNR:EX
Subject: Re: Fraser Surrey Docks Project

This is within thhe Federal Harbour. No land tenures are required. Just aapproval under the water act.
Keith Anderson from Blackberry

From: Rosenboom, Remko FLNR:EX
Sent: Friday, January 03, 2014 09:11 AM Pacific Standard Time
To: Haberl, Kevin J FLNR:EX; Kreye, Ross A FLNR:EX; Anderson, Keith FLNR:EX
Subject: FW: Fraser Surrey Docks Project

FYI.

Ross, are there other FLNRO permits required for this project? If that's the case, would it be useful to have someone from RIO attend as well?

Thanks,
Remko

Section Head Water Allocations, South Coast Region
Ministry of Forests, Lands and Natural Resource Operations

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---

From: Communities.and.Coal [mailto:communitiesandcoal@gmail.com]
Sent: Thursday, January 2, 2014 10:54 PM
To: Rosenboom, Remko FLNR:EX
Subject: Fraser Surrey Docks Project

Hello Mr. Rosenboom,

I am contacting you regarding the Fraser Surrey Docks US Thermal Coal proposal. I am a resident of South Surrey who started the community group, Communities and Coal, in order to help raise awareness on this issue from White Rock to Texada Island. We have been successful in this process, and as a result have been able to get Delta, Surrey, Richmond, and Langley to either oppose the proposal or call for a Health Impact Assessment.

I have become aware that under the 'Water Act' an approval would be required from the Ministry of Forests, Lands and Natural Resource Operations.

Would you have some time to discuss this issue a bit further so that I may have a better understanding of the Water Act and the role this plays in Fraser Surrey Docks' proposal? If a meeting is possible, it would be greatly appreciated.

Kind regards,

Paula Williams

--
COMMUNITIES AND COAL
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facebook.com/communitiesandcoal
@NoUSThermalCoal

Russell, Veronica A ENV:EX

From: Rosenboom, Remko FLNR:EX
Sent: Tuesday, January 7, 2014 1:31 PM
To: 'Communities.and.Coal'
Subject: RE: Fraser Surrey Docks Project

Hi Paula,

Thank you for your email.

The provincial Water Act regulations the use of surface water and changes in and about streams. As some parts of this project could result in impacts to streams there is most likely a need to get an Water Act Approval. The proponent will then submit an application which we will review and make a decision on. This review will be a technical one focussed on aspects such as the net impacts to the stream ecology and landowners. Impacts on human health are not part of such a review, nor will this decision be a political one. The project will solely be reviewed on its strictly water related technical merits. Different agencies, municipalities as well as First Nations with an interest in this area will be consulted before making a decision on such an approval.

As I haven't received any applications yet, I would like defer a meeting with you to a later phase of the project.

More information on the *Water Act* and such an Approval can be found at:
http://www.env.gov.bc.ca/wsd/water_rights/licence_application/section9/index.html

Kind regards,
Remko Rosenboom

Section Head Water Allocations, South Coast Region
Ministry of Forests, Lands and Natural Resource Operations

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Fax: 604-586-4444
Email: remko.rosenboom@gov.bc.ca
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---

From: Communities.and.Coal [mailto:communitiesandcoal@gmail.com]
Sent: Thursday, January 2, 2014 10:54 PM
To: Rosenboom, Remko FLNR:EX
Subject: Fraser Surrey Docks Project

Hello Mr. Rosenboom,

I am contacting you regarding the Fraser Surrey Docks US Thermal Coal proposal. I am a resident of South Surrey who started the community group, Communities and Coal, in order to help raise awareness on this issue from White Rock to Texada Island. We have been successful in this process, and as a result have been able to get Delta, Surrey, Richmond, and Langley to either oppose the proposal or call for a Health Impact Assessment.

I have become aware that under the 'Water Act' an approval would be required from the Ministry of Forests, Lands and Natural Resource Operations.

Would you have some time to discuss this issue a bit further so that I may have a better understanding of the Water Act and the role this plays in Fraser Surrey Docks' proposal? If a meeting is possible, it would be greatly appreciated.

Kind regards,

Paula Williams

--
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Russell, Veronica A ENV:EX

From: Rosenboom, Remko FLNR:EX
Sent: Wednesday, January 8, 2014 3:37 PM
To: Kreye, Ross A FLNR:EX; Haberl, Kevin J FLNR:EX
Subject: FW: Fraser Surrey Docks Project

FYI,
They seemed to be satisfied with my answers to far. No follow-up required at the moment.

Thanks,
Remko

Section Head Water Allocations, South Coast Region
Ministry of Forests, Lands and Natural Resource Operations

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From: Communities And Coal [mailto:communitiesandcoal@gmail.com]
Sent: Wednesday, January 8, 2014 3:35 PM
To: Rosenboom, Remko FLNR:EX
Subject: Re: Fraser Surrey Docks Project

Thank you. I appreciate the info.

Kind regards,

Paula

Sent from my iPhone

On Jan 8, 2014, at 3:33 PM, "Rosenboom, Remko FLNR:EX" <Remko.Rosenboom@gov.bc.ca> wrote:

> Hi Paula,
>
> Yes the Water Act also applies on Texada Island. But as the Lafarge site on Texada island is authorized under the Mines Act, and the Ministry of Energy and Mines has the authority to administrate the Water Act for mine sites, they will be the one to contact with questions about the Water Act for that site. Unfortunately I don't know who to contact within that ministry.
>
> Regards,
> Remko
>
> Section Head Water Allocations, South Coast Region
> Ministry of Forests, Lands and Natural Resource Operations

Office: 604-586-5629
Fax: 604-586-4444
Email: remko.rosenboom@gov.bc.ca
Website: http://www.env.gov.bc.ca/wsd/
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---

From: Communities.and.Coal [mailto:communitiesandcoal@gmail.com]
Sent: Wednesday, January 8, 2014 11:19 AM
To: Rosenboom, Remko FLNR:EX
Subject: Re: Fraser Surrey Docks Project

Hello Mr. Rosenboom,

Thank you for your reply and for the information. It has been helpful.

Before I let you go, I have one other question for you...

The coal will be shipped to Texada Island and stockpiled at Lafarge until it is ready to ship overseas. Is the BC Water Act applicable on Texada Island? My understanding is that they already have a water contamination issue and the proposed project may impact their water supply as well. Please see the attached letter from Paul Martiquet, Medical Health Officer for Vancouver Coastal Health.

Kind regards,

Paula Williams

On Tue, Jan 7, 2014 at 1:30 PM, Rosenboom, Remko FLNR:EX <Remko.Rosenboom@gov.bc.ca> wrote:

Hi Paula,

Thank you for your email.

The provincial Water Act regulations the use of surface water and changes in and about streams. As some parts of this project could result in impacts to streams there is most likely a need to get an Water Act Approval. The proponent will then submit an application which we will review and make a decision on. This review will be a technical one focussed on aspects such as the net impacts to the stream ecology and landowners. Impacts on human health are not part of such a review, nor will this decision be a political one. The project will solely be reviewed on its strictly water related technical merits. Different agencies, municipalities as well as First Nations with an interest in this area will be consulted before making a decision on such an approval.

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http://www.env.gov.bc.ca/wsd/water_rights/licence_application/section9/index.html

Kind regards,

Remko Rosenboom

Section Head Water Allocations, South Coast Region

Ministry of Forests, Lands and Natural Resource Operations

Office: 604-586-5629

Fax: 604-586-4444

Email: remko.rosenboom@gov.bc.ca

Website: http://www.env.gov.bc.ca/wsd/
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From: Communities.and.Coal [mailto:communitiesandcoal@gmail.com]
Sent: Thursday, January 2, 2014 10:54 PM
To: Rosenboom, Remko FLNR:EX
Subject: Fraser Surrey Docks Project

Hello Mr. Rosenboom,

I am contacting you regarding the Fraser Surrey Docks US Thermal Coal proposal. I am a resident of South Surrey who started the community group, Communities and Coal, in order to help raise awareness on this issue from White Rock to Texada Island. We have been successful in this process, and as a result have been able to get Delta, Surrey, Richmond, and Langley to either oppose the proposal or call for a Health Impact Assessment.

I have become aware that under the 'Water Act' an approval would be required from the Ministry of Forests, Lands and Natural Resource Operations.

Would you have some time to discuss this issue a bit further so that I may have a better understanding of the Water Act and the role this plays in Fraser Surrey Docks' proposal? If a meeting is possible, it would be greatly appreciated.

Kind regards,

Paula Williams

--

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Vancouver CoastalHealth

Coast Garibaldi/Bella Bella/Bella Coola
Health Services
Box 78, 494 South Fletcher Road
Gibsons, BC V0N 1V0
Tel: 604-886-5600
Fax: 604-886-2250

September 13, 2013

Ministry of Energy and Mines
Mining & Mineral Division
6th Floor, 1810 Blanshard Street
Victoria, B.C.
V8W9M9

Attention; Ed Taje

Re; Review of Proposed Expansion of Coal Handling Facility on Texada Island

I am writing to you as the Medical Health Officer designated for the geographic area of the Sunshine Coast, Sea to Sky, Bella Bella/ Bella Coola. It is my duty to protect the public as established in the BC Public Health Act, specifically Section 73 where I am required to report and advise on public health issues.

I understand that Texada Quarries has applied to the Ministry of Energy and Mines to increase their coal storage permit (Permit M-66, File 1475-20) from 400,000 tonnes per year to 8,000,000 tonnes per year over 5 years. Accompanying the application was a Stormwater Management Plan specifically related to the proposed coal stockpile and loading area prepared by Norwest Corporation.

I support the views of my colleagues; Dr Paul Van Buynder (Chief Medical Health Officer, Fraser Health Authority) and Dr. Patricia Daly (Chief Medical Health Officer, Vancouver Coastal Health Authority) in their recommendation for the inclusion of a *Health Impact Assessment* (HIA) in the review of the expanded coal handling and storage area on Texada Island. This HIA will supplement the review of this entire project including Metro Vancouver ports, Neptune Terminals and Fraser Surrey Docks. We believe it is extremely important in addressing questions from both the public and local government about potential health impacts of expanded coal storage, transport and shipment throughout each geographical area.

As Medical Health Officer for this area I recommend the following:

1. That a full *Health Impact Assessment* be completed to include a comprehensive consultation with the affected regional health authorities, local governments, First Nations and the public. The HIA should include but not be limited to: the impacts of airborne dust, potential contamination of air, land, fresh water and tidal water, diesel exhaust impacts, excessive noise and the effects of increased marine traffic.
2. There are outstanding questions related to the stormwater management plan. For example; we have concerns about utilizing an estuary for the purpose of coal dust runoff containment and there is conflicting evidence that an estuary actually exists. The effectiveness of the settling ponds is questionable due to the low specific gravity of the coal dust. We recommend that the stormwater management plan be revised and included in the HIA.

3. Lafarge has a poor track record in addressing concerns of run-off from the limestone quarry that has affected a neighbouring watershed with elevated heavy metals and nitrates. Drinking Water Officer Dan Glover is presently working with Lafarge to resolve these serious contamination issues, but since 2009 there has been very little progress towards resolution. We recommend that this be resolved as a condition of expansion of the coal storage area.
4. Potential heavy metals in the coal are one of our larger concerns in view of the fact that the drinking water for Texada Quarries is already being treated for elevated arsenic, antimony and uranium. An assessment of the impact on the receiving environment should be included in the HIA.
5. Details should be included in the HIA regarding potential fuel spills on land and in the marine environment.
6. If water is going to be utilized for dust and particulate control, the source, volume and subsequent impact should be identified in the HIA.

I concur with my colleagues Dr. Van Buynder and Dr. Daly, that the proponents of these projects be required to undertake the HIA, that the terms of reference of the HIA be agreed with us prior to its commencement and that the independent contractors employed to undertake the activity be approved by us prior to the commencement of the review.

It is also recommended that verification processes be built into the HIA and that non-compliance has meaningful consequences in the permit approvals. Substantive community consultation will be a critical component of the acceptability of the outcome of the HIA.

Yours sincerely,

Paul Martiquet, M.D.,C.M.,CCFP.,M.H.Sc.,FRCP(c)
Medical Health Officer
Tel: 604-886-5620
Fax: 604-886-2250
paul.martiquet@vch.ca
www.vch.ca

Scott, Michele CSNR:EX

From: Taje, Eddy MEM:EX
Sent: Tuesday, January 14, 2014 11:51 AM
To: Pope, Rue MEM:EX
Cc: Howe, Diane J MEM:EX; Collins, Denis A FLNR:EX
Subject: FW: Stormwater Management Plan for Lafarge Canada Coal Facility at the Limestone
Attachments: Lafarge Canada Coal Facility on Texada Island BC.pdf

Please add to the MMS file Diane and Denis for nformation. The bottom line is no waste management or effluent permit is required.

From: Jacobsen, Jaclyn ENV:EX
Sent: Monday, January 13, 2014 3:07 PM
To: 'Darren.Brown@Lafarge.com'
Cc: 'GJohnson@norwestcorp.com'; Taje, Eddy MEM:EX
Subject: Re: Stormwater Management Plan for Lafarge Canada Coal Facility at the Limestone

Good Afternoon,

Please find attached letter regarding Stormwater Management Plan for Lafarge Canada Coal Facility at the Limestone on behalf of Jonn Braman.

Thank you,

Jaclyn

Jaclyn Jacobsen
South Coast Administrative Support Services
Ministry of Environment
Suite 200, 10470 152nd Street
Surrey, BC V3R 0Y3
P: (604) 582-5231 F: (604) 930-7119 E: jaclyn.jacobsen@gov.bc.ca

ED Taje / MAB Date May 22/13

Lafarge Texada

. No EIO triggers - to be confirmed by next week

Application for stockpile Coal.

Permitted ship loaders therefore => a "port of entry" from Cust. Can.

No volume capacity attached to ship loader facility
- limestone, Coal for Cement, Agg.

Now propose in stockpile area - increase vol of coal to ≈ 300K from 300K

Need to manage water / foreshore

Fig 4-1.

Already under M permit
No new land.
New access road - doesn't bear on this appl.

Main issue is stormwater mgmt.

Date

Private land + Mineral Tenure

Referrals:

MOU

Local Gov

2.1.5

FN - Skeena

Brad Kohl has met w FN.

DFO - no HADD ⇒ no CEAA trigger

MOE

Transport Canada ?

No other permits or LTC required.

- Make them advertize project
- Some changes to conveyor system.
- Public concerns ?

Check contact & letter.

Coal may come from US + tolomine on barge, off load + stockpile + then load ships.

All mines Act approvals

No Land Act

Already permitted to load out 12 m Tons & another 12 m Tons capacity.

(4) How does this come thru FCBC - survey

Need I.L.R status ing

Ops Coord is regional - this is Ministers Permit

Alec Dingsdale / Keith Anderson

Date

- Stationing
→ Report on outcome for referrals
Send Referrals
- collect maps → MEM
< FN Consultation
- Get Laforge consultation record also.
- Public ~~com~~ received comments submitted to FLNR → CIM

Barging Permit - Land Act
Purpose of land Act tenure
All private?

~~1:30~~ 2pm
Call w/ Alec Drysdale + Keith Anderson

Send Pkg to AD/KT
Set up call next week.

LAFARGE

May 7, 2013

Ministry of Energy and Mines
Mining & Minerals Division
6th Floor, 1810 Blanshard Street
Victoria, B.C
V8W 9M9

Attention: Ed Taje

Dear Sir:

Re: Letter of Amendment to increase Coal Storage on Texada Quarries Reclamation Permit M-66, File 14745-20.

Texada Quarries has the opportunity to expand it coal transshipment business through its existing facility. To facilitate the increased business we must modify the offload system and increase our live storage. We have engaged a consultant to design a comprehensive storm water management plan to capture and manage all runoff water from the stockpile area. The volume of coal that will need to be stockpiled will increase to 800k tonnes.

The following are documents are for your reference and approval:

1. Storm water management plan from Norwest Corporation
2. Shoreline improvements and conveyor modifications from Kreator Equipment.
3. Site plan incorporating the modifications, storm water management plan and existing infrastructure.
4. Previous correspondence from 1990 to Ideal Cement now Texada Quarries.
5. Aerial view with Water Lot leases plotted on.

All conditions stated in the June 5, 1990 amendment will remain the same. The stockpiles of coal will remain on Lots 606 and 575 and no additional area will need to be permitted. As requested the ship loader conveyor belt will we upgraded to grade 2 flame resistant belting to match the rest of the conveyor upgrades.

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I trust you will find the above request in order. If you have any questions or concerns please contact me directly.

Regards,

Brad Kohl
Vice President, Vancouver Aggregates

STORMWATER MANAGEMENT PLAN
COAL STOCKPILE AREA
TEXADA ISLAND SHIP LOADING AREA

Submitted to:
LAFARGE CANADA INC.

Date:
April 18, 2013

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CERTIFICATE of AUTHENTICATION

This report has been prepared for Lafarge Canada Inc. (Lafarge). The text contained herein presents documentation of the design work carried out by Norwest Corporation regarding the Stormwater Management Plan to support the expansion of coal stockpiling facilities associated with Lafarge's Texada Island quarry and ship loading facilities. The report includes information provided by Lafarge and third parties that has not been independently verified.

All data contained herein has been reviewed and interpreted by, or generated under the direct supervision of, Gordon J. Johnson, P.Eng. All designs have been reviewed and approved for submission by Gordon J. Johnson, P.Eng.

"original signed and sealed by author"

April 18, 2013

Gordon J. Johnson, P.Eng.
Vice President, Water Resources
Norwest Corporation

1 INTRODUCTION

1.1 BACKGROUND

Lafarge Canada Inc. (Lafarge) operates a quarry and marine loading facility on the south shore of Texada Island (Site), shown in Figure 1-1. Lafarge is upgrading these facilities by increasing stockpile capacity for transhipping coal for its current and potential future customers. The quarry produces raw materials for cement manufacturing and specialty rock products for the construction industry. The loading facilities are used to ship limestone and transhipping coal because it is the only deep water port in the area that can load ocean-going ships.

Lafarge is currently developing plans to expand the area that is used to stockpile and transhipping coal, and it wants to include active stormwater management as part of this expansion to mitigate the potential environmental effects associated with the release of coal sediments into the surrounding marine environment.

Lafarge has retained Norwest Corporation (Norwest) to develop a Stormwater Management Plan to support this expansion.

1.2 PURPOSE AND SCOPE

This report describes the design of the Stormwater Management Plan associated with expansion of the coal stockpiling area and includes the following information:

- description of the coal transshipping area, proposed expansion and associated stormwater management strategy;
- design criteria and standards applied to the stormwater containment and diversion system designs;
- assessments completed to support the design of the stormwater infrastructure;
- overview of the design features and standards used as a framework;
- construction specifications, including quality assurance and quality control (QA/QC) procedures; and
- design drawings.

1.3 REPORT ORGANIZATION

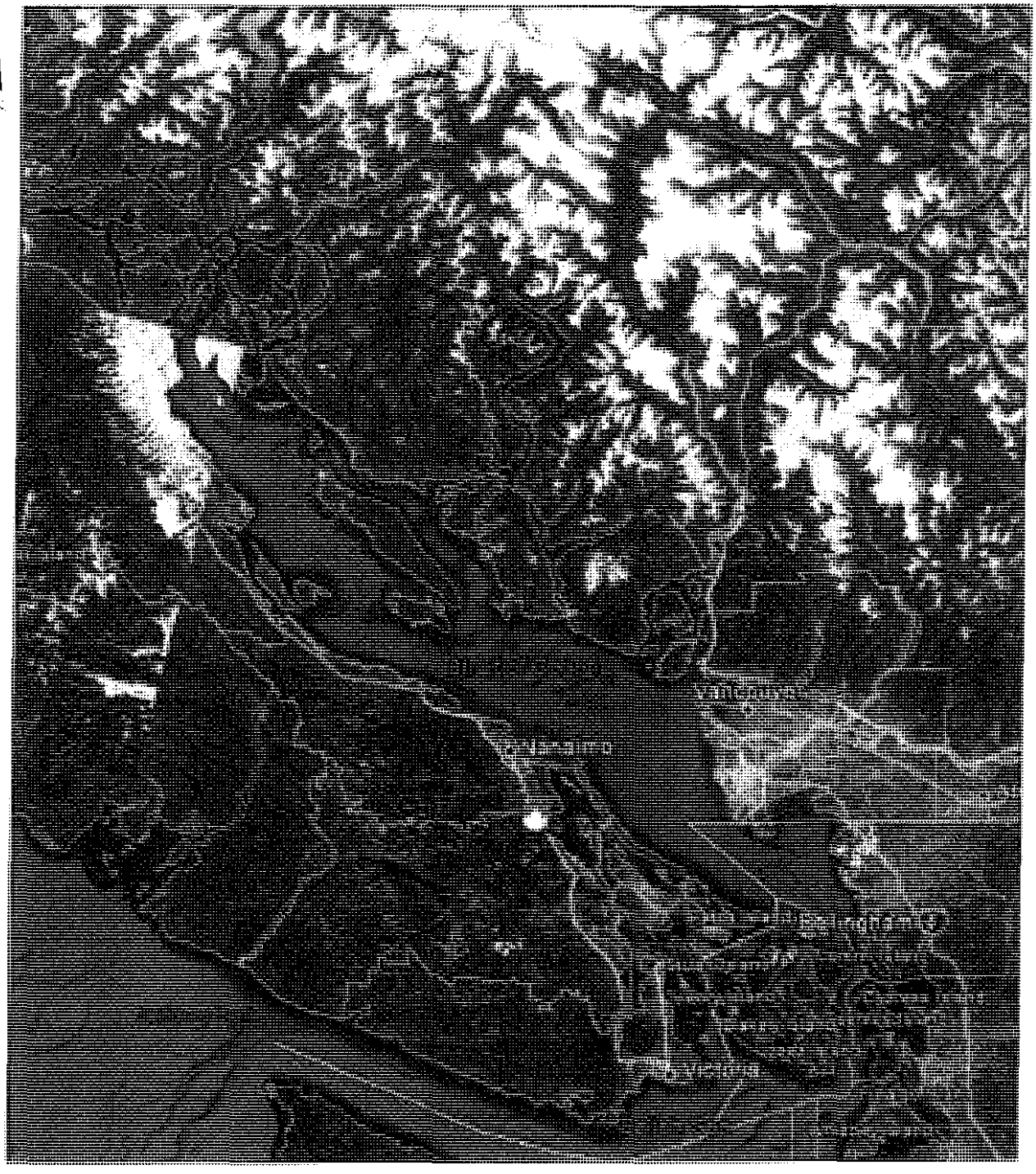
The main body of this report describes the design principles and the basis for the Stormwater Management Plan. Engineering-design drawings can found in Appendix A. Technical specifications can be found in Appendix B.

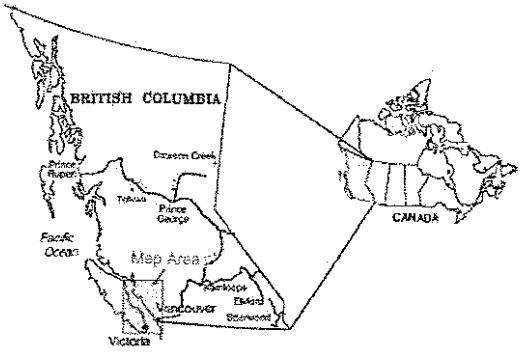
1.4 ROLES AND RESPONSIBILITY

The following roles and responsibilities have been established for this project:

- Lafarge will manage the expansion project: project managers are Shawn Holloway and Andre Balfe;
- Kreator Equipment will design and install the facilities associated with the expansion project;
- Norwest will design the Stormwater Management Plan: project manager is Gordon Johnson, VP Water Resources; and,
- Earthworks will implement be implemented by Lafarge, using existing Site equipment, or by third party contractor.

The regulatory agency for this work is the BC Ministry of Energy and Mines.





LAFARGE

TEXADA STORMWATER MANAGEMENT

PROJECT LOCATION MAP

FIGURE 1-1

DRAWN BY: A.W CHK'D BY: M.U DATE: 13 03 13	FILE: Fig 1-1_Project Location Map.dwg G:\Project Data\Lafarge Canada_566\566-1_Texada\Reports\Draft	NORWEST APEGGA Permit P05013

2 SITE DESCRIPTION

2.1 GENERAL

Lafarge's Texada Island facilities are located approximately 100 km northwest of Vancouver, adjacent to the town of Powell River (Figure 1-1). The operation produces minerals and aggregate from one of the most significant mineral reserves on the west coast of BC and has been operating for more than 60 years.

Lafarge mines high-quality limestone, construction and asphalt-quality aggregates from this area where gold was mined a century ago, and iron ore was mined until the 1970s. Since then, companies such as Lafarge have mined millions of tonnes of limestone. The facility also imports coal, gypsum and slag by barge, and transships these materials to customers overseas using the deep water port.

In 2012, total production of quarried limestone and construction materials is estimated to be 3 million tonnes. Limestone production is the largest part of the operation and limestone is used for cement manufacturing, chemical plants, agriculture products and specialty products. Materials are sorted according to composition, quality, size and colour and are loaded onto ships and barges using one of three existing loading facilities.

2.2 SHIPPING FACILITIES

The shipping facilities include three individual loading facilities that are supported by the material staging and stockpiling area. The first one is located northwest of the staging and stockpiling area: it is dedicated to loading limestone for cement manufacturing and is supported by three offshore loading dolphins. The remaining two loading facilities are shore-based, located on the northwest corner of the staging and stockpile area: they receive and ship coal and specialty rock products. The foreshore staging and stockpiling area is a flat, semi-circular area constructed of waste rock fill covering an area of approximately 4 ha. The current foreshore facilities are shown in Figure 2-1.

The expansion program consists of modifying the materials handling facilities to increase capacity and throughput, and expanding the staging area to allow larger volumes of coal to be stockpiled. The expansion of the staging area is the component of the project that is most relevant to stormwater management. This expansion will be achieved by moving the staging area access ramp to the southeast end of the pad and excavating into the slope that forms the north boundary

of the staging area. The intent is to expand the area available for stockpiling materials to approximately 6 ha. A plan view of the proposed expansion is shown in Figure 2-2.

2.3 PHYSIOGRAPHY AND DRAINAGE

Lafarge's shipping facilities are located on the northwest end of Texada Island, where the land slopes moderately to steeply to the southwest towards the Georgia Strait. On the northwest end of Texada Island, the ground surface elevation varies from sea level to approximately 300 masl. In the immediate vicinity of Lafarge's quarry and shipping facilities, the ground surface elevation varies from sea level to approximately 100 masl. In the vicinity of the shipping facilities, the ground surface has been largely altered by quarrying activities and related infrastructure. With the exception of the ephemeral creek, runoff in this area is directed into quarry depressions. The ephemeral creek that will be redirected into the eastern estuary is the only natural drainage feature in the project development area.

2.4 CLIMATE

Climate information for the project location was obtained from Environment Canada weather stations that are located in Powell River and Comox, BC. Texada Island is situated within a temperate rainforest, Coastal Western Hemlock biogeoclimatic zone, which is the rainiest biogeoclimatic zone in BC. The zone typically has a cool meso-thermal climate: cool summers (although hot dry spells can be frequent) and mild winters. The mean annual temperature is about 8°C and the mean monthly temperature is above 10°C for four to six months of the year. Mean annual precipitation for Powell River is 1,100 mm. Table 2.1 summarizes the climate normals for Powell River.

TABLE 2.1
CLIMATE SUMMARY FOR POWELL RIVER

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Record high °C (°F)	15.6 (60.1)	18 (64)	20 (68)	23.9 (75)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	24 (75)	20 (68)	15 (59)	[illegible]
Average high °C (°F)	6.2 (43.2)	7.7 (45.9)	10.1 (50.2)	13.3 (55.9)	16.9 (62.4)	19.7 (67.5)	22.7 (72.9)	22.6 (72.7)	19.3 (66.7)	13.6 (56.5)	8.9 (48)	6.5 (43.7)	14 (57)
Average low °C (°F)	1.7 (35.1)	2.3 (36.1)	3.3 (37.9)	5.4 (41.7)	8.5 (47.3)	11.5 (52.7)	13.7 (56.7)	14.1 (57.4)	11.7 (53.1)	8 (46)	4.3 (39.7)	2.2 (36)	7.2 (45)
Record low °C (°F)	−14.4 (6.1)	−12 (10)	−10 (14)	−1.7 (28.9)	−6.7 (19.9)	3.3 (37.9)	6.1 (43)	6 (43)	0 (32)	−4 (25)	−11 (12)	−12.8 (9)	−14.4 (6.1)
Precipitation mm (inches)	138.4 (5.449)	105.2 (4.142)	98 (3.86)	67.7 (2.665)	70.4 (2.772)	62.5 (2.461)	40.1 (1.579)	47.1 (1.854)	56.9 (2.24)	116.2 (4.573)	160.3 (6.311)	141.2 (5.559)	1,103.7 (43.453)
Rainfall mm (inches)	125.5 (4.941)	98.4 (3.874)	95.9 (3.776)	67.7 (2.665)	70.4 (2.772)	62.5 (2.461)	40.1 (1.579)	47.1 (1.854)	56.9 (2.24)	116 (4.57)	156.4 (6.157)	135.5 (5.335)	1,072.1 (42.209)
Snowfall cm (inches)	12.9 (5.08)	6.9 (2.72)	2.1 (0.83)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0.2 (0.08)	3.9 (1.54)	5.7 (2.24)	31.6 (12.44)

(Environment Canada)

2.5 STORMWATER MANAGEMENT STRATEGY

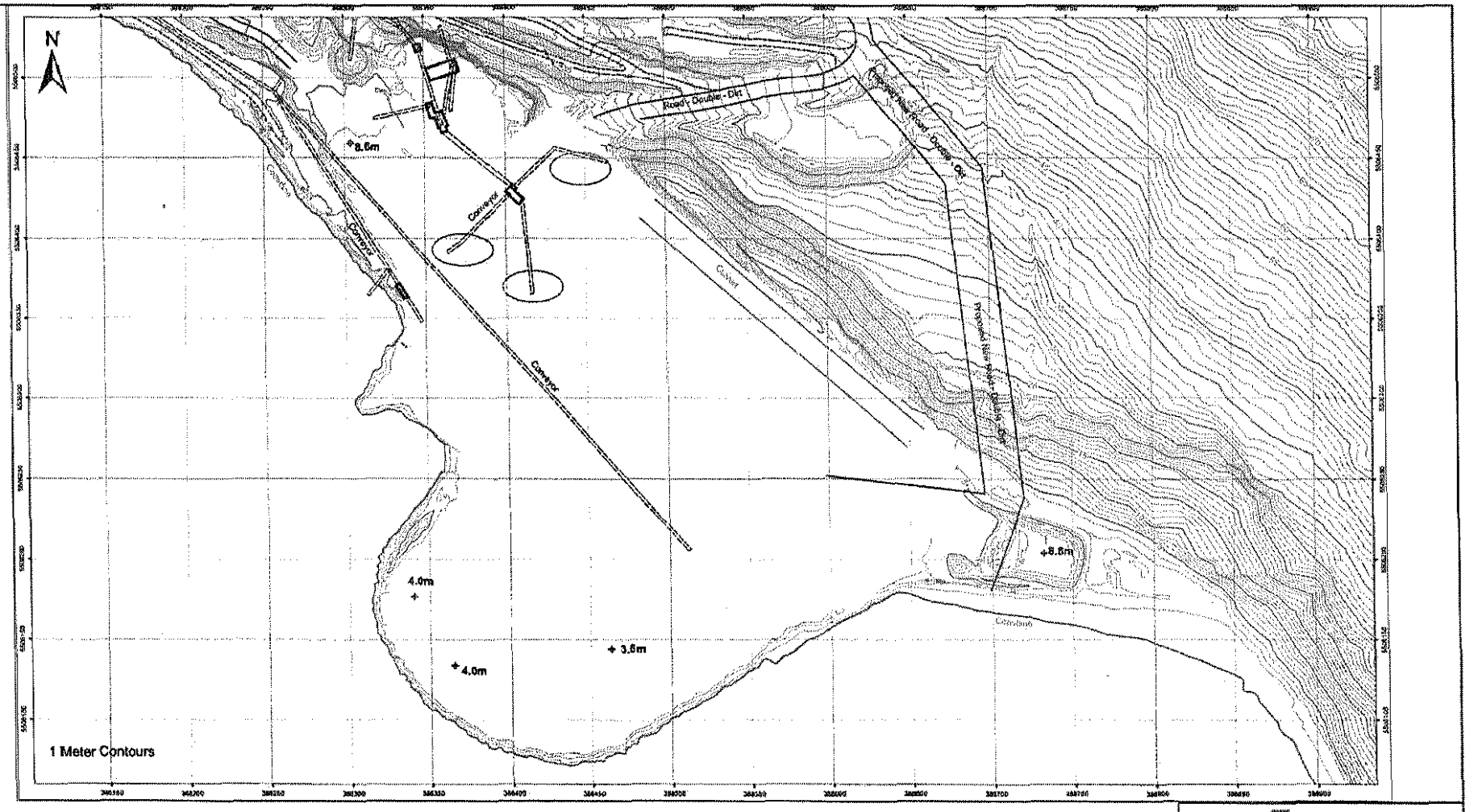
Modifications to the management of stormwater flows in the coal stockpiling portion of the staging area are required to prevent runoff containing suspended coal sediments from discharging directly into the surrounding marine foreshore.

The following strategies will be used to manage the stormwater in the coal stockpile area (Figure 2-3):

1. Use a water infiltration pond to allow stormwater runoff to seep into the ground and into the adjacent estuary. The pond would be located along the north edge of the staging area, in the planned excavation area, and be bound to the south and west by the staging pad, to the north by the excavated embankment and to the east by the new access ramp to the stockpiling area.
2. Divert flows in the existing ephemeral creek using a ditch constructed along the northeast edge of the access ramp to the staging area. This ditch will discharge into the small estuary located east of the staging area.
3. Fill and grade the surface of the staging area to drain towards the north, away from the ocean and towards the infiltration pond.
4. Construct perimeter ditches around the outside of the staging area foreshore to prevent direct release of staging area runoff into the ocean. This ditch will also act as an infiltration structure.

This strategy is consistent with generally recognized "Best Management Practices" for stormwater and is similar to the stormwater management practices used around the coal stockpiles of the Richmond Cement Plant in Richmond, BC.


LAFARGE
PLAN VIEW OF EXISTING FORESHORE



Basemap data obtained from Natural Resource Canada.
Aero Geomatics Ltd., Imagery acquired August 2012

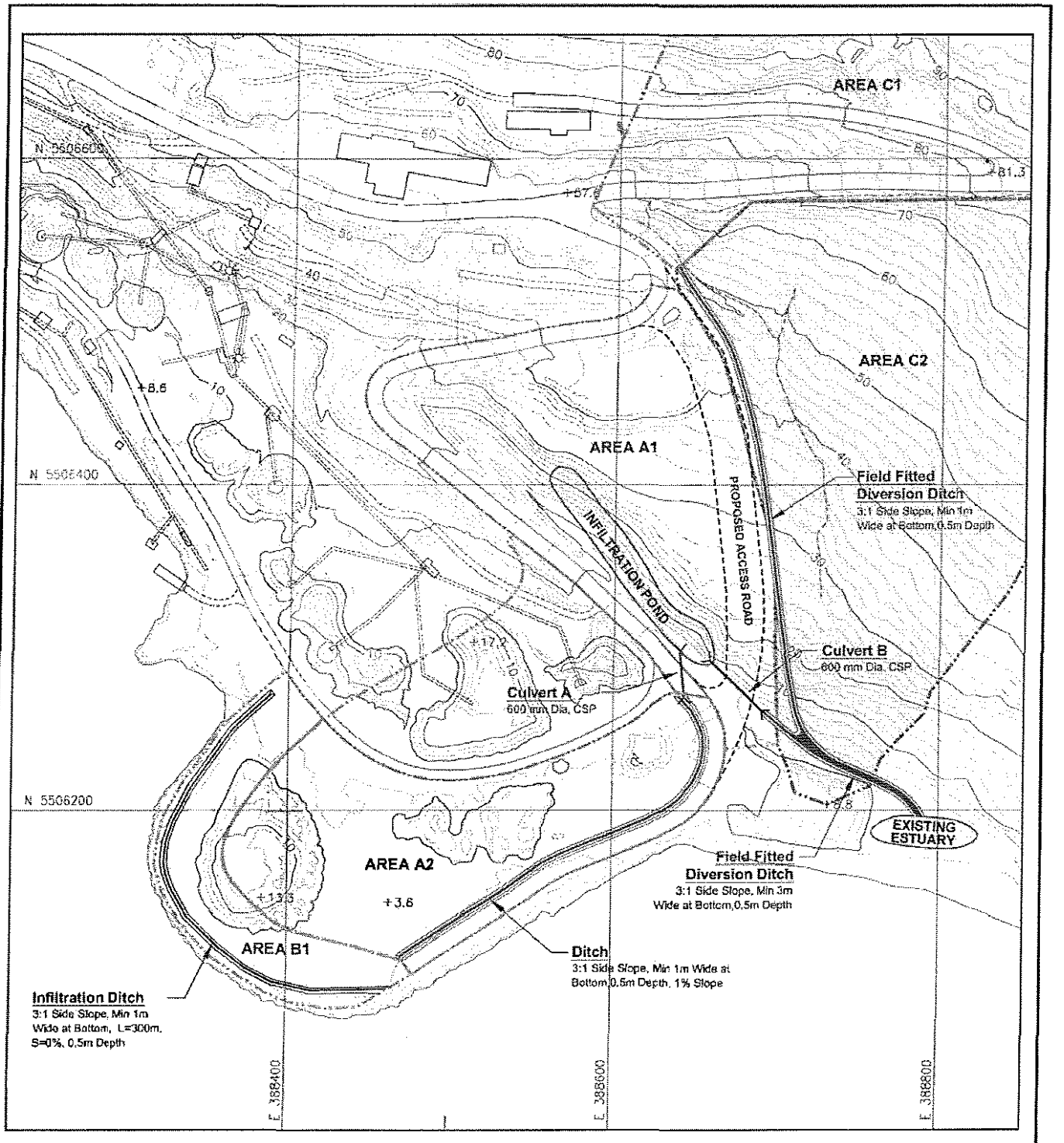
LAFARGE

TEXADA STORMWATER MANAGEMENT

POST EXPANSION PLAN VIEW

FIGURE 2-2

NORWEST



LEGEND

- Existing Creek or Ditch Alignment
- 20 Contour Index (2m Interval)
- Conveyor
- Gravel Road
- Pole
- Pole Utility
- Light

100 0 100

Metres

Projection: UTM Zone 10 Datum NAD83
NTS Mapsheet 92F/10 & 15

Notes:

* Contour lines in treed areas should be treated as indefinite.
* Water levels at time of photography.

LAFARGE

TEXADA STORMWATER MANAGEMENT

OVERVIEW OF STORMWATER MANAGEMENT PLAN

FIGURE 2-3

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3 DESIGN BASIS

3.1 DESIGN CRITERIA AND METHODS

The following design criteria have been used:

1. The pond and perimeter ditch are designed to contain the runoff generated by the 1 in 5 years, 24-hour rainfall event. The 1 in 5 years, 24-hour rainfall event is estimated to be 54 mm.
2. Infiltration structures (access ramp, pond perimeter and infiltration ditches) are designed to allow the natural seepage of stormwater equivalent to the runoff generated during the average wettest month (usually November), plus one standard deviation, conveyed over a 30-day period. The estimated precipitation during the wettest month, plus one standard deviation, is 180 mm.
3. The 1:100-year return period, 24-hour duration storm simulated by the SWMHYMO model was used to evaluate the overland drainage conveyance systems, and erosion and sediment control measures.
4. Continuous simulation of the post-expansion Site conditions were estimated using the QHM model and were used to evaluate the storage requirements for the proposed infiltration ditch and infiltration pond. The historical hourly precipitation database was obtained from the National Climate Data and Information Archive services and covered the period from 1962 to 2005.

Coal dust is known to have relatively low bulk density, similar to and potentially less than that of water. The low specific gravity hinders the ability of the coal particles to settle when suspended in water. Therefore, the infiltration ditch and infiltration pond are being used to contain runoff and mitigate the release of coal fines into the adjacent marine environment. These facilities will be designed to totally contain any runoff associated with normal runoff events, and to reduce the runoff associated with extreme runoff events.

3.2 DESIGN STANDARDS

Because there are no standards to design or construct the Stormwater Management Plan for Lafarge's Texada Island facilities, the BC Ministry of Water, Land and Air Protection's *A Guidebook for British Columbia Stormwater Planning* (May, 2002) was used, where relevant, to guide the design of the Lafarge's Stormwater Management Plan.

4 TECHNICAL APPROACH

4.1 GOVERNING PRINCIPLES

The Stormwater Management Plan for the Site will allow the coal handling area to drain overland and be directed by road ditches to desired locations. Road ditches will be directed to culverts, and an infiltration pond and infiltration ditch will receive direct overland sheet runoff. Culverts to and from the infiltration pond will convey the runoff under roadways allowing the runoff to cross roads without interfering with traffic.

The runoff generated from the 1:100-year return period, 24-hour duration rainfall event will be used to design the overland drainage system, including culverts and evaluation of erosion and sediment control measures for the development. Culverts will be a minimum of 600 mm in diameter (as required by BC's *A Guidebook for British Columbia Stormwater Planning* (May, 2002).

4.2 NUMERICAL MODELING APPROACH

The SWMHYMO and QHM computer models were used to simulate runoff from the Site and the ephemeral creek that will be diverted by the expansion works. Both SWMHYMO and QHM models are widely accepted for use in this type of study and are capable of the following:

- generating hydrological models to simulate watershed conditions for specific design storm events;
- producing hydrographs, flow volumes and flow rates at specified points;
- evaluating flows in engineering structures (e.g., channels, control structures and reservoirs);
- determining flows for future land use conditions; and
- accepting input in the form of hydrographs.

STORMWATER FLOW ESTIMATES

Drainage characteristics of the study area were estimated for post-expansion conditions. These characteristics include catchment size, imperviousness ratio, slope, depression storage and Soil Conservation Service (SCS) runoff curve number. Modeling parameters were selected in accordance with the SWMHYMO manual and as determined by Norwest.

The total study area (41.25 ha) was delineated into five catchments based on Site contours, drainage patterns and proposed road profiles (Figure 4-1). Table 4.1 shows the catchment parameters used for the post-expansion analysis.

The SWMHYMO model with 1:100-year return period and 24hour duration rainfall event was applied to assess the overland drainage and to determine the erosion protection measures required to mitigate the risk of erosion. Table 4.2 shows the resulting peak discharges, depths of flow and velocities of flow for the critical flow locations, as shown in Figure 4-1.

TABLE 4.1
POST-EXPANSION CATCHMENT PARAMETERS

Catchment ID	Area (ha)	Curve Number	Initial Abstraction (mm)
A1	3.73	71.6	20.1
A2	3.02	94	6.3
B1	0.93	94.2	3.2
C1	26.59	69	22.8
C2	6.98	69	22.8
Total Area (ha)	**41.25**		

TABLE 4.2
OVERLAND FLOW ASSESSMENT

Catchment ID	Peak Discharge[1] (L/s)	Slope of Overland Drainage (%)	Maximum Depth (mm)	Maximum Velocity (m/s)	Culvert/ Location ID
A2	400	1	192	1.325	Conveyance Ditch
C1	1,022	33	89	3.7	U/S End of Diversion

Note: [1] The flows are based on the design storm event (1:100-year return period, 24-hour duration rainfall event).

STORMWATER STORAGE REQUIREMENTS

The simulated stormwater storage requirements for the infiltration pond and ditch are shown in Table 4.3, with the SWMHYMO, QHM and extrapolated HYDSTAT results for 1:100-year return period storage requirements.

TABLE 4.3
SUMMARY OF REQUIREMENTS FOR STORMWATER STORAGE

Storage Facility ID	SWMHYMO Storage (cumulative)	QHM Storage (cumulative)	HYDSTAT Storage (cumulative) [1]	SWMF Storage Provided (cumulative)
Infiltration Pond	1,378	4,120	2,375[2]	2,414
Infiltration Ditch	345	674	668[3]	784

Notes: [1] Governing volume (SWMHYMO versus QHM/HYDSTAT).
[2] Represents 1 in 5 years return period volume.
[3] Represents 1 in 100 years return period volume.

EROSION AND SEDIMENT CONTROL MEASURES

Several areas were identified as being susceptible to erosion during high-flow events (Figure 4-1). Table 4.4 summarized the measures that were included in the design to reduce potential erosion and sediment transportation.

TABLE 4.4
EROSION AND SEDIMENT CONTROL MEASURES (ESCM)

Area of Concern	Channel Geometry[1]	ESC Rock Armoring[2]	Peak Flow (L/s)
A – Culverts	3, 1, 3, 1%	d_{50} = 125 mm, 3 m Long Apron	185
B – Upper Portion of Diversion Channel	3, 1, 3, 33%	d_{50} = 230 mm	1,022
C – Directional Bends of Diversion Channel	3, 3, 3, 33%	d_{50} = 350 mm	1,022
D – Lower Portion of Diversion Channel	3, 3, 3, 0.5%	d_{50} = 125 mm	1,022

[1] - Channel Geometry is identified as left bank slope, bottom width, right bank slope, longitudal slope (%) (3,0.3,3,1% - means the left bank slope is 3H:1V, the bottom with is 1 m, the right bank slope is 3H: 1V and the longitudal slope is 1%).
[2] - Results are based on Riprap Design Curves from BC Ministry of Transportation Guidelines.

4.3 FILTER AND LINER DESIGNS

The upper surfaces of the perimeter ditches, stormwater pond, stockpile surface and face of the access road adjacent to the pond are lined with finer grained granular materials designed to act as filters, preventing the finer grained suspended coal sediments from seeping through these liners, migrating through native soils and discharging into the adjacent aquatic environments. For the

purpose of this assessment, it is assumed that the suspended coal sediments will have the grain-size distribution that is summarized in Table 4.5.

TABLE 4.5
ASSUMED GRAIN-SIZE DISTRIBUTION OF COAL FINES

Particle Size Indicator	Size Range (microns)
D_{85}	75 to 100
D_{50}	25 to 75
D_{15}	10 to 25

The filter lines were designed using the following typical criteria:

- D15 (filter) < 5 x D85 (sediment); and
- D60 (filter) < 6 x D10 (filter).

The particle size distribution for the filter is summarized in Table 4.6.

TABLE 4.6
GRAIN-SIZE DISTRIBUTION OF FILTER

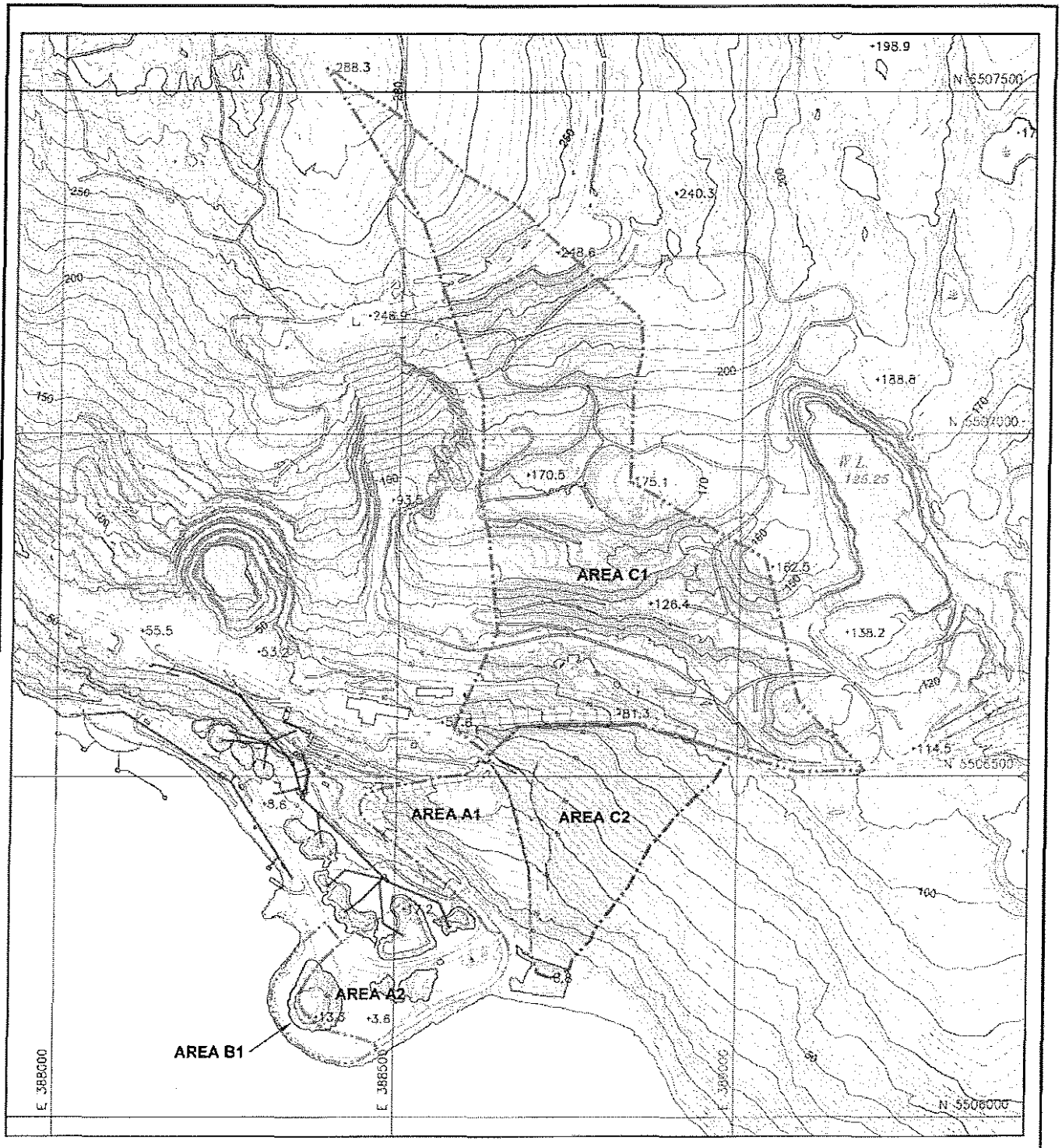
Particle Size Indicator	Size Range (mm)
D_{85}	1 to 3
D_{60}	0.8 to 1.2
D_{15}	0.20 to 0.3
D_{10}	> 0.2

The hydraulic conduetivity of the proposed filter layer is estimated using the following variation on the Hazen Formula (Bear and Verruijt, 1987): $k = C(D_{10})^2$

where:

- k is the hydraulic conductivity (m/sec);
- C is a constant (100 m/see); and
- D_{10} is the grain size of the filter (m).

Based on a D_{10} = 0.2 mm, the hydraulic conductivity of the filter is estimated to be 4×10^{-6} m/sec.



LEGEND

- Contour Index (2m Interval)
- Gravel Road
- Marsh
- Lake

Notes:

* Contour lines in treed areas should be treated as indefinite.
* Water levels at time of photography.

200 0 200

Metres

Projection: UTM Zone 10 Datum NAD83
NTS Mapsheet 92F/10 & 15

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TEXADA STORMWATER MANAGEMENT

CATCHMENT AREAS

FIGURE 4-1

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AFS/BCA Permit P05015

5 STORMWATER MANAGEMENT PLAN

5.1 DESIGN FEATURES

The design of the Stormwater Management Plan includes the following features:

1. The main body of the coal staging and stockpiling area is graded so that it drains toward the north, away from the foreshore, and towards the stormwater pond and management system.
2. The stormwater infiltration pond is located along the north edge of the staging area and is formed through excavation.
3. A permeable access ramp to the east edge of the pond allows water that accumulates in the pond to seep into the existing estuary to the east of the ramp.
4. An overflow culvert conveys extreme flows through the access ramp, and into the estuary.
5. A diversion ditch constructed along the northeast edge of the access ramp to the staging area intercepts and diverts flows from the existing ephemeral creek and discharges into the small estuary located east of the staging area.
6. An infiltration ditch around the outside perimeter of the staging area foreshore prevents direct release of runoff from the outer perimeter of the staging area.

The following subsections describe each of these Stormwater Management Plan design features. Drawing 1 (Appendix A) shows the coal stockpile development plan that is required to support expansion of the coal transshipping facilities, and Drawings 2 to 4 (Appendix A) show the design features.

5.2 GRADING PLAN

The coal stockpiling area is filled and graded to direct the majority of runoff towards the stormwater infiltration pond. The pond serves to remove suspended coal particles from the runoff by filtering those particles using the pond bottom and the access road embankment as filter media. The grading of the stockpiling area also serves to improve drainage, which should improve productivity and workability of the coal piles.

Waste rock products are used as fill to raise the elevation of the coal stockpile area to establish the desired grade. These materials comprise relatively durable granular fill which will enhance infiltration and drainage; this will reduce the proportion of rainfall that runs off the stockpiling area. Granular material will also improve trafficability of the stockpile surface.

The elevations of the stockpile area are determined by the following:

- desired grade of 1%;

- dimensions of the stockpile surface; and
- minimum elevation required to maintain the stockpile area above the potential height of storm surge (4 masl).

Drawing 2 (Appendix A) shows the desired grade of the pad along with the approximate thicknesses of fill required to achieve the design grade.

5.3 STORMWATER INFILTRATION POND

EXCAVATION AND POND CONSTRUCTION

The stormwater infiltration pond is sized to contain the runoff generated by the 1 in 5 years, 24-hour single storm rainfall runoff event and by the continuous simulation of runoff based on historical hourly precipitation records. The more demanding simulation governs the infiltration pond design storage capacity. The infiltration pond is positioned to minimize its impact on the area available for stockpiling coal and to the activities associated with handling and loading the coal. Towards this end, the pond is located along the north edge of the stockpiling area, adjacent to the hillside that rises up into the quarry and materials crushing and sorting area. The pond is elongated and situated in an existing depression that collects water from the existing ephemeral stream.

Excavation will be used to establish the dimensions of the pond: the side-slopes will be built to a slope of 2:1 due to frequent water level fluctuation. The finish grade of the pond will provide a storage depth of 3 m. For the most part it will be possible to excavate the soils and colluvium that are present using a track-mounted excavator. In some areas it may be necessary to jack-hammer weathered surface rock to develop the grades. Blasting of bedrock is not required or desirable. If competent rock is encountered, it will be left in place and the pond geometry will be adjusted accordingly. The pond excavation will be covered by a filter liner that is 0.5 m thick. Coarse rock may be used to stabilize the perimeter of the pond.

ACCESS ROAD EMBANKMENT DESIGN

The access road design includes a coarse rock core that is designed to freely drain and is covered by a filter layer adjacent to the pond that prevents seepage of coal fines out of the pond. The core is constructed using waste rock which has a 75 mm minus particle size gradation. The inside face of the access road is covered with a minimum 3-metre thick filter layer up to the top of the overflow culvert.

OVERFLOW CULVERT

An overflow culvert is included in the access road design to convey extreme stormwater runoff flows that exceed the storage capacity of the pond. The invert of the culvert is located at an

elevation of 4 masl, which is positioned to prevent flooding of the stockpile surface. The culvert design consists of the following:

- 600-mm diameter, galvanized, corrugated steel pipe;
- 100-mm thick layer of sand bedding and backfill around the culvert;
- 1-metre thick, sand-bentonite plugs at either end of the culvert; and
- flared ends with bar screens.

Culverts are prepared, placed and covered in sequence with the access road construction. Preparation of the culvert bed consists of the following:

- removing all ice, snow, organic matter, protrusions and sizes greater than 200 mm in the area of the culvert footprint;
- developing a 1% grade over the length of the culvert, towards the estuary (east) to allow the culvert to freely drain following extreme runoff flow events;
- placing and smoothing bedding materials along the footprint of the culvert; and
- backfilling the culvert to a level suitable to support subsequent road construction.

The culvert length is sized to protrude a minimum of 1 m past the edges of the embankments, assuming an embankment slope of 4H:1V.

5.4 INFILTRATION DITCH

The infiltration ditch finished grade is excavated to a depth of 0.75 m at an average slope of 2H:1V and an average base width of 1 m. The liner for the ditch is placed to an average thickness of 300 mm, after the ditch excavation has been completed. The ditch has a containment capacity of approximately 1 m^3/m when 2/3 full of water. The corresponding infiltration rate of the ditch is estimated to be 0.1 $m^3/day/m$. This rate of seepage is expected to diminish over time as the ditch liner gradually fills with coal fines. Norwest recommends that the ditch is cleaned whenever the infiltration rate is inhibited by accumulated coal fines.

5.5 DIVERSION

The diversion channel for the existing natural creek with a base flow will provide a controlled and modified alignment of the stream and a safe conveyance of runoff flows to the existing estuary. The finished grade of the diversion ditch provides a minimum of 0.5 m depth and 3H:1V side slopes. Directional bends and curves of the diversion ditch will be armored and steepened, and the depth increased to a minimum of 1 m.

6 CONSTRUCTION STANDARDS AND QUALITY CONTROL

The components of the Stormwater Management Plan will be constructed by Lafarge's Texada Island workforce, using equipment and materials already on Site. It will be constructed according to the technical specifications found in Appendix B. These technical specifications, when followed, will result in construction quality that is consistent with the basis and assumptions of the Stormwater Management Plan design.

Construction will also be subject to QA/QC procedures, which complement the technical specifications, and these will be used by Lafarge's construction team and engineer. The QA/QC program will be implemented during construction to ensure that construction materials and methods comply with the performance and design standards described in this report. Specific aspects of the QA/QC program are described in the construction specifications and can be found in Appendix B. The complete QA/QC testing program is summarized in Table 6.1.

TABLE 6.1
SUMMARY OF QUALITY CONTROL AND QUALITY ASSURANCE TESTING PROGRAM

Component	Property	ASTM[1] Standard	Frequency	Requirement
Ditch Liner	Grain Size	D421	3 Total	$0.15 < D_{10} < 0.3$ (mm)
Stockpile Surface	Grain Size	D421	3 Total	$0.15 < D_{10} < 0.3$ (mm)
Stockpile Surface	Density	D2922	1 per 250 m^3	> 95% SPD
Access Road Surface	Density	D2922	1 per 250 m^3	> 95% SPD
Access Road Core	Grain Size	D421	3 Total	$D_{50} > 1.0$ (mm)
Access Road Apron	Grain Size	D421	3 Total	$0.15 < D_{10} < 0.3$ (mm)
Pond Liner	Grain Size	D421	3 Total	$0.15 < D_{10} < 0.3$ (mm)

Notes: [1] American Standard of Testing and Measures

7 REFERENCES

Alberta Environmental Protection, "Stormwater Management Guidelines for the Province of Alberta", 1999.

Bear and Verruijt, "Modeling Groundwater Flow and Pollution", Czech Technical University, Faculaty of Civil Engineering, 1987.

British Columbia Ministry of Transportation & Infrastructure, "Guide to Rural Subdivision Approvals", June 2011 via website.

British Columbia Ministry of Transportation & Infrastructure, "Supplement to TAC geometric Design Guide", June 2007.

British Columbia Ministry of Water, Land & Air Protection, "A Guidebook for British Columbia Stormwater Planning", May 2002.

Centre for Water Resources Studies, DalTech – Dalhousie University, "QHM, Version 2.0 for MS Windows", January 1998.

Environment Canada, "Environment Canada—Canadian Climate Normals 1971–2000" March 2013 via website.

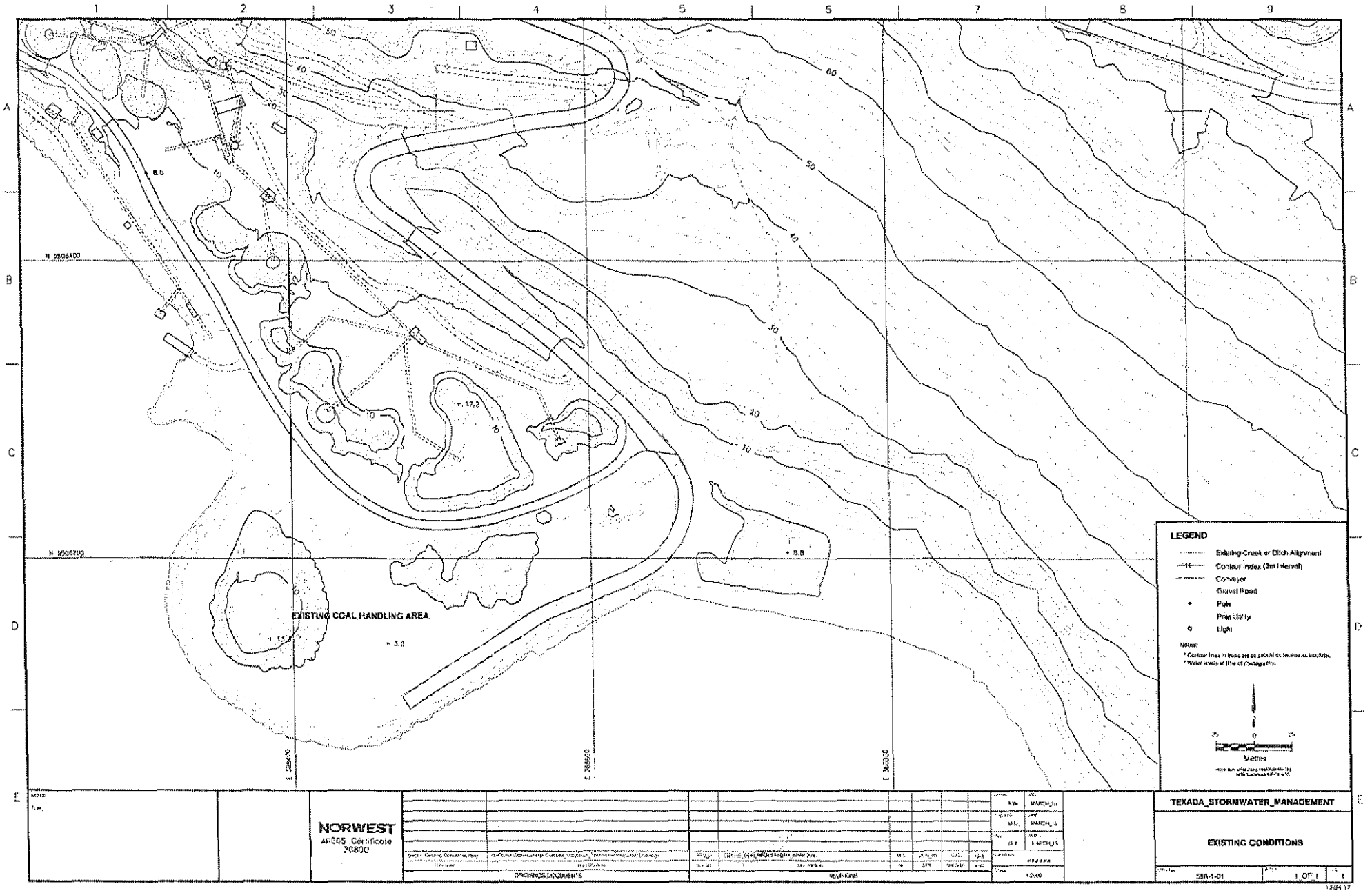
J.F. Sabourin and Associates Inc., "SWMHYMO Stormwater Management Hydrologic Model – User's Manual", May 2000 (reprinted April 2005).

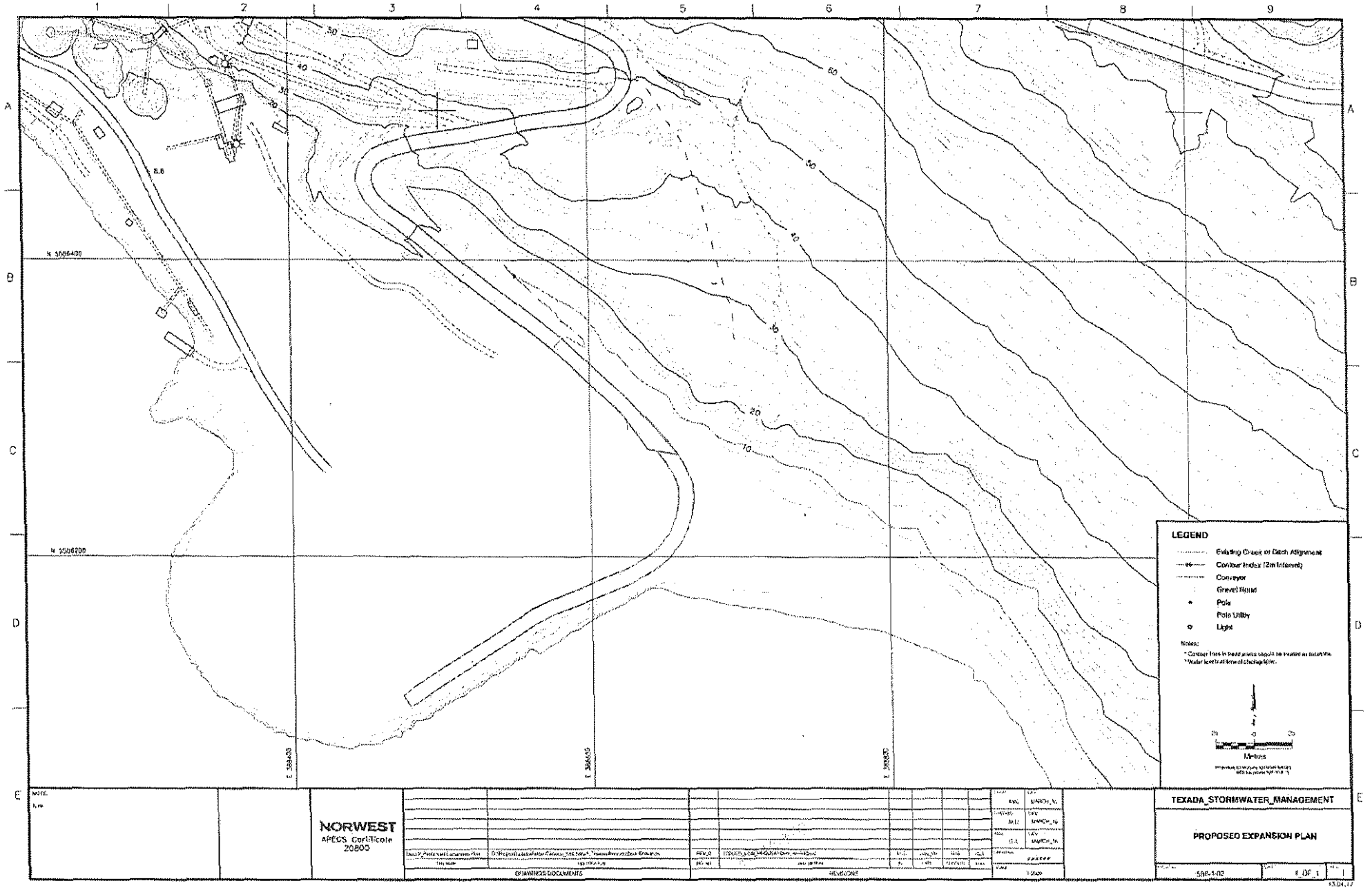
Keith E. Saxton in cooperation with Department of Biological Systems Engineering, Washington State University "Soil Water Characteristics – Version 6.02.74", 2009.

Stormwater Solutions, Inc., "Technical Memo, Lafarge Stormwater Management Plan", September 16, 2011.

NORWEST
CORPORATION

APPENDIX A
DESIGN DRAWINGS


EXISTING COAL HANDLING AREA
LEGEND
Existing Creek or Ditch Alignment
Contour Index (2m Interval)
Conveyor
Gravel Road
Pole
Pole Utility
Light
Notes:
Metres
NORWEST
APEGS Certificate 20800
TEXADA_STORMWATER_MANAGEMENT
EXISTING CONDITIONS
SBA-1-01


LEGEND
Existing Creek or Ditch Alignment
Contour Index (2m Interval)
Conveyor
Gravel Road
Pole
Pole Utility
Light
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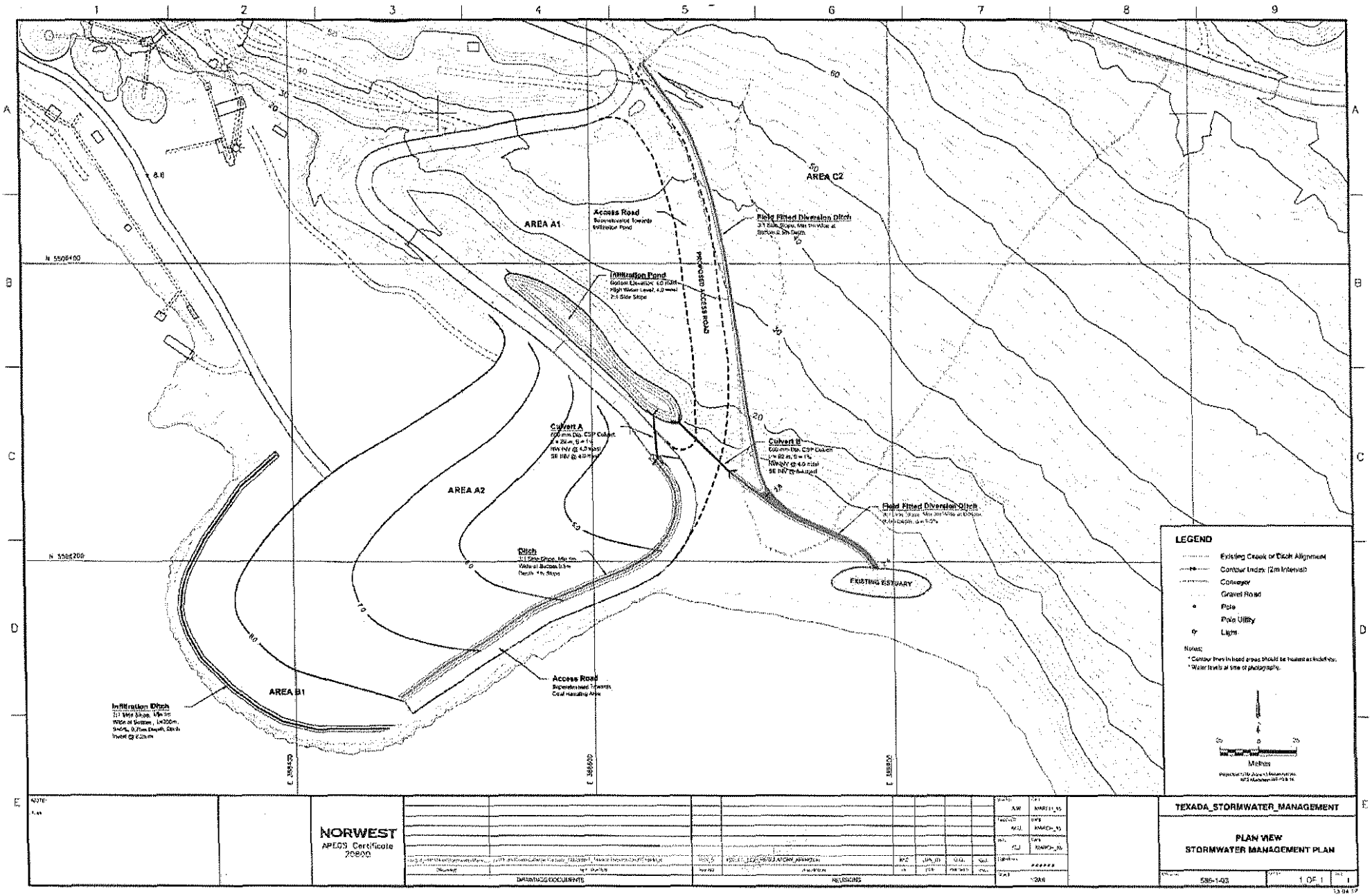
PROPOSED EXPANSION PLAN
SRK-1-03
1 OF 1


AREA A1
AREA A2
AREA B1
AREA C2
Access Road
Infiltration Pond
Culvert A
Culvert B
Ditch
Field Fitted Diversion Ditch
Access Road
Infiltration Ditch
PROPOSED ACCESS ROAD
EXISTING ESTUARY
LEGEND
Existing Creek or Ditch Alignment
Contour Index (2m Intervals)
Conveyor
Gravel Road
Pole
Pole Utility
Light
Notes:
Metres
NORWEST
APEGS Certificate
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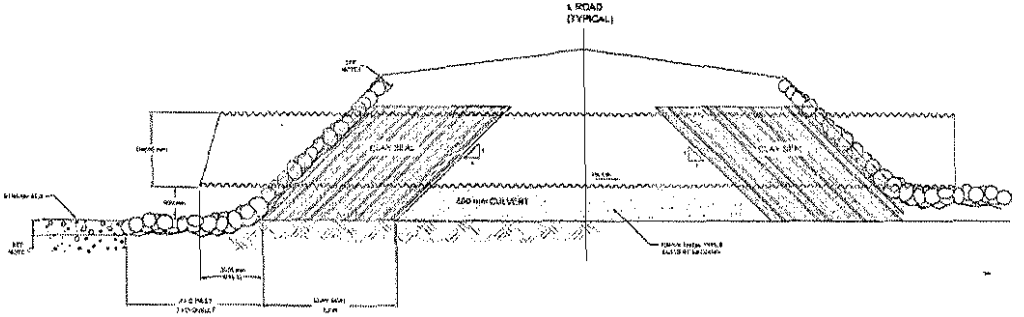
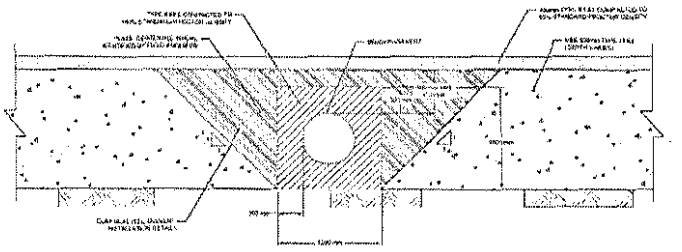
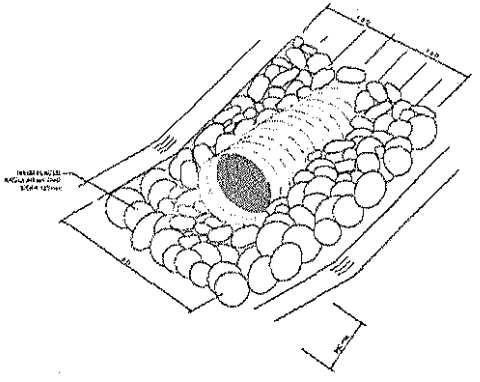
TEXADA_STORMWATER_MANAGEMENT
PLAN VIEW
STORMWATER MANAGEMENT PLAN
DRAWING/DOCUMENTS
REVISIONS



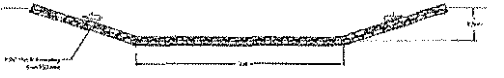




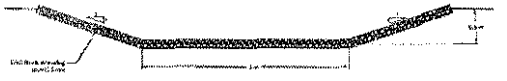
ISOMETRIC VIEW

NOTES:
1. ASPHALT THICKNESS 50mm
2. ANGULAR RIP RAP SHALL BE HAND PLACED ROCK OR AS SPECIFIED BY THE ENGINEER.
3. MINIMUM CULVERT DIA 300 mm
4. 100 mm DROP FROM BOTTOM OF CULVERT TO RIP RAP AT FOR OUTLET END ONLY
5. PLAN VIEW - CULVERT TO BE PLACED AT THE BEGINNING OF CURVE OF THE CURB RETURN

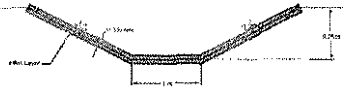
DITCH SECTION



DITCH SECTION



DITCH SECTION



DITCH SECTION

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CULVERT AND DITCH DETAILS

APPENDIX B
TECHNICAL SPECIFICATION

1 GENERAL

1.1 SECTION INCLUDES

This section includes information on the following items of work specifically associated with the construction of the Pond and related earthworks.

1.2 REFERENCES

- American Society for Testing and Materials (ASTM) D422 – 63(2007) Standard Test Method for Particle-Size Analysis of Soils.
- ASTM D698 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort.
- ASTM D2216 – 05 Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock –by Mass.
- ASTM D2922 – 04 Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- ASTM D3017 – Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

1.3 TESTS AND INSPECTIONS

a. The testing and inspection of materials and compaction of embankments will be carried out by a qualified third party to be retained by the Owner. Standards for construction of earthworks are summarized in Table 4.1.

b. Cooperate with the Engineer and third party testing technician, and assist as required to allow efficient execution of the works.

1.4 BURIED SERVICES

a. Before commencing work, establish with Owner the location of all potential buried services on and adjacent to the Site.

b. Arrange with Owner for relocation of buried services that interfere with the execution of the works. The Owner shall be responsible for any costs incurred associated with the relocation of buried services.

1.5 PROTECTION

a. Keep excavations clean, free of standing water and the soil loose.

b. Protect natural and manmade features required to remain undisturbed.

2 PRODUCTS

2.1 GENERAL GRANULAR FILL

Off-specification aggregate native to the Site, which is free of lumps or rocks larger than 75 mm, frozen lumps, sharp fragments, organic material, debris and swelling clays.

2.2 FILTER LAYER

Filter material to comply with the underlying particle size distribution.

GRAIN SIZE DISTRIBUTION OF FILTER

Particle Size Indicator	Size Range (mm)
D_{85}	1 to 3
D_{60}	0.8 to 1.2
D_{15}	0.20 to 0.30
D_{10}	> 0.2

3 EXECUTION

3.1 EXCAVATION

a. Excavate all material encountered as required to complete the works.

b. Remove any soft zones or zones containing deleterious materials and replace it with compacted fill.

3.2 FILLING - GENERAL

a. Inspection: do not commence backfilling until fill material and areas to be filled have been inspected and approved by the Engineer.

b. Remove construction debris, organic soil, and standing water from areas to be filled.

3.3 COMPACTED FILL

a. Use General Granular Fill as specified by the Engineer.

b. Use only acceptable material from the Pond excavation, as directed by the Engineer.

c. Place and compact fill in (maximum) 300 mm thick loose lifts and compact each lift of material to a minimum of 95% of the maximum dry density as measured by ASTM D698 (Standard Proctor Density, SPD).

3.4 FILTER LAYER

a. Use Filter material as specified by the Engineer.

b. Place in 300 mm thick loose lifts and tamp to form a smooth, consistent and firm surface.

3.5 CULVERT BACKFILL

Culvert Pipe Zone Granular Backfill Material – pipe zone granular backfill material shall consist of filter material or equivalent.

A mixture of 10% bentonite and granular backfill materials, by dry weight, shall be used to construct end plugs on either end of the culvert installation.

Culvert Pipe Materials – the drainage culvert pipes shall be 600 mm diameter, lock-seam, galvanized corrugated steel pipe (CSP). The CSP culvert pipe body shall have helical corrugations, while the culvert pipe ends shall have annular corrugations. The CSP culvert pipe shall be made from 2 mm thick galvanized steel. All CSP culvert pipe fittings shall be galvanized and shall be compatible with the pipe type and end treatments.

Culvert Subgrade And Site Preparation - the contractor shall ensure that the ground surface and the general area of the culvert installation is suitably prepared prior to the commencement of the installation of the pipe culvert.

Culvert Pipe Zone Granular Backfill Material Placement – pipe zone granular backfill material shall be used for culvert pipe bedding. Pipe zone granular backfill shall be placed in uniform lifts not to exceed 125 mm thick throughout the culvert pipe zone. Pipe zone granular backfill material shall be placed, spread and levelled in uniform lifts using suitable equipment and construction methods.

The placement of pipe zone granular backfill material shall only be initiated when the owner and his representative have approved the condition of the foundation soils at the base (invert) of the existing drainage ditch.

Culvert Pipe Installation – install the culvert pipe at the locations shown on the drawings. Install the culvert pipe so that the end of the culvert pipe extends 1.0 m beyond the toe of slope of the access road random fill/pipe zone backfill through the ditch section.

Culvert Random Fill Material Placement – random fill above the pipe zone shall be dumped and spread in loose lifts/layers not to exceed 0.45 m thick. Random fill materials shall be placed, spread and levelled in uniform lifts on a continuous basis using suitable equipment and construction methods.

The contractor shall ensure that there is a minimum of 1.2 m of total cover over the crown of the culvert pipe prior to using heavy construction equipment.

Culvert Pipe Zone Granular Material Compaction – the contractor shall compact each pipe zone granular backfill material lift with a combination of personnel operated and self-propelled compaction equipment that is capable of providing sufficient static or dynamic force to achieve a density of a minimum of 95% of the standard proctor density. Compaction of pipe zone granular material shall not cause damage to the culvert pipe or cause the culvert pipe to displace horizontally or vertical.

Culvert Pipe Random Fill Compaction – the contractor shall compact each random fill lift with a minimum of four passes with self-propelled compaction equipment that is capable of providing sufficient static or dynamic force to adequately consolidate the soil materials to form a stable access road/ditch culvert pipe embankment fill. The contractor shall ensure that there is a minimum of 1.2 m of total cover over the crown of the culvert pipe prior to using heavy construction equipment.

Culvert Pipe Installation Alignment And Grade – the culvert pipes for ditch crossings shall be installed on an alignment that is coincident with the centreline of the ditch and at a grade that allows for the unimpeded, efficient movement of water along the drainage ditch without significant ponding at either end of the pipe culvert.

END OF SECTION

1 GENERAL

1.1 SECTION INCLUDES

- Scope of Work;
- Drawings;
- Description of Work;
- Use of Site;
- Mobilization and Start Up;
- Existing Services;
- Superintendence;
- Examination;
- Work by Others;
- Restoration;
- Record Documents;
- Water Control;
- Erosion and Sediment Control;
- Dust and Particulate Control;
- Demobilization; and
- Health and Safety.

1.2 RELATED SECTIONS

- Section 01 13 00 – Surveying; and,
- Section 31 14 11 – Earthworks.

2 GENERAL INSTRUCTIONS

2.1 SCOPE OF WORK

Works to be performed under the specified conditions include construction of the Stormwater Management Plan in accordance with the Drawings presented in Table 1 and these Specifications.

2.2 DRAWINGS

a. Drawings issued with and forming part of this Report, and complementing these Specifications are listed below.

b. Perform the works in accordance with these Drawings and associated Specifications. Where conflict exists between the Drawings and Specifications, immediately request clarification from the Engineer.

c. Revised Drawings may be issued from time to time by the Engineer and such Drawings will supersede previous versions.

TABLE 1
DRAWINGS

Existing Conditions	Drawing 1	Current Site conditions (before development).
Expansion Plan	Drawing 2	Stockpile area after the expansion.
Plan View – Stormwater Management Plan	Drawing 3	Plan View of the Pond with details.

2.3 DESCRIPTION OF WORK

The works include but are not limited to, the following:

a. Mobilization, start-up and demobilization of construction equipment;

b. General excavation of pond;

c. General filling and grading of the coal stockpile area;

d. Excavation of the perimeter exfiltration ditch;

e. Installation of the overflow culvert; and,

f. Lining of the ditch, pond and stockpile area.

The overall expansion of Lafarge's Texada facility staging area is not included in this scope.

2.4 USE OF SITE

a. When unfavorable conditions exist, discontinue operations and work that may be adversely affected by such conditions. Do not construct or cause to be constructed any portion of the works under conditions which would adversely affect the quality of the works, unless special means or precautions are taken to perform the works in a proper and satisfactory manner.

b. Maintain adequate facilities for storage of materials, tools and equipment which are subject to damage by weather.

2.5 MOBILIZATION AND START-UP

a. Ensure planned activities are consistent with existing regulatory approvals.

b. Perform planning and scheduling activities as required for the performance of the works.

c. Purchased materials, mobilized equipment and supplies are incidental to the Site.

d. Use the existing Site access roads to the designated work areas during mobilization. Complete improvements to roads as required.

e. Confining equipment, storage of materials and operation to work in areas designated by the Owner. Do not unreasonably encumber the Site with construction equipment or other materials and equipment.

2.6 SUPERINTENDENCE

Provide all necessary superintendence during the execution of the works. Employ and assign to the works a competent and authorized individual, herein referred to as the Superintendent, who shall be responsible for supervision, inspection and direction of the works. The Superintendent will have responsibility and authority over the Site activities. Upon request, the Engineer will confirm instructions in writing. The superintendent shall be available to the works and the Site at all times during execution of the works.

2.7 EXAMINATION

a. Inspect the Site to review and establish the condition of the area of the works including existing buildings, wells, trees and other plants, grassed areas, fencing, service poles,

wires, paving, and survey bench marks or monuments on or adjacent to the Site which may be affected by the works.

b. Provide ongoing review, inspection, and attendance during performance of the works to properly document conditions. Promptly note any existing conditions at the Site affected by the works which may require restoration, repair, or replacement. Do not cover up any of the works prior to the appropriate testing and verification.

c. Protect existing Site structures and facilities from damage while work is in progress and repair any damage resulting from the works.

d. Verify that existing Site conditions and substrate surfaces are acceptable for subsequent work.

2.8 WORK BY OTHERS

Activities will be coordinated with other Contractors when they are incorporated into the works. If any part of the works under this design Specification depends on the proper exeeution or result upon the work of another Contractor, report promptly to Owner, in writing, any defects which may interfere with proper execution of the works.

2.9 RESTORATION

a. Except where specifically required otherwise by other Specification sections, restore areas affected by the performance of the works to match the condition of similar adjacent, undisturbed areas.

b. Ensure that restored areas match prescribed grade and surface drainage characteristics, except as otherwise specified, and ensure a smooth transition from restored surfaces to existing surfaces.

c. Utilize construction methods and procedures during the performance of the works which keep the disturbance and damage of whatever existing nature to the practical minimum.

2.10 RECORD DOCUMENTS

a. Maintain on Site, one set of the following documents:

i. Drawings;

ii. Specifications;

iii. QA/QC requirements summary sheet; and,

iv. QA/QC testing results.

b. Maintain a record of execution of the works, including all approved changes. Ensure entries are complete and accurate, enabling future reference.

c. Record information concurrent with construction progress.

2.11 WATER CONTROL

a. Maintain excavations free of water. Provide, operate, and maintain necessary equipment appropriately sized to keep excavations, and other work areas free from water.

b. Transfer water into local depressions that are located entirely within the boundaries of the Site. Water shall not be released to the surrounding watershed unless testing shows that the water quality meets the surface water discharge criteria.

2.12 EROSION AND SEDIMENT CONTROL

a. Plan and execute construction by methods to control surface drainage from cuts and fills, from stockpiles, and other work areas. Prevent erosion and sedimentation.

b. Provide and maintain temporary measures to prevent erosion and migration of silt and sediment off of the Site.

2.13 DUST AND PARTICULATE CONTROL

Provide and maintain dust and particulate control measures such as a water misting system as required to prevent the generation of dust and particulate.

2.14 HEALTH AND SAFETY REQUIREMENTS

a. Complete works in accordance with the Health, Safety and Environmental Plan to be provided by Owner.

b. Implement construction activities in accordance with Occupational Health and Safety (OH&S) legislation of the Province of British Columbia.

c. The Superintendent is responsible for ensuring that all employees comply with the health and safety policies on the Site.

END OF SECTION

1 GENERAL

1.1 SECTION INCLUDES

This section includes all surveying work in support of stormwater management plan construction activities.

2 GENERAL INSTRUCTIONS

2.1 SCOPE OF WORK

a. Work to be performed includes surveying of the works as directed by these Specifications and as directed by the Engineer.

b. The term "Surveyor" may be used to refer to and individual surveyor, or a surveying company, provided in relation to the survey requirements to execute the works.

c. The Owner will supply benchmarks and control points required for vertical and horizontal control. The Surveyor will be provided with this information prior to mobilizing to the Site. All other staking and survey control after the initial set of control points shall be the responsibility of the Surveyor.

d. Establish elevations, lines, and levels, utilizing recognized engineering survey practices.

e. Should work be suspended for any reason, complete a detailed survey of the condition of the works at the time of work suspension and submit it to the Engineer.

2.2 COMPETENCE AND AVAILABILITY

a. The Surveyor shall be selected based on competency and availability to the Site. The Surveyor shall be experienced in completing survey work in support of earthworks projects.

b. The Surveyor shall be provided with a minimum of 24 hours of notice prior to the expected time the Surveyor is required to be on the Site.

c. The Surveyor shall be available to the Site at all times, provided the request for services is submitted in a timely manner (i.e. minimum of 24 hours of notice). The Surveyor shall provide a competent replacement to the Site in the event that the Surveyor is not available so as not to cause a delay to the works. It is the responsibility of the Surveyor to provide the replacement with the relevant information to the works, including, but not limited to:

design drawings, coordinate system, control points, Site contacts, data labeling format and background information related to the work already completed.

d. The Surveyor shall make all reasonable efforts to accommodate to the request for services. If the Surveyor is not able to provide service on the requested date, and no replacement is found, the Engineer shall be informed immediately.

2.3 FIELD SURVEYING

a. Verify locations of survey control points prior to starting work. Promptly notify the Engineer of any discrepancies discovered.

b. Locate, preserve, and protect survey control and reference points as set or established. Promptly replace the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.

c. Maintain a complete and accurate log of control and survey work as it progresses.

3 PART 3 EXECUTION

3.1 GENERAL

a. Prior to the commencement of work, the Surveyor and Engineer shall develop a list of the minimum expected surveying requirements for the associated works.

b. Prior to the commencement of work, the Surveyor, Owner and the Engineer shall develop a list of milestones, which will require submission of survey data to verify grades, elevations and alignment.

c. All data recorded by the Surveyor shall be neat and orderly such that it is easily transferred, and so the Engineer may interpret the data in a timely manner. The Surveyor may record any number of shots as requested or required by the Surveyor, the Owner or the Engineer; however, these survey points shall not be included with the as-built package of survey points if not required by Section 3.2 of this Specification.

d. All discrepancies shall be immediately reported to the Engineer. Works that would be affected by the discrepancy shall not be completed until the discrepancy has been clarified to the satisfaction of the Engineer.

3.2 SURVEY DATA REQUIREMENTS

a. The following provides information on the minimum survey data required for completion of the as-built package following completion of the works:

   i. An initial survey has been completed to capture the existing conditions prior to the commencement of the works. The initial survey covers all areas where existing condition are to be disturbed or constructed upon. The purpose of the initial survey is to reconcile construction volumes upon completion of the works and to verify the survey information used for design.

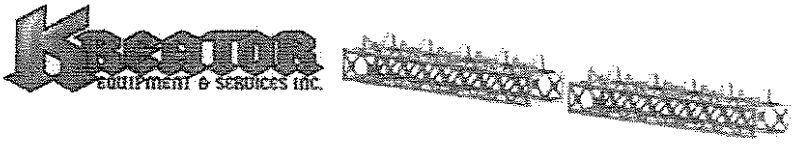
   ii. Upon completing the stockpile area and pond, complete a detailed survey in a maximum 20 m x 20 m spaced grid to confirm the elevations and geometry, which includes a survey of all break points to show the limits and depth of pond.

   iii. Once the culvert has been placed and the diversion ditch has been excavated, complete a detailed survey to confirm locations and grades.

b. All data points shall be clearly labeled. If the Surveyor has a preferred legend for labeling data, the legend must be approved by the Engineer prior to use.

c. Survey data shall be made available to the Engineer to verify grades, elevations, geometries, thicknesses or any other component of the works as requested by the Engineer. The Engineer shall be provided with a minimum 48 hours of notice of the incoming information. At a minimum, the survey data as described within this Specification shall be organized and provided to the Engineer.

END OF SECTION



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CANADA

Mr. Brad Kohl,

Please find attached the technical scope of the shoreline conveyor system for Texada Island.

The scope of work for Kreator is to Design, Engineer, Build, Transport and Install a system to unload 8,000 metric ton barges and convey the material to the storage area for future shipping and / or to load the ship loader directly. The material being handled is Powder River Basin Coal; the weight is 44 lbs. per cubic foot. The material will be unloaded by two Crawler Mounted Material Handlers with $8m^3$ clam style buckets. The material handlers will gather the material from the barge and load it into the hoppers located on the unload barge system. The barge will be equipped with a conveyor system and loading hoppers to deliver the material to the shore line conveyor system. The shore line conveyor system will have the ability to take the material to the storage yard allowing the coal storage area to be reloaded and / or be sent directly to the ship loader.

It is pertinent to note the following points when considering the system design:

a. All belts are 440PIW ¼" x 1/8" grade 2 flame resistant belting.
b. All transfer points are enclosed to minimize fugitive dust.
c. Dust suppression systems have been incorporated into the design at critical transfer points.
d. The system will tie into the existing 60" ship loading conveyor at the existing ship loading conveyor reload hopper.
e. Lafarge will upgrade the existing ship loading conveyor to 60" grade 2 flame resistant belting.
f. The existing piles will be used to secure the unloading barge. No reconfiguration of the existing shoreline is required.
g. The coal will be stored on the existing material storage pad.
h. The design has incorporated the location of the existing ground-water monitoring wells.
i. The design has been developed to remain complimentary to the existing environmental management and material handling best practice currently applied on Texada Island.
j. The design has considered that all material coming from Powder River Basin will be coated with a Dust Suppressant agent and, when seasonal conditions require, an Anti-Oxidant agent for spontaneous combustion management.
k. The design has been validated with operational site visits to a source mine in Powder River Basin, Montana to consider the handling process, material composition and the application of dust suppressant and anti-oxidant agents.

Regards,

Wm. Keith Miles
KREATOR

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Amaranth, Ontario
L9W 2Z3 Canada
PH: 519 941 7876 FX: 519 941 6240
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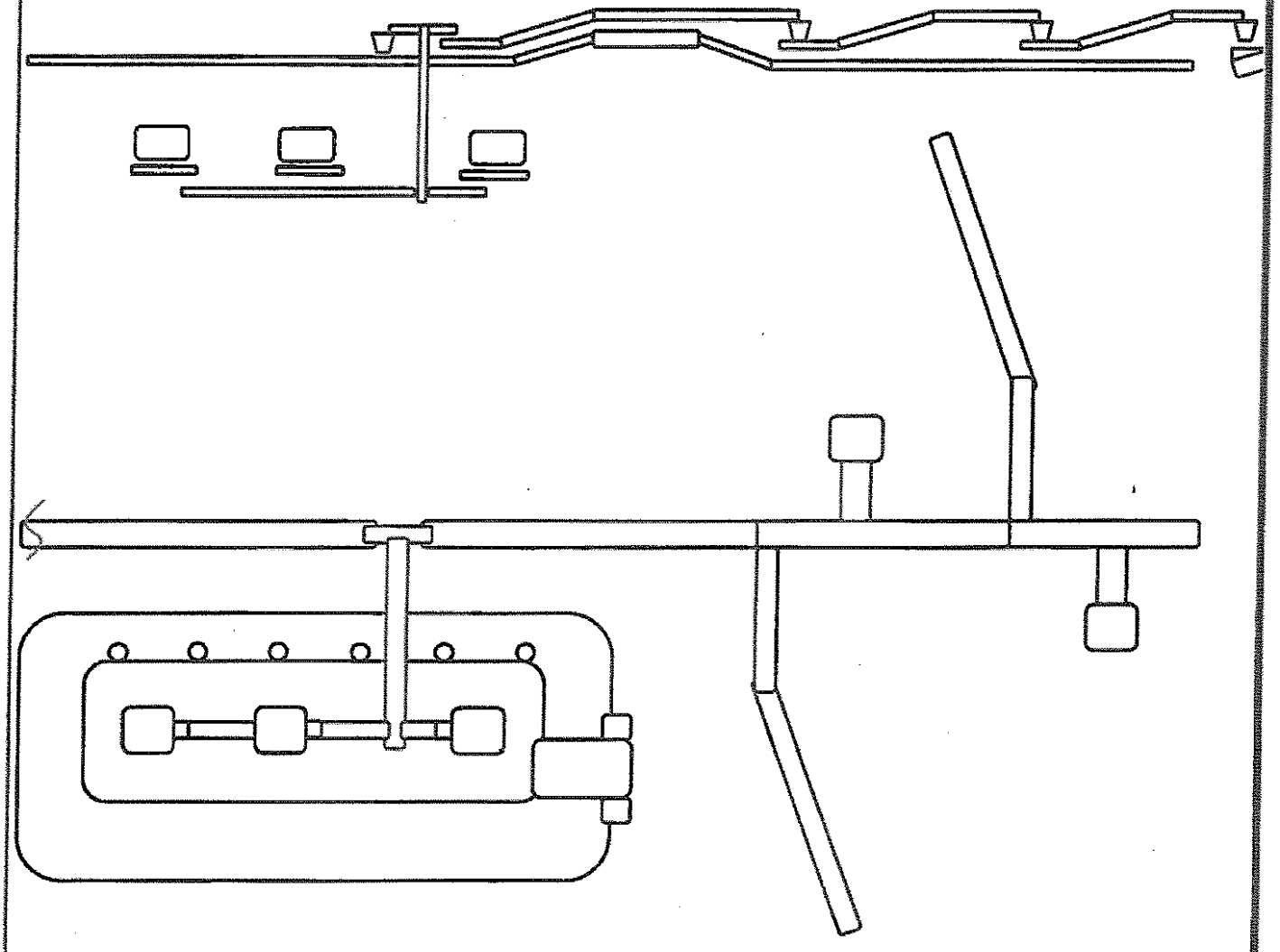
Attn: Lincoln Kyne – lincoln.kyne@lafarge-na.com Eric Anderson – eric.anderson@lafarge-na.com

Lafarge Texada - 120425KM1R12 - Coal Trans Shipping Project



Quote Summary:

Design, Engineer, Build, Transport and Install a system to unload 8,000 metric ton barges and convey the material to the storage area for future shipping and / or to load the ship loader directly. The material being handled is Powder River Basin Coal; the weight is 44 lbs. per cubic foot. The material will be unloaded by an excavator like material handler with a 6 to 8 yard clam style bucket. The material handler will gather the material from the barge and load it into the hoppers located on the unload barge system. The barge will be equipped with a conveyor system and loading hoppers to deliver the material to the shore line conveyor system. The shore line conveyor system will have the ability to take the material to the storage yard allowing the coal storage area to be reloaded and / or be sent directly to the ship loader.

The success of this project will be based on a well understood scope between both parties.
If anything is unclear please indicate what it is and we will send you a revision for final approval.
Thank you for the interest in our company.

Equipment Summary:

Barge System:

Equipment No. CC1 (60" x 160' @ 800fpm Horizontal Think System Channel Conveyor).

Equipment No. CC2 (60" x 60' @ 800fpm Horizontal Think System Channel Conveyor).

Equipment No. CC3 (60" x 140' @ 800fpm Inclined Think System Truss Conveyor).

Equipment No. HP1 (20' x 20' load hopper c/w relieving angle bottom and 60 degree sides).

Equipment No. HPC2 48" x 24' feeder cartridge set on a constant speed of 120fpm with a 35:1 307SMTP and 25HP motor

Equipment No. HP2 (20' x 20' load hopper c/w relieving angle bottom and 60 degree sides).

Equipment No. HPC2 48" x 24' feeder cartridge set on a constant speed of 120fpm with a 35:1 307SMTP and 25HP motor

Equipment No. HP3 (20' x 20' load hopper c/w relieving angle bottom and 60 degree sides).

Equipment No. HPC2 48" x 24' feeder cartridge set on a constant speed of 120fpm with a 35:1 307SMTP and 25HP motor

Barge Switch Gear and Lock Out Room

Shore Line System:

Equipment No. CC4 (60" x 40' @ 800fpm Horizontal Think System Reversible Conveyor).

Equipment No. CC5 (60" x 40' @ 800fpm Truss section, shore line truck feed conveyor).

Equipment No. CC6 - 60" x 435' @ 800fpm Horizontal Think System Channel Conveyor that will be directional to the stock pile area from the barge main transfer.

Equipment No. CC7 - 60" x 200' 800fpm Horizontal Think System Channel Conveyor that will be directional to the stock pile area from the barge main transfer.

Equipment No. CC8 - 60" x 210' 800fpm Horizontal Think System Channel Conveyor that will be directional to the stock pile area from the barge main transfer.

Two re-feed points that will sit over the 60" conveyor on (CC6,7,8)

Two re-feed points that will sit over the 60" conveyor (CC7)

Equipment No. CC9 - 60" x 1200' - 800fpm Horizontal Think System Channel Conveyor that will be directional from the stock pile area to the ship loader.

Equipment No. CC10 & CC11 - Two (2) 60" x 60' Portable Feeders (Pit Portable)

Equipment No. CC12 & CC13 - Two (2) 60" x 60' jump conveyors (Pit Portable)

Equipment No. CC14 & CC15 - Two (2) 60" x 125' stackers Truss Pit Portable

Control Tower and Switch Gear Tower (20' x 8')

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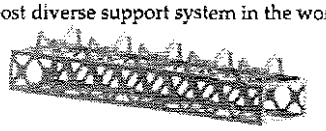


Barge System:

Equipment No. CC1 60" x 160' @ 800fpm Horizontal Think System Channel Conveyor. HP2 and HP3 conveyor on the barge.

Specific Specification:
This conveyor will be mounted to the deck of the barge at a height of 40" to 48".
The conveyor components will have 35 degree rollers.
The conveyor will be galvanized.
The tail section will be a wing pulley c/w tail guard.
The head section will come complete with a martin QC1 belt scraper
The head section will come complete with a transition chute to the next conveyor
The electrical on this conveyor will be done back to the control room switch gear.
The conveyor is supplied for site assembly.
Return roller guards included
The belting will be 440PIW 1/4" x 1/8" x 60" grade 2 Flame resistant belting
Vulcanized splice

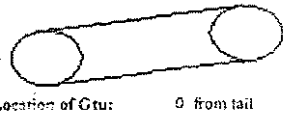
Generic Specification:
Kreator integral channel design.
The entire main frame of this system is an engineered to structurally withstand forces from X,Y,Z axis. This is not typical in the industry, as a conventional truss designs are engineered to withstand forces from X,Y axis and do a lesser job with the Z axis forces. During flex fatigue failure and catastrophic failure a truss assemble will twist prior to failure, prevent the twist prevent the failure.
Our side plates are laser cut and formed with a calculated corner radius to maximize the twisting resistance of the system
Having the side segments be in one piece 20' long and 8" deep allow us maximum flexibility the side plates have incremental hole spacing throughout the side, top and bottom for mounting idlers, e stop brackets, belt loops, hoods, electrical supports, impact beds, safety guarding, etc. This conveyor is designed so that any field fitting is a bolt on assembly, no expensive damaging field welding required.
The lateral and transverse members of the system are made up of 2" schedule 40 1060 pipe with a standard Kreator designed bolted connection. The connection is jointed at the perfect junction to eliminate stress dissipation in the joints, but rather distribute the stress for load sharing.
The system can be purchased as a kit for field erection
Fits into sea containers and is limited on weight before volume like conventional truss assemblies
The majority of the components are interchangeable and reversible for ease of assembly
The design is engineered to ensure proper coating of the materials prior to assembly. This allows for a holiday free coating.
The standard coating is galvanized transverse and lateral supports, and optional painted or galvanized sides.
Our standard color is Orange, although we will paint it to your company color. (optional)
This truss system is engineered for applications in military bridging, municipal walkways due to its cosmetically pleasing appearance. Relieve bridging in catastrophic weather relieve, flood shoring, dynamic load supports, vertical static load supports. The system can be stacked vertically and horizontally to achieve any width and length.
Vertical support columns will be constructed of 4" formed channel or equivalent.
Conveyor to have a walkway down both sides. Right hand side will be tied in to the off load hopper walkway, and the left will be straight down to the tail of the conveyor.

Drive Calculations:
V-Belt drives adjusted to reflect ½" lagging on head/drive pulley. If other than ½" used we can adjust.

CC1 Barge Conveyor – 60" x 160'

Material:

Coal Kreator	
Repose:	38 deg
Surcharge:	25 deg
Density:	44 lb/ft³
Maximum Incline:	22



Location of Gtu:	0 from tail
Location of Drive:	160 from tail

Inputs	
Belt Width:	60 in
Belt Speed:	800 fpm
Capacity:	2200 tph
Length:	160 ft
Lift:	0 ft
Incline:	0 °
TC Weight:	11.29
Skirtboard:	In
Min temp:	32 F
# Plows:	1
# Scrapers:	1
% Belt PIW:	15 %
Belt Selection:	440 PIW
Idler Type:	E7

Tension Summary	
Te:	1969 lbs.
T-1:	3990 lbs
T-2:	2021 lbs.
T-t:	2065 lbs.
T-tu:	2065 lbs.
T-head:	3990 lbs.
Start Torque:	196 ft*lb.
HP:	60 hp
Demand HP:	52 hp
% Loaded:	67 %
Theoretical Capacity:	3281 tph

Reducer Information

Motor Type: Hostile Duty	Shaft mount reducer: 307SMTP05	Driver Sheave: [illegible]	Belt Qty: 3
Motor RPM: 1750	Torque Arm Kit: 307TAP-H	Driver Bushing: B 2 3/8	V-Belt Svc Factor: 1.3
Motor: H60P2E	Shaft mount bushing: 307TBP215	Driven Sheave: 3B5V124	Reducer Svc Factor: Class 2 1.4 SF
Motor Base: MB215-307	Backstop: N/A	Driven Bushing: B 2	Mechanical SMTP HP: 93.91182
Motor Base Adapter: MMA307	Fan Kit: N/A	Belts: 5VX1030	BG Mat: 307BGMKPT
Motor Base Support: MMS307H	Belt Guard: BGP24 24-38		

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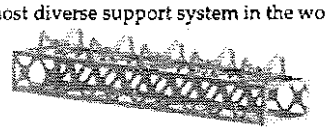

Pulley Information

Location	Pulley Diameter	Face Width	Shaft Diameter	Bearing Journal	Drive Journal	Shaft Length	Lagging	Wrap
Drive	12	63	4-7/16	3-7/16	2-15/16	106	Yes	180
Tail	12	63	3-15/16	2-15/16		87		180

Pulley design is based on CEMA standards. Contact pulley manufacturer for exact pulley design, dimensions and load capacity.

Equipment No. CC2 60" x 60' @ 800fpm Horizontal Think System Channel Conveyor. HP1 conveyor on the barge.

Specific Specification:
This conveyor will be mounted to the deck of the barge at a height of 40" to 48".
The conveyor components will have 35 degree rollers.
The conveyor will be galvanized.
The tail section will be a wing pulley c/w tail guard.
The head section will come complete with a martin QC1 belt scraper
The head section will come complete with a transition chute to the next conveyor
The electrical on this conveyor will be done back to the control room switch gear.
The conveyor is supplied for site assembly.
Return roller guards included
The belting will be 440PIW 1/4" x 1/8" x 60" grade 2 Flame resistant belting
Vulcanized splice

Generic Specification:
Kreator integral channel design.
The entire main frame of this system is an engineered to structurally withstand forces from X,Y,Z axis. This is not typical in the industry, as a conventional truss designs are engineered to withstand forces from X,Y axis and do a lesser job with the Z axis forces. During flex fatigue failure and catastrophic failure a truss assemble will twist prior to failure, prevent the twist prevent the failure.
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Having the side segments be in one piece 20' long and 8" deep allow us maximum flexibility the side plates have incremental hole spacing throughout the side, top and bottom for mounting idlers, e stop brackets, belt loops, hoods, electrical supports, impact beds, safety guarding, etc. This conveyor is designed so that any field fitting is a bolt on assembly, no expensive damaging field welding required.
The lateral and transverse members of the system are made up of 2" schedule 40 106B pipe with a standard Kreator designed bolted connection. The connection is jointed at the perfect junction to eliminate stress dissipation in the joints, but rather distribute the stress for load sharing.
The system can be purchased as a kit for field erection
Fits into sea containers and is limited on weight before volume like conventional truss assemblies
The majority of the components are interchangeable and reversible for ease of assembly
The design is engineered to ensure proper coating of the materials prior to assembly. This allows for a holiday free coating.
The standard coating is galvanized transverse and lateral supports, and optional painted or galvanized sides.
Our standard color is Orange, although we will paint it to your company color. (optional)
This truss system is engineered for applications in military bridging, municipal walkways due to its cosmetically pleasing appearance. Relieve bridging in catastrophic weather relieve, flood shoring, dynamic load supports, vertical static load supports. The system can be stacked vertically and horizontally to achieve any width and length.
Vertical support columns will be constructed of 4" formed channel or equivalent.
Conveyor to have a walkway down both sides. Right hand side will be tied in to the off load hopper walkway, and the left will be straight down to the tail of the conveyor.

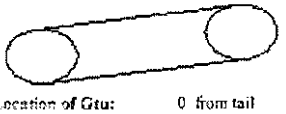
Drive Calculations:

CC2 Barge – 60" x 60'

Material:

Coal Kreator

Repose:	38 deg
Surcharge:	25 deg
Density:	44 lb/ft³
Maximum Incline:	22 lb/ft³



Location of Gtu:	0 from tail
Location of Drive:	60 from tail

Inputs

Belt Width: 60 in	
Belt Speed: 800 fpm	
Capacity: 2500 tph	
Length: 60 ft	
Lift: 0 ft	
Incline: 0 %	
Belt Weight: 4129	
Sideboard: 10	
Min temp: 32 F	
# Plows: 1	
# Scrapers: 1	
% Belt PIW: 14 %	
Belt Selection: 440 PIW	
Idler Type: E7	

Tension Summary

Te: 1519 lbs.	
T-1: 3568 lbs	
T-2: 2048 lbs.	
T-t: 2065 lbs.	
T-tu: 2065 lbs.	
T-head: 3568 lbs.	
StartTorque: 131 ft*lb.	
HP: 50 hp	
Demand HP: 40 hp	
% Loaded: 67 %	
Theoretical Capacity: 3281 tph	

Reducer Information

Motor Type: Hostile Duty | Shaft mount reducer: 307SMTP05 | Driver Sheave: 3B5V80 | Belt Qty: 3

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Motor RPM: 1750	Torque Arm Kit: 307TAP-H	Driver Bushing: B 2 1/8	V-Belt Svc Factor: 1.3
Motor: H50P2E	Shaft mount bushing: 307TBP215	Driven Sheave: 3B5V110	Reducer Svc Factor: Class 2 1.4 SF
Motor Base: MB215-307	Backstop: N/A	Driven Bushing: B 2	Mechanical SMTP HP: 93.91182
Motor Base Adapter: MMA307	Fan Kit: N/A	Belts: 5VX950	BG Mat: 307BGMKPT
Motor Base Support: MMS307H	Belt Guard: BGP20 22-34		

Pulley Information

Location	Pulley Diameter	Face Width	Shaft Diameter	Bearing Journal	Drive Journal	Shaft Length	Lagging	Wrap
Drive	12	63	4-7/16	3-7/16	2-15/16	106	Yes	180
Tail	12	63	3-15/16	2-15/16		87		180

Equipment No. CC3 - 60" x 140' @ 800fpm Inclined Think System Truss Conveyor. Barge to Land conveyor.

Specific Specification:
This conveyor will be mounted to the deck of the barge at the tail at a height of 40" to 48" and go to the land conveyor system at approximately 20' high and mount to the shore line system.
The conveyor components will have 35 degree rollers.
The return rollers will be set on Kreator EZ slide mounts.
The conveyor will be galvanized.
The tail section will be a wing pulley c/w tail guard.
The head section will come complete with a martin QC1 belt scraper
The head section will come complete with a transition chute to the next conveyor
The electrical on this conveyor will be done back to the control room switch gear.
The conveyor is supplied for site assembly.
Return roller guards included
The belting will be 440PIW 1/4" x 1/8" x 60" grade 2 Flame resistant belting
Vulcanized splice

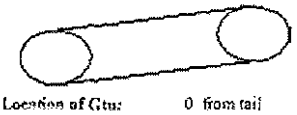
Generic Specification:
Kreator integral channel design.
The entire main frame of this system is an engineered to structurally withstand forces from X,Y,Z axis. This is not typical in the industry, as a conventional truss designs are engineered to withstand forces from X,Y axis and do an lesser job with the Z axis forces. During flex fatigue failure and catastrophic failure a truss assemble will twist prior to failure, prevent the twist prevent the failure.
Our side plates are laser cut and formed with a calculated corner radius to maximize the twisting resistance of the system
Having the side segments be in one piece 20' long and 30" deep allow us maximum flexibility the side plates have incremental hole spacing throughout the side, top and bottom for mounting idlers, e stop brackets, belt loops, hoods, electrical supports, impact beds, safety guarding, etc. This conveyor is designed so that any field fitting is a bolt on assembly, no expensive damaging field welding required.
The lateral and transverse members of the system are made up of 2" schedule 40 1061B pipe with a standard Kreator designed bolted connection. The connection is jointed at the perfect junction to eliminate stress dissipation in the joints, but rather distribute the stress for load sharing.
The system can be purchased as a kit for field erection
Fits into sea containers and is limited on weight before volume like conventional truss assemblies
The majority of the components are interchangeable and reversible for ease of assembly
The design is engineered to ensure proper coating of the materials prior to assembly. This allows for a holiday free coating.
The standard coating is galvanized transverse and lateral supports, and optional painted or galvanized sides.
Our standard color is Orange, although we will paint it to your company color. (optional)
This truss system is engineered for applications in military bridging, municipal walkways due to its cosmetically pleasing appearance. Relieve bridging in catastrophic weather relieve, flood shoring, dynamic load supports, vertical static load supports. The system can be stacked vertically and horizontally to achieve any width and length.
Vertical support columns will be constructed of 4" formed channel or equivalent.
Conveyor to have a walkway down both sides. Right hand side will be tied in to the off load hopper walkway, and the left will be straight down to the tail of the conveyor.

Drive Calculations:

CC3 Barge 60" x 140' barge to shore line system

Material:

Coal Kreator	
Repose:	38 deg
Surcharge:	25 deg
Density:	44 lb/ft^3
Maximum Incline:	22 i



Location of Gtu:	0 from tail
Location of Drive:	140 from tail

Inputs

Belt Width:	60 in
Belt Speed:	800 fpm
Capacity:	2200 tph
Length:	140 ft
Lift:	30 ft
Incline:	12.37 %
TU Weight:	6268
Skirtboard:	10
Min temp:	32 F
# Plows:	1
# Scrapers:	1
% Belt PIW:	31 %

Tension Summary

Te:	4549 lbs.
T-1:	8189 lbs
T-2:	3639 lbs.
T-t:	3134 lbs.
T-tu:	3134 lbs.
T-head:	8189 lbs.
StartTorque:	369 ft*lb.
HP:	125 hp
Demand HP:	120 hp
% Loaded:	67 %
Theoretical	3281 tph

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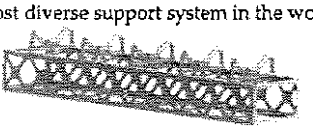

	Belt Selection: 440 PIW Idler Type: E7	Capacity:

Reducer Information

Motor Type: Hostile Duty	Shaft mount reducer: 415SMTP05B	Driver Sheave: N/A	Belt Qty: 0
Motor RPM: 1750	Torque Arm Kit: 415TAP-HB	Driver Bushing: N/A	V-Belt Svc Factor: 1.3
Motor: H125P2F	Shaft mount bushing: 415TBP415B	Driven Sheave: N/A	Reducer Svc Factor: Class 2 1.4 SF
Motor Base: MB407-415	Backstop: 415BSP	Driven Bushing: N/A	Mechanical SMTP HP: 214.582984
Motor Base Adapter: MMA407-415	Fan Kit: N/A	Belts: N/A	BG Met: N/A
Motor Base Support: MMS415H	Belt Guard: N/A		

Note 3: It is your responsibility to select appropriate shaft diameter. Bushing selected only because it has the MAXIMUM bore this reducer will accept. Larger shaft diameter will require larger reducer.

Note 4: Belt guards are available from PTS. and are required by OSHA to be installed on all Belt drives.

Pulley Information

Location	Pulley Diameter	Face Width	Shaft Diameter	Bearing Journal	Drive Journal	Shaft Length	Lagging	Wrap
Drive	14	63	4-15/16	3-15/16	4-15/16	112	Yes	180
Tail	12	63	3-7/16	3-7/16		87		180

Pulley design is based on CEMA standards. Contact pulley manufacturer for exact pulley design, dimensions and load capacity.

Equipment No. HP1 (20' x 20' load hopper c/w relieving angle bottom and 60 degree sides).

Equipment No. HPC2 48" x 24' feeder cartridge set on a constant speed of 120fpm with a 35:1 307SMTP and 25HP motor

Constructed of ¼" SA36 plate steel and 8" x 26 lbs. wide flange beam

Liner to be removable ¼" AR400 liner

Tapered opening in the bottom of the hopper to control the material discharge and prolong skirting life

The feeder hopper will be mounted on 6" male / female pins in opposing corners

Painted orange and grey c/w yellow guarding

Equipment No. HP2 (20' x 20' load hopper c/w relieving angle bottom and 60 degree sides).

Equipment No. HPC2 48" x 24' feeder cartridge set on a constant speed of 120fpm with a 35:1 307SMTP and 25HP motor

Constructed of ¼" SA36 plate steel and 8" x 26 lbs. wide flange beam

Liner to be removable ¼" AR400 liner

Tapered opening in the bottom of the hopper to control the material discharge and prolong skirting life

The feeder hopper will be mounted on 6" male / female pins in opposing corners

Painted orange and grey c/w yellow guarding

Equipment No. HP3 (20' x 20' load hopper c/w relieving angle bottom and 60 degree sides).

Equipment No. HPC2 48" x 24' feeder cartridge set on a constant speed of 120fpm with a 35:1 307SMTP and 25HP motor

Constructed of ¼" SA36 plate steel and 8" x 26 lbs. wide flange beam

Liner to be removable ¼" AR400 liner

Tapered opening in the bottom of the hopper to control the material discharge and prolong skirting life

The feeder hopper will be mounted on 6" male / female pins in opposing corners

Painted orange and grey c/w yellow guarding

Barge Switch Gear and Lock Out Room

10' x 20' container with the required switch gear for the barge

This will allow the barge to have a single line running to shore, with the exception of the communications cables

Air conditioning

Vented

Two man doors c/w windows

Window next to each door

Painted Grey

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Shore Line System

Equipment No. CC4 (60" x 40' - 800fpm Horizontal Think System Reversible Conveyor).

Specific Specification:
This conveyor will be mounted to a frame at a height of 30' so that the system will have the flexibility to load 777D rock trucks off the back side if desired.
The conveyor components will have 20 degree rollers.
The conveyor will be galvanized.

30" truss conveyor under the hopper c/w 20 degree rollers spaced every 12"

Drive to be a 25:1 ratio 307STMP shaft mounted gearbox with a 40HP 575volt 60Hz 1800RPM motor

Guarded both sides

No back stop
The tail section will be a drum pulley c/w guard.
The head section will come complete with a martin QC1 belt scraper on both sides of the conveyor
The head section will come complete with a transition chute to the next conveyor
The electrical on this conveyor will be done back to the control room switch gear.
The conveyor is supplied for site assembly.
Return roller guards included
The belting will be 440PIW 1/4" x 1/8" x 60" grade 2 Flame resistant belting
Vulcanized splice

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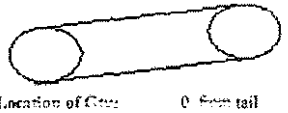
The system can be purchased as a kit for field erection
Fits into sea containers and is limited on weight before volume like conventional truss assemblies
The majority of the components are interchangeable and reversible for ease of assembly
The design is engineered to ensure proper coating of the materials prior to assembly. This allows for a holiday free coating.
The standard coating is galvanized transverse and lateral supports, and optional painted or galvanized sides.
Our standard color is Orange, although we will paint it to your company color. (optional)
This truss system is engineered for applications in military bridging, municipal walkways due to its cosmetically pleasing appearance. Relieve bridging in catastrophic weather relieve, flood shoring, dynamic load supports, vertical static load supports. The systems can be stacked vertically and horizontally to achieve any width and length.
Vertical support columns will be constructed of 4" formed channel or equivalent.
Conveyor to have a walkway down both sides. Right hand side will be tied in to the off load hopper walkway, and the left will be straight down to the tail of the conveyor.

CC4 manual calculations. Lift beyond program scope. Use same drive as CC3. HP required for 30' lift = 67, plus HP for length and speed = 103HP.

CC4 Main transfer conveyor on the shore line system

Materials

Coal Kreator	
Repose:	38 deg
Surcharge:	25 deg
Density:	44 lb/ft³
Maximum Incline:	22



Location of Gate:	0 from tail
Location of Drive:	40 from tail

Inputs

Belt Width: 60 in	
Belt Speed: 800 fpm	
Capacity: 2200 tph	
Length: 40' ft	
Lift: 0 ft	
Incline: 0 %	
Bulk Weight: 44 lb/ft³	
Skirtboard: 10	
Min temp: 32 F	
# Plows: 1	
# Scrapers: 1	
% Belt PIW: 13 %	
Belt Selection: 440 PIW	
Idler Type: E7	

Tension Summary

Te:	1427 lbs.
T-1:	3481 lbs
T-2:	2054 lbs.
T-t:	2065 lbs.
T-tu:	2065 lbs.
T-head:	3481 lbs.
Start Torque:	117 ft*lb.
HP:	40 hp
Demand HP:	38 hp
% Loaded:	67 %
Theoretical Capacity:	3281 tph

Reducer Information

Motor Type: Hostile Duty	Shaft mount reducer: 215SMTP05	Driver Sheave: 2B5V94	Belt Qty: 2
Motor RPM: 1750	Torque Arm Kit: 215TAP-H	Driver Bushing: B 2 1/8	V-Belt Svc Factor: 1.3
Motor: H40P2E	Shaft mount bushing: 215TBP215	Driven Sheave: 2B5V124	Reducer Svc Factor: Class 2 1.4 SF
Motor Base: MB215-307	Backstop: N/A	Driven Bushing: B 1 7/8	Mechanical SMTP HP: 62.3252012
Motor Base Adapter: MMA215	Fan Kit: N/A	Belts: 5VX1000	BG Mnt: 215BGMKPT

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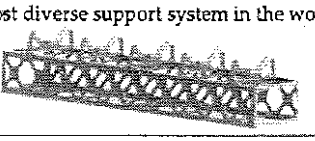

Motor Base Support: MMS215H Belt Guard: BGP20 22-34

Pulley Information

Location	Pulley Diameter	Face Width	Shaft Diameter	Bearing Journal	Drive Journal	Shaft Length	Lagging	Wrap
Drive	12	63	4-7/16	3-7/16	2-15/16	103	Yes	180
Tail	12	63	3-15/16	2-15/16		87		180

Pulley design is based on CEMA standards. Contact pulley manufacturer for exact pulley design, dimensions and load capacity.

Bearing Information

	Bore Size	Type	Left Bearing	Qty	Right Bearing	Qty
Drive	3-7/16	Tapered Roller	RPB-307-4	1	ERPB-307-4	1
Tail	2-15/16	Tapered Roller	RPB-215-4	1	ERPB-215-4	1

Equipment No. CC5 (60" x 40' - 800fpm Truss section, shore line truck feed conveyor).

This conveyor will receive from the overflow chute to load trucks if desired. This will allow the trucks to drive in parallel with the system.

Specific Specification:
The conveyor components will have 35 degree rollers.
The conveyor will be galvanized.
The tail section will be a wing pulley c/w tail guard.
The head section will come complete with a martin QC1 belt scraper
The head section will come complete with a transition chute to the next conveyor
The electrical on this conveyor will be done back to the control room switch gear.
The conveyor is supplied for site assembly.
Return roller guards included
The belting will be 440PIW 1/4" x 1/8" x 60" grade 2 Flame resistant belting
Vulcanized splice

Generic Specifications:
Kreator integral truss design.
The entire main frame of this system is an engineered to structurally withstand forces from X,Y,Z axis. This is not typical in the industry, as a conventional truss designs are engineered to withstand forces from X,Y axis and do an lesser job with the Z axis forces. During flex fatigue failure and catastrophic failure a truss assemble will twist prior to failure, prevent the twist prevent the failure.
Our side plates are laser cut and formed with a calculated corner radius to maximize the twisting resistance of the system
Having the side segments be in one piece 20' long and 30" deep allow us maximum flexibility the side plates have incremental hole spacing throughout the side, top and bottom for mounting idlers, e stop brackets, belt loops, hoods, electrical supports, impact beds, safety guarding, etc. This conveyor is designed so that any field fitting is a bolt on assembly, no expensive damaging field welding required.
The lateral and transverse members of the system are made up of 2" schedule 40 106B pipe with a standard Kreator designed bolted connection. The connection is jointed at the perfect junction to eliminate stress dissipation in the joints, but rather distribute the stress for load sharing.
The system can be purchased as a kit for field erection
Fits into sea containers and is limited on weight before volume like conventional truss assemblies
The majority of the components are interchangeable and reversible for ease of assembly
The design is engineered to ensure proper coating of the materials prior to assembly. This allows for a holiday free coating.
The standard coating is galvanized transverse and lateral supports, and optional painted or galvanized sides.
Our standard color is Orange, although we will paint it to your company color. (optional)
This truss system is engineered for applications in military bridging, municipal walkways due to its cosmetically pleasing appearance. Relieve bridging in catastrophic weather relieve, flood shoring, dynamic load supports, vertical static load supports. The system can be stacked vertically and horizontally to achieve any width and length.
Vertical support columns will be constructed of 8" formed channel or equivalent.
Conveyor to have a walkway down both sides. Right hand side will be tied in to the off load hopper walkway, and the left will be straight down to the tail of the conveyor.

440PIW 4 Ply belting

CC5 manual calculations. Lift beyond program scope. Use same drive as CC3, HP required for 30' lift = 67, plus HP for length and speed = 103HP.

CC5 Truck load conveyor off of the main transfer

Material:

Coal Kreator	
Repose:	38 deg
Surcharge:	25 deg
Density:	44 lb/ft³
Maximum Incline:	22

Inputs	
Belt Width:	60 in
Belt Speed:	800 fpm
Capacity:	2200 tph
Length:	40 ft
Lift:	0 ft
Incline:	0 %
TU Weight:	4129
Skirtboard:	10

Tension Summary	
Te:	1427 lbs.
T-1:	3481 lbs
T-2:	2054 lbs.
T-t:	2065 lbs
T-tu:	2065 lbs.
T-head:	3481 lbs.
Start Torque:	117 ft*lb.
HP:	40 hp

The success of this project will be based on a well understood scope between both parties.
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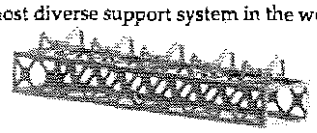

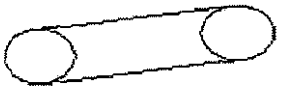

Location of Gtu:	0 from tail	Min temp: 32 F		Demand HP: 38 hp	
Location of Drive:	40 from tail	# Plows: 1		% Loaded: 67 %	
		# Scrapers: 1			
		% Belt PIW: 13 %		Theoretical	
		Belt Selection: 440 PIW		Capacity: 3281 tph	
		Idler Type: E7			

Reducer Information

Motor Type: Hostile Duty	Shaft mount reducer: 215SMTP05	Driver Sheave: 2B5V94		Belt Qty: 2	
Motor RPM: 1760	Torque Arm Kit: 215TAP-H	Driver Bushing: B 2 1/8		V-Belt Svc Factor: 1.3	
Motor: H40P2E	Shaft mount bushing: 215TSP215	Driven Sheave: 2B5V124		Reducer Svc Factor: Class 2 1.4 SF	
Motor Base: MB215-307	Backstop: N/A	Driven Bushing: B 1 7/8		Mechanical SMTP HP: 62.3252012	
Motor Base Adapter: MMA215	Fan Kit: N/A	Belts: 5VX1000		BG Mnt: 215BGMKPT	
Motor Base Support: MMS215H	Belt Guard: BGP28 22-34				

Pulley Information

Location	Pulley Diameter	Face Width	Shaft Diameter	Bearing Journal	Drive Journal	Shaft Length	Lagging	Wrap
Drive	12	63	4-7/16	3-7/16	2-15/16	103	Yes	180
Tail	12	63	3-15/16	2-15/16		87		180

Pulley design is based on CEMA standards. Contact pulley manufacturer for exact pulley design, dimensions and load capacity.

Bearing Information

	Bore Size	Type	Left Bearing	Qty	Right Bearing	Qty
Drive	3-7/16	Tapered Roller	RPB-307-4	1	RRPB-307-4	1
Tail	2-15/16	Tapered Roller	RPB-215-4	1	RRPB-215-4	1

Equipment No. CC6 - 60" x 435' - 800fpm Horizontal Think System Channel Conveyor that will be directional to the stock pile area from the barge main transfer. (800fpm)

Specific Specification:
The conveyor components will have 35 degree rollers.
The conveyor will be galvanized.

30 truss conveyor under the hopper c/w 20 degree rollers spaced every 12"

Drive to be a 25:1 ratio 307STMP shaft mounted gearbox with a 40HP 575volt 60Hz 1800RPM motor

Guarded both sides

No back stop
The tail section will be a drum pulley c/w guard.
The head section will come complete with a martin QC1 belt scraper
The head section will come complete with a transition chute to the next conveyor
The electrical on this conveyor will be done back to the control room switch gear.
The conveyor is supplied for site assembly.
Return roller guards included
The belting will be 440PIW 1/4" x 1/8" x 60" grade 2 Flame resistant belting
Vulcanized splice

Generic Specification:
Kreator integral channel design.
The entire main frame of this system is an engineered to structurally withstand forces from X,Y,Z axis. This is not typical in the industry, as a conventional truss designs are engineered to withstand forces from X,Y axis and do an lesser job with the Z axis forces. During flex fatigue failure and catastrophic failure a truss assemble will twist prior to failure, prevent the twist prevent the failure.
Our side plates are laser cut and formed with a calculated corner radius to maximize the twisting resistance of the system
Having the side segments be in one piece 20' long and 8" deep allow us maximum flexibility the side plates have incremental hole spacing throughout the side, top and bottom for mounting idlers, e stop brackets, belt loops, hoods, electrical supports, impact beds, safety guarding, etc. This conveyor is designed so that any field fitting is a bolt on assembly, no expensive damaging field welding required.
The lateral and transverse members of the system are made up of 2" schedule 40 106B pipe with a standard Kreator designed bolted connection. The connection is jointed at the perfect junction to eliminate stress dissipation in the joints, but rather distribute the stress for load sharing.
The system can be purchased as a kit for field erection
Fits into sea containers and is limited on weight before volume like conventional truss assemblies
The majority of the components are interchangeable and reversible for ease of assembly
The design is engineered to ensure proper coating of the materials prior to assembly. This allows for a holiday free coating.
The standard coating is galvanized transverse and lateral supports, and optional painted or galvanized sides.
Our standard color is Orange, although we will paint it to your company color. (optional)
This truss system is engineered for applications in military bridging, municipal walkways due to its cosmetically pleasing appearance. Relieve bridging in catastrophic weather relieve, flood

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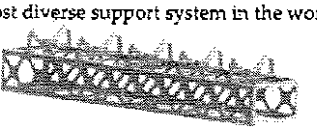

shoring, dynamic load supports, vertical static load supports. The system can be stacked vertically and horizontally to achieve any width and length.
Vertical support columns will be constructed of 4" formed channel or equivalent.
Conveyor to have a walkway down both sides. Right hand side will be tied in to the off load hopper walkway, and the left will be straight down to the tail of the conveyor.

Drive Calculations:
Typical to CC3

Equipment No. CC7 - 60" x 200' - 800fpm Horizontal Think System Channel Conveyor that will be directional to the stock pile area from the barge main transfer.

Specific Specification:
The conveyor components will have 35 degree rollers.
The conveyor will be galvanized.
The tail section will be a wing pulley c/w tail guard.
The head section will come complete with a martin QC1 belt scraper
The head section will come complete with a transition chute to the next conveyor
The electrical on this conveyor will be done back to the control room switch gear.
The conveyor is supplied for site assembly.
Return roller guards included
The belting will be 440PIW 1/4" x 1/8" x 60" grade 2 with Vulcanized splice Flame resistant belting

Generic Specification:
Kreator integral truss design.
The entire main frame of this system is an engineered to structurally withstand forces from X,Y,Z axis. This is not typical in the industry, as a conventional truss designs are engineered to withstand forces from X,Y axis and do an lesser job with the Z axis forces. During flex fatigue failure and catastrophic failure a truss assemble will twist prior to failure, prevent the twist prevent the failure.
Our side plates are laser cut and formed with a calculated corner radius to maximize the twisting resistance of the system
Having the side segments be in one piece 20' long and 30" deep allow us maximum flexibility the side plates have incremental hole spacing throughout the side, top and bottom for mounting idlers, e stop brackets, belt loops, hoods, electrical supports, impact beds, safety guarding, etc. This conveyor is designed so that any field fitting is a bolt on assembly, no expensive damaging field welding required.
The lateral and transverse members of the system are made up of 2" schedule 40 106B pipe with a standard Kreator designed bolted connection. The connection is jointed at the perfect junction to eliminate stress dissipation in the joints, but rather distribute the stress for load sharing.
The system can be purchased as a kit for field erection
Fits into sea containers and is limited on weight before volume like conventional truss assemblies
The majority of the components are interchangeable and reversible for ease of assembly
The design is engineered to ensure proper coating of the materials prior to assembly. This allows for a holiday free coating.
The standard coating is galvanized transverse and lateral supports, and optional painted or galvanized sides.
Our standard color is Orange, although we will paint it to your company color. (optional)
This truss system is engineered for applications in military bridging, municipal walkways due to its cosmetically pleasing appearance. Relieve bridging in catastrophic weather relieve, flood shoring, dynamic load supports, vertical static load supports. The system can be stacked vertically and horizontally to achieve any width and length.
Head section with walkways down both sides to stairs and stairs to grade.
Guarded both sides
440PIW 4 Ply belting

Drive Calculations:
Typical to CC3

Equipment No. CC8 - 60" x 210' - 800fpm Horizontal Think System Channel Conveyor that will be directional to the stock pile area from the barge main transfer.

Specific Specification:
This conveyor will be mounted under the frame of the reversing conveyor and span from the coal storage area to the ship loader.
This conveyor will come complete with a fold or a slide (final decision will come out in the design)
The conveyor components will have 35 degree rollers.
The return rollers will be set on Kreator EZ slide mounts.
The conveyor will be galvanized.
The tail section will be a wing pulley c/w tail guard.
The head section will come complete with a martin QC1 belt scraper
The head section will come complete with a transition chute to the next conveyor
The electrical on this conveyor will be done back to the control room switch gear.
The conveyor is supplied for site assembly.
Return roller guards included
The belting will be 440PIW 1/4" x 1/8" x 60" grade 2 Vulcanized splice Flame resistant belting

Generic Specification:
Kreator integral truss design.
The entire main frame of this system is an engineered to structurally withstand forces from X,Y,Z axis. This is not typical in the industry, as a conventional truss designs are engineered to withstand forces from X,Y axis and do an lesser job with the Z axis forces. During flex fatigue failure and catastrophic failure a truss assemble will twist prior to failure, prevent the twist prevent the failure.
Our side plates are laser cut and formed with a calculated corner radius to maximize the twisting resistance of the system
Having the side segments be in one piece 20' long and 30" deep allow us maximum flexibility the side plates have incremental hole spacing throughout the side, top and bottom for mounting idlers, e stop brackets, belt loops, hoods, electrical supports, impact beds, safety guarding, etc. This conveyor is designed so that any field fitting is a bolt on assembly, no expensive damaging

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field welding required.
The lateral and transverse members of the system are made up of 2" schedule 40 106B pipe with a standard Kreator designed bolted connection. The connection is jointed at the perfect junction to eliminate stress dissipation in the joints, but rather distribute the stress for load sharing.
The system can be purchased as a kit for field erection
Fits into sea containers and is limited on weight before volume like conventional truss assemblies
The majority of the components are interchangeable and reversible for ease of assembly
The design is engineered to ensure proper coating of the materials prior to assembly. This allows for a holiday free coating.
The standard coating is galvanized transverse and lateral supports, and optional painted or galvanized sides.
Our standard color is Orange, although we will paint it to your company color. (optional)
This truss system is engineered for applications in military bridging, municipal walkways due to its cosmetically pleasing appearance. Relieve bridging in catastrophic weather relieve, flood shoring, dynamic load supports, vertical static load supports. The system can be stacked vertically and horizontally to achieve any width and length.
Head section with walkways down both sides to stairs and stairs to grade.
Guarded both sides
440PIW 4 Ply belting ¼" x 1/8" Grade 2

Drive Calculations:
Typical to CC3

Two re-feed points that will sit over the 60" conveyor on (CC6,7,8)

Constructed of ¾" SA36 plate steel and 8" x 26 lbs. wide flange beam

Liner to be removable ¼" AR400 liner

Tapered opening in the bottom of the hopper to control the material discharge and prolong skirting life

System guarded to local standards

Painted orange and grey c/w yellow guarding

Follow through sides

Equipment No. CC9 - 60" x 1200' - 800fpm Horizontal Think System Channel Conveyor that will be directional from the stock pile area to the ship loader under the main barge transfer.

Specific Specification:
This conveyor will be mounted under the frame of the reversing conveyor and span from the coal storage area to the ship loader.
This conveyor will come complete with a fold or a slide (final decision will come out in the design)
The conveyor components will have 35 degree rollers.
The return rollers will be set on Kreator EZ slide mounts.
The conveyor will be galvanized.
The tail section will be a wing pulley c/w tail guard.
The head section will come complete with a martin QC1 belt scraper
The head section will come complete with a transition chute to the next conveyor
The electrical on this conveyor will be done back to the control room switch gear.
The conveyor is supplied for site assembly.
Return roller guards included
The belting will be 440PIW 1/4" x 1/8" x 60" grade 2 Vulcanized splice Flame resistant belting

Generic Specification:
Kreator integral truss design
The entire main frame of this system is an engineered to structurally withstand forces from X,Y,Z axis. This is not typical in the industry, as a conventional truss designs are engineered to withstand forces from X,Y axis and do an lesser job with the Z axis forces. During flex fatigue failure and catastrophic failure a truss assemble will twist prior to failure, prevent the twist prevent the failure.
Our side plates are laser cut and formed with a calculated corner radius to maximize the twisting resistance of the system
Having the side segments be in one piece 20' long and 36" deep allow us maximum flexibility the side plates have incremental hole spacing throughout the side, top and bottom for mounting idlers, e stop brackets, belt loops, hoods, electrical supports, impact beds, safety guarding, etc. This conveyor is designed so that any field fitting is a bolt on assembly, no expensive damaging field welding required.
The lateral and transverse members of the system are made up of 2" schedule 40 106B pipe with a standard Kreator designed bolted connection. The connection is jointed at the perfect junction to eliminate stress dissipation in the joints, but rather distribute the stress for load sharing.
The system can be purchased as a kit for field erection
Fits into sea containers and is limited on weight before volume like conventional truss assemblies
The majority of the components are interchangeable and reversible for ease of assembly
The design is engineered to ensure proper coating of the materials prior to assembly. This allows for a holiday free coating.
The standard coating is galvanized transverse and lateral supports, and optional painted or galvanized sides.
Our standard color is Orange, although we will paint it to your company color. (optional)
This truss system is engineered for applications in military bridging, municipal walkways due to its cosmetically pleasing appearance. Relieve bridging in catastrophic weather relieve, flood shoring, dynamic load supports, vertical static load supports. The system can be stacked vertically and horizontally to achieve any width and length.
Head section with walkways down both sides to stairs and stairs to grade.
Guarded both sides
440PIW 4 Ply belting ¼" x 1/8" Grade 2

Drive Calculations:

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CC9 directional conveyor from the far side of the stockpile area to the Ship loader

Material:

Coal Kreator

Repose:	38 deg
Surcharge:	25 deg
Density:	44 lb/ft³
Maximum Incline:	22

Location of Gtu:	600 from tail
Location of Drive:	1200 from tail

Inputs

Belt Width:	60 in
Belt Speed:	[illegible]
Capacity:	3025 tph
Length:	1200 ft
Lift:	25 ft
Incline:	1.19 %
TU Weight:	9619
Skirtboard:	10
Min temp:	32 F
# Plows:	1
# Scrapers:	1
% Belt PIW:	55 %
Belt Selection:	440 PIW
Idler Type:	85

Tension Summary

Te:	9746 lbs.
T-1:	14619 lbs
T-2:	4873 lbs.
T-t:	4746 lbs.
T-tu:	4809 lbs.
T-head:	14619 lbs.
StartTorque:	1069 ft*lb.
HP:	300 hp
Demand HP:	[illegible] hp
% Loaded:	92 %
Theoretical Capacity:	[illegible] tph

No shaft mount solution found

Pulley Information

Location	Pulley Diameter	Face Width	Shaft Diameter	Bearing Journal	Drive Journal	Shaft Length	Lagging	Wrap
Drive	[illegible]	63	5-15/16	4-15/16	None	0	Yes	180
Tail	12	63	4-15/16	3-15/16		87		180
Bend 1	16	63	4-7/16	3-7/16		87		90
Bend 2	16	63	4-7/16	3-7/16		87		90
TakeUp	12	63	4-15/16	3-15/16		87		180

Pulley design is based on CEMA standards. Contact pulley manufacturer for exact pulley design, dimensions and load capacity.

Bearing Information

	Bore Size	Type	Left Bearing	Qty	Right Bearing	Qty
Drive	4-15/16	Tapered Roller	RPB-415-4	1	ERPB-415-4	1
Tail	3-15/16	Tapered Roller	RPB-315-4	1	ERPB-315-4	1
Bend 1	3-7/16	Tapered Roller	RPB-307-4	1	ERPB-307-4	1
Bend 2	3-7/16	Tapered Roller	RPB-307-4	1	ERPB-307-4	1
TakeUp	3-15/16	Tapered Roller	RPB-315-4	1	ERPB-315-4	1

This solution is based on the use of PTS Components. Substitution of competitive product may result in reduced drive life and/or unsatisfactory performance.

CC10 & CC11 - Two (2) 60" x 60' Portable Feeders (Pit Portable)

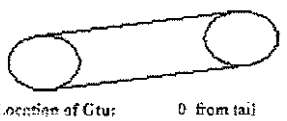
Drive Calculations:

CC10 + 11 Portable Feeders

Material:

Coal Kreator

Repose:	38 deg
Surcharge:	25 deg
Density:	44 lb/ft³
Maximum Incline:	22 lb/ft³



Location of Gtu:	0 from tail
Location of Drive:	60 from tail

Inputs

Belt Width:	60 in
Belt Speed:	[illegible]
Capacity:	3025 tph
Length:	60 ft
Lift:	12 ft
Incline:	11.54 %
TU Weight:	5442
Skirtboard:	10
Min temp:	32 F
# Plows:	1
# Scrapers:	1
% Belt PIW:	24 %

Tension Summary

Te:	3298 lbs.
T-1:	6220 lbs
T-2:	2922 lbs.
T-t:	2721 lbs.
T-tu:	2721 lbs.
T-head:	6220 lbs.
StartTorque:	264 ft*lb.
HP:	100 hp
Demand HP:	[illegible] hp
% Loaded:	92 %
Theoretical Capacity:	[illegible] tph

The success of this project will be based on a well understood scope between both parties.
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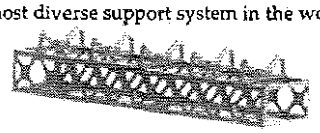


Belt Selection: 440 PIW Capacity:

Idler Type: E7

Reducer Information 286 RPM

Motor Type: Hostile Duty	Shaft mount reducer: 407SMTP05B	Driver Sheave: N/A	Belt Qty: 0
Motor RPM: 1750	Torque Arm Kit: 407TAP-HB	Driver Bushing: N/A	V-Belt Svc Factor: 1.3
Motor: HI00P2E	Shaft mount bushing: 407TBP215B	Driven Sheave: N/A	Reducer Svc Factor: Class 2 1.4 SF
Motor Base: MB407-415	Backstop: 407BSP	Driven Bushing: N/A	Mechanical SMTP HP: 184.196629
Motor Base Adapter: MMA407-415	Fan Kit: N/A	Belts: N/A	BG Mnt: N/A
Motor Base Support: MMS407H	Belt Guard: N/A		

Note 4; Belt guards are available from PTS, and are required by OSHA to be installed on all Belt drives.

Pulley Information

Location	Pulley Diameter	Face Width	Shaft Diameter	Bearing Journal	Drive Journal	Shaft Length	Lagging	Wrap
Drive	12	63	4-15/16	3-15/16	2-15/16	109	Yes	180
Tail	12	63	3-7/16	3-7/16		87		180

Pulley design is based on CEMA standards. Contact pulley manufacturer for exact pulley design, dimensions and load capacity.

Bearing Information

	Bore Size	Type	Left Bearing	Qty	Right Bearing	Qty
Drive	3-15/16	Tapered Roller	RPB-315-4	1	ERPB-315-4	1
Tail	3-7/16	Tapered Roller	RPB-307-4	1	ERPB-307-4	1

CC12 & CC13 - Two (2) 60" x 60' jump conveyors (Pit Portable) The system will have the switch gear and cables installed for four additional jump conveyors for future expansion. These are recommended to be purchased with the system to truly utilize the coal storage footprint.

Drive Calculations:
Typical to CC10 and CC11

CC14 & CC15 - Two (2) 60" x 125' stackers Truss Pit Portable

Drive Calculations:
Typical to CC3

Generic Specifications:
Kreator integral truss design.
The entire main frame of this system is an engineered to structurally withstand forces from X,Y,Z axis. This is not typical in the industry, as a conventional truss designs are engineered to withstand forces from X,Y axis and do an lesser job with the Z axis forces. During flex fatigue failure and catastrophic failure a truss assemble will twist prior to failure, prevent the twist prevent the failure.
Our side plates are laser cut and formed with a calculated corner radius to maximize the twisting resistance of the system
Having the side segments be in one piece 20' long and 30" deep allow us maximum flexibility the side plates have incremental hole spacing throughout the side, top and bottom for mounting idlers, e stop brackets, belt loops, hoods, electrical supports, impact beds, safety guarding, etc. This conveyor is designed so that any field fitting is a bolt on assembly, no expensive damaging field welding required.
The lateral and transverse members of the system are made up of 2" schedule 40 106B pipe with a standard Kreator designed bolted connection. The connection is jointed at the perfect junction to eliminate stress dissipation in the joints, but rather distribute the stress for load sharing.
The system can be purchased as a kit for field erection
Fits into sea containers and is limited on weight before volume like conventional truss assemblies
The majority of the components are interchangeable and reversible for ease of assembly
The design is engineered to ensure proper coating of the materials prior to assembly. This allows for a holiday free coating.
The standard coating is galvanized transverse and lateral supports, and optional painted or galvanized sides.
Our standard color is Orange, although we will paint it to your company color. (optional)
This truss system is engineered for applications in military bridging, municipal walkways due to its cosmetically pleasing appearance. Relieve bridging in catastrophic weather relieve, flood shoring, dynamic load supports, vertical static load supports. The system can be stacked vertically and horizontally to achieve any width and length.

The success of this project will be based on a well understood scope between both parties.
If anything is unclear please indicate what it is and we will send you and revision.
Thank you for the interest in our company.

The most diverse support system in the world!

Installation:
The existing conveyor would be removed by the Kreator. Conveyor must be in a Zero Energy State prior to Commencement of work.
Installation of all equipment listed above included

Civil Works:
Form and set rebar
Prepare for the pour
Manage the pour
Final finishing

Electrical:
All conveyors wired back to the control room
Installation of the cables
E stops
Switch gear and set up of the control room
The entire system with be equipped for a double light standard at most transfer points

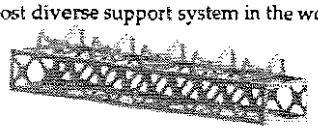
Control Room and Switch Gear Room:
Two level switch gear room
Sea Can assembly c/w stairs connecting the two
Air conditioning in both
Tower to have a captain's chair and storage
Stairs from the ground
Painted and decaled to match the installation

Conveyor Cross Overs (3) three units supplied:
Stairs up both sides with a walkway across for access

Wm. Keith Miles President & C.E.O.
647 234 7378 519 941 7876 519 941 6240
1 855 KREATOR (573 2867)

The success of this project will be based on a well understood scope between both parties.
If anything is unclear please indicate what it is and we will send you and revision.
Thank you for the interest in our company.

The most diverse support system in the world!



KREATOR Equipment & Services Inc. Standard Terms and Conditions of Sale

1. **OFFER AND ACCEPTANCE**. This order is accepted on and subject to the following terms and conditions. Seller's acceptance of any offer by Buyer to purchase the merchandise is expressly conditional upon the Buyer's assent to all of the terms and conditions herein, including any terms additional to or different from those contained in the offer to purchase. Seller hereby objects to any different or additional terms or conditions contained in any acceptance by Buyer of any offer made by Seller or in any other documents submitted by Buyer. If the merchandise set forth in the reverse hereof are being provided pursuant to a quotation in writing from Seller, the terms of such quotation shall apply to this sale as they differ from those general conditions of sale and, in all other respects, these general conditions of sale shall govern. The above applies even if Buyer previously submitted a purchase order or other document that limits acceptance by Seller to terms of that purchase order.

2. **TAXES**. Buyer shall pay all taxes and charges of any nature imposed by any federal, provincial, or local governmental authority by reason of the sale or delivery of the merchandise described herein whether levied or assessed against Seller, Buyer, or the merchandise. Such applicable taxes or charges, if not included in this invoice, shall be invoiced separately.

3. **LIMITATION OF LIABILITY AND REMEDY**. In no event, whether arising out of breach of contract, warranty or tort shall Seller be liable to Buyer, or to any third party, for any direct, indirect, consequential or incidental damages, including, but not limited to loss of profits or revenues, loss of use of equipment or services furnished by Seller, damage to associated equipment, costs of capital, substitute products, facilities, replacement power or down-time costs. Buyer assumes all other risks and liabilities for any loss, damage or injury to persons, property, or the environment arising from the use of the equipment. Buyer agrees to identify and hold Seller harmless from all claims, actions, suits, demands, and judgments arising from actions brought under the occupational safety and health act or other governmental regulations or laws. Buyer expressly agrees that the remedies granted to it hereunder are Buyer's sole and exclusive remedies with respect to any claim of Buyer arising under this Contract.

The liability of seller shall not, whether for breach of contract, breach of warranty or any other circumstances exceed the purchase price of the products furnished.

4. **TERMINATION**. Buyer may cancel its order only with the written consent of Seller and upon terms that will indemnify Seller for any loss, damage and expense arising from such cancellation. Seller may terminate this contract as a result of an act of force majeure as defined in Paragraph 8 hereof, and in such event, Seller shall have no further liability to produce or ship any equipment hereunder and shall have no liability for damages to Buyer or others. If Seller terminates this contract, other than as result of an act of force majeure, Seller's sole liability shall be to use reasonable efforts to obtain similar products from another source at a price not to exceed Seller's quoted price for the equipment.

5. **TECHNICAL ADVICE**. Seller's warranty shall not be enlarged, and no obligation or liability shall arise out of Seller's rendering of technical advice, in connection with Buyer's order of the equipment. Any technical advice furnished, or recommendation made by Seller or any employee or representative of Seller, concerning any use or application of any equipment or parts furnished under this Contract is believed to be reliable, but Seller makes no warranty, express or implied, of results to be obtained. Buyer shall assume all responsibility for loss or damage resulting from the handling or use of any such equipment or parts in accordance with such technical advice.

6. **ASSIGNMENT** Buyer shall not assign its rights or obligations under this Contract without Seller's prior written consent. Buyer shall not assert against any assignee of Seller of this Contract (or any part hereof) any claim or defense that it may have against Seller.

7. **GOVERNING LAW**. The validity, interpretation and performance of the terms and conditions of this Contract shall be governed and construed in accordance with the laws of the Province of Ontario, Canada.

8. **FORCE MAJEURE**. Seller does not assume the risk of and shall not be liable for failure to perform any obligation relating to the sale of the equipment caused by civil insurrection, war, fire, strike, labor stoppages or other labor disturbances, acts of God, acts or omission of Buyer, acts or omission of the Canadian Government, floods, epidemics, freight embargoes, shortages of fuel, energy or materials, failure of suppliers or subcontractors to satisfactorily meet scheduled deliveries, or any other cause beyond the control of Seller.

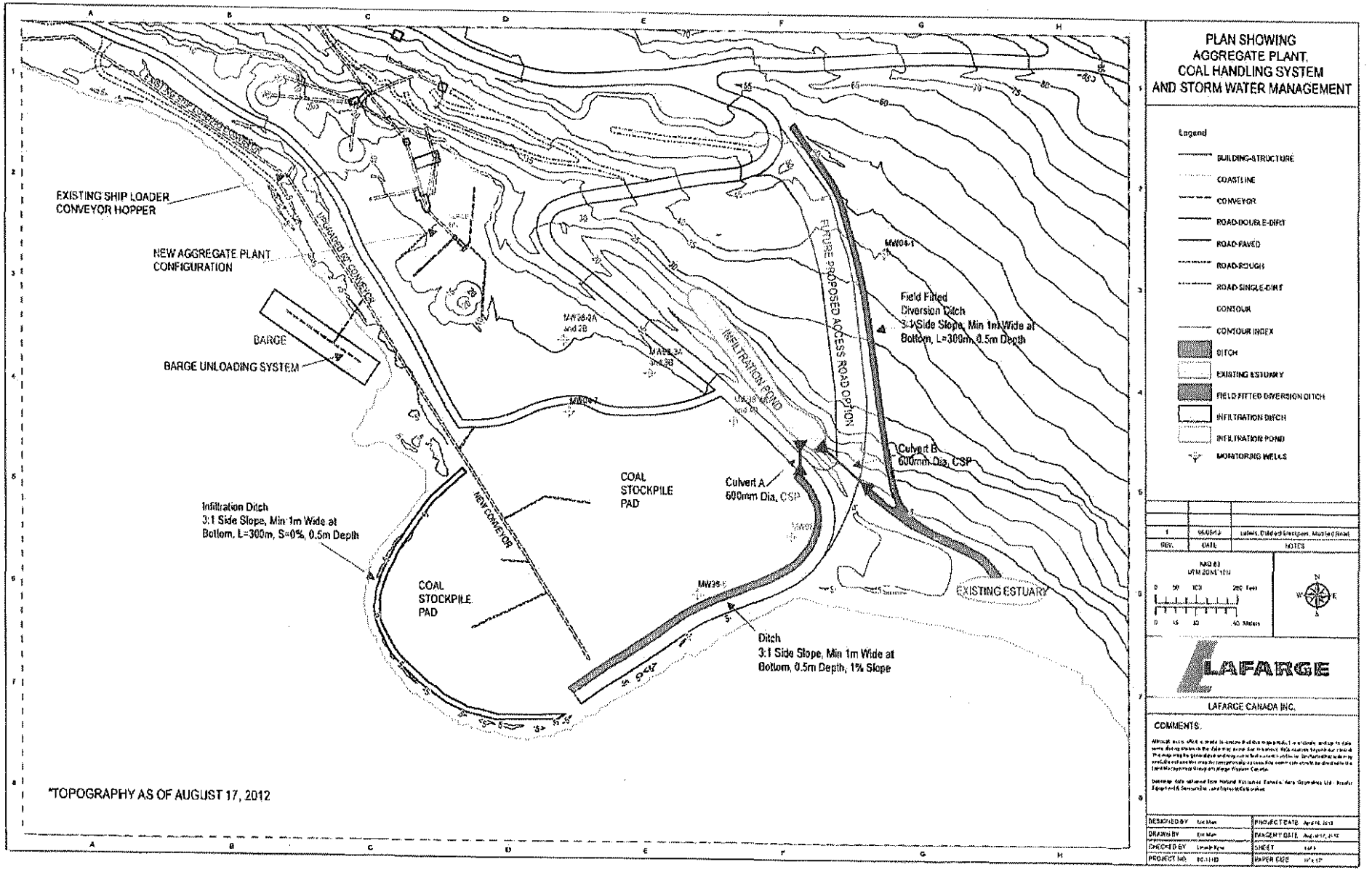
9. **TIME FOR CLAIMS**. Any action by Buyer based on a claim arising out of this Contract must be commenced within in year after the basis for such claim could reasonably have been discovered.

10. **ENTIRE AGREEMENT**. The terms set forth herein constitute the sole terms and conditions of the contract between Buyer and Seller. No other warranty term, condition or understanding, weather oral or written shall be binding upon Seller, unless hereafter made in writing and signed by Seller's authorized representative.

THANK YOU,

THE KREATOR Team

The success of this project will be based on a well understood scope between both parties.
If anything is unclear please indicate what it is and we will send you and revision.
Thank you for the interest in our company.


PLAN SHOWING
AGGREGATE PLANT,
COAL HANDLING SYSTEM
AND STORM WATER MANAGEMENT
Legend
BUILDING-STRUCTURE
COASTLINE
CONVEYOR
ROAD-DOUBLE-DIRT
ROAD-PAVED
ROAD-ROUGH
ROAD-SINGLE-DIRT
CONTOUR
CONTOUR INDEX
DITCH
EXISTING ESTUARY
FIELD FITTED DIVERSION DITCH
INFILTRATION DITCH
INFILTRATION POND
MONITORING WELLS
EXISTING SHIP LOADER CONVEYOR HOPPER
NEW AGGREGATE PLANT CONFIGURATION
BARGE
BARGE UNLOADING SYSTEM
Infiltration Ditch
3:1 Side Slope, Min 1m Wide at
Bottom, L=300m, S=0%, 0.5m Depth
COAL
STOCKPILE
PAD
COAL
STOCKPILE
PAD
NEW CONVEYOR
INFILTRATION POND
FUTURE PROPOSED ACCESS ROAD OPTION
Field Fitted
Diversion Ditch
3:1 Side Slope, Min 1m Wide at
Bottom, L=300m, 0.5m Depth
Culvert A
600mm Dia, CSP
Culvert B
600mm Dia, CSP
Ditch
3:1 Side Slope, Min 1m Wide at
Bottom, 0.5m Depth, 1% Slope
EXISTING ESTUARY
*TOPOGRAPHY AS OF AUGUST 17, 2012
LAFARGE
LAFARGE CANADA INC.
COMMENTS:

June 5, 1990 File: 14745-20

Ideal Cement Company Limited
P. O. Box 160
Vananda, B. C.
V0N 3K0

Attention: P. M. Stiles, General Manager

Dear Sir:

Re: Barge and Ship Loading Facilities
Texada Island

Following a referral to other agencies of the proposed use of the existing Texada Mine shipping facility for storing and loading out coal to Panamex size vessels, listed below are some of the requirements.

1. The loading of ships with coal shall be carried out in such a manner as to prevent coal from entering the water or foreshore.

2. Dust suppression equipment such as sprinkling systems to be available to prevent coal or dust from leaving the stockpile area.

3. A berm of limestone or similar material to be installed around the foreshore side of the stockpile with a clear strip being left between the berm and base of the coal stockpile.

Your attention to the aforementioned requirements will be appreciated.

Yours truly,

R. Bone, P. Eng.,
District Inspector of Mines and
Resident Engineer

RB\gp

Government of Canada / Gouvernement du Canada
Fisheries and Oceans / Pêches et Océans

Fisheries Branch
South Coast Division
3225 Stephenson Pt. Rd.
Nanaimo, B.C. V9T 1K3
(604) 756-7270
Fax (604) 758-9600

May 16, 1990

Mr. R. Bone, P. Eng.
Inspector of Mines
Ministry of Energy, Mines and Petroleum Resources
1 A 3411 Shenton Road
Namaimo, B.C.
V9T 2H1

Dear Sir:

RE; BARGE AND SHIP LOADING FACILITIES
IDEAL CEMENT-TEXADA ISLAND

The Department of Fisheries and Oceans reviewed your memo and accompanying letters from Ideal Cement reguarding the above subject and we have no objections to this proposal.

However we request that the following conditions be adhered to:

1: The loading of ships with coal shall be carried out in such a manner to prevent coal from entering the water or foreshore.

2: Dust suppresion equipment such as a sprinkling system should be available to prevent coal or dust from leaving the stockpile area.

Should you require any clarification please call the undersigned at 756-7266.

Yours truly,

B. Lawley

Barry Lawley
Habitat Technician

cc F.O. i/c Powell River

FILE NO.

To: All Vancouver Island Mine
Development Review Committee Members

May 10, 1990

File: 11000-01
204-20

Bob Bone, Eng. & Insp. Branch, Nanaimo
Eric Beresford, Eng. & Insp. Branch, Nanaimo
Jorge Alvarez, Eng. & Insp. Branch, Nanaimo
Paul Pashnik, MOF, Port Alberni
Ted Oldham, Waste Man. Branch, MOE, Nanaimo
Paul Wilton, Applied Geol. Branch, Victoria
Bill Hollingshead, Water Man. Branch, MOE, Nanaimo
Doug Morrison, Fish & Wildlife Branch, MOE, Nanaimo
Darcy Yule, MOF, Campbell River
Gerry Kaspryk, Pol. Analysis, MOAF, Victoria
Barry Lawley, Dept. of Fisheries & Oceans, Nanaimo
Keith Ferguson, Env. Prot. Service, Vancouver
Rik Simmons, MOP, Vancouver Island Region (Parks)
Doug Berry, Vancouver Island Region, MOCL, Victoria
Terry Pollock, Dept. of Highways

RE: Barge and Ship Loading Facilities - Ideal Cement, Texada Island

Please find attached letters from P.M. Stiles regarding transhipment of coal.

The stockpile area is within the mining Permit #M-66 still in existence for the underground mine belonging originally to Texada Mines. The permit does allow for the storing and handling of other products and is specifically stated in the conditions of the permit. However, would you please inform me if you have any comments regarding the proposal.

The loading facility originally handled copper and magnetite concentrates. If you can think of any conditions that may be appropriate please call. I will be requesting that a low-grade limestone berm be erected around the seaward side of the stockpile as a containment structure.

Your prompt reply will be appreciated.

Yours truly,

R. Bone, P. Eng.
Chairman
Vancouver Island MDRC

RB/km

enc.

Ideal Cement Company
Limited

P.O. Box 160
Vananda, British Columbia V0N 3K0
604 689-7627

IDEAL

May 8th, 1990

Mr. R. Bone
Inspector of Mines & Resident Engineer
Ministry of Energy, Mines, & Petroleum Resources
1A, 3411 Shenton Road
NANAIMO, B. C.
V9T 2H1

Re: Reclamation Permit No. M-66

Dear Sir:

I wish to make application under an existing reclamation permit - M-66 - to extend the terms of that permit to include the transhipment of coal. Coal will be received on barges, unloaded at the existing barge ramp and stockpiled. The stockpiled coal will be reclaimed and loaded on ships with the existing ship loader. Repairs of the dock structure, shiploader, and shore facilities are in progress.

The coal stockpile area has been covered with a layer of white limestone which will have three functions:-

1. to act as an indicator when reclaiming coal for shipment,
2. to act as an acid drainage neutralizer should there be any need,
3. to assist in clean-up after the coal handling has ceased. The mixture of limestone and coal remaining will be shipped to a cement plant.

The stockpile is situated on the former Texada Iron Mines tailings pile, more particularly on Lots 606 and 575. It is well removed from private dwellings and private property. The terms of the water lot allow for the "storing of other products as may be handled" hence allowing the handling of coal.

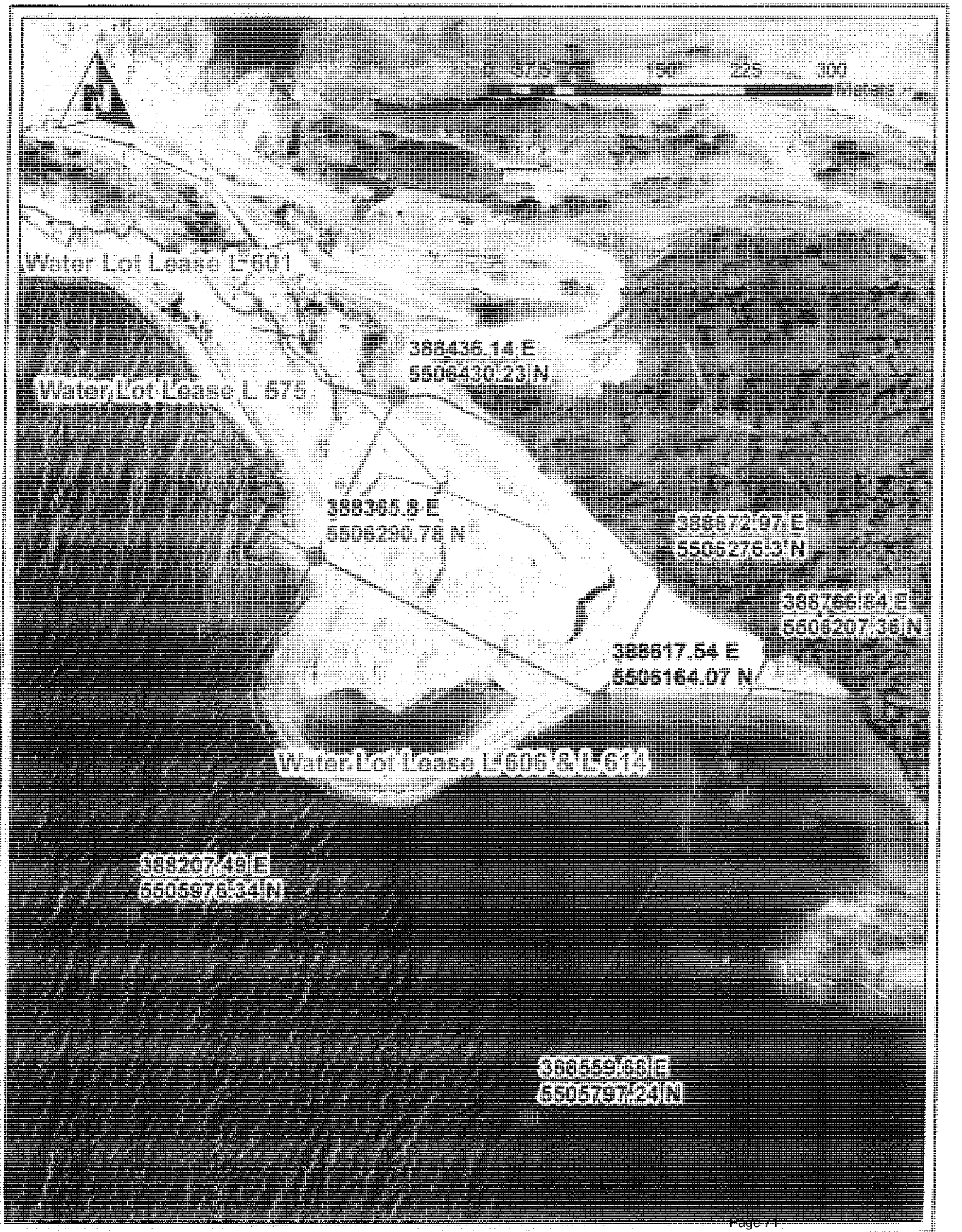
Your attention to this application will be much appreciated, particularly with the time constraints we find ourselves under.

Yours truly,
IDEAL CEMENT COMPANY LTD.

P. M. Stiles
General Manager

PMS:mcs

cc: Mr. R.W. McGinn
Chief Insp of Mines


N
0 37.5 75 150 225 300
Meters
Water Lot Lease L-601
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5506430.23 N
Water Lot Lease L-575
388365.8 E
5506290.78 N
388672.97 E
5506276.3 N
388766.84 E
5506207.36 N
388617.54 E
5506164.07 N
Water Lot Lease L-606 & L-614
388207.49 E
6505976.34 N
388559.68 E
6505797.24 N